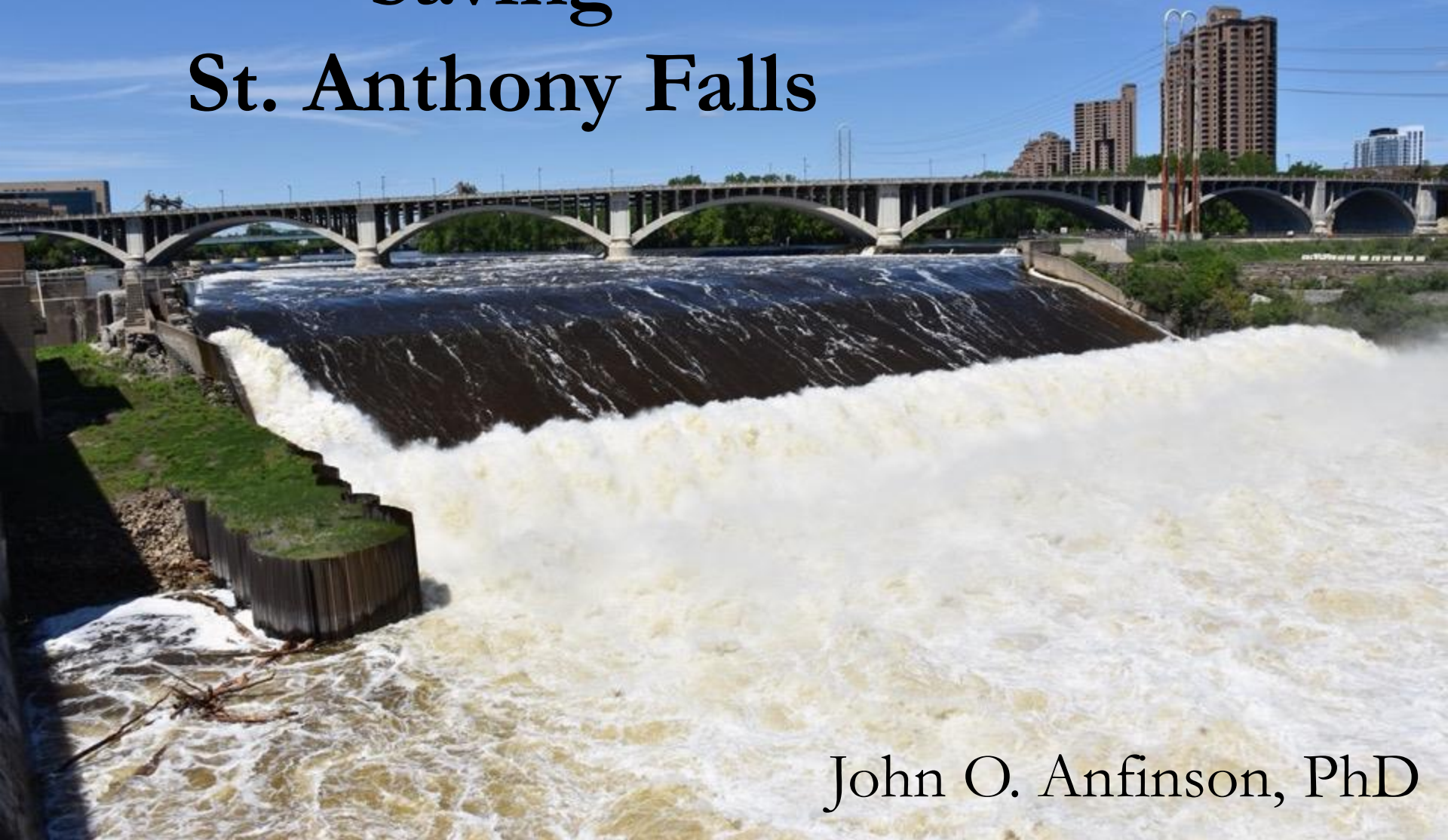
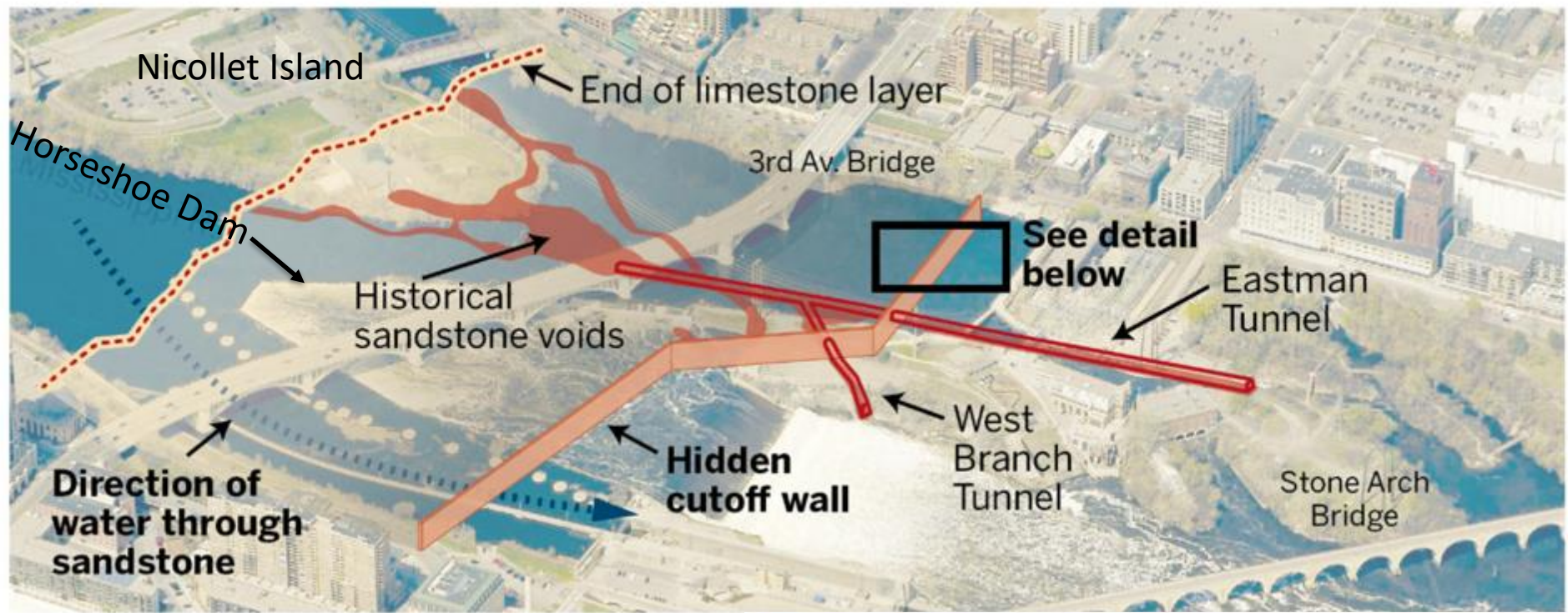


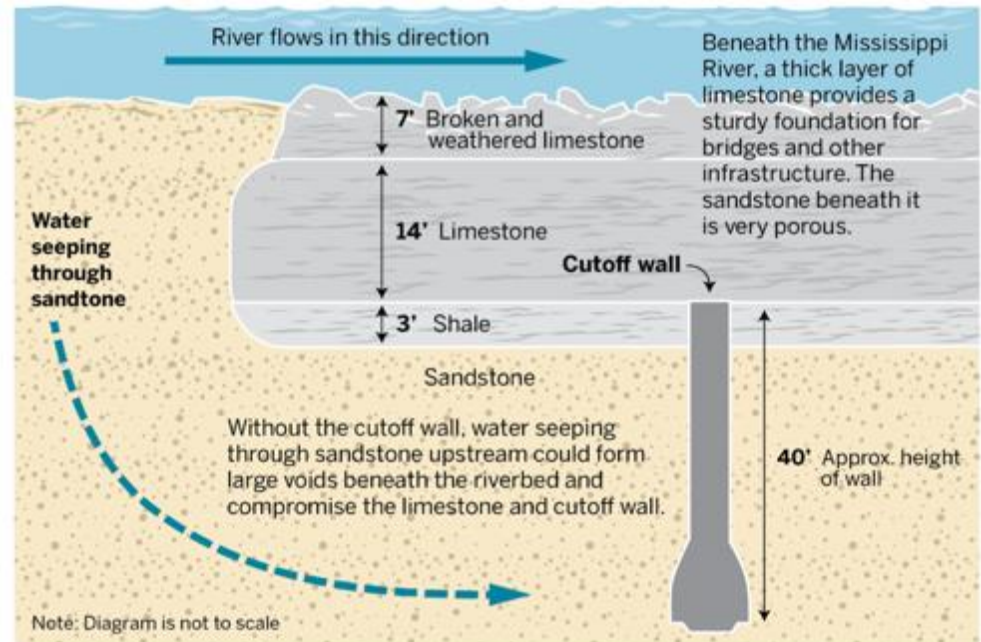
Saving St. Anthony Falls



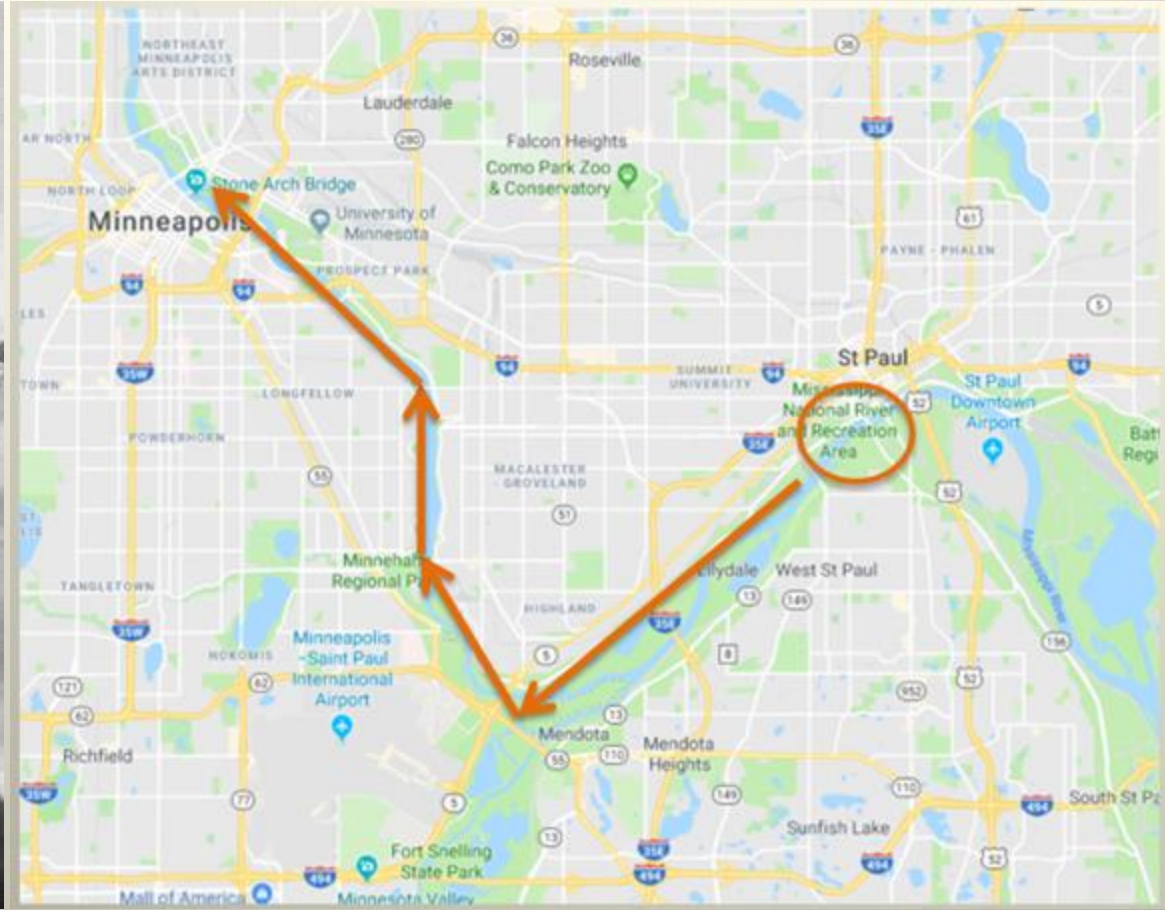
John O. Anfinson, PhD



“Historical, hidden wall protecting St. Anthony Falls draws new scrutiny over its unknown condition.”
 By Eric Roper, *Minneapolis StarTribune*, August 14, 2021.



Retreat of the Glacial River Warren Falls

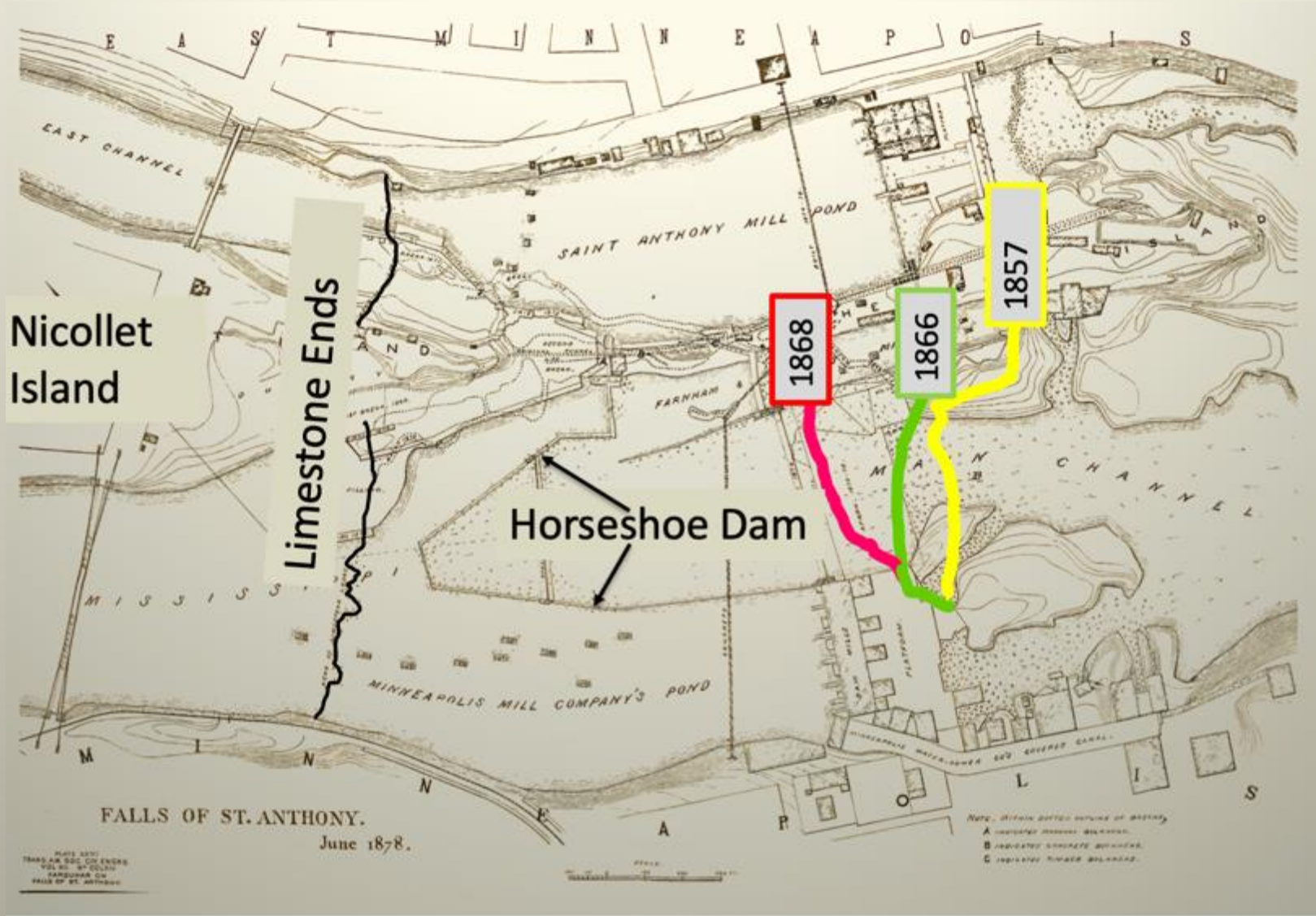


Gutav Grunwald, Fine Arts Museums of
San Francisco

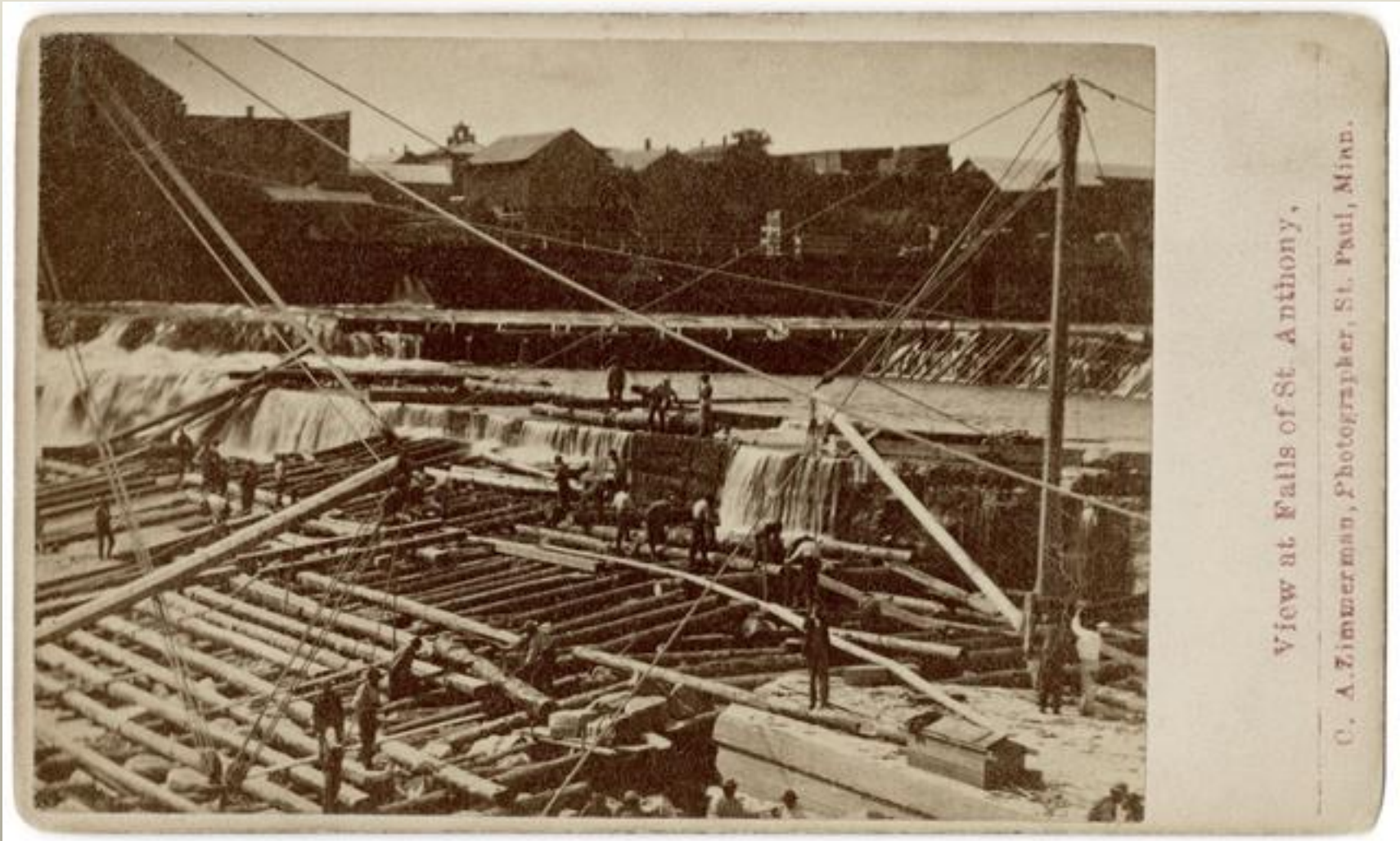
Accelerating the Retreat of St. Anthony Falls



Falls Retreat after Milling Begins



Apron Construction 1867



View at Falls of St. Anthony,

C. A. Zimmerman, Photographer, St. Paul, Minn.



Major General G.K. Warren, First St. Paul District Commander

“One more flood like that of 1867 might complete the destruction,...”

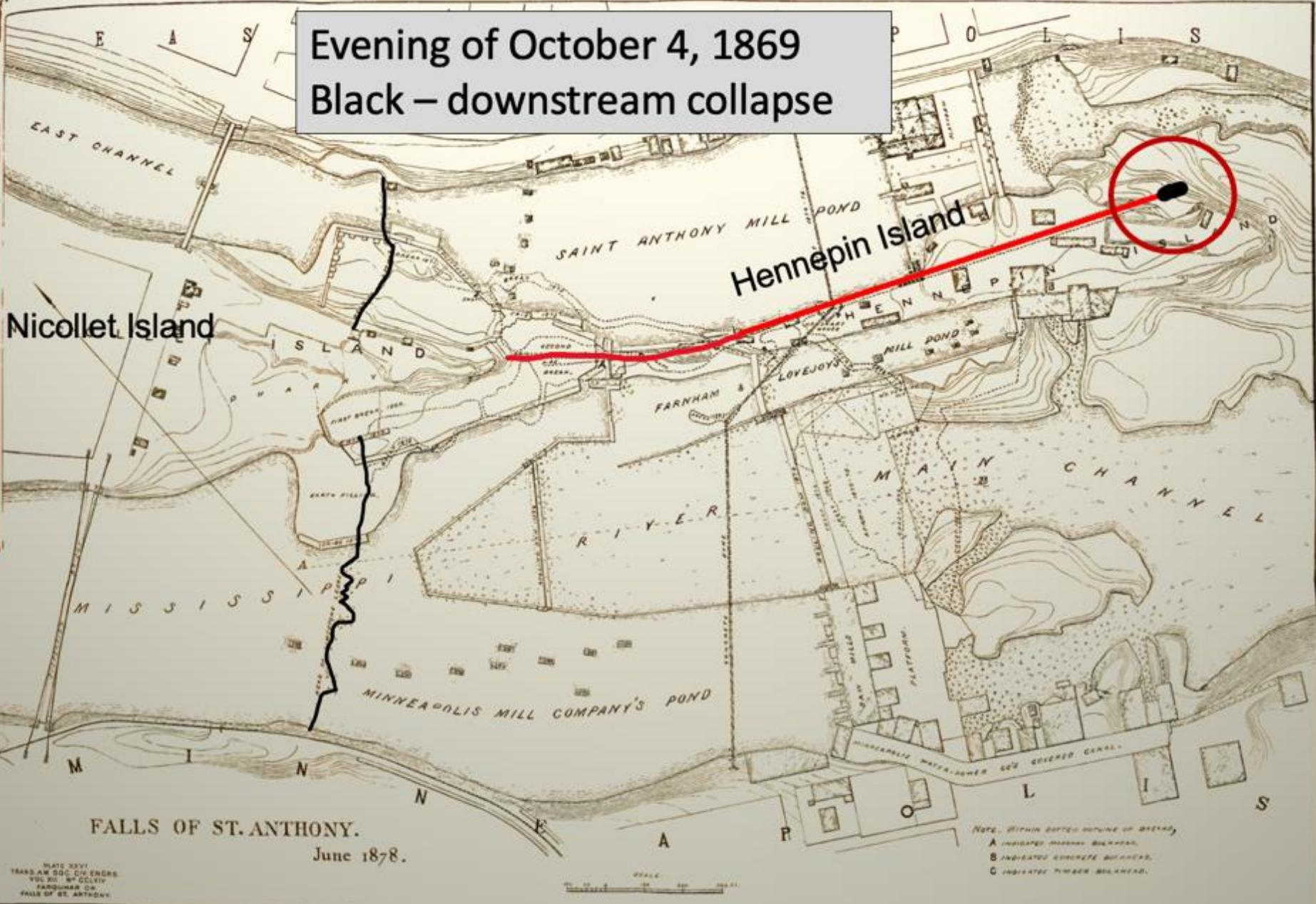
Eastman Tunnel Alignment, 1868



Evening of October 4, 1869
Black – downstream collapse

Nicollet Island

Hennepin Island



FALLS OF ST. ANTHONY.
June 1878.

PLATE XXVI
TRANS. AM. SOC. CIV. ENGRS.
VOL. 30. BY COLVIN
FARGUNER OR
FALLS OF ST. ANTHONY.

NOTE. WITHIN DOTTED OUTLINE OF BRIDGE,
A INDICATES MASONRY BULKHEAD,
B INDICATES CONCRETE BULKHEAD,
C INDICATES TIMBER BULKHEAD.

October 5, 1869 Black – 2nd
downstream collapse

Nicollet Island

Hennepin Island

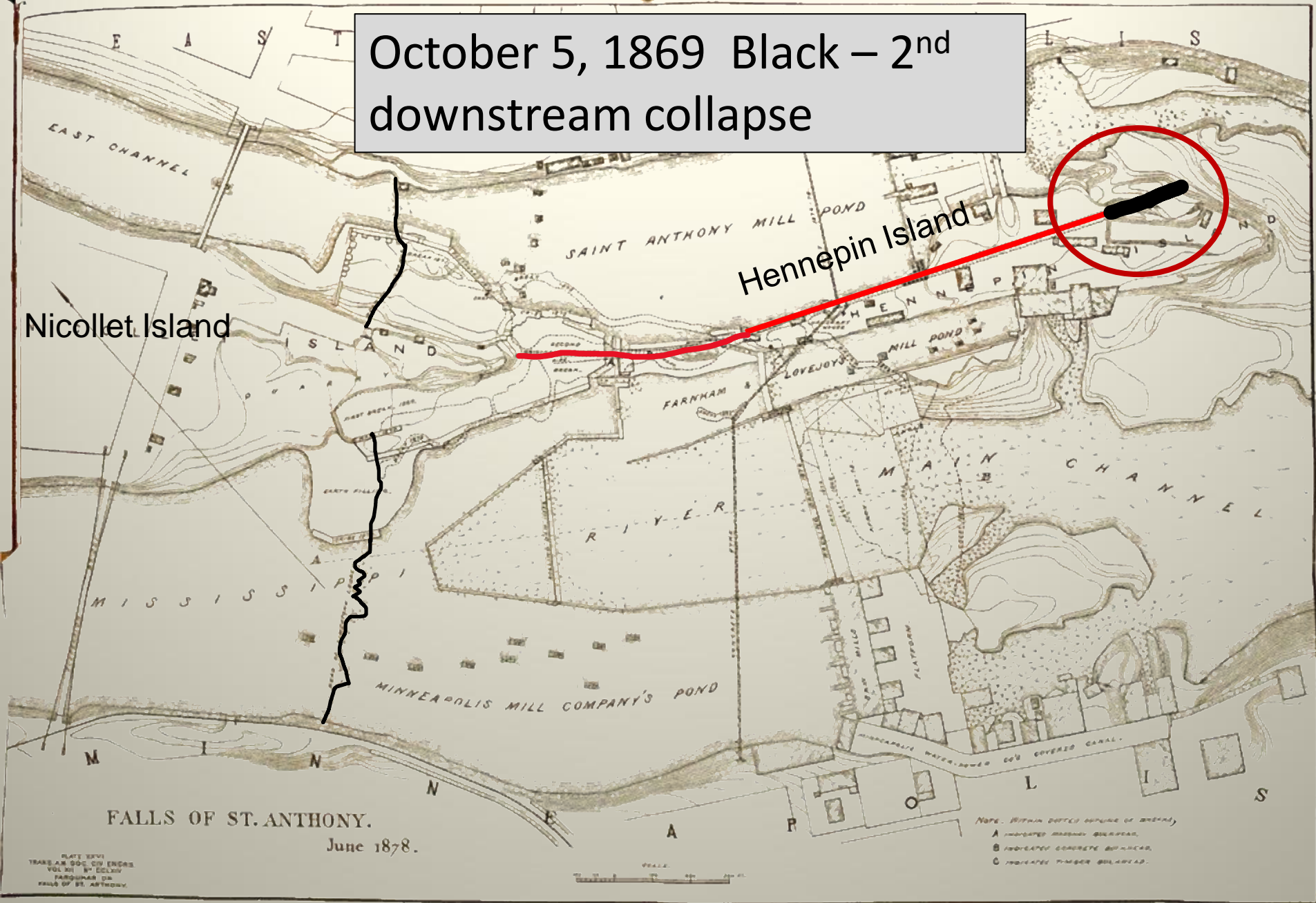
FALLS OF ST. ANTHONY.

June 1878.

PLATE XXVI
TRANS. AM. SOC. CIV. ENGRS.
VOL. XI. N. 12
P. 100
FALLS OF ST. ANTHONY.

SCALE
0 10 20 30 40 50 60 70 80 90 100

NOTE: WITHIN DOTTED LINES OF BRIDGE,
A INDICATES MARINE BULKHEAD,
B INDICATES CONCRETE BULKHEAD,
C INDICATES TIMBER BULKHEAD.

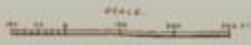


October 5, 1869. Collapse Upstream



FALLS OF ST. ANTHONY.
June 1878.

PLATE XXVI
TRANS AM SOC CIV ENGRS
VOL. 10, 1ST COL. 14
PUBLISHED BY
J. B. BARNES & CO.
FALLS OF ST. ANTHONY



NOTE. WITHIN DOTTED OUTLINE OF ISLANDS,
A INDICATES MASSIVE BULKHEAD,
B INDICATES CONCRETE BULKHEAD,
C INDICATES PILING BULKHEAD.



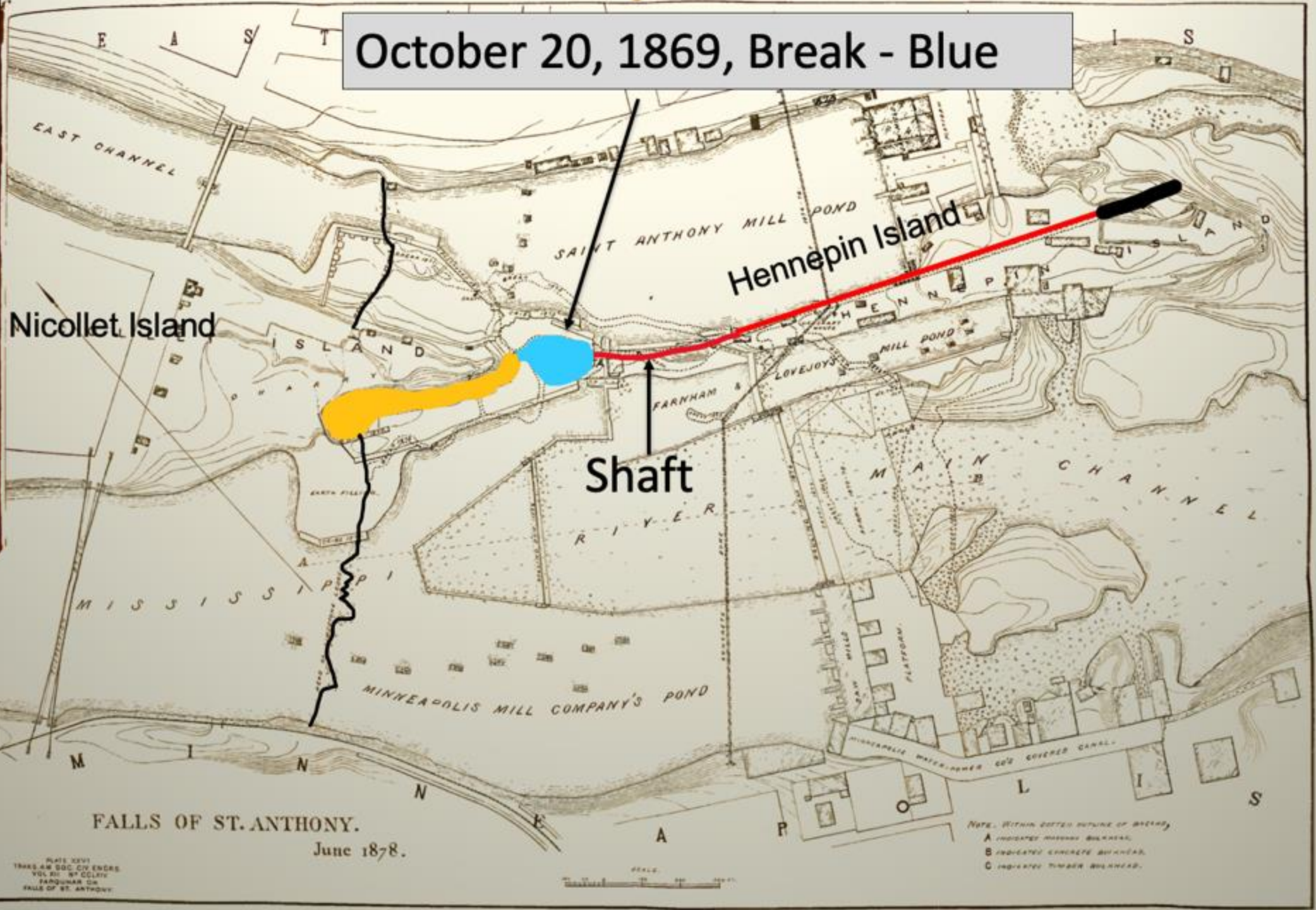
Cofferdam and
break in limestone
riverbed, 1869.

October 20, 1869, Break - Blue

Nicollet Island

Hennepin Island

Shaft



FALLS OF ST. ANTHONY.
June 1878.

PLATE XXVI
TRANS. AM. SOC. CIV. ENGINEERS
VOL. XI - 2^D ECLIPSE
PANGLOSS ON
FALLS OF ST. ANTHONY

NOTE. WITHIN DOTTED OUTLINE OF BRIDGE,
A INDICATES MASSIVE BULKHEAD,
B INDICATES CONCRETE BULKHEAD,
C INDICATES TIMBER BULKHEAD.



Wonders with Alicia

A Federal Interest

- Congress insisted there had to be a federal interest, a federal purpose.
- The Corps argued they needed to save the falls to preserve navigation above it.



April 1870 Flood.
Warehouse
collapses.
Summit Mills will
also fall.

July 1871 Scour Event – Purple

Nicollet Island

Hennepin Island

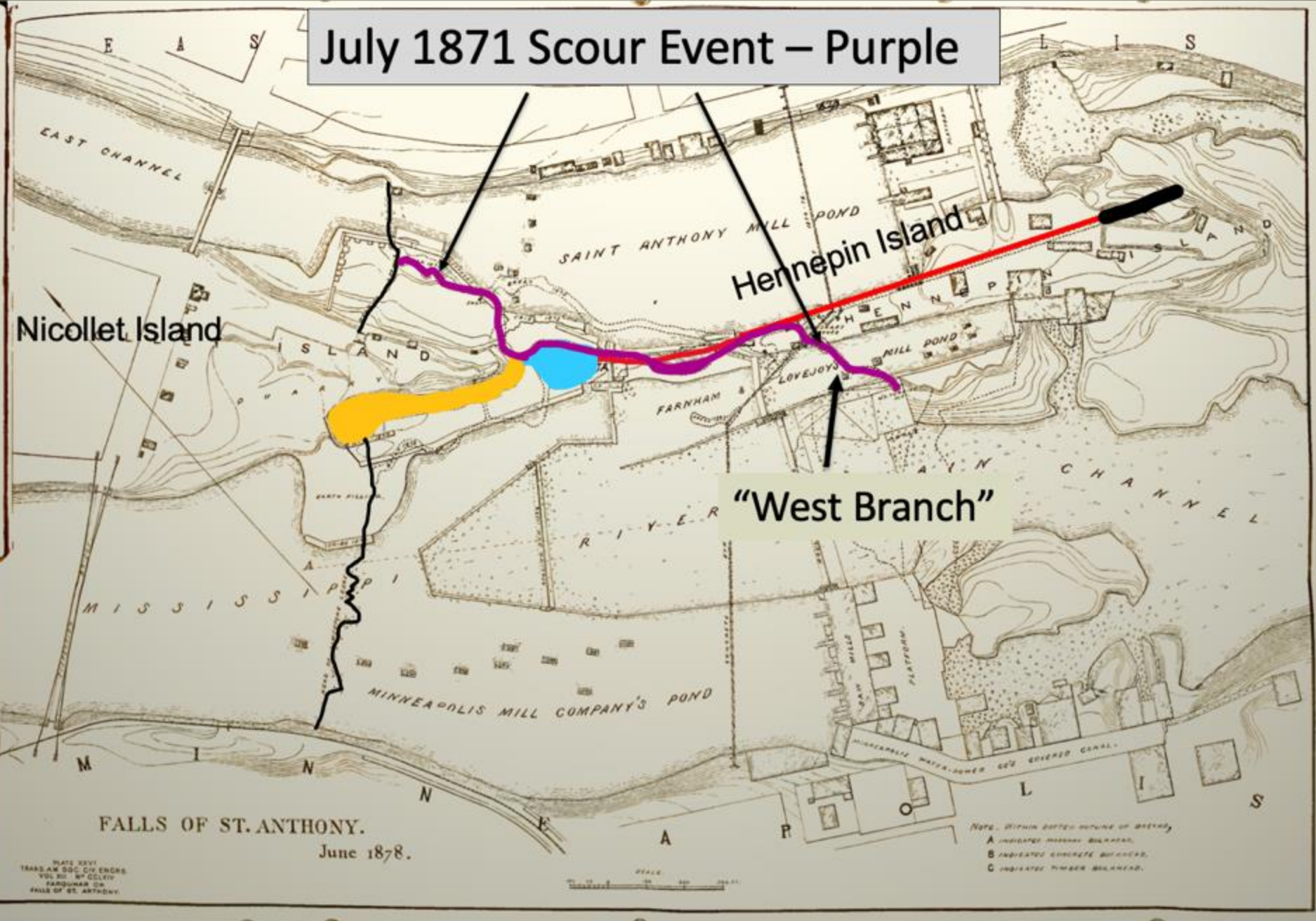
“West Branch”

June 1878.

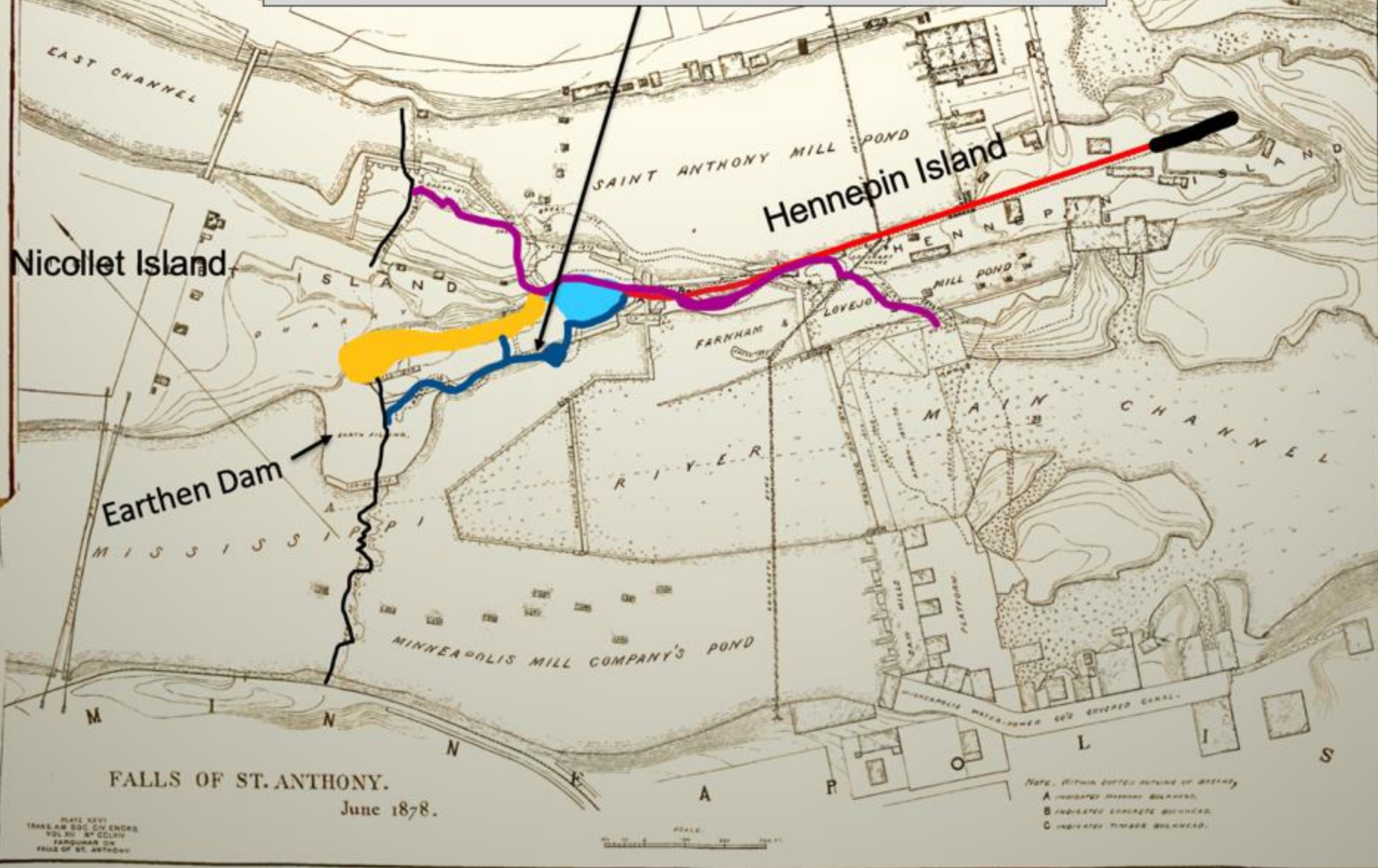
NOTE: WITHIN DOTTED OUTLINE OF BRIDGE,
A INDICATES IRONWORK BRIDGEHEAD,
B INDICATES CONCRETE BRIDGEHEAD,
C INDICATES TIMBER BRIDGEHEAD.

PLATE XXVII
TRANS. AM. SOC. CIV. ENGRS.
VOL. 20: 87-125
FARGUES & CO.
FALLS OF ST. ANTHONY.

SCALE
0 10 20 30 40 50



May 1873 Scour Event – Dark Blue



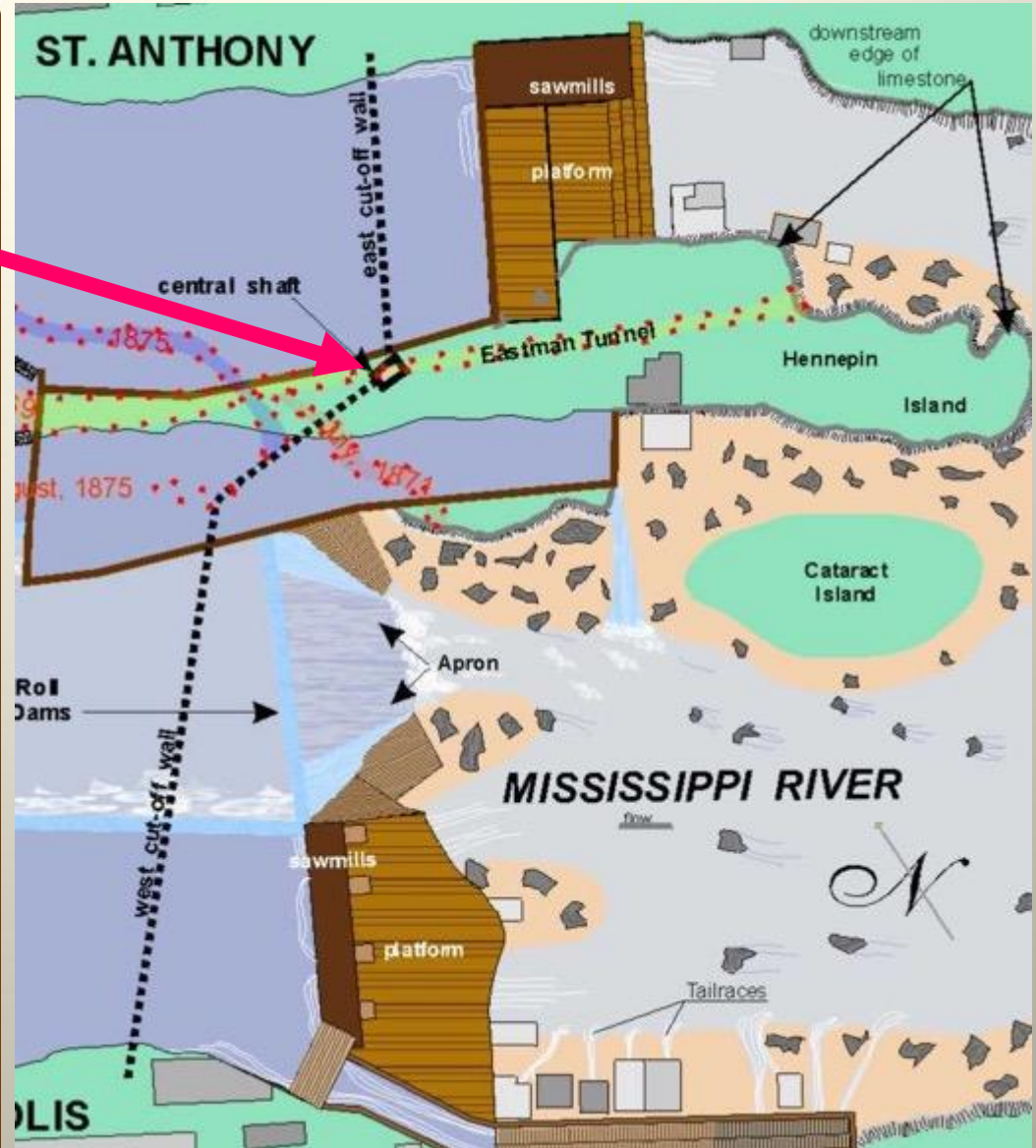
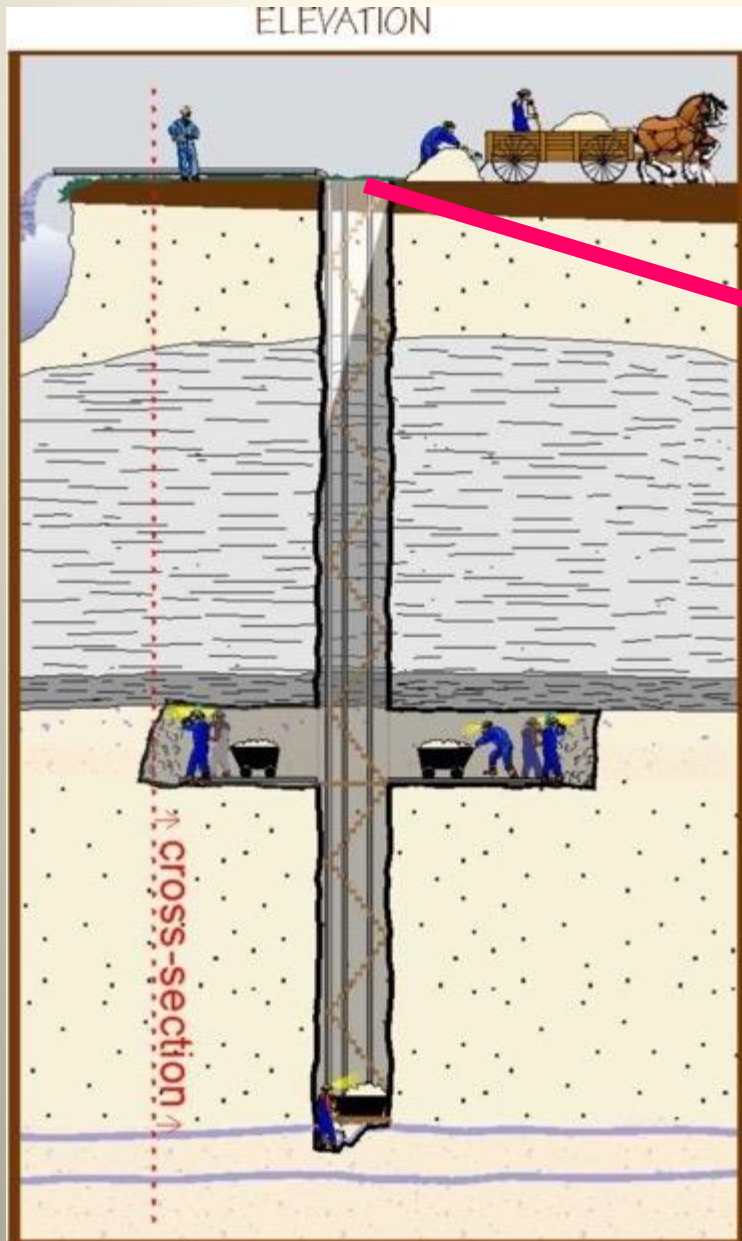
FALLS OF ST. ANTHONY.
June 1878.

PLATE XXVI
TRANS. AM. SOC. CIV. ENGRS.
VOL. XII, NO. 12, 1878
ENGRS. ON
FALLS OF ST. ANTHONY

SCALE
0 100 200 300 FT.

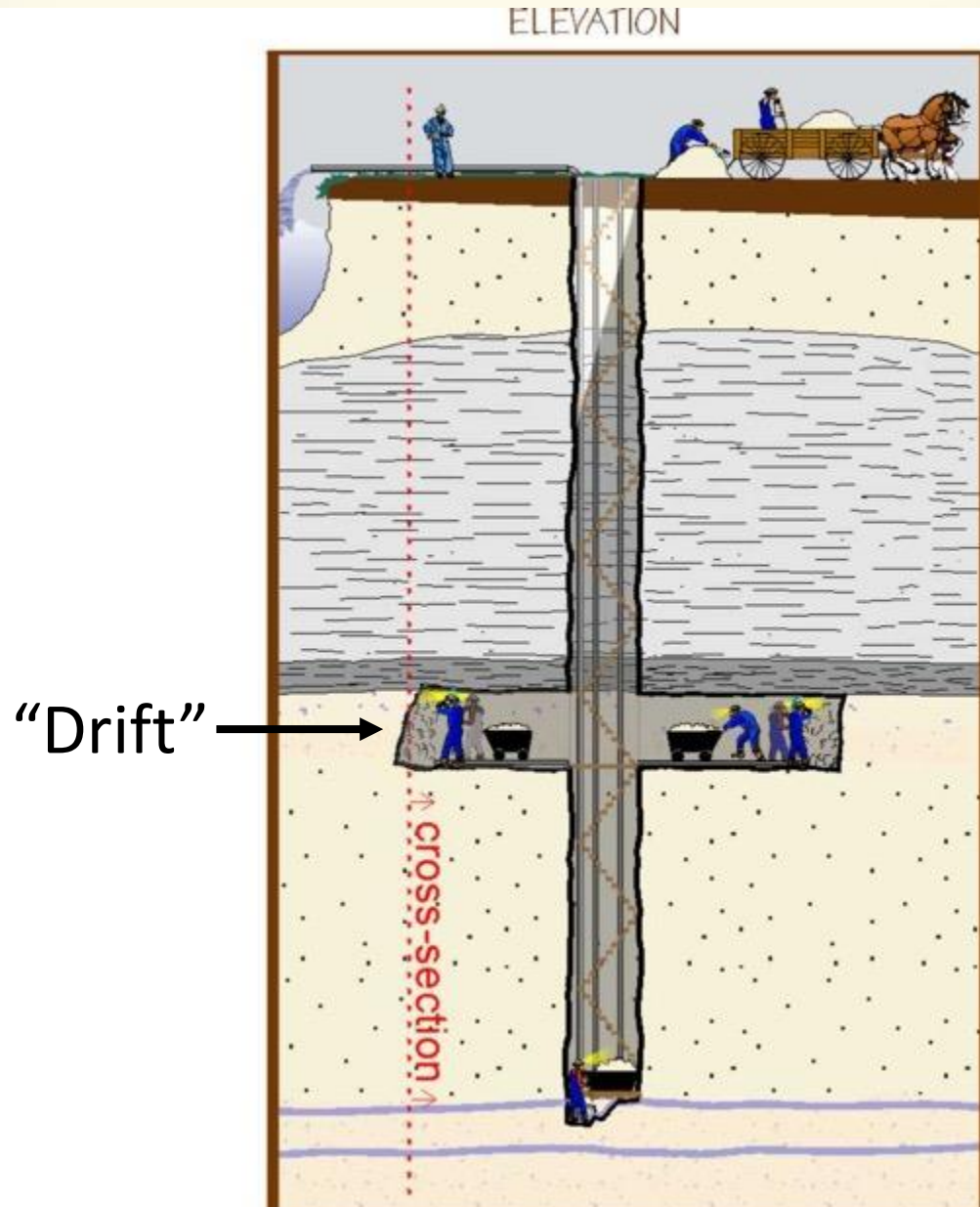
NOTE. WITHIN DOTTED OUTLINE OF BRIDGE,
A INDICATES IRON-PIER BULKHEAD,
B INDICATES CONCRETE BULKHEAD,
C INDICATES TIMBER BULKHEAD.

Shaft & Wall Excavation 1, Hennepin Island

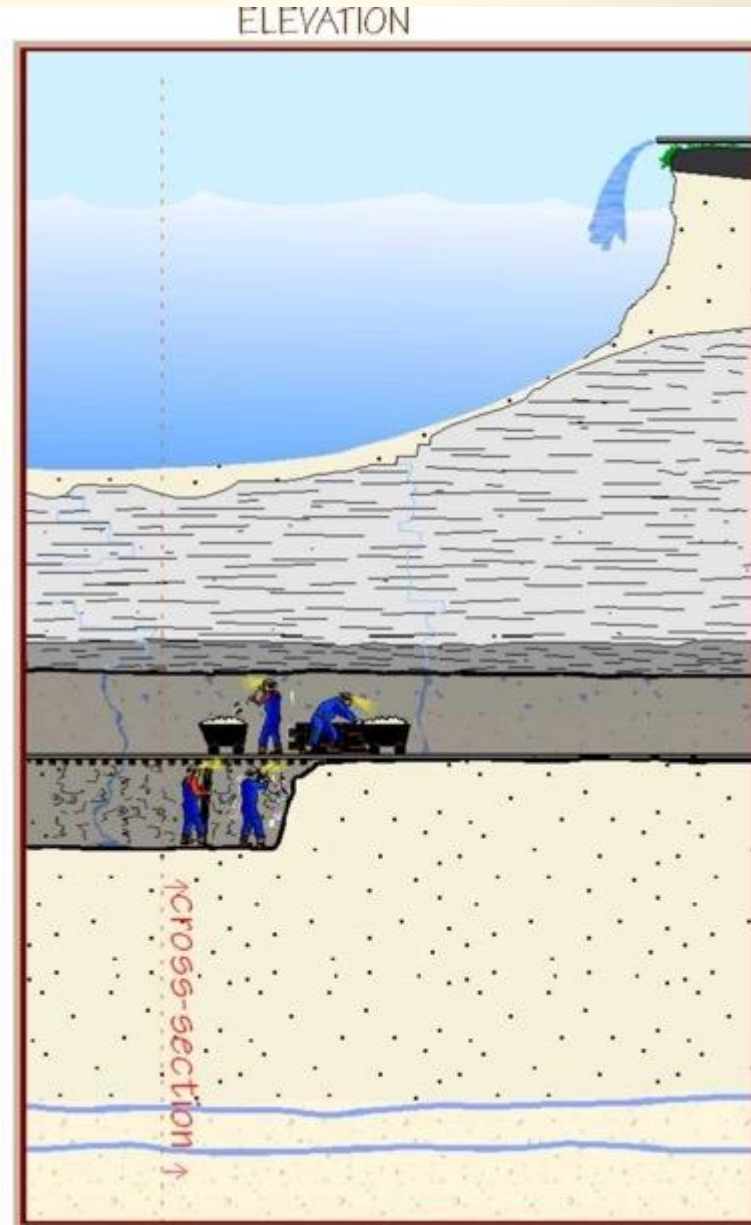


All Cutoff Wall Drawings - Corps of Engineers

Shaft & Wall Excavation 2, Hennepin Island

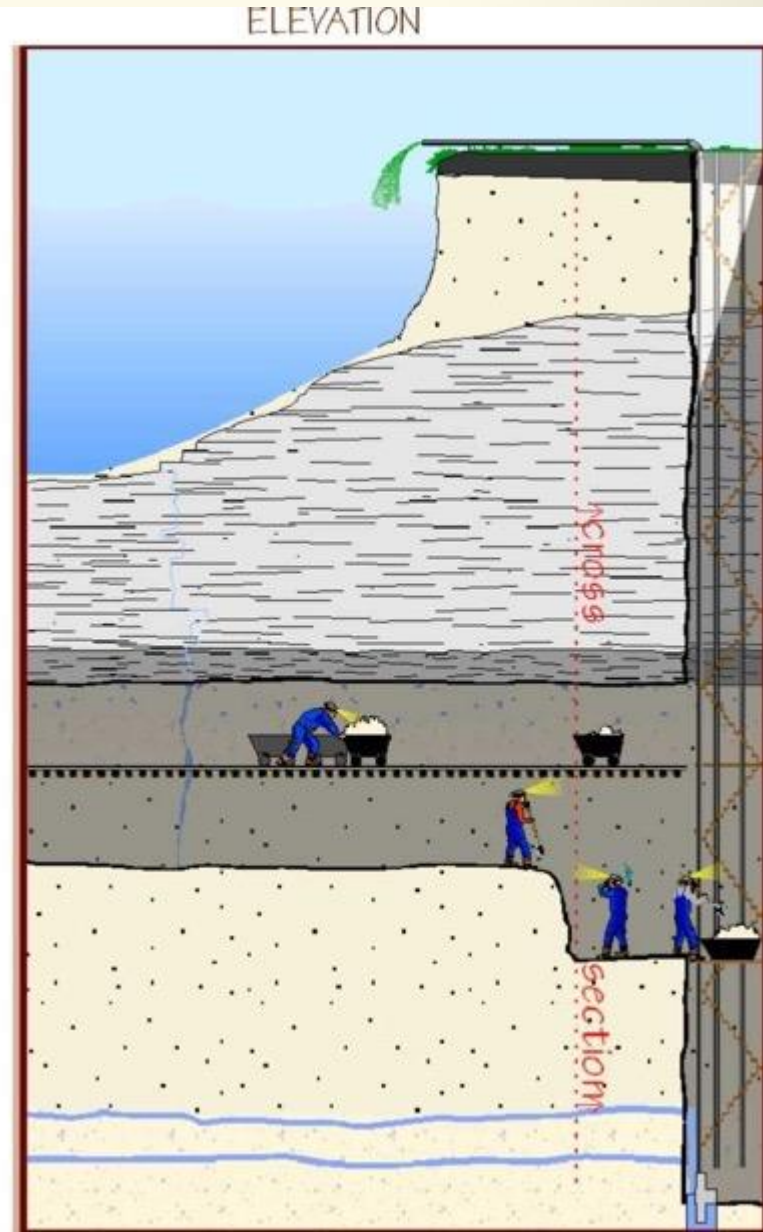
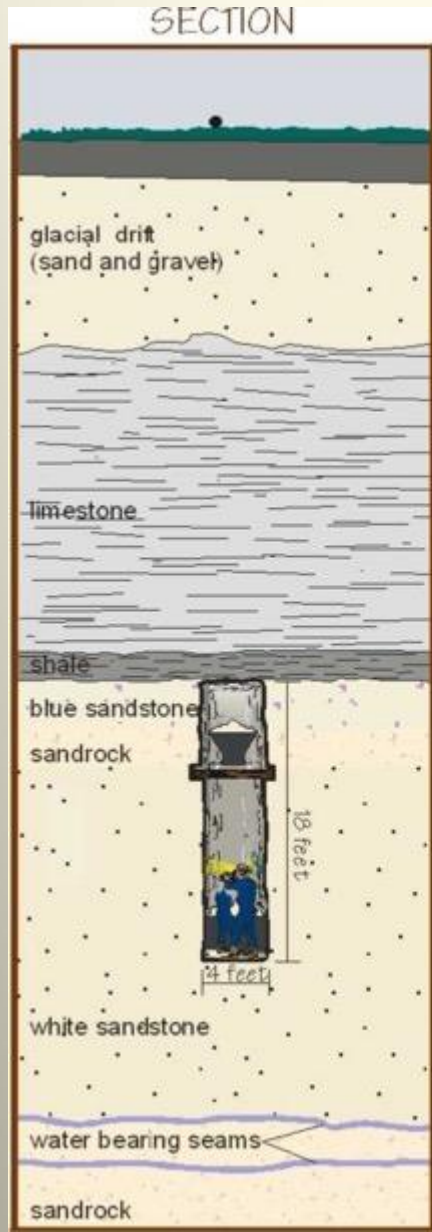


Wall Excavation 3, St. Anthony Falls

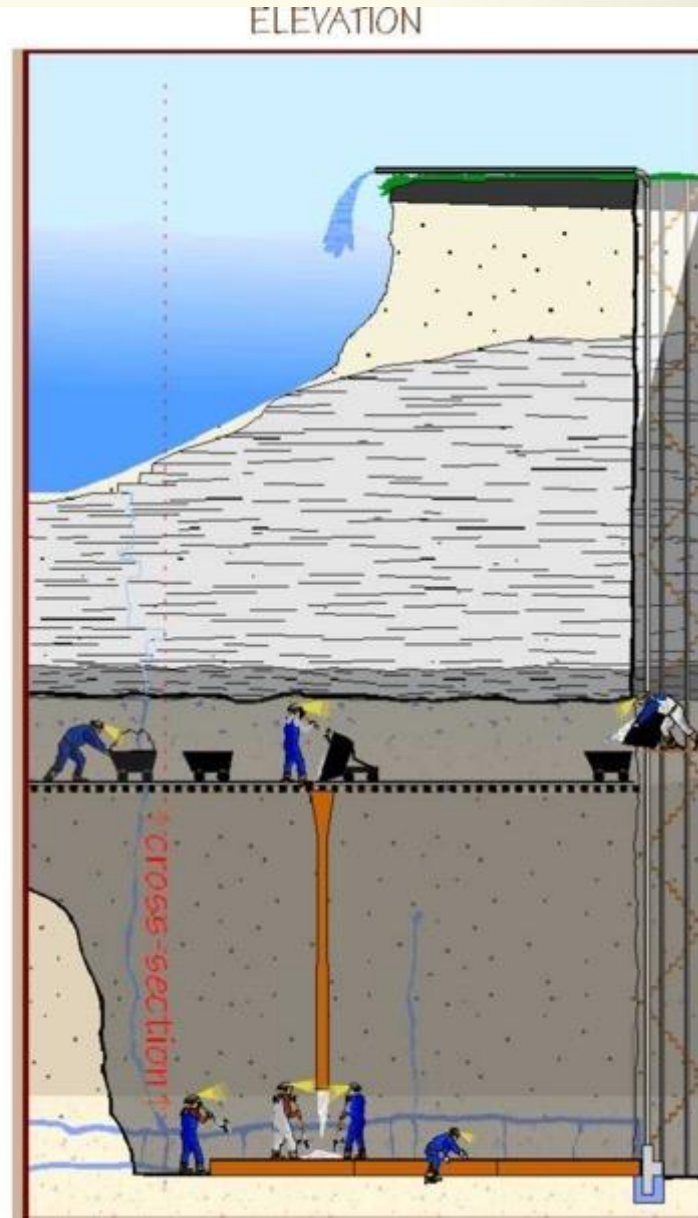


Drift
Drift

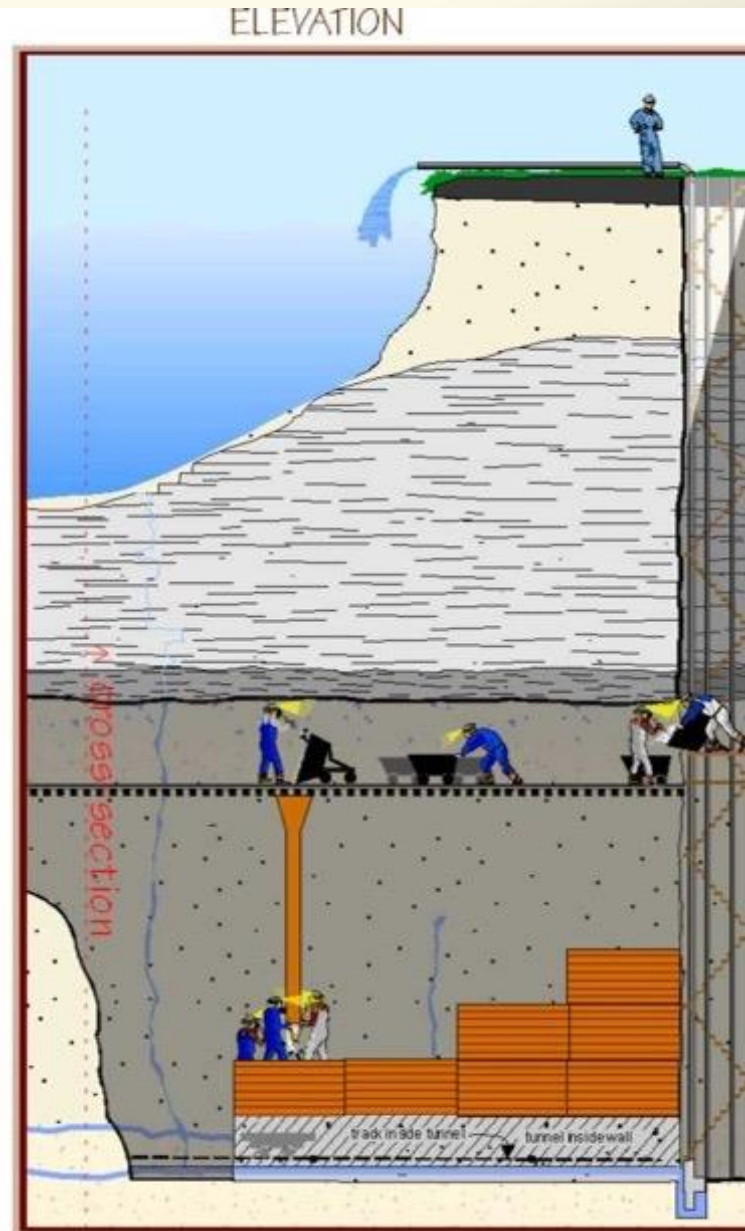
Wall Excavation 4, St. Anthony Falls



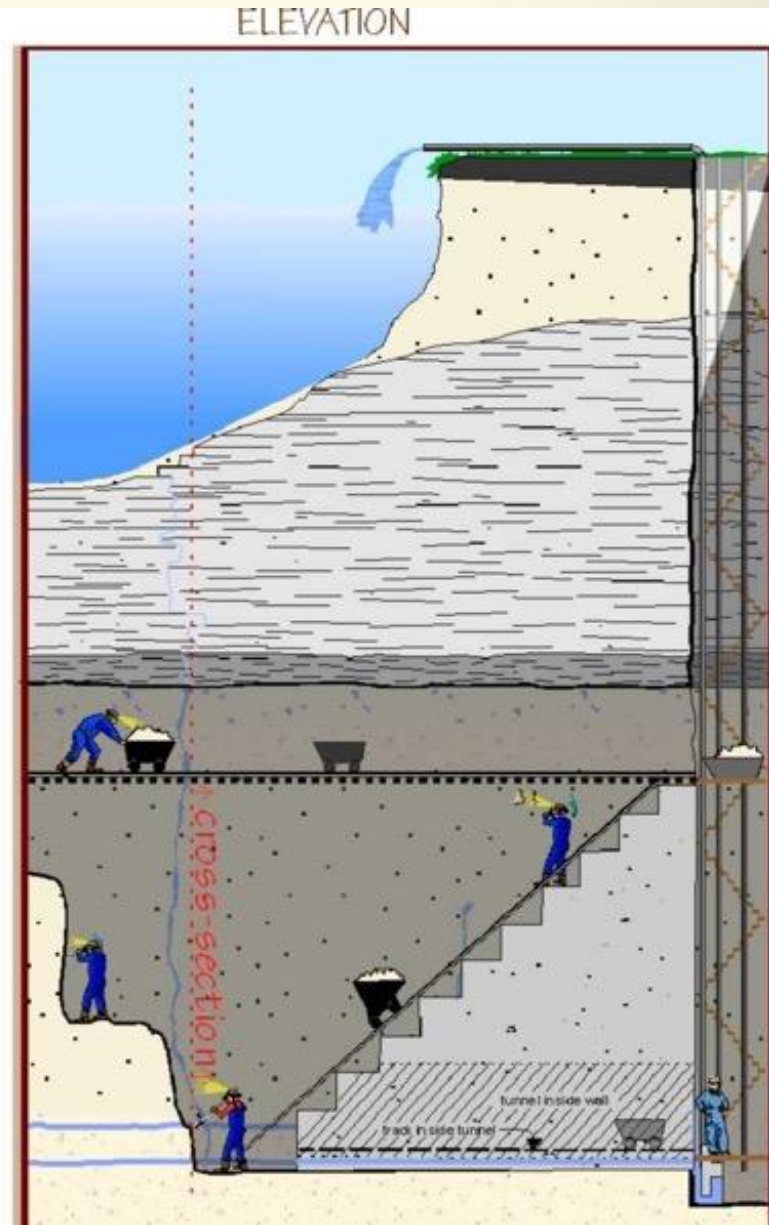
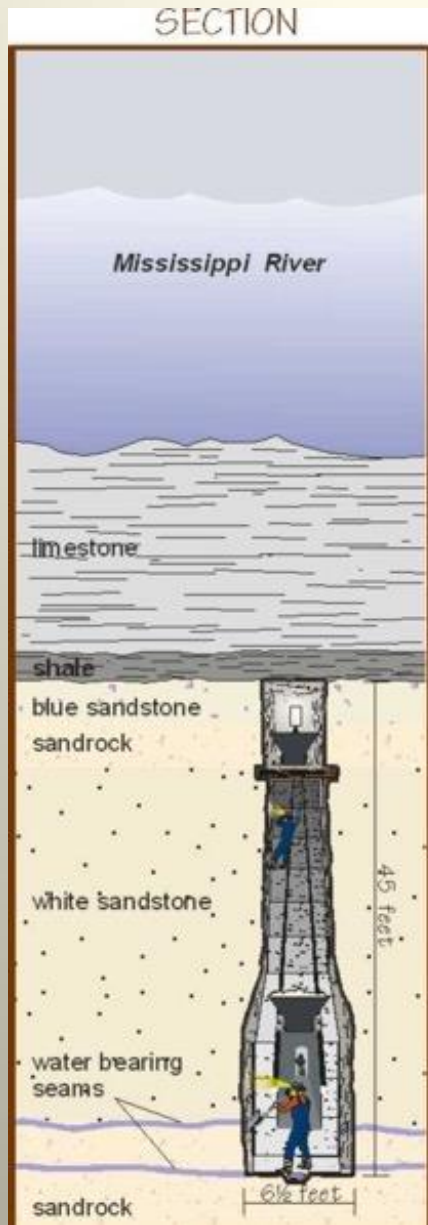
Wall Construction 5, St. Anthony Falls



Wall Construction 6, St. Anthony Falls



Wall Construction 7, St. Anthony Falls



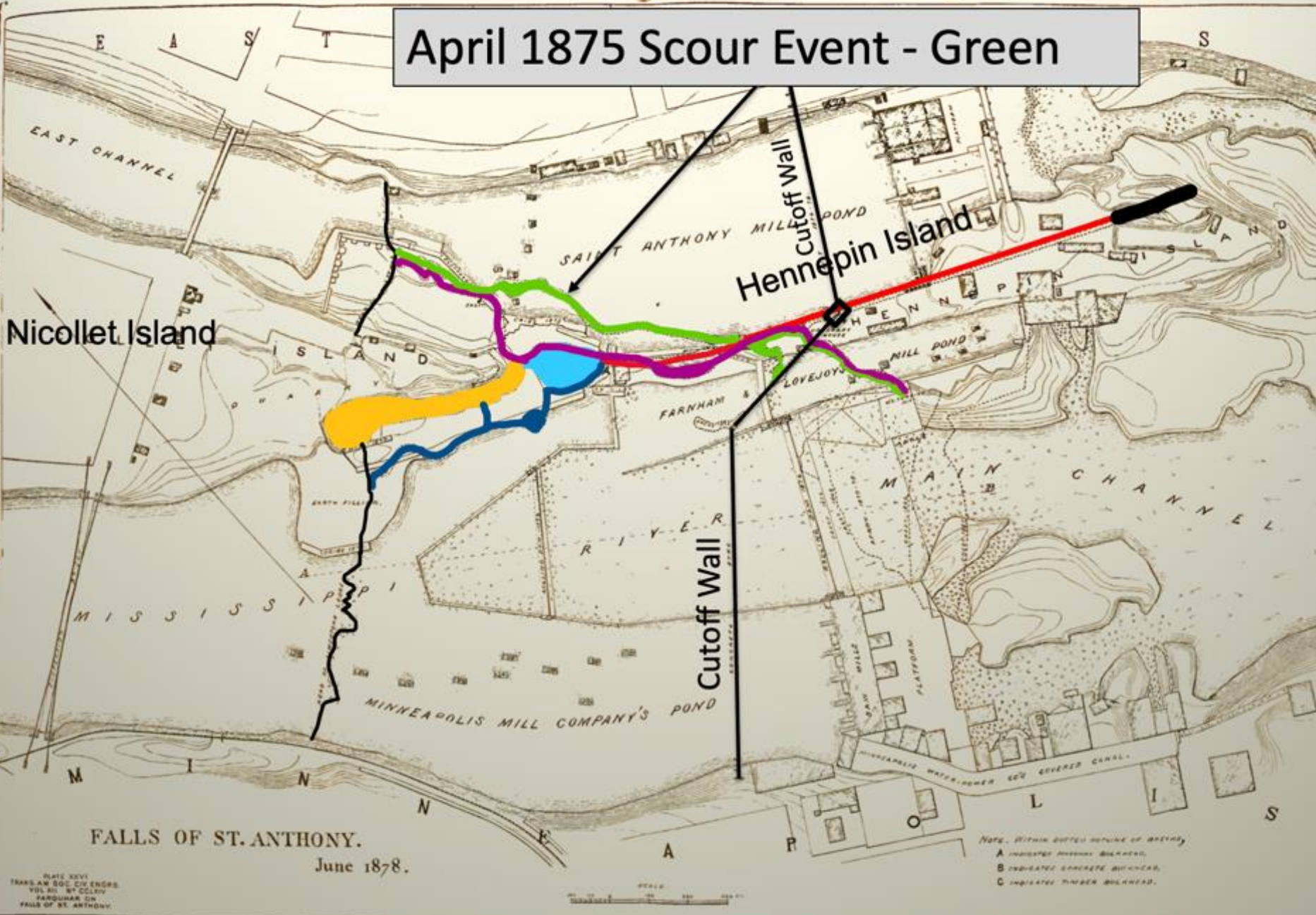
April 1875 Scour Event - Green

Nicollet Island

Hennepin Island

Cutoff Wall

Cutoff Wall

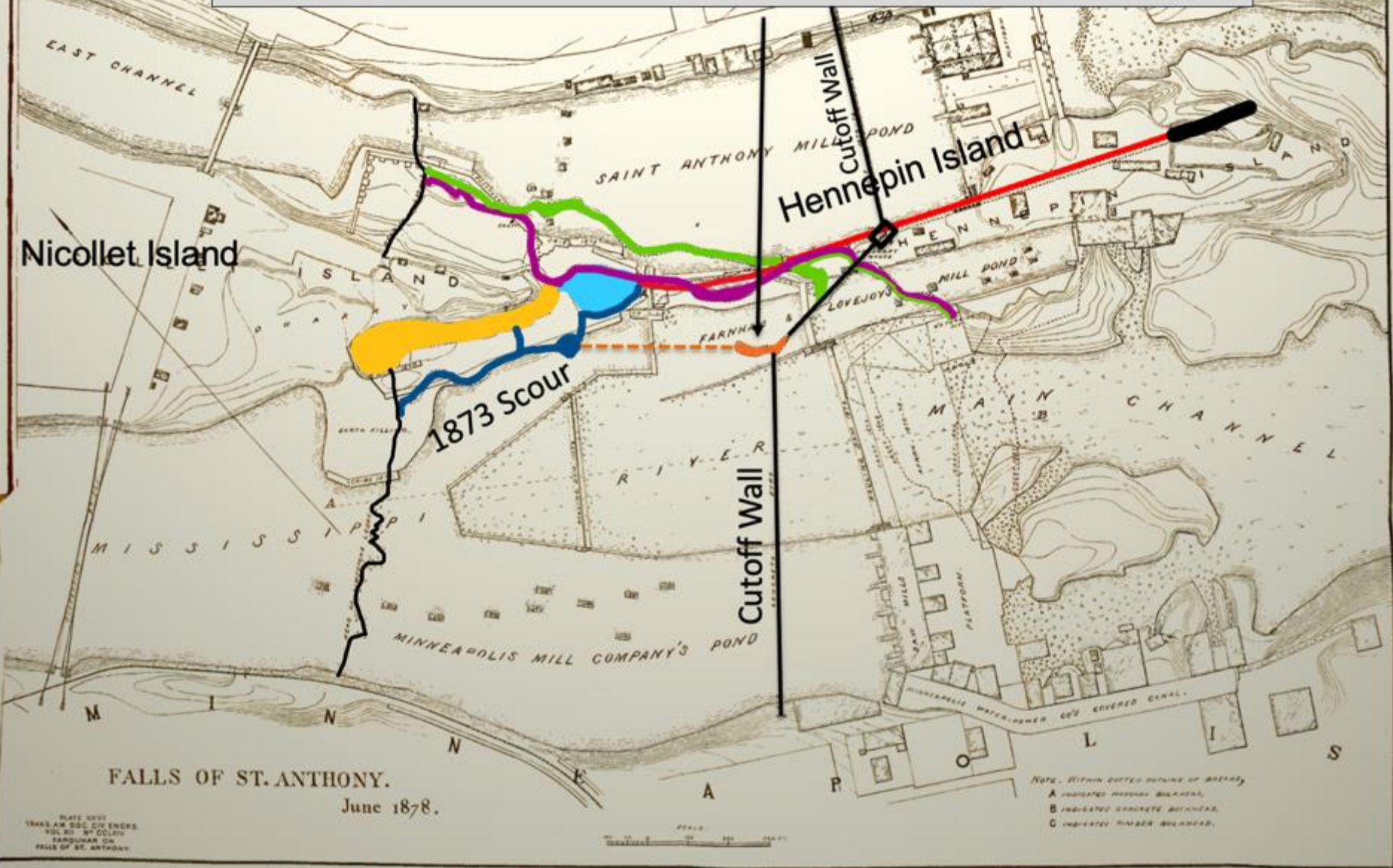


FALLS OF ST. ANTHONY.
June 1878.

PLATE XXVI
TRANS AM SOC CIV ENGRS
VOL 20 BY COLBY
BARQUEM CA
FALLS OF ST ANTHONY

NOTE. WITHIN DOTTED LINES OF BRIDGES,
A INDICATES IRON-PIER BULKHEAD,
B INDICATES CONCRETE BULKHEAD,
C INDICATES TIMBER BULKHEAD.

July-August, 1875 Scour Event – Dark Orange



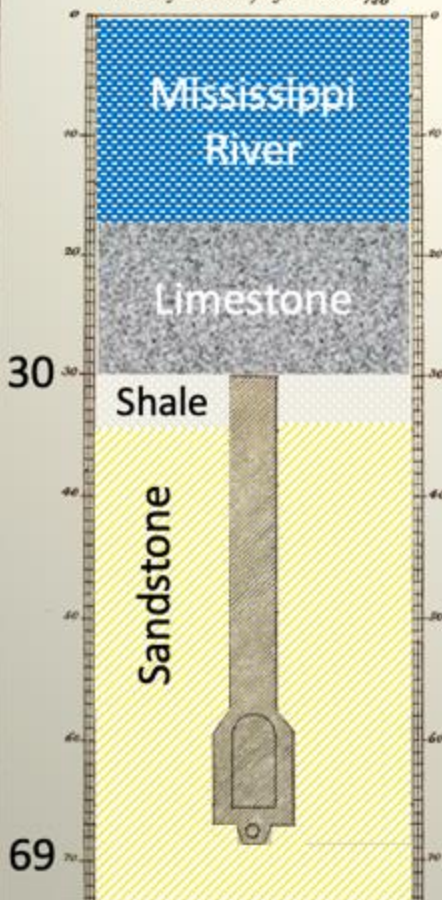
FALLS OF ST. ANTHONY.
June 1878.

PLATE XXVI
TRAKS AND SDC. CIV. ENGRS.
VOL. 31 - ST. CLOUD
FARGUHAN OR
FALLS OF ST. ANTHONY

SCALE
0 25 50 100 150 200

NOTE - WITHIN DOTTED OUTLINE OF BRIDGES,
A INDICATES BRIDGE BULKHEAD,
B INDICATES CONCRETE BULKHEAD,
C INDICATES TIMBER BULKHEAD.

Section No. 1
Geological Section on Line c-d
showing section of dyke Scale $\frac{1}{120}$.



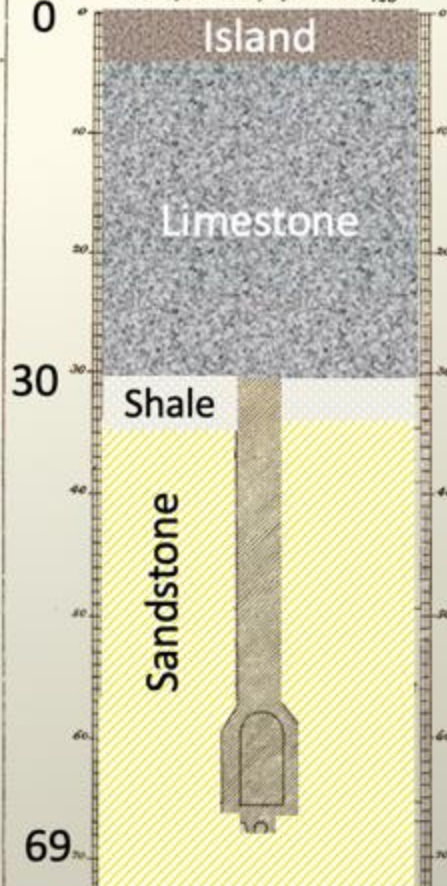
CROSS SECTIONS
 OF
DYKE
 AT
FALLS
 OF
ST. ANTHONY.

Under the
 Mississippi
 River

Scale $\frac{1}{120}$

PLATE XXVII
 TRANS. AM. SOC. CIV. ENGRS.
 VOL. XII, P. CCLXIV
 FANDUHAN ON
 FALLS OF ST. ANTHONY.

Section No. 1
Geological Section on Line c-d
showing section of dyke Scale $\frac{1}{120}$.



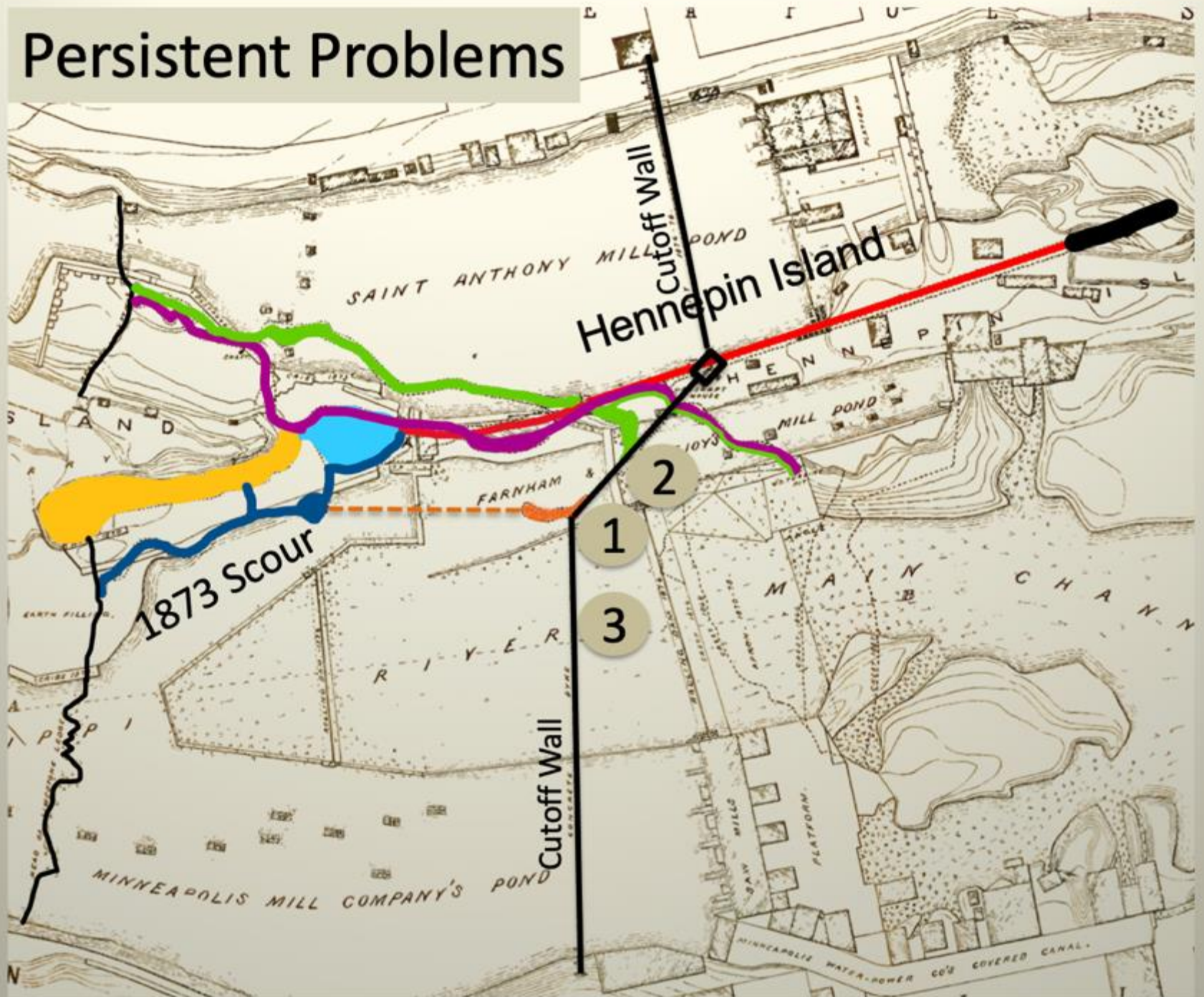
CROSS SECTIONS
 OF
DYKE
 AT
FALLS
 OF
ST. ANTHONY.

Under
 Hennepin
 Island

Scale $\frac{1}{120}$

PLATE XXVII
 TRANS. AM. SOC. CIV. ENGRS.
 VOL. XII, P. CCLXIV
 FANDUHAN ON
 FALLS OF ST. ANTHONY.

Persistent Problems



Some concerns since 1877

- All the problems did not occur in the distant past. According to the Corps 2015 Period Assessment for their locks and dams:
- 1920-1930: Leaks “through” the cutoff wall.
- 1936: Repairs completed in “to prevent further caving.”
- 2009: audible water running in the upper end of the Eastman Tunnel below the wall.

Choose Your View

- *Minneapolis Tribune*: “This artificial fortress ... is more lasting than nature itself.” 1876

MISSISSIPPI RIVER
at the
FALLS OF ST. ANTHONY
from a survey made under the direction of
MAJ. F. U. PARQUIER, CORPS OF ENGRS. U.S.A.
June and July 1873.
SHOWING PROPOSED IMPROVEMENTS
in accordance with the Report of Board of Engineers of April 11, 1874.

Sound
Gravel filling



Choose Your View

- *Major General G. K. Warren: “Only eternal vigilance will preserve the Falls of St. Anthony.”*
~1880



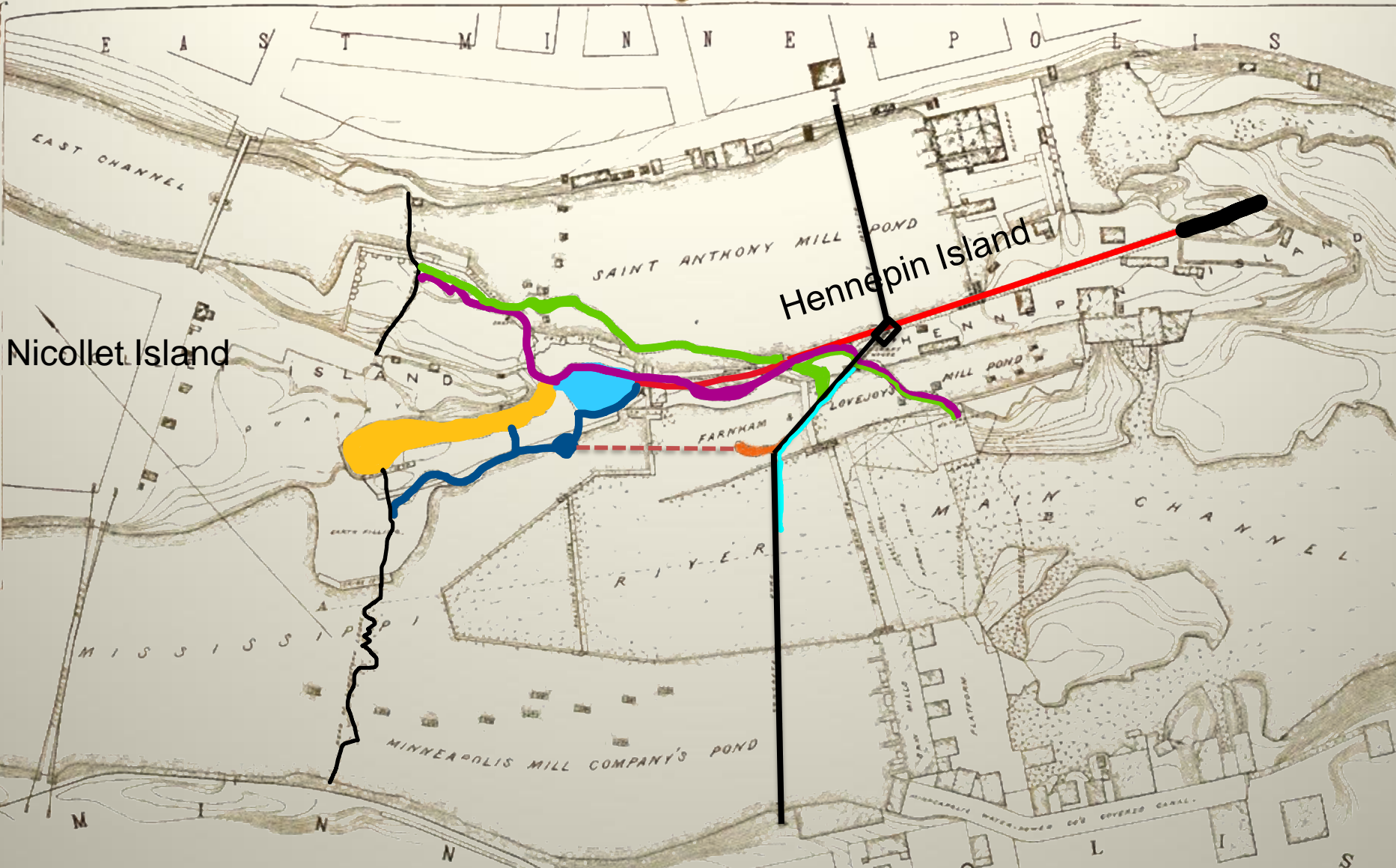
Actions Needed

- Determination of ownership.
- Thorough study of the cutoff wall and surrounding geology.
- Emergency Action Plan.

MISSISSIPPI RIVER
at the
FALLS OF ST. ANTHONY
from a survey made under the direction of
MAJ. F. U. PARQUHAR, CORPS OF ENGRS., U.S.A.
June and July 1873.
SHOWING PROPOSED IMPROVEMENTS
in accordance with the Report of Board of Engineers of April 11, 1874.

Flowed
Ground Elevation





Nicollet Island

Hennepin Island

FALLS OF ST. ANTHONY.

June 1878.

Questions

PLATE XXVI
TRANS. AM. SOC. CIV. ENGRS.
VOL. XI. N. 12. 1878.
PUBLISHED BY
FARRINGTON & CO.
FALLS OF ST. ANTHONY.

NOTE. WITHIN DOTTED LINES OF BRIDGE,
A INDICATES IRON BRIDGE,
B INDICATES CONCRETE BRIDGE,
C INDICATES TIMBER BRIDGE.