

Course on Landscape Architecture and Site Planning-Basic fundamental
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Lecture 31
Module 7
Landform Design

Good morning, so how was your experience over the last few lectures? So far what we have discussed? We have discussed about the basically fundamentals of the landscaping, the categories, various historical examples, then behavioral issues and then site analysis. Now I am entering into a domain which is very very important this domain you know when you will be handling a landscape (sa) project whether as a study or as a profession you will find that there are three major components which you have to handle very very carefully and they are very objective very technical.

Apparently they are less important, but truly they are very important for a landscape project to really succeed. I will be focusing on one of them this week and rather two of them this week and another the third one the next week, okay. Now we start with this, so today we will start with certain topics which I feel very essential for a successful landscape project, I will be discussing about these aspects there are three such technical matters in fact two of them are very technical like landform design and the storm water management and the third one is the plant sciences.

Now these three I will be discussing over the these two weeks so today I will be covering this landform design and storm water management, in the next week I will be focusing on the plant sciences. The landform design what it is really? Basically, the landscape has to sit over a surface of the earth whatever maybe its domain, whatever maybe the scale of it. On this particular scale on this domain since it is sitting on the surface of the earth the profile of the earth matters and this profile generation, profile creation, profile manipulation, profile maneuvering all these are another scope of this landform design.

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Look at this, it is natural God has created, but it has a profile if you look at it now let us look at it as a sort of landscape corrosion look at this particular picture I am sure that you are very amazed this (2:48) picture but I liked it very much I liked it very much because of multiple reasons. If I just leave aside landscape I try to understand this as a pictorial, then I do find that there are good combination of and contrastic combination of multiple colors which are all green and blue dominated.

It is hardly any sign of much of brown or red, so if you are an artist you are looking at it with one kind of view point, but as a landscape just I am looking at it as a profile, I am looking at it as nature, I am looking at the combination of profiles which nature has created. So these profiles, the forms, the formations are referred by many people in different terminologies some people call this now suppose I do I will say that this is landform design in fact I say this always in all my lectures that I am doing a landform design, so the landform I am designing, okay.

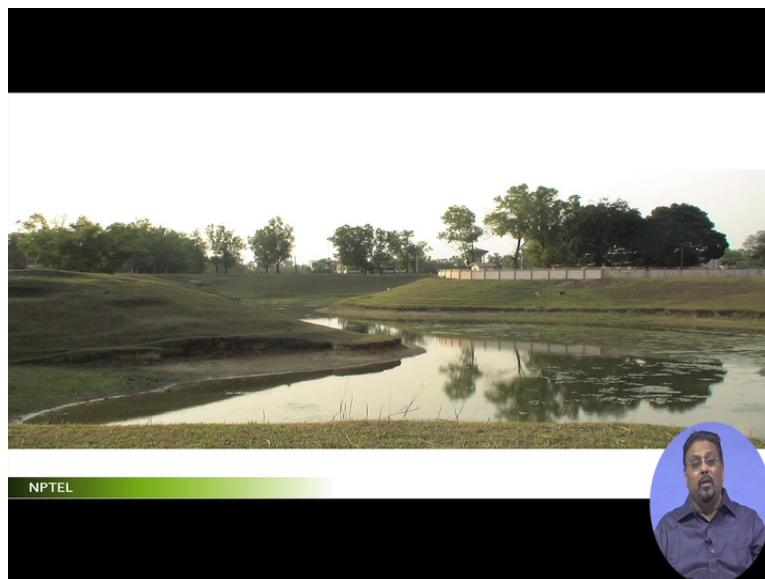
But some people say it is called ground modeling, no harm some people say as a ground shaping, no harm because it means the same and the action is also same, okay. Some people also say the landform shaping, landform modeling so I am not going to play with this words or do not get confused by these words, what basically the idea is that you have a land mass a surface which you are now going to play with for a creation of a landscape within a domain of a landscape, okay.

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Some more pictures like is it a landform? Yes, if you look at it yes there are multiple such levels, now if I consider only the central part where I am running by cursor, is it a landform? Yes, it is only thing is it is flat. How about the lower picture? Yes it is flat to a great extent and at one point certainly a little bit of rise and that to variable rise, no problem. So landform does not mean undulations, no landform means the profile of the earth if it is flat, flat landform, if it is undulated, undulated landform, if it is terraced, terraced landform.

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So the point is be very very clear the landform is not the undulations alone, landform is the profile of this particular earth makes a lot of sense in our landform works and especially the landscape work I am just sighting few examples which I have shot myself when I was doing a project with NIT (())(5:07) and I am sure the faculties and the students or the alumni of the NIT (())(5:12) will be able to identify this and really it is a wonderful area and what is a landform in it? See if I talk about the land cover in such cases this is land cover where do we have the water and we have the grass, we have the trees.

But if I am focusing on the landform, it has a profile, the profile which is gradually leading to the water edge and the profile which is gradually leading to the water edge and the water which is you know in a (())(5:41) profile. So the point is ultimately all together the profile of the landform which may give rise to another situation of creating something called drainage, modes, river and such things of pounds basically it is nothing but a combinations of landform and the water body.

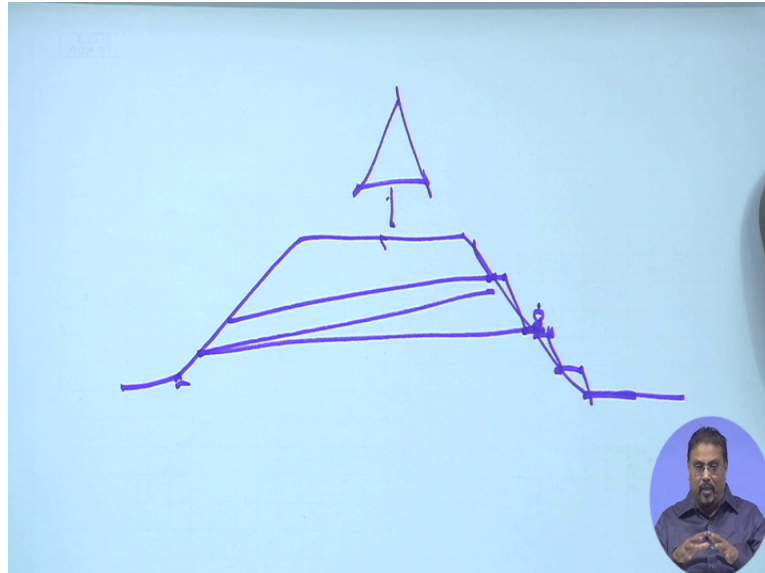
Now in this situation if it is suppose I have to design if it was whatever kind of profile and I am trying to design this landform that means I must know the technicalities of handling it because it is strongly related to the study a very detailed study called pedology. Pedology is a study of soil and when you are working with a landform you must be very clear about pedology but I do not want you to be an expert in pedology, I want you to have the basic knowledge of the pedology, rather I would say very simply termed as soil so that you know how it is to be handled how it to be manipulated maneuvered in your site because ultimately you are the creator, you are designing it.

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I am just showing you two three slides essentially that how how extensive the landform and the landscape can be blended here it is it is one of the slag dumps in Europe.

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Now this slag dump which was a dump like I am just showing you here as a pictorial on my paper just look at it that originally when I visited it was a slag dump like this with cut edges making paths and we have winded over this means it is leading like this kind of paths. So we walked along all these areas and went to the top of it and we there we found there is one piece of art at a (7:18) supported fine.

Now the thing is when I visited this I found it was all bare no plantations. So if I really could make out at that point of time I was not really very focused to see this landform, I was focused to see the object on the top at a (7:45) which is a you know wonderful creation of prize winning entry of one of the designer, but in fact I would have focused on this I would have seen that the landform has some kind of technicalities by which it has been created. And the picture that I am showing you is of the same place where now vegetation has been planted in between in all these areas and keeping the center portion here look at the picture center portion bare so that it gets accentuated and the rest of the portion is green.

Now, the plant scientist will say that okay it is a handy work of plantations, landform expert will say it is a handy work of landform works, the drainage people will say it is a handy work of drainage work, I would say please do not contest with each other because they are all integrated and this is how the landform design gets a very strong footing on the entire process of landscape design I hope I have made my point clear one more picture.

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Look at this it was also another very low key slag dump I may be showing some more slag dumps later which has been converted to landscape because (th) slag dump is a very strong reflection of a high altitude landform, okay and that is manmade.

Here, look at this if what is the role of this landform design in my landscape? If it was just look at the picture where my cursor is running if you just dump like this there was no harm it was just

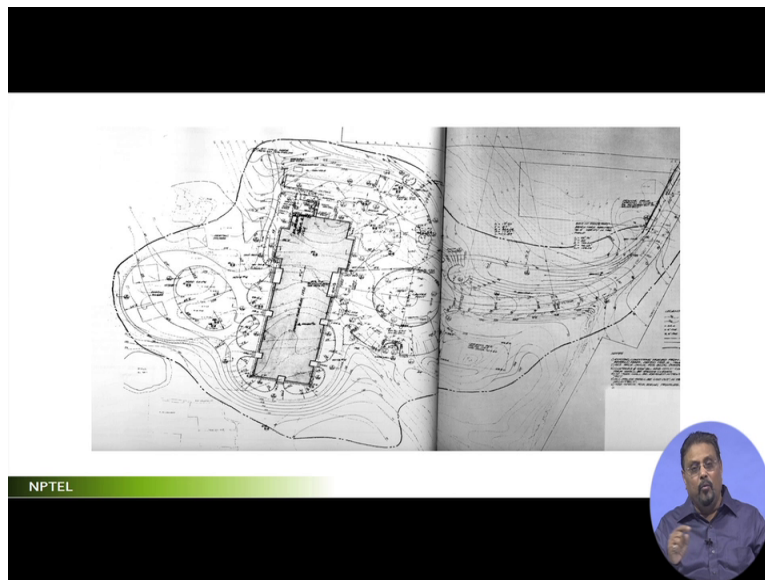
a dump which we call in the mining engineering term called overburden, okay it is overburden left over there alright, but when you are converting this to a landscape, then there are certain things which are coming in the utility of it, the profile of it, the look of it, the (fu) actual functionality and any other aesthetics associated with it then what happens is all these work started like say, okay if it is aesthetics and accentuation let there be a sculpture at the center at the pinnacle, okay if there is a sculpture whether it is to be viewed from away or should it be viewed from close.

If it is to be viewed from close, people would be allowed should be allowed to go to the top and if they have to go to the top there are many ways of doing it, you can always take steps and ultimately go like this as we do see in many of the hill temples. But here the designer he created an ambiance which will have a serial vision sequential vision always it will be changing if you remember I discussed about this in the circulation when your trajectory you know you are moving in one direction in a curve manner at the same time you are also sloping down I showed you that example when I was talking about the circulation.

Here it is just reversed, you are going in one direction and you are rising up. So naturally at every point of time the serial vision, the frame, the view frames keep on changing and it gives you different kinds of views. So (whe) by the time you have come say started from this particular point and came to this particular level you have almost traversed 360 degree but spirally, okay. Walking on the spiral, walking for the 360 degree and rising these elevations all these are the handy work in your landform design.

So the landform design must be respected well and practiced well. So here, many of the bases of this landform design I will be touch touching upon because these particular subjects are such it can take you know days after days to be more knowledgeable about it, I am just trying to give you the overview because this particular objective of this particular course is to discuss about the basics, so I will try to remain in the basics but yet also ensure that the basics that you are being exposed to gives you sufficient amount of background to understand and to comprehend and then later detail it out research it out by yourself, no no harm, okay.

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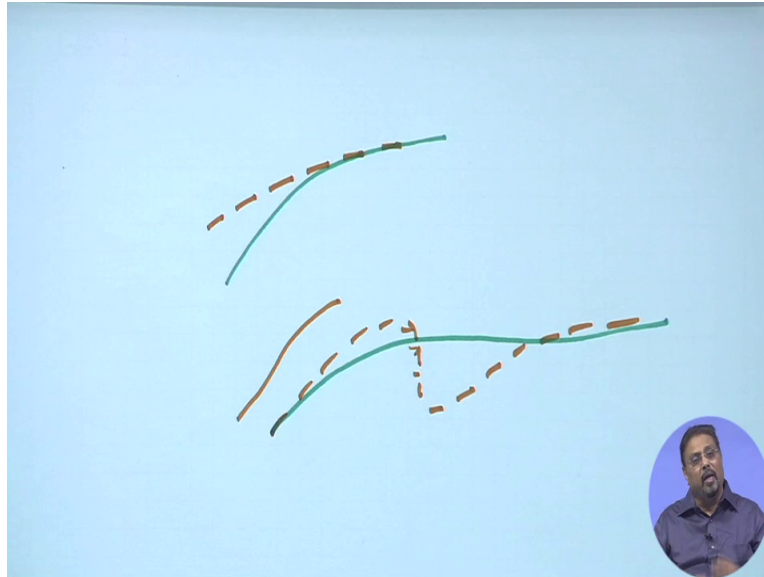


Now, how a landform drawing looks like, I have borrowed this picture this drawing I think the book is written by () (11:41) as far as I remember so old story I do not remember exactly I think it is a site planning that is written by () (11:49) at the end of the entire course I will give a series of references in which all those references which I have referred over here I will give a list of it so that at one shot you will get the entire set of references.

Let me tell you here at this point initially I thought that at the end of every lecture I will give a set of references and glossary, then I change my stance the reason is that every time if I keep on giving there will be multiple references which will be repeated so I did not want to be repeat. So what I decided is in the beginning you must have found that the set of glossary and maybe a few references, but later I have decided that okay I will give a set of glossary and reference at the end, okay.

Now, this is the kind of drawing look like when you prepare a landform drawing, what you have here let me give you an idea with respect to the basics of the landform, what is the landform? It is a profile, the profile how we represent in our drawing, we represent in terms of contours and the slopes you remember we discussed this in our site analysis and investigation and appraisal, okay.

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Now whenever we are drawing existing contour line we draw this as dash line and in case I am changing this to a graded contour line means proposed contour line with some of the parts of this existing contour line may match in such case what will happen is this is the line which will be continuous.

So what happens here is you see this particular drawing let me explain that existing contour line came like this the graded contour line which match with existing contour at this particular point and then change to this level this point, okay the level over here are same originally towards this now it is changed. The drawing that you are seeing here on the screen this particular drawing has both and in fact all your tactical drawings of the landform must be having both the contours so that it can be ascertain or comprehended by the executioner that how executer that how it is going to be handled.

That means there is always relative one existing contour line and then another proposed contour line, maybe be matching may not be matching so it may change. But one thing let me tell you that existing contour line maybe little irregular an example let me give again on this paper that existing contour line may sorry let me draw it in dash line it may be going like this and your proposed contour is trying to go like this it may so happen quite often you might find that existing contour line is very irregular, but very rarely you will find the propose contour line is irregular.

You know why? The reason is that the proposed contour line is the handy work of the designer and the designer is trying to you know stream line the levels elevations, slopes of that particular area when it is done very rarely irregularity comes in, it may not be a straight line but it has to be a little regular line then contour existing contour line. Existing contour line can go in any direction because that is our nature's creation, okay if you have understood this then let us see in this particular picture there are say at this point I am not sure whether you are being able to see at this point I can see an existing contour line which is going in this direction and along the same place the proposed contour line is going in this particular direction, okay.

Basically what has happened is that this contour what was the elevation now has been changed to this orientation. So originally if it was like I am just please follow my cursor and even if you do not see just follow the cursor and try to make a image of the line this was the original line and now this is the proposed line. So what will happen is the drawing is of this particular nature will always be looking very very complicated, this complication give me one second, okay this complication of the drawings does not make the work complicated it is basically the idea is that the whole thing is being changed and both are being kept on the same drawing so that people can comprehend.

So when you see this kind of drawings do not get confused, rather try to understand the contour lines contour drawings. You remember that I was discussing this during the site analysis when I was talking about the contour analysis showing a picture like this will give an idea that okay the whatever maybe the contour in whichever direction (16:28) contour is going. But the proposed contour line is following a some bit of regularities some geometries some technicalities.

So whenever you are handling this landform this has to be very very clear to you.

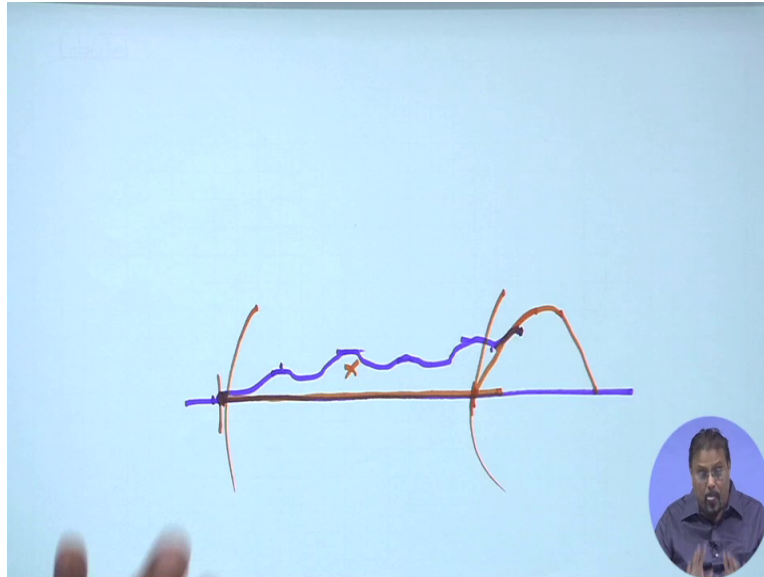
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Another drawing, look at this particular drawing you will find that this is the drawing in which we have different situations like say here there are multiple sports grounds have been kept and a racing track has been given over here this picture I have taken essentially to show you that original the ground was not that flat and for the racing track you have to have a very flat land so originally it was not.

So to make this particular regular flat ground the ground had to be leveled I am just trying to give you an idea with respect to a section of this section along this particular line if you are seeing what I am drawing here try to follow.

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Originally if this was a lowest point and this was the highest point it might had been having this, I am just trying to generate a very conceptual picture for your understanding. Now what happens is this area has to now made flat if the whole area has to be made flat and if I consider that these are different contour levels these are all different levels, okay in such case to make it flat what you have to do is in fact think realistically I you have to push the entire set of soil to the edge.

Once you push the entire set of soil which is patrolling above to attain the level which is this as a flat so called flat, then what will happen is the whole thing will come here and ultimately get collected at this particular point and then become a hip, I hope this is understood. Option, option 1 is cut this through it somewhere else, option 2 is cut this dump it here, okay now as soon as you have done this what happens is the contour line which was originally at this particular base came down to this particular level.

So the original contour and the proposed contour means this line has come to this that means, this at up to this level the level is same and the reaming portion has been changed. It is not necessary that the entire amount of earth that you are removed from here has to be dumped over here but I will make a separate description for you on this issue. But the idea is the whole set of soil that has been removed and pushed and ultimately brought to this level give rise to this particular picture is here a very series of contours if you look at it.

A series of contours which are very closed by that means, if the contours are closed what is our inference? If the contour lines are closed that means they are steep, if the contour lines are apart that means they are gentle, okay if the contour line is entering into another that means there is a cave, if the contour line is merging with this that means there is a gorge the verticality I hope you remember that last time I discussed, okay. So the point is this is how the whole landform design you have to work out with.

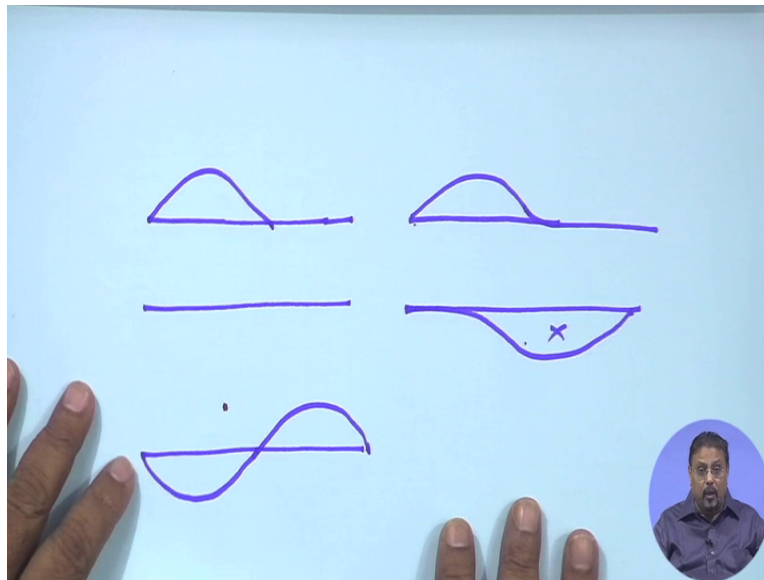
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Now let me start a little formally on this issue, what are the aims of the landform? First and foremost purpose of landform design people think it is esthetics, people thinks it looks, no it is for efficient drainage to achieve efficient drainage because see the landscape project is outdoor it is substitute to rain fall and that particular area is has to be protected from water logging and all this rather it has to be saved from water logging, if it is such then what is important is the water has to fall and then immediately get drained out.

If such thing has to happen naturally without any external forces, then you have to give a slope. The moment you give a slope which was nonexistent earlier you have created a landform. Another thing let me draw here for your understanding, see quite often you know why I am raising these points because quite often I got some questions from my students you know for seeking a little further clarification.

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Look at this paper, I am just drawing situations if there is a land like this which is flat if you create something it is a landform. If you have a land you do not do anything, it is a landform activity because you are deciding nothing to do on this if there is a (ma) mount like this which you want to flatten this is the landform activity. If you have a flat land where you have to dig by cutting this is also landform activity and if suppose you have a flat land where you have taken the land from here soil mass from here and fill it up here, this is also landform activity.

So landform activity means basically handling that profile here what happened is it was flat, it was sorry it was there and it has been flatten and here it was flat remain flatten, here it is it was flat then you dug from here and then you filled up from here landform activity. Here you had this created and then maintain it, here you have in this you have created, in this you have dug it out and remove the soil wherever you wanted all these are landform activity. So if everything is visible and practically required in terms of landform activity when you are trying to get efficient drainage, this should not be missed this point is very important.

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The slide features a black header bar at the top. Below it, the title "Aims of Landform Design" is centered in a red font. Two bullet points, each preceded by a small yellow square, are listed below the title. The first bullet point reads "To achieve efficient drainage" and the second reads "To facilitate location of buildings and roads etc.". At the bottom left, there is a green and white NPTEL logo. At the bottom right, there is a circular inset image of a man with a beard and glasses, wearing a blue shirt, who appears to be the speaker.

Aims of Landform Design

- To achieve efficient drainage
- To facilitate location of buildings and roads etc.

NPTEL

Next aim is to facilitate of location of buildings and roads etcetera in the landscape what happens is you are trying to locate buildings different parts of the greens, gardens, water bodies, pathways, roads, fountains so basically your (lan) landscape activity is not purely living it in the nature. So you are trying to bring in some elements some components within your landscape the moment you are doing it basically you are ensuring this is what is facilitating you are ensuring that each of this components has its own place.

That means here this point refers to planning how you organize, how you arrange now if you fall back or rather look back towards this particular examples how they have developed you will find basically what they have done is they have followed the second path of it this second point here they facilitated a different functions different component within that particular landscape. This is what is the landform work, means here you are deciding what is going to go (th) where.

Interestingly I will come to one point here that what analysis that you have already done which makes sense for this, I will come to this after this slide is over, okay. so the first point then I am repeating the first point is whatever it is almost do nothing for landform but you have to do at least minimum so that water rolls out does not get logged.


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Aims of Landform Design

- To achieve efficient drainage
- To facilitate location of buildings and roads etc.
- To create pleasing effect and appearance of the project site

NPTEL



Second one is where which function are to be placed, the third to create pleasing effect and appreciate appearance of the project site, that means now you are doing the landform work for esthetic purposes look to bring more look interesting look esthetic look beauty to the whole site.

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Aims of Landform Design

- To achieve efficient drainage
- To facilitate location of buildings and roads etc.
- To create pleasing effect and appearance of the project site
- To fit design elements to site

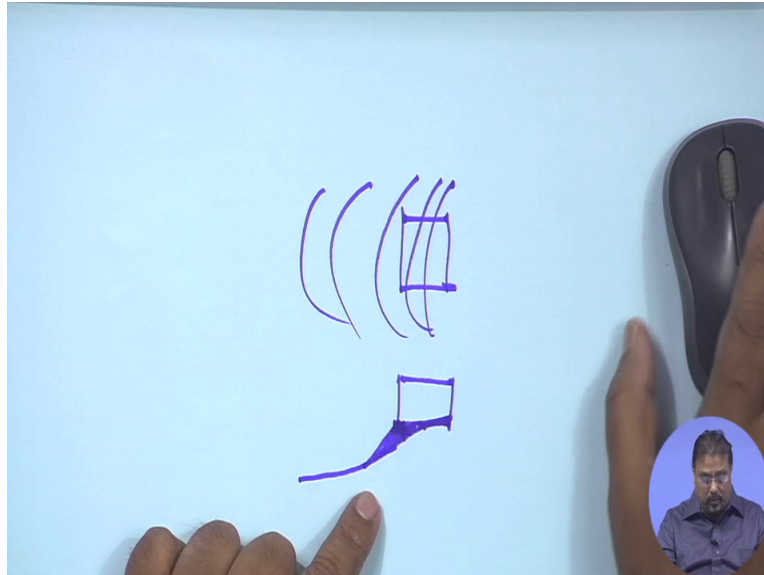
NPTEL



And then fourth one is to fit design elements in site you know this fitting the difference between the second point and the fourth point is very critical, never get confused. The fourth point is where you are going to place what and the sorry the second point is where you are going to place what and the fourth point is how you are going to place a particular function where and how.

Where has been decided by the second point so in the fourth point you are saying how it is going to be done, an example let me tell you.

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Suppose in the whole landscape I am trying to generate this particular idea for you, suppose in the landscape I have a contour like this in this contour I want to place some function which is going to be here, the moment I see this I am seeing that it is very steep so the section if I draw section is like this and on which I am trying to put a building. What I have done in the first one is a second point I have (con) supported look where it is where it is to be placed and what I am going to do now here is the fourth point of action in landform design how I am going to do it, okay.

So what happens what you will would do? Naturally you would do is either you droop it from the below so that this portion is supported on the ground and this portion is hanging above and then you are propping so it does not fall. Another designer will say no, I will not do this propping I will add more soil here and I will seal this up and make it fully supported to this. So basically initially you were facilitating location and the third in this particular point you are trying to fit, for fitting there are lots of different activities, okay.

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Aims of Landform Design

- To achieve efficient drainage
- To facilitate location of buildings and roads etc.
- To create pleasing effect and appearance of the project site
- To fit design elements to site
- To perform land reclamation activities

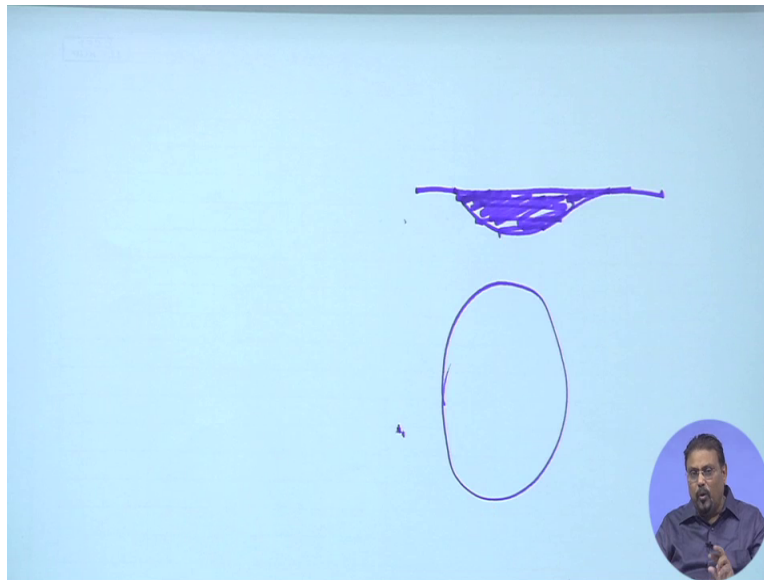
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Finally there is a fifth activity to perform reclamation activity, reclamation activity has a differential scales reclamation activity is basically means you have some land some piece of land within your landscape project site which is now lying unutilizable unused I would not say, unused is you are trying to make use of the entire area so I am not saying unused unutilizing this particular kind of you know path we call it as derelict land, that means it has some problem some kind of problem, stability problem, depth problem, the soil quality problem whatever it is meant for some reason we cannot use it.

To perform reclamation means I am now trying to reclaim this from the worst case to the best case or the better case this is what is the landform activity, an example you must be seeing in the urban years now a days have strong reclamation activities which are going on in rampantly without any regulation of people are protesting it, you know what is that?

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In most of the urban areas in the suburbs of any part of our country you will find that there are there were originally ponds water bodies there where.

And these water bodies somehow you know have we can dry because of the hydrological changes the water table (dep) depleted and ultimately these become a kind of ditch which is dried. People are now questioning that why should we have a kind of ditch or a turf which is dried if this had water people would have liked it people say that if it is not having water then this piece of land which I am having in the form of say a profile like this in plan is now underutilized or unutilizable let us make it utilizable the moment it is agreed by some people the owner or the say people who are suggesting the moment you find this you find that this is being filled up with soil.

This is theoretically is reclaiming the land from unutilizable to this reclaiming the land from derelict to proper, okay this is what is a reclamation activities I have given an example in small scale but I can tell you that reclamation activity can go to a very very large extent a large area which is being spoiled not being handled properly. So these are to be now reclaimed to make best use of it in the landform, is that clear? What is landform? Is that clear that what is the aim, now I will go technically forward to discuss about various aspects how to handle this landform, okay enjoy it.