



LHR

300

LHR

Bauer BG 36



O NAMA

LHR d.o.o je osnovan 1991 god. kao privredno društvo za promet, građevinarstvo i inženjering sa sedištem na Novom Beogradu, u ulici Tadije Sondermajera 10J.

Danas je LHR jedna od vodećih izvođačkih kompanija u oblasti dubokog fundiranja, zaštite temeljnih jama i sanacije objekta.

Specijalizovani smo za izvođenje svih vrsta šipova i to:

- Franky-Simplex šipova prečnika 406, 520 i 600 mm livenih u tlu;
- gotovih armirano-betonskih i čeličnih šipova;
- bušenih klasičnih šipova prečnika od 400 do 2000 mm;
- bušenih CFA šipova sa kontinualnom spiralom prečnika od 400 do 1000 mm;
- bušenih FDP (SDP) šipova prečnika 410 i 510 mm;
- "Mega" šipova.

Specijalizovani smo i za izvođenje armirano-betonskih zidova u tlu tzv. dijafragmi, debljina:

400 mm, 600 mm, 800 mm i 1000 mm, sa dužinom lamele od 2,5 m i 3,0 m.

Takođe, specijalizovani smo za pobijanje čeličnih talpi raznog poprečnog preseka.

Prema izrađenom projektu konstrukcije, geološkoj gradi terena i uslovima na dатој lokaciji, Investitor se opredeljuje za jednu od navedenih vrsta šipova ili dijafragme radi fundiranja objekata, zaštite iskopa temeljne jame i susednih objekata, sanacije objekta i sl.

LHR je u svojoj dosadašnjoj praksi učestvovao u velikom broju važnih projekata i poseduje zavidne reference. Kompanija od svog osnivanja konstantno ulaže kako u najsvremeniju tehnologiju, tako i u usavršavanje stručnog kadra zbog čega se svrstava u jednu od vodećih kompanija u Srbiji koje su specijalizovane za ovu vrstu radova.

Naše reference su: Airport City faze I i II, Navigator Bussines Center 2, Sirius I i II, Ikea, Hotel Mona, Voždove kapije, Skyline, Blok 67a, Central Garden, brza pruga Beograd-Novi Sad-Kelebjia (državna granica), železara Smederevo, TENT B, nova flotacija u Majdanpeku, Fabrika guma Linglong u Zrenjaninu, Fabrika guma Toyo Tire u Indiji, Silosi u Bačkoj Topoli, Novom Bečeju, Bačkom Petrovom selu i mnogi drugi objekti.



ABOUT US

LHR d.o.o. was established in 1991 as a company for traffic, construction, and engineering, with its headquarters in New Belgrade, at 10 Tadija Sondermajer Street.

Today, LHR Ltd. is one of the leading construction companies in the fields of deep foundations, protection of foundation pits, and rehabilitation of facilities.

We specialize in manufacturing all types of piles, namely:

- Franky-Simplex, 406, 520, and 600 mm in diameter, piles cast in the soil;
- Steel piles and precast reinforced concrete piles;
- Drilled classic piles with diameters ranging from 400 to 2000 mm;
- Drilled CFA piles with a continuous spiral, 400 to 1000 mm in diameter;
- FDP (SDP) piles with diameters of 410 and 510 mm;
- "Mega" piles

We specialize in the installation of reinforced concrete walls in the soil, the so-called diaphragm walls, of the following thickness: 400 mm, 600 mm, 800 mm and 1000 mm, with a panel length up to 2.5 m and 3.0 m.



We also specialize in installing steel sheet piles of various cross sections.

According to the prepared construction design, the geological structure of the terrain, and conditions at the given location, the Investor opts for one of the above-mentioned types of piles or diaphragm walls in order to fund the facilities, protect the excavation of the foundation pit and neighboring facilities, rehabilitate facilities, etc.

In its previous practice, LHR has participated in a large number of important projects and has enviable references. Since its founding, the company has been constantly investing in the most up-to-date technology, as well as in the training of professional staff, which makes it one of the leading companies in Serbia that specialize in this type of work.

Our references are the following: Airport City, phases I and II, Navigator Business Center 2, Sirius I and II, IKEA, Hotel Mona, Voždove Kapije, Skyline, Blok 67a, Central Garden, Belgrade-Novи Sad-Kelbijia (state border) high speed railway, Smederevo Ironworks, TENT B, new flotation plant in Majdanpek, Ling Long tire factory in Zrenjanin, Toyo Tire tire factory in Indija, silos in Bačka Topola, Novi Bečeј, Bačko Petrovo Selo and many other facilities.

FRANKY-SIMPLEX

IZRADA FRANKY-SIMPLEX ŠIPOVA LIVENIH U TLU PREČNIKA 406, 520 I 600 mm DUŽINE DO 25 m

LHR izvodi Franky-Simplex šipove po "Delmag" tehnologiji a brza izrada ove vrste šipova pruža ekonomično rešenje pri fundiranju.

Proces izrade: Čelična cev zahtevanog prečnika se pobija do određene dubine pomoću dizel ili hidrauličnog malja, ubacuje se projektovani armaturni koš, vrši se betoniranje do zahtevane kote i cev se izvlači uz snažno vibriranje betona.

Prečnici čeličnih cevi za pobijanje su: 406, 520 i 600 mm dužine do 25 m. U odnosu na druge metode pobijanja ova tehnologija izvođenja je brža, nosivost ujednačena, a uticaj ljudskog faktora je sведен na minimum.

INSTALLING FRANKY-SIMPLEX, 406, 520, AND 600 mm DIAMETER PILES CAST IN SOIL OF UP TO 25 m.

LHR installs Franky-Simplex piles according to "Delmag" technology, and the rapid execution of this type of pile provides a cost-effective solution for funding.

The process of installation: a steel pipe of the required diameter is driven to a certain depth using a diesel or hydraulic hammer, then the designed reinforcing cage is inserted, concrete is poured to the required elevation, and the pipe is pulled out by strongly vibrating the concrete.

The diameters of the steel pipes are 406, 520, and 600 mm, and the length is up to 25 m. Compared to other methods of installation, this technology is faster, the bearing capacity is uniform, and the influence of the human factor is reduced to a minimum

1.

Makare DELMAG



2.

Pristan, Luka Bogojevo

Dock, Port Bogojevo



3.

Silos, Bačka Topola

Silos, Backa Topola





4.

Beogradska arena

Belgrade Arena



5.

Airport city
poslovne zgrade,
Beograd

Airport city
business park,
Belgrade



6.

NAVIGATOR 2
poslovni objekat,
Beograd

NAVIGATOR 2
business center,
Belgrade

GOTOVI AB ŠIPOVI

Gotovi AB šipovi mogu biti raznih oblika i dimenzija, i to:

- Kružni, kvadratni, osmougaoni i dr.
- Dimenzijs: 300x300mm, 350x350mm, 400x400mm, 450x450 mm

Ovi šipovi se pobijaju kod izrazito loših terena gde se noseći sloj nalazi na većoj dubini. Prednost ovih šipova je u kontrolisanom kvalitetu same izrade šipova kao i rad u svim vremenskim uslovima.

1.

Stambena zgrada
BLOK A na gotovim
pobijenim šipovima
450x450mm

Residential building
of Block A on precast
driven 450x450 mm
piles



2.

Tržni centar IKEA
na gotovim pobijenim
šipovima 400x400mm

IKEA shopping center
on precast driven
400x400mm piles



PRECAST RC PILES

Precast RC piles can be of different shapes and dimensions as follows:

- circular, square, octagonal, etc.
- dimensions: 300x300 mm, 350x350 mm, 400x400 mm, 450x450 mm.

These piles are used in extremely bad terrains where the load-bearing layer is located at a greater depth. The advantage of these piles is in their controlled quality of manufacturing as well as in the fact that they enable working in all weather conditions.



2.

Tržni centar IKEA
na gotovim pobijenim
šipovima 400x400mm

IKEA shopping center
on precast driven
400x400mm piles

BUŠENI ŠIPOVI

IZRADA BUŠENIH ŠIPOVA PREČNIKA OD 400 DO 2000 MM, SA I BEZ ZACEVLJENJA

Izvodimo bušene šipove prema sistemu koji prenosi torziju i vertikalnu silu pritiska na alate za bušenje putem teleskopske Kelly šipke. Šipovi se mogu se izraditi sa zacevljenjem i bez zacevljenja. Bušenje se obavlja rotacionom opremom za bušenje. Korišćenjem različitih alata za bušenje (burgija, baket, itd.) ovaj sistem se može primeniti na sve tipove tla, uključujući i stene.

Šipovi zahtevanog prečnika se buše na osovinskom rastojanju kako je dato u osnovi projekta. Zacevljenje se postavlja tačno na projektovano mesto šipa, izvrši se kontrola vertikalnosti pravca, fiksira se, a potom se pristupa bušenju. Nakon izrade bušotine u nju se ubacuje armaturni koš prema projektu, a zatim se vrši betoniranje šipa od dna uz pomoć cevi za kontraktorsko betoniranje. Ukoliko postoje podzemne vode, cev se postavlja do dna bušotine, postepenom ugradnjom betona cev se podiže unutar bušotine, pri čemu je njen vrh uronjen u beton, tj. ispod nivoa vode. Betoniranje jednog šipa mora biti strogo kontinualno bez prekida betoniranja celog šipa. Pošto se beton kontinualno unosi u zacevljenje ne dolazi do mešanja betona i podzemne vode, pa je time obezbeđena neprekidnost šipa. Paralelno sa betoniranjem šipa vrši se i postepeno izvlačenje zaštitnih kolona.

Veličina bušenih šipova omogućava da pored vertikalne nosivosti primaju i horizontalne sile. Nosivost se ostvaruje trenjem duž stabla, i oslanjanjem na čvrsto tlo ispod baze šipa.

Prečnik šipa diktira njegovu vertikalnu nosivost, tako da za prečnike od 400 mm do 2000 mm ona iznosi od 500 do 6000 kN.

1.

Zaštita temeljne jame
na gradilištu Skyline,
Beograd

Protective foundation
pits on the Skyline
construction site,
Belgrade



DRILLED PILES

INSTALLING DRILLED, 400 TO 2000 MM IN DIAMETER PILES, WITH AND WITHOUT CASING

We install drilled piles based on a system that transmits torque and vertical pressure force to drilling tools via a telescopic Kelly rod. Piles can be made with or without casing. Drilling is performed using rotary drilling equipment. By using various drilling tools (drill, bucket, etc.), this system can be applied to all types of soil, including rocks.

The required diameter piles are drilled at the axial distance specified in the design basis. The casing is placed exactly on the designed place of the pile, the direction is checked for verticality, it is fixed, and then drilling is started. After the drilling is made, a reinforcing cage is inserted into it according to the design, and then the piles are concreted from the bottom with the aid of a concrete tremie pipe. In the case of the presence of groundwater, the pipe is placed at the bottom of the bore. By gradually installing the concrete, it is raised inside the bore, while the tip of the pipe is immersed in concrete, i.e., below water level. Pile concreting must be strictly continuous without interrupting the concreting of the bore pile. Since the concrete is continuously introduced into the casing, there is no mixing of concrete and groundwater, thus ensuring the continuity of the pile. In parallel with concreting the pile, the protective casing is gradually pulled out.

The size of the drilled piles allows them to receive horizontal forces in addition to their vertical bearing capacity. Bearing capacity is achieved by friction along the body, and leaning on solid ground under the pile base.

The vertical bearing capacity of a pile is determined by its diameter: between 500 and 6000 kN for diameters between 400 and 2000 mm.



2.

Central Garden
Beograd

3.

Poslovni objekat,
Čanj, Crna Gora

Bussiness center,
Čanj, Montenegro



4.

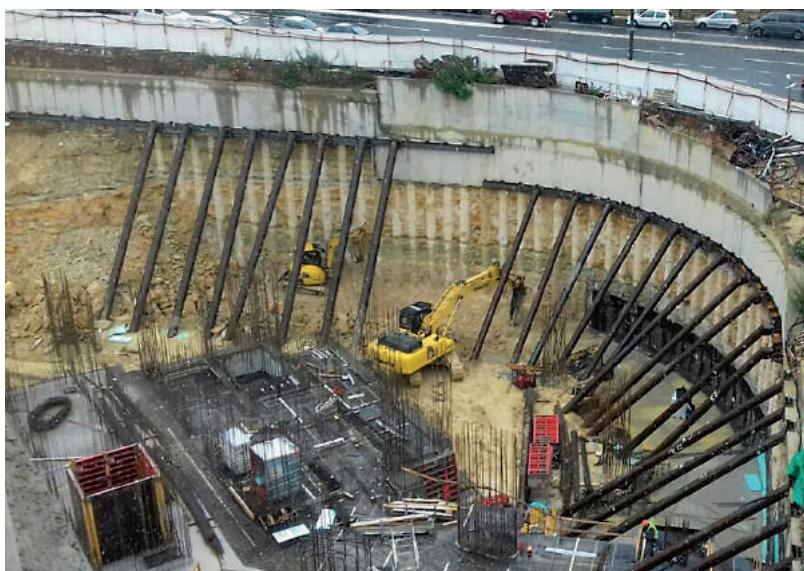
Mait HR 180,
Toyo Tire, Indija





5.

Skyline
Beograd



6.

Zaštita temeljne jame
na gradilištu Skyline,
Beograd

Protective foundation
pits on the Skyline
construction site,
Belgrade

C.F.A. BUŠENI ŠIPOVI

IZRADA C.F.A. BUŠENIH ŠIPOVA KONTINUALNOM SPIRALOM PREČNIKA OD 400 DO 1000 mm

LHR izvodi CFA šipove prečnika od 400 do 1000 mm dužine do 24 m.

Ovi šipovi imaju istu namenu i nosivost kao i klasično izvedeni bušeni šipovi. Izvode se brže i jednostavnije.

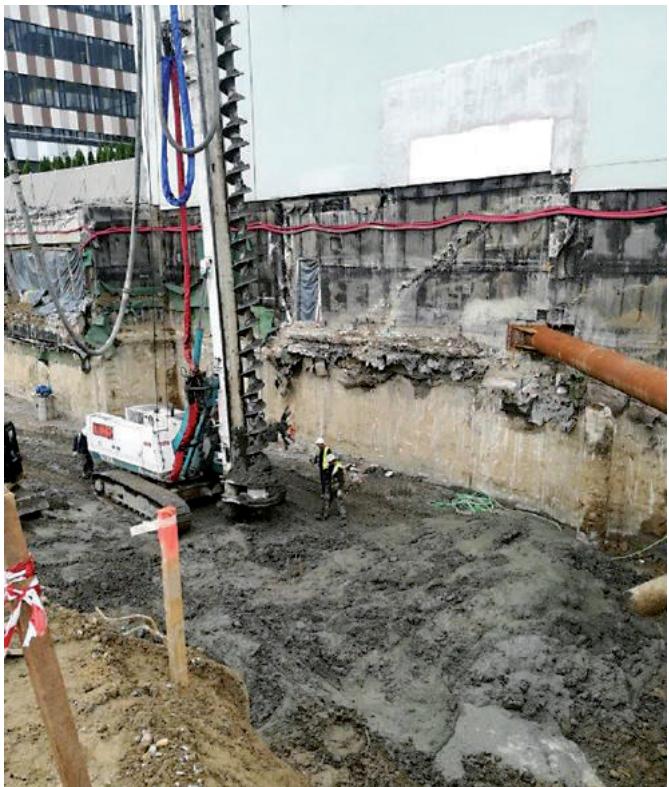
Tehnologija izrade šipa sastoji se iz bušenja tla beskonačnom spiralom prečnika od 400 do 1000 mm do projektovane dubine. Zatim se na vrh beskonačne spirale namontira izlaz betonske pumpe i kontrolisano se ugrađuje beton kroz središnji otvor beskonačne spirale od dna bušotine na više, uz postepeno izvlačenje beskonačne spirale iz bušotine. Po završenom betoniranju, uz pomoć vibratora u svež beton se ugrađuje ranije pripremljen armaturni koš.

Šipovi izvedeni kontinualnom spiralom, poznati kao CFA šipovi sve se češće upotrebljavaju jer je njihova izrada veoma ekonomična. Odgovarajućim projektovanjem i planiranjem, efikasnom opremom i sa iskusnom radnom snagom mogu se postići izuzetni učinci.

1.

Poslovni prostor
SIRIUS 1,
izrada CFA šipova,
Beograd

SIRIUS 1
business center,
execution of CFA piles,
Belgrade



C.F.A. DRILLED PILES

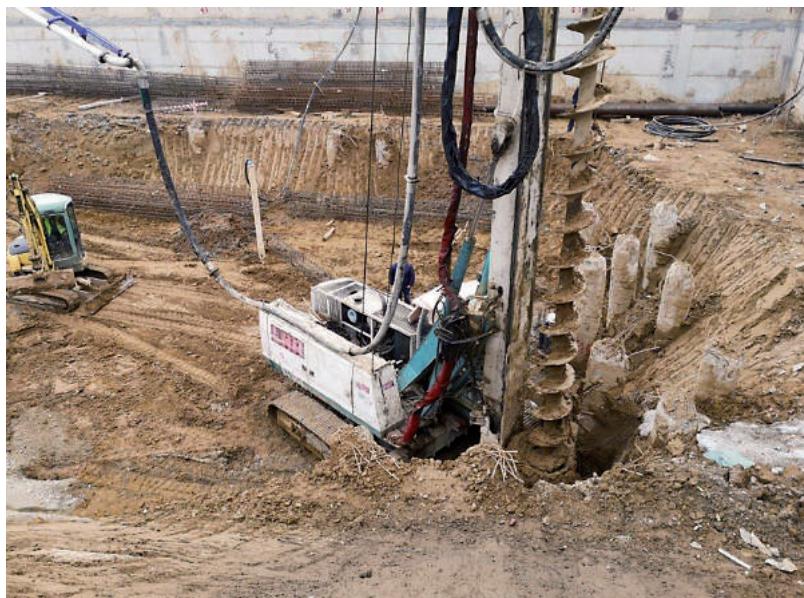
INSTALLING CFA DRILLED PILES WITH CONTINUOUS SPIRAL WITH 400-1000 mm DIAMETER

LHR installs 400 to 1000 mm in diameter CFA piles of up to 24 m length.

These piles have the same purpose and bearing capacity as the classic drilled piles. Their execution is faster and easier.

The technology of the pile executing consists of drilling the soil with an endless 400 to 1000 mm diameter hollow stem continuous flight auger to the projected depth. Then the concrete pump outlet is mounted on top of the endless spiral and concrete is installed in a controlled way through the central opening of the endless spiral from the bottom of the bore to the top, with the endless spiral gradually being pulled out of the bore. The previously produced reinforcing cage is inserted into the fresh concrete using a vibrator once the concreting is completed.

Piles made of a continuous spiral, known as CFA piles, are increasingly used because their execution is highly cost-effective. With proper design and planning, efficient equipment, and an experienced workforce, outstanding effects can be achieved.



2.

Stampeni objekat u
Vojvodanskoj,
izrada CFA šipova,
Beograd

Residential building in
Vojvodjanska street,
execution of CFA piles,
Belgrade

3.

Izrada "CFA" šipova

Execution of "CFA" piles

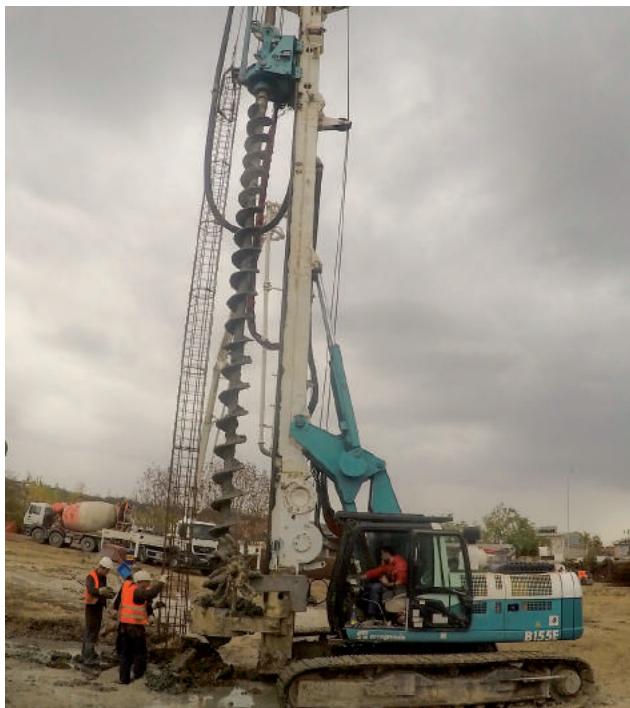


4.

Izgled iskopanih
CFA šipova

Appearance of
excavated CFA piles

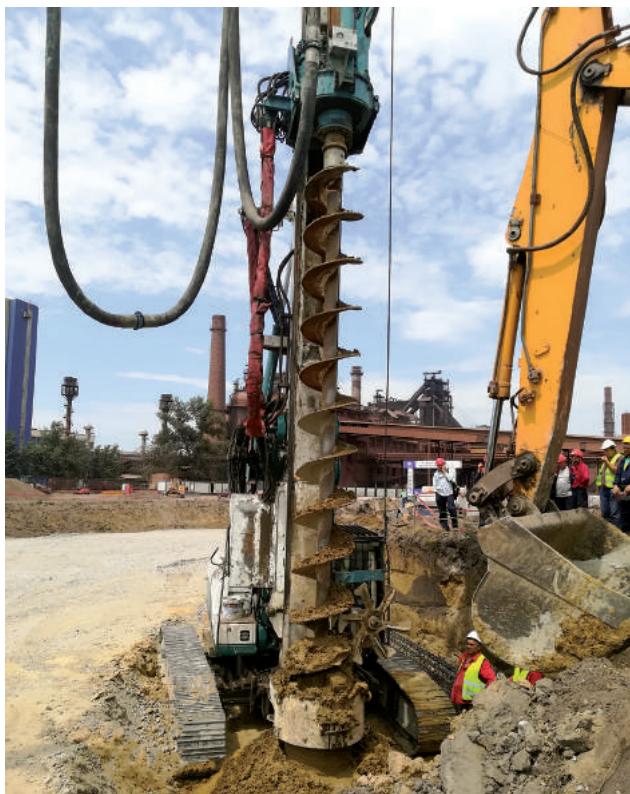




5.

Fabrika piva Heineken,
izrada CFA šipova,
Zaječar

Heineken brewery,
execution of CFA piles,
Zaječar



6.

Železara Smederevo,
izrada "CFA" šipova

Smederevo steel plant,
execution of "CFA" piles

SDP (FDP) ŠIPOVI

TEHNOLOGIJA IZRADE SDP ŠIPOVA PREČNIKA 410 i 510 mm (UTISKUJUĆI BUŠENI ŠIPOVI)

SDP (Soil Displacement Piles) šipovi su bušeni šipovi, liveni na licu mesta koji se izrađuju utiskivanjem burgije mašinom za bušenje uz veliki obrtni momenat. Predispozicija za uspešno izvođenje ovih šipova je moderna mašina sa velikim obrtnim momentom i snagom utiskivanja, kao i specijalizovan alat koji se koristi.

Glavne odlike SDP tehnologije su:

- Veći kapacitet nosivosti u odnosu na bušene šipove;
- Velika dinamika izrade (kao kod CFA šipova);
- Nema iskopanog materijala koji treba ukloniti.



1.

Izgled iskopanih
CFA šipova

Appearance of
excavated CFA piles

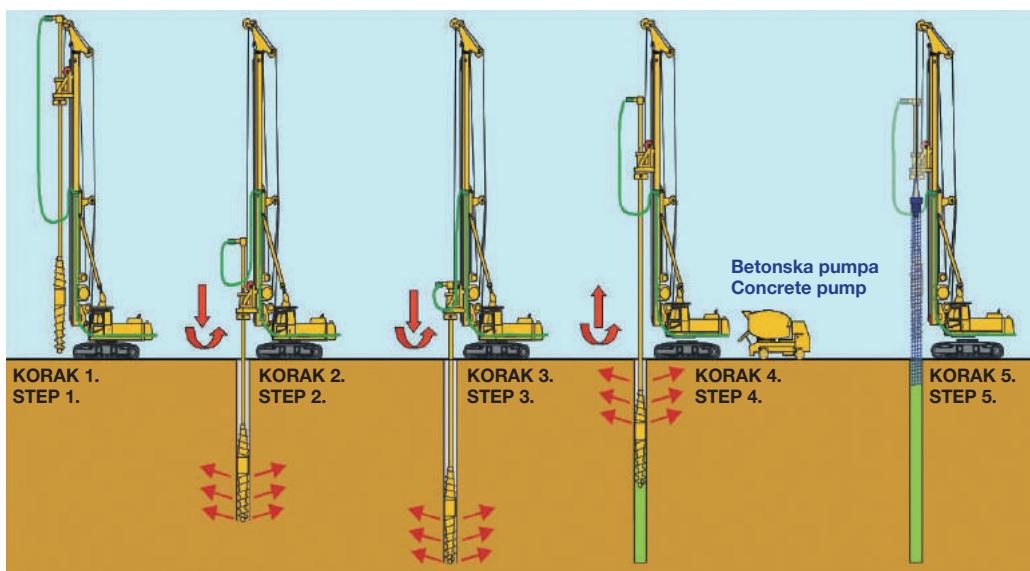
SDP (FDP) PILE

TECHNOLOGY OF MAKING SDP, 410, AND 510 mm IN DIAMETER PILES (DRIVEN DRILLED PILES)

SDP (Soil Displacement Piles) piles are drilled piles that are cast in-situ, which are made by driving a drill bit with a high-torque drilling machine. The prerequisite for the successful execution of these piles is a modern machine with high torque and pressing power, as well as a specialized tool that is used.

The following are the main features of SDP technology:

- Higher bearing capacity compared to drilled piles;
- High dynamics of production (as with CFA piles);
- There is no excavated material to be removed.



Pozicioniranje
mašine.

Positioning of rig.

Bušenje tla
utiskujućom burgijom
vrši se rotacijom i
utiskivanjem alata.Tlo
se oslobođa vrhom
burgije i utiskuje u
okolno tlo proširenim
telom.

Drilling of the
displacement tool
into the ground by
rotating and pushing
off the tool. The soil
is loosened by the
auger starter and
then pushed into the
surrounding soil by
the displacement
body.

Dubina bušenja se
može povećati do
10m korišćenjem keli
šipke.

Installation depth
can be extended up
to 10m by using the
kelly extension.

Nakon dostizanja
konačne dubine
alat se izvlači uz
pumpanje betona
kroz šupljinu alata.

On reaching the
final depth the tool
is extracted and
concrete is pumped
through the hollow
stem of the tool.

Instalacija armature
vrši se u svež beton.

Installation of
reinforcement
cage into the fresh
concrete.



3. Bauer BG24

AB DIJAFRAGME

IZRADA ARMIRANO-BETONSKIH DIJAFRAGMI DEBLJINE 400, 600, 800 i 1000 mm, SA DUŽINOM LAMELE OD 2,5 m i 3,0 m

Dijafragme se primenjuju pri zaštiti temeljnih jama, kao konstruktivni elementi, pri sanaciji klizišta, kao ulazno - izlazne građevine u tunelima, kao antifiltracione zavese i dr.

Sama operacija izrade dijafragmi se sastoji od iskopa lamele pod zaštitom bentonitske suspenzije, ugradnje oformljenog armaturnog koša, kao i ugradnje betona kontraktorskim postupkom.

Velika prednost dijafragmi je što se mogu izvoditi u gotovo svim vrstama tla, čak i ispod nivoa podzemne vode do značajne dubine.

Nijedan drugi metod nije doneo toliko promena u građevinarstvu kao što je to slučaj sa metodom izvođenja dijafragmi.

RC DIAPHRAGM WALLS

INSTALLING REINFORCED CONCRETE DIAPHRAGM WALLS OF 400, 600, 800, AND 1000 mm THICKNESS, WITH A PANEL LENGTH UP TO 2.5 m AND 3.0 m.

Diaphragms are used in the protection of foundation pits, as structural elements in the rehabilitation of landslides, as entrance-exit structures in tunnels, as anti-filtration screens, etc.

The operation of making diaphragms consists of excavating the panel under the protection of the bentonite suspension, installing the formed reinforcing cage, as well as installing concrete by the tremie concreting procedure.

The great advantage of diaphragms is that they can be installed in almost all types of soil, even to a significant depth below the groundwater level.

No other method has brought as many changes in civil engineering as the method of installing diaphragms.

1.

Poslovni prostor
NAVIGATOR 2,
izrada dijafragmi,
Beograd

NAVIGATOR 2
business center,
installing diaphragms,
Belgrade



2.

Poslovni prostor
NAVIGATOR 2,
izrada dijafragmi,
Beograd

NAVIGATOR 2
business center,
installing diaphragms,
Belgrade





3.

Poslovna zgrada
izrada dijafragmi,
Beograd

Business center,
installing diaphragms,
Belgrade



4.

Poslovna zgrada
izrada dijafragmi,
Beograd

Business center,
installing diaphragms,
Belgrade

POBIJANJE ČELIČNIH TALPI RAZNOG POPREČNOG PRESEKA

Jedna od najstarijih i najrasprostranjenijih tehnika za potporu dubokih iskopa i osiguranja kosina. Talpe se mogu koristiti kada je varijanta fleksibilnog potpornog zida prihvatljiva, npr. duž ulica, kao i u slučaju kada tlo iza objekta nema dovoljnu nosivost.

“Larssen” talpe, kao i talpe ostalih svetskih proizvođača, su najčešće upotrebljivana vrsta čeličnih talpi. Mogu se koristiti za sve vrste radova u građevinarstvu.

U nedostatku ovih talpi uspešna zaštita temeljnih jama se sprovodi i sa klasičnim “I” profilima.

Trajinost čeličnih talpi omogućava da se koriste i kao stalne konstrukcije, a imaju i višestruku primenu kao privremeni objekti.

INSTALLING STEEL SHEET PILES OF VARIOUS CROSS SECTIONS

This is one of the oldest and most widespread techniques for supporting deep excavations and securing slopes. Sheet piles can be used when a flexible retaining wall variant is acceptable, e.g. along streets as well as in cases when the soil bearing capacity behind the building is insufficient.

“Larssen” sheet piles, as well as piles from other major manufacturers, are the most commonly used types of steel sheet piles. They can be used for all types of construction work.

In the absence of sheet piles, the successful protection of foundation pits is also carried out using classic “I” profiles.

The durability of steel sheet piles allows them to be used as permanent structures, and they have multiple applications as temporary structures.



1. Pobijanje talpi / Installing sheet piles



2.

Pobijanje talpi,
crpna stanica
Obrenovac

Installing sheet piles,
pumping station
Obrenovac

ANKERI (GEOTEHNIČKA SIDRA)

TEHNOLOGIJA IZVOĐENJA AKTIVNIH GEOTEHNIČKIH ANKERA

Aktivni ankeri služe za utezanje i pridržavanje zaštitne konstrukcije. Rad na izradi projektovanih ankera se odvija po sledećim fazama:

- obeležavanje položaja i broja ankera na izvedenim šipovima
- bušenje rupa za ankere
- proširenje bušotina sidrene zone
- priprema ankera
- ugradnja pripremljenih ankera
- injektiranje sidrene zone i slobodnog dela ankera
- utezanje ankera na projektovanu silu.

ANCHORS (GROUND ANCHORS)

THE TECHNOLOGY OF INSTALLING ACTIVE GROUND ANCHORS

Active anchors are used to tighten and stabilize the protective structure.

Developing anchors consists of the following stages:

- Marking the position and number of anchors on the installed piles
- Drilling bores for anchors
- Expanding the bores of the anchor zone
- Preparing the anchors
- Installing the prepared anchors
- Injecting the anchor zone and the free part of the anchor
- Tightening the anchor to the designed force.



1. Mašina za ankerovanje / Anchoring machinery

“MEGA” ŠIPOVI

IZRADA “MEGA” ŠIPOVA, CEVASTIH PREČNIKA OD 100 DO 400 mm, KAO I BETONSKIH PREČNIKA 200, 300 mm

Mega šipovi koriste se za ojačanje i sanaciju temelja već postojećih objekata u nekoliko varijanti:

- Delimično ili potpuno poduhvatanje temelja usled prekomernog sleganja tla koje se manifestuje pukotinama i naprslinama na zidovima temeljima. Ovim se sprečavaju tonjenja i druga ozbiljna oštećenja.
- Poduhvatanje oštećenog temelja radi njegove sanacije i vraćanja u vertikalni položaj.
- Poduhvatanje temelja kako bi se povećala nosivost ili omogućila dodatna opterećenja postojećem objektu.

“Mega” šipovi se često izvode u kombinaciji sa bušenim šipovima pri zaštiti temeljnih jama u gradskim jezgrima, kao i u drugim ograničenim uslovima.

“MEGA” PILES



INSTALLING TUBULAR, 100-400 mm IN DIAMETER, AS WELL AS CONCRETE, 200 AND 300 mm IN DIAMETER “MEGA” PILES

Mega piles are used to strengthen and rehabilitate the foundations of existing buildings in several modes:

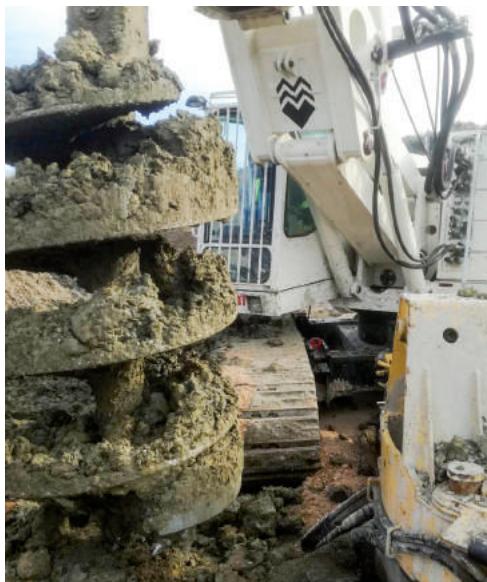
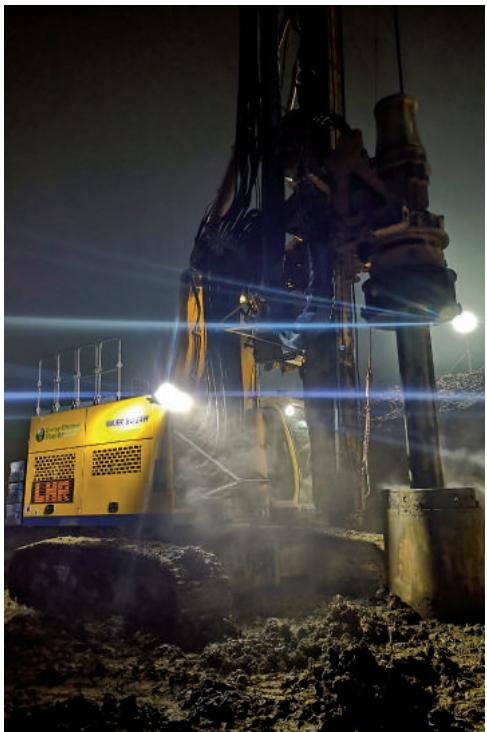
- supporting partially or completely the foundation due to excessive subsidence of the soil, which is manifested by cracks and fissures in the foundation walls. This prevents sinking and other serious damage.
- supporting the damaged foundation in order to repair it and return it to a vertical position.
- supporting the foundation in order to increase bearing capacity or allow additional loads to be applied to the existing facility.

“Mega” piles are often installed in combination with drilled piles to protect foundation pits in city cores, as well as in other limited conditions.

1. Glava “Mega” šipa / “Mega” pile head











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