

SMP

Professionalism confirmed by experience



CHALLENGING PROJECTS WITH **SMP-ENGINEERING**

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In Brief

- **Tunneling**
- **Oil and Inclined wells**
- **HDD**
- **R&D**
- **Engineering and Consulting**
- **Highly Qualified Personnel**

Brief History

A comparatively small engineering company founded in 2013 with a team of extremely experienced engineers in tunneling and HDD.

3D designers from aviation industry joined the team in 2015 substantially increasing our ability to create, calculate and present to the customer our engineering solutions or solutions of our partners.

Major customers: wesu GmbH (Germany), Bessac (France, Singapore), Tatoi (Russia), Universal HDD (USA), Riyada Group (Bahrain, Middle East), ZAO Priss (Russia, Romania)

Our web-page: www.smp-engineering.com



Vasily Anishchenko
Founder, Executive Director



What We Can Do for You

1. Cost effective assistance to engineering companies prior to challenging projects
2. Customer support at tunneling and drilling projects
3. Research and development. New equipment. New technology
4. Providing of highly qualified personnel for HDD and tunneling projects



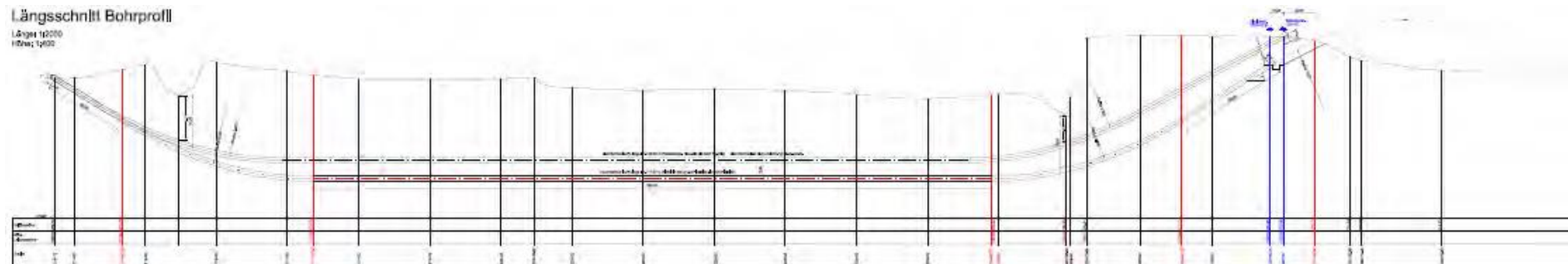
COST EFFECTIVE ASSISTANCE TO ENGINEERING COMPANIES PRIOR TO CHALLENGING PROJECTS



Customer Support

- Project analysis, geological reports, survey analysis
- Compilation of method statement
- Engineering calculations: drilling trajectory, strength, buoyancy control etc.
- Repairs, service and maintenance of Mega and Maxi HDD rigs.
- Job site drawings and designs
- Control of the hole geometry before pipe pull in
- Drilling fluids engineering
- Education of customers' specialists
- Pipe site layout (s-curve geometry, roller supports, measures to reduce pull force)

In the picture:
1750 m 56" HDD
crossing across
Amudaria





Tunneling

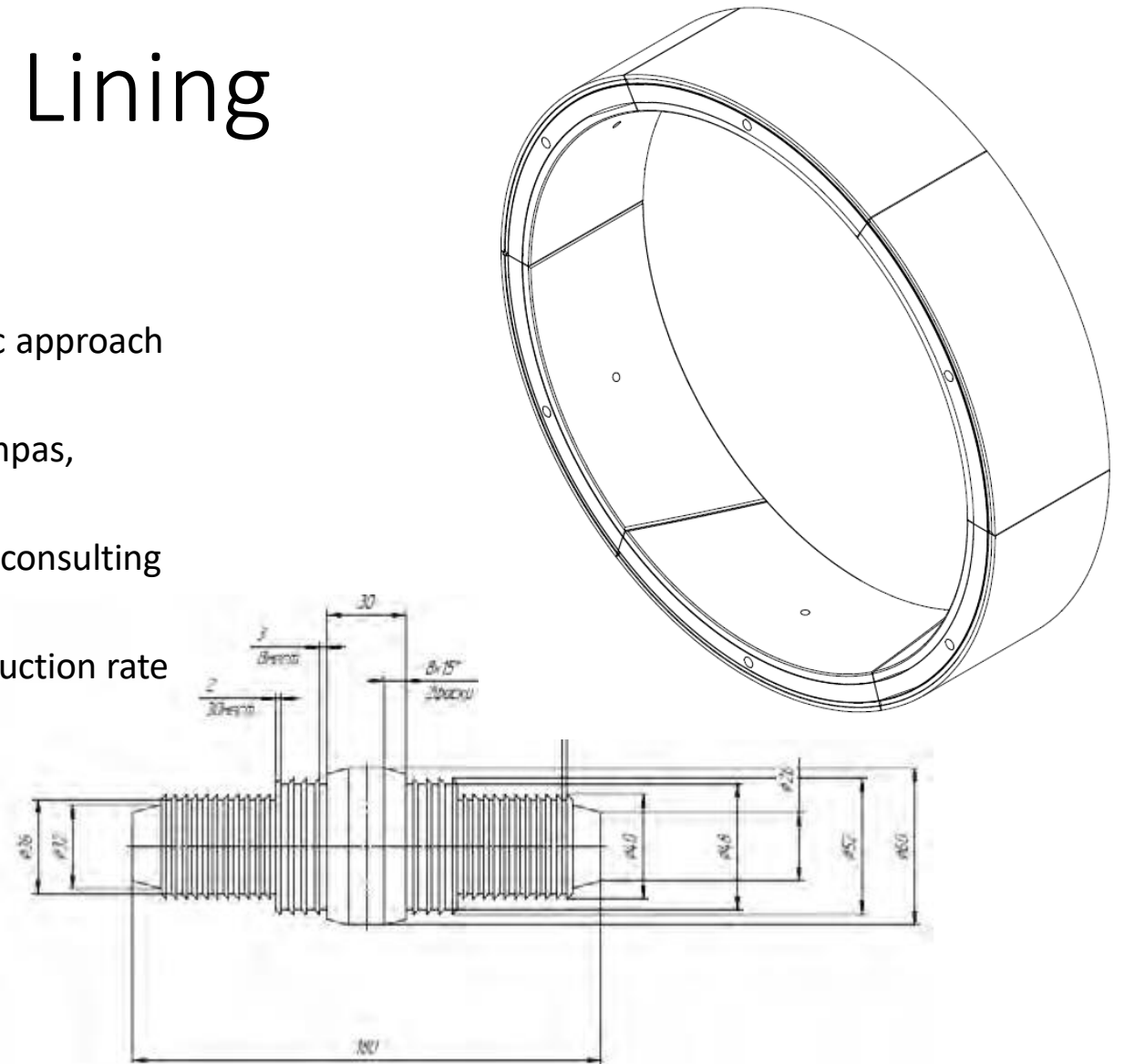
- Design of segmental lining
- Strength calculations
- Project engineering
- Trajectory calculations
- Job site layouts
- Method statements
- Experienced personnel provision
- Job site project support:
 - ✓ trouble shooting,
 - ✓ crisis management, etc.





Design of Segmental Lining

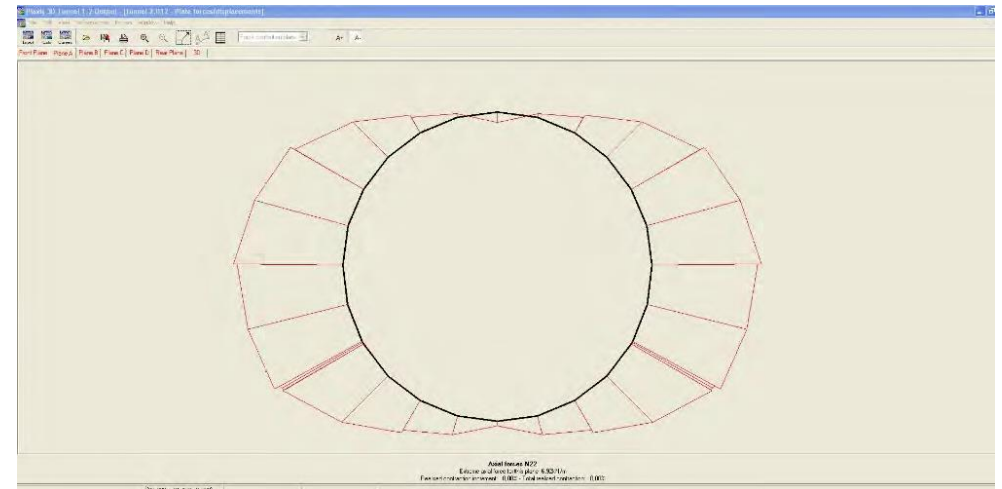
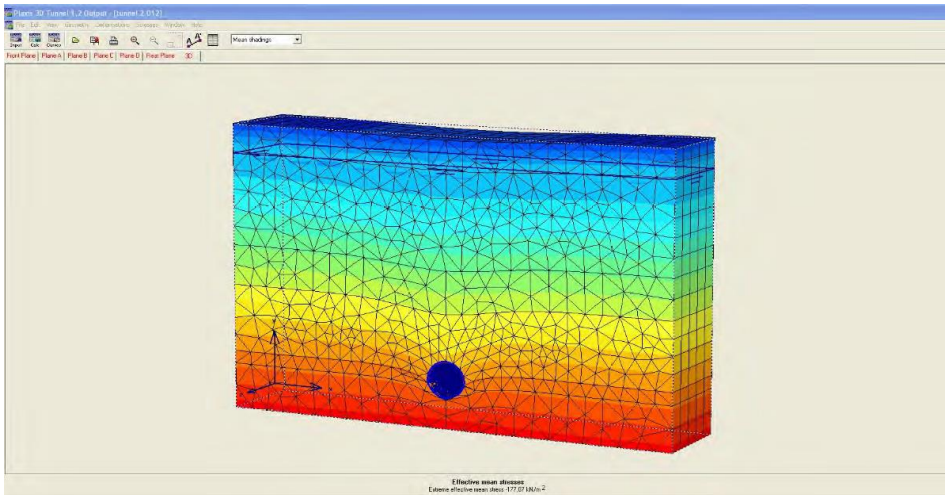
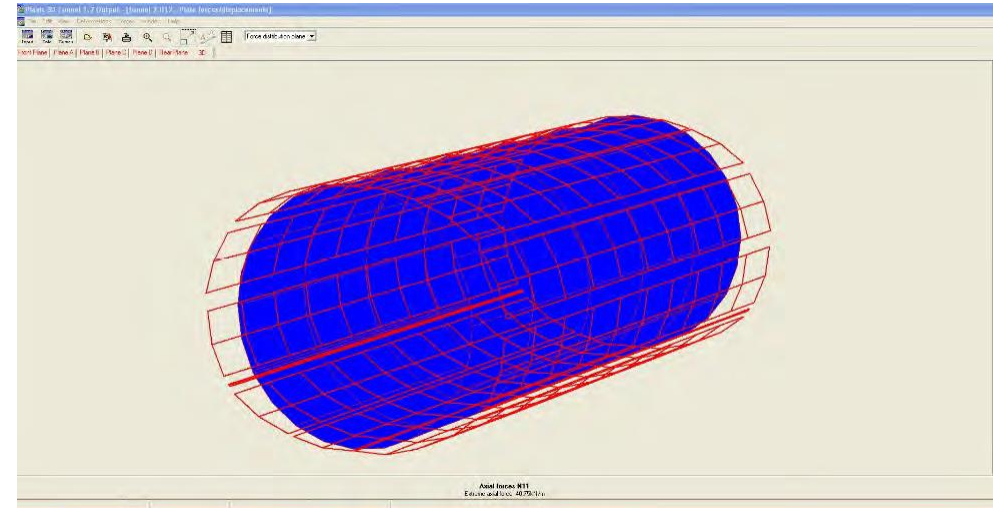
- St. Petersburg central collector
- New types of segments (cone pins). Dynamic and static approach to design
- 3D modelling (dynamic and static): Solid, Inventor, Compas, Autocad (link to CAD files can be sent at request).
- Getting positive approval from independent European consulting companies
- Consulting the customer on segment production (production rate calculation for carousel and linear production lines)





Strength Calculations for Pipes and Segmental Rings

- Plaxis Tunnel 3D software
- Hand control of the results
- Reinforcement design and recommendations to the concrete based on the calculation results





Method Statements / Local Regulations

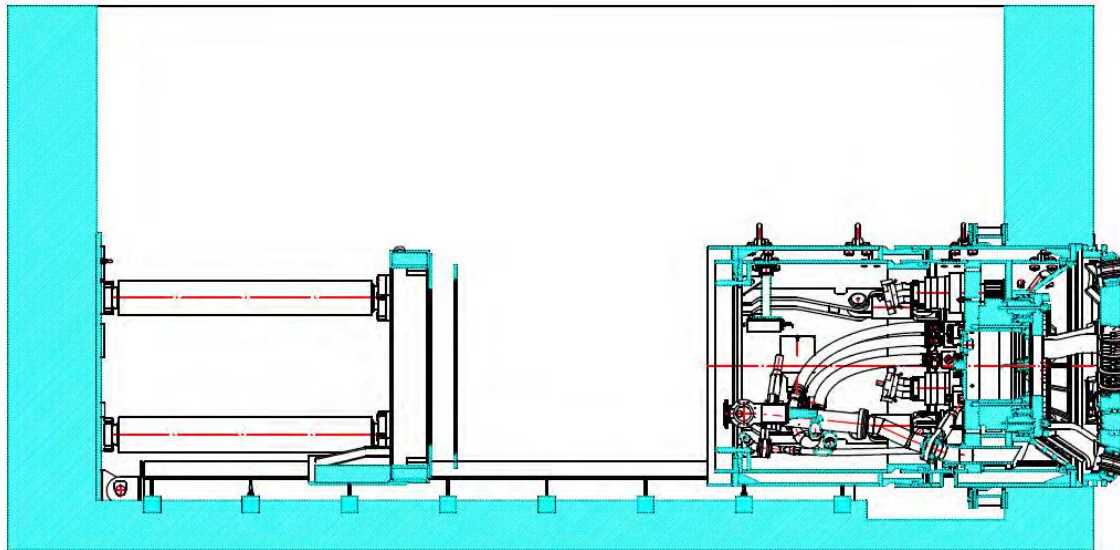
- Considering all project conditions
- Considering existing and new equipment
- Studying all available technologies
- Considering available methods
- FR Standard “Trenchless Oil Pipelines Crossings under Roads and Rail Roads in Russian Federation” was 90% developed by SMP, Customer: Transneft
- Mud programs
- ETC
- Feasibility reports (technical and financial)



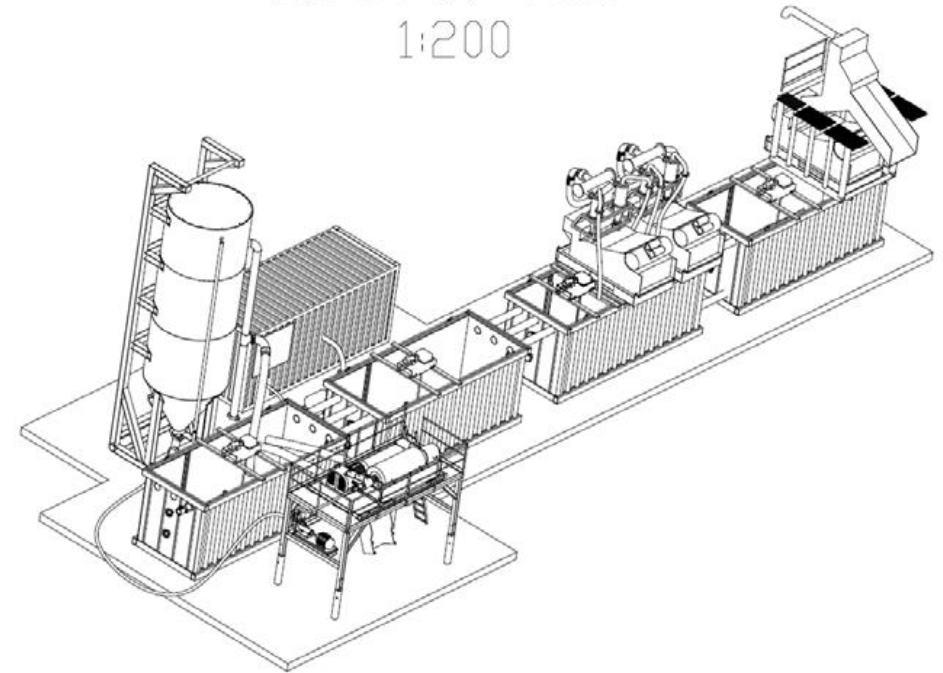


Project Engineering

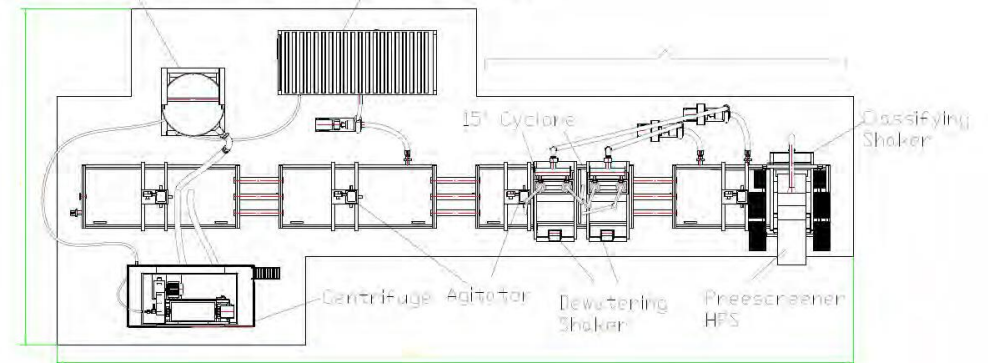
- Job site layouts (3d and 2d)
- Design of individual site assemblies
- Manuals for equipment
- Manuals to technological processes
- Charts, diagrams, wiring, etc.



General View
1:200



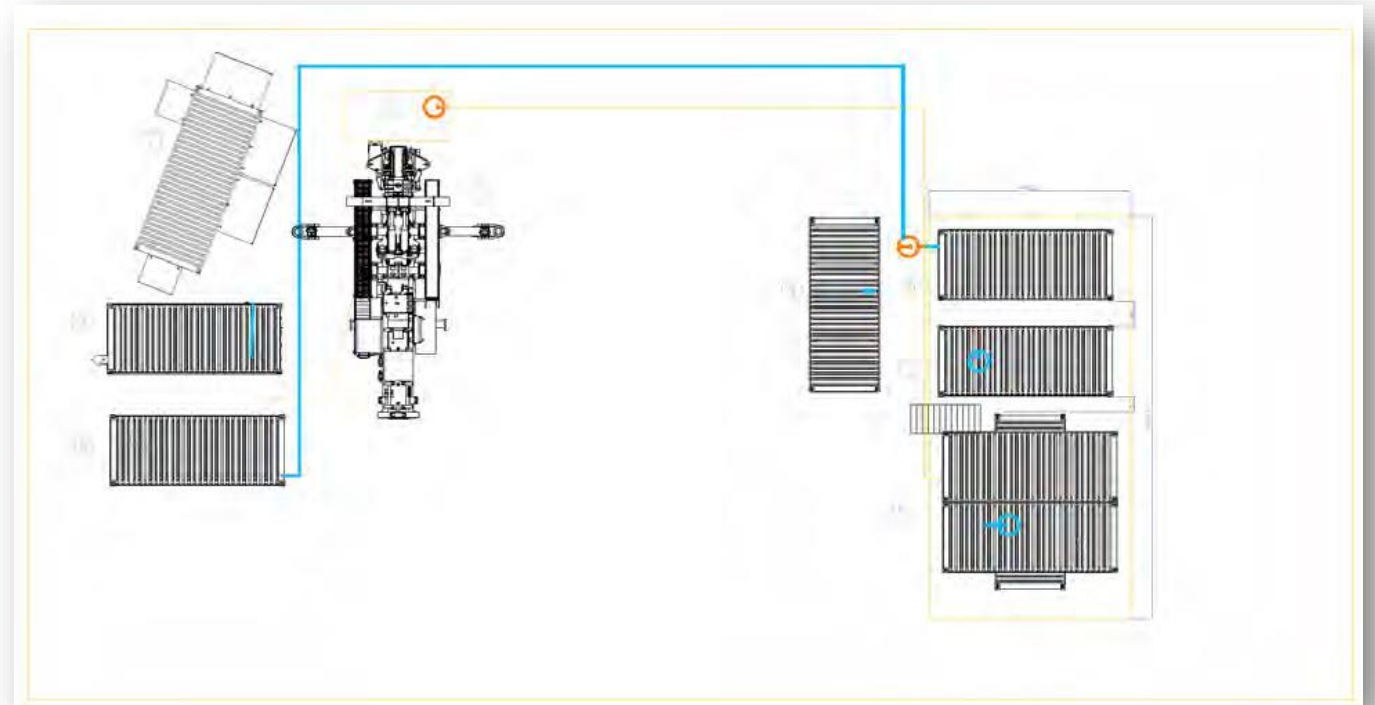
Vertical Clarifier HVC 27 Automatic Flocculation Unit





HDD Job Site Engineering and Consulting

- Job site layout, recommendations in Mega projects
- Mostly as a subcontractor of Russian oil and gas companies or as a subcontractor of European companies. No experience of independent bidding in Europe.



Picture. SDD job site fluid scheme. Connecting mud feed and return lines is easier after a proper design plan.

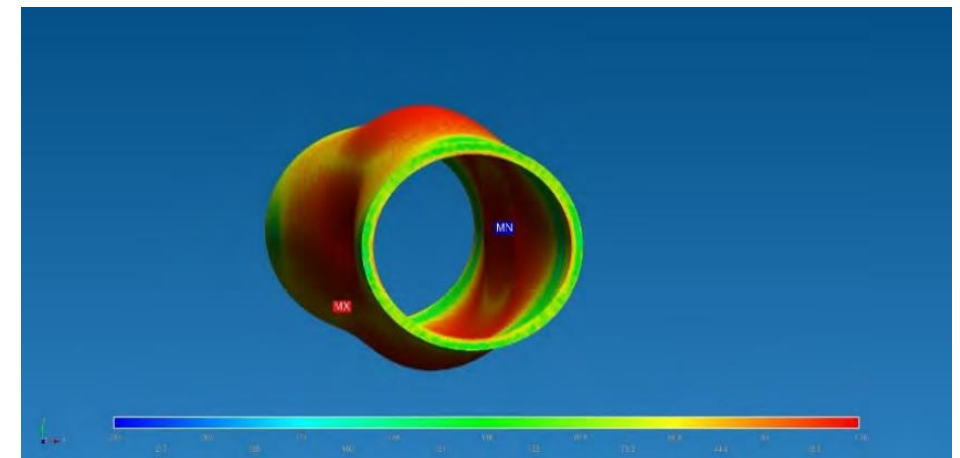
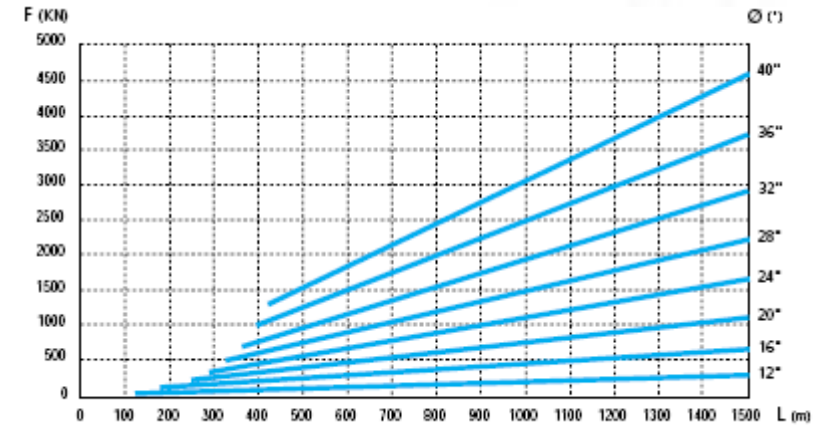


Choice of the Rig. Pipe Stress Analysis. Trajectory Checking

$$P_{tc} = \frac{2E}{1 - \nu^2} \frac{1}{\frac{D}{t} \left(\frac{D}{t} - 1 \right)^2}$$

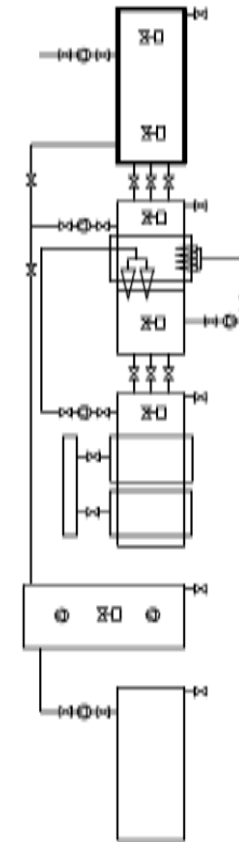
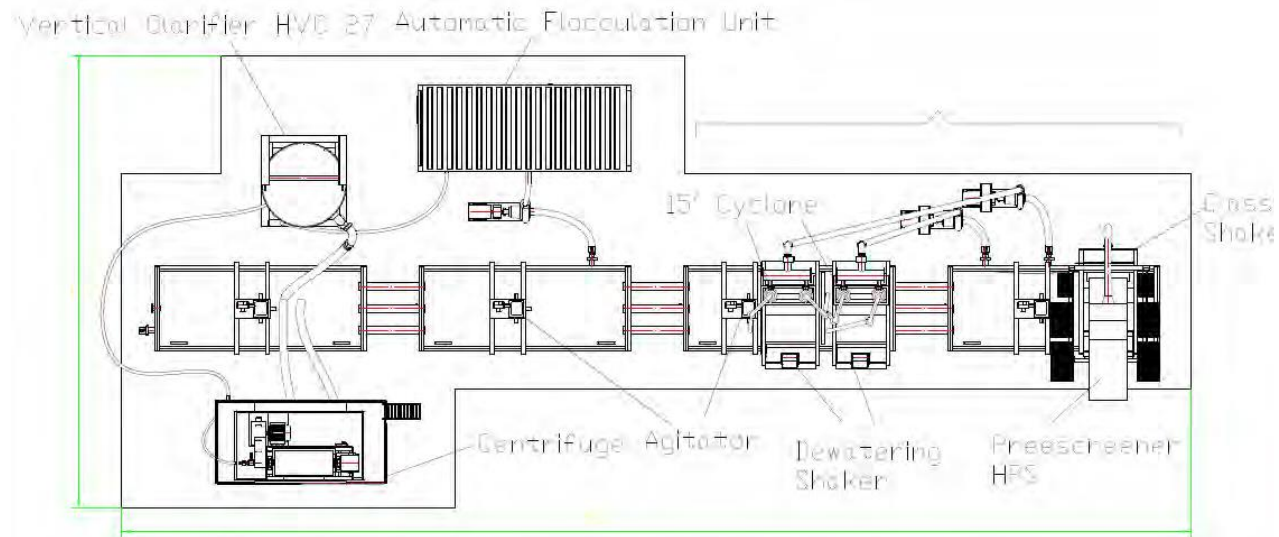
RivCross Survey Export 2.6.5
New Job
25/7/2011

Joint	MD	Incl	Az	Away	Elev	Right	Dls	Build/Joint	3 Jt Av	Ream 3 Jt Rad (m)
23 (+1.43)	226.74	91.13	172.63	219.89	-7.32	-1.91	5.21	0.63	0.19	3069
24 (+1.56)	236.26	91.96	172.61	229.4	-7.06	-1.86	2.76	0.83	0.53	1074
25 (+1.46)	245.75	92.86	173.18	238.88	-6.67	-1.73	3.13	0.9	0.79	728
26 (+1.24)	255.16	94.44	172.4	248.27	-6.07	-1.65	6.01	1.58	1.10	519
27 (+0.9)	264.44	96.06	171.96	257.52	-5.23	-1.68	5.46	1.62	1.37	419
28 (+0.69)	273.81	98.94	171.99	266.8	-3.98	-1.73	7.62	2.88	2.03	283
29 (+0.38)	283.2	101.14	171.41	276.04	-2.33	-1.82	6.44	2.2	2.23	257
30 (+0.26)	292.64	102.09	171.15	285.28	-0.4	-1.96	2.29	0.95	2.01	285
31 (+0.09)	301.99	101.76	172.1	294.43	1.51	-2.09	4.97	-0.33	0.94	610
31 (+9.53)	311.43	102.95	171.94	303.66	3.52	-2.15	4.58	1.19	0.60	950





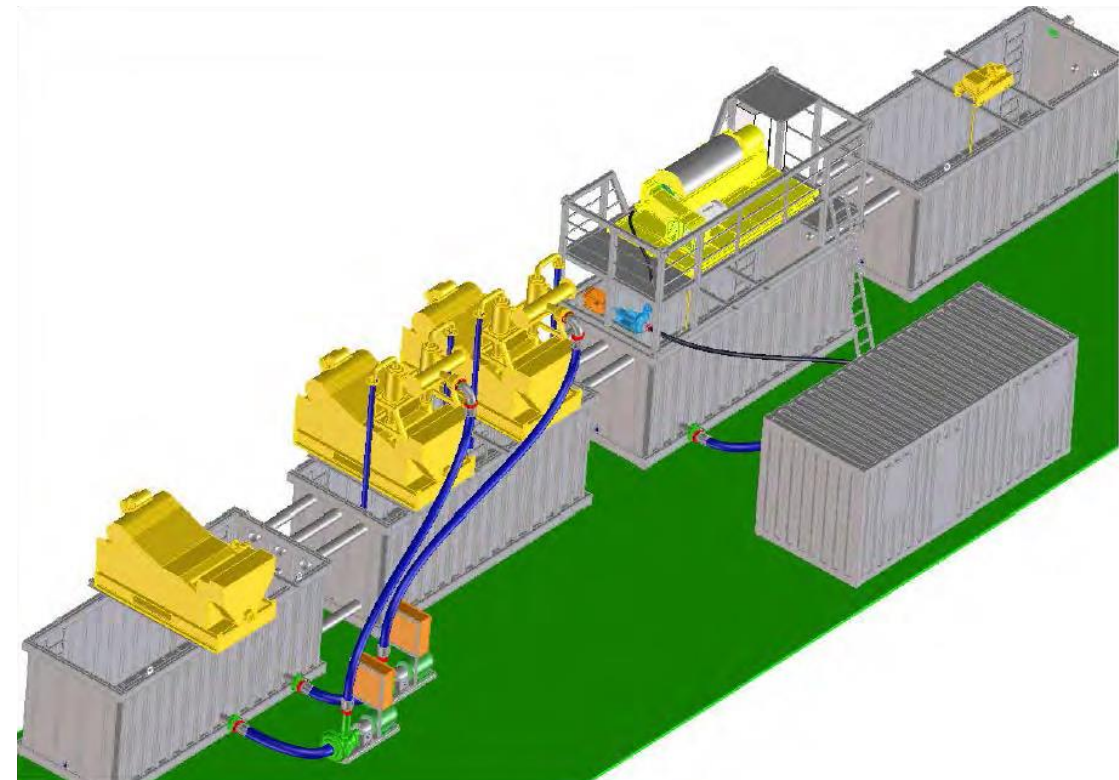
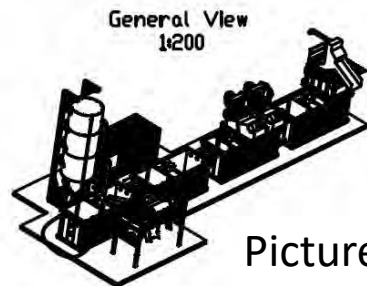
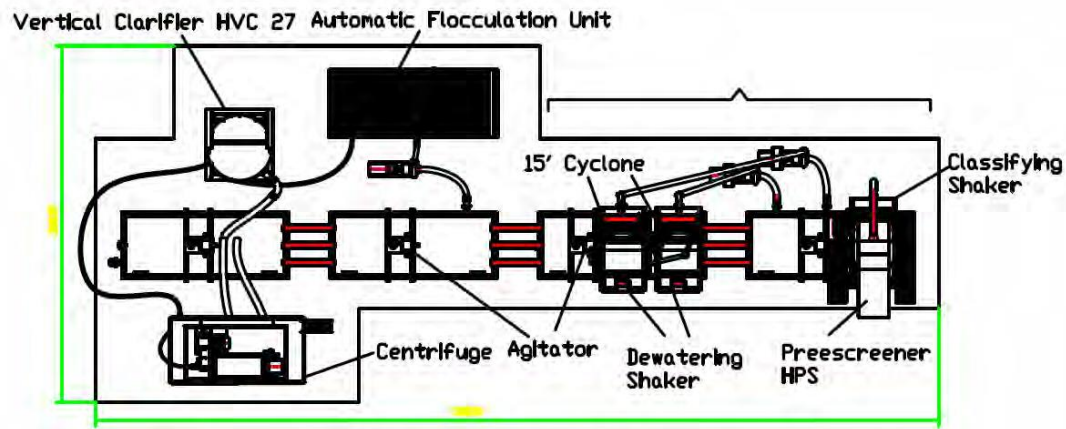
Job Site Layout. Separation Plants' Design. Mud Cleaning Program. Pumps. Mud Motors. RSS. Rigs of Any Type and Producer



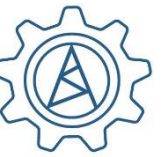
Pictures: Separations plants for a project in Australia and Canada.
A proper drawing with a specifications make the assembly process a lot easier



Job Site Layout. Separation Plants' Design. Mud Cleaning Program. Pumps. Mud Motors. RSS. Rigs of Any Type and Producer



Pictures. 3D solid works. Model of a separation plant from the previous foil.



CUSTOMER SUPPORT AT TUNNELING AND DRILLING PROJECTS



Problem Solving

- St. Petersburg crossing under a rail road. Oil and gas construction failed to build a shaft due to high water level and silt with zero cohesion. After finishing the sheet piles a special concrete was injected into the future bottom of the shaft. The project was finished successfully. SMP specialists administered the operation at the request of our customer.





Problem Solving

- Kurkino river direct pipe crossing. Project Owner: Gazprom. General contractor: Podzemburstroy. Equipment: MTS. The specific gravity of water in the slurry lines due to harsh geological conditions stopped the pumps. SMP came to the job site for problem solving. Educated the general contractor how to use flocculation, but as there were no standard flocculants available, found a solution at a local chemical factory. The project was a success.





- 1750 m of 56 inch gas pipeline crossing along the pipeline Turkmenistan -China (world record HDD job)
- 1000 m of 56 inch gas pipeline crossing in Vologda, Russia (gravel and small boulders in sand and clay), the pipeline was pushed, not pulled into the hole
- 980 m of 56 inch pipeline crossing the Sukhon River in Russia
- Ashalchi Bitumen oil Field development (supervision and engineering contract for the first 30 wells 1 -1.5 km)
- Numerous smaller HDD projects in North Dakota, South America, Russia, Middle East, Korea etc.





HDD Job: Turkmenistan 1420 (56") Pipe 1750 Meters





Yarega Heavy Oil Field. SAGD Wells. Launch of Innovative Equipment





Bessac TBM Designed and Built for Minsk Metro

- SMP organized contact with the customer
- Provided specification and consulting at the design stage
- Designed problem solving solutions at most crucial points
- Job site assembly
- First 500 meters of Tunneling was carried out by SMP specialists





Unconventional HDD and Drilling Job Sites



Most of engineering and drilling companies either apply strictly traditional solutions to unconventional projects or try to avoid innovative approaches.



Ashalchi SAGD Project

- Drilling of inclined 1 mile long wells at Ashalchi and Yarega heavy oil fields.
- First trial of technology with rack and pinion rigs.
- Convinced the customer that the technology would cut down drilling expenses 50%.
- Successfully supervised the first 30 wells. Consulting contract with TATOIL.





HDD Projects in North Dakota in 2015 and in Kuwait in 2016 / 2017. Contractor Support (precision pipeline)

- Launching rigs
- Education the customer's specialists
- Trouble shooting
- Problem solving
- Subcontracting to local engineering and drilling companies





Research and Development



Design Department

- Four people with huge experience, our own office space in Russia, one supervisor in Germany, all customers are in Germany, France and USA, no Russian customers.



Novelties

- Navigational systems (Indoor GPS+ Optical-LazerGyro Systems in cooperation with the Silicon Valley companies in LA)
- Water blasting (using cumulative water effect on the face of the rock tunnel, being tested in the laboratory, first test: concrete block split, laboratory destroyed(. The next test should be done at the face of a tunnel.)





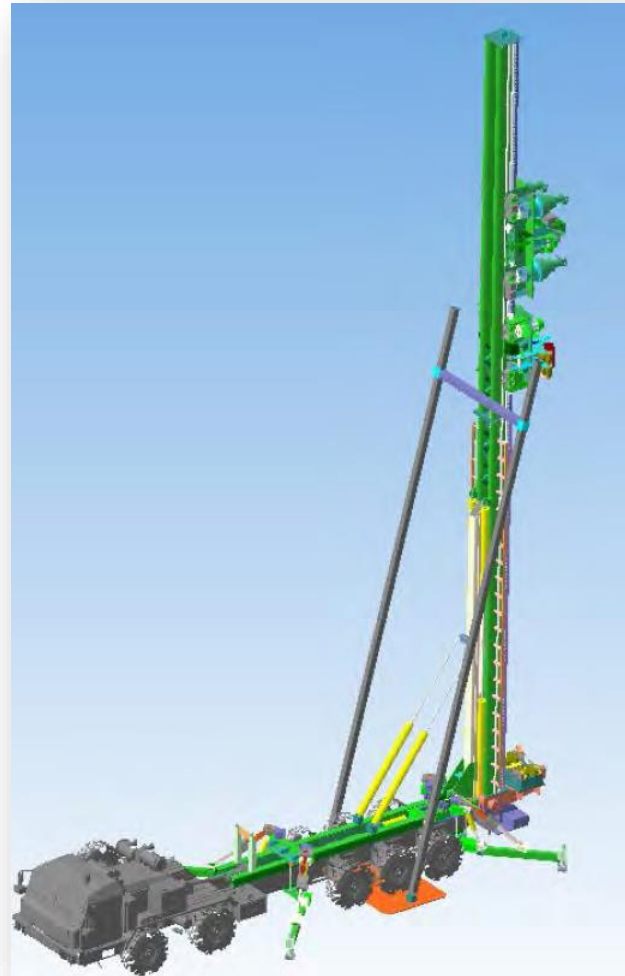
Design of New Generation Drilling Rigs

- The design was accomplished by SMP for Russian biggest coal producer SUEK. The production is planned in Chicago, USA.
- The picture is taken from a 3D Inventor drawing engineered by a team of SMP design engineers. CAD file can be sent confidentially at request.





Design of New Generation Drilling Rigs





Inclined Drilling



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- Vertical Drilling
(since 1920s)

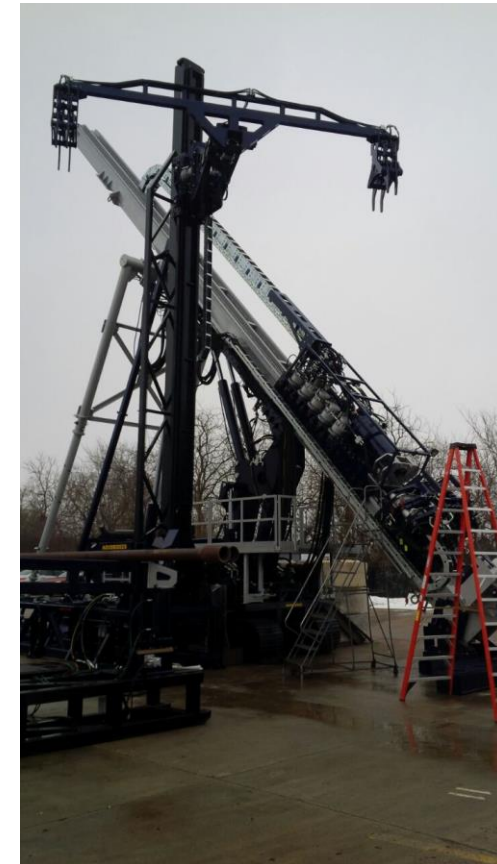
- HDD (since 1972)

- Slant Directional Drilling, SDD (since 2011)



ADI Rigs Produced in Chicago

- Concept of the rig by SMP
- General design – team work of SMP and UNI specialists
- Production in Chicago
- Field testing and supervising - SMP



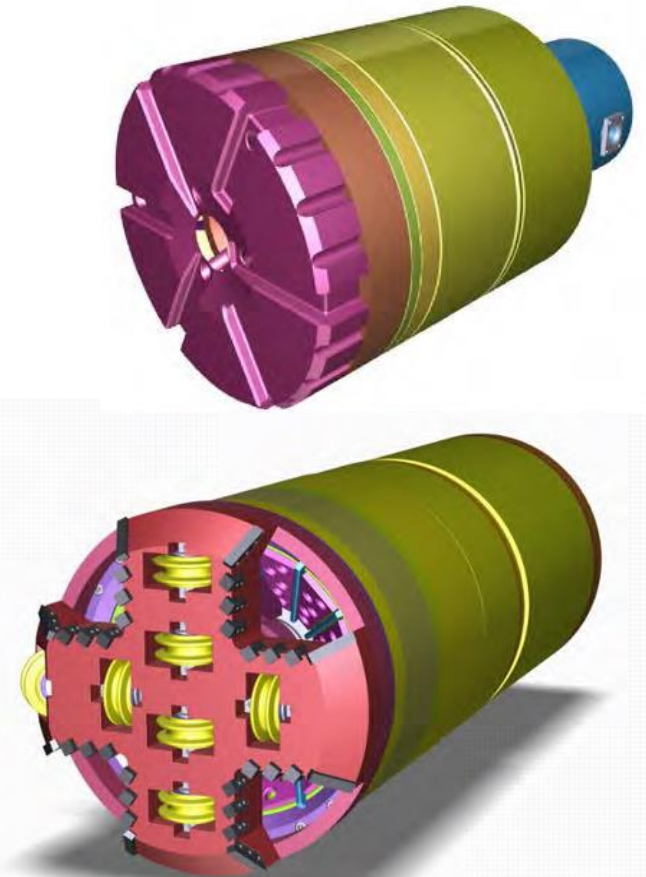
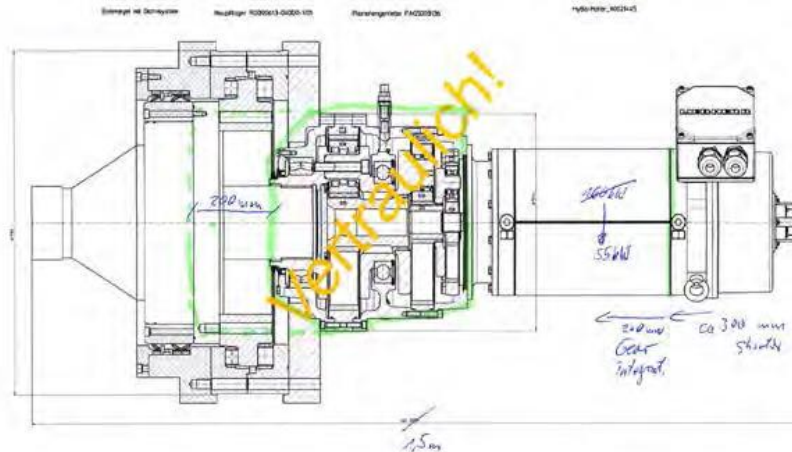




Developing New Generation Tunneling Equipment

- AVN 800 with Liebherr 57 kW Electric Drive designed by SMP supervised by WESU GMBH
- Air hammer + Auger Boring machine designed by SMP and WESU GMBH
- 3D files at request

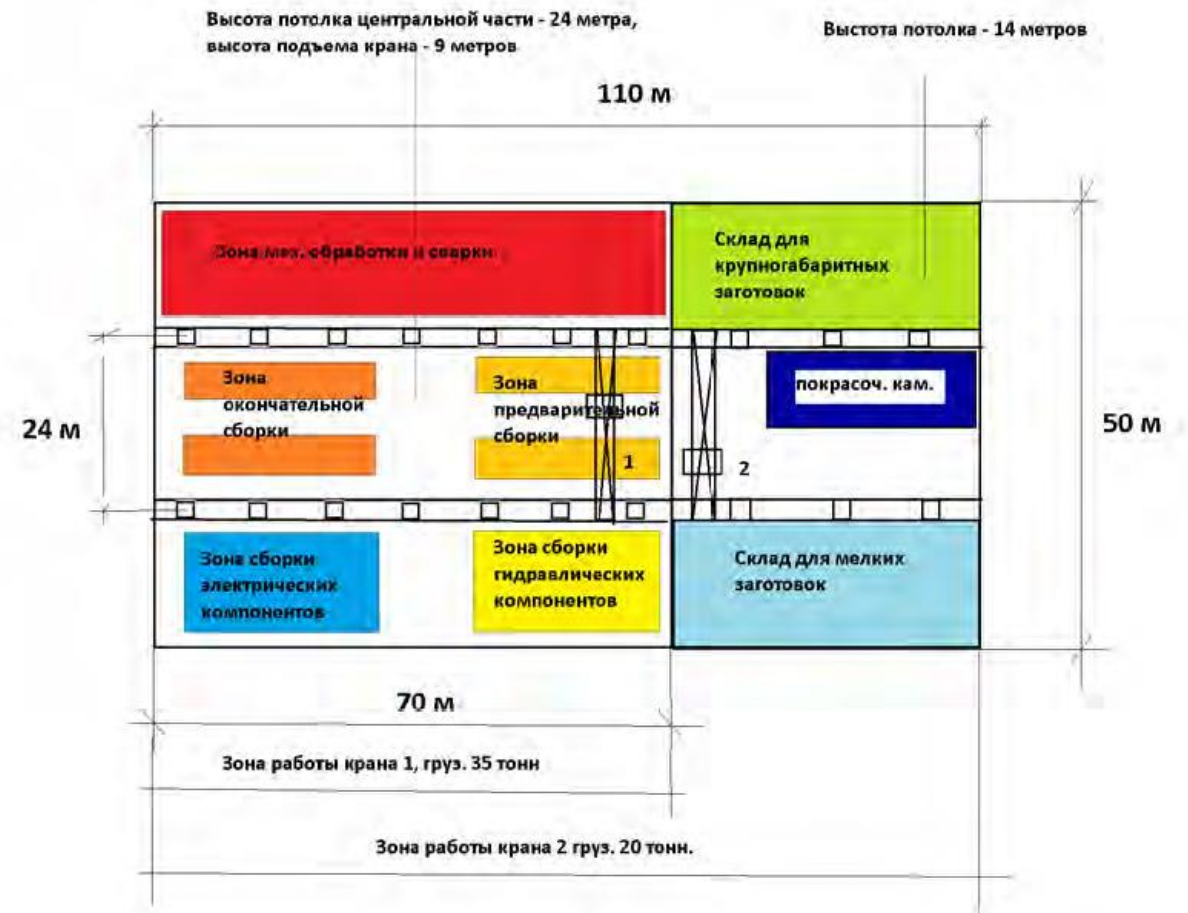
Projekt MTB 800 / Antriebskonzept – Liebherr Komponenten Elektrisch





Engineering of Equipment Production Processes. Consulting

- Plans of shops, technical requirements and consulting on logistics of components and production technology. Consulting of Universal HDD in production process.





PROVIDING OF HIGHLY QUALIFIED PERSONNEL FOR HDD AND TUNNELING PROJECTS



Job Site Support Personnel with Over 10 Years Experience in Tunneling

- TBM Operator, Mechanical and Hydraulic Engineer, Project Manager Alexey Bykovskiy
- TBM Electrician, Hydraulic / Electronics / Mechanical Engineer Evgeny Bocharov
- Mechanical Engineer/TBM Design Engineer Alexander Nesterov
- TBM Operator, PLC Engineer, Mechanical Engineer Evgeny Titov
- TMB Operator, Project Manager, Site Manager/Foreman Nikolay Egorov
- TBM Operator, Mechanical Engineer, Hydraulic Technician, Project Manager Vyacheslav Gudkov
- TBM Operator Alexander Namyshkin
- Mechanical Engineer, Project Manager Korney Gnatyuk
- Electrician, PLC Engineer, Project and Site Manager, Mechanical Engineer, TBM Hydraulics Specialist Sergey Tomchuk
- Electrician, Surveyor Igor Krasnozhen
- Project Manager, Mechanical Engineer, CEO Vasily Anishchenko



Tunneling Projects with SMP Specialists

- Minsk Metro Tunnel – 6 m, 1600 metres, sand and bolders, EBP with Bessac
- Azerbaijan Kura River Crossing, AVN 1800, 1000 meters with Bessac
- Singapore AVN 800 tunnels with Bessac
- Multiple tunneling projects in Moscow supporting major local tunneling contractors.
- Ahern AVN 2000 project in Rock (Basil Anishchenko before SMP)
- A great number of AVN and EPB tunnels across Moscow, St. Petersburg and other Russian cities (Basil Anishchenko before SMP)
- VSM projects (shaft sinkers) Metro Park Pobedy, Moscow (Basil Anishchenko before SMP)



Thank you very much for your attention

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