B-79

Howard Street Tunnel & Power House, (Baltimore Belt Railroad, Baltimore & Ohio Railroad)

Architectural Survey File

This is the architectural survey file for this MIHP record. The survey file is organized reverse-chronological (that is, with the latest material on top). It contains all MIHP inventory forms, National Register nomination forms, determinations of eligibility (DOE) forms, and accompanying documentation such as photographs and maps.

Users should be aware that additional undigitized material about this property may be found in on-site architectural reports, copies of HABS/HAER or other documentation, drawings, and the “vertical files” at the MHT Library in Crownsville. The vertical files may include newspaper clippings, field notes, draft versions of forms and architectural reports, photographs, maps, and drawings. Researchers who need a thorough understanding of this property should plan to visit the MHT Library as part of their research project; look at the MHT web site (mht.maryland.gov) for details about how to make an appointment.

All material is property of the Maryland Historical Trust.

Last Updated: 03-10-2011
Form 10-300  UNITED STATES DEPARTMENT OF THE INTERIOR  NATIONAL PARK SERVICE
NATIONAL REGISTER OF HISTORIC PLACES  INVENTORY - NOMINATION FORM
(Type all entries - complete applicable sections)

1. NAME
COMMON: Howard Street Tunnel
AND OR HISTORIC:

2. LOCATION
STREET AND NUMBER:
Beneath Howard Street from Mt. Royal Station to Camden Station
CITY OR TOWN: Baltimore
STATE: Maryland
COUNTY: Baltimore City
ENTRY NUMBER: 210

3. CLASSIFICATION
CATEGORY (Check One)

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OWNERSHIP

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ACCESSIBLE TO THE PUBLIC

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<th>Unrestricted</th>
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PRESENT USE (Check One or More as Appropriate)

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<table>
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<th>Transportation</th>
<th>Other (Specify): tunnel</th>
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4. OWNER OF PROPERTY
OWNER'S NAME:
Baltimore & Ohio and Chesapeake & Ohio Railroad Companies
STREET AND NUMBER:
Baltimore and Charles Streets
CITY OR TOWN: Baltimore
STATE: Maryland

5. LOCATION OF LEGAL DESCRIPTION
COURTHOUSE REGISTER OF DEEDS, ETC.
Baltimore City Courthouse
STREET AND NUMBER:
St. Paul and Fayette Streets
CITY OR TOWN: Baltimore
STATE: Maryland

5. LOCATION OF LEGAL DESCRIPTION
COURTHOUSE REGISTER OF DEEDS, ETC.
Baltimore City Courthouse
STREET AND NUMBER:
St. Paul and Fayette Streets
CITY OR TOWN: Baltimore
STATE: Maryland

6. REPRESENTATION IN EXISTING SURVEYS
TITLE OF SURVEY:
Maryland Register of Historic Sites and Landmarks
DATE OF SURVEY: 1970

DEPOSITORY FOR SURVEY RECORDS:
Maryland Historical Trust
STREET AND NUMBER:
2525 Riva Road
CITY OR TOWN: Annapolis
STATE: Maryland
ENTRY NUMBER: 10
The Howard Street Tunnel provides cover for an underground rail connection beneath Howard Street in downtown Baltimore between the Mount Royal and Camden Stations of the Baltimore and Ohio Railroad. The tunnel is 7,341 feet long, 21 feet 3 inches at extreme height, 27 feet wide, and averages between 50 and 65 feet below the pavement. It is built of brick with iron-ring centerings shaped in an arch. The flooring is a flat reverse arch which provides additional strength to the walls. The tunnel has a grade of 0.8 degrees which allows the southbound trains to coast from Mount Royal Station to Camden Station.

The tunnel was constructed beneath one of Baltimore's busiest streets; through relatively soft gravel with the everpresent threat of water seepage, hidden underground streams and patches of quicksand. The City of Baltimore placed restrictions on the construction which limited the length of uncompleted tunnel sections and insisted that no uncompleted sections be contiguous. The City's fears proved groundless, for no buildings were injured by the tunnel construction. Even the street car line remained undisturbed.

The tunnel is still in use.
The Howard Street Tunnel is a monument in the history of American engineering. The construction of a 7,341-foot tunnel through soft ground under a busy street, and the innovational use of electricity for illumination and for powering the tunnel locomotives, represent an outstanding accomplishment for its time.

The Baltimore Belt Railroad, chartered in 1888, built the Howard Street Tunnel. The seven-mile-long railroad connected the main branch of the Baltimore and Ohio Railroad that extends westward with its Philadelphia branch. Previously, trains had taken a circuitous route around Baltimore, which included ferrying all trains across the Patapsco River. Two decades earlier, the Pennsylvania Railroad had constructed tracks directly through Baltimore. In order for the B & O to remain competitive with the Pennsylvania company, the Baltimore Belt Railroad was built. The growth of the city eliminated the possibility of an above-ground track, necessitating the construction of a tunnel.

Samuel Raw was the Chief Engineer of the tunnel. A native of Pennsylvania, he previously had worked on the New York tunnel extension of the Pennsylvania Railroad and on the Hell Gate Bridge of the New York Connecting Railroad.

Construction of the tunnel began in 1890. On May 1, 1895, the first passenger train passed through it.

The power for the locomotives moving the trains through the tunnel was provided by electricity—a novel idea in the 1890's as electricity was then only beginning to be used by railroads. The General Electric Company designed electric locomotives especially for the Howard Street Tunnel, and an electric power station was built on the Camden Station yard to power them. The electricity that provided the illumination for the tunnel was another innovative achievement.
9. MAJOR BIBLIOGRAPHICAL REFERENCES

"The Baltimore Belt Railroad." Engineering News. XXVI (December 12, 1891), 557-559; (December 19, 1891), 585-587.


10. GEOGRAPHICAL DATA

LATITUDE AND LONGITUDE COORDINATES

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<td>39° 18' 17&quot;</td>
<td>76° 37' 13.5&quot;</td>
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<tr>
<td>SE</td>
<td>39° 17' 07&quot;</td>
<td>76° 37' 9.5&quot;</td>
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<tr>
<td>SW</td>
<td>39° 17' 07&quot;</td>
<td>76° 37' 11&quot;</td>
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APPROXIMATE ACREAGE OF NOMINATED PROPERTY:

THREE

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

<table>
<thead>
<tr>
<th>STATE:</th>
<th>CODE</th>
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11. FORM PREPARED BY

NAME AND TITLE: Nancy Miller, Historian

ORGANIZATION: Maryland Historical Trust

STREET AND NUMBER: 2525 Riva Road

CITY OR TOWN: Annapolis

12. STATE LIASON OFFICER CERTIFICATION

As the designated State Liaison Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby designate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service. The recommended level of significance of this nomination is:

Name: Orlando Ridout IV
Title: State Liaison Officer for Maryland
Date: August 21, 1972

I hereby certify that this property is included in the National Register.

Chief, Office of Archeology and Historic Preservation

ATTEST:

Keeper of The National Register

DATE: August 21, 1972
**NATIONAL REGISTER OF HISTORIC PLACES**

**PROPERTY MAP FORM**

*Type all entries - attach to or enclose with map*

---

### 1. NAME

**COMMON:** Howard Street Tunnel  
**AND/OR HISTORIC:**

### 2. LOCATION

**STREET AND NUMBER:** Beneath Howard Street from Mt. Royal Station to Camden Station  
**CITY OR TOWN:** Baltimore  
**STATE:** Maryland  
**CODE:** 24  
**COUNTY:** Baltimore City  
**CODE:** 510

### 3. MAP REFERENCE

**SOURCE:** USGS 7.5 minute map; Baltimore East quadrangle  
**SCALE:** 1: 24 000  
**DATE:** photorevised 1966

### 4. REQUIREMENTS

*TO BE INCLUDED ON ALL MAPS*

1. Property boundaries where required.  
2. North arrow.  
3. Latitude and longitude reference.

---
1. NAME
COMMON: Howard Tunnel

2. LOCATION
STREET AND NUMBER: Beneath Howard Street from Mt. Royal Station to Camden Station
CITY OR TOWN: Baltimore
STATE: Maryland

3. PHOTO REFERENCE
PHOTO CREDIT: Mark Adams
DATE OF PHOTO: 1969
NEGATIVE FILED AT: City Hall, Baltimore, Maryland 21202
Commission for Historical & Architectural Preservation, 402

4. IDENTIFICATION
DESCRIBE VIEW, DIRECTION, ETC.
north entrance to the tunnel
1. NAME

HISTORIC

Baltimore Belt (Baltimore and Ohio) Railroad

AND/OR COMMON

Howard Street Tunnel and Power House (Belt Railroad, Baltimore)

2. LOCATION

STREET & NUMBER

Tunnel beneath Howard Street from Mt. Royal Station to Camden Station - Power House - Bet. Montgomery and Henrietta west side of Howard

CITY, TOWN

Baltimore

VICINITY OF

Seventh

STATE

Maryland

CODE

24

3. CLASSIFICATION

CATEGORY

LOCATION OF LEGAL DESCRIPTION

COURTHOUSE, REGISTRY OF DEEDS, ETC.

Baltimore City Courthouse

STREET & NUMBER

Calvert and Lexington Streets

CITY, TOWN

Baltimore

STATE

Maryland

DATE

1970

DEPOSITORY FOR SURVEY RECORDS

Maryland Historical Trust

CITY, TOWN

Annapolis

STATE

Maryland

4. OWNER OF PROPERTY

NAME

Baltimore & Ohio and Chesapeake & Ohio Railroad Companies

STREET & NUMBER

Baltimore and Charles Streets

CITY, TOWN

Baltimore

STATE

Maryland

5. REPRESENTATION IN EXISTING SURVEYS

TITLE

Maryland Register of Historic Sites and Landmarks

DATE

1970

DEPOSITORY FOR SURVEY RECORDS

Maryland Historical Trust

CITY, TOWN

Annapolis

STATE

Maryland
MAJOR BIBLIOGRAPHICAL REFERENCES

"The Baltimore Belt Railroad," Engineering News. XXVI (December 12, 1891), 557-559; (December 19, 1891), 585-587.
See continuation sheet #4

GEOGRAPHICAL DATA

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UTM REFERENCES

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<td>197</td>
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<tr>
<td>D</td>
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VERBAL BOUNDARY DESCRIPTION

Two non-continuous structures, the Howard Street Tunnel and the Belt Railroad powerhouse form the site; the boundaries of the site are the physical dimensions of these two structures.

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

<table>
<thead>
<tr>
<th>STATE CODE</th>
<th>COUNTY CODE</th>
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FORM PREPARED BY

Nancy Miller, Historian/revised Steven Levy Nov. 1976

ORGANIZATION
Maryland Historical Trust

STREET & NUMBER
21 State Circle

CITY OR TOWN
Annapolis

STATE
Maryland

21401

STATE HISTORIC PRESERVATION OFFICER CERTIFICATION

THE EVALUATED SIGNIFICANCE OF THIS PROPERTY WITHIN THE STATE IS:

<table>
<thead>
<tr>
<th>NATIONAL</th>
<th>STATE</th>
<th>LOCAL</th>
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As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

STATE HISTORIC PRESERVATION OFFICER SIGNATURE

TITLE

DATE

FOR NPS USE ONLY

I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION

ATTEST:

KEEPER OF THE NATIONAL REGISTER

DATE

DATE

DATE
The Howard Street Tunnel provides for an underground rail connection beneath Howard Street between the Mount Royal and Camden Stations of the Baltimore and Ohio Railroad. The tunnel measures 7,341 feet in length and 21 feet in height and 29 feet in width, and is placed between 50 and 65 feet below grade. Fifty-nine hundred feet of the side walls are constructed of brick; the remainder of the side walls and the portals are built of cut stone. Iron rings shaped to conform to the tunnel arch were used as centerings in the construction of the structure. The roof is shaped in an inverted arch and the flooring is a flat reverse arch providing additional strength to the side walls. Originally housing a double track, the tunnel now contains a single track, built at an 0.8% upgrade from Camden Station, and is still in use today.

Located adjacent to the line near South Howard between Montgomery and Henrietta Streets, the Belt Railroad Powerhouse originally housed the generators which powered the General Electric locomotives used to tow northbound trains through the tunnel. The powerhouse was originally fitted with five E.P. Allis 500 KW engine-generators plus several lighting dynamos.

The Powerhouse is an exceptionally tall, one-story L-shaped brick building with a slate gable roof. There are pent roofs extending the length of the north and south gable ends. The building is 21 bays from north to south. The bulk of the structure is two bays wide, except for the southern end which is three bays wide. This section originally housed the generator's boilers. The north west corner of the building appears to have been truncated. The building has a simple brick cornice and a stepped brick watertable. The windows and doorways have brick relieving arches. Each bay is enclosed by a set of brick piers on either side. Above, they are enclosed by corbelling.

In 1914, the building ceased to be used as a powerhouse. It was then converted into a car and locomotive shop. Since circa 1971, the building has stood vacant. The interior space is unpartitioned, and is open to the steel roof trussing. The floor is covered with wooden planking and contains a work pit.

The north end of the building, especially the roof and trussing has been damaged by fire. The doors, most of the windows and the north end of the roof are open to the elements. There is a modern, one-story, rectangular cinder block addition built onto the western side of the building. It is six bays long, one bay wide and flat roofed.
The Howard Street Tunnel is a monument in the history of American engineering. The construction of a 7,341-foot tunnel through soft ground under a busy street, and the innovational use of electricity for illumination and for powering the tunnel locomotives, represent an outstanding accomplishment for its time.

"When the Baltimore & Ohio's Philadelphia Branch from Baltimore to Philadelphia (and by affiliated lines to Jersey City) was completed in 1886, there was no rail connection between it and the railroad's main lines from the south and west terminating at Camden Station, Baltimore. All freight and passenger business through Baltimore was carried by ferry across the harbor between Locust Point and Canton, with enormous inconvenience and delay.

To connect these two elements of its system, the B & O constructed the Baltimore Belt Railroad, extending about eight miles from Bay View Junction (Orangeville) in northeast Baltimore, along the (then) northern edge of the city to Camden Station downtown. The project included eight minor tunnels carrying the double-track line under principal thoroughfares, and the Howard Street Tunnel. This, the last completed, was a major work -- among the longest soft-ground tunnels in the U.S. at the time. It extended from Mount Royal Station, the railroad's new uptown depot and part of the scheme, south to Camden Station."  

"The growth of the city had eliminated the possibility of an above ground track, necessitating the building of a tunnel. Constructed in soft ground using the 'German Method' with small side drifts, a top drift, and then opened up to full bore, no shield or compressed air was used. The tunnel, the largest of 176 tunnels on the Chessie system (Baltimore & Ohio, Chesapeake & Ohio, Western Maryland) was worked from the ends and several intermediate shafts. In the course of the work the Baltimore City College at Centre Street was undermined, and completely rebuilt by the contractor."

See continuation sheet #2
Description (continued)

Material for description taken from "Some Industrial Archaeology of the Monumental city and Environs" (Society for Industrial Archaeology, Robert Vogel, Editor, 1975) and National Register for Historic Places Nomination June 2, 1973, for the Howard Street Tunnel, by Nancy Miller, Historian for the Maryland Historical Trust.
Statement of Significance (continued)

"The tunnel was constructed beneath one of Baltimore's busiest streets; through relatively soft gravel with the everpresent threat of water seepage, hidden underground streams and patches of quicksand. The City of Baltimore placed restrictions on the construction which limited the length of uncompleted tunnel sections and insisted that no uncompleted sections be contiguous. The city's fears proved groundless, for no buildings were injured by the tunnel construction. Even the street car line remained undisturbed."  

"Significantly, it was decided to employ electric traction on the 'Belt Line', imperative because the Howard Street tunnel's length and the commercial area above it made it impossible to ventilate. Worse, the entire line, including the tunnel, was on an 0.8% upgrade from Camden Station; had steam locomotives been used, they would have been working heavily and smokily on northbound trains.

This was the world's first application of electric traction in mainline railroad service. Northbound trains were towed, their locomotives dead, by heavy General Electric locomotives, designed by the Company especially for the Howard Street Tunnel. Five E.P. Allis 500 KW engine-generators housed in a powerhouse erected for that purpose powered the locomotives. Southbound trains were able to coast down to Camden. Several dynamos also located in the powerhouse provided illumination for the tunnel another innovative achievement."

"Samuel Rea was the Chief Engineer of the tunnel. A native of Pennsylvania, he previously had worked on the New York tunnel extension of the Pennsylvania Railroad and on the Hell Gate Bridge of the New York Connecting Railroad.

Construction of the tunnel began in 1890. On May 1, 1895, the first passenger train passed through it."

See continuation sheet #3
Statement of Significance (continued)

1 National Register for Historical Places Nomination for the Howard Street Tunnel June 2, 1973, Nancy Miller, Historian, Maryland Historical Trust.

2 "Some Industrial Archaeology of the Monumental City and Environos" (Society for Industrial Archaeology, Robert Vogel, Editor, 1975)

3 Ibid

4 Miller

5 Vogel

6 Miller

MAJOR BIBLIOGRAPHICAL REFERENCES (continued)


"Some Industrial Archaeology of the Monumental City and Environos" (Society for Industrial Archaeology) Robert Vogel, Editor, 1975.

Baltimore Belt Railroad
U.S.G.S. 7.5' Baltimore East
1:2000 UTM A 18 360450 4351970
H 18 360080 4387900
C 18 360070 438780
D 18 360090 4351970
Howard Street Tunnel
Baltimore, Maryland
B-79
Howard Street Tunnel
Baltimore, Maryland

COMMISSION FOR HISTORICAL AND ARCHITECTURAL PRESERVATION
402 CITY HALL
BALTIMORE, MD. 21202

1969 Photo Credit Mark Adams
B-79
Baltimore Belt Railroad Powerhouse (site)
Mark R. Edwards
Negative on file at MHF