

**Enforcement of Contracts**  
**For Underground Construction and Tunneling**  
The Challenges in respect of MoRTH Standard EPC Contracts

India has shown substantial improvement in its Ease of doing business moving up to 63 number in list of the countries. However in **Enforcement of the contracts** which is an element of these ranking there has been hardly any significant improvement - India marginally gained rank (163 rd position in 2019 from 172<sup>nd</sup> position in 2017). The contract clauses remain the same in all underground and over ground tenders, even while the conditions differ drastically i.e. lack of knowledge regarding the sub-surface conditions and the reaction of the surrounding ground mass to the excavation and support of the cavities.

**Industry requests Ministry's consideration for a separate MORTH Contract Document and separate document for DPRs for Tunnelling, in particular.**

The element of balancing the risk between the Employer and the Contractor has to be balanced and worked well in Indian Contracts particularly for underground works. In international contracts like FIDIC and NEC these risks are based on the idea of fairness. In the Indian Contracts too, the related risks should be allocated to the Party that is best prepared to control them:

1. The risk of the sub-surface conditions should be allocated to the Employer; the Employer is the Party who has the possibility of assessing those risks during the preparation of Tender Documents.
2. The risk of the production rates within a given sub-surface condition should be allocated to the Contractor; the Contractor is the Party who has the experience in the detail design and construction for such conditions, including the avoidance and/or limitation of impact on third parties.

**Industry thus recommended inclusion of the following principles in the MoRTH contract and amendment in contradictory clauses in the tender documents:**

**CORE ISSUES – The Central Principles**

**1. The Geotechnical Baseline Report GBR and the Baseline Schedule**

**The GBR and the Baseline Schedule shall have highest priority amongst the Contract documents.**

The present MoRTH contract document gives the geological data only for interpretation of the contractor. It is not considered as a benchmark or baseline data. Consequently, the responsibility of accuracy of this data and its resultant risks are transferred to the contractor.

**Industry suggests that the geological data be interpreted and considered as Geological Baseline Report to be used at the benchmark for interpretation of any variation in ground strata condition.**

Should in case, encountered ground conditions are different from GBR, it influences completion time of project, the cost of excavation and ground support. These variation should be adjusted with respect to cost and time to the party which is affected. The information - geotechnical parameters, method of excavation and support with relevant classification, should be defined and described in the Geotechnical Baseline Report (GBR), to be considered as single source for allocation of sub-surface

risks. The anticipated quantities of excavation and support items of work for the Underground Excavation included in the GBR shall be listed in the Baseline Schedule. The Tenderer shall then enter the corresponding production rate against each different item.

## **2. Time Adjustment**

The sub-surface conditions are within the risk sphere of the Employer and the production rates are within the risk sphere of the Contractor, **the time available to the Contractor for the Underground Excavation and Lining shall be adjusted against the difference between the sub-surface conditions expected (as described in the GBR and as quantified in the Baseline Schedule) and the sub-surface conditions actually encountered.**

**The adjustment mechanism shall be clearly stated in the Tender Documents.** No adjustment shall be provided for any difference between the performance rates stated in the Contractor's Proposal and the performance rates actually achieved for the specified sub-surface ground conditions in the Baseline Schedule. The Milestones that are relevant to the Employer shall be clearly stated in the Completion Schedule which shall be compatible with and based on the quantities itemized in the Baseline Schedule.

**Time adjustments and Extensions of Time, if any, shall be calculated and determined by reference only to the Baseline Schedule and the Completion Schedule.**

## **3. Time-related Charges**

**A major portion of the costs incurred by Contractor's is related to time rather than to the quantities produced (in particular, technical, commercial and administrative overheads, depreciation and maintenance of Contractor's Equipment, leasing costs etc.).** The Contract documents shall consequently provide for items for time-related charges which, allow for corresponding adjustments in the Contract Price according to the adjustments in Time for Completion.

Industry suggests that Time related charges either may be asked to be submitted in the tender or a fixed percentage cost be worked out to compensate for the overheads. If required this fixed percentages can be also be worked as percentage of excavation & Lining cost of the government estimate rates, if there is an apprehension of its misuse.

## **4. Technical Cell with Panel of Experts at Ministry level to include Industry Representation**

Majority of projects in Himalayan geology have been delayed either due to technical decisions or due to problems of implementation of suggested solutions at the project level by stakeholders. **Industry recommends to establish a Technical Cell with Panel of Experts at the ministry level, also with representation of Industry experts in the panel, to address such issues that arise in execution of large tunneling projects.** This body can be helpful in providing expert advise right from the project conceptualization / planning stage to end of the project. Expert Panel could visit large project sites and suggest key inputs. The recommendations of this body shall speed up logjams of the project. **A panel of five experts is recommended , wherein two members can be recommended by ASSOCHAM.**

## **OTHER RECOMMENDATIONS FOR CONSIDERATION**

- 1. Establishment of Project Management Consultancy (PMC) instead of Independent / Authority Engineer**
- 2. Relaxing conditions of contracts (Technical and Financial criteria), which will help increase number of bidders /participants and increase competition and lowering of cost of infrastructure projects. It will help growth and participation of small and medium enterprises in bidding process.**
- 3. Improvement in quality of DPR**  
The quality of DPR are poor and is required to be improved. **Industry suggests a document for DPRs for Tunneling in particular, be prepared. Also the cost of DPR may please be raised to around 2% with mandate conditions for quality delivery, as also clauses for failure prevention be incorporated therein.**
- 4. Division of large projects.**  
Honourable Minister suggested Industry to give there opinion for division of large projects like Zozila in smaller components so as ensure larger participation of the industry and bring up more competition and competence of SME's.
- 5. Establish Central repository of Case studies**  
**Mandate a Museum to record history of every underground excavation project at the side of project and data so available be made available for development and designs of further projects.**  
Final lessons learned and ways for improvement regarding the core issues encountered in the Projects should be a mandatory part of the closure of the Projects for Owners, Contractors and Designers
- 6. Increase in machinery advance**  
It was discussed and suggested to improve the machinery advance to 10% so as to assist the SME's to establish the themselves in delivery of the projects by handling the upfront cost. It is suggested that this machinery advance be kept interest free for the initial 50% along with provision for its recovery after 12 months in large projects. This shall assist good cash flow in the initial stages of project, when the requirement is highest of project funding.
- 7. Technology and speed of construction**  
New Technology and Methods to help speed up tunneling projects should be included in MoRTH Contract Document for tunneling in particular.
- 8. Institutional Training and research.**  
Promote research and development with help of premier institutes like IIT so that new technologies could be brought in over a period of time. Government can fund such projects. There is also requirement institutional training in area of tunneling for the government staff along with other stake holder. A tunnel training course could be initiated at MIT.

## 9. Risk Matrix

**Equitable risk matrix should be brought in.** In areas of adverse climatic conditions, squeezing ground condition, Extra ordinary ground condition the risk distribution (75% cost to be borne by contractor and 25% by developer/ owner) is unfair. On the contrary, Industry suggests consideration for 65:35 ratio in favour of contractor.

### Constraints in MoRT&H Standard bidding document (Few examples)

#### **Clause 4.1 Obligations of the Contractor**

- I. Subject to and on the terms and conditions of this Agreement, the Contractor shall undertake the survey, investigation, design, engineering, procurement, construction, and maintenance of the Project Highway and observe, fulfil, comply with and perform all its obligations set out in this Agreement or arising hereunder.

#### **Clause 4.8 Unforeseeable Difficulties**

Except as otherwise stated in the Agreement:

- (a) The Contractor accepts complete responsibility for having foreseen all difficulties and costs of successfully completing the Works;
- (b) The Contract price shall not be adjusted to take account of any unforeseen difficulties or costs; and
- (c) The Scheduled Completion Date shall not be adjusted to take account of unforeseen difficulties or costs.

#### **Clause 4.11 Site Data**

- (i) The Contractor shall be deemed to have inspected and examined the Site and its surroundings and to have satisfied himself before entering into the Agreement in all material respects including but not limited to:
  - (a) The form and nature of the Site (including, inter-alia, the surface and subsurface conditions and geo-technical factors);
  - (b) The hydrological and climatic conditions;
  - (h) All other factors and circumstances affecting the Contractor's rights and obligations under

The Agreement, the Contract Price and Time for Completion.

#### **Clause 4.12 Sufficiency of Contract Price**

The Contractor shall have satisfied itself as to the correctness and sufficiency of the Contract Price. The Contract Price shall cover all its obligations under the Agreement, **in addition to all risks the Contractor has agreed to undertake under the Agreement**, including those associated with the performance of its obligations under the Agreement and all things necessary for the provision of the Works in a manner satisfactory to the Authority and in accordance with this Agreement.

#### **Clause 6.1 Disclaimer**

- (i) The Contractor acknowledges that prior to the execution of this Agreement, the Contractor has, after has, after a complete and careful examination, made an independent evaluation of the RFP, scope of project, specification Standards of design, construction and maintenance, Site, local conditions, physical qualities of ground, subsoil and geology, traffic volumes, suitability and

availability of access routes to the Site and all information provided by the Authority or obtained, procured or gathered otherwise, and has determined to its satisfaction the accuracy.....whatsoever against the Authority in this regard.

(ii) The Contractor acknowledges and hereby accepts the risk of inadequacy, mistake or error in or relating to any of the matters set forth in Clause 6.1 (i) above and hereby acknowledges and agrees that the Authority shall not be liable for the same in any manner whatsoever to the Contractor, or any person claiming through or under any of them, and shall not lead to any adjustment of contract Price or Scheduled Completion Date.

#### ***Clause 8.4 Site to be free from Encumbrances***

(iii) Subject to the provisions of Clause 8.2, the Site shall be made available by the Authority to the Contractor pursuant hereto free from all Encumbrances and occupations and without the Contractor being required to make any payment to the Authority because of any costs, compensation, expenses and charges for the acquisition and use of such Site for the duration of the Project Completion Schedule. For the avoidance of doubt, it is agreed that the existing rights of way, easements, privileges, liberties and appurtenances to the Site shall not be deemed to be Encumbrances. It is further agreed that, unless otherwise specified in this Agreement, the Contractor accepts and undertakes to bear any and all risks arising out of the inadequacy or physical condition of the Site.

#### ***Clause 10.5 Extension of time for completion***

(i) Without prejudice to any other provision of this Agreement for and in respect of extension of time, the Contractor shall be entitled to extension of time in the Project Completion Schedule (the "Time Extension") to the extent that completion of any Project Milestone is or will be delayed by any of the following, namely:

- (a) Delay in providing the Right of Way of Construction Zone, environmental clearances or approval of railway authorities, specified in Clause 3.1 (iv);
- (b) Change of Scope (unless an adjustment to the Scheduled Completion Date has been agreed under Article 13);
- (c) Occurrence of a Force Majeure Event;
- (d) Any delay, impediment or prevention caused by or attributable to the Authority, the Authority's personnel or the Authority's other contractors on the Site; and
- (e) Any other cause or delay which entitles the Contractor to Time Extension in accordance with the provisions of this Agreement.

#### **DOSE NOT INCLUDE GEOLOGICAL CONDITIONS**

#### **Suggested solutions by ASSOCHAM**

##### **Site Data and Items of Reference**

The Employer shall have made available to the Contractor, prior to the Base Date,

- (a) the **Geotechnical Baseline Report (GBR)**;
- (b) the **Geotechnical Data Report (GDR)**; and
- (c) all relevant data in the Employer's possession on the topography of the Site and on sub-surface, hydrological, climatic and environmental conditions at the Site.

The Employer shall promptly make available to the Contractor all such data which comes into the Employer's possession after the Base Date.

The original survey control points, lines and levels of reference (the "items of reference" in these Conditions) shall be specified in the Employer's Requirements or issued to the Contractor by a Notice from the Engineer.

#### **SITE DATA- Contractors Responsibility**

The Contractor shall be responsible for interpreting all data referred.

**To the extent which was practicable**(taking account of time and cost), the Contractor shall be deemed to have obtained all necessary information as to risks, contingencies and other circumstances which may influence or affect the Tender or Works. To the same extent, the Contractor shall be deemed to have inspected and examined the Site, its surroundings, the above data other available information, and to have been satisfied before submitting the Tender as to all matters relevant to the execution of the works, including:

- *The form and nature of the site.*
- *The hydrological and climatic conditions, and their effects at the site;*
- *The extent and nature of the work and Goods necessary for the execution and completion of the works and the remedying of any defects,*
- *The Laws, procedures and labour practices of the Country, and*
- *The Contractor's requirements for access, accommodation, facilities, personnel, power, transport, water and other utilities and/or services.*

#### **Use of Geotechnical Baseline Report & Baseline schedule**

The Contractor shall be entitled to reply on the contractually anticipated sub-surface conditions as set out in the Baseline Schedule and on the contents of the Geotechnical Baseline Report, irrespective of any discrepancies or contradictions that may exist between such conditions and the conditions described in Site Data or any other documents including all documents made available by the Employer.

#### **Unforeseeable Physical Conditions**

- In this Clause, "Physical conditions" means natural physical conditions and physical obstructions (natural or man-made) and pollutants, which the Contractor encounters at the Site during execution of the works, including sub-surface and hydrological conditions but excluding climatic conditions at the Site and the effects of those climatic conditions.
- If the Contractor encounters physical conditions which the Contractor considers to have been Unforeseeable and that will have an adverse effect on the progress and/or increase the Cost of the execution of the works, the followings procedures shall apply.

"However, for the avoidance of doubt, the impact on progress and/or cost of any physical conditions that depart from the baseline conditions contemplated in the Baseline Schedule but that are nevertheless within the range contemplated in the Geotechnical Baseline Report, shall not be assessed under this sub-clause but under sub clause *Measurement of time for completion and Contract Price*.

### **Agreement or determination of delay and/or Cost**

- The agreement or determination, [Agreement or determination of the claim], of any Claim under [Delay and/or Cost] **shall include consideration of weather and (if so) to what extent the physical conditions were Unforeseeable.**
- The Engineer may also review whether other physical conditions in similar parts of the works (if any) were more favourable than could reasonably have been foreseen by the Base Date, it being understood that physical conditions that may give rise to an adjustment. [Measurement of time-related charge items] would not be considered for this purpose. If and to the extent that these more favourable conditions were encountered, the Engineer may take account of the reductions in cost which were due to these conditions in calculating the additional cost to be agreed or determined. However, the net effect of all additions and reductions under this shall not result in a net reduction in the Contract Price.
- The Engineer may take account of any evidence of the physical conditions foreseen by the Contractor by the Base Date, which the Contractor may include in the supporting particulars for the claim under [Fully detailed Claim] but shall not be bound by any such evidence.

### **Extension of Time for Completion**

The Contractor shall be entitled [Claims For Payment and/or EOT] to Extension of Time if and to the extent that completion. [Taking over the Works and Sections] is or will be delayed by any of the following causes:

- A **Variation** [Claims For Payment and/or EOT)];
- A cause of delay giving an entitlement to EOT under a Sub-Clause of these Conditions;
- **Exceptionally adverse climatic conditions**, which for the purpose of these Conditions shall mean adverse climatic conditions at the Site which are Unforeseeable having regard to climatic data made available by the Employer [Site Data and Items of Reference] and/or climatic data published in the Country for the geographical location of the Site;
- **Unforeseeable shortages** in the availability of personnel or Goods (or Employer-Supplied Materials, if any) **caused by epidemic or governmental actions**; or
- Any delay, impediment or prevention caused by or attributable to the Employer, the Employer's Personnel, or the Employer's other contractors on the Site.
- When determining each EOT [Claims for Payment and/or EOT], the Engineer shall review previous determinations [Agreement or Determination] and **may increase, but shall not decrease, the total EOT.**
- **If a delay caused by a matter which is the Employer's responsibility is concurrent with a delay caused by a matter which is the Contractor's responsibility, the Contractor's entitlement to EOT shall be assessed in accordance with the rules and procedures stated in the Special Provisions** (if not stated, as appropriate taking due regard of all relevant circumstances).
- For the avoidance of doubt, any adjustment to the Time for Completion arising out of the remeasurement of Excavation and Lining shall be determined pursuant to [Measurement and Adjustment of Time for Completion and the Contract Price].

### **Measurement and adjustment of Time for Completion and Contract price**

- Subject to the provisions of this Sub-Clause, the Excavation and Lining, and time-related charges shall be measured, and **the Contract Price and Time for Completion shall be adjusted.**
- For the avoidance of doubt, **this Sub-Clause shall not apply if the Contractor suffers delay and/or incur Cost as a result of sub-surface physical conditions encountered that are outside the scope of possible conditions foreseen in the GBR.** In this case **[Unforeseeable Physical Conditions] and/or [Extension of Time for Completion] may apply.**

- Unless otherwise stated in the Contract, all works and activities other than Excavation and Lining and associated time-related charges, shall not be subject to re-measurement and shall be deemed to be included in the lump sum Accepted Contract Amount.

**Adjustment of Time for Completion**

- For the Excavation and Lining or each Section or Milestone (if any) thereof, the time allowed in the Completion Schedule shall be adjusted by applying the production rates provided by the Contractor in the Baseline Schedule, to the actual quantity of each item of work or activity necessarily carried out and measured, as recorded, agreed and/or confirmed by the Engineer pursuant to [Engineer's Specific Duties and Authority for Underground Excavation and Lining].
- The Time for Completion of the Works, Section or Milestone shall be adjusted (shortened or extended) if the adjustment stands to affect the Time for Completion of the Works, Section or Milestone (if any) (adversely or favourably, as the case may be), based only on the logical sequential links provided in the Completion Schedule).