

ENGINEERING GEOLOGY OF THE NORTHEAST CORRIDOR WASHINGTON, D. C., TO BOSTON, MASSACHUSETTS LOCATION OF EXCAVATIONS AND BORINGS THAT SERVE AS SOURCES OF ENGINEERING DATA

Prepared by the
United States Geological Survey
at the request of the
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SCALE 1:1 500 000

0 20 40 60 80 100 MILES
0 20 40 60 80 100 KILOMETERS

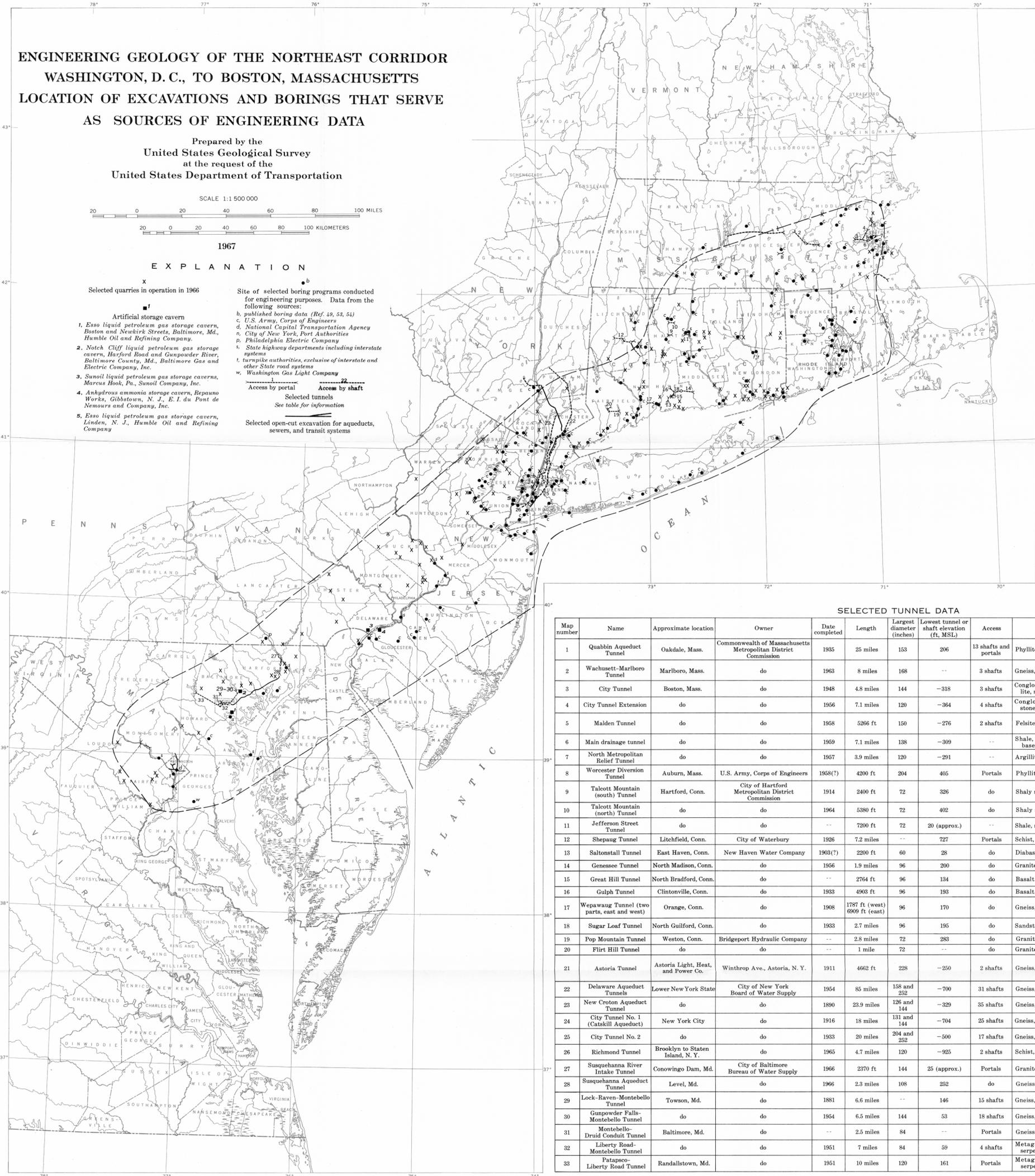
1967

EXPLANATION

Selected quarries in operation in 1966

Site of selected boring programs conducted for engineering purposes. Data from the following sources:

- a. Artificial storage cavern
- 1. Esso liquid petroleum gas storage cavern, Boston and Newkirk Streets, Baltimore, Md., Humble Oil and Refining Company.
- 2. Natch Cliffs liquid petroleum gas storage cavern, Harford Road and Gaspower River, Baltimore County, Md., Baltimore Gas and Electric Company, Inc.
- 3. Sanoil liquid petroleum gas storage caverns, Marcus Hook, Pa., Sanoil Company, Inc.
- 4. Anhydrous ammonia storage cavern, Repano Works, Gibbstown, N. J., E. I. du Pont de Nemours and Company, Inc.
- 5. Esso liquid petroleum gas storage cavern, Linden, N. J., Humble Oil and Refining Company.
- b. Published boring data (Ref. 49, 53, 54)
- c. U.S. Army, Corps of Engineers
- d. National Capital Transportation Agency
- e. City of New York, Port Authorities
- f. Philadelphia Electric Company
- g. State highway departments including interstate systems
- h. Turnpike authorities, exclusive of interstate and other State road systems
- i. Washington Gas Light Company
- Access by portal
- Access by shaft
- Selected tunnels
- See table for information
- Selected open-cut excavation for aqueducts, sewers, and transit systems



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SELECTED TUNNEL DATA

Map number	Name	Approximate location	Owner	Date completed	Length	Largest diameter (inches)	Lowest tunnel or shaft elevation (ft, MSL)	Access	Rock types	Remarks
1	Quabbin Aqueduct Tunnel	Oakdale, Mass.	Commonwealth of Massachusetts Metropolitan District Commission	1935	25 miles	153	206	13 shafts and portals	Phyllite, quartzite, schist, granite	1.9 percent timber support, 9.3 percent gunite reinforcement; ref. 11, 12
2	Wachusett-Marlboro Tunnel	Marlboro, Mass.	do	1963	8 miles	168	---	3 shafts	Gneiss, granite, schist	Encountered Clinchton Fault and 300 other faults of displacement greater than 16 feet; ref. 29
3	City Tunnel	Boston, Mass.	do	1948	4.8 miles	144	-318	3 shafts	Conglomerate, melophyre, argillite, sandstone, diabase, tuff	5.6 percent steel support mostly in altered argillite and dike rock; ref. 8
4	City Tunnel Extension	do	do	1956	7.1 miles	120	-364	4 shafts	Conglomerate, diabase, sandstone, argillite	52 percent steel support; excessive water; intersected Northern Boundary Fault; ref. 7
5	Malden Tunnel	do	do	1958	5266 ft	150	-276	2 shafts	Felsite, argillite, diabase	Shale altered to clay; 49 percent steel support; ref. 23, 26
6	Main drainage tunnel	do	do	1959	7.1 miles	138	-309	---	Shale, conglomerate, slate, diabase	Shale altered to clay; 49 percent steel support; ref. 23, 26
7	North Metropolitan Relief Tunnel	do	do	1957	3.9 miles	120	-291	---	Argillite, sandstone, diabase	Argillite altered to clay; 24 percent steel support
8	Worcester Diversion Tunnel	Auburn, Mass.	U.S. Army, Corps of Engineers	1958(?)	4200 ft	204	405	Portals	Phyllite, schist	
9	Talcott Mountain (south) Tunnel	Hartford, Conn.	City of Hartford Metropolitan District Commission	1914	2400 ft	72	326	do	Shaly sandstone, basalt	Excessive water from zone between base of basalt and top of sandstone
10	Talcott Mountain (north) Tunnel	do	do	1964	5380 ft	72	402	do	Shaly sandstone, basalt	
11	Jefferson Street Tunnel	do	do	---	7200 ft	72	20 (approx.)	---	Shale, sandstone, basalt	
12	Shepaug Tunnel	Litchfield, Conn.	City of Waterbury	1926	7.2 miles	---	727	Portals	Schist, diorite, gneiss, granite	Ref. 1
13	Saltonstall Tunnel	East Haven, Conn.	New Haven Water Company	1903(?)	2200 ft	60	28	do	Diabase, conglomerate	14 percent supported and concrete lined; ref. 24, 25
14	Genesee Tunnel	North Madison, Conn.	do	1956	1.9 miles	96	200	do	Granite, gneiss	17 percent steel supported and lined
15	Great Hill Tunnel	North Bradford, Conn.	do	---	2764 ft	96	134	do	Basalt	100 percent supported and lined, excessive scaling and stoping
16	Gulph Tunnel	Clintonville, Conn.	do	1933	4903 ft	96	133	do	Basalt, breccia, sandstone	34 percent supported and lined
17	Wepawaug Tunnel (two parts, east and west)	Orange, Conn.	do	1908	1787 ft (west) 6909 ft (east)	96	170	do	Gneiss, schist	100 percent supported and lined in west part, 64 percent supported and lined in east part
18	Sugar Loaf Tunnel	North Guilford, Conn.	do	1933	2.7 miles	96	195	do	Sandstone, siltstone	Excessive overbreak, sandstone clogged drills
19	Pop Mountain Tunnel	Weston, Conn.	Bridgeport Hydraulic Company	---	2.8 miles	72	283	do	Granite, gneiss	
20	Flirt Hill Tunnel	do	do	---	1 mile	72	---	do	Granite, fault gouge	Excessive water
21	Astoria Tunnel	Astoria Light, Heat, and Power Co.	Winthrop Ave., Astoria, N. Y.	1911	4662 ft	228	-250	2 shafts	Gneiss, dolomite	450-foot zone of decomposed rock, water flows 300 to 10,000 gallons per minute, water pressure head 95 psi; ref. 9
22	Delaware Aqueduct Tunnels	Lower New York State	City of New York Board of Water Supply	1954	85 miles	158 and 252	-700	31 shafts	Gneiss, schist, granite, limestone	"Popping rock" in Yonkers granite; ref. 16, 18, 19
23	New Croton Aqueduct Tunnel	do	do	1890	23.9 miles	126 and 144	-329	35 shafts	Gneiss, schist, granite, limestone	Wide fault zone at Harlem River crossing; ref. 14, 33
24	City Tunnel No. 1 (Catskill Aqueduct)	New York City	do	1916	18 miles	133 and 144	-704	25 shafts	Gneiss, schist, granite, limestone	Ref. 4, 5, 6, 14, 19, 27, 33
25	City Tunnel No. 2	do	do	1933	20 miles	204 and 252	-500	17 shafts	Gneiss, schist, granite, limestone	Ref. 5, 6, 17, 19, 27, 30
26	Richmond Tunnel	Brooklyn to Staten Island, N. Y.	do	1965	4.7 miles	120	-925	2 shafts	Schist, limestone	300 feet bored by machine, shaft site frozen before excavation; ref. 10, 31
27	Susquehanna River Intake Tunnel	Conowingo Dam, Md.	City of Baltimore Bureau of Water Supply	1966	2370 ft	144	25 (approx.)	Portals	Granite, gneiss	
28	Susquehanna Aqueduct Tunnel	Level, Md.	do	1966	2.3 miles	108	252	do	Gneiss, metagabbro	Excessive overbreak along joints; ref. 3
29	Lock-Raven-Montebello Tunnel	Towson, Md.	do	1881	6.6 miles	---	146	15 shafts	Gneiss, granite, quartzite	
30	Gaspower Falls-Montebello Tunnel	do	do	1964	6.5 miles	144	53	18 shafts	Gneiss, granite	
31	Montebello-Druid Conduit Tunnel	Baltimore, Md.	do	---	2.5 miles	84	---	Portals	Gneiss, schist, weathered rock	Broke into "quicksand" at Alameda and 33d St., Baltimore, Md.
32	Liberty Road-Montebello Tunnel	do	do	1951	7 miles	84	59	4 shafts	Metagabbro, gabbro, granite, serpentine, gneiss, schist	Ref. 2, 20
33	Liberty Road Tunnel	Randallstown, Md.	do	1951	10 miles	120	161	Portals	Metagabbro, gabbro, gneiss, serpentine	Ref. 20