MOVAX
Total Piling Solutions

# MSL
# SOIL STABILISATION LEADERS

TECHNICAL SPECIFICATION


VALID FROM JAN 2023


# HIGHER PRODUCTIVITY – SIGNIFICANT SAVINGS

## Efficient. Fast. Versatile. Accurate. Safe. Reliable.

MOVAX WAY-OF-PILING

# INTRODUCTION

Movax Oy, established in 1993, is a Finnish-based, privately-owned world-leading innovator, developer and manufacturer of excavator-mounted piling and foundation equipment with highly advanced automatic control systems and information management solutions.

## A TOTAL SOLUTION

Movax Oy focuses solely on solutions for the piling & foundation industry. The comprehensive range of excavator-mounted piling & foundation equipment and customized solutions cover a complete range of piling technologies - including both driven and bored piles.

## UNIQUE, VALUE-ADDING TECHNOLOGY

Movax Oy's piling and foundation equipment provide the optimum way-of-working - **MOVAX WAY-OF-PILING™** - when constructing foundations, building retaining walls, both temporary and permanent, cofferdams and when performing trenching and excavation work and soil stabilisation in a wide range of applications.

## QUALITY BUILT-TO-LAST

MOVAX is made with high-class materials, equipment and components – and modern, state-of-the-art production technologies and machinery ensuring the highest possible quality of manufacture. Movax Oy's Quality Management Systems is certified on accordance with ISO 9001:2015.

## GLOBALLY PROVEN

With almost **30 years of experience** and more than **3000 units delivered** to all over the world and with a clear focus on the piling and foundation industry, MOVAX has a deep understanding and know-how of varying site and soil conditions - and of all kinds of different type of excavators and rail roaders. Movax Oy's experience also covers a wide range of applications ranging from Rail, Road and Civil to Waterways & Piers, Utilities and Environmental & Energy.

## GLOBALLY LOCAL CUSTOMER CARE

Movax Oy focuses on superior customer service and support together with a world-wide network of local partners, established in more than 30 countries all over the world, performing trenching and excavation work in a wide range of applications from civil/ structural, rail and road to waterways & piers, utilities and environmental.

## INNOVATION & CONTINUOUS DEVELOPMENT

Movax Oy is the inventor of the modular, vibratory side grip pile driver technology. Movax Oy's inventions have resulted in numerous patents (50+) and its trademark, MOVAX®, is registered and well known for the quality it represents all over the world.

Movax Oy is strongly committed to continuously develop its products and services in close cooperation with its customers and local partners.

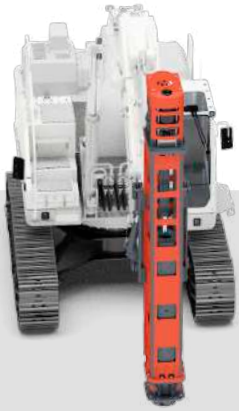
CE QUALITY SYSTEM CERTIFICATION DNV·GL ISO 9001

TOTAL SOLUTION

# PILING, FOUNDATION & SOIL STABILISATION

MOVAX excavator mounted piling equipment and customised solutions are available for different piling technologies, including both driven and bored piles, and for varying site and soil conditions and requirements.

The MOVAX Control System links the excavator with the MOVAX piling equipment and customised solutions whereas the MOVAX Information Management System (MIMS) provides essential information about the piling process and the pile installation - and about the MOVAX piling equipment.



## PILE DRIVERS

Side grip vibratory-type pile driver for handling, pitching, driving & extracting a complete range of driven piles, including sheet piles, H-beams, tubular steel piles and timber piles.

## PILING HAMMERS

Hydraulic, double-acting impact-type piling hammers for driving load-bearing piles or assisting in sheet pile driving in even the most difficult soil conditions.

## PILING DRILLS

Telescopic/kelly bar-type piling drills for bored, cast-in-situ (concrete) piles.

## MOVAX CONTROL SYSTEM

The **MOVAX Control System (mControl+)** controls all MOVAX piling equipment and customised solutions. The system controls the auxiliary hydraulics of the excavator and all the functions of MOVAX's piling equipment.

## MULTI-TOOL PILING LEADERS

Customised multi-purpose piling leaders with tooling including vibratory pile driver, piling hammer and rotary drives for pre-augering and CFA piling.

## COLUMN STABILISATION LEADERS

Customised column stabilisation leader for increasing strength, improving deformation properties and to increase stiffness of soft soil.


## INFORMATION MANAGEMENT

The **MOVAX Information Management System (MIMS)** provides essential information about the piling process and the pile installation – mLogbook - as well as about the MOVAX piling equipment itself – mFLeet Management.

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## CUSTOMISED SOLUTIONS

# COLUMN STABILISATION LEADERS

MOVAX excavator-mounted stabilisation leader provides a versatile solution for column stabilisation utilising both dry and wet binder material.

MOVAX column stabilisation leader and its tooling are designed to work on a standard excavator with normal auxiliary hydraulics and are controlled with the MOVAX Control System.

MOVAX column stabilisation leaders are based on a modular concept and always customised to meet customer-specific requirements.

## Column stabilisation leaders for SOIL IMPROVEMENT

MOVAX Oy & ALLU Oy from Finland cooperate in order to provide a total, excavator mounted solution for mass and column stabilisation. The solution includes the mechanical equipment for the storage and feed of the binder, the mixing of the binder into the soil in question and the fully integrated control and information management (3D/reporting) systems.

# COLUMN STABILISATION LEADERS

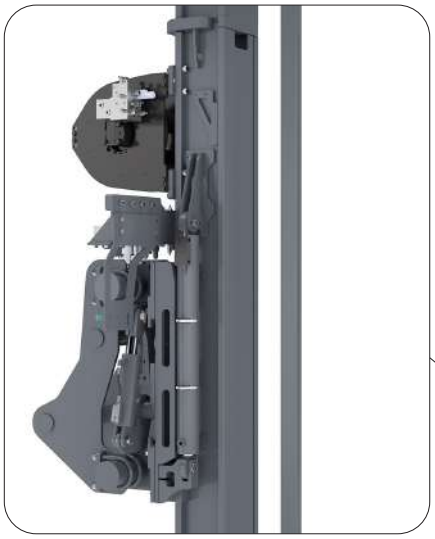
# MSL-300

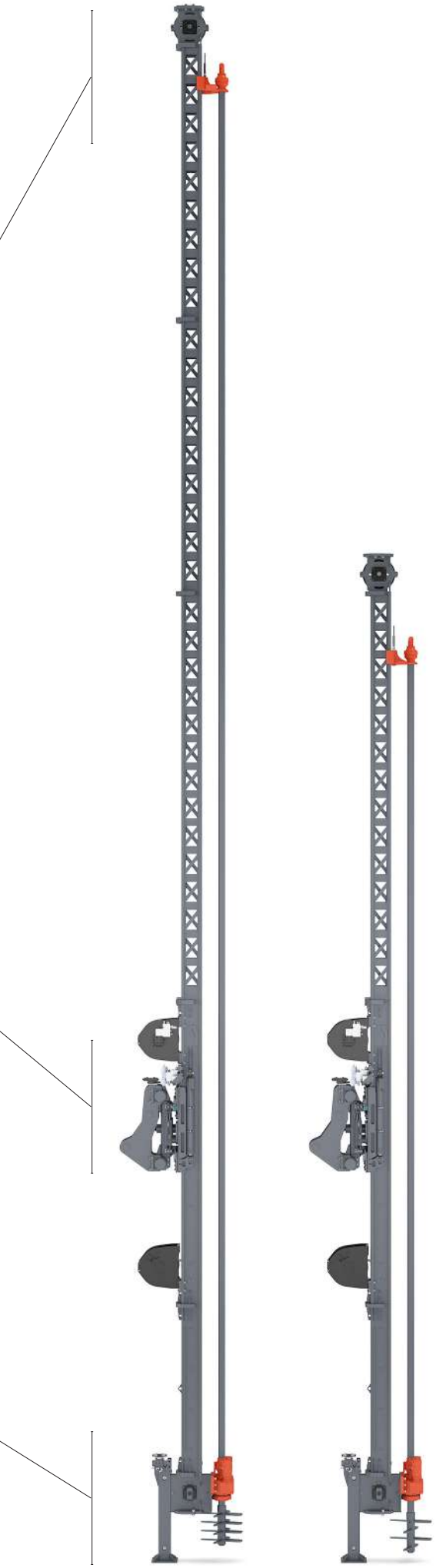
## FEATURES

- Excavator mounted stabilisation leader
- The leader and its tooling are designed to work on a standard excavator with normal auxiliary hydraulics; all required hydraulics is integrated into the leader itself
- Maximum depth 20-25 meters depending on excavator size; due to the modular design the leader can be shortened to 12 or 16 meter effective depth
- Column diameters between Ø500–800 mm due to interchangeable mixer tip
- Mixer tip vertical movement is achieved with two hydraulic winches
- Binder feed at the top of the mixing rod to which a rotating joint for the binder hose is integrated.
- Roller mechanism on the rotary drive to apply torque and simultaneously allow feedthrough of the mixing tube
- Integrated rotary drive and telescopic bottom foot at the end of the leader
- Additional support for binder feed hoses and electric cables along the leader

*DISCLAIMER*

*MPL Multi-tool piling leaders are customised solutions. Hence the features and technical data of a specific MPL delivery might differ from the data presented in this catalogue.*





# TECHNICAL DATA

## Column stabilisation leader

| Model | | MSL-300 |
|---|---|---|
| Column depth | **m** | 20–25 |
| Column diameter | **mm** | 500–800 |
| Weight (w/o adapter) | **kg** | 6500 |
| Height | **m** | 23–28 |
| Tilt angle | **o** | +/- 8 |
| Winches | | |
| · number | **pcs** | 2 |
| · pull down/extraction force | **kN** | 57/57 |
| · speed | **m/min** | 0–30 |

| Rotary drive | | |
|---|---|---|
| Torque | **kNm** | 20 |
| Rotational speed | **rpm** | 180–200 |
| Features/instrumentation | | |
| · rotation speed | | |
| · rotation torque | | |
| · column depth/ascent rate | | |
| · driving angle | | |

| Mixer/mixer tip | | |
|---|---|---|
| Mixer tip levels | **pcs** | 4 |
| Diameter | **mm** | 500-800, nominal |
| Binder feed | **kg/s** | 3,0 |
| Compressed air, pressure | **bar** | 10 |
| Compressed air, flow rate | **m³/min** | 6,5 |
| Ascent rate | **mm/r** | 20 |
| Rotational velocity | **rpm** | 180–200 |
| Injection pipe | | |
| length | **m** | 21,3–26,3 |
| inner diameter | **mm** | 34 |
| Support pipe | | |
| length | **m** | 21,3–26,3 |
| size / wall thickness | **mm** | 100 x 100 mm square/8 mm |

*NOTE! Preliminary data.*

*Detailed technical data to be provided on case by case basis.*
*Column depth and other technical data dependent on excavator size.*

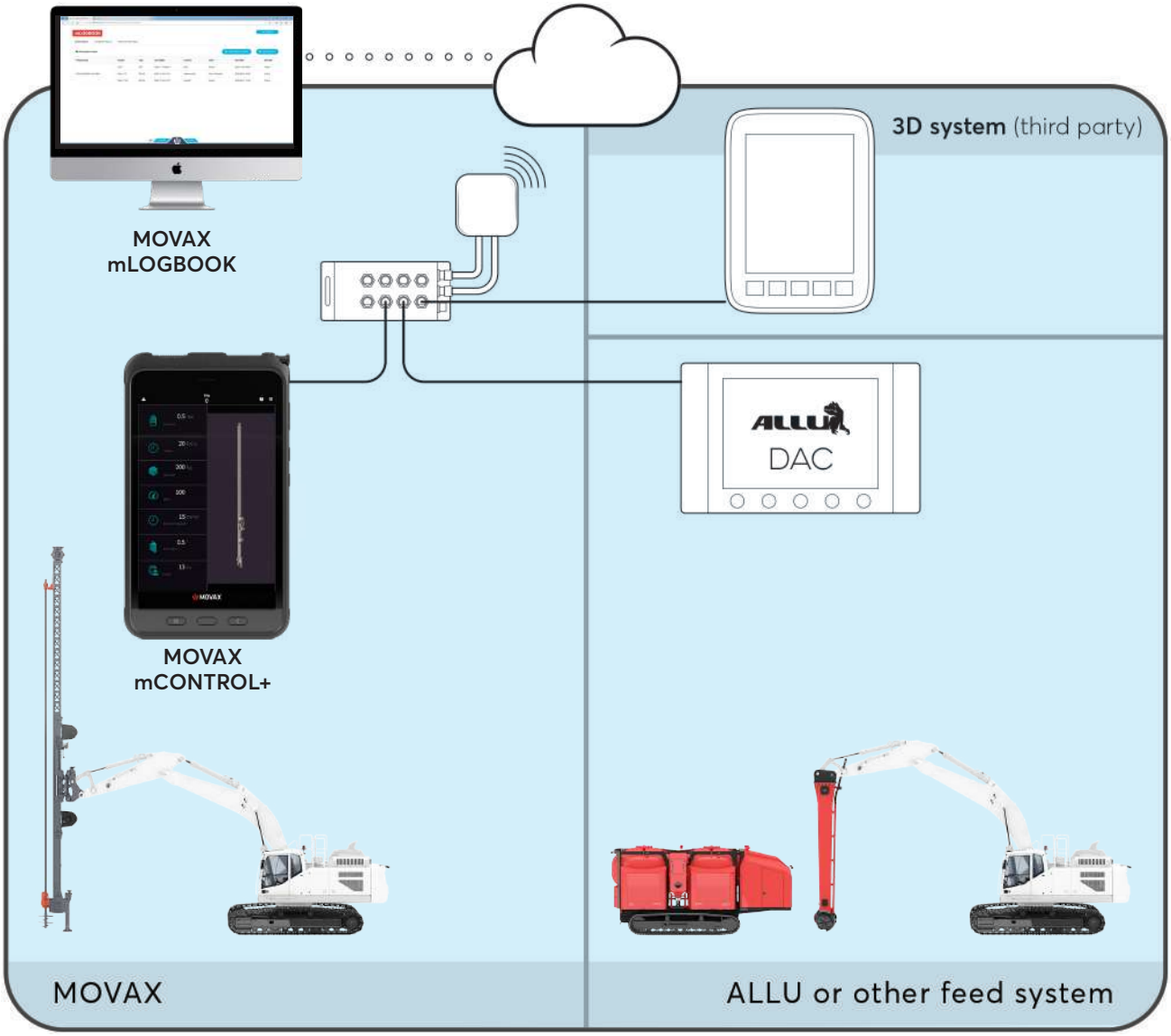
## COLUMN STABILISATION LEADERS

# MONITORING & REPORTING

The Column stabilisation process is controlled and the work is monitored using the MOVAX mControl+ PRO control system. The mControl+ PRO is designed to communicate with external systems such as ALLU's DAC control system and different 3D systems (the connectivity will be developed on a case-by-case basis).

The control, monitoring and reporting system consists of the following systems which communicate with each other over the CAN-bus:

- MOVAX mCONTROL+ control system
- MOVAX mLogbook reporting system
- ALLU DAC control system or other feed system
- Third party 3D system  connectivity



## PLANNING

The stabilisation drawings and plans are accessed through the 3rd party 3D system. From the display the operator can see the planned location of the mass stabilisation fields or the stabilisation columns.

## MONITORING

The work flow is monitored utilizing MOVAX mCONTROL+ and the 3rd Party 3D-system. The location and positioning data is monitored utilizing the 3rd Party 3D system display. The mCONTROL+ -display is utilized to monitor all other stabilisation parameters such as;

- column stabilisation; for example binder quantity per column, ascent rate and rotational speed
- mass stabilisation; for example binder quantity, feed and mixing times

The operator can view the result of the stabilisation work on the displays of the MOVAX mCONTROL+ and the 3rd Party 3D-system. The realised positioning data is shown in the 3rd Party 3D system whereas all other reported parameters can be found in the MOVAX mCONTROL+-system.


## REPORTING

The mass and column stabilisation work is reported utilizing the 3rd Party 3D-system as well as MOVAX mLogbook reporting system.

The MOVAX mCONTROL+ system sends the data to a cloud-based server (mCLOUD) where all the information is stored. The user can access the information and ready made reports through a password protected web-based interface.

In addition to ready made reports the MOVAX mLogbook-reporting system also includes efficient tools for printing (pdf-format) and to transfer the data to for instance Microsoft Excel.

# MSL PROJECT REPORT

The mLogbook **'project report'** includes all the information related to the piling or foundation project including pile type & dimensions, the depth to which the pile has been driven with the various tools and for instance in the case of load bearing piles also information related to the pile set.

Different parameters are reported for the different MOVAX piling equipment.

mLOGBOOK

**PROJECT REPORT**
**Column stabilisation**

| | | | | | |
|---|---|---|---|---|---|
| **Main project** | Bridge construction | **Stabilization method** | column stabilization | **Operator** | Tom Jackson |
| **Sub project** | SE Exit | **Binder material** | Cement | **Start date** | 2020-05-12 |
| **Location** | Islington, London | **Jobsite data (measured)** | | **End date** | 2020-05-31 |
| **Customer** | Road constuctors ltd | **Total mass**<br>**Total volume** | 2328 kg<br>32 m³ | **Note!** | |
| **Contract number** | 923000-A1 | | | | |

| Column # | Column ID | Position data | PF ID | Section dimensions [mm] | Total depth [m] | Binder [kg/m³] | Total amount [kg] | Total volume [m³] | Pressure [bar] | Flow [kg/s] | Feeding time [hh:min:ss] | Mixing time [hh:min:ss] | Date |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1,1 | 53°26'54.036"N 2°12'47.012"W | K7R234 | 800 | 15 | 88 | 530 | 5,39 | 0,2 | 2,9 | 0:07:45 | 0:08:34 | 2020-05-12 |
| 2 | 1,2 | 53°26'54.037"N 2°12'47.012"W | K7R234 | 800 | 15 | 89 | 510 | 5,55 | 0,3 | 2,7 | 0:06:45 | 0:07:34 | 2020-05-13 |
| 3 | 1,3 | 53°26'54.038"N 2°12'47.012"W | K7R234 | 800 | 15 | 87 | 540 | 5,33 | 0,2 | 3,1 | 0:08:34 | 0:07:45 | 2020-05-13 |
| 4 | 1,4 | 53°26'54.039"N 2°12'47.012"W | K7R234 | 800 | 15 | 85 | 525 | 5,72 | 0,4 | 3,2 | 0:07:34 | 0:06:45 | 2020-05-13 |
| 5 | 1,5 | 53°26'54.040"N 2°12'47.012"W | K7R234 | 800 | 15 | 86 | 530 | 5,11 | 0,2 | 3,1 | 0:07:45 | 0:08:34 | 2020-05-13 |
| 6 | 1,6 | 53°26'54.041"N 2°12'47.012"W | K7R234 | 800 | 15 | 83 | 525 | 5,64 | 0,2 | 3,3 | 0:06:45 | 0:08:34 | 2020-05-13 |
| 7 | 1,7 | 53°26'54.038"N 2°12'47.012"W | K7R234 | 800 | 15 | 84 | 530 | 5,21 | 0,2 | 2,6 | 0:08:34 | 0:07:34 | 2020-05-13 |
| 8 | 2,1 | 53°26'54.041"N 2°12'47.012"W | K7R234 | 800 | 15 | 89 | 510 | 5,03 | 0,3 | 2,9 | 0:07:34 | 0:07:45 | 2020-05-13 |
| 9 | 2,2 | 53°26'54.038"N 2°12'47.012"W | K7R234 | 800 | 15 | 88 | 540 | 5,20 | 0,2 | 2,9 | 0:07:45 | 0:06:45 | 2020-05-13 |
| 10 | 2,3 | 53°26'54.041"N 2°12'47.012"W | K7R234 | 800 | 15 | 89 | 525 | 5,79 | 0,4 | 2,7 | 0:06:45 | 0:08:34 | 2020-05-14 |
| 11 | 2,4 | 53°26'54.038"N 2°12'47.012"W | K7R234 | 800 | 15 | 87 | 530 | 5,87 | 0,2 | 3,1 | 0:08:34 | 0:08:34 | 2020-05-15 |
| 12 | 2,5 | 53°26'54.041"N 2°12'47.012"W | K7R234 | 800 | 15 | 85 | 525 | 5,73 | 0,2 | 3,2 | 0:07:34 | 0:07:34 | 2020-05-16 |
| 13 | 2,6 | 53°26'54.038"N 2°12'47.012"W | K7R234 | 800 | 15 | 86 | 530 | 5,24 | 0,2 | 3,1 | 0:07:45 | 0:07:45 | 2020-05-17 |
| 14 | 2,7 | 53°26'54.041"N 2°12'47.012"W | K7R234 | 800 | 15 | 83 | 510 | 5,91 | 0,3 | 3,3 | 0:06:45 | 0:06:45 | 2020-05-18 |
| 15 | 3,1 | 53°26'54.038"N 2°12'47.012"W | K7R234 | 800 | 15 | 84 | 540 | 5,44 | 0,2 | 2,6 | 0:08:34 | 0:08:34 | 2020-05-18 |
| 16 | 3,2 | 53°26'54.041"N 2°12'47.012"W | K7R234 | 800 | 15 | 89 | 525 | 5,44 | 0,4 | 2,9 | 0:07:34 | 0:08:34 | 2020-05-25 |
| 17 | 3,3 | 53°26'54.038"N 2°12'47.012"W | K7R234 | 800 | 15 | 88 | 530 | 5,67 | 0,2 | 2,9 | 0:07:45 | 0:07:34 | 2020-05-26 |
| 18 | 3,4 | 53°26'54.041"N 2°12'47.012"W | K7R234 | 800 | 15 | 89 | 525 | 5,41 | 0,2 | 2,7 | 0:06:45 | 0:07:45 | 2020-05-26 |
| 19 | 3,5 | 53°26'54.038"N 2°12'47.012"W | K7R234 | 800 | 15 | 88 | 530 | 5,07 | 0,2 | 3,1 | 0:08:34 | 0:06:45 | 2020-05-26 |
| 20 | 3,6 | 53°26'54.041"N 2°12'47.012"W | K7R234 | 800 | 15 | 89 | 510 | 5,86 | 0,3 | 3,2 | 0:07:34 | 0:08:34 | 2020-05-26 |

**The individual, pile specific reports for the MOVAX MSL include the following information:**
Position data, Pile type, Pile dimensions, Pile depth, Angle, Torque, Binder amount, Feed pressure
Ascent rate, Start time, End time, Elapsed time, Date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# MOVAX way-of-piling

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