

MICHIGAN INFRASTRUCTURE & TRANSPORTATION ASSOCIATION ANNUAL CONFERENCE

LTG Scott A. Spellmon
55th Chief of Engineers &
Commanding General
U.S. Army Corps of Engineers

21 January 2021



US Army Corps
of Engineers®



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A Quick History of the Soo Locks

1798 First Lock on St. Marys River

To support the growing fur trade, the Northwest Fur Company built a canoe lock on the north shore of the river. This lock was approximately 40 feet-long and 9 feet-wide.



1855 "State Lock" opens

Built in only two years this tandem lock used two chambers each measuring 350'X 70' and each with a lift of 10 feet to bypass the rapids.

This lock was operated and maintained by the State of Michigan.



1896 Poe Lock opens

Built on the site of the former State Lock, the Poe lock was 800 feet long and 100 feet wide.



1919 Sabin Lock opens

An exact twin of the Davis Lock, it was begun even before the Davis was finished. It is also the only lock on the site named for a civilian, Louis Sabin, the only civilian to ever serve as the Detroit District Engineer.



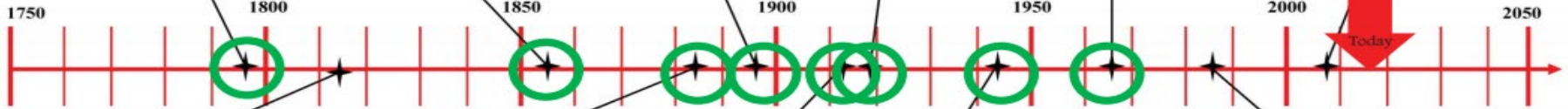
1968 Second Poe Lock opens

As the design for a new lock neared completion it became clear that an even larger lock would be needed as boats measuring 1,000 feet-long were being planned. Originally set to be 1,000 feet-long and 100 feet-wide it was redesigned to its current size of 1,200 feet-long and 110 feet-wide.



2009 Preparatory work for new lock completed

Funds were provided to build coffer dams at each end of the Sabin Lock and to dredge the approach channels to 28.5 feet.



1814 Lock Destroyed

During the War of 1812 American forces destroyed the British lock. Goods had to be unloaded and stored in warehouses at either end of the falls and transported on a railway running down Portage Avenue.



1883 Wietzel Lock opens

This lock was the first one to fill and empty the chamber through openings in the floor, reducing turbulence in the lock.

During its construction in 1881 the entire facility was transferred from the state to the U.S. Army Corps of Engineers.



1914 Davis Lock opens

At 1,350 feet-long the Davis lock held the honor of being the longest lock in the world when it opened.



1943 MacArthur Lock opens

Opening of a new, deeper lock became a matter of national security during World War II and the MacArthur Lock was built in 15 months. During the war thousands of soldiers were stationed at the Soo to protect the locks and the flow of iron ore.



1986 New Lock Authorized

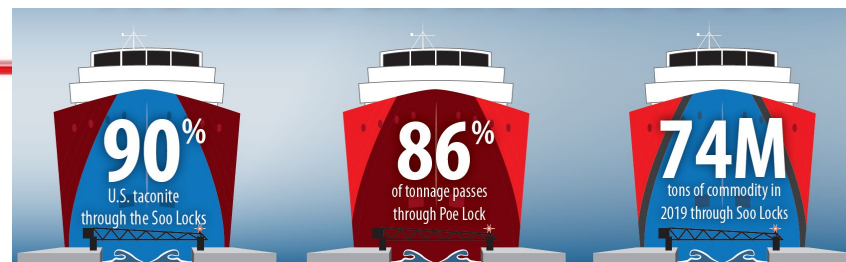
As part of the Water Resources Development Act, Congress authorized the construction of a new lock to be built on the site of the Sabin and Davis Locks. This new lock will be the same size as the Poe Lock.



It has been nearly 50 years since a new lock was built at the Soo

IMPORTANCE

- Construction of a new lock with dimensions equal to the Poe Lock (1,200 feet long x 110 feet wide) will provide much needed resiliency in the Great Lakes Navigation System.
- Nearly all domestically produced advanced high strength steel used to manufacture products like automobiles and appliances is made with taconite (iron ore) that transits the Poe Lock.
- A 30 day outage of the Poe Lock has a greater impact on the nation than a 30 day outage of any other USACE lock.
- The New Lock is expected to provide annual benefits of \$77.4 million and a benefit-cost ratio of 2.32 at a 7.0 percent discount rate.



Heroes of the Soo Locks Operations & Maintenance



Removing a dewatering bulkhead



Removal of ice build up on miter gate prior to making repairs to miter gate

Ice build up on miter gates



Pulling the 1st dewatering bulkhead to relood the chamber





Performing a periodic inspection of miter gates Dewatering bulkheads with ice build up





Air system in use to move ice to allow miter gates to open





COST & BUDGET



Current total project cost \$1.03 billion
\$364.8 million funded to date (35% funded)

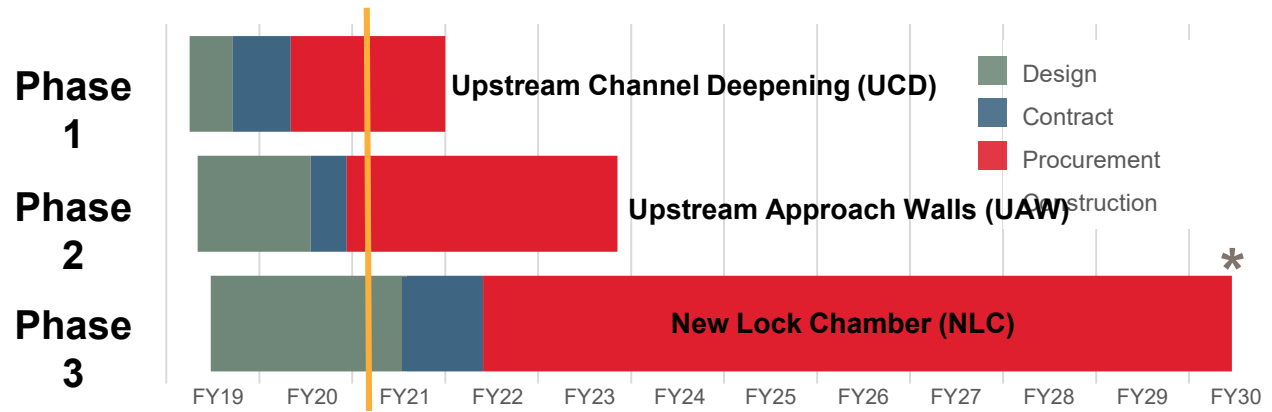
Fiscal Year	Allocation/(Capability)	Activities Funded/Capabilities
Prior to 2018	\$32.0M	<ul style="list-style-type: none"> Design and planning efforts Downstream Channel Deepening construction completed Sabin Lock Cofferdam construction completed
2019	\$69.2M \$32.3M Work Plan \$36.9M State of MI*	<ul style="list-style-type: none"> Complete Upstream Channel Deepening design and award construction contract Complete Upstream Approach Walls design Resume New Lock Chamber design
2020	\$125.3M \$75.3M Allocated \$50M Work Plan	<ul style="list-style-type: none"> Upstream Channel Deepening: complete and manage construction Upstream Approach Walls: complete design, award and manage construction contract New Lock: continue design
2021	(\$260.4M)** \$123.2M Allocated	<ul style="list-style-type: none"> Upstream Channel Deepening – manage construction Upstream Approach Walls – complete and manage construction New Lock - complete design and advertise construction contract <p>\$137.2M remaining capability identified in fiscal year 2021</p>
2022	(\$156.9M)**	<ul style="list-style-type: none"> Upstream Approach Walls – manage construction New Lock Chamber – year 2 of construction contract
2023-2030**	(\$371.5M)**	<ul style="list-style-type: none"> Continue New Lock Chamber construction through completion

*\$15.1M of the state of Michigan funds remaining

** Fully funded costs, escalated through mid-point of construction

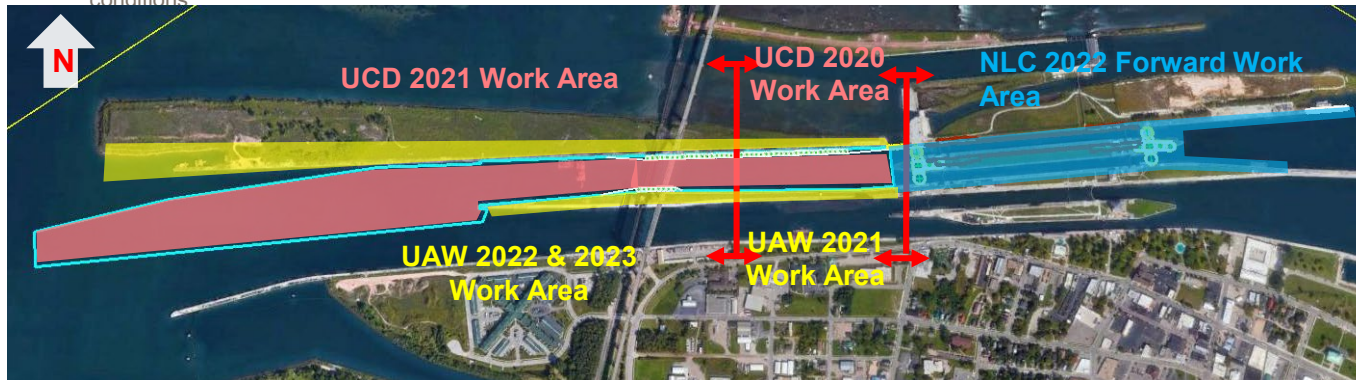


CONSTRUCTION MILESTONES



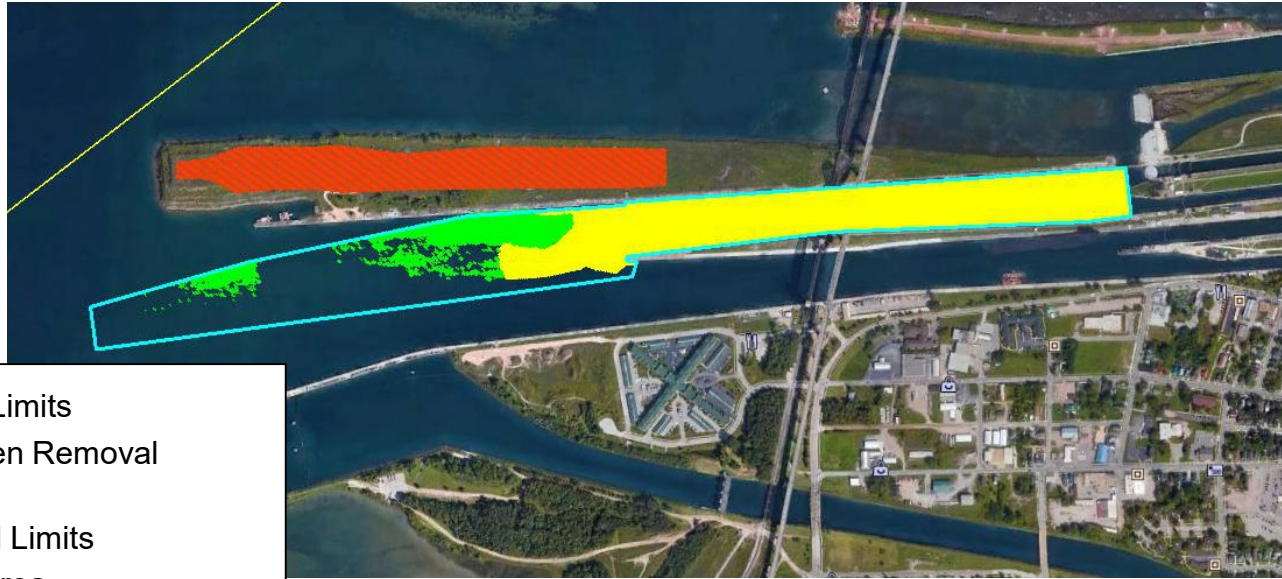
WE ARE HERE

* Early completion could be realized with approval of continuing contracts clause, efficient funding, and favorable weather conditions.





PHASE 1: UPSTREAM CHANNEL DEEPENING



- Channel Deepening Limits
- Bedrock & Overburden Removal Limits
- Overburden Removal Limits
- Material Placement Area

Scope: Remove 300,000 CY of Jacobsville sandstone and overburden (loose sediment) to deepen the Upstream Approach Channel to depth of 30 feet

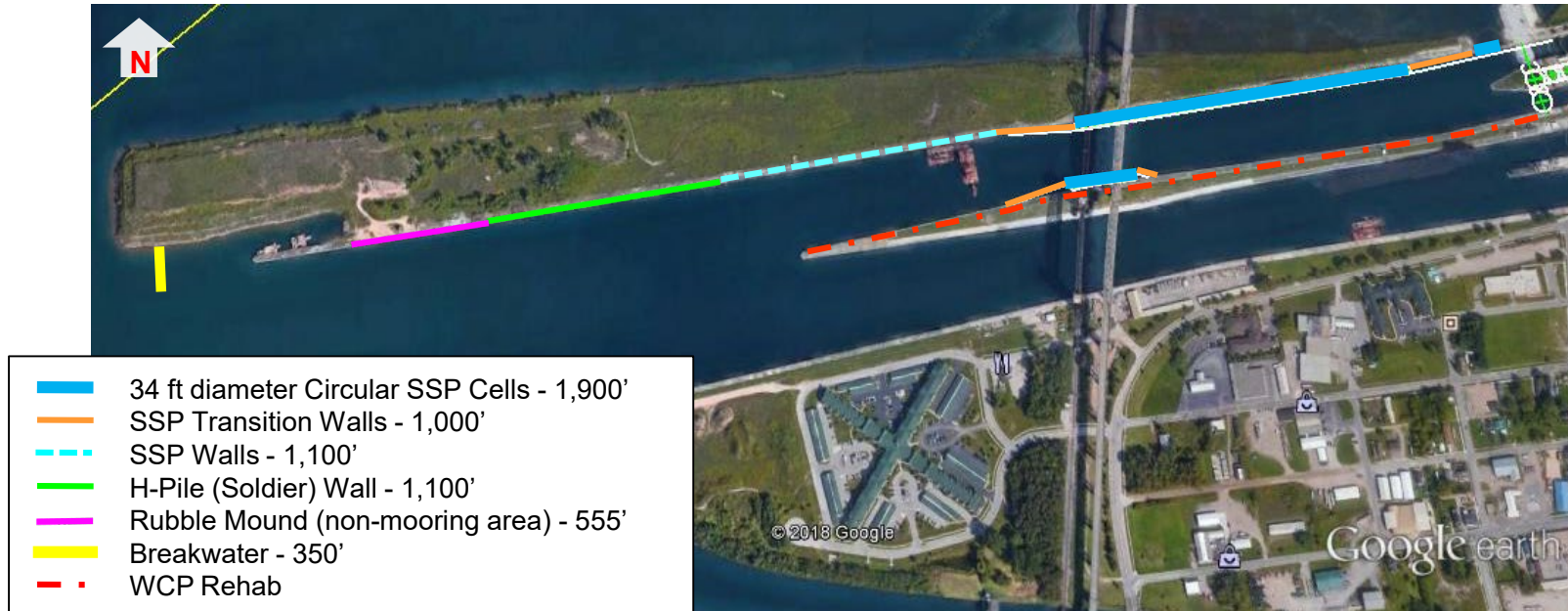
Construction Status:

- \$52.6M Contract awarded in January 2020 to Trade West Construction Co. of Nevada.
- Contractor is working from East to West and has completed roughly 50% of the required contract work. The contractor is on track to complete work on time by Fall 2021

Estimated Performance Period: 20 Months



PHASE 2: UPSTREAM APPROACH WALLS



Scope: Rehabilitate approach walls upstream of New Soo Lock including reconstruction of walls, concrete caps, mooring bollards, electrical, and lighting.

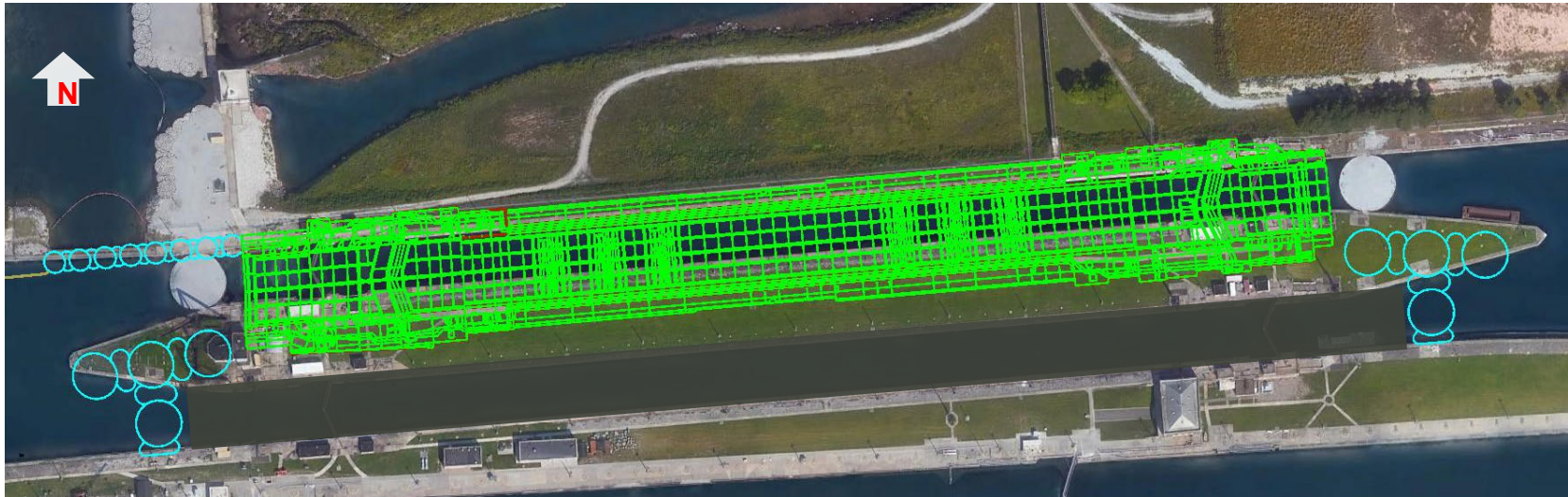
Project Status:

- \$111.3M Contract awarded to Kokosing Alberici in September 2020
- Contractor expected to arrive on site in Spring 2021 and complete work in Fall 2023

Estimated Performance Period: 36 Months



PHASE 3: NEW LOCK CHAMBER



Scope: Construct new 1,200' long by 110' wide by 32' deep chamber and rehabilitate downstream approach walls.

Project Status:

- 70% Design review completed in July 2020
- 100% Design to be complete in July 2021
- Construction contract award expected in Winter 2022 with contractor mobilization in Late Spring 2022

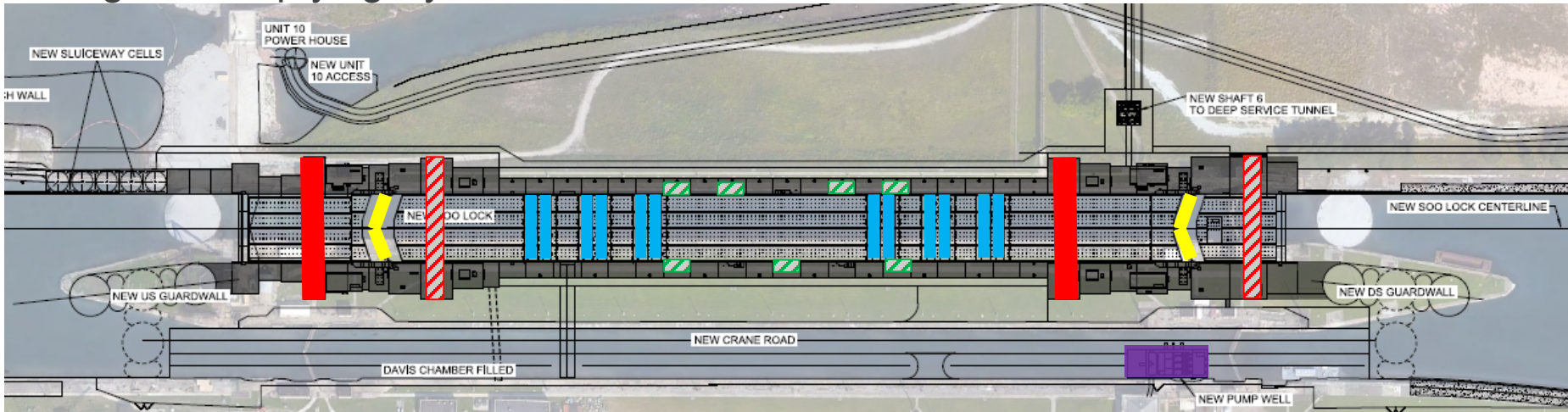
Estimated Performance Period: 5-8 Years



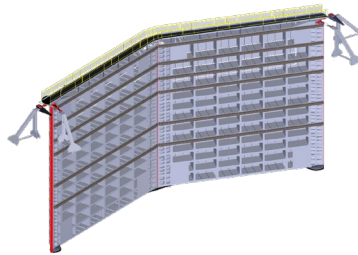
NEW LOCK CHAMBER KEY FEATURES



Miter Gates Filling and Emptying System



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Miter Gates



Ship Arrestor



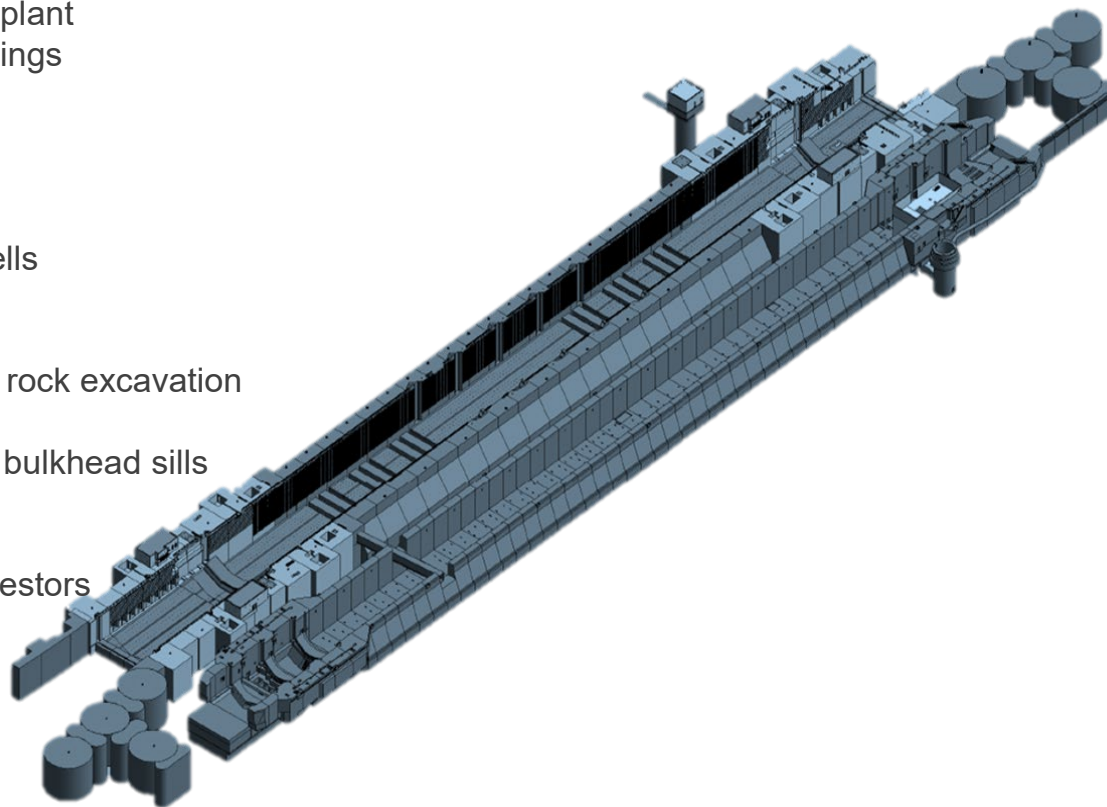
Hands Free Mooring Unit



NEW LOCK CHAMBER CONSTRUCTION SEQUENCING



1. Mobilizing to site including constructing batch plant
2. Demolish Existing Davis and Sabin Lock buildings
3. Relocate Power from Unit 10 to NPP
4. Construct grout curtain
5. Construct New Bridge to NPP and Shaft 6
6. Demolish nose piers
7. Construct upstream and downstream coffer cells
8. Prepare Davis Lock for Dewatering
9. Dewater Sabin and Davis Locks
10. Demolish Sabin walls and floor and additional rock excavation
11. Fill Davis Chamber with Excavated Material
12. Construct wide wall monoliths, miter gate and bulkhead sills
13. Construct control houses
14. Construct chamber monoliths
15. Install miter gates, culvert valves, and ship arrestors
16. Install electrical and mechanical equipment
17. Remove cofferdam cells
18. Install downstream approach walls
19. Install HFM units
20. Install downstream ship arrestors
21. Complete site work



View 3D model on YouTube:

<https://www.youtube.com/watch?v=lpWzCeSIIOc&feature=youtu.be>



ARTISTIC RENDERING OF NEW LOCK AT THE SOO





PROJECT MANAGER – NEW SOO LOCK



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U.S. ARMY CORPS OF ENGINEERS OVER 245 YEARS OF SERVICE TO THE NATION



U.S. Capitol - 1800
Washington Monument - 1884
Lincoln Memorial - 1922



Southwest Border Wall Project - 2019



The Pentagon - 1941



Panama Canal - 1914



Bonneville Dam - 1937



Kennedy Space Center - 1962