Chapter 15
Construction Claims

15.1 Introduction

Changes and claims are a common element of today's construction industry, particularly where the project is complex and may result in millions of dollars of extra payment. Construction changes were also discussed in a previous chapter; here mainly construction claims or unresolved changes will be addressed. A claim is an unresolved change and if a change is agreed and processed, it will not turn to a claim. It is therefore beneficial to both the Owner and the Contractor to resolve the changes promptly, fairly, and sensibly to avoid reaching the claim situation. However, the major role of all parties to the contract should be to avoid problems or to minimize their impact when they do arise.

15.2 Construction Claims

15.2.1 Definition of a Claim

A claim is a written statement by one party seeking, as a matter of right, additional time and/or money for acts or omissions by other party during performance of the contract with respect to the terms of the contract. In fact, claims are an integral part of the construction process, and good claim and administration principles are equally important as managing quality and safety, etc. on construction sites. The provisions are outlined in most of the standard forms of contract, under which the Contractor can claim against the Owner for any losses suffered if the progress of work is affected due to certain specified causes.

Early identification and notification are the most important factors of the entire claim process. Prompt identification enables the Employer to verify, confirm, and

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possibly remedy the situation at the earliest possible. With early identification, the Contractor becomes in a position to study the problems, analyze different proposals and notification options, so as to prepare the claim properly without any trouble.

15.3 Types/Causes of Claims

There are many causes of claims; however, some of the consistent causes of claims are summarized here:

(a) *Delays & Accelerations*: Delay and accelerations are an extremely common source of construction claims.

(i) ***Delay***: Delay refers to the situation in which the activity of one party is affected by the inactivity, inability, or constraints of another party. Progress delays occur in many construction projects. Examples could be:

1. Delay in handing over site to the Contractor
2. Delay in approvals and decisions
3. Delay due to Owner's nominated subcontractors or by the General Contractor's subcontractors
4. Delay or defects in items supplied by the Owner
5. Delay in delivery and supply of materials
6. Delay in progress of work by the Contractor
7. Failure to adequately schedule and coordinate the work
8. Strikes, adverse weather, Contractor errors, variations and Owner-directed suspension, and so on.

Progress delays are of two types: excusable delays and non-excusable delays.

Excusable delays Excusable are delays to the completion of works arising from conditions beyond the control (and without the fault or negligence) of the parties, e.g., acts of God, fires, floods, strikes, severe weather, etc. An excusable delay is one that justifies an extension of time.

Non-excusable delays Non-excusable delays do not justify an extension of time. Non-excusable delays are those that are generally within the control of the Contractor or have been contractually assigned to the Contractor. The examples could be delay in submission of shop drawings, lack of sufficient resources, subcontractor delays, etc.

Excusable delays are further classified into compensable and non-compensable delays.

Compensable delays Compensable delays occur when one party fails, without excuse to timely perform a contractual duty, which causes a delay in the other party's performance. The examples could be poor planning and management of Contractor's site staff, lack of resources, delay in handing over site by the Owner, design errors, etc. Compensable delays authorize both an extension of completion time as well as collection of damages caused by the delay. Compensable delay may

result in the contractor's termination for default or the assessment of liquidated damages.

According to CCDC 2 [1] clause 6.5, if the Contractor is delayed in the performance of the work because of the Owner, Consultant, or anyone employed or engaged by them directly or indirectly, or by a court or other public authority, without any fault of the Contractor, then the Contractor shall be entitled for reasonable time extension and costs incurred by the Contractor as the result of such delay.

Non-compensable delays There are two forms of non-compensable delay impacts [2]:

1. An excusable delay may be non-compensable if the project delay is beyond the control of both parties. Inclement weather and acts of God may entitle the Contractor to a time extension but not monetary compensation.
2. An excusable delay is non-compensable if the conditions could have been avoided by the Contractor. For example, if the project was delayed by the Contractor's actions or inactions, the Contractor would not be entitled to time or money for the delay.

(ii) **Acceleration**

Acceleration is speeding up the progress by the Contractor to achieve early completion or to make up for time lost due to delays unless a time extension is granted. Acceleration can be classified as (1) voluntary, (2) directed, or (3) constructive.

Under voluntary acceleration, the Contractor at his own initiative decides to speed up the progress either to cover his own delays or to complete the project earlier than planned.

Directed acceleration occurs where an order to accelerate performance is given by the Owner. The contractor normally is entitled to compensation for any extra expense caused by an acceleration order.

Constructive acceleration occurs in the absence of an Owner directed acceleration or where the Contractor has not actually been expressly directed to accelerate. This happens when the Owner has refused a valid request for time extensions or threatened other action.

As a result, if the Contractor accelerates its performance (to avoid liquidated damages or other loss or risk of loss) and incurs additional expense in order to overcome the delay and achieve the original completion date, then the Contractor's performance has been "constructively" accelerated, even though no direct acceleration order has been given. The Contractor normally is entitled to compensation for constructive acceleration.

It is important that the Contractor advises the Owner/Contract Administrator that any efforts undertaken by the Contractor to accelerate performance are not voluntary, especially when there is the perception of acceleration but an instruction has not been received.

The principle of constructive acceleration has been applied in the United States and Canada but may vary in other countries. Canadian cases such as *Morrison-Knudsen Co. v. British Columbia Hydro & Power Authority* [3] and *W.A. Stephenson Construction (Western) Ltd. v. Metro Canada Ltd.* [4] can be referenced in this context.

(b) *Directed and Constructive Changes*: Directed change refers to the change in scope of work, i.e., addition or deletion of works or the use of different methods, materials, or design. It is a directive by an Owner or his authorized agent through a written change order to make a change to the contract.

Constructive change, also known as "force account work," is not the same as directive change, as no written change order is issued for the change with respect to work required. An oral or written communication by an Owner or his authorized Agent is considered having the same effect as a written change order.

Whenever a change during work occurs and the change is not the responsibility of the Contractor, the Contractor should immediately give written notice to an Owner that a change has been made. Contractors should not wait for final calculation of cost or delay. Sometimes, on a job with many changes, the Contractor at the end of job is in a loss position and submits claims for the total impact of the changes. Such claims are usually denied because the impacts and delays are not traceable to specific cause [5].

(c) *Concurrent Delays*: A concurrent delay occurs when two or more independent causes of delay overlap in time [6]. For example, if a Contractor-caused delay is 2 weeks and an Owner-caused delay is 1 week and they do not overlap, then the Contractor would be entitled for only 1 week time extension for the nonconcurrent Owner-caused delay, whereas if they overlap, then the Contractor would not be entitled to an extension of time because of concurrent delay. In another example, if the Contractor-caused delay is 1 week and Owner-caused delay is 2 weeks, and they overlap, then the Contractor would be entitled to get 1 week extension for the non-overlapping week.

(d) *Cardinal Changes*: A cardinal change made by the Owner is one where the purpose of the original contract has been frustrated or made impracticable or impossible by the magnitude of the requested change. A cardinal change is mostly viewed as a breach of contract on the part of Owner, and the Contractor may either refuse to perform the work or may elect to complete the work under protest and recover reasonable cost for performing the changed work.

(e) *Differing or Changed Site Conditions*: This situation refers to the changes encountered during work performance which were not visible and not known at the time of bidding. Differing site conditions are addressed under FIDIC [7] Sub-clause 4.12 as "unforeseeable physical conditions" and under CCDC2 [1] clause 6.4 as "concealed or unknown conditions." Unforeseeable physical conditions are also the most common source of claims and disputes in construction projects. According to FIDIC [7] Sub-clause 4.12, physical conditions mean natural physical conditions (such as change in soil characteristics, encountering rock, etc.) and man-made (such as unidentified utilities, buried structures) and other physical obstructions and pollutants including subsurface and hydrological conditions but excluding climatic conditions. The most common problems are changes in subsurface soil conditions and unidentified subsurface utility lines.

According to FIDIC [7] Sub-clause 4.10, the Employer has to make available to the Contractor for his information all available details of subsurface and hydrological conditions at the site including environmental aspects. The

Contractor shall be responsible for interpreting all such data and making his own inquiries in order to satisfy himself that the tender is adequate.

However, if the site conditions actually are concealed from the Contractor, then the concealment of the site conditions may give rise to a tort claim for fraud and misrepresentation.

If a construction contract represents that certain conditions exists on the site and in fact the actual conditions on the site differ from those represented in the contract drawings and specifications or the Contractor encounters adverse physical conditions which he considers to have been unforeseeable, then a contract-based claim arises.

CCDC2 [1] under clause 6.4 provides that if the Owner or the Contractor discovers that subsurface or concealed physical conditions, other than conditions due to weather, differ materially from those provided in the Contract Documents, then the observing party shall give notice in writing to the other party within 5 working days without disturbing the discovered conditions. The Consultant shall investigate such conditions which may cause an increase or decrease in the Contractor's cost or time to perform the work. The Consultant with the approval of the Owner will issue appropriate instructions for a change in the work.

As mentioned above, it may be noted that claims with respect to differing site conditions must be for physical conditions. Claims are not entertained under nonphysical conditions such as labor disputes, governmental, political, and economic, or weather conditions.

Most standard Contract Documents, identify two types of differing or changed site conditions as Type-1 and Type-2.

Type-1 Changed Conditions Type-1 condition refers to subsurface or concealed (hidden) physical conditions, differing materially from those provided in the Contract Documents. Type-1 conditions should not be considered as subsurface conditions only, but they also cover conditions which are at or above surface that are concealed or hidden, for example, presence of plumbing in walls, which is not shown or identified in the contract documents at the time of bidding. Some other examples of Type-1 conditions include:

1. Presence of subsurface water or encountering rock during subsoil excavation, not indicated in the Contract Documents.
2. Presence of permafrost, not indicated in the Contract Documents. National Geographic describes permafrost as a permanently frozen layer below the earth's surface, consisting of soil, gravel and sand usually bound together by ice.

Type-2 Changed Conditions Type-2 condition is described by most Contract Documents as unknown physical conditions of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inhering in the work [8]. By definition, a Type-2 condition is not described in the Contract Documents. It must be an unknown physical condition of an unusual nature [9]. Example could be that during excavation a water table was encountered to be much

higher than reasonably could have been anticipated in such type of works, within surrounding areas.

(f) *Inclement weather*: CCDC-2 [1] defines this as abnormally adverse weather (Sub-clause 6.5.3), whereas FIDIC [7] addresses this condition as exceptionally adverse conditions (Sub-clause 8.4). Both standard forms in fact refer to extremely adverse weather conditions rather than merely bad weather. Primarily, inclement weather conditions are considered as an excusable delay for which extension of time is allowed without monetary compensation. However, the Contractor has to prove that the climate conditions were abnormally adverse and actually delayed the completion of the project.

(g) *Force Majeure*: Force majeure refers to the events beyond the control of parties. Like inclement weather conditions, this is considered by most of the standard forms as an excusable delay for which extension of time is allowed only. Force majeure is also explained in Chaps. 10 and 16.

(h) *Permits*: Acquisition of permits and approvals from outside agencies.

(i) *Termination*: Contract suspension or termination. It is further explained in Chap. 16

(j) *Breach of contract*: This is also explained in Chap. 16.

(k) *Implied warranty*: Duty to perform work in a skillful, careful, and diligent and workman-like manner. Breach of implied warranty is considered a tort, and the most common implied warranty claims are discussed in Chap. 18.

(l) *Defective and deficient contract documents*: Contract Documents that contain errors and omissions, code violations, or a lack of inter-discipline coordination. The Owner would be considered responsible for delays caused by defective plans and specifications, including the failure to make those revisions in a timely fashion.

(m) *Hiding Facts*: Conditions/facts withhold knowingly by the Owner that will adversely affect the Contractor's performance. Such type of claim is known as "superior knowledge" by the court system.

(n) *Disruption*: Disruptions are impacts which delay specific activities but not the overall project completion date. Disruptions are situations which lead to loss of output and production or performance of the work in a less efficient manner. Sometimes the work takes more time to complete, using the original/same resources, or the work takes the same time but requires increased resources. Lost productivity claims are based upon a variety of factors. Most of these factors result in a disruption which creates problems in production, e.g., changes in sequence of work, disruption to planned continuity of work, etc.

15.4 Dealing with Claims

Identification of claims must be followed by notification. For any type of claim situation described above, the affected party must notify the other party in a timely manner as soon as claims situation arises. CCDC-2 [1] clause 6.6 specifies that if either the Contractor or the Owner intends to make a claim for an increase or credit

to the contract price, respectively, that party shall give timely notice in writing of intent to claim to the other party and to the Consultant. Timely notification allows both parties to verify conditions, to assemble facts, and to resolve disputes while the issues are fresh in their minds.

When a Contractor encounters any claim situation, such as differing site conditions or any error or omission on drawings, he should stop that particular activity until a satisfactory response is obtained from the Owner. If the Contractor continues work with the affected activity, that may result in a Contractor's obligation to correct the defective work at his own cost. The Contractor, while submitting notice, should always stress for early resolution of a dispute and should request acknowledgement. Delay in notifying the concerned parties will prolong the resolution of the claim issue.

In addition to notification, proper documentation of all facts related to the claim situation plays a very important role in resolving the dispute. Proper records should be maintained throughout the life of the project, so as to support a claim in a suitable manner. Sometimes it happens that claims, which might be valid, are rejected because of the following:

(a) Timely notice was not submitted by the affected party.
(b) The claim was submitted late.
(c) Contract procedures were ignored or not followed properly.
(d) Proper records were not available.
(e) Inadequate submittal to support claim quantification.
(f) Inadequate proof of claim entitlement under the contract.

Most standard forms of contract stipulate certain procedural steps that must be followed if a claim is to succeed. FIDIC [7] under Sub-clause 20.1 provides a disciplined way of dealing with claims for any extension of time or additional payment to avoid prolonged disputes, which requires the Contractor:

1. Notify his intention to claim for additional payment to the Engineer and Employer within 28 days after the event giving rise to the claim has first arisen.
2. Keep contemporary records.
3. Submit the claim to the Engineer within 42 days after the first notice, along with detailed particulars of the amount claimed and the reasons of claim.

A Contractor, who fails to meet the procedure laid down in the conditions, will limit his entitlement to payment, because without the supply of contemporary record evidence, the Contractor cannot put the claim in a better position. It is therefore necessary that the Contractor should submit a properly documented and verifiable claim containing:

(a) A brief summary of the claim
(b) The contract clauses, on which the claim is based, i.e., entitlement
(c) Reasons and instructions giving rise to the claim
(d) Valuation and justification of the claim, supported by the proper documentation
(e) Details of any delay and time extension applicable

As soon as the Consultant receives the Contractor's "notice of claim," he has to decide whether or not the Contractor's claim is well founded. The Consultant may request the Contractor provide additional information that is reasonably necessary. The Consultant may need to take such steps as to:

(a) Evaluate and investigate the reasons for the claim submitted.
(b) Modify the design, if required, to meet the changed situation.
(c) Take any corrective action that may be required to mitigate the problem.
(d) Inform and discuss the issue with the Owner for agreement.

As per CCDC-2 [1] Sub-clause 6.6.5, the Consultant will provide notice in writing to both parties about his findings on the claim within 30 working days after receipt of the claim by the Consultant, or within such other time period agreed by the parties.

When the Consultant has completed due consultation with the Owner and agrees in principal with the Contractor's claim, the Contractor shall be entitled to get that amount included in any interim payment certified by the Consultant. However, if such finding is not acceptable to either party, then as per CCDC-2 [1] Sub-clause 6.6.6, the claim shall be settled in accordance with the "Dispute Resolution" clause under Part 8 of the General Conditions.

15.5 Maintaining Claim Records

Records and documentation are the most important part of claim administration as it plays a significant role in the successful settlement of contract claims. Maintaining adequate documentation is important to both the Owner and the Contractor. The daily events and details of the work must be documented to substantiate claims and prove damages.

FIDIC [7] Sub-clause 20.1 requires that the Contractor should submit contemporary records to substantiate the claim. A contemporary record is a timely record of an event. If a document is created much later than a few weeks following the event, the document will not be considered "contemporary." If it is noticed that some records are missing a few days after the event, or if there is only time to make a rough contemporaneous note, it is not too late to remedy the situation by supplementing those records a few days or even weeks later.

Contemporaneous project records also serves as an important evidence in courts. The records must be prepared to show that the records were "business records" kept in the ordinary course of business and were relied upon in the operation of the business. If these facts cannot be proven, then the records are of limited value as evidence in a construction trial.

15.5.1 Types of Records Required

There are many types of records that should be maintained during a construction contract. The following pre-construction and post-construction list of documents will be of great help in resolving a construction claim:

1. *Owner's bid package and contractor's bid preparation documents*: These records provide a good evidence as to what was intended by a construction contract. It is particularly useful for the Contractor to know which job or units were above or below originally estimated quantities.
2. *Construction specifications*: Construction specifications, including a complete set of all revisions to the specifications, should be retained.
3. *Construction schedule*: Construction schedule defines how the job will be performed indicating the timing of the major activities of the project, providing sufficient details of the critical activities and their interrelationship to meet the stipulated completion time. In general, the delay must affect the critical path of the work to be compensable. If the delay absorbs the float in the schedule, then it is not compensable. The Contractor usually monitors the actual progress of the work and compares with the base schedule on a regular basis by highlighting on the bar chart as the work continues. Schedules are a great help in analyzing any delay encountered.
4. *Tender drawings, construction drawings, revised drawings, and shop drawings*: Generally, Contractors treat construction drawings very casually which is mainly the record of design changes or errors or which may provide crucial support for a Contractor's claim of extra work. The construction drawings stamped with the date of receipt and kept in chronological order is extremely helpful in monitoring the design development of the project. Dates on revised drawings can establish delay in approval which may result in construction delays.

   Shop drawings also play important role in the claims. Often, the Contractor is required by contract to describe exactly how the work is to be installed. The approval stamp on the drawings by the Consultant can provide crucial evidence that the Contractor's means and methods of construction were known to the Owner's design professionals.
5. *Project correspondence including minutes of meetings*: Every Project Manager or Contract Administrator recognizes the importance of project correspondence, transmittals, notices, and record of meetings. These records provide vital evidence of what happened on the job and when and what was discussed and agreed. It is very helpful to stamp all mail or transmittals with the date the document was received. Often, correspondence is actually received many days after the date on the letter of transmittal, and the only way to prove this later is with a date stamp showing when the document actually was received.
6. *Daily record of labors and plants, concrete pours, material delivery, time record*: These documents are critical job records as they help with calculating any claim, particularly on a time and material basis. Material records are not only used to verify what material was delivered to the site and when but also to verify escalation costs. They can also be reused to establish proof that the Contractor did not cause delays due to failure to have material on time. Daily labor, plant, and time records help in establishing the number of hours worked, when two or more items of work were performed and which machinery used on any given day.
7. *Work progress reports* including cash flows, progress photographs, inspection reports, and test reports.

8. *Measurement record*, interim valuations, change order logs, request for information (RFI) logs, and payment certificates.
9. *Employee payroll records*.
10. *Record of payment* made to suppliers and subcontractors.
11. *Site survey* records, like existing ground levels, etc.
12. *Project diary* indicating record of weather, visitors, deliveries, accidents, and any notable event that may cause delay or affect productivity.

15.6 Pricing of Claims

There are several methods of pricing construction claims. Each of these methods may be acceptable, depending upon the facts and circumstances of each case. However, the preferred methods for pricing construction claims include calculation of actual cost (direct cost), impact costs and overheads (indirect cost), and profits.

A second method of pricing construction claims is the "total cost method." This method includes the actual total cost less the base tendered cost and less the cost of variations/change orders already paid.

The second method, being simple, is less popular for computing adjustments because it becomes difficult to prove the Employer's liability for the extra costs and to prove whether the Contractor was working inefficiently or his tender was underestimated. For these reasons, the total cost approach should only be used where no other method of pricing the claim is available.

15.6.1 Direct and Indirect Costs

1. *Actual Cost or Direct Cost*

If any claim involves carrying out changed work or extra/additional work on site, then the actual cost of the labor and machinery involved and material consumed should be calculated. Such work is primarily calculated as explained in Chap. 12.

2. *Impact Cost*

Whenever a change is incorporated in the planned scope of work, it can affect the other unchanged work as well. Impact cost is the result of impact on other activity, delay costs, acceleration cost (overtime, etc.), and lost productivity or disruption costs.

To calculate the effect of changes on unchanged work, it is simply a matter of computing the additional hours of equipment and labor used or planned to be used along with additional materials that will be needed.

Most of the claims for loss and/or expense occur due to delay in completion of the works by any of the causes stated earlier. When the Contractor delays the project, the Employer can recover the loss by applying liquidated damages. However, when delay is not caused by the Contractor, then the Contractor is entitled to submit a

claim, which usually is based not on delay in completion of the works but on the fact that the regular progress of those works has been disrupted.

It may be noted that the Contractor must prove that a loss has been suffered and that all possible steps had been taken by the Contractor to mitigate the effect of the delay, e.g., by way of reducing labor force, removal of machinery, and utilizing them productively elsewhere on site. The law does not allow a plaintiff to recover damages to compensate him for loss which would not have been suffered if he had taken reasonable measures to mitigate the loss.

When the work is prolonged or disrupted, the Contractor cannot achieve the productivity that was originally anticipated. It may be necessary for the Contractor to employ additional labor or work overtime, use extra materials or hire extra plant and equipment, simply in order to achieve the same result. With a prolonged duration claim, the cost of materials and labor may have escalated. In this way, many activities which are affected will be considered in pricing a claim.

Productivity or efficiency can be defined as

$$= \frac{Amount\ of\ work\ produced}{Amount\ of\ time\ (man-hours)} or \frac{Production\ Output\ (say\ 200m\ of\ pipe)}{Resource\ Input\ (10\ Labor-hours)}$$

Loss of productivity or efficiency can be calculated using several methods. However, the "measured mile analysis" is widely acknowledged as the most acceptable method for calculating lost productivity costs. The analysis compares identical tasks in impacted and non-impacted periods of the project to estimate the productivity loss caused by the impact of a known series of events.

Generally, a productivity or efficiency claim seeks the increased labor cost. Typically, each area of lost productivity is determined by comparing productivity of the work performed under actual impacted conditions versus work rates achieved under normal working conditions. Once the area of lost productivity is determined, the damages are calculated for each individual item of work or task where productivity is lost. It is, therefore, very important to keep detailed time record when the project is disrupted. The record of similar performance on other projects will also help.

A simple example to understand the measured mile concept is provided here:

a. Measured mile: Assume the non-impacted or least impacted activity took 1000 man-hours to install 10 miles of PVC pipe.

   Hence, the productivity of period under normal conditions = 100 man-hours/mile

b. Impact: 640 man-hours were used to install 4 miles of PVC pipe.

   Hence, the productivity of the period that has been impacted = 160 man-hours/mile

c. Loss of productivity:

$$\text{Loss of Productivity} = \text{Impacted conditions} - \text{Normal conditions}$$
$$= 160 - 100 = 60\ \text{man - hours / mile}$$
$$\text{or } 60 \times 4\ \text{miles} = 240\ \text{man - hours}$$

It may be noted that the compensation because of impacts due to delay, inefficiency, disruption, or acceleration shall not include payment for profit. The intent of paying monetary damages is to pay the Contractor for actual compensable, quantifiable, and verifiable damages. This generally, does not include payment for profit. A Contractor is only entitled to earn a profit for constructing the project through producing quantities of work, which means actual work under contract, and changes in the work, but not for damages. OPSS provincial defines change in the work as the deletion, extension, increase, decrease, or alteration of lines, grades, quantities, etc. but does not consider damages as a change within the specified/contracted work.

3. *Overheads & Profit*

   In addition to actual and impact costs, the Contractor is also entitled to a reasonable allowance for site and head office overheads (indirect costs) and profit. Usually they are paid in the form of fixed percentage markups. These markups should be either specified in the Contract or agreed in writing by the parties after the contract has been awarded. It helps in avoiding the problem of computing actual additional overhead and costs for each change. The combined rate for overheads and profit employed by various organizations is 15%. However, sometimes separate percentage markups are also used depending on the nature of the claim.

Site overheads Site overheads usually include the expenditure on supervisory and administrative site staff and site accommodation including all water, electricity, telephone/fax charges, etc. It also includes construction equipment and tools along with necessary supplies for upkeep, running, and maintenance costs. If a fixed markup is not stated in the contract, site overheads can be computed from the Contractor's contemporary records.

Head office overheads Head office overheads usually include office rent, telephone/fax, electricity, documentation, office staff salaries, taxes, insurance if applicable, etc. Since these overhead expenses are an indirect expense which benefits the entire project, it must be allocated to all components on a shared basis.

As described above, it is always advisable to negotiate a fixed percentage markup, which should be added to actual and impact cost including overhead and profit. However, there are several methods that can be adopted to compute head office overheads.

Hudson formula This formula includes the head office overheads and profit combined:

$$\frac{h}{100} \times \frac{c}{cp} \times pd$$

where h = the head office overheads and profit including in the contract
c = the contract sum
cp = the contract period in weeks
pd = the period of delay in weeks

Eichleay formula For delay claims, this formula computes head office overheads on a daily rate basis. The Contractor is reimbursed that amount of overhead for each day of delay that occurred. This formula assumes that almost all overhead is fixed and evenly distributed across all projects. The formula is developed in three stages:

- *Step 1*: *Calculate the amount of overhead allocable to the contract*

$$\frac{\text{Contract billings}}{\text{Total billings for actual contract period}} \times \text{Total overhead for contract period} = \text{Allocable overhead}$$

- *Step 2*: *Use the amount of overhead allocable to the contract to calculate a daily overhead amount*

$$\frac{\text{Allocable overhead}}{\text{Actual days of contract performance}} = \text{Daily overhead}$$

- *Step 3*: *Use the daily overhead amount to calculate unabsorbed overhead*

$$\text{Daily overhead} \times \text{number of days of delay} = \text{unabsorbed overhead}$$

4. *Other Costs*

Other costs usually include interest, lost anticipated profits, claim preparation costs, legal and professional fees, and others. Generally, these costs are non-compensable.

15.7 Claim Avoidance

Understanding the cause of claims as discussed above along with careful planning of how to deal with them will help to avoid or at least minimize the occurrence of claims.

1. *Contract Documents*: Always use standard forms of Contract Documents and specifications. One-sided or Owner-drafted Contract Documents are not advisable for both the parties, as they generate more claims instead of preventing them. However, it may be noted that usually standard forms of contract also need some modifications as many items are not provided in the standard forms of contract and need proper clarification to avoid confusion and claims. Make sure following clauses are provided in the contract:
2. *Contractor's Markup*: Ensure that Contractor's markup is clearly defined in the contract, for example:

   "Contractor's markup (overhead and profit combined) on work and services completed by its own forces shall be 15% and on work and services completed by its Subcontractor's shall be 5%," and similarly, a clause shall be added for Subcontractor's markup also.

- Ensure to clarify that the markup claimed by the General Contractor on his Subcontractor shall be on work done only, excluding markup; similarly markup claimed by a Subcontractor on his Subcontractor shall be claimed on work done only, excluding markup. In most cases, it is usually claimed on the total amount including markup. The limit on subcontractors of subcontractors should be clarified. Better to specify total figure of markup for a General Contractor and his subcontractors.
- The equipment rental rates provided by OPSS 127 [10] include direct and indirect costs and hence make sure no markup is added to the rental charges claimed.
- Sometimes contractors add additional bonding costs into their quotation, which as per Industry practice are not acceptable. Better to add a clause, "The Contractor shall (& subcontractor) not include any additional Bonding costs in their quotation for any Change Order work that may be required or performed."
- Often Contractors claim hours for superintendent on site in their claim for additional or extra work done on time and material bases. This is called "double-dipping" or requesting payment for the same cost twice, as supervision is part of indirect costs and is already covered in the agreed markup (overhead and profit) in the contract. However, to avoid this confusion and bad practice, it is better to add clause, such as:

> The mark-up provided in the contract shall constitute the only compensation the Contractor and/or Subcontractor shall be entitled to for any and all overhead, profit, incidental and administrative costs whatsoever related to the change, extra work or additional work, including but not limited to costs relating to superintendence and supervision, shop drawing production, estimating, site office, and home office expenses, workers tools, temporarily facilities, and controls, and coordination of any and all work related activities

3. *Standby Time*: OPSS Muni *100* [11] provides that "the Owner shall pay the Contractor for standby time of equipment at 35% of OPS 127 [10] rate or 35% of the invoice price whichever is appropriate". Some standard forms allow 50% of the invoice price for standby time of equipment. The Owner shall also pay for labor and/or operators who cannot be otherwise employed during the standby period.
4. Be familiar with the contract; read every article and all requirements of the contract thoroughly.
5. Carry out the contents of the contract faithfully and do what the contract requires.
6. Don't proceed with any variation, without proper documentation.
7. Use most appropriate type of contract delivery system.
8. Avoid incomplete, inaccurate, and poorly defined design details.
9. Define the scope of work in detail, so as to control what is and is not included in the project. Avoid ambiguities in the contract. When drawings and specifications have two reasonable interpretation, it is said to be ambiguous. Since Contract Documents are prepared by the Owner through the Consultant, any ambiguity in the interpretation of the contract will be interpreted in favor of the Contractor. Ambiguities should be resolved in a fair manner with the involvement of the Contractor to prevent delay claims.

The item description shall be provided clearly or in detail either in the specifications or in the form of tender/bill of quantities. In one of the GO transit station project, the description of an item provided in the form of tender was "Remove and dispose of canopies to Platform." Since the description of the item was not complete and was not further explained in the specifications what was incurred under this item, the Contractor claimed for removal of grade slab concrete of the canopy, which in fact was the part of overall canopy structure. It is therefore important to provide a clear description of what is required explaining clearly what is covered under the scope of that particular item.

Usually, a list of items (schedule of rates) is provided with the Form of Tender for Contractors to quote rates for any additional work if required. Make sure this list should address as many items as possible which would be helpful in pricing additional/extra items. An overly robust provisional rates section can invalidate the (perceived or actual) integrity of the contract. It serves to acknowledge that the Owner/Consultant missed a lot and anticipate a lot of changes. Also, if of large financial magnitude, it allows a Contractor to unbalance his bid and secure the provisional funds whether the items are used or not.

10. Prepare a realistic and more detailed schedule with related work breakdown structure (WBS) that fits the required dates in the contract and distribute it to all the related parties to the contract. so that everyone knows what is expected of them and can plan their work effectively and economically.
11. Allocate project risks fairly, sensibly, and equitably among the parties to the contract.
12. A major source of conflict is differing site conditions. A timely and thorough subsurface investigation, to know as much as possible about the site, by the Owner will minimize misunderstandings and disputes resulting from extra and additional works; however, if the investigations are inadequate, it will adversely affect the Owner's proposed budget. On a recent project, the dewatering volumes investigated by the geological consultants were underestimated which resulted in huge claims. The lesson learned was to allocate dewatering risk to the Contractor being the party that is best able to manage the risk and who has a duty to mitigate the damages, by adding the requirements of a PTTW (permission to take water) from the Ministry of Environment (MOE) in the scope of work. The condition can read as:

    The Contractor shall be responsible for obtaining the MOE permit for ground water lowering if deemed required prior to the start of dewatering works. All costs associated with obtaining the required permit including preparing and submitting required MOE documentation shall be paid for by the Contractor. If necessary, the Contractor shall use and pay for the services of a qualified geotechnical Consultant to prepare and submit the required documents on behalf of the Contractor and Owner.

13. With respect to differing site conditions mentioned above, contractors must review Owner provided geotechnical information carefully prior to submit bids. If the information is included as a "guide," then the contractor might be at

risk if he relies completely on this information based on a court's ruling with respect to a claim of *Stuyvesant Dredging Company v. United States* under Army Corps of Engineers contract for maintenance dredging of the Corpus Christi Entrance Channel in Texas [12]. Under this case, the Contractor claimed that during the performance of the work, they encountered increased density of materials which impacted their productivity resulting in an increase in cost. The court examined the case and denied the claim; its ruling was "the six average density readings were identified to be guide only – did not reach the level of estimates and were clearly not facts upon which plaintiff could rely [13]."

14. Better site supervision and control by qualified, experienced, and trained personnel will help to resolve issues at the initial stage minimizing the occurrence of claims and conflicts.

Reference and Further Reading

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2. Texas Department of Transportation (Third Quarter 2007) – The disputes and claims analysis process – Construction and material tips. Published Quarterly by the Construction and Bridge Division.
3. Morrison-Knudsen Co. v. British Columbia Hydro & Power Authority (No.2) (1978) 85 D.L.R (3d) 186 (BC. Ct App).
4. W.A. Stephenson Construction (Western) Ltd. v. Metro Canada Ltd. 27(1987), 27 C.L.R. 113 (B.C. S.C.).
5. Levin, P. (1998). *Construction contract claims, changes & dispute resolution* (2nd ed.). VA, USA: American Society of Civil Engineers Press.
6. DLA Piper Law Firm. (2013). Asia Pacific projects update- An Article on "Concurrent Delay".
7. FIDIC. (1999). Conditions of contract for construction. Red Book: Author FIDIC (International Federation of Consulting Engineers).
8. Federal Acquisition Regulation, §52.236–2, *Differing Site Conditions* (APR 1984). (48 FR 42478, Sept. 19, 1983, as amended at 60 FR 34761, July 3, 1995).
9. Fullerton & Knowles; Attorneys and Counsellors at Law in Virginia, Maryland, Pennsylvania and the District of Columbia- Construction Law Survival Manual- Ch 5 – Changes, delays and other claims.
10. OPSS 127. (2015). Ontario provincial standard specification – Schedule of rental rates for construction equipment, including model and specification reference.
11. OPS. (2006). General conditions of contract – Ontario Provincial Standards for Roads & Public Works- OPSS. MUNI 100.
12. Stuyvesant Dredging Company, Plaintiff-appellant, v. the United States, Defendant-appellee, 834 F.2d 1576 (Fed. Cir. 1987).
13. Collins, S. A., & Zack, J. G, Jr. A technical article on "Changing Trend in Risk Allocation – Differing Site Conditions".