

# NEW YORK TRANSIT MUSEUM

The New York Transit Museum  
Archives

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Finding Aid for

## **Eugene Casey Tunneling Collection Accession # 1996.1001**

### **SUMMARY INFORMATION**

**CREATOR:** Eugene F. Casey

**TITLE:** Eugene Casey Tunneling Collection

**INCLUSIVE DATES:** 1903-1990

**BULK DATES:** 1912-1921, 1969-1980s

**QUANTITY:** Includes 533 photographs, 15 drawings and cartoons, 34 bound reports and documents, approximately 110 articles, pamphlets, and reports.

**ABSTRACT:** The Eugene Casey Tunneling Collection contains documents reflecting the history of tunneling in North America and the World. The collection contains documents pertaining to tunnel methods for construction, early subway construction photographs, the 63<sup>rd</sup> Street Tunnel, and over one hundred photographs documenting the Hudson & Manhattan Railroad Tube from 1912, and most notably contains records regarding the construction of the Holland Tunnel, including signed reports by Clifford Milburn Holland.

## **ADMINISTRATIVE INFORMATION**

ACCESS RESTRICTIONS:	Access is based on archivist discretion
ACQUISITION:	Gift of Eugene F. Casey
COPYRIGHT:	Use of certain material in the collection may need copyright to be acquired from creating agencies.
PREFERRED CITATION:	Item, folder, box, accession #, collection title, New York Transit Museum Archives, New York Transit Museum
PROCESSING INFORMATION:	Finding aid prepared by Desiree Alden (updated from old finding aid written by Kathleen Collins)

## **HISTORICAL NOTE/BIOGRAPHICAL NOTE**

### **Subway Tunnels in New York City**

Early underwater subway tunnels (with the exception of the Harlem Tunnel; also referred to as the 149<sup>th</sup> Street Tunnel, which used a sub aqueous tunnel method) were built by using a tunneling shield method in concurrence with a compressed air system. These underwater tunnels were excavated by laborers known as ‘sandhogs’ and the job was considered one of the most dangerous construction types for the building of the subways. The two biggest dangers of the position included the possibility of Caissons Disease, more commonly known as ‘the bends’, as well as the danger of working underground in a compressed air system where the tunneling structure could be unstable, causing what would be referred to as blowouts.

The majority of subway tunnels were built largely in part during what was referred to as the Dual Contracts Era from the 1910s-1920s. The Dual Contracts provided extensions, additions, and rehabilitation of lines for the then privately owned Interborough Rapid Transit Company and the Brooklyn Rapid Transit Company. These extensions saw the building of the Montague Street Tunnel, 60<sup>th</sup> Street Tunnel, Lexington Avenue Tunnel, 14<sup>th</sup> Street Tunnel, Clark Street Tunnel, and the purchase of the preexisting Steinway Tunnel. The next big wave of tunnel construction for the subways took place in the 1930s when the City of New York began running their own subway system known as the Independent System. The creation of another competing subway in New York led to the building of the Cranberry Street Tunnel, Rutgers Street Tunnel, 53<sup>rd</sup> Street Tunnel, and the Concourse Tunnel.

The last tunnel to be built for the New York subway system was the 63<sup>rd</sup> Street Tunnel which was originally done to enable New York City Transit and the Long Island Railroad east side access between Manhattan and Queens. The tunnel was built using an immersed tube tunneling method which allows sections of the tunnel to be created off site then later moved and

sunk into place. The tunnel was created as a 2 level and 4 track tunnel with subway service on the upper level and Long Island Rail Road service on the lower level. Construction for the tunnel began in 1969 but was put on hold during the fiscal crisis New York City suffered in the 1970s. The tunnel eventually would partially open for subway service in 1989 and full subway service in 2001. The lower level is still not in use but construction has resumed on the East Side Access Project to connect Long Island Rail Road commuter trains to Grand Central Terminal which is projected to be completed sometime around 2015.

### **Railroad Tunnels in New York City**

The planning and construction of the Hudson River Tunnels, now referred to as the Hudson Tubes, began as early as 1874 but due to costly accidents, legal issues, and loss of financial backing the project was abandoned in 1882. After many attempts to build the tunnels, construction finally began again in 1902 and would see to the completion of the Trans Hudson Tubes. The original tubes known as the uptown tubes “Hoboken-Morton Tunnels“ would open in 1908 and a year later the downtown tubes “Montgomery-Cortlandt Tunnels“ would open for service. The Hudson Tubes would be the first transportation tunnel under a major river. The building of the Hudson Tubes incorporated sub aqueous tunneling methods, tubular cast iron construction, and cut and cover construction. The Tubes created by the Hudson & Manhattan Railroad Company are currently operated by the Port Authority Trans-Hudson Corporation (PATH) since their takeover in 1962.

The East River Tunnels and the North River Tunnels that served the Pennsylvania Railroad opened in 1910. The East River Tunnels would run from Pennsylvania Station in Manhattan to Long Island City in Queens allowing for the Pennsylvania Railroad Company access to a newly created Sunnyside Yards. Long Island Railroad was also a subsidiary of the Pennsylvania Railroad and the tunnels provided their only access from Queens into Manhattan. The North River Tunnels provide direct access between New Jersey and the newly built Pennsylvania Station in Manhattan. The tunnels were built by using a tunneling shield method in concurrence with a compressed air system. The Tunnels ownership would become under the jurisdiction of Penn Central in 1968 and Amtrak in 1976. The East and North River Tunnels are currently used as part of Amtrak’s Northeast and Empire Corridors, by New Jersey Transit, and by Long Island Railroad.

### **Vehicular Tunnels in New York City**

The Holland Tunnel (originally referred to as the Hudson River Vehicular Tunnel) was the first vehicular tunnel to be built in New York, and the first to create an innovative transverse ventilation design. In 1920 the construction of the tunnel was awarded to Clifford M. Holland. The tunnel was constructed using the tunnel shield method and the tunnel consisted of a pair of tubes each containing two lanes for traffic. In October of 1924 Clifford M. Holland died and the Tunnel was aptly named for its original chief engineer. Holland was succeeded by Milton H. Freeman, who died of pneumonia in March 1925. Ole Singstad would become the chief engineer of the tunnel and create the innovative ventilation design of the tunnel. The Holland Tunnel would open to vehicular traffic in 1927.

The Lincoln Tunnel (originally referred to as the Midtown Hudson Tunnel) originally started under the New Deal's Public Works Administration and designed by chief engineer Ole Singstad who previously helped to build the Holland Tunnel. Construction began on the first tube (center tube) in 1934 and was completed in 1937. The construction of the second tube (north tube) stopped in 1938 and due to WWII was not completed until 1945. Originally the tunnel was designed to only have two tubes, but a third would be proposed, eventually the third tube (south tube) was opened in 1957.

The Queens Midtown Tunnel and the Brooklyn-Battery Tunnel were also designed by engineer Ole Singstad. Both tunnels would use the tunneling shield method in concurrence with a compressed air system. The Queens Midtown Tunnel would start construction in 1936 amid political riffs between Mayor LaGuardia and Robert Moses. In 1938, Mayor LaGuardia ran out of funds and eventually would have to go to Robert Moses to fund the two East River vehicular tunnels. The Queens Midtown Tunnel would be completed in 1940 before LaGuardia's New York City Tunnel Authority and Moses' Triborough Bridge Authority merged into the Triborough Bridge and Tunnel Authority in 1946. During this merger the Brooklyn-Battery Tunnel was under construction, having started in 1940 but halted during WWII. When Moses took over the building of the tunnel in 1946 he fired Ole Singstad and replaced design features for the tunnel walls. This design caused leaks in the tunnel and eventually Singstad's design was used. The Brooklyn-Battery tunnel opened in 1950 and is still the longest continuous underwater vehicular tunnel in North America.

### **Eugene F. Casey**

Eugene F. Casey was a civil engineer who worked on several major projects for the Transit Authority including the 63<sup>rd</sup> Street Tunnel Connector.

The Eugene Casey Tunneling Collection was donated to the New York Transit Museum Archives in 1996.

## SCOPE AND CONTENT NOTE

Notable items from this collection include hundreds of early subway construction photographs, original reports and documents pertaining to the Holland Tunnel signed by Holland himself, an early photograph of the “10-Car Train No. 3998”, Red Hook Interceptor Tunnel documents, and an original hand-drawn diagram of a “hospital lock.” Also very significant are two document boxes containing over one hundred photographs of the construction of the Hudson & Manhattan Railroad Tube from 1912. It is thought that these are the only photographs of this subject in existence, assuming that all others were destroyed in the Port Authority Archives at the World Trade Center.

Casey’s collection, when received by the Archives in at least 11 cubic foot storage boxes, appeared to be in no logical order. It was an extensive assortment of photographs & slides, publications, clippings, reports, engineering drawings, prints, and personal papers reflecting a well rounded history of tunneling and construction methods in North America and in the world. Rather than leave the collection “in situ,” it was necessary to arrange the material into a workable system for future research purposes.

The collection has been divided into four series:

Series 1: *Photographs* – arranged by subway route then by subject (some photographs remain with the document series if attached to documents)

Series 2: *Slides* – arranged by subject in 3 ring binders

Series 3: *Documents* – arranged by subject then chronologically in document boxes

Series 4: *Oversized Drawings and Prints* – arranged by type of medium and format in oversized boxes.

## BOX, LOCATION, AND FOLDER LISTING

<b>Box no. and Location</b>	<b>Description</b>
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### **1: PHOTOGRAPHS – 2 BWAY, ROW 4, UNIT D, SHELF 6**

#### **Box 1**

##### **Routes**

Contract #2, Joralemon Tunnel, 1903-1908, 1915 (2 folders)

Route 4 & 36, Section 2: 1915

Route 4 & 38, Section 1: 1916-1917

Route 4 & 38, Section 2: 1915-1916

Route 4 & 38, Section 4: 1914, 1918

Route 4 & 38, Section 5: 1914

Route 4 & 38, Section 6: 1914

Route 5, Section 1A: 1913, 1915, 1919

Route 5, Section 2: 1912, 1915, 1917

Route 5, Section 2A: 1912-1913

Route 5, Section 3: 1913

Route 5, Section 4: 1914  
Route 5, Section 8: 1912-1913  
Route 5, Section 9: 1912-1914  
Route 5, Section 10: 1913  
Route 5, Section 11: 1912-1914  
Route 5, Section 12: 1917  
Route 5, Section 13: 1913, 1918  
Route 5, Section 14: 1913 (2 folders)  
Route 5, Section Unknown: ca. 1913

## **Box 2**

### **Routes**

Route 8, Section 1: 1917, 1918, 1920  
Route 8, Section 2: 1921  
Route 11A, Section 1: 1910  
Route 11B, Section 1: 1913  
Route 11B, Section 2: 1913  
Route 12, Section 1: 1917  
Route 12, Section 2: 1918-1919  
Route 33, Section 2: 1917  
Route 33, Section 3: 1917-1918  
Route 43, Section 1: 1914-1915  
Route 48, Section 2: 1915  
Route 48, Section 3: 1915  
Route 61: 1916, 1918  
Route 101, Section 1: 1928-1930  
Route 101, Section 4: 1927  
Route 101, Section 5: 1927, 1929  
Route 101, Section 6: 1937-1939 (5 folders)  
Route 101, Section 9: 1937

## **Box 3**

### **Routes**

Route 101, Section 12: 1961-1965 (3 folders)  
Route 101, Section 13: 1962-1963  
Route 102, Section 5: 1927  
Route 103, Section 1: 1930  
Route 103, Section 2: 1930  
Route 103, Section 4: 1932  
Route 107, Section 12: 1928-1930  
Route 110, Section 6B: 1941  
Route 125A, Section 1: 1951

**Box 4**

**Routes**

Route 131A, Section 1: ca. 1970s (7 folders)  
Route 131A, Sections 1, 2, & 3: ca. 1970s  
Route 131A, Section 2: ca. 1970s  
Route 131A, Section 5: ca. 1970s  
Route 131A, Section 5A: ca. 1970s  
Route 131A, Section 6: ca. 1970s  
Route MB EX. 1: 1910-1911  
Route Sea Beach: 1914  
Route ?, Section 10-C: 1917

**Box 5**

**Misc. Photographs**

Beach Pneumatic Subway: 1940  
Coney Island Shop/Yard: ca. 1970s  
Drawings: no date  
East River Bridges: ca. 1970s  
East River Tunneling Project Diagrams:  
Historical Prints: no date  
Jamaica Bus Depot: ca. 1970s  
Midtown Hudson Tunnel (Lincoln Tunnel): no date, 1934-1935, 1953  
N.Y.C.D.E.P. Division of Sewers Construction: 1984  
Port Authority Tunnel East: no date  
Power (misc.): no date  
P-208: Avenue Z Substation: ca. 1967  
P-214: York Street Substation: 1975  
Rock Tunnels: no date, 1940s  
10-Car Train No. 3998: no date  
Unidentified (Early): ca. 1900-1930s  
Unidentified: 1928  
Unidentified Tunneling Project-Lower Manhattan: 1910-1920  
Unidentified with Gene Casey: ca. 1970s  
Unidentified: 1950s-1960s  
Unidentified: ca. 1970s  
Vietnam-Dau Tieng Bridge-Military Personnel: 1967

**Box 6**

**Hudson and Manhattan Railroad Tube**

Photographs #1137-1350: 1912

**Box 7**

**Hudson and Manhattan Railroad Tube**

Photographs #5029 to 5471: 1912-1913, 1922-1923

**2: SLIDES – 2 BWAY, ROW 4, UNIT D, SHELF 5**

**Binder 1**

Contract #2; Route 4 & 38; Route 8, Sections 1 & 3; Route 33, Section 2; Route 48;  
Route 61; Route 101, Sections 1 & 12

**Binder 2**

Construction Methods

**Binder 3**

Hydraulic Pile-Washington D.C.; Austin, TX; University of Illinois

**Binder 4**

Mexico City; Hawaii; Japan; Montreal; Tokyo; Lisbon

**Binder 5**

Northfield (Mass); Grace Pine (PA); Climax Mine (CO); “U.S. Trip”; San Francisco;  
Chicago

**Binder 6**

Route 5

**Binder 7**

Route 131-A, Sections 1, 5A, 5B, 6, and 7

**Binder 8**

Route 131-D; Route 133

**Binder 9**

Red Hook

\*(On Shelf) Video-“Joralemon Street Tunnel” TRK #2: 1983

**3: DOCUMENTS – 2 BWAY, ROW 4, UNIT D, SHELVES 2 TO 4, AND UNIT C, SHELF 1**

**Box 8**

**Subways-General History**

Correspondence-“A Short History of the 1<sup>st</sup> Division...”: 1914

Article-“Rapid Transit Development in New York” Public Service Record, By:  
Daniel L. Turner: 1915

Article-“Transportation in the City Plan” Public Service Record, By: Daniel L.  
Turner: 1915

Paper-“History of the Manhattan Railway Company’s System”: 1918

Pamphlet-“The Untermeyer Plan for Subway Unification”: 1931

Article-“Mike and Rosee” Public Service Record, By: James C. Meem: ca. 1910s

Report-“(typewritten copy) Annual Report of the Chief Engineer for the Period  
June 1, 1919 to December 31, 1919”: no date (ca. 1920s?)

Report-“(typewritten copy) Annual Report of the Chief Engineer for the Period  
June 1, 1919 to December 31, 1919”: no date (ca. 1920s?)

Paper-“(typewritten copy) The Dual System Contracts in Their Relation to Rapid Transit History in New York” By: Leroy T. Harkness: no date (ca. 1910s-1920s?)

Paper-“(typewritten copy) The New York Rapid Transit Subway” By: William Barclay Parsons: no date (ca. 1910s-1920s?)

## **Box 9**

### **Subways and Tunneling – New York City**

Journals-“Public Service Record”: 1914

Journals-“Public Service Record”: 1915

Journals-“Public Service Record”: 1916

Journals-“Public Service Record”: 1917

Journals-“Public Service Record-Dual Contracts”: 1914-1917

Journals-“Public Service Record-Steinway Tunnel”: 1915

Pamphlet-“How a Twenty Million Dollar Railroad was Built in Mid-Air: Third Tracking the New York “L” By: IRT Co.: 1917

Paper-“Construction Problems of the Manhattan-Bronx, and Lexington Avenue Subway Junction and Queens borough Tunnel Connections” By: George Perrine: 1917

Estimates: 1919

Report-“Stopping Leaks in the BRT Subway at Broadway-Canal Street Station”: 1920

Correspondence-“The Narrows Tunnel”: ca. 1920s

Memorandum-“Vehicular Tunnels and Rapid Transit Tunnels”: ca. 1920s

Contract Book- “Contract No. 4: The Narrows Tunnel – New York Bay Section – Shield Method-Invitation to Bid” By: Board of Estimates: 1925

Contract Book-“Contract No. 4: The Narrows Tunnel– New York Bay Section – Shield Method-Drawings #1-45” By: Board of Estimates: 1925

Correspondence-“Additional Construction Costs” By: Tunnel Division: 1927

Correspondence-“Re: Construction of the East River Tunnel from Fulton to Cranberry Streets”: 1927

Paper-“The Rapid Transit Subways of New York City” By: Robert Ridgway: 1929

Drawing-“Method of Constructing Subways”: 1936

Journal-“The Municipal Engineer’s Journal: Discussion on Construction of 6<sup>th</sup> Avenue Subway” Vol. 26: 1940

Articles-“The Delaware Water Supply for the City of New York: A Series of 14 Articles”: 1942

Reports-“Under River Tunnels: Brooklyn Battery Tunnel and Queens Midtown Tunnel”: 1942 and 1944

Seminar Lecture-“Subway Construction Methods” By: William Stuart: 1949

## Box 10

### **Subways and Tunneling – New York City**

- Report-“Major NYC Sub aqueous Vehicular Rapid Transit and Railroad Tunnels”  
By: NYCTA, 1970
- Report-“Major NYC Sub aqueous Vehicular Rapid Transit and Railroad Tunnels-  
Key Plans and Profiles” By: NYCTA, 1970
- Report-“Welfare Island Subway Station Flat Jack Tests” By: Foundation  
Sciences, Inc.: 1970
- Booklet-“The Tunnel: Transportation Link to New York’s Future”: 1971
- Article-“Major Queens Subway Link with Twin Tunnels Due for Completion this  
Year” By: Constructioner: 1978
- Article-“The \$1 Billion Tunnel to Nowhere” New York Magazine: 1979
- Report-“City of New York, Office of the Comptroller: Procedural Guidelines for  
the Pre-audit of Contracts”: 1981
- Report, Litigation-“Claim Analysis and Report of Clark-Fitzpatrick vs. Long  
Island Rail Road, Contract #5130, Line Improvements, Phase 1A, Amott to  
Huntington”: 1986
- Report-“City of New York, Office of the Comptroller: Policy-Payment  
Vouchers”: 1987
- Report-“City of New York, Office of the Comptroller: Personal Expenses”:1988
- Correspondence-“Compressed Air Tunnel Work (Route 104)”: no date
- Report-“Board of Transportation: Construction” By: Charles M. Madden and E.A.  
Thompson: no date
- Report-“Hudson and Manhattan” By: George D. Snyder: no date
- Report-“Model Making” By: Arthur Weindorf: no date
- Reports-“Tunnels, Harlem River”: no date

## Box 11

### **Tunneling-Domestic Projects**

- Notebook-“American Tunneling Projects”: no date
- Paper (photocopy)-“Construction Methods on the Moffat Tunnel” By: Dr. R.H.  
Keays: 1927
- Bulletin-“Monthly Bulletin of the State College of Washington”: 1935
- Domestic Newsletter-“Tunneling Technology”:1977, 1979, 1980
- Report-“Calumet Intercepting Sewer (Ill.)” (oversize): ca. 1970s
- Article-“Cities Look Hopefully to Chicago’s TARP” Constructioner Magazine:  
1979
- Booklet-“A Research Program for Rapid Underground Construction/Stillwater  
Tunnel: A Practical Laboratory” By: US Dept. of Interior: 1971
- Conference Program and Correspondence-“Stillwater Tunnel Research  
Conference”: 1972
- Magazine-Article-“Birthplace of Modern Rock-Tunneling: Hoosac Tunnel,  
Mass.”: 1981

Article- "Camden's Composting Project Requires a King Size Slab"  
Constructioner Magazine: 1978  
Report-"Cut and Cover Data Report" By NFTA (Buffalo, NY): 1978  
Article-"Movements around Soil Tunnel on the Washington Metro" By: E.J.  
Cording: 1973

## Box 12

### Tunneling-International

Correspondence-"English Tunnels": no date (ca. 1920s?)  
Journal-"Discussion on the Ilford Tube (England)" Journal of the Institution of  
Civil Engineers, no. 5: By: Geoffrey Lancaster Groves: 1946  
Paper-"U-Bahnstrecken der Stadtverwaltung" By: Schnellbahn and Referat: 1970  
Paper-"Construction of Tunnels in Japan" By: Dr. Matsutaro Fujii: no date  
Booklet-"Major Tunnels in Japan" By: Japan Society of Civil Engineers: 1967  
Report-"New San-Yo Line Rokko & Kobe Tunnel" By: Japanese National  
Railways: 1968  
Report-"Undersea Tunnel and its Influence in Economy" By: Japan Railway  
Construction: 1970  
Report-"The Outline of Rapid Transit Railways (Under Operation, Construction,  
or Planning) of Principal Cities in Japan": 1970  
Notebook-"Articles Relating to Tunneling": ca. 1970s  
Notebook-"International Tunnels": no date

## Box 13

### Tunneling Methods

Article-Boring-"Tunnel Boring Machines Grow Bigger, Stronger" Construction  
Equipment Magazine: 1979  
Report-Cut and Cover-"Cut and Cover Method of Construction" NYCTA, By:  
Pirelli, Stephen J.: 1970  
Article-Drilling-"Button Bits Pace Hard-Rock Tunnels" Construction Methods  
Magazine, By: Coram, Robert: 1969  
Report-Earth Tunnels-"Construction of Earth Tunnels" By: NYCTA: 1971  
Report-Excavation-"Symposium-Rapid Excavation: Highway Research Record:  
no. 339" By: National Academy of Sciences: 1970  
Report-Excavation-"Tunnels: Machine Excavation Rate of Progress-Machine  
Data" By: US Dept. of Interior: 1972  
Conference Paper-Grouting-"Construction of Large Underground Openings and  
Use of Grouts" By: Mongilardi & Tornaghi: 1986  
Operations Manual-Grouting-"Grouting in Soils-Design and Operations Manual,  
vol. 2" By: Herndon & Lehahan: 1976  
Conference Paper-Grouting-"An Illustrated Review of Recent Developments in  
Ground Treatment" By: D.A. Bruce: 1987  
Paper-Grouting-"New Developments in Ground Reinforcement and Treatment for  
Tunneling" By: Bruce, Boley, & Gallavresi: 1987

Paper-Grouting-“Repair and Rehabilitation of Concrete Structures” By: American Railway Engineers Association: 1983  
Paper-Grouting-“Structural Repair by Grouting” By. D.A. Bruce: 1987  
Technical Bulletin and Correspondence-Grouting-“Surface Seal for Subway Leak Repairs”: 1987  
Article-Jacking-“Jacked Pipe Provides Roof for Underground Construction in Busy Urban Area” Civil Engineering, ASCE Magazine, By: G. Musso: 1979  
Article-Rock Bolting-“What You Should Know About Rock Bolting” Engineering News, By: George Allen: 1962  
Article-Rock Bolting-“New Method Allows for Anchorage Check for Rock Bolts” Mining Engineering, By: Matilla and Boyd: 1985  
Book-Rock Tunnels-“Rock Tunnel Methods” (photocopy) By: Hercules Powder Company: 1931  
Article-Soft Rock-“Soft Rock Exploration with Pressure Equipment” Civil Engineering-ASCE Magazine: 1968  
Article-Shafts-“Shaft Sinking Can Be Chilling” By: Engineering News Record: 1962  
Catalog-Shield Driven Tunnels-“Mitsubishi Machine Production List”: no date  
Manual-Shield Driven Tunnels-“Mitsubishi Confined Soil Shield”: no date  
Manual-Shield Driven Tunnels-“Mitsubishi-Outline of Slurry Shield”: no date  
Reports and Manuals- Shield Driven Tunnels-“Slurry Shield”: no date

## Box 14

### Tunneling Methods

Draft Report-Shield Driven Tunnels-“East River Tunnels”: no date  
Surveys-Shield Driven Tunnels-“Tunnel Surveys-Battery-Joralemon Street” By: Frederick C. Noble: no date  
Report-Shield Driven Tunnels-“Report of Shields Used in Joralemon Street Tunnel (copy)”: no date  
Paper-Shield Driven Tunnels-“East River Tunnel from Joralemon Street” (photocopy) Brooklyn Engineer’s Club, By: Frederick C. Noble: 1908  
Article-Shield Driven Tunnels-“Land and River Borings-Routes of the Dual System” Public Service Record, By: W.F. Stevenson: 1914  
Article-Shield Driven Tunnels-“Breaking Ground for the East River Tunnels” Public Service Record: 1914  
Paper and Correspondence-Shield Driven Tunnels-“History of New York Subway-Battery Tunnel-Sec. 2A” By: James Sanborn: 1921  
Paper-Shield Driven Tunnels-“Blowout in Tunnel”: no date (ca. 1910s?)  
Article-Shield Driven Tunnels-“Standard Types of Roadbed for the Dual System” Public Service Record, By: R.H.M. Canfield: 1916  
Correspondence-Shield Driven Tunnels-“Excavation Progress Rates”: 1922  
Article-Shield Driven Tunnels-“Two Lines of the Dual System in Operation” Public Service Record: 1915  
Article-Shield Driven Tunnels-“East River Tunnels Approach River Front” Public Service Record: 1915

Article-Shield Driven Tunnels-“Design of Shaft at Furman and Clark Street, Brooklyn” Public Service Record, By: Ole Singstad: 1916  
Paper-Shield Driven Tunnels-“History and Design of Whitehall Street Subway, R.33, S.1” By: C.E. Conover: 1921  
Article-Shield Driven Tunnels-“16ft. Diameter Shield Driven Tunnel” By: Fred F. Voit: 1967  
Conference Paper-Soft Ground Tunneling-“Half a Century of Progress in Soft Ground Tunneling” By: G. A. Fox and L.E. Nicolau: 1975  
Report-Soft Rock Tunneling-“Deep Excavations and Tunneling in Soft Ground” By: Ralph B. Peck: no date (ca. 1970s?)  
Draft Paper-Tunnels-General-“Soft Ground Tunneling”: no date  
Paper-Tunnel Linings-“Tunnel Linings with Reference to a New Form of Reinforced Concrete Lining” By: G.L. Groves: ca. 1943  
Standards Report-Tunnel Linings-“Building Code Requirements for Reinforced Concrete” By: American Concrete Institute: 1963  
Reports, Articles, Publications-Tunnel Linings-Miscellaneous: 1960s-1970s  
Reports and Brochures-Tunnel Supports: 1970s  
Article-Tunnel Supports-“Setting a Rib in Four Steps” Engineering News Record: 1951  
Article-Tunnel Supports-“Sheet Piling Braces Complicate Forming of Textured Walls” Construction Methods Magazine: 1969  
Article-Tunnel Supports-“Simplified Analysis for Tunnel Supports” Journal of the Geotechnical Engineering Division, By: H.H. Einstein: 1979  
Article-Tunnel Supports-“Mechanical Splices of Reinforcing Bars” Concrete Construction Magazine, By: Harry Lancelot: 1985  
Reports, Articles, and Publications-Underpinning: no date, 1970s-1980s

## **Box 15**

### **Tunneling Methods-Trench Tunnels**

Articles-Clippings-Slurry Trenches-“Miscellaneous Notebook Clippings”: 1960s-1970s  
Correspondence and Manual-Slurry Trenches-“Diaphragm Walls”: 1970  
Articles and Reports (photocopies)-Trench Tunnels-“Detroit River Tunnel”: no date  
Report and Photographs-Trench Tunnels-“Harlem River Tunnel of the Lexington Avenue Line”: 1917  
Articles-Clippings-Trench Tunnels-“International” (2 Folders): no date, 1940s-1970s  
Reports and Correspondence-Trench Tunnels-“Report of Trench Tunnel Investigations” By: C.M. Holland, C.E.: 1920  
Articles, Reports, Correspondence, and Publications-Trench Tunnels (5 folders): 1950s-1970s

**Box 16**

**Tunneling Projects-Capital Project PW 101**

- Report-"Port Richmond Water Pollution Control Project, Contract 3B: Proposed Method of Evaluation of Intercepting Sewer Tunnel Lining" By: Soil and Rock Instrumentation, Inc.: 1973
- Report-"Tunnel Report-Port Richmond Water Pollution Control Project, Contract 3A-East Branch Intercepting Sewer from Victoria's Boulevard to Sailor's Snug Harbor" By: Mason & Hanger-Silas Mason Co., Inc.: 1976
- Report-"Tunnel Report-Port Richmond Water Pollution Control Project, Contract 3B-East Branch Intercepting Sewer from Sailor's Snug Harbor to Taylor Street" By: Mason & Hanger-Silas Mason Co., Inc.: 1976
- Report-"Final Report-Port Richmond Water Pollution Control Project, Contract 3A-East Branch Intercepting Sewer from Victoria's Boulevard to Sailor's Snug Harbor" By: Mason & Hanger-Silas Mason Co., Inc.: 1977
- Report-"Final Report-Port Richmond Water Pollution Control Project, Contract 4A-East Branch Intercepting Sewer from Nautilus Street to Hannah Street Pumping Station" By: Mason & Hanger-Silas Mason Co., Inc.: 1977
- Report-"Final Report-Port Richmond Water Pollution Control Project, Contract 3C-East Branch Intercepting Sewer from Taylor Street to Dongan Street" By: Mason & Hanger-Silas Mason Co., Inc.: 1979
- Report-"Final Report-Port Richmond Water Pollution Control Project, Contract 3B-East Branch Intercepting Sewer from Sailor's Snug Harbor to Taylor Street" By: Mason & Hanger-Silas Mason Co., Inc.: 1980

**Box 17**

**Tunneling Projects-WP 152-Red Hook Interceptor Tunnel**

- Report-"Analysis of Transit Authority Tubes Crossing Joralemon Street" By: Parsons, Brickerhoff, Quade, and Douglas: ca. 1970s
- Survey and Report-"Archeological Survey-Contract 1A-Red Hook Water Pollution Control Project": ca. 1970s
- Report and Correspondence-"Red Hook Water Pollution Control Project-Contract 1A-Sewer Crossing of Subway Tracks, Joralemon Street to Clark Street": 1978
- Report-"WP 152: Red Hook Water Pollution Control Project-Finite Element Studies": 1979
- Report Draft-"Red Hook Interceptor Tunnel-NYCTA-Tunnel Crossings at Joralemon Street to Clark Street" By: Mason & Hanger-Silas Mason Co., Inc.: 1979
- Report-"Red Hook Interceptor Tunnel-Progress Report-Joralemon Street-Finite Element Studies" By: Parsons, Brickerhoff, Quade, and Douglas: 1979

**Box 18**

**Tunneling Projects-WP 152-Red Hook Interceptor Tunnel**

- Report and Correspondence-"Geologic References Used in Assessment with Questions Related to Contract 1A-Red Hook Intercepting Sewer": 1970s

- Correspondence-“Questions Concerning Proposed Dewatering Near Construction Shaft-Contract 1A” By: Woodward-Clyde Consultants: 1978
- Report and Correspondence-“Evaluation of Pumping Test on Site” by: Ground/Water Technologies, Inc. 1978
- Report and Correspondence-“Proposed Recharge System at Brooklyn Bridge Anchorage” by: Ground/Water Technologies, Inc. 1978
- Correspondence-“Study of Anticipated Effects of Dewatering on Existing Structures along Portions of Furman and Fulton Street” By: Woodward-Clyde Consultants: 1978
- Correspondence-“Study of Anticipated Groundwater Drawdown and Effects on Existing Structures” By: Woodward-Clyde Consultants: 1978
- Report-“Interim Report-Study of Anticipated Groundwater Drawdown and Effects on Existing Structures, Contract 1A” By: Woodward-Clyde Consultants: 1978
- Report-“Study Requested by City of New York Department of Buildings-Study of Anticipated Groundwater Drawdown and Effects on Existing Structures, Contract 1A” By: Woodward-Clyde Consultants: 1978
- Correspondence-“Dewatering for Manhole 5 and Its Possible Effects on Interior Column Supports” By: Woodward-Clyde Consultants: 1978
- Correspondence-“Study of Anticipated Groundwater Drawdown and Effects on Existing Structures” By: Woodward-Clyde Consultants: 1979
- Correspondence and Operation Manual-“Observation Wells and Piezometer Installation” By: Woodward-Clyde Consultants: 1979
- Correspondence-“Study of Anticipated Groundwater Drawdown and Effects on Existing Structures Adjacent to the Shield Removal Pit and Manhole MH-1” By: Woodward-Clyde Consultants: 1979
- Correspondence-Addendum-“Addendum 1: Study of Anticipated Groundwater Drawdown and Effects on Existing Structures Adjacent to the Shield Removal Pit and Manhole MH-1” By: Woodward-Clyde Consultants: 1979
- Correspondence-“Study of Anticipated Groundwater Drawdown and Effects on Existing Structures Adjacent to the Shield Removal Pit and Manhole MH-2” By: Woodward-Clyde Consultants: 1980
- Correspondence and Report-“Preliminary Dewatering Study-Contract 3F-3G” By: Woodward-Clyde Consultants: 1978
- Correspondence and Report-“Final Dewatering Study-Contract 3F-3G” By: Woodward-Clyde Consultants: 1978
- Correspondence-“Contract 3-F-Study of Anticipated and Groundwater Drawdown Using Well points” By: Woodward-Clyde Consultants: 1979
- Correspondence-“Addendum 1: Contract 3-F-Study of Anticipated and Groundwater Drawdown Using Well points” By: Woodward-Clyde Consultants: 1979
- Correspondence and Operation Manual-“Contract 3F: Installation of Observation Wells and Piezometers” By: Woodward-Clyde Consultants: 1979

- Correspondence-“Addendum 2: Contract 3-F-Study of Anticipated and Groundwater Drawdown Using Well points” By: Woodward-Clyde Consultants: 1979
- Report and Correspondence-“Report on Radius of Influence of Vibration Effects Emanating From Construction Activities”: 1980
- Correspondence-“Pre-Construction Report: Combined Relief Sewer and Appurtenances”: 1980
- Correspondence-“Summary of Fees and Charges” By: Woodward-Clyde Consultants: 1978

**Box 19**

**Tunneling Projects-WP 152-Red Hook Interceptor Tunnel**

- Report-“Red Hook Interceptor Tunnel-Crossings, Finite Elements Analysis and Studies, and Tunnel Lining Stresses” By: Parsons Brinckerhoff Quade and Douglas, Inc.: 1979-1980
- Report-“WP 152: Evaluation of Proposed Crossings of Subways at Clark and Joralemon Streets” By: Parsons Brinckerhoff Quade and Douglas, Inc.: 1980
- Report and Survey-“Archaeological Survey-Stage 2: The Archaeology and History of the Empire Stores, 2-14 Main Street, Brooklyn-Contract 1A-Red Hook Water Pollution Control Project” By: Ralph S. Solecki, Phd.: 1980
- Report-“Final Report- Red Hook Interceptor Tunnel-Evaluation of Proposed Crossings of Subways at Clark and Joralemon Streets”: 1980
- Report-“WP152: Summary Report-Field Measurements for Crossing of Subways at Clark Street” By: Parsons Brinckerhoff Quade and Douglas, Inc.: 1980
- Report and Correspondence-“WP 152: Summary Report-Field Measurements for Crossing of Subways at Clark Street” By: Parsons Brinckerhoff Quade and Douglas, Inc.: 1980
- Report-“WP 152: Draft-Summary of Instrumentation Procedures and Results- Joralemon Street IRT Tunnel Crossing-Red Hook Interceptor Sewer Tunnel-Contract 1A” By: Woodward-Clyde Consultants: 1980
- Report-Underpinning-“WP 152: Red Hook Water Pollution Control Project-Cost Analysis of Underpinning”: 1980

**Box 20**

**Tunneling Projects-WP 152-Red Hook Interceptor Tunnel**

- Report-“Instrumentation Procedures and Results, Contract 1A” By: Woodward-Clyde Consultants: 1980
- Correspondence and Report-“WP 152: Supplemental Instrumentation Monitoring Following Completion of Tunneling and Termination of Compressed Air Procedures” By: Woodward-Clyde Consultants: 1980
- Report-“Summary Report-Field Measurements for Crossing of Subways at Joralemon Street-Red Hook Interceptor Tunnel” By: Parsons Brinckerhoff Quade and Douglas, Inc.: 1980

**Box 21**

**Tunneling Projects-WP 152-Red Hook Interceptor Tunnel**

Report-“Report on the Effects of the Red Hook Intercepting Sewer Crossing Over the NYCTA Tunnels at Joralemon and Clark Streets in Furman Street”

Prepared By: New York City Department of Environmental Protection: 1980

Report-“Final Report-Capital Project WP 152-Red Hook Water Pollution Control Project-Contract 2A-2-Interceptor Sewer-From Manhole 2 to President Street”: 1984

Report-“Final Report-Capital Project WP 152-Red Hook Water Pollution Control Project-Contract 1A-Interceptor Sewer-From the Red Hook Water Pollution Control Plant to Manhole 1 at Atlantic Avenue and Furman Street, vol.1”:  
1986

Report-“Final Report-Capital Project WP 152-Red Hook Water Pollution Control Project-Contract 1A-Interceptor Sewer-From the Red Hook Water Pollution Control Plant to Manhole 1 at Atlantic Avenue and Furman Street, vol.2”:  
1986

**Box 22**

**Tunneling Projects-Hudson River Vehicular Tunnel (Holland Tunnel)**

Photographs-“Holland Tunnel”: 1920s

Report-“Hudson River Vehicular Tunnel” (photocopy): 1919

Report-“Miscellaneous Reports on Concrete Block Tunnel”: 1919-1920

Report-“Report on Goethal’s Design for a Hudson River Vehicular Tunnel-42’ Concrete Block Tunnel”: ca. 1920

Reports and Blueprints-“Progress Reports and Records of Construction and Estimates”-1920s-1930s

Report and Presentation-“Holland Tunnel: Presentation to the Hoboken Chamber of Commerce”: 1920

Memorandum-“For Mr. Holland-Report on the Boring Contract” By: Mr. Freeman: 1920

Blueprints-“Hudson River Boring Contract” By: New York State Bridge and Tunnel Commission and New Jersey Interstate Bridge and Tunnel Commission ca. 1920s

Drawings-“Hudson River Vehicular Tunnel”: ca. 1920s

Records-“Hudson River Vehicular Tunnel”: By: New York State Bridge and Tunnel Commission and New Jersey Interstate Bridge and Tunnel Commission: 1919-1920

Ledger Records-“Holland River Vehicular Tunnel: Estimates from October 1, 1920 to June 2, 1920”: 1920

Report and Correspondence-“Holland Tunnel Vehicular Tunnel-Materials”: 1920-1921

Report- “Holland River Vehicular Tunnel: Fire Protection-Drainage-Lighting-Misc.”: 1920

Report- “Holland River Vehicular Tunnel: Costs-Cast Iron no. 4”: 1921

Report-“Holland River Vehicular Tunnel: Pavements-Cast Iron No. 5”: 1919-1920  
Report-“Holland River Vehicular Tunnel: Design Specifications”: 1920  
Correspondence-“Chief Engineer’s Outline Analysis of Vehicular Tunnel Project-Cast Iron No. 9”: 1919  
Appendices-“Holland River Vehicular Tunnel: Location-Surveys-Borings-Traffic-Capacity”: 1919-1920  
Appendices-“Holland River Vehicular Tunnel: Ventilation-Type and Method-Misc.-Estimates”: 1920-1921

**Box 23**

**Tunneling Projects-Hudson River Vehicular Tunnel (Holland Tunnel)**

Correspondence and Reports-“New York State Bridge and Tunnel Commission”: 1919-1920  
Blueprints-“Hudson River Vehicular Tunnel- New York State Bridge and Tunnel Commission”: 1919  
Correspondence-“Hudson River Vehicular Tunnel- New York State Bridge and Tunnel Commission-Miscellaneous Memoranda”: 1921  
Correspondence-“Hudson River Vehicular Tunnel- New York State Bridge and Tunnel Commission-Estimates, Blueprints, Memoranda”: 1919

**Box 24**

**Tunneling Projects-NYCTA Project No. TSC-622**

Report Binder-“Final Report-Inspection and Analysis of Rapid Transit River Tunnels-Phase I”: 1982  
Report Binder-“Summary Report-Inspection and Analysis of Rapid Transit River Tunnels-Phase I”: 1982  
Report Binder-“Final Report-Inspection and Analysis of Rapid Transit River Tunnels-Phase I-Appendix D-Vol. III”: 1982

**Box 25**

**Subway Routes-Articles, Reports, Documents Misc.**

Paper-“Route 5: Tunnel Work on Sections 8, 9, 10, and 11-Broadway-Lexington Avenue Subway” BY: Isreal V. Werbin, ASCE Journal: 1916 (photocopy)  
Notebook-“Route 5: Lexington Avenue Subway”: 1910-1920s  
Report-“Route 5: Harlem River Tunnel of the Lexington Avenue Line” By: R.S. Bennett: no date (photocopy)  
Article-Route 11-“The Fourth Avenue Subway in Brooklyn” By: James Blaine Walker, Public Service Record: 1915  
Article-Route 11-“Heavy Earth Pressures and How They Act” By: Max Miller, Public Service Record: 1916  
Article-Route 11-“Soil Values on Flatbush Avenue, Brooklyn” By: Harry R. Wickham, Public Service Record: 1917  
Article-Route 11-“The Fourth Avenue Subway, Brooklyn” By: Paul Entenman: no date (photocopy and typewritten copy)

Article-Route 11-“Tunnel of Fourth Avenue Subway Beneath Flatbush Avenue  
Subway, Brooklyn” By: Frederick H. Mellert: no date  
Article-Route 11-“The Fourth Avenue Subway, Brooklyn” By: Henry L.  
Oestreich: no date  
Table-Route 11-“Table-Subway Construction Costs”: no date  
Article-Route 12, Sec. 2A-“Tunneling Methods, Flatbush Avenue, Brooklyn” By:  
Waldo C. Briggs: no date  
Article-Route 12, Sec. 2A-“Giant Tunneling Shield” By: Charles M. Torpey,  
Public Service Record: 1917  
Report-Route 48, Sec. 3-“Weekly Reports #13 to 21”: 1914  
Drawings-Route 101, Sec. 6-“Contract Drawings”: 1930s (copies)  
Correspondence-Route 109-“Memoranda and Estimates”: 1926-1927  
Report and Photographs-Route 119G-“Construction of High Trestle and Swing  
Bridges across Jamaica Bay”: 1950s (3 folders)

## Box 26

### **Subway Routes-6<sup>th</sup> Avenue Line, Route 101, Section 12**

Reports-Route 101, Sec. 12-“Estimates”: 1961-1963  
Article-Route 101, Sec. 12-“Special and Trial Term Part XII” By: Justice Jacob  
Markowitz, NY Law Journal: 1962 (photocopy)  
Sketches-Route 101, Sec. 12-“Sketches”: 1962  
Procedures-Route 101, Sec. 12-“Inspection and Warning Procedures” By: PATH  
Corporation: 1963  
Legal Booklet-Route 101, Sec. 12-“Supplemental Agreement to Contract for  
Construction of a Part of a Rapid Transit Railroad...”: 1963  
Report-Route 101, Sec. 12-“Confidential Report on Soil and Water Conditions at  
the North Heading of Route 101, Section 12, Sixth Avenue Subway” By: King  
& Gavaris Consulting Engineers: 1963  
Chart-Route 101, Sec. 12-“Chart of Accounts” By: Maclean, Grove, & Shepherd:  
1963  
Sketches-Route 101, Sec. 12-“Contractor’s Method of Excavation, South  
Heading” By: J. Tremko: 1963, 1965  
Sketches-Route 101, Sec. 12-“Contractor’s Method of Excavation, North  
Heading” By: J. Tremko: 1963, 1965  
Diazotypes and Copy Sketches-Route 101, Sec. 12-“Contractor’s Method of  
Excavation, North Heading” By: J. Tremko: 1963, 1965  
Correspondence-Route 101, Sec. 12-“Statements of Costs and Schedules” By:  
Maclean, Grove, & Shepherd: 1964  
Correspondence-Route 101, Sec. 12-“Correspondence Regarding Non-  
reimbursable Costs”: 1964  
Report-Route 12, Sec. 12-“Estimates”:1964  
Paper-Route 101, Section 12-“Construction of Sixth Avenue Subway” By:  
Norman Nadal, Municipal Engineer’s Journal, Vol. 51: 1965 (copy)  
Report-Route 101, Sec. 12-“Appraisals and Inventory-On Job Site Values”: 1966  
Report-Route 101, Sec. 12-“Appraisals and Inventory-Liquidation Values”: 1966

Report-Route 101, Sec. 12-“Subdivision No. 2 Sample Final Estimate Sheets”:  
1967  
Article-Route 101, Sec. 12-“Lampach v. City of NY” NY Law Journal: 1968  
(copy)  
Correspondence-Route 101, Sec. 12-“Correspondence and Memoranda between  
NYCTA and Maclean, Grove, & Shepherd Inc.: 1968-1969  
Report and Blueprints-Route 101, Sec. 12 (Legal)-“Subdivision No. 3-Division of  
Designs, Engineering Bureau-Board of Transportation-Review of Office  
Work 1925-1942” By: Alfred Brahdly: 1942  
Unidentified Drawing-Route 101, Sec. 12: no date  
Report-Route 101, Sec. 12-“Unidentified Draft Report”: no date  
Correspondence and Notes-Route 101, Sec. 12-“Misc.-Job History and Notes”:  
1960s

**Box 27**

**Subway Routes-East 63<sup>rd</sup> Street Tunnel-Route 131-A, Section 1**

Binder-Report-“East 63<sup>rd</sup> Street Tunnel between the Boroughs of Queens and  
Manhattan-Monthly Progress Report from January to June” By: NYCTA:  
1970  
Report- E. 63<sup>rd</sup> Street Tunnel-“Design Calculations for 40’-0” O.D. Tunnel”:  
1966  
Report-“Sub Aqueous Tunnel Construction” By: NYCTA: 1970  
Report-“An Analysis of Present Day Inadequacies and Needed Improvements in  
the Technology of Immersed Tube Tunnel Construction” By: NYCTA: 1970  
Paper No. 377-“East 63<sup>rd</sup> Street Tunnel” By: Eugene F. Casey: 1972  
Report-“Engineering Study: Feasibility of Tunnel Boring Machine, East 63<sup>rd</sup>  
Street Line, Route 131-A” By: Parsons Brinckerhoff Quade and Douglas, Inc.:  
1974  
Article-“The Threshold of the Seventies: The East 63<sup>rd</sup> Street Tunnel” By: Eugene  
F. Casey: no date

**Box 28**

**Subway Routes-East 63<sup>rd</sup> Street Tunnel-Route 131-A, All Sections**

Correspondence and Blueprints-“Re: Study of Trench Tunnel for East River  
Tunnel Crossing at E. 64<sup>th</sup> Street”: 1964  
Correspondence and Drawings-“Estimates and Construction Times-Route 131-  
A”: 1969  
Photographs-“Route 131-A, Section 1-Substation”: 1970  
Photographs-“Route 131-A, Section 1-Queens Shaft”: 1970-1971  
Photographs-“Route 131-A, Section 1-Welfare Island Shaft”:1970-1972  
Photographs-“Route 131-A, Section 1-Queens Tunnel”: 1970-1971  
Photographs-“Route 131-A, Section 1-Welfare Island Tunnel”: 1970-1972  
Photographs-“Route 131-A, Section 1-Dredging”: 1970  
Photographs-“Route 131-A, Section 1-Fabrication”: 1970-1971  
Photographs-“Route 131-A, Section 1-Outfitting”: 1970-1971

Photographs-“Route 131-A, Section 1-Placing Barge in West Channel”:1971  
Photographs-“Route 131-A, Section 1-Landfill”: 1970  
Photographs-“Route 131-A, Section 1-General”: 1969-1970  
Report-Route 131-A, Sections 2 & 3-“The Subway Under Central Park” By: Peter B. Fisher: no date (copy)  
Diazotype Drawings-Route 131-A, Section 4-“Associated Drawings”: 1975  
Diazotype Drawing- Route 131-A, Section 5A-“Project Plan and Elevation”: 1976  
Report-Route 131-A, Section 5A-“Rock Shaft Stability Calculations” By: Woodward-Clyde Consultants: 1977  
Drawings-Route 131-A, Section 5B-“Plans”: 1970s  
Report- Route 131-A, Section 6-“Final Report-Instrumentation Program” By: Woodward-Clyde Consultants: 1979

## Box 29

### Miscellaneous Documents and Reference Materials

Journal-“Municipal Engineer’s Journal Index”: various dates  
Book (photocopy)-“Modern Tunnel Practice” By: David McNeely Stauffer: 1906  
Paper No. 1212 (photocopy)-“The Detroit River Tunnel” By: W.S. Kinnear, ASCE: 1911  
Book (photocopy)-“Shield and Compressed Air Tunneling” By: B.H.M. Hewett and S. Johannesson: 1922  
Article (photocopy)-“Engineer Describes under Water Tunnel Construction” By: L.S. Stiles, General Contractor’s Association: 1936  
Paper No. 191-“Ancient Engineering” By: Walter D. Binger, Municipal Engineers Journal: 1939  
Articles-Clippings-“Construction Methods”: 1940, 1952  
Journal (photocopy)-“Boston Society of Civil Engineers, vol. xxix no. 3”: 1942  
Paper-“Application of Geology to Tunneling Problems” By: Ernest E. Wahlstrom, ASCE Journal: 1947-1948  
Article-“Unidentified Article from the Explosive Engineer”: 1949  
Articles-Clippings (some copies)-“Engineering News Record” 1904, 1907, 1949, 1951, 1953, 1955, 1961, 1962  
Journal-“Civil Engineering: 100 Years of Engineered Progress”:1952  
Article (copy)-“Opening Dates” By: Electric Railroads, no.23: 1954  
Book (photocopy)-“Tunnel Engineering” By: Rolt Hammond: 1959  
Book (photocopy)-“The World Beneath the City” By: Robert Daly: 1959  
Article- Special and Trial Term Part XII” By: Justice Jacob Markowitz, NY Law Journal: 1962 (photocopy)  
Circular-“Tunneling Technology: It’s Past and Present” By: US Department of the Interior: 1968  
Article-“Designing Trench Type Sub Aqueous Tunnels” By: J.O.Bickel, Consulting Engineer Magazine: 1969  
Article (photocopy)-“Three Steps to CS Tenure” By: Frank J. Priall II, The Chief Newspaper: 1969

Questionnaire-“Advisory Conference on Tunneling” By: Organisation for Economic Co-Operation and Development: 1969  
Articles-Clippings-“Civil Engineering-American Society of Civil Engineers”: 1969, 1973

**Box 30**

**Miscellaneous Documents and Reference Materials**

Index-“List of Articles in Engineering Journals”: 1970  
Paper-“Advances in Tunneling” By: Norman A. Nadal, Society of Mining Engineer’s if AIME: 1970  
Misc. Documents-“Organisation for Economic Co-Operation and Development Conference”: 1970  
Correspondence and Report-“Organisation for Economic Co-Operation and Development Inspection Trip to New York”: 1970-1971  
Newsletter-“Soils, vol. 1”: 1972  
Report-“Report on the Feasibility of a More Coherent National Policy for the Governance of Underground Space” By: National Academy of Sciences: 1972  
Journal-“Readings from Scientific American: Animal Engineering”: 1974  
Articles-“Brooklyn has the Oldest Subway in the World” Brooklyn Daily Eagle: Reprinted 1974  
Newsletter-“A Selected, Annotated List on Tunneling” Tunneling Technology Newsletter: 1974  
Lecture-“Tunnel Construction in New York” ASCE Seminar: 1974  
Article-“The Collision between India and Eurasia” By: Peter Molnar and Paul Taponnier: 1975  
Seminar Paper-“Lateral Soil Pressures Generated by Pipes, Piles, Tunnels, and Caissons”: 1975  
Article-“The Oldest Rocks and the Growth of Continents” By: Stephen Moorbath, Scientific America: 1977  
Report-“Catalog of US Tunnels under Construction during 1978-1979” By: U.S. National Committee on Tunneling Technology: 1979  
Newsletter-“Tunneling Technology No. 35”: 1981  
Newsletter-“Geotech 1984 Report on Tunneling Activities” AEG Newsletter: 1984  
Correspondence-“American Society of Civil Engineers”: 1985  
Book-“High Occupancy Vehicle Facilities: Current Planning, Operation, and Design Practices” By: Charles A. Fuhs: 1990  
Article-Summary of Soft-Ground Tunneling Institute” By: Paul A. Seaburg: no date  
Index-“List of Articles from Engineering Magazines”: no date  
Notebook-“Historical Data Areas”: no date  
Reports-“Caisson Disease”: no date  
Papers-“The Bentonite Tunneling Machine” By: J.V. Bartlett et al.: no date (ca. 1970s?)  
Manual-“Program S113-Bar Schedule and Estimate of Bar Weights”: no date

**Box 31**

**Eugene F. Casey Personal Papers and Documents**

Photographs-Miscellaneous-Eugene Casey: ca. 1970

Correspondence -"Eugene Casey-Personal Correspondence and Awards": 1970s-1980s

Greeting Cards-"Eugene Casey-Christmas Cards": 1970s

Correspondence-"Re: Elgood Mayo Drawing": 1974 (see Oversize Drawings)

Lecture-"Open Cut Construction Seminar" By: Eugene F. Casey: 1975

\*(On Row 4, Unit D, Shelf 5-No Box)

Contract Book-"Alterations to 14<sup>th</sup> Street Union Square Station, C-30575": ca. 1978

Manuals-American Society of Civil Engineers, MET Section Construction Group:  
"Open Cut Seminars" (1975) and "Tunnel Seminar II" (1979)

**4: OVERSIZED MATERIALS – 2 BWAY, ROW 4, UNIT C, SHELVES 5 AND 6**

**Box 32**

**Roll Storage-Drawings (Row 4, Unit D, Shelf 1)**

Drawings-"Route 109, Section 5B: Express Tracks and Local Tracks

Drawings-"Tracing from a Drawing...Reinforced Concrete Blocks for Tunnel  
Construction, No. 5"

**Box 33**

**Drawings**

"Tunneling-in Soft Ground by Crown Bar Method"-East River Tunnels, 1916

"Hospital Lock-East River Tunnels": Drawing #18, 1916

Delaware Aqueduct: Contract 322-"Method of placing Tunnel Concrete", City of  
New York Board of Water Supply: ca. 1941 (2 prints)

Delaware Aqueduct, Eastern Department: Contract 322-"Typical Tunnel Driving  
Method", City of New York Board of Water Supply: ca. 1940 (2 prints)

"Method 1, sheet 1 & 2; Method 2, sheet 1 & 2"-By: Stephen J. Pirelli: no date (4  
Tunneling Diagrams)

**Box 34**

**Drawings**

40 Photostat Drawings-"Route 61-Record Drawings of Completed Tunnels" 60<sup>th</sup>  
Street-East River Tunnels: By: Transit Commission, Chief engineer: Robert  
Ridgway: 1923

**Box 35**

**Drawings**

1 Binder containing Photostats -"Record Drawings of Completed Tunnels: Route  
48, Section 3-Clark Street Tunnel" By: Transit Commission: no date (ca.  
1920s?)

1 Binder containing Photostats-“Record Drawings of Completed Tunnels: Route 33, Section 2-Montague Street Tunnel” By: Transit Commission: no date (ca. 1920s?)

## Box 36

### Oversize Photographs and Prints

Illustration-“63<sup>rd</sup> Street Tunnel”, ca. 1970s (3 prints)  
Drawing Mounted on Board-“Elgood Mayo Cartoon Drawing” By: Blashko, ca. 1974  
Photograph Mounted on Board-“Tunnel Curve of 150ft. Radius, at Morton and Greenwich Streets in Sand and Gravel Formation: Sharpest Tunnel Curve Driven to Date by Hydraulic Shield under Compressed Air” By: New York and Jersey Railroad Company, signed by: Charles M. Jacobs, C.E.: 1904  
Photograph Mounted on Board-“#104-Station 14+70-South Tunnel, Looking East towards Second Lock”: 1904  
Photostat-“The Thames Tunnel: Open to the Public...”: no date  
Print-“Isometric View of Underground Piping at the Intersection of Broadway and Fulton Street in 1890”: no date  
Photograph Mounted on Board-“Unidentified-Tunnel Equipment/Part”: no date (ca. 1904)  
Photograph-“24<sup>th</sup> Annual Dinner Sponsored By the Transportation Quarter Century Club, New York City Transit Authority, Grand Street Boys Club”: 1962  
Photograph-“Route 101, Section 13”: NYCTA: 1962  
Photograph-“Route 101, Section 13”: NYCTA: 1962  
Photograph-“Route 101, Section 12”: NYCTA: 1964  
Photograph-“Welfare Island-63<sup>rd</sup> Street Tunnel”: NYCTA: ca. 1970s  
Photograph-“Excavation- 63<sup>rd</sup> Street Tunnel”: NYCTA, Steve DiSanto: 1970  
Photograph-“Route 131A-63<sup>rd</sup> Street Tunnel”: NYCTA: ca. 1970s  
Photograph-“Eugene Casey Overseeing Construction of 63<sup>rd</sup> Street Tunnel”: NYCTA: ca. 1970s  
Photograph-“Overview of Construction for the 63<sup>rd</sup> Street Tunnel”: NYCTA: ca. 1970s  
Photograph-“Overview of Construction for the 63<sup>rd</sup> Street Tunnel Showing Excavation Machinery”: NYCTA: ca. 1970s  
Photograph-“Overview of 63<sup>rd</sup> Street Tunnel Section on Barge”: NYCTA: ca. 1970s  
Photograph-“Overview of 63<sup>rd</sup> Street Tunnel Section on Barge”: NYCTA: ca. 1970s  
Print on Board -“Overview of Construction for the 63<sup>rd</sup> Street Tunnel Showing Excavation Machinery and Construction of all 4 Tunnels”: NYCTA: ca. 1970s  
Print on Board -“Overview of Barge in East River”: NYCTA: ca. 1970s  
Print on Board -“Overview of 63<sup>rd</sup> Street Tunnel Walls and Lining”: NYCTA: ca. 1970s

Print on Board-“Overview of 63<sup>rd</sup> Street Tunnel Walls and Lining”: NYCTA: ca. 1970s

Print on Board-“Overview of 63<sup>rd</sup> Street Tunnel Section on Barge Being Unloaded into East River”: NYCTA: ca. 1970s

Photograph-“Mission Street-California”: no date

Photograph-“Mission Street-California”: no date

\*unprocessed negatives-3 canisters of Double X Aerographic Film, 2405 Estar Base:”Yards-292 Photos”; “TSRPC-17 photos”; “TSC241-Elevated Lines Structural Survey”: 1974 (located on row 4, unit c, shelf 5)

## **List of Major Subway, Railroad, and Vehicular Tunnels in New York**

### *Subway Tunnels*

149<sup>th</sup> Street Tunnel: opened 1905  
Joralemon Street Tunnel: opened 1908  
Steinway Tunnel: opened 1915  
Lexington Avenue Tunnel: opened 1918  
Clark Street Tunnel: opened 1919  
Montague Street Tunnel: opened 1920  
60<sup>th</sup> Street Tunnel: opened 1920  
14<sup>th</sup> Street Tunnel: opened 1924  
Concourse Tunnel: opened 1933  
Cranberry Street Tunnel: opened 1933  
53<sup>rd</sup> Street Tunnel: opened 1933  
Rutgers Street Tunnel: opened 1936  
63<sup>rd</sup> Street Tunnel (Upper): opened 1989

### *Railroad Tunnels*

Hudson Tubes: opened 1908 and 1909  
East River Tunnels: opened 1910  
North River Tunnels: opened 1910

### *Vehicular Tunnels in New York City*

Holland Tunnel (I-78): opened 1927  
Lincoln Tunnel (NJ): portions opened between 1930s-1950s  
Queens Midtown Tunnel (I-495): opened 1940  
Brooklyn-Battery Tunnel (I-478): opened 1950

