



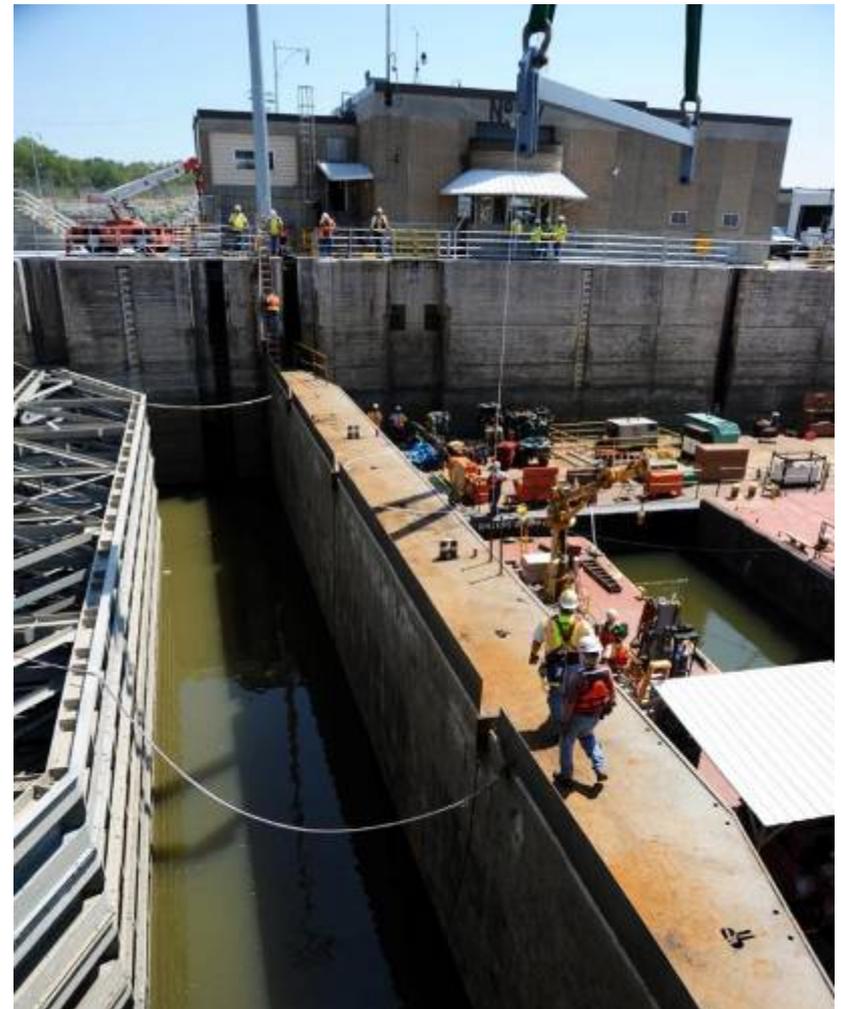
# Lock 27, Auxiliary and Main Lock Lift Gate Replacement

Lock and Dam Maintenance  
Workshop 2011



# Agenda

- Project Snapshot
- Key Planning Tools
- Schedule Milestones
- Keys to Safety Success
- Site Layout
- Critical Lift Plan
- Daily Execution
- Issues
- Results





## SNAPSHOT

### Locks 27, Granite City

Auxiliary and Main Lock Lift Gate  
Downstream Leaf Replacement

#### Gate Design/Fabrication:

- Each leaf weighs approx 540,000 lbs (270T) .
- Fabrication Time = 30 months
- Fabrication Cost = \$8M (\$4M each)
- Designed by USACE St. Louis.

#### Gate Installation:

- Approx 20,000 lbs (10T) of rigging hardware are added to make the lift.
- Lift performed by the H.M Shreve 550T crane from the Louisville District.
- Work will be performed by USACE St. Louis operations and maintenance staff and direct hire labor (supplement from MVR.)
- Auxiliary Lock Installation Costs: \$970K (O&M Funded) for 12-hr operations
- Main Lock Installation Costs: \$1.1M (ARRA Funded) for 24-hr operations to minimize impact to Navigation Industry



#### Schedule Milestones:

Aux Lock Lift Gate	01-14 June 2010
Aux Lock Anchor Arm	14-18 June 2010
Main Lock Lift Gate	25June-02July 2010
Demobilize	06-09July 2010

#### Interesting Facts:

- Lock 27 is the busiest inland lock in the United States, pushing over 73 Million Tons of goods each year.
- One 15-barge tow holds the equivalent of 1050 tractor trailer semi trucks.
- Project Planning began over 4 years ago.
- Detailed work Plan and Critical Lift Plan were over 6-months in the making.



## Key Planning Tools

- Weekly PDT Meetings
- Detailed Work Plan
- CPM Schedule (with contingencies)
- Site Layout
  - four other CG projects going on concurrently
- Budget and Detailed Estimates
  - for various contingencies)
- Risk Register
- Accident Prevention Plan





# Schedule Milestones

- Originally set for April 2010
  - perform Aux lock then Main Lock
  - Maximize benefit of lessons learned
- High water caused multiple delays
  - First to June,
  - then after starting Aux Lock running thru July
- Changed work plan in July
  - Close-up Aux Lock work and make lock operational
  - Complete Main Lock first to reduce risk of losing ARRA funding in FY10.
- Actual performance
  - Main Lock Lift Gate                      23AUG-03SEP
  - Aux Lock Lift Gate                         07-14 SEP



# Safety Keys to Success

- Accident Prevention Plan specific to the site, project and crew
- Mandatory 100% project orientation
- Mandatory PPE
- Designated “Competent Persons”
- Full time SSHO (Site-safety and health Officer)
- Near-miss reporting process
- Formal safety walk-thru’s
- Safety Deficiency Log kept and posted.
- Management commitment to the 4 Safety Principles.
- Project Goals
  - ZERO recordable incidents
  - No Mechanical Failures
  - Keep Schedule Milestones



# Safety Mission & Competent Persons List

US Army Corps of Engineers

Designated Competent Person Roster

L27 Auxiliary and Main Lock Lift Gate Replacements

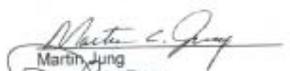
### 2.0 SAFETY MISSION / MANAGEMENT STATEMENT OF POLICY

Our primary goal is to eliminate or control both known and potential safety and health hazards our employees face on the job. In order to do so, we must adhere to the following guidelines:

- A. Safety and health are a shared responsibility. Everyone from top management and supervisors to each and every worker must take ownership of their own safety and that of co-workers. Everyone is a safety officer! You have the authority and responsibility to stop any unsafe act to include shutting down a task or project until that unsafe condition is rectified.
- B. We recognize the prevention of accidents and the promotion of safe working practices are of the greatest importance. Maintaining a safe and healthful work environment is not just an idea – it is a value.
- C. We realize the attitudes of our employees towards safety are of paramount importance in the effective operation of our accident prevention program. Supervisors must constantly endeavor to maintain safe working conditions and keep accident prevention as an essential part of their planning and operations.
- D. It is everyone's job to spot hazards and to correct or report them immediately.
- E. The hazardous nature of our work will not be accepted as a reason for failing to do all that can be done to eliminate or reduce the waste and suffering that accidents cause. We must do everything possible to decrease work hazards and strive for the best safety record possible.

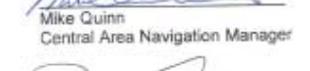
The goal of this project is to have zero recordable incidents for the entire duration of the project.

#### Project Team:

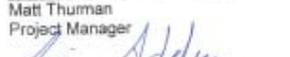
  
 Martin Jung  
 Project Manager

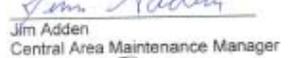
  
 Gary Lowe  
 ARRA Project Manager

  
 Mike Quinn  
 Central Area Navigation Manager

  
 Pete Coleman  
 Southern Area Navigation Manager

  
 Matt Thurman  
 Project Manager

  
 Jim Adden  
 Central Area Maintenance Manager

  
 Chris Gibson  
 Physical Support Base Crew Lead

  
 Gary Hipkins  
 Lock 27 Lock Master

Hazard Type or Task	Designated Competent	Contact Phone Number
SSHO #1	Martin Jung	314-239-3468
SSHO #2	Marty Werdebaugh	314-540-6274
SSHO #3	Mike Henry	314-623-0549
SSHO Alternate	John Tatum	618-977-0460
SSHO Alternate	Gary Hipkins	314-570-0304
Site Specific Orientations	Martin Jung, SSHO	314-239-3468
PPE Compliance	SSHO, John Tatum	618-977-0460
Hot Work	William Redecker	636-388-1106
Fire Prevention/Protection	William Redecker	636-388-1106
Fire Prevention/Protection	Gary Hipkins	314-570-0304
MSDS/HazCom	Gary Hipkins	314-570-0304
MSDS/HazCom	John Tatum	618-977-0460
First Aid/CPR	Martin Jung, SSHO,	314-239-3468
First Aid/CPR	Jimmy Thompson	618-5507225
Lockout/Tagout	Allen Barnes	501-730-3093
Lockout/Tagout	John Tatum	618-977-0460
Lockout/Tagout	Chad Adamson	314-560-3558
Lockout/Tagout	John Branson Jr.	314-623-8298
Electrical Safety/GFCI	Allen Barnes	501-730-3093
Electrical Safety/GFCI	John Tatum	618-977-0460
Electrical Safety/GFCI	Chad Adamson	314-560-3558
Electrical Safety/GFCI	John Branson Jr.	314-623-8298
Fall Protection	Martin Jung	314-239-3468
Fall Protection	Daniel Bowman	RADIO
Fall Protection	Brian Smith	618-357-1022 / Radio
Scaffolds/Aerial Lifts	Aaron Pieplow	618-558-9462 / Radio
Rigging/Hoisting	JW Hall	502-396-9432
Rigging/Hoisting	Bruce Grau	RADIO
Rigging/Hoisting	Aaron Pieplow	618-558-9462 / Radio



# Site Layout

- General Layout
- Construction Limits (4 other projects)
  - I-Wall Control House
  - Concrete Restoration
  - High Mast Lighting
  - Lower Sill Tie-down
- Break Areas
- Emergency Evacuation Points
- Visitor Area





# Critical Lift Plan

Gate: 270 T

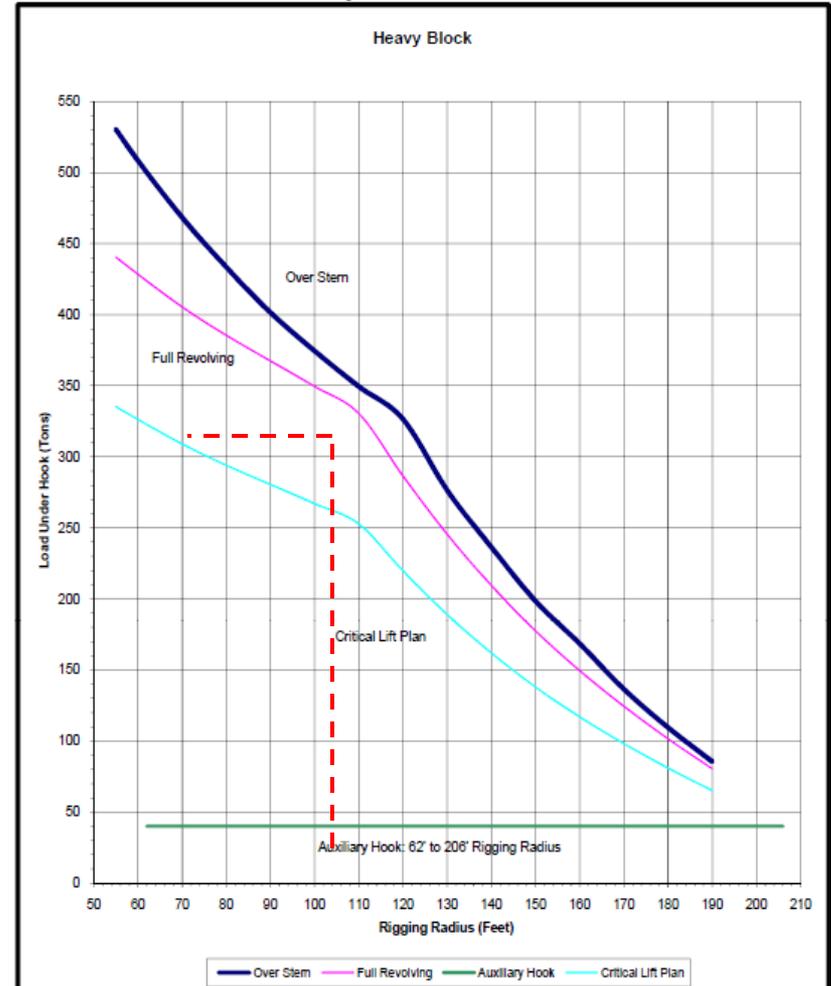
Rigging : 9.5T

Radius: 80' Max

Full Revolving Limit at 80': 380 T

$279.5/380 = 73.6\%$  of Crane  
Capacity at 80'

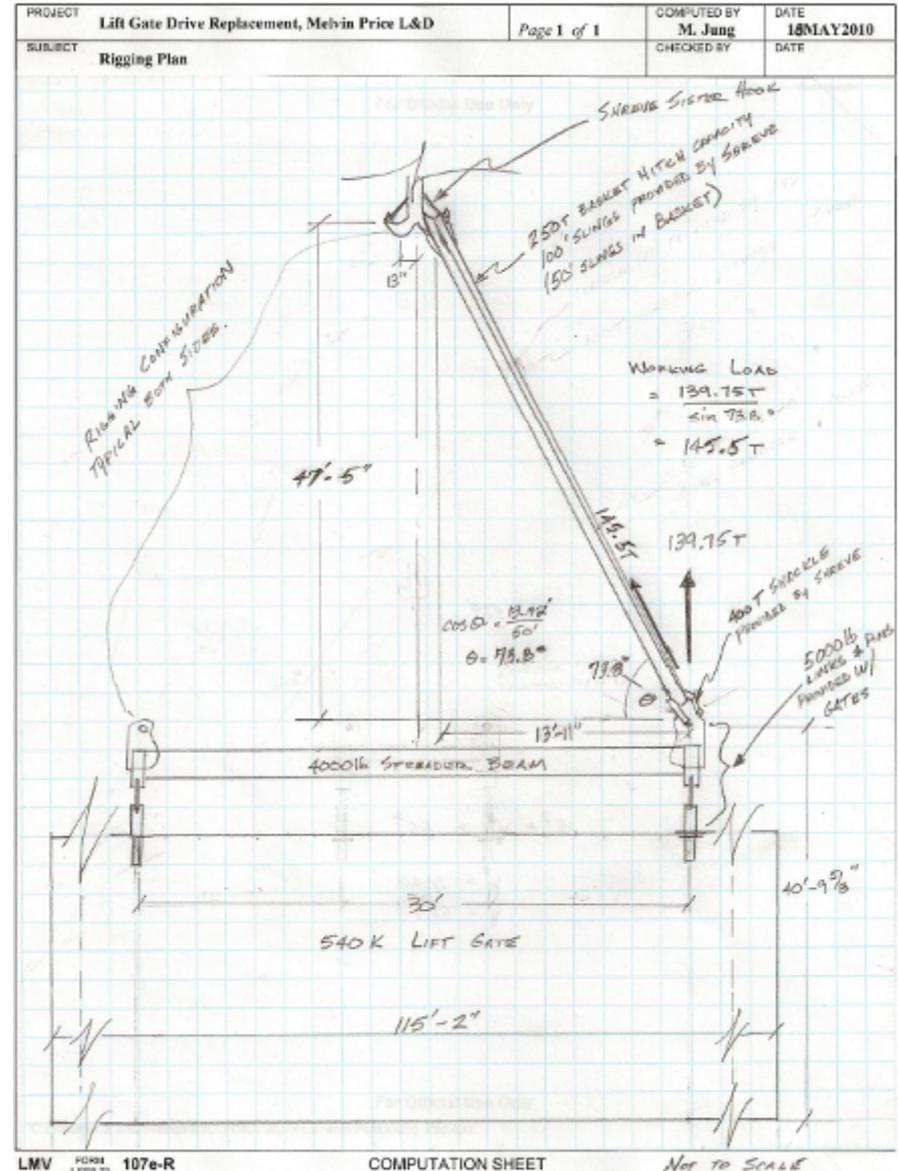
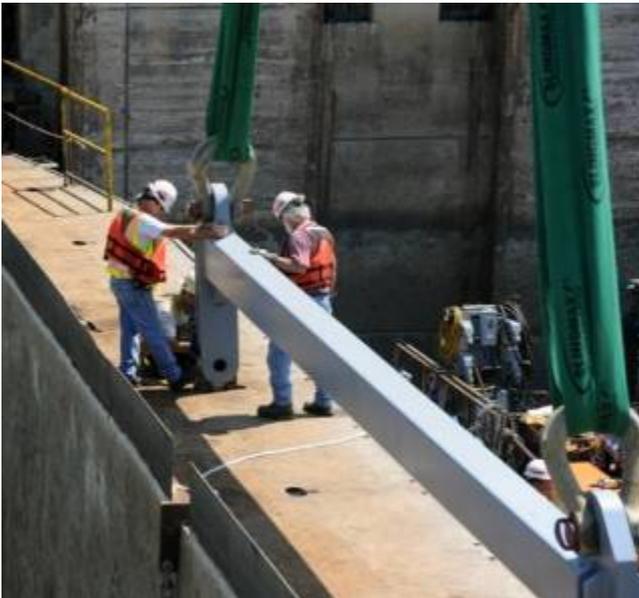
LD-777 Henry M. Shreve  
Heavy Lift Derrick Crane





# Rigging

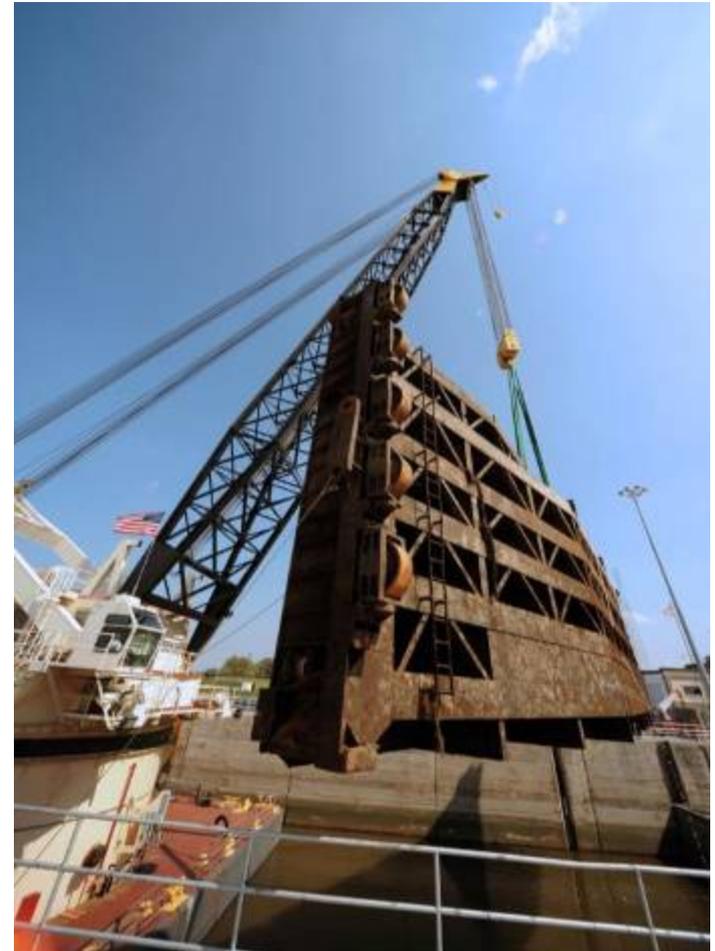
- Sling 250T Basket Capacity = 100' Long (50' basket)
- Custom Spreader Beam 4000 lbs x 1 ea.
- Drop Link 397lbs x 2 ea.
- 400T Shackle 1234lbs x 2
- Gate Up-righting Links 5,000 lbs x 2 ea
- Total Rigging Weight = 18,932 lbs = **9.5 Tons**





# Daily Execution “Battle Rhythm”

- 0600 Daily Safety Huddle  
AHA Brief
- 0630 Start work
- 0900 Engineer/Ops Walk-thru
- 1400 Safety Walk-thru
- 1700 Leaders Staff Meeting
- 1800 Shift change or end of day



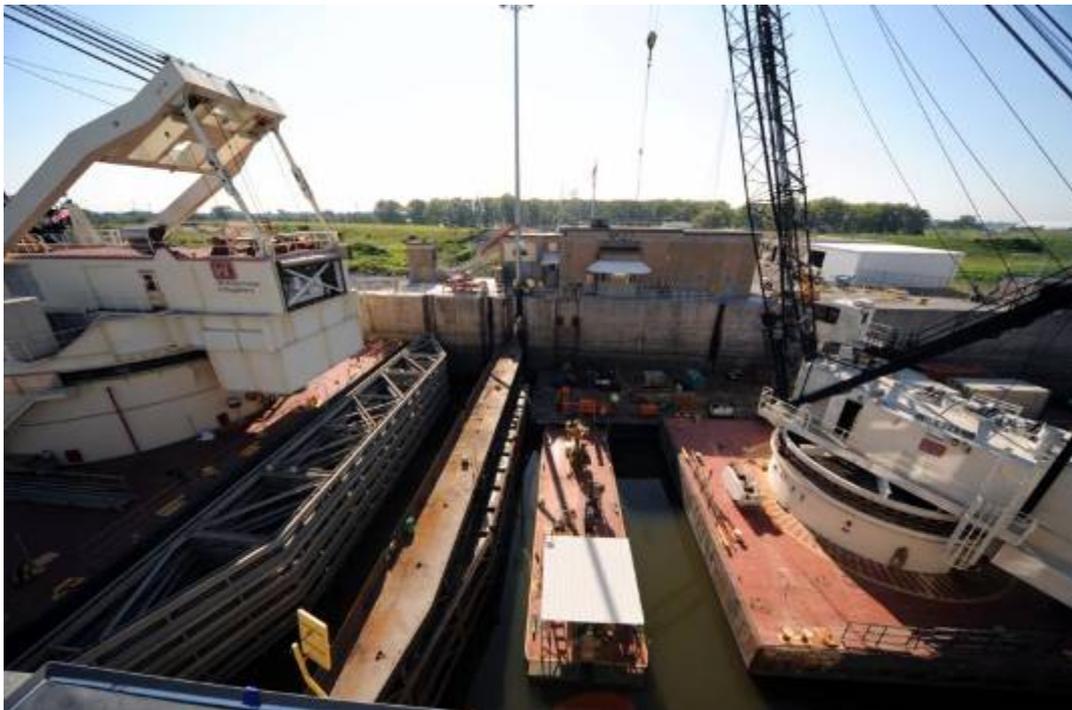


## Daily Staff Meeting

- Safety
  - Incidents / Near Misses
- Equipment Status
  - List of equipment and operational/deadline issues
- Lock Operational Issues
  - Closure
  - Vessels in the Cue
  - Coordination Issues
- Current Project Status
  - Schedule Comparison
  - Risk Analysis
- Night Shift Plan
- Next Day Shift Plan
- Potential Issues/Concerns
- Time Sheets/Staffing coordination

## Issues

- High water delay/contingency planning
- Initial coordination of daily vessel movements
- Lifting Lug modifications due to mis-aligned diaphragms
- Radio SOI and commercial traffic

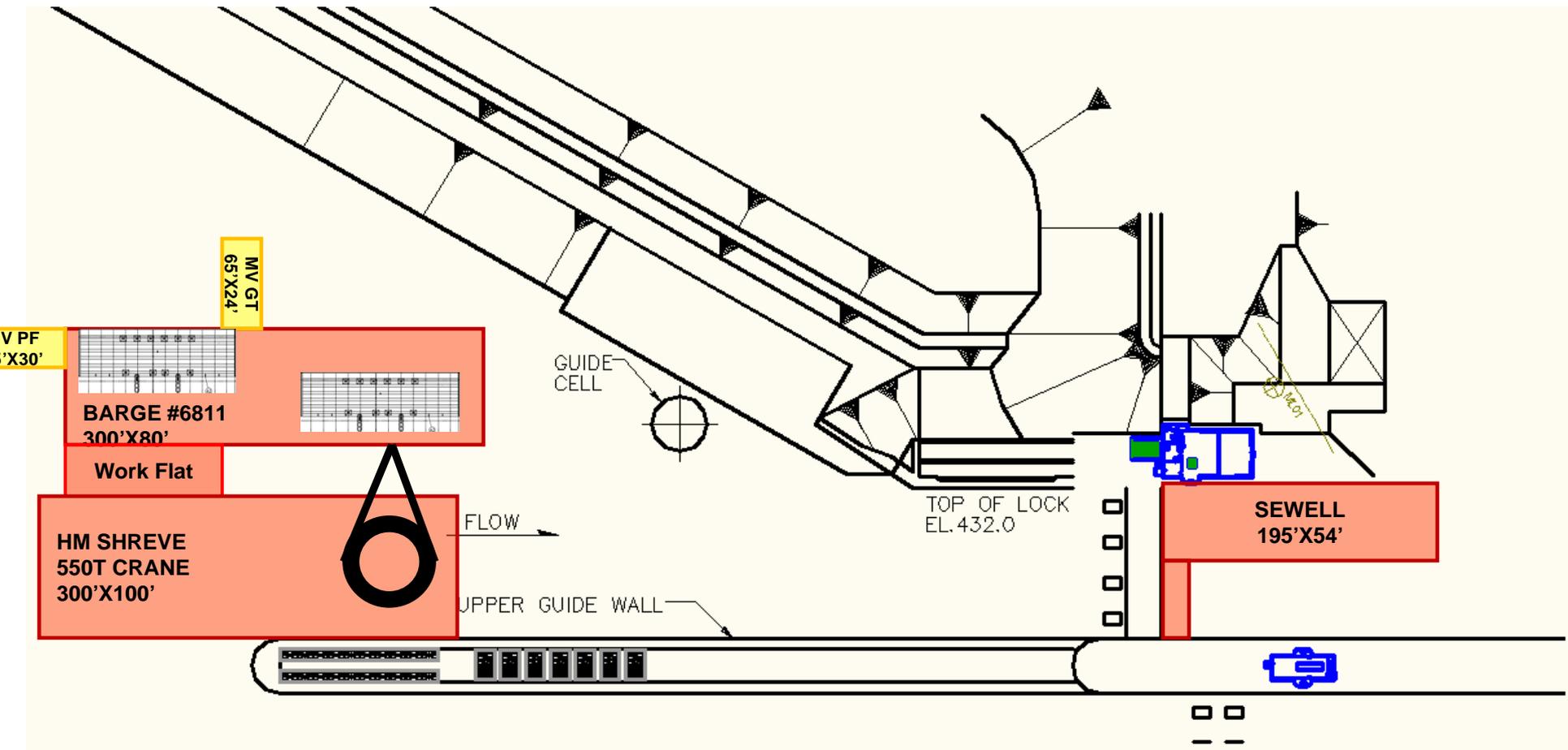




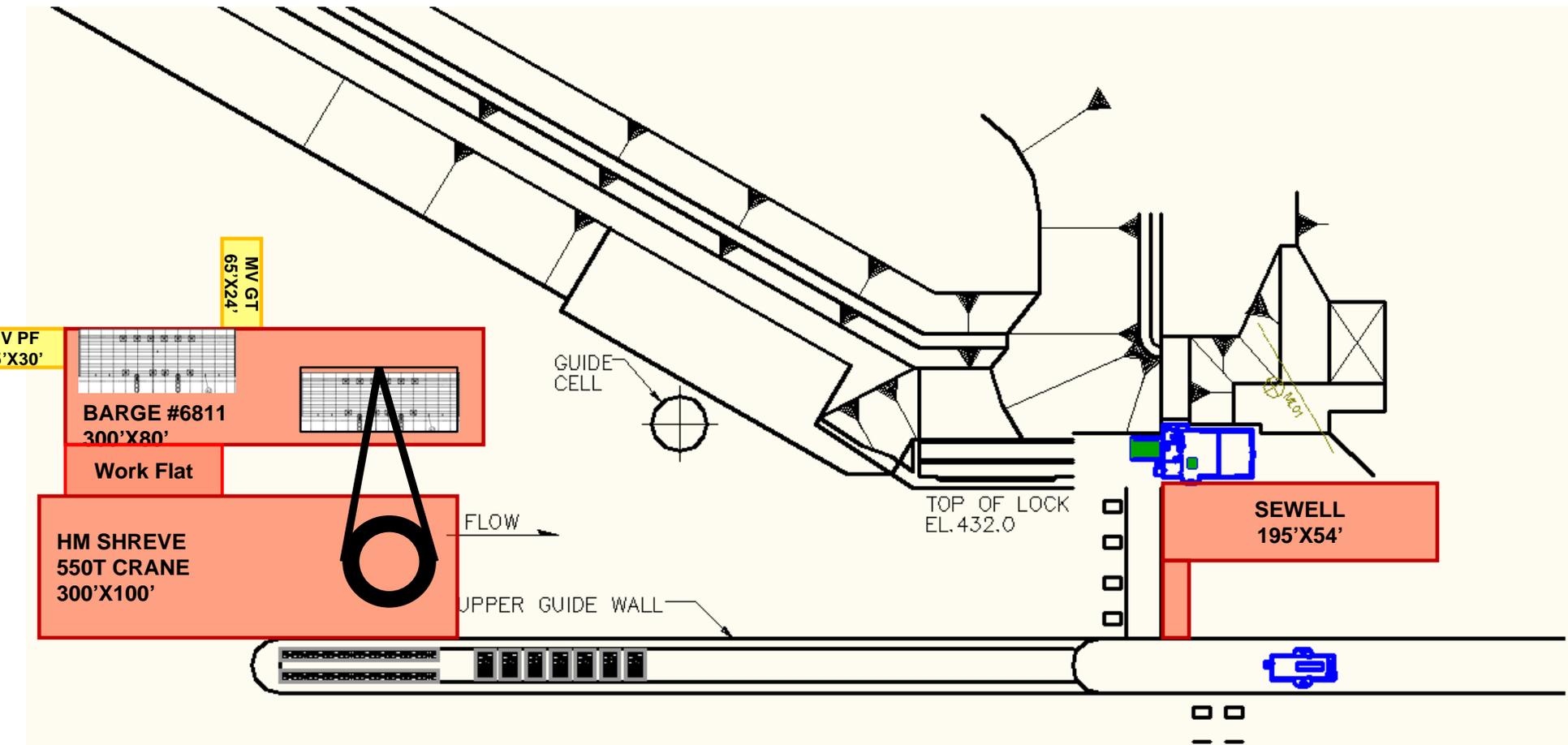
## Results

- Opened Main Lock 1.5 days early
- Opened Aux Lock 2-days early from original closure durations
- Under budget on both
- > 5,500 Manhours without a single recordable incident
- Four Near Misses reported
- One first Aid case reported

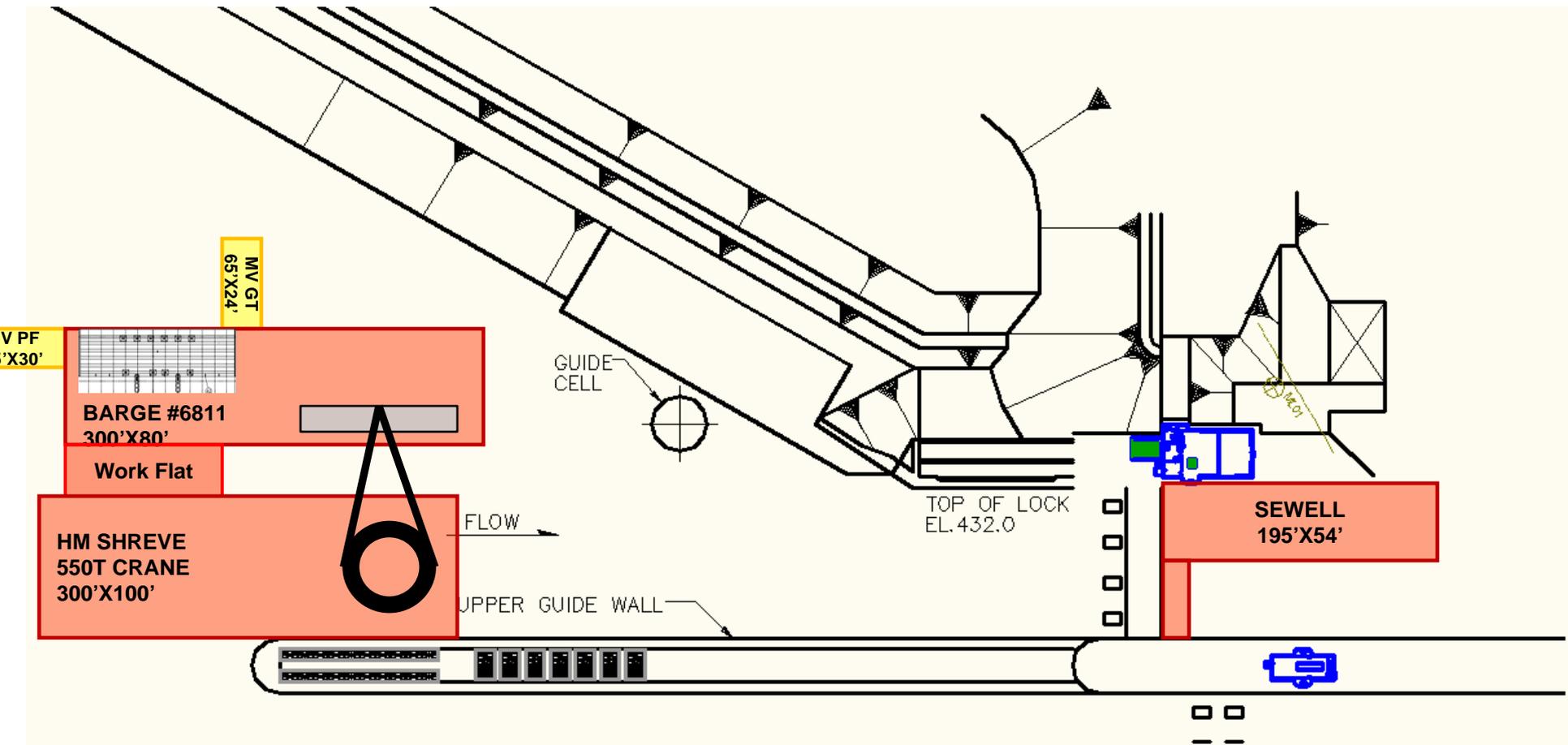




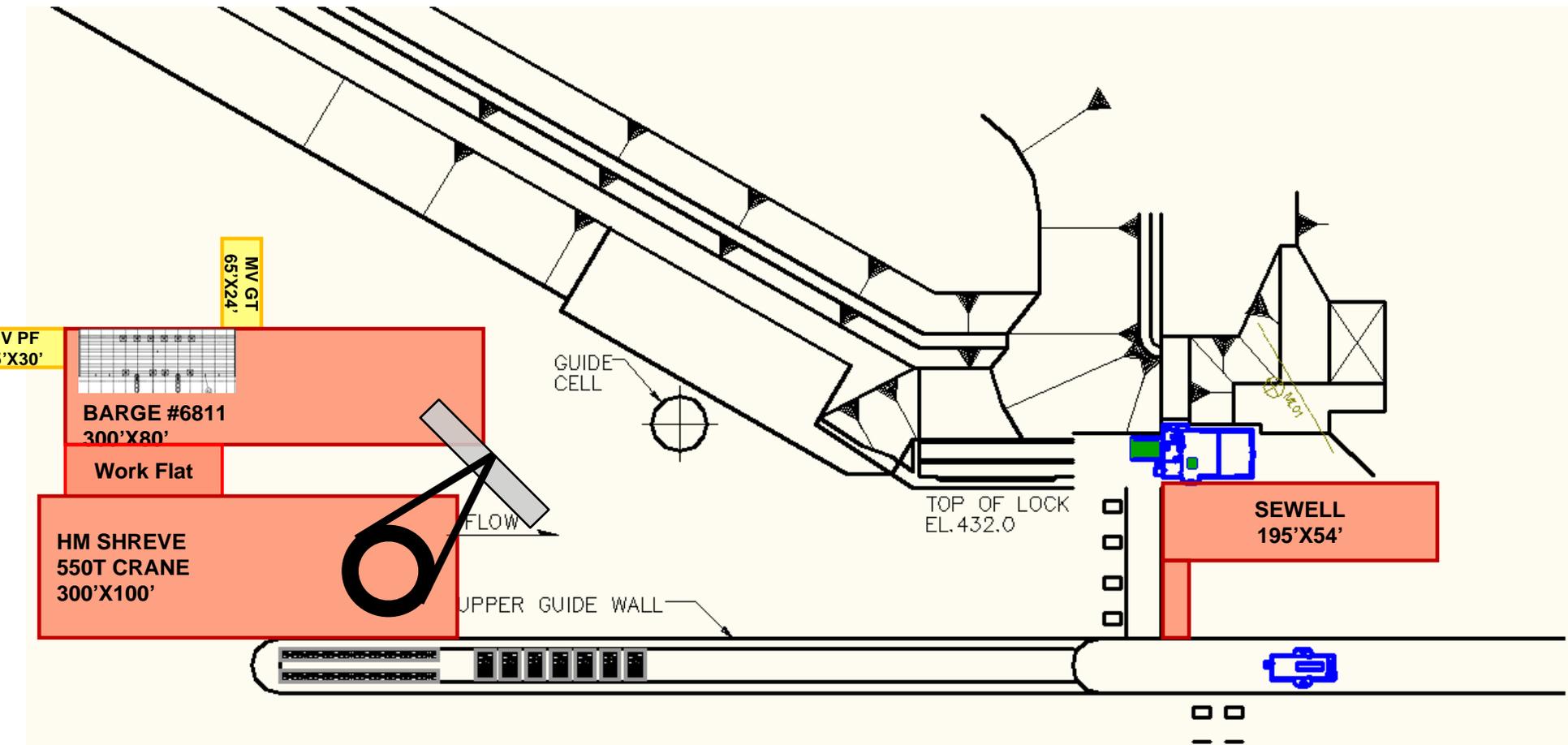
## Vessel Movements



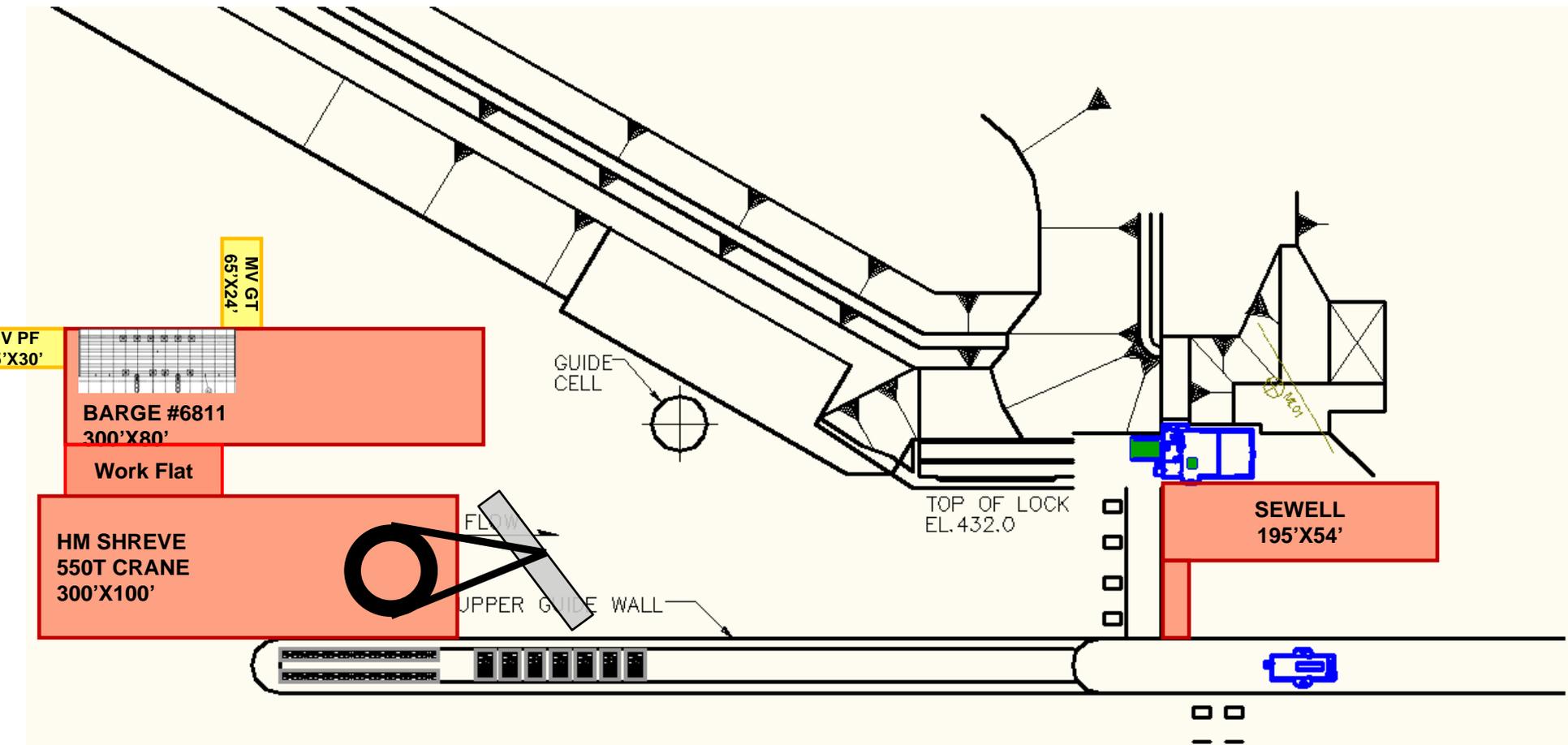
## Vessel Movements



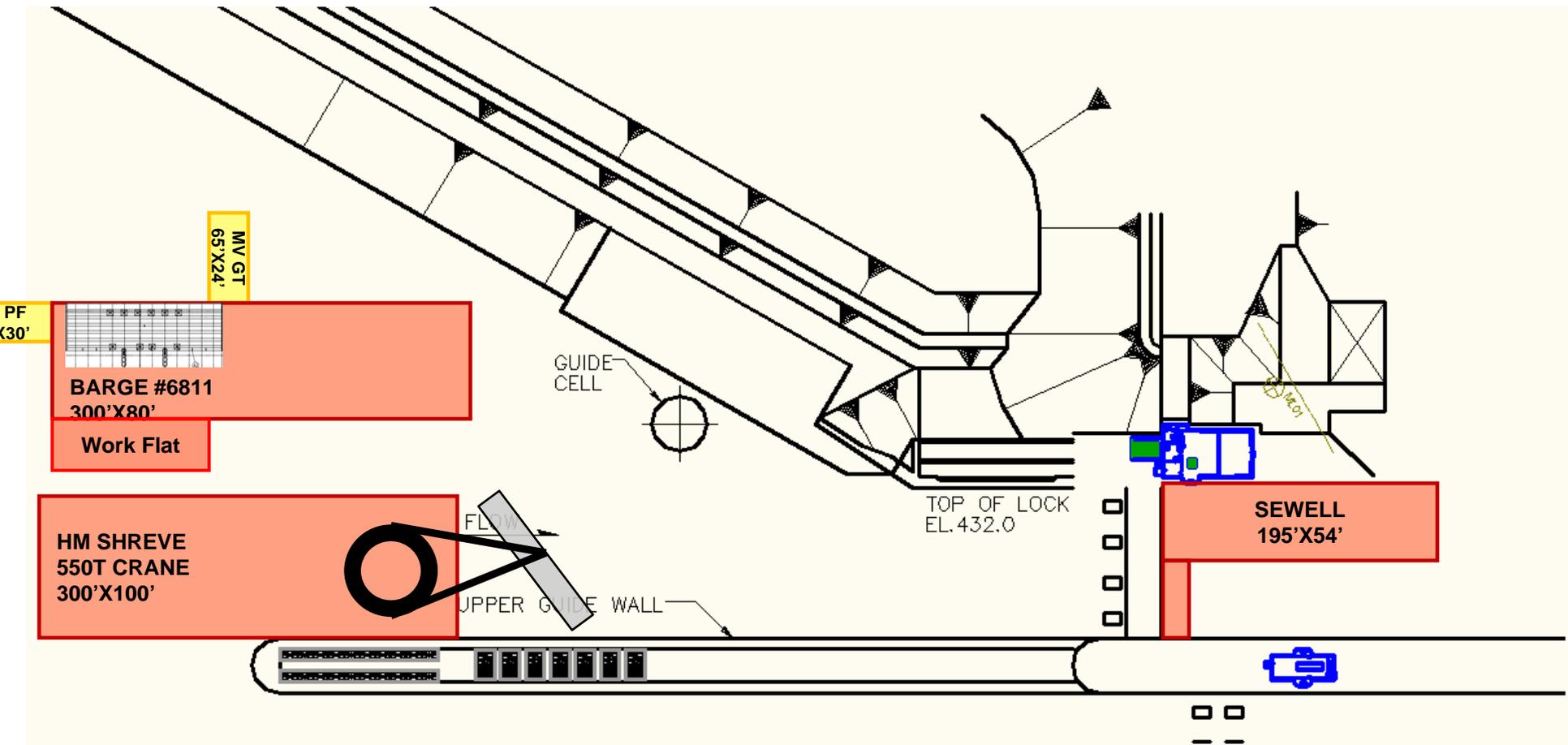
## Vessel Movements



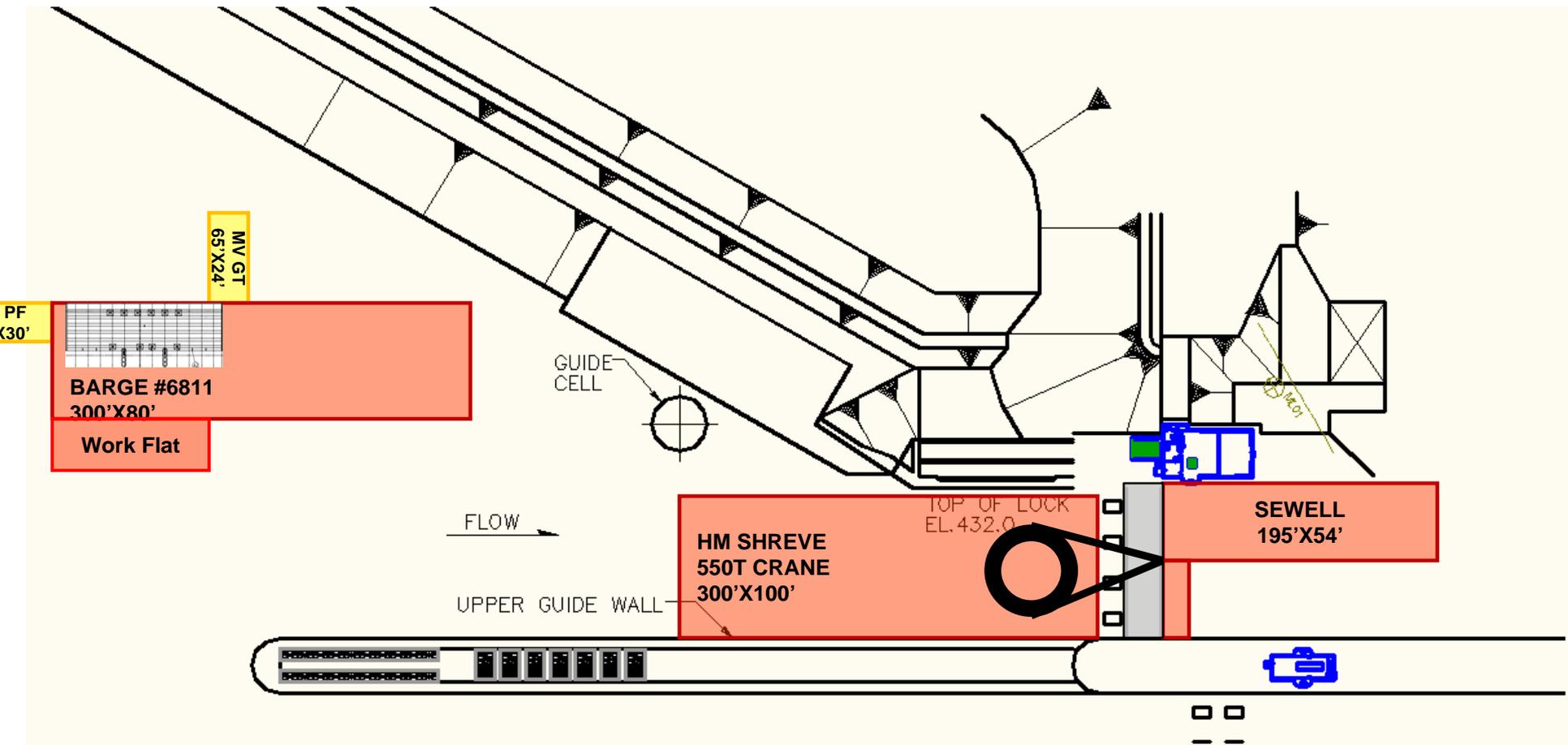
## Vessel Movements



## Vessel Movements



## Vessel Movements



## Vessel Movements



# QUESTIONS?