

C3 Log Vessel Grapple



CILT Breakfast Meeting
15 March 2023

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LINX CARGO
CARE
GROUP



C3 Limited

Brief History



New Zealand's Oldest Log Marshaller

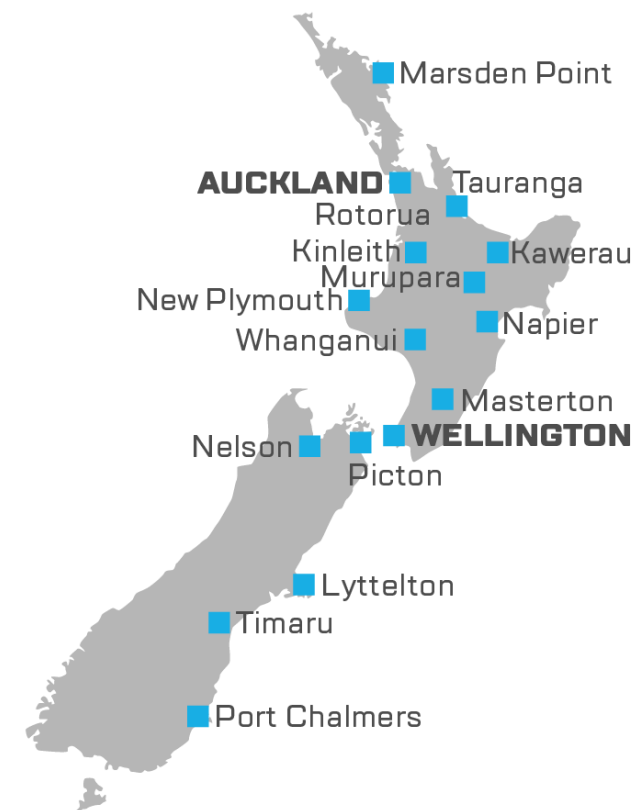
- Evolved from Mount Maunganui and Tauranga Stevedores formed by Sir Bob Owens in the early 1950's
- The Owens Group grew to encompass over 30 different businesses
- C3 Limited grew from the Stevedoring and Marshalling aspects of what was Owens Services BOP
- No other Stevedore or marshaller has such a long history in NZ





C3 Today

- Part of the LINX Cargo Care Group
- Employ around 1200 staff across 16 locations handling in excess of 16 million tonnes of cargo annually
- Wide range of services across NZ
 - Log Marshalling
 - Log Stevedoring
 - Log Debarking
 - Woodchip stockpile management
 - Export Documentation
 - Transport
 - Warehousing
 - Container handling
 - Pure Car Carrier load / unload (Roll on/Roll off)





LINX Cargo Care Group

- LINX emerged following our separation from Patrick and the Asciano Group
- The group employs more than 3,300 people across Australia and New Zealand
- The five businesses have over 100 years of ports and logistics experience



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No-one on the wharf



No-one on the Wharf

- In 2013, C3 designed a strategy that was intended to remove people from areas of higher risk, such as the wharf
- Similar to mechanisation in forestry crews, the intent was to automate functions that were previously carried out manually to reduce risk and where that wasn't entirely possible to reduce the exposure to risk through engineered safety and minimising time in higher risk areas
- Some components of this strategy have taken
- Key components to this program are:
 - Log Vessel Grapples
 - COM3Ts Scaling systems
 - Fall protected check point ramps
 - Auto Tally solution





Log Vessel Grapple

Traditional Log Stevedoring Method

- For many years, logs have been loaded using wires and self release log lifters, this requires staff on the ground to pull the wires under a bundle of logs and connect the loose end of the wire to the log lifter
- While we have robust safety processes, lock outs and good communication, anytime people are around the crane there is a degree of risk

C3 LVG Method

- **Improved Safety** – Removes the need for wharf hands to sling loads thereby eliminating a number of risks currently being managed by stevedores nationwide.
- **Greater Flexibility** – The LVGs are able to operate in any port, they are self-powered and remote controlled, so no special infrastructure is required, and it is easily transportable.





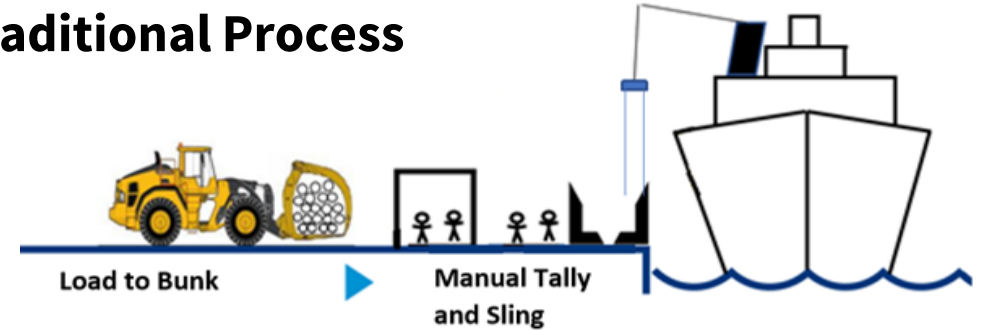
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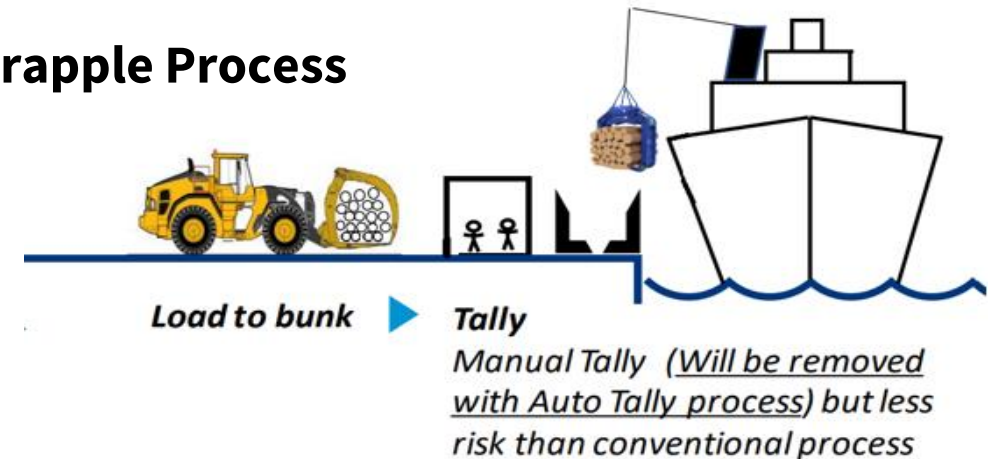
Comparison of Methods

- In traditional log loading, the process is:
 1. The lift is placed in the bunk
 2. Lift is butted with butting tractors
 3. The Lift is tallied
 4. The crane positions the wires at the back of the lift
 5. The staff pull the wires around the lift
 6. The wires are connected to the log lifter
 7. Staff return to safe zone and lift is lifted
- For Grapple loading, the process is:
 1. The lift is placed in the bunk
 2. Lift is butted with butting tractors
 3. The Lift is tallied
 4. Staff return to safe zone
 5. The crane positions the grapple, closes grapple and lifts the lift

Traditional Process



Grapple Process





C3 Log Vessel Grapple

- Integral part of C3's "No one on the wharf" strategy
- Concept in development since 2013 – waiting for technology to catch up to the vision
- Early design aided by Auckland and Canterbury Universities
- Final design and all manufacturing carried out by our Tauranga based partners, Page Macrae Engineering
- Winner of the 2022 Chartered Institute of Logistics and Transport (NZ) Safety Made Simple award



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LVG Key Features

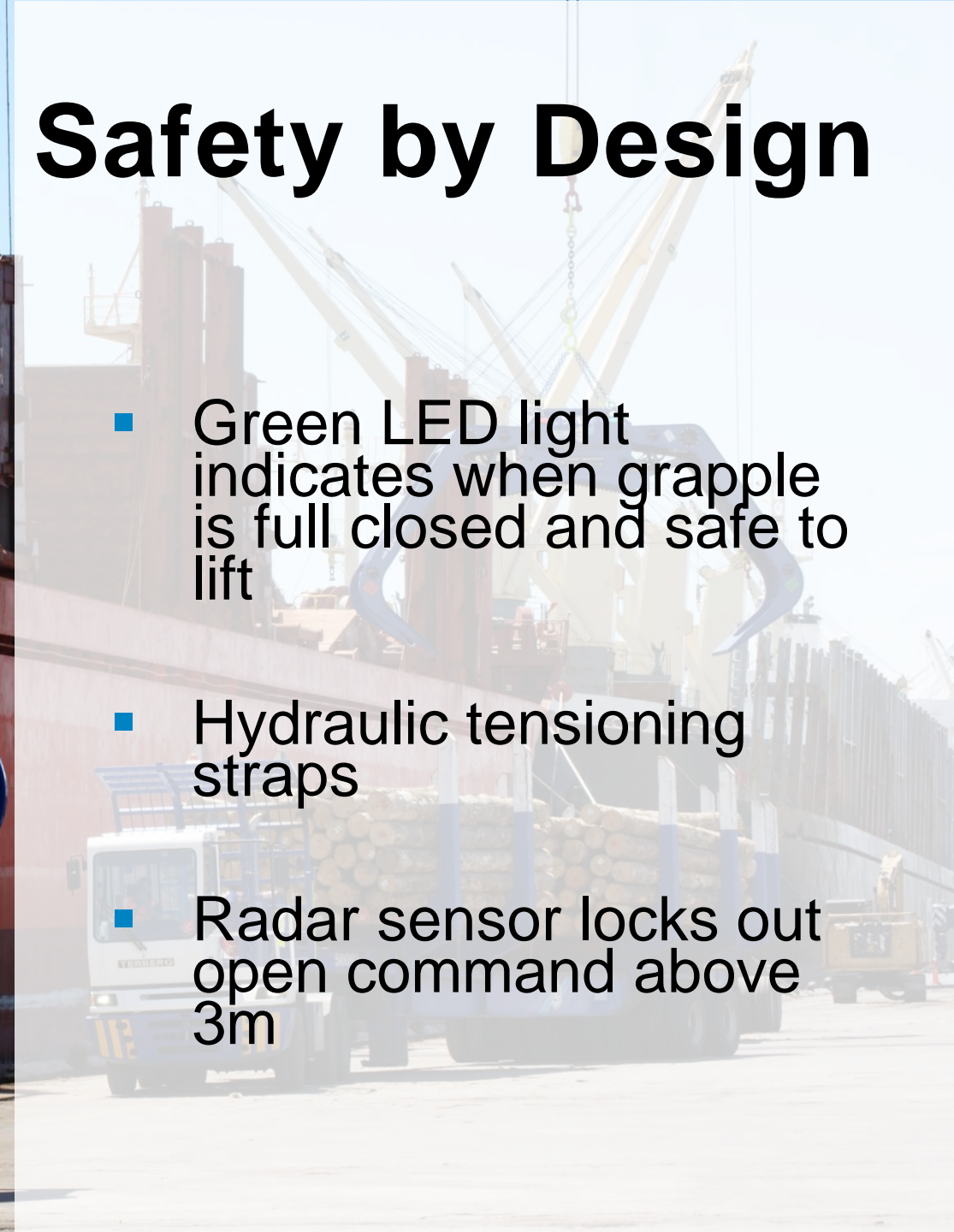
- Self-contained Hook-on Log Loader with Square shape tines providing controlled lift of logs
- Hydraulic tensioning straps to secure cargo in LVG
- Designed to operate from 30t ships crane
 - Tare weight of LVG: 7.2 Tonne
 - Safe Working Load: 22 Tonne
 - Total lift weight: 29.2 Tonne
- 4 x High powered thrust fans for rotation of LVG with Auto Align feature





Safety by Design

- Green LED light indicates when grapple is full closed and safe to lift
- Hydraulic tensioning straps
- Radar sensor locks out open command above 3m



Safety by Design

- Custom designed trailer provides safe storage and transport of LVGs
- Trailers fitted with AS1657 compliant work platforms for basic maintenance, testing fuelling and rigging of LVGs
- All designed to provide the safest work environment possible for stevedores and mechanics





Further C3 Innovation



COM3TS



COM3TS Automated Scaling

Chasing a vision of digitally scaling logs, the integration of advanced technology and artificial intelligence enabled the C3 NZ Team to develop a tool that sets the standard for automated scaling.

For C3 Customers, COM3TS provides:

- Consistently higher accuracy
- Improved speed
- Greater flexibility
- Reduced training time through automation

C3 are now working on a wireless version of the COM3TS hardware that will allow us to remove the backpack and further enhance our operation

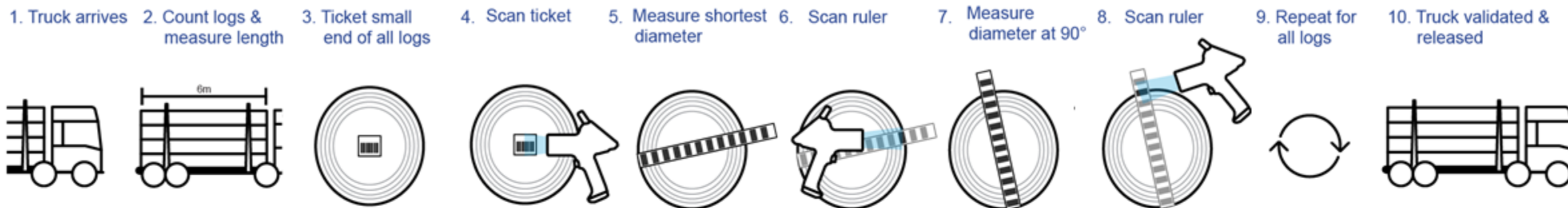
Joint winner of the 2021 Chartered Institute of Logistics and Transport (NZ) Innovation award for Com3ts and its supportive scaling ramps



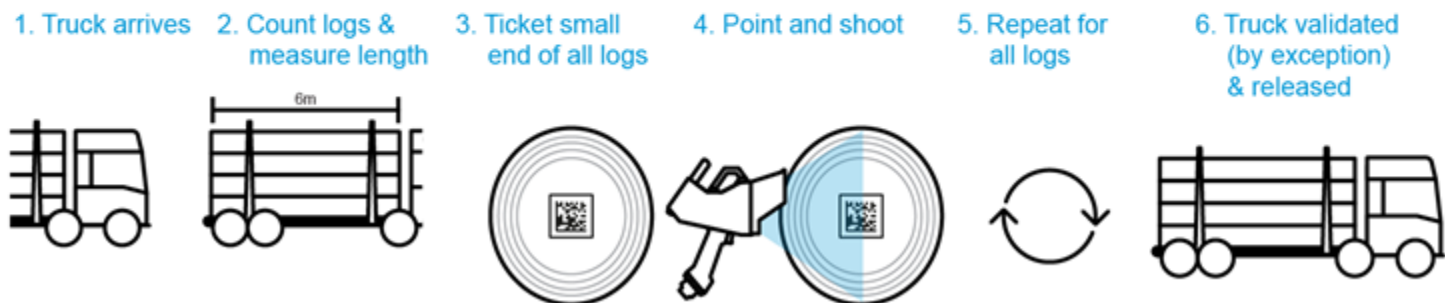


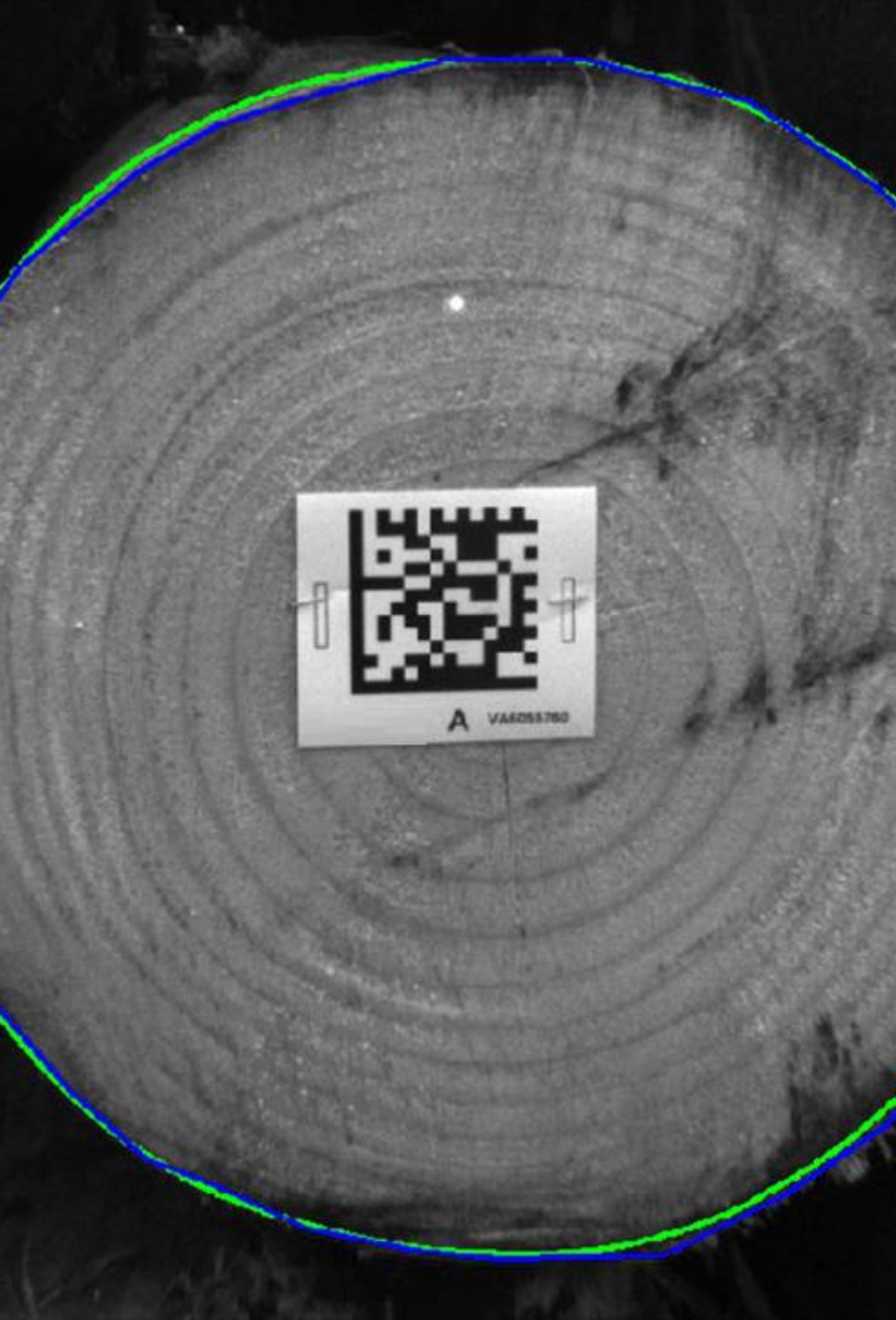
Change for the Better

Current Scaling Operation



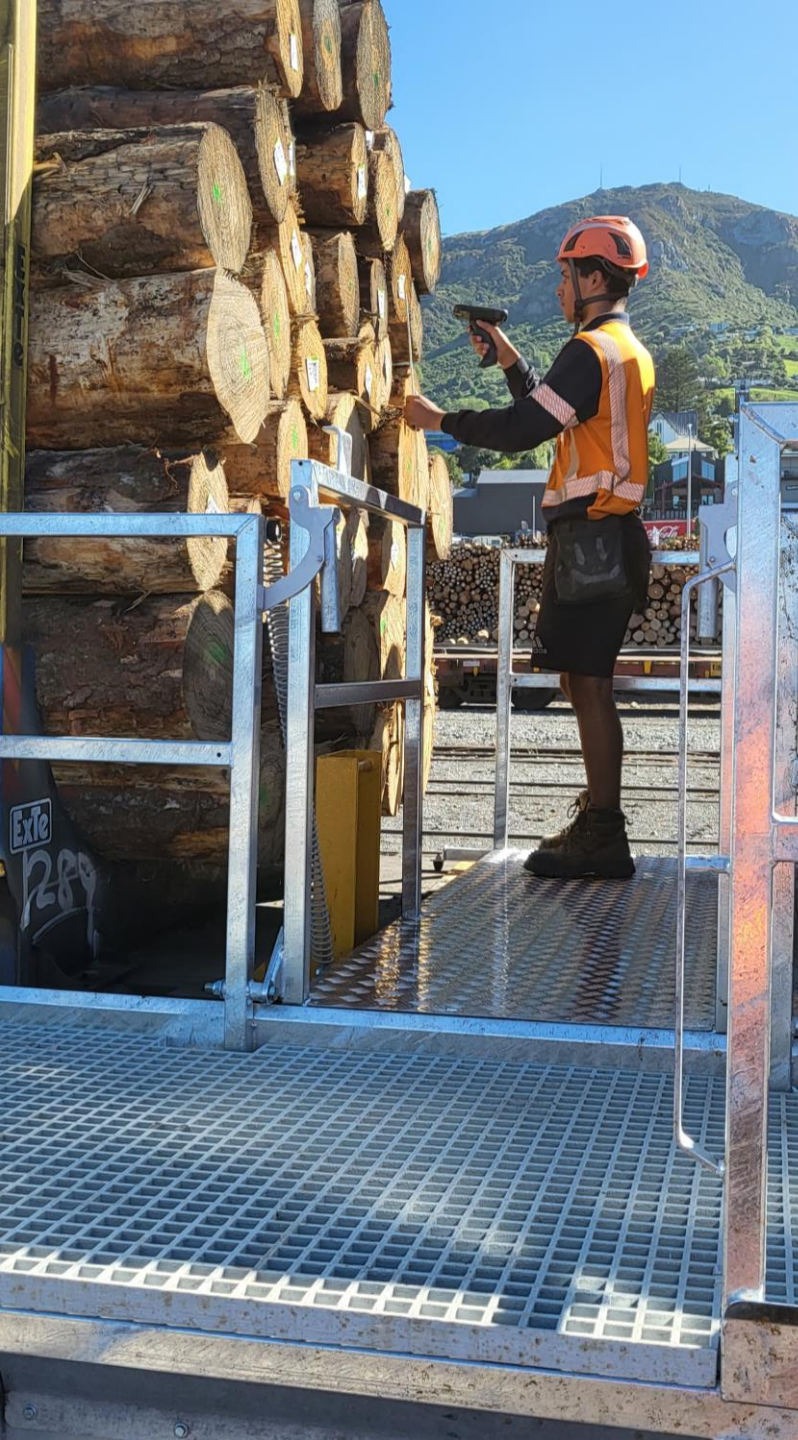
COM3TS Scaling Operation





Consistent Quality

- The same result no matter who pulls the COM3TS trigger
- Reduced bias (human error) means quality control is easier



Scaling Access Solutions

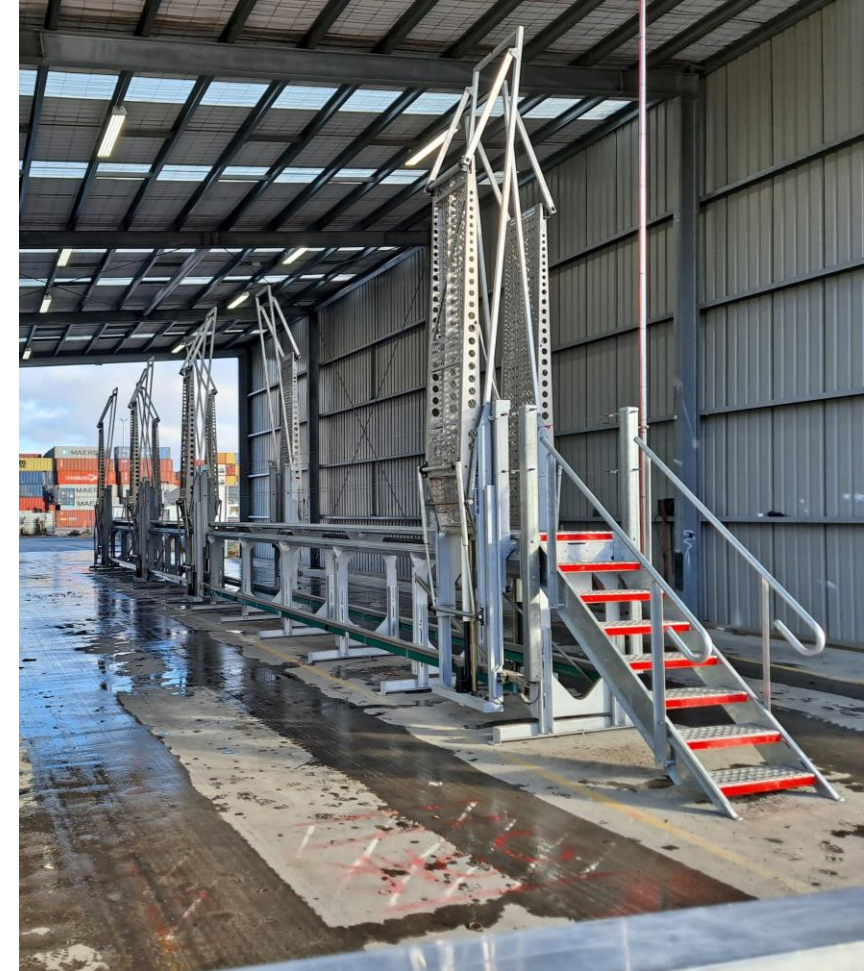


Checkpoint Scaling Ramps

Partnering with a Nelson based engineering company, C3 has commissioned Australasia's only fall protected checkpoint ramps, the key features:

- Elevated wider central platform with fall protection
- Folding handrails for work area
- Spring assisted folding of ramp
- Electrically height adjustable
- Compliant with AS/NZS 1657 standard

Now deployed to all C3 truck checkpoints in NZ





Rail Scaling Ramp

- Designed in partnership between C3 Lyttelton team and Active VMA engineering, key features:
 - Light and portable for easy relocation on rail wagons
 - Spring assisted folding of ramp
 - Stable, visible and safe work area for scalers

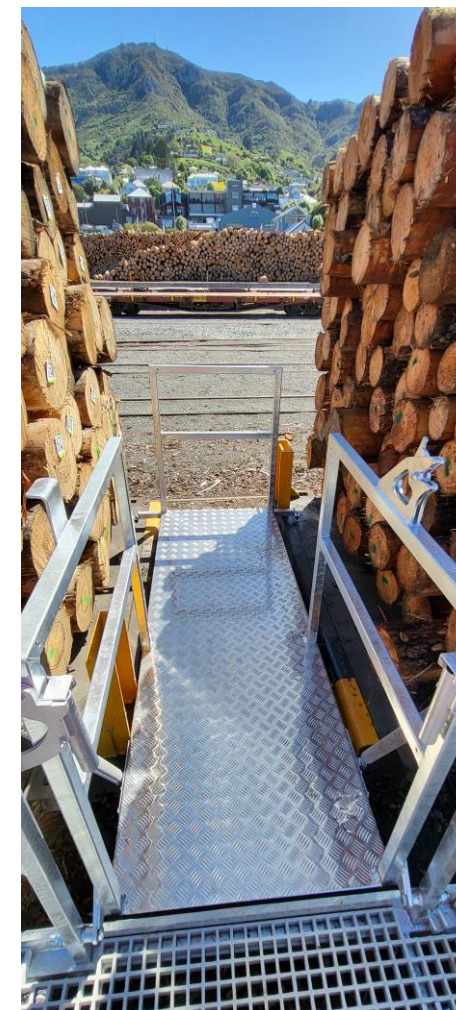




Rail Scaling Ramp

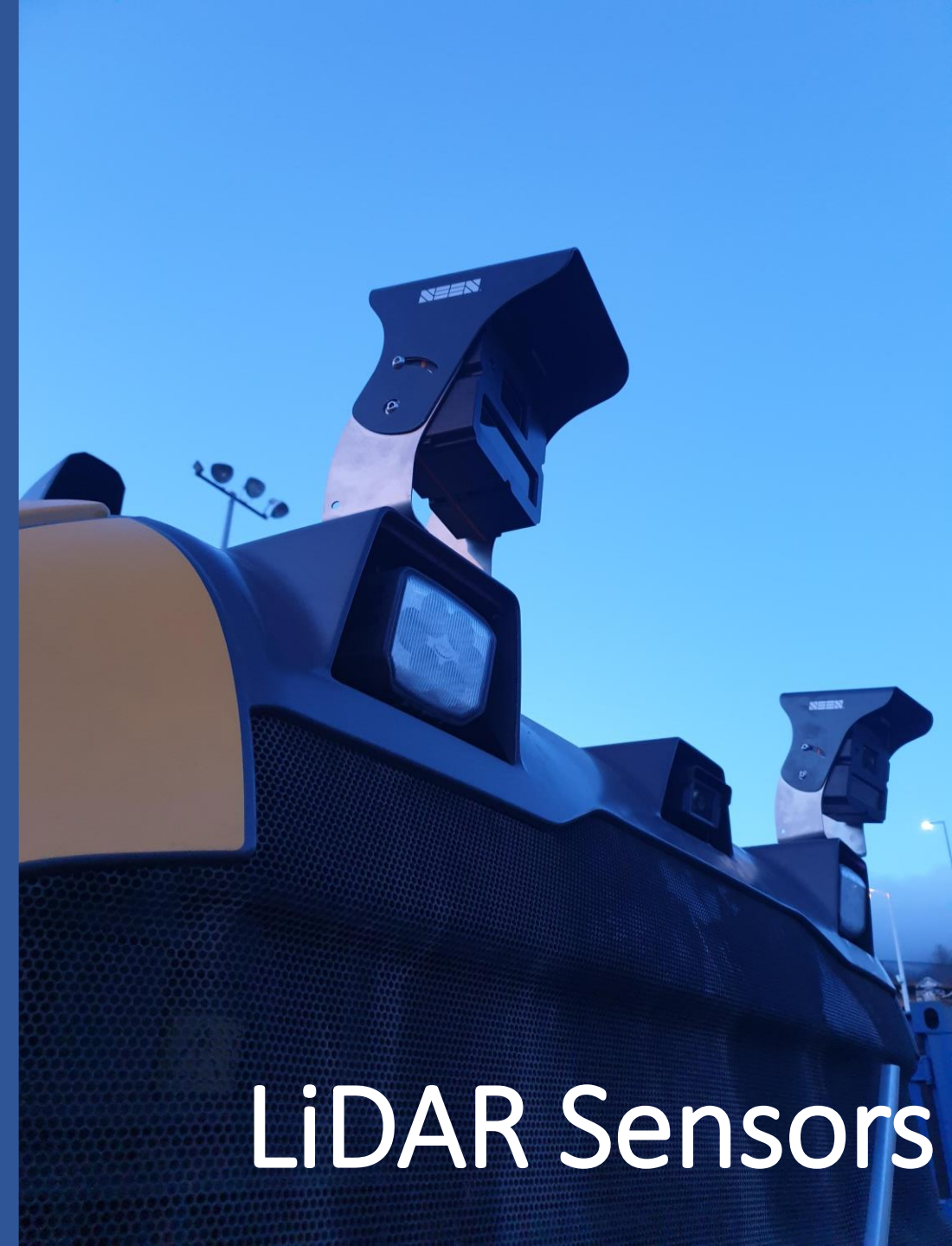


Without Ramp



With Ramp





LiDAR Sensors



LiDAR Sensors

Seen Safety is a New Zealand company based in Wellington who designed the IRIS 860 range of sensors. These are designed to detect and alert to the presence of reflective material within a set detection cone. This reflective material is present in our Day/night Hi-viz vests, as well as C3 vehicle decals and lock out flags

Key features of the IRIS 860 system:

- ✓ 60 degree horizontal x 45 degree vertical detection area
 - ✓ configurable to suit the application and reduce false alerts
- ✓ 1.2 -8m detection range
- ✓ 94dB audible alert for driver and pedestrian
- ✓ IP67 designed for outdoor use
- ✓ Shock and vibration resistant
- ✓ Class 1 eye safe infrared laser
- ✓ No RF interference Issues
- ✓ Maintenance free
- ✓ Multiple sensors can work together
- ✓ Active detection of reflective tape





Why LiDAR?

C3 operates many large heavy pivot loaders that have a number of blind spots, these blind spots are worse when the machines are handling logs. The below photo is an example of why C3 has worked with the manufacturer to develop and begin deploying forward sensors to the loaders:



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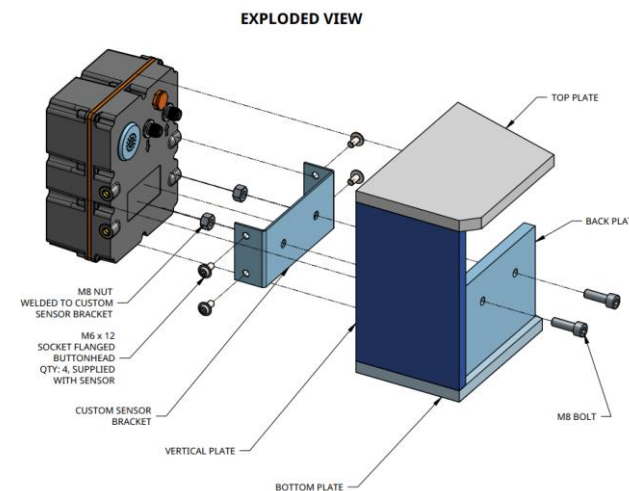
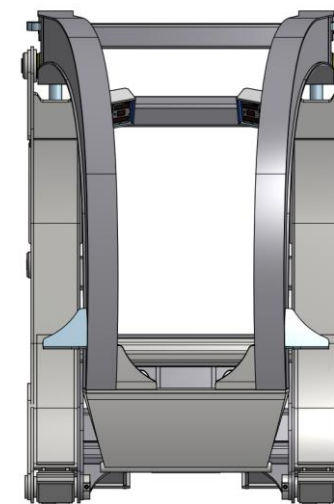
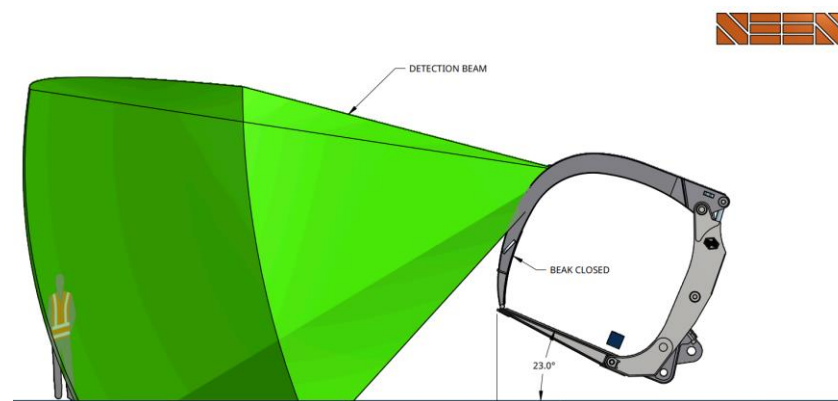
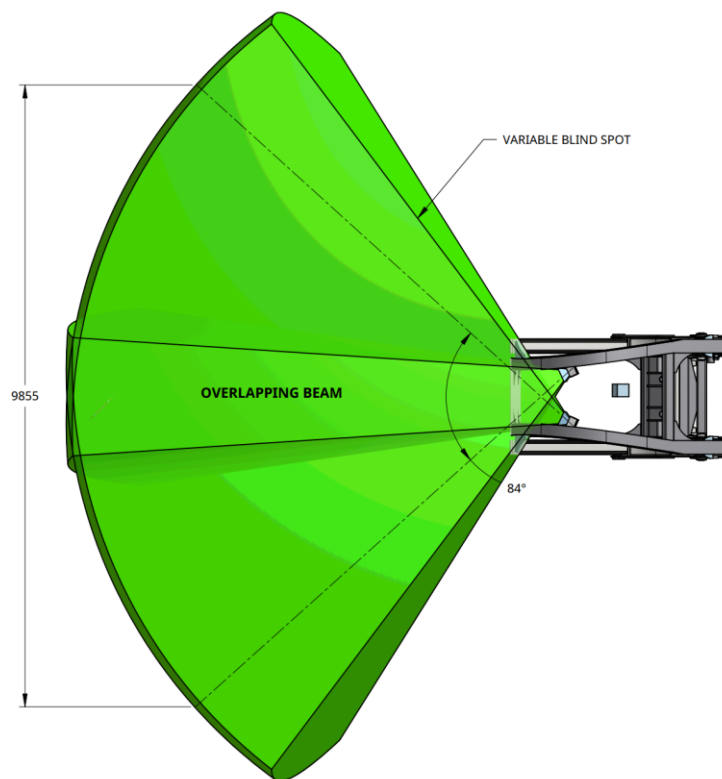


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Forward LiDAR Coverage

- LiDAR sensors to be mounted in log head to provide detection in front of log head
- Custom housings in provide protection to sensors in log heads
- Designed and tested in co-operation with the manufacturer





Thank you

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