TRENCHLESS
ENGINEERING SERVICES PRIVATE LIMITED

Specialist HDD and Microtunneling Contractors

ISO 9001:2015; ISO 14001:2015; ISO 45001: 2018 certified company

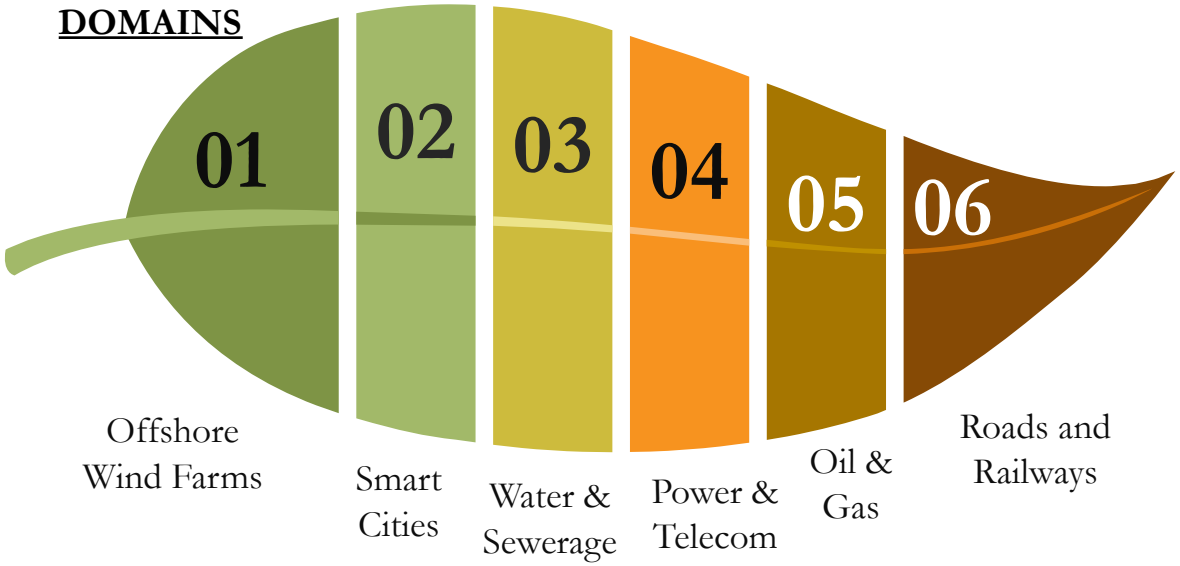
ABOUT TRENCHLESS

OVERVIEW

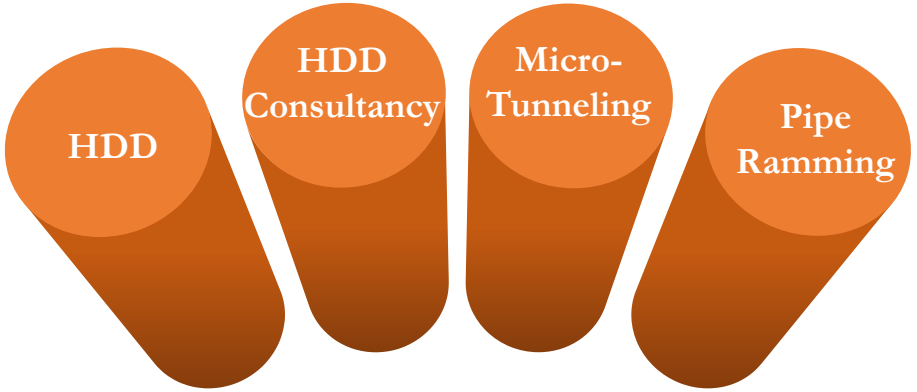
- Founded in **2000**
- Experience in **9** countries in Middle East, Africa, and Asia
- Employs **400+** experienced professionals
- One of the **largest fleet** of **28 HDD rig spreads** and Microtunneling machines
- Nominated for **Gold Standard Award in Innovative Techniques** by China Petroleum Corporation (CPC) Taiwan
- Headquartered in **New Delhi, India**

PRESENCE

DOMAINS



SERVICES



OUR EXPERIENCE

20 + Crossings of 2,000+ meters

- **Brahmaputra river, Assam, India** – 3,558-meter length of 6" diameter piping for GAIL completed in Jun 2021
- **Mahanadi river, Odisha, India** – 3,200-meter length of 12" and 6" diameter piping for GAIL completed in Aug 2021
- **Ganga river, Bihar, India** – 2,023-meter length of 30" diameter piping for IOCL completed in May 2021

Single Order Value exceeding USD 5 million

- **CPC Corporation, Taiwan** – USD 32 million and USD 26 million
- **Indian Oil Corporation** – USD 16.5 million
- **Gas Authority of India Limited** – USD 7.9 million and USD 5.2 million

HDD Crossing of 36" or above

- **Umbhrat River** – 42" diameter HDD for 1,150 meters
- **Taichung LNG Terminal** - 36" diameter HDD for 1,750 meters
- **Yamuna River** - 36" diameter HDD for 2,000 meters

Multiple Crossing in One Project

- **Bahrain –** 35 kiilometers while deploying 4 rigs on the project
- **Telangana & Andhra Pradesh** – 53 crossings while deploying 5 rigs on the project for L&T

HDD crossings by Intersection

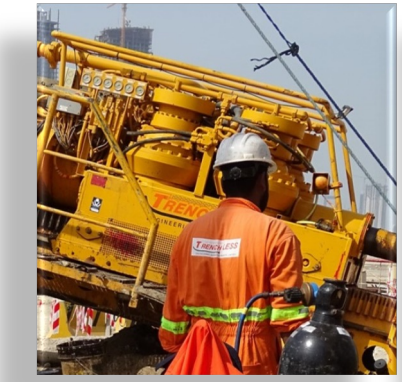
- **Vashi Creek :** 18 Inches x 2600 m
- **Mahanadi River : 12 + 6 Inches x 3223 m**
- **Brahmaputra River : 6 Inches x 3550 m**

Complete list of 2000+ meters crossings

OUR EQUIPMENT (Slide 1 of 2)

28
HDD RIGS

30-90 T	08 Nos.
100-150 T	07 Nos.
250-500 T	13 Nos.



OUR EQUIPMENT (Slide 2 of 2)

- 200 GPM — 05 Nos.
- 300 GPM — 04 Nos.
- 600 GPM — 10 Nos.

28 Mud Pumps

20 Recycling Systems

- 500 GPM — 12 Nos.
- 600 GPM — 07 Nos.
- 1000 GPM — 10 Nos.

2 Microtunneling Rigs with 1200 mm diameter and sleeve size up to 1800 mm

OUR ACHIEVEMENTS

LONGEST

Completed India's longest HDD crossing of dimensions 6" x 3,558 meters at Brahmaputra River, India

LARGEST

Installing Asia's longest HDD crossing of dimensions 24" x 3,800 meters at Mahanadi River, India and 24" x 3,550 meters at Brahmaputra River

DEEPEST

Completed World's then-deepest HDD crossing with a mix of 16" and 6" x 1,450 meters at 140-meter depth at Chambal River, India

MAXIMUM CROSSINGS

Installed Maximum number of HDD crossings by the Intersection technique in Asia.

MULTIPLE CROSSINGS

Completed Multiple crossings (53) at a single location deploying up to 7 HDD rigs.

INNOVATION IS AT OUR CORE

1 Indigenously-built Pipe Thruster

TESPL pipe thruster has been entirely designed, engineered and fabricated in-house.

Capacity to push the pipe in a continuous fashion unlike other thrusters that utilize 3-4 operations per pipe, thereby speeding up the pipe pulling process.

Advantageous in laying down mainline pipelines in swampy and mountainous regions.

2 Intersection Crossing Technique

Technique utilising Electromagnetic Steering Technology for precise real-time tracking, wherein pilot holes are drilled from both ends using two separate drilling arrangements.

It makes it indispensible for longer crossings as the torque available at mud motor for driving and steering the drill is compromised and directional control of the drill becomes difficult in HDD for longer crossings.

RICH EXPERIENCE IN HANDLING COMPLEX HDD WITH INNOVATION

01	02	03	04
台灣中油股份有限公司 CPC Corporation, Taiwan Jan De Nul GROUP	台灣中油股份有限公司 CPC Corporation, Taiwan	Bharat Petroleum	GAIL GAIL (India) Limited
TAIWAN OWF	**TAICHUNG HARBOUR**	**VASHI CREEK**	**MAHANADI RIVER CROSSING**
Trenchless installed cables from Sea to Shore (windmill) using the HDD method Trenchless installed 4 x 20" Pipes for an average length of 550 meters.	The Taichung harbour was to be crossed by a pipeline that CPC intended to use for distributing LNG. Pipes measuring 36" x 1,750 metres and 12" x 1,900 metres were placed without digging any trenches through the harbor.	From Mumbai to Manmad, which has an extremely hard rock geology, BPCL sought to build a pipeline. The 18" x 2,600 metres and 6" x 2,600 metres pipe were drilled HDD and the intersection approach.	To transfer gas from Jagdishpur to Haldia/Bokaro, GAIL needed to bridge the 3,000-meter-wide Mahanadi River in Odisha, India. Two 12" and 6" pipelines were drilled using trenchless technology.

PROJECT 1 – TAIWAN OWF

Location and Description

Taiwan has been investing heavily in green energy by developing wind farms along their coast. For Project Formosa II, Jan De Nul (JDN) was awarded the project to install the windmills and cable installation.

TE Project Detail

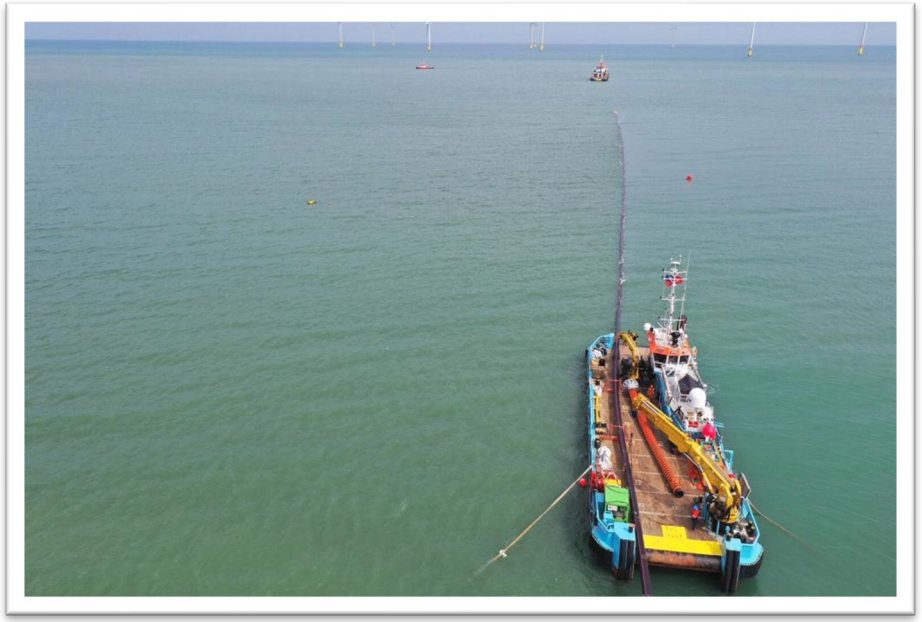
JDN trusted Trenchless to install the cables from Sea to Shore using the HDD method. Trenchless installed 4 x 20" Pipes for an average length of 550 meters.

Challenges

There was no land available from the Pipe side. Trenchless fabricated a pipe on the beach and then tug it to the exit point 550 meters into the sea.

Timeline – Trenchless was given permission to drill from April 2020, with a target to install 4 lines by July 2020. These stringent timelines were imposed since Taiwan experiences a Heavy Typhoon season after July, which disrupts execution.

COVID-19 – To add to the challenges, this was the time when COVID-19 pandemic was at its peak. Trenchless had to relocate teams ensuring their safety. Trenchless Management could execute the project without any COVID-19 infection.



PROJECT 2 – TAICHUNG HARBOUR

Location and Description

China Petroleum Corporation (CPC) has an LNG Terminal in Taichung Harbor. They wanted to install a pipeline across the harbor for Gas Distribution.

TE Project Detail

Trenchless was awarded the job for installing the pipeline 36" x 1,750 meters and 12" x 1,900 meters parallelly through the harbor.

Challenges

There were space constraint on the pipe-side for punch out, since 26" and 6" lines were pre-existing (These were also installed by Trenchless in 2014). Trenchless had to punch out the line within a minute 2-meter margin. This line was also surveyed in the S-curve.

1,800 m of land was not available on the pipe-side, so Trenchless fabricated 3 segments of 600 meters each. The Golden Joints at the time pulling were very critical and Trenchless did a seamless work.

Since the Diameter and Length of the pipe were giant, Trenchless had to do Buoyancy Control.

PROJECT 3 – VASHI CREEK

Location and Description

Bharat Petroleum Corporation Limited (BPCL) wanted to install a pipeline from Mumbai to Manmad.

TE Project Detail

Trenchless was awarded the job for installing pipeline 18" x 2,600 meters and 6" x 2,600 meters parallelly in a very Hard Rock Geology.

Challenges

Drilling Challenges – Trenchless had to use Intersection Technique, since the length of the crossing was large.

It was in Mangroves Area, which is considered environmentally sensitive. We ensure of keeping local flora and fauna intact.

It was in very hard rock conditions and Trenchless encountered a major challenge in cutting out hole for pumping.

Trenchless had limited possibilities to lay coils for the survey.

PROJECT 4 – MAHANADI RIVER CROSSING

Location and Description

Gas Authority of India Limited (GAIL) wanted to cross river Mahanadi in Odisha, India for delivering Gas from Jagdhishpur to Haldia/ Bokaro.

TE Project Detail

River was 3,200 meters wide at the location of Drill. Trenchless had to install two pipelines for 12” and 6”.

Challenges

This was a fast-track project, Trenchless had to install both the pipelines before the onset of monsoon in the region.

Trenchless decided to pull both pipelines in a bundle to shorten the delivery time. For such a large crossing, bundle pulling always comes with risks. Trenchless finished this crossing in 4 months.

Exit Side had only 150 meters of straight space, following which there was a need to curve the pipe-string. Handling the curve pipe string at the time of pullback is very challenging, but Trenchless did a remarkable job.

OUR CLIENTELE

台灣中油股份有限公司
CPC Corporation, Taiwan

LANCO

ओएनजीसी
ONGC

ऑयल इंडिया लिमिटेड
Oil India Limited

DJN Jan De Nul GROUP

गेल GAIL
GAIL (India) Limited

AL-KOOHEJI ELECTRICAL
CONTRACTORS & CONSTRUCTION WLL

इंडियनऑयल
IndianOil

গ্যাস ট্রান্সমিশন কোম্পানী লিমিটেড
JL
GAS TRANSMISSION
COMPANY LIMITED

mears

Bharat Petroleum

हिन्दुस्तान पेट्रोलियम
HP

Reliance
Gas Pipelines Limited

Punj Lloyd

L&T Hydrocarbon Engineering

TRENCHLESS IS UNIQUELY POSITIONED TO DELIVER THIS PROJECT

Rich exposure to the NEOM Project so far and Experts at Implementing Large Scale Project Internationally.

Involved with Bechtel at early stage of this project. We assisted them with Design and Engineering Calculations, Site Visits.

Unmatched and Unique credentials with having the record of (i) completing Asia's Longest HDD Crossing, (ii) World's then-deepest HDD Crossing at 140 m depth, and (iii) Laid 250,000+ meters of steel pipeline

Highly Experienced Team with Record Timely Delivery

Rich experience of working in Different Soil conditions including Sand, Silty Clay, and Hard Rock

PIPELINE INSTALLATIONS (>2,000 M) – Slide 1 of 2

S. NO.	COMPLETION DATE	CROSSING	LOCATION	COUNTRY	CLIENT	PIPE DIAMETER (inch)	LENGTH (m)
1	Installing	Mahanadi River	Odisha	India	GAIL	24”	3,800
2	Installing	Brahmaputra River	Assam	India	GAIL	24”	3,550
3	October 2021	Brahmaputra River	Assam	India	GAIL	6”	3,555
4	Aug 2021	Mahanadi River	Odisha	India	GAIL	12”	3,223
5	Aug 2021	Mahanadi River	Odisha	India	GAIL	6”	3,200
6	Aug 2020	Vashi Creek	Mumbai	India	BPCL	18”	2,552
7	Oct 2019	Vashi Creek	Maharashtra	India	BPCL	6”	2,524
8	July 2019	Ganga River	Bihar	India	PLN	10.75”	2,025
9	Dec 2018	Maner River	Telangana	India	KPTL	18”	2,530
10	Dec 2018	Maner River	Telangana	India	KPTL	6”	2,523
11	Feb 2018	Narmada River	Gujarat	India	OPaL	12”	2,110
12	Feb 2018	Narmada River	Gujarat	India	OPaL	6”	2,103
13	May 2017	Ganga River	Barauni, Bihar	India	JSIW	24”	2,317
14	May 2017	Ganga River	Barauni, Bihar	India	JSIW	6”	2,312

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PIPELINE INSTALLATIONS (>2,000 M) – Slide 2 of 2

S. NO.	COMPLETION DATE	CROSSING	LOCATION	COUNTRY	CLIENT	PIPE DIAMETER (inch)	LENGTH (m)
15	Jun 2016	Narmada River	Gujarat	India	ONGC	8”	2,250
16	Apr 2016	Ganga River	Allahabad, UP	India	IOAGPL	8”	2,400
17	Apr 2016	Yamuna River	Saharanpur, UP	India	GAIL	36”	2,000
18	Apr 2016	Yamuna River	Saharanpur, UP	India	GAIL	6”	2,015
19	Sep 2014	Ganga River	Farrukhabad, UP	India	NRP	24”	2,325
20	Sep 2014	Ganga River	Farrukhabad, UP	India	NRP	6”	2,320
21	Jan 2014	Mahi River	Gujarat	India	JSIW	12”	2,121
22	Jan 2014	Narmada River	Gujarat	India	GAIL	30”	2,015
23	Jan 2014	Narmada River	Gujarat	India	GAIL	6”	2,003
24	Jul 2012	Ganga	Kanpur, UP	India	GAIL	18”	2,000
25	Jul 2012	Ganga	Kanpur, UP	India	GAIL	6”	2,009
26	Jan 2011	Ganga	Farrukhabad, UP	India	GAIL	24”	2,200
27	Jan 2011	Ganga	Farrukhabad, UP	India	GAIL	6”	2,193

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NOMINATED FOR GOLD STANDARD AWARD BY CPC, TAIWAN

S. NO.	CROSSING NAME	DIAMETER	LENGTH (M)	COMPLETION
1	Taichung Harbour (Section A)	26”	1418 m	Jun 2016
2	Wusi River (Section D)	26”	709 m	Dec 2016
3	Dudu Irrigation Canal (Section C)	26”	705 m	Apr 2017
4	Shanjiao Dapai (Section B)	26”	798 m	Dec 2017
5	Taichung Harbour	36”	1796 m	May 2019
6	Taichung Harbour	12”	1750 m	July 2019

PROJECT EXECUTION CAPABILITIES

TESPL has the capability & executed the Projects with single work order value:

SINGLE WORK ORDER VALUE	PROJECT DETAILS
USD 32 Million	Project in Taiwan for CPC Corporation
USD 26 Million	Project in Taiwan for CPC Corporation
USD 16.5 Million (INR 1320 Million)	Project in India for Indian Oil Corporation Limited
USD 7.90 Million (INR 630 Million)	Project in India for Gail India Limited (under execution)
USD 5.20 Million (INR 420 Million)	Project in India for Gail India Limited (Under execution)

CURRENTLY AWARDED PROJECTS IN INDIA

Single-shot HDD projects
Multiple crossings