



**OCEANA**GOLD

# Deployment of Lightweight Trays on Macraes Open Pit Fleet

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# OPEN PIT LOAD AND HAUL FLEET (at Aug '23)



3x Hitachi EX3600 backhoes  
1x Hitachi EX2500 backhoe

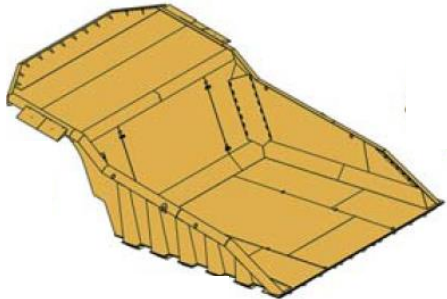
12x Cat 789C (original)  
7x Cat 789D  
2x Cat 789C (rebuilt to D specs)

# SO WHY CHANGE THE TRAYS?

*At Project Initiation (2021)....*



Flat Floor (9 of)



X Body (6 of)



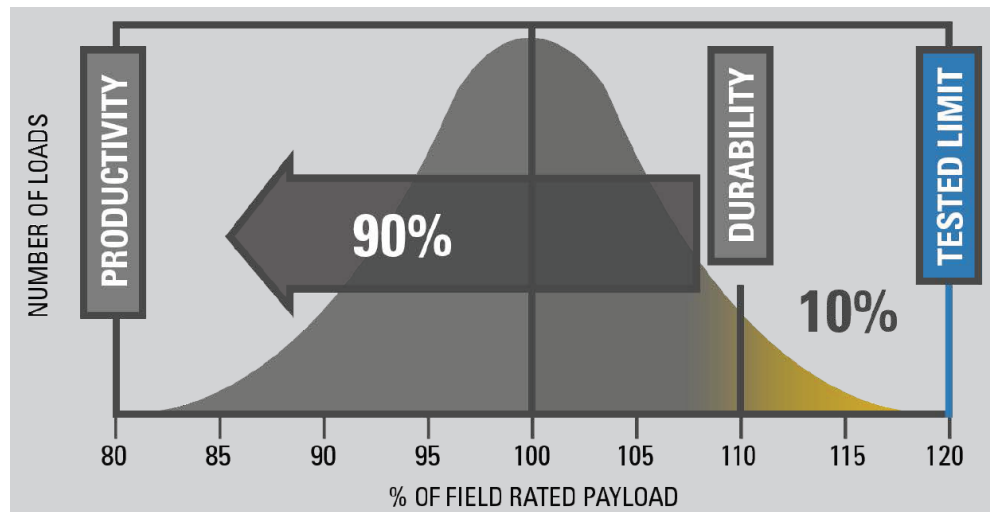
Dual Slope (5 of)

- Many bodies were over 15 years old and +60,000hrs, substantial refurbishment cost
- Empty truck weights had increased over the years
- Empty truck weights limited target payload to 170t
  - ***4½ passes with EX3600's***

# EFFECT OF PAYLOAD ON HAUL COST

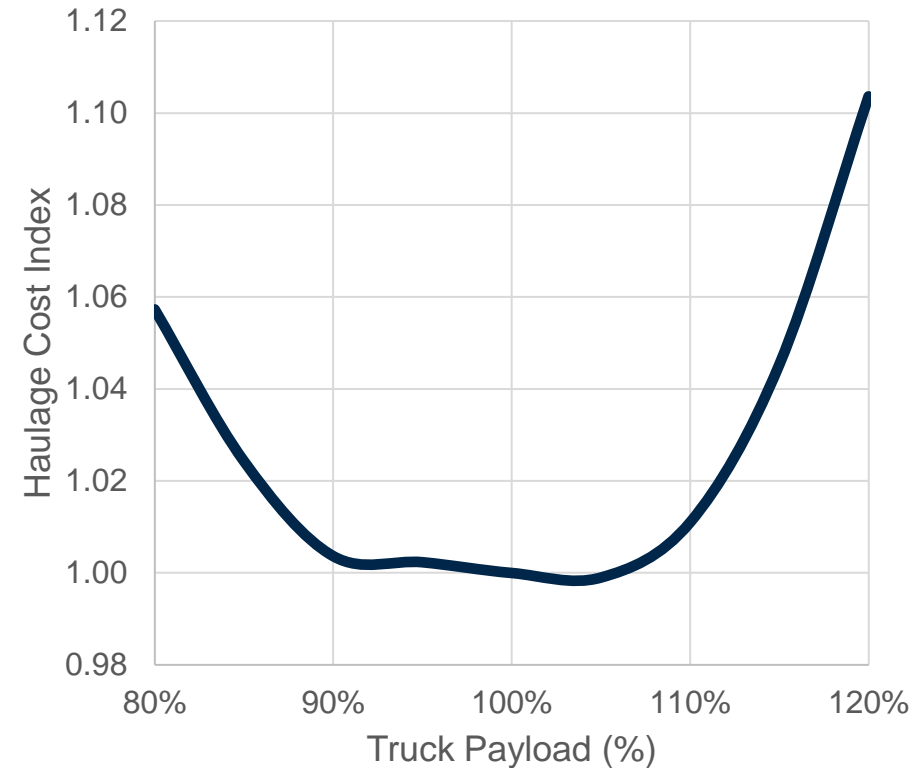
## Caterpillar Payload Policy:

*“No more than **10%** of payloads may exceed **110%** the Field Rated Payload; no single payload shall ever exceed the Maximum Allowable Payload, typically **120%** of Field Rated Payload. The mean of the payloads shall not exceed the Field Rated Payload”*



Caterpillar Inc (2021)

## Haulage Costs (productivity & maintenance)



Hardy (2007)

# SELECTION CRITERIA



*Bulga Coal, NSW. Driver suffered serious leg injuries from 2018 nose to tail incident*

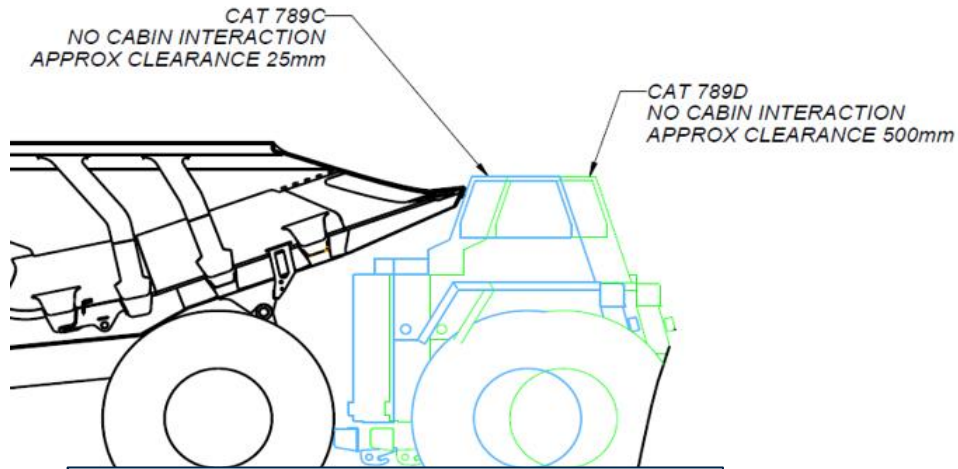
## MUST HAVES

- Eliminate nose to tail collision risk
- Provide a good pass match with EX3600's
- Minimise total cost of ownership

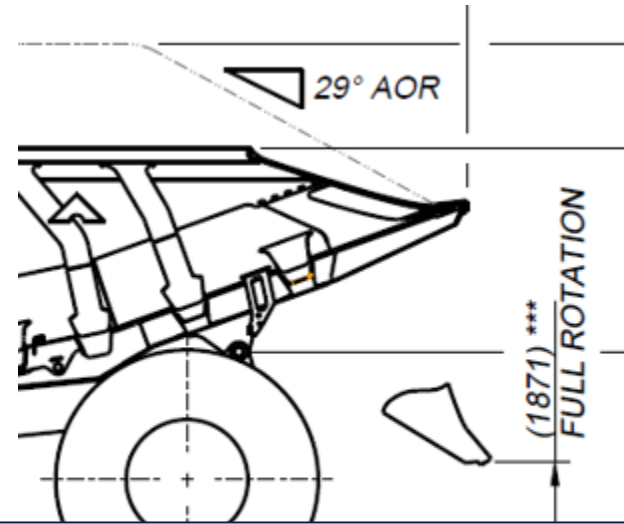
## DESIRABLES

- Eject material off the dump face to reduce dozer support
- Minimise or eliminate material carry back
- Tail clearance higher than dump windrows
- Surplus volume capacity at rated payload

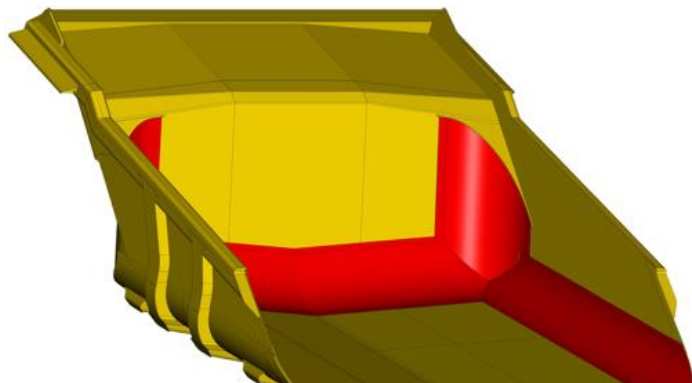
# DESIGN FEATURES WE VALUED FROM AUSTIN TRAYS



*Nose to tail risk eliminated*



*Windrow clearance*

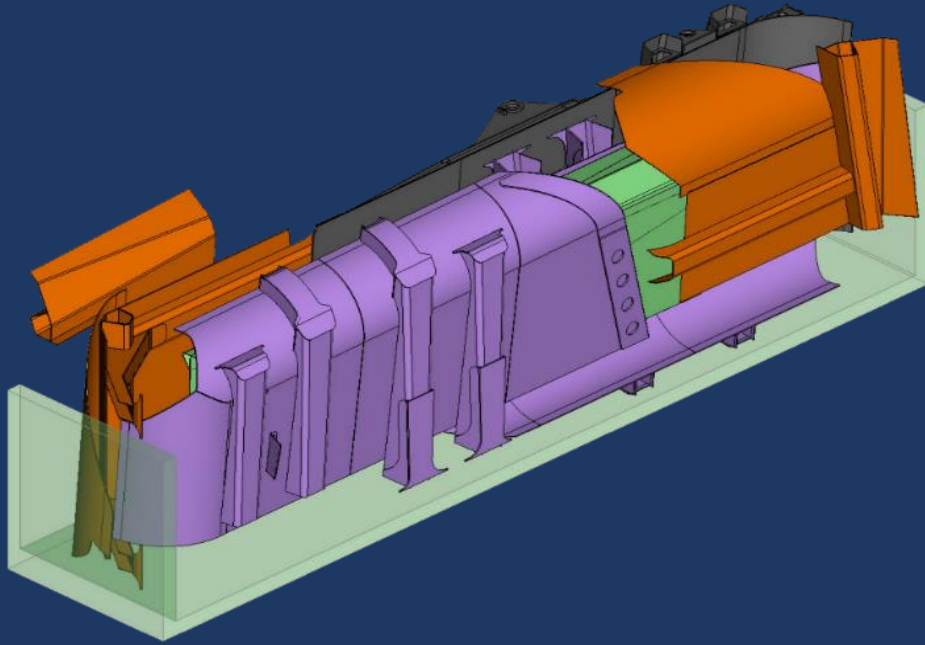


*Minimal carry back*



*Lightweight restraint strap*

# LOGISTICS



- Manufactured in Indonesia
- Shipped to NZ in 40ft containers
- Normal road transport Lyttleton to Palmerston
- Assembly in Palmerston by WAE Engineering under Austin supervision
- Oversize loads only from Palmerston to Macraes (30km)

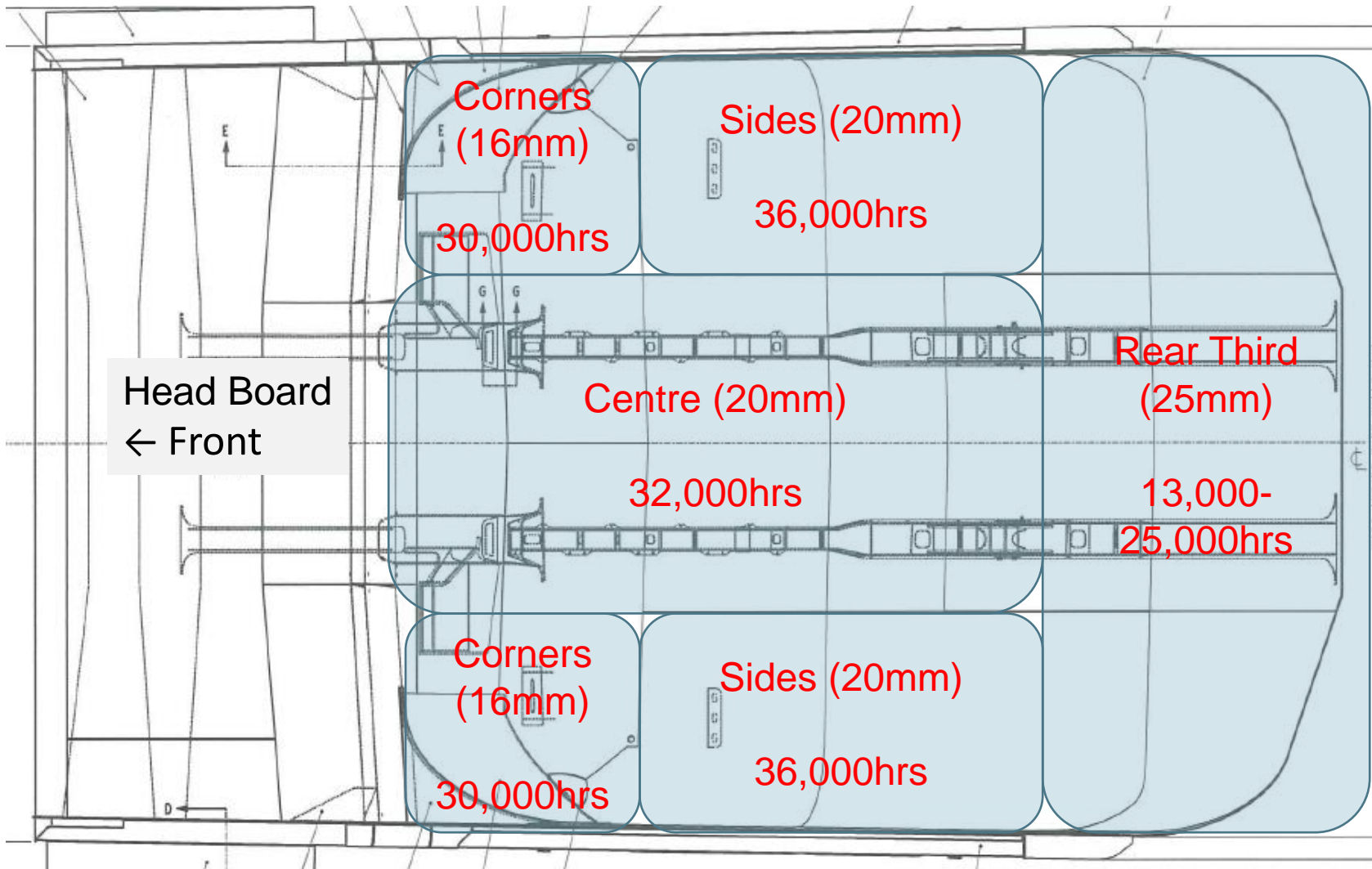


# RESULTS – MATERIAL EJECTION



*Similar tip time  
Note material ejection and windrow clearance*

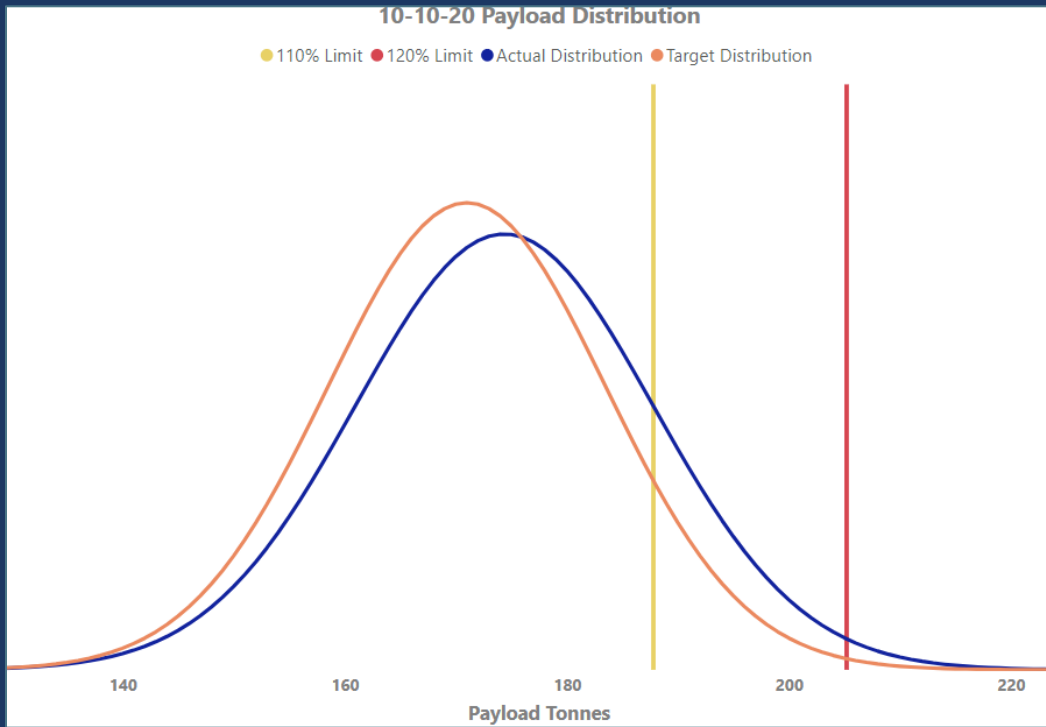
# RESULTS – DURABILITY (at 5,700hrs)



*Steel is Hardox 500 Tuf (500 HBW)*

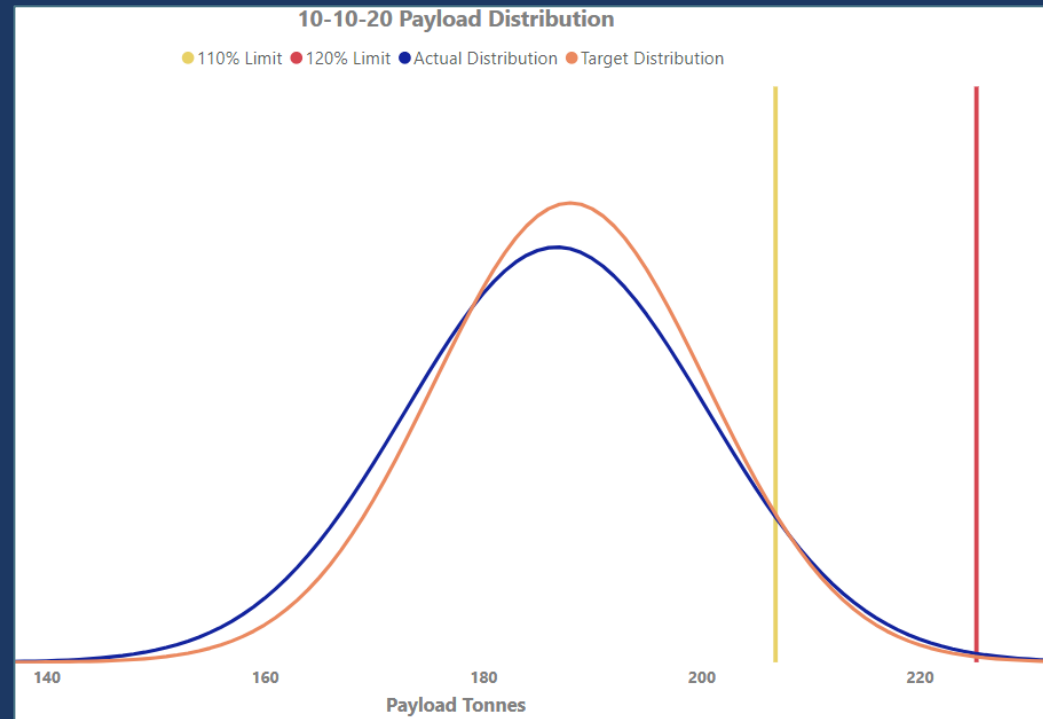
*Notes refer to when work is trending to be required, based on 12mm minimum*

# RESULTS - PAYLOAD DISTRIBUTION



## October 2022 (old trays)

- Average 102% of target
- 13% of loads >110% of target
- 0.9% of loads >120% of target\*



## July 2023 (new trays)

- Average 99% of target
- 6% of loads >110% of target
- 0.1% of loads >120% of target\*

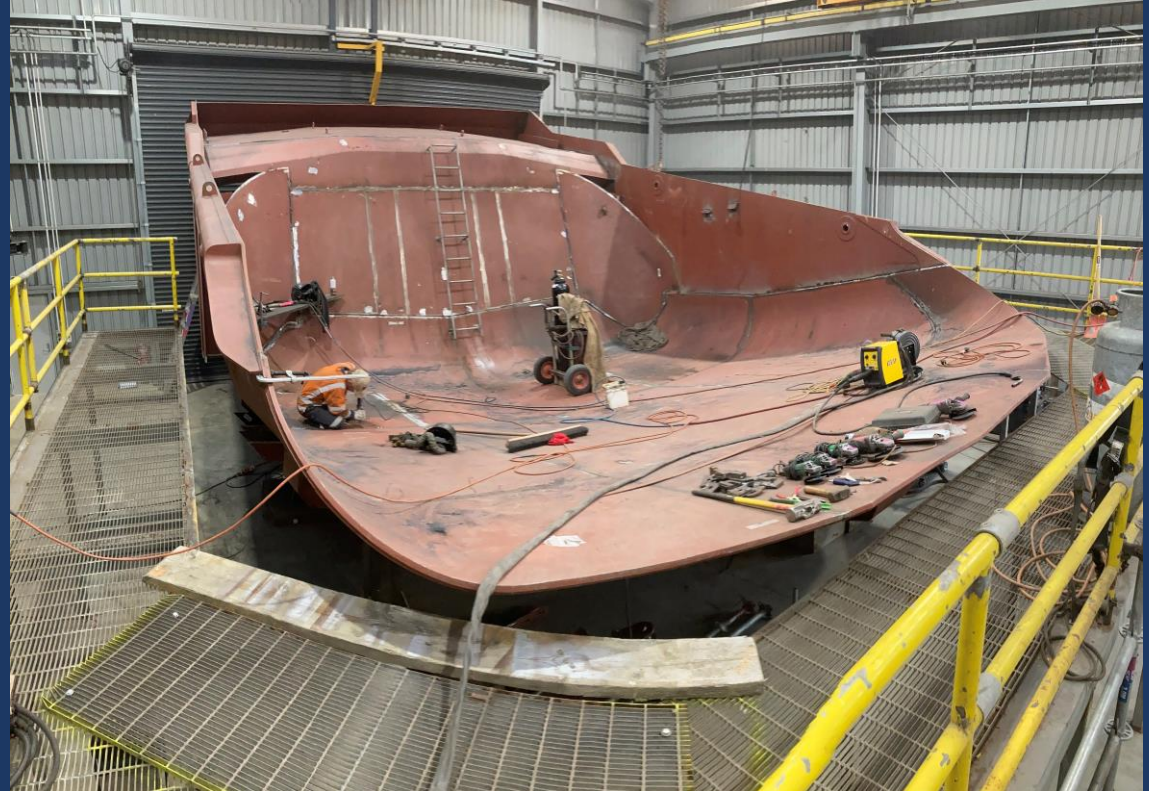
\* Site procedure is to tip any +20% overloads back at the digger

# RESULTS - PROJECT OUTCOMES

Factor	Target	Actual	Comment
Cost	Budget or better	✓	Favourable forex
Payload pass match	c. 190t	✓	188t = 5 pass loading
Completion date	On time	✗	Overestimated subcontractor ability to deliver to timelines
Tipping	1. Better material ejection 2. Tail clearance > windrow	✓ ✓	
Carry back	Eliminate carry back	✓	None observed, even in clayey topsoil
Surplus volume	Freeboard at rated payload	✓	Education needed for digger operators

# LESSONS LEARNT

- We were too optimistic with our assumptions that sub-contractors can resource everything
- Empty truck weights and on board scales need to be verified & calibrated regularly
- Modern tray designs offer benefits beyond additional payload
- Pass matching the loader / truck combination improves field payload management



# WHAT ABOUT THE OLD TRAYS?

Blasthole stemming  
storage

Almost eliminated  
wastage





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