# Monitor costing systems on medium rise building and construction projects
## CPCCBC5002A

# Assignment No 1

**Assignment Overview**

This Assignment relates to the following Project:

**Project 2 Medium Rise Apartments**
Job Address:   2135 The Boulevard, Strathfield, NSW
Job Title:       Proposed Commercial and Residential Development
Client:           AKM Developments
Architect:       Olympic Designs, 55 Olympic Pde, Homebush, NSW

You should obtain the following documents, from the OLS, for the job:

Plans:                          Page 1 – Site Plan
                                  Page 2 – Basement 1
                                  Page 3 – Basement 2
                                  Page 4 - Basement 1 Setout
                                  Page 5 - Basement 2 Setout
                                  Page 6 – Floor Plan Level 1
                                  Page 7 - Floor Plan Level 2
                                  Page 8 - Floor Plan Level 3
                                  Page 9 - Floor Plan Level 4
                                  Page 10 - Floor Plan Level 5
                                  Page 11 – Setout Level 1 and 2
                                  Page 12 - Setout Level 3 and 4
                                  Page 13 - Setout Level 5
                                  Page 14 – South Elevation
                                  Page 15 - North Elevation
                                  Page 16 – East and West Elevations

Bill of Quantities:        Preliminary Estimate (6 pages)

Specification of Works   (60 pages)

**Question 1**

Use the following information to prepare a Precedence Diagram to establish Early Start/Early Finish, Late Start/Late Finish, and Float and identify the critical path.

You can prepare the diagram manually or using a computer program such as Microsoft Project. You should use a 5 day calendar to allow for the fact that this is a preliminary estimate. The project will work on a 6 day schedule once construction starts and this will provide a contingency allowance for the project.

The project is scheduled to start on 13th January 2014.

## PROGRAM ACTIVITY SCHEDULE

| ID | Task Name | Duration | Predecessors |
|---|---|---|---|
| 1 | **Job Duration** | **255 days** | |
| 2 | Start | 0 days | |
| 3 | Preliminaries | Whole of Job | 2 |
| 4 | Groundworks | 20 days | 3 |
| 5 | **Concrete** | **155 days** | |
| 6 | Concrete Basement 2 | 17 days | 4,36,51 |
| 7 | Concrete Basement 1 | 16 days | 6,14 |
| 8 | Concrete Level 1 | 22 days | 7,15 |
| 9 | Concrete Level 2 | 15 days | 8,24,16 |
| 10 | Concrete Level 3 | 13 days | 9,25,17 |
| 11 | Concrete Level 4 | 14 days | 10,26,18 |
| 12 | Concrete Level 5 | 15 days | 4,11,27,19 |
| 13 | **Masonry** | **144 days** | |
| 14 | Masonry Basement 2 | 6 days | 6 |
| 15 | Masonry Basement 1 | 4 days | 14,7 |
| 16 | Masonry Level 1 | 11 days | 15,8 |
| 17 | Masonry Level 2 | 8 days | 16,9 |

| | | | |
|---|---|---|---|
| 18 | Masonry Level 3 | 6 days | 17,10 |
| 19 | Masonry Level 4 | 8 days | 18,11 |
| 20 | Masonry Level 5 | 6 days | 19,12 |
| 21 | **Metalwork** | **197 days** | |
| 22 | Metalwork Basement 2 | 2 days | 6,14SS+1 day |
| 23 | Metalwork Basement 1 | 2 days | 22,15SS+1 day |
| 24 | Metalwork level 1 Windows and Doors | 3 days | 23,16SS+1 day |
| 25 | Metalwork level 2 Windows and Doors | 3 days | 24,17SS+1 day |
| 26 | Metalwork level 3 Windows and Doors | 3 days | 25,18SS+1 day |
| 27 | Metalwork level 4 Windows and Doors | 3 days | 26,19SS+1 day |
| 28 | Metalwork level 5 Windows and Doors | 3 days | 27,20SS+1 day |
| 29 | Metalwork level 1 Fitout | 3 days | 93,115 |
| 30 | Metalwork level 2 Fitout | 3 days | 29,94,116 |
| 31 | Metalwork level 3 Fitout | 3 days | 30,95,117 |
| 32 | Metalwork level 4 Fitout | 3 days | 31,96,118 |
| 33 | Metalwork level 5 Fitout | 3 days | 32,97,119 |
| 34 | **Hydraulics** | **224 days** | |
| 35 | Hydraulics Rough In Sub basement | 7 days | 4 |
| 36 | Hydraulics Rough In Basement 2 | 7 days | 4 |
| 37 | Hydraulics Rough In Basement 1 | 7 days | 36,6 |
| 38 | Hydraulics Rough In Level 1 | 7 days | 37,7 |
| 39 | Hydraulics Rough In Level 2 | 7 days | 38,8 |
| 40 | Hydraulics Rough In Level 3 | 7 days | 39,9 |

| 41 | Hydraulics Rough In Level 4 | 7 days | 40,10 |
|----|----|----|----|
| 42 | Hydraulics Rough In Level 5 | 7 days | 41,11 |
| 43 | Hydraulics Fitoff Basement 2 | 5 days | 115,42 |
| 44 | Hydraulics Fitoff Basement 1 | 5 days | 43,115 |
| 45 | Hydraulics Fitoff Level 1 | 5 days | 44,115 |
| 46 | Hydraulics Fitoff Level 2 | 5 days | 45,116 |
| 47 | Hydraulics Fitoff Level 3 | 5 days | 46,117 |
| 48 | Hydraulics Fitoff Level 4 | 5 days | 47,118 |
| 49 | Hydraulics Fitoff Level 5 | 5 days | 36,7,89,97,48,119 |
| 50 | **Electrical** | **221 days** | |
| 51 | Electrical Rough in Below Basement Level | 3 days | 4 |
| 52 | Electrical Rough in Basement 2 | 2 days | 51,14 |
| 53 | Electrical Rough in Basement 1 | 2 days | 52,15 |
| 54 | Electrical Rough in Level 1 | 2 days | 53,16 |
| 55 | Electrical Rough in Level 2 | 2 days | 54,17 |
| 56 | Electrical Rough in Level 3 | 2 days | 55,18 |
| 57 | Electrical Rough in Level 4 | 2 days | 56,19 |
| 58 | Electrical Rough in Level 5 | 2 days | 57,20 |
| 59 | Electrical Fitoff Basement 2 | 2 days | 52,91,58 |
| 60 | Electrical Fitoff Basement 1 | 2 days | 59,53,92 |
| 61 | Electrical Fitoff Level 1 | 2 days | 60,54,115 |
| 62 | Electrical Fitoff Level 2 | 2 days | 61,55,116 |
| 63 | Electrical Fitoff Level 3 | 2 days | 62,56,117 |

| | | | |
|---|---|---|---|
| 64 | Electrical Fitoff Level 4 | 2 days | 63,57,118 |
| 65 | Electrical Fitoff Level 5 | 2 days | 64,58,119 |
| 66 | **Mechanical** | **138 days** | |
| 67 | Mechanincal Rough in Lift | 5 days | 7 |
| 68 | Mechanincal Fitoff Lift | 3 days | 67,97 |
| 69 | Mechanincal Rough in AC to Basement 2 | 2 days | 7 |
| 70 | Mechanincal Rough in AC to Basement 1 | 2 days | 69,8 |
| 71 | Mechanincal Rough in AC to Level 1 | 2 days | 70,9 |
| 72 | Mechanincal Rough in AC to Level 2 | 2 days | 71,10 |
| 73 | Mechanincal Rough in AC to Level 3 | 2 days | 72,11 |
| 74 | Mechanincal Rough in AC to Level 4 | 2 days | 73,12 |
| 75 | Mechanincal Rough in AC to Level 5 | 2 days | 74,13 |
| 76 | Mechanincal Fitoff to Basement 2 | 2 days | 91,75 |
| 77 | Mechanincal Fitoff to Basement 1 | 2 days | 76,92 |
| 78 | Mechanincal Fitoff to Level 1 | 2 days | 77,93 |
| 79 | Mechanincal Fitoff to Level 2 | 2 days | 78,94 |
| 80 | Mechanincal Fitoff to Level 3 | 2 days | 79,95 |
| 81 | Mechanincal Fitoff to Level 4 | 2 days | 80,96 |
| 82 | Mechanincal Fitoff to Level 5 | 2 days | 81,97 |
| 83 | **Waterproofing** | **87 days** | |
| 84 | Waterproofing to Level 1 | 2 days | 93FS+5 days |
| 85 | Waterproofing to Level 2 | 2 days | 84,94FS+5 days |
| 86 | Waterproofing to Level 3 | 2 days | 85,95FS+5 days |

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|---|---|---|---|
| 87 | Waterproofing to Level 4 | 2 days | 86,96FS+5 days |
| 88 | Waterproofing to Level 5 | 2 days | 87,97FS+5 days |
| 89 | Roofer | 7 days | 12,20 |
| 90 | **Plasterer** | **143 days** | |
| 91 | Plasterer to Basement 2 | 3 days | 14,52 |
| 92 | Plasterer to Basement 1 | 3 days | 91,53 |
| 93 | Plasterer to Level 1 | 5 days | 92,54 |
| 94 | Plasterer to Level 2 | 5 days | 93,55 |
| 95 | Plasterer to Level 3 | 5 days | 94,56 |
| 96 | Plasterer to Level 4 | 5 days | 95,57 |
| 97 | Plasterer to Level 5 | 5 days | 96,58 |
| 98 | **Carpenter Fitout** | **19 days** | |
| 99 | Carpenter Fitout to Basement 2 | 2 days | 76 |
| 100 | Carpenter Fitout to Basement 1 | 2 days | 99,77 |
| 101 | Carpenter Fitout to Level 1 | 3 days | 100,78 |
| 102 | Carpenter Fitout to Level 2 | 3 days | 101,79 |
| 103 | Carpenter Fitout to Level 3 | 3 days | 102,80 |
| 104 | Carpenter Fitout to Level 4 | 3 days | 103,81 |
| 105 | Carpenter Fitout to Level 5 | 3 days | 104,82 |
| 106 | **Painter** | **53 days** | |
| 107 | Painter to Basement 2 | 3 days | 59 |
| 108 | Painter to Basement 1 | 3 days | 107,60 |
| 109 | Painter to Level 1 | 4 days | 108,61 |

| | | | |
|---|---|---|---|
| 110 | Painter to Level 2 | 4 days | 109,62 |
| 111 | Painter to Level 3 | 4 days | 110,63 |
| 112 | Painter to Level 4 | 4 days | 111,64 |
| 113 | Painter to Level 5 | 4 days | 112,65 |
| 114 | **Ceramic Tiler** | **40 days** | |
| 115 | Ceramic Tiler to Level 1 | 8 days | 101,84FS+5 days |
| 116 | Ceramic Tiler to Level 2 | 8 days | 115,102,85FS+5 days |
| 117 | Ceramic Tiler to Level 3 | 8 days | 116,103,86FS+5 days |
| 118 | Ceramic Tiler to Level 4 | 8 days | 117,104,87FS+5 days |
| 119 | Ceramic Tiler to Level 5 | 8 days | 118,105,88FS+5 days |
| 120 | **Carpet** | **40 days** | |
| 121 | Carpet to Level 1 | 8 days | 109 |
| 122 | Carpet to Level 2 | 8 days | 121,110 |
| 123 | Carpet to Level 3 | 8 days | 122,111 |
| 124 | Carpet to Level 4 | 8 days | 123,112 |
| 125 | Carpet to Level 5 | 8 days | 124,113 |
| 126 | **Cleaner** | **33 days** | |
| 127 | Cleaner to Basement 2 | 1 day | 109,121 |
| 128 | Cleaner to Basement 1 | 1 day | 109,121 |
| 129 | Cleaner to Level 1 | 1 day | 109,121 |
| 130 | Cleaner to Level 2 | 1 day | 129,110,122 |
| 131 | Cleaner to Level 3 | 1 day | 130,111,123 |
| 132 | Cleaner to Level 4 | 1 day | 131,112,124 |

| 133 | Cleaner to Level 5 | 1 day | 132,113,125 |
|---|---|---|---|
| 134 | External Works | 21 days | 97 |
| 135 | Finish | 0 days | 133,134 |

**Question 2**

Using the Bill of Quantities for the Preliminary Estimate, allocate the costs for each activity and create an S-Curve for the job based on the activities Early Start dates.

Note:
- You will need to allocate the PC ITEMS to the relevant activities.
- The Preliminaries will be allocated across the entire duration of the project.

**Question 3**

Collate the S-Curve costs into monthly summaries and prepare a cash flow statement to determine the capital required for the job.

| Expenditure | Month 1 | = | $_____ |
|---|---|---|---|
| | Month 2 | = | $_____ |
| | Month 3 | = | $_____ |
| | Month 4 | = | $_____ |
| | Month 5 | = | $_____ |
| | Month 6 | = | $_____ |
| | Month 7 | = | $_____ |
| | Month 8 | = | $_____ |
| | Month 9 | = | $_____ |
| | Month 10 | = | $_____ |
| | Month 11 | = | $_____ |
| | Month 12 | = | $_____ |

Use the following information to create your cash flow statement:

| Profit and Overhead | = | 18% |
|---|---|---|
| Defects Liability Period | = | Twelve (12) weeks. |
| Cost of Finance | = | 12% per annum, To be entered the month after any negative Cumulative Total. |
| Frequency of Claims | = | At the end of each four (4) weeks. |
| Period of Payment | = | Four [4] weeks between claim and payment. |

Deposit           =         5% of Contract Sum
To be included as additional income in Month 1, and then deducted from the first Progress Claim.

Initial Project Float    =    $      300,000.00
To be included as additional income in Month 1, and then deducted any time after the Cumulative Total (Progress Account) is trading positive.

Bank Guarantee    =    Two (2) x 8% of Contract Sum

Use the template over the page to calculate your costs:

**Cash Flow Chart**

Contract Sum: [        ]

Total (Maximum) Retention Held: [        ]

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Month** | | | | | | | | | | | | | |
| **Income** | - Float | | | | | | | | | | | | |
| | - cash deposit | | | | | | | | | | | | |
| | - Pclaim (Gross) | | | | | | | | | | | | |
| | - deposit deducted | | | | | | | | | | | | |
| | - retention deducted | | | | | | | | | | | | |
| | - retention returned | | | | | | | | | | | | |
| | - float returned | | | | | | | | | | | | |
| | *Sub - Total* | | | | | | | | | | | | |
| **Expend** | - Direct Project costs | | | | | | | | | | | | |
| | - Interest | | | | | | | | | | | | |
| | *Sub - Total* | | | | | | | | | | | | |
| **Total per period** | | | | | | | | | | | | | |
| **Cumulative total** | | | | | | | | | | | | | |
| Interest | per year | | | | | | | | | | | | |
| Interest | per month | | | | | | | | | | | | |