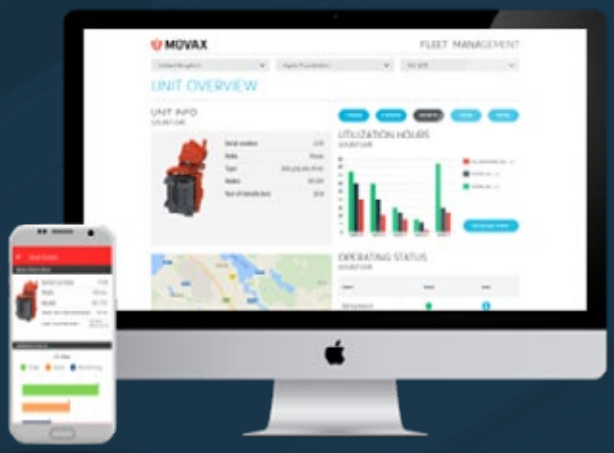
MOVAX

TECHNICAL SPECIFICATION

INFORMATION MANAGEMENT SYSTEM



valid from Jan 2022

HIGHER PRODUCTIVITY – SIGNIFICANT SAVINGS

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

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 **2500 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.

MOVAX INFORMATION MANAGEMENT SYSTEM (MIMS)

The MOVAX Information Management System (MIMS) provides essential information about the piling process and the pile installation, and about the MOVAX piling equipment itself. The information is intended for maintenance personnel and for the owners, operators and engineers designing and overseeing a piling or foundation project.

The goal is increase the availability of the MOVAX piling equipment and to improve the quality of the piling project and to save costs in reporting and testing.

The **MIMS hardware (HW)** which is included with mControl+ PRO and optional in case of mControl+ LITE is provided for data collection, initial storage and transfer. The MIMS HW is connected to mControl+ from which the data is collected automatically.

MIMS data suites (SW) provide detailed real-time information, documentation and reports which are accessed through a web-based user interface

mFleet Management

provides essential information about the operation, performance and condition of the MOVAX piling equipment. mFleetManagement is designed to assist in troubleshooting, diagnostics and analysis - and for fast and efficient customer technical support.

mLogbook

is a documentation and reporting tool which provides essential data related to the piling process and the piling or foundation project.

MIMS HARDWARE

DATA COLLECTION AND -TRANSFER

The MIMS hardware (HW), which is connected to the MOVAX Control System and installed onto the excavator (or other carrier) is utilised for automatic data collection and data transfer. The same HW is utilised for all MIMS data suites (SW), The MIMS HW includes a fully integrated 3G/GPS-system providing the remote connection as well as the general location of the excavator and the MOVAX piling equipment.

The MIMS module will automatically recognize the specific MOVAX piling equipment (SG vibratory pile driver, DH piling hammer, MPL Multi-tool piling leader etc.) connected to the excavator and collect the data accordingly.

MOVAX Information Management System is compatible with third-party global positioning systems such as Novatron/MOBA, Trimble and Leica. When connected to a third party global positioning system it is possible to obtain also the exact location of the pile to be driven. In addition, independent global positioning sensors (RTK GNSS) compatible with the MOVAX Information Management System are also available for pile specific precise GPS information.

The MIMS HW includes the following;

- MOVAX MIMS module (MRM) with GPS and 3G- antennas
- Cabling, connectors
- Mounting kit

DATA STORAGE AND USER INTERFACE

The information is sent to and stored in the MOVAX mCLOUD data storage. The information stored in the mCLOUD data storage is accessed through a web-based user interface. The information can also be accessed through the mFleetCare app.

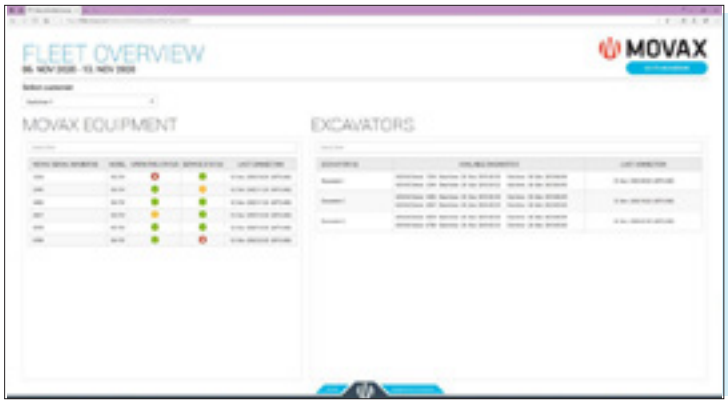
MOVAX Information Management System ‘log-in’

mFleet Management

The mFleetManagement-data suite provides basic operational, real-time information about the MOVAX piling equipment as well as the general global positioning (GPS) data of the MOVAX piling equipment and the excavator it is connected to. The information can be accessed remotely for adjustment and calibration – and for instance to provide operational guidance and support – as well as for trouble-shooting and quick problem-solving.

mFleetManagement also provides information for the prediction of maintenance requirements thus enabling preventive maintenance with the intent to maximize the availability of the MOVAX piling equipment.

The information can furthermore be utilised for instance for invoicing purposes, etc.



The **'Fleet Overview'** presents an overview of all the MOVAX piling equipment including all the excavators the MOVAX piling equipment is connected to. The 'Fleet overview' also provides a quick overview of the operating and service status of the entire fleet.

The MOVAX piling equipment to be monitored or analysed in more detail is selected from the 'Fleet Overview'.

The main '**Unit Overview'** provides the general information about the specific MOVAX piling equipment in question, its general geographical location, overall utilization hours, operating and service status.

More detailed information is obtained by moving from the 'unit overview' to the ready-prepared reports.

REPORTS

The operational information is presented in an illustrative, easy-to-view and -browse format. The point-in-time or time interval to be reviewed or analysed can be selected flexibly. The information presented is providing a fast and flexibly overview of the operation, how the unit has been operated – especially in regards to the limits of some of the key operational parameters.

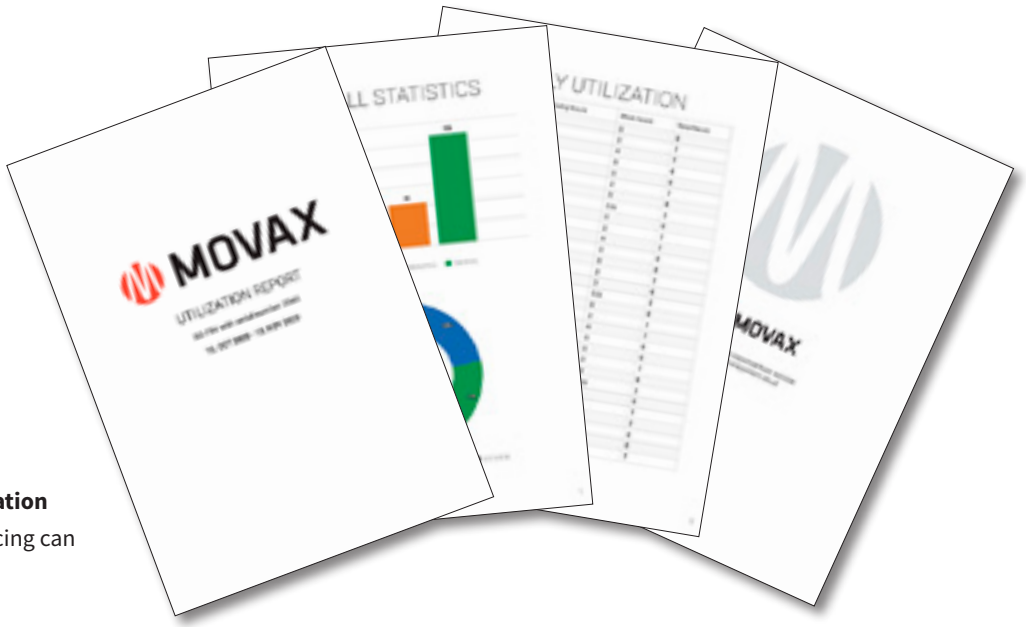
SG rpm/frequency

SG utilization

The ready-made reports include the following:

MOVAX SG Side grip pile drivers	**MOVAX DH** Piling hammers	**MOVAX PA** Pre-augers	**MOVAX KB/TAD** Piling drills	**MOVAX MPL** Multi-tool piling leaders
Utilization hours	Utilization hours	Utilization hours	Utilization hours	Utilization hours
RPM/Frequency	Back pressure	Working pressure	RPM	Working pressure
Working pressure	Refusal	Back pressure	Working pressure	Back pressure
Back pressure		Drain pressure	Back pressure	
Drain pressure			Drain pressure	
Clamp pressure				
Refusal*				

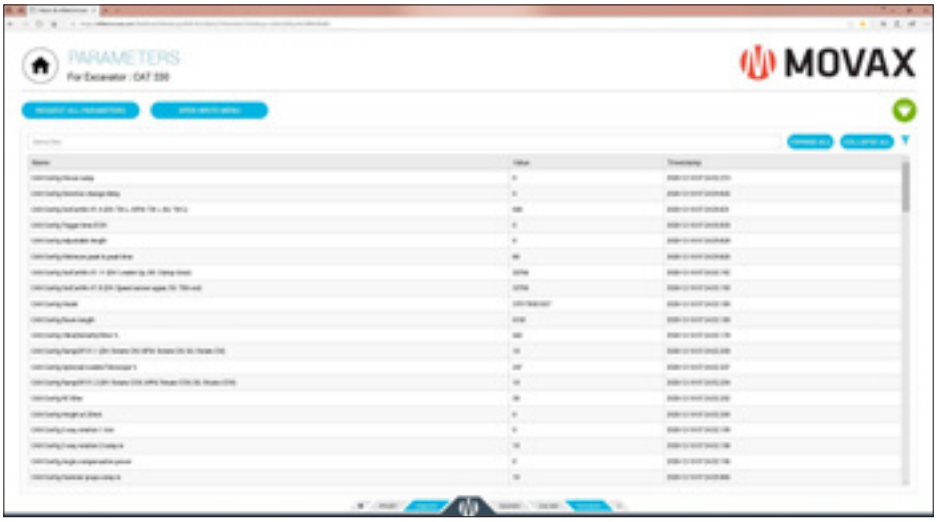
**requires mControl+ PRO*



Based on for instance the **'Utilization hours'** a pdf-document for invoicing can be generated.

TOOLS FOR ANALYSIS

With the mFleetManagement it is possible to prevent failures, predict maintenance requirements and analyse and solve any unexpected problems. mFleetManagement includes versatile tools which enables analysis of the entire work cycle and makes it possible to find deviations and abnormalities. The amount of data varies based on the MOVAX piling equipment in question.



mLOGBOOK

mLogbook is a documentation and reporting tool which provides essential data related to the piling process and the piling or foundation project.

The piling information is collected by the MOVAX Control System and stored in the MOVAX Control System's excavator module. To report the piling works the operator only has to input the pile number, the system will take care of the rest. Data concerning site and pile information is added by the user (engineer or equal) and the system will generate automatically illustrative, ready-made reports - including both measured and calculated data - which provide essential information about the piling process and its quality.

mLogbook is compatible with commonly used global positioning systems such as Trmble, Novatron and Leica which adds also the positioning data to the pile reports. Optionally independent global positioning sensors (RTK GNSS) can also be provided to allow for the addition of the exact pile positioning data without a third party global positioning system.

PROJECT OVERVIEW

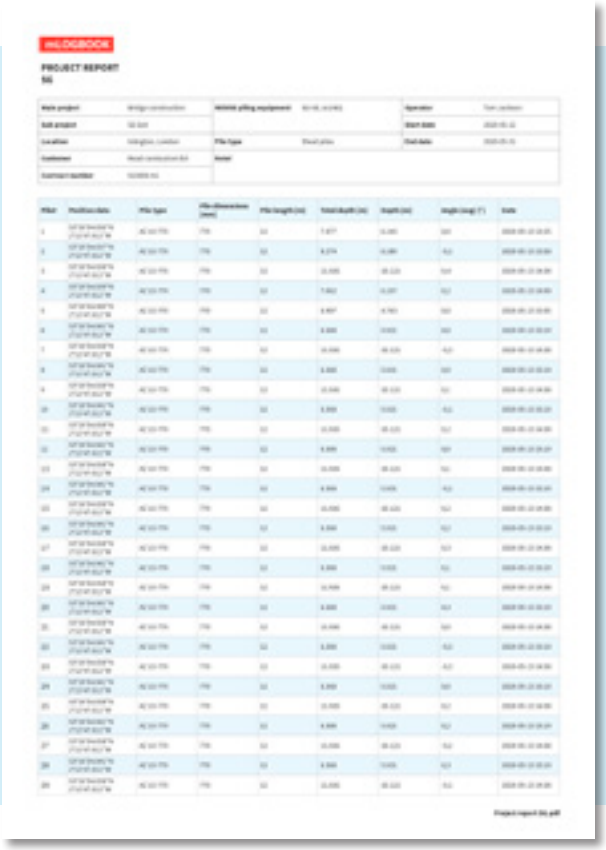
Specific reports are generated for MOVAX piling equipment including MOVAX side grip pile drivers, MOVAX piling hammers, MOVAX piling drills and MOVAX multi-tool piling leaders including the associated tooling,

The 'Project overview' provides the information of all main projects and also sub-projects.

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.



Project report SG

Project report SG+DH

The individual, pile specific reports include the following information:

MOVAX SG Side grip pile driver
Penetration rate
Centrifugal force
Working pressure
Eccentric moment
RPM
Inclination

MOVAX DH Piling hammer
Penetration rate
Rate per blow
Drop height
Energy
Inclination
Flow profile
Torque

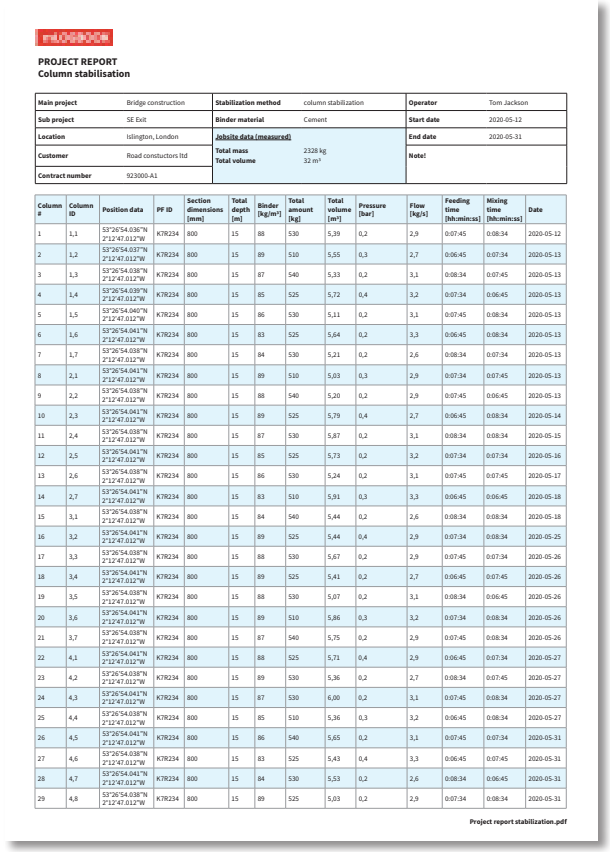
MOVAX MPL 300/400/CFA
Position data
Pile type
Pile dimensions
Pile depth
Angle
Torque
Concrete volume
Concrete pressure
Start time
End time
Elapsed time
Date

MOVAX MSL
Position data
Pile type
Pile dimensions
Pile depth
Angle
Torque
Binder amount
Feed pressure
Ascent rate
Start time
End time
Elapsed time
Date

In case multiple MOVAX piling equipment is used on the same site, the report will include all MOVAX piling equipment.

PROJECT REPORT

Project report CFA



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**	2328 kg	**Note!**	
Contract number	923000-A1	**Total volume**	32 m³		

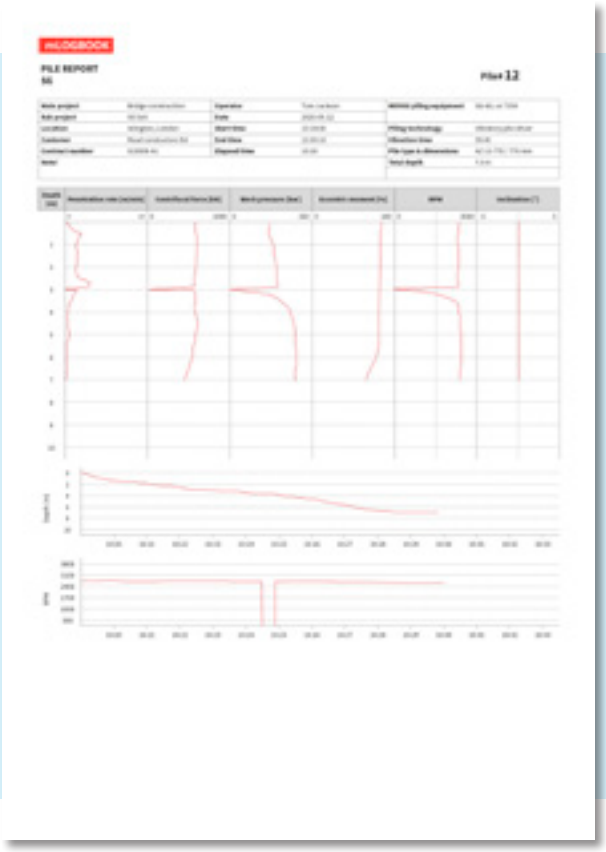
Column #	Column ID	Position data	PF ID	Section dimensions [mm]	Total depth [m]	Binder [kg/m³]	Total amount [kg]	Total volume [m³]	Pressure [bar]	Flow [kg/s]	Feeding time [hh:mm:ss]	Mixing time [hh:mm:ss]	Date
1	1,1	53°26'54.036"N 2°12'47.012"W	K7R234	800	15	88	530	5,39	0,2	2,9	0:07:45	0:08:34	2020-05-12
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
21	3,7	53°26'54.038"N 2°12'47.012"W	K7R234	800	15	87	540	5,75	0,2	2,9	0:07:45	0:08:34	2020-05-26
22	4,1	53°26'54.041"N 2°12'47.012"W	K7R234	800	15	88	525	5,71	0,4	2,9	0:06:45	0:07:34	2020-05-27
23	4,2	53°26'54.038"N 2°12'47.012"W	K7R234	800	15	89	530	5,36	0,2	2,7	0:08:34	0:07:45	2020-05-27
24	4,3	53°26'54.041"N 2°12'47.012"W	K7R234	800	15	87	530	6,00	0,2	3,1	0:07:45	0:08:34	2020-05-27
25	4,4	53°26'54.038"N 2°12'47.012"W	K7R234	800	15	85	510	5,36	0,3	3,2	0:06:45	0:08:34	2020-05-27
26	4,5	53°26'54.041"N 2°12'47.012"W	K7R234	800	15	86	540	5,65	0,2	3,1	0:07:45	0:07:34	2020-05-31
27	4,6	53°26'54.038"N 2°12'47.012"W	K7R234	800	15	83	525	5,43	0,4	3,3	0:06:45	0:07:45	2020-05-31
28	4,7	53°26'54.041"N 2°12'47.012"W	K7R234	800	15	84	530	5,53	0,2	2,6	0:08:34	0:06:45	2020-05-31
29	4,8	53°26'54.038"N 2°12'47.012"W	K7R234	800	15	89	525	5,03	0,2	2,9	0:07:34	0:08:34	2020-05-31

Project report stabilization.pdf

Project report MSL

PILE REPORT

Based on the project report it is possible to generate pile specific reports for each individual pile; and for each individual MOVAX piling equipment.



Pile report SG

Pile report DH

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Penetration rate
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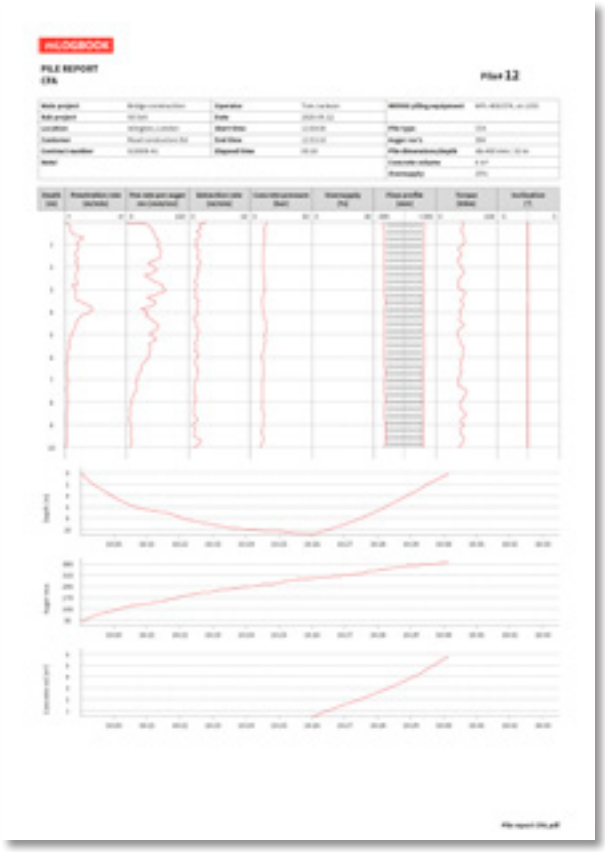
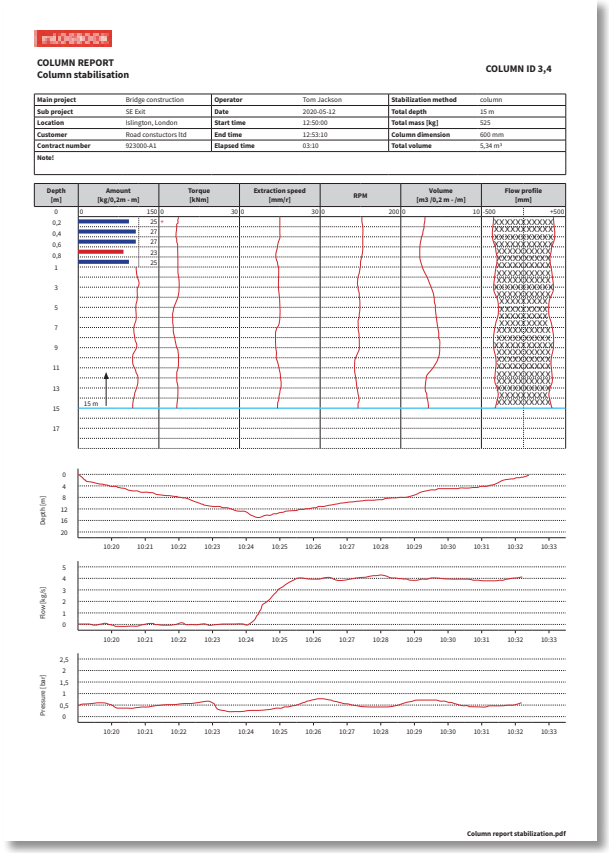


Pile report CFA



COLUMN REPORT
Column stabilisation

COLUMN ID 3,4

Main project	Bridge construction	**Operator**	Tom Jackson	**Stabilization method**	column
Sub project	SE Exit	**Date**	2020-05-12	**Total depth**	15 m
Location	Islington, London	**Start time**	12:50:00	**Total mass [kg]**	525
Customer	Road constuctors ltd	**End time**	12:53:10	**Column dimension**	600 mm
Contract number	923000-A1	**Elapsed time**	03:10	**Total volume**	5,34 m³
Note!					

Column report stabilization.pdf

Column report MSL

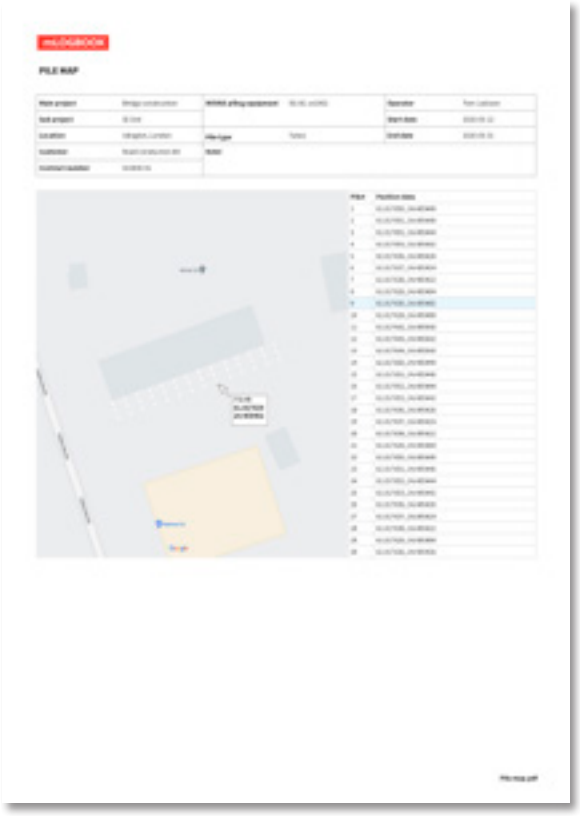
PILE CUT-OFF REPORT

A cut-off report is provided when the information related to the remaining section ie. the cut-off length of the pile is needed.

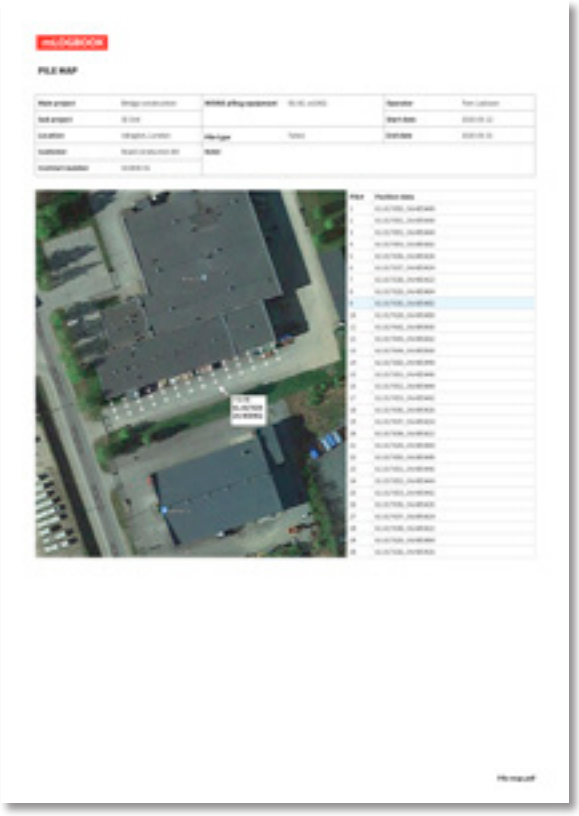
Pile cut-off report

PILE MAP

When connected to a third party global positioning system or when or when equipped with an independent global positioning sensor, also a pile map can be generated.



Pile map



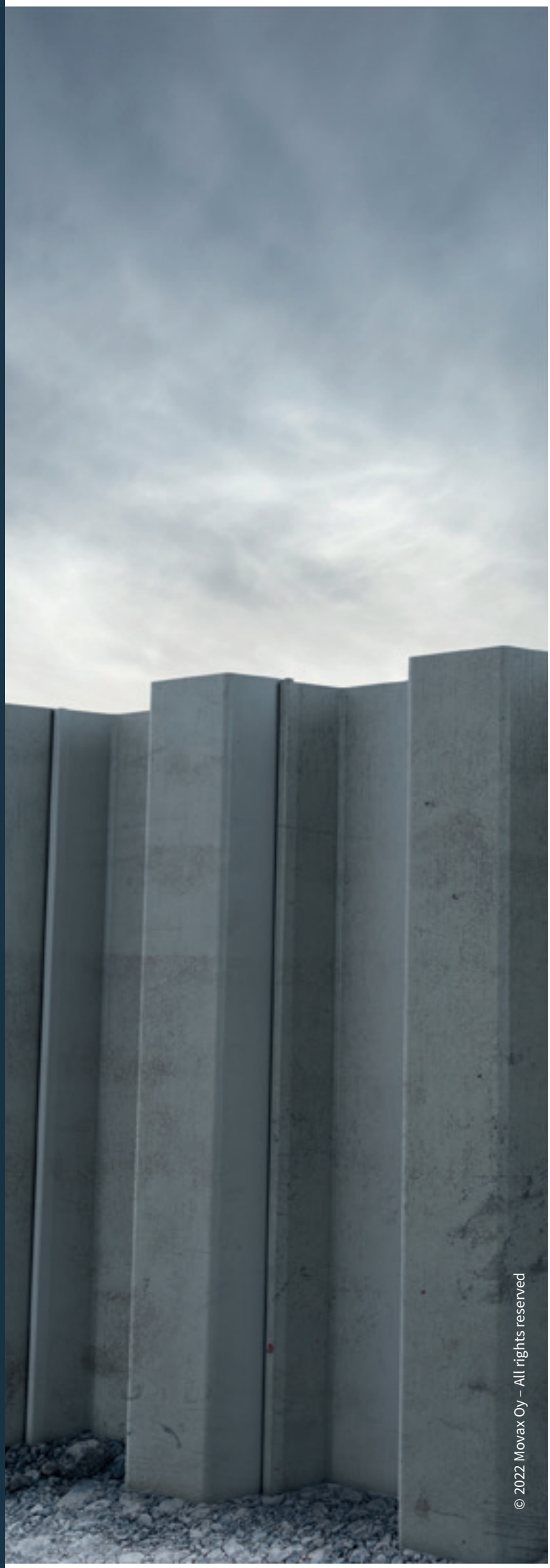
Pile map


MOVAX
SERVICE STATUS
Item
Operating hours
Service interval
Status
Gear oil
Oil filter
PILING CONTRACTORS

MOVAX
way-of-piling

HIGHER PRODUCTIVITY - SIGNIFICANT SAVINGS

fast. efficient. versatile. accurate. safe. reliable.



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