Week 5 Project

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# Hourly Wages for Concrete Foundation

According to the Bureau of Labor Statistics, as of May 2017, concrete finishers and cement masons received median salaries of $40,650 per year, or wages of $19.54 per hour, nationally. Among these workers, the highest 10 percent made more than $35.05 per hour which totals to $72,910 per year. While the lowest-paid 10 percent earned about $13.25 per hour, which equals to $27,550 per year. Among construction workers, those who work on building exteriors foundations, and structure make up over half of the total laborer jobs. The median earnings of labor in this category of construction are $44,240 per year, which amounts to an hourly rate of $21.27 (BLS, 2018). Therefore, the hourly wage of the labor that will work on the building’s foundations is also taken to be $21.27.

# Cost of a cubic yard of reinforced concrete

Calculating the cost of concrete involves more than obtaining the price of concrete from a list of suppliers. The project manager has to determine the type of concrete according to the project specifications and provide the location of the construction area to the supplier for them to offer a quote. Furthermore, the building’s foundation requires reinforced concrete in which the reinforcement is usually provided by a steel rebar, fiber, plastic mesh, or wire mesh, depending on the project specifications. The extent of reinforcement and the type of material used is aimed at increasing the crack-resistance and strength of the concrete. A standard reinforcement of concrete adds an estimated 0.18 cents per square feet to the cost of the reinforced concrete. The foundation of the building will require a reinforced concrete slab to enhance the floor area's sturdiness. In structural weight-bearing projects, the standard strength of concrete used in the foundations should be about 4000 psi. For this type of reinforced concrete, the average price is $115 per cubic yards (Day, 2018).

# Estimate of Labor Expense of Pouring Foundation

Workers = 8
 Number of Days = 5/Week

Shift = 10 hours/Day

Time for Foundation = 3 Weeks

Using average median wage for concrete foundation workers = $21.27/Hour

Total Labor expense = (8\*21.27$) \* 10hrs \* 15 Days = $25524

# Cost of Materials for Pouring Foundation

Concrete Quantity for Foundation = 400 cubic yards

Concrete Price = 115$ per Cubic Yard

Total cost of Materials: $46000

# Impact of Overhead Charges

To costing process of a project involves calculating the direct costs of machinery, resources, labor, materials, as well as overhead charges. These overhead charges can result in increased and unexpected costs, while also potentially resulting in penalties in case of delays. As opposed to direct costs, overhead charges are not associated with the performance of a specific component of a project but rather linked to the overall running of a project. In many cases, these include the cost of utilities, supervision, insurance, services, safety, and office. Moreover, in the case of labor costs, overhead charges can come in the form of estimated time overruns which add to the base time required to complete a task, resultantly leading to higher overhead charges. These additional costs could also arise as a result of high personal time rates which reduce the total workable time of the labor. Thus, it would take more time for the labor to complete the same task than estimated, thereby increasing the overall costs (Meredith, Samuel J. Mantel, & Shafer, 2014).

In the case of materials, these overhead charges may include labor compensation insurance, or costs of small equipment such as hoists, steam shovels, or related to hiring and maintaining concrete mixers. It can also include installation overhead and freight charges. Other forms of overhead charges can result from the country in which the contractor operates due to varied practices, laws, and customs. Each of these adds to the overall project costs and require project managers to make an estimation of projected overhead costs in the budgeting process.

# Impact of Cost of Steel

 Although a number of variables are involved in determining the cost per square foot of the building's foundation. The cost of steel provides a considerable increase in the overall budget. Notwithstanding, the different uses of steel in various components of a project, the reinforced concrete, used as the prime material for the construction of the foundation, makes extensive use of steel reinforcing bars. These steel bars are embedded into the concrete before it sets in order to enhance the foundation’s tensile strength, elasticity, and ductility. It increases the concrete’s ability to resist tensile stress in specific regions which would otherwise cause cracking and structural failure (Samman & Erbatur, 1995). The stronger the tensile strength needed, the higher ration of steel is required as reinforcement. Thus, the total cost of the concrete increases in proportion to the ratio of steel, as its price increases.

# Impact of Hurricane on Schedule

 Hurricanes leave a major impact on the operations of construction sites. In case of an imminent hurricane, most contractors implement a range of precautions as high winds and storm surges can damage and flood the retaining walls and foundations of a building. Furthermore, hurricanes create an interruption in operations and planned schedules that adversely affect a project's efficiency (Grogan, 2017). Construction delays in projects often arise from force majeure events, the extension of contractor schedules, and increased costs of labor. These also create a significant potential for dispute as the contractor and owner’s views can often differ regarding schedule extension. Storm-related factors can also lead to reduced labor productivity because of a lack of equipment and material, disrupted supply chain and work processes (Galeno, 2017). Labor productivity can also be affected by demoralization caused by the loss of vehicles, property, and uncertainty about the future. Additionally, quality control processes and supervision may be absent from the site which can cause further disruptions in the project schedule.

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