

# **National Apprentice & Industrial Training Authority**

## **Report on Industrial Training**

**At**

**Kelsey Homes Developments PLC.**



**Advanced Technological Institute**

**Colombo-15**

Name :- Jeewani Wellawala A D

Student Number :- ATI/MK/HNDQS/E/F/2012/055

Course :- Higher National Diploma in Engineering

Field :- Quantity Surveying

Period :- 2014 – 2015

## **2.0 TRAINING EXPERIENCE**

### **2.1 EXPERIENCE GAINED**

#### **2.1.1 SUB CONTRACTOR PAYMENTS**

Direct sub-contractors of Kelsey Homes are being paid twice a month which is an advance payment in the middle of the month and a monthly bill at the end of the month. During my training period at Temple's Square Project – Mount Lavinia site , I had the opportunity to prepare several sub-contractor payments.

##### **On Site Measurements**

On Site Measurements of the brick wall, plastering, , exposed brick work, formwork were taken in order to do the payments of subcontractors, quantify the daily progress of the site and do the work studies to prepare the rate for subcontractor works. Basically labor supplied subcontractors were paid for the labor days worked and some items were paid for the work done. Therefore to measure the work done on site measurements were taken for brick work, plastering and exposed brick work to avoid recurrence and problems of the sub contractors payments.

##### **Joints Measurements**

Joint measurement were taken for the cut and polish work for columns at site in lower ground floor in order to certify the payments for specialized subcontractor together with the subcontractor. Cut and polish work for columns was done by specialized subcontractor and work was partly completed up to a considerable amount. Other parts were cannot started because column construction process till going on the site. Subcontractor should work until finish that work to start their work. After took the measurement prepared the total quantity in measurement sheet with sub contractor representative and certified by the site quantity surveyor.

##### **Preperation of Sub Contractor Payments**

During the construction process main responsible of the Assistant QS is checking the all the measurement sheets submitted by the domestic, specialized, and nominated subcontractors for the actual work done of the given month. It was difficult to take site measurements for the domestic subcontractors monthly work done. Because there were more than 30 domestic subcontractors in the site. Site measurements were taken twice a month for domestic subcontractors. First site

measurement was taken to check the work done for paid advance payment and the second measurement was taken to preparation of monthly bill.

The payment for specialized sub contractors done in once a month. Joint measurement were taken by AQS and me. But I had opportunity to get joint measurement for nominated subcontractor. When he submitted their measurement sheet I checked this with the joint measurements which took previously.

### **Certify the Sub Contractor Payments**

At Mount Lvt site domestic subcontractors basically for labor contracts. After preparation of sub contractor bills checked by the Site QS and approved by the PM. Then it was send to the head office to make the payment. For specialized and nominated Subcontracts, monthly bill is prepared by the subcontractor according to the joint measurements and then check the work done by the main contractor and certified by CQS.

Most of the time I involved the preparation of domestic subcontractors work. This work consist of measure and pay as well as on day work payments.

### **2.1.2 WORK STUDIES**

When I was at Mount Lvt site, the site Quantity Surveyor instructed me to do several work studies. The purpose of these was, to establish norms for the preparation of rates for current and future projects and sub-contractor rates.

The work studies I did are following;

- ✓ Brick work
- ✓ External Plastering
- ✓ Form work

### **Productivity Studies**

I was able to carry out productivity studies whenever I had the opportunity to observe the construction activities especially the construction of brick walls, form work of beams and External plastering and which is difficult than normal plastering work etc. I recorded all the observations related to my productivity studies like actual labour working hours, number of labours etc.

When there was a requirement to identify new labour rates for domestic sub-contractors work, were obtained from the work studies which I have performed. Then the new rates are sent to the Kelsey Homes head office for getting approval. Then those rates are used to prepare sub-contractors monthly bills.

### **Workstudy for Internal Painting**

- 1.0 Applying skim coat (1st coat)
- 2.0 Applying skim coat (2nd coat)
- 3.0 Sanding the dry wall
- 4.0 Applying paint coat (1st coat)
- 5.0 Filling holes, cracks and sanding
- 6.0 Applying paint coat (2nd coat)

#### **1.0 Actual labour allocation**

##### **1.0 Bathroom painting**

Consider for bathroom area - 30.00 m<sup>2</sup>

Skill	11.00	Day	x	800.00	Rs.	=	8,800.00	Rs.
	33.00	OT	x	150.00	Rs.	=	4,950.00	Rs.
Unskill	3.00	Day	x	600.00	Rs.	=	1,800.00	Rs.
	9.00	OT	x	121.00	Rs.	=	<u>1,089.00</u>	Rs.
Total							<u><u>16,639.00</u></u>	Rs.

**Per 1 m<sup>2</sup> 554.63 Rs.**

##### **2.0 Wall painting**

Consider for wall area - 50.00 m<sup>2</sup>

Skill	5.00	Day	x	800.00	Rs.	=	4,000.00	Rs.
	15.00	OT	x	150.00	Rs.	=	2,250.00	Rs.
Unskill	2.00	Day	x	600.00	Rs.	=	1,200.00	Rs.
	6.00	OT	x	121.00	Rs.	=	<u>726.00</u>	Rs.
Total							<u><u>8,176.00</u></u>	Rs.

**Per 1 m<sup>2</sup> 163.52 Rs.**

### **2.1.3 RECORD KEEPING**

When preparing a claim we have to submit the evidence to prove the claim purpose with necessary attachments. As a example daily progress report is scan and mail to consultant office by the site QS division. Then DPR were compiled and keep it in a separate file. Because these reports can use as the evidence of the claims or any dispute. These records were valuable if there is a circumstance where an Extension of Time for Completion claim or any other such was to be prepared in the future.

- Daily Labour attendance
- Daily Weather record
- Daily Work done
- Daily progress report

Daily progress report (DPR) is a mirror which depicts the daily performance of the site with the actual details of manpower plant and equipment usage and weather condition and previous day work done and progress of next day. I was assist to do the prepare daily progress report every other day. Remaining days daily progress report prepared by the other trainee QS. I got the next day programme from technical officers and previous day work done got from visiting the site and manpower plant and equipment usage details were got from record books. All the day DPR should submit to the consultant before 4.00 p.m

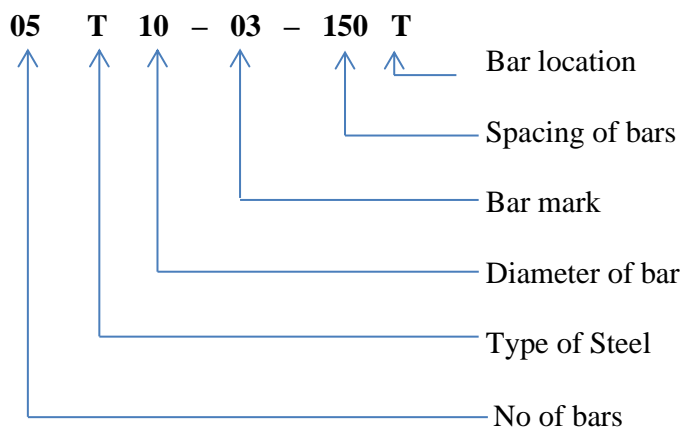
### **2.1.4 PREPARATION OF SUB –CONTRACT AGREEMENTS**

After the selection of a particular sub-contractor, an agreement has to be signed by the both parties, which secures the obligation of the two parties towards the contract and perform the subcontract work practically at site. At Kelsey Homes specialized subcontract agreements are prepared by the CEO of design & estimate division. Subcontractor can initiate his practical work at site after receiving the Letter of Acceptance from the main contractor.

In Mount Lvt site I prepared the labor subcontractor agreements. This consist labor subcontractor name, address, mobile phone number, their workers names, national identity card no and responsible person instead of subcontractor and attached the copy of the ID card.

## 2.1.5 PREPARATION OF REINFORCEMENT BAR SCHEDULES

During my training period at Kelsey Homes Mount Lavinia site I prepared some reinforcement bar schedules of slabs, beams, stair cases, columns, Lift, water sump and retaining wall for the preparation of the Interim Valuation. These were prepared both by using structural drawings as well as site measurements. If there is any doubt on the drawing or a missing detail, I consulted the technical officer in-charge of reinforcement to clarify the details. All these bar schedules are attached to the interim valuation as attachment with summary sheets where the weight of each diameter bar is separately stated.



### Lap Length

Reinforcement bars are not available in any length. Therefore, for large lengths they should join. In joining, there should be the lap length, which has specified for a particular bar. Then proper lap lengths are to be maintained to secure proper strength.

Member	Bar mark	Type & Dia		No of memb	No of bars	Total Nos	Length of each bar	Total Length	Kg/m	Total Kg	20 mm	12 mm	10 mm
Base	1	T	20	1	24	24	4.34	104.16	2.467	256.93	256.93		
	2	T	20	1	21	21	4.21	88.41	2.467	218.08	218.08		
	3	T	12	1	18	18	4.11	73.98	0.888	65.69		65.69	
	4	T	12	1	19	19	4	76.00	0.888	67.49		67.49	
	5	T	12	1	2	2	14	28.00	0.888	24.86		24.86	
										633.05			

<b>Wall</b>													
	6,7	T	12	2	11	22	2.35	51.70	0.888	45.91		45.91	
	8,9	T	12	2	11	22	2.35	51.70	0.888	45.91		45.91	
	10,11	T	12	2	11	22	2.35	51.70	0.888	45.91		45.91	
	12,13	T	12	2	11	22	2.35	51.70	0.888	45.91		45.91	
	14	T	10	1	10	10	3.3	33.00	0.617	20.35			20.35
	15	T	10	1	10	10	3.3	33.00	0.617	20.35			20.35
	16	T	10	1	10	10	3.3	33.00	0.617	20.35			20.35
	17	T	10	1	10	10	3.3	33.00	0.617	20.35			20.35
	20	T	10	1	10	10	3.3	33.00	0.617	20.35			20.35
	21	T	10	1	10	10	3.3	33.00	0.617	20.35			20.35
	18	T	10	1	10	10	3.3	33.00	0.617	20.35			20.35
	19	T	10	1	10	10	3.3	33.00	0.617	20.35			20.35
	22	R	10	4	60	240	0.22	52.80	0.617	32.56			32.56
										379.00			
											475.01	341.68	195.36
<b>TOTAL</b>										1,012.05	0.48	0.34	0.20

**Table 2.1: Bar Schedule Format**

## 2.1.6 USAGE OF COMPUTER APPLICATIONS

The Kelsey Homes QS division is highly aware of new computer applications and software's. So Kelsey Homes head office has separate division for Information Technology. There is a local area network in all the computers in the QS division. During my training period at Kelsey Homes I was required to take off & prepare BOQs. The measurement were taken from the AutoCAD drawings and & I have directly transferred them to the excel sheets. This software increases the efficiency of the QS as well as it is easy to refer and find any information. It is also time saving and increases the accuracy of the work.

## 2.1.7 SITE ORGANIZATION AND ACTIVITIES

### Familiarize with Construction Techniques & Quality Control

During my training at Mount Lavinia Site I was able to observe various construction techniques. But I only work within limit of time period in the site. So I couldn't get lot of experience about the technology. But within this limit of time period I tried to get maximum use. As far as the construction techniques are concerned I could experience the

- Anti termite treatment
- Slab and staircase concrete
- Fairface finishes
- Exposed brick work construction
- Swimming pool construction

In the Kelsey Homes highly concerned about the quality of the output. Because Kelsey Homes have higher reputation about the quality of the product. The site quality control process was carried out by the technical officers & once a month 5S officer is visiting the site & ensures whether the quality procedures used at site were follows the 5S concepts and also there were instances where they had decided to use more reliable long lasting expensive construction materials instead of cheap ones available in the market, which serve the same function. It was great opportunity to engage in working with various construction professionals at Mount Lvt site & it leads to gain priceless knowledge & experience on modern construction techniques.



**Figure 2.1: Anti termite treatment**



**Figure 2.2: Reinforcement Work**





**Figure 2.3: Form Work**



**Figure 2.4: Concrete Work**



**Figure 2.5: Swimming Pool Construction**



**Figure 2.6: Exposed Brick Work**



**Figure 2.7: Screen Wall Structure**

## **Familiarize with Construction Materials & Material Management**

Managing of plant material and equipment has been considered as an essential task in the construction and it has greater impact on the cost of the project. Throughout my training period at the sites I had to frequently interact with the Material Storage and obtain information from the Store Keeper for various tasks such as calculating material at site for interim valuations, weekly material usage, data for rate breakdowns etc. I involved in issue the material requisition notes for direct and indirect materials and after that inquires send to the suppliers with coordination of the head office. After selected the supplier then purchase order send to the supplier and supplier send the material with invoice. After that store keeper issue the good received note. Material dispatch to the site according to the requirement by store keeper.

## **Familiarize with Construction Plant & Plant Management.**

During my training period I got to experience various types, usage of machinery and plant. As same as materials I had to gain information regarding these for various purposes. When preparing 'Daily Progress Report' I contacted store keeper and found out about working conditions of these items.

## **2.1.8 PROGRESS MONITORING**

### **Attending Site Weekly Meeting.**

I had participated to the weekly meetings conducted in each and every Wednesdays during my training period at Kelsey Homes site. All laborers and staff members should participate this meeting. Construction progress, Safety equipments and problems, reasons for the delays, Problems regarding the subcontractor works were discussed during the meeting and also relevant actions were discussed and instructions were given to accelerate the construction process and resolve the problems.

These meetings are very effective to understand the progress, problems and the relationship between staff and laborers.

## **2.1.9 PREPERATION OF INTERIM VALUATION**

The main function of a site QS is to prepare the interim valuation bills including measurements. I was involved in the preparation of R/F bar schedules for columns. Monthly interim bills prepared on the first week of an every month. I was involved in preparation of the 6th interim bill. With the actual work done quantity in the preparation of the interim valuation is carried out including all the other extra works and variations on a cumulative basis. The project is measure and pay. Although site quantity surveyor calculate the total quantity and claimed work done quantity as a percentage. Therefore monthly progress is identify by visiting the site and progress attach to the IPA. In addition I got the knowledge about the pricing preliminaries for IPA preparation from site QS and I refer the lump sump project IPA to gain more knowledge about the difference two procedures.

During my training session several responsibilities of the site QS was given to me. As a trainee it was a great opportunity to hold those responsibilities. I was able to perform them up to the maximum satisfaction of the QS.

## **2.1.10 ORDERING MATERIALS**

In many times I was asked to do the calculations for ordering materials needed to the construction works. Ready mix concrete were used in Temple's Square project and I had to calculate the quantities to order the concrete quantity while considering the wastage.

## **2.1.11 ESTIMATING AND TENDERING**

### **Studying Tender documents and Project's information**

Studying tender documents is very important to identify the elements of the tender documents and how the contract is formed between parties. During the training at Kelsey Project office, our Chief QS asked me to read and understand the tender document of project. It helped me to get familiar with the including of a tender document. Even though the tender documents are unique to each and every firm the contents of it remain the same in order to standardize the procedures. I carefully went through the Instruction to Bidders, Bidding Data, Contract Data, specifications, BOQ and drawings, etc. And it helped me to enhance my knowledge.

## **Preparation Of Bills Of Quantities**

I engaged in preparation of BOQ for Additional works of the Kelsey Project office. The drawings and the specifications were given to me and I went through all of them before I started the work. While doing the taking off work I was required to make close relationships with the Chief QS, Architect, Engineers etc.

## **2.1.12 STUDING CONTRACT DOCUMENTS**

During my training at Brandix Project I received the main contract document . I studied it carefully and understood the contents of a contract document. I got some knowledge about construction contracts, contract documentation etc.

## **CONSTRUCTION CONTRACTS**

A construction contract is formed when a client accepts an offer from the builder to construct a building or Civil Engineering structure for a sum of money, provided that the two parties have the intention to enter into a written agreement. The contract between client and main contractor is called the Head Contract or Main Contract.

## **CONTRACT DOCUMENT**

The size and the complexity of the project determine the amount of documentation that is included in the contract document. The list of documents included is unique to each contract. The contents of the contract document are as follows,

- Letter of Acceptance
- Contract Agreement
- Conditions of Contract ( General and Particular )
- Contract Data
- Guarantees and Bonds
- Insurance
- Drawings
- Specifications
- Bills of Quantities
- Any other pertaining documents

## **2.2 PROBLEMS ENCOUNTERED AND REMEDIAL ACTIONS TAKEN**

### **2.2.1 UNFAMILIARITY OF WORK AT THE BEGINNING**

At the very beginning of the training period I faced some difficulty on carrying out tasks since I was new to the industry. Though I was very keen to be trained in a site, I found the site environment a bit difficult to tackle and totally new at the beginning. Since Quantity Surveying is a practical subject I suddenly felt that the theoretical environment we had during Academic time worthless without practical experience. But soon I was able to identify the specific practical areas of the site environment and also the importance of the knowledge we gained through the institute to quickly identifying the works of the practical world.

### **2.2.2 CONDUCTING WORK STUDIES**

The purpose of conducting work studies is to observe how a particular work item is really done at a site for the purpose of making a more realistic rate. Therefore when I was conducting Work Studies at Mount Lvt site, I tried not to let the workers know that I am monitoring their work. But there were situations where they knew that I'm monitoring them for the purpose of preparing rates. Then they tried to convince me how difficult the work is. In such situations I tried to convince them that I'm conducting a research for my own educational purpose as a trainee.

### **2.2.3 LACK OF COMPUTER FACILITIES AT THE SITE.**

The lack of computer facilities to carry out the day today commitment was one of a major problem I encountered at the site. Although there was only one computer at QS division it was used by the assistant QS. So that When I need to do work in the computer I have to wait until she completed her work. To overcome that I bring my laptop to the site.

### **2.2.4 PROBLEMS ENCOUNTERED IN PREPARATION OF RATES**

Major problem I had while preparing rate breakdowns was to identify labour requirement correctly for the work items. As I was not experienced in site works it was difficult for me to assess the labour requirement for the particular works. Therefore I got the help from assistant engineer when I was not able to ascertain the labour requirement in preparing the rates. I understood the importance of having experience in the field, use of work studies and productivity studies in this kind of situations.

### **2.2.5 UNFAMILIARITY WITH AUTOCAD SOFTWARE**

At the beginning I was not much familiar with the AutoCAD. But it was very essential in carrying out my works. It was useful for me to take off quantities and prepare sketches. I was involved in preparation of Reinforcement bar schedule using AutoCAD quantities. Thereafter, whenever I was free I learned about AutoCAD from the draft person and finally, I was able to do my work efficiently with AutoCAD.