

Architectural Conservation and Historic Presentation
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Lecture -25
Documenting Heritage Properties

We have earlier talked about the value significance we have talked about how to understand the significance; we have talked about the causes of decay and damage. So, after understanding this aspects we have to understand that we have to whenever we sort of see that there is proper values we have to document and investigate a structure and the enlist the structure in a proper way. So, today we will just give a brief idea about the documenting the heritage properties.

(Refer Slide Time: 00:50)

The slide is titled "How heritage properties are identified". It is divided into two main sections: "Preparation of conservation document" and "Investigation".

- Preparation of conservation document**
 - ✓ Inventory of defects
 - ✓ Condition recording
- Investigation**
 - Inventories
 - Evaluating
 - Researching and Documenting
 - Listing
 - Inventories of Craft and Skill
 - Report Preparation
 - Guidelines and Maintenance Strategy

The slide also features the IIT Kharagpur logo and NPTEL Online Certification Courses logo at the bottom left, and a small video inset of the professor at the bottom right.

Now, when we talk about the documenting the heritage properties actually the how the properties are identified this is one aspect and that needs a preparation of a conservation document which the two very important aspects of preparation of conservation document. One is the inventory of the defects and one is the condition recording.

And which broadly we say the investigation we will talk briefly about that. And the various parts of this preparation of a conservation document is inventories, evaluating, researching and documenting, listing and inventories of craft and skill, and report preparation. These are very important aspects of preparation of conservation document.

Now, we will take one by one and also off course the guidelines and maintenance strategy for future action short term long term maintenance strategy.

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The slide is titled "How heritage properties are identified". It is divided into two main sections. On the left, under the heading "Steps", there is a bulleted list: "Inventories", "Initial inspections", "Continuing Documentation & Diagnosis". On the right, under the heading "Contents of the conservation document", there are four sub-sections: "Measure drawings" (Identifying various types of construction system, materials and techniques used in the structure), "Problem identification" (Identifying various types of defects in the structure and preparing legend for all kinds of defects), "Condition documentation" (Marking the defects in the drawings such as floors, ceiling, internal wall surfaces, external wall surfaces, terrace, decorative features and sections), and "Evaluate causes of decay" (Identifying and analysis of causes of defects and their consequences). A small image of a textured surface is shown next to the "Problem identification" section. At the bottom left are the logos for IIT KHARAGPUR and NPTEL ONLINE CERTIFICATION COURSES. At the bottom right is a small video inset showing a woman speaking.

Now, what are the steps? The steps are the same one is the inventories, the initial inspection and continuing documentation because it is a continuing process once you start even the work many many things and come up and the diagnosis. Diagnosis is very important part that until and unless understand what is the real cause of the damage we cannot sort of suggest be the methods or how to mitigate the damage or how mitigate or how what are the steps to be taken.

So, as I say the contents of the conservation document is measure drawing it is very important part. Problem identification the condition document or condition assessment and evaluate the causes of decay.

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Contents of the conservation document

Measure drawings

- To maintain the authenticity of any heritage building it is necessary to collect **all available information** of the structure
- Building itself is an **authentic record** of its architecture, which needs to be recorded.
- The next step is to prepare **measured drawings and photographs** of all aspects of the item.
- This document can be used to accurately **record evidence** and analysis of an item's history and significance.

The slide includes four architectural drawings: two elevations of a building with a dome and two floor plans. The bottom of the slide features the IIT Kharagpur logo, the NPTEL Online Certification Courses logo, and a small video inset of a woman speaking.

Now, measure drawing as you can see that are taken example from some monument that it is a very accurate measure drawing is the first and foremost task of the conservation document preparation. If they are available then we can use that as a base and then we solve the further updated, if it is not available then we also have to do the measure drawing. So, that becomes a basic preliminary record.

Now, why measure drawing? Because to maintain the authenticity of any heritage building. It is necessary to collect all available information of the structure. Each and every building structure, a (Refer Time: 03:27), a site is an authentic record of its architecture which needs to be recorded. As I say that even we change it or we do further invent inventories or intervention we must understand that what stage we found that structure. For this the measure drawing is first and foremost step.

The next step is not only the measure drawing preparation, but we have to have the photographic documentation and relate the photographic documentation through each and every part of the structure and these are visual records and this document can be used to accurately record evidences and analyse analysis of an items history and significance. Though as I say the measure drawing forms a very important preliminary step of preparing a conservation report, this is some example of measure drawing are taken from the various sources and some of the references are given.

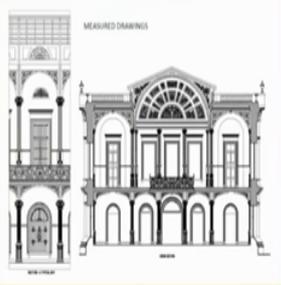
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Contents of the conservation document

Measure drawings

- Identifying various types of construction system
- Materials and techniques used in the structure
- Drawings required for documentation

All floor plans, All external elevations, Reflected ceiling plan, Floor plan, Sections, All internal wall elevations, Door and window details, Decorative features



<https://www.slideshare.net/akshadamuley/case-studies-on-heritage-conservation>

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Now, these measure drawing is we have to as I say the measure drawing is the basic document, but after the measure drawing we have to work on it. Why? Because in measure drawing the identifying the various types of construction system that was the original construction system. If there were some other repair, so it is actually all this things has to be understood it is just not taking measure drawing, but each and every aspect, the every element the construction system has been taken into and recorded.

The materials which are used the techniques there is in the structure over the years if there are some changes record that and these are supported with the drawings. And when we talk about the there are different types of drawing which has to be prepared. All floor plans, all external elevation, reflected ceiling plan, floor plan, sections, all internal wall, elevations door and window detail decorative features. Remember that it is like for constructing a new building we want the construction drawing and in a conservation work we want measure drawing that records that at what stage that becomes the basics starting points.

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Preparation of conservation document

Problem identification

Identifying various types of defects in the structure and preparing legend for all kinds of defects

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Now, as I say that voice becomes the starting points because this also becomes a source for the problem identification and with the help of measure drawing and other type of research. That what are the different types of structure and meet a legends of these kinds of defects which we see in the structure these are of course, for in this root has grown over the tree and it is actually supporting the structure for a major crack has happened due to the structures, so recording the crack, the position, the vegetation growth in this case that many of the tiles have come down and vegetation growth is there is a plaster thing.

So, this are something which has to be after making the preparation drawing we have to first also understand that what are the problem of the building.

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Preparation of conservation document

Problem identification

Identifying various types of defects in the structure and preparing legend for all kinds of defects

Analysis

A detailed analysis should be carried out for diagnosis of principal decay mechanism, assessment of general strength properties and causes of structural distress.

The slide features a yellow background with a blue header and footer. On the right side, there are three images: a large orange temple structure, a close-up of a temple wall with a portrait, and a smaller temple structure. In the bottom right corner, there is a small video inset of a woman speaking. The footer contains the logos of IIT KHARAGPUR and NPTEL ONLINE CERTIFICATION COURSES.

And it does not mean that in the last example we have shown the structures which are in a very very dilapidated condition progressive showing that that they may be some structure which may look good while preserved, but they can have some other problem. Like this is in (Refer Time: 07:05), this is a temple and you can see that this is a close view of some. This looks will maintain, but it is very wrongly maintained, the repair work, maintenance work which has been done is with synthetic enamel paint, it is actually stopping the breathing of the structure, it is actually interfering the authenticity of the structure, the colour of the structure, the material of the structure and in a long run it is actually making new types of details which are not part of that.

And so it may look good it may look well maintained, but one has to understand that what is actually happening to this structures. The other structures also it again looks well maintained, but they have used the cement plaster and what is also thing some of the old sort of a decorations have come out and they are putting the pictures there. It can be remain without any decoration it is not an authentic idea to do that.

So, again the lot of good intension, a lot of resources available some of the times it is it is not the way it should be done specially it is of a heritage value I am not sort of saying that it is the sort of owners because it needs training and capacity building that what are the better ways preserve this structure and what are the damage it can happen. So, these are all part of the this problem identification of the measure drawing.

And these actually is the analysis, a detailed analysis should be carried out for diagnosis of principal decay mechanism, assessment of general strength properties and causes of structural distress if it is any. Like crack always does not mean that it is a structure distress, but we have to see that there can be dampness, there can be cracks, there can be this type of repair measure one can has to understand and analyse the properties if required with bringing the proper expertise that what are the problem.

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Preparation of conservation document

Problem identification

Identifying and analysis of **causes of defects** and their **consequences**

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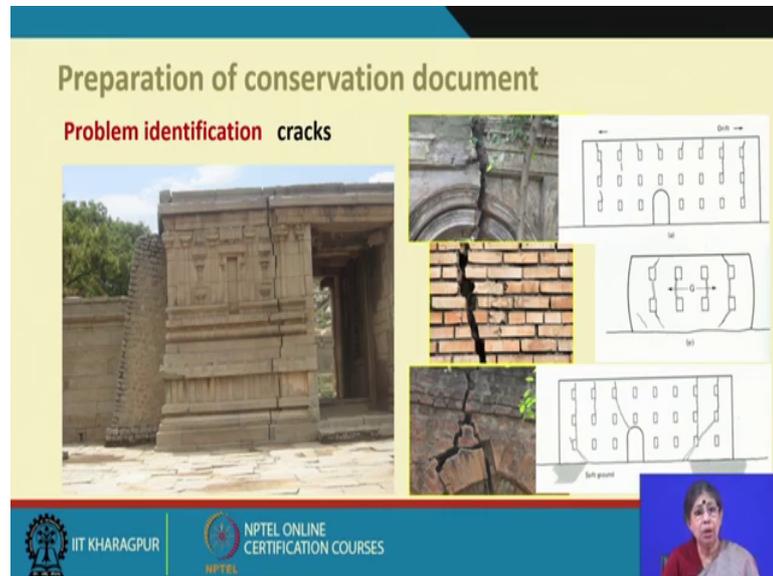
So, the major idea of this problem identification is identifying the analysis of causes of defects and their consequences, this one has to remember very cool what are the causes of decay and what are the consequence.

As you can see that there are cracks, different types of cracks. Now, are all the cracks I mean of a similar magnitude, of a similar thing this has to be seen it has to be tested analyse. Also depending, but the recording of the cracks and the monitoring of the cracks understanding the cracks and what are the causes of the cracks has to be really understood, until and unless you remove the cause, until and unless we diagnose the cause we really cannot take any solution, just filling of the (Refer Time: 09:59).

We mention about the (Refer Time: 10:00), there are different types of (Refer Time: 10:03) which is actually the monitoring of the crack which sort of can over a longer period it can sort of record the vertical and the horizontal (Refer Time: 10:11) where the crack is a live crack and dead crack. And also simultaneously one has to also use the

other causes of decay and properly record that what are the things we have found that structure there that recording is very important.

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The cracks as I say that this is an hump you can see the cracks is defiantly the building is inclining and there is a support which has been given. Now, what is the reason of course, this type of support is some time required because as a temporary immediate measure so that it cannot cause further problem to the structures sometimes it may be due to the foundations, sometimes it may be due to the change in ground water level.

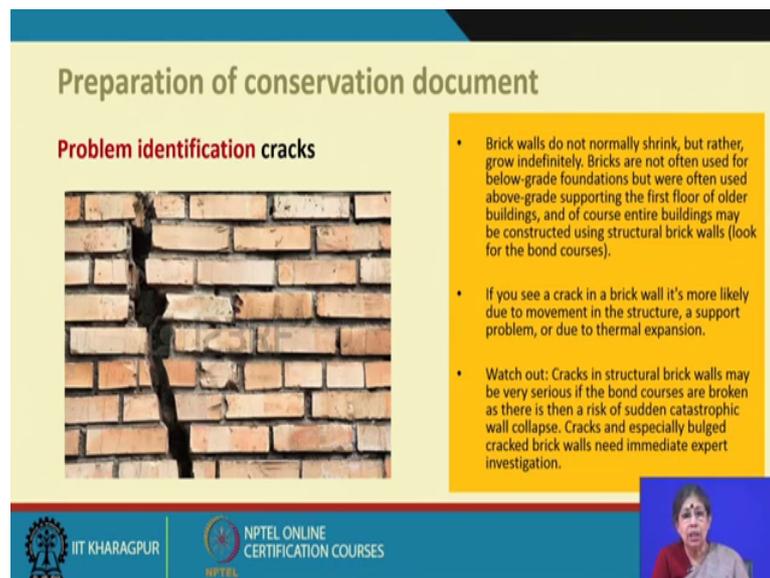
So, there may be varied reasons, so one has to understand that, but at the same time while the investigation can take a long time one has to think about that what can be the temporary measure. In this example (Refer Time: 11:06) temporary (Refer Time: 11:08) wall has been prepared.

Now, one has to understand that from the pattern of cracks also one can understand that what are the problems like in these case this is the shear crack which has happened because the soft ground. So, there is an equal displacement or the settlement of the building which has caused this type of crack. So, we need the structure experts who can from the cracks they can say that what is happening there.

These type of cracks are generally due to the temperature fluctuations, no one can understand that what could be the likely cause. So, if required sometimes the foundation

investigation also can be done and as I say that as you can see the severe cracks which have been developed which are definitely the structural problem. And why the structure is something to do with the foundation or something to do with the vegetative growth or sometimes to do with the other causes or wrong repair measures or sometimes may be the initial construction was not done properly. So, there may be, so these have to be recorded this is a part of the conservation document.

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Preparation of conservation document

Problem identification cracks



- Brick walls do not normally shrink, but rather, grow indefinitely. Bricks are not often used for below-grade foundations but were often used above-grade supporting the first floor of older buildings, and of course entire buildings may be constructed using structural brick walls (look for the bond courses).
- If you see a crack in a brick wall it's more likely due to movement in the structure, a support problem, or due to thermal expansion.
- Watch out: Cracks in structural brick walls may be very serious if the bond courses are broken as there is then a risk of sudden catastrophic wall collapse. Cracks and especially bulged cracked brick walls need immediate expert investigation.

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As I say the cracks is a major thing like brick walls do not normally shrink, but rather they. So, if they in a big crack is happening is like this what we are seeing in the picture then it is more likely due to the movement in the structure support problem or due to the thermal expansion.

The cracks in the structure break wall may be very very serious and if bond course are broken then there is a risk of sudden at a wall suddenly collapse. So, and this time we have to give the temporary sort of (Refer Time: 12:52) sort of adopt some temporary intermediate immediate prevention measures to support the structure and then to see that what is happening and what can be the likely measure.

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Preparation of conservation document

Techniques for documentation

1. **No Destructive** method should be used for the condition recording.
2. Visual survey
3. Photography
4. Plaster survey-Hollow plaster should be checked by knocking either by hand or small tools without destructing the fabric.

PATHRA

Reconstruction of column is done to retain the structural stability

Harmonious integration of missing and decayed parts

Original plaster is preserved by chosing the edges

Original plaster is preserved by chosing the edges

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Now, techniques of documentation because we are saying that we have also have to understand the causes of documentation in that case we know that the structure is already there. So, one very important thing to remember is that no destructive method should be used for condition recording. As I say we have to understand the foundation.

So, there is a foundation investigation method or which also without damaging the structure there are and there are other lot of technologies are happening like, there is a visual survey understanding from the symptoms that what can be the likely measures, photography, plaster survey because some just by touching or hammering one can feel and there are some tools and techniques which have been developed to understand that what can be the things.

So, as I say the photographic documentation very clearly understanding each and every part that how from where it was it is not just a tourism type of a photography actual documentation.

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Preparation of conservation document

Non destructive testing
Preservation and rehabilitation of historic buildings can successfully be accomplished only

1. If **diagnosis** of the state of damage of the building has been formulated .
2. The **knowledge about the building construction** should be deep in order to understand
 - The role of all its features and details ,
 - characteristics of the materials and
 - characteristic of the structure together with evolution of time



Use of Resistograph, or resistance drill, a very effective nondestructive tool for assessing the condition of wooden timbers

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Now, talking about the non destructive technique it is very important part of that the preservation and rehabilitation of historic buildings can successfully accomplished by if the if the diagnosis of the state of damage of the building has been formulated. So, as I again and again say the diagnosis is very important, the knowledge about the building construction should be deep in order to understand the role of all its features and details and characteristic of material and characteristic of the structure together with the evolution of time because when it was probably built then the material was in different stage probably years material has where there may be surrounding development has happen.

So, one has to understood, one has to understand that how this construction the different types of construction techniques were used or methodologies or principles were used, one has to have a very good understanding about that soil would change in the surrounding situation all this.

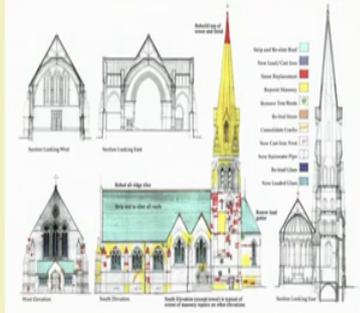
As I say that nowadays a lot of different non destructive techniques are happening that even without really proving much (Refer Time: 15:18) to the structure what can understand like in this case use of resistograph which is resistant a very effective non-destructive tool for assessing the condition of wooden timber. Say this is one example, but many many tools which are happening and they are coming up and one has to understand that how it could be used.

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Preparation of conservation document

Condition documentation

Marking the defects in the drawings such as floors, ceiling, internal wall surfaces, external wall surfaces, terrace, decorative features and sections



https://www.simpsonandbrown.co.uk/files/content/21_rotator3.jpg

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Now, once the this problem identification measure drawing is done the third stage is how they are actually recorded. So, what we call the condition document or condition assessment of the condition mapping, their various terms are used to put that on the picture. As you can see that the measure drawing as I say is the basic step, but with the help of measure drawing and with the help of the different type of techniques or testing one sort of has to record that and put that information on the measure drawing as you can see in this images that how the different (Refer Time: 16:24) has been used to mark the different type of damage decay or replacement of the materials on that.

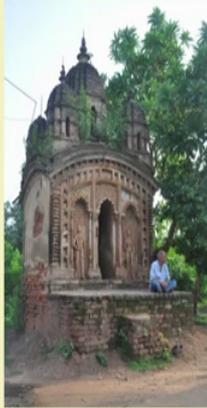
So, marking the defects in the drawings such as floor, ceiling, internal wall surfaces, external wall surfaces, decorative features and other with a detail sort of a (Refer Time: 16:44) which has to be prepare on which contict this is there and this condition mapping forms a very important document before we start intervening within the historic structure.

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Preparation of conservation document

Need for condition assessment:

1. To understand the present status of the structure
2. To identify the reasons for material and structural deterioration of structure, analyze the condition.
3. To calculate the quantities of decayed areas like area of plaster flaking, area for missing masonry etc.
4. To prioritize the conservation items of works in different phases



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Now, what is the need for condition assessment? May be the structure is in this, may be small structure, but suppose we are starting to record that it is the need for condition assessment is to understand the present status of the structure, to identify the reasons for material and structural deterioration and to analyse the condition, to calculate the quantities of decayed areas like area of plaster flaking, area for missing masonry. Because it is just not calculating a wall area and then they say this much of because we would like to keep as many breaks old breaks possible and to repair only the minimum.

, that quantity actually is important for further specification or starting before we start and actually conservation work to prioritize the conservation items of works in different phases.

So, this is the need for condition as adjustment which is very accurate and very. And again I am saying it is an ongoing process because while intervention has started we can sort of a discover more problems.

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Preparation of conservation document

Condition documentation

Marking the defects in the drawings such as floors, ceiling, internal wall surfaces, external wall surfaces, terrace, decorative features and sections

Ref: Dasgupta, Shalini, DOCUMENTATION & CONDITION MAPPING FOR RESTORATION & REVITALISATION OF HISTORIC SHEESH MAHAL & CHAR BAGH COMPLEX IN PATIALA (PUNJAB), INDIA ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences, Volume IV-2/W2, 2017m26th International CIPA Symposium 2017, 28 August-01 September 2017, Ottawa, Canada



Condition mapping, historic Sheesh Mahal & Char Bagh Complex In Patiala (Punjab), India

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This again a example from Patiala in Punjab which is done by Shalini Das Gupta, another expert in conservation. As you can see that the will on the conservation just showing one wall internal wall that how this marking, this legend is very important and how the marking has been given to show the amount of damage due to the water or the plaster flaking and others different types of materials have also given the reference one can sort of see this type of documents to refer, and how condition assessment, condition mapping is done for old mapping structures.

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Preparation of conservation document **Condition documentation**



Ref: Dasgupta Shalini (2017), op cit

Condition mapping, historic Sheesh Mahal & Char Bagh Complex In Patiala (Punjab), India

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As I say it is not only the drawing it is very important to do a photographic documentation, properly number, properly record, actual position of the photograph shown because they will remain the historic documents to show that what is state that historic structure was there.

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Intervention options

- Identifying conservation items**
of work for each type of work separately
- Quantification of defects and preparing specifications**
Quantifying each kind of problems in area, volume, length or numbers and preparing specifications
- Preparing specification**
Testing of materials
Specifications of all items
- Conservation estimates**
Rates analysis and preparing conservation estimate

The slide includes a photograph of a restoration site showing various materials and tools. At the bottom, there are logos for IIT KHARAGPUR and NPTEL ONLINE CERTIFICATION COURSES, along with a small video inset of a speaker.

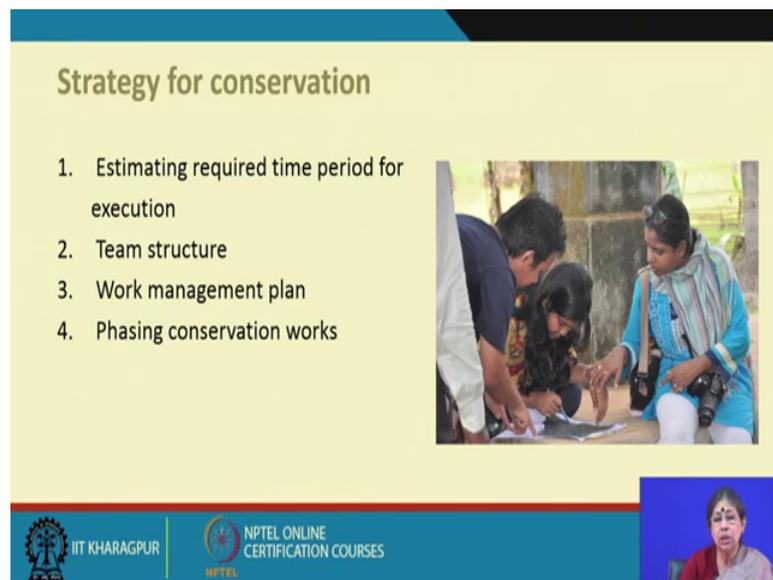
After that thing so, once we have done the measure drawing we have understood the intervention or causes of decay and then condition mapping then comes that what are the intervention option. As I say that there can be various intervention option, but thumb rule is the minimum intervention and we have to understand that what and there are also certain measures which are the immediate, there are measures which has to be taken immediately, and there may be intermediate and the long term measure.

So, this three type of measure have to be a part of any conservation document and, but before we start I say the quantification of def defects and preparing specification is a very important wall it is different from new building. So, each kind of problem in area volume length numbers is required for preparing the specification.

For preparing the specification one has to have general idea about knowledge about the materials which there. As I say the if it was in line mortar it has to be done in line mortar some ad mixture can be done, but what is effect of ad mixture that things you can see this is a an image from Shanti Nikhetan, this was done by ASI the Vishnu Bharathi, the almost quite a few heritage structure beautifully restored and preserved. And you can see

that varies in sequence of traditional time mortar preparation and they are (Refer Time: 20:39) are actually making that in the quantities preparing; that means, a different type of skill, very different from the present system or construction. And we just cannot take each and every building depending on the structure depending on the method on the status of decay it needs a different type of specification. It cannot be equated with a normal standard specification.

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Strategy for conservation

1. Estimating required time period for execution
2. Team structure
3. Work management plan
4. Phasing conservation works

The slide includes an inset photograph showing three individuals (two men and one woman) gathered around a table, looking at documents or plans. The slide footer contains the logos for IIT KHARAGPUR and NPTEL ONLINE CERTIFICATION COURSES, along with a small video feed of a person in the bottom right corner.

And the rate analysis preparing specification and the how the, it may need a different type of skill, different type of man power this brings us to the (Refer Time: 20:19) making a team for conservation. And what is the time period which will be required and the team structure who will be the exposed depending on the cause and other thing, the nature and the work management plan, how the face wise, face wise preparation of the work will be done, and facing of the conservation as I say again the different type of mitigation measure and other. So, this are very preliminary idea about how the documentation process will go on.

As I say first is the your understanding the measure drawing which will make a basis for that and the different parts has to be documented. And on the measure drawing one has to do the problem identification and also give suggestion for that what are the further investigation which has required for that. Preliminary investigation report and the further investigation record, it is an ongoing process, and then what are the immediate measure

intermediate measure at the long term process, and then the condition mapping which is very very important and very accurately it has to be done with the proper expertise that what is the state of conservation. It is again a multi disciplinary work depending on the status depending on the structure, depending on the problems we have to involve different types of specialize specialist and where even the historian the archaeologist, the documents it needs a lot of research to understand that. And based on that one has to find out that what are the intervention measures.

And then we talked about the divergent approaches of conservation there it will come into the useful that what should be done with the structure. The value and the significance the different approach all now has to be put together before we [vocalize-noise] sort of say that what is the proper conservation approach for this specific structure and then depending on that we have to find out the estimate specification and make a team and (Refer Time: 23:31).

In our next lecture we will try to take up one structure and try to say that how sort of make some sort of understanding of this documentation process. Another part of the documentation type of the process is a list the category, that which category it is. Again because all structures are not world dated size all structures are not nationally important. So, the listing is a very important part which has a pollicisation, which has also a legal implication we will talk more about that, but listing the categorization or category grading generally what is called is a very important part.

We may now, talk about grading and this stage in the next stage, but we probably will take one structure to see that how the documentation can help in understanding the decay and makes documentation.

Thank you.