INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

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Housing Policy & Planning

Lecture – 20
Housing Infrastructure and Services-2
Drainage, Sanitation, Electricity & SWM

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Hello, today we will discuss the second part of the discussion, second part of the infrastructure and services and the facilities for required for housing. So last day we discussed the requirement, I mean how the infrastructure and services are the very important part of housing development or any township development and we discussed some element of the transportation and road. The categories of road, how differ hierarchy of the roads are placed and you also told that the infrastructures, services, facilities and amenities are planned at various levels starting from the local level, cluster level, neighbourhood level and at the city level.

So based on the different level the requirement of the land, requirement of the investment and the planning approach will be different. So far all kind of infrastructure, the different approach and different requirements are there out of that the most important part of the transportation and road, which is another part of the physical infrastructure. So physical infrastructures are the physically the infrastructures, which are physically existing we can see fill and benefit of the physical infrastructure, we call it as service like water supply, or electricity whatever.

And the some amount of facilities in term of social infrastructure or social amenities are provided and the facilities and amenities both basically qualifies the house as a it improves the quality of the living or the quality of the live substantially for any housing project. So based on that today we will have just overview of few others infrastructures like electricity, drainage,

sanitation, and worst management, how it place very crucial road in township development or any city and how it is related with housing development.

So, for this we already had discussion on the last day's discussion, last day few points so far any drainage development what are the major consideration before he come to the points, the drainage is important because to develop any township or any city the most important part of the vulneuarability of the particular area is the flat situation. So for during any rainy season it can go below the flat level and the flat water can come.

So it is always important to check the flat level of any area before the development of any housing development or housing project. So maintaining the flat level is very important apart from the flat level another points are out full and the where the drainage water surface drainage, water will go and will be disposed off.

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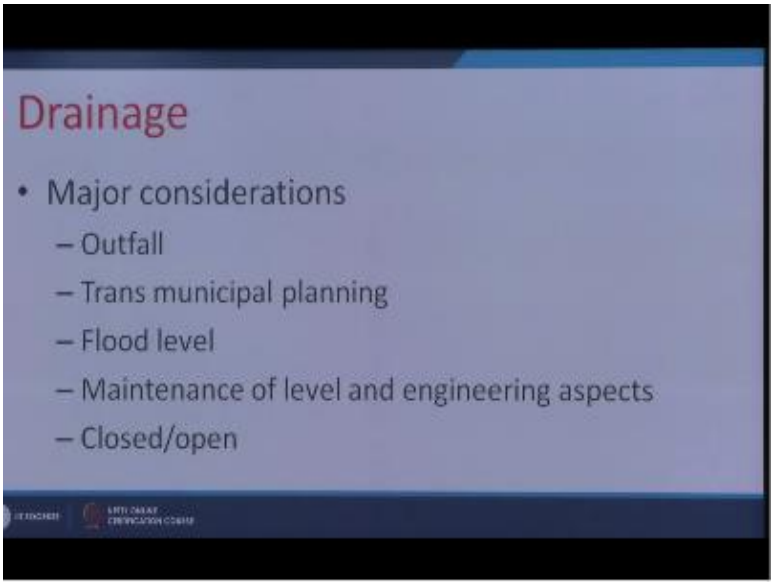

For any housing develop or any township development, the huge area areas under the concreting or the hot surface so because of the hard surface it does not observe the rain water or the surface water and as a result the surface water, the rain water it comes to the out full area. So out full

can be for a city or the overall township or out full can be at the local level. So in some of the places when one particular municipal area or one particular town or city does not have out full or it is not having the out full because of it local so there could be possibility that we could have trans municipal planning.

So we can take few municipalities few bigger township or some combination of small and medium township to make a large drainage facility to orient them to guide them to the large this you are out full facility and also the maintains of lay fall and engineering aspects are very important as per the housing development is concern, we can go for closed and open rent. So far drainage one major important is along the roads, we provide the drainage in both side of the road like last day we discuss the arterial roads or vertical road elected in the local road.

For each kind of road the surface drainage was there. No drainage could be closed or open. So one more point like for drainage if the township is very huge and large for maintaining this loads sometimes the lifting facility or drainage pumping session could be required. So as per this space is required for drainage you could not need another separate space for designing because it is accommodated within along the road, but for the pumping station definitely you need little bigger junk of the land so that you can take the water, you pump it to the different level so that the water can go to the final out full, which can be kind of a river or can be canal or can be any other natural out-full.

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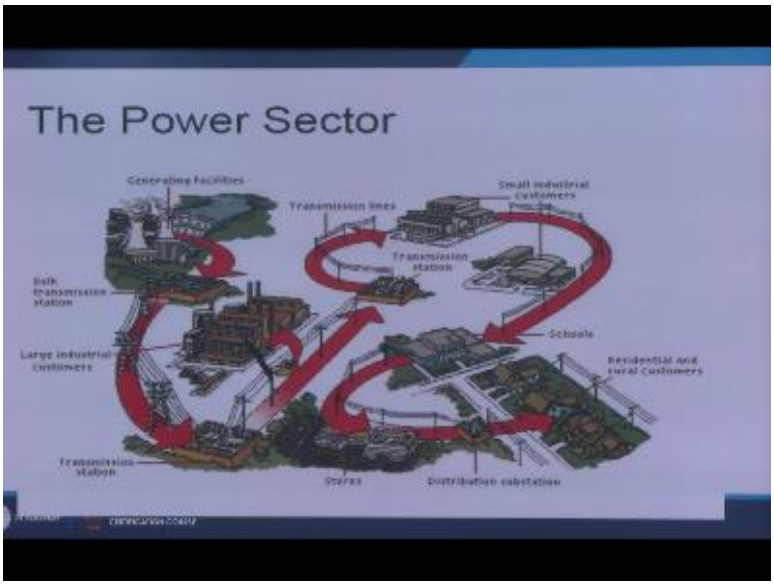

Usually for the final out-fall or the external outfall we treat the natural course of water as the major mean of the out-fall. So apart from the drainage we have the power supply or electricity. Electricity can be generator through different modes like say the thermal power plant or nuclear power plant or hydro power plant or renewable energy.

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Now for housing development or city development we need to establish basically the areas where the substation will be put, the various level of substation based on the city level or the local level substation. So those area requirements are listed in the numbs and cords and apart from this substation area we need to accommodate the lift installation along the road sometime the electricity wires are put in the underground or it can be over ground.

So whatever it is the basic focus is that we need a dedicated space for electrical installation along the road and at the substation area. So if you are going to develop a large area of land in bigger housing project or bigger township project so you have to keeps some amount of area ranging from to 2 to 5% for the power original ration for distribution, electrical distribution, the substation and the distribution wires along the roads.

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Like this so along this road you can put this kind of areas for the street lights and in both side you can take another if the road is very wider like arterial road or sub arterial road, the electrical instillation can be accommodated. Then we come to the river and sanitation this is very, very

important because without this facility plot or raw plot or agricultural plot does not become a live able plot. So there are separate sewerage and sanitations.

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Objectives of the sewerage and sanitation are to have a sustainable disposal of the human excreta and the liquid human excrete and elected waste. So one approach is natural and the traditional process for example is Kolkata wed land and worst cycling region. It is the very huge recycling region where the natural process is there to recycle the waste water and the natural recycling of this river.

Apart from the natural process there could be underground favourite system where you have to establish various treatment plans and from this various treatment plan you can several distribution dots like this. So in plant underground sewerage system you have like STP. Now STP takes very huge area 50 to 60 hector in a bigger project and from HTP you have to have the distribution through the road again below the road or sometimes it can be distributed below the ground like green open areas.

And to maintain the slope sometime sewerage lifting stations are also provided and this is the house hold. So from house hold this sewerage comes like this. So this is the intimidate IS, LS, intermediate sewerage lifting station and from the sewerage military station this your come to the STP for the treatment. So this is the fundamental process.

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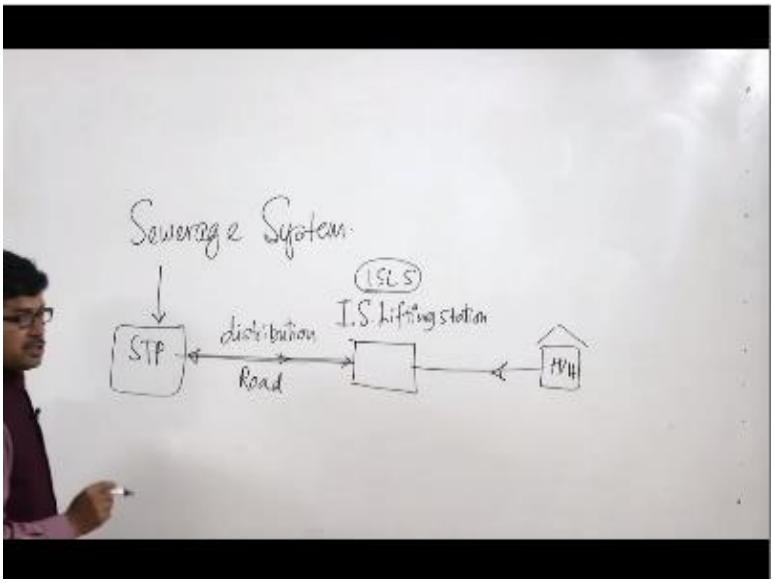

So intermediate sewerage lifting station require some amount of space ranging from 50 to 60 meter in to another 50 to 60 meter and the sewerage can be taken below the road or below the any other open space like that. So for example, if this is a local road last day we discussed the sessions of lob areas, kinds of load, so usually sewerage is taken below the road like this sewerage pipelines. Whereas the drainage like this, objective is that surface water can come to the drainage and water and also the from the house hold this is the building.

At the spite of the building so from the building the surface water can come to the drainage box and also from the road the water can come to the drainage box. So drainage can come in both side of the road and this sewerage line right and also we can keep dedicate space for electricity like this. So this is arrangement for local roads if it is arterial or sub arterial road similarly this

can be distributed over the whole area and the more number of drainage pipe lines or drainage bus gates or drainage boxes can come in that case.

So apart from the treatment process including the sewerage treatment plan and the lifting station and the network, there could be local system like the septic tank or the soak pit which is popular in various rural areas and also suburban areas where individual family or house can or a simple housing project or small community, can have a bigger septic tank and through the septic tank they can have the sewerage facility or sanitation facility.

So this personalized solution is available in small cities and it is very much popular. The advantage of this facility that it is maintain by the individual invocative for this you do not have to put any extra money from the authority, but the disadvantage is that sometimes it can create problem in the area because of the non-maintains and the advantage of the underground sewerage system is that it provides the land suitability.

I mean it provides the effective system using very minimum amount of space because here you are not using the space for septic tank. The space tank is safe through this sewerage network and but it is definitely a costly options then the individual septic tank, so both are having the advantages and disadvantages as per the township and housing is developed.

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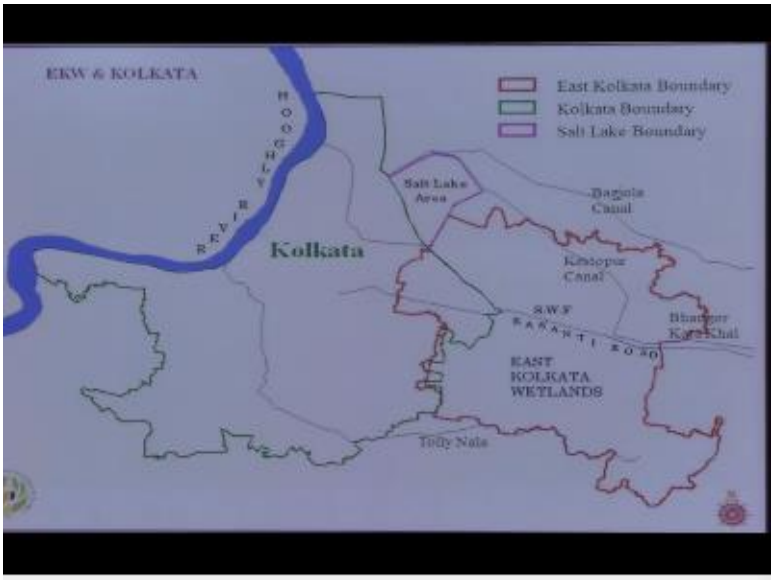

So this is example of the natural area of the Kolkata white land and the cycling region, which basically recycles the west and the sewer water from the city of Kolkata, so lot of natural water bodies is there and this water bodies are having the fish. So fish are feed and because of the fish feeding they recycle this sewerage in natural way. So this is new example, so because of the unique example the main part of the Kolkata residence are the housing projects are the people look at their they get the benefit, but definitely for other areas like town Kolkata or the other areas and other cities we showed.

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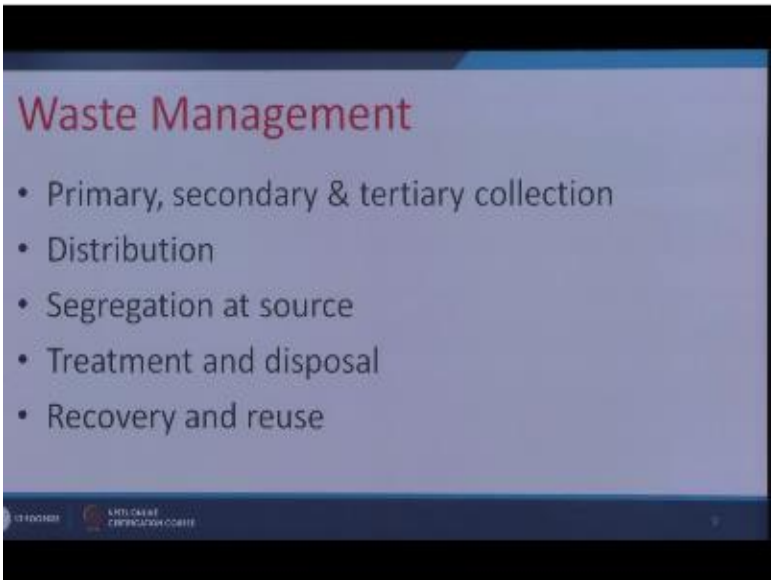

They need to have the sewerage treatment plan or the personal facility like septic tank. The second part is very important part is the waste management for any housing area or any locality we have seen the one of the major problem in today life is waste management. Everywhere you will find that the solid waste or the liquid waste is lying in the road at the open area. You have definitely about this region, the objective for this region is to have the 100% waste management in our cities are in our housing areas.

And also to eliminate the open defecation for our country so apart from this sewage barath of the region though it is mission for all over the India for each and every housing project or every township development, waste management is an essential services, essential infrastructure we should establish so waste management has several stages like say collection, distribution segregation, and treatment and recovery.

So we have several stages of the collection it can be collected at the house hold level. So at the house hold level the collected and then it can be carried to the neighbourhood level. Now they

neighbourhood level collection can be through the carriage facts or carriage wires provided by the municipal authority so either it can be carried out by the manually transported courts.

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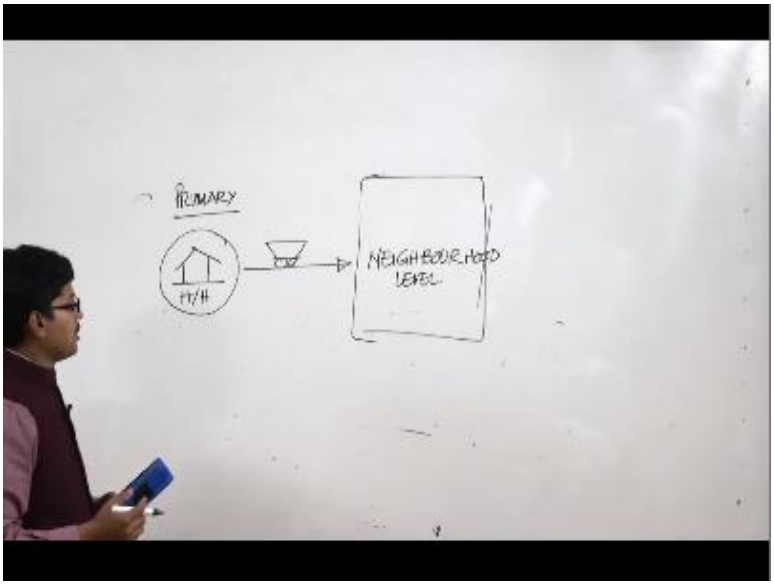

So from the house hold to neighbourhood level so this is the primary collection. At the never hood level it is secondary collection and after that it will transported to designated area in the city or city level or zone level where large amount of areas will be reserved to bring the areas which we called as tertiary collection. So from secondary to tertiary this part since it involve some much amount of the sewerage so it is basically not manual so it can be manual definitely.

But it is not manual by the mechanised mode and after this we go for disposal and treatment. So this is mechanism of the waste management for as per as the housing or the residential areas or concern another very important concept here is the segregation. We have basically organic and inorganic element of waste so for every treatment the segregation of organic and inorganic waste is very important part.

So one of the objective of the segregation is that weather we can segregate this organic and inorganic west at the primary level using different kind of bucket system or different colour bucket system so that organic and inorganic can be collected in the separate bucket and then collected separately to the level collection facility. So the ultimately the process become easier, process becomes the user friendly.

So far the distribution at the secondary level and the tertiary level we need substantial amount of land space at the suitable local in the locality so that you can accommodate the collection facility, but definitely it should be design and plan in such way so that it should not disturbed the neighbouring area. It should not imitate the false smell in the area but adequately it should be located in such a way.

So that it can collect the garbage from the overall neighbouring area from the primary collection. So that is the distribution facility required from the township level. Segregation we discussed then treatment and disposal, recovery and reuse. So at the disposal level there it is not fully un disposal of the current course but definitely recovery of the cost is very important part in the waste management. Unlike the water supply or electricity

The waste is one area for recovery is very challenging because nobody is ready to pay money for the waste recovery. So we can pay like for the primary collection the people who are collecting waste from our household level, but what after that when the waste to the disposal and for the treatment. So there are means and methods how, where we can technically and physically we can recycle the waste and from the recycled waste we can develop several product and product can be utilize for the recovery of the projects.

So the whole method of the primary, secondary and tertiary collection disposal and treatment could be decided in such a way. So that in a township it functions and sustainably as per as the environment is concerns sustainably as well as the economical recovery is concern. So waste management is very important but do not neglect the part in wherever you get the opportunity to plan and deciding the township or the housing development.

So in the next lecture though we will come to the discussion of the social infrastructure but before you close the section let me mention few more infrastructures which we deal apart from the electricity,

sanitation and drainage and waste management like few more infrastructures like gas supply, petrol pumps. These are very important physical element or physical elements which are facilities required.

Sometimes like in few townships you have seen that gas supply is possible through the pipe network, so if the gas supply is given through the pipe network so that space should be kept at the adequately in the road or in some other suitable place. So that is one part and other than that also distribution network of the gas and the network of the petrol pumps and the gas distribution stations are required at the various location of the township.

So apart from that few more physical element apart from the district likes a terminals and we have discussed about the road but apart from the road we need large terminals like say railway stations or the ports or the metro stations. So how terminals can be integrated in the other element of the development of the residential development and other development that is very important as per as the development of any housing area or residential use concern because please take mental note that for any residential development very important part of the residential development is how it is connected with the commercial area or the areas where the live job opportunities or the job locations are there.

So for that connectivity and the linkage are very important, so for this reason the road connectivity, linkage and the notes are very important to locate and to design. Apart from the road and transportation we have discussed today for the drainage where we discuss the very important part of the drainage is the out fall and the distribution system and drainage is designed and the located in the road itself.

we discussed about the electrical system, where electrical system similarly the electrical system is placed below the road but we need substation at the sector level and the city level after that we have discussed the sewerage of sanitation system. Sewerage of sanitation system is consisting of the sewerage treating plan it is network and its collection at different location.

It can be naturally treated it can be mechanically treated using sewerage treatment plan or it can be design as personal life like septic tank and the sewerage. Finally we discussed the waste management where the waste can be solid waste, liquid waste or biological or the medical waste but for our case the housing development the solid waste which is coming from the household day to day basic that is very, very important.

So two kinds of waste are there organic and inorganic, so the objective is to segregate them at the primary collection that is at the household level and then to transport at the neighbourhood level, secondary collection and at the city or the journal level and the tertiary collection and the major part of the waste management is the its treatment and disposal.

So that we can on the recovery of the amount we invested for this purpose and so next day we will discuss about the other part of infrastructural facility the social part, so for we have discussed road transportation, drainage electricity and waste management and sanitation and also we have mentioned about few more element like gas supply and the petrol pumps and all those facility.

So next day we will discuss about the social facility, social infrastructure and the community facilities and ammonites required at the site or beyond the site which is very, very essential and also we will see that how the norms and standards are there what kind of standards are there and what are the space requirement and the population standards which we follow to mention all the social facilities. So thank you for today.

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