



**Indian Society for
Trenchless Technology**

Brief

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BRIEF ON IndSTT

1. Preamble

The section deals with the background of the society formation in the Indian Continent. It discusses Trenchless Technology definition, its importance for the urban settings, benefits of using this technology, application issues, challenges posed, and finally the nurturing and growth of the society which is the apex organization promoting the application of Trenchless Technology in the Indian Continent.

1.1 Trenchless Technology

Trenchless Technology is the branch of construction engineering dealing with techniques and the equipment used to develop, maintain and renew subsurface utility networks without excavating trenches.

It is a branch of applied engineering, which is State-of-Art, used to develop, manage, and renew continuous cabled and/or piped networks for transferring signals and fluids respectively. Major applications of the techniques are in the areas of water supply, rainwater disposal, sewer disposal, gas, and Petrochemical products, electrical and telecom signals and other underground networks.

1.2 Importance

Presence of the above mentioned utility networks for the efficient functionality of a community and urban development is an important precondition. Development of such network obviously is an important portion of the urban development process. In addition, the capacities and the condition of such networks deteriorates with the passage of time and hence a regular management and renewal process for these networks is an equally important activity of the urban planners and managers.

Developing, managing, and renewing of all such networks is generally carried out mainly by the open cut methods (by excavating a trench, installing new network, rectifying or replacing the older networks and then filling up the trench again). In view of the many disadvantages connected with trenching and the growing ecological

awareness of the population, it is successively becoming imperative to consider trenchless methods as an alternative in the planning and execution of networks or sections thereof.

1.3 Benefits

Trenchless applications have achieved a very high level of precision due to the progressive development of equipment and method technology and this has made the execution of practically all types of supply and disposal lines possible, irrespective of their sizes or the geological and hydrogeological limiting conditions in an ecologically friendly and enclosed method of underground construction.

Where employers have fully recognized and utilized the possibilities of this technology, they have not been slow in reaping the economic rewards. Crossings of major rivers for laying telecom cables and product pipelines for oil and gas across major rivers like Hoogli or Chambal at breakneck speeds have yielded good economic results for such employers. One look at such rivers and one can understand the importance and relative benefits of trenchless technology over the conventional construction methods.

By using trenchless technology one can achieve reduction of the following:

- Disruptions to traffic and movement.*
- Danger to existing underground facilities while developing or managing networks.*
- Easement requirements.*
- Environmental impact - dust and noise.*
- Potential for settlement damage.*
- Potential of injuries due to open excavations.*
- Required time & time related costs.*

Other benefits of using trenchless technology are as under:

- They help in the effective use of geological settings;*
- Provisioning for future use and sustainability is enhanced by Trenchless techniques;*

- One can achieve the maximization of underground developable space;*
- Deterioration of underground networks can be contained;*
- Unlike the open cut projects there are generally no hindrances over the entire project length;*
- Camouflage of the utility networks for security purpose can be done more efficiently.*

Do you find them of your interest? If yes, would you like to promote their use in your projects? If yes, we will be keen to work jointly with you and welcome you to our fold.

1.4 Application Issues

*Trenchless technology without doubt, is a comparatively better system of subsurface network construction. It has been termed as **Environmentally Sound Technology** by UNEP. Its ingress in industry however is faced with several impediments like less sensitization of the stakeholders, non availability of critical ingredients and inertia against the use of new working methods. Introduction of trenchless technology and its subsequent promotion in the Indian continent therefore needs certain focused activities. Such activities can be grouped in to two sections, **Technology** and **Owner** related activities, as discussed hereafter.*

Technology related activities:

- *Identifying suitable technology and their providers for a perceived need;*
- *Identifying suitable equipment and their providers;*
- *Networking with such technology providers to develop their applications;*
- *Evaluating such technologies to develop application plan;*
- *Supporting the local service providers to upgrade their activities by associating with the newer technology providers;*
- *Developing equipment testing and delivery systems including the spare part supply chain development;*
- *Developing equipment repair and maintenance systems;*
- *Developing consumable testing and delivery systems;*

- *Charting out the indigenization road maps for all the imported material to bring about cost effectiveness;*
- *Charting out international business development for local service providers to enhance the revenue earnings;*
- *Other related activities to meet the above desired results.*

Owner related activities:

- *Identifying stakeholders & sensitizing them about these techniques.*
- *Once having sensitized - to develop the employers' preparedness to absorb such technology. This development activity has the following sub-activities:*
 - *Developing understanding about the state of the subsurface networks;*
 - *Preparation of ground geological and hydrogeological existing status and evaluation plans;*
 - *Data collection and assimilation under GeoInformation System;*
 - *Development of location maps in Geo Positioning System;*
 - *Development, management and renewal methodologies selection;*
 - *Establishing project execution methodologies;*
 - *Project planning and financial structuring;*
 - *Development of Codes of Practice for different techniques;*
 - *Establishing harmonized bidding and contracting systems for procuring such services;*
 - *Proposal understanding and Bid evaluation methods;*
 - *Life expectancy and life cycle evaluation methodologies;*
 - *Inventory management plans;*
 - *Data management plans; and*
 - *Other related working systems for obtaining optimum results from the subsurface networks.*

1.5 Challenges

Activities, as cited above, become challenging owing to the fact that despite several benefits of trenchless technology discussed earlier, competitive distortion, when compared to the open cut methods, has not yet been removed due to ignorance of indirect costs in project accounting. Even direct costs themselves are, at times, less when open cut costs are compared with the trenchless costs inspite the low wage economy prevailing in the region but this fact is ignored or not considered at all. This naturally leads to a situation where the employers are led to believe that all trenchless operations are comparatively more expensive which maybe contrary to the reality.

The actual fact is that, at times when the network depths exceed a certain value, even the direct costs of Trenchless Applications are comparatively less than the conventional construction methods. For an example, as a rule of thumb, this situation occurs when the depth of excavation exceeds 3 m in Europe. (In the Indian continent this value is 4.5 m). This valuation however can not be generalized as the working rates do change from location to location and with different type of subsurface strata. The primary issue, however, is to understand the dynamics as, at times, due to less sensitization, employers are made to accept working methods involving open cut excavations in place of Trenchless methods despite the formers superiority over the later.

In Indian situation another complexity plays a vital role due to the aging of urban settlements. Several of the major cities have ages exceeding, at locations, hundred years and the urban settlements at such locations therefore are equally old. Subsurface networks in such areas, wherever existing, have unimaginable deficiencies like reduced capacities due to increased loads, structurally failed sections, discontinuities due to missing links, blockages or siltages in the sections.

Whenever detected, all such deficiencies existing under the urban areas require treatment by trenchless techniques. Employers however face difficulties even in detecting the presence of such utilities leave aside identifying and quantifying deficiencies leading to emergency situations like structural collapses or at times complete failure of networks.

This again necessitates institutional intervention where the employers are sensitized and such failures are prevented. This Institutional intervention internationally has been done by the International society for trenchless technology earlier. A similar intervention is being undertaken for India with the formation of Indian Society for trenchless technology (IndSTT).

1.6 Society Formation

In order to meet the above challenges and perform the required actions, IndSTT was established as a direct sequel of the recommendations from a Committee of Ministry of Urban Affairs, Government of India. The following brief, details the salient features of IndSTT.

2. About IndSTT

This section deals with the formation of the society, its objective charter, membership structure, and other relevant organization related matters.

2.1 Formation

IndSTT is the apex organization to promote trenchless technology in India and was established in 1995. The society was registered under SRA Act of 1860 with registration number 32943 of 1998.

*In the last twenty years IndSTT has emerged as one of the major technical organizations of the nation. In the trenchless sector it is one of the leading global organizations with **5 Code of Practice**, **28 video cd's** of expert lectures on different techniques, **29 technical reference books**, **5 operation manuals**, substantial number of **technical papers & presentations** to its credit. In addition, it is involved in developing and promoting more books & materials on the subject.*

*It is involved in the standardization of trenchless technology activities in India and has already released the **Codes of Practice** for various trenchless techniques suiting Indian Conditions. There are several more codes of practice being developed to be*

*released shortly. Recently it has also released the fourth edition of **Schedule of Rates** for construction contracts employing trenchless technology covering several common techniques already being used in India.*

*It circulates **No Dig India Journal** on a regular basis to sensitize stakeholders across the country. Copies of this quarterly journal are hosted on society's website <http://www.indstt.org>. It organizes No Dig India Shows/workshops/training seminars & displays/demonstrations on various trenchless techniques, related products & services.*

It supports stakeholders in their technical requirements. All the activities are conducted to increase the spread of trenchless technology, so that institutions and individuals are sensitized & educated in the sector.

Trenchless sector in India is growing due to the pro-active and vibrant approach of IndSTT and its stakeholders who are accepting the new ideas and concepts developed globally. Such approach has been carefully cultivated under the guidance of its governing council which is a strong and experienced body of professionals drawn from a varied cross section of the construction industry.

2.2 Objective Charter

The Society has been established to meet the following objectives:

- 2.2.1 Technical advancement of trenchless technology for public benefit.*
- 2.2.2 Promotion of better and more effective utilization of trenchless technology.*
- 2.2.3 Sensitizing stakeholders about trenchless technology applications.*
- 2.2.4 Professionalizing trenchless technology applications and underground asset management practices.*
- 2.2.5 Information dissemination about trenchless technology related field.*
- 2.2.6 Sponsoring research & development in the sector.*

2.2.7 *Promoting educational activities in trenchless technology sector through professional degrees, diplomas and certificates at various levels.*

2.2.8 *Providing the main networking platform to the sector stakeholders for information and data exchange.*

2.3 MEMBERSHIP

2.3.1 General

The society is formed by its general body, which include stakeholders from different walks of trenchless and allied fields. The general body consists of the following categories of members:

2.3.1.1 *Founder members (FMITT)*

2.3.1.2 *Institutional members (CMITT)*

2.3.1.3 *Individual members (IMITT)*

2.3.1.4 *Professional members (PMITT)*

2.3.1.5 *Associate member / Student / Research members (AMITT / SMITT / RMITT)*

2.3.1.6 *Fellow / Hon. fellow members (FMITT)*

2.3.1.7 *Patron members (PAMITT)*

Each category of member receives certain privileges & benefits from the society to enhance their technical skills. The benefits offered to members are detailed in section 2.3.2.

Every person or organization desirous of being enrolled as a member of the society has to apply in the prescribed form to the council. The admission is subject to satisfaction of the conditions of eligibility stipulated for each category. Such application is considered and approved or disapproved by the council on such terms and conditions as per the rules in force and on the merit of each individual application. For more details on this topic please refer to membership Toolkit hosted at our website <http://www.indstt.org>.

2.3.2 Member benefits

The seven categories, as listed above comprise of two entities - corporate & individual. Detailed hereunder are the benefits which accrue to either of these. A detailed benefit list for each category is included in the membership toolkit and posted on our website. The benefits are subject to revision from time to time and all members are advised to check the current status from IndSTT secretariate.

2.3.2.1 Benefits to the corporate members

1. *Listing of name, address, other contact details and web link on Corporate members page of IndSTT website. The listing would be in any one, or more if desired by the member, of the four sections as under :*
 - 1.1 *Dealers of trenchless equipment;*
 - 1.2 *Manufacturers of trenchless products;*
 - 1.3 *Provider of trenchless services;*
 - 1.4 *Designers of trenchless projects;*
2. *Hosting of one page profile containing contact details, work history, regions of operation etc. as provided by the members. All such data shall be hosted on good faith by IndSTT and the responsibility of correctness and completeness shall be of the member providing the details;*
3. *Free copies of the No-Dig journal (Upto a maximum of 5 copies per issue, to the nominated addresses anywhere in the world depending on the membership category);*
4. *Access to online "INDSTT" magazine past issues hosted on IndSTT website in the members section;*
5. *Access to technical literature and presentations hosted on IndSTT website in the members section;*
6. *Information about the relevant tenders hosted on IndSTT website in the members section;*
7. *One page advertisement, on the regular pages, in the No Dig Magazine, every year, to be redeemable by the member for it's own use in the issue of it's choice;*
8. *One free display stand of the smallest size at the annual No Dig India Show whenever conducted every year to be redeemable by the member for its own use. Stand booking would need to be placed at the time of taking / renewing the membership at the start of the year;*

9. *Discount of 20% on subsequent No Dig India Journal Advertisement that year;*
10. *Discount of 20% on sponsorship fee in No Dig India Show;*
11. *Discount of 20% on the delegate fee in No Dig India Show that year;*
12. *Discount of 20% on purchase of "IndSTT Publication" books that year;*
13. *Discount of 10% on purchase of other publications that year;*
14. *Discount of 15% on participation fee for trenchless training courses conducted by IndSTT/Associate organizations.*
15. *Discount of 15% on testing and certification fee for trenchless professionals conducted by IndSTT/Associates.*

2.3.2.2 Benefits to the individual members

1. *Listing of name and other contact details on Individual Members page of IndSTT website. The listing would be in any one or more categories if desired by the member, of the three sections of the Page: (Not for students/research members)*
 - 1.1 *Dealers of Trenchless Equipment;*
 - 1.2 *Providers of Trenchless Services;*
 - 1.3 *Designers of Trenchless Projects;*
2. *Free copies of the No-Dig journal (1 copy per issue, to the nominated addresses anywhere in India);*
3. *Access to online "IndSTT" magazine past issues hosted on IndSTT website in the members section;*
4. *Access to technical literature and presentations hosted on IndSTT website in the members section;*
5. *Information about the relevant tenders hosted on IndSTT website in the members section;*
6. *One free business card printing in the No-Dig magazine, each year, to be redeemable by the member for its own use, in the issue of his/her choice in that year; (Not for students/research members)*
7. *Discount of 10% on the delegate fee in No-Dig India show that year;*
8. *Discount of 10% on purchase of "IndSTT publication" books that year;*
9. *Discount of 5% on purchase of other publications that year;*

10. *Discount of 10% on participation fee for trenchless training courses conducted by IndSTT/Associate organizations.*
11. *Discount of 15% on testing and certification fee for trenchless professionals conducted by IndSTT/Associates.*

3. Indian Trenchless Scenario

Indian Society for Trenchless Technology is the representative of the Indian trenchless industry having members from the cross section of the Industry. It is also a member of various national and international professional bodies. Need and usage of trenchless technology has multiplied many times over since the formulation of IndSTT. Some of the major catalysts are JnNURM for water & drainage sector, Hydrocarbon vision 2025 for oil & gas sector, Vision 2010/2020 for telecom sector, National electricity policy for power sector, and the directives/environmental standards of CPCB for pollution control activities. Detailed hereunder are the salient features of Indian trenchless industry and IndSTT's national networks.

3.1 Indian Trenchless Industry

Since its formulation in 1995, several organizations & individuals have joined IndSTT & a composite list of such organizations & persons is hosted on IndSTT website at http://www.indstt.org/IndSTT_Member.html.

3.2 IndSTT Networks:

INDSTT is member of several professional and technical bodies. Each membership is related to a specific goal aimed at value addition for the participating member. Members depending upon their priorities take part in various related activities. The society also encourages members to network further to achieve results for overall betterment.

3.2.1 Founding Membership & Governorship of Engineering Council of India

IndSTT is one of the governors & founding members of Engineering Council of India (ECI). ECI is the apex organization of engineering professional bodies involved in the following activities in India:

- *Taking all actions needed for the advancement of the engineering profession in various disciplines and for enhancing the image of engineers in society.*

- *Laying down strict norms of professional conduct and take appropriate penal action against failure to follow them.*
- *Certifying the competence of engineers for undertaking professional activities both inside the country and outside and meeting all obligations under the WTO charter.*
- *Ensuring the competence of engineering organizations offering consultancy services.*

While individual professional societies are competent to decide on the ability and competence required for performing professional duties and activities in their specific areas of work, ECI, as a confederation of professional societies is looking after the global picture of the engineering profession in India.

IndSTT is deeply involved with all the above charters and initial formation works are underway. By virtue of being a governing body member of ECI, IndSTT is contributing substantially to the nation building process.

3.2.2 Membership of International Council of Consultants

IndSTT is on the board of governors of International Council of Consultants (ICC), the apex organization of consultants, involved in the following activities:

- *Propagating and popularizing the concept of globalization of norms and standards of the professional services provided by consultants;*
- *Providing assistance, guidance and information relating to facilities for all types of domestic and international commercial consultancy;*
- *Identifying the problems of commercial consultancy and suggesting ways and means of overcoming any constraints experienced by the professionals;*
- *Studying the rules, techniques and procedures to conduct research and undertake projects to promote and uplift the standard of the profession of commercial consultancy;*
- *Organizing seminars, conferences, workshops, study groups in India and abroad;*

As one of the governors, IndSTT is involved in all the above activities so as to promote the application of trenchless techniques within the consultancy sector.

3.2.3 Membership of Council for Application of Actuarial Science in Risk Management in Construction and Allied Industries

The Council for Application of Actuarial Science in Risk Management in Construction and Allied Industries (CARM) operates to promote or to conduct research work related to the practice of the risk actuary, and develops models, data, and information leading to such research work. It is intended to benefit from detailed training / exposure to risk management and application of actuarial sciences and risk management for suitable use in the trenchless technology field.

4. Education

4.1 Trenchless Education

Education is one of the main thrust areas of IndSTT activities. Actions in this case range from developing training manuals for professionals at all levels, developing training courses in consonance with different state technical boards and universities leading to various certificate, diploma, post diploma, and post graduate qualifications in the trenchless technology field.

4.2 Trenchless Research

IndSTT is involved in establishing trenchless technology research and education centers jointly with stakeholders. One such centre is in Vidisha, M.P, where it is named as National Habitat Centre on Subsurface and trenchless technology.

4.3 Trenchless Experts Panel

IndSTT has also established an experts panel for Trenchless Technology where people having doubts on trenchless technology issues can pose their questions to the panel members. Such questions and answers are listed on IndSTT website at <http://www.indstt.org>. It has two sections, individuals and corporates and both sections comprise of experts/manufacturers who respond to common questions.

5. Books / Publications

5.1 General sensitization books

For user sensitization, IndSTT has developed the following books for the use of professionals :

5.1.1 Basics of Trenchless Technology

5.1.2 Trenchless Technology & Subsurface Construction (SSTT)

5.1.3 Subsurface Asset Development Guidelines (SSAD)

5.1.4 Subsurface Asset Administration (SSAA)

5.1.5 Subsurface Asset Termination (SSAT)

5.1.6 Safety Issues in Subsurface Networks Development & Management

5.1.7 Waste Management & Trenchless Technology

5.1.8 Pipeline Condition Assessment

5.2 Professional Reference Manuals

IndSTT has published the following manuals for reference purposes :

5.2.1 HDD Good Practices Guidelines

5.2.2 Microtunneling & Pipe Jacking Good Practices Guidelines

5.2.3 Rehabilitation Methods

5.2.4 Replacement Methods

5.3 Operator manuals

Trenchless technology depends mostly on equipment operations. The important aspect therefore is the operator's manual through which operators can understand the working systems and safety guidelines. IndSTT has developed following sample operator's manuals for the guidance of operators:

- 5.3.1 *Training Manual HDD Operation;*
- 5.3.2 *Training Manual Molding Operation;*
- 5.3.3 *Training Manual Pipe Bursting Operation;*
- 5.3.4 *Training Manual Pipe Ramming Operation;*
- 5.3.5 *Training Manual Microtunneling Operation*

5.4 Procurement Systems

IndSTT has published the following set of documents for standardizing the procurement process:

- 5.4.1 *Standard General Conditions for Construction Contracts Employing Trenchless Technology (Second Edition)*
- 5.4.2 *Guidelines for Application for Conditions in Construction Contracts Employing Trenchless Technology (Second Edition)*
- 5.4.3 *Schedule of Rates for Construction Contracts Employing Trenchless Technology 2016 (Eighth Edition)*
- 5.4.4 *Model Consultancy Contract for HDD Crossing (MCC-HDD)*
- 5.4.5 *General Conditions of Contract Document for Horizontal Directional Drilling (GCC-HDD)*
- 5.4.6 *Trenchless Technology Selection Guidelines*

5.5 Code of Practice

IndSTT has so far released the Code of Practice for Horizontal Directional Drilling suiting Indian conditions. Its JnNURM Committee & working groups are involved in developing further codes as listed hereunder:

- 5.5.1 *Code of Practice for Horizontal Directional Drilling Suiting Indian Conditions;*
- 5.5.2 *Code of Practice for Cured in Place Pipeline Technique Suiting Indian Conditions;*
- 5.5.3 *Code of Practice for Pipe Bursting Suiting Indian Condition*
- 5.5.4 *Code of Practice for Microtunneling & Pipe Jacking Suiting Indian Condition*
- 5.5.5 *Code of Practice for Glass Reinforced Pipe Technique Suiting Indian Condition*

6. International Reference Materials

In addition to the above, IndSTT has entered into associations with the following international companies to source their trenchless related publications in India :

6.1 Stein & Patner, Germany

6.2 WRc Plc., U.K.

6.3 Vulkar Verlag

7. NoDig India Shows

IndSTT, in its role as the nodal trenchless organization in India has been organising relevant information dissemination events for industry constituents for promotion of Trenchless best working practices and ingress of newer techniques. One of such series of events is NoDig India Show..

8. Technical Journal

The official journal of IndSTT is No Dig India. It is published on a regular basis for private circulations to the society members, other stakeholders, and interested persons for the purpose of dissemination of information and generating discussions. The journal has been a great information provider to the interested persons who desire to know more about trenchless techniques and their applications.

9. Training Courses

IndSTT conducts basic training programs for trenchless technology applications and two main programs are :

9.1 Foundation course in Horizontal Directional Drilling

9.2 Foundation course in Microtunneling

10. Trenchless Essentials Lecture Series :

IndSTT, has developed essential lecture series on different aspects of trenchless technology as under:

- 10.1 HDD project design*
- 10.2 Tracking and Surveying basics for HDD*
- 10.3 Basics of drilling fluids Part- I*
- 10.4 Uniform Sewer Condition Classification System*
- 10.5 Geotechnical Investigations*
- 10.6 Geotechnical Investigation methods & procedures*
- 10.7 Stress analysis for steel product pipe in HDD*
- 10.8 Selection of technology for Sewer Rehabilitation and Replacement*
- 10.9 Basics of drilling fluids Part- II*
- 10.10 Grouting operations*
- 10.11 Downhole Tools for HDD*
- 10.12 Grouting to shut off seepage & Grout curtain*
- 10.13 Drilling Operator Qualifications*
- 10.14 Basic formulas & calculation for drilling*
- 10.15 Reinforced Concrete Pipe Design*
- 10.16 Maintaining Borehole Stability*
- 10.17 Rehabilitation through Lining of Pipes*
- 10.18 Excavation Safety*
- 10.19 Specifications supervision and inspection of grouting*
- 10.20 Basics of CIPP Technique*
- 10.21 Confined Space Working*
- 10.22 Water in surface & subsurface- Ground Stabilization*
- 10.23 Stability during drilling in rocky strata*
- 10.24 Basics of Slip Lining*

- 10.25 Managing rehabilitation and renewal work sites*
- 10.26 Dispute resolution and trenchless contracts*
- 10.27 Moling and Pipe Ramming*
- 10.28 Basics of Auger Boring and Pipe Jacking*
- 10.29 Shafts construction for Trenchless Technology applications*
- 10.30 HDD Contract Conditions*
- 10.31 Subsurface Utility Engineering*
- 10.32 Stress analysis for plastic product pipe in HDD*
- 10.33 Grouting, Theory & Technology*
- 10.34 Pipeline Condition Assessment*
- 10.35 Fiber glass pipe design*
- 10.36 Retrieval of Stuck pipe in HDD*
- 10.37 Basics of Drillstring*
- 10.38 Managing Drilling Operations*
- 10.39 Grouting in shafts & tunnels for strength*
- 10.40 Failures in plastic pipes*
- 10.41 Basics of Pipe Bursting Technique*
- 10.42 Safety at street works*
- 10.43 Subsurface Asset Management Methods*
- 10.44 Drilling fluid Formula & Calculation*
- 10.45 Stresses around boreholes & borehole Failure criteria*

11. IndSTT Website

IndSTT has one of the most visited websites on trenchless technology data & details. It has a sea of information on various issues related to trenchless technology. It can be accessed by visiting <http://www.indstt.org>, <http://www.indstt.com>.

12. Governing Council of INDSTT

The Governing Council (2006~10) comprises of the following members:

<i>Patron</i>	Padmabhushan Dr. G.V. Ramakrishna
<i>Chairman</i>	Dr. Chander Verma, <i>Chairman, Continental Construction Projects Limited</i>
<i>Vice Chairman</i>	Lt. Gen. Sanjiv Talwar, AVSM <i>Engineer-In-Chief, Indian Army</i>
<i>Members</i>	Dr. P R Swarup, <i>Director General,</i> <i>Construction Industry Development Council</i>
	Dr. P.S. Rana, <i>Former Chairman cum Managing Director, HUDCO</i>
	Mr. V Suresh <i>Ex-CMD, HUDCO</i>
	Mr. K B. Dubey <i>Executive Director,</i> <i>National Thermal Power Corporation Limited</i>
	Mr. S M Kava <i>Proprietor, Urmi Enterprise</i>
	Mr. S. K. Chaudhry <i>Director Projects</i> <i>National Building Construction Corporation Ltd.</i>

INDSTT Publications

S.No.	Name
1.	<i>Basics of Trenchless Technology</i>
2.	<i>HDD Good Practices Guidelines</i>
3.	<i>Microtunneling & Pipe Jacking Good Practices Guidelines</i>
4.	<i>Rehabilitation Methods</i>
5.	<i>Replacement Methods</i>
6.	<i>Trenchless Technology & Subsurface Construction (SSTT)</i>
7.	<i>Subsurface Asset Development Guidelines (SSAD)</i>
8.	<i>Subsurface Asset Administration (SSAA)</i>
9.	<i>Subsurface Asset Termination (SSAT)</i>
10.	<i>Safety Issues in Subsurface Networks Development & Management</i>
11.	<i>Waste Management & Trenchless Technology</i>
12.	<i>Pipeline Condition Assessment</i>
13.	<i>Training Manual for HDD Operation</i>
14.	<i>Training Manual for Microtunneling Operation</i>
15.	<i>Training Manual for Molding Operation</i>
16.	<i>Training Manual for Pipe Bursting Operation</i>
17.	<i>Training Manual for Pipe Ramming Operation</i>
18.	<i>Code of Practice for Cured in Place Pipe Technique Suiting Indian Conditions</i>
19.	<i>Code of Practice for Pipe Bursting Suiting Indian Conditions</i>
20.	<i>Code of Practice for Horizontal Directional Drilling Suiting Indian Conditions</i>
21.	<i>Code of Practice for Microtunneling & Pipe Jacking Suiting Indian Conditions</i>
22.	<i>Code of Practice for Glass Reinforced Pipe Technique Suiting Indian Conditions</i>
23.	<i>Model Consultancy Contract for HDD Crossing (MCC-HDD)</i>

24. *General Conditions of Contract Document for Horizontal Directional Drilling (GCC-HDD)*
25. *Introduction to Pipeline Rehabilitation*
26. *Trenchless Technology Selection Guidelines*
27. *Trenchless Technology Scope of Works Manual*
28. *Trenchless Technology Risk Mitigation Manual 2011 Edition*
29. *Standard Operating Procedures for Application of Trenchless Technology*
30. *Standard General Conditions of Contract for Construction Contracts Employing Trenchless Technology, 2nd revised Edition**
31. *Guidelines for Application of Special Condition of Contract in Construction Contract Employing Trenchless Technology, 2nd Revised Edition**
32. *Schedule of Rates for Construction Contracts Employing Trenchless Technology (Seventh Edition)**
33. *Manual of Trenchless Project Supervision*
34. *Manual of Standard Method Statements for Trenchless Projects*
35. *Manual of Site Investigations for Trenchless Projects*
36. *Manual of Trenchless Project Management*
37. *Third Party Inspection Manual*
38. *Trenchless Arbitral Procedures and Dispute Resolution Systems*
39. *Building Smart Cities through Trenchless Technology^{New}*

Note:

- (1) *INDSTT members shall receive discount over the printed price as per their eligibility.*
- (2) *Order must accompany 100% advance.*
- (3) *Please provide 15 days for processing the order and delivery.*
- (4) *10% discount is offered if complete set is purchased.*
- (5) *30% discount for complete set having * marking.*
- (6) *P&P shall be extra (at actual)*

For further information :

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