Attachment 6

Workshop on Trenchless Technologies for Urban Projects

9-10 August 2011

Feedback of Participants

The participants were asked to list three important things they learnt from the workshop and three important things that were not included in the program but can be included in the next program. A summary of their feedback is below.

Important things Learnt from the Workshop

- Trenchless technologies adoption is must for present urban development for city having traffic conjunction
- Solution are available for trenchless working
- Learned many points to be consider before formation of project
- Quite educative about latest technique about pipeline laying rehabilitation / renovation etc
- Good know how about difficulties encountered during crossing and their remedy
- Awareness about companies concerned with the job and their latest required equipments
- Codes of practice for different methods of trenchless technology and schedule of rates would be very helpful for me
- Learning about the latest geotechnical investigations was very important to me
- Concept about different methods of trenchless technology
- Idea about its need and utility in urban projects
- Economic aspect – cost wise
- Came to know where to provide trenchless technology (micro technology), HDD
- Pipe bursting and new pipe providing to avoid environmental, traffic stopping
- Future of trenchless technology
- Preparation of prefeasibility reports
- How to decide for the TT procedure
- Prefeasibility study to be carried out prior to DPR & preparation
- Based on the field conditions the tender document should be made
- Cost comparison of trenchless technology & open cut should include the intangible factors
- Basics of trenchless technology techniques
- Guidelines to establish contract condition for design and construction by trenchless technology
- Geotechnical techniques for preliminary survey
- Sub surface utility engineering techniques
- Micro tunneling
- Development in trenchless tech all around. Otherwise it was only a theoretical technique for me.
- Importance of trenchless technology in urban projects
- International practices in trenchless technology

- Urgent need to adopt trenchless technology in our projects, at least in critical situations
- Basic design method description, procedure and application under real field conditions for trenchless technology
- Basic ideas about DPR ' s / Bid document preparation regarding trenchless technology. Contractual requirement for client & contractor
- Detailed knowledge on sub – surface investigations, types of equipment required. PVC pipes types. Application in trenchless technology. Avoiding NRW through trenchless technology
- Detailed methodology of trenchless technology for water supply & sewage
- Preparation of DPR's & formation of relevant contract document conditions in contract bid document & contract requirement for trenchless technology
- Various subsurface investigations, available equipments methodology, various types of pipes especially about HDPE, PE 100. Reduction of UAW by replacing techniques of damaged pipes etc
- Given exposure to the latest & acceptable technology available
- Where & how to go for technology
- Conditions of contract & schedules of rates
- Importance of pro-active measures
- Exposure to trenchless technology, its relevance, economics and current use in the country
- Lining concept introduced was great knowledge which is highly applicable in our local scene
- Pipe busting technique development in the country was great insight
- Different type of Trenchless technology
- Assessment of subsurface utilities
- Situations under which this technology can be used successfully
- Need of the trenchless technologies
- Work on a valid DPR and use Trenchless technologies where ever it requires
- How we can know the existing pipeline is okay or any rehabilitation required for this
- Introduction to a relatively new technology
- Applicability of the technology
- Codes, conditions of contract, guidelines are really useful
- Techniques of Trenchless
- Better option to overcome populous area, etc
- Important points before framing DPR
- To give importance of leakages of pipes, sewer, tunnels etc
- Importance of initial survey & exploring all possible method is much prior to preparation & finalization of detailed project report. Not only economics, other factors like demand of area, convenience, time factor, etc. need to be considered for concluding between open cuts & trenchless method
- As DPR it is very important to incorporate more suitable specifications & rates in the contract so as to avoid any complication during & after execution of trenchless work. All necessary information should be highlighted in contract document
- Another important thing learnt in this workshop was rehabilitation of old and worn out sewer lines by pushing in new pipes. This is very effective as it is both cost & time saving

- Sub surface utility engineering (SOE) was another very useful thing learn during the training program
- Comparative study with reference to cost utilities and public inconvenience
- Preparation of feasibility report
- Preparation of contract documents
- G.P.R. Technologies
- Contract conditions for trenchless technology
- I have just listened about trenchless technology. Now I think that it is very important technology and help the nation in the way of environment, pollution ,etc
- Importance of geo typical investigation in trenchless technology
- Preparation of proper tender document for trenchless technology
- Preparation of feasibility survey report is very essential the preparation of DPR

Topics to be Included in Future Workshops

- Field visit to be included if possible
- Animation presentation to be replaced by video / photograph (Real)
- A forum may be setup for interacting the engineers working for trenchless technologies
- Detailed case studies giving details of work executed with complete transparency
- More elaboration steps to be taken in present relevant work requirement in urban area projects of state PHEDS
- IndSTT should arrange to provide details of maximum no of companies doing all type of trenchless work starting from smaller work (Rs 5 – 10 lakhs) to bigger amounts
- I think the workshop has covered / touched sufficiently every subject concerning the trenchless technology
- Cost comparison for different scenario / situation between open at and trenchless
- More visual adds to clear concept about different methods and develop clear understanding
- More success stories and its increased use verses decreased cost per unit length
- Site inspection should have been carried out.
- Still more usual presentation should have been given
- Point to point details of TT & tunneling
- Economics of Trenchless Technology with reference to open technology
- Detailed technology & economics involved and procedures for tender items
- A field visit may be kept for the trenchless worksites
- National level policy to be framed to introduce trenchless technology
- Similar types of workshop is to conduct at state level
- Practical / field visit need to be performed for all clarification
- Strata wise / depth wise / Dia wise cost analysis of Micro tunneling
- Risk factors and precautions
- A site visit to an ongoing project work would be valuable
- Case studies of a few completed projects presented by project engineer
- Workshop duration a bit short
- Quality control aspects of trenchless technology
- Separate session for application of trenchless technology in water supply & sewage
- Site visit to trenchless application

- Quality control aspects of trenchless technology, justification of rates derived for doing the trenchless technology with DSR
- More case studies taken from India specially urban projects, as well as more emphasis on use of trenchless technology
- More specific on water supply & sewage work application as well as exposure visit to site of work which can be more learning full. More meaningful information should be provided
- Deeper case studies & the remedial steps taken
- Experienced person from (site) field should be invited
- Insists Government for adopting trenchless technologies
- Special requirement for mountainous terrain like Sikkim
- Most of major civil works are central Government sponsored and types of extensive research and study required for suggesting trenchless technologies require fund which is not available with the state Government, ULB nor is it provided by central Government
- Major decision required for technical work still made by political and bureaucratic bodies who need to be convinced about benefits of adopting technologies and pre-studies / proactive measures as suggested
- Regarding maintenance of the long run pipelines
- Portable equipments available in market for day to day repairs use
- Most of the examples / slide which shown / discussed in the presentation are of foreign countries. So this cannot relate our condition properly
- Each and every technologies have much limitation but on the limitation, we have not clean vision in this program
- Site visit would have been appropriate
- Possibility of Trenchless Technology in hilly region
- To one come hard rock if we encounter at the time of doing trenchless work
- Possibility or feasibility of trenchless technology in hilly areas
- Case study and practical experience of trenchless technology in hilly areas
- Trenchless technology of sewer in the north eastern states of India
- There was much discussion over detection of leakages/ other problems, preparation of detailed project report, preparation of bid document etc but practical problem faced during the execution of work or expected during execution of work were not discussed in detail. General & specific problems encountered during the course of execution of work & precautionary / remedial measures suggested needed to be discussed in length
- Since there is lot of emphasis on server sector with enonoumous projects under execution & huge number to follow. Specific conditions / requirements for such works should have been discussed as line & grade is essential requirements for sewers.
- Practical problem faced during the execution of trenchless work & steps taken to overcome them should have be described with photograph / videos if possible
- What is the method for evaluating the indirect cost? Rest everything was almost covered.
- Time allotted is less compared to the topics covered
- Some site visit to live Trenchless constructions
- About the quality and quantity of water in sub surface investigation (geophysical investigation)