निर्माण प्रबंधन (Construction Management) के सिद्धांत

[Nirman prabandhan (Construction Management) ke Siddhant]

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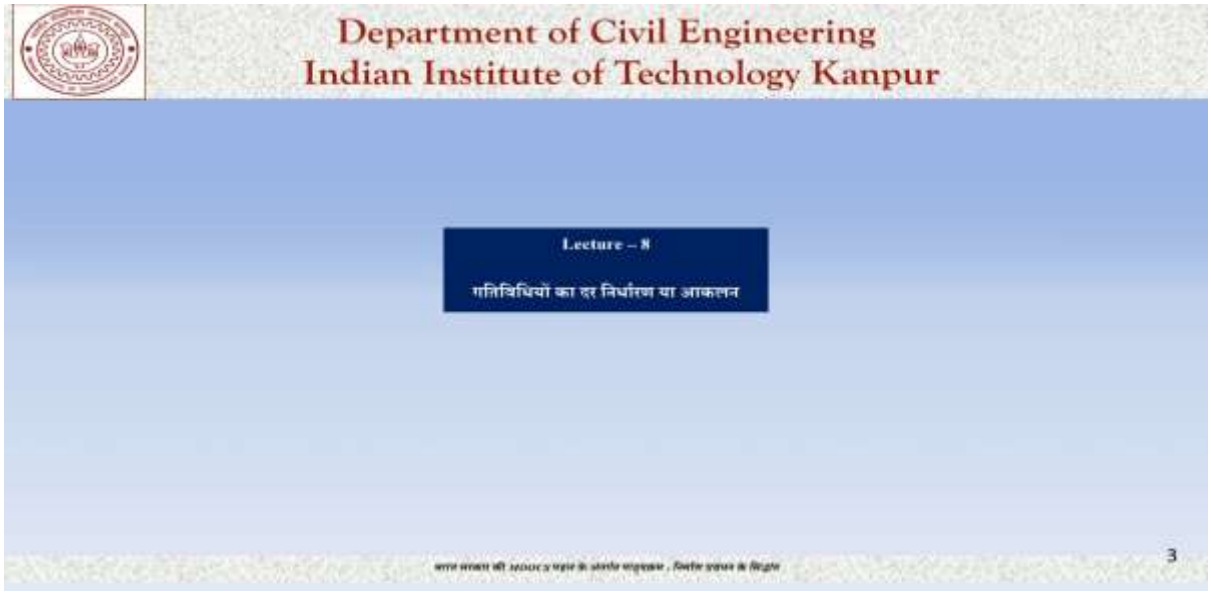
Lecture – 8

Gatividhiyon kee dar nirdhaaran ya aakalan

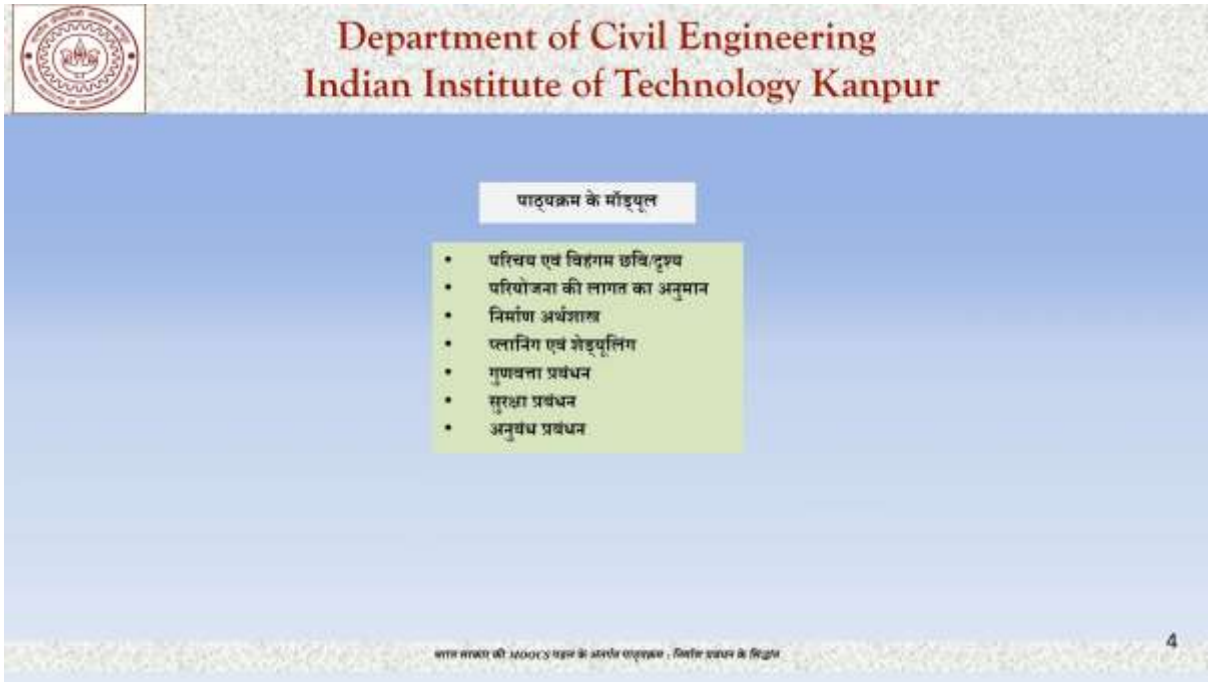
Namaskaar aur aapaka ek baar phir svaagat hai Bhaarat Sarakaar kee MOOCS pahal ke antargat paathyakram Nirmaan Prabandhan ke Siddhaant.

(Reference Time 00:22)



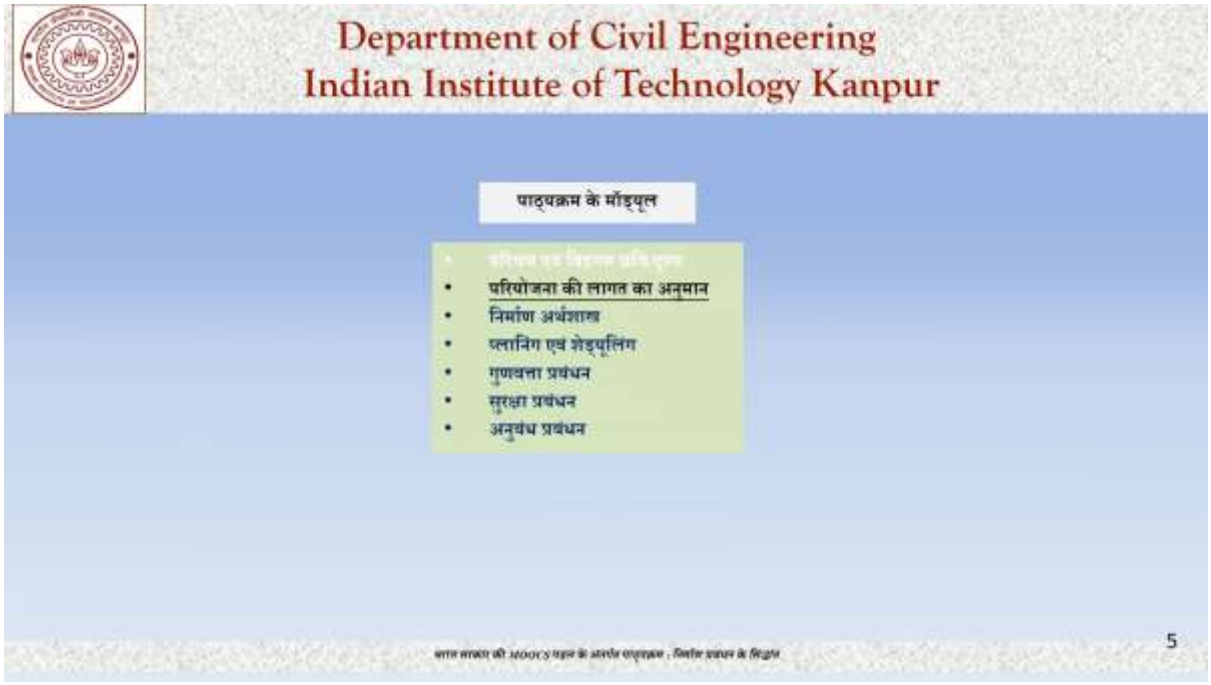
Aaj ham log hain lecture 8 par, jahaan par ki ham baat karenge gatividhiyon kee dar nirdhaaran ya aakalan arthaat ek gatividhi ko karane mein kitanee laagat aaegee.

(Reference Time 00:39)



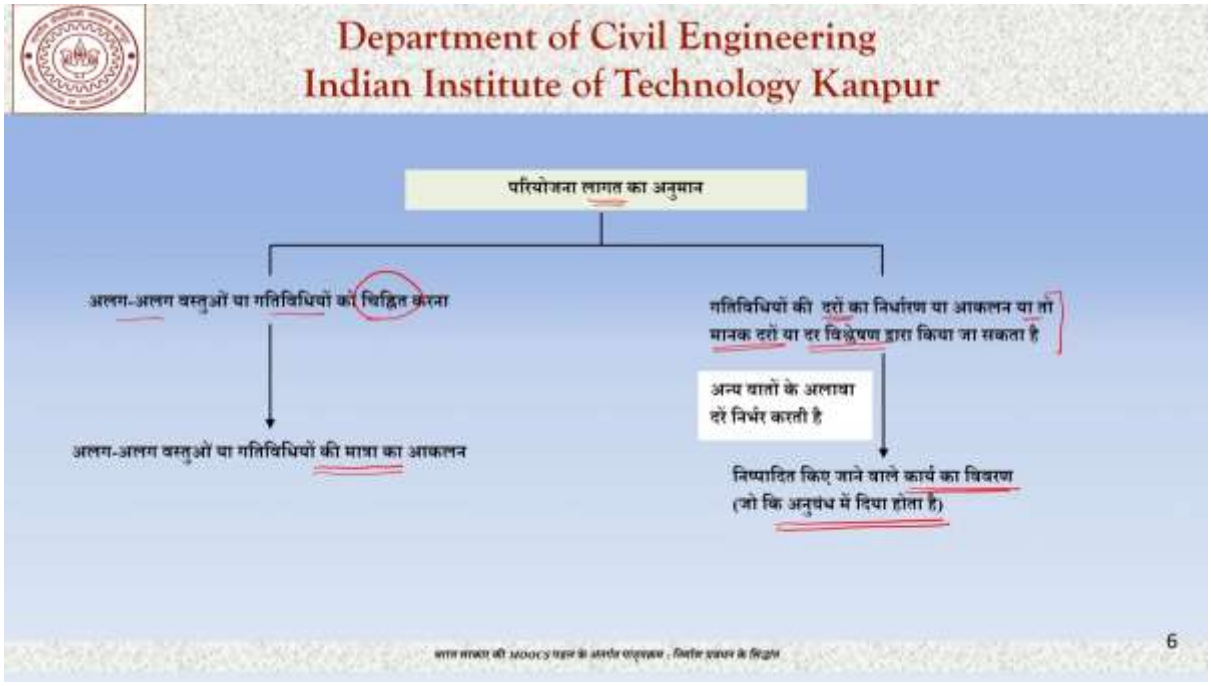
Yah charcha ham kar rahe hain paathyakram ke module pariyojana kee laagat ka anumaan isake antargat yahaan par die gae hain sabhee module jo ki ham is paathyakram mein cover karenge.

(Reference Time 00:47)



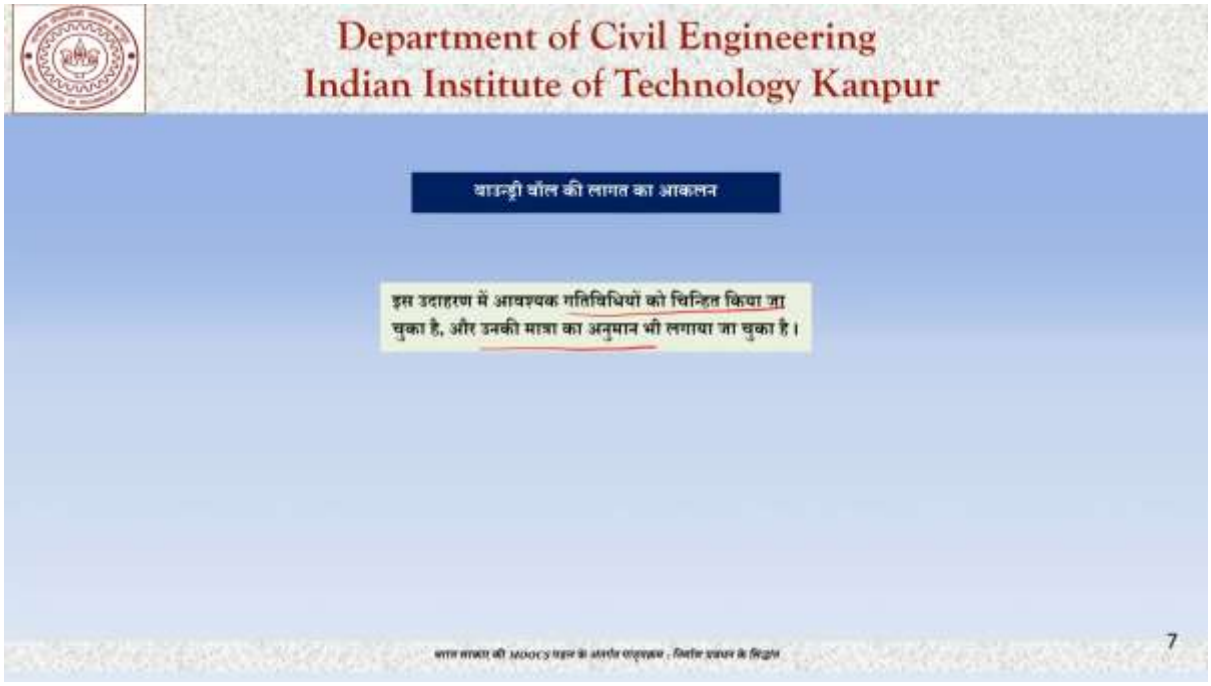
Aur jo aaj kee charcha hai vah mainne jaisa kaha pariyojana kee laagat ka anumaan isake antargat aa rahee hai.

(Reference Time 00:55)



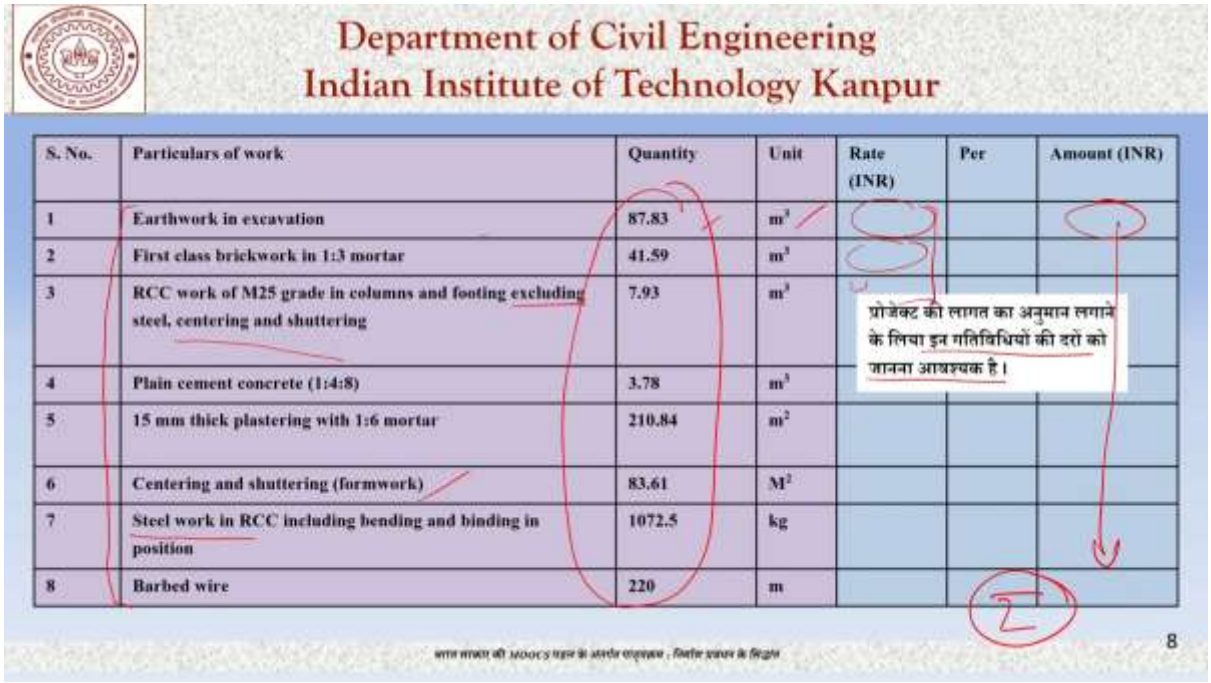
Aage badhate hain yah slide pahale ham aapako dikha chuke hain ki pariyojana laagat ka anumaan lagaane ke lie pahale to hamen alag-alag vastuon ya gatividhiyon ko chinhit kar lena chaahie aur chinhit karane ke baad un gatividhiyon kee maatra hamako pata honee chaahie. Maatra pata karane ke saath-saath laagat pata karane ke lie hamako chaahie dar. Gatividhiyon kee daron ka nirdhaaran ya aakalan kaise kiya jae ya to ham maanakon mein dee gaee daren unaka prayog kar sakate hain aur ya phir kisee bhee gatividhi ko dar vishleshan arthaat rate analysis ke maadhyam se tay kar sakate hain. Dar tay karate samay yah bhee dhyaan mein rakhana hota hai ki kaary ka vivaran ya specifications kya hai. Yah sabhee baaten anubandh mein spasht roop se dee jaatee hai. Jo contract hota hai usamen in baaton par bharapoor dhyaan diya jaata hai aur spasht roop se vivaran aadi likha hota hai. To hamen dar nirdhaarit karane mein sahaayata hotee hai.

(Reference Time 02:05)



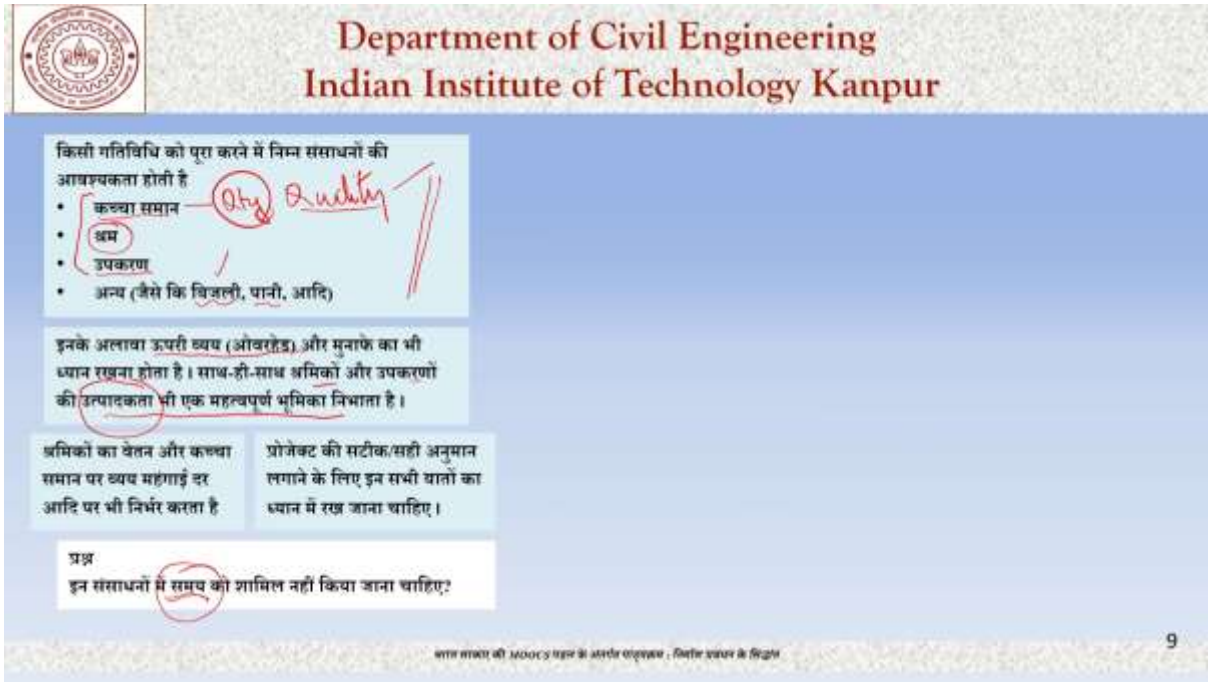
Aage badhate hain aur jo hamaara udaaharan chal raha hai boundary wall usakee laagat ka aakalan karane ka prayaas karate hain. Aapako yaad hoga ki is udaaharan mein aavashyak gatividhiyon ko chinhit kiya ja chuka hai aur unakee maatra ka anumaan bhee lagaaya ja chuka hai. Pichhale do lecture mein shaayad hamane tamaam gatividhiyaan tay kar dee thee ki excavation hoga, PCC hoga, brick work hoga, concrete hoga, sariya ka thoda bahut kaam hoga aur usake baad vivaran par bhee charcha ho chukee hai ki kis prakaar se un gatividhiyon ko kaaryaanvit kiya jaega. Saath hee saath maatra ka aakalan bhee drawings ke aadhaar par kiya ja chuka hai. Baakee bacha hai dar pata karana.

(Reference Time 02:52)



To yah ek taalika hai jahaan par ki jo item hamane tay kie the vah list kie gae hain. Earth work in excavation, first class brick work in 1 ratio 3 mortar, RCC work of m25 grade in columns and footings excluding steel, centering and shuttering kyonki steel ka kaam yahaan liya gaya aur centering and shuttering ka kaam formwork ke roop mein yahaan liya gaya. Plan cement concrete, plaster aur barbed wirein gatividhiyon ko chinhit karake hamane in maatraon ko bhee nikaala hua hai unakee yah units hain. To ab is project kee laagat nikaalane ke lie hamen in gatividhiyon kee daron ko jaanana aavashyak hai. Hamako yah pata hona chaahie ki excavation ka kya rate hoga, brickwork ka kya rate hoga, RCC work ka kya rate hoga agar hamako per unit yah rate pata hoga to ham har gatividhi ka amount nikaal sakate hain aur in sabhee amounts ko ham jod denge to hamako pariyojana kee laagat ka anumaan mil jaega. To aage badhate hain dekhate hain ki daren kaise nikaalee jaatee hain?

(Reference Time 04:11)



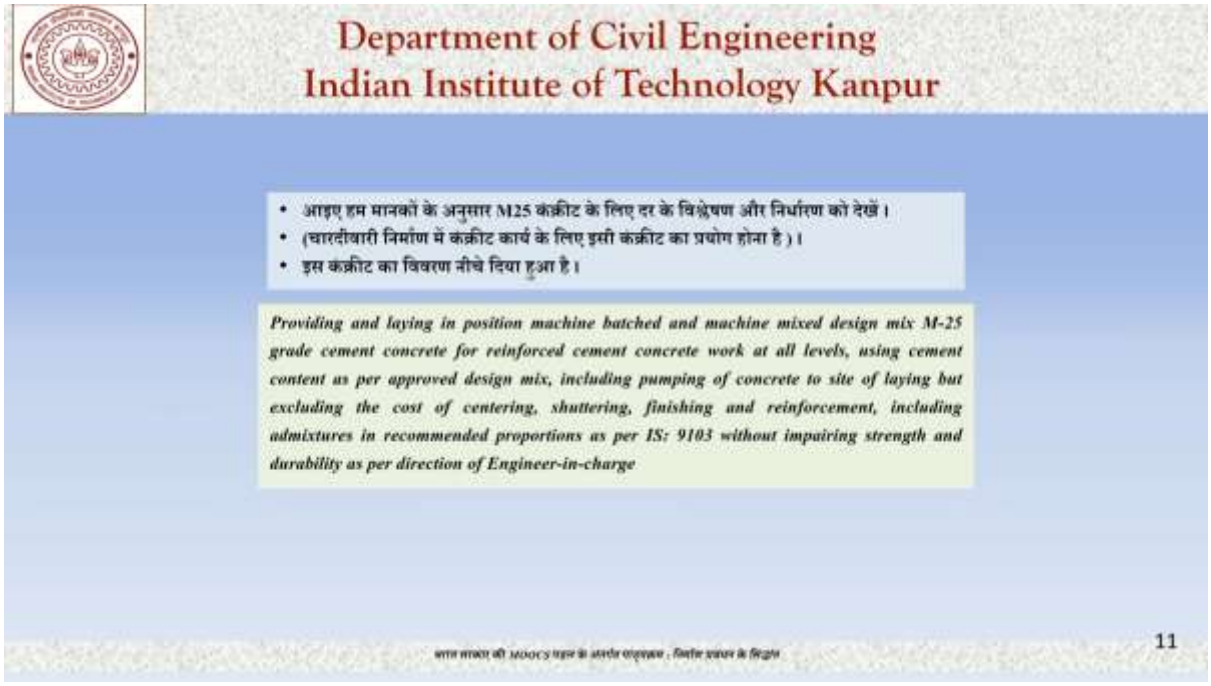
Kisee bhee gatividhi ya activity ko poora karane ke lie nimn sansaadhanon kee aavashyakata hotee hai kachcha saamaan (row material), shram yaanee labour, upakaran yaanee equipment and machine aur any jaise bijalee, paanee ityaadi. Jab ham kachche saamaan kee baat karate hain to isamen do baaten aatee hain, ek to hai maatra arthaat quantity aur doosara usakee quality. Yah hamen pata hona chaahie ki hamen koee bhee saamaan kis maatra mein chaahie aur kis quality ka chaahie. Steel hai to hamen kitanee chaahie, kis quality kee chaahie, kis diameter ka reinforcement chaahie. Concrete hai to m25 hai ki m30 hai kya hai kitanee concrete hai, kitana row material usamen lagega? Jab ham shram kee baat karate hain labour kee baat karate hain to hamen kis prakaar ke shramik chaahie, welder chaahie mason chaahie, carpenter chaahie is baat ko dhyaan mein rakhana hoga. Upakaran bhee usee prakaar se kis prakaar ke upakaran ya machine ek nirmaan gatividhi mein lagenge. Welding machine yadi chaahie to lagegee nahin chaahie to nahin lagegee. Earth moving equipment hamen aavashyakata hogee to lenge nahin to nahin lenge. Is prakaar se ek list karana aavashyak hota hai ki kisee bhee gatividhi mein kis prakaar ke sansaadhan prayog mein aaenge. Isake baad aatee hai baat bijalee aur paanee kee. Kisee bhee gatividhi ko poora karane ke lie nirmaan kaary mein bahut saara paanee lagata hai. Paanee kee laagat ka anumaan lagaana mushkil

hota hai. Usake lie aksar tamaam any vyayon ko jodakar ek presentation chaahe vah 1 percent ho, 2 percent ho usako ham paanee ke prati vyay maan lete hain. Usee prakaar se bijalee agar koee vishesh aavashyakata ya vishesh baat nahin hai vah bhee ham any vyayon ko jodakar ek presentation lekar aage badh sakate hain anumaan lagaane ke lie. Yah baat dhyaan rakhanee chaahie ki antatah ham log maatr anumaan laga rahe hain. Jitana bhee ham tamaam factors ko apanee soch mein sammilit kar lenge utana hee hamaara anumaan sateek aur sahee hoga. Oopar die gae vyayon ke alaava ooparee vyay arthaat overhead aur munaaphe ka bhee dhyaan rakhana hota hai. Saath hee saath shramikon aur upakaranon kee utpaadakata bhee ek mahatvapoorn bhoomika nibhaate hain. Yah dhyaan mein rakhana chaahie ki shramikon ka vetan aur kachcha saamaan par hone vaala vyay, mahangaee dar aur market forces par bhee nirbhar karata hai. Jaisa ki hamane pahale kaha hai ki ek nirmaan pariyojana kaee machines ya kabhee-kabhee kaee saal chalatee hai. To us avadhi mein kis prakaar se vetan badalenge nyoonatam vetan sarakar tay karatee hai har 6 maheene mein usaka ek revision aata hai, sanshodhan aata hai us baat ko dhyaan mein rakhate hue hee hamako labour cost lenee chaahie. Mahangaee dar ka jahaan tak savaal hai vah hamaare kachche saamaan ke vyay par bhee seedha prabhaav daalatee hai. Steel ka daam, cement ka daam market mein oopar neeche hota hai is baat ko bhee dhyaan mein rakhana hota hai. At: project ka sahee aur sateek anumaan lagaane ke lie in sabhee baaton ka agar ham dhyaan mein rakhate hain to hamaara anumaan sahee hoga. Nahin to hamaare anumaan se vaastavik laagat bahut bhinn ho sakatee hai. Ab ek prashn jis par ki hamane abhee charcha nahin kee hai tamaam factors mein jab charcha yahaan par huee, vah hai samay. In sansaadhanon mein samay ko shaamil nahin kiya gaya hai, yah kiya jaana chaahie ya nahin kiya jaana chaahie is par ham kisee samay vichaar avashy karenge lekin vartamaan ke lie hamane isako chhod diya hai. Lekin paroksh roop mein jab ham utpaadakata kee baat karate hain to samay apane aap usamen shaamil ho jaata hai. Udaaharan ke taur par agar hamako 100 cubic meter excavation karana hai, hamaare paas ek machine hai jo ki 10 cubic meter excavation 1 ghante mein karatee hai, to 100 cubic meter excavation karane ke lie hamako 10 ghante lagenge. Agar yahee gatividhi ham haanth se karate hain manually karate hain to hamen pata hona chaahie ki shramik ek ghante mein kitana excavation kar paate hain. To hamen main days, main months inaka calculation karana hoga to samay paroksh roop se hamaare calculation mein sammilit hai lekin direct inheen cheejon ko ham apane aakalan mein shaamil karate hain.

(Reference Time 09:03)

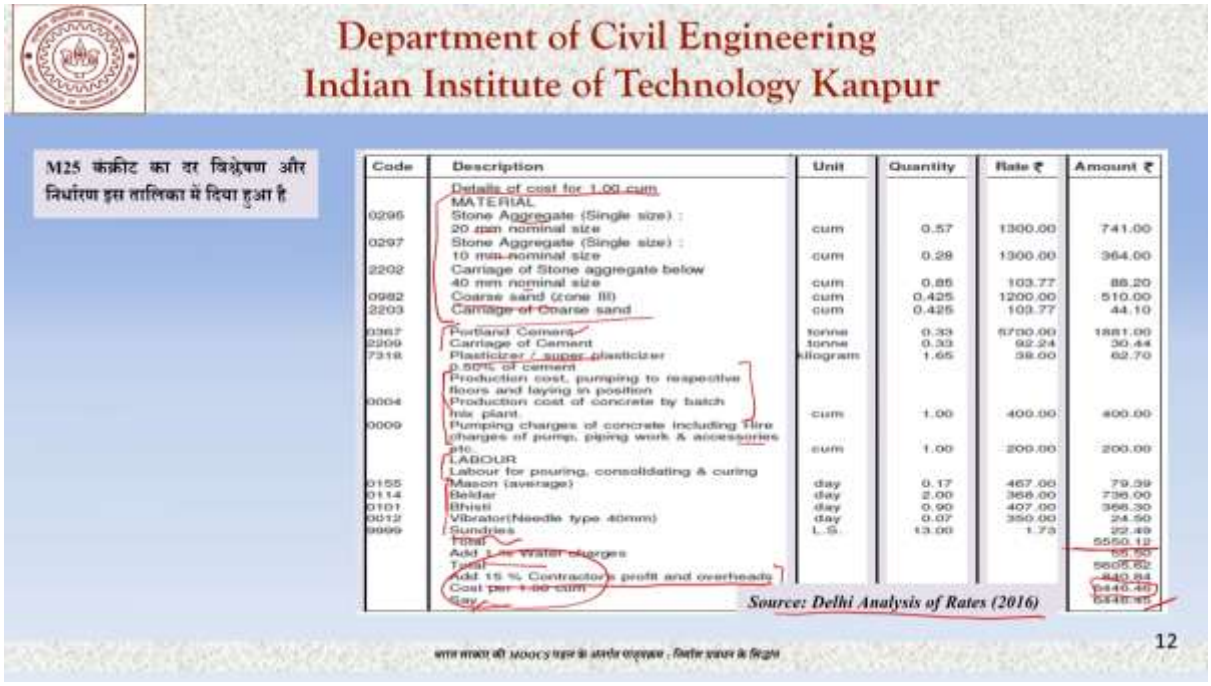
To aage badhate hain to ham gatividhi kee dar ka anumaan lagaane ke lie ek kadam aur aage badhate hain. In baaton ko dhyaan mein rakhate hue desh kee vibhinn sansthaen jaise CPWD aur sarakaar ke any vibhaag samay-samay par nirmaan kaary mein saamaany roop se prayog mein aane vaalee gatividhiyon kee daren prakaashit karate hain. In sabhee baaton ko dhyaan mein rakhakar Schedule of Rates or Analysis of Rates ke roop mein tamaam sansthaen yah daren prakaashit karatee hain yahee ham in prakaashit daron ko ham maanak daren maan sakate hain ham ek standard rate maan sakate hain anumaan lagaane ke lie. Yadi kisee vishesh gatividhi kee dar nahin bhee dee gaee hai to dar vishleshan dvaara isakee dar ko nirdhaarit bhee kiya ja sakata hai. Yadyapi CPWD dvaara prakaashit maanakon mein hajaaron gatividhiyon kee daren dee jaatee hai lekin yah ho sakata hai ki ek vishesh nirmaan pariyojana mein koee aisee baat ho, koee aisee gatividhi ho jis par ki CPWD ke maanakon mein dar upalabdh na ho. Us gatividhi kee dar hamako rate analysis ya dar vishleshan dvaara pata karanee hogee. Isaka bhee ek udaaharan ham thoda sa dekhenge aur baat vahee hogee jo sansaadhan hamen chaahiye unakee vistrt jaanakaaree aur unakee maatra yah agar hamen pata hai to ham dar vishleshan dvaara us gatividhi kee dar ko bhee calculate kar sakate hain.

(Reference Time 10:35)



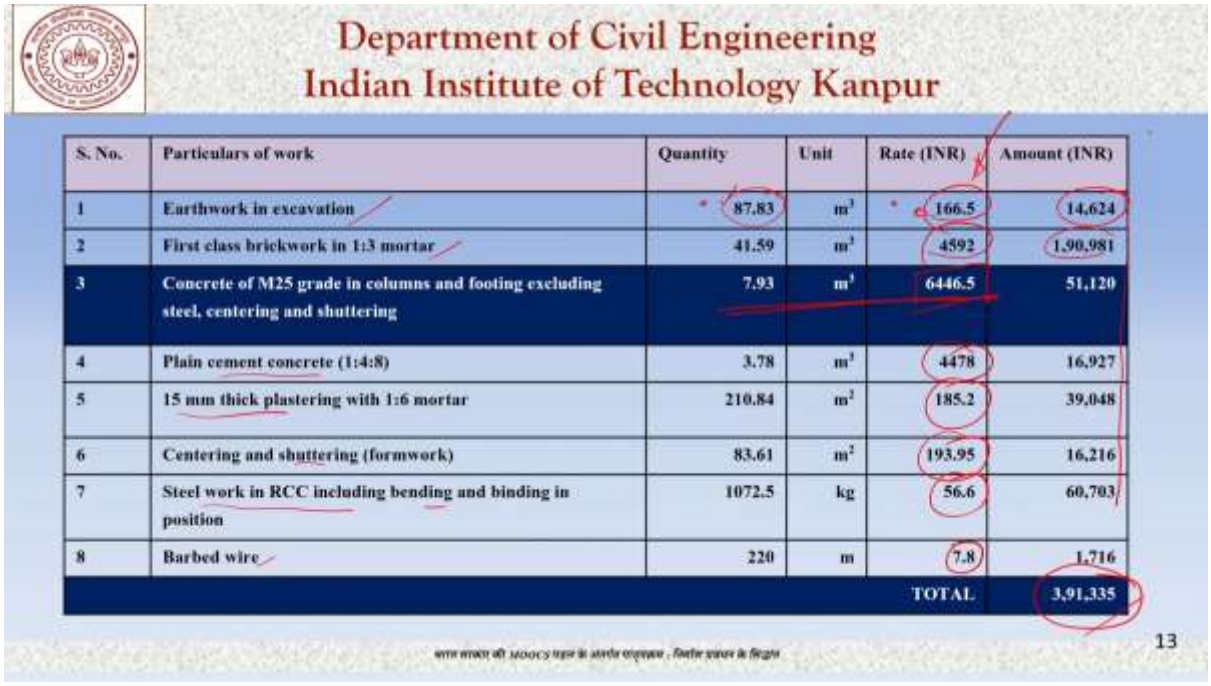
To aaiye ham maanakon ke anusaar m25 concrete ke liye dar ke vishleshan aur nirdhaaran ko dekhen. M25 vahee concrete grade hai jo ki chaaradivaaree ke nirmaan ya hamaaree jo boundary wall ka udaaharan ho raha hai usamen upayog mein laee jaane vaalee concrete hai aur is concrete ka vivaran neeche diya hua hai. Is vivaran par ham log pahale charcha kar chuke hain. Providing and laying in position machine batched and machine mixed design mix M25 grade cement concrete for reinforced cement concrete work at all levels, using cement content as per approved design mix including pumping of concrete to site of laying but excluding the cost of centering, shuttering, finishing and reinforcement but including the cost of admixtures in recommended proportions as per IS 9103 without impairing strength and durability as per directions of Engineer-in-Charge. To jaisa ki pahale hamane jab vivaran pe charcha kee thee to hamane isamen diye gaye sabhee keywords vishleshan kiya tha. In paristhitiyon mein m25 concrete kee dar kya hogee yah pata karana hai?

(Reference Time 11:51)



To hamako m25 concrete kee ek cubic meter kee dar gyaat karanee hai. Udaaharan ke lie hamane liya hai maanak daily analysis of rates, 2016 ka hai thoda puraana hai lekin agar aap naya version lenge to aapako kuchh alag value shaayad milengee lekin udaaharan ke lie kaaphee hai. Yahaan par diya gaya hai details of cost floor 1 cubic meter of concrete. Isamen material ka cost diya hua hai arthaat jo saamagree use hogee stone egreeget ek size ka doosaree size ka teesaree size ka, sand aur carriage usake baad cement kee baat huee, usake baad plasticizer kee baat huee, phir baat huee production cost pumping to respective floor and leying in position production cost of concrete by batch mix plant, pumping charges of concrete including higher charges of pump, piping work and accessories. To yah sab baaten huee equipment ko lekar. Phir shram arthaat labour kee baat huee ki labour for pouring, consolidating and curing isamen tarah-tarah ke jo shramik hissa lenge unake baare mein jikr hua. Phir vividh phir sundries chhote-mote jo kharch honge unako liya gaya aur jab yahaan par ham 5,520 par pahunch gae tab 1 percent water charge ko jod diya gaya aur usake baad 15 percent thekedaar profits and overheads ko jodakar ek cubic meter m25 concrete kee keemat 6,446 rupaye 46 paise, 6,446 rupaye 45 paise kee lee ja sakatee hai. Yah baat is vivaran se spasht hotee hai. Agar hamaaree site par jo concrete prayog mein aanee hai vah isase bhinn hai. To hamako pata hai ki kis jagah par vo baat bhinn ho jaegee aur ham usako incorporate karake usako apanee soch mein jod karake ek naee cost nikaal sakate hain.

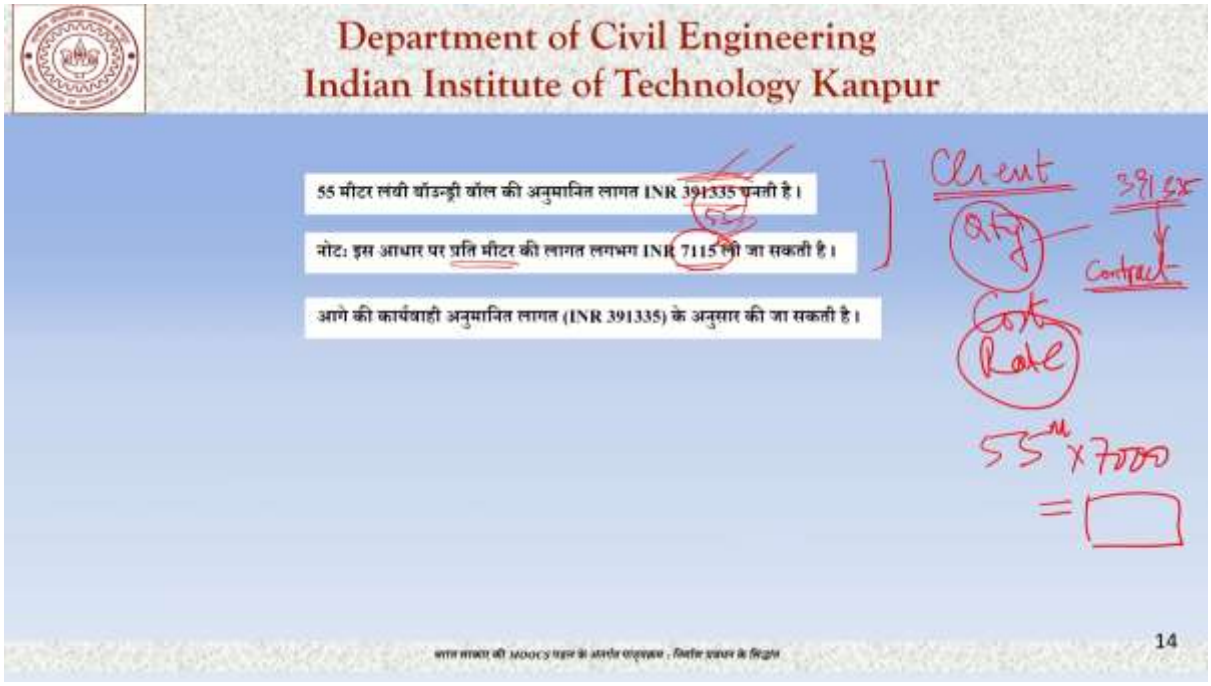
(Reference Time 14:00)



S. No.	Particulars of work	Quantity	Unit	Rate (INR)	Amount (INR)
1	Earthwork in excavation	87.83	m^3	166.5	14,624
2	First class brickwork in 1:3 mortar	41.59	m^3	4592	1,90,981
3	Concrete of M25 grade in columns and footing excluding steel, centering and shuttering	7.93	m^3	6446.5	51,120
4	Plain cement concrete (1:4:8)	3.78	m^3	4478	16,927
5	15 mm thick plastering with 1:6 mortar	210.84	m^2	185.2	39,048
6	Centering and shuttering (formwork)	83.61	m^2	193.95	16,216
7	Steel work in RCC including bending and binding in position	1072.5	kg	56.6	60,703
8	Barbed wire	220	m	7.8	1,716
				TOTAL	3,91,335

Isee prakaar agar ham any gatividhiyon jaise earth work, brick work, plain cement concrete jo ki foundation ke neeche aaegee, plaster, centering and shuttering, steel work in RCC including bending and binding in position barbed wire inakee detail ya inaka vivaran dekhenge to yah rates hamako mil jaenge. Concrete ka rate hamane abhee dekha ki 6,446 rupe 50 paise liya gaya hai, vahaan par 45 paise aa raha tha. To agar ham ye rates maan lete hain to yah maatra dee huee hai, rate hamako pata hai to isaka amount hamaare paas aa jaega. Isako yahaan die gae sankhya aur yahaan dee gaee sankhya ko guna karate chalenge to yah hamaare paas amount nikal aaenge aur yah hamaara aa jaega kul yog. Ab jab kul yog 3,91,335 rupe aaya to isaka kya matalab hai? Isaka matalab hua ki hamako jo boundary wall banaanee hai 55 meter kee jisake ki aadhaar par hamane yah maatraen nikaalee theen aur un gatividhiyon kee dar hamane Daily Analysis of Rates se liya, us baat ko dhyaan mein rakhate hue agar ham inako jodate hain to 3,91,335 rupee mein vah deevaar ban jaanee chaahie. To us deevaar kee ek anumaanit laagat 3,91,335 rupaye maanee ja sakatee hai.

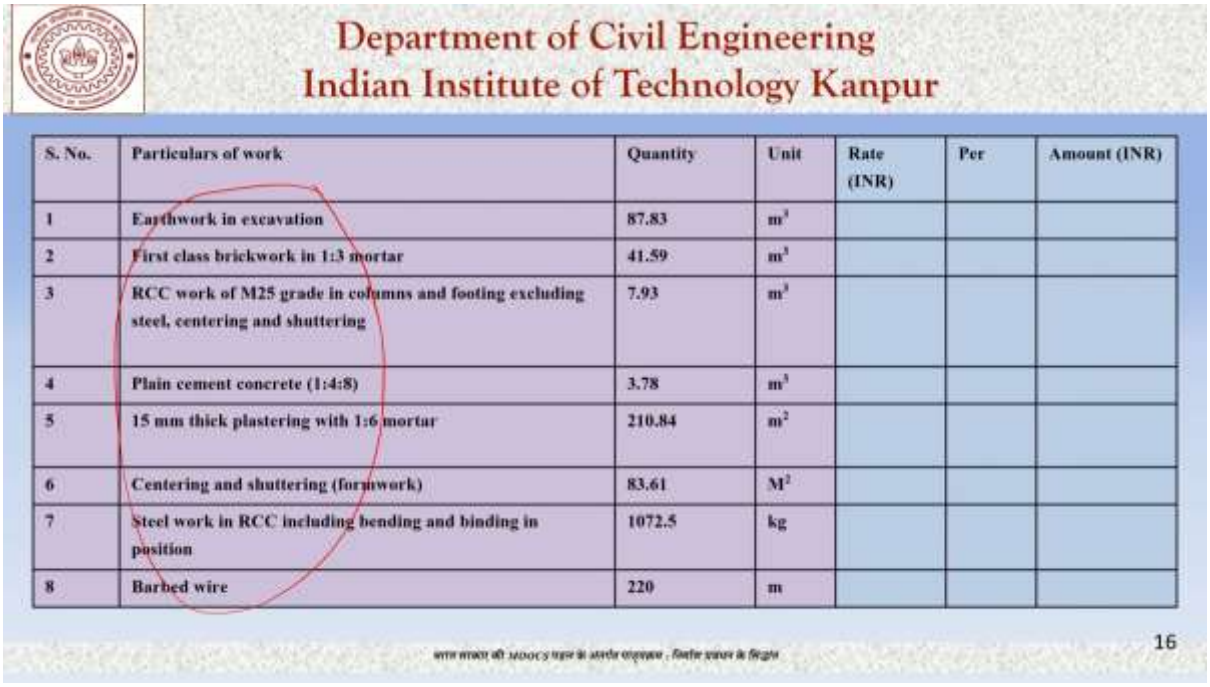
(Reference Time 15:38)



Yahee baat yahaan par likhee huee hai ki 55 meter lambee boundary wall kee anumaanit laagat 3,91,335 rupaye banatee hai. Is aadhaar par agar prati meter kee laagat nikaalana chaahen, to hamako milega 7,115. 3,91,335 divided by 55 agar ham karate hain to lagabhag 7,115 rupaye kee laagat aayegee. To yah prati meter kee jab ham baat karane lagate hain to yah 7,000 rupee chaahe vah 7,115 ho jae 7,110 ho; 7,000 ho; 7,200 ho yah baat anubhav par aa jaatee hai agar hamaare engineer ko anubhav hai boundary wall banaane ka to vah kah sakata hai ki theek hai aapakee yah drawing hai isamen aarasee work hoga, brick work hoga to har meter par aapako 7,000 se lekar 7,200 rupaye ke beech mein kharcha aaega. To agar aapakee 55 meter kee boundary wall hai to aapaka anumaanit kharcha 3,91,000 minus 4,00,000 rupe hoga agar yahee boundary wall 100 meter kee hogee to ham 7,00,000 7,15,000 ka anumaan laga sakate hain. Aage kee kaarravaee arthaat yah jo laagat ka anumaan lagaaya gaya vah to ownar kee or se lagaaya gaya hai. Jo ownar hai usane yah tay kiya ki ham ek boundary wall banaayenge ya hamen banaanee chaahie vah 55 meter kee hogee usake lie hamane drawing tay kee aur usase hamane sabhee gatividhiyon kee maatraen nikaalee aur ek rate lekar ke ek anumaanit laagat ka calculation kiya. Yah bilkul aavashyak nahin hai ki boundary wall kee vaastavik laagat 3,91,335 rupe hee ho, kyon? Kyonki hamaaree quantity arthaat jo hamane maatra lee hai vah alag ho sakatee hai hamane excavation mein thoda sa andaaja liya hua hai, hamane brick work mein andaaja liya hua hai, reinforcement mein kuchh baaten hain jo ki aage hamen dhyaan mein rakhana hoga. To jo quantity hai maatra hai usamen thoda sa fark ho sakata hai hamane jo cost estimate kiya hai arthaat jo rate liya hai vah ek published rate hai maanako ke aadhaar par liya gaya hai. Bilkul aavashyak nahin hai ki jo thekedaar hai jo bid karega hamaare project ke lie vah unheen rates par bid kare, har thekedaar apanee taraph se apane tareeke se rates ka calculation karata hai aur un rates ke aadhaar par apanee bid value deta hai. Isalie 3,91,335 ka jo aankada hai contract value usase bhinn ho sakata hai is baat par ham log baad mein charcha karenge lekin tender nikaalane ke lie, logon ko bataane ke lie ki kitana work involved hai usake lie 3,91,335 kee value theek hai usake alaava hamaare paas koee chaara nahin hai. Yah dhyaan rakhie ki yah laagat ya yah value hamane ek detail estimate banaaya hai hamaare paas drawing thee us hamane maatra nikaalee aur hamane rate lekar ke usako calculate kiya hai. Yah bhee ho sakata tha ki ham

yah sab kuchh na karate maatr anubhav ke aadhaar par kahate ki 55 meter kee boundary wall hai 7,000 rupe hamaare per meter lagenge aur hamaaree estimated cost yah hai isake aadhaar par bhee ham tender nikaal sakate the. Is baat par bhee ham aage charcha karenge lekin yah 3,91,335 nikaalane ke baad ham log isee value ko lekar tender nikaal sakate hain aur contract ke lie logon ko aamantrit kar sakate hain arthaat notice inviting tender ya notice inviting bidders publish kar sakate hain ya usako prakaashit kar sakate hain.

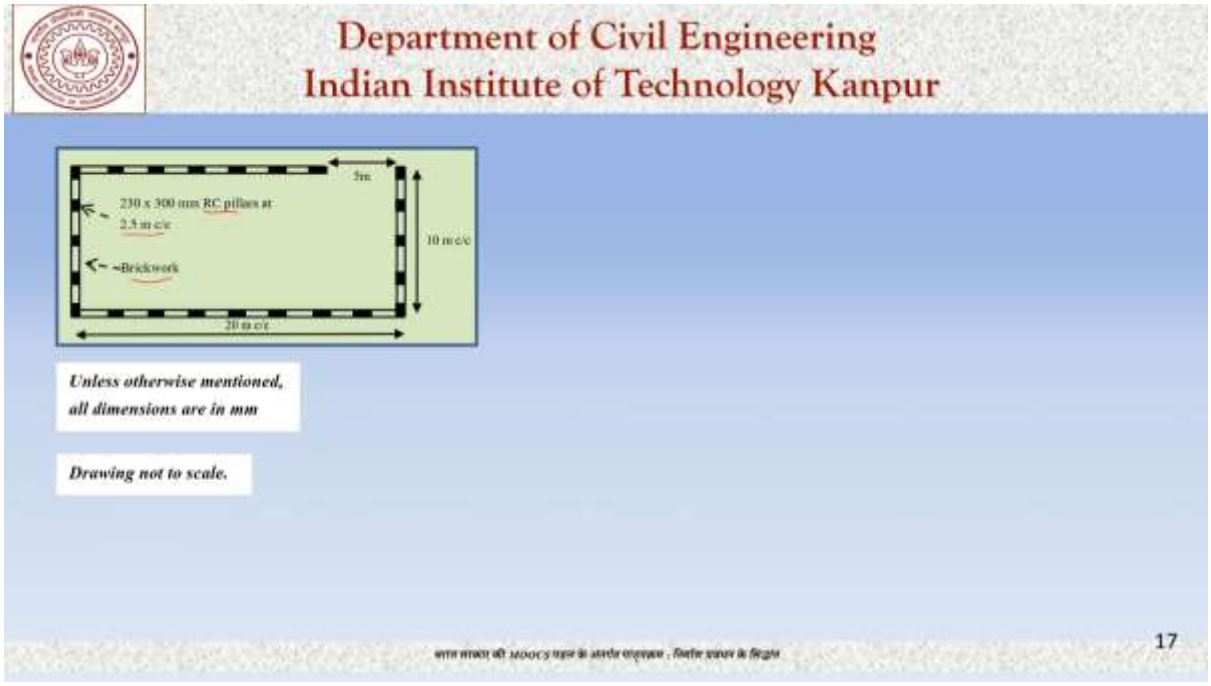
(Reference Time 19:51)



S. No.	Particulars of work	Quantity	Unit	Rate (INR)	Per	Amount (INR)
1	Earthwork in excavation	87.83	m^3			
2	First class brickwork in 1:3 mortar	41.59	m^3			
3	RCC work of M25 grade in columns and footing excluding steel, centering and shuttering	7.93	m^3			
4	Plain cement concrete (1:4:8)	3.78	m^3			
5	15 mm thick plastering with 1:6 mortar	210.84	m^2			
6	Centering and shuttering (formwork)	83.61	M^2			
7	Steel work in RCC including bending and binding in position	1072.5	kg			
8	Barbed wire	220	m			

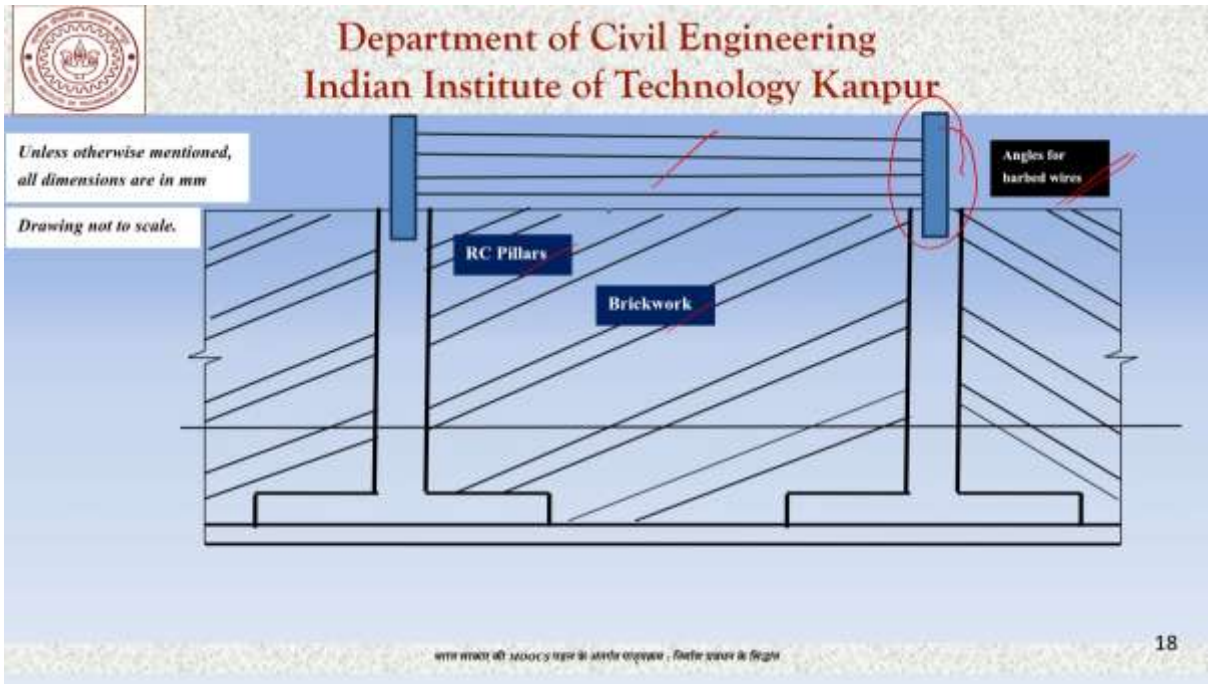
To aaiye aage badhate hain aur yah dekhate hain ki yah jo gatividhiyaan hamane is udaaharan mein lee hain, kya isake alaava bhee aur koee gatividhi hai jo hamen apanee boundary wall banaane ke lie aavashyak hai?

(Reference Time 20:09)



Ek baar phir ham boundary wall ke chitr ko dekhate hain ki hamaara 2.5m center to center RC pillars, brick work, 10m aur 20m kee deevaar hai, yahaan par 5 meter kee opening hai aapako yaad hoga mainne pahale bhee kaha tha ki isamen ham ek cheej nahin le rahe hain usee kee charcha ham karane ja rahe hain.

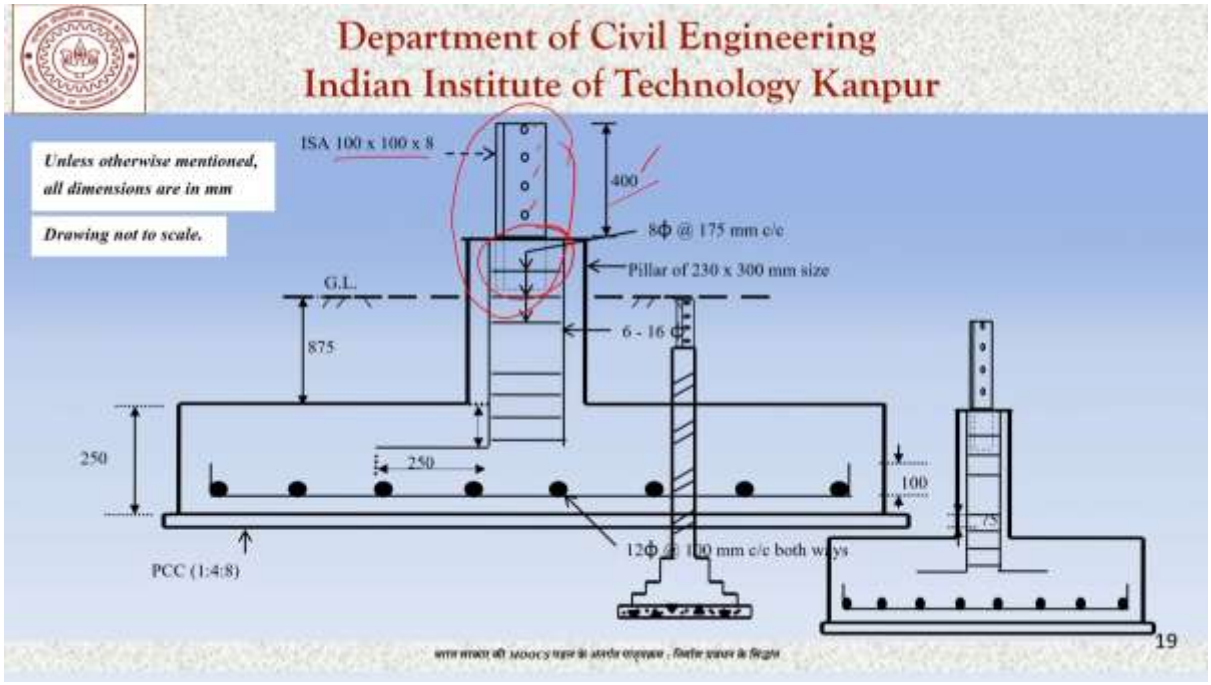
(Reference Time 20:30)



Ham phir se is drawing ko bhee dekhate hain jahaan par ki RC pillars aur brickwork ek doosare way mein dikhaaye gaye hain ye hamaare barbed wire hain aur yah hai angel jin par ki barbed wire lagae jaenge. Ab in angel jin par ki barbed wires lagae jaenge isakee charcha hamane apane gatividhiyon mein nahin kee hai. Angel par jo vyay aayega angel ko khareedane mein, usako kaatane mein, usako yahaan par fixs karane mein usaka vyay

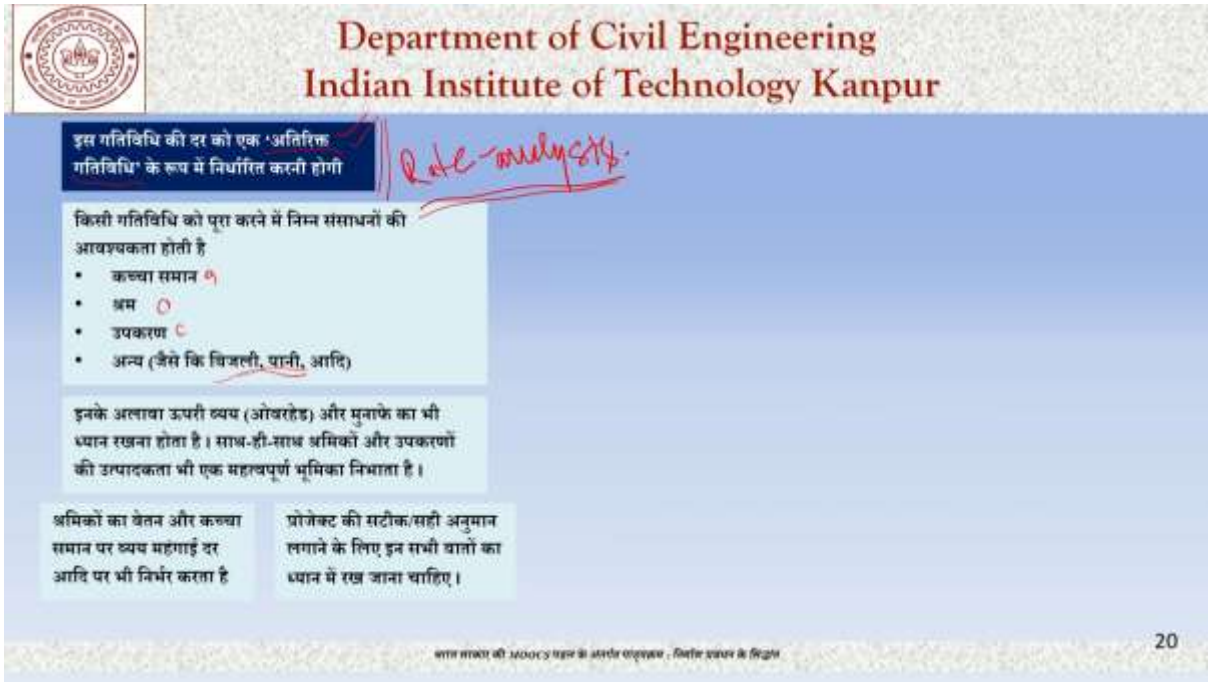
hamane apane anumaanit laagat mein nahin liya hai. Is tareeke kee truti, oversight galatee ho jaatee hai. Yah bhee ho sakata hai ki hamane sabhee gatividhiyaan le leen lekin project ke execution yaanee nishpaadan ke dauraan yah laga ki yahaan par hamako kuchh sanshodhan bhee karana chaahie, to vahaan par bhee aisee gatividhi aa sakatee hai jo ki hamaare original anubandh mein nahin hai.

(Reference Time 21:29)



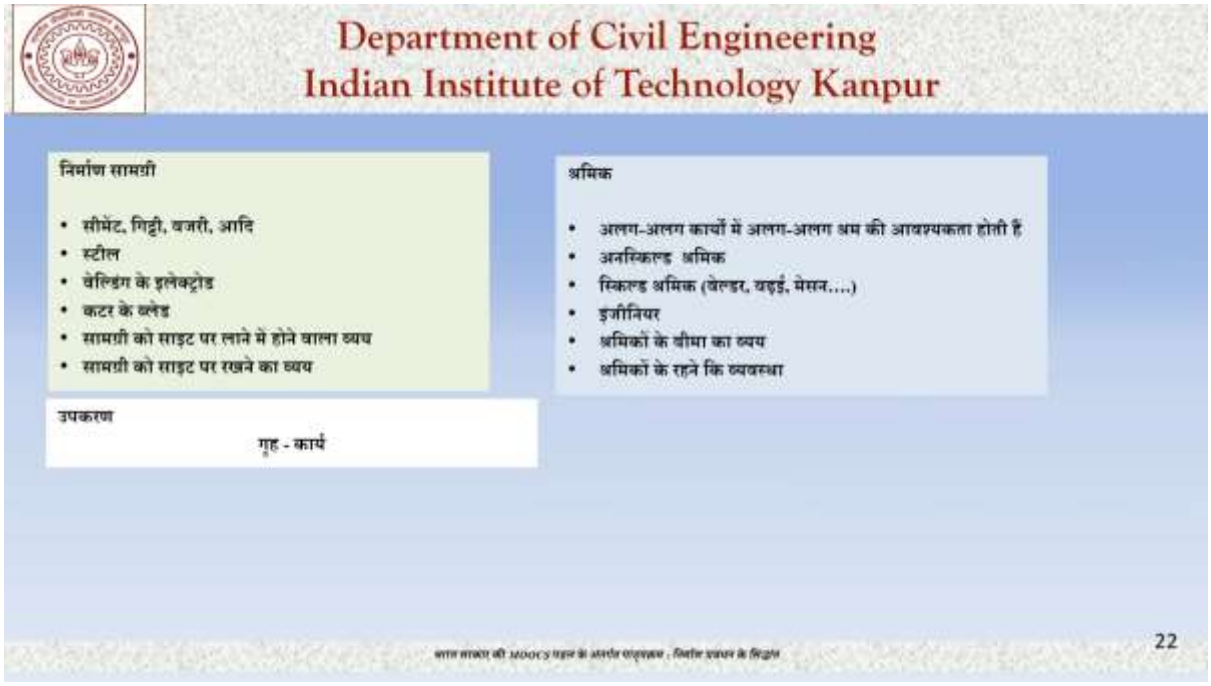
Yahaan par un angel ka ek aur chitr hai ki angel hain 100 into 100 into 8 usaka size diya hua hai, usakee lambaee dee huee hai 400 oopar aaega aur phir kuchh embedment hoga. Yahaan par un angel mein chaar chhed kie jaenge. In sabhee chhotee-chhotee baaton ko dhyaan mein rakhakar hee ham cost estimation sateek karate hain.

(Reference Time 21:54)



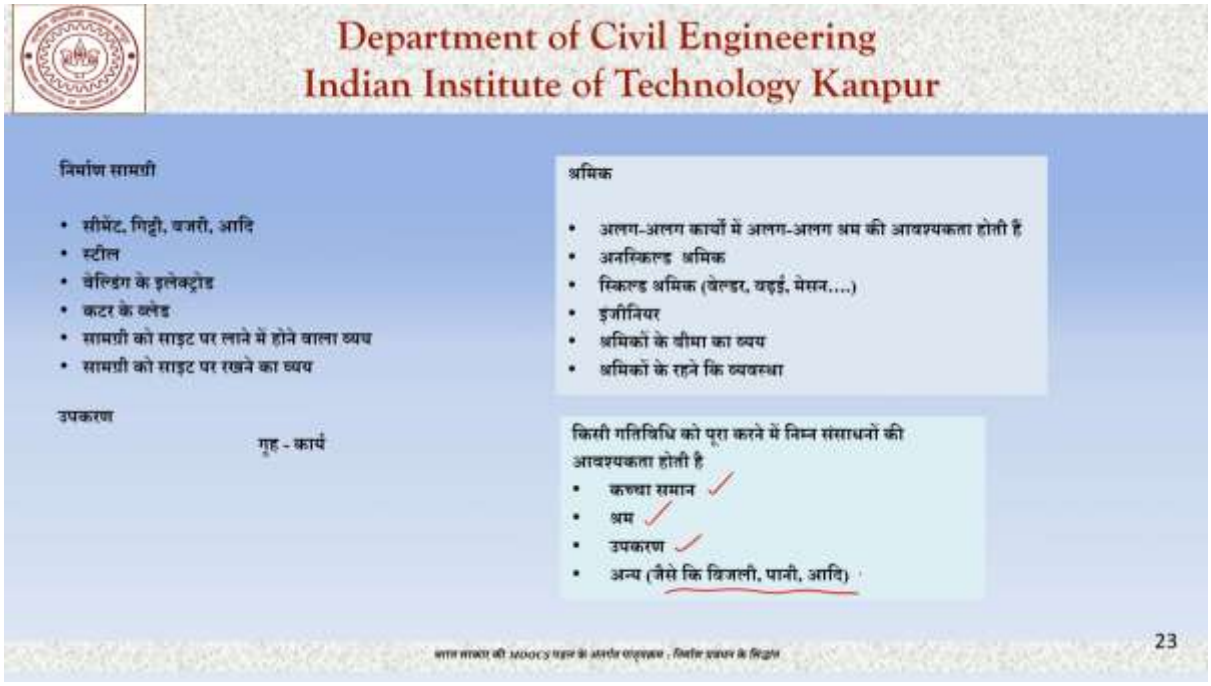
To aage badhate hain ab is gatividhi ko hamen atirikt gatividhi ke roop mein dekhana hoga, to providing angles in this boundary wall, boundary wall mein un angel ko lagaana hamako ek atirikt gatividhi arthaat extra item ke roop mein dekhana hoga aur usakee dar nirdhaarit karanee hogee. Jo hamane abhee tak calculation kiya usamen vah dar sammilit hee nahin thee to usake lie hamen kya karana hoga? Ham vaapas basics par jaenge aur dekhenge ki is atirikt gatividhi mein saamaan kya lagega, labour kya lagega, upakaran kis tareeke ke use honge aur bijalee, paanee aadi ka kharcha kitana aaega. Saath hee saath us gatividhi par overhead ya munaapha kitana hoga, shramikon upakaranon kee utpaadakata kya hai, mahangaee dar kya hai, in sab baaton ko dhyaan mein rakhakar hee hum is atirikt gatividhi kee dar nikaal sakate hain. Is exercise ya ye abhyaas jo ham karate hain usako hee ham kahate hain dar vishleshan arthaat rate analysis. To rate analysis karane ke lie hamako vaapas jis prakaar se concrete kee ek taalika hamane aapako dikhaee thee ki material, labour, machine un sabhee ka inaput kitana hai vah dekhana hoga 1 ton ya ek fixed value ke steel work pa. Yah steel work sariya ke kaam se bhinn hai isalie isako alag se hee dekha jaata hai.

(Reference Time 23:31)



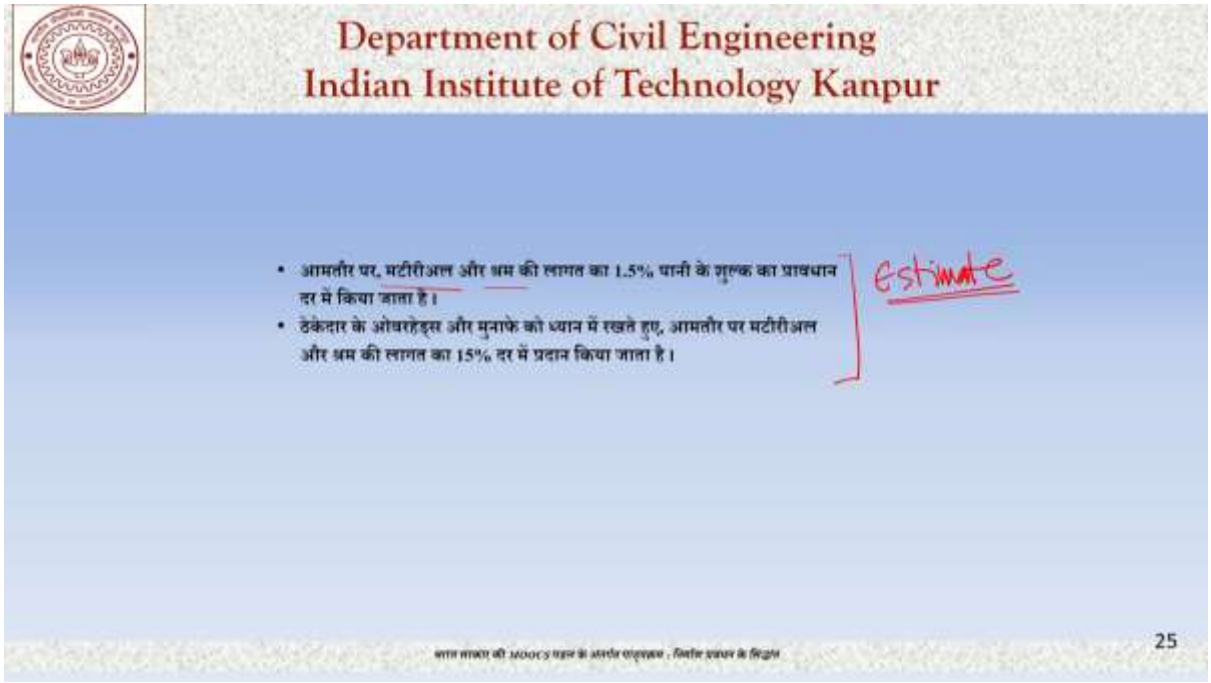
Jab ham nirmaan saamagree kee baat karate hain to kis prakaar ke nirmaan saamagriyon kee baat hotee hai - cement, bajaree, gittee aadi kee baat ho sakatee hai, steel kee baat ho sakatee hai, welding mein prayog hone vaale electrodes vah bhee saamaan hai, cutter agar use hota hai koee cheej kaatane ke lie jaise ki is udaaharan mein hamen ek lamba angel laakar ke chhote pieces mein kaatana padega to ek cutter chaahie. To cutter mein blade lagata hai, saamagree ko site par laane mein hone vaala vyay, saamagree ko site par rakhane mein vyay in sabhee vyayon ko hamako dhyaan mein rakhana hoga. Saamagree ke baad shram arthaat labour kee baat hotee hai. To alag-alag kaaryon mein alag-alag prakaar ke shramikon kee alag-alag prakaar se train shramikon kee aavashyakata hotee hai jaise ki yah bhee ho sakata hai ki kisee project mein hamako unskilled labour kuchh chaahie hon aur saath mein skilled shramik bhee chaahie ho sakate hain jo ki welders honge, badhee honge, masons honge, engineers chaahie honge. Shramikon ke beema mein hone vaala vyay, shramikon ke rahane kee vyavastha kabhee-kabhee site par kee jaatee hai usamen hone vaala vyay yah sab ek tareeke se labour cost mein sammilit karake labour cost nikaalanee hogee. Jahaan tak upakaranon ka savaal hai yah baat main aapake oopar grhakaary mein chhod deta hoon kisee bhee gatividhi ko le leejie chaahe vah aap is baar jo udaaharan chal raha hai jisamen ki ham kah rahe hain ki atirikt gatividhi ke roop mein angel ko lagaana, usamen kis prakaar ke upakaran chaahie honge unakee ek list banaen.

(Reference Time 25:05)



Nirmaan saamagree shram aur upakaran ke baad bijalee, paanee aadi ke lie kya kar sakate hain?

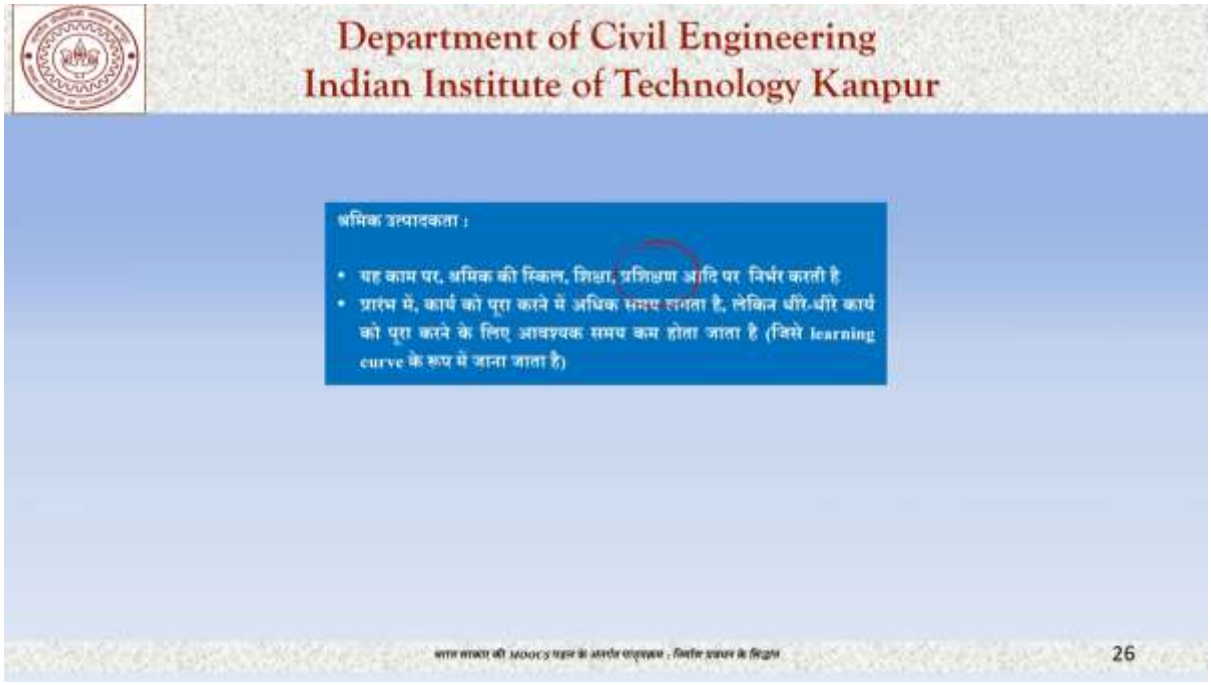
(Reference Time 25:12)



Ham aamataur par material aur shram kee laagat ka 1.5 percent paanee ke shulk ke roop mein praavadhaan le sakate hain. Dhyaan rakhie ki yahaan par keval material aur shram kee laagat lee gaee hai. Upakaranon kee laagat is calculation mein nahin lee jaatee hai yah ek convention hai. Aur jahaan tak thekedaar ke overheads aur munaaphe ka prashn hai vahaan par aamataur par material aur shram kee laagat ka 15 percent lene ka praavadhaan kiya ja sakata hai. Antat: yah dhyaan mein hamesha rakhana chaahie ki yah sab karake ham ek sateek estimate hee bana rahe hain isake aadhaar par vyay nahin kar rahe hain. Vyay hamaara

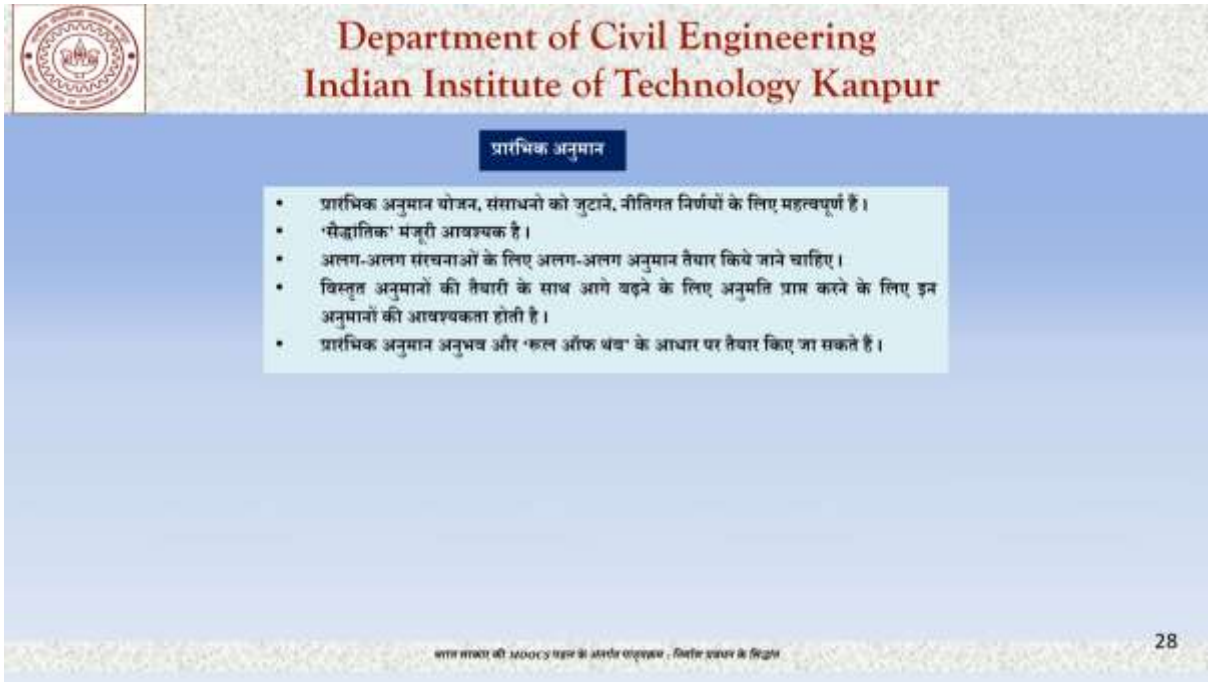
hoga jab ham ek thekedaar chinhit kar lenge aur usake dvaara die gae rates ham maan lenge aur un rates ke aadhaar par nishpaadit maatra ko dhyaan mein rakhakar, usako mejor karake vo payment jo ham karenge to vah hamaara actual payment hoga actual ya vaastavik vyay vahaan par hoga. Isalie yahaan par ham kisee na kisee prakaar se kuchh andaaja bhee laga sakate hain. Aaj ka lecture samaapt karane se pahale kuchh any baaton par bhee main aapaka dhyaan aakarshit karana chaahoonga ek hai shramik utpaadakata. Is baat par pahale bhee charcha huee jabaki hamane kaha ki 100 cubic meter excavation karane ke lie hamako kitane shramik lagenge ya kitanee machine lagegee usakee utpaadakata hamen jaanana chaahie. To shramik utpaadakata arthaat labour productivity ka jahaan tak savaal hai, usamen yah kis baat par nirbhar karatee hai?

(Reference Time 26:51)



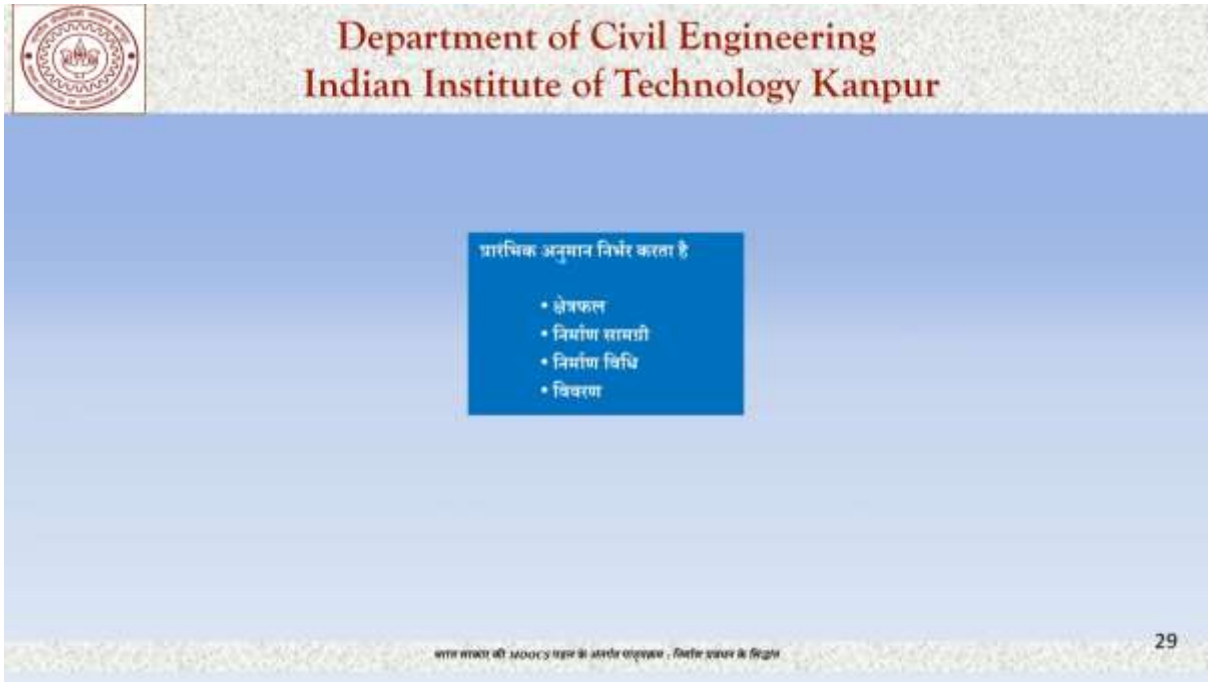
Yah kaam par shramik kee skill par, usakee shiksha par prashikshan par nirbhar karatee hai. Ek kaam jisakee ki kuchh maatra hai 10 square meter painting hai, 50 square meter brick work hai usako karane ke lie ek prashikshit shramik ya labour dvaara lie jaane vaala samay aur ek aprashikshit shramik dvaara lie jaane vaala samay alag-alag hoga. Praarambh mein kaary ko poora karane ke lie adhik samay lagata hai lekin dheere-dheere kaary ko poora karane ke lie aavashyak samay kam hota jaata hai jise learning curve ke roop mein jaana jaata hai. Yah bhee ho sakata hai ki shuroo mein jabaki hamaaree labour team naee hai, ek nae vaataavaran mein kaam kar rahee hai to usako ek cubic meter brick work karane mein ya ek cubic meter excavation karane mein thoda samay lage lekin dheere-dheere jaise vahaan par vo log rama hote jaate hain, unako samajh mein aa jaata hai to ham unakee utpaadakata mein vrddhi dekhate hain vah kaam jaldee samaapt hota hai. To yah hai baat shramik utpaadakata ki jab 55 meter kee boundary wall par 3,91,335 rupe kee baat huee thee tab ek praarambhik anumaan kee baat bhee huee thee. Jabaki hamane kaha ki prati meter us boundary wall par 7115 ya is tareeke kee koee value thee yah hamaara vyay aaega to yah praarambhik anumaan kis tareeke se lagaaya ja sakata hai kisake aadhaar par lagaaya ja sakata hai.

(Reference Time 28:19)



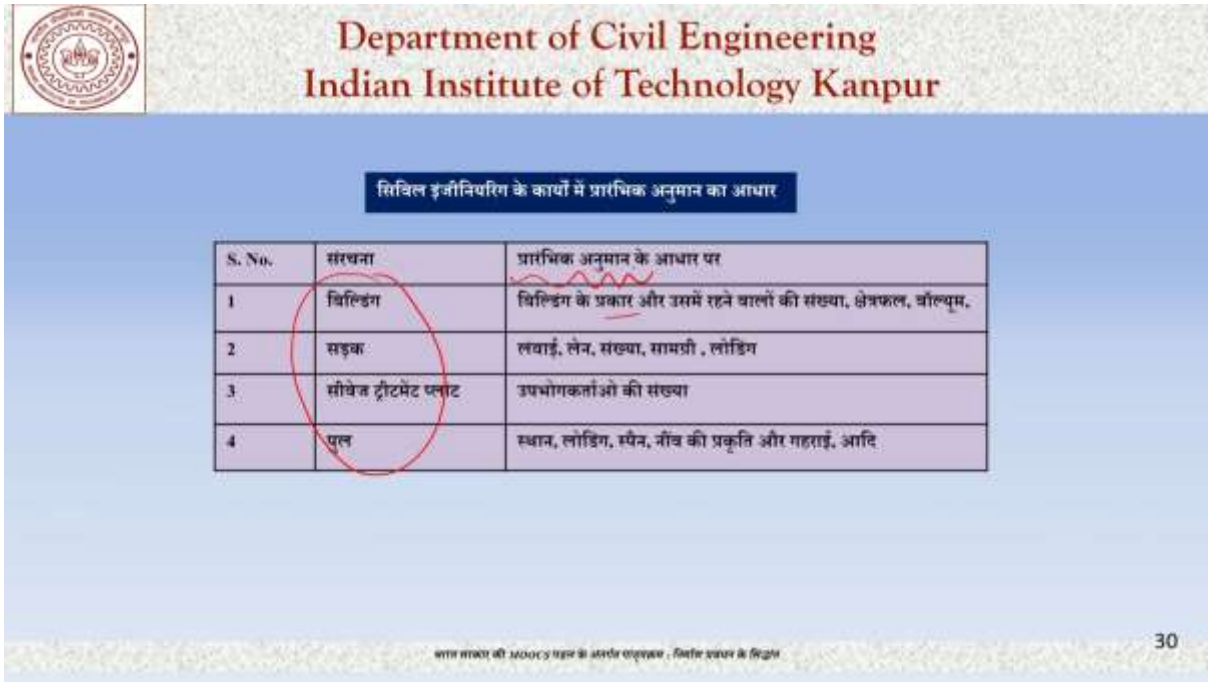
Yah praarambhik anumaan yojan, sansaadhanon ko jutaane, neetigat nirnay ko lene ke lie mahatvapoorn hota hai, saiddhaantik manjooree ke lie aavashyak hota hai arthaat hamako koee na koee ek value chaahie jisase ki ham siddhaant roop mein ek approval le saken ki haan 3,91,000 hai to 4,00,000 ka ham approval le len ya 3,50,000 ka approval len ki haan theek hai us boundary wall par itana kharcha shaayad aaega. Alag-alag sanrachanaon ya structure ke lie alag-alag anumaan taiyaar kie jaane chaahie. Vistrt anumaano kee taiyaaree ke saath aage badhane ke lie anumati praapt karane ke lie in anumaanon kee aavashyakata hotee hai. To jab hamen ek baar siddhaant roop mein anumati mil jaatee hai tab ham aage badhate hain aur vistrt anumaan. Yah jo 3,91,335 aaya hai vah ek tareeke se vistrt anumaan hai. Maine pahale bhee kaha ki ek praarambhik anumaan anubhav ke aadhaar par prati meter 7,000 rupe, 7,500 rupe lekar banaaya ja sakata tha. Praarambhik anumaan anubhav aur rule of thumb ke aadhaar par taiyaar kiya ja sakate hain.

(Reference Time 29:28)



Ab jo praarambhik anumaan hain vah kin baaton par nirbhar karate hain? Kshetraphal (area) ho sakata hai, nirmaan saamagree ho sakatee hai, nirmaan vidhi ho sakatee hai ya vivaran ya specification ho sakate hain. In baaton ko agar ham dhyaan mein rakhen.

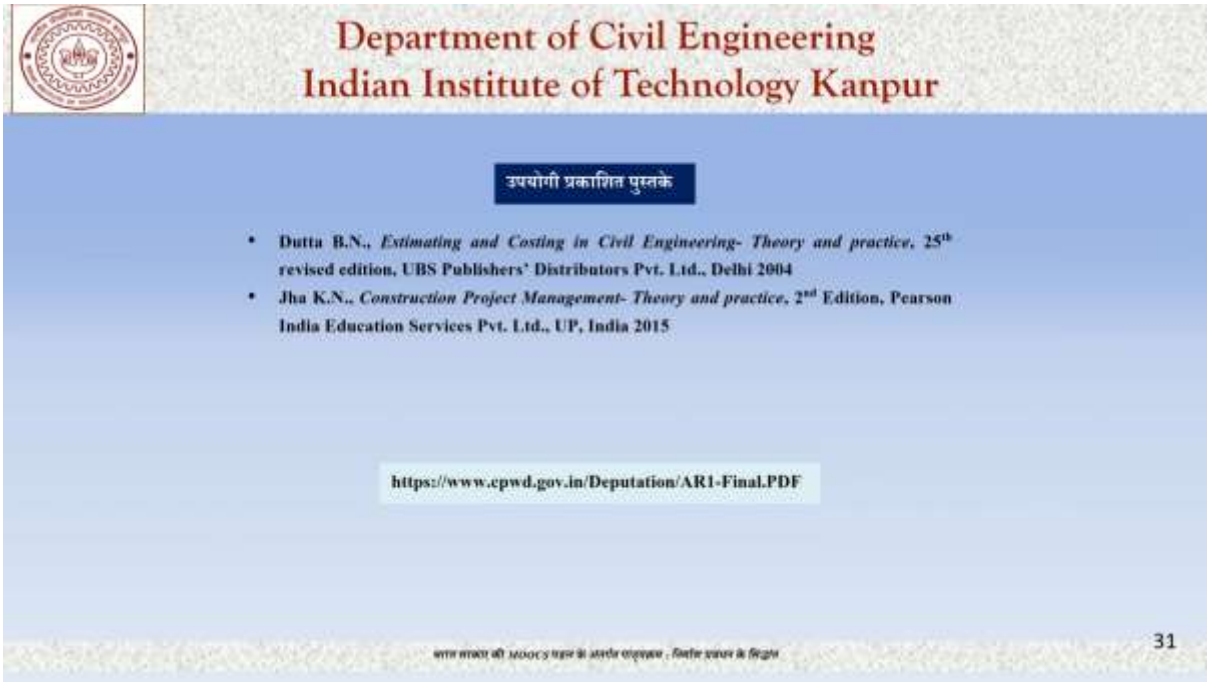
(Reference Time 29:47)



Aur dekhen ki building, sadak, sewage treatment plant or bridge inake praarambhik anumaan ke aadhaar kya honge? To ham dekhenge ki building ke lie building ka prakaar, usamen rahane vaalon kee sankhya kshetraphal ya volume kuchh bhee ho sakata hai. To ek anumaan kee theek hai hajaar square meter kee building banegee, 2000 cubic meter space cover hogee isake aadhaar par ek praarambhik anumaan lagaane ke lie hamaare paas aankada hona chaahie ki prati square meter 2000 rupaye, 20,000 rupaye vah building aspataal kee hai ya

school kee hai isake aadhaar par bhee thoda bahut phark padega. Jahaan tak sadak ka savaal hai sadak kee lambaee ho sakatee hai, usamen kitanee lene hain len kee sankhya ho sakatee hai, saamagree arthaat concrete kee sadak hai ya bitumen kee sadak hai. Loading kya hai? Kya vah ek halkee sadak hai jis par ki ham nahin samajhate hain ki bahut bhaaree gaadiyaan chalengee ya vah ek bhaaree vaahanon ke lie sadak banaee ja rahee hai. Isake aadhaar par usaka praarambhik anumaan bhee alag-alag ho sakata hai. Is tareeke kee kisee facility ka savaal hai vahaan par upayogakartaon kee sankhya aakhir hamaara yah plant 10000 logon ke lie hai ya 5000 logon ke lie hai usase ham ek anumaan laga sakate hain ki theek hai anubhav ke aadhaar par prati vyakti 1000 rupaye ka kharcha aaega, sewage treatment plant lagaane mein. Isee prakaar pul ke lie kahaan par pul ban raha hai usaka sthaan kis tareeke kee loading hai vah sadak pul hai ya rail pul hai kitana spans hai, neev kee prakrti kya hai, kya usamen piling hogee ya nahee hogee piles, kitanee gaharee hongee agar hongee ityaadi. In sab baaton ko dhyaan mein rakhate hue vibhinn sanrachanaon ka praarambhik anumaan lagaaya jaata hai. Yah baat huee hamaaree aaj kee charcha mein anumaanit laagat.

(Reference Time 31:44)



Yahaan par is slide mein dee gaee prakaashit pustaken aapako is lecture mein cover kie gae material aur balki poore paathyakram mein jo material ham cover kar rahe hain usako samajhane mein saarthak siddh hongee. Yahaan par hamane ek website bhee dee hai CPWD kee jahaan se ki aap Analysis of Rates ko lekar adhik jaanakaaree praapt kar sakate hain. Ham agale lecture mein aapase phir milenge. Jay hind. Dhanyavaad.