Equipment Management

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Ownership Costs

The use and ownership of equipment affects every type of Construction Company and accurately accounting for actual costs is a complex process and has caused problems for many. The process of evaluating and accounting for all costs associated with equipment usage and ownership is complicated by the fact that some costs do not appear on invoices and, in fact, aren't incurred in the course of operations. These costs, while not easily recognized, will eventually have to be paid. Although various formulas are used to cope with equipment costs, the total costs of ownership are sometimes misunderstood. All costs, including those hidden, must be recognized and planned for in advance.

Contractors face many equipment concerns, for example: whether to buy or lease, which equipment to invest in, and when to invest. Equipment-intensive contractors, like road builders, landscapers, sheet metal contractors, and others have to make these decisions often, and they have a long term and profound effect on success. Other contractors have the same concerns, but less effort may be put into these decisions because equipment isn't a big part of their business. Debt service and maintenance costs may exist for contractors who own very little equipment, but these costs usually exist in a big way for equipment-intensive contractors. This chapter discusses problems primarily facing equipment-intensive construction businesses, but the principles apply to all construction companies that own equipment.

How Much to Own

The first step in controlling equipment costs is to control the amount of equipment owned. The decision to purchase new equipment is made for basically two reasons: to replace aging equipment or for expansion. Both reasons are certainly valid business reasons. Nevertheless, both reasons must be considered judiciously because the company is usually committing a great deal of their money with limited assurance of future work.

In replacing equipment, management must weigh very heavily whether the new equipment is really more productive than what they have, and if so, by what margin? Is that difference worth the investment? If the existing piece of equipment is a maintenance headache, should the company invest in a complete reconditioning and get three or four more years out of it or replace it? Are the next two to five years of work a certainty? Is the marketplace growing or shrinking, or is it likely to change soon in either direction? Of course, no one can answer these questions with certainty.

The decision to purchase new equipment, which must produce profits over a period of years or be a financial liability, is not an easy or simple one. The decision to buy means taking on additional costs and creating a necessity to get at least enough work to keep the equipment busy. Too often, contractors “want” to buy newer and bigger equipment rather than “need” to buy it. When they need a replacement, some assume that bigger is better.

Reasons to Buy

The decision to buy additional equipment for expansion is usually made for one of two reasons: new work is already contracted and there is no owned equipment available to do work, or the contractor is in an expanding marketplace and wants to have the equipment on hand to do the anticipated greater volume.

If the marketplace is getting stronger and is growing, it may be reasonable to assume that the company will get their share of the growth and therefore greater volume. The problem with buying or committing to more equipment in advance of getting the work is, as already mentioned; the company MUST then get more work just to keep the equipment busy and to justify the investment. Equipment can run a contractor instead of the other way around.

Competitive Position

One of the difficulties in getting this new amount of work is that the company's competitive position relative to their marketplace may not stay the same when the marketplace grows. Their regular competition may also have a bigger appetite and may be going after the work more aggressively than they did in the past. Another situation that often develops when a marketplace gets stronger is the influx of outside competition. When out-of-area contractors are drawn to a strong or growing marketplace, they need to get a foothold and often bid very tight to get the first job or two. Local contractors may react by bidding even more aggressively. New equipment becomes a real burden when it forces the organization to go after a greater amount of work at a time when they must bid work at a lower markup in order to get it.

Even if a company has contracted for more work than their current equipment will bear, the conditions of an expanding marketplace still make purchasing risky. Once the existing work starts to finish up and the equipment used on those jobs becomes available, the company may have idle machinery. Increasing inventory of equipment should be very carefully thought out, not only as it relates to the work, but also as it relates to the marketplace, the company's competitive position, and resources to do the additional work at a profit. Many successful contractors have loaded up on equipment in good times only to be forced into severe difficulties by the very same equipment when the marketplace went back to normal. The equipment begins to run these contractors instead of the other way around.

Calculating Equipment Costs

The subject of calculating and accounting for owned equipment cost is one that is ignored by some organizations or lost sight of by others who believe their accountants are taking care of it. To estimate work and bid a job, a contractor needs to know exactly how much equipment is going to cost per unit time, and has to include all maintenance and replacement costs to do that. A contractor must have this information to accurately price the work at a profit and to know whether on-going jobs are profitable. The basic concept for costing of equipment is quite simple, but calculating it can be another story.

The basic objective of operating a business is to produce net income, which results from receiving more from a customer for services rendered than the total expense of producing the service. As assets such as equipment are used in operations, they lose part of their service value, or "depreciate. This is an element of expense, called depreciation expense.[viii] A portion of the actual cost of the asset (equipment) expires in each accounting period during the useful life of the

equipment. This periodic cost requires no periodic cash outlay, but, nevertheless, is a continuous expense of operating the business.[ix] There are a number of methods that may be used in calculating depreciation by GAAP rules, but all are based on the purchase cost of the asset (equipment). Although depreciation is an estimate,[x] it cannot be based on replacement cost of the equipment, which presents a serious problem for the equipment-intensive contractor.

Time and Usage

The cost of owning equipment is a function of both time and usage. Some equipment may be busy all the time under normal one-shift-per-day conditions, for example, a rock crusher. The example works for 12-months or seasonal businesses. The company owns the rock crusher when it starts on a particular job and the machine is intended to operate all day, every day. It was purchased new. The direct costs to the company during the first month of operation, assuming mobilization is charged separately, are fuel, insurance, and regular maintenance. These costs are fairly easy to track monthly because they will be incurred during each month of operation. However, as there may be major maintenance as the project progresses and spare parts required, an allowance for this must be included in the equipment costs.

The allowance for maintenance and parts is an estimated cost that should be tracked and corrected occasionally to reflect what actually occurred. The allowance should be treated as an actual (if not incurred) cost because in several months, the crusher may need new belts and bearings, and the cost for these are not correctly chargeable to the month incurred. The belts and bearing were consumed over several months, and this maintenance cost should be charged in a timely manner by estimating it in advance in an attempt to reflect reality. These very real costs must be captured in a timely manner to account for the true cost of ownership of the equipment, but because some of these costs are yet to be incurred, they cannot be arrived at from the company's accounting records. They must be estimated

Estimated regular and extraordinary maintenance costs are very real and should be included in the unit cost of owned equipment because they are necessary to keep the equipment operable and in the condition it was when it was purchased. If these costs are not charged to the unit costs and charged against the work, then the cost of some maintenance will come out of profits. The estimated cost should be applied to cost control the same as incurred costs to ensure monthly costs are accurate. Estimated maintenance costs should be updated periodically (usually annually). If the equipment will need major overhauls such as engine replacements after two or three years, these costs have to be factored into the estimated maintenance and accounted for from the first month the equipment is put into service. If this is not done, the company will be overstating their real profit by not charging the wear of the equipment to the jobs that caused it. It creates a false economy.

Replacement Costs

In order for equipment-intensive contractors to enable their companies to replace their machinery, they must charge a replacement cost to the unit costs. The replacement cost should not be confused with the purchase price used in depreciation calculations. Furthermore, these charges should be applied to the cost control system hourly, weekly or monthly as a true (actual), if not incurred, cost. The replacement value is calculated by determining the useful life of the equipment and estimating the replacement cost, less salvage at the end of its useful life. The

replacement cost is divided by the useful life to get the monthly cost that will be incurred. In this calculation the number of hours, weeks or months the equipment is anticipated to work per year is used. The replacement cost represents the cost to the company of using up or consuming the piece of equipment. If an organization uses the purchase price and not replacement costs as many do, and divides by the useful life, they will not collect the replacement cost of the equipment during its use because of inflation.

A contractor may ask, "Do you really want me to charge my clients for next year's inflation when I'm only working for them this year?" The answer is, "No. You can always pay for it yourself." If an equipment-intensive contractor does not charge replacement cost, they are paying for the privilege of being in business. They are consuming equipment at rates that are intended to repay the company for the amount they paid for the machinery. However, when the equipment is replaced, for example in five years, the company will need more than what was originally paid for the equipment to replace it. To be self-sustaining, an operating business must replenish or regenerate itself from operations and total cost of ownership. It is an economic reality that inflation is a cost of doing business and for an equipment-intensive contractor, this means charging replacement cost to the unit costs of equipment as it is used.

Economic analyses supporting a decision on equipment replacement are aimed at determining the equipment replacement interval that will yield the maximum on the equipment investment. The period of equipment ownership that yields the maximum profit on the equipment investment may be considerably shorter than the economic life of the equipment. Equipment ownership costs, as the term implies, represent the cost of owning the equipment. Although these costs are usually prorated on an hourly basis for estimating and accounting purposes, they represent costs that would be incurred whether the equipment is actually used or not.[xi]

Equipment Costs Charged To Projects

The purpose of charging all equipment costs to the jobs and applying these charges monthly as costs are incurred in a cost control system is to give the contractor a realistic picture of whether the company is making or losing money in time to do something about losing situations. Equipment is not an overhead cost any more than moving equipment back to the yard stops ongoing costs.

Consider the heavy equipment contractor during a slow period. The company can either charge more of the equipment costs to fewer jobs or consume the difference. During a slow period, there will be no fuel cost, and maintenance can be suspended, but the insurance cost goes on as does replacement cost. Replacement is a function of usage, age and obsolescence. It is often obsolescence that causes replacement, so the timing of replacement isn't only affected by usage. If a contractor believes that downtime will extend the useful life of the equipment, then they can adjust the replacement cost as long as they factor in an amount for deterioration from storage and non-usage. Deterioration can be a costly factor because most construction equipment wears better in use than out of use. Taking work just to break-even is never justified except for survival.

Idle Equipment

The alternatives open to a contractor whose equipment is idle because of an inability to capture profitable work are not encouraging. To take work in other geographic locations (see Chapter 4) or on a tight schedule isn't good business because the company takes on too much risk just to keep the equipment working. To take highly competitive work just to break-even is rarely justified, except for survival. Liquidating some equipment is an alternative, but must be considered in the context of the overall business, including new work anticipated. There is seldom a profit to be made in liquidating used construction equipment, although liquidation can reduce losses caused by the ongoing cost of idle equipment. Leasing out idle equipment is a favorable alternative, but this is usually difficult to do if there is a general slowdown in the market.

If nothing can be done to mitigate the loss from idle equipment, it should be left on the last job it worked on and the real costs of owning it charged monthly to the job. This serves as a reminder that the equipment is idle, and management, who should have anticipated when the equipment would be free, will be encouraged to get everyone talking about where it should go next. It also tends to discourage project people from always asking for more equipment than they really need.

If idle equipment makes one or more jobs show losses by the month, it simply points out the real costs being incurred. If idle equipment is not charged to projects, it is possible for all jobs to be showing a profit on paper. However, the real picture for the company is not as good as the paperwork is showing. Positive cash flow that can be mistaken for profit.

Cash Flow

Cash Flow is equal to the sum of earnings (after taxes) and depreciation.[xii] Taxes on earnings are paid in cash reducing the company's cash flow, but depreciation is a non-cash expense and thus contributes to cash flow.

The majority of the cost of equipment ownership does not occur concurrently with the equipment's usage, thus equipment intensive-contractors usually have a positive cash flow that can be mistaken for profit. Even if an organization accepts these concepts and accounts for all of the costs as described above, the company's cash flow will be greater than their real profit. If the replacement charges and extraordinary maintenance charges are not accounted for and actually placed in reserves, then funds won't be there when needed. During slow periods with a lot of idle machinery, an equipment-intensive contractor could be showing losses on all jobs, but still have a positive cash flow and is therefore able to weather the storm well. If the company uses some or all of the funds reserved for equipment replacement and if they are not replenished out of future profits, there isn't going to be enough money to replace the equipment when the time comes.

Because most equipment is purchased not with cash but on credit, the equipment is expected to be paid off from future work. The example used above was for equipment purchased for cash because it makes the concepts easier to relate to and follow. For equipment purchased on credit, there is a slight change in the proposition. Interest costs are added to the formula as an expense similar to fuel and insurance. Since both interest and principal must be paid concurrently with usage, cash flow during slow periods is affected. During idle time or when losses occur for any reason, there may be a loss with a negative cash flow. Depending on the length of a slow down or loosing period, there may not be enough cash flow to make the equipment payments.

Equipment Obsolescence

Equipment-intensive contractors have another exposure in the equipment area that is not as apparent and often not planned for, and that is equipment obsolescence. Companies incur a great deal of cost in replacing equipment as it wears out. Broken-down equipment delays jobs, hinders progress and costs money.[xiii] However, obsolescence can occur well before machinery reaches its useful life. The productivity of equipment dramatically affects the profitability of equipment-intensive contractors and is part of their competitive edge. Equipment productivity is critical to making a profit and to bidding and getting the work. As newer and more productive equipment comes into the market and a contractor's competitors buy it, the contractor can be forced into equipment replacement earlier than planned just to remain competitive. Equipment obsolescence prior to useful life is a difficult issue because it is almost impossible to predict and consequently to plan for. It is therefore a risk of doing business for equipment-intensive contractors

Equipment Obsolescence Case Study

This case study is about a well-established specialty contractor with aging duct-making machinery that faced new and unexpected competition from a start-up contractor who had the latest technology equipment. The productivity of the new equipment allowed the start-up contractor to bid lower on every job of any size that came out during their first year in business, until the established contractor had hardly any work. The established contractor decided the only way to remain in business was to replace their equipment with the more productive machinery their competition was using. Like most contractors, they had not reserved money for equipment replacement or, for that matter, even accounted for it. The company's current financial statements reflected a bad year because of the new competition, and the established contractor was unable to purchase the new equipment because they could not secure the financing. In fact, the new equipment was so expensive that their last five years' total profit wouldn't have paid for it.

The contractor was very aware of potential equipment obsolescence and the benefits of new technologies, keeping abreast of the latest developments in their field such as computer operated duct fabricating machinery. In fact, they knew that eventually some or all of their equipment would need to be replaced, but felt that it still had a lot of good years left in it. However, replacement costs were not included anywhere in their cost accounting. By ignoring the real cost of replacing his equipment, the company was enjoying a "false profit." Had the contractor accounted for realistic replacement reserves, they would have seen that their real profits weren't what they thought they were. Additionally, had they considered obsolescence, they may have planned for continual upgrading of equipment or at least measured how far the company was falling behind technology and quantified the risk and cost to the business.

Contractors must understand that competition is a strong force in the construction industry, including specific construction disciplines and sub-disciplines. The notion that the established contractor could not have foreseen the eventuality of the start-up company entering the marketplace is not the issue. New businesses with better ideas are a reality in any industry, existing competition may gear up and tool up at any time to increase their market share, and out-of-town contractors are always on the lookout for new areas to expand into, particularly if existing competition appears weak or less productive. An equipment-intensive construction

enterprise that does not concern themselves with the effect of obsolescence on their business and with remaining at least as productive as industry averages nation-wide, is a business that is at great risk.

Simply reserving the anticipated cost of "keeping up" is not enough because a company may not be able to gear up fast enough if the their competitive balance shifts rapidly. It is necessary to also spend the reserves and keep up with national standards, not just local standards, because the industry is mobile and unanticipated competition can originate from anywhere.

Replacement Cost Incurred Daily

The entire future replacement cost of equipment, including the costs due to inflation, obsolescence, and wear, necessary to remain in business will become due whether or not it is accounted for or reserved by contractors. Replacement cost is a very real cost of doing business, and is a cost that is incurred each day, not only at replacement time. Following is a simplistic example.

A contractor decides to go into the dirt-moving business and buy a $100,000 bulldozer, how shall they account for the ownership of this piece of equipment in years to come? Let's say they buy it for cash from personal savings and that it will last for five years, at which time it will be worn out. For this example, we'll assume zero salvage value. There are a number of ways to account for depreciation, and we'll select straight-line depreciation over five years or depreciation of $20,000 a year.

The new business recovers all other usage costs during that five years and charges only $20,000 depreciation in their accounting for equipment ownership, where will they be in five years? They will no longer have their $100,000 because they spent it to buy the bulldozer in the first place. They won't have the bulldozer because it is worn out and has no salvage value, and they won't have a job because they don't have the piece of equipment. What happened to the $100,000? It has been consumed by the business. Sure, they made profits during those years and the depreciation allowed them to have $20,000 of the profit without corporate tax, but the $100,000 was after-tax dollars. They spent the company's profits on salary and operating costs. A new bulldozer today costs more than the $100,000 it cost five years ago, say, $150,000. To stay in business they need to borrow the $150,000. In this situation, the contractor is not only short the $100,000 that they started with five years ago, but they are also in debt another $150,000.

While the example is simplistic, it provides good food for thought. Of course, replacement costs to be incurred five plus years in the future would be calculated at the present value of the future cost and tax considerations would impact the calculations. Nevertheless, replacement costs will become due at some point and will almost always be more than the original purchase price, so one cannot rely on allowable depreciation alone to accurately account for the cost of ownership of equipment. If the company buys equipment on credit and replaces it with credit, as most contractors do, the company will go deeper into debt by at least the rate of inflation the longer it remains in business. Equipment replacement costs won't be incurred for five or more years which are not a big problem unless you intend to be in business longer than that.

Summary

When a company does not account for the real replacement cost of equipment, profits are exaggerated, which gives a false picture of where the organization is and certainly of where they are headed. While the IRS does not allow funds reserved for equipment replacement costs to be tax free, they are clearly a cost of doing business. There is a lot of debate on this subject from accountants and tax experts, and it would be beneficial to unite and determine what the optimal method is for all parties considered.

Industry economic conditions raise the question of whether a fleet of equipment is a liability or asset.[xiv] Ignoring the real replacement cost of equipment necessary to remain in business can influence an organization to operate in a false economy, go farther into debt over time, and for many contractors create serious long-term financial problems. Costs that are incurred and due in the current accounting period are no more real than costs that will definitely be incurred in the future and will become due in a subsequent accounting period; it is just harder to recognize them and account for them. In the example provided, equipment replacement costs won't be incurred for five or more years, which is not a big problem unless you intend to be in business longer than that.