

Auditing Final Bills – What For and Why?

Eng. Ilan

As business owners, independent contractors and individuals we check our bank account at least once a day, if not more. Now, pause for just a moment and ask yourselves, shouldn't this also be our daily routine when it comes to the projects in which we are involved? Whether as a contractor, project manager or client, each one for their own purposes. Yes, even the client, which is mainly a government body in the field of construction, learns how to audit the bills it is issued and use them to assess the quality of work and the annual/multi-year cash flows it manages. This process is imperative since we know that in the infrastructure and construction projects we are involved in vast amounts of money change hands and every little error in planning is reflected through change orders and significant costs that come up when the final bills are submitted. Over the past few years, as part of external audits conducted for infrastructure companies, including in the State Comptroller's reports, it became apparent that there is a need to audit contractor bills. I believe that rechecking contractor bills, even some of the partial bills and certainly the final bills, when performed by experienced engineers, is a welcome and important step with many benefits both for the quality of the project and its cost, as comprehensively explained in this article.

After auditing about two hundred projects over the past few years, it is apparent that a lot of money can be saved by utilizing these checks and audits.

There are many reasons why such a firm auditing process has been implemented by state authorities, and why it is now a vital service, and we will list some of these reasons here.

The first is the amount of tasks and demands that project managers and supervisors are faced with, which have grown in quantity as projects have become more and more complex. Systems and infrastructures are much more intricate and coordination requirements and expectations have become more stringent, while wages have been eroding over the years, something which is especially evident considering that the supervisor of old, who was only required to assess the quality of work and bills, currently also serves as the project manager (on-site), executive and the main person in charge on behalf of the client.

In addition, if in the past, and not only Israel, the majority of those engaged in engineering were locals, today a large number of civil engineers study in various institutions, some of them even abroad, and are not fluent in the local language. They used to mostly come from the Technion or Ben Gurion University. Their educational background isn't similar, the institutional level isn't the same, not everyone has the same grasp of things when it comes to the standards used in contracts and specifications, and some of them do not even have full control of the Hebrew language, meaning that engineers in our field are becoming a hot commodity... sound familiar?

There is a generation gap as well, supervisors were once caring, punctual and attentive to detail, while today these traits are less common and supervisors are not as meticulous, maybe due in part to the larger and oftentimes ludicrous volume of work to which the infrastructure industry has become accustomed to in the past several years.

Add to this contractors for whom the profession's grandeur and integrity are not a guiding light, substantial discounts that some of the institutional entities are forced to accept since seemingly the cheapest proposal must be the one approved, and low price lists, meaning that contractors also come to work with the desire to make a profit no matter the cost.

This loophole had to be closed, so more and more municipalities, state-owned enterprises and other institutional entities chose to perform an additional audit of bills and recognized the significant importance of this process in terms of saving money and preventing improper auditing of bills. This dual audit process of final bills (an audit by the project manager and an audit by a neutral outside entity as a measure of quality assurance over the project manager's audit) has become the norm due to companies like Netivei Israel (formerly National Roads Company and before that Maatz), the Ministry of Housing and Construction and the Israel Ports Company.

The final bills audit is performed while using the following principles:

The first principle is an important one and it is to ensure that all information required for the audit is disclosed. This is a lot of material and it has become evident that it is all vital (we cannot delve into why in such a short article), such as tender plans, contractual bill of quantities, work logs, price list discounts, plans as executed, quantity calculations and more. Documenting and maintaining this material over the years is crucial so that one may handle various suits and claims, but also be able to reproduce the engineering history and execution of the project, whether to reproduce successes or prevent repeating faults and failures.

The second stage is to verify that the information disclosed is in proper order. When we first started carrying out such comprehensive audits five years ago, it transpired that, rather surprisingly, the most basic function of bill auditing wasn't being performed – quantity calculations!

We received bills in which the “quantity calculation” was only the final result, without multiplications or diagrams [this is, of course, in stark contrast to that stipulated in the contract, which requires quantity calculations]. Some of the supervisors simply corrected the quantity written by the contractor to the quantity that appears in the contract and called it a day.

During our work, we also received ‘plans as executed’ where the surveyors did not go on-site, despite being legally obligated to carry out measurements properly and reliably. For example, they marked a sidewalk where there wasn't one, or surveyors who marked sewage manholes in the road and later all manholes were put in the bills as though they were height-adjusted, while a visit on-site revealed that only some of the manholes marked by the surveyor were actually adjusted.

The second principle is full consideration of the entity we are actually auditing, the project management company and the contractor. The bill auditor must attempt to make it clear to these entities that the auditor and the client only wish to streamline and improve the system, not to harm their status or criticize them on a personal level; we just represent a system that wishes to improve. From our experience, we believe that the auditor must strive to reach agreements over bill-mandated cuts based on significant faults discovered. It is not recommended to intervene in agreements made between the supervisor and the contractor in gray areas. The goal of the auditor (who has the tools to judge and evaluate professional claims) is to provide project managers and contractors with a stage so that they may voice their claims, as they sometimes shed light on matters that were considered billing errors when the report was issued. At the end of this process, agreements over necessary cuts can be reached based on the answers given.

It is worth mentioning that in large-scale supportive systems, after meeting the persons involved and the client providing his complete backing and when the entire system is aware of the bill auditing process, this human engineering process becomes very professional and much simpler.

The third principle is also very important and it has to do with the entities being audited recognizing and being aware that the auditing engineers are not simple office folk, rather they are also supervisors or project managers who are ‘from the field’ and have worked with contractors, checked bills and know all of the agreements,

dilemmas, compromises and problems that go on between a supervisor and a contractor until the end product is submitted and signed as the final bill.

The fourth principle, one cannot conduct an effective bill audit without going out to visit and photograph the site. It is always surprising just how much information can be obtained from touring the site itself, by taking sample measurements, identifying works that were not performed and collecting much more data, while also providing another pair of eyes to comment on the quality of work.

When the audit is complete, many errors in the bill are found that are beyond the legitimate understandings reached between the supervisor and the contractor, there are proven issues that cannot be waived [not to mention bill approvals that fall within the definition of absurd and some even showcase unethical conduct in the project] and this is how savings are achieved. But not just. There are many cases in which works have not been performed and appear in the bill as though they have, an irregular product or method is used outside the scope of the agreed-upon price list in the contract, failure to enter a discount given in the contract, misinterpretation of measurement methods specified in the contract, misappropriation of prices, errors in measured quantities, measurement of the contractor's actual work performed and not according to what was supposed to be performed according to the plans. This is one phenomenon we have seen quite often; there are plans in place and the contractor must execute them, but if he dug deeper or poured more concrete into the building's floor than necessary, he demands to be paid according to actual work performed and, to our bewilderment, he is paid what he asks for more often than not.

We have found that milling and resurfacing processes in road maintenance projects are also cracked wide open, in many municipalities and councils, and I would be putting it lightly saying that there is usually no proper planning of asphalt layers in the resurfacing process, and even when there are specific details, the workers on-site do not feel that these details obligate them. In the majority of cases no proper height measurement is performed after milling is complete, even though the Blue Book explicitly states as much. In fact, it is impossible to know exactly how much asphalt was used, and not enough asphalt cores [drilling into the asphalt] are used to determine the thickness of the layers. This results in many instances where delivery certificates are the only evidence of how much asphalt is on-site and needs to be paid for. We believe that this is insufficient and unreliable. Parenthetically, we think that it is best to pay a surveyor on behalf of the client, who will perform such measurements after milling, and we believe doing so saves the state money in the long run.

But why does the client need to add control mechanisms? Isn't a professional and reliable project manager with a string of expert planners and advisors enough?

Well, the benefit to the client from auditing bills is that there is an actual audit in place.

As soon as those working on the project are aware that a professional audit is taking place, there is already an improvement in calculations and billing.

Bills previously issued in a sloppy manner are significantly improved, even if at the basic level of how a bill should be issued.

Of course, the client usually benefits from proven financial savings by having another pair of eyes. Quality control is performed by professionals who have seen many projects and can attest to the project's overall quality and how it compares to the many projects that they have assessed. Under the circumstances currently prevalent in Israel, I think this audit needs to be a basic tool used by every client.

Important note:

To those who believe that this is just another layer in the bureaucracy, they best think who they hire to provide them with service. The way I see it, this is also a useful tool for ensuring bills are issued promptly and reckoning is completed as soon as possible. This is how I believe work needs to be done; quickly, efficiently and by agreement with all entities involved and not just another entity acting as a fig leaf.

An example of a field survey conducted as part of a final bill audit:

Manholes marked in the plans ‘as executed’ by surveyor – the contractor put them in the bill as height-adjusted manholes and the supervisor confirmed that ‘they appear in the plans as executed’; 130 such manholes.

In practice, only 20 such manholes were true height-adjusted manholes fitted with a new concrete collar [cost difference – tens of thousands of Shekels].

See the following example of final reckoning in which we saved the client hundreds of thousands of Shekels:

Project Manager	Contractor	Bill		Change Relative to Original Contract Value
		Project Manager – Current	Final – Approved by Auditing Firm, Project Manager and Contractor	
***	***	1,700,000	1,450,000	-14%

To summarize, bill auditing can yield the client significant benefits. The project file will include all engineering information required to reproduce the project’s history in order to follow-up on works performed over the years, and fair payment will be made according to the works and changes actually performed and in accordance with contractual provisions and written change order instructions, and most importantly: the audit process kick-starts an improvement process across all mechanisms throughout the project’s lifecycle ensuring that the final product is better and our money as taxpayers is optimally utilized to benefit us all.

Example of Final Bill Audit**1. Section 51.3.005 – Type A Bed Distributed in Layers – Layer Thickness up to 15cm.**

In his bill, the contractor priced beds where milling was performed, even though where milling is performed there are no beds, rather just another layer. The price needs to be reduced by $2,137 \text{ m}^2$ multiplied by 0.6 which equals $1,282 \text{ m}^3$.

The contractor also requested 60cm beds, but the planning specifications all show 50cm beds. 10cm needs to be reduced from the final quantities – 5,016 minus 2,137, which equals $2,879 \text{ m}^2$ multiplied by 0.1 is 288 m^3 .

Total reduced – $2,425 \text{ m}^3$.

2. Section 51.4.037 – 7cm Bottom Bearing Asphalt Concrete Surface

Planning specifications called for a 4cm thick top asphalt layer with $\frac{3}{4}$ " aggregate gradation. In the bill, the contractor asked for the following:

- 6cm thick bottom layer with 1" aggregate gradation per Section 51.4.036.
- 6cm binding asphalt layer with 1" aggregate gradation per Section 51.4.040.

- 7cm asphalt layer with 1" aggregate gradation per Section 51.4.037.

Section 51.4.035 which specifies a 4cm thick top asphalt layer with $\frac{3}{4}$ " aggregate gradation is nowhere to be found in the bill and has instead been replaced by a 7cm thick asphalt layer. The planning called for a 4cm top layer and lab tests showed that the aggregate was in fact $\frac{3}{4}$ " for the top layer, so the two sections must be switched.