



# EASYFOOTINGS®

## S Y S T E M

### ASSEMBLY INSTRUCTIONS EASYFOOTINGS®



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Foundations

EasyFootings® designs and manufactures steel micro-pile foundations. Soil is a true foundation by its nature, having the strength and structure to bear all loads undisturbed. Our foundations serve two primary functions: properly transferring loads to the soil structure and providing a connection to the above-ground structure. EasyFootings® micro-piles maintain the integrity and load-bearing capacity of the soil structure.

Micro-pile Technology

EasyFootings® micro-pile technology involves grouping micro-piles into rigid stacks and positioning them in the soil using a positioning module. Micro-piles are driven at an angle determined by the module, into undisturbed soil layers, creating a solid foundation without the need for excavations. The group of micro-piles simulates natural solutions found in nature, resembling the roots of a tree and providing load-bearing capacity, resistance to pulling and lateral pressures. EasyFootings® micro-pile foundations are a reliable technology that effectively transfers loads to undisturbed and undisturbed soil structures.

EasyFootings® System

The innovative solution introduced by EasyFootings® is the technology of a pile of micropiles, which has been widely adopted thanks to the excellent prefabricated steel module - EasyFootings®. This module serves as a guide for driving micropiles into the ground in the correct arrangement and at the proper angle, ensuring their locking into one structural unit. It provides a solid foundation for the target structural construction, ensuring stability and cost-effectiveness. The EasyFootings® foundation not only serves as a supporting element but also preserves the natural functions of the ground, enabling it to effectively bear the loads to which it is subjected. It can be easily and securely connected to the structural elements built on it. This

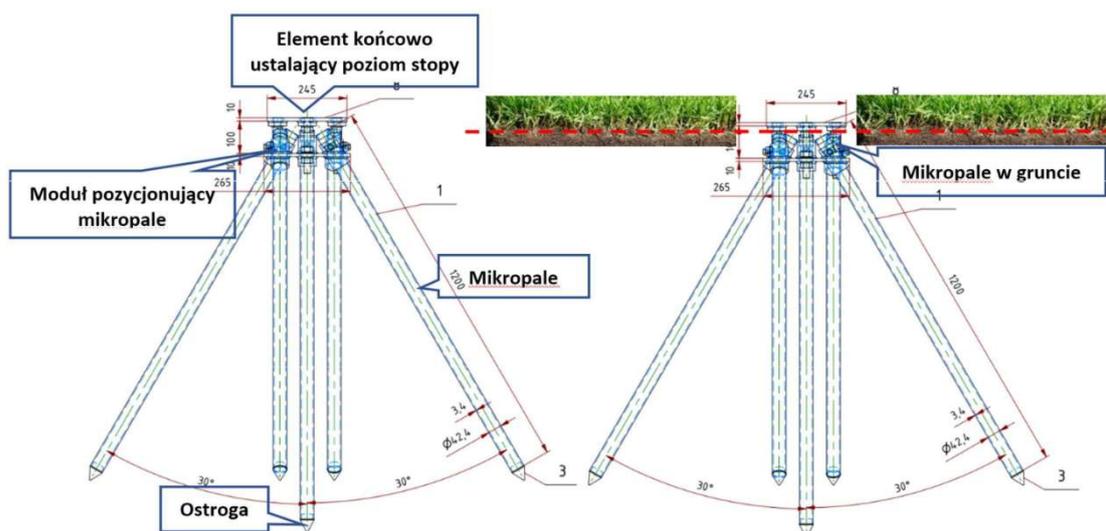


manual contains information and instructions for installing EasyFootings® foundations in residential and commercial construction under normal ground conditions (see the next chapter).

Conditions and Applications EasyFootings® micropile foundations are designed for use in all projects after analyzing their suitability for a specific investment. Normal soil conditions are typical for most areas and are defined in Table R401.4.1 of the International Residential Code (IRC), which specifies the allowable loads for foundations. EasyFootings® are best suited for soils with a bearing capacity of at least 140 kN/m<sup>2</sup>. If the soils in which we want to install EasyFootings® do not meet the required bearing capacity specified by regulations and do not provide the expected foundation strength, their bearing capacity can be determined by soil testing and foundation load testing.

### Weak soils

Some soils may not be suitable for installing EasyFootings® foundations, such as soils weaker than 75kN/m<sup>2</sup>, highly expansive, shifting or sliding soils, slopes greater than 2:1 (27 degrees), contaminated soils, or soils where traditional concrete footing pads accepted by regulations cannot provide adequate conditions to transfer project loads or protect the structure from negative effects such as freezing. Where there are soils of unknown structure, the designer may be required to conduct a soil investigation prior to the project. Soils can also be weakened if they retain standing water or are improperly drained, which can also cause stability problems. A depression in the ground with standing water or a pond may indicate poor soil quality. An EasyFootings® foundation adjacent to any body of water should be subject to thorough analysis. Depending on the variables, soils on the edge or within lakes, ponds, rivers, streams, or tidal zones may be significantly weaker (even by 40% or more) than dry or well-drained soils. Soils adjacent to existing foundations may also be improperly or loosely filled, which can also cause poor drainage or soil conditions. It is important to inform the project designer if any of these conditions exist on the investment plot. Contact us if you have any questions about the project or soil conditions and/or the proper use of EasyFootings® products or "EasyFootings® Load Table".



WARNING: Before installing EasyFootings®, you must always check and ensure that there are no underground installations such as power lines, gas lines, telecommunications or sewage systems at the installation location that may be damaged during the installation of the foundations. To avoid danger and unnecessary costs associated with repairing damage, contact the appropriate company or institution to check if there are any underground installations at the installation location. Before starting work, you should also obtain the necessary permits and approvals from the relevant authorities.

## EASYFOOTINGS® LOAD TABLE

**Silt/clay** (CH - highly cohesive soils; CL - medium cohesive and dense cohesive soils; MH and ML - low cohesive soils)

### Minimum 75 kN/m<sup>2</sup> -7.5ton/m<sup>2</sup>

Model EF	Maximum Load kN /ton	Micropile Length cm	Traditional Equivalent cm/cm	Frost Depth cm	Pullout Strength kN/ton	Lateral Forces kN/ton
EF 120	42,0kN/4,2 ton	120	65x65	120	38,5kN/3,85ton	29,3kN/2,93ton
EF 150	52,5kN/5,2ton 92,3	150	75x75	150	48,2kN/4,82ton*	29,3kN/2,93ton*
EF 200	kN/9,2ton	200	95x95	200	<u>64,2kN/6,42ton*</u>	29,3kN/2,93ton*

**Sands/gravel** (SW - Clean sieved sand; SP - poorly sieved sand; SM - Sand with silt; SC - Sand with clay; GM - Gravel with silt; GC - Gravel with clay)

### Minimum 100 kN/m<sup>2</sup> -10ton/m<sup>2</sup>

Model EF	Maximum Load kN /ton	Micropile Length cm	Traditional Equivalent cm/cm	Frost Depth cm	Pullout Strength kN/ton	Lateral Forces kN/ton
EF 120	56,0kN/5,6 ton ~ 78,0kN/7,8ton	120	75x75~ 90x90	120	38,5kN/3,85ton	29,3kN/2,93ton
EF 150	65,6kN/6,5ton ~ 97,5kN/9,8ton	150	80x80~ 100x100	150	48,2kN/4,82ton*	29,3kN/2,93ton*
EF 200	123,0kN/12,3ton ~ 156,0kN/15,6ton	200	110x110~ 125x125	200	64,2kN/6,42ton*	29,3kN/2,93ton*

Equivalent to traditional concrete feet.

\*interpolated value from test

Interpolated based on field test values depending values on the type of soil.

Attention: The EasyFootings® system is not intended for structures that are exposed to asymmetric, rotational, or dynamic forces. This load chart is intended for structures supported by columns, pillars, and footing beams not exceeding the specified values. The EasyFootings® system is not intended for structures that are exposed to asymmetric, rotational, tipping, or dynamic loads. The EasyFootings® types listed in the table above use five micro-piles of specified length to transfer loads in the EF positioning module. To select the appropriate EF solution and evaluate performance in specific location conditions, soil testing, foundation design based on the EasyFootings® system for building permits, and load testing for specific locations and soil conditions are required. The listed loads are tested using

a safety factor of 1.4 and only apply to properly selected EF types for specific soils and applications. Specialized location and project analysis is required for soils with a bearing capacity below 75 kN/m<sup>2</sup> or soils with unknown properties. All types of EasyFootings® use five micro-piles of specified length and wall thickness to transfer loads to the soil. Load testing is mandatory! Contact us for further information. Post-construction measurement of permissible loads can be commissioned, for example, from <https://www.draco.com.pl>. If you have any questions, please contact us for further information.

The innovative EasyFootings® system is a fast and easy alternative to traditional concrete foundations. Thanks to this solution, there is no need for excavations and soil removal, as well as the use of heavy machinery and formwork. The complete lack of concrete means lower costs and no impact on the environment. This system is based on the use of micro-piles placed in a special positioning module, which enables easy and precise placement of the structure. This is a particularly beneficial solution for small buildings, gazebos, terraces or structures for small machinery and equipment.



The EasyFootings® system has a wide range of applications in residential and infrastructure construction. It can be used as an alternative to traditional concrete foundations in projects such as single-family homes, small and medium-sized residential buildings, bridges, canopies, scenic pathways, sidewalks, stairs, and auxiliary structures.

EasyFootings® load tables present the load-bearing capacity and frost resistance for different versions of EasyFootings® foot types. These data allow designers to match EasyFootings® feet to specific load-bearing and frost resistance requirements, depending on the soil characteristics and project load.

Compared to traditional concrete foundations, the EasyFootings® system has many advantages, such as no need for excavation and soil removal, no use of heavy machinery and formwork, and lower costs. This system is also more environmentally friendly, as it does not generate waste and does not require concrete.

EasyFootings® resistance to frost and uplift. This system is very efficient and effective in preventing problems related to frost and uplift, which are common in traditional concrete foundations. Thanks to its innovative design, EasyFootings® offers a stable foundation for both bearing and uplifting forces, and the unique head construction allows the soil to move up and down along the micro-pile axis without affecting the position of the foundation. This makes EasyFootings® a good solution for projects in areas with extreme cold, where traditional concrete foundations may not suffice.

Resistance to uplift To prevent uplift and damage due to frost, most traditional concrete foundations need to be placed at a significant depth and have a large gross mass. Such foundations require significant amounts of concrete with varying

composition and properties, and their installation requires significant labor inputs, such as excavations that weaken the soil structure, cause water problems, and leave large amounts of debris to be removed from the site after foundation work is completed.

EasyFootings® foundations are resistant to heavy loads and are used in areas that require protection against frost. These foundations work through micropiles, which are embedded in the undisturbed soil structure and prevent changes in the slope angle under load using a steel head, creating a stable foundation for bearing and lifting forces. Thanks to the unique design of the EasyFootings® head, the soil can move up and down along the micropile axis without affecting the position of the EasyFootings® foundation, which is locked in place by a group of micropiles. This feature allows EasyFootings® foundations to absorb ground loads caused by frost or expansive conditions without transferring these deformations to the above-ground structure. When evaluating projects in areas with extreme frost, it is important to remember cases where traditional concrete foundations have failed, requiring the use of larger, deeper concrete foundations. Therefore, it is worth considering the use of EasyFootings® foundations as an effective way to protect against frost and heaving.

**Installation Instructions for EasyFootings® Foundations** These instructions apply to the installation of EasyFootings® foundations in normal soil conditions, according to the load table. Before starting the installation, check the soil for any underground obstacles, such as rocks, tree roots, power lines, etc., and locate them. Pay particular attention to underground obstacles under tension. EasyFootings® foundations should not be installed or micro-piles driven without first marking all underground obstacles. We also recommend watching the instructional video on YouTube entitled "Innovative Foundations Without Concrete, Excavations, and Formwork".

1. Before starting work, make sure that the soil is suitable for installing EasyFootings® foundations according to the "EASYFOOTINGS® LOAD TABLE".
2. Check the soil for underground obstacles, such as rocks, tree roots, power lines, and other buried objects that may prevent the installation of the EasyFootings® system.
3. Mark all underground obstacles, especially those under tension, before starting the installation.
4. Do not install EasyFootings® foundations or drive micro-piles until all underground obstacles have been marked and located.
5. Carry out preliminary earthworks, such as removing vegetation, soil, and other obstacles from the surface of the soil in the planned location of the EasyFootings® foundations.
6. Conduct a soil bearing capacity test to determine the allowable load for the EasyFootings® foundations.
7. Select the appropriate head and length of the micro-pile to provide the necessary support for the load, according to the project requirements.
8. Choose the appropriate installation method, depending on the type of soil and soil conditions, according to the manufacturer's recommendations.
9. Drive the micro-piles into the ground using appropriate equipment and tools, according to the project requirements.

10. Position the heads in the correct position according to the design, and tighten them firmly with a head key.
11. Conduct a load test on each micro-pile to ensure that each pile is well-settled and has the appropriate load capacity.
12. After conducting load tests, secure the EasyFootings® foundations against heaving or displacement, especially in areas of extreme cold.
13. Carry out finishing work according to project requirements.
14. Conduct regular inspections and maintenance of the EasyFootings® foundations to ensure their durability and safety.

Note that this instruction is general and can be adapted to specific project conditions and requirements. If you have any doubts or questions regarding the installation of EasyFootings® foundations, contact the manufacturer or a foundation specialist.

All underground power lines must be located and properly marked. Disconnect the power source of any electrical lines in the vicinity before installing EasyFootings®. Never allow the body to come into contact with uninsulated parts of the automatic hammer. Wear appropriate rubber gloves and shoes. Additionally, if there are any underground devices at the location where the EasyFootings® feet are being installed, contact the local owner/operator to confirm the required safety zones. You must ensure that the horizontal distance between the micro-piles of your foundation will have sufficient horizontal clearance for safety zones, including the safety zone of the EasyFootings® installation, measured from the center of the positioning head screw in the horizontal direction to the vertical boundary of the end of the micro-pile of a given type of EasyFootings® model.

Check your project. To meet the loads shown in the "EASYFOOTINGS LOAD TABLE", EasyFootings® feet must be spaced at least 2 meters apart (from the center of one positioning head to the center of the next positioning head). For dedicated design versions, EasyFootings® feet may have a different distance. If the feet are spaced less than 2 meters apart, the load capacity may decrease by 13% for each EasyFootings® foot. The feet must also be positioned horizontally and spaced away from existing foundations or other obstacles in the ground. The loads of the supported structure must be properly calculated and the feet spaced accordingly, so that each foot only works up to the designated allowable loads.

#### Tools and Consumables

This is a list of the tools and consumables that are needed to install EasyFootings® mounting kits. Before starting work, check that all kit components are available and undamaged. Then assemble the required tools and equipment, including an automatic impact hammer, an optical level, a flat or adjustable wrench, a hammer, a level, a measuring tape, a pipe wrench, and appropriate protective equipment, such as safety glasses, hearing protection, insulated gloves, protective clothing, and shoes. It is also recommended that installation be conducted by a minimum two-person crew.

You must have the following tools and equipment:

Automatic impact hammer with a minimum force of 41 kJ up to 70 kJ with a 1-1/8 hex socket for micro piles  
Leica NA324 optical leveler [tripod + staff] SET  
Flat or adjustable wrench 30 - Hammer  
Impact hammer - BOSCH DEMOLITION HAMMER GSH 16-30 41J 1750W

YATO 3/4" 42mm socket - LEICA DISTO X310 laser distance meter or regular measuring tape, angle level, and regular level  
Mounting platform (optional), Square edge shovel, Hand hammer Leveling tool  
Measuring tape, Pipe wrench Appropriate safety equipment, including safety glasses, hearing protection, insulated gloves, protective clothing, and shoes  
For installation, we recommend a minimum crew of two people.



### Installation:

1. Find the location where the micro-pile positioning module will be placed.
2. Mark the location using reference points that will make it easy to identify the central position of the module, even after removing the top layer of soil. Tip: Place a rope or string approximately at the center of the module, a few centimeters above the ground, to get a quick reference point and maintain position.

### Setting up the steel positioning module:

1. Dig a square hole of the same size as the positioning module (including its height).
2. Place the positioning module in the hole in the central position. Ensure that the top of the module is level and centered.
3. In the next stage of installation, insert the first vertical micro-pile, previously equipped with a spur, into the hole and drive it into the ground using a hammer drill. Remember not to drive them in all the way at once, but alternate their placement every 0.3 meters until they are fully driven into the ground. This will prevent the module from tilting during installation.

**WARNING:** Do not install EasyFootings® foundations and drive micro-piles until all underground obstacles, especially those under tension, have been located and marked.



1. Remove any dirt and debris from the sections of the positioning module's pipes where the micro-piles will be driven into the ground, so that they can move smoothly during the installation process.
2. Install control plugs on the ends of the micro-piles after they are driven into the ground.
3. Insert screws into the holes in the steel head, which will be used for the final leveling of the end element on which the constructed structure will rest.
4. When driving the micro-piles into the ground, a member of the installation team should support the pile being driven, and the micro-piles should be driven alternately in sections. Periodically check the alignment and level. Be careful not to let the weight of the automatic hammer hit the positioning module during the final phase of driving the micro-piles.
5. Finish driving the micro-piles into the ground using an automatic hammer (with a driving pin attachment), being careful not to damage the precast micro-piles in the positioning module while driving them into the ground. Leave the micro-piles protruding from the module by approximately 3/4" after they are driven in, to make room for the PVC caps to be placed on the ends of the micro-piles.

**WARNING:** Micro-piles should only be driven using a hammer drill. Note 1: Micro-piles should not be driven all the way to the end; this can damage the ends of the micro-piles or the positioning module, and prevent the attachment of PVC protective caps to the micro-piles. Note 2: Micro-piles should not be driven all the way down simultaneously, but rather in alternating sections. Otherwise, the micro-pile may pull the module and cause it to tilt to one side. Micro-piles should be driven alternately around the positioning module, in sections, until the installation is complete. Note 3: Do not continue driving the micro-pile if it is bouncing or rubbing against impenetrable obstacles in the ground. This can result in improper installation of EasyFootings®. Determine what the micro-pile is encountering in the ground to avoid damaging previously un-inventoried underground installations.

**Encountering obstacles:** If you notice that the micro-pile stops moving while driving it in, immediately STOP the driving process and check what obstacle it has encountered. If you are sure that it is not an underground installation, but for example a root or a cluster of stones, try to drive in the micro-pile again using a driving machine. If this fails, remove all micro-piles (see "Removing micro-piles"), rotate the module around its axis by a certain angle, and try to reinstall it again, avoiding obstacles. The module can also be moved to another location according to the design parameters if it is necessary to avoid underground objects. If the obstacle is close enough to the surface, it can be excavated and removed. After finishing, recompact the soil using a vibrator, and then reinstall EasyFootings®.

**Removing micro-piles:** To remove micro-piles from the positioning module, use a method of simultaneous rotation and pulling using a pipe wrench, such as the RIDGID S8A compound lever pipe wrench, and a crowbar for prying. This method works best when the micro-pile protrudes from the module at least 5 cm. Follow the instructions and rotate the micro-pile in a corkscrew motion upwards to remove it."

Note: it is worth noting that removing micro-piles is a task that requires specialized tools and skills. In case of lack of experience, it is recommended to use the services of specialized companies that deal with this type of work.



Auxiliary parts and equipment Support brackets for posts and beam footing / Floor System Support brackets are sometimes needed to connect the EasyFootings® foundation with a structure placed at a certain height above ground level, and can be purchased separately if needed. Details of the Floor System are available on our website [www.EasyFootings.info](http://www.EasyFootings.info). Make sure the EasyFootings® base is matched to the appropriate size of support bracket and its load. These brackets are designed to allow for leveling and final adjustment of the bracket's position. Horizontal beams can also be directly placed into the appropriate support bracket for direct connection to EasyFootings®. Choose the appropriate end of the support bracket depending on the requirements of the structure that will be placed on the EasyFootings® foundation. All bolts are made of stainless structural steel to avoid possible corrosion in the future.

Micro pile driving hammers Standard impact hammers with a minimum impact force of 41 kJ are used for driving micro piles. It is best to use hexagonal nut sockets with a diameter of 1-1/8 inch, which corresponds to the diameter of the micro piles. Hammers can be rented or purchased from local dealers or directly from us. Below is a list of dedicated electrically powered impact hammers:

- BOSCH GSH 16-30 Demolition Hammer 41J 1750W
- BOSCH BH2760VC 63-lb Jackhammer; Bit type: 1-1/8
- MAKITA Model HM1307CB 35-pound Demolition Hammer; Bit type: 1-1/8
- HITACHI Model H65SD2 40-pound Demolition Hammer; Bit type: 1-1/8
- BOSCH Model 11335K 35-pound Jackhammer; Bit type: 1-1/8
- MILWAUKEE Model No. 5338 71-pound Jackhammer; Bit type: 1-1/8
- DeWalt D25901K - 40 J • Hilti TE 3000-AVR - 68 J • Bosch GSH 16-28 - 41 J
- Makita HM1812 - 70 J
- Milwaukee 5337-21 - 40 J
- HILTI TE 2000-22 Cordless Jackhammer - 69 J

INSPECTION If the installation instructions are followed, EasyFootings® should be leveled and perform their intended function. Permissible loads EasyFootings® should not be overloaded. The total load on a specific footing depends on the designed total

load of the structure and the soil conditions of its installation. The total load is a combination of actual load (e.g. snow, people, equipment) and dead load (the weight of the structure itself). This value should not exceed the specified loads for each model of EasyFootings® and its corresponding length of micro-piles. Inspection PVC plugs After installing the micro-piles, PVC plugs are fitted on each driven micro-pile to prevent them from getting dirty. This enables inspectors to insert a measuring tape into the micro-pile from the top to check its length. When fitting the tightly-fitted PVC plugs onto the micro-piles, use a rubber mallet to tap them onto the end of the micro-pile. Follow the complete installation instructions contained in this manual.

**INSPECTION - TROUBLESHOOTING** Always check the materials received from the supplier. If an EasyFootings® is installed improperly, it should be removed and reset. Then, re-drive the micro-piles, constantly checking the level. If one of the micro-piles is not going straight and causes the module to tilt, install the remaining micro-piles first, and then carefully finish the last micro-pile. Always transport and store parts in a clean manner. Warranty: To learn about warranty details, please visit [www.easyfooting.info](http://www.easyfooting.info). **WARNING!** Please read these instructions carefully and thoroughly. By doing so, you will avoid problems that may arise from improper handling of the set. The manufacturer is not responsible for damages resulting from non-compliance with the instructions. By proceeding with the installation without careful study of these instructions, you do so at your own risk! Any damage to any part of the set resulting from improper handling of the instructions will result in the loss of warranty.

**CHECK - TROUBLESHOOTING** Always check materials upon receipt from the supplier. If the EasyFootings® base is installed improperly, it must be removed and repositioned. When driving micropiles back into the ground, constantly check the level. If one micropile is not going straight and causes the module to tilt, install the remaining micropiles first, then carefully complete the last one. Always transport and store parts in cleanliness. Warranty: Information regarding the warranty can be found at [www.easyfooting.info](http://www.easyfooting.info). **CAUTION!** Read this instruction carefully and thoroughly. You will avoid problems that may arise if you do not follow the instruction. The manufacturer is not responsible for any damages resulting from non-compliance with these instructions. By proceeding with installation without thorough review of this instruction, you are doing so at your own risk! Any damage to any component part of the set resulting from non-compliance with these instructions will result in loss of warranty.