

1. Change orders

What is a change order?

A change order is extension to the work that wasn't originally planned.

The bid documents that include the scope of work, specifications, agreement, and the drawings should completely describe the whole content of the work.

If the bid documents are not full and comprehensive, the project reaches a situation where not all the work is done, therefore need to issue a new change order.

1.1 The reasons for the appearance of change orders.

There are different reasons for change orders, all of them theoretically are professionally unjustified.

It is easier to explain this statement by saying that the more change orders a project has, the worse the management ability is. The best project even if it is rare, has no change orders no budget overruns and is complete on time.

The time issue is relevant because many change orders cause delays or reflect delays on time, because additional work means more time for the project.

Following are the reasons for the change orders:

1.1.1 Change orders arising from **new demands from the owners**- The least severe CO.

These CO occur after the completion of the design and determine the budget and then new demands arise.

The new demands can be such as adding a gallery or choosing a new expensive ceramic floor.

Reasons-this type of CO is caused by the owners not investing enough time and pondering with the architect and the project manager to find out what they want to design and prepare a good space program.

Consequences –we put these types of CO, as the least severe because if the owner makes mistakes it is his money and usually he has lack of knowledge compared to professionals.

In the project's early stages, it is hard to decide what the client really wants.

We think that if the owners would have known how these changes affect them and the overall cost, they would invest more time in the design phase to decide about all the project aspects.

Then they will avoid any new changes after the design's completion.

The **effects of changes after** the design completion and during the project performance:

The changes force the consultants to issue new drawings, usually those changes refer to all the consultants.

Those changes during the performance, delay the project because the team is waiting for new drawings.

When the team is waiting on new drawings, it causes delays in the project. Therefore, it has to be clear that new changes mean failure to meet the deadlines.

The cost of the changes is always much more compared to the prices that the owner could have receive at the bid stage.

The more the project progresses on the site, the changes' influence is more severe.

The cost is higher because the subcontractors use this opportunity to demand much higher prices for

the same work which initially they would do for much lower prices.

One reason for the higher prices of the change orders compare to the prices that the subcontractors submitted in the bid process, this is because they have to invest new

management resources on the job for the extra work during the performance. The second reason is because they use this opportunity that they already won the job, to earn more money. The bottom line is that the client **pays much more money and lose of time** even for change orders that initially look harmless and inevitable.

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1.1.2 Change orders arising from: poor bids documents.

These types of CO arise from many problems in the bids documents such as the ones listed below:

As described in the paragraph subcontractors' contracts, many change orders appear because of bad contracts. Many more change orders arise as a result of incomplete drawings and many contradictions within the project documents.

The reasons for poor bids documents derive from: mismanagement, unprofessional team [no education and certificates], consultants with not enough motivation, and **pressure from the client** to begin with the construction process ASAP.

But good management is the most important to prevent this problem. Also by explanations to the client what the serious consequences are of pressure to begin working without the completion all the design and the bid process.

Usually good design and bid process would start from the day the architect begins to work until the bid process is completely finished (between one to two years); Most of the clients do not understand this.

If the project manager is good he manages the consultants, explains the process to the client and makes sure the design and the bid process will be finished completely.

He then begins the work on site, after he has good drawings, specifications, scope of work and good agreements with the subcontractors.

It should be emphasized that starting the job without full and complete bid documents, doesn't save time, on the contrary, this significantly extends the duration of the project

1.1.3 Change orders arising from: Client's Improper project management during execution.

Even if everything was conducted well in the bid phase, but afterwards the client didn't hire a professional project manager on site, usually it causes a project failure and many change orders. Most of the CO that caused as a result of bad decisions on site, derive from late response to questions that arise from the subcontractors, and lack of coordination between all the parties involved on the project. Usually late response from the project manager to questions and problems that arise on site [such as lack of design details] become claims for delays from the subcontractors.

1.1.4 Change orders arising from: subcontractors' improper project management during execution.

If unfortunately, the client chose for instance an unprofessional skeleton subcontractors, or a subcontractors that offered very low prices in order to win the job, this type of subcontractors will

fail to do the work properly, hence, delays will occur. The subcontractors will try to find any excuses to request for change orders.

For example, Unknown Steel and Old Castel failed to coordinate the job between them, they didn't issue final sealed drawings by a professional engineer and therefore caused the project a lot of technical problems that hurt their own cause and others.

As a result of this bad management, they led to delays in the project.

Ironically, they issued change orders for delays by THE OWNER, instead of paying to THE OWNER fines for failure to meet deadlines.

1.1.5 Change orders arising from: Lack of good faith of subcontractors, or lack of

knowledge.

When subcontractors find out that they are working with a project manager or a superintendent that are inexperienced, some of them try to utilize this opportunity and release many unjustified change orders in order to earn much more money.

Some of the subcontractors may know how to do the job, but just don't know how to read documents correctly so they tend to request many change orders.

If they are dealing with unqualified project manager who confirms these unjustified change orders without checking, they are in luck to receive more money.

1.1.6 Change orders arising from: Force major

Some of the change orders can be caused by special security reasons; extreme weather conditions etc. then the client has to accept these change orders.

1.1.7 Change orders arising from: A bid process which continues throughout the project.

The bid process doesn't end, at the beginning of the project, the project starting to be a combination of contracts and change orders which been signed during all the duration of the project. The differences between change orders and new contracts are blurred.

1.2 How to review the change orders and ways to improve them.

1.2.1 Confirmation of standby rates and delays for equipment and labor.

As we noticed in construction projects, in this type of demand there are few common problems in most of the change orders.

1.2.1.1 If a subcontractor wants to stand by rates as a result of delays that were not his fault, he has to submit the right prices.

1.2.1.2 The correct labor's prices, must appear in the contract then it is clear from where he can pick the price for possible CO.

1.2.1.3 In many contracts such as Unknown's contract, he didn't fill labor rates and THE OWNER allowed him to do so. This is a management failure.

1.2.1.4 Even if the hourly rates didn't appear in the contract, it doesn't mean that the client has to accept any high prices that the subcontractors offers in his greedy change orders. Unknown's hourly rates for the crane, were twice as higher than normal. They were also higher in dozens percentage for the workers` labor rates. Therefore, his CO's prices were much higher than should be.

1.2.1.5 In cases like that, the project manager has to reject the price and to use a well-known tariff or to use hourly rates from any other data he has.

It is not likely that a company like THE OWNER, has no data like a crane's prices per hour. Therefore, after a short checking, THE OWNER had to reject a price of 562\$ per hour.

1.2.1.6 As will be explained later, in this case there was no need to pay for any delays. However in this paragraph we are explaining what to do in cases when the client decides to pay to the subcontractors.

1.2.2 A unit prices` confirmation for an additional job.

1.2.2.1 When the subcontractors priced theirs change orders, they used any kind of unit prices

they wanted, this was wrong, and it must be stopped.

1.2.2.2 One of the contracts' problems was a very short and limited SOV .

Although the SOV that THE OWNER prepared in the contracts was so short, most of the subcontractors still didn't fill it or filled only part of it.

1.2.2.3 These are the solutions to prevent subcontractors' high unit prices for any new work:

The first step is to make the required efforts to use similar prices from the contract by trying to make logical analysis, what should be the correct price based on the contract?

Example-unknown Plumbing issued very complicated change orders.

We cannot understand why he didn't use his prices for kitchens and baths in the contract, in order to price the new kitchens and baths. [maybe it's easier to make sophisticated calculations instead of to use the simple low prices he had in his contract]

1.2.2.4 The project manager shouldn't allow the subcontractors to submit unit prices without justification and references why he is charging the customer for these prices.

The prices can be offered from a known price list, or any market prices that should be checked and has to be added as reference to the CO.

Recommendation – it is warmly recommended to enforce the subcontractors to be committed through the contract to a well-known tariff. In case a new job arises during the project, they will pick the prices without arguments from this tariff.

THE OWNER can combine a price list of its own and add it as an addendum to the contract.

[It is possible to allow the subcontractors to offer a discount or an addition, in percentages, to this price list].

1.2.2.5 Recommendation, SOV – the SOV has to be much more detailed, as we saw in many other projects that we audited.

It is recommended to use the consultants as part of their services, to produce a better SOV for the client.

1.2.2.6 Recommendation, unit prices- it is highly recommended to have a list of unit prices

in the contracts. It could be achieved by the help of the consultants, or by requesting the

competitors a list of their own unit prices, then come up with common unit prices to resubmit by all the bidders.

1.2.2.7 Example for a high extra unit price.

In another project that we checked in the city, we reviewed a subcontractors' price for an extra plywood in the price of 4.5\$ per sq. almost the same as the contractual unit price for all the partition 5.5\$.

If the superintended would have checked the proportion between the prices, or if he was looking for an acceptable market price, he would have found out that the price he got is double or triple. If he would have tried to dive more into the contract he would have seen that he had an alternate for plywood, meaning a price of 1\$ per sq.!

1.2.3 Approval of quantities without checking.

The subcontractors are submitting their change orders as a multiply of quantity by price, then they determine the total price.

The quantity of the work in the CO usually wasn't calculated by the subcontractors on paper, we only saw the final number without any breakdown of the price.

They didn't attach calculations, sketches or any other necessary references in order to show

how they determined this amount.

The only correct way to do it is by showing full calculations with the proper drawings and sketches for the superintendent's review, otherwise it is totally unprofessional and indecent.

There are no explanations and excuses for lack of time or knowledge to do that, THE OWNER's team

should demand it in every project.

It is not acceptable that subcontractors that earn millions of dollars can't hire an engineer to do proper calculations and change orders for them.

We already saw that how the subcontractors determine the price is wrong, now we can see that the quantities are not reliable. Thus, **we are concluding that in these indecent "calculations" hiding several millions of dollars is being spent on THE OWNER's projects, instead of staying in the client's pocket.**

1.2.4 **General - Change orders stem from any problem such as scope of work, drawings etc.**

We noticed that all the subcontractors don't show full and detailed change orders that justify their request for payment, therefore it is THE OWNER's management issue of not enforcing them to submit their change orders correctly.

In most of the change orders the subcontractors declare that the architect/THE OWNER construction asked

them to make changes or additional work. However they didn't attach any documents supporting this request. Sometimes they show a sketch from the architect or one of the consultants that describes a change or clarifies the work as a proof for the change order.

It is likely that the architect didn't even know that the subcontractors are going to use the sketch as a request for a change order. For example, they sent to Unknown Steel, new plans because they failed to complete the shop drawings and had lack of supports. Afterwards, the plans are utilized by the subcontractors as a proof for an additional CO.

Proper submission of the change orders -the project manager has to ask for full documentation. From subcontractors that earn millions of dollars it is expected to receive full documentation. In most of the cases it turns out that there is no approvals or letters that support the demand for a change order.

It is essential to be in better communication with the consultants, for assistance and clarification regarding to CO's confirmation.

It should be emphasized, any change order has to be reviewed very carefully The project manager has to do a very extensive research in the scope of work, drawings, the contract and the specification in order to find out, if the request of the subcontractors is justified. This research is essential in order to see that the new claims doesn't appear in his contract/drawings/scope of work/specifications as provisions or obligation [that included in his contract's price] that afterward are subcontractors' new demands.

In most cases this research will lead to the conclusion that there is no base for the new demand. Usually the architect and the other consultants know very well what they want and defend the clients from any possible claims by very detailed project documents.

The tendency of the team on site to blame the consultants instead of to work with them as a team, is only an attempt to rid themselves of the blame for the project's failures.

Example – Unknown steel asked for a change order for Signed and Sealed Calculations for his shop drawings. However, he was required to do it in his scope of work, with no additional price.

Proper treatment of the change orders- the project manager has to review the correct

documents [in this case the specifications] and reject those kind of change orders.

1.3 Change orders summary.

1.3.1 Change orders caused as a result of incorrect management.

1.3.2 Change orders have to be submitted correctly with all the proper documentation.

1.3.3 Good contract, design and proper bid documents, prevent CO

1.3.4 Proper management during the execution prevents CO.

1.3.5 Cooperation and good relationship with the consultant prevent CO.

1.3.6 Project manager and the superintendents that have a good knowledge of the project`s documents and drawings, can prevents many CO.

1.3.7 Professional team can prevent a lot of CO and can save money and time for the project.

1.3.8 The process of examining the CO by THE OWNER, must change dramatically.

The subcontractors should be aware, that THE OWNER will not confirm unjustified payments. Training of the staff is needed.

1.3.9 Change orders are time consuming - usually any change order causes a substantial loss of time.

The duration of the time consumed depends on how complicated the specific work is.

Thus, a change order costs far more than it seems.

First, the prices are much higher, second, delays translate to a considerable financial loss.

1.3.10 Entrepreneurial company that manages its own projects, has to instruct their team accordingly. Many professionals in the industry comes from CM companies that are not entrepreneurs. In such organizations, there is an organizational culture that encourage change orders, although it is not their client`s wish, because from each change order, they are making more money.

This habit maybe exist in some of the professionals in the company, that used to confirm CO for subcontractors, without examination and hesitation.