IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SOLARIS OILFIELD SITE SERVICES OPERATING, LLC and SOLARIS OILFIELD SITE SERVICES PERSONNEL, LLC,
Petitioners,

v.

MASABA, INC.
Patent Owner.

Case No. IPR2024-01179
Patent No. 11,780,689
Issue Date: October 10, 2023

Title: Aggregate Transferring System

DECLARATION OF DAN BRINKMAN

1. My name is Dan Brinkman. I have been the Director of Manufacturing Engineering at Masaba, Inc. ("Masaba") since July 2023. From June 2016 to July 2023, I was an Engineering Manager at Masaba. I make this declaration based on my personal knowledge and based on records to which I have access in my role at Masaba.

2. In July 2020, Masaba was approached by Mike Stanton at Anchor Technical Equipment, LLC ("Anchor") with a potential project for Solaris. The project required designing and manufacturing a road-portable system that could transfer frac sand from belly dump trucks to the inlets at the top of Solaris's storage silos and do so at a faster material flow rate than Solaris's then-current method of using pneumatic trucks. Solaris's method of using pneumatic trucks relied on a compressor to generate compressed air to force frac sand from the trucks up a 4- to 6-inch pipe to the top of the silos.

3. I became the engineering manager at Masaba for this project, and Jason Brenden and Tyler Dewitt were two of the engineers at Masaba on my team. Both Jason and Tyler are mechanical engineers. Jason has worked as a design engineer at Masaba since 2019, and Tyler has worked as an engineer at Masaba since before I came to Masaba in 2016. Masaba is in the business of designing and building heavy equipment, including equipment for moving, crushing, and washing aggregate. Mike Stanton at Anchor was a liaison between Masaba and Solaris. Jeremy Weinstein was

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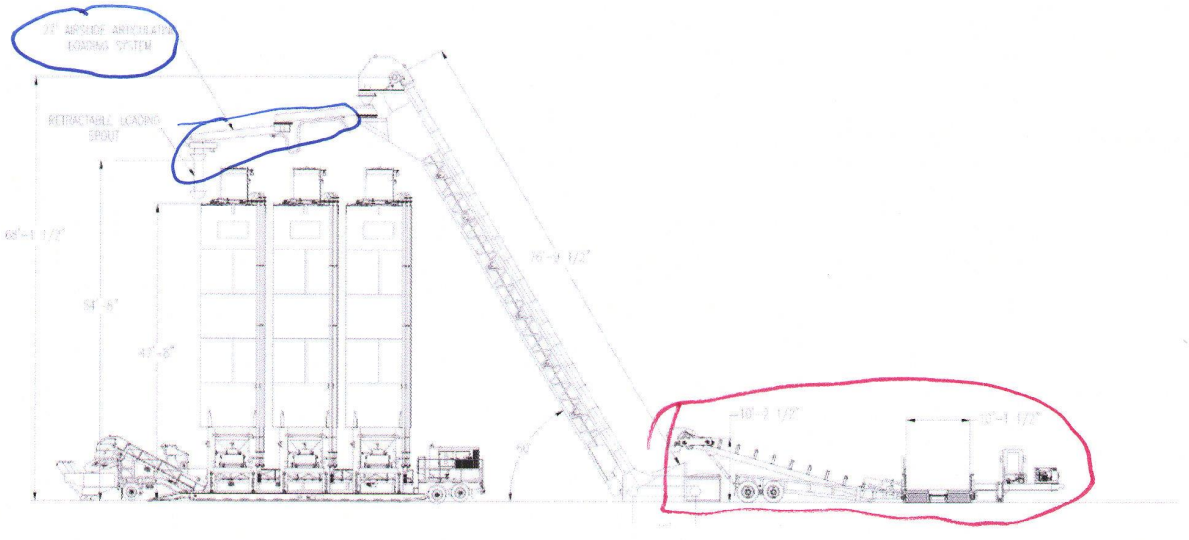
an engineer for Solaris who served as the main point of contact for Solaris during the project.

4. The project was originally presented to Masaba as requiring a high capacity, high-speed belt conveyor in order to obtain the desired material flow rates and a high angle of incline in order to minimize the footprint of the system. In August 2020, Masaba generated an initial concept, which is shown in the drawing reproduced below:



5. As seen in the drawing above, the August 2020 concept involved a truck unloader unit that feeds a 76^{+}-foot walled belt conveyor mounted at a 60-degree incline angle that, in turn, feeds a 27-foot articulating airslide system. My team thought that that an articulating airslide system was preferable because it was lightweight and would best prevent dust. The August 2020 concept did not yet reflect a mechanism for making the system road portable.

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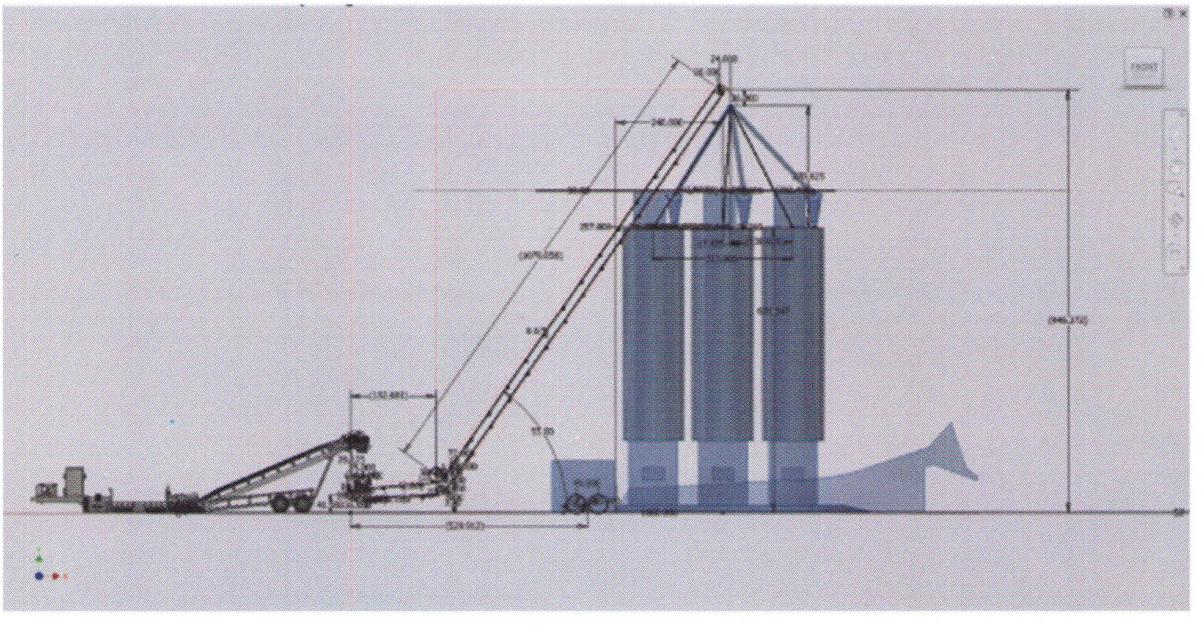
6. Solaris decided to move forward. In order to accommodate Solaris's expedited and demanding timetable, Masaba gave the project top priority. Masaba pulled engineers from other jobs and assigned them to the project.

7. By early January 2021, as work on the project continued, Masaba engineers had come up with a design iteration in which the incline for the belt conveyor was about 55 degrees and were thinking that the airslide should be replaced with a gravity-fed tube-in-tube extending chute, as seen in the diagram reproduced below:



8. At about the same time, Solaris communicated that it wanted to explore increasing the incline angle of the belt conveyor to 90 degrees, if possible, in order to decrease the footprint of the system. My team concluded, however, that given the road-portability and material flow rate constraints for the system and the constraints

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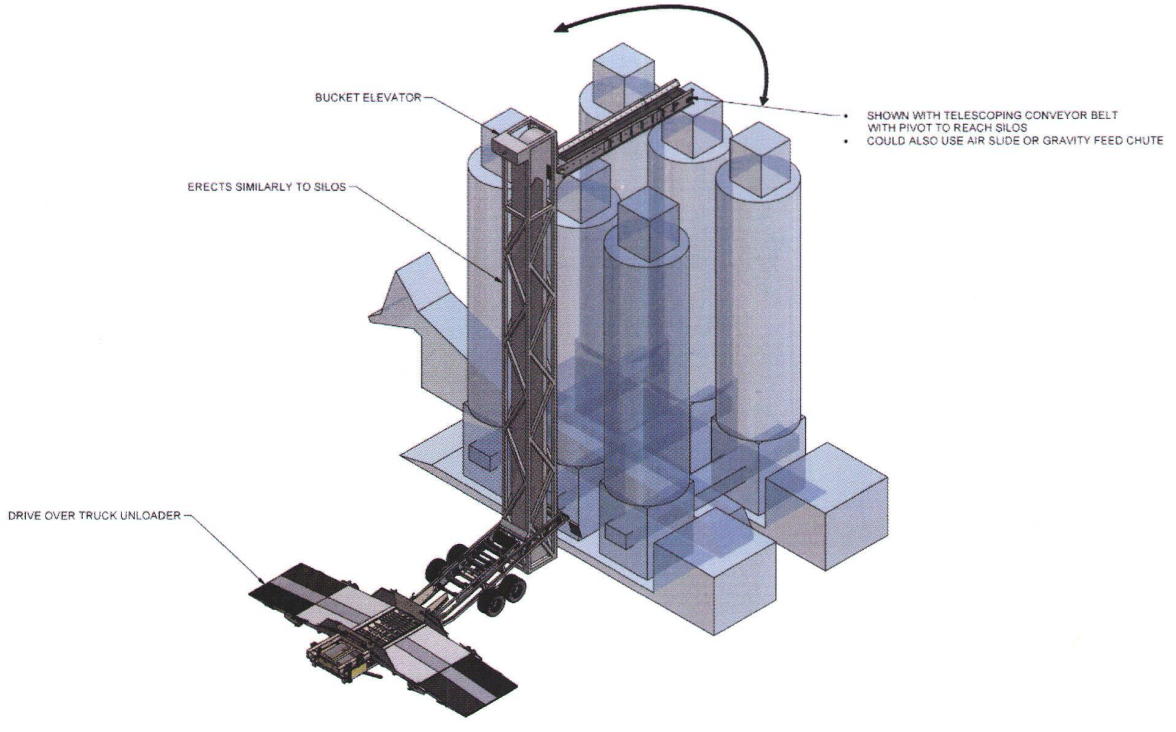
of the belt conveyor, the maximum incline for the belt conveyor was about 55-60 degrees and inclining the belt conveyor at 90 degrees was not doable.

9. It was at this point that the Masaba team suggested using a bucket elevator instead of an inclined belt conveyor to Mike Stanton. At that time, the concept was that the bucket elevator would feed a telescoping belt conveyor, an air slide, or a gravity-fed chute, not an articulated belt conveyor. A diagram showing this concept, created by Tyler Dewitt, is reproduced below:



10. In response, Mike Stanton told us that Solaris was willing to consider a bucket elevator design but that Solaris were cautious because bucket elevators do not have a good reputation in the oil field. At the same time, Mike Stanton further

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told us that Solaris wanted us to look at using a belt conveyor with a 75-80% incline even if it meant a reduced material flow rate.

11. Eventually, Jeremy Weinstein told us that Solaris had become convinced that the limitations associated with using the walled belt conveyor were too great and that our bucket elevator design should be pursued instead of the walled belt conveyor design.

12. When pursuing the bucket elevator design, Masaba engineers were aware of the Dynatek Econoloader articulated belt conveyor (shown in Appendix A) but believed that it would not work with the bucket elevator (and still believe that it would not work) for several reasons: It was not long enough, was too heavy even at its too-short length, had too high a profile for the overall system to be road portable, and had dust control issues. Thus, in considering the bucket elevator design, Masaba engineers focused first on using a telescoping belt conveyor, as shown in the diagram reproduced above. When it became apparent that a telescoping belt conveyor would not fold down sufficiently so that the system could be road portable, Masaba engineers then briefly focused on using an air slide. After it became apparent that an air slide would require a higher bucket elevator (making it more difficult to be road portable), Masaba engineers conceived of an articulated inner/outer belt conveyor with both the inner conveyor and the outer conveyor implemented as slider bed belt conveyors. The Masaba slider bed belt conveyors use a conveyor belt sliding on a

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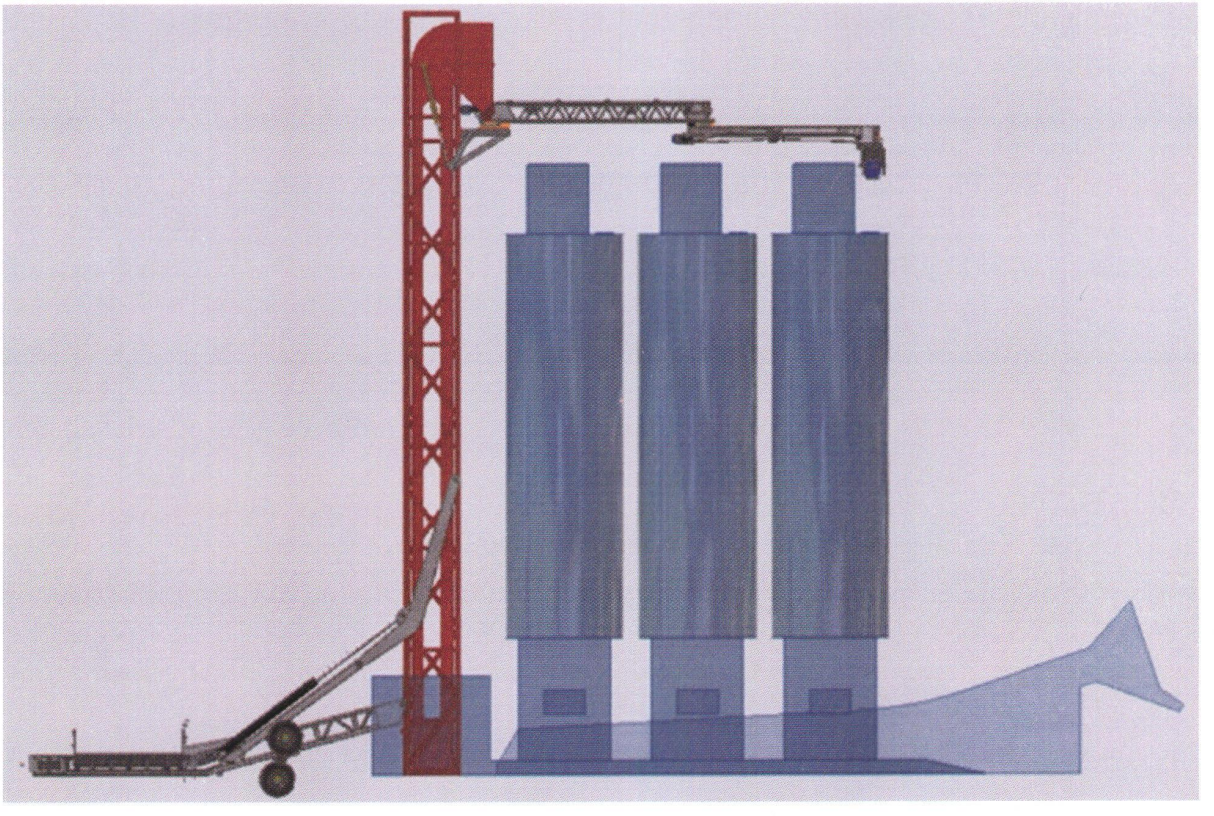
plastic-coated steel pan and do not have any idler rollers, making it much lighter and having a lower height profile than a conventional belt conveyor (such as the belt conveyors used in the Dynatek Econoloader). Masaba's concept of using the bucket elevator in combination with slider bed belt conveyors in an articulated inner/outer belt conveyor configuration is shown in the diagram reproduced below. As can be seen in the diagram, the inner conveyor is designed to have a stronger frame than the outer frame in order to support the weight of the outer conveyor, but both arms are lower profiled and lighter than the arms of the articulated Dynatek Econoloader:



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13. After Masaba presented this concept, Solaris agreed to purchase one unit of the Masaba system. Masaba sold the system to Anchor, and Anchor resold the system to Solaris.

14. After receiving the purchase order, Masaba continued designing and engineering the system. As engineering progressed, Solaris communicated concerns about the reliability of the articulated inner/outer slider bed belt conveyors, including concerns about belt tracking. Belt mistracking occurs when a belt conveyor is not level side-to-side. When the left side of a belt conveyor is not at the same height as the right side of a belt conveyor, the conveyor belt will move, or "track," from the high side to the low side. When a conveyor belt "mistracks," it can result in damage to the conveyor belt, damage to the components that the belt is running up against, and/or material spillage.

15. In early April 2021, Anchor representatives and Solaris representatives, including Jeremy Weinstein and his supervisor Scott Lambert, visited Masaba in South Dakota to meet Masaba's team and to tour its manufacturing facility. Masaba thereafter completed the design of its system and began manufacturing a first unit. In early June 2021, Anchor and Solaris representatives again visited Masaba to tour the facility and review progress. At some point during this period, Jeremy Weinstein personally told me that Solaris was very excited about the Masaba design, that Solaris expected the design to change their business and even the industry, and that

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Solaris would be purchasing several more units in the future. Anchor then ordered a second unit from Masaba.

16. Over a few days in late July and early August 2021, Masaba performed testing on the first unit. Solaris representatives, including Jeremy Weinstein and Scott Lambert, were in attendance for the tests. The first tests were performed at Masaba's facility, and then the first unit was towed a few miles to a gravel pit, where Solaris silos had been set up and where Solaris had provided two truckloads of frac sand for further testing.

17. The following photographs show what the first unit looked like at the time of this testing at Masaba's facility:

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18. The following photographs show scenes from the testing of the first unit at the gravel pit:

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19. The following photographs were taken during the testing at the gravel pit using a drone:

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20. After the testing, Masaba continued working on, testing, and fine tuning the first unit, and in October 2021, Masaba delivered the first unit to Solaris in Monahan, Texas. Masaba personnel accompanied the first unit to Texas for the delivery. The following is a screenshot from a video taken of the delivered first unit in Monahan, Texas and a photo of the delivered first unit raised to an operating position next to Solaris silos in Monahan, Texas:

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21. Masaba sold the first unit at a loss of hundreds of thousands of dollars due to the extensive and unanticipated engineering and design work involved and an increase in steel prices that Masaba did not include in the sale price. Masaba provided the discount pricing for the first unit because Solaris repeatedly stated that it would purchase many more units.

22. As Masaba was completing the first unit, Masaba began working on the second unit that had been ordered by Anchor, but I understand that Anchor and Solaris could not reach an agreement regarding the sale price of the second unit. As a result, Masaba terminated its work on the second unit.

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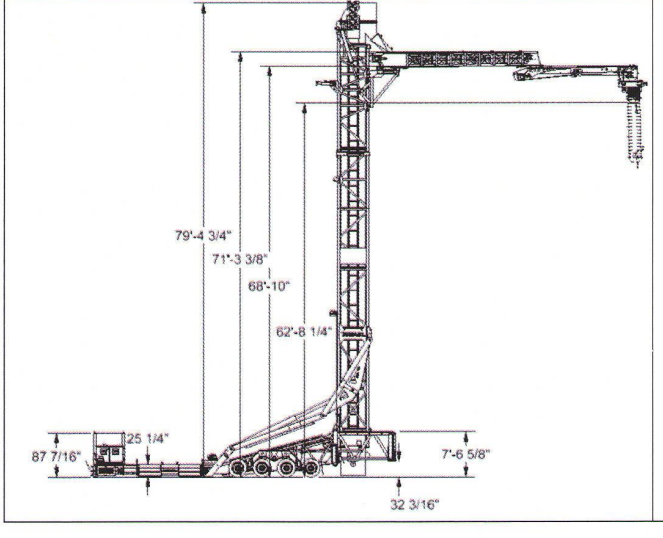
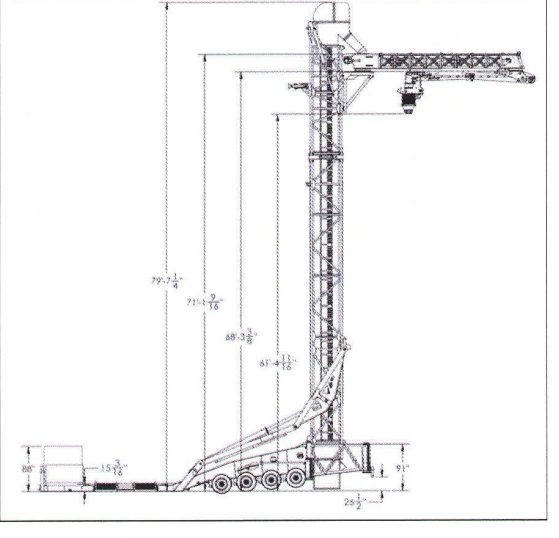
23. At some point after that, I became aware that Solaris had made copies of the first unit. I was given a copy of the Solaris spec sheet shown in Appendix B, which shows both Masaba's first unit on the first page and a system offered by Solaris that is substantially identical to the first unit delivered to Solaris by Masaba on the ensuing pages. The spec sheet includes dimensions for the Solaris system, and most of the dimensions shown in the spec sheet are within a few inches of the dimensions of Masaba's first unit. Below are figures taken from the final CAD drawings of Masaba's first unit (with dimensions of the Masaba first unit) compared side by side with figures taken from the Solaris spec sheet (with the dimensions shown in the spec sheet):

Masaba First Unit	Solaris Spec Sheet
	

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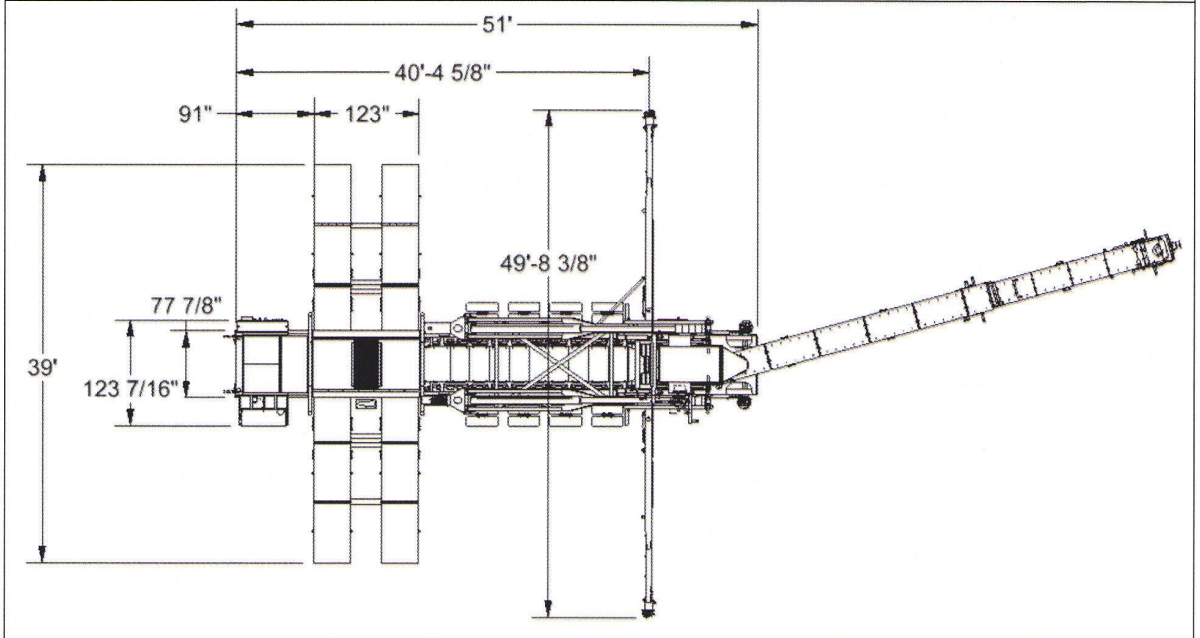
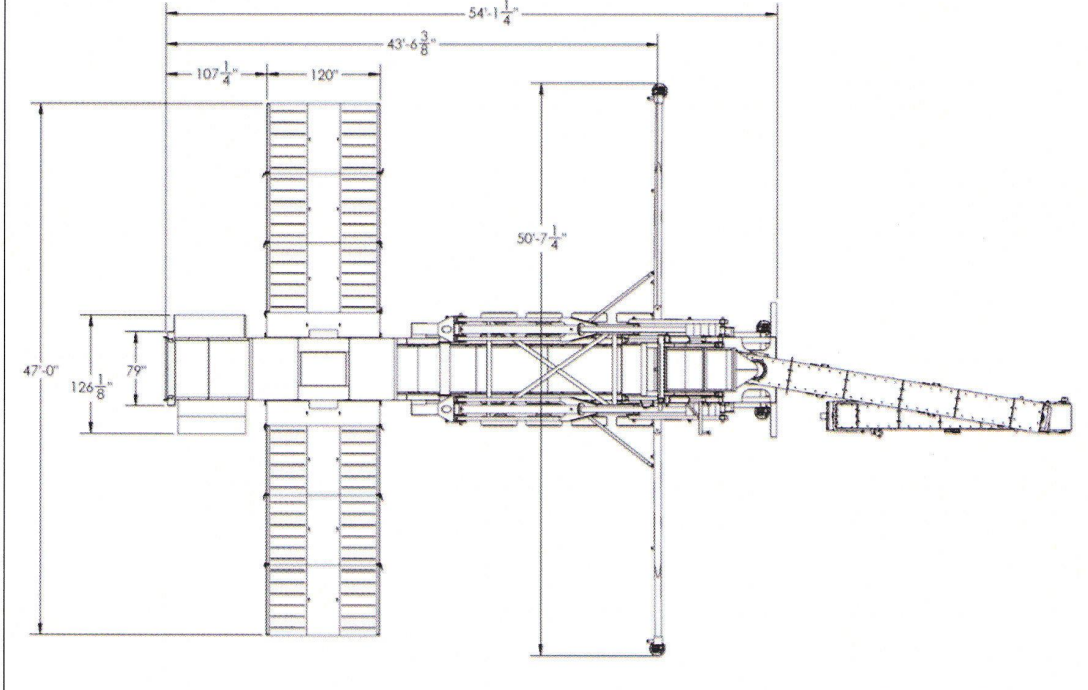
Masaba First Unit



Solaris Spec Sheet



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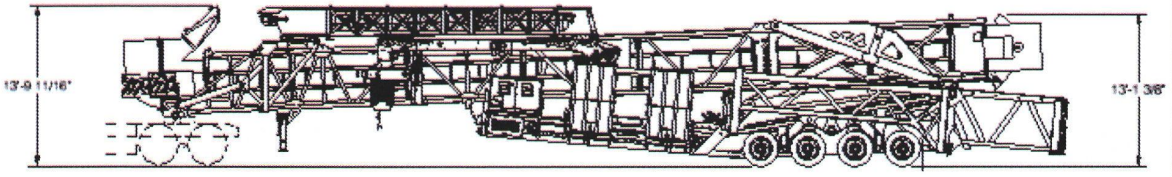
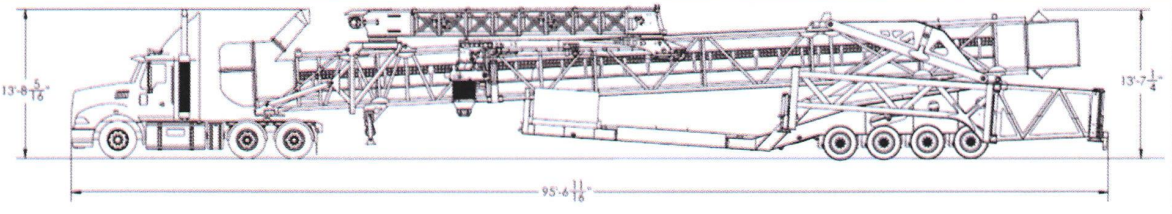
Masaba First Unit



Solaris Spec Sheet



24. I hereby declare under penalty of perjury of the laws of the United States of America that the foregoing statements are true to the best of my knowledge; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the results of these proceedings.

Dated: April ___, 2025

_____

Signature of Declarant
Dan Brinkman

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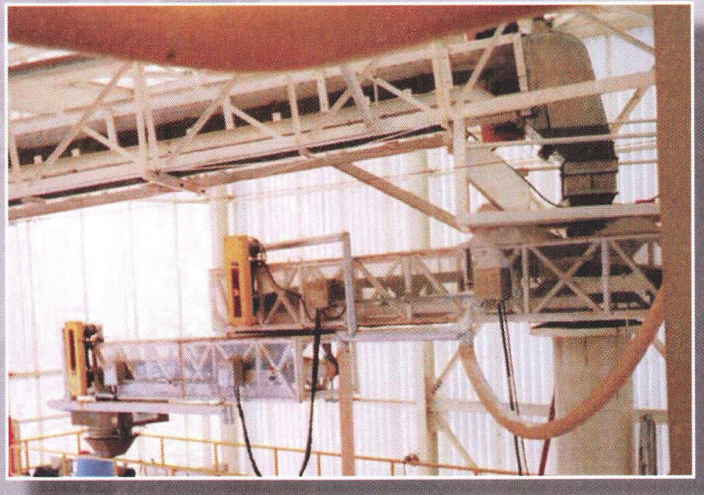
EconoLoader™ - Belt Conveyor Design

DYNATEK
ARTICULATED LOADING SYSTEMS

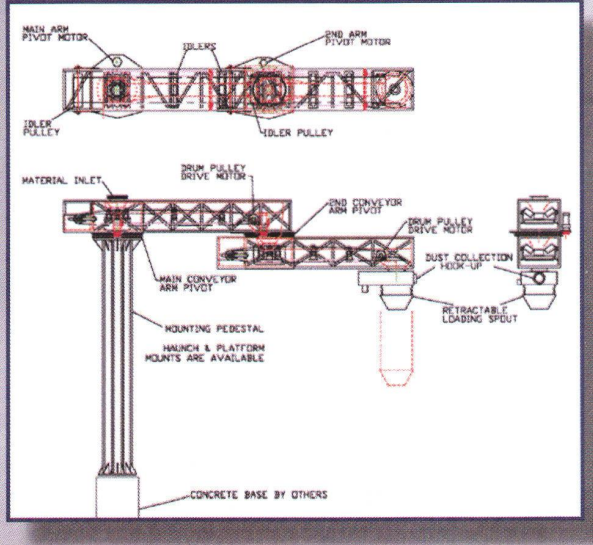
Belt Conveyor-based Loading Systems

DYNATEK's belt-based EconoLoader™ is the most versatile and economical articulated loader available. A variety of design configurations involving mild or stainless steel truss frame construction, troughing idlers, corrugated sidewall belts and even air-guided belt conveying, make this version of EconoLoader™ the right choice for loading applications involving granular, irregular, abrasive, sticky, even wet materials like coal, compost, sand, gravel, minerals and fertilizer.

Belt conveyor-based EconoLoaders™ consist of (2) open or enclosed conveying arms, each containing its own belt conveyor. Material enters the loader through an inlet in the main arm and discharges through the outlet or a dust recovery load-out spout at the end of the 2nd arm (loading arm).



Like all DYNATEK loading systems, belt conveyor-based models are designed for articulated motion. Two slewing bearing-based pivots, enable both conveyor arms to pivot separately resulting in nearly 330 degrees of rotation and loader reach of up to 27 feet. Loading is fast and convenient because you position the loader, not the truck, railcar or barge being loaded.



EconoLoader™ Specifications

Loader Type	Articulated belt conveyor
Construction	Two carbon steel structural truss frames with CEMA-C type, lifetime lubricated idlers.
Belts	Two, 2-ply, 3/8" thick, black, oil and heat resistant EPDM belts driven with totally enclosed drum motors. Exact Belt specifications are application and material dependent.
Loader Reach	22 feet from inlet CL to discharge CL for truck loading. 27 feet from inlet CL to discharge CL for railcar loading. (longer lengths are optionally available)
Loading Rate	Belt widths of 18" & 24" can convey material at theoretical rates of more than 26,400 cubic feet / hour (Actual rates are material dependent)
Arm Positioning	Hydraulic or electromechanically-driven slewing bearings with capacities between 80,000 and 443,000 ft-lbs, rotate the loading conveyor up to 330 degrees horizontally at ½ - 1 RPM to provide articulated motion.
Load-out	Retractable Loading spouts with 3 to 60 feet of vertical travel and dust recovery
Control	Fully wired NEMA 4 control panel with hand-held control pendant allows a single operator to rotate both conveyor arms, raise / lower the loading spout and start/ stop conveyor operation. Control voltage = 120 VAC, 60 HZ, 1 PH Motor voltage = 230 / 460 VAC, 60 HZ, 3 PH (other NEMA-rated enclosures and voltage configurations are available)
Finish	White metal sand blast with gray epoxy primer and polyurethane final coat.

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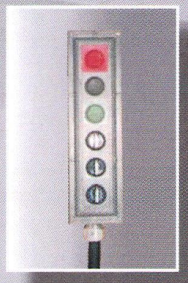
EconoLoader™ - Belt Conveyor Design

Loader Moves – Not the Transport Vehicle

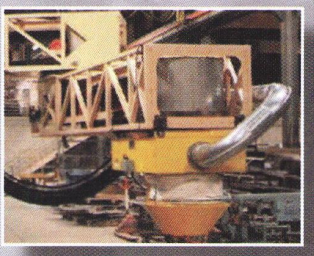
Slewing bearings allow both conveyor sections to rotate up to 330 degrees and reach up to 30 ft. This "articulated motion" lets you precisely position the discharge point without having to move the truck, railcar or barge.



Easy Pendant – based Operation

Operation of the EconoLoader™ couldn't be easier. A NEMA 4, hand-held pendant lets the operator drive the loader to the loading point, lower the loading spout into the hatch and start the loading process.

Load Point Control & Dust Recovery



Retractable loading spouts with or without dust collection, insure precise, clean loading.

Design Flexibility

Every DYNATEK EconoLoader™ is custom-engineered for the application so filling special customer requests is no issue. Here are some examples:

- Stainless steel frame construction
- Special conveying belts with/without corrugated sidewalls
- Loader reach radii > 27 ft
- Loading conveyor widths > 24 in
- Post, haunch or platform mounting
- Abrasion-resistant in-feed and discharge transitions
- In-feed control gates
- Special control features and DCS interfaces
- NEMA 7 or 9 control housings

Conveying Rates For Belt Conveyor-based EconoLoaders™

A surcharge angle of 20 degrees was assumed for the calculations reflected in this chart.

BELT WIDTH (INCHES)	TROUGH DEGREES	CROSS-SECTION AREA (Sq. Ft.)	CONVEYING RATES in Short Tons Per Hour Density of 100 Pounds Per Cubic Foot Assumed							
			BELT SPEED in Feet Per Minute							
			50	100	150	200	250	300	350	400
18	20	0.161	24	48	72	96	120	145	169	193
18	35	0.205	31	61	92	123	154	185	215	246
18	45	0.226	34	68	102	135	169	203	237	271
24	20	0.321	48	96	144	193	241	289	337	385
24	35	0.406	61	122	183	244	305	365	426	487
24	45	0.440	66	132	198	264	330	396	462	528

Experienced and Tested

Over the years, DYNATEK has supplied a wide assortment of unique articulated loading solutions to customers like BASF, General Mills, Valero and Nucor Steel. Using screw, belt, drag and air slide conveyor based designs, DYNATEK Loaders are being used throughout the country to load materials like DDGS, calcium carbonate, silica, salt, soy meal, coffee and a host of other materials. So challenge us with your loading requirements, no matter how difficult and find out why so many companies prefer DYNATEK Articulated Loading Systems.

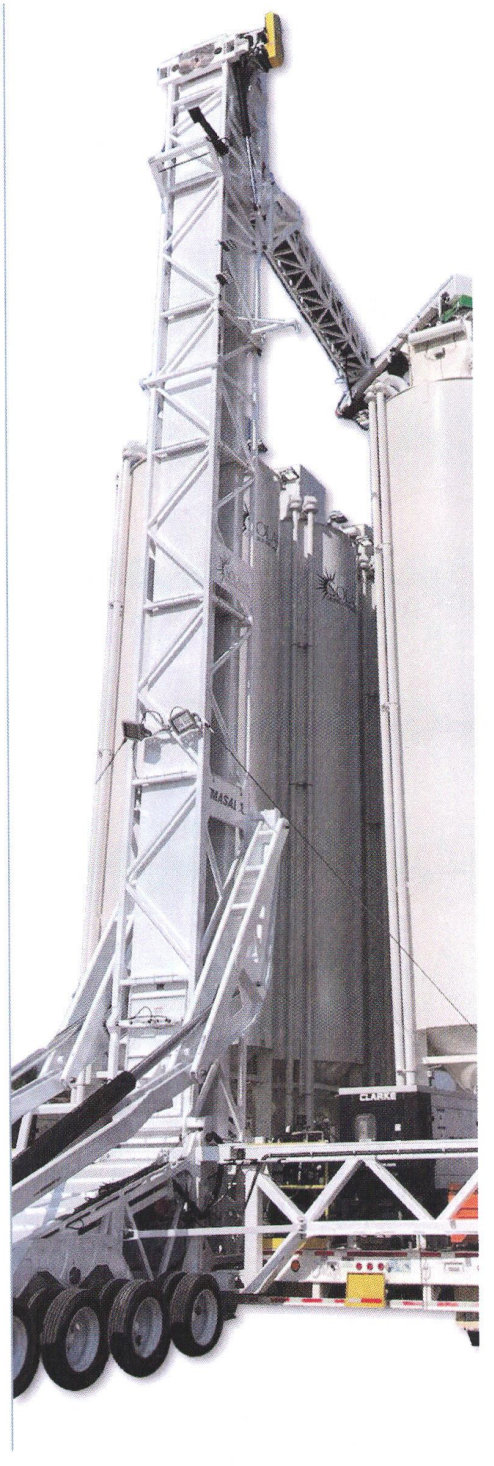
DYNATEK
ARTICULATED LOADING SYSTEMS

P.O. Box 215
200 North Harrison Street
North Prairie, WI 53153 USA

Toll Free: 888.853.5444
Phone: 262.392.2162
Fax: 262.392.2984
Email: info@dynatekloadingsystems.com
Website: www.dynatekloadingsystems.com
A Division of D&D Products, Inc.

Scan this tag with your Smartphone to learn more

Top Fill
Sand Loading System



Application

Provides a new, faster alternative to sand loading at the wellsite. With increased payload and faster unloading, Solaris' Top Fill Sand Loading System increases truck utilization, turn rate and supply-chain reliability through multiple trucking options, resulting in lower cost per ton, reduced carbon footprint and higher logistics efficiency.

Features and Benefits

- All-electric design powered by system provided generator, or alternate source used for an electric fleet
- Vertical design and flexible placement, it can be positioned along the sides or at the end of the silos based on wellsite dimensions
- Fewer drivers required
- Higher truck utilization
- Truck offload rate: 400 tons/hour (13,300 lbs./min)
- Unloads 54,000 lbs. truck in less than 5 minutes
- Allows use of belly dump and pneumatic trucks individually or simultaneously
- Requires same permit load dimensions as our silo transport trailer

solarisoilfield.com/topfill

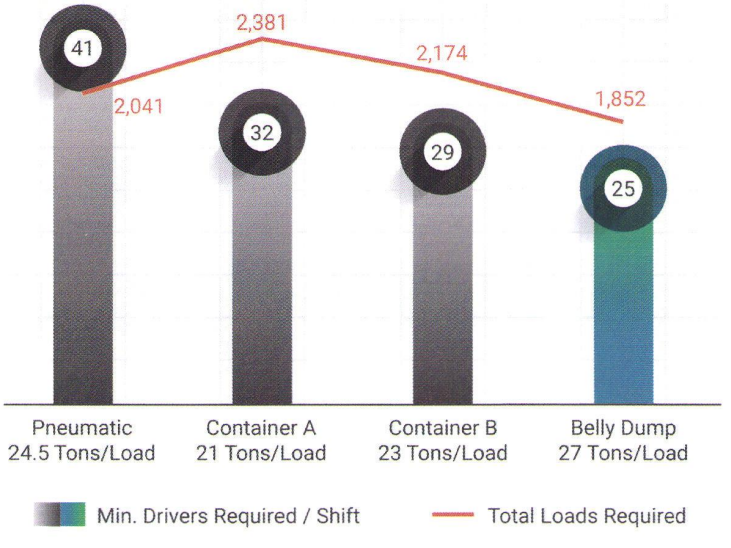
SOLARIS®
OILFIELD INFRASTRUCTURE

Top Fill
Sand Loading System

Top Fill By the Numbers

TOP FILL VS OTHER SYSTEMS	PNEUMATIC	BOXES	BELLY DUMP
Load Time (hrs.)	0.25	0.25	0.25
Total Travel Time (hrs.)	3.00	3.00	3.00
Offload Time (hrs.)	1.00	0.25	0.25
Cycle Time (hrs.)	**4.25**	**3.50**	**3.50**
Max Cycles / 12 Hr. Shift	**2.0**	**3.0**	**3.0**
Tons / Load	24.5	22.0	27.0
Max Tons Deliverable / 12 Hr. Shift	49.0	66.0	81.0
Loads Required / Day	81.6	90.9	74.1
Min Drivers Required / Day	41.0	30.0	25.0
# of Truck Loads / Job	2,041	2,273	1,852

Assumptions: Mileage: 60; Pumping Days: 25; Tons/Day: 2,000; Total Job: 50,000



Up to

39%

Reduction of Drivers Required

Up to

22%

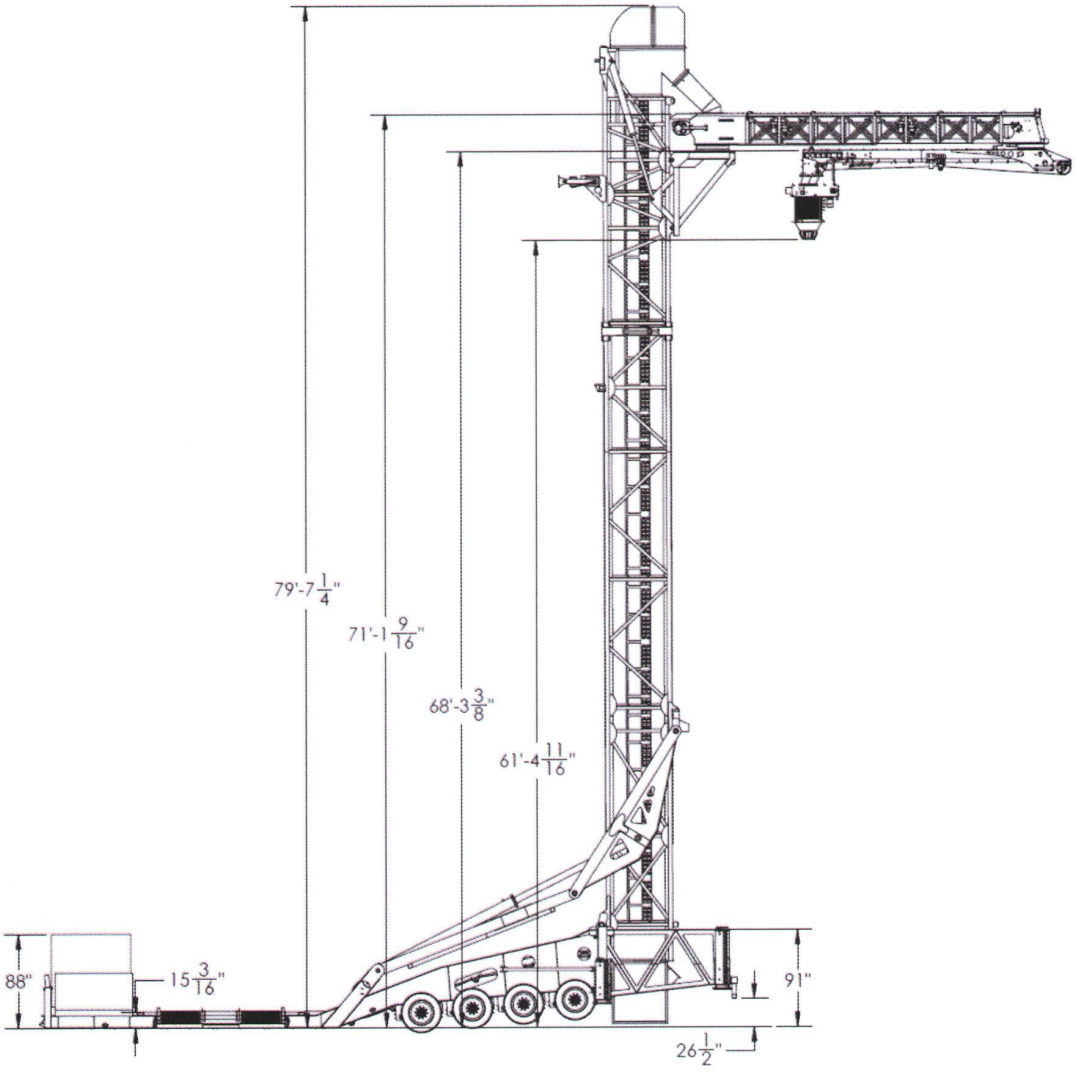
Reduction of Loads Required

solarisoilfield.com/topfill

SOLARIS® OILFIELD INFRASTRUCTURE

Top Fill
Sand Loading System

Dimensions



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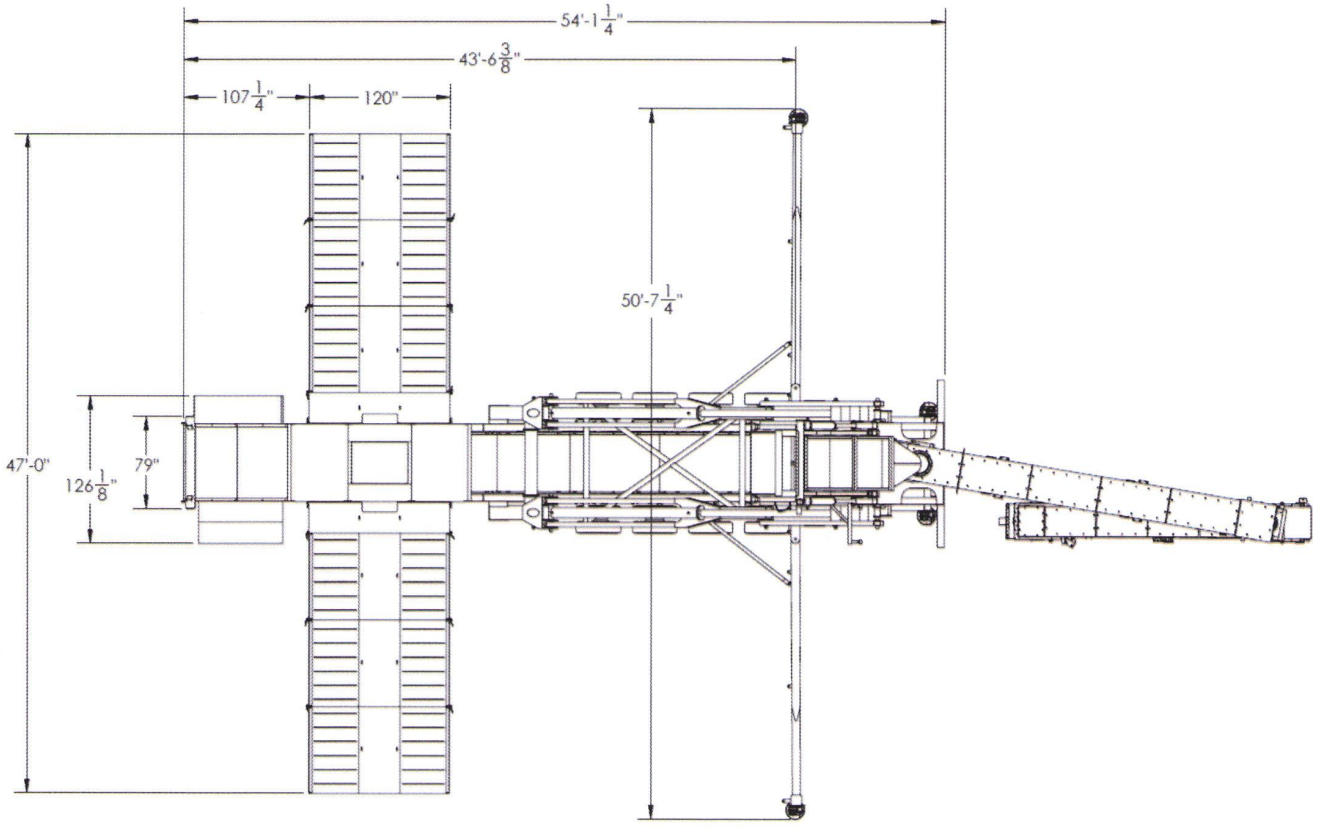
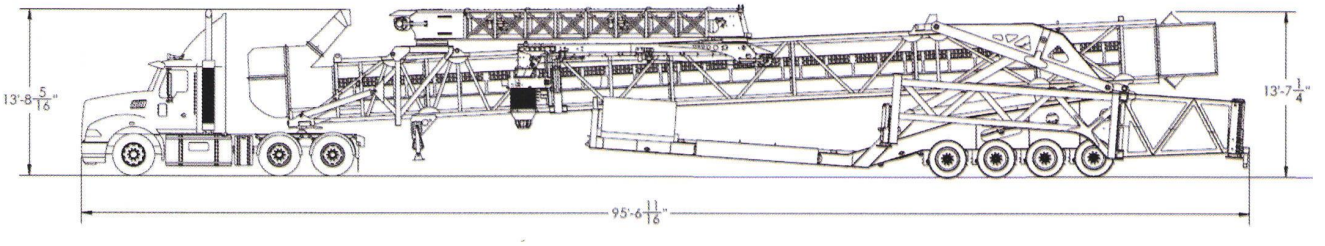
SOLARIS® OILFIELD INFRASTRUCTURE

Top Fill
Sand Loading System

Dimensions





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SOLARIS®
OILFIELD INFRASTRUCTURE