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Imagine a self-propelled boom lift with working heights of up to 27 metres, that is less than half the weight and considerably faster than conventional booms, offers gradeability of up to 45 percent, can automatically level up and work on slopes, yet does not employ a tracked undercarriage do you think it would be a winner? After all the cost of transportation, traversing soft ground without having to put in expensive temporary roads, concern over surface damage to pavements and increasingly critical floor loadings are all becoming major issues on sites and in other places that aerial lifts are being used.

Well, there is such a product - the All Terrain, Semi Self-Propelled or Self Drive platform. The fact that there is no clear industry name for this category illustrates its lack of widespread popularity. Quite why this extremely capable and useful platform type has never captured the imagination of rental companies or end users is something of a mystery and so it has remained a niche product for all of its almost 30 year's existence.

Despite having being around in one form or another since the late 1970s, limited demand means only a few manufacturers include such a product in their line-ups, resulting in relatively low annual sales. Could this be another case of rental companies following the market like sheep, rather than introducing their customers to alternative and possibly better solutions to their access problems? Cranes & Access takes a look at the development of the AT/SD sector, the products currently available and tries to answer that question.

The first All Terrain type self-propelled lifts were just what the name suggests and used a rugged 4x4 chassis from that peculiarly British, go anywhere 'site dumper' built by manufacturers such as Benford, Winget, Thwaites and others. Mounting an articulated boom - usually sourced from a trailer lift - in place of the normal material skip, resulted in a light, speedy, platform that could travel over almost any terrain. And all but the very earliest units had the facility to level the chassis using four outriggers.

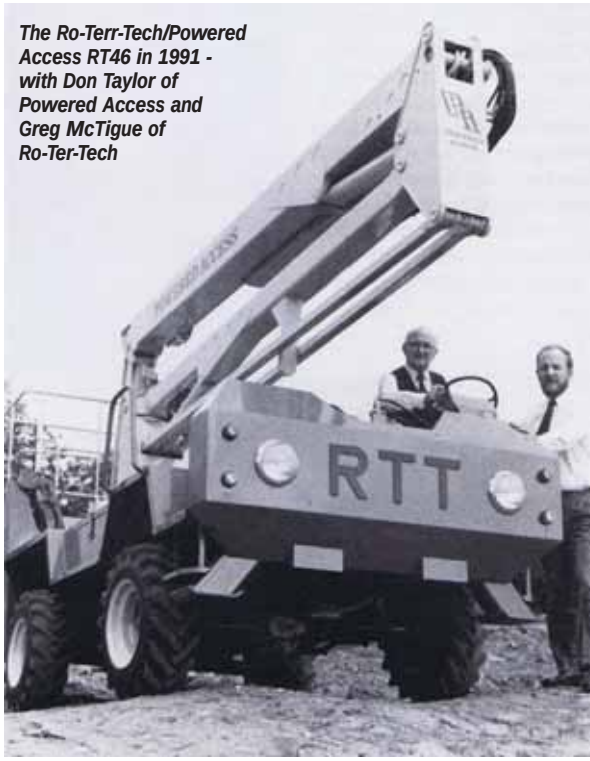
The initial machines were in fact quite popular, possibly due to the fact that they appealed to general rental companies who in those days bought large numbers of dumpers, so they understood the technology, as did contractors. This combined with the growing popularity of powered access rental, then still in its infancy in Europe, helped boost sales in what was then a much smaller market. Design developments and improvements through the 1980s saw the introduction of more suitable 4x4 chassis, either using the longer wheelbase dumpers coming on the scene at that time or by building the drive line components into a purpose-built chassis frame. These units were also fitted with open, seated driving stations and producers included Pegasus (later Thwaites), Benford, Powered Access, Simon Aerials/Kombilift and Aerial.

In the 1990's the concept was refined still further with something of a split away from the dual control position machines with their dumper genetics towards the concept we see today. This was led by Finnish company Rotator/ Scanlift. None of these brands have survived and today there are just five manufacturers offering this type of lift – Niftylift, Bil-Jax, Dinolift, Snorkel and Nostolift/Kesla.

Stage one: The dumpers

Benford and later Powered Access Ltd were among the first UK manufacturers to produce an AT/SD type platform. The RT46 was an early Powered Access platform using a modified dumper type chassis built by Ro-Terr-Tech of Gateshead. It was a simple articulated boom offering 14 metres working height and 6.2 metres of outreach, with a high top speed of 35kph and a chassis mounted driving seat. An optional cab was also available for those who planned to use it on the road in winter. Platform capacity was 215kg and it featured four outriggers which allowed the machine to be levelled up from the driver's seat. A 50ft platform - 17 metre working height model - the RT56 came later.

Benford had started out with the simplest product of all, when it mounted a lightweight articulated trailer lift boom with one man platform to its standard two tonne capacity TS40 swing dumper chassis in place of the usual skip.



The Ro-Terr-Tech/Powered Access RT46 in 1991 - with Don Taylor of Powered Access and Greg McTigue of Ro-Ter-Tech

The resulting unit - the LM31D Liftmate - had a working height of 9.5 metres. However in order to move the centre of gravity forward, chassis modifications - including using heavy steel plate for front fabrications such as mudguards - were needed. 'Modern' platform features included entrance into the basket at ground level and up to 4.2 metres of outreach without stabilisers.

In a report on the machine at the time Benford was quoted as saying that 'stability is the most important safety aspect of any self-propelled aerial work platform'. It said that the LM31D was stable in all boom positions on slopes of up to five degrees. The use of foam-filled puncture-proof front tyres further increased safety and a dual axis inclinometer was also fitted. The company said at the time that it was also considering a 12 metre version with a short third boom but this would require stabilisers. As far as we know it never saw the light of day, having been superseded by the Powered Access type product which was quickly trumped by units with telescopic booms.

Rather than develop the dumper mounted concept Benford went on manufacturer to a wider range of access equipment, all built in the UK. Its line-up eventually included a popular range of self-propelled 'construction' scissor lifts and the 14 metre, zero tail swing LM46 self-propelled boom which featured one of the first articulated jibs, which it referred to as a droop snoot. Meanwhile US-based Marklift, having acquired the Liner plant in the UK northeast, introduced the RT95 but the entire venture was short lived and few ever made it onto the market.

The Marklift RT95

Stage two: sophistication creeps in

The Benford LM31 Liftmate

John Hocking - an engineer and early access industry innovator - also spotted the potential of the dumper-mounted lift and established the Pegasus company in 1985 which operated out of a manufacturing facility in Hixon, Staffordshire.

Remaining with the dumper concept and components, he used a longer wheelbase chassis which could travel at greater speeds and also level up on uneven ground. After producing around 200 platforms, the company ceased trading in 1990 and the assets were purchased by leading dumper manufacturer Thwaites. The most popular model - the AT52T - had a purpose-designed, all-terrain chassis single stage riser and telescopic top boom.

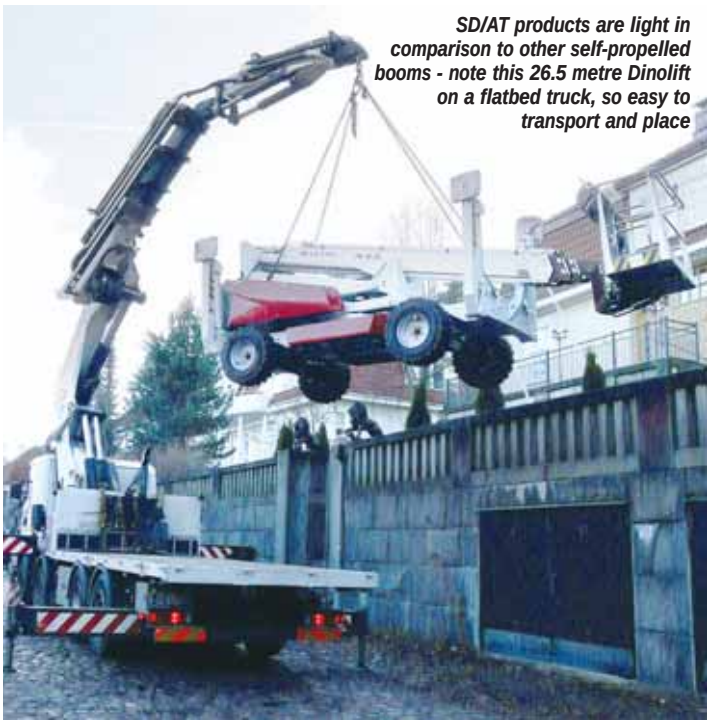
In spite of an unattractive dollar/sterling exchange rate at that time Thwaites saw the North American market as vital to its long-term sales success – the USA

A Pegasus AT52 in the USA

The Pegasus AT52T after the Thwaites acquisition

being the largest market in the world for self- propelled scissors and booms. It was hoped that applications such as airport construction, commercial aircraft maintenance, petrochemical and refinery work - jobs where the distances were great and the high speed was a plus - would provide strong demand. However in spite of the obvious benefits that the Thwaites/Pegasus offered, most units were sold to rental companies with the long recession of the early to mid-1990s effectively killing the product off.

Even 25 years ago, these early manufacturers recognised the limited mobility of most scissors and booms both in speed and gradeability which is why machines such as the AT52T were popular. A combination of its 215kg capacity, 34 kph travel speed, 30 percent gradeability, 16 metre (52ft) working height, outrigger levelling and gross vehicle weight of less than four tonnes gave it the versatility not available in other types of platform. It followed the concept at the time of site equipment being driven to site under its own steam, loader backhoes, telehandlers and products such as the Pegasus could all be made road legal and were regularly seen on the road travelling between job sites. Some of this was dictated by the fact that in the early days of powered access there were way too few dedicated delivery vehicles that could load and unload self–propelled platforms on site. There were low loaders of course, but these were hugely expensive in comparison to two or three axle flatbed trucks and were only operated by specialist transport companies who knew how to charge.



SD/AT products are light in comparison to other self-propelled booms - note this 26.5 metre Dinolift on a flatbed truck, so easy to transport and place

Around the same time as Hocking was working on the Pegasus, Powered Access of Market Harborough in the UK - the name which brought together a number of brand names including Acklift,

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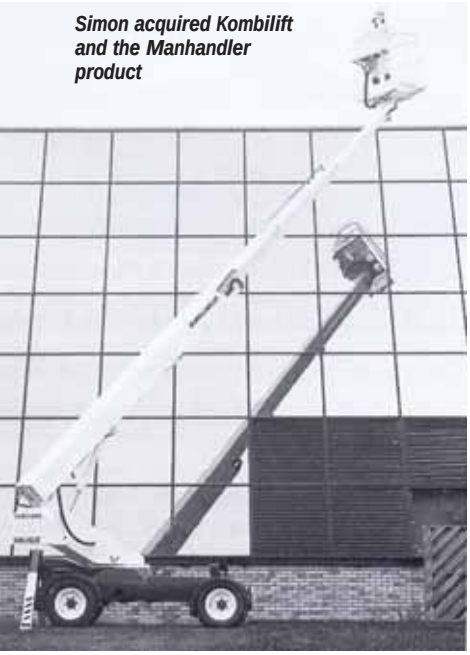
The Manhandler Roughneck made a big splash but never quite achieved its full potential

Spencer and Armfield - introduced the 40ft platform height RT46 mentioned earlier in this article and others soon joined these two. One of the most interesting was a product with a similar idea but different concept - the Manhandler designed by Bob Kinsey of Kombilift. The Manhandler 'range' consisted of the 'Aircruiser' for the aircraft ground equipment market and the Roughneck 66 for construction applications. The Roughneck used a similar dumper type chassis concept with separate mid mounted driving position, but boasted a straight four section telescopic boom in place of the trailer derived articulated booms of the others. It also used two large rear mounted A-frame outriggers in place of four. It boasted a 60ft platform height - 20 metres working height - which was a very popular boom size of at the time. It also had up to 13 metres of outreach and used a load management system it called MaxiReach. The unit had an oscillating front axle which helped provide great rough terrain capability and speeds of up to 24kph. The machine was heavier than the others at 4,800kg but still half the weight of the very lightest self-propelled boom available at the time. The company made a major push into the North American market, shipping demonstration units out, along with a young sales rep to tour rental companies and solicit orders. The anticipated US breakthrough never really happened and around 1989 the company and its products were acquired by Simon.

Production of the Manhandler was transferred to the Simon Aerials plant in Thetford, Norfolk and the product - following a facelift - was added to the massive Simon product range of the time. In the land of their origin - the UK - the dumper-based units reached their zenith in the late 1980s and early 1990's when the access business was booming. The full line aerial lift producers from North America began to look at the category but then the recession of the early 1990s killed that off as new sales dried up. However rental rates for this type of lift held up through the slow-down, thanks to the platforms' all terrain ability which found favour with users outside the construction industry, such as forestry, maintenance and inspection work. This remains the case today, however over the past 20 years demand has never really taken off from the levels of the early 1990s, explaining perhaps for the relatively few manufacturers in the sector today.



Simon acquired Kombilift and the Manhandler product

Stage three: The modern era

The Scanlift became the Kesla lift with two models, the XS190 and the XS240

If you look at those that remain in the market, one thing jumps out (apart from the almost defunct Kesla, now Nostolift) all are principally trailer lift producers. The trailer lift boom with its offset slew ring, lends itself to mounting on an all terrain chassis, allowing such companies to produce a self-propelled boom lift without committing to a totally new design.

While some think of these machines as a quintessentially British product, the modern all-terrain arguably hails from Finland where in 1991 forestry equipment manufacturer Kesla introduced an 18 metre working height telescopic boom lift on a 4x4 all terrain chassis, calling it the Scanlift SL180, which became the 18.5 metre SL185 after production began in 1992. Some of the first units were sold in Holland and sensing their might be some overseas potential the company signed an agreement with a major access equipment distributor Rotator Oy - which also handled JLG. In the mid 1990's 24 and 32 metre models were added to the range, although the 32 may not have made it onto the open market? A year or so later the company took back the distribution rights and then several years later when it introduced up dated and more reliable versions it chose to completely rebrand them as Kesla lifts. The Kesla XS range is still built in tiny volumes by Finish based Nostolift. Scanlift was joined in 2006 by fellow Finn Dinolift, making this a distinctly Finnish market sector.

Danish neighbour Denka also took a stab at the market in the mid 1990's with its 23 metre telescopic RST2300 model developed in partnership with its German distributor Rothlehner and manufacturer PB. While a few units were built the product never gained standard product status.

Back in the UK, Milton Keynes based Niftylift was approached in 1995 by its Dutch distributor Eurosupply to design a machine for construction work on the major Schiphol expansion project that was being planned. The contractor was looking for a 17 metre working height self-propelled boom lift that was lightweight and that could spread its weight over a wide area to meet tight floor loading challenges. Using the Nifty 170 trailer lift superstructure the two developed a special that was later developed into the SD170 = 17 metre Self-Drive. Since then customer demand has caused it to add a larger and more recently a smaller machine to its line-up to create its current three model SD range and the company is now one of the leading manufacturers along with Dinolift.

The Rohlehner/Denka RST2300

The Nifty 170 was designed in 1995 and is the company's most popular SD model

The Nifty SD120T

The Nifty SD210 handles soft ground with ease thanks to its large turf tyres

Unlike most of the products on the market the Niftylift SD210 has spring suspension

The Niftylift 170 is the company's most popular SD model. "Users like the quick travel speed and low ground pressure of the SD platforms," says Niftylift managing director John Keely. "Tracked machines have problems with weight, stability on steep ground, travel speed and surface damage so for numerous applications the SD is the best solution and is particularly popular with tree surgeons and for use on large estates."

One major design difference between the all-terrain products produced today and the original machines is that all modern platforms are driven from the basket. Early designs - particularly those based on site dumpers - used the chassis' operator's seat and controls, the high - 20kph plus - travel speed has also gone. The one exception to this is the dumper based Snorkel which is still produced to order.

Each of Niftylift's three models adds something different to its SD concept. The smallest, the SD120T uses the articulated lift mechanism - single riser and telescopic upper boom - from its very popular HR12 fully self-propelled boom lift and T120T compact trailer lift. It offers a 12.65 metre working height and 6.1 metres of outreach yet weighs just 2,260kg.

The larger 17.1 metre working height SD170 has the same performance as the company's 170 trailer lift, in terms of working height and its 8.7 metres of outreach, but with a driveable 4x4 chassis. At 2,750kg it is two tonnes lighter than Niftylift's HR17 Hybrid fully self-propelled boom lift and over half the weight of most 50ft boom lifts on the market.

The largest model in the range - the SD210 4x4x4 - is a totally different beast and according to Nifty, the 'ultimate' SD/AT, featuring fully independent suspension with four wheel drive and four wheel steer. When fitted with turf tyres the unit can easily travel over sensitive ground without damage thanks to its larger tyres, suspension and low gross vehicle weight of just 3,950kg almost half that of any articulated self-propelled boom on the market. Yet it can comfortably travel at speeds of up to 7.5kph and climb slopes of up to 45 percent. It offers 21.3 metres of working height (64ft platform height) with 12.6 metres of outreach, 7.5 metres of up-and-over reach and the versatility of a 150 degree articulating jib, not to mention standard platform rotation.

The two smaller Niftylift SD machines have full hydraulic controls, levelling outriggers and are available with petrol, diesel, battery and Bi-Energy power, making them ideal indoor/outdoor machines as well as for working in sensitive areas such as private homes or hospitals etc.

Back to the past

As we have already mentioned Snorkel still has an AT platform in its range, although it's AB48HSRT is now only built to special order. The platform (previously the UpRight AB48HSRT) is based on the Aerial Pioneer AD17T which used the Aerial K17 articulated telescopic trailer lift boom with 130 degree articulated jib, mounted on a bespoke chassis using an Ausa dumper drive train. The unit is built like a tank with short chunky heavy duty chassis and large box section A-frame outriggers. It offers a 49ft platform height – 16.8 metres of working height - with almost eight metres of outreach yet its gross vehicle weight is just 3,500kg and when set up on outriggers it has a footprint similar to many fully self-propelled boom lifts at 2.4 metres wide. Unlike all the other all terrain lifts on offer it has a four speed dumper type transmission and can travel at 22kph and can be made fully street legal.

Where it falls down though is on price and complexity, making it more suited to specific applications.

An American entrant

The most recent entrant in to this market is North American-based Bil-Jax, now part of Haulotte, having joined the market at the start of 2007. It has a three model line-up - two with articulated booms and jibs and one straight telescopic. Its units are particularly light weight, simple yet rugged machines with a good specification. Prior to the company's acquisition by Haulotte Bil-Jax had launched what it calls its X range in Europe and had done well with it, particularly in Germany. Its telescopic model the 37ft platform /13.2 metre working height 36XT is a particularly attractive unit (in performance terms - not aesthetically), with almost 10 metres of outreach and yet weighing just 2,300kg. The 4x4 unit was originally gas powered, but now comes with a battery electric power pack, making it very attractive for working around family homes etc.

The two articulated models are both larger, the 45ft platform height 45XA and 55ft – 18.7 metre

The Snorkel AB46HSRT is based on the Aerial Pioneer AD17T and is the only machine left with dumper DNA

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The Bil-Jax 36XT demonstrates how this type of lift easily copes with soft ground....


.... And slopes


The Kesla has been rebranded as Nostolift


The Bil-Jax 55XA

working height 55XA has, we understand that the latter unit has been less successful than the other two and may be in the process of being phased out? All units include articulating axles and fast auto levelling outriggers.

Back in Europe and moving north, there are, as we have said two Nordic producers both based in Finland - Dinolift which has three models and Nostolift – which acquired Kesla Oyj and the trade names of Scanlift and Kesla XS - with two models.

Dinolift and Niftylift are the only companies left in the market with any serious volume, at least in Europe. Dinolift's RXT models are all over 20 metres and so dovetail nicely with Niftylift's offerings. The Dino 205RXT offers a 61ft platform height - 20.5 metres working height - the 240RXT has 72ft platform - 24 metres working height and the most recently introduced model the 260RXT, launched at Intermat 2009, has an 81ft platform height - 26.5 metres working. All use a heavy duty articulated dual pantograph type riser and a four section telescopic upper boom. Outreach varies depending on capacity but ranges from 12.6 metres on the 205 to 11.7 metres on the 260. All three models have a high specification with 360 degree continuous slew, 180 degrees of platform rotation, four wheel three mode steering and high lift auto levelling outriggers. As you might expect from such large machines, gross vehicle weights are higher, ranging from 4,200 to 4,500kg, but still come in at less than 30 percent of the weight of most fully self-propelled boom lift, which are typically in the 15,000 to 16,000 kg range. Gradeability is 35 percent and speed is similar to typical self-propelled lift levels of just under five kph.

A name associated with AT lifts for many years is that of Kesla with its distinctive pale blue and orange telescopic machines. However in 2006 the company sold its aerial lift business to fellow Finnish company Nostolift Oy, a low volume producer of truck mounted aerial lifts. The deal included designs and tooling for all of the company's aerial lifts and today Nostolift has a two model XS range – the 19 metre XS190 originally launched in 2005 the and the 24 metre XS240. Production of the Kesla platforms moved to Nostolift's 2,100 square metre plant in Eura in South Western Finland after the acquisition and the units rebranded as Nostolifts.

The fact that the Kesla/Nostolift machines look similar to the Scanlift products of the early 1990's is no surprise since they inherited their DNA. Rotator launched what it called a 'new' access platform which it thought would fill a gap in the market between the trailer mounted lifts and the four wheel drive telescopic fully self-propelled boom lifts. Using a chassis that looks very similar to current machines. The original Scanlift SL180 offered four wheel drive and steer and was driven from the platform by using a stalk mounted lower control box that could only be reached and activated when the boom was stowed. This concept, which is still a feature of the Nostolift/Kesla machines, eliminated the need to plum any chassis related hydraulics or electrics up the boom. Overall weight was exceptionally low at 2,600kg with good gradeability. The unit had a three section boom with sizeable jib and levelled using four outriggers. The machines were particularly popular in North America where they were adopted by golf courses for tree trimming and other working at height applications. It has to be said that the Scanlift introduced the modern, or should we say current, AT/SD product concept which Niftylift and Dinolift have taken up and made their own.


The largest of its type, the 26.5 metre working height Dino lift 265 RXT was launched two years ago

The Dinolift 205RXT like most products in the sector has good levelling capability

The All Terrain/Self Drive models available

The All Terrain/Self Drive models available							
Make	Model	Work height	Max outreach	Max speed kph	Max Grade %	Articulated/ Telescopic boom	GVW
Bil-Jax	36XT	13.3m	9.8m	5.6	45	Telescopic	2,313kg
Bil-Jax	45XA	15.5m	8.2m	6.0	48	Articulated	2,139kg
Bil-Jax	55XA	18.7m	10.2m	7.3	45	Articulated	2,722kg
Dinolift	205RXT	20.5m	12.6m	4.7	35	Articulated	4,200kg
Dinolift	240RXT	24.0m	12.1m	4.7	35	Articulated	4,400kg
Dinolift	265RXT	26.5m	11.7m	4.7	35	Articulated	4,500kg
Niftylift	SD120T	12.6m	6.1m	4.0	45	Articulated	2,260kg
Niftylift	SD170	17.1m	8.7m	5.0	30	Articulated	2,750kg
Niftylift	SD210	21.3m	12.6m	7.5	45	Articulated	3,950kg
Nostolift	XS190	18.7m	12.3m	3.7	35	Telescopic	3,700kg
Nostolift	XS240	24.0m	12.8m	5.0	35	Telescopic	4,850kg
Snorkel	AB48HSRT	17.0m	7.9m	22	40	Telescopic	3,500kg

The current AT boom lift manufacturers have kept reasonably close to the original Scanlift specification, although most now use articulated booms. All are lightweight for their height and have good gradeability but travel speed has slowed to less than 10km per hour. The only exception is Snorkel's special build platform the only one still based on a dumper (Ausa) which has a top speed of 22kph.

Perhaps if rental companies and users didn't always look to tracked spider lifts for rough ground solutions, the all terrain self drive platform would be more popular. It is after all, basically a wider tracked machine on wheels – with some additional advantages....

Up to the Mark

A Niftylift SD120T from UK based Mark 1Hire enabled essential maintenance work to be completed on one of Essex's historic listed buildings. The Round House, in Havering-atte-Bower - a three storey Grade II listed late Georgian villa - needed some important repair work to its lead guttering and roof.

Surrounded by steeply sloping grass banks, the building's roof and guttering had proven very tricky to reach for its owners without causing damage to the grass, or more importantly the basement rooms located underneath, which substantially limit the slope's load supporting capacity. Essex-based access and tool hire specialists Mark 1 assessed the site and offered one of the newest additions to its fleet, the Niftylift SD120T. With its 12.2 metre working height and 6.1 metres of outreach, but most importantly it's Gross Vehicle Weight of just over two tonnes and hydraulic outriggers allowed it to level up on the slopes.

"The SD120T has been an excellent addition to our fleet," said Mark 1 Hire. "It is economical to transport to and from site, manoeuvres easily on rough terrain and doesn't tear up delicate surfaces like grass. It can even work on rough, sloping or unprepared ground. It's a great all-rounder and is proving very popular with our customers."

SD 120T Mark hire