

Use of Technology in the Construction Industry – The Way Forward

Complaints against lack of quality in the construction industry seems to be a norm. It was not too long ago that netizens were treated to a lengthy YouTube video of a disgruntled purchaser wrecking his newly handed over condominium due to unhappiness with the build quality. Complaints about inferior construction quality are not confined to residential dwellings only, but also include commercial and industrial development projects.

In this article, I will first explore common complaints of end-purchasers and explain how such quality issues may arise. Thereafter, I will look at issues facing contractors so that readers can better appreciate the underlying problems faced by contractors leading to the quality issues. Finally, I propose the use of technology as a way for moving forward.

Common complaints of end-purchasers

Home purchasers would know that after they take delivery of their keys, there is still a defects liability period which would last for 2 to 3 years. Although purchasers are somewhat protected to a certain extent against defective works, nevertheless it is still an inconvenience to purchasers who would have to arrange for contractors to visit and carry out the rectification works. This would be aggravated if the purchasers are already staying in the unit.

Additionally, if purchasers have already carried out their own renovations to the units, it may lead to disputes as to whether the defects were caused by the original building contractors or the renovation contractors engaged by the purchasers themselves. Additionally, if problems are discovered in areas where there are new built-in cabinets, these problems would be difficult to be rectified without causing potential damage to the renovation works.

For units bought for investment purposes, these units may be left vacant for a considerable amount of time. As a result, nobody in fact knows about the defects in the units until such time that the investor manages to secure a tenant or decides to move into the unit himself.

Some common defects that are usually discovered in new units include as follows:

Wavy or uneven walls

Wavy or uneven walls are not apparent until light is shone on the walls at night. That is why these defects are not easily identified during construction stage. More often than not, wavy or uneven walls occur due to uneven plastering.

Hollow floor tiles

One can easily identify hollow floor tiles by tapping on them. Although based on industry standards, hollow floor tiles would not qualify as a defect, nevertheless it is one of the more common complaints of purchasers. It used to be that the laying of tiles would require different groups of workers. The first group would do the screeding work. After that, a second group would mark the floor, before the tile-layer lays the tile one by one. However, time is a luxury these days in construction, as a result tiles are oftentimes laid before the cement fully dries. As a result, when the cement actually dries, it would shrink leading to a loosening of the bond with the tiles, resulting in hollow floor tiles.

Non-uniform floor tiles

If tiles are specially ordered and the batch ordered was insufficient after taking into account all wastages and replacements, then there may be an issue whereby the replacement tile cannot perfectly match the replaced tile. This problem also occurs when wastages are more than anticipated, possibly due to the utilisation of unskilled labour.

Leakage and plumbing issues

Sometimes units are left vacant for a period of time. Thereafter, when purchasers seek to renovate the units, they would usually install a water pump. The utilisation of a water pump pushing water through pipe joints which have already dried up due to non-usage may lead to a dislocation of the pipe joints. This would result in water leakage from pipes which are in fact concealed, and it is a tremendous challenge to properly identify the source of the leakage.

Cracklines in external walls

This defect is especially prevalent in building with dark colours. Due to the need to complete the building expeditiously, contractors may commence painting works before the external plastering is totally dry. Subsequently, when the plastering dries up, it shrinks, thereby causing crack lines on the wall. This is in fact a minor problem, and the fact that there are cracklines does not indicate structural weaknesses. Nevertheless, the use of dark-coloured paint aggravates this defect because the cracklines will appear white in colour making the problem appear far more severe than the reality.

Waterproofing issues

Waterproofing is a specialised work, and there is a long checklist of tasks to be carried out to ensure that waterproofing is done properly. Few basic yet important procedures must be carried out such as ensure crack lines on substrate and soffit must be rectified prior to water proofing works. For IBS elements, the contractor needs to place a layer of fiberglass / joint treatment tape for floor and walls without concrete kicker or drops. All outlet pipes / protrusion must be treated properly or dressed around by using polyurethane sealant or flexible type water proofing, and the list goes on. Furthermore, it is important to ensure all these are done in order to properly waterproof the works, otherwise the units below may face a lot of issues and rectification would affect both units on the upper and lower floors.

Why do these issues persist in the industry?

First and foremost, the profit margin for contractors have continuously declined. Furthermore, the consistent use of nominated subcontractors by employers and their consultants further diminishes the profit margin of contractors. Although contracts may provide for some profit and attendance costs, nevertheless the liability to the contractors far outweigh the minimal profit and attendance that it would be entitled to receive. Main contractors end up being liable for defective works of nominated subcontractors, and the costs for rectifying such defective works (in addition to liquidated damages when there are delays) far outweigh any profit and attendance received. It is long overdue to resolve issues surrounding nominated subcontractors, and there is a need to consider whether the contracting mechanism ought to be amended or overhauled to address such concerns.

The liability to contractors would primarily revolve around the issue of defects and delays. These days, contractors rush to complete the job simply because they cannot afford to be subjected to liquidated

damages for delay. These liquidated damages can be very substantial, and the main contractor would be liable for such damages regardless whether the delay is caused by itself or by one of the many nominated subcontractors identified by the employer.

Furthermore, the construction industry is facing an acute shortage of skilled labour. Even the supervisory staff is extremely limited. The lack of supervision can be said to be one of the major contributors to defective works. The problem is that whilst most contractors can identify the lack of supervisory staff to be a major issue, nevertheless there is simply not sufficient experienced supervisors to employ. Ideally, supervisors ought to know not only how to get the job done but also how to troubleshoot when issues inevitably crop up.

The problem is aggravated by the fact that most labourers in the industry are untrained or unskilled. When contractors seek to employ foreign labour, they need to rely on the biodata furnished by the agents. However, whilst the biodata indicates that the worker may be skilled in a certain trade, the reality is that when the worker arrives to the site, they turn out to be former cooks or delivery workers.

Hence, the contractor is left with no option but to do his utmost best using the unskilled worker he has available. Of course, eventually these workers would develop the necessary skills, but then they would be required to leave as there is a maximum limit of 10 years for workers to stay in the country. This means that the contractor is left with unskilled workers to start all over again.

Besides issues with workers, contractors also face the following problems:

Faulty design by consultants

Contractors have no design responsibilities. Hence, they would construct according to the designs prepared by the consultants. One common issue that oftentimes crops up is the failure by the architect to provide for a drop in the shower area. As a result, the shower area oftentimes flood, leading to damage to other floor areas including the timber flooring in the bedrooms.

Substandard materials purchased by employers or nominated sub suppliers

A developer may well get a good bargain for its bulk purchase of materials. However, these materials which are sometimes imported, may end up to be substandard. As a result, the materials will fail rapidly when put to constant use.

Lack of workers for rectification works

Subcontractors engaged to carry out particular scope of works would usually not be available to carry out the subsequent rectification works. The main contractor who is facing the pressure of a demanding employer and an unresponsive subcontractor ends up carrying out the defects rectification works by itself using its own general workers. This means that the time needed for rectification, as well as the quality of rectification carried out, would both suffer.

The way forward for the industry

It would seem to me that the only way forward for the industry is to embrace technology. This can be by way of use of precast materials, adoption of IBS, or even the use of robotics for manual tasks. Otherwise, it is quite an uphill battle for the contractor to both meet the requirements of speed and quality.

Of course, the use of technology would always be expensive. This is where a mindset change is required especially on the part of the employers. If employers insist on engaging the lowest priced contractor in order to maximise its own profits, then the construction industry will never move forward. Employers must bear in mind that it is not only the costs of construction that must be taken into account, but also the costs of rectification.

Investing in technology may lead to a temporary setback due to the high initial costs. However, a contractor who adopts technology will find that the costs can possibly be recouped after a few projects. In the meantime, the gains in terms of speed and quality would already become a new norm for the contractor concerned.

Conclusion

Construction industry is one of the least automated industries that features manual intensive labor as the primary source of productivity. This makes the industry heavily reliant on labour and susceptible to quality issues compared to an automated industry. Contractors should now consider investing in technologies as a way forward. There are plenty of technologies that would enhance the progress and results, however, contractors should at least be involved in utilising Artificial Intelligence (AI), Machine Learning (ML), Robotics and Drones, IBS, BIM technology, and 3D printing for physical works among others. In addition, it is also time for contractors to equip themselves with knowledge on Big Data, Augmented Reality (AR) / Virtual Reality (VR), Mobile and Cloud Technologies for its commercial and administrative implementation. For those who choose to stay stagnant, they may well find themselves redundant in the near future.