

Principles of Construction Management
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Lecture - 04
Illustrative examples for evaluation of bids based on different schemes

[FL] and welcome to this module on Principles of Construction Management. And this is lecture number 4 in this module, and we will do illustrative examples for evaluation of bids based on different schemes.

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Consider a project whose estimated cost is Rs.1,00,000. The details of the financial bids submitted by four bidders are given below.

S. No.	Bidder	Financial bid (in thousands, INR)
1	A	95
2	B	87
3	C	64
4	D	76

Evaluation criteria:
Award to the lowest bidder.


The project awarded to Bidder-C

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So, now, to start the discussion let us consider a project whose estimated cost is let us say rupees a 100000 and the details of the financial bids submitted by 4 bidders is as follows. We have bidders A B C and D and they bid 95, 87, 64 and 76 1000 rupees.

Now, if the rules of the game were to be that award to the lowest bidder that is a simplest of rules, that is a so called 1 1 criteria. There is no discussion 64 is the lowest the bidder is C the project is awarded to bidder C.

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Example-1

Consider a project in which four bidders have quoted. The estimated cost of the project is Rs.1,00,000, and details of the scores in technical bids and the value of their financial bids are given below.


S. No.	Bidder	Score of <u>technical bid*</u>	Financial bid (in thousands, INR)
1	A	80	110
2	B	75	98
3	C	45	85
4	D	60	100

*: evaluated out of 100 based on certain technical criteria

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Now the situation need not be all that simple, if we now consider a situation for the same project let us about 100000 rupees, the details of technical bids and their financial bids are available to us. What we are saying is that there is a technical bid and based on some criteria we are not getting into that criteria and this evaluation here in this lecture, but at some point of time perhaps we will, let us say that we have been able to evaluate the 4 bidders at 80, 75, 45 and 60 out of 100, and the financial bid given by these bidders is this.

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Evaluate the bids based on the following criteria:

1. Technical score must be more than 50
2. For technically qualified bidders, cost will be the **ONLY** criteria to select the contractor.

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Now, what could be the options? The options could be that the bid should be evaluated in a manner, that the technical score must be more than 50. So, basically what we are saying is that a person or a bidder should have at least 50 points out of 100 in the technical score, and for only technically qualified bidders cost will be the only criteria to select the contractor.

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S. No.	Bidder	Score of technical bid	Financial bid (in thousands, INR)
1	A	80	110
2	B	75	98
3	C	45 < 50	85
4	D	60	100

- Bidder-C is disqualified based on the Rule-1 of the criteria.
- Bidders A,B and D qualify the technical criteria.
- Arranging A, B and D in the ascending order of cost:
 $B < D < A$
- And hence, B is awarded the job.

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Now, if this was the rule, then bidder C gets disqualified because this number is less than 50. So, this goes out of the consideration altogether, and among those that survive that is A B and D we can arrange them in the order of cost and we find that B is the lowest followed by D and followed by A.

So, in this case the decision is again simple B is awarded the job. So, what we have done here is said that there is a threshold technical score beyond which everybody is equal. So, we are not trying to differentiate between D which scored 60 points and A which scored 80 points on the technical bid.

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Alternative Scenario

Evaluate the bids based on the following criteria:

1. Technical score must be more than 50
2. Job is awarded to the bidder with highest composite score evaluated by considering equal weightages for technical and financial bids.

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Now, if we want to incorporate this, we will have to give a weightage to the technical scores and the financial scores. So, that is what is done here in an alternative scenario, where we say that the technical score must be more than 50 which is the same condition as the last one.

And we have said that the job is awarded to the bidder with the highest composite score evaluated by considering equal weightage to technical and financial bids.

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S. No.	Bidder	Score of technical bid (out of 100)	Financial bid (in thousands, INR)
1	A	80	110
2	B	75	98
3	C	45	85
4	D	60	100

How to convert the quoted prices (financial bids) into 'marks'?

One possible alternative could be the following:


- Award 100 marks to the lowest bidder, and,
- Allocate marks to others proportionately

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It is easier set than because what we have is information like this of course, without getting into the details as to how these points or marks were arrived at, we have an even bigger problem of converting this to some kind of marks. How do we convert the quoted prices which is a financial bids into marks so that we can arrive at a composite score.

Now, one alternative or a possibility could be that award 100 marks to the lowest bidder and relative to that allocate marks to the others proportionately. If we do that exercise of course, c gets eliminated in the first round because of this 45 being less than 50.

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S. No.	Bidder	Score of technical bid	Financial bid (in thousands, INR)	Marks awarded to the cost
1	A	80	110	87.76
2	B	75	98	100
3	D	60	100	97.96

Bidder-B gets 100 marks as his/her cost is the lowest


Score for bidder-A = $100 - \left\{ \frac{110 - 98}{98} * 100 \right\} = 87.76$

Score for bidder-D = $100 - \left\{ \frac{100 - 98}{98} * 100 \right\} = 97.96$

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As far as the others are concerned B which is the lowest bid financially is awarded a 100 points, and for A the score is 87.76 arrived at by saying that this was 110, this was the lowest bidder and with this simple linear equation we get 87.76 and similarly we can get 97.96 marks for D.

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S. No.	Bidder	Score of technical bid	Marks awarded to the cost	Composite score*
1	A	80 ✓	87.76 ✓	83.88 ✓
2	B	75	100	87.50 ✓
3	D	60	97.96	78.98 ✓


*: evaluated as 50% technical and 50% financial

With the highest composite score, Bidder-B wins the bid

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So, if we do that, then what we have is this is our technical score and this is our financial score. We can calculate the composite score by giving an equal weightage to these and we get these numbers remember that in this case we have used a 50-50 criteria that is the technical bid and the financial bid are equally weighted. Now if this happens then the highest composite score is 87.5 and with this score bidder B wins the bid now of course, there is no sacrosanct reason why the weightage of the technical bid and the financial bid should be 50-50.

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Another alternative scenario

Let the composite score be evaluated giving a weightage of 80% to technical marks and 20% to the financial bid.

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There can always be a situation where the weightage is 80 percent to technical and 20 percent to the financial.

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S. No.	Bidder	Score of technical bid	Marks awarded to the cost	Composite score*
1	A	80	87.76	81.55
2	B	75	100	80
3	D	60	97.96	67.59

*: evaluated as 80% technical and 20% financial

For these weights, with the highest composite score, Bidder-A wins the bid.

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Now, if that kind of a scenario is operated then the composite score which is calculated becomes something like this and here bidder A becomes the winner of the project. So, it is obvious that if we increase the weightage of the technical bid, bidder D which scored the lowest as far as the technical bid is concerned gets more and more disadvantaged, and bidder A which is the technically most sound becomes in advantageous position.

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Example The details of marks of the technical and the financial bids of four bidders, who bid for a project having an estimated cost of Rs.1,00,000 are given below:

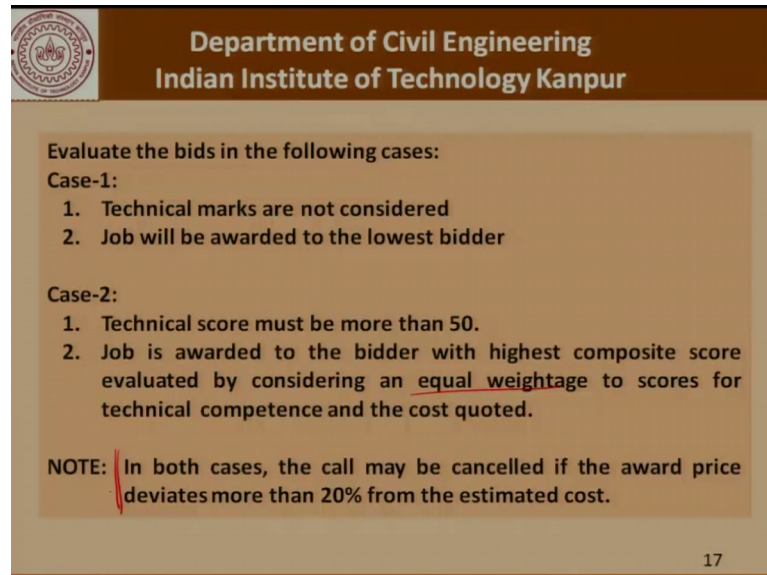
S. No.	Bidder	Score of technical bid*	Financial bid (in thousands, INR)
1	A	80	135
2	B	75	125
3	C	45	101
4	D	60	130

*: evaluated out of 100 based on certain technical criteria

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In this example if we consider the technical and financial bids of 4 bidders as given here in this table and these marks being evaluated out of 100 based on some criteria the rules of the game being the following.

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The slide is titled "Department of Civil Engineering Indian Institute of Technology Kanpur". It contains the following text:

Evaluate the bids in the following cases:

Case-1:

1. Technical marks are not considered
2. Job will be awarded to the lowest bidder

Case-2:

1. Technical score must be more than 50.
2. Job is awarded to the bidder with highest composite score evaluated by considering an equal weightage to scores for technical competence and the cost quoted.

NOTE: In both cases, the call may be cancelled if the award price deviates more than 20% from the estimated cost.

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There is case one technical marks are not considered, job will be awarded to the lowest bidder that was the simplest case that we discussed right in the beginning of this discussion and case 2 is technical score must be more than 50 which is exactly what we talked about, and the job is awarded to the bidder with the highest composite score within equal weightage. So, nothing has changed from with the kind of discussion that we have done, except that this condition gets added. In both cases the call may be canceled if the award price deviates more than 20 percent from the estimated cost.

Now, somebody will say why this kind of a clause is required. One of the simplest of reasons that I can give you for this is that you will recall that there is an approval which has been taken based on some estimates, for spending a certain amount of money on a certain project. If the award price deviates too much from that especially on the higher side, then fresh approvals must be sought before the bid is awarded and the work is actually taken up there have to be reasons for that, there has to be a justification which has to be provided to the kind of authorities, which approved the project in the first place and so on. As far as the deviation on the lower side is concerned we will talk about it at the end of this class today.

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Evaluating the bids in Case-1

S. No.	Bidder	Score of technical bid	Financial bid (in thousands, INR)
1	A	80	135
2	B	75	125
3	C	45	101
4	D	60	130

Since technical marks are not considered, bidder-C gets the job (being the lowest bidder).
Check : Award value (Rs.1,01,000) is within the allowable deviation (20%) from the estimated cost (Rs.1,00,000)

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Now, if this rule was to be operated then in case 1, the technical marks are not being considered bidder C gets the job being the lowest bid because this part does not really matter this guy here is 101, it is the lowest and we should check that the award price which is a 101000 is within the allowable deviation of 20 percent from the estimated cost of a 100000 now coming to case 2 the situation becomes more complicated.

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Evaluating the bids in Case-2

S. No.	Bidder	Score of technical bid	Financial bid (in thousands, INR)
1	A	80	135
2	B	75	125
3	C	45	101
4	D	60	130

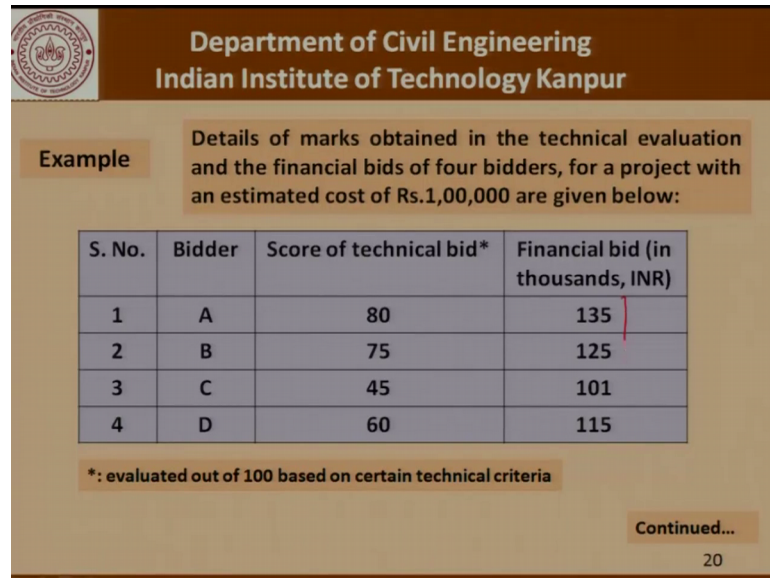
- Bidder-C is disqualified as the technical score is less than 50
- No matter who gets the job, the award value will be more than the allowed deviation (>20%) from the estimated cost.
- Therefore, cancel the call.

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Because bidder c gets disqualified not having secured 50 percent marks in the technical bid, and it is clear that this guy is quoted a 135, this is 125 and this is 130. So, no matter

who gets the job the award value will be more than the allowed deviation of 20 percent from the estimated cost and therefore, the result is cancel the call and go for a fresh process.

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Example Details of marks obtained in the technical evaluation and the financial bids of four bidders, for a project with an estimated cost of Rs.1,00,000 are given below:

S. No.	Bidder	Score of technical bid*	Financial bid (in thousands, INR)
1	A	80	135
2	B	75	125
3	C	45	101
4	D	60	115

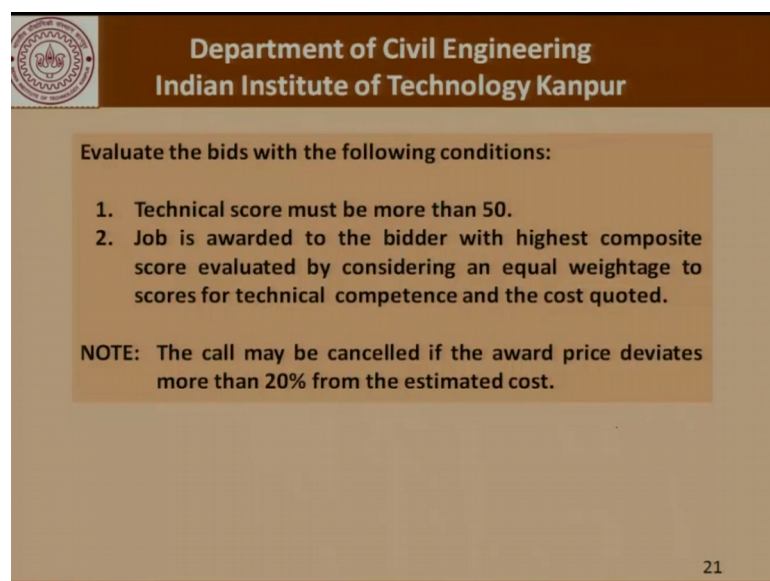
*: evaluated out of 100 based on certain technical criteria

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Now, if the situation on the financial bids was to change marginally, and these were the numbers that we were dealing with instead of the numbers in the previous table so, these here just lists the conditions that we are applying.

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Evaluate the bids with the following conditions:

1. Technical score must be more than 50.
2. Job is awarded to the bidder with highest composite score evaluated by considering an equal weightage to scores for technical competence and the cost quoted.

NOTE: The call may be cancelled if the award price deviates more than 20% from the estimated cost.

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Evaluating the bids

S. No.	Bidder	Score of technical bid	Financial bid (in thousands, INR)	Marks awarded to the cost	Composite score*
1	A	80	135	82.60	81.30
2	B	75	125	91.30	83.15
3	D	60	115	100	80

*: evaluated as 50% technical and 50% financial

• Bidder-B has the highest score, but the bid value is Rs.1,25,000, which exceeded the allowable limit (Rs. 1,20,000).

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And now we come to evaluation of these bids bidder C gets disqualified having a lower technical score now here is a situation where D is a potential bidder with a 115 points which is within the 120 allowed by the 20 percent deviation, but the question is will D get the job given the fact that there is a 50 50 weightage being applied to the technical bid and the financial bid.

Now, if we carry out the calculations and determine the composite scores this is what we get. Bidder B has the highest score, but the bid value is 125, the technical score is 83 and his value is 125, and this is in excess of the maximum deviation allowed which allows you to go up to 120 and therefore, the call has to be cancelled.

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Consider a project whose estimated cost is Rs.1,00,000. The details of the financial bids submitted by four bidders are given below.

S. No.	Bidder	Financial bid (in thousands, INR)
1	A	95
2	B	87
3	C	64
4	D	76

**Evaluation criteria
Award to the lowest bidder.**

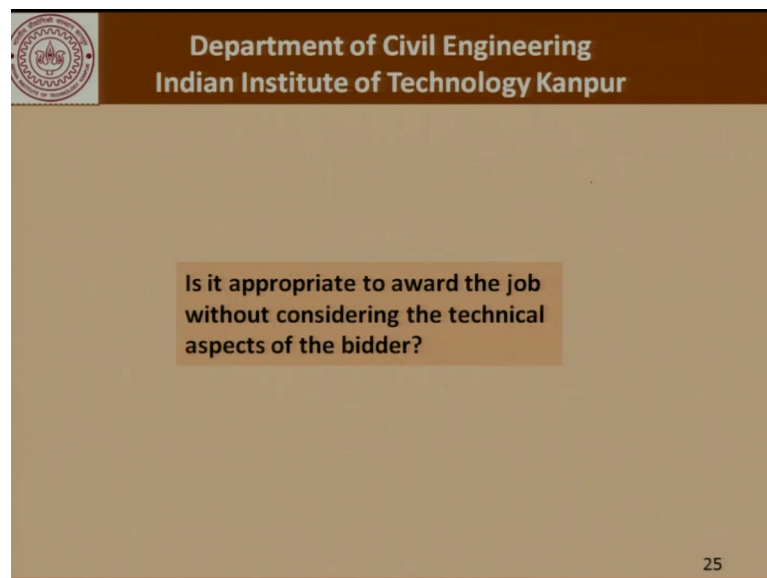
As per the criteria, the project has to be awarded to bidder-C

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So, with this discussion here I think we have covered several examples, where we try to give different weightages to technical and financial bids, try to evaluate the bids based on different criteria and also invoke the principle that the final award value should be within a certain range of the estimated value.

So, having said all that let us look at this table once again, which is the financial bid for 4 bidders for a project which was estimated to be a 100 1000 that is the numbers that we have been working with in an earlier example as well, the question that we must ask ourselves as for the criteria indeed, the project has to be awarded to see because this guy is indeed the lowest bidder, but please also remember that the bid is 64 compared to an estimated cost of a 100 the question we must ask ourselves.

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Is it appropriate to award the job without considering the technical aspects of the bidder at all or whether we should award the job to the lowest bidder regardless of how much lower it is compared to the estimated cost. The issue really is what is the client looking for when we are trying to identify a bidder or identify a contractor to do a particular project.

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In principle, the client looks for a technically sound bidder who will carry out the job at a 'reasonable' cost.

Food for thought

Is the client not concerned about the 'quality' of the work?

The condition of disqualifying a bidder if technical score is too low is an outcome of the above principle

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The issue is we are looking for a technically sound bidder, who will carry out the project at a reasonable cost; one term or parameter we have not invoked at all is quality. And that is something which I had leave to you to think about is the client not concerned about the quality of the work. We are talking of technical merit or technical performance of bidders, how are we ensuring the quality of the job that the bidder will do is it being completely ignored.

In fact, the condition of disqualifying a bidder if the technical score is too low is an outcome of this principle. The inherent thought process here is that for a bidder which is technically not competent or has a low score, it is difficult to believe that the bidder will be able to do a quality job and that is why we fix a threshold, that at least so much should be the score for the bidder to be considered for the opening of the financial bid.

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- A bid which is too much lower than the estimate can be looked upon with suspicion!
- We can have a clause disqualifying a bidder if the bid value is lower than 80% (?) of the estimated cost.

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Similarly, a bid which is too much lower than the estimate can also be looked upon with suspicion, now the question is can we have a clause for disqualifying a bidder if the bid value is lower than 80 percent or some such number of the estimated cost. Please remember that this discussion that we have today is not necessarily something which is followed in award of jobs, but the principle or the issue which I wanted to highlight through this discussion today was to draw your attention, to the importance of carrying out a proper technical evaluation of the bids independent of the financial evaluation, and trying to see whether or how the technical marks or the marks obtained for the technical performance or technical competence, how they can be incorporated in our system of evaluation of bids.

Having said all that we must also remember that no matter what we do if we want to evaluate the bidders for technical performance. The exact procedure as to how the marks will be awarded should be declared upfront it should be part of the conditions of the contract so, that the bidders really know that these are the parameters on which the technical evaluation will be done, and no change should be made after the game I started. So, it is clear from some of the examples that we did that depending on the weightages that we assign, the whole call could be canceled bidder 1 could get the job, bidder 2 could get the job and we cannot just have a situation where this is left to the whims and fancies of the client, the whole thing is just too serious to risk that.

Therefore, in this day and age when we are talking of transparency accountability and so on its very very important that these conditions are announced upfront and followed in letter and spirit as far as the evaluation of bits is concerned.

So, with this we come to an end of our discussion today, we will see you in the next class.

Thank you.