

# GOS DOOSAN DX170W-7 ROAD/RAIL CONVERSIONS



# GOS DOOSAN DX170W-7 WHEELED EXCAVATOR ROAD/RAIL CONVERSIONS



## WORLD LEADING TECHNOLOGY

Renowned for its innovative road/rail vehicles (RRV's) over many years, GOS uses the well-proven Doosan DX170-7 wheeled excavator as the base for a comprehensive range of friction drive and hydrostatic drive machines to match all challenging work applications.

### RELIABILITY

Building on the standard Doosan excavator's reliability, all GOS engineering changes follow the Doosan philosophy, using superior material and enhanced impact strength components. Against the Network Rail Plant Performance System (PPS) criteria, GOS DX170W-7 based machines score 99.8 % reliability.

### SUPERIOR STABILITY

Using "in-house" design and manufacturing facilities, GOS optimise the use of additional counterweight and chassis mounted mass, to ensure superior machine stability, delivering class - leading lift capability. Stabiliser leg option available.

### YOUR SAFETY IS OUR PRIORITY

As well as the standard Doosan equipment, GOS road/rail machines feature additional cameras and work lights, fire suppression systems, additional strategically positioned emergency stops, enhanced "working at height" guards. All in accordance with exacting Network Rail safety standards.

### TOTAL CONTROL

Using upgraded components, towing connections for fully automatic rail trailer braking (air or hydraulically actuated) fitted to both ends of the machine. Direct rail wheel or hydrostatic braking available, depending on selected model. All machines feature the latest Network Rail Approved Rated Capacity Indicator (RCI), in accordance with the current issues of industry standards RIS-1530-PLT and BS EN 15746.

### EASE OF OPERATION

The GOS RCI installation (complete with cab mounted touch screen) meets all the requirements for adjacent and open line operation (ALO with "virtual wall" function), working under overhead cables (OLE with height limit) and tandem lifting, as well as delivering general load/lift status and control.

### RECOVERY SYSTEM

On-board 11 hp Diesel engine (with electric start) provided for emergency recovery, complete with integrated hydraulic connections and circuitry. This permits the machine to return back into rail gauge before removal from the breakdown site, using a tow bar and appropriate rescue road/railer.



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VERSATILITY AT IT'S MAX...



## OPERATIONAL TASKS

Suitably equipped, here's just a few examples of the variety of tasks that this versatile machine can undertake:

- Track tamping
- Rail brushing
- Site layout and preparation work
- Sleeper changing
- MOVAX vibro pile driving
- Tilt rotator use
- Grading and formation building
- Lifting fork fitment for pallet handling
- Suction ballast excavation unit
- Long rail handling/thimbling
- Long and "super long" boom capability
- Pile hammer use
- Gantry and OLE installation
- Mulching/flailing
- Multiple standard bucket use
- Multiple attachment use with quick hitch for log grabbing, bag lifting, hammer/breaker, etc.



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THE POWER TO RAISE PRODUCTIVITY



## INTRODUCTION



The GOS DX170W-7 Series road/rail machines have become the company's core product – they are the UK market leader, for this size of machine.

The friction drive version is the acknowledged prime workhorse of the UK rail maintenance industry. As the name implies, travel drive utilises the friction between the machine's rubber tyres and the rail wheels. This is the simplest and most robust option built by GOS and has a measured reliability factor of 99.8 %.

Currently, two main variants are available:

- DX170 Ultimate 250 –  
Approx. finished machine weight 25 tonnes
  - DX170 Ultimate 270 — labelled "the heavy lifter"  
Approx. finished machine weight 31 tonnes
- Key features include:
- Direct rail wheel braking
  - Rail trailer towing (both hydraulic and air actuation) up to 140 tonnes
  - Enhanced lift performance
  - Full function Network Rail Approved RCI system with "virtual wall" and height limitation, enabling operation under live OLE and with adjacent line open (ALO)
  - Various dipper configurations available, including 2.1m (civil option) and 5.5m (lifting option, typically used for gantry installation maintenance and other lineside works). Longer booms also available, up to 10m length

## INTRODUCTION

Similar to the friction drive version, except that travel drive is by the use of hydrostatic motors bolted directly to the rail wheels. Rail wheel braking is provided by the control/regulation of the hydrostatic motors.



Based on the Doosan DX170W-7 wheeled excavator, the GOS DX170W Hydrostatic Drive Series includes:

- Hydrostatic travel drive capability, including rail wheel braking
- Optional retractable stabiliser legs at each "corner" of the machine to provide additional stability in operation (Variant HS only)

Currently, 4 main variants are available:

- DX170 SH Ultimate 250/270 – Standard machine, NO drop down stabilisers
- DX170 HS Ultimate 270 - WITH drop down stabilisers, for increased lift capacity and enhanced machine stability
- DX170 SH Ultimate 270 SL (Self Levelling) - Standard machine, NO drop down stabilisers
- DX170 HS Ultimate 270 SL (Self Levelling) - Selflevelling machine WITH drop down stabilisers, for increased lift capacity and enhanced machine stability

Key features include:

- Where the SL variant is selected, the self levelling function (SLF) is provided to allow the machine to perform at its optimum capability, allowing the excavator boom to remain essentially PERPENDICULAR to the horizon (IRRESPECTIVE of the rail cant) and thus prevent boom side loading. The SLF acts ONLY on the fixed/levelling axle of the machine.
- Hydrostatic rail wheel braking
- Rail trailer towing (both hydraulic and air actuation) up to 70 tonnes
- Enhanced lift performance
- Full function Network Rail Approved RCI system with "virtual wall" and height limitation, enabling operation under live OLE and with adjacent line open (ALO)
- Various dipper configurations available, including 2.1 m (civil option) and 5.5 m (lifting option, typically used for gantry installation maintenance and other lineside works). Longer booms also available, up to 10m length.

## ENGINE

Designed to deliver superior performance and fuel efficiency, the Doosan DLo6V diesel engine fully meets the latest Stage V emission regulations. To optimise machine performance, the engine uses high-pressure fuel injectors, air-to-air inter-cooler and electronic engine controls. 4-Cycle Water-Cooled. wastegate Turbocharged. Diesel Oxidation Catalyst (DOC). Selective Catalytic Reduction (SCR) and Diesel Particulate Filter (DPF)

## UNDERCARRIAGE

Essentially as per Doosan standard construction but design enhanced to specifically endure the rigours of road/rail operation on Network Rail and other rail infrastructures.

GOS modifications to chassis (including additional counterweight mass as required by version/variant) using comparable high specification steel to that used on the Doosan OEM build.

## WHEELBASE

Road mode (all variants) : 2650 mm  
Rail mode: SH Variant: 4600 mm  
HS Variant: 5467 mm  
SL Variant: 5519 mm

## HYDRAULIC SYSTEM

The e-EPOS (Electric Power Optimising System) is the brain of the excavator - minimising fuel consumption and optimising the efficiency of the hydraulic system for all working conditions. To harmonise the operation of the engine and the hydraulics, the e-EPOS is connected to the engine's electronic control unit (ECU) via a data transfer link.

- The hydraulic system enables independent, or combined operations
- 2 travel speeds offer either increased torque, or high speed
- Cross-sensing pump system for fuel savings.
- Auto-deceleration system
- 4 operating modes. 4 power modes
- Flow and pressure control of auxillary hydraulic circuits from control panel
- Computer-aided pump flow control

## HYDRAULIC CYLINDERS

Component cylinders remain as per standard Doosan fitment, but with GOS modified boom geometry, to increase hydraulic power by up to 30%, to suit rail specific application.

## TYRE DIMENSIONS

10 X 20 Trelleborg Highway profile, foam filled

## OVERALL WIDTH

2800 mm



- Machine built in general accordance with local railway legislation, such as the current UK Railway Group Standard RIS-1530-PLT, EN15746 and AS7502.
- Compliant with the requirements of Network Rail Remit MLD/R003 – Remit for fitment of Electro and Electromechanical Movement Limiting Devices (UK only).
- Variants currently available to suit 1435mm and 1600mm nominal gauges.
- Ability to on/off track on 150mm cant. Fully stable on 180mm cant in work mode and 200mm in travel mode.
- Available with or without drop down stabilisers, dependent on selected variant
- LUL specification compliant version available
- 700mm diameter cast steel rail wheels fitted to heavy duty EN16T steel axles
- Hydraulically operated railgear with double pilot-operated check valves
- Anti-burst protection on ALL boom elements
- Rail gear raise/lower deployment interlock system
- Pivoting axle with axle-lock cylinders and pilot-operated check valves
- Approved Rated Capacity Indicator system, including data logging
- Fully automatic trailer park and service braking.
- Quick connect service and park brake couplings front and rear for towing trailers
- Friction driver version – travel drive using rubber tyres directly driving rail wheels
- Direct rail wheel braking (friction driver version) – using separate brake disc and actuating system. Acts directly on rail wheel
- Hydrostatic drive version - travel drive using hydrostatic motors bolted to rail wheels, including slip reduction system
- Rail wheel braking (hydrostatic drive version) - via hydrostatic drive system/motor directly bolted to rail wheel.

BRAKE OPERATION TYPE	PARK BRAKE - AVAILABLE RELEASE PRESSURE RANGE (BAR)	SERVICE BRAKE - AVAILABLE INPUT PRESSURE RANGE (BAR)
Hydraulic	30 MIN, 100 MAX	0-100 MAX
Air	4.0, MIN, 6.0 MAX	0-6 MAX

- Electrical sockets front and rear for operating automatic lighting on trailers. Also compatible with Philmor/GOS T Series trailer personnel carrier attachments.
- Chassis mounted rail lighting with automatic direction switching and neutral "all red" condition
- Emergency recovery tow bar, with 40mm diameter end connections
- Emergency recovery system, using 11 HP diesel recovery engine with electric start, together with tow bar
- Cab fitted fire extinguisher – Aqueous Film Forming Foam (AFFF) Type.
- GOS RailSafe CANbus based control system with diagnostic capabilities. Cab mounted display screen.

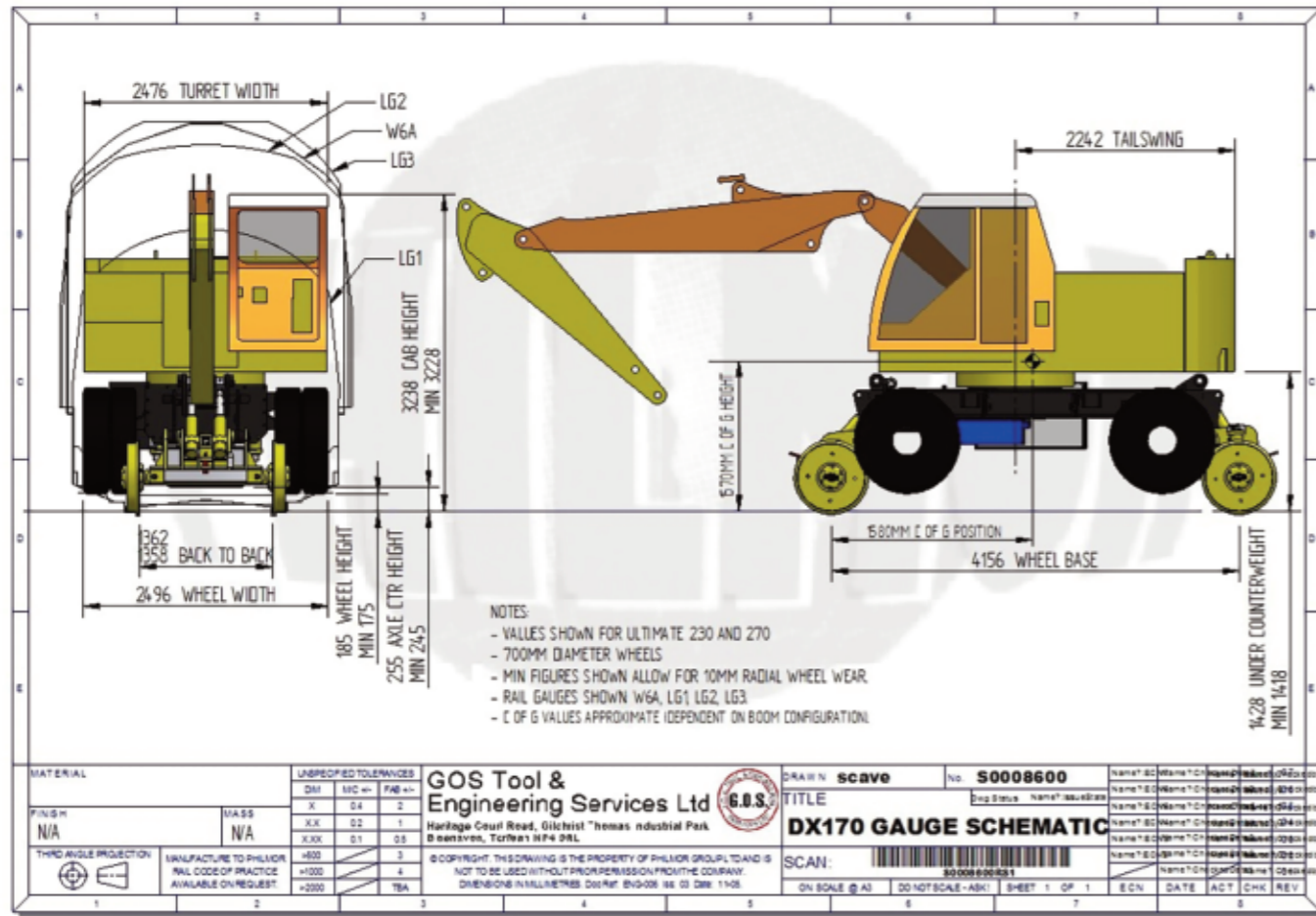


## AVAILABLE OPTIONS

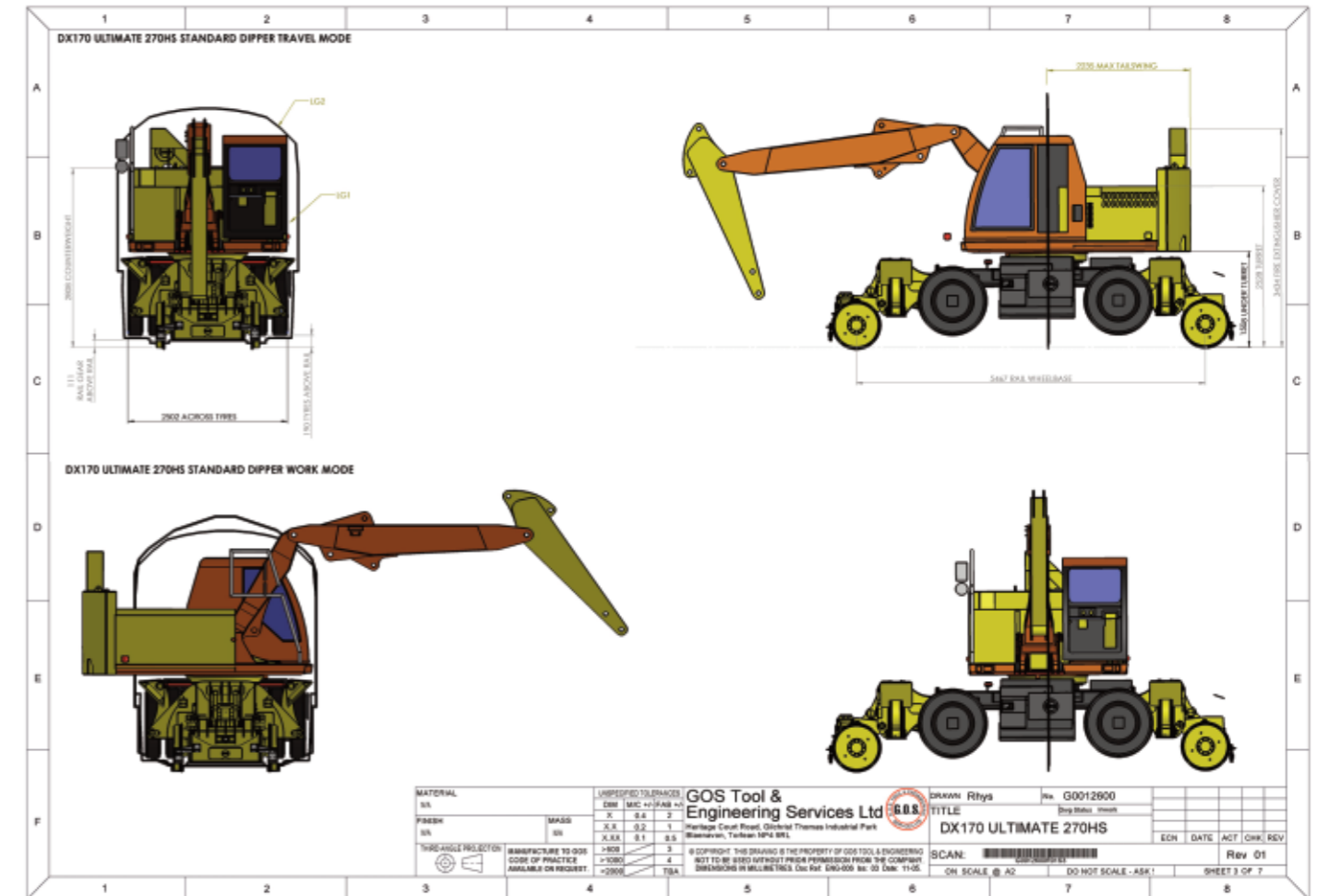
- Double cab. Seating for one passenger.
- FIRETRACE automatic AFFF system
- "Deadman" or "vigilance" operator systems.
- "Blind side" CCTV system
- 5.5m and 10m "long reach" dippers
- ENGCON specific Tiltrotator driver controls
- MOVAX Pile Driver specific driver controls
- Rail wheel brake emergency recovery hydraulic connection
- Work restraint anchor point
- Power connections on boom elements
- Hydraulically operated retractable machine stabiliser legs at front and rear of the machine (HS and HS-SL variant only)
- Optional approved system wireless tandem link available
- Dedicated hammer flow valve for enhanced equipment operations, eg rail brushing



# TYPICAL MACHINE DIMENSIONS

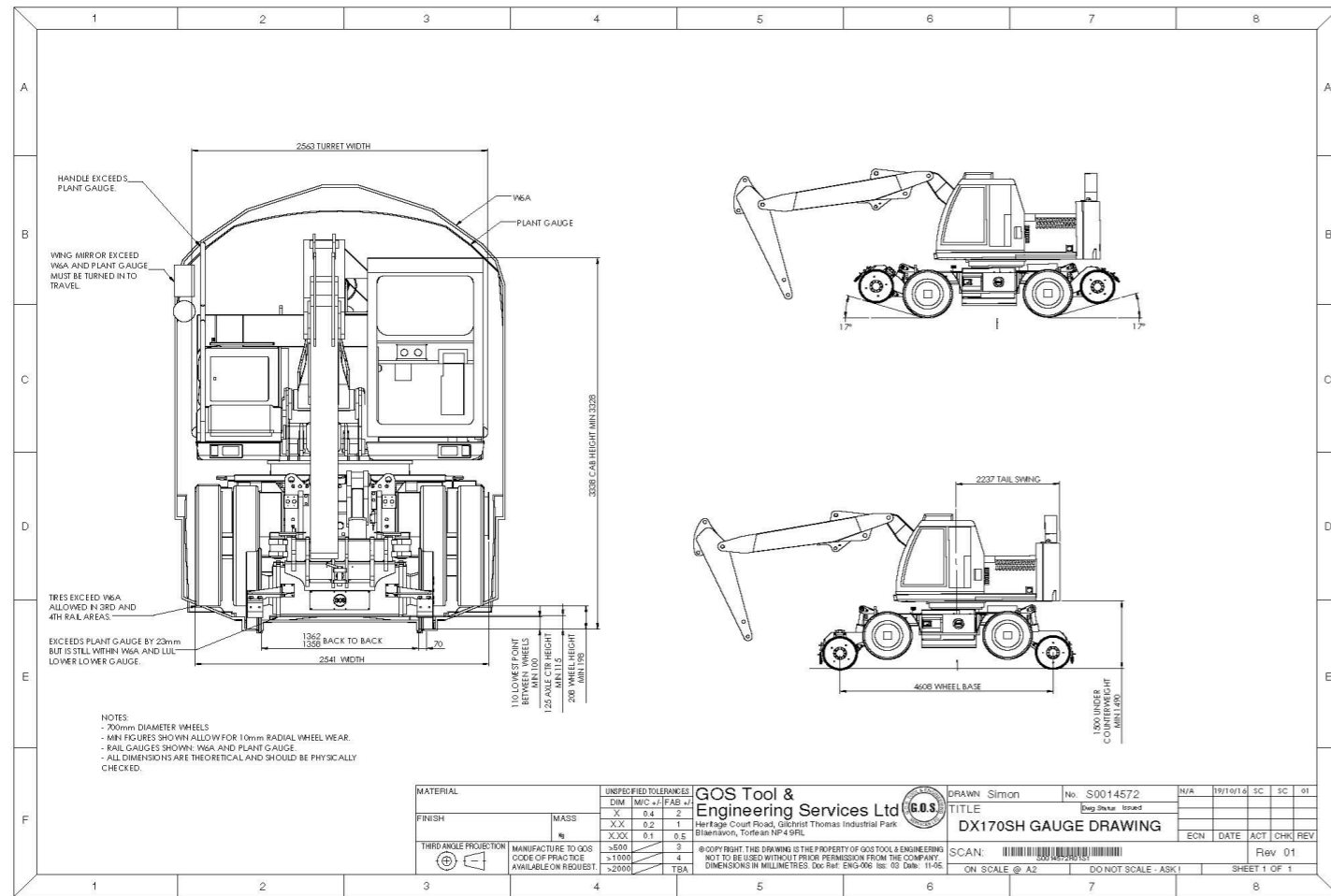


Friction Drive - DX Ultimate 250/270

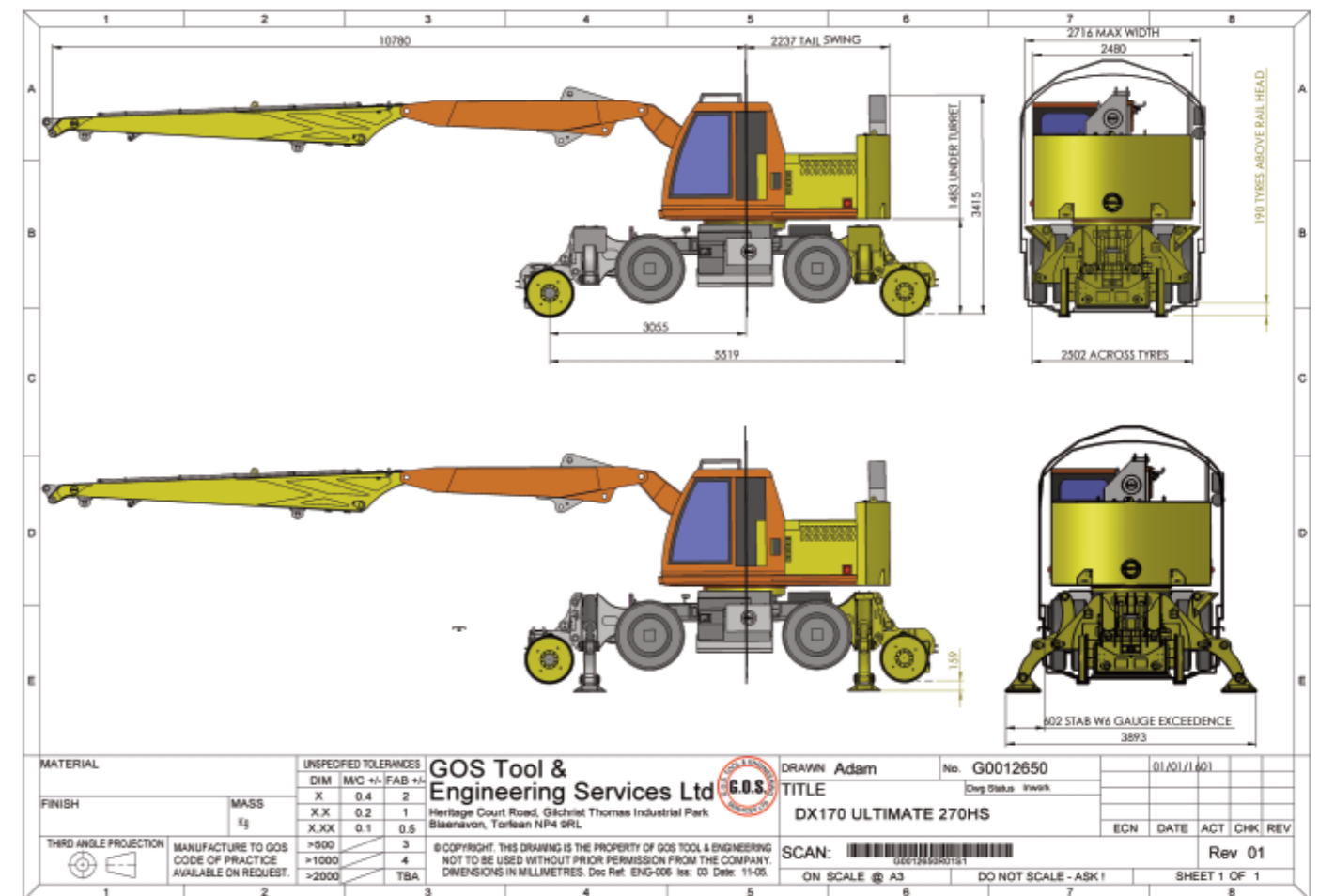


Hydrostatic Drive - DX Ultimate 270HS with 2.1m Dipper

# TYPICAL MACHINE DIMENSIONS



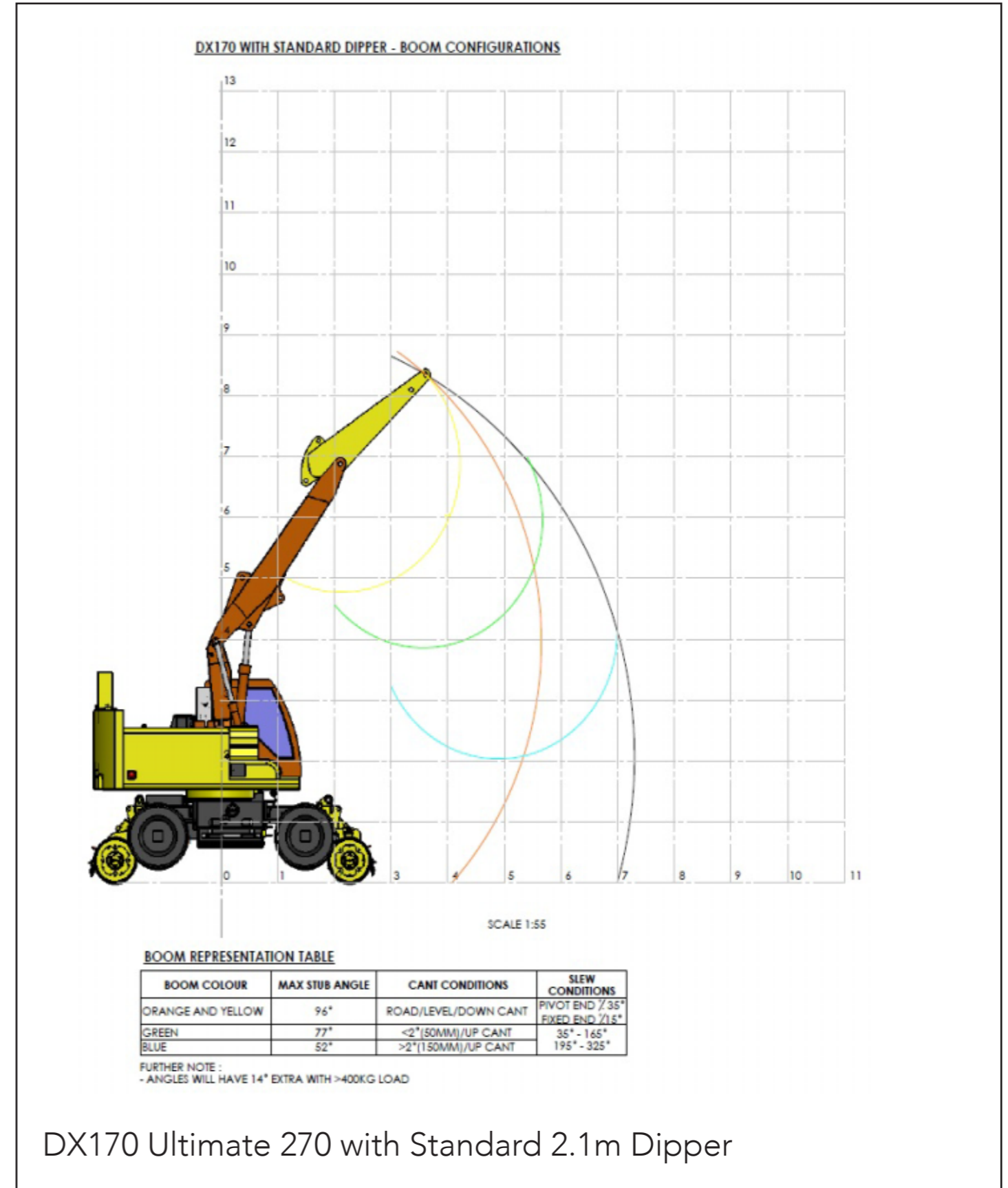
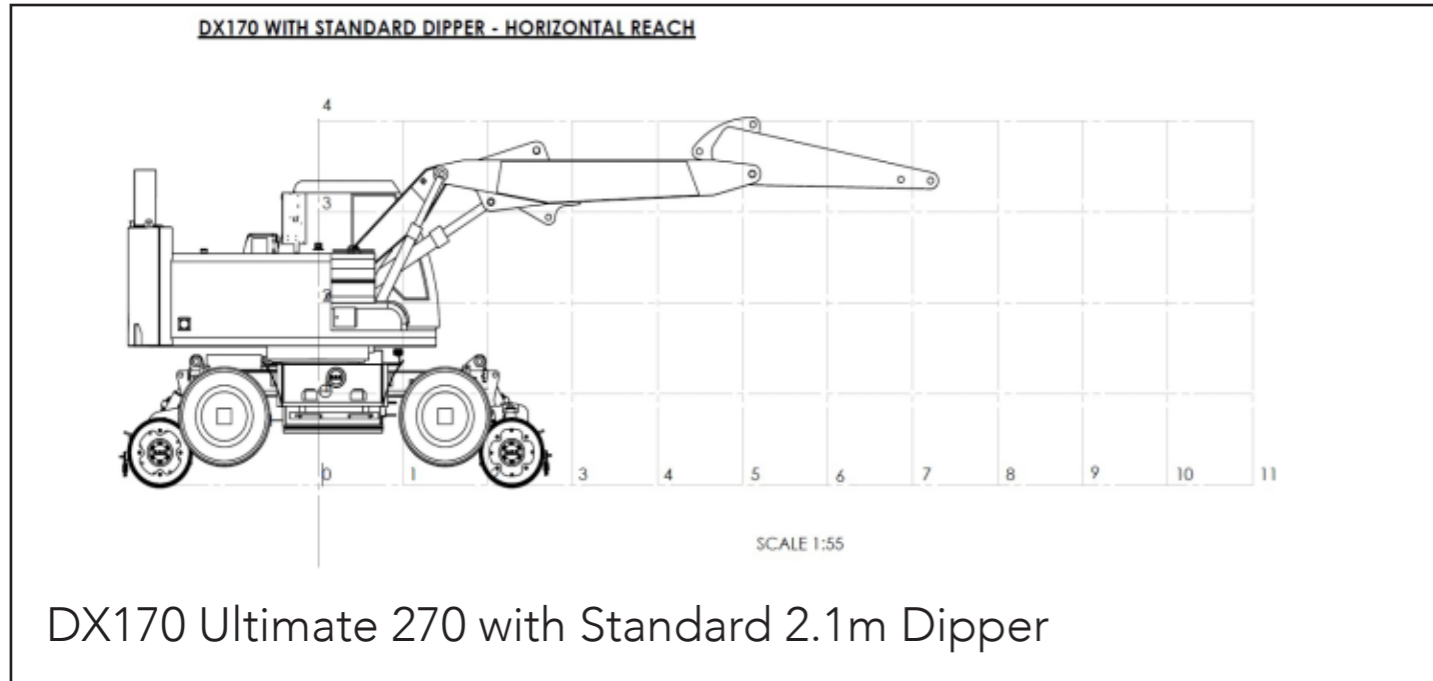
Hydrostatic Drive - DX Ultimate 270HS with 2.1m Dipper



Hydrostatic Drive - DX Ultimate 270HS with 5.5m Dipper and self levelling function (SL)

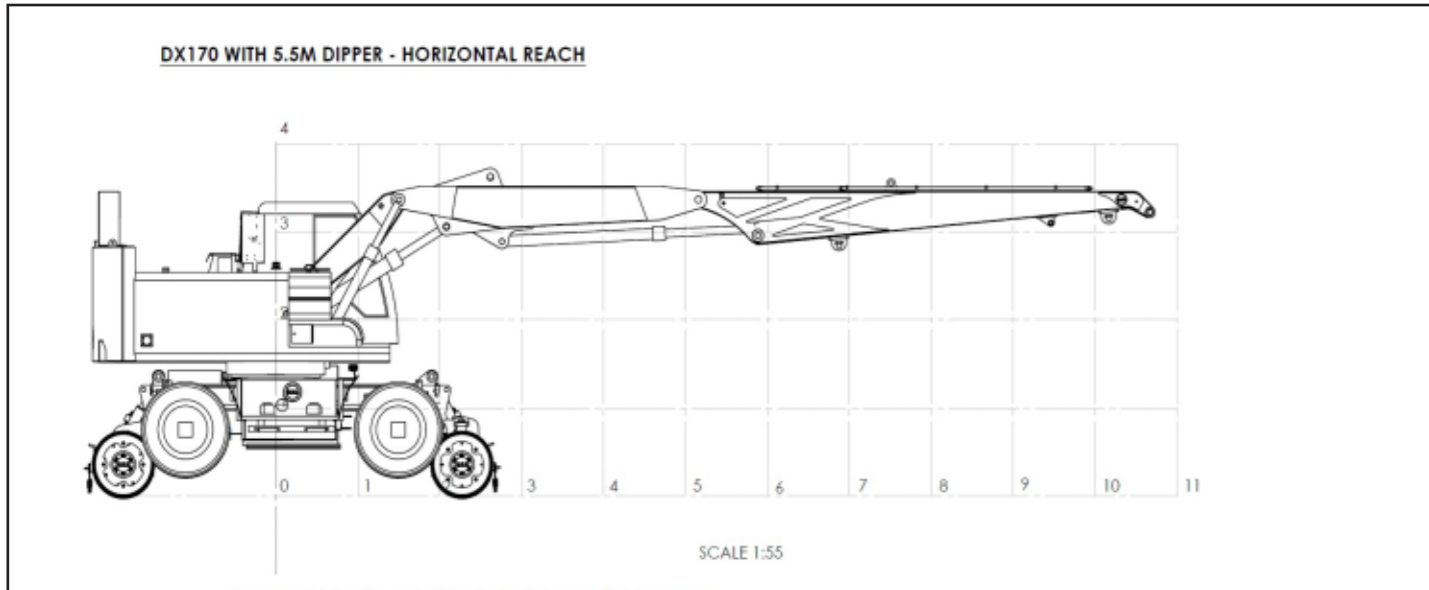
# TYPICAL WORKING RANGE

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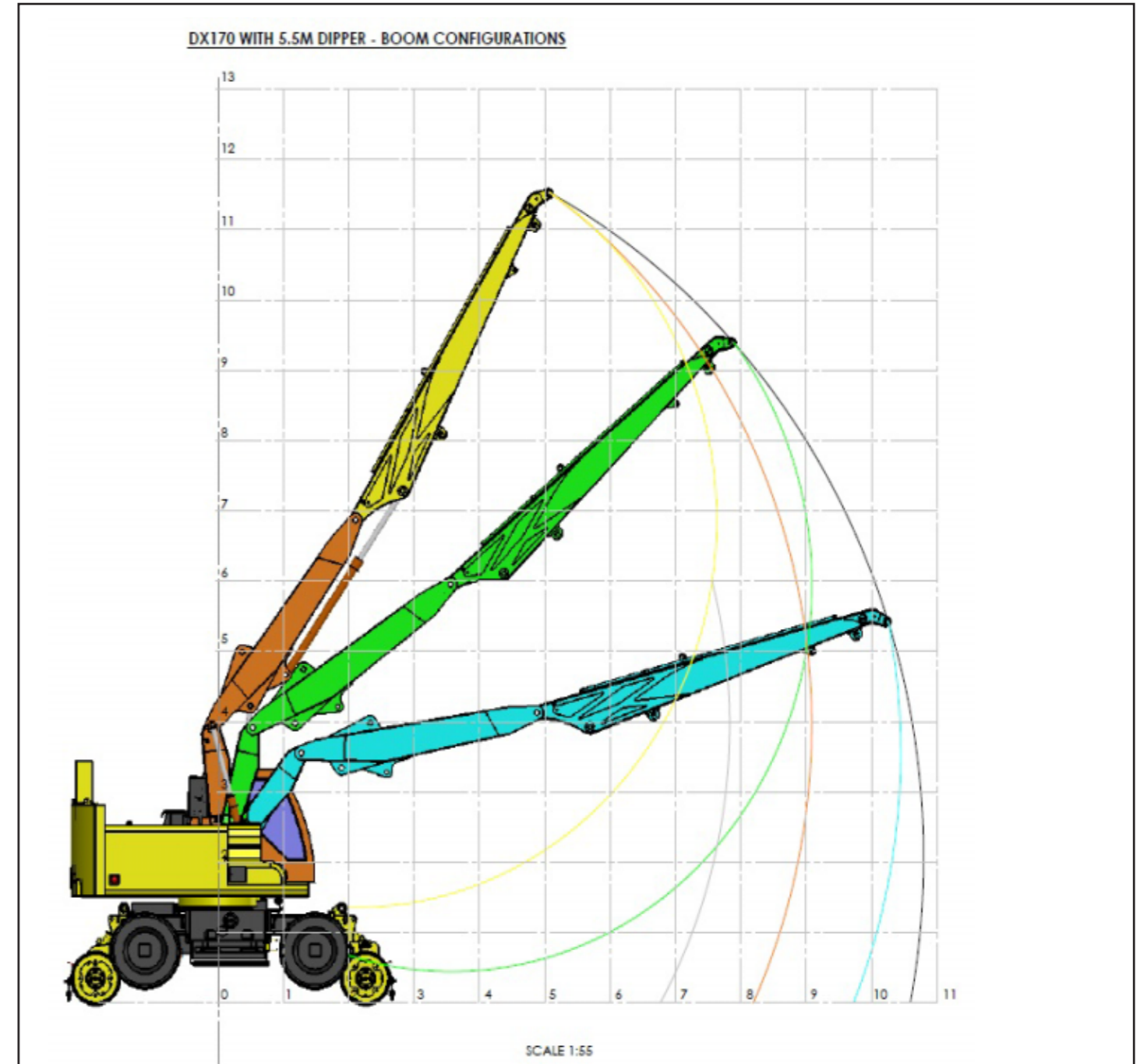


# TYPICAL WORKING RANGE

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DX170 with 5.5m Dipper - Horizontal Reach



BOOM REPRESENTATION TABLE

BOOM COLOUR	MAX STUB ANGLE	CANT CONDITIONS	SLEW CONDITIONS
ORANGE AND YELLOW	96°	ROAD/LEVEL/DOWN CANT	PIVOT END / 35° FIXED END / 15°
GREEN	77°	<2° (50MM)/UP CANT	35° - 165°
BLUE	52°	>2° (150MM)/UP CANT	195° - 325°

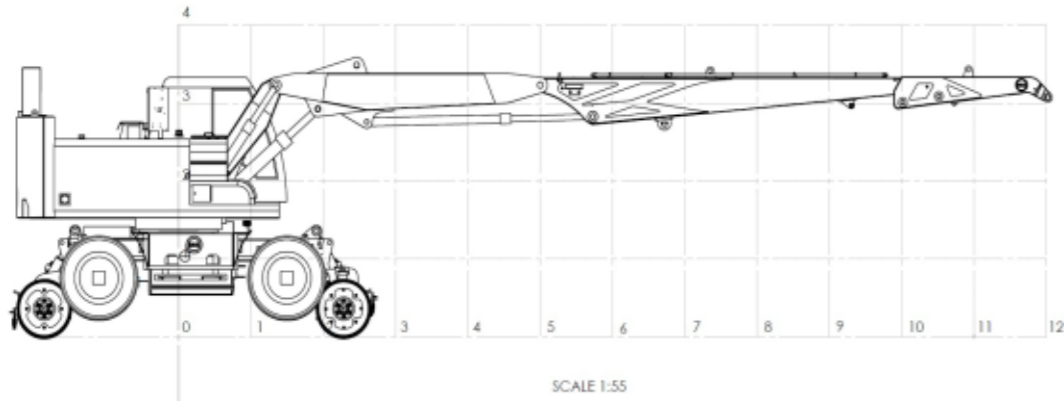
FURTHER NOTE:  
- ANGLES WILL HAVE 14° EXTRA WITH >400KG LOAD

DX170 Ultimate 270 with Standard 5m Dipper

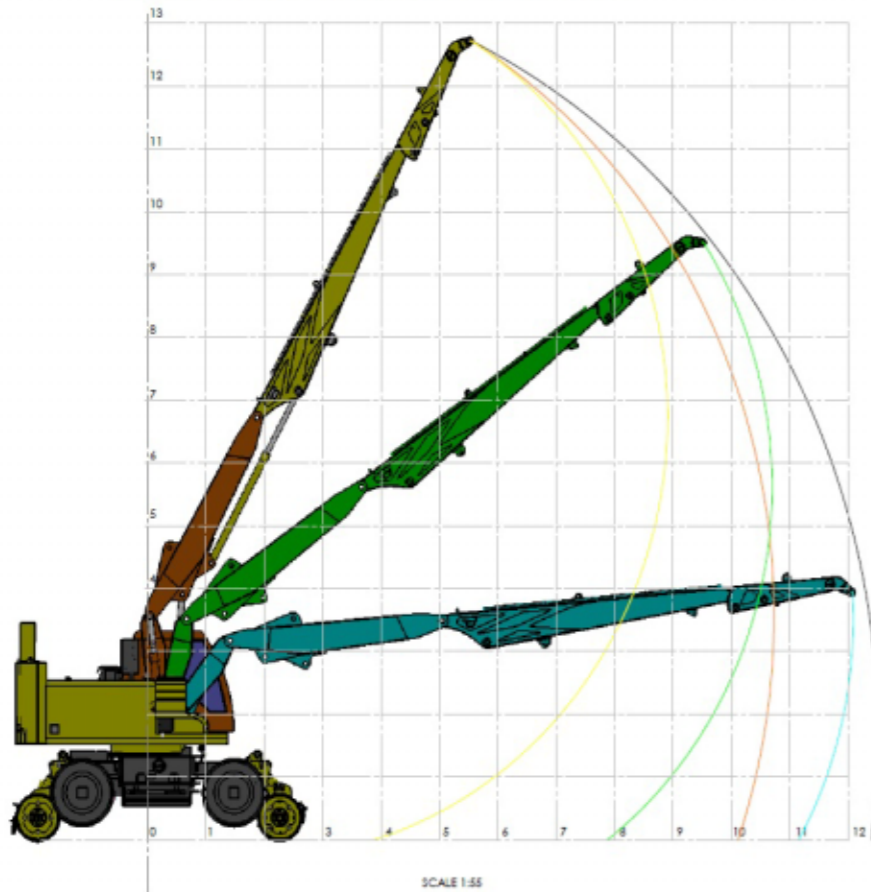
# TYPICAL WORKING RANGE



DX170 WITH 5.5M DIPPER + 1.5M EXTENSION - HORIZONTAL REACH



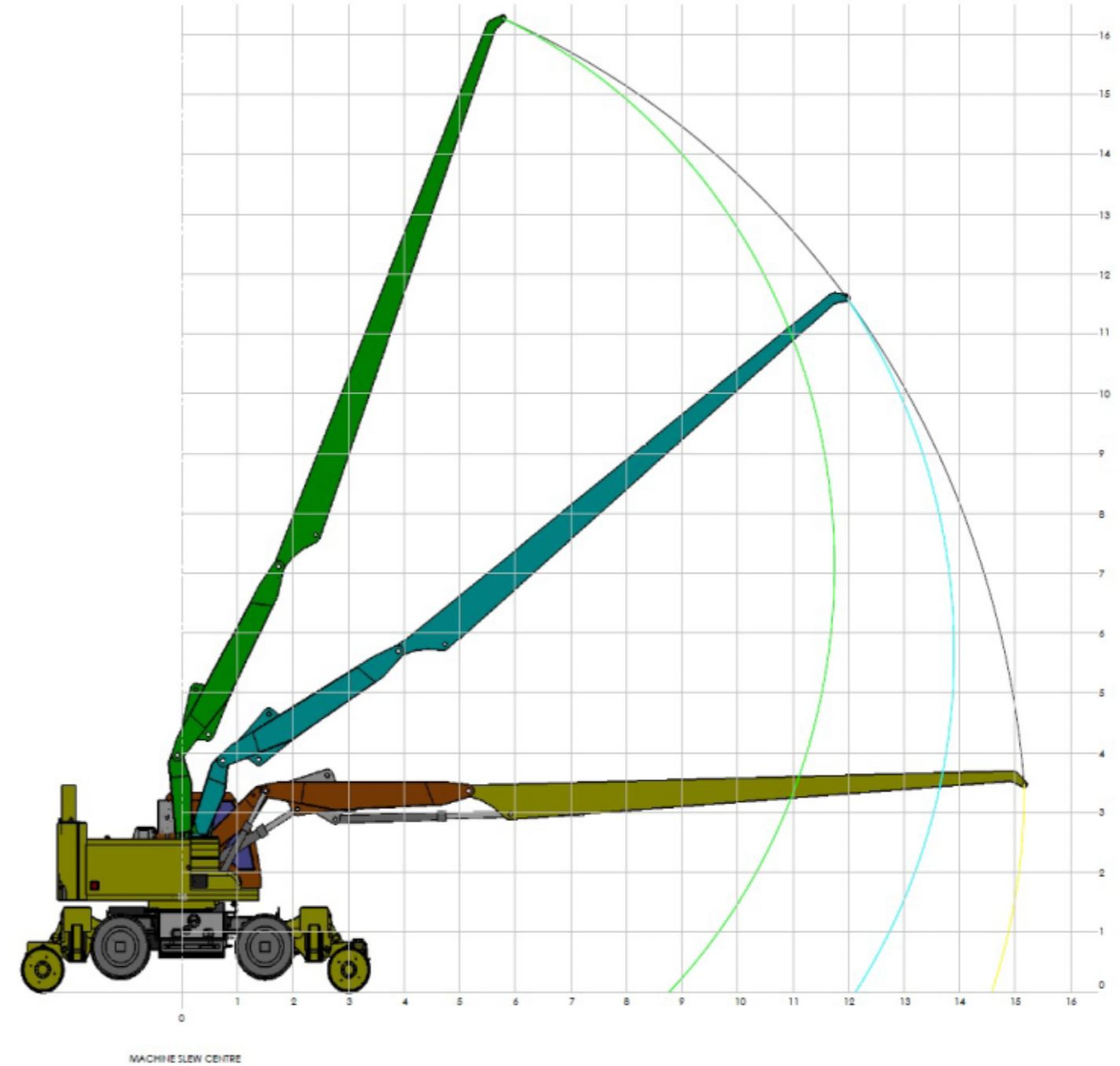
DX170 WITH 5.5M DIPPER + 1.5M DIPPER EXTENSION - BOOM CONFIGURATIONS



BOOM REPRESENTATION TABLE

BOOM COLOUR	MAX SWIV ANGLE	CANT CONDITIONS	SLEW CONDITIONS
ORANGE AND YELLOW	96°	ROAD/LEVEL/DOWN CANT	PIVOT B/D / 35° FIXED B/D / 16°
GREEN	77°	<2° (DOWN)/UP CANT	35° - 165°
BLUE	52°	>2° (DOWN)/UP CANT	195° - 325°

FURTHER NOTE:  
- ANGLES WILL HAVE 14° EXTRA WITH >400KG LOAD



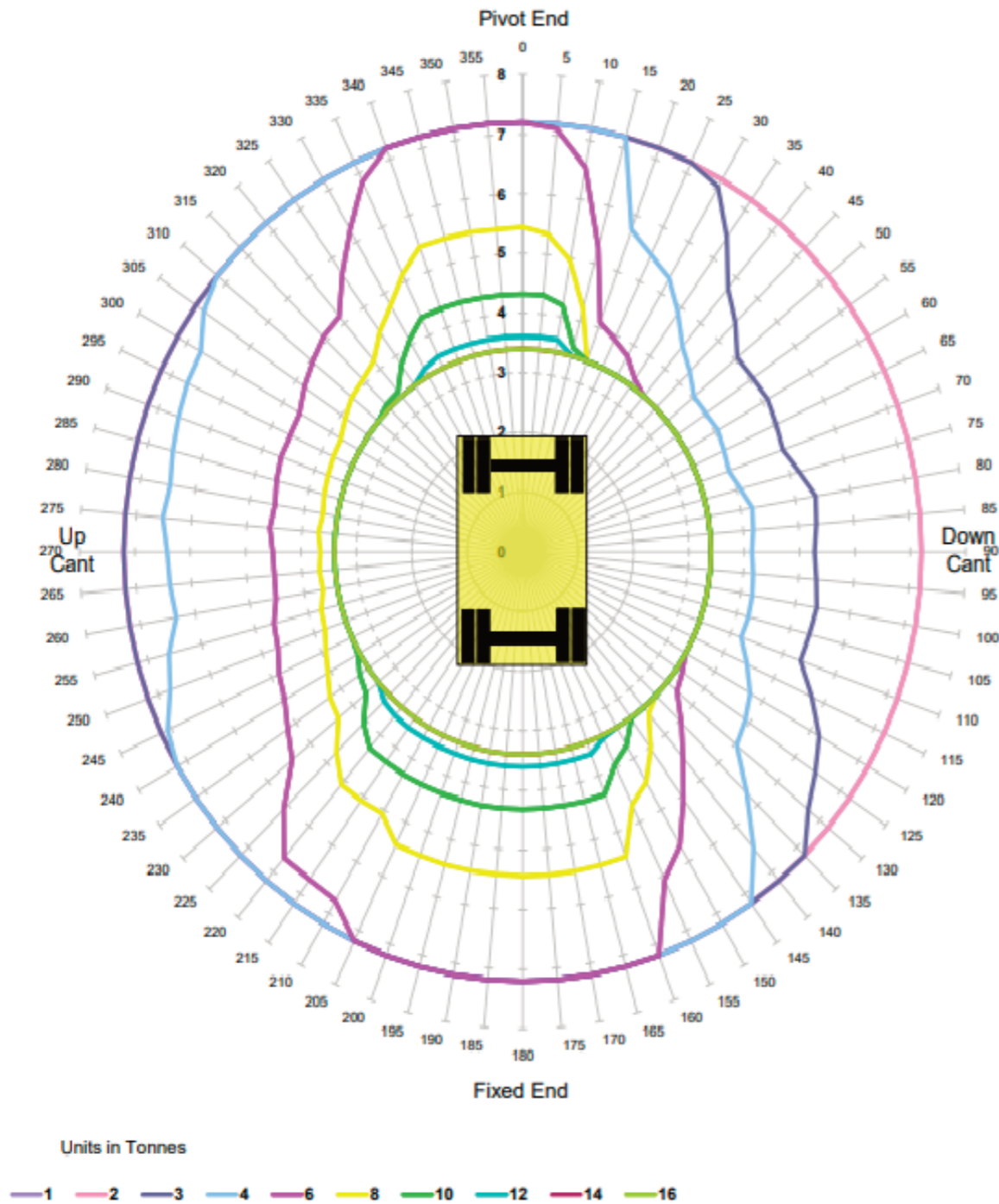
DX170 Ultimate with 5m Dipper + Extension

DX170 Ultimate 170HS with 10m Dipper

## GOS TOOL AND ENGINEERING SERVICES LTD



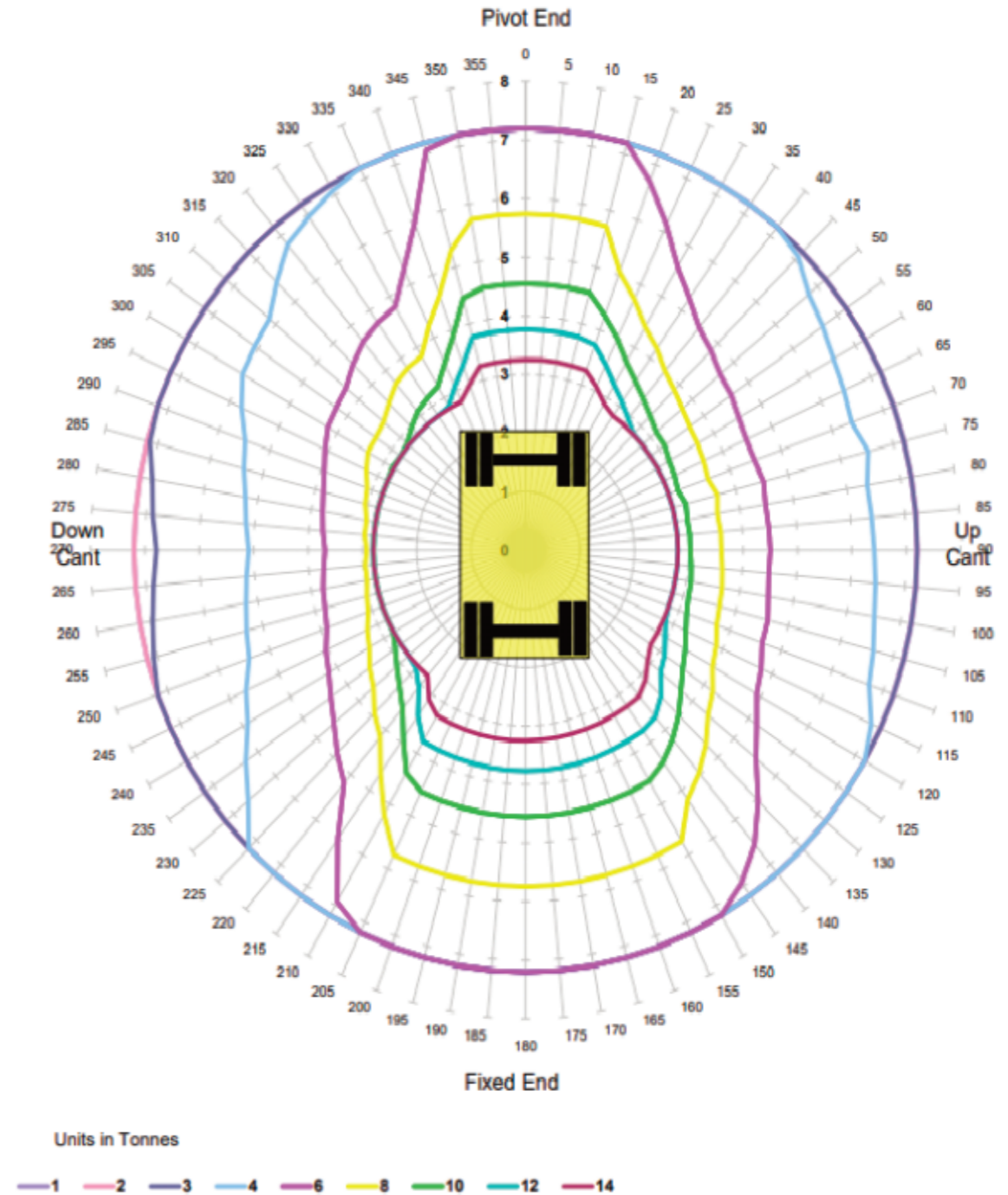
**DOOSAN DX170 HS**  
 Max Capacity Contours of Radius(m) Plots 2.1m Dipper  
 Gradient 1 in -25 Height 2m Lift BP  
Locked Rail Cant -150mm



## GOS TOOL AND ENGINEERING SERVICES LTD



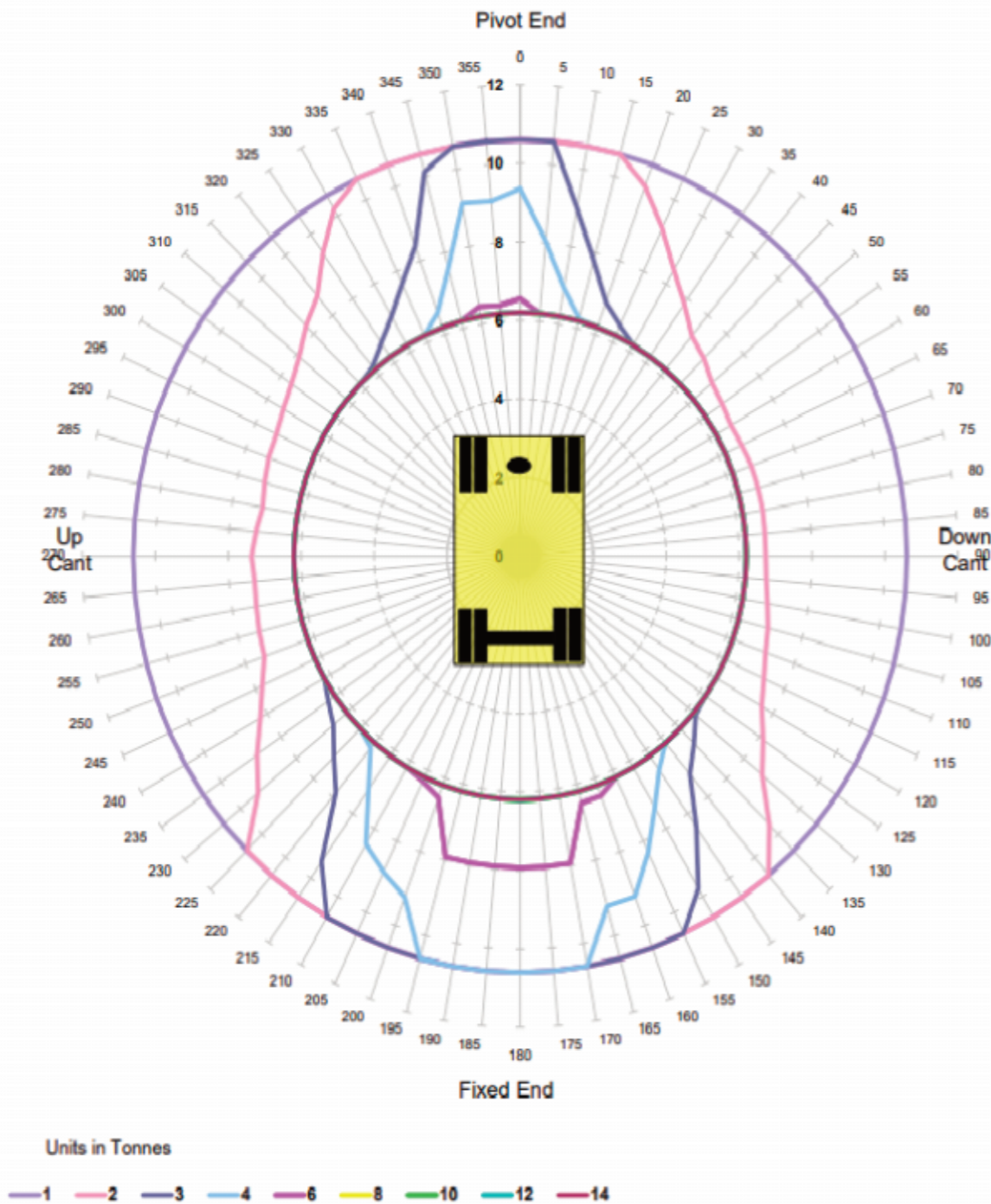
**DOOSAN ULTIMATE 270**  
 Max Capacity Contours of Radius(m) Plots 2.1m Dipper  
 Gradient 1 in -25 Height 2m Lift BP  
Locked Rail Cant 50mm



**GOS TOOL AND ENGINEERING SERVICES LTD**



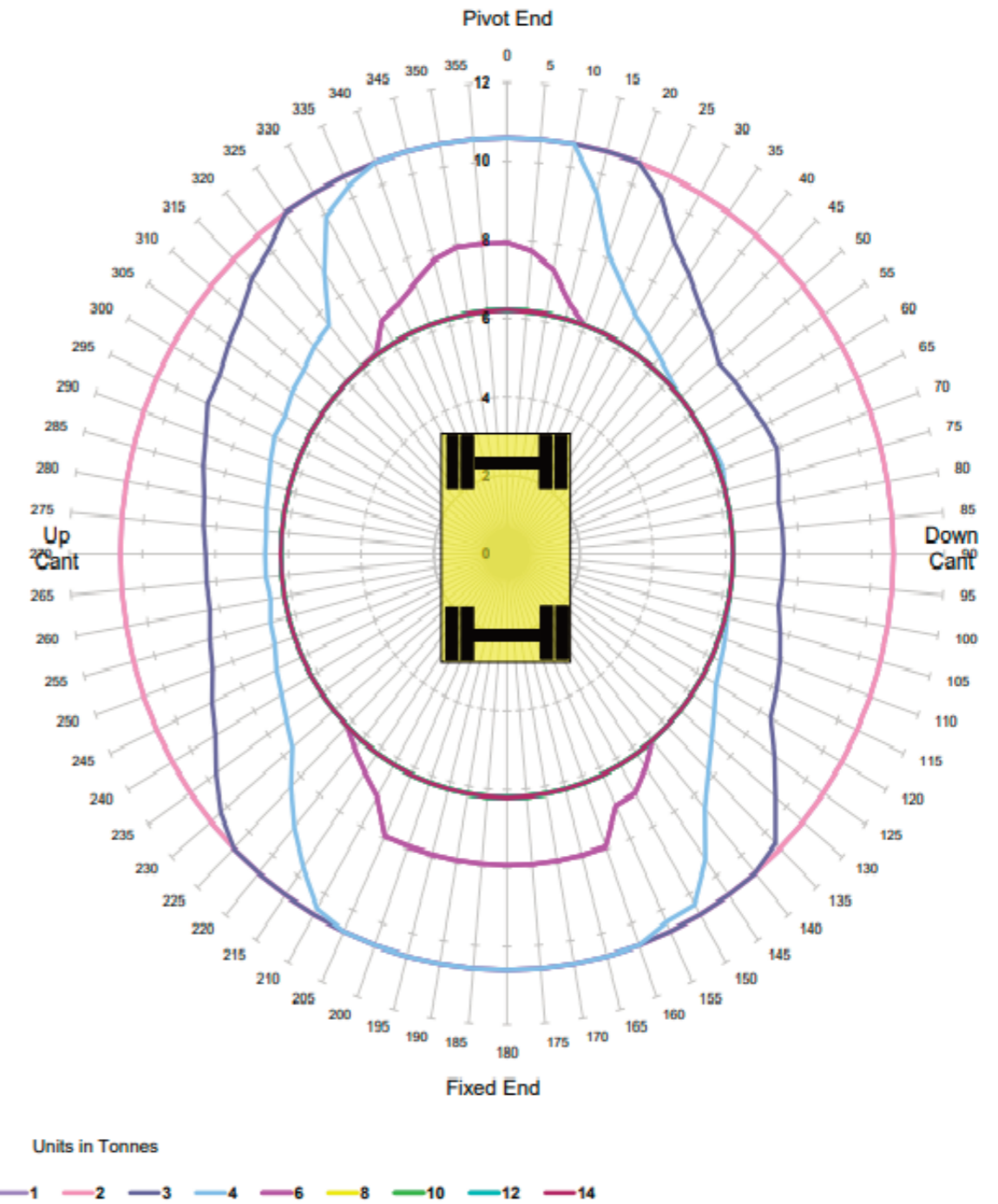
**DOOSAN ULTIMATE 270**  
 Max Capacity Contours of Radius(m) Plots 5.5m Dipper  
 Gradient 1 in -25 Height 2m Lift BP  
Unlocked Rail Cant -50mm



**GOS TOOL AND ENGINEERING SERVICES LTD**



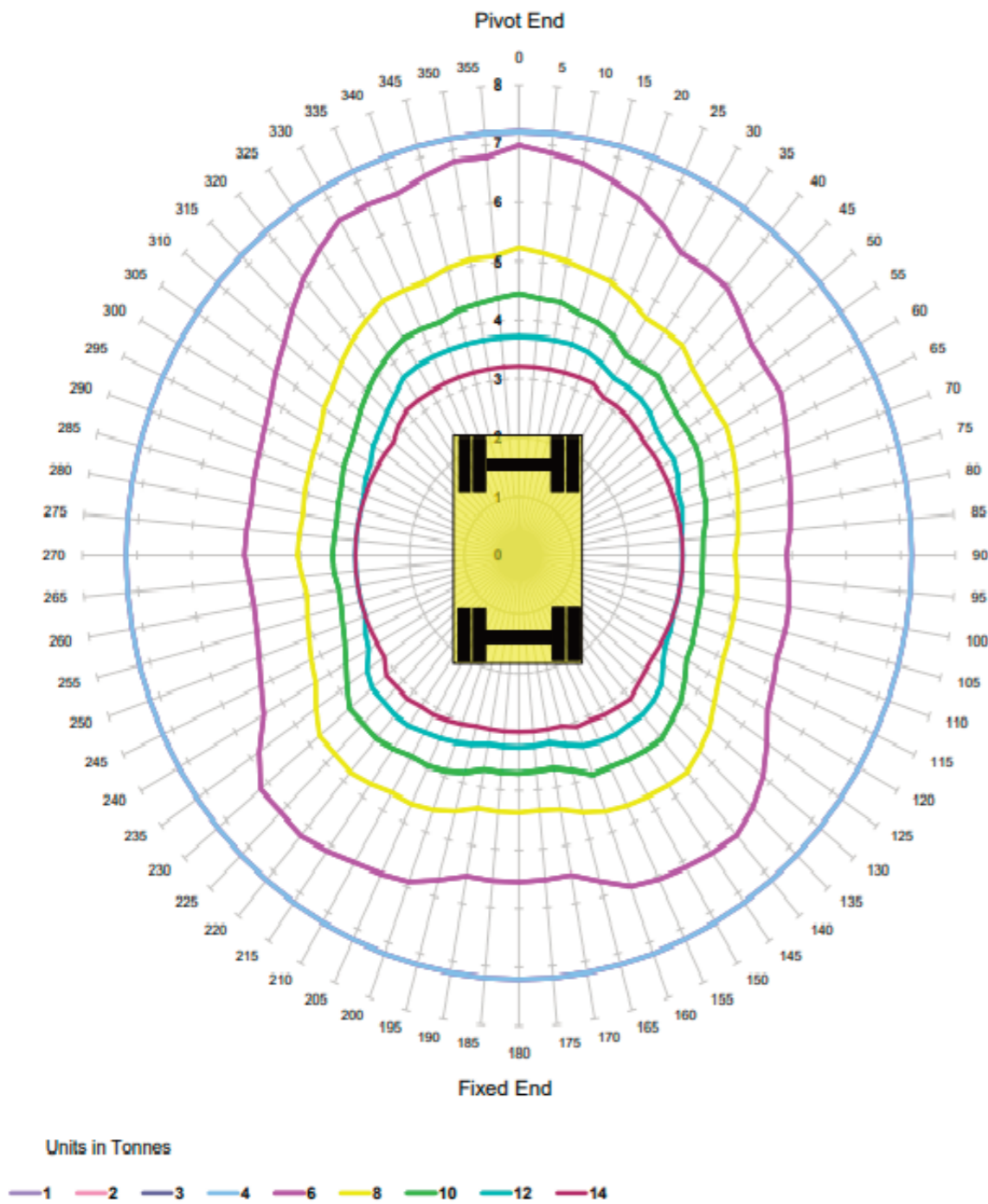
**DOOSAN ULTIMATE 270**  
 Max Capacity Contours of Radius(m) Plots 5.5m Dipper  
 Gradient 1 in -25 Height 2m Lift BP  
Locked Rail Cant -50mm



## GOS TOOL AND ENGINEERING SERVICES LTD



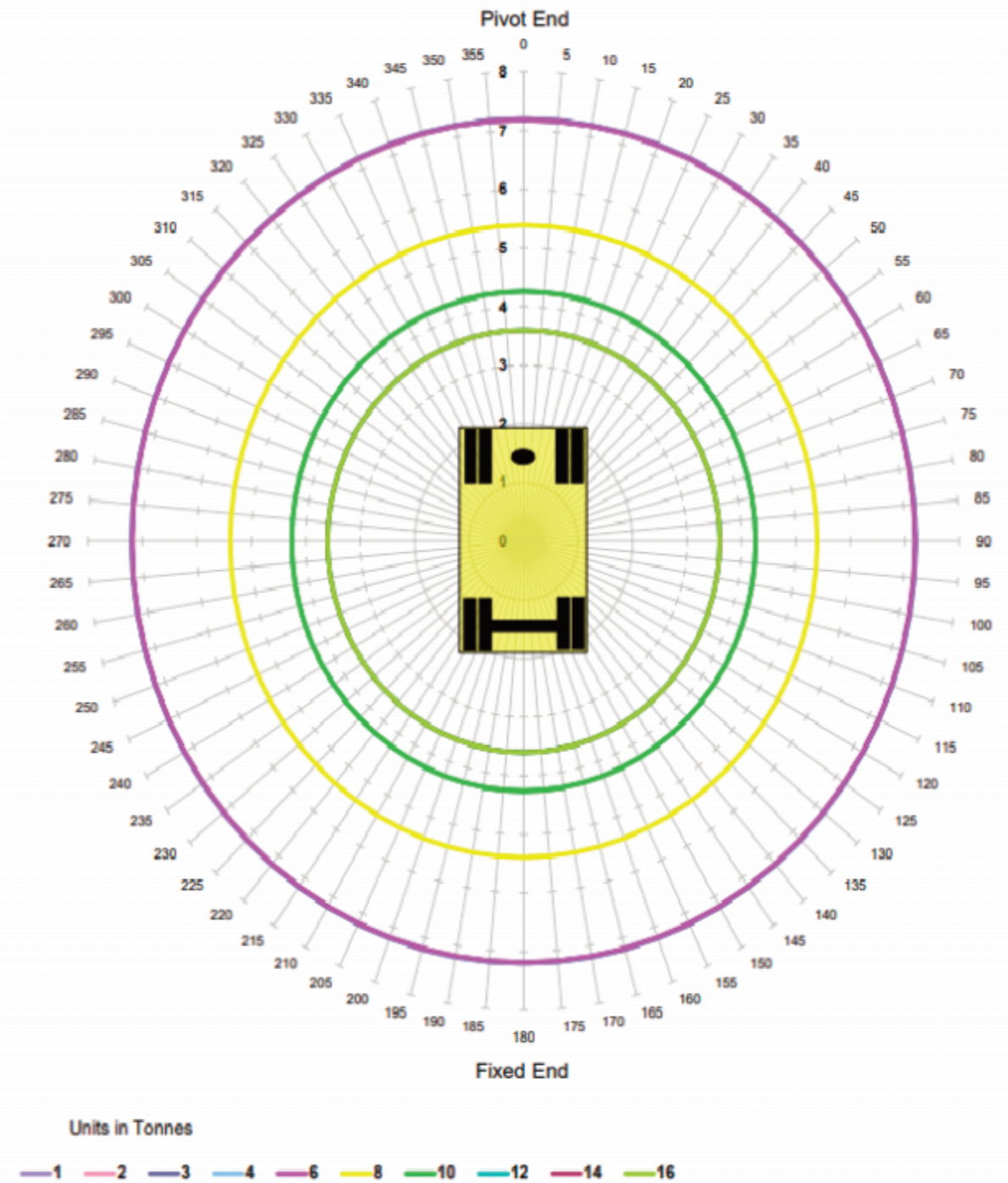
**DOOSAN ULTIMATE 270**  
 Max Capacity Contours of Radius(m) Plots 2.1m Dipper  
 Level Ground Height 2m Lift BP  
Locked Road



## GOS TOOL AND ENGINEERING SERVICES LTD



**DOOSAN DX170 HS**  
 Max Capacity Contours of Radius(m) Plots 2.1m Dipper  
 Level Ground Height 2m Lift BP  
Stabilisers



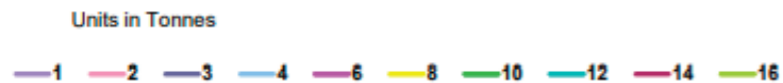
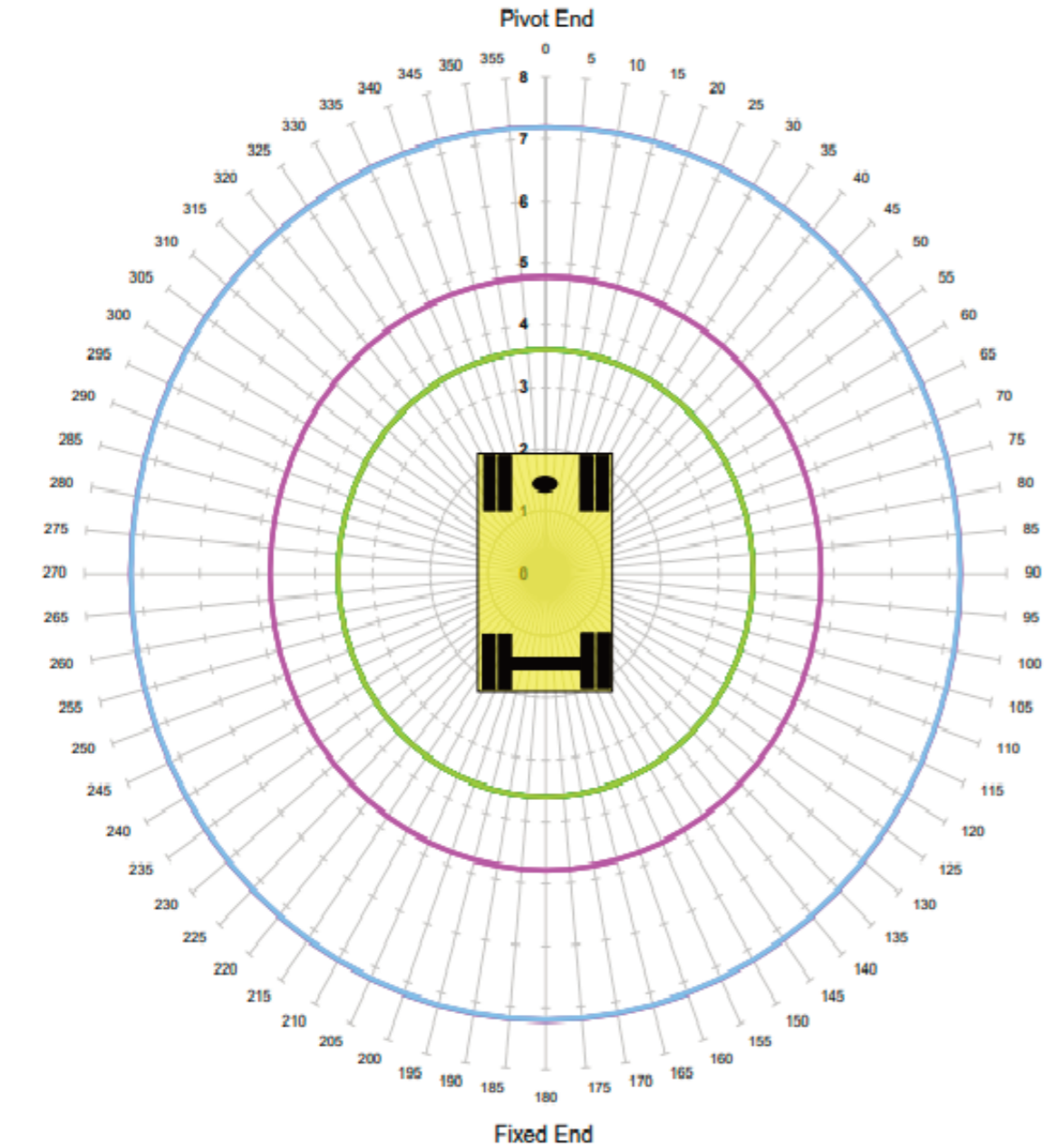


## GOS TOOL AND ENGINEERING SERVICES LTD



### DOOSAN DX170 HS

Max Capacity Contours of Radius(m) Plots 2.1m Dipper  
Level Ground Height 2m Lift BP  
Stabilisers Tandem



## GOS TOOL AND ENGINEERING SERVICES LTD



### DOOSAN ULTIMATE 270

Max Capacity Contours of Radius(m) Plots 2.1m Dipper  
Gradient 1 in -25 Height 2m Lift BP  
Unlocked Rail Cant 50mm

