निर्माण प्रबंधन (Construction Management) के सिद्धांत

[Nirman prabandhan (Construction Management) ke Siddhant]

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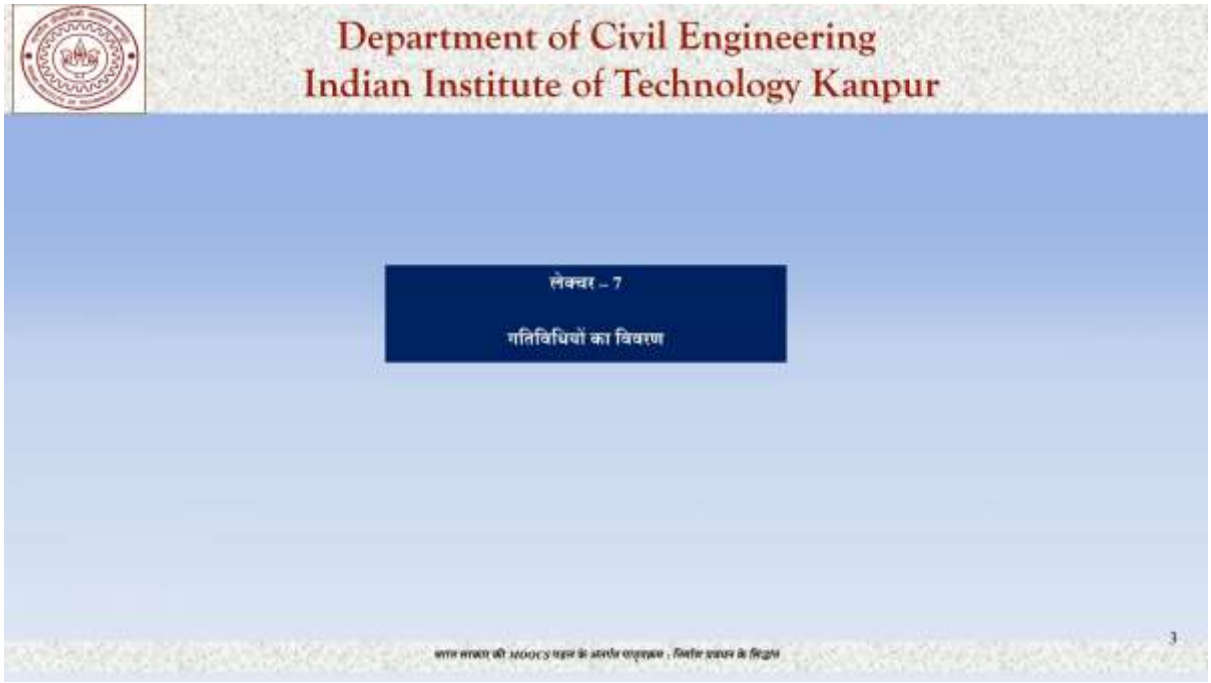
Lecture – 7

Gatividhiyon ka vivaran

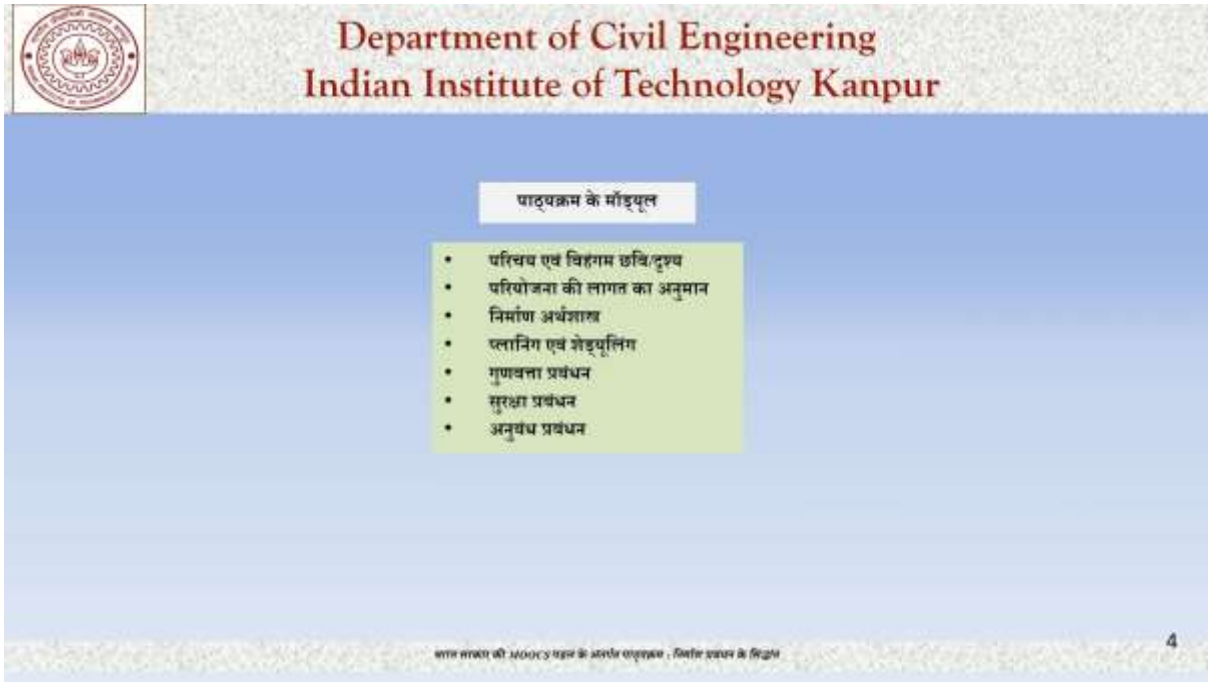
Namaskaar aur ek baar phir se aapaka svaagat hai Bhaarat sarakaar kee MOOCs pahal ke antargat paathyakram Nirmaan Prabandhan ke Siddhaant.

(Reference Time 00:23)



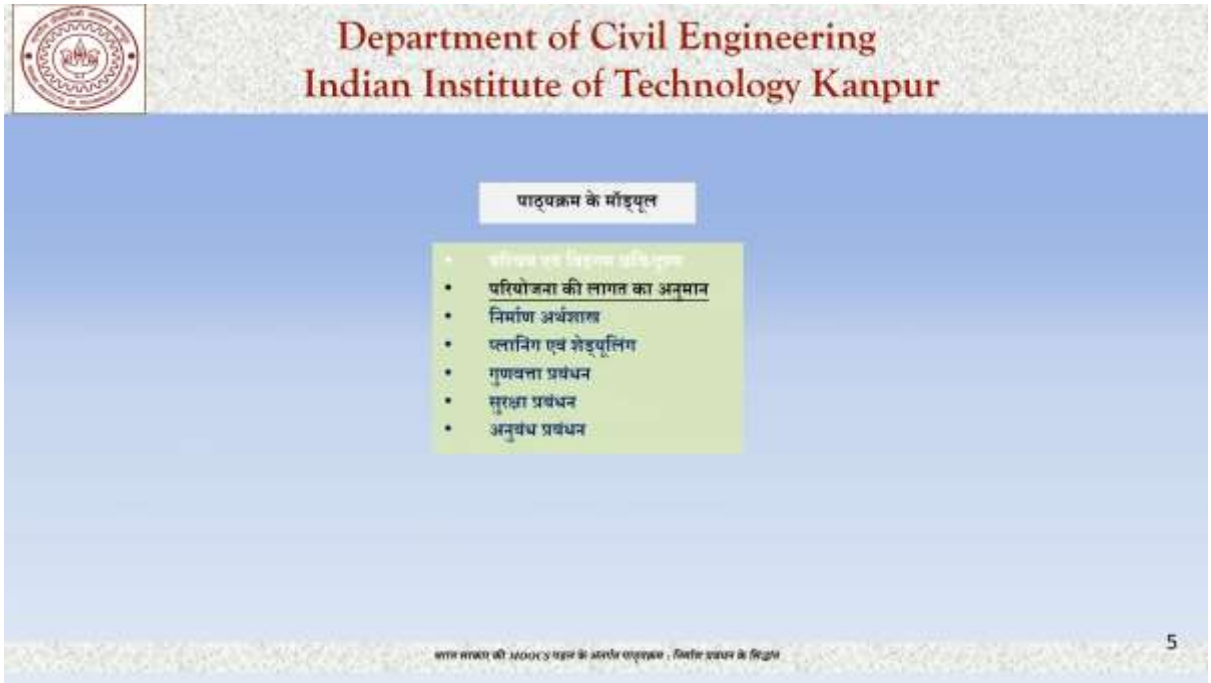
Jisamen ki aaj ham lecture 7 par hain aur aaj ka hamaara vishay hai Gatividhiyon ka Vivaran.

(Reference Time 00:30)



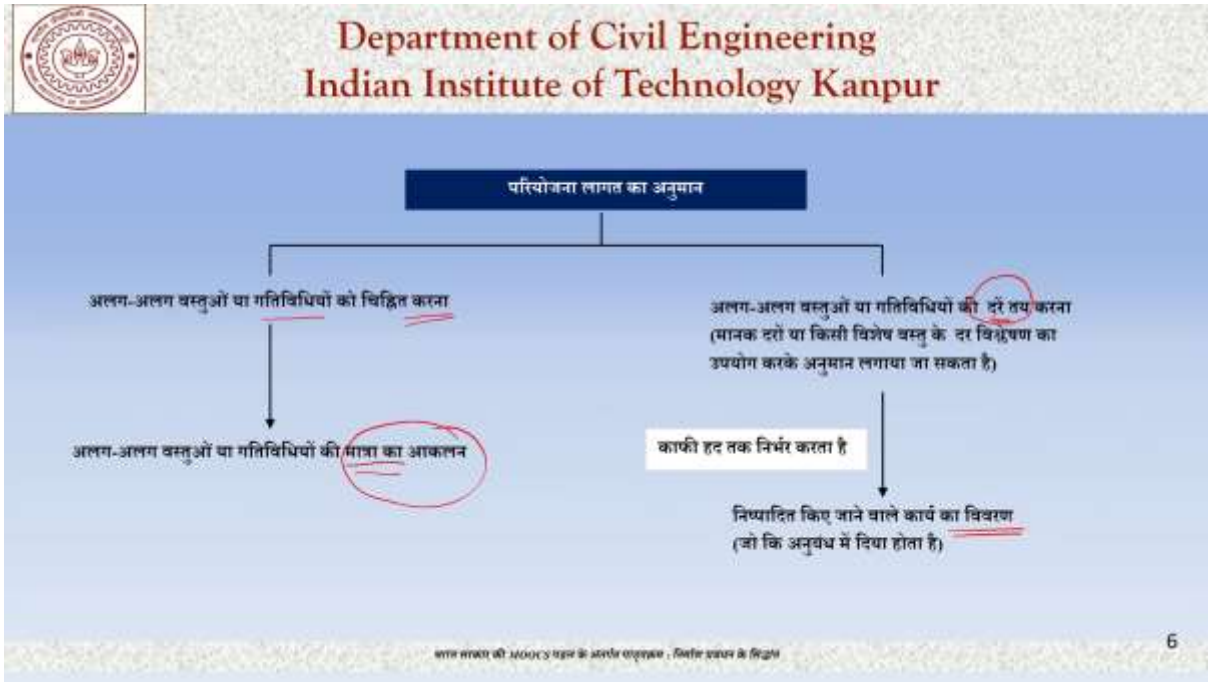
Is paathyakram mein in modules par charcha honee hai.

(Reference Time 00:34)



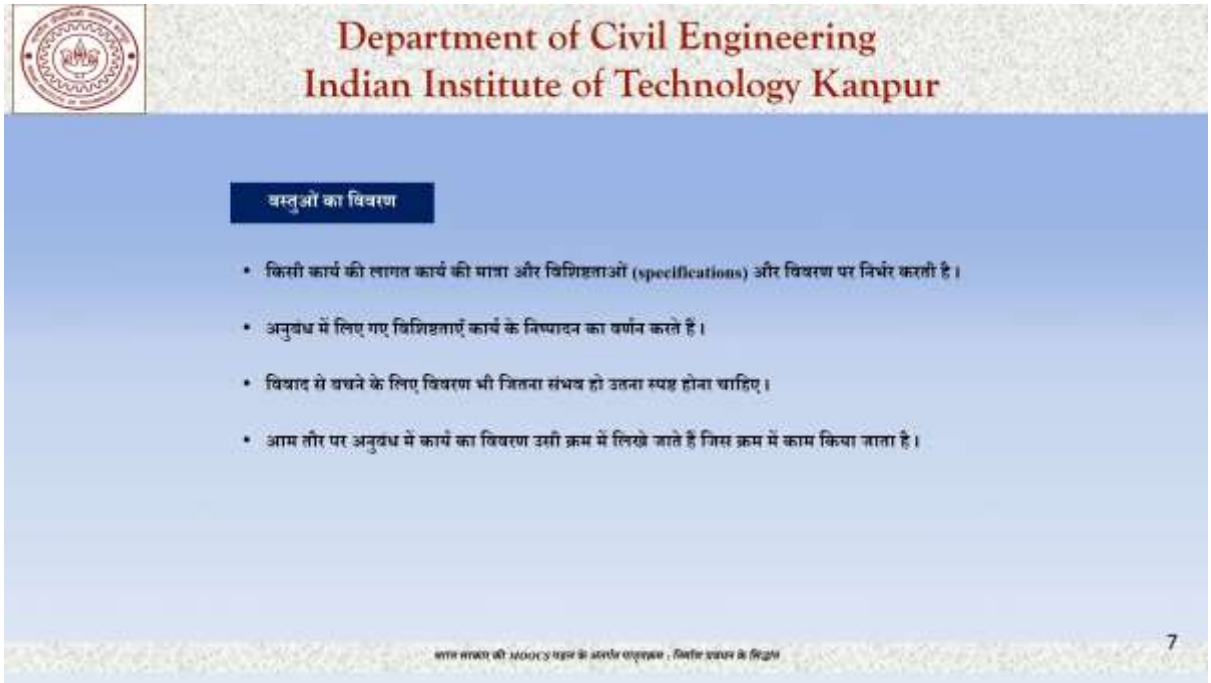
Aur ham log pariyojana kee laagat ka anumaan doosare module kee charcha kar rahe hain jisake ki antargat aaj hamaara vishay hai gatividhiyon ka vivaran.

(Reference Time 00:42)



Yah chitr aapake saamane pahale bhee aa chuka hai. Pariyojana laagat ka anumaan lagaane ke lie hamen alag-alag vastuon aur gatividhiyon ko chinhit karana aavashyak hai. Unakee maatra ka aakalan karana aavashyak hai yah maatra bhee ek anumaanit maatra hogee jo ki ham chitron aadi ke maadhyam se karate hain. Isake baad hamen un gatividhiyon kee daron ke baare mein pata hona chaahie rate pata hona chaahie aur us gatividhi ka vivaran yah bhee bahut hee aavashyak bhaag hota hai. Aaj hamaara vishay gatividhiyon ke vivaran ka hai.

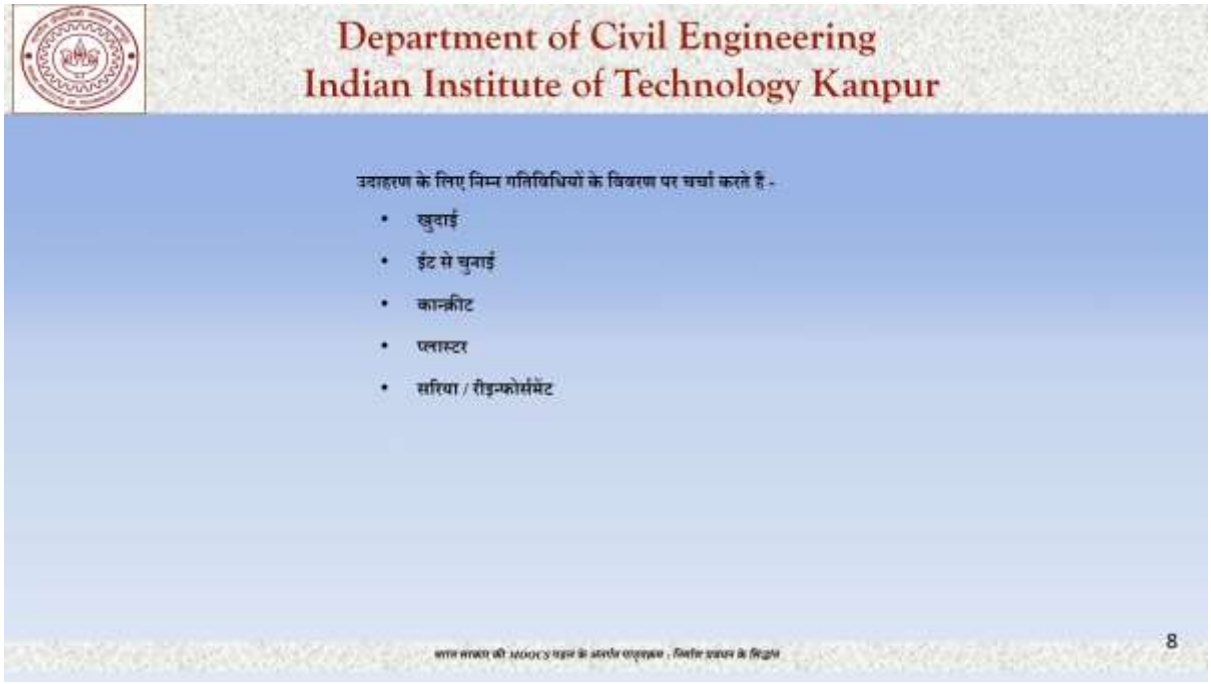
(Reference Time 01:23)



To aaiye aage badhate hain. Vastuon ke vivaran kee jab ham baat karate hain to kisee kaary ya pariyojana kee laagat kaary kee maatra aur vishishtataon (specifications) aur vivaran par nirbhar karatee hai. Anubandh mein lee gaee vishishtataayen kaary ke nishpaadan mein

sahaayak hotee hain. Vivaad se bachane ke lie vivaran bhee jitana sambhav ho utana spasht hona chaahie. Saath-saath aamataur par anubandh mein kaary ka vivaran ya gatividhi ka vivaran usee kram mein likha jaata hai jis kram mein kaam kiya jaata hai.

(Reference Time 01:55)

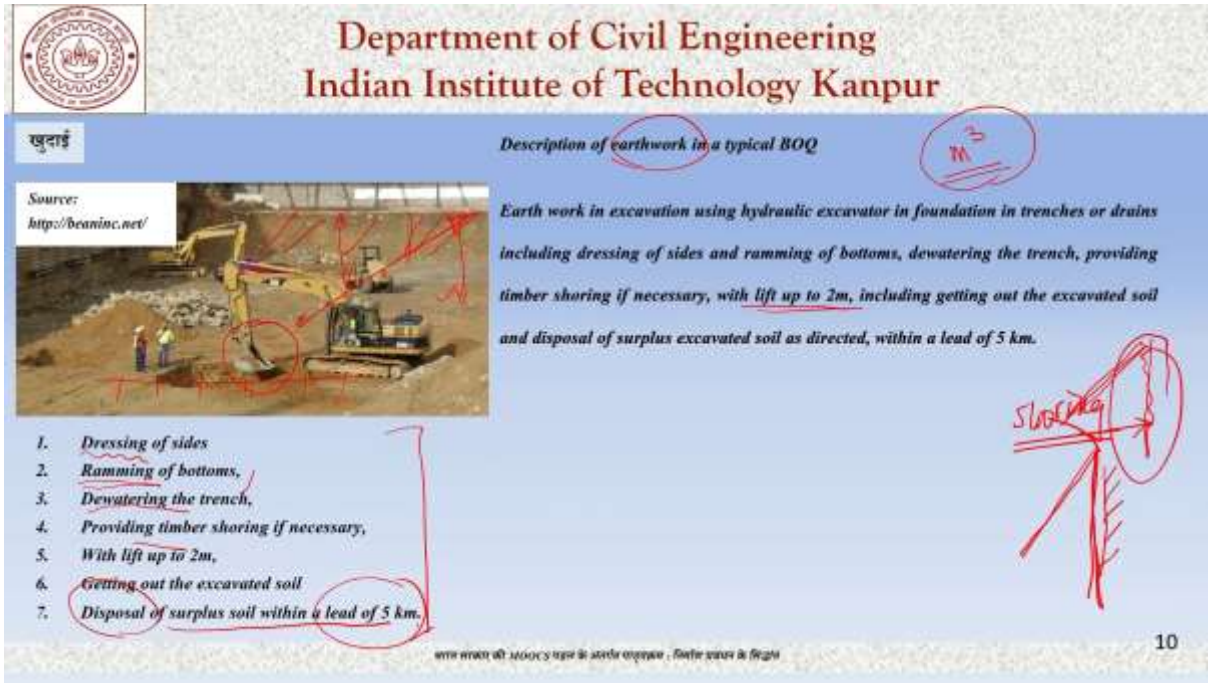


To aaj ham udaaharan ke lie nimn gatividhiyon par charcha karenge, unake vivaran ko dekhenge. Khudaee (Excavation), eent se chunaee (brick work), concrete work, plaster aur sariya ya reinforcement in paanch gatividhiyon ke vivaran par charcha karenge.

(Reference Time 02:15)

Aaiye sabase pahale chalate hain khudaee ya earthwork par. Earthwork ka description ya vivaran ek BQ mein diya hota hai. Yah BQ kya hota hai? Bill of Quantities aur yah anubandh ka mahatvapoorn bhaag hota hai. Yahaan pariyojana kee sabhee gatividhiyon kee maatra evan vistrt vivaran die jaate hain, jaise ki yahaan par earthwork ka vistrt vivaran diya gaya hai. Yah vivaran dene kee aavashyakata kya hai? Isaka prayojan kya hai? Isase ham kya acheev karana chaahate hain? Target yah hota hai ki jo bidder hai ya thekedaar hai vah yah vivaran padhakar samajhata hai ki is particular ya is vishesh gatividhi ko karane mein kya-kya cheejen, kya-kya sab activity included hain usamen sammilit hain. Jaise ki ham agar earthwork ka description padhate hain to usamen likha hai that earthwork in excavation using hydraulic excavator, in foundation, in trenches or drains including dressing of sides and ramming of bottoms, dewatering the trench providing timber shoring if necessary with lift up to 2 meters including getting out the excavated soil and disposal of surplus excavated soil as directed within a lead of 5 km. To yah description earthwork ke lie diya hua hai. Ab ham isamen die gae har shabd ka vishleshan karate hain.

(Reference Time 03:47)



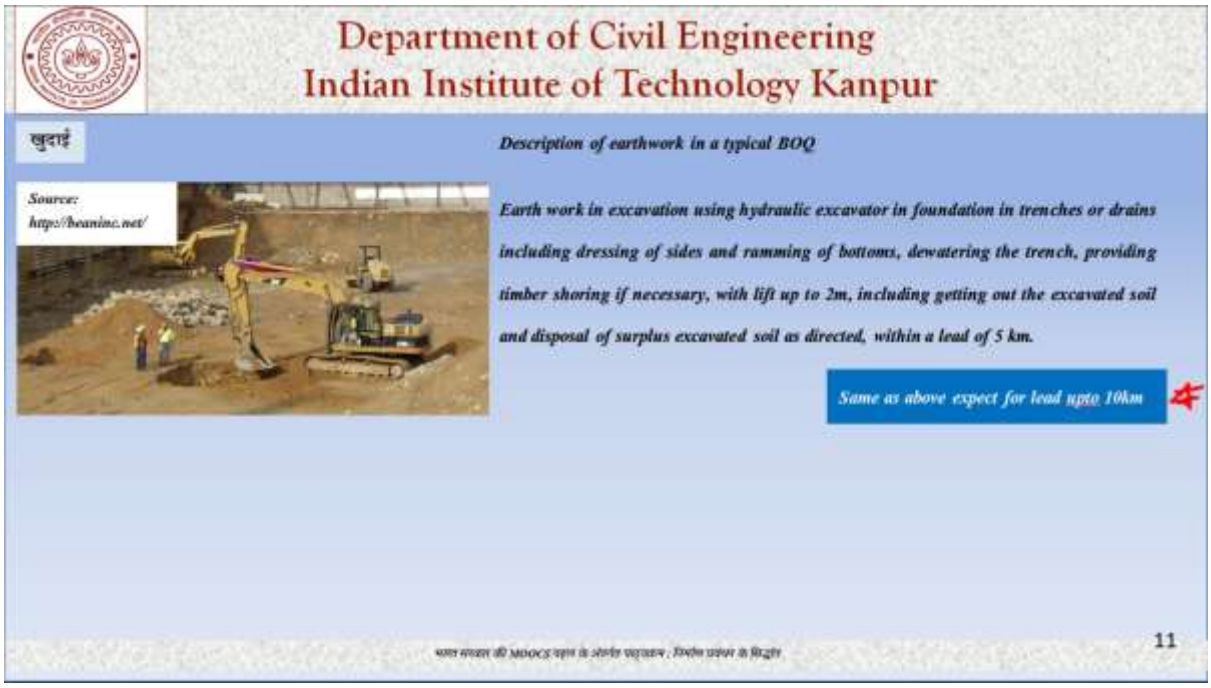
Pahalee baat hai dressing of sides. Yah dressing of side kya hota hai? Yah chitr dikhaata hai ek excavation kee gatividhi ko. To jo side hote hain vah yah vaale jo hai yahaan per side honge aur in side ko agar ham machine se excavate karate hain to yah koee jarooree nahin hai ki yah side bahut hee achchhee tareeke se jaisa ham chaahate hain agar vertical chaahate hain to vertical ya agar ham slop mein chaahate hain to slop, is tareeke ke slop mein aa jaen. Machine se kie gae excavation aur side ko us desired shape mein laana yah dressing kahalaata hai. Isako hamen aksar haath se karana padata hai ya chhote aujaaron se karana padata hai.

Aage badhate hain ramming of bottoms arthaat yah jo satah hamaaree generate hotee hai neeche kee, isako ho sakata hai hamen pakka karane ke lie kabhee-kabhee requirement hotee hai ramming kee. Ham usako durmut se ya kisee any cheej se densify karate hain usako pakka karate hain. Dewatering the trench – Dewatering the trench matalab ho sakata hai, excavation karate samay trench mein ya excavated area mein paanee bhar jae. To us paanee ko nikaalane ke lie hamen dewatering karanee padegee, pump laane padenge, un pump ko

laana, unako chalaana usakee cost bhee isee excavation mein sammilit hogee. Dhyaan rahe kee excavation cubic meter mein pe kiya jaega arthaat ek thekedaar ko 100 cubic meter agar excavation hota hai to usako har cubic meter ke hisaab se payment hona hai. Us cubic meter excavation mein kya-kya sammilit ho sakata hai vah yahaan diya hua hai. To us 100 meter ke excavation ke lie ya 100 cubic meter excavation ke lie agar dewatering kee aavashyakata padatee hai to vah bhee extra payment nahin maana jaega.

Aage badhate hain providing timber shoring if necessary. Jaise-jaise ham is excavation kee gaharaee ko badhaate jaenge yah slop unstable ho jaega. Hamako ek ya to slop kaatana padega ya jab ham mittee yahaan par kaat denge to yahaan par jisako ki ham kahate hain shoring, vo shoring lagaanee padegee aur us shoring kee keemat bhee isee cubic meter mein shaamil maanee jaegee yadi aavashyakata huee to shoring lagaane ka cost isee excavation bhee sammilit hona chaahie. Excavation jaise-jaise gahara hota jaega vaise-vaise mushkil hota jaega aur is baat ko dhyaan mein rakhane ke lie yah diya gaya hai ki theek hai is particular case mein ham samajhate hain ki 2m ka excavation hee hoga isake 2 meter tak ke excavation kee cost ham jaanana chaahate hain. Getting out the excavated soil. Svaabhaavik hai ki jo mittee yahaan se nikaalee jaegee vah kaheen na kaheen rakhee jaegee aur usake baad us mittee ko kaheen par disposed kiya jaega. Use disposal kee cost bhee isee cubic meter mein shaamil karanee hogee aur kahaan dispose hogee? Usake lie diya gaya hai lead of 5 kilometers. To side se 5 kilometer kee dooree tak agar engineer charge kahata hai ki yah excess arth jo nikali hui mittee aaee hai usako 5 kilometer ke andar amukh jagah par dispose kare to vah cost bhee isee excavation kee cost mein maanee jaegee. Haan, ab inamen se koee bhee condition ya koee bhee shart agar laagoo nahin hotee hai ya ullanghan hota hai usaka to extra cost banatee hai.

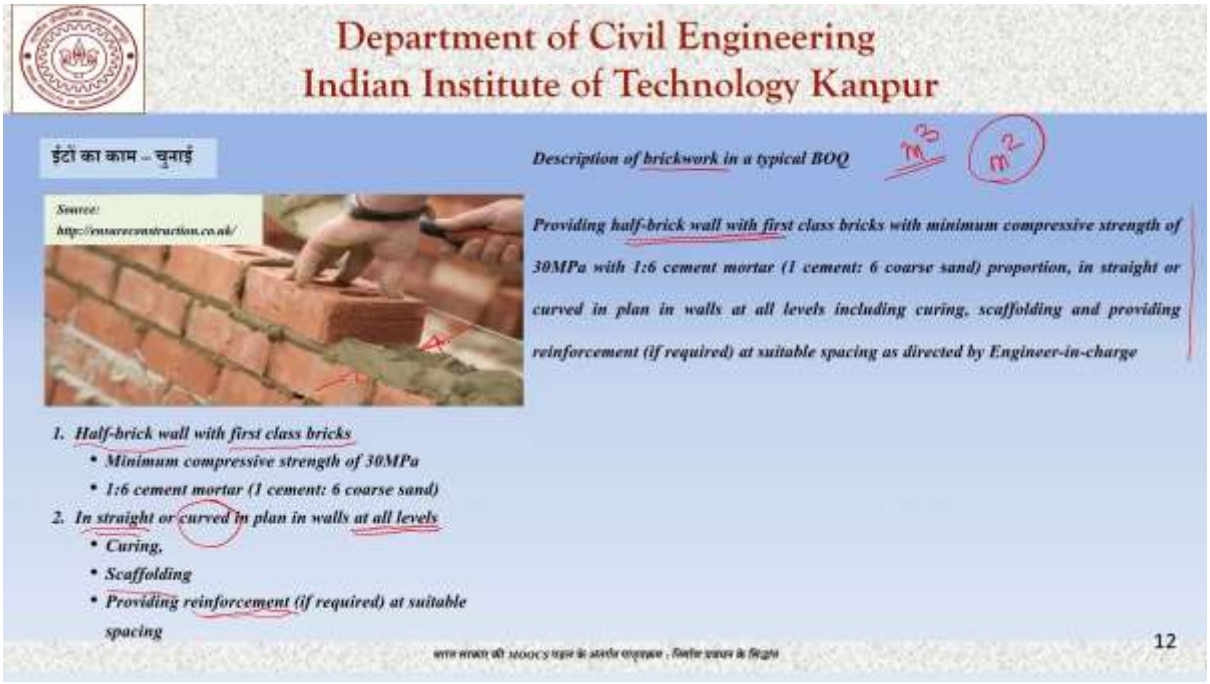
(Reference Time 07:44)



Jaise ki ek item ho sakata hai ki excavation ke sabhee item jo conditions jo sharten sab thee, vah sab laagoo hongee maatr yahaan diya gaya hai ki yah lead 5 kilometer kee jagah 10 kilometer ho gaee hai. To usase bidder ya thekedaar ko ek vikalp milata hai ki ham apane cost ko badal sakate hain. To ham kah sakate hain ki theek hai agar excavation mein disposal ke lie site 5 kilometer ke andar hai to 100 rupaye per cubic meter hoga. Lekin agar 5

kilometer se jyaada hai 10 kilometer se kam hai to vah 100 rupaye kee jagah 112 rupe hoga. Yah bhee kaha ja sakata hai ki 5 kilometer kee jagah kam kar diya jae aur kaha jaaye kee 2 kilometer tak mein disposal hai, to ho sakata hai vah 100 rupaye kee keemat 80 rupaye aa jae. Is prakaar se kisee bhee shart ke badalaav ko dhyaan mein rakhane ke lie ham die gae vivaran ko badal sakate hain badal dete hain anubandh mein.

(Reference Time 08:46)

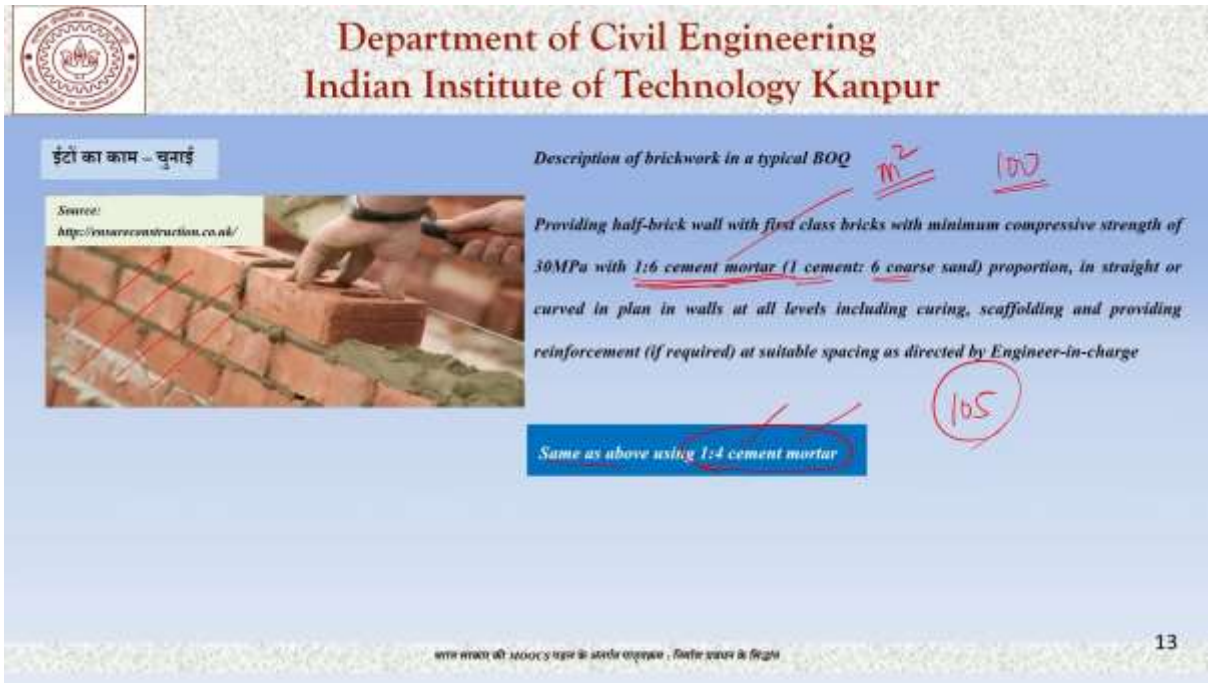


Ek aur udaaharan lete hain brick work ka yaanee chunaee. Is chitr mein chunaee kee ja rahee hai aur usaka vivaran yahaan diya hua hai. Providing half brick wall with first class bricks with minimum compressive strength of 30 MPA with 1:6 cement mortar (1 cement 6 course sand) proportion in straight or curved, in plan in walls at all levels including curing scaffolding and providing reinforcement (if required) at suitable spacing as directed by Engineer-in-Charge. To yah ek saanketik description hai eent kee chunaee ka. Ab ham isamen bhee har shabd ka, har condition ka (har shart ka) vishleshan kar sakate hain. Yah half brick wall with first class bricks arthaat yah jo eent kee width hai ya jo deevaar kee width hai vah half brick wall hai aur usamen first class bricks hee use kie jaenge aur kis prakaar ke brick honge? Unakee compressive strength minimum 30 mpa hogee unako kis masale mein chunana hai 1:6 cement mortar arthaat 1 cement aur 6 coarse sand yah civil engineering mein ek established terminology hai ki mortar ka anupaat 1:6, 1:4, 1:7 is tareeke se diya jaata hai straight or curved in plan in walls at all levels. To yahaan par aap yah dekhenge ki brick work karate samay jo hamaara mesan hai, jo hamaare expertise hai vo adhik hogee agar deevaar curved hai. Seedhee deevaar mein sambhavat: sabhee tareeke ke mesan kaam kar sakate hain lekin us deevaar ko curved mein le lene mein kuchh expertise aatee hai. To thekedaar ke paas yah option hai ki theek hai agar curved hai to hamaaree cost badhegee ya nahee badhegee is case mein is udaaharan mein usaka praavadhaan nahin kiya gaya hai.

Phir yahaan likha gaya hai all levels arthaat agar ham kisee multi-story building kee baat kar rahe hain to usamen is particular udaaharan mein isaka bhedabhaav nahin kiya gaya hai ki brick work first floor par ho raha hai ya 10th floor par ho raha hai jo ki ek practical roop se theek nahin hai. To ho sakata hai is particular udaaharan mein oonchaee ka mahatv nahin hai. To jahaan par jis shart ka mahatv hota hai un sharton ko sammilit kiya jaata hai description

mein yaani vivaran mein. Aur usamen saath-saath curing, scaffolding aur providing reinforcement bhee shaamil hai. Ab scaffolding kya hotee hai? Scaffolding jab ham brick work karate hain to usamen pahunchane ke lie ek temporary structure khada kiya jaata hai usako scaffolding kahate hain. Reinforcement brick work mein kabhee-kabhee yah praavadhaan hota hai ki kuchh layers ke baad kuchh usamen reinforcement baars daalee jae. To us chitr mein brick work ke detail mein un reinforcement bars ka un sariyon ka jikr hota hai unako dhyaan mein rakhate hue thekedaar ko yah bataana hoga ya bidder ko yah bataana hoga ki brickwork kee ham kya cost lenge. Jab boundary wall ke udaaharan mein brick work kee charcha ho rahee thee to hamane dekha tha ki hamane brick work ko cubic meter mein liya hai aur yah bhee kaha tha ki agar brick work kee chaudaee de dee jaegee tab ham usako square meter mein le sakate hain ya lena chaahie. To is udaaharan mein brick work square meter mein kiya jaega.

(Reference Time 12:25)

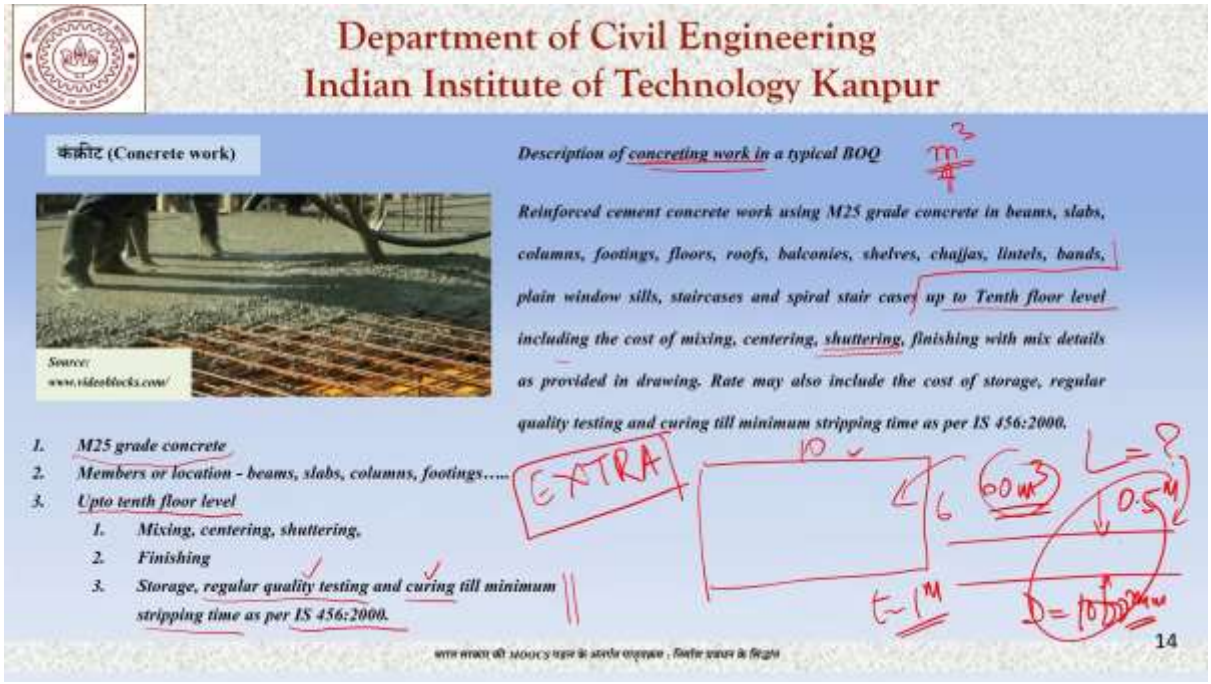


Aur yahaan par hamaare vivaran mein ek aur vivaran sammilit ho sakata hai jisamen sirph yah kaha jae ki same as above using 1:4 cement mortar arthaat hamako 1:6 kee jagah 1:4 cement mortar use karana hai. To ab thekedaar ke paas ya bidder ke paas yah vikalp hai ki 1:6 mortar ka yahaan par per square meter ka rate maanga gaya hai ya nirdhaarit karana hai to vahaan par 1:6 mortar mein vah kar sakata hai ki hamaara 100 rupaye square meter ka rate hoga lekin agar 1:4 cement mortar ham use karenge, to yah rate badhega ya ghatega? Isake lie yah dekhana hoga ki kaun sa mortar karana rich hai kisakee cost jyaada aayegee. 1:6 ka matalab hua ki 1 cement par 6 guna sand use ho rahee hai, jab 1:4 kee baat hotee hai to 1 cement par 4 guna sand hogee arthaat yah mortar 1:6 yah ek poorer mortar hai isamen cement ka consumption kam hai, isamen cement ka consumption jyaada hai isalie ho sakata hai ki yah cost 100 kee jagah 105 ho jae. Yah baaten bidding ke time mein saamane aatee hai jinakee ki charcha ham aage kisee samay karenge.

Agale description kee ham baat karate hain vah hai concrete ka kaam. Is chitr mein concreting dikhaee ja rahee hai. Is description mein yah dhyaan rahe ki hamane is brick work par hone vaale plaster ko brick work mein sammilit nahin kiya hai. Yah bhee ho sakata hai ki

is samay ham plaster ko ek alag item ya alag vivaran na de karake yah kah den ki isamen plaster bhee sammilit hai.

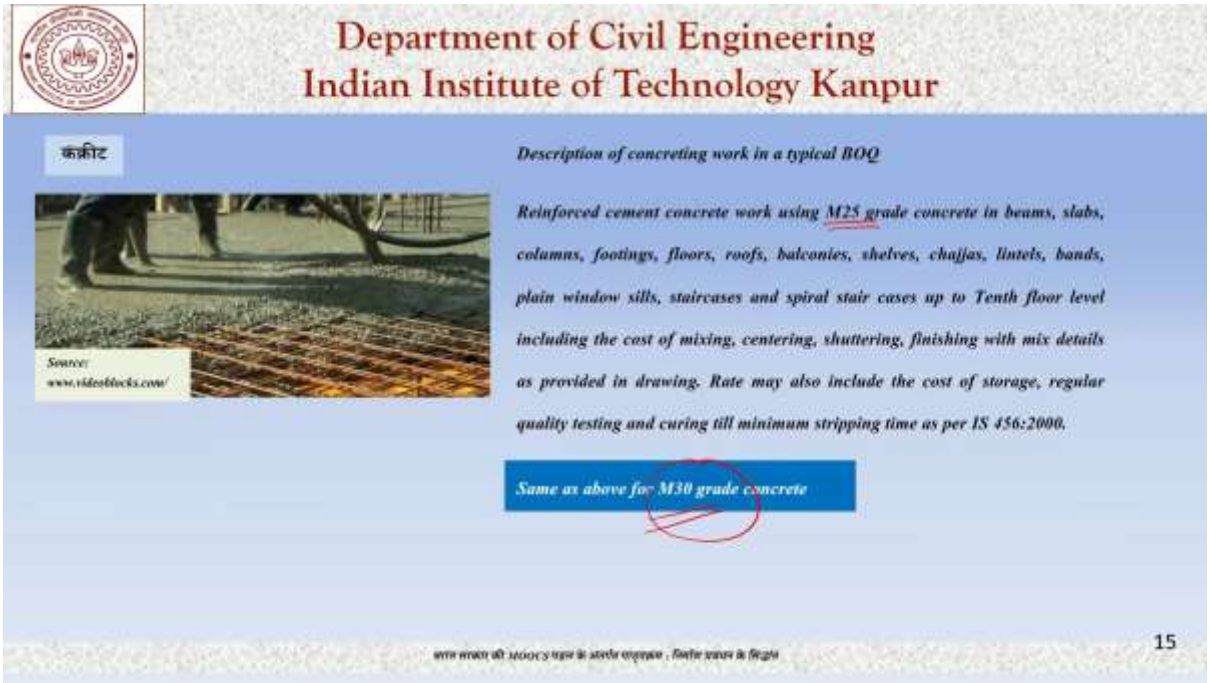
(Reference Time 14:07)



Aaiye aage badhate hain ham log chalate hain concrete ke description kee or yahaan par concreting ho rahee hai aur concrete ke description mein jaisa likha hai ki reinforced cement concrete work using m25 grade concrete in beam slabs tarah-tarah ke membars likhe hue hain ap too 10th floor level including cost of mixing, centering, shuttering, finishing with mixed details is provided in the drawing. The rate also includes cost of storage, regular quality checking and curing till minimum stripping time as per IS 456:2000. Aur to isamen bhee ham har shart ko agar dekhate hain to pahalee baat to hai ki yah rate jo maanga gaya hai vah m25 grade concrete ke lie hai kisee aur grade ke lie yah bhinn ho sakata hai. Members aur location beams, slabs, columns, footings isamen tarah-tarah ke member die gae hain. Isamen difficulty kahaan par aatee hai? Agar hamaare paas ek raft hai bahut bada raft hai, concrete ka cost membar ke oopar kyon nirbhar karata hai? Agar ham yah dekhen ki hamako ek raft banaana hai jo ki maan leejie 10 meter by 6 meter hai aur isakee thickness 1 meter hai. To yahaan par kul milaakar 60 cubic meter concrete lagegee. Ab ham aapako ek homework dete hain ki yahee 60 cubic meter concrete agar hamako ek beam mein daalanee hai jisakee ki chaudaee 0.5 m (500 mm) hai aur depth 1 meter hai, to 60 cubic meter pahunchane ke lie hamako kitanee badee beam lagegee? Aur ab aap samajhane kee koshish karie ki kyonki is concreting kee cost per cubic meter hogee, dar cubic meter ke hisaab se hai to yah 60 cubic meter chaahe vo raft mein ho, chaahe vah beam mein ho, kya alag-alag nahin hoga? Kyonki yahaan par 10 meter by 6 meter ke ek tukade mein 60 cubic meter concrete pore ho jaegee. Yahaan par ek kaaphee lambee beam cast karanee hogee. Vishesh roop se agar shuttering bhee usamen judee huee hai to yahaan par raft mein shuttering kee maatra aur beam mein shuttering kee maatra bhee aap nikaal kar dekhie, kitanee alag hogee. Usako agar ham sammilit karate hain tab usakee cost par calculation karana hoga. Iseelie vivaran mein kya likha hai kya nahin likha hai yah bahut hee mahatvapoorn ho jaata hai. To yah to huee members kee baat. Ap too 10th floor level, ab ye 10th floor level sahee hai galat hai 10th floor mein kya 8th floor aur 1st floor ek hee baat hai yah baat charcha ka vishay hai. Us par ham log tarah-tarah ke vivaran likh sakate hain agar ham is vivaran ko todana chaahen to tod sakate hain ki 1st floor par kya

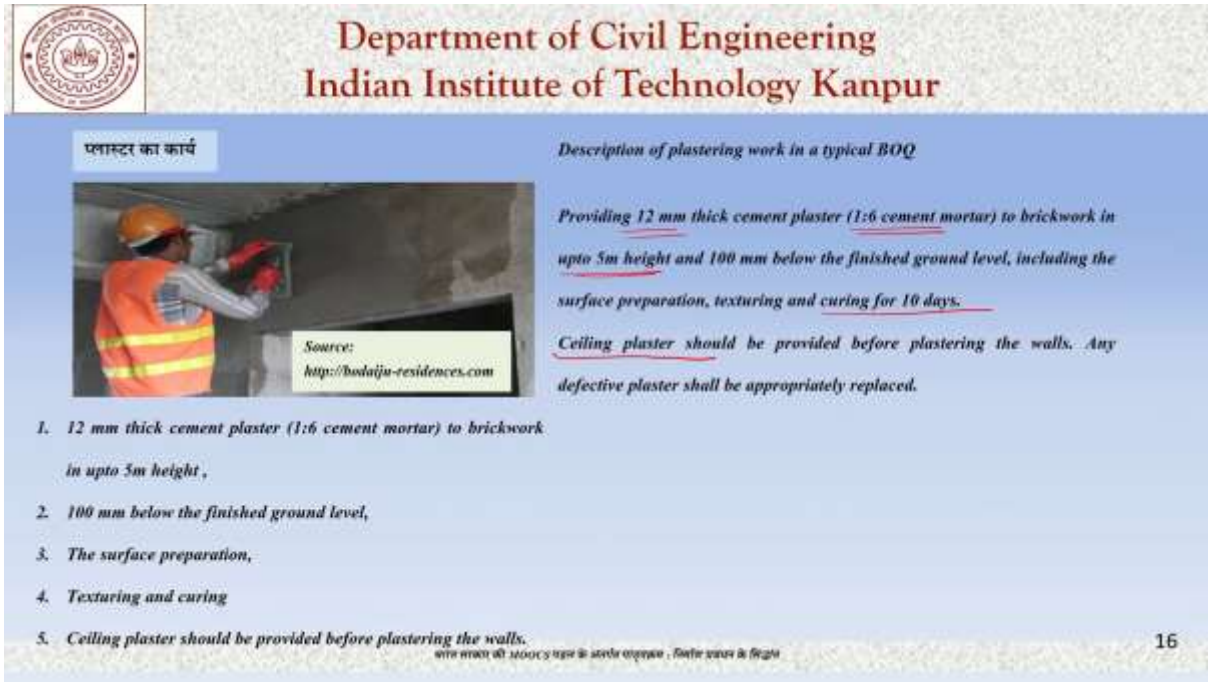
cost aaegee, 2nd floor par kya cost aaegee? Is udaaharan mein yah kah diya gaya hai ki ham alag-alag nahin rakhenge aur 10th floor tak aane vaalee sabhee concrete kee cost ek see maanee jaegee. Jisamen ki mixing, centering, shuttering aadi sab kuchh shaamil hai. Saath hee mein shaamil hai regular quality testing and curing till minimum stripping time as per IS 456. To casting ke baad jo curing hogee ya usamen quality control kee checking hogee cube banaakar strength test karana yah sab jo cost aaegee vah bhee isee cubic meter mein sammilit maanee jaegee. Isalie description bahut hee aavashyak hota hai, usamen kya-kya likha hai kya nahin likha hai kyonki jo cheej description mein nahin likhee hai, vivaran mein nahin hai usake lie ek extra item ban jaata hai. Thekedaar yah kah sakata hai ki yah cheej vivaran mein nahin thee isalie hamen extra payment kiya jaana banata hai. Vivaad ho sakata hai nahin ho sakata hai vo alag baat hai lekin extra item banata hai. Is par bhee ham log kisee agale lecture mein charcha karenge. Aapako dhyaan hoga mainne kaha tha jab ham boundary wall kee charcha kar rahe the ki ek item hamane usamen chhod diya hai ya chhoot gaya hai aur us item ko lekar extra item ban jaega is par ham log aage kisee samay charcha karenge.

(Reference Time 18:48)



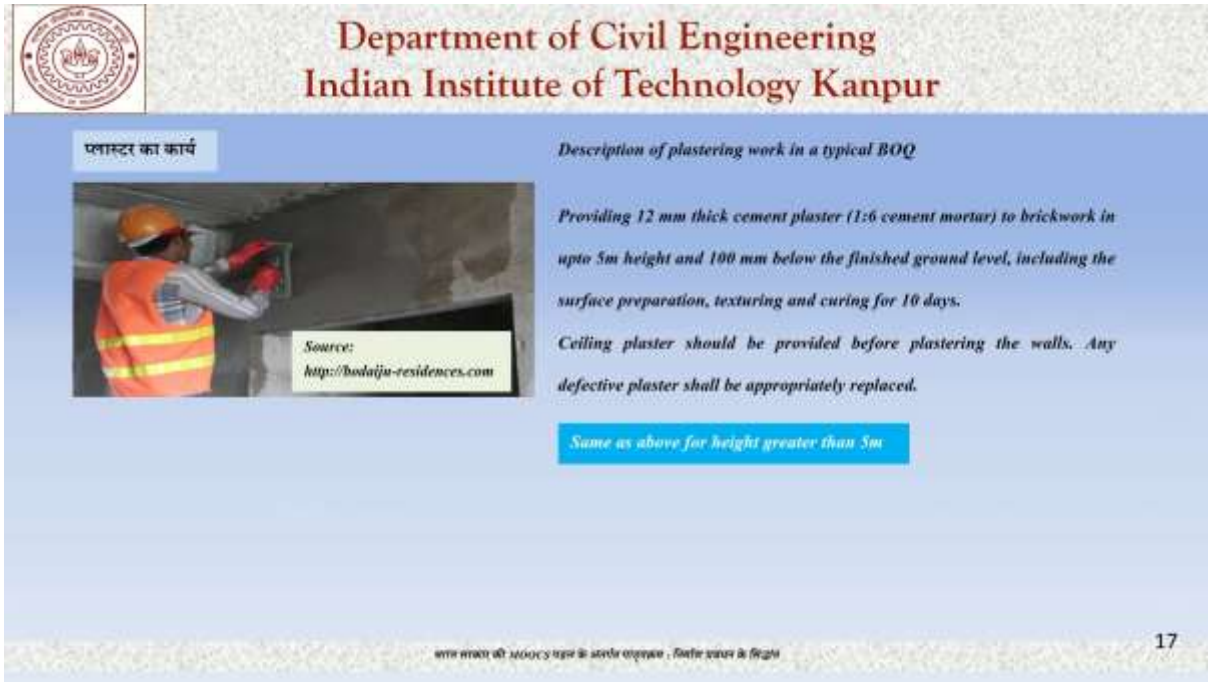
To aaiye ham aage badhate hain aur concrete mein agar ham phir se m30 concrete kee baat karen. To baakee sab kuchh yahee rahega sirph m25 kee jagah m30 concrete ho jaegee arthaat richer concrete ho jaegee. Svaabhaavik hai ki m25 ka jo rate aaega ya jo rate hota hai usase thoda sa adhik m30 ka rate hoga. Kitana adhik hoga yah kah paana mushkil hai kyonki us rate par kya-kya shaamil hota hai isakee thodee see charcha ham karenge jab ham concrete ke dar ko nirdhaarit karane mein kin sansaadhanon ka prayog hota hai isakee charcha karenge aur vo sambhavat: ham log agale class mein karenge.

(Reference Time 19:26)



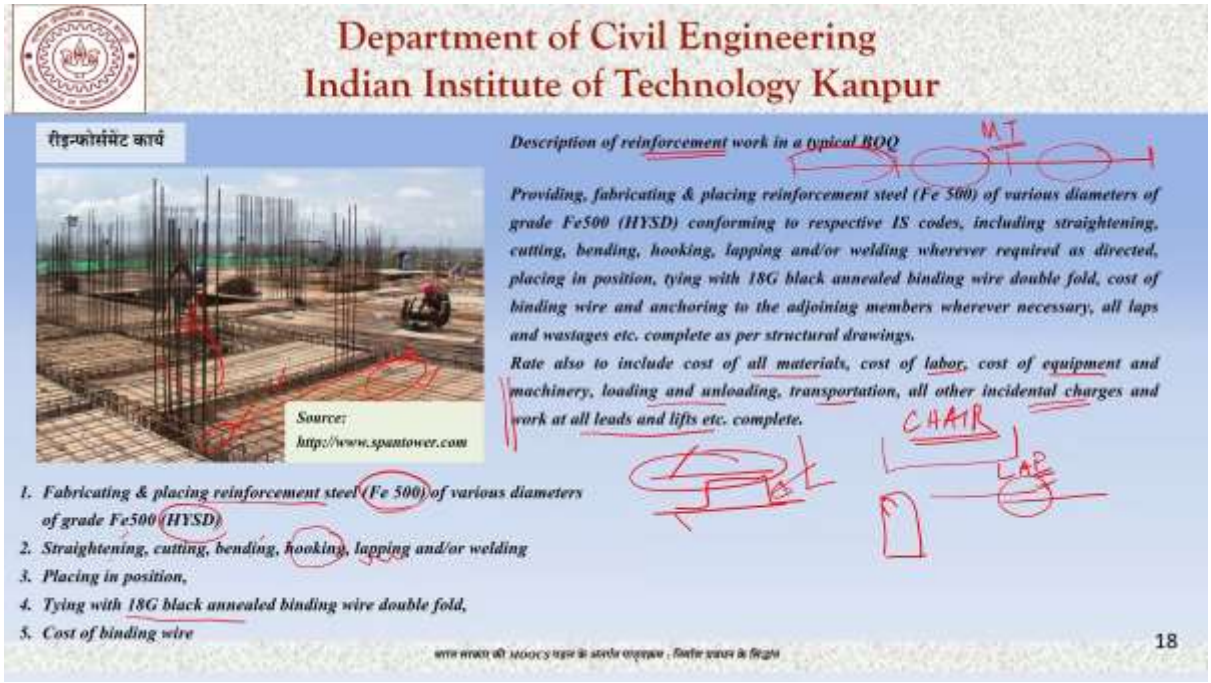
Aage badhate hain isee prakaar plastering work deevaaron par plaster kiya jaana chaahe vah concrete ho, chaahe vah brick work ho to usaka aap ek jo vivaran hai vah yahaan par diya hua hai ki providing 12 mm thick plaster with 1:6 mortar for brick work in height up to 5 meters and 100 mm below the ground level including surface preparation, texturing and curing for 10 days. Ceiling plaster should be provided before plastering the walls. Any defective plaster shall be appropriately replaced. To isamen ceiling ka plaster bhee shaamil kar diya gaya hai. Yah bhee kaha gaya hai ki 5 meter tak kee height ek maanee jaegee. Plaster kee thickness 12 mm hogee usamen 1:6 cement mortar use hoga aur 10 dinon tak curing ya taraee kee jaegee. To isake lie yah description agar ham todakar dekhate hain to yahaan diya hua hai ki 12 mm thick cement plaster 1:6 cement mortar 5 meetar, 100 mm below ground level, surface preparation, texturing and curing yah sab isamen shaamil hai.

(Reference Time 20:48)



Ceiling ka plaster bee isamen sammilit hai. Ham isee baat ko ek doosara item bana sakate hain jabaki ham kahen ki baakee sab theek hai vahee rahega lekin height 5 meter se agar adhik hai to rate kitana badal sakata hai ya kitana badalega.

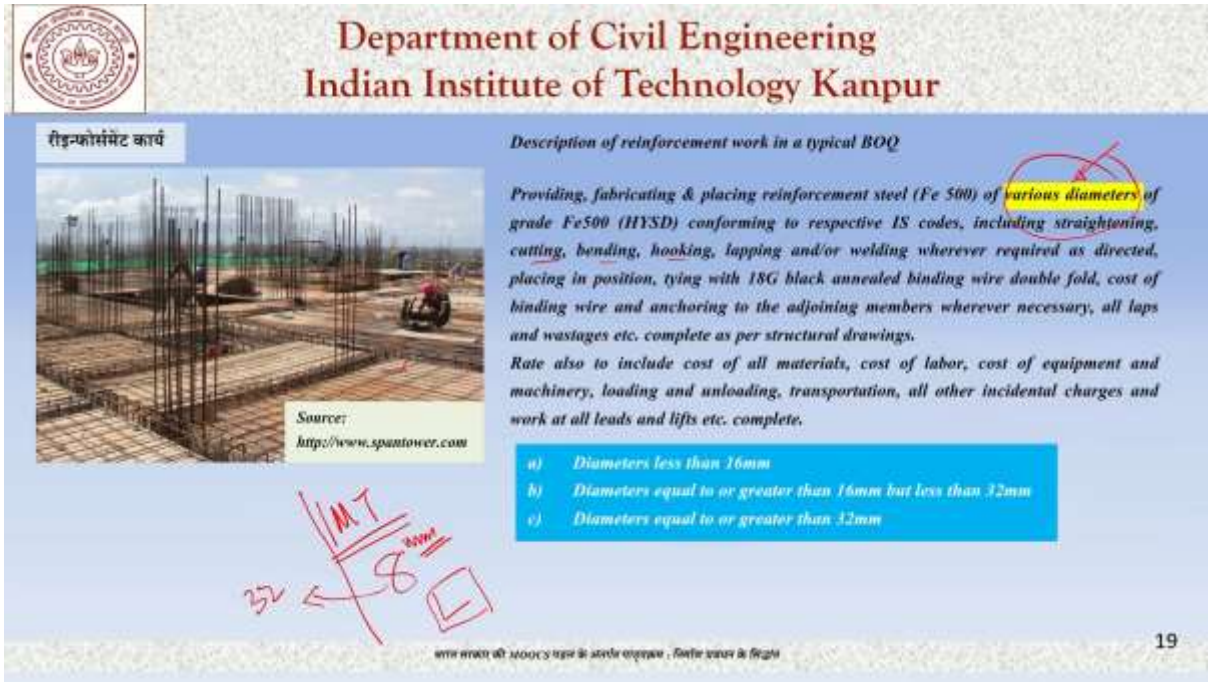
(Reference Time 20:54)



Aage badhate hue ham log charcha karate hain reinforcement work kee. Reinforcement maane sariya ka kaam. Is picture mein ya is chitr mein aap dekh sakate hain sariya ka kaam jo ki ek building kee site par ho raha hai. Isamen sariya vibhinn diameters kee ho sakatee hain. Unake location alag hai yah slab hai, yah beam hai, yah column hai. In sabhee ko ek sang baandh kar rakhana hota hai isake pahale ki ham isamen concrete ke dhalaee karen. Aaiye ham isaka description padhane kee koshish karate hain - Providing, Fabricating and

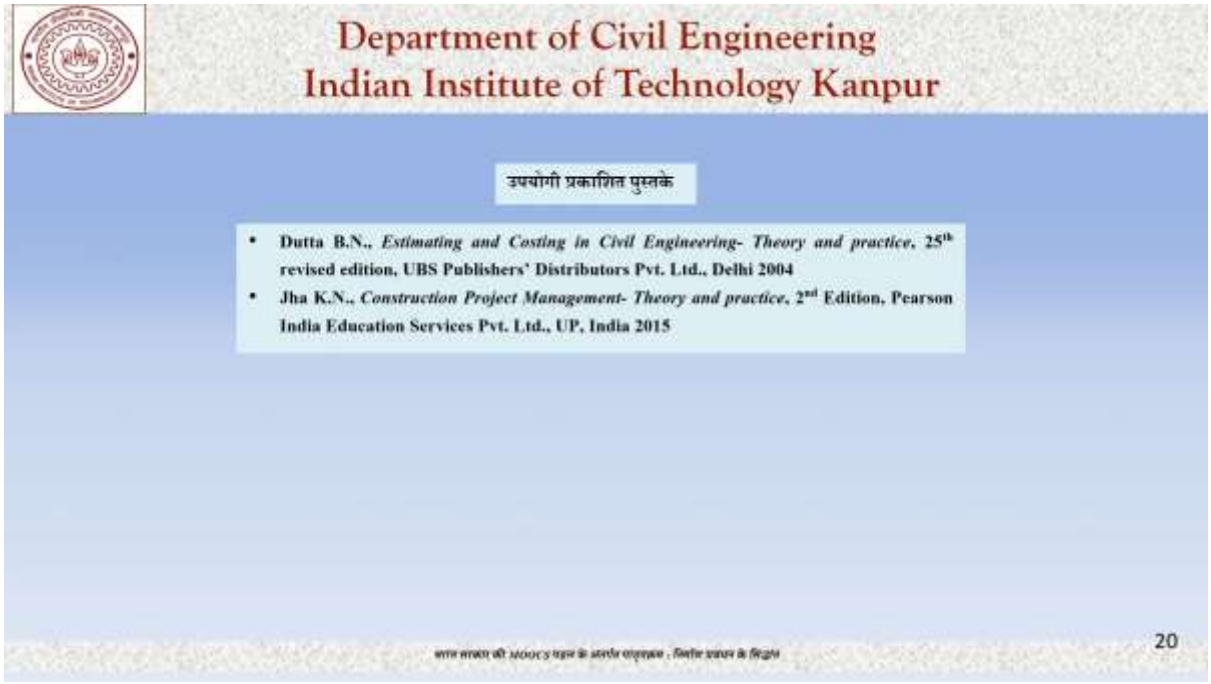
Placing Reinforcement Steel (FE 500) of various diameters of grade FE500 (HYSD) steel conforming to relevant IS Codes, Including Straightening, Cutting Bending, Hooking, Lapping and/or Welding wherever required as directed, Placing in position, Tying with 18G Black and Annealed Binding Wire Double Fold, Cost of Binding Wire and Anchoring to the Adjoining Members wherever necessary, All Laps and Wastes, Complete as per Structural Drawing, Rate also to include Cost of all Materials, Cost of Labour, Cost of Equipment and Machinery, Loading and Unloading, Transportation, All Other Incidental Charges and Work at all Leads and Lifts Complete; to yah description de diya gaya maan leejie reinforcement work ke lie. To isamen keywords kya hain? Pahalee cheej to kahee gaee ki reinforcement kee quality kya hogee? FE500 hongee, HYSD bars hongee. High in strength deformed bars yah sariya use kiya jaayega. Straightening, cutting, bending, hooking, lapping and/or welding jo sariya aata hai vah ek lambaee mein aata hai. Ham logon ne jab boundary wall kee charcha kee thee to vahaan par dekha tha ki itanee lambee sariya nahin use hotee hai usake lie ham cut length nikaalate hain ki kis cut length kee sariya hamen kitanee maatra mein chaahie, unako hamen kis shape mein bend karana hai chaahe vo L ho, chaahe vo U ho ya jo ham logon ne column mein hook kee charcha kee thee vo hook hon. Yahaan par agar aap dhyaan se dekhenge to column mein to nahin lekin haan beam mein prayog hone vaale stirrups dekhe ja sakate hain usamen bhee isee prakaar kee sariya use hotee hai. To jab reinforcement kee cost kee baat hotee hai to hamako yah sab opration Straightening, cutting, bending, hooking aur lapping in sabako us cost mein hee jodana hai yah bidder ko pata chal jaata hai. Straightening kya huee? Yah sariya agar thoda tehadee hai kisee bhee prakaar se to hamako usako seedha karana padega, kaatana padega, modana padega aavashyakata padee to hook karane padenge aur lapping karana padega. Lapping karane ka kya arth hua? Ki agar hamaare paas yah lambaee is lambaee kee ek sariya upalabdh nahee hai, to ham kya karate hain? Ham ek sariya yahaan tak leke aate hain aur doosaree sariya yahaan par usamen jodate hain yah lapping kahalaata hai. To kitane laps honge vah hamako thoda sa andaaza hona chaahie. To un laps ke lie additional payment nahin hoga kyonki aakhirakaar jab vazan kee baat hotee hai reinforcement work ka dhyaan rakhie meetrik tan yaanee vazan ke hisaab se payable hota hai. To usamen is prakaar jo laps honge unaka bhee vazan shaamil hoga lekin vah pe nahee hoga kyonki payment drawing mein die gae reinforcement ke hisaab se hota hai aur drawing mein diya gaya reinforcement laps aksar nahin dikhaata hai. Laps ke alaava ab isamen nahin likha hai ek cheej hotee hai chair. Jab sariya ka kaam ham karate hain to usamen chairs lagaee jaatee hain, chairs kya hotee hain? Yadi sariya do layer mein rakhee jaatee hai to usakee top layer ko support karane ke lie bottom layer mein is prakaar kee sariya lagaee jaatee hai isako kahate hain chairs. To jo chair aavashyakataanusaar lagaanee padegee vah bhee is total tonnage mein shaamil maanee jaegee. Yah sab chhotee-chhotee baaten vivaran mein jahaan tak ho sake spasht roop se likhana anivaary hota hai. Placing in position arthaat har sariya ko apanee jagah par le jaana usako rakhana aur time with 18G black annealed binding wire double fold, to tie each bar. Har sariya ko baandhane ke lie ab is chitr mein utana nahin dikh raha hai saaph lekin main aapase anurodh karoonga ki aap svayan is baat ko samajhane kee koshish karen koee aur reference material dekhen ki ham sariya ko vahaan par rokate kaise hain? Ham rokate hain usako binding wires se baandhakar aur us binding wires kee quality kya hogee 18 black annealed binding wire, usakee cost bhee isee reinforcement tonnage mein shaamil hogee. Cost of binding wire, jaahir see baat hai usamen shaamil hogee aur is poore opration mein kaam mein aane vaala material, labor, equipment, loading-unloading, transportation aur sabhee chhutaput kharche har lead aur lift arthaat yahaan par jo diya gaya hai usamen kaha gaya hai ki agar building ban rahee hai to har height ke lie ek hee rate applicable hoga. Ham yah kah sakate hain ki reinforcement work up to 5 m, reinforcement work up to 10 meter aur is tareeke se ham reinforcement ke vivaran ko tod sakate hain.

(Reference Time 26:59)



Saath hee saath ham reinforcement ke vivaran ko tod sakate hain kyonki jab ham boundary wall kee charcha kar rahe the tab bhee baat huee thee ki 8 mm kee sariya mein kaam karana aur maan leejie 16 ya 25 mm kee sariya mein kaam karana ek hee level of difficulty nahin hai vishesh roop se jab casting, bending aadi sab involved hotee hai. To ham kah sakate hain ki ham veriyas diameters jo ki is case mein kaha gaya hai har diameters ek hee sang liya hai usee jagah ham kahen ki diameters less than 16 mm ki 16 mm se kam kee jitanee saariyaan hai unaka kya rate hai, 16 mm ya 32 mm se kam jo sariya hai unaka rate kya hoga aur 32 mm se adhik kee sariya ka rate kya hoga. Yah bhee dhyaan mein rakhane kee baat hai ki 1 ton sariya ka kaam karane ke lie agar ham 8 mm kee sariya prayog karate hain to usakee lambaee kitanee hogee arthaat kitanee lambaee kee sariyon mein hamako casting, bending aadi karanee hogee taaki hamen ek metric ton ka payment mile. Usee metric ton ke lie agar 8 mm kee jagah 32 mm kee sariya hamako milatee hai, to hamako kitanee lambaee mein ek metric ton mil jaega . To yah sab baaten bidder, contractor aur site par kaam karane vaale log dhyaan mein rakhate hain unako andaaja hota hai aur isee andaaj ko codified kar diya jaata hai ek tareeke se standardize kiya jaata hai jab ham anumaan lagaate hain. To anumaan lagaate samay agar ham yah baaten dhyaan mein rakhate hain to hamaara anumaan aur sateek ho jaata hai agar ham isako dhyaan mein nahin rakhate hain to anumaan mein ek approximation rahata hai. To is vivaran ke saath ham lecture apana samaapt karana chaahenge.

(Reference Time 28:49)



Aur yahaan par upayogee prakaashit pustaken hain lagaataar aapako sujhaav dete hain unako aap padhate hain to aapako adhik jaanakaaree mil sakatee hai. Agale lecture mein ham aapase daron kee charcha karenge. Dhanyavaad. Jay hind. Namaskaar.