Basic Surveying
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Module - 10
Lecture - 1

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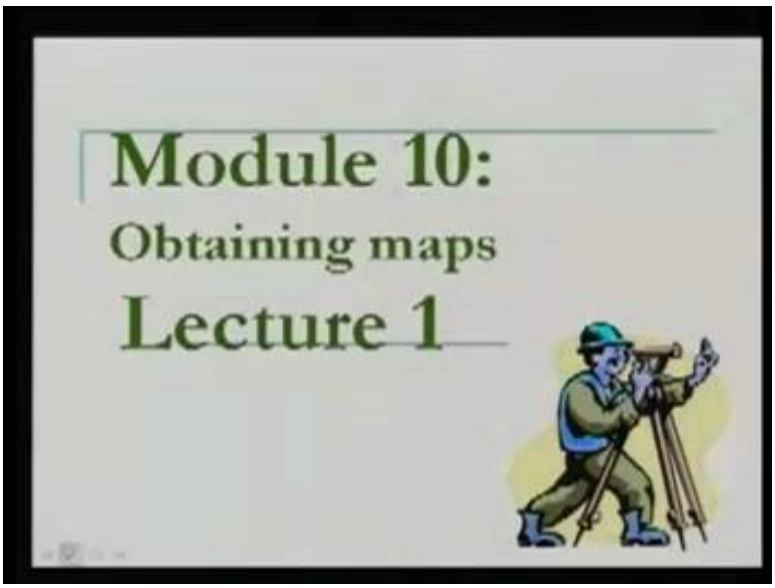

Welcome to this video lecture on basic surveying. Today, we are in module 10 and this module is about obtaining maps. If we need to purchase the map of our area how to go about it, what is the agency in India, from where we can buy the map? So, this is what we are going to cover in obtaining maps. We will have only one lecture in this module, what we have done so far as is seen in the slide?

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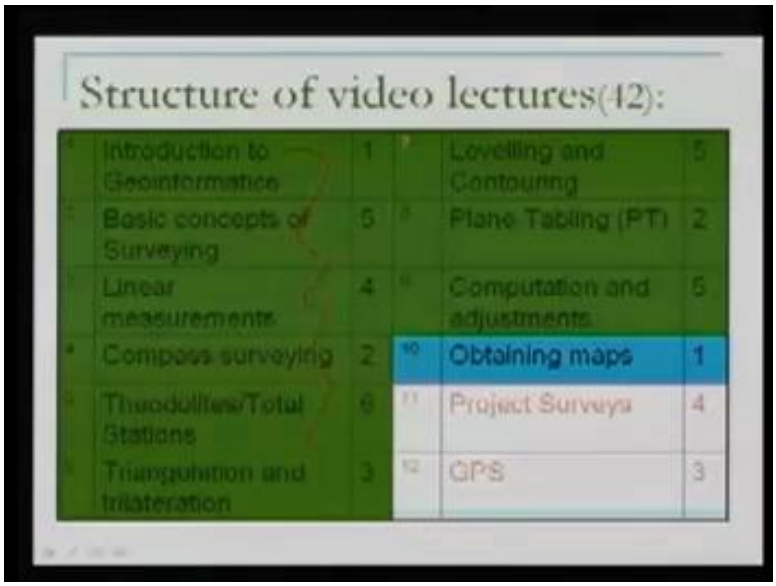

We have done all these methods and these methods so far are about making the maps not only making the maps. We have learnt the various techniques of surveying and levelling and computation of the data adjustments of the errors. So, at the end of it we may be able to make a map also we may be able to do various other kinds of jobs which are related with the surveying. So, we have already understood what a map is why the map is important what all information's should be there in the map we have seen the procedures of making the maps. So, today in our, this module we are looking into this obtaining maps.

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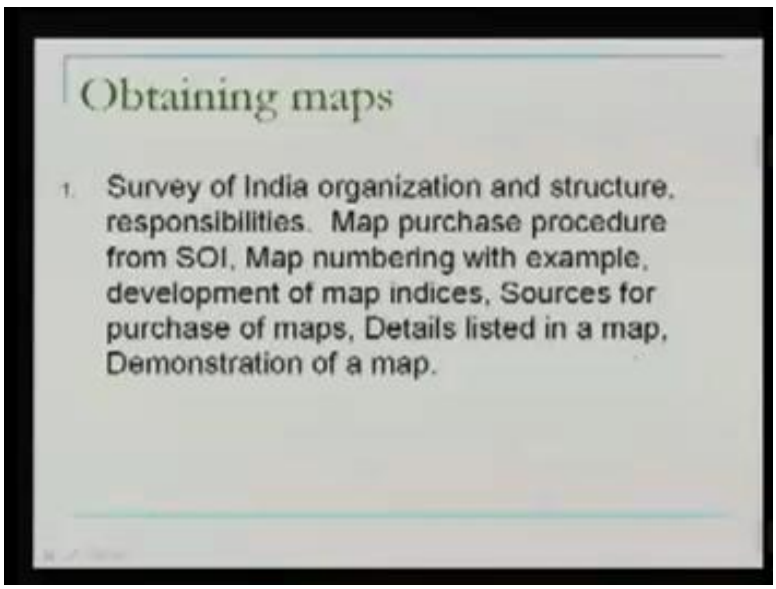

We would like to cover in this as you can see here the Survey of India organization. In India the main organization for mapping is Survey of India we will see what this organization is it structure and its responsibilities. We will see how we can purchase a map from Survey of India. They follow a particular map numbering system. So, we will see we will try to understand that system. So, that you are able to purchase a map of your area provided you know some basic things about your area. Also one associated thing that is called map index, how to develop that index why it is useful? We look into that. And finally, we will see a demonstration of a Survey of India toposheet. Well this Survey of India organization is the main mapping organization in India.

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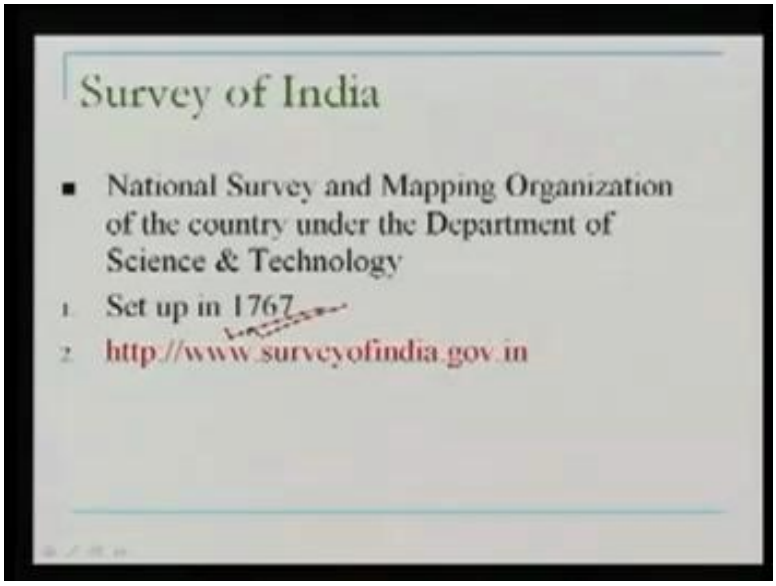

It was set up in 1767 and it is said to be the oldest scientific organization in India. Old details of Survey of India you can find many of the details in their website, which is Survey of India dot gov dot in. For this lecture I have taken lot of material from this site as well as I obtained some material from Survey of India leaflets as you will see in this lecture.

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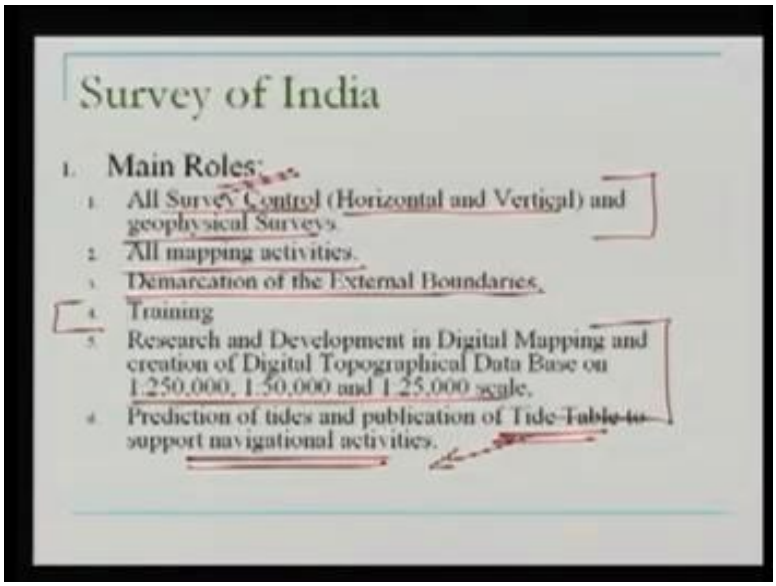

The main roles which are there with Survey of India are Number 1 and very important 1 is all survey control horizontal and vertical is to be done by Survey of India. So, you know we have already discussed this, what is the vertical control what is the horizontal control, what is the geodetic control? And this control for our country is established by Survey of India. So, if you need the coordinates of any control point we will have to approach Survey of India for the coordinates. At the same time they also perform geophysical surveys then all mapping activities the meaning is whether it is large scale small scale mapping Survey of India does all.

Any development work you know a big project a dam site is there for which some surveying job is to be done. So, Survey of India is the organization which is requested many times to perform those jobs also. Then the responsibility of Survey of India is to demarcate as we can see here external boundaries of our country. In addition to these it also provides training, training to its own officers training to people from public as well as to foreigners. It does research and development also. One very important activity of Survey of India right now is developing digital data base. So, they are developing the digital data base at various scales as we can see here. One more job of Survey of India is prediction of tide as well as they make the tide tables as we can see here these are very important tables for navigational activities.

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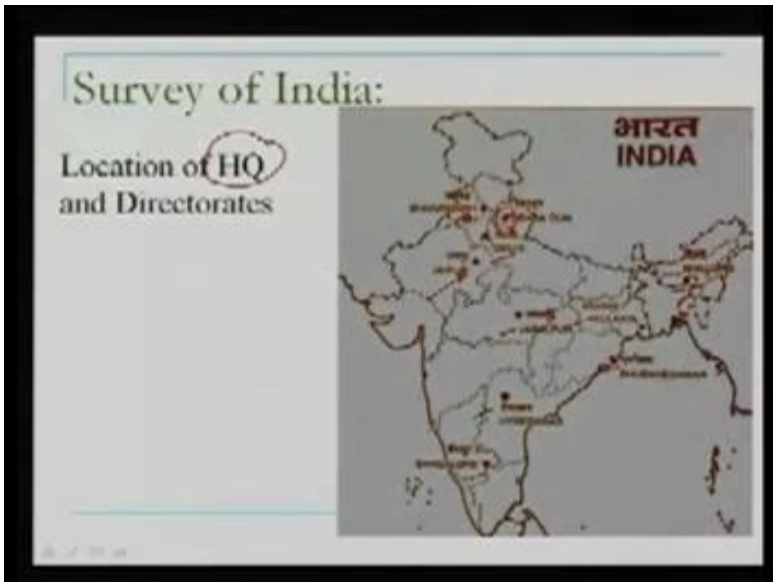

Well, here in this map we can see the location of Survey of India head quarter, which is there in Dehradune. And then the various directorate all these are the directorates listed in Shillong, Bhuvaneshwar, Hyderabad, Bangalore all which are listed in this map.

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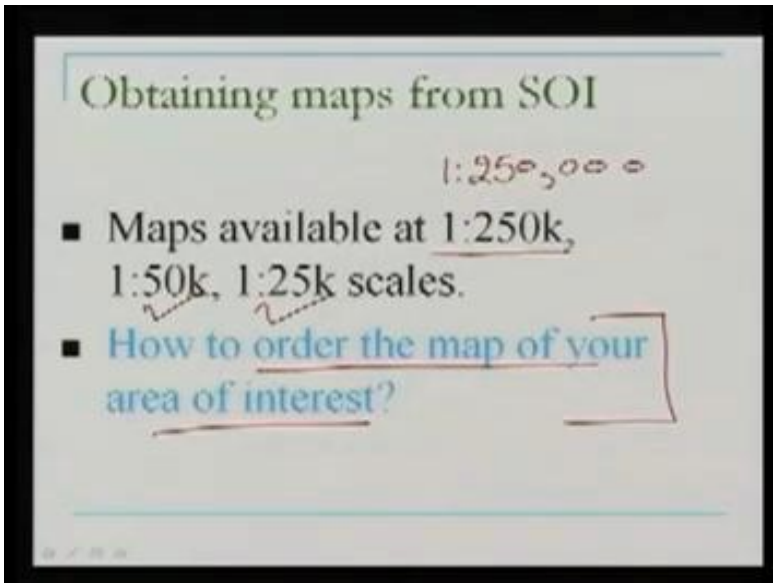

Now, we come back to our own question you know for example, I need a map to carry out a project for this area how should I proceed, how should I approach the Survey of India what should I ask them is there any procedure for that? So, we will try to see that thing now. The maps which are available from Survey of India are at various scales. As

we can see here the maps are available at 1 is to 250000 this is a. In fact, 1 is to 250 K means the 1000 here to save the space I am using K. Similarly, 1 is to 50000 1 is to 250000. At these scales we can procure we can buy maps from Survey of India. So, the main question is how to order these maps for our area of interest? Well there is a document as we can see here.

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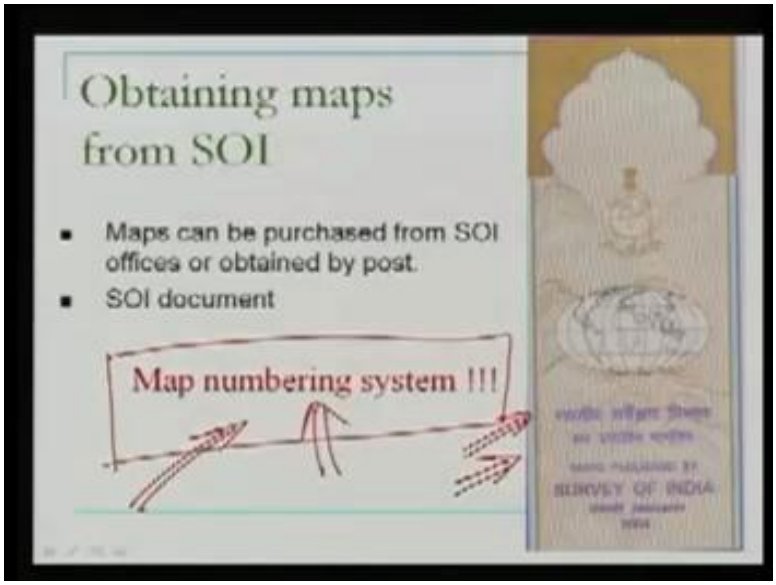

If you write to Survey of India they will post you one document a leaflet this is the front page of that document. And once we open this document it has various details and how to procure a map is listed inside that what all maps are available at what kind of scales that is also listed there. So, what we will see? We will make use of this document and the system which is given there in order to procure a map from Survey of India. Now, there is one very interesting thing, because in order to procure a map we need a system in order to indicate that.

Well, I need the map of a particular area and this system is map numbering system. So, if I know the longitude and latitude of this place this is a basic information I can write to Survey of India I need the map of this longitude latitude what kind of coverage and all that. I can also write it you know better way I can indicate that well I need a the map numbers you know from this number to that number that kind of thing we can give some numbers. So, based on those numbers the Survey of India can supply the maps to us. We

can buy these maps going to the Survey of India offices in their sales department or we can directly write to them and get it by post.

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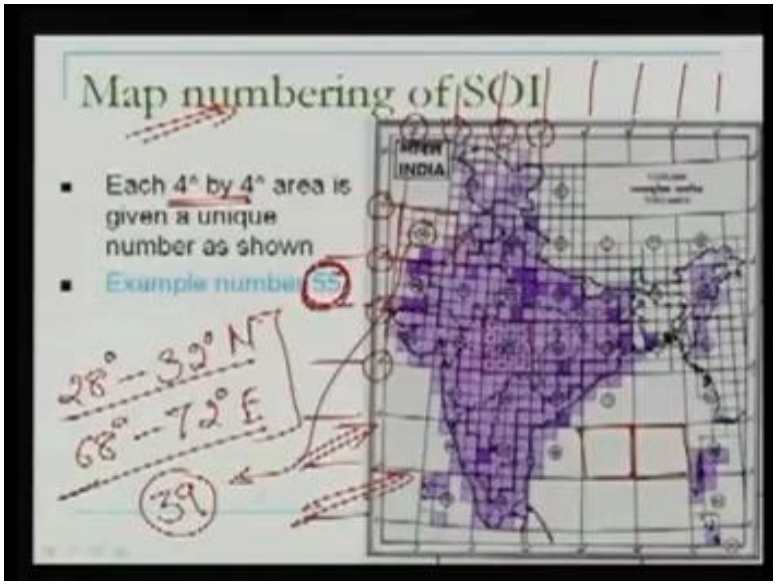

Now, over here we would like to see as we can see in the slide that what is the map numbering system of Survey of India? Well, look at this map here and this is also I have taken from the leaflet from Survey of India the leaflet which was from Survey of India. Now, in this we can see the entire country India and if we are you know interested to procure the maps we will make use of a system. As we can see the latitudes over here and the longitudes here the entire area surrounding India has been divided in a grid the grid is 4 degree by 4 degree. Well, what is the meaning of this 4 degree by 4 degree? In that entire area the latitudes and the longitudes we have made the grids of 4 degree by 4 degree. So, one block is a 4 degree by 4 degree. Now, we can see those blocks here for example, this is one block, this is another block and all these blocks are 4 degree by 4 degree.

What Survey of India has done? They have given these blocks some numbers for example, here this particular block which extends from you cannot read it I write it 28 to 32 north. That is the latitude and as well as it extends here 68 to 72 68 to 72 East. So, within this within this extent the number of the block which is given over here is 39. So, the very first number in the system in the map numbering system which determine you know depending where my area of interest is. For example, if you see in the slide if my

area of interest is within this extent you know it is from 20 to 24. And as well as here 76 to 80 if my area of interest is within this extent I will say my map will be having a number 55 or our interest block is 55. So, that is the very first number which we get from this sheet. Now, other second one.

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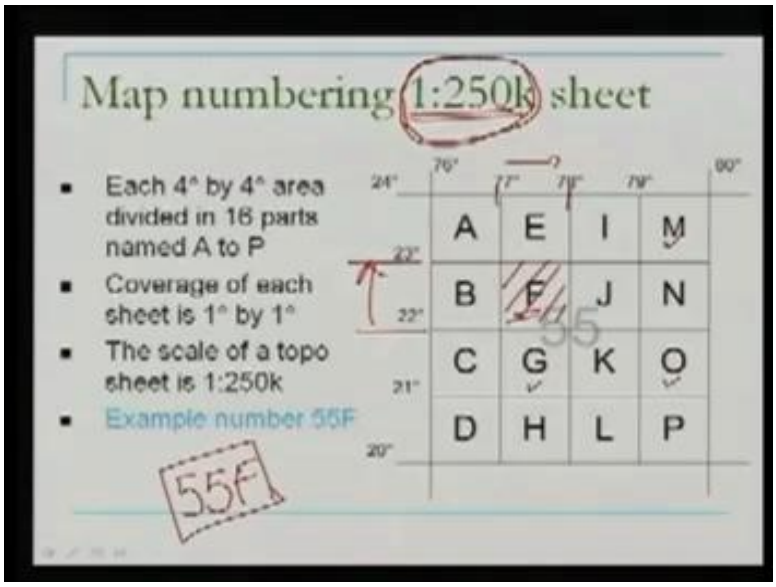

Because the map which we can procure from Survey of India they start from 1 is to 2 100 50000 scale we can also have maps at 1 is to 1 million for states. But here for the toposheets we are looking for a map at 1 is to 250000. So, for our area of interest if I am going to procure a map at 1 is to 250000, what should be the number of the map? How do we find that number? This is what we are going to see now. We have already seen in our previous drawing. Well, where is my area of interest? My area of interest lies within this block and we are saying that 4 degree by 4 degree block is having a number 55 now my area is within that. So, what we have done this 55 as you can see here the 55 block which is 4 degree starts from 20 to 24 and 76 to 80 this is 4 degree by 4 degree block and its number is 55. Now, what has been done? It has been divided in 16 further blocks as we can see here and each of these are given the names A to P as you can see. So, we have further sub blocks which are having a size of 1 degree along the longitude and 1 degree and along the latitude again 1 degree, so this 1 degree by 1 degree.

Well now, we will see where is our area you see know the longitude latitude of our place I can see where my area falls. So, if my area of interest falls let us say in this block my

area of interest is within 77 and 78 longitudes and 22 and 23 latitudes. So, my area of interest is in F block. So, what we will say our map number is 55 F. Now, at this stage at this stage the map sheet will have a scale of 1 is to 250 as we can see over here. So, if you are interested in 1 is to 250000 scale maps, the numbers will be like you know 63 B 55 F or 55 G 55 O 55 M or 53 A. You know any number like that indicates are in a scale a scale of 1 is to 250000. So, what we need to do? We need to locate in which block our area of interest is and then we can order the map. Well, we might like to go in a scale which is better than this scale 1 is to 250000 we would like to go for example.

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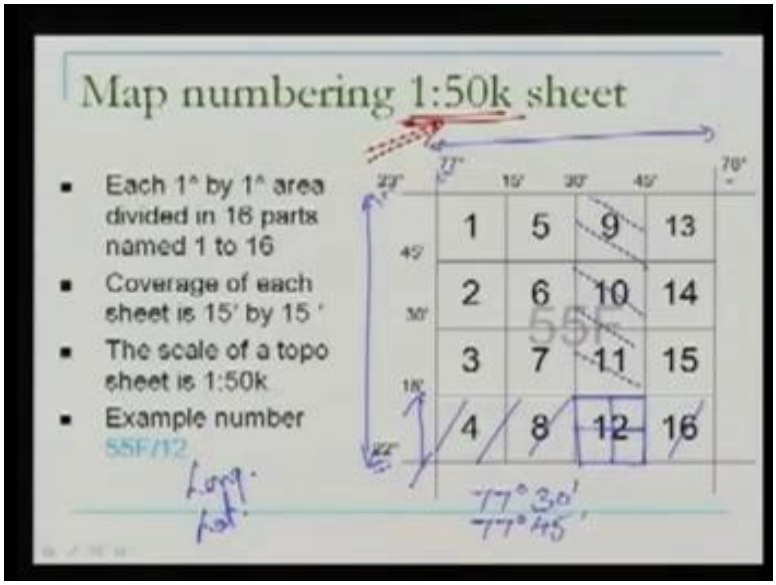

For a scale 1 is to 50000, because we know the that you know details the information will be more in 1 is to 50000 then in 1 is to 250000. In one is to 250000 that large area is covered within that sheet. But you know 1 is to 50000 the area will be smaller the sheet size is same that is why our scale is 1 is to 50000 and we will have more details. So, if you are interested in more details you would like to go for a better scale. Now, at this scale how to locate that what will be the map sheet number? What is done in this case as we saw earlier our map sheet of interest was 55 F that is the map sheet of our interest you know one block here and this block had a size of 1 degree by 1 degree. So, what we do? We divide this block as we can see here we divide this in further parts 16 parts like that and this is what I am doing in my next drawing here.

I have divided this in further 16 parts and I am giving the numbers 1 2 3 4 and so on up to 16. Well, now our block that entire one we know it this is 1 degree distance 22 to 23 as well as this is also 1 degree distance 77 to 78and in between we have now 16 sub blocks. Again depending upon where my area of interest is if I know the longitude and latitude of my place I can find well my area of interest is between 22 to 22 15. So; that means, it should be somewhere in this and it is in between in terms of the longitude 77 30 and 77 45. Let us say my area of interest is within 77 degree 30 minute and 77 degree 45 minute. If it is, so my area of interest should be somewhere within this. So, what we find from here you find that my area of interest is in this block.

Well, what we will write now our sheet number will thus become 55 F by 12 as you can see F by 12. So, any sheet number like this you know 55 F by 12 is a sheet of 1 is to 50000 scale. Similarly, we may have you know 63 V by 4. So, that is also the map sheet at 1 is to 50000 scale. So, we can determine the numbers at 1 is to 50000. Well, let us go further down for the down mean if you looking for even better scale let me delete it here. In order to clean it for a better scale what is done this area or this particular block is divided in further 4 parts. Because this block has a size now, as you can see here 15 minutes in latitudes and 15 minutes in longitudes, so we have 15 minute by 15 minute sheet.

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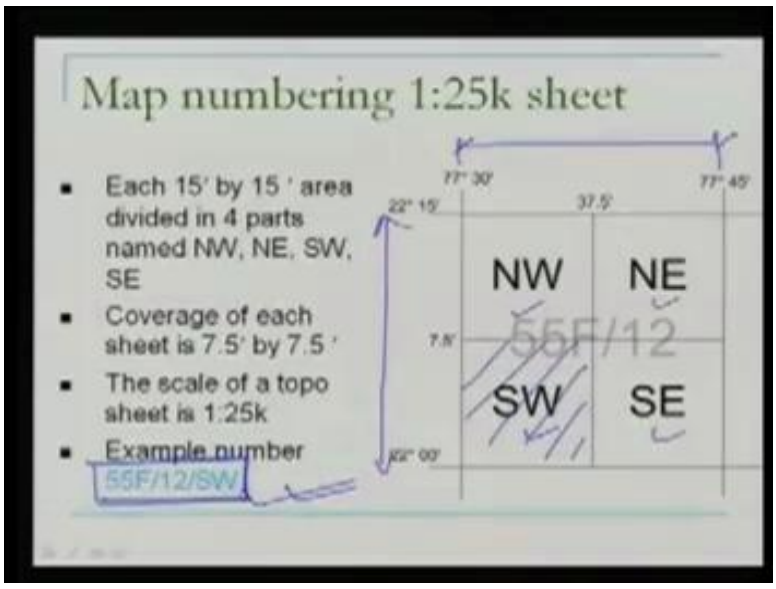

What we do this 15 minute by 15 minute, because this is 15 minutes and here also it is 15 minutes we divide this it in 4 parts and we give them names NW NE SW SE. Again depending where our area is depending the latitude and longitude if you find that our area should be within this we give the final number to our sheet as 55 F by 12 by SW. So, this is the final map sheet number. Now, what we will do? We will see this entire process by an example, we will start from a longitude, latitude and then we will follow that example. So, that we understand it better. And for the example I have taken the place as IIT Kanpur.

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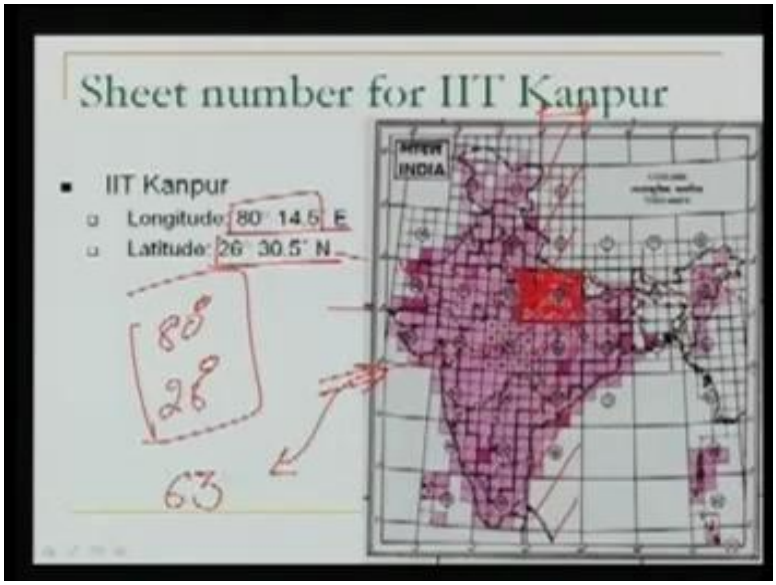

For the IIT Kanpur you can see here the longitude is 88 degree 14.5 minutes in East and latitude is 26 degree 30.5 minute north. Well, what we are looking for I am looking for let us the job is I need to buy a map for this area for IIT Kanpur at a scale of 1 is to to 250000. So, what should be the map number? That is the job. So, what we will see or what we will do the very first job? We will look for this area where this particular point this longitude latitude is we will try to look at in our very first sheet this sheet has 4 degree by 4 degree blocks.

So, if you follow it 88 and 14 and you know 88 degrees and 26 degrees this if you go over here 88 to eighty-four is this block let me shade it. Now, this is 26 latitude, now where the 26 latitude will be this is twenty-four and twenty-eight. So, 26 latitude will be here let me shade this also. So, what we find these 2 they intersect or our area of interest

is within this. So, this is our area of interest and this area of interest as written over here has a number 63. So, that is the number at a scale of let me delete this, this the number at a scale of or I would not say scale rather at 4 degree by 4 degree level our area of interest is in 63 sheet or 63 number block. Now, let us go further down.

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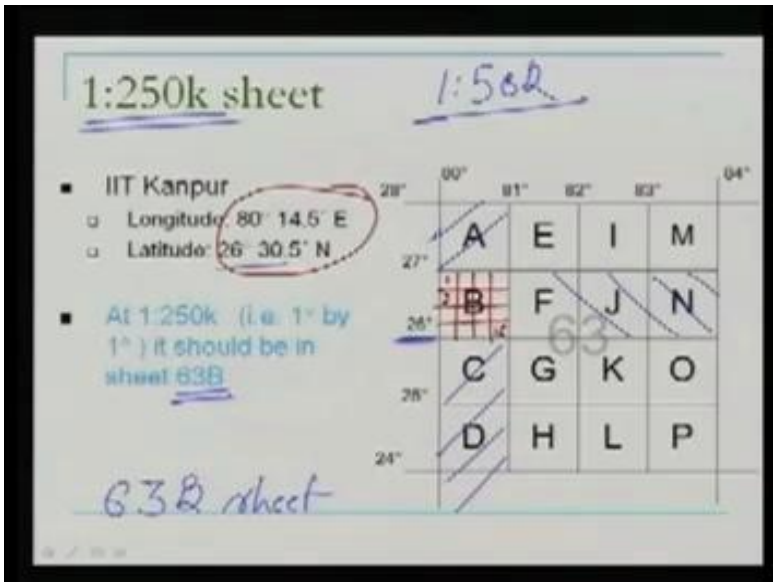

Well because we are looking for a map sheet which is at a scale of 1 is to 2 hundred fifty thousand. So, what we will do this block 63 is being divided again as we have seen in 14 parts sorry 16 parts A to P each is 1 degree by 1 degree the degree sheet. Now, in this where our area of interest is our area of interest is no 88 14 26 30. So, if you see over here 88 14 let me shade it again 88 14 means it should be somewhere between these 2 longitudes 26 30, because this is 63 here 26 degree and 30 minutes. So, it should be in between these 2 latitudes.

So, what you will find from here? Our area of interest is in 63 B sheet. Well, if you are going to procure a map at 1 is 250000 for the area where IIT Kanpur is we will say that we need a sheet of number 63 B and the extent of the sheet is 1 degree by 1 degree. Well we may like to purchase a map at 1 is to 50000. So, what we will do as we know we would like to or rather as per the system. The way the system which we follow we will divide our, this area in further 416 parts as you can see over here and these are given numbers 1 2 up to 16. And then we will see where this longitude and latitude are. Let us do that.

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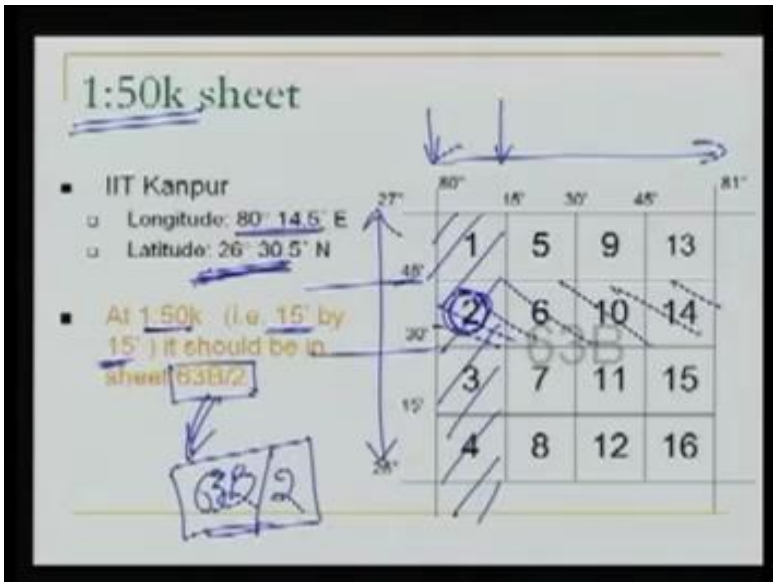

One degree by one degree this is one degree in longitude and in latitude. Our area is 88 degree 14.5 88 is somewhere here 14.5 will be within this these 2 longitudes. So, our area of interest should be in the shaded area when we look at the latitude it is 26 30. So, 26 30 should be, because it is 30.5 more than 30 and less than 45. So, it should be between these 2 latitudes. So, our area of interest should be here. So, what we get from here? We get that our area of interest is having a number 2 at this.

So, what we can write? We can write that our area of interest which has an extent of you know 15 by 15 the sheet extent at 1 is to 50000 scale has a number 63 B by it is 63 B by 2 all right. So, if we procure this sheet 63 B by 2 from Survey of India the sheet will have a scale of 1 is to 50000 as well as the IIT Kanpur will be there inside that sheet. In a moment we will see a demonstration of a sheet like this that sheet is at 1 is to 50,000 scale and having this number 63 B by 2 and will in that sheet we will see that IIT Kanpur is located in one column.

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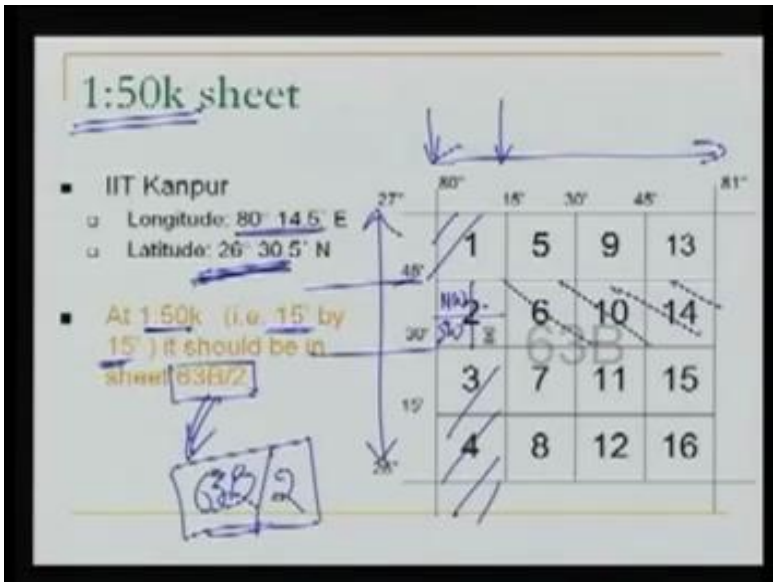

Well, as we know what we do we divide this area further, because that is our area of interest. If you are looking for better scale what we will do in the next step this area is divided further and given the names as NW, SW and so on. So, this, what we do now.

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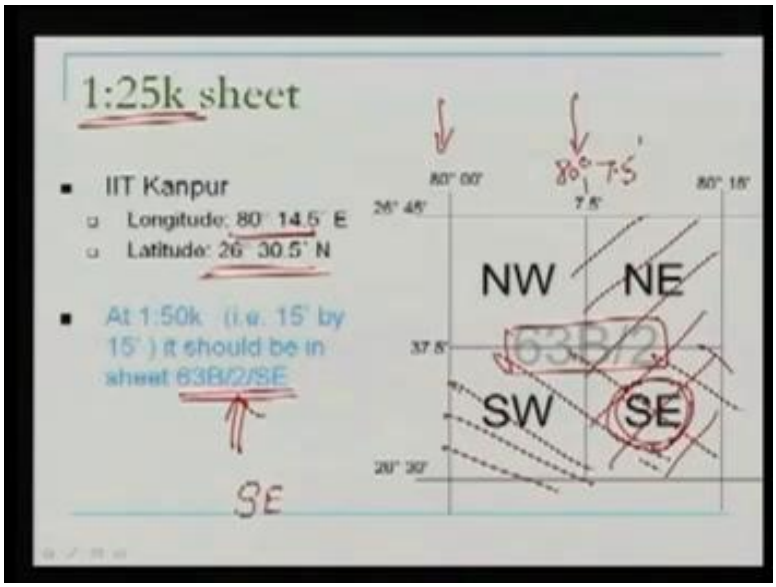

For a scale of 1 is to 250000 well where our our area of interest should be it is 88 14.5. So, 88 is here this is 88 how do how do I write this point this I can write is at 88 degree and 7.5 minute. So, my area of interest is between these 2 longitudes. Now, in terms of the latitude it is 30.5minutes. So, 30.5 will be somewhere here. So, what we find that our

area of interest is in SE block. Well, we can give our area of interest the number now. So, the number will be 63 B by 2 by SE because that. So, far you are in 63 B by 2 that was the sheet which was divided in further 4 parts and finally, we find that we are in this SE block our area of interest is there. So, that is the sheet number.

So, for procuring a map sheet at 1 is to 25000 scale for IIT Kanpur or rather a sheet in which IIT Kanpur will be there we will write to the Survey of India a map sheet number as 63 B by 2 by SE . So, this, what we have seen now how to procure the maps. Many times what we will observe that procuring a single sheet is not good enough. You know you are working in a project and in that project we find that you know your project extends or the extent of the project is more than the size of one sheet the area covered by one sheet so many times. What you would like to do? For example, in this case.

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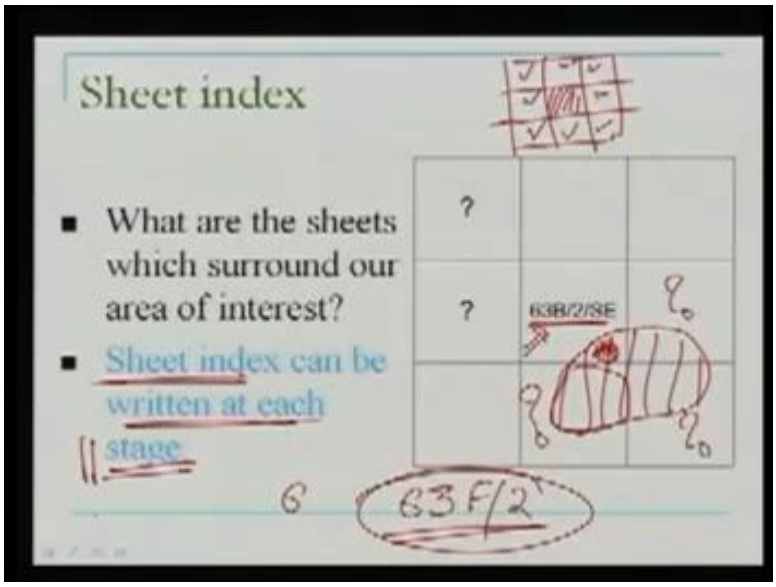

We procure a sheet 63 B by 2 SE yes IIT Kanpur is within that. Let us say for example, if that was the sheet and the IIT Kanpur is somewhere here in that sheet and if we are going to you know do a project where we are interested in not only in IIT Kanpur, but also in surrounding area. So, what we are interested in we are interested in this entire area we know where is IIT Kanpur the IIT Kanpur is in sheet as we can see again here IIT Kanpur is in sheet 63 B by 2 by SE, but our project is going or spilling over that sheet. So, we should know what are the adjacent sheets also. I have procured this sheet now using the sheet I should be able to locate that. In order to work in this particular area

what should be the sheet number here, what should be the sheet number here what should be the sheet number here?

So, basically what we are looking for? We are looking for our main area main sheet and what are the adjacent sheets. So, this kind of index which we say sheet index, so we can generate the sheet index based on the system of the map numbering if I give you any map number for example, 63 F by 2. And I ask you can we generate the sheet index for this the meaning is the sheet number over here is 63 F by 2. What is the sheet number here, what is the sheet number here, what is the sheet number here, what is the sheet number here? And all that can we determine that this is important we need that you know many times. So, there should be a system there should be a way out of doing it.

So, we will do it for again the same example IIT Kanpur and one more interesting thing here the sheet index can be returned at each stage at any stage. Now, what is the meaning of this statement? In the very first level of map numbering you know 4 degree by 4 degree blocks if I know the IIT Kanpur is in 63 number block I want the sheet index there itself. I know the IIT Kanpur at a scale of 1 is to 250000 is in 63 B. So, for 63 B being the centre sheet what are the sheets adjacent I can create that map index. So, similarly what I am doing I am creating the sheet index at 4 degree by 4 degree level 1 degree by 1 degree level 15 minute by 15 minute level and half a minute by half a minute sorry 7.5 minute by 7.5 minute level. So, at each level we can generate the sheet index then and this is what we are going to see now.

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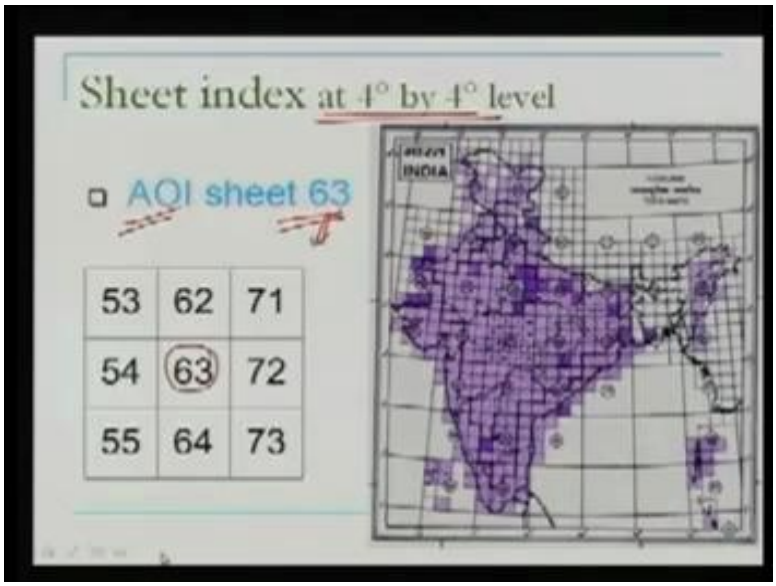

Now, here in this case at a level 4 degree by 4 degree well our area of interest AOI stands for area of interest our area of interest sheet number is 63. So, what is the sheet index? To find the corresponding sheet index for this being in centre and the surrounding sheet sheets no, what are the sheet numbers over here, what would we do? We will go back to our this map well 63 is here I can see the corresponding number 62 64 71 72 73 53 54 55 and this is what I write here 53 54 55 62 63 64 and so on. So, at this level 4 degree by 4 degree this is the sheet index we can say with this mean formation what are the adjoining or adjacent sheets. Now, in the next level.

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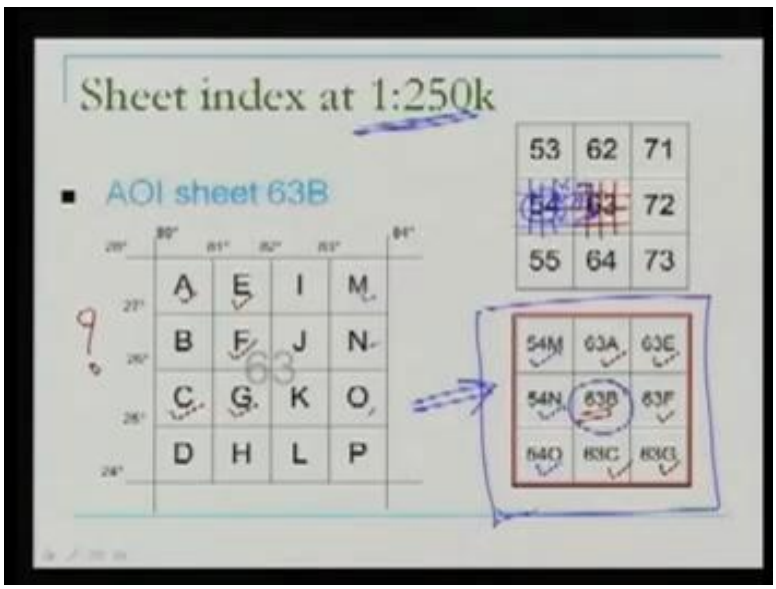

When the scale is 1 is to 250000 our area of interest is in 63 B that we have already seen well 63 B means. It is here the sheet now or the area 63 or the block 63 is 4 degree in latitude by 4 degree in longitude. What we had done? We had divided that in 16 parts A to P and at this scale our area of interest is in this block B. So, our area of interest is 63 B what we are looking for I am looking for the sheets which will be surrounding this at this scale. Well directly we can see here surrounding this we should have the sheet 63 A 63 E 63 F 63 G and 63 C how about here?

So, what we are doing? We are developing the sheet index now. So, to develop the sheet index I have written here 63 B is our our area of interest. So, the adjoining sheets are these I am writing these. Now, how to get these ones, what are these sheets and how to arrive at there? Now, if you look here this block is 63 what is the block on this side on the left side of this. Because over here there will be a block which is covering this area no no that is 4 degree by 4 degree here and that block is also divided in 16parts A to P. So, if I look this sheet index here at 4 degree by 4 degree level next to the 63 we have 54 well this 63 is as we have seen divided in 16 parts.

Similarly, I will change the colour similarly next sheet is also divided in 16 parts as you can see and the names which are given to these parts are A to P. So, we have A B C D similarly we will have M N O P. So, corresponding to our area of interest our area of interest is this 63 B this one and all these there from the sheet index. So, in order to complete the sheet index I need this number this number and this number also. So, what these numbers will be? These will be 54 M N oh because M N O the division is same. So, the sheet index will finally, look like this 54 M 54 N 54 O. So, this is the final sheet index for 63 B at a scale, because these numbers they indicate the scale is 1 is to 250000.

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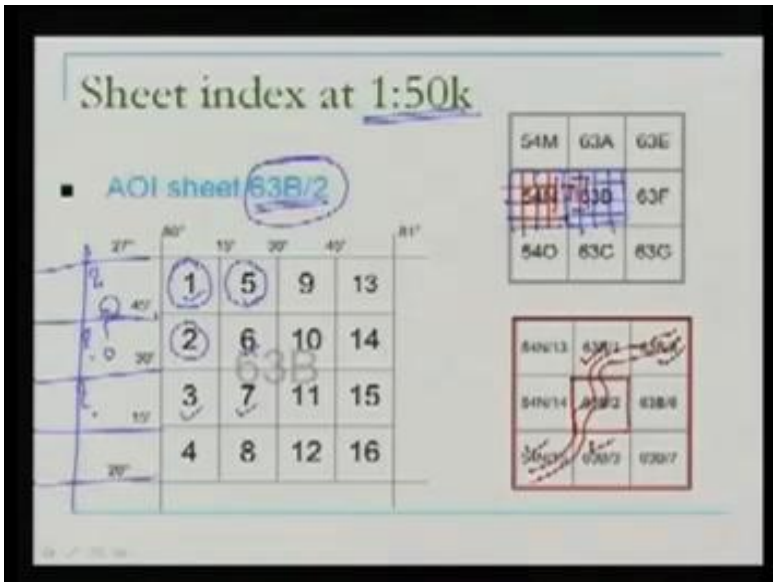

Well, we go further, because we know that our area of interest at this scale is this sheet 63 B by 2 and we are looking to make sheet index for this sheet 63 B by 2. So, 63 B as we can see let me clean this.

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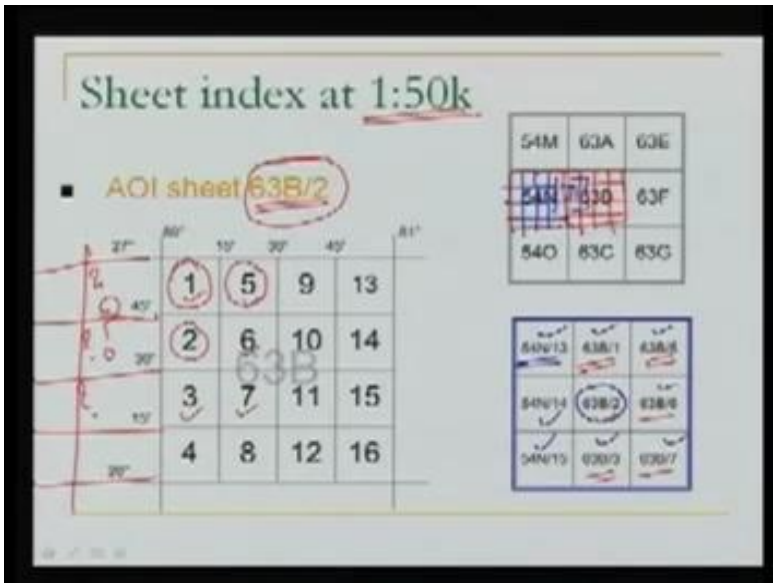

Our 63 is the block here now this block we know it is further divided in 16 parts which are numbered 1 to 16 all right. So, this is what happening here 63 B which is 1 degree 1 degree here and 1 degree here 6 26 to 27. This is divided in 16 and our area of interest is oh 63 B by 2. So, our area of interest is in this block. Now, what is the sheet index for

this? Obviously the sheet index will include the sheets because this is our area of interest. So, these will this will include the sheets and. So, we make the sheet index and we write it here 63 B by 2 area of interest this 1 is 63 B by 1 63 B by 5. So, this, what we are writing 63 B by 1 63 B by 5 B by 6 B by 7 B by 3.

Now, how about here as in the previous case we are looking here that what these sheets will be, what will be the number here, what will be the number here, what will be the number here in order to complete the sheet index? So, what is the next block? The block corresponding to 63 B by 2 that is 54 N like this 63 B was divided in 12 sorry in 16 parts. The 63 sorry 54 N is also divided in 16 parts our area of interest is here we already know these numbers we are interested in knowing these numbers. So, what these numbers will be? These numbers will be; obviously, 54 N by 13, because this will be 13 14 15 and 16 you know as you can see 13 14 15 and 16, so 54 N by 13 54 N by 14 54 N by 15.

So, the final sheet index will look like this for our area of interest that is the area of interest these are the sheets which surrounded. So, by doing this you know if our project as I was saying if our project extends our area of interest we had a project here for example, there is a road which is coming up. So, in order to know what are the other sheets which surround this will procure this sheet, this sheet and this sheet as well as this one. So, we need to make the sheet index in all these cases. Now, if you go one step down further means at 1 is to 250000 scale.

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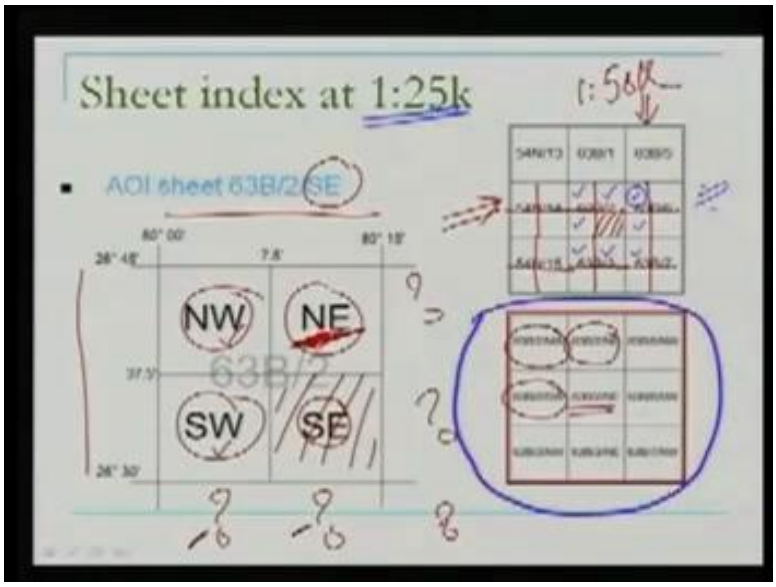

Here our area of interest sheet is 63 B by 2 SE. Now, we are looking for a sheet index for this sheet we know that as we can see in the previous one our area of interest was 63 B by 2 which is here. And the size of this block is 15 minutes in latitude and 15 minutes in longitude and we know that in our next level this is further divided in 4 parts. So, this the same thing is happening here this 15 minutes 15 minutes being divided into 4 parts and our area of interest is in SE block. So, our area of interest is here. Now, what should be the sheet index? Obviously this will form the sheet index this will also be a sheet this will be the another sheet. Now, we are looking for what will be the sheet number here here here here as well as here in order to complete the sheet index.

Well, so what we do corresponding to this area of interest? We write these sheet numbers first. So, for our area of interest we will write the sheet numbers which are known to us for example, this is 63 B by 2 and E because this is 63 B by 2 and E and over here. Well, what will the sheet in number here and here? If you look at the sheet index at a level of 1 is to 50000 that is the sheet index each of these sheets are being divided in 4 parts is not it for the next level our area of interest is here. So, what are the sheets which are adjacent to it? The sheets which are adjacent to these are one here second, third, fourth, fifth, sixth, seventh and eighth.

So, using by making use of this sheet index we can very easily find their numbers. You know the number over here should be 63 B by 6 and W. So, that is what we write here? 63 B by 6 and W the number here should be 63 B by 6 by SW. So, this also we are writing 63 B by 6 SW down here. You know this particular block over here what should be this it is as you can see here 63 B by 7 and this is NW. So, we write the same thing 63 B by seven NW. And similarly for this and this is how we complete the sheet index. So, this is the sheet index at a scale of 1 is to 250000 for a sheet number 63 B by 2 by SE. So, what we have seen? We have seen so far if we know the latitude longitude of a place. So, far I was taking a point it could be an extent also you know a polygon and we want to see what all sheets will cover that polygon.

So, that can be also done. So, right now we have an example we saw for one point at any scale whether 250000 50000 250000, what is the sheet which will cover that area or that point? So, that is the sheet which will procure from Survey of India. As well as we have seen, because many times our project may be big enough big and a single sheet will not do. Or if you have a single sheet we want to know what is the sheet on top of it behind

no on the bottom of it on this side and this side and this also can be done by developing the sheet index. So, the mapping numbering system which we saw in this lecture is the one which is being used by Survey of India. Similarly, there are other mapping system numbers also at international level.

The basic philosophy for all these is absolutely same if they will begin with starting different numbers. They may have the starting blocks of 4 degree by 6 degree they may have a different way of giving the numbers. But the basic philosophy how these numbers are actually given how the sheet index is generated is same. Now, what we will do? We will have a demonstration on Survey of India map sheet the sheets, which we procure from Survey of India. You know we can say topographical maps or toposheets or map sheets. What all things are there in a map sheet, what is the format, what is you know how the various things are arranged in that this is what we would like to see that?

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Now, over here we can see the map sheet this map sheet is at a scale of 1 is to 50000 and this map sheet has a number 63 B by 2 which we used in our map map numbering exercise. So, the IIT Kanpur is somewhere in this sheet. Now, if we follow each everything in the sheet one by one we will start from one column and we will follow the things the way they are listed here all right. As far as the details are concerned you can look at the map the map has various details. Over here we have river Gangas. So, this is the river Ganges all right then we have this particular line here which you can see in red

colour is GT road as you can see also written over here is Grand Trunk Road all right then we have some villages and so on.

Similarly, we have a canal this is lower Ganga canal. So, and various details are listed there in the map it will not be very clear right now in this video screen. But I will advise you to purchase the map or go to a laboratory or somewhere where you can have a map. And in that map look for the details what all details are there what all things are plotted there. We also have in this map the contour lines we have already discussed what are the contours? So, those contour lines they indicate the elevation of various places. Now, looking at various things we will start from the, this corner here.

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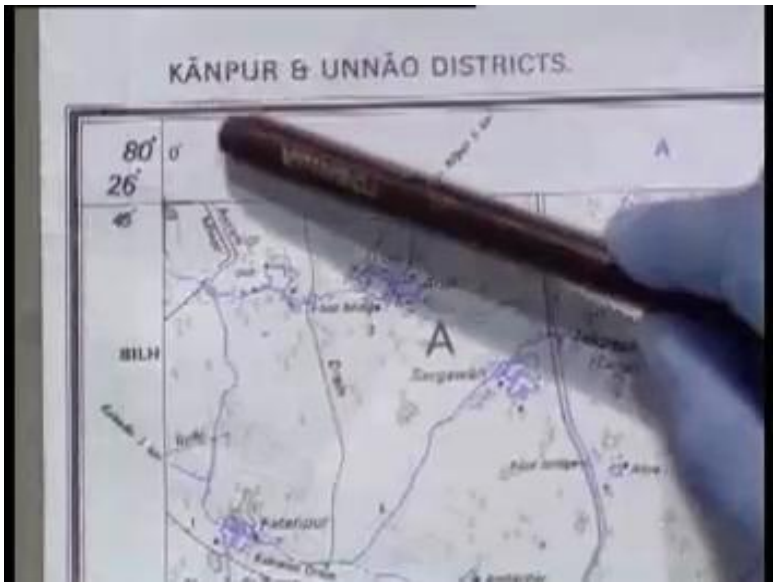

What we see 88 0. So, this is the value of longitude 26 45 that is the value of latitude here this latitude and that is the longitude. Over here we find Kanpur and Unnao district, because this these are the areas which are covered by this map.

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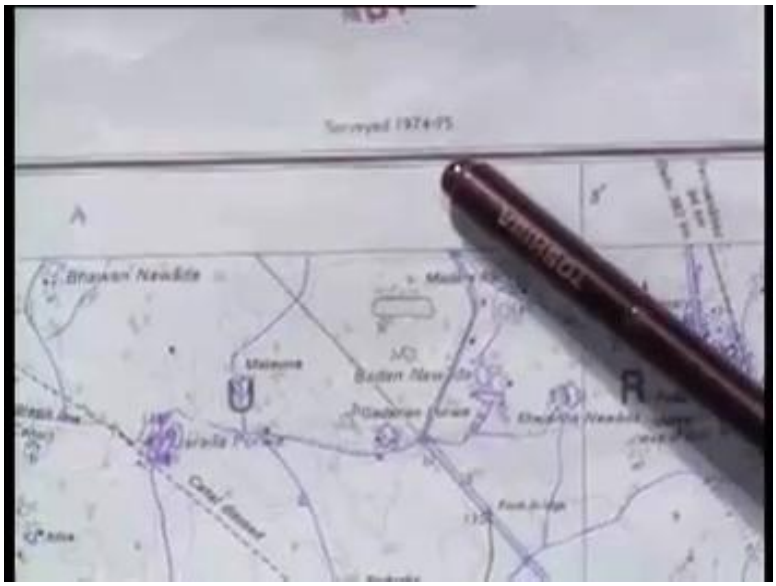

Then over here, we can see surveyed 1974-75; that means this map was made in 1974-75.

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This is for the state of Uttar Pradesh. Further as you can see along the longitudes because this map covers an extent of 15 minutes by 15 minutes this entire sheet has been divided in 5 minute by 5 minute blocks. So, there is a 5 minute block here and this way if you go down. So, this block for example, this very first block is 5 minute by 5 minutes. Similarly, we have some more blocks.

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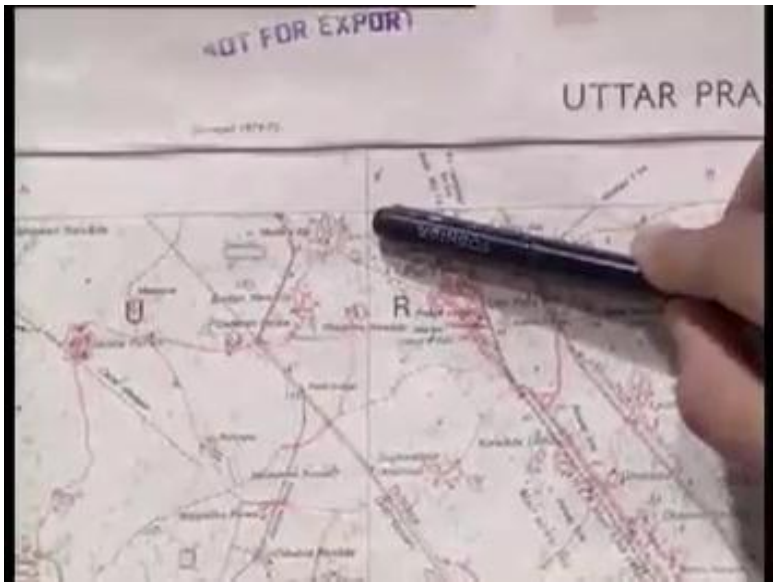

So, the longitude of this place is 80 degree 5 minutes. Over here the longitude of this line here is 88 degree 10 minutes. So, we have these lines you know division of these maps by these longitudes it helps to understand the map it helps to locate the longitude and latitudes of various places.

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Well, if you go further here over here is written, if you can see it on your video screen magnetic variation from true North about 1 by 4 degree West in 1970. When we are talking about the magnetic meridian and in you know true meridian then we talked about

this variation. So, in 1970 in at this place it is 1 by 4 towards West. Further at this corner here this map.

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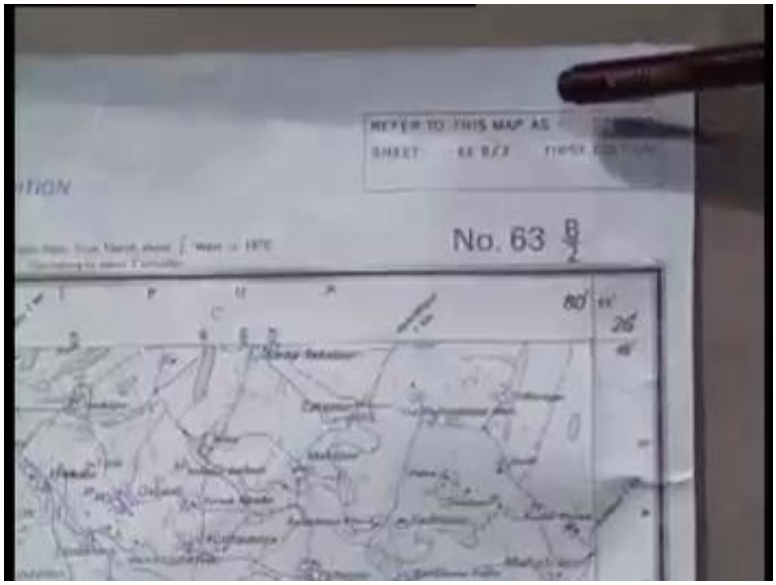

We have written here India refer to this map as 1 is to 50000 the scale of the map. It is sheet 63 B by 2 and the first edition. The sheet number is also listed here, because sheet number is very important. So, we should know what this, what is the sheet number of this map sheet? If you go down now again we will see some divisions you know for those blocks 5 minute by 5 minutes. So, these are the lines along latitude.

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We go further down another line at 35 minutes we go further down another line at 26 thirty. So, that is the starting of the map. So, 26 30 here is the latitude of this line while the longitude as we know is 88 degree 15 minutes. Now, somewhere here as you can see is the IIT Kanpur campus. So, if right now we are working in a sheet which is at 1 is to 50000 scale having a number 63 B by 2 in that sheet IIT Kanpur is here. If we are going to procure a map sheet covering IIT Kanpur at 1 is to 250000 what will happen this entire sheet of 1 is to 15000 will be divided in 4 parts. So, this part will be in SE block.

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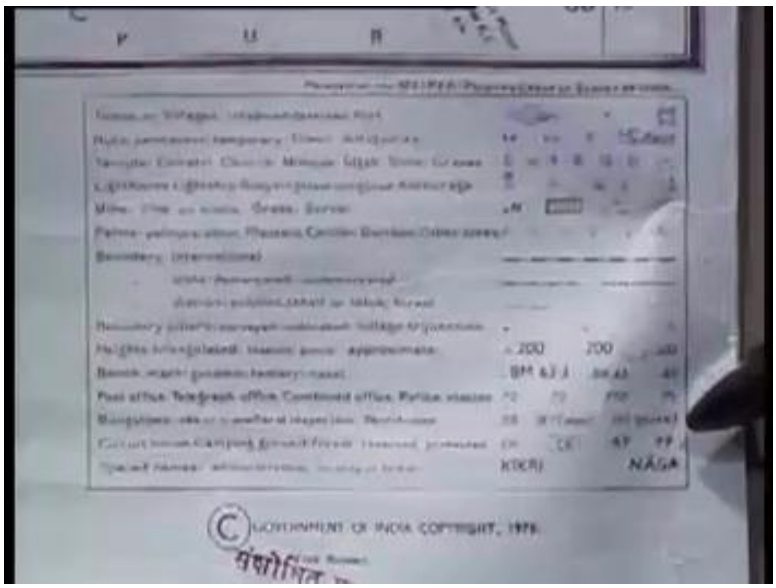

Well we go further down over here this is the legend, legend means it shows you the various details which are there in the map. For example, how to denote town or villages how to denote the huts a map is representation of the ground. So, once we are looking for the representation whatever is there in the measure we have to represent it on the on the sheet. So, we make use of the symbols. So, those symbols are shown here with their mean you know each of these for example, for the temple for mosque for any other building.

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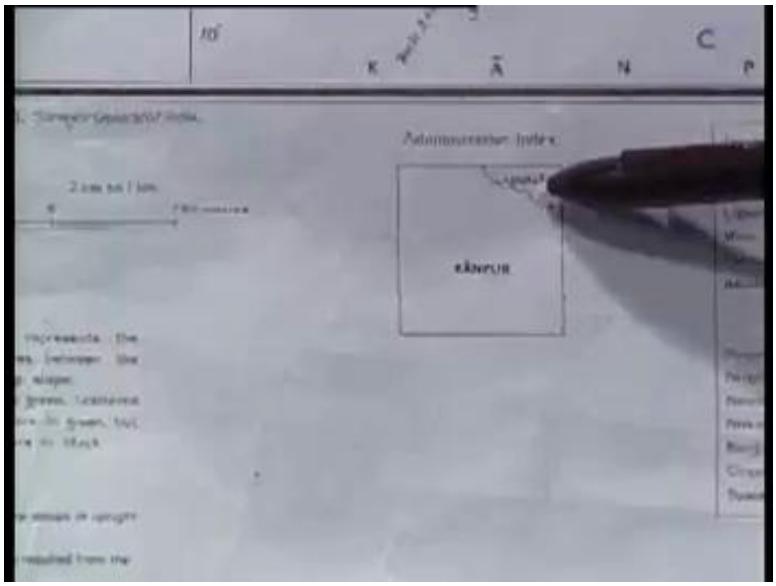

We go further here it shows us the administrative index means what are the districts which are being covered which are covered by this map sheet it is here Kanpur and Unnao. Well now we would like to see this particular block here.

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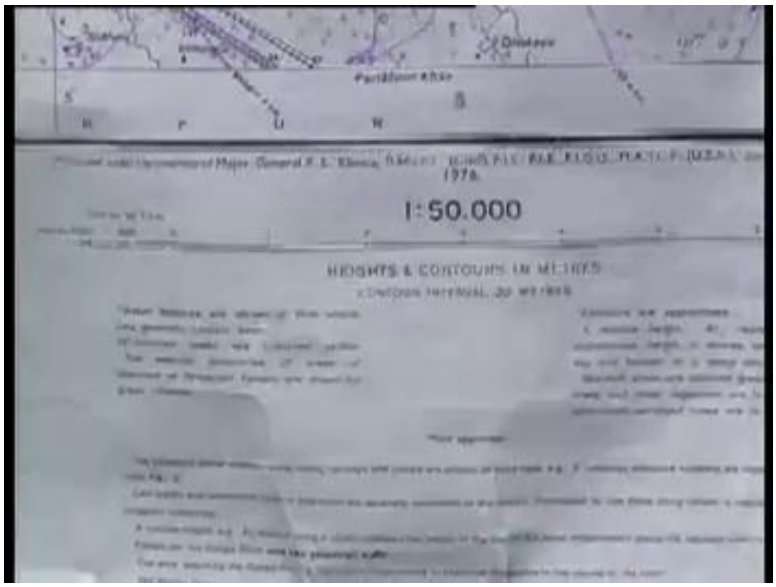

Now, in this particular block we have number one the important thing a graphical scale you can see here this line is a graphical scale we know the importance of the graphical scale. This representative factor 1 is to 50000 is not always good enough in order to measure the distances on the map. Because the map might have shrunk or expanded

because of whatever the reason, but the graphical scale can still be used. So, because of that purpose we have the graphical scale here. Similarly, when this map was produced who was the Surveyor General of Indian? Because the map is produced under the direction of Surveyor General of India, so the name of the Surveyor General of India is also written there.

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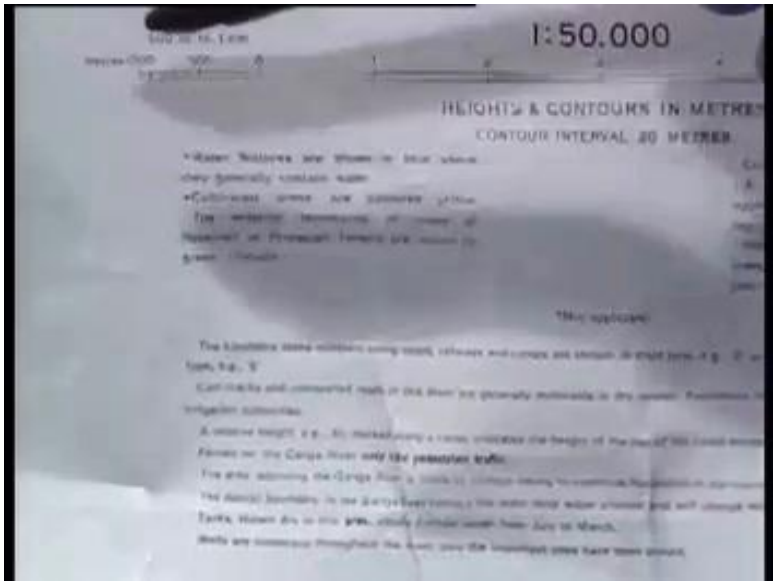

Finally some more fine details are there. Then next to that as we have seen this is the sheet index.

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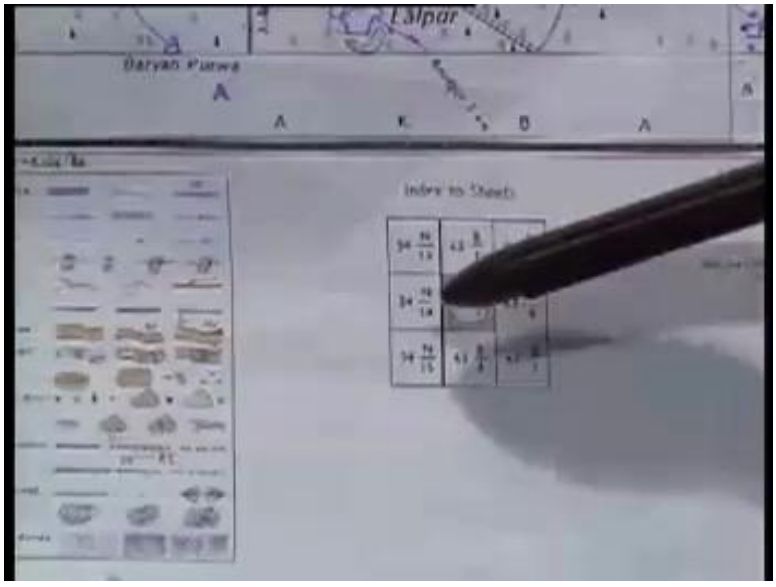

So, the sheet index is also available in the map sheet corresponding to our area of interest 63 B by 2. There are other sheets, which surrounded then some more symbols of the legend here. Again in addition to 1 you know this scale and another thing written elsewhere we have also this map number and a sheet written over here. Because the way keep these maps folded at sometime you know it should be possible for us to see as quickly as possible the scale as well as the sheet number. So, that is why it is written at 2 corners. So, what we have seen? We have seen a demonstration on the toposheet, which we procured from Survey of India.

Well, in order to understand it properly I will advice you that you should procure one to proceed from whichever the source and start looking at the details. Because we went through all the details very quickly you have to read each and every detail there. Understand the thing; understand the legend whenever you are going to make a map make use of the legend which is there, because this is a standard legend. Not only reading the map the important thing is taking a map going in the field with that. And you know locating the various details which are shown in the map there in the field.

And seeing that you know how update the map is are there the details which are there in the ground, but not on the map; that means, the map needs updation. So, playing with the map, using the map in the field, making use of that, it is very important and very interesting exercise. So, please do that some time in your laboratory exercises there in the field. So, we finish our, this video lecture here in which we covered the Survey of India Organization. If you want to procure the map from Survey of India how to procure, what is the map numbering system, how do we make the sheet indexes? And then finally, we saw a survey toposheet.

Thank you.