

Guideline for Occupational Health and Safety Cost

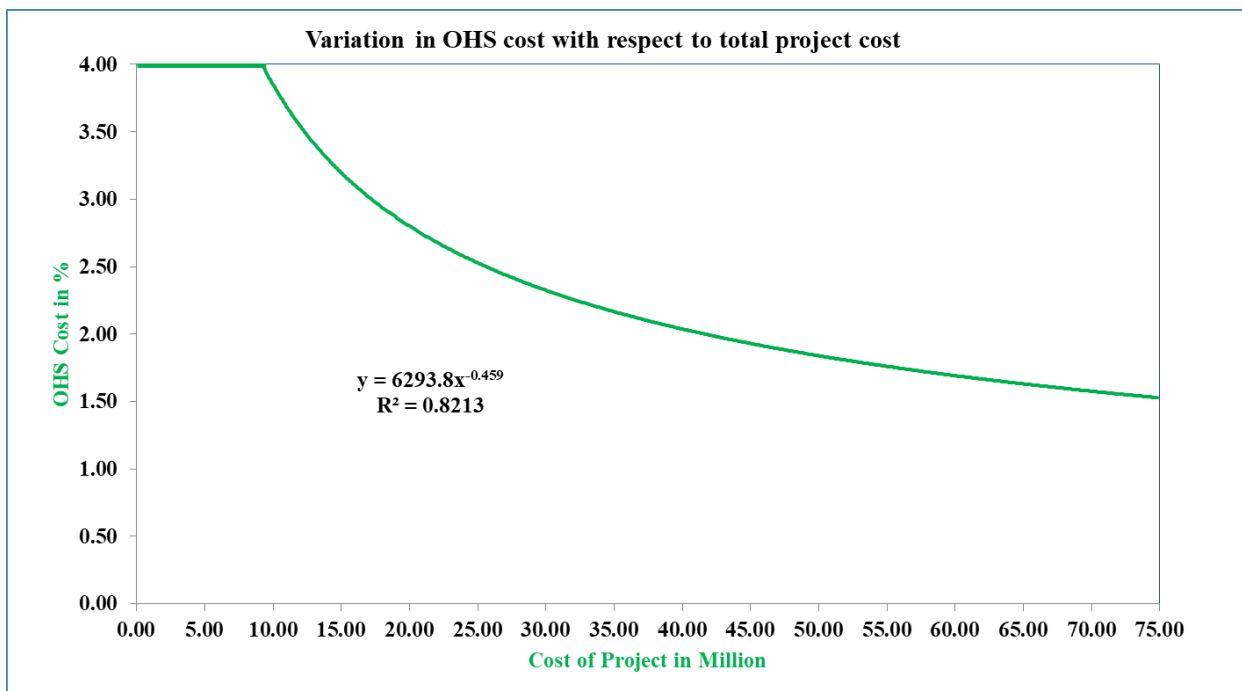
1. For the purpose of estimation of overall project cost, the cost for Occupational Health and Safety (OHS) may be derived using one of the two equations below, generated from the line of best fit plotted for cost of project versus the percentage of OHS cost. The OHS cost shall be calculated as the percentage of the estimated project cost.

1.1. Selection of the Best Fit Curve

Given the varying nature of the work, it is very challenging to get a best fit curve for every type of construction work. The following curves have been developed for the most common type of construction works in the country. For types of work not covered, the procuring agency may select the curve most suitable to their work from the two curves.

However, the procuring agencies are encouraged to design and analyze their OHS cost depending on the complexity of their project and also if their project requires additional OHS inputs beyond the minimal mandatory requirements specified in Section 2 of this guideline.

1.2. For Buildings and Bridges



$$y = 6293.8 x^{-0.459} \quad ^1 \text{ (Up to a maximum of 4 percent)}$$

Where; y = OHS Cost in %
 x = estimated project cost

¹ **Important Note:** For projects where the equation yields a percentage of OHS cost higher than 4 percent, the procuring agencies should limit the OHS cost to a maximum of 4 percent.

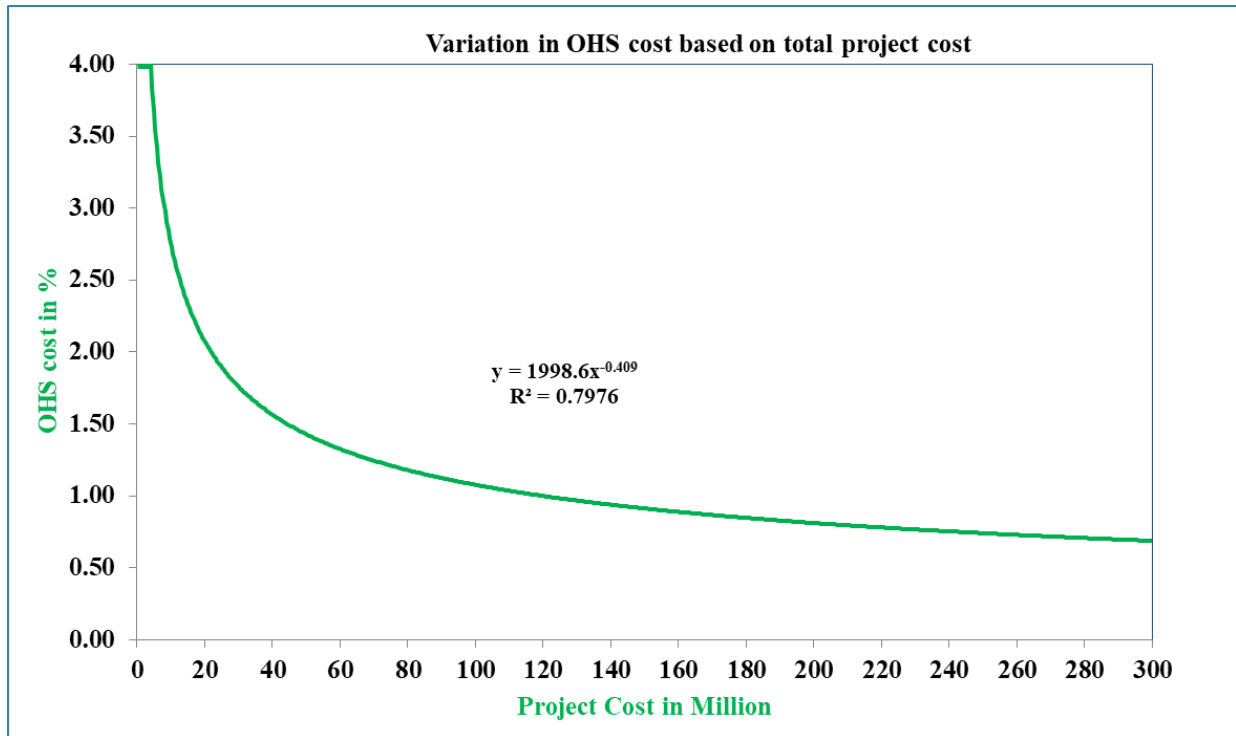
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For example, if the estimated project cost is Nu. 30 Million, the cost of OHS would be:

$$\begin{aligned}\text{OHS Cost in \%} &= 6293.8 * (30,000,000)^{-0.459} \\ &= 2.33 \%\end{aligned}$$

Therefore, the OHS cost will be: 2.33 % * 30,000,000 = Nu. 699,000.00

1.3. For Road and Irrigation Works



$$y = 1998.6 x^{-0.409} \quad ^2 \quad (\text{Up to a maximum of 4\%})$$

Where; y = OHS Cost in %
 x = estimated project cost

For example, if the estimated project cost is Nu.100 Million, the cost of OHS would be:

$$\begin{aligned}\text{OHS Cost in \%} &= 1998.6 * (100,000,000)^{-0.409} \\ &= 1.07 \%\end{aligned}$$

Therefore, the OHS cost will be: 1.07 % * 100,000,000.00 = Nu. 1,070,000.00

² **Important Note:** For projects where the equation yields a percentage of OHS cost higher than 4 percent, the procuring agencies should limit the OHS cost to a maximum of 4 percent.

2. The following list of OHS inputs are the minimal mandatory requirements at a construction site. These requirements had been derived in consensus with the Department of Labour (DoL), Ministry of Labour and Human Resources (MoLHR).

2.1. Insurance

Every worker shall be insured for the entire period of construction. The capital sum to be insured shall be as per the requirements of Labour and Employment Act of Bhutan - 2007 and its regulations.

2.2. Personal Protective Equipment (PPE)

Every worker shall be provided with minimal PPE to minimize exposure to hazard and to ensure safety at the construction sites **“at all times”**. The PPE could be grouped and provided as below:

- ❑ To be provided to all:
 - Safety helmet
 - Safety shoes
 - Protective gloves
 - High visibility Vest
 - Dust mask
- ❑ To be provided to specific workers: ³
 - Safety belt
 - Safety harness
 - Safety goggle and spectacle
 - Ear muffs
 - Ear plugs
 - Welding shield/glass

2.3. Common Protection Measures (CPMs)

- First Aid tool box with aid kits
- Medical examination and records
- Adequate safety signs and signboards
- Boundary fence/barricade
- Fire and electrical safety
- Fall protection
- Trained OHS Officer/ Safety Supervisor/Safety Representative ⁴
- Trained first aider ⁵
- Safety and health orientation to new workers and safety training
- Housekeeping
- Traffic management at construction site
- Trenching and excavation safety

³ Specific workers includes (but not limited to) those workers working at height, welders, workers engaged in works with high noise level, etc.

⁴ This requirement will only come into effect after the DoL and CDB starts the required training. The site engineer/project manager of the contractor can be OHS officer after getting trained.

⁵ The site supervisor or one of the workers can be the first aider after getting trained.

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3. The standards and specifications for the OHS materials and (or) equipment shall be in compliance with the Labour and Employment Act - 2007, Regulation on Occupational Health, Safety and Welfare - 2012, and other relevant national documents.

4. The list of the OHS requirements as per the above list with additional list (if any) shall be attached along the Bill of Quantities (BoQ) along with an appropriate item description to allow the bidder to quote reasonably against the item, and to enable strict compliance and ease the monitoring during the project implementation time.

The procuring agency may allow the reuse of OHS items so long as these reused items serve the intended purpose. Furthermore, all OHS items will remain as the property of the bidder upon completion of the project. This is to encourage the bidders to conscientiously assess the OHS cost and quote reasonably keeping in view the reusability of such items in later projects.

Procuring agencies may also include the OHS officer and the first aider as 'key personnel' required by Labour and Employment Act – 2007 and its regulations depending on the complexity of the project.

5. **Monitoring:** Once OHS is integrated into the project cost and the work awarded, the contractor will have to mandatorily mobilize the resources. The site engineers and the respective Procuring Agencies will have to monitor and ensure that the OHS requirements are provided by the contractor at site and used appropriately “**at all times**”. Besides this regular monitoring, a Third Party monitoring of OHS will also be carried out by the Construction Development Board and the Ministry of Labour from time to time.

6. **Mode of Payment:** It is recommended that the payment mode be designed to suit the procuring agency. Before making the payment, the project engineer/site engineer and the project manager should verify and confirm that the OHS input requirements have been mobilized and implemented at site. It is also recommended that the payment be made in phases depending on the nature and duration of the project.

7. **General Note:** The guideline is prepared fundamentally for the purpose of estimation of the cost of OHS in the project. For the purpose of the payment, it shall be based on the contractor's quoted amount/contract agreement.