

CASHMAN

Development & Implementation of a Drag Ripping Device

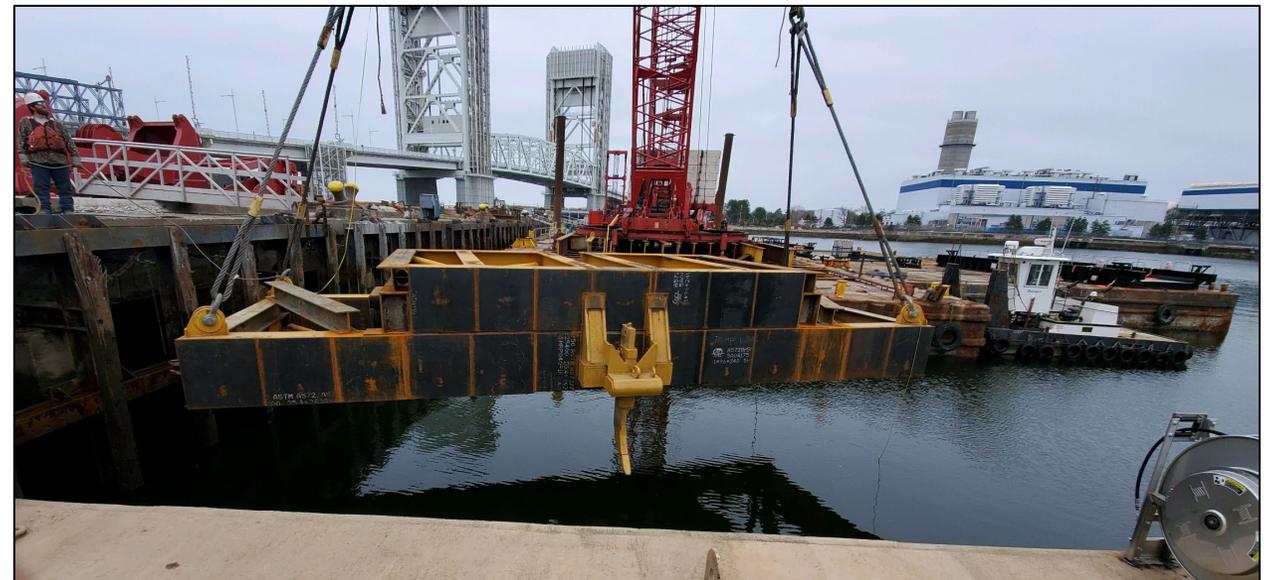
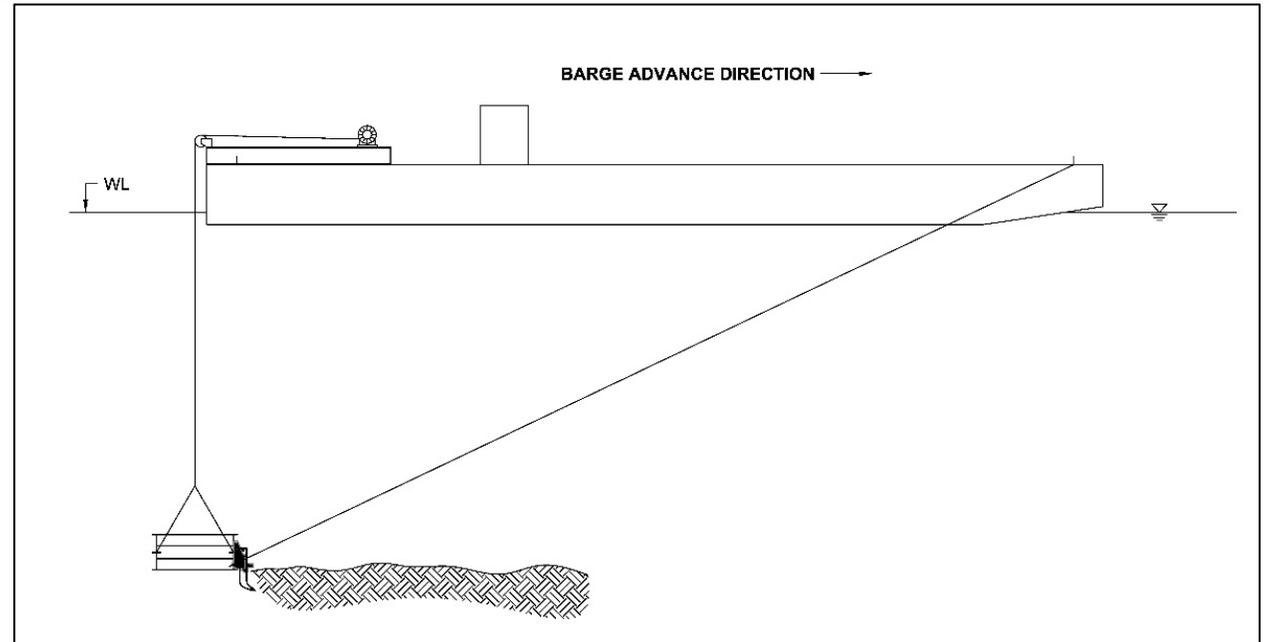
Aiden Horan
June 17, 2021

www.jaycashman.com/innovation



OUTLINE:

- Background
- Problem Statement
- Approach
- Solution
- Review



BACKGROUND:

- Boston Harbor Deepening
- 12 million yd³ (~9.2 MM m³)
- Soft clays to glacial tills
- Challenge: Find Operational improvements/innovations
 - Safety
 - Efficiency
 - Quality
- Ripper just one example

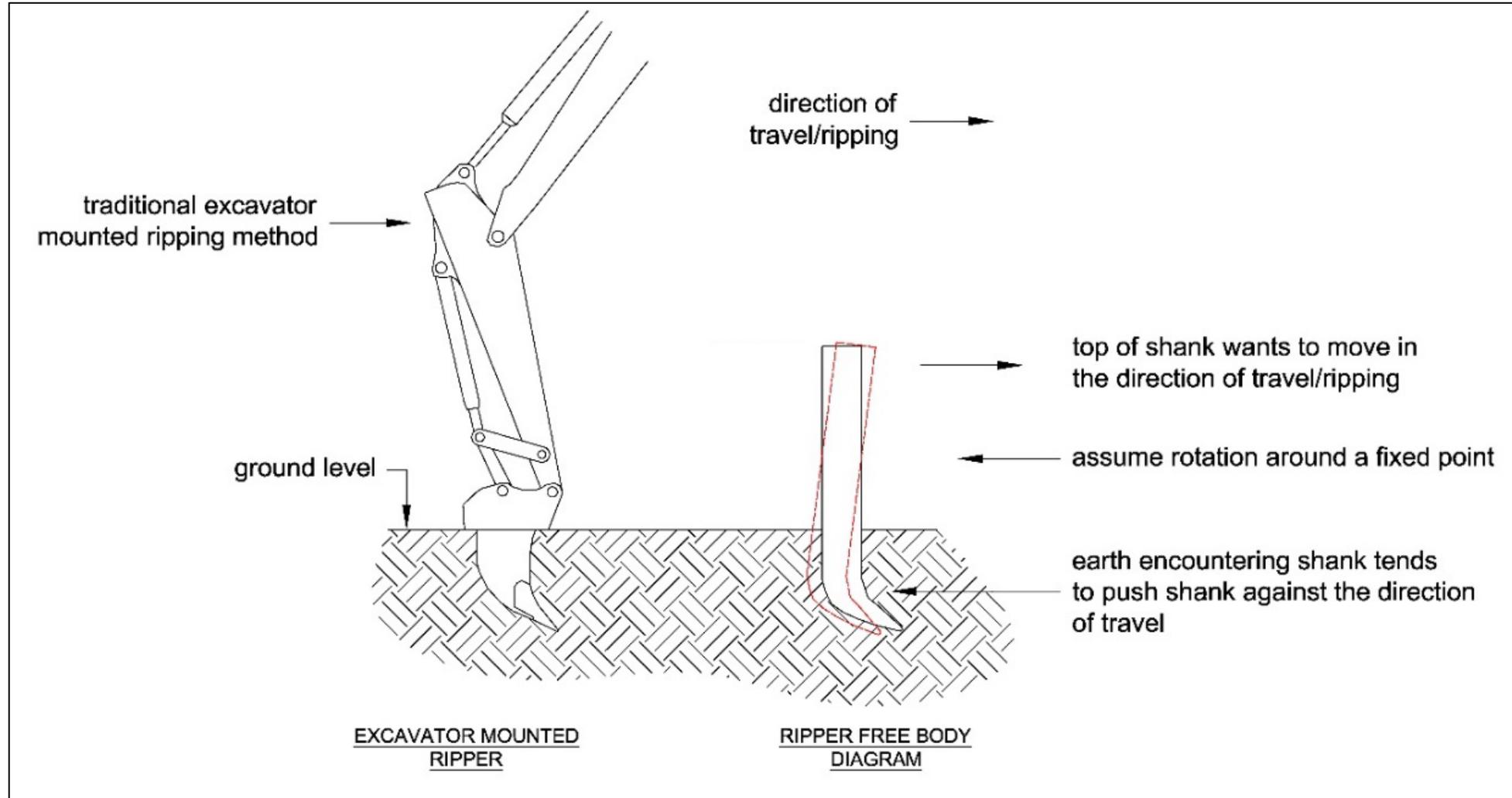


Problem Statement:

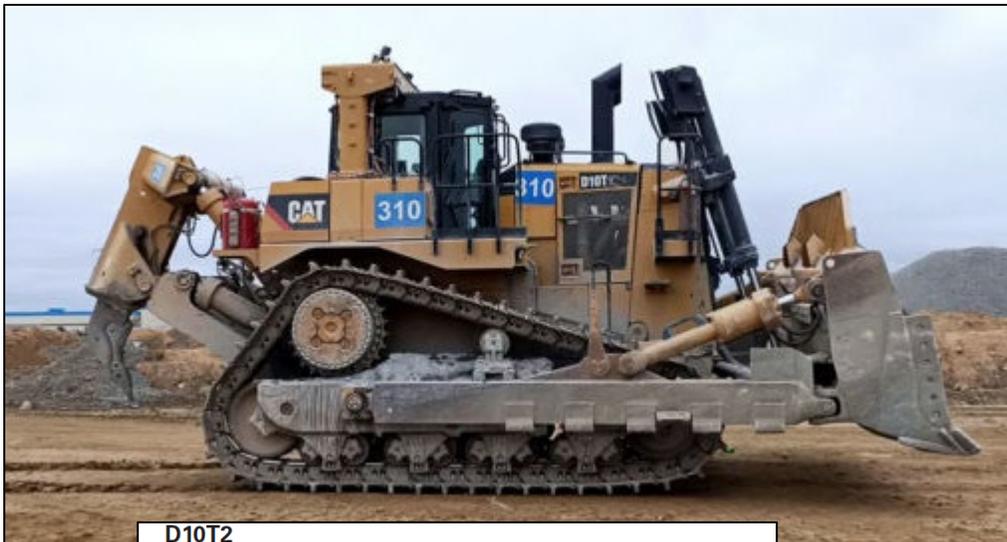
“examine more cost-effective methods for the removal of hard packed soils on capital improvement dredging projects”



APPROACH: Understanding the problem



APPROACH: Desk study – force available



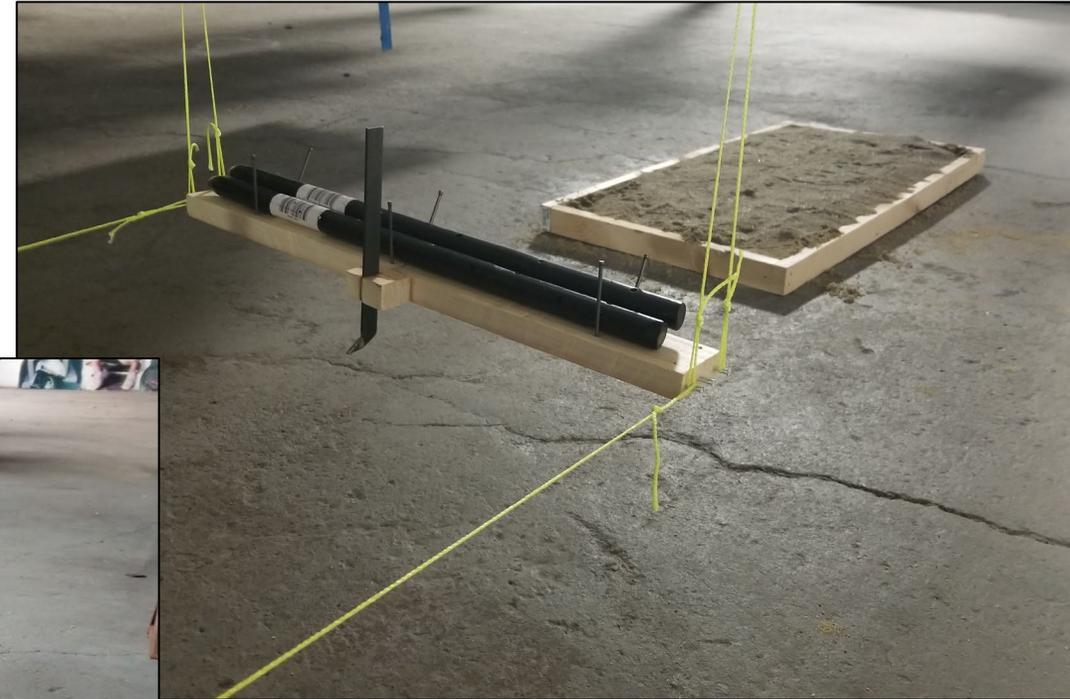
VS



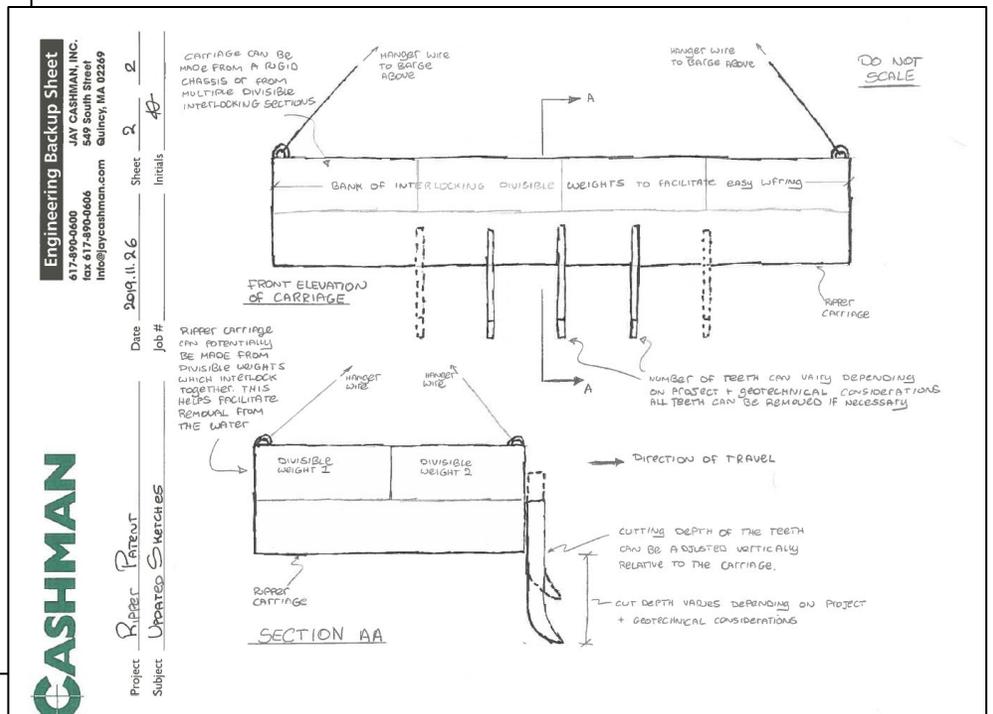
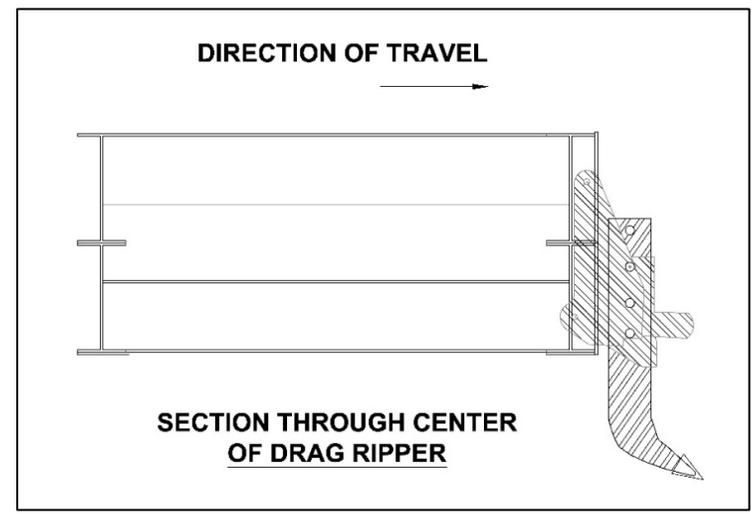
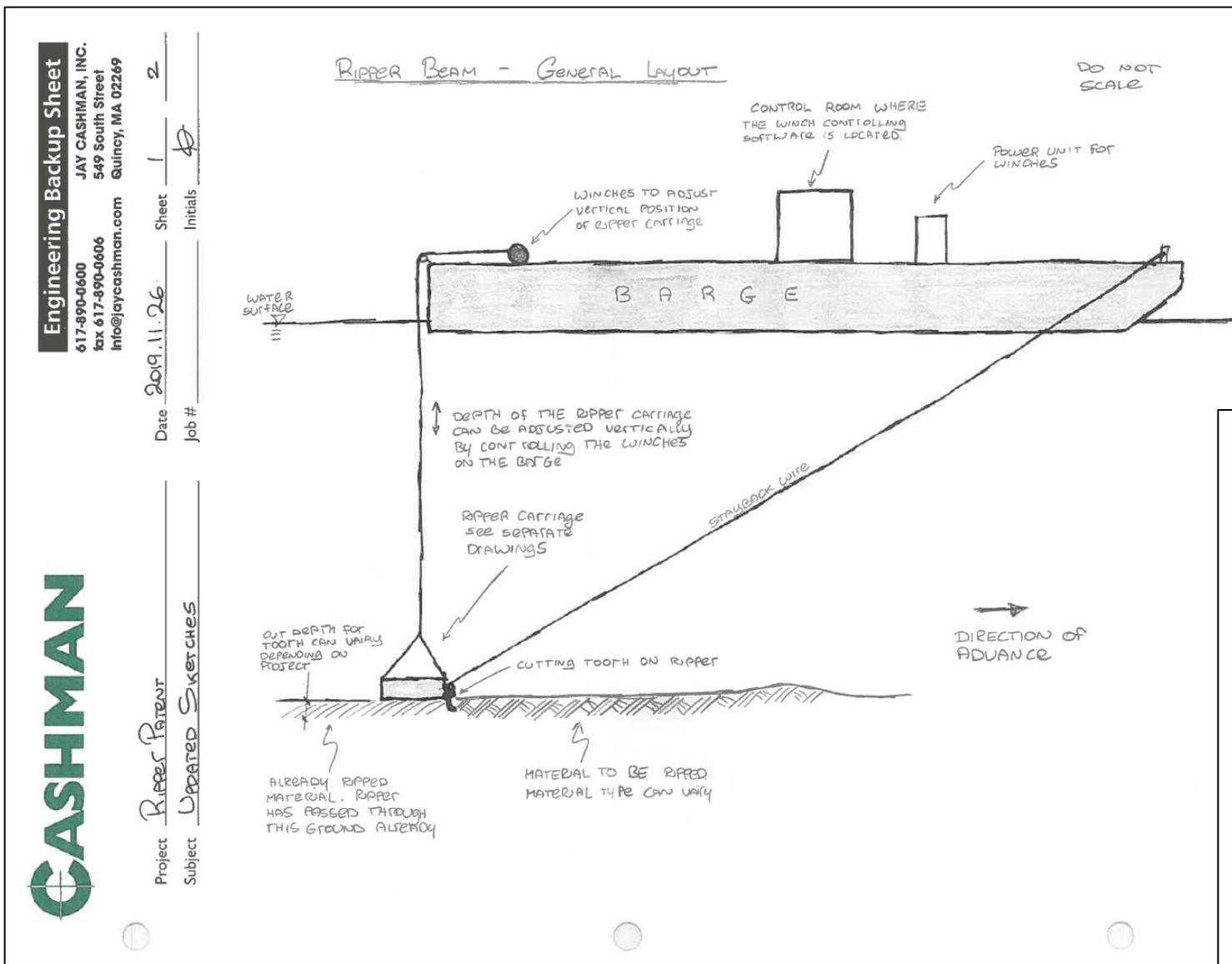
Bollard pull for 3,000 – 4,000 HP tugboats commonly found on dredging projects

~ 70,000 – 110,000 lbs

APPROACH: Scale model concept testing



APPROACH: Exploring possible solutions



SOLUTION:



(12) **United States Patent**
Cashman et al. (10) **Patent No.:** US 10,920,400 B2
 (45) **Date of Patent:** Feb. 16, 2021

(54) **DRAGGING APPARATUS WITH RIPPER SHANK** (52) **U.S. CL. CPC** E02F 9/2041 (2013.01); E02F 3/815 (2013.01); E02F 3/907 (2013.01); E02F 5/006 (2013.01); E02F 9/2875 (2013.01); E02F 5/285 (2013.01)

(71) **Applicant:** CASHMAN DREDGING AND MARINE CONTRACTING, CO., LLC, Quincy, MA (US) (58) **Field of Classification Search**
 CPC E02F 9/2041; E02F 9/2875; E02F 9/06; E02F 9/065; E02F 3/815; E02F 3/106; E02F 5/006; E02F 5/285; E02F 3/907; A01B 3/64; A01B 13/08; A01B 15/06
 See application file for complete search history.

(72) **Inventors:** Jay Cashman, Quincy, MA (US); Frank Belesimo, Easton, MA (US); Alden Horan, Hampton Falls, NH (US); Timothy Hammering, Marshfield, MA (US); Norman Bourque, Rochester, MA (US) (56) **References Cited**
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 43,664 A * 8/1864 Benjamin E02F 5/287 37/342

(73) **Assignee:** CASHMAN DREDGING AND MARINE CONTRACTING, CO., LLC, Quincy, MA (US)

(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(22) **Filed:** Dec. 23, 2019 *Primary Examiner — Jamie L. McGowan*

(65) **Prior Publication Data** (74) **Attorney, Agent, or Firm —** Jacob M. Ward; Ward Law Office LLC

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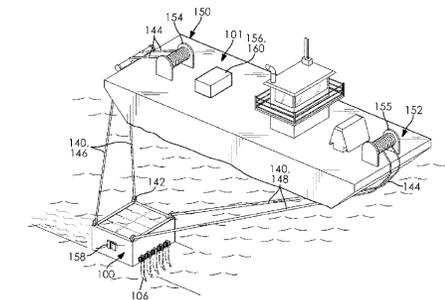
Related U.S. Application Data

(60) **Provisional application No. 62/784,973, filed on Dec. 26, 2018.**

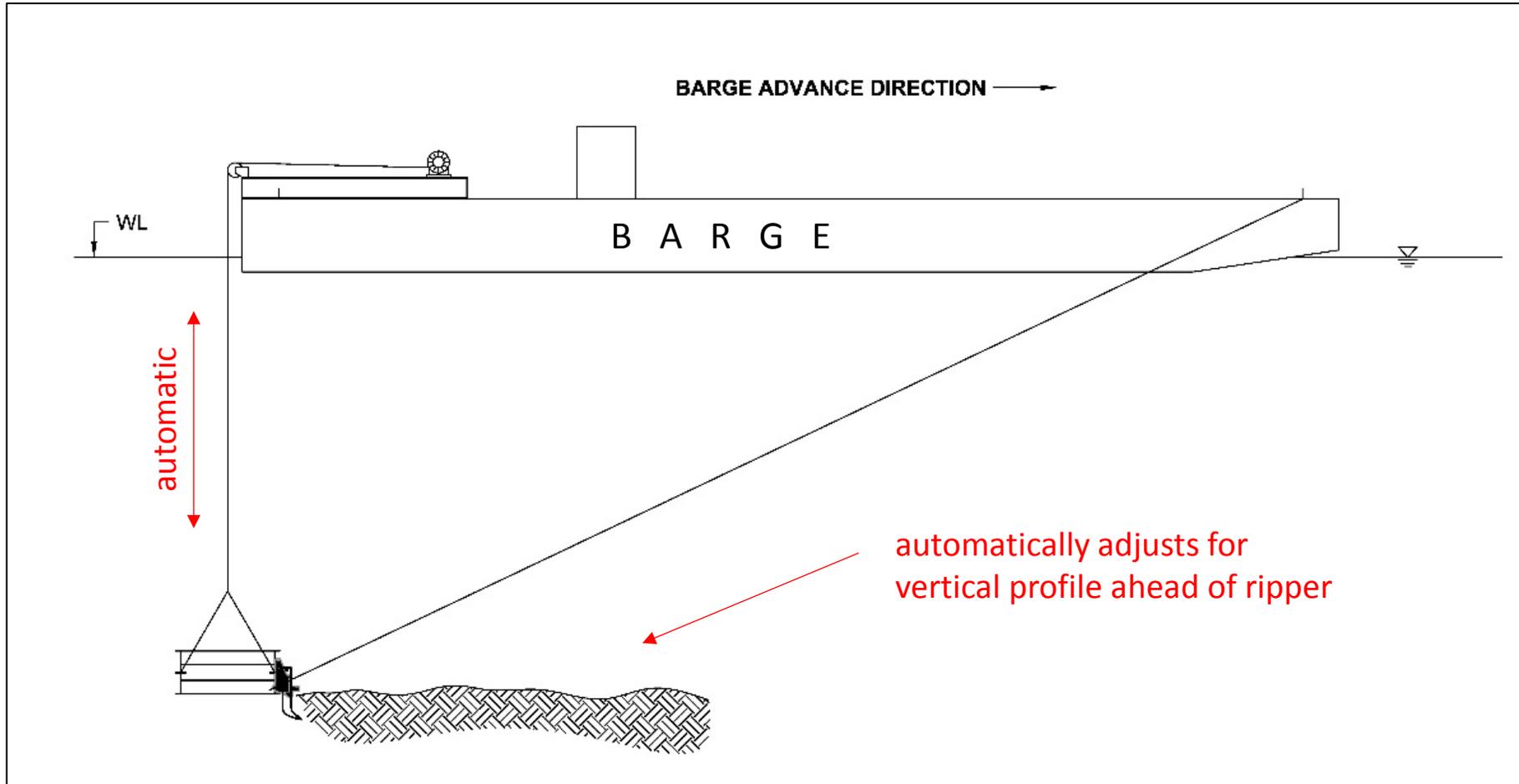
(51) **Int. Cl.**
 E02F 9/20 (2006.01)
 E02F 5/00 (2006.01)
 E02F 9/28 (2006.01)
 E02F 3/815 (2006.01)
 E02F 3/90 (2006.01)
 E02F 5/28 (2006.01)

ABSTRACT
 A dragging apparatus has a carriage body. The carriage body has at least one attachment portion. The attachment portion is configured to connect the carriage body to a drag barge. At least one ripper shank is disposed on the carriage body. The ripper shank extends downwardly from the carriage body. A method for operating a dragging apparatus includes providing a barge and a dragging apparatus, and then lowering the dragging apparatus to a floor or bottom of a body of water to agitate the floor or bottom.

17 Claims, 5 Drawing Sheets

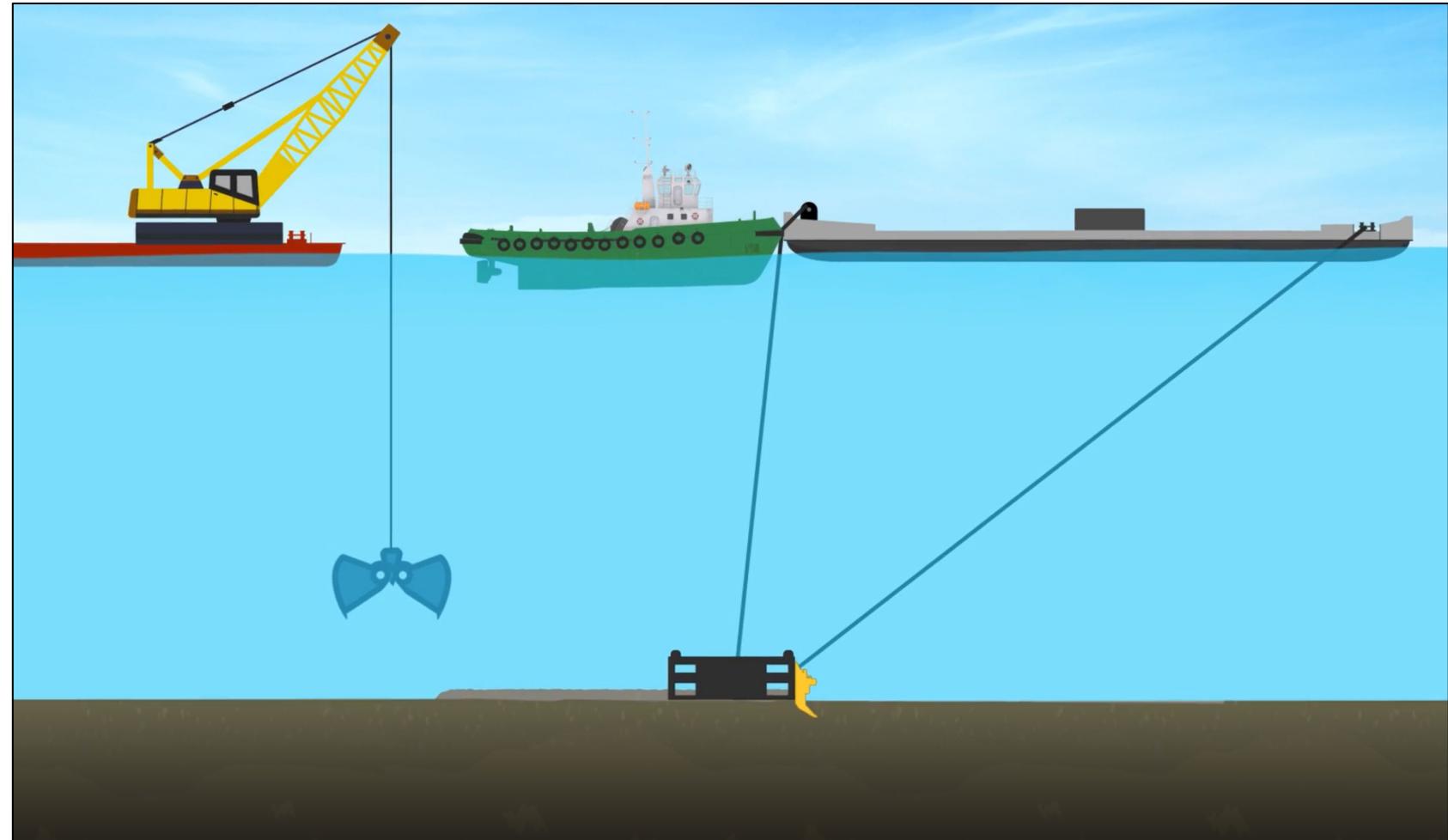


SOLUTION: Automation



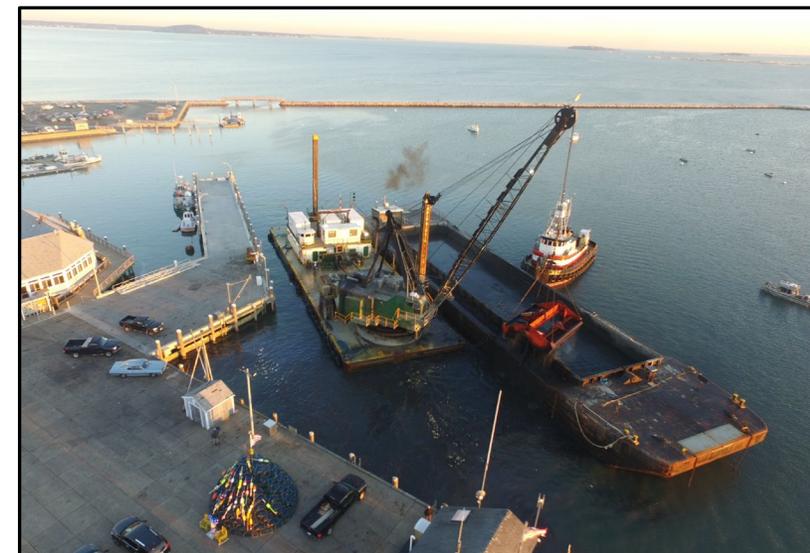
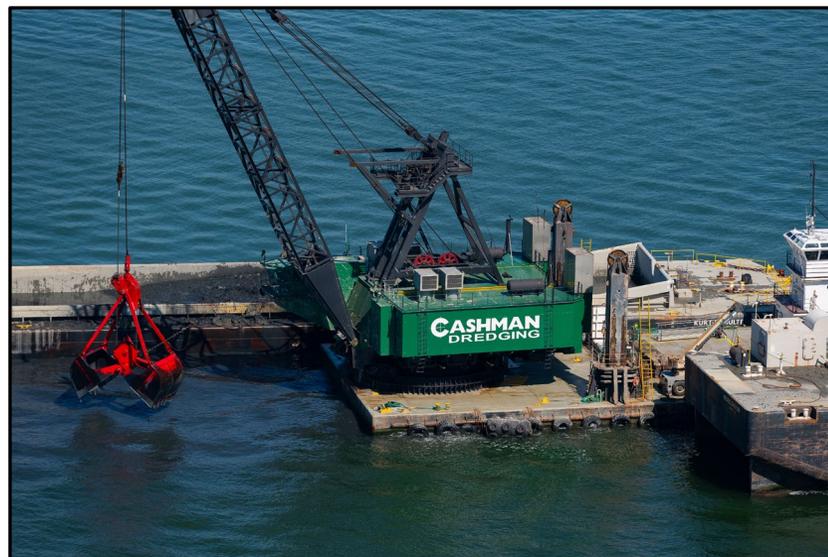
REVIEW:

- Steep learning curve
- Found to work well in glacial tills, sand and dense clays
- Follow on re-dredging of skipped areas found to be more cost effective
- Does not work on rock
- Does not work as method to prove fast rock



THANK YOU !

- Questions



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