

SCRAPERS

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[First published in the VASSA Newsletter October 2024: <https://www.vassa.org.za/newsletters/>]

(Photographs by Ralph Malan)

We went to Sandstone Estate outside Ficksburg in mid-September 2024. It is renowned for having purchased and restored many of the narrow gauge railway locos and rolling stock. They have built a track on the farm so the trains are not just static displays.

Besides the narrow gauge railway they have assembled a host of other legacy machinery which is inherently protected by being in the dry Free State air but even so much of it is housed in huge farm sheds – one per machine type: viz tractors, stationary engines, railway rolling stock, SANDF vehicles, SAR locomotives and earthmoving machines plus there are sheds with the current farm machinery for it is an active farm. There is a big collection of tractor-drawn implements, ploughs, harrows, graders and scrapers.



The ploughs and drawn implements are arranged along an avenue of poplar trees.



An abandoned donkey scraper (photo Carl Grobbelaar).

The *VASSA Journal* #28 (<https://www.vassa.org.za/journal-38/>) has an article by Carl Grobbelaar, 'Historical construction and use of 'saaidamme' along the Tankwa River' in which the use of a *donkieskraper* is described and this picture of one is included. They were drawn by two or more donkeys to level a patch of alluvial ground adjoining the Tankwa River and surround it with a wall about 1 metre high. Water was led into the dam and allowed to soak away into the ground before wheat was planted which then had a supply of water that lasted through to reaping time.

For over 100 years donkeys have been used in the Karoo for building dams. A team of donkeys pull a type of scraper that scrapes the ground and picks the earth up at the same time. A person needs to guide the scraper as the donkeys pull. The donkeys can work on dams that are difficult for modern machines to reach, and their hooves can compact the earth far better (donkeysasntuary.co.za).

This is a link to a video of a donkey team at work near Carnarvon:

<https://www.youtube.com/watch?v=YlysHe5oZII&list=PPSV>.

I would like to show the development of scrapers as seen in the Sandstone collection.



An animal drawn scraper. There is a hand lever at the back which pivots the bin so the front can be lowered to scrape up earth and fill the bin as it is drawn forwards. Then the front is raised clear of the earth and the load moved to where it is wanted. The shape of the axle allows the lowering of the front of the bin so the lip engages with the ground and the bin swivels under the axle until it is inverted and the load completely discharged. The wheels make it much easier for the mules to draw the loaded bin compared to what the donkeys had to do with the *donkiescraper* but otherwise operation is the same.



A tractor drawn scraper. It connects to a tractor to the left; the wheel is a castor wheel which would face the other way when being pulled by the tractor. The pivot of the bin is where the trapezoidal piece has been attached to the lower side of the side beam (you can see the pivot on the far side). The stop rests on the side beam holding the bin is in the working position. The 3-point linkage of the tractor raises and lowers the beam thereby controlling the depth of the scrape. The bin swivels on the pivot to discharge the load just as in the previous one, again the bin is lowered until the lip digs into the ground and it swivels raising the castor wheel clear of the ground.



This is not an artefact, it is a working machine which levelled the ground for laying the railway line. It is self-propelled but fundamentally very similar to the two above.



The bin is lowered here into the scraping position. There are a pair of hydraulic cylinders to raise/lower the front of the bin which pivots at the end of the long arm alongside the bin. The same basic layout as the two implements above.



The lower end of the bin cylinders.



The machine is hinged in the middle with two hydraulic rams and a linkage to make it pivot. That is the power steering system; the machine bends in the middle. The gooseneck allows the tractor unit to swivel to 90° relative to the bin with one of the wheels beneath the gooseneck.



There are actually two of these scrapers at Sandstone. Here you can see the pair of vertical cylinders to raise/lower the bin and one of the horizontal steering cylinders to the left of them. The back wall of the bin is controlled by another hydraulic cylinder. Here it is in the forward position. It is used to discharge the load, which gets pushed out through the opening at the front. No longer does the whole bin need to rotate to discharge the load.

Scrapers are used for cut and fill operations. The high bits are scraped off and used to fill the low bits. Repeated until the roadway/rail bed is at a uniform gradient.

These are self-propelled single engine scrapers; there are also models available with another engine between the rear wheels.



The front of the bin is articulated inside the bin. There is a linkage holding it at a fixed height – between the bin's two raise/lower pistons – so when the bin is fully raised it is closed at the front but it opens progressively as the bin is lowered. Similar to the red tractor drawn scraper above.