# Creating Custom Over / Under Billing Reports via MS Query

In this session we will cover the ability to create a custom Over / Under Billing Report using the MS Query tool and Excel.

First, we will create a sheet with a complete job list. This is done because we are not sure that all jobs have all of the information contained within the O/U Report (ie: contract, estimated cost, change orders, cost and billing). We will pull this information from additional queries and link the data together in a single spreadsheet.

## JOB LIST

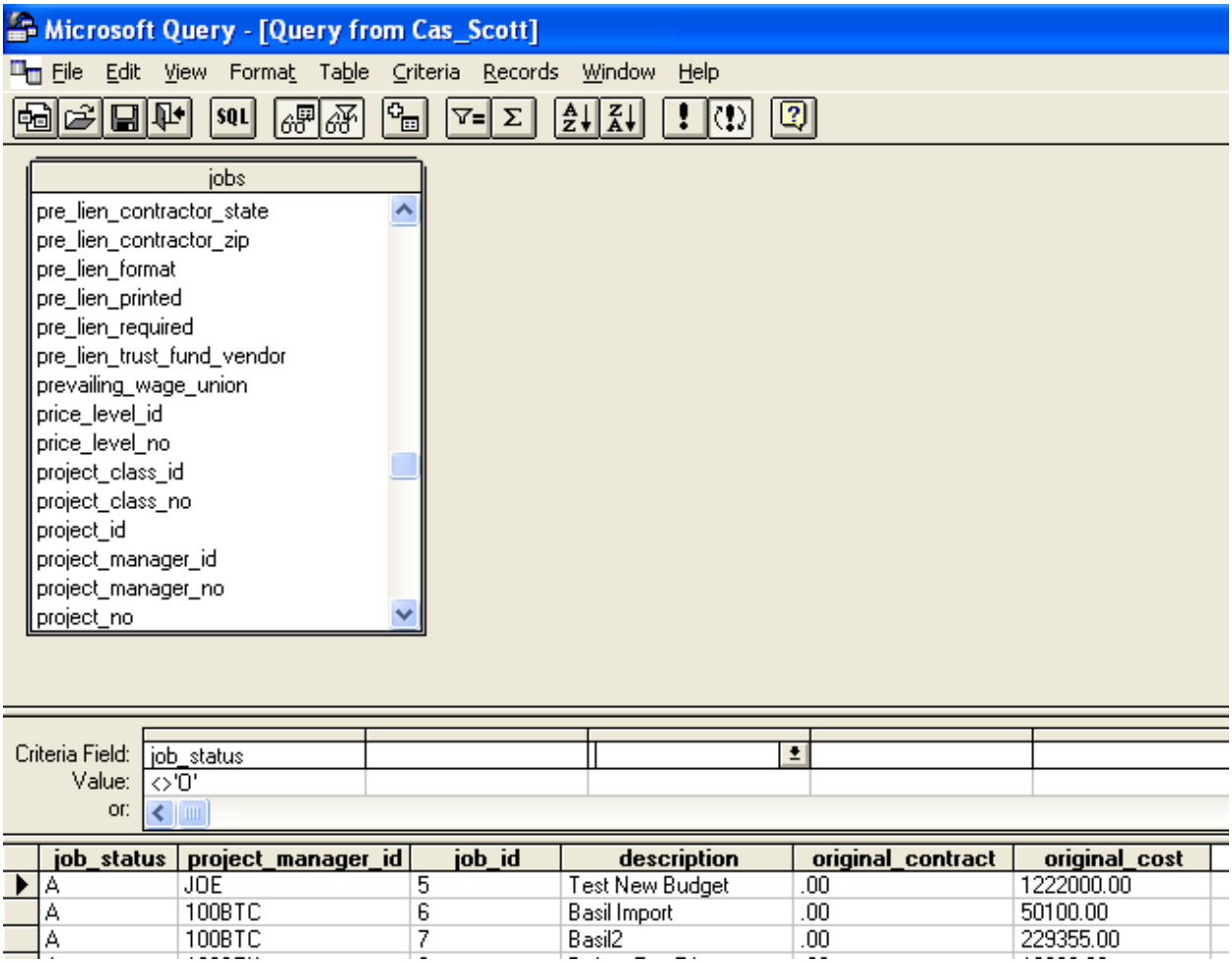
Access the JOBS table from the MS Query tool.

Select the following fields:

JOB_STATUS
PROJECT_MANAGER_ID
JOB_ID
DESCRIPTION
ORIGINAL_CONTRACT
ORIGINAL_COST

We will enable criteria to ***not include*** "O" – Overhead jobs based on the Job_Status field.

The Original_Contract and Original_Cost fields are the information entered on the General Tab of the Job Maintenance record.




Return the Data to Excel, rename the tab JOB and access the second tab.

## CHANGE ORDERS

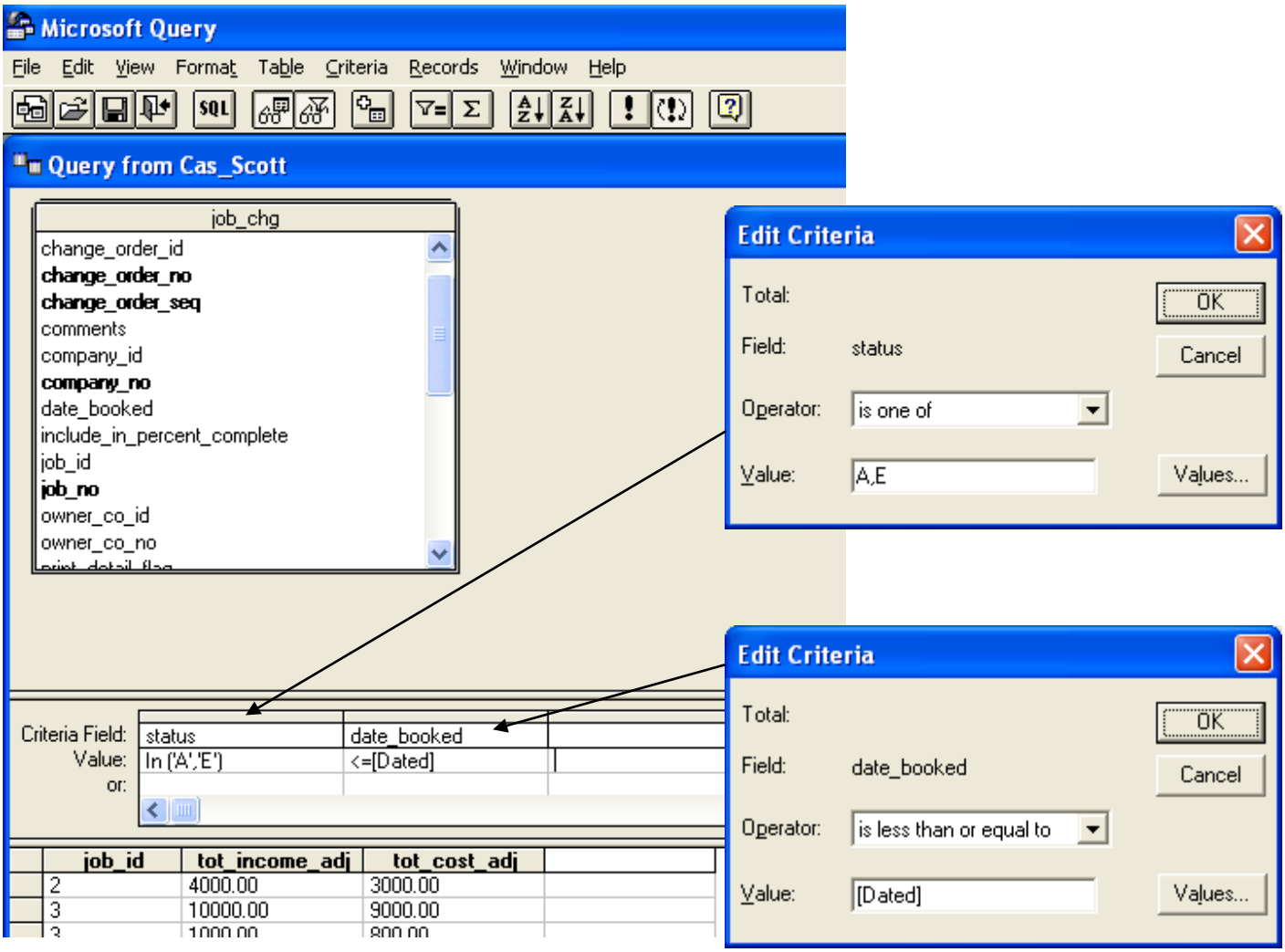
On the second tab, we will query change order information. This will include changes in contract amount and changes in estimated cost.

The table we will use is titled JOB_CHG. Select the following fields.

JOB_ID
TOT_INCOME_ADJ
TOT_COST_ADJ

We will also enable some criteria to select Change Orders with a Status of A for Approved and E for Estimate only.

Additional criteria will be enabled to include Change Orders dated on or before a particular date.




Return this data to the second tab, rename the tab CO of the Excel Sheet.

**BILLINGS**

On the third tab, we will create a sheet for the billings on the contract.

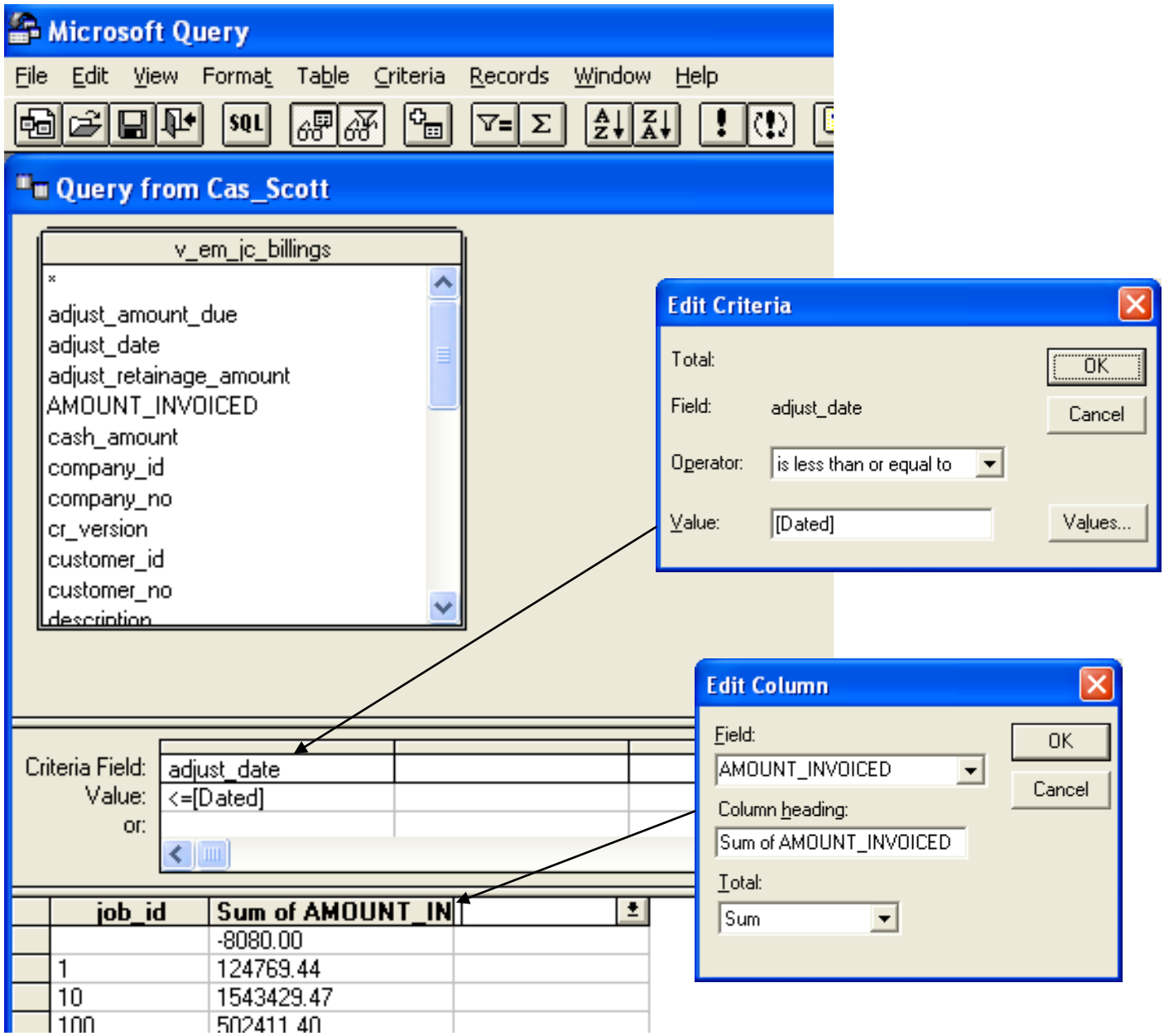
For this query, we will use the V_EM_JC_BILLINGS table.

Pull the following fields from the table:

JOB_ID
AMOUNT_INVOICED

Criteria will be added based on the ADJUST_DATE field to show billings on or before a particular date.

We can also sum the total of amount_invoiced field into a single line per job.




Return the Data to the third tab, rename the tab to BILL.

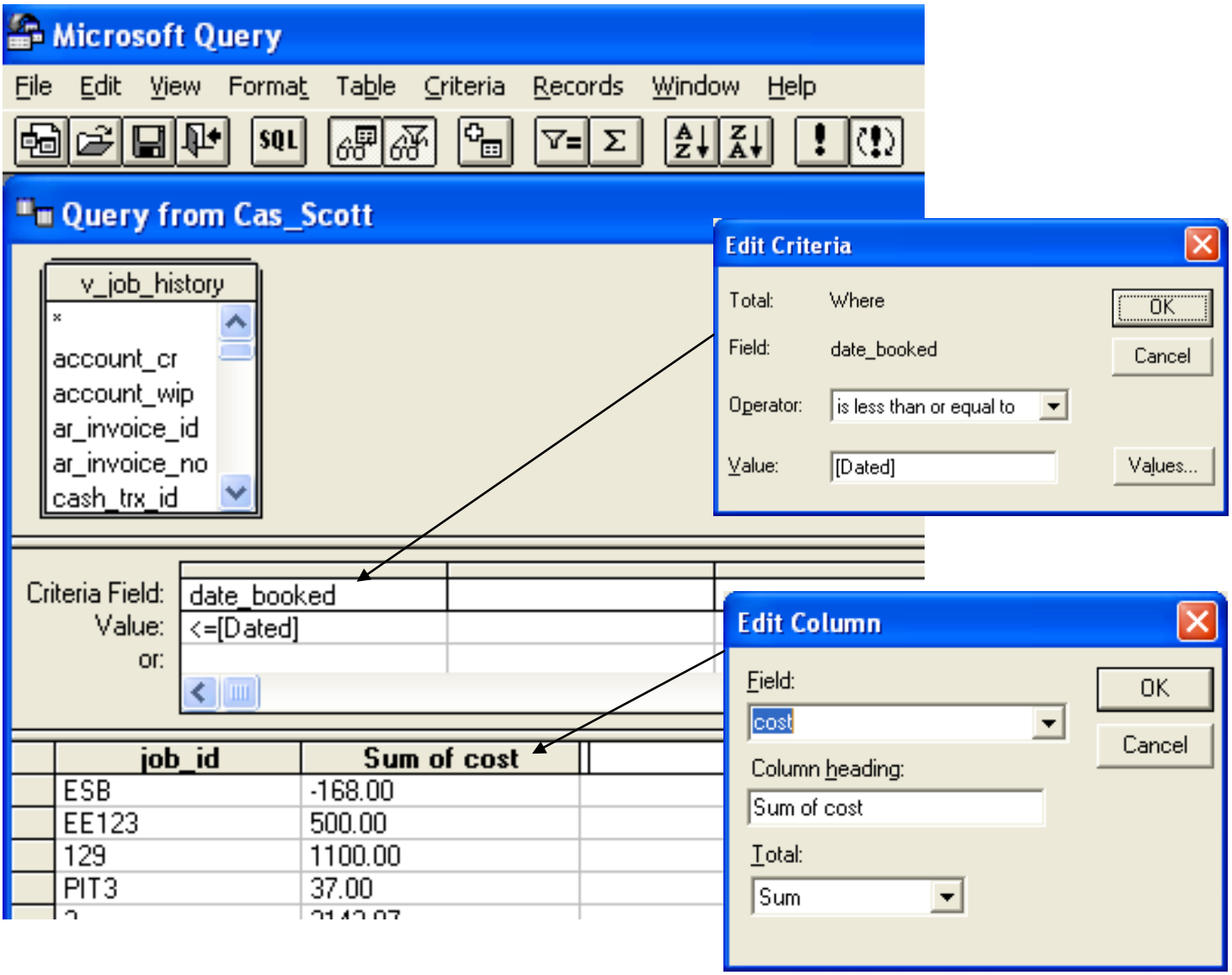
**JOB COST**

Acces the Fourth and Final Tab of the the query and access the V_JOB_HISTORY table to pull in job to date costs.

Select the following Fields:

JOB_ID
COSTS

We will enable criteria on the date_booked field to include records on or before a certain date, and we will sum the costs for consolidation to one line per job.




Return the Data to the fourth tab of Excel and rename the tab COST.

## COMBINING THE DATA TO A SINGLE SHEET

OK, so we have 4 tabs of information, all the building blocks of an Over/Under Billing Report. Now we will need to consolidate all of the information to a single sheet.

This is possible by using our formulaic friends VLOOKUP and SUMIF.

If you are stilll struggling with these formulas, remember that the VLOOKUP works if you are returning a single value from another page, or if you are looking up TEXT based information. SUMIF formulas are used when there are multiple values to SUM together and consolidate to a single sheet based on the reference cell. You can also use a SUMIF formula to return a single value, but you can not return text based information with a SUMIF formula.

When creating the queries for this lesson, I purposely left the Change Order Information in detail to illustrate the use of a SUMIF formula.

We need to "marry" the information on the Change Order Sheet to the Main Job List Sheet based on the Job_ID.

**JOB SHEET**

| | B | C | D |
|---|---|---|---|
| 1 | project_manager_id | job_id | description |
| 2 | JOE | 5 | Test New Budget |
| 3 | 100BTC | 6 | Basil Import |
| 4 | 100BTC | 7 | Basil2 |
| 5 | 100STK | 8 | Before Tax Fringe |
| 6 | GEF | 10 | T&M Job |
| 7 | 100STK | 50 | Fessler & Bowman |
| 8 | 100STK | 51 | Here is the Auto Refresh |

**CHANGE ORDER (CO) SHEET**

| | A | B | C |
|---|---|---|---|
| 1 | job_id | tot_income_adj | tot_cost_adj |
| 2 | 2 | 4000 | 3000 |
| 3 | 3 | 10000 | 9000 |
| 4 | 3 | 1000 | 800 |
| 5 | 5 | 3000 | 2000 |
| 6 | 5 | 2000 | 1000 |
| 7 | 5 | 2000 | 1000 |
| 8 | 10 | 12300 | 35654 |
| 9 | 10 | 45000 | 27400 |
| 10 | 10 | 12000 | 27400 |
| 11 | 100 | 100 | 50 |

The information on the Change Order Sheet has 3 lines of data. These are values from 3 individual change orders against Job number 5.

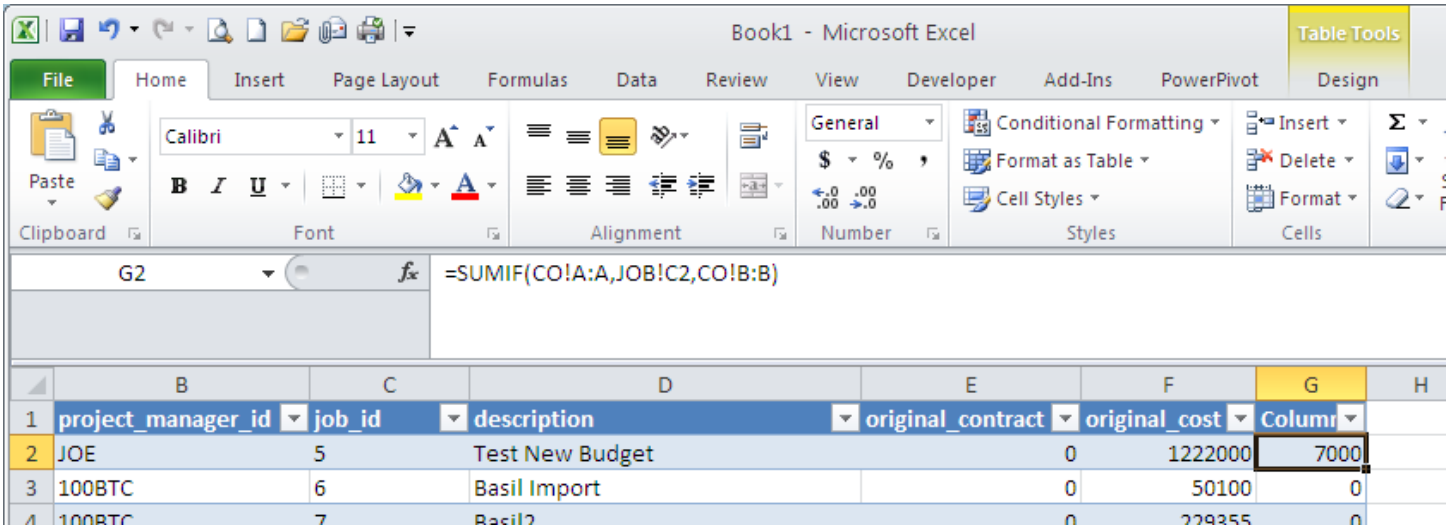
In order to tie the SUM of the three values back to the main sheet, we will use the SUMIF formula.

The VLOOKUP formula will NOT work in this case, as it would find the first match for Job number 5 on the Change Order sheet, and return a single value, not the SUM of all of the values on the sheet.

On the Job list sheet, in Cell G2, create the following formula:

=SUMIF(CO!A:A,JOB!C2,CO!B:B)

This formula "says" – look in all of column A of the CO sheet. Look for a value based on the value in cell C2 of the JOB sheet (in this case – Job 5). When you find that value, SUM any number found in Column B (total income adjustment) on the CO tab.

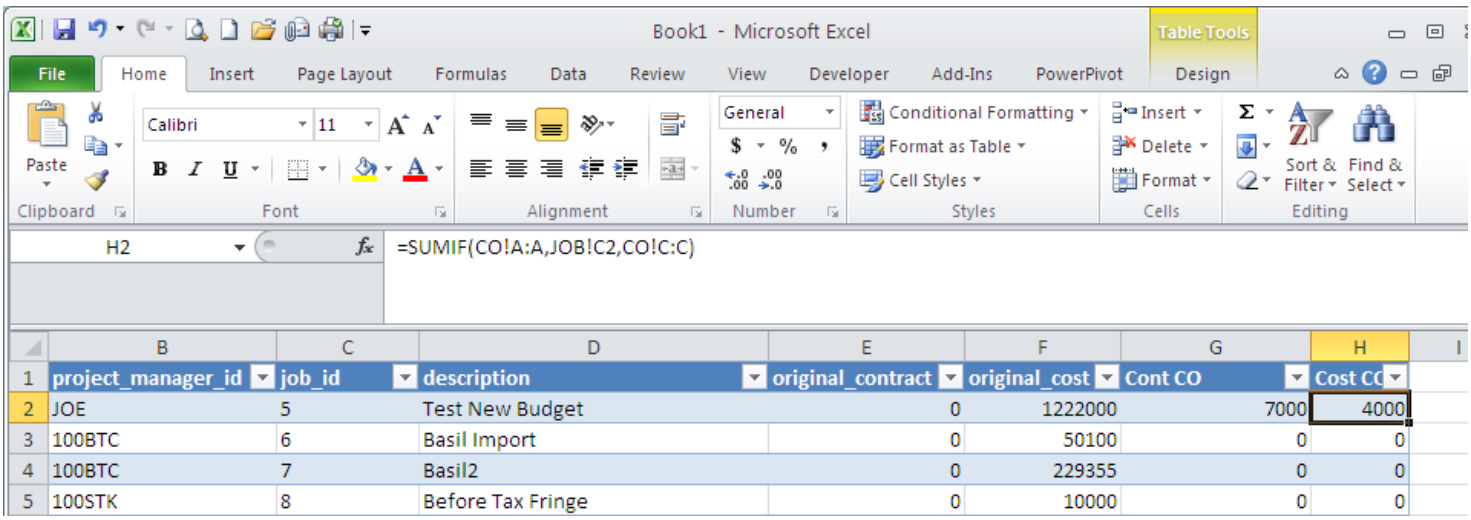



| | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|
| 1 | project_manager_id | job_id | description | original_contract | original_cost | Columr | |
| 2 | JOE | 5 | Test New Budget | 0 | 1222000 | 7000 | |
| 3 | 100BTC | 6 | Basil Import | 0 | 50100 | 0 | |
| 4 | 100BTC | 7 | Basil2 | 0 | 229355 | 0 | |

This sum represents the total income adjustments to the particular job. Create a similar formula to sum the total COST adjustments from the change orders.

The formula is identical except for the last parameter that tells the formula to look in Column C for the values to sum.

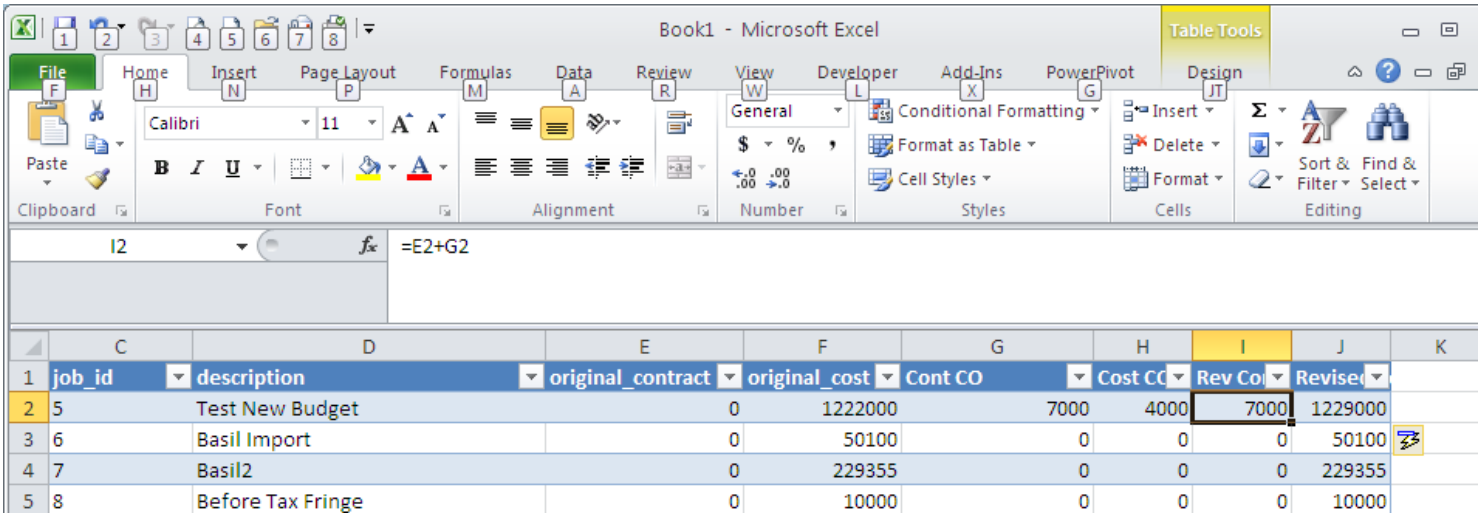
=SUMIF(CO!A:A,JOB!C2,CO!C:C)




| | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|
| 1 | project_manager_id | job_id | description | original_contract | original_cost | Cont CO | Cost CC | |
| 2 | JOE | 5 | Test New Budget | 0 | 1222000 | 7000 | 4000 | |
| 3 | 100BTC | 6 | Basil Import | 0 | 50100 | 0 | 0 | |
| 4 | 100BTC | 7 | Basil2 | 0 | 229355 | 0 | 0 | |
| 5 | 100STK | 8 | Before Tax Fringe | 0 | 10000 | 0 | 0 | |

Add two more columns to the JOB sheet titled Revised Contract and Revised Cost.

These are simple additions that add the original contract and the changes to contract and the original costs to the changes in cost.



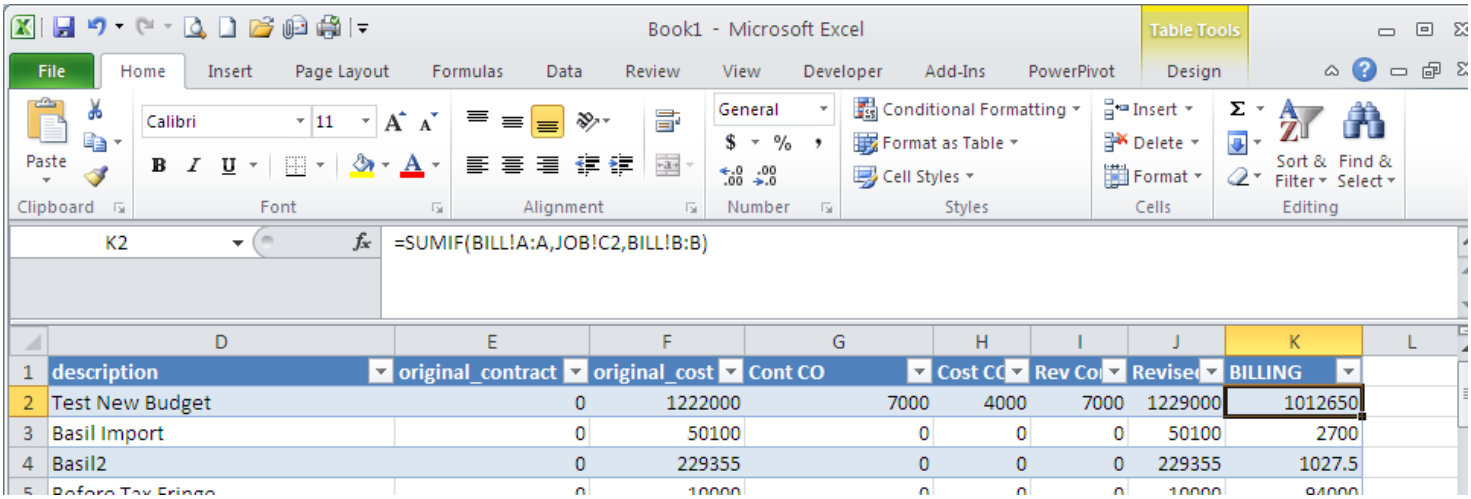

| | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|
| 1 | job_id | description | original_contract | original_cost | Cont CO | Cost CO | Rev Co | Revise | |
| 2 | 5 | Test New Budget | 0 | 1222000 | 7000 | 4000 | 7000 | 1229000 | |
| 3 | 6 | Basil Import | 0 | 50100 | 0 | 0 | 0 | 50100 | |
| 4 | 7 | Basil2 | 0 | 229355 | 0 | 0 | 0 | 229355 | |
| 5 | 8 | Before Tax Fringe | 0 | 10000 | 0 | 0 | 0 | 10000 | |

We will now pull in the Billing information from the BILL sheet.

Even though we consolidated the data within the query by using the SUM function, we can use the SUMIF to pull the data from the BILL sheet to the JOB sheet.

=SUMIF(BILL!A:A,JOB!C2,BILL!B:B)

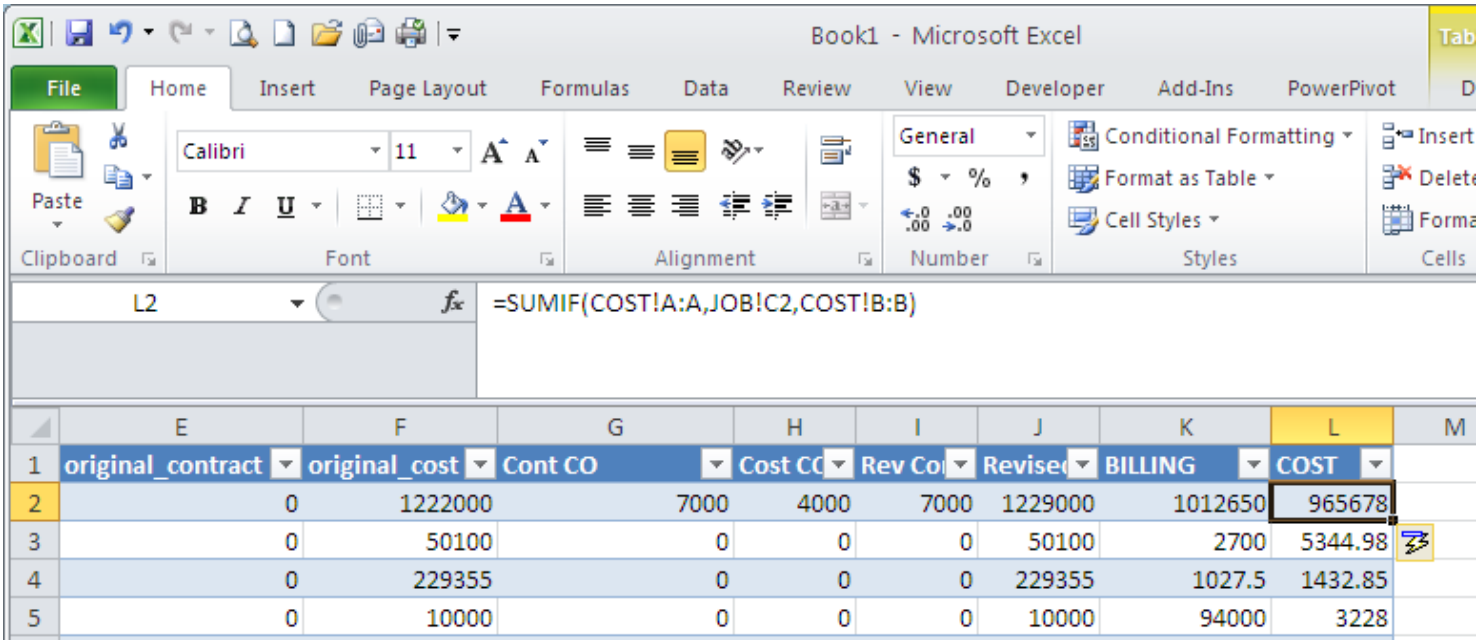
If the value on the BILL sheet in column A matches the value in CELL C2 (job 5) then sum the assocuated value in Column B of the BILL sheet.




| | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|
| 1 | description | original_contract | original_cost | Cont CO | Cost CO | Rev Co | Revise | BILLING | |
| 2 | Test New Budget | 0 | 1222000 | 7000 | 4000 | 7000 | 1229000 | 1012650 | |
| 3 | Basil Import | 0 | 50100 | 0 | 0 | 0 | 50100 | 2700 | |
| 4 | Basil2 | 0 | 229355 | 0 | 0 | 0 | 229355 | 1027.5 | |
| 5 | Before Tax Fringe | 0 | 10000 | 0 | 0 | 0 | 10000 | 84000 | |

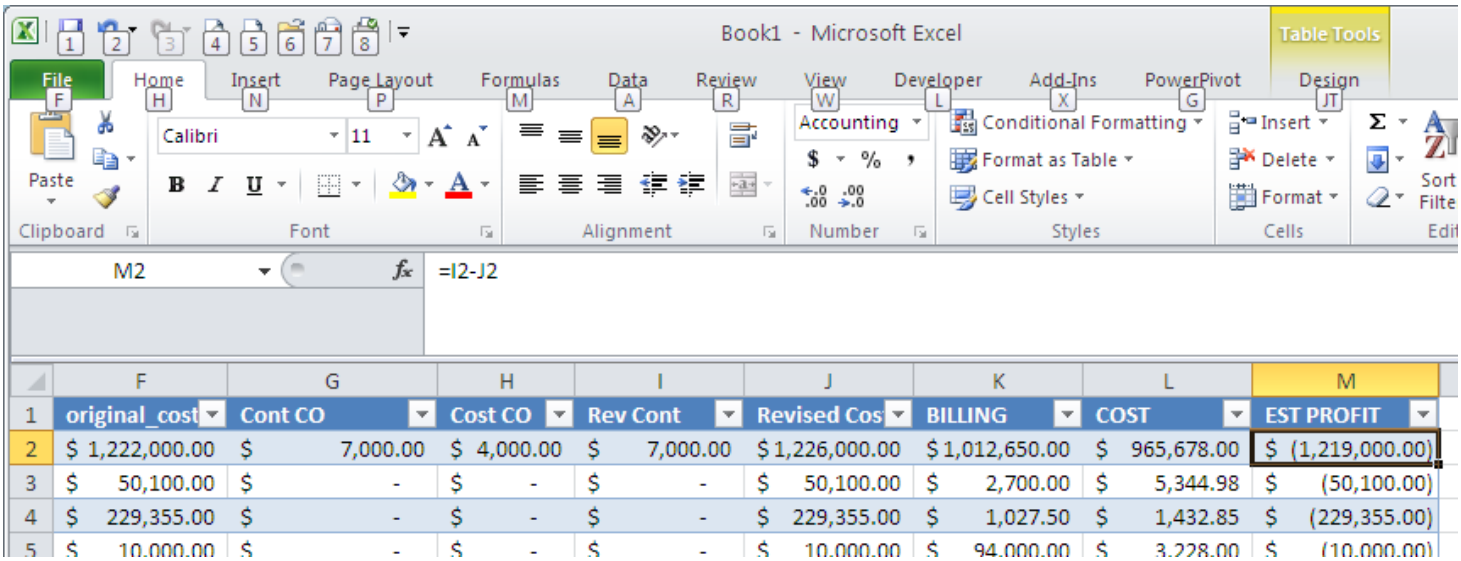
Pulling COST to the JOB sheet. Wash, Rinse, Repeat for the Cost information, create a SUMIF to pull the data from the COST tab to the JOB tab.

=SUMIF(COST!A:A,JOB!C2,COST!B:B)




| | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|
| 1 | original_contract | original_cost | Cont CO | Cost CO | Rev Co | Revise( | BILLING | COST | |
| 2 | 0 | 1222000 | 7000 | 4000 | 7000 | 1229000 | 1012650 | 965678 | |
| 3 | 0 | 50100 | 0 | 0 | 0 | 50100 | 2700 | 5344.98 | |
| 4 | 0 | 229355 | 0 | 0 | 0 | 229355 | 1027.5 | 1432.85 | |
| 5 | 0 | 10000 | 0 | 0 | 0 | 10000 | 94000 | 3228 | |

Now create the formula to calculate the Estimated Profit = Revised Contract – Revised Cost:

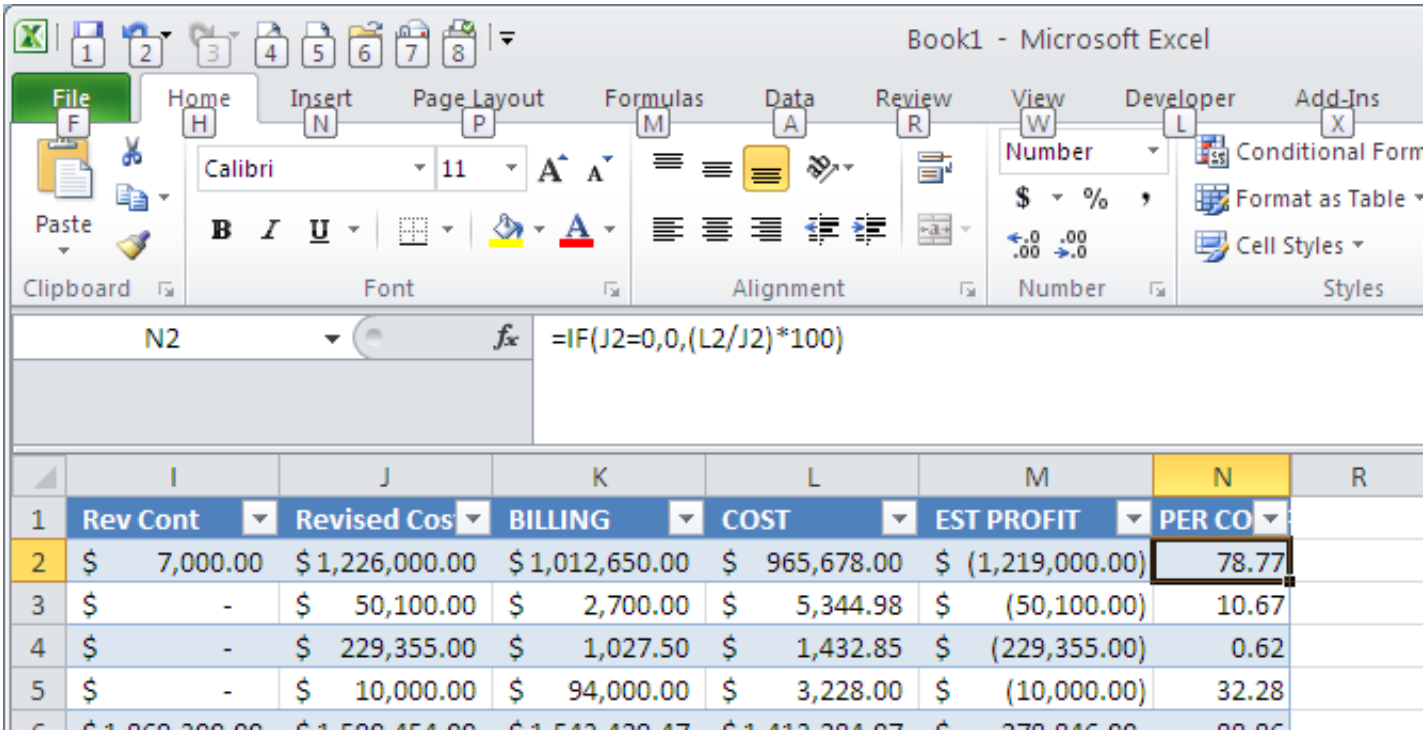



| | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|
| 1 | original_cost | Cont CO | Cost CO | Rev Cont | Revised Cos | BILLING | COST | EST PROFIT |
| 2 | $ 1,222,000.00 | $ 7,000.00 | $ 4,000.00 | $ 7,000.00 | $ 1,226,000.00 | $ 1,012,650.00 | $ 965,678.00 | $ (1,219,000.00) |
| 3 | $ 50,100.00 | $ - | $ - | $ - | $ 50,100.00 | $ 2,700.00 | $ 5,344.98 | $ (50,100.00) |
| 4 | $ 229,355.00 | $ - | $ - | $ - | $ 229,355.00 | $ 1,027.50 | $ 1,432.85 | $ (229,355.00) |
| 5 | $ 10,000.00 | $ - | $ - | $ - | $ 10,000.00 | $ 94,000.00 | $ 3,228.00 | $ (10,000.00) |

Create a formula to calculate Percentage of Completion:

## If Revised Estimated Cost = 0,0,(Cost / Revised Estmated Cost)*100

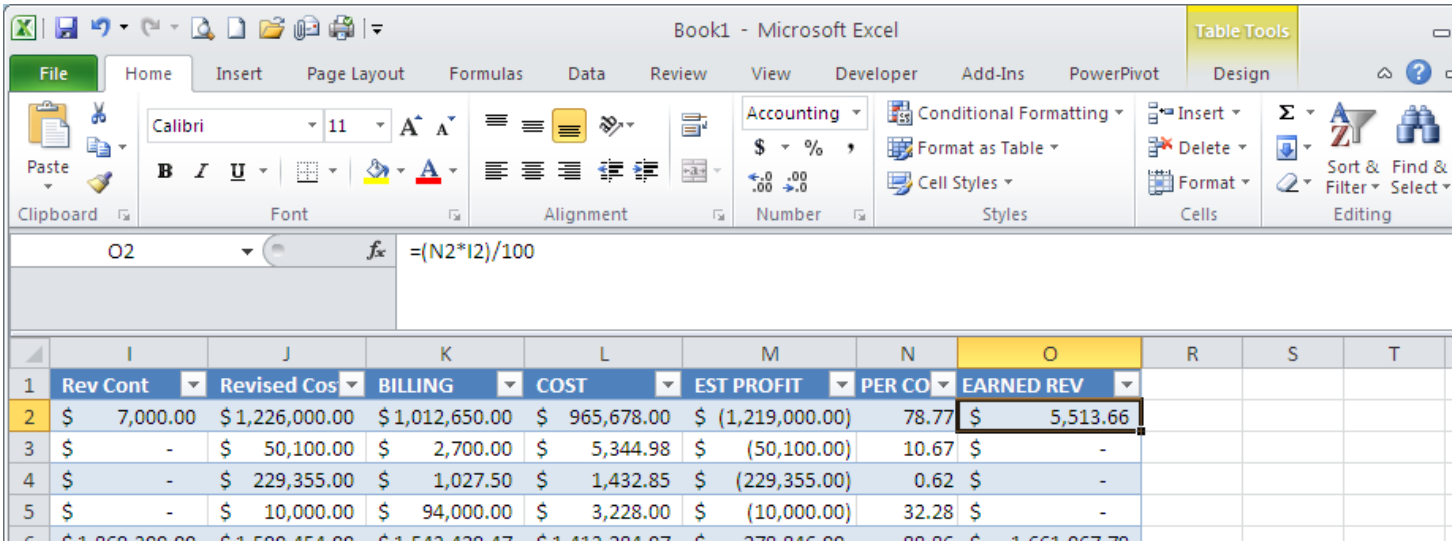
This will remove the possibility of those pesky #DIV/0 errors




| | I | J | K | L | M | N | R |
|---|---|---|---|---|---|---|---|
| 1 | Rev Cont | Revised Cos | BILLING | COST | EST PROFIT | PER CO | |
| 2 | $ 7,000.00 | $ 1,226,000.00 | $ 1,012,650.00 | $ 965,678.00 | $ (1,219,000.00) | 78.77 | |
| 3 | $ - | $ 50,100.00 | $ 2,700.00 | $ 5,344.98 | $ (50,100.00) | 10.67 | |
| 4 | $ - | $ 229,355.00 | $ 1,027.50 | $ 1,432.85 | $ (229,355.00) | 0.62 | |
| 5 | $ - | $ 10,000.00 | $ 94,000.00 | $ 3,228.00 | $ (10,000.00) | 32.28 | |

Next, we will calculate the Earned Revenue amount:

Percentage of Completion * Revised Contract Amount



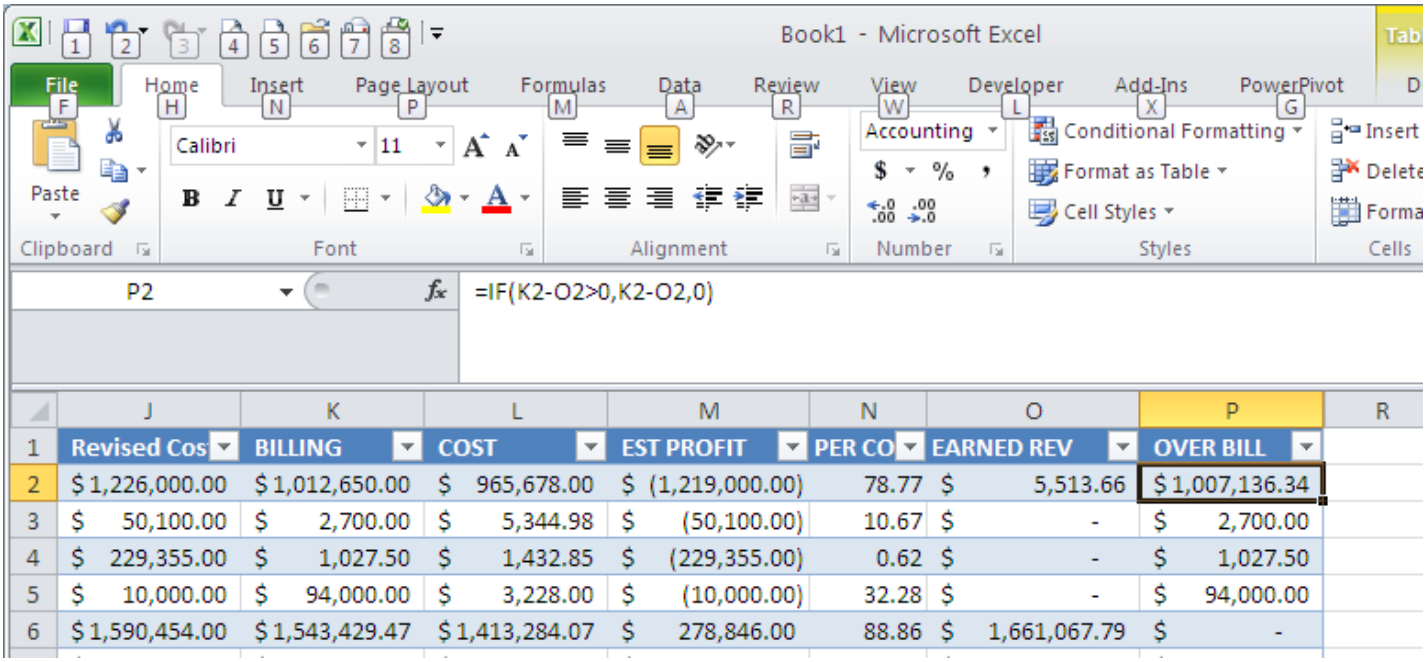

| | I | J | K | L | M | N | O | R | S | T |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Rev Cont | Revised Cos | BILLING | COST | EST PROFIT | PER CO | EARNED REV | | | |
| 2 | $ 7,000.00 | $ 1,226,000.00 | $ 1,012,650.00 | $ 965,678.00 | $ (1,219,000.00) | 78.77 | $ 5,513.66 | | | |
| 3 | $ - | $ 50,100.00 | $ 2,700.00 | $ 5,344.98 | $ (50,100.00) | 10.67 | $ - | | | |
| 4 | $ - | $ 229,355.00 | $ 1,027.50 | $ 1,432.85 | $ (229,355.00) | 0.62 | $ - | | | |
| 5 | $ - | $ 10,000.00 | $ 94,000.00 | $ 3,228.00 | $ (10,000.00) | 32.28 | $ - | | | |

NOTE: The Earned Revenue calculation shown in this example is not the “gospel”, many companies calculate the earned revenue figure in different manner (ie: Earned Profit + Cost To Date). You may use whatever calculation you choose when creating these reports.

Calculation for OVER BILLING:

If Billing to Date – Earned Revenue > 0, Billing to Date – Earned Revenue otherwise 0.

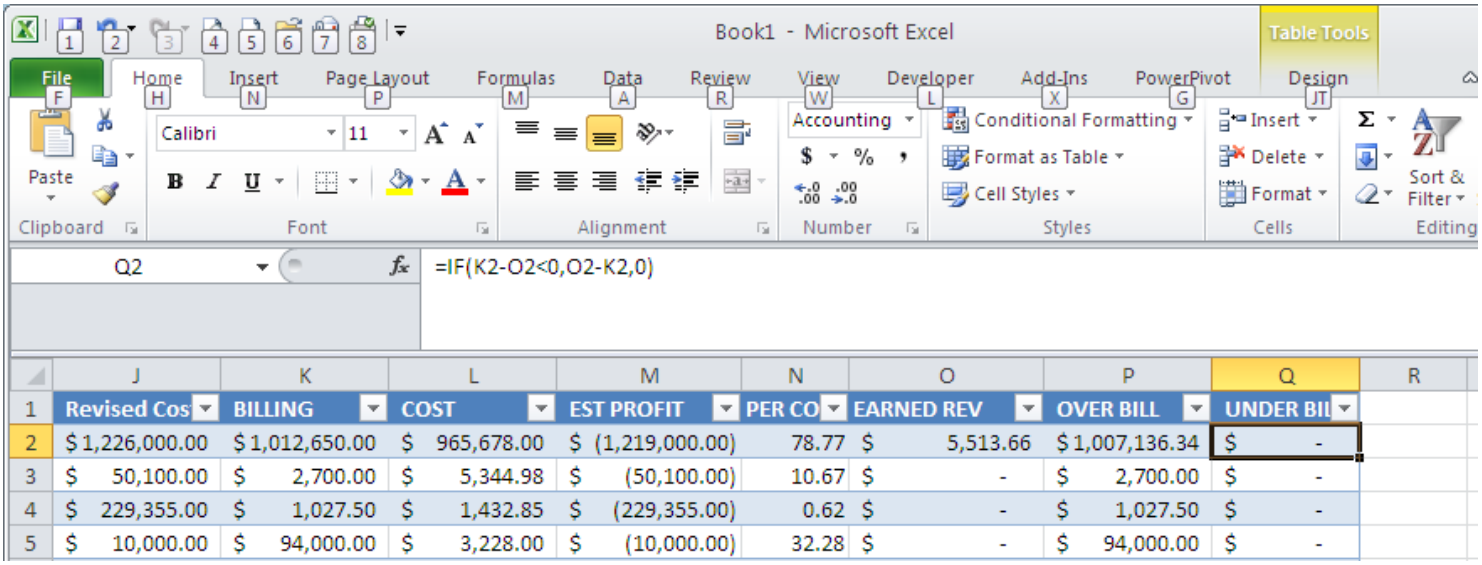
This formula states that if you have Billed more than the Earned Revenue amount, you are OVERBILLED by the amount of the Billing less the Earned Revenue Amount. If you are NOT overbilled, then show a $0.00 value in the column.




| | J | K | L | M | N | O | P | R |
|---|---|---|---|---|---|---|---|---|
| 1 | Revised Cos | BILLING | COST | EST PROFIT | PER CO | EARNED REV | OVER BILL | |
| 2 | $ 1,226,000.00 | $ 1,012,650.00 | $ 965,678.00 | $ (1,219,000.00) | 78.77 | $ 5,513.66 | $ 1,007,136.34 | |
| 3 | $ 50,100.00 | $ 2,700.00 | $ 5,344.98 | $ (50,100.00) | 10.67 | $ - | $ 2,700.00 | |
| 4 | $ 229,355.00 | $ 1,027.50 | $ 1,432.85 | $ (229,355.00) | 0.62 | $ - | $ 1,027.50 | |
| 5 | $ 10,000.00 | $ 94,000.00 | $ 3,228.00 | $ (10,000.00) | 32.28 | $ - | $ 94,000.00 | |
| 6 | $ 1,590,454.00 | $ 1,543,429.47 | $ 1,413,284.07 | $ 278,846.00 | 88.86 | $ 1,661,067.79 | $ - | |

Calculation for UNDER BILLING:

This caclulation computes if you have billed LESS than the EARNED REVENUE figure. If the Billing amount less the Earned Revenue is less than 0, then subtract the BILLING AMOUNT from the EARNED REVENUE amount, otherwise show $0.00.

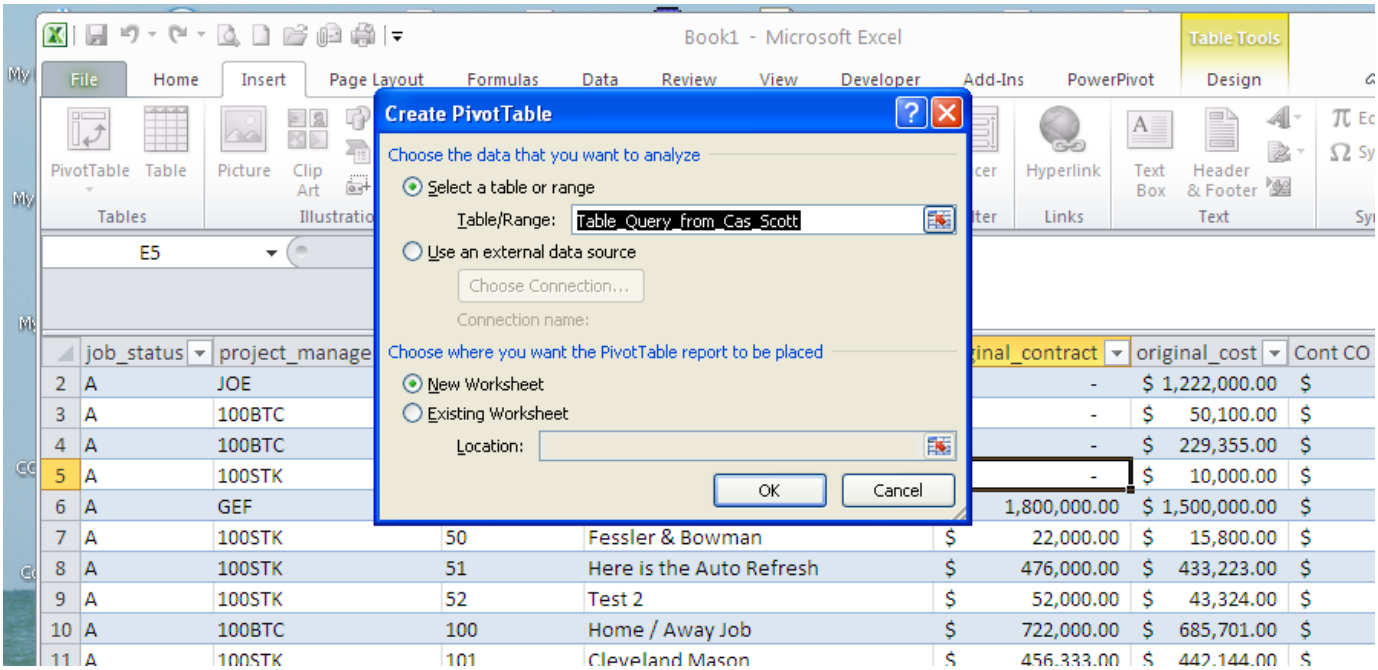



| | J | K | L | M | N | O | P | Q | R |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Revised Cos | BILLING | COST | EST PROFIT | PER CO | EARNED REV | OVER BILL | UNDER BIL | |
| 2 | $ 1,226,000.00 | $ 1,012,650.00 | $ 965,678.00 | $ (1,219,000.00) | 78.77 | $ 5,513.66 | $ 1,007,136.34 | $ - | |
| 3 | $ 50,100.00 | $ 2,700.00 | $ 5,344.98 | $ (50,100.00) | 10.67 | $ - | $ 2,700.00 | $ - | |
| 4 | $ 229,355.00 | $ 1,027.50 | $ 1,432.85 | $ (229,355.00) | 0.62 | $ - | $ 1,027.50 | $ - | |
| 5 | $ 10,000.00 | $ 94,000.00 | $ 3,228.00 | $ (10,000.00) | 32.28 | $ - | $ 94,000.00 | $ - | |

We now have all the components to create the over/under billing report.

We needed to include the % OF COMPLETION caclulation within our Database Tabl, but we will have to rewrite the equation in the Pivot Table, as we do not want the % of COMPLETION amounts to add up, we would like to see an overall percentage of completion amount for all of the jobs on the report.

Wewill insert a PIVOT TABLE based on the data collected within the new table on the JOB tab. The pivot table will be created on a new spreadsheet.

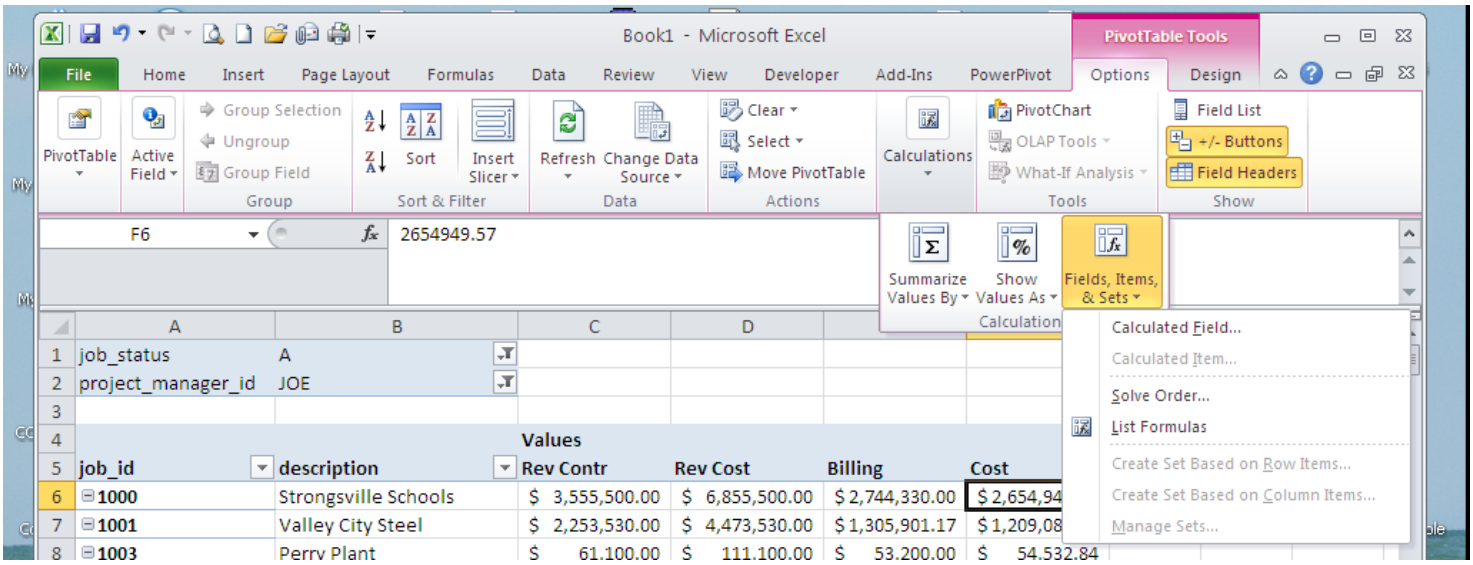



| | job_status | project_manage | | | inal_contract | original_cost | Cont CO |
|---|---|---|---|---|---|---|---|
| 2 | A | JOE | | | - | $ 1,222,000.00 | $ |
| 3 | A | 100BTC | | | - | $ 50,100.00 | $ |
| 4 | A | 100BTC | | | - | $ 229,355.00 | $ |
| 5 | A | 100STK | | | - | $ 10,000.00 | $ |
| 6 | A | GEF | | | 1,800,000.00 | $ 1,500,000.00 | $ |
| 7 | A | 100STK | 50 | Fessler & Bowman | $ 22,000.00 | $ 15,800.00 | $ |
| 8 | A | 100STK | 51 | Here is the Auto Refresh | $ 476,000.00 | $ 433,223.00 | $ |
| 9 | A | 100STK | 52 | Test 2 | $ 52,000.00 | $ 43,324.00 | $ |
| 10 | A | 100BTC | 100 | Home / Away Job | $ 722,000.00 | $ 685,701.00 | $ |
| 11 | A | 100STK | 101 | Cleveland Mason | $ 456,333.00 | $ 442,144.00 | $ |

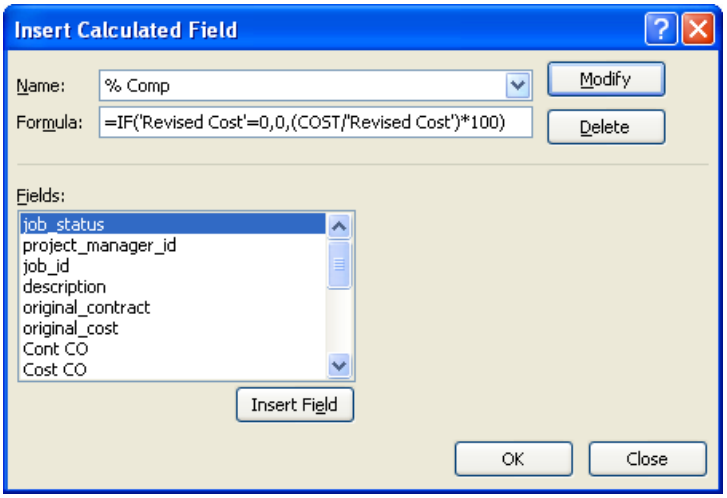
Format the pivot table with your desired criteria. NOTE – DO NOT INCLUDE PERCENTAGE OF COMPLETION as one of the VALUE fields, we will create a calculated field for this figure.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | job_status | A | | | | | | | | |
| 2 | project_manager_id | 100STK | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | Values | | | | | | | |
| 5 | job_id | description | Rev Contr | Rev Cost | Est Profit | Earned Rev | Billing | Cost | Over Bill | Under Bill |
| 6 | 101 | Cleveland Mason | $ 456,333.00 | $ 442,144.00 | $ 14,189.00 | $ 4,331.69 | $ 5,302.00 | $ 4,197.00 | $ 970.31 | $ - |
| 7 | 104 | Belcher Delivery to Job | $ 27,500.00 | $ 12,500.00 | $ 15,000.00 | $ 25,297.80 | $ 13,000.00 | $ 11,499.00 | $ - | $ 12,297.80 |
| 8 | 109 | I/N test Job | $ 100,000.00 | $ 90,000.00 | $ 10,000.00 | $ 7,421.80 | $ - | $ 6,679.62 | $ - | $ 7,421.80 |
| 9 | 115 | Hunt Test | $ 25,000.00 | $ 23,553.00 | $ 1,447.00 | $ 1,175.83 | $ 1,300.00 | $ 1,107.77 | $ 124.17 | $ - |
| 10 | 119 | 2 Engert | $ 62,000.00 | $ 53,266.00 | $ 8,734.00 | $ 9,449.69 | $ - | $ 8,118.50 | $ - | $ 9,449.69 |
| 11 | 161 | Duggan & Duggan | $ - | $ 3,455.00 | $ (3,455.00) | $ - | $ - | $ 1,440.00 | $ - | $ - |
| 12 | 172 | FBG Test | $ - | $ 45,345.00 | $ (45,345.00) | $ - | $ - | $ 29,431.15 | $ - | $ - |
| 13 | 50 | Fessler & Bowman | $ 22,000.00 | $ 15,800.00 | $ 6,200.00 | $ 9,586.96 | $ 150,100.00 | $ 6,885.18 | $ 140,513.04 | $ - |
| 14 | 51 | Here is the Auto Refresh | $ 476,000.00 | $ 433,223.00 | $ 42,777.00 | $ - | $ - | $ - | $ - | $ - |
| 15 | 52 | Test 2 | $ 52,000.00 | $ 43,324.00 | $ 8,676.00 | $ - | $ - | $ - | $ - | $ - |
| 16 | 8 | Before Tax Fringe | $ - | $ 10,000.00 | $ (10,000.00) | $ - | $ 94,000.00 | $ 3,228.00 | $ 94,000.00 | $ - |
| 17 | Grand Total | | $ 1,220,833.00 | $ 1,172,610.00 | $ 48,223.00 | $ 57,263.76 | $ 263,702.00 | $ 72,586.22 | $ 235,607.53 | $ 29,169.29 |
| 18 | | | | | | | | | | |

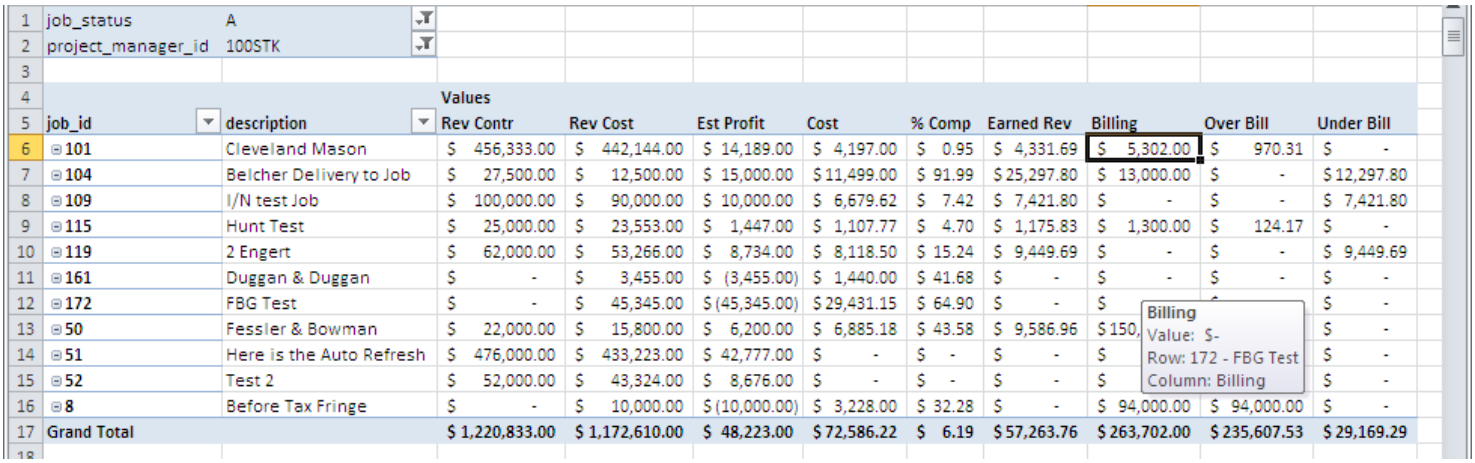
On the Pivot Table Tools OPTIONS tab, under Calculation, Fields,Items & Sets, select Calculated Field




Percent Complete: =IF('Revised Cost'=0,0,(COST/'Revised Cost')*100) the IF statement is written to removepotential #DIV/O errors when there are no estimated costs.




Click OK to save the formula to save and place the new calculation in the desired column within the pivot table report.



You may quickly change the criteria for the Over/Under Billing report via the column headings:

Here is an example of the O/U Billing Report for a different Project Manager.

| | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | job_status | A | | | | | | | | | |
| 2 | project_manager_id | 100BTC | | | | | | | | | |
| 3 | | | | | | | | | | | |
| 4 | | | Values | | | | | | | | |
| 5 | job_id | description | Rev Contr | Rev Cost | Est Profit | Cost | % Comp | Earned Rev | Billing | Over Bill | Under Bill |
| 6 | 100 | Home / Away Job | $ 723,200.00 | $ 686,641.00 | $ 36,559.00 | $ 384,170.77 | $ 55.95 | $ 404,625.27 | $ 502,411.40 | $ 97,786.13 | $ - |
| 7 | 103 | PERDIEM JOB | $ 45,000.00 | $ 34,452.00 | $ 10,548.00 | $ 2,542.28 | $ 7.38 | $ 3,320.64 | $ 500.00 | $ - | $ 2,820.64 |
| 8 | 107 | Document Control Job | $ 15,647.00 | $ 12,345.00 | $ 3,302.00 | $ 2,577.90 | $ 20.88 | $ 3,267.43 | $ - | $ - | $ 3,267.43 |
| 9 | 108 | Lien Job | $ 870,000.00 | $ 720,000.00 | $ 150,000.00 | $ 110.00 | $ 0.02 | $ 132.92 | $ 165,442.00 | $ 165,309.08 | $ - |
| 10 | 111 | OCIP JOB - 100% OCIP | $ 92,664.00 | $ 88,752.00 | $ 3,912.00 | $ 12,163.52 | $ 13.71 | $ 12,699.66 | $ - | $ - | $ 12,699.66 |
| 11 | 113 | CA OCIP JOB | $ 20,000.00 | $ 17,000.00 | $ 3,000.00 | $ - | $ - | $ - | $ - | $ - | $ - |
| 12 | 162 | New Monitoring Job | $ - | $ 3,322.00 | $ (3,322.00) | $ - | $ - | $ - | $ 1,200.00 | $ 1,200.00 | $ - |
| 13 | 6 | Basil Import | $ - | $ 50,100.00 | $ (50,100.00) | $ 5,344.98 | $ 10.67 | $ - | $ 2,700.00 | $ 2,700.00 | $ - |
| 14 | 7 | Basil2 | $ - | $ 229,355.00 | $ (229,355.00) | $ 1,432.85 | $ 0.62 | $ - | $ 1,027.50 | $ 1,027.50 | $ - |
| 15 | D001016 | Advanced Communications | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| 16 | Grand Total | | $ 1,766,511.00 | $ 1,841,967.00 | $ (75,456.00) | $ 408,342.30 | $ 22.17 | $ 424,045.92 | $ 673,280.90 | $ 268,022.71 | $ 18,787.73 |
| 17 | | | | | | | | | | | |

NOTE: We pulled in data from the JOBS table that included JOB_STATUS and PROJECT_MANAGER_ID. You may wish to sort this by Project Class, Geographic Area, even the Payroll Local Tax field. Remember to plan the report first, and add these fields when creating the first JOB LIST tab in this lesson.

You may also sort and filter this report using USER DEFINED fields. With this option, the sorting and filtering possibilies are endless.