People and Plant Interaction: A view from the cab

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6th Sense - Proximity Braking

Line of Sight - `Site` dumpers

The Mk1 Eyeball - Hydradig
Proximity Braking: a product upgrade
• Detection zone providing a ‘bubble’ around the machine,

• Vibrating transponder to warn the pedestrian,

• Audible warning in the cab for the machine operator,

• Automatic braking to help reduce the risk of a collision.
Site dumpers: a product evolution
Site dumpers are involved in around a third of construction transport accidents, causing many deaths and serious injuries.

OH BROTHER! Man almost killed after being crushed under a three-tonne dumper truck being driven by his own BROTHER

Plumber Dave Green became trapped under the vehicle operated by his sibling Danny when it tipped over.

Driver killed in dump truck collision

Police
What is a typical site?

1-2T
- Urban site – City
- Flat ground
- Small load
- Fenced site

3/6T
- Housebuilding site
- Roadways
- Medium load
- Segregated

6/9T
- Civil site
- Dry ruts and mud
- High load
- Un-segregated site

10T+
- Large site
- Off-road
- Bulk work
- Segregated site
Current options

6/9T

- Poor front visibility
- Unstable - heaped
- Un-protected operator
Site Dumpers Today - 3 Challenges

1. Visibility
2. Stability - Loaded
3. Operator Protection
Forward Visibility Challenge

All round visibility ✓
Stability Challenge

No loss in: Payload, Ground Clearance, Turning Circle

Lower COG ✔️
Operator Protection Challenge

1. Roll over protection
2. Operator impact during loading
3. Operator off machine during loading

Safest place for operator is cab
JCB Hi-Viz Dumper Concept

Visibility

Stability

Operator protection

Innovation checklist

1. Front Visibility ✓
2. Rear Visibility ✓
3. Stability ✓
4. Operator Protection ✓
5. Maintain Ground Clearance ✓
6. Maintain Turning Circle ✓
7. Maintain Simplicity ✓
8. Maintain overall height ✓
9. Three per lorry load ✓
10. 7t / 2m³ Liquid Volume ✓
7 Tonne Hi-Viz Concept
HYDRADIG: a product revolution
URBAN & CONGESTED sites are becoming increasingly complex

Customers need a highly mobile machine capable of:

DIGGING, LOADING, LIFTING, PLACING & MOVING MATERIAL
Today's Compromise

Restricted view over engine

Remove the obstructions

Create a cone of vision

Blind spots

VISIBILITY

Design Challenge
STABILITY

Small machines not stable
High centre of gravity
Can't handle large payloads

Double the payload

Lower the CoG
Small machines not stable

Perfect stability

Zero tail swing
Large rear overhang

Today's Compromise

Design Challenge
Today's Compromise

Slow and have poor acceleration

Highly mobile and quick uphill

MOBILITY
Today's Compromise

2 wheel steer - large turning circle

4 wheel steer - small turning circle

Design Challenge

Difficult to operate on congested sites

MANOEUVRABILITY
Not safe working at height

Safe, ground level service access

SERVICEABILITY
visibility
re-position the engine

mobility
50:50 weight distribution and seamless 40kph

stability
lower the CoG by over 0.5m

serviceability
ground level service

manoeuvrability
4 wheel steer
All round visibility to ground level
Lift 1,000kg over the side, with zero tail swing
40 kph roading with a stepless hydrostatic transmission
2 wheel, 4 wheel and crab steer for go anywhere capability
Safe, ground level service access