1. NEW TANK PROJECT

New tank is constructed across the valley in order to store the water for irrigation and domestic water supply.

Irrigation may be defined as the process of artificial supply of water to the soil for raising crops. It is the science of planning and designing an efficient, low cost economic irrigation system tailored to fit in natural conditions. It is an engineering of controlling and harvesting the various natural resources of water by the construction of dams and various reservoirs and finally distributing the water to the agricultural fields.

Irrigation engineering includes the study and design of works in connection with water control, drainage of water logged areas and generation of hydroelectric power.

The site for the proposed tank project should be so selected that it should satisfy all the requirements of the best possible site and to irrigate the area at the downstream side of the dam.

1.1 SELECTION OF SITE FOR RESERVOIR:

- Geological condition of catchment area should be such that the percolation losses are minimum and the runoff is maximum.
- Suitable dam site should exist.
- Adequate storage of water
- Area of submergence should be less, and submergence cost should be as minimum as possible.

ZONES OF STORAGE IN RESERVOIR:

1.1 Full Supply Level:

The level to which the water will rise during ordinary conditions of operations is full supply or normal pool level.

1.2 High Flood Level:

The level to which water will rise during the design flood is maximum pool or high flood level.

1.3 Live Storage:

It is the volume of water stored between FTL and dead storage level (minimum pool level).

1.4 Dead Storage:

The volume of water below the maximum pool level is called as a dead storage. It can't be used for any useful purpose.

To fix the height and the storage capacity of the tank the following survey works are necessary for the New Tank Project

- Preliminary survey
- Detailed survey

Preliminary survey includes the following:

- Longitudinal and cross sections along and across the centre line of the bund.
- Block levels for the waste weir or surplus weir.
- Capacity contours for different reduced levels.
- Canal alignment

LONGITUDINAL AND CROSS SECTION:

1.1 Objective: -

To get construction details.

1.2 Specification: -

- The length of the proposed bund should be a minimum.
- There should be the availability of good foundation.

1.3 Equipments Required: -

- Dumpy level with Tripod stand.
- Leveling staff
- 30m chain and tape
- Arrows
- Compass with stand
- Ranging rods
- Wooden pegs

1.4 Procedure: -

A temporary bench mark is selected whose reduced level is been determined previously. Starting from this TBM, the RL of the bottom of the point is determined with the help of fly level.

From that point (whose RL is been established), levels are carried along the center line of the bund, called “Longitudinal section”.

Cross sections are taken at every 10m distance on the either side of the center line of the bund at right angles to it.

Wooden pegs are driven at every 5m along the centre line and temporary bench mark is left to facilitate taking cross section readings.

Block leveling is done at waist weir site.

1.5 Drawings Required: -

- The longitudinal section of the profile, drawn to the scale.
- The cross sections at various chainages showing the profile.
- The block leveling at the valley site is to be drawn to the scale; showing the contour interpolation at a contour interval of 5m.

2. WATER SUPPLY AND SANITATION

In order to ensure the availability of sufficient quantity of good quality water, it becomes almost imperative in a modern society, to plan and build suitable water supply schemes, which may provide potable water to the various sections of community in accordance with their demands and requirements. The provision of such a scheme shall ensure constant and reliable water supply to that section of the people for which it has been designed.

2.1. FACTORS TO BE CONSIDERED FOR A WATER SUPPLY SCHEME ARE LISTED BELOW:

2.1 Population:

Present population data has to be collected from census report from region and population has to be forecasted for the design period of 30 years by any of the following method:

- Arithmetic mean method.
- Geometric increase method.
- Decreasing rate of growth method.
- Simple graphical method.
- Comparative graphical method.
- Master plan method or zoning method.
- The ratio method.
- Logistic curve method.

2.2 Per Capita Water Supply:

Amount of water required per person is dependent on living standards of people in region.

2.3 Sources Of Water Supply:

The source has to be studied to see whether they can supply the requisite amount of water for future demands. An alternative source has to be found if it cannot meet future demands.

2.4 Purification Works:

Depending on quality of water, the purification work has to be designed.

2.5 Waterpumps:

Pumps are to be provided to lift water from the intake works to treatment plant to storage reservoir side of the village. Future growth has to be considered in the design of pumps.

2.6 Storage Resrvoir:

The position of the reservoir has to be determined by conducting all the necessary surveys.

2.7 Distributionsystem:

Master plan of the city has to be studied to design the layout of the distribution system. Further growth has to be considered.

MASTERPLAN**:**

A master plan has to be prepared to present entire water supply scheme in its different stages with regard to sources of supply purification and distribution system

2.8 Water Treatment

Water treatment consists of:

- Intake works using pumping plan.
- Plain sedimentation.
- Sedimentation with coagulation.
- Filtration.
- Water softening plan.
- miscellaneous treatment plant
- Disinfection.
- Clear water reservoir.
- Pumps for pumping the water in the service reservoir.

- Elegant or underground service reservoir.

2.9 INTAKE WORKS:

Whenever water has to be drawn from a surface it is not always possible to draw the water directly from it. It becomes necessary to construct intake structure. Intake structure may be well infiltration gallery etc… These are the temporary storage reservoir than the source from where is pumped to the treatment plant.

2.10 OBJECTIVES:

To keep safety with drawing water from the sources over the predetermined range of fly level and the storage water to withdraw conducts.

The intake structure primarily consists of the following:

- Screens.
- Intake conduit.
- Pumps.

2.11 TREATMENT PLANT:

The water which is taken from the source cannot be supplied directly. Before distribution, the water has to be treated properly to meet the domestic water standards.

OBJECTIVES:

- To remove dissolved gases, color, odor of water.
- To remove unpleasant or objectionable taste from water. To kill pathogenic bacteria and germs. To make water fit for domestic use.
- To estimate the corrosive properties of water that affect the conduits and pipes

The water treatment plant should be located as near as possible to the town. The main advantage of doing this is that water will reach every consumer with pressure and purity.

The treatment process directly depends as the impurities present in the water. The different processes to remove impurities are below.

The following water treatment proposed for water supply scheme.

- Screens.
- Sedimentation with coagulation.
- Filtration.

Equipments:

- Plane table and accessories.
- Level with stand and staff.
- Measuring tape.
- Ranging rods.

2.1 Procedure:

A map of the village is to be obtained using plane table methods and various details regarding existing distribution systems, layout of loads, houses, etc. are measured on plane table sheet.

3. HIGHWAY PROJECT

In present era planning is considered as pre-requisite before attempting any development programme. This is particularly true for any engineering works as planning is basic requirement for any new project. Thus highway planning is also basic need for highway development. Particularly planning is of great importance when the funds available are limited whereas total requirement is much higher.

3.1 HIGHWAY ALIGNMENT:

The position or the layout of the line of the highway on the ground is called alignment. The horizontal alignment includes the straight path, the horizontal deviations and curves, changes in gradient and vertical curves are covered under vertical alignments of roads.

A new road should be aligned very carefully as improper alignment would result in one or of the following disadvantages:-

- Increase in the construction cost.
- Increase in the maintenance cost.
- Increase in the vehicle operation cost.
- Increase in the accident rate.

Once the road is aligned and constructed, it is not easy to change the alignment due to increase in the cost of the adjoining land and construction of costly structures by the road side. Hence the importance of careful construction while finalizing the alignment of a new road need not be over emphasized.

3.2 ENGINEERING SURVEY FOR HIGHWAY LOCATIONS:

Before a highway alignment is finalized in highway project, the engineering surveys are to be carried out. The survey may be completed in four stages.

The stages of the engineering surveys are:

1) Map study.

2) Reconnaissance survey.

3) Preliminary survey.

4) Final location and detailed survey.

1) MAP STUDY:

If the topography map of the area is available, it is possible to suggest the likely routes to the road. In India, topographic maps are available from 'Survey of India' with 15 or 30m countdown intervals. The main features like rivers, hill, valley, etc., are also shown on these map

1.1 **RECONNAISSANCE:**

The second stage of survey for highway location is the reconnaissance to examine the general character of the area for deciding the most feasible routes for detailed studies.

A field survey party may inspect a fairly route stretch of the may inspect a fairly road stretch of the land along the proposed alternative routes of the map in the field. Only very simple instruments like abbey level, tangent clinometers, barometer etc., and all the relevant details not available in the maps are collected and noted down. In this survey, valleys, ponds, lakes, marshy land, ridge, hills, permanent structures and other obstructions along the route which are not available in the map are studied in detail. Approximate values of the gradient, length of gradients and radius of curves of alternate alignments.

1.2 **PRELIMINARY SURVEY:**

The main objectives of the preliminary survey are:

- To survey the various alternate alignments proposed after the reconnaissance survey and to collect all the necessary physical information and the details of topography, drainage and soil.
- To compare the different proposals in view of requirements of a good alignments.
- To estimate quantity of the earthwork materials and other construction aspects and to work out the cost of alternate proposals
- To finalize the best alignment from all considerations.

3.3 FINAL LOCATION AND DETAILED SURVEY:

The alignment finalized at the design office after the preliminary survey is to be first located on the field by establishing the line. Next detailed survey should be carried for collecting the information necessary for the preparation of plans and construction details for the highway project.

1.1 **LOCATION:**

The line of the road finalized.

In the drawings is to be translated on the ground during the location survey. This is done using a transit theodolite by staking of the line. The location of the centre line should follow, as closely as practicable; the alignment is finalized after the preliminary surveys.

3.5 DETAILED SURVEYS:

Temporary benchmarks are fixed interval of about 250meters and at all drainage and under pass structures. Levels along the final centre line should be taken at all staked points. Leveling work is of great importance as the vertical alignment, earthwork calculations and drainage details are to be worked out from the level notice. All river crossing, valley etc., should be surveyed in details up to considerable distance on either side. CBR values of soils along the alignments may be determined for designing the pavement.

4. OLD TANK PROJECT

4.1. INTRODUCTION

Rivers and lakes continue for mankind, the preliminary source water for his needs. However these constitute very much less than of the available water on the earth. The management of such a resource is very essential in light of vagaries of rainfall flood droughts etc. One of the ways of elevating or mitigating this problem is by conserving the storages. Such storage can be underground water storages like wells or surface water storages like ponds tanks or large reservoirs.

4.1 THE WORKS CONSISTS OF

- Exiting Bund Details study
- The surveying of longitudinal and cross section of existing bund.
- Block leveling at upstream side of the bund.

4.2 SURVEY DETAILS

The existing bund details are studied. In order to obtain the bund level we need to locate the two points A and B of equal elevation at each side of the existing bund. The survey is done along the bund line for finding the levels of sluices, maximum water level, waste weir, full tank level, free board height of existing bund.

The following survey work is conducted,

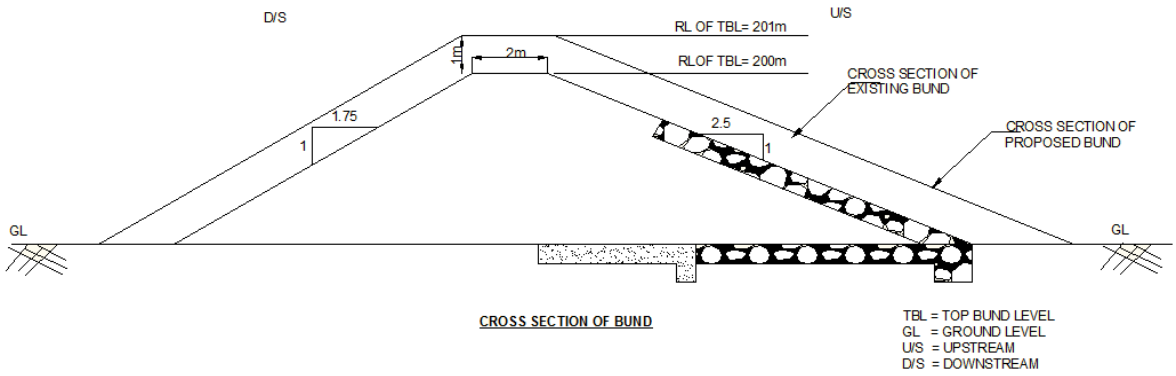
- Longitudinal and cross section leveling of existing bund using total station.
- Contouring of the U/S using Dumpy level.

4.3 LONGITUDINAL AND CROSS SECTION OF THE BUND

In longitudinal leveling the back sight, intermediate sight and fore sight reading are taken at regular intervals at every set up of the instruments. The bearings of the lines and the bench marks are taken. The

change points are noted in the level book. This operation is taken in order to determine the undulations of the existing bund along the bund line. The reduced levels are calculated in the present survey work. The levels are taken at each 10m interval. In cross sectional leveling the levels are taken in the transverse direction in the longitudinal leveling. The Cross sections are taken on either surface of the top of the bund, at the base of the existing bund on both sides, and 5m intervals up to 15m on either sides of the slope. The slopes of both the sides of the existing bund are measured. The cross sectional leveling is done in order to know the nature of existing bund across the centerline alignment.

4.4 SECTION OF BUND



4.5 CONTOURING

The survey is done along the bund line and across the bund 10m interval up to a length of 90m. The readings are tabulated in a excel sheet and using AutoCAD Software the contour is plotted. The contour is done at two R.L marks one

5. TOWN PLANNING

LAYOUT PLANNING

The art and science of ordering the use of land and siting of buildings and communication routes so as to secure the maximum practicable degree of economy, convenience, and beauty.

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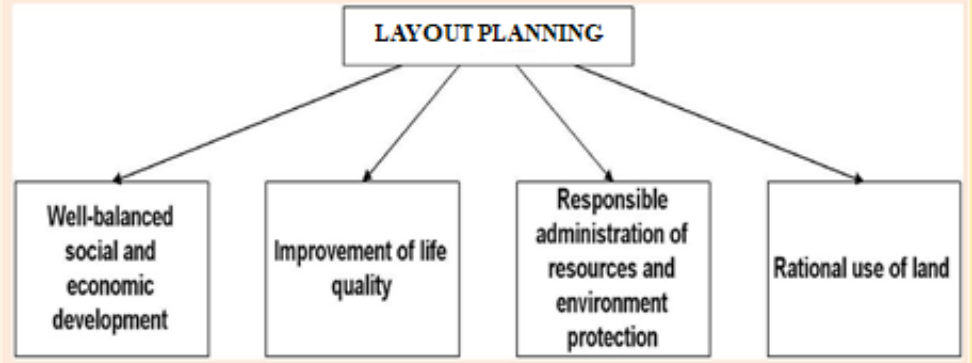
Town planning is the planning and design of all the new buildings, roads, and parks in a place in order to make them attractive and convenient for the people who live there.



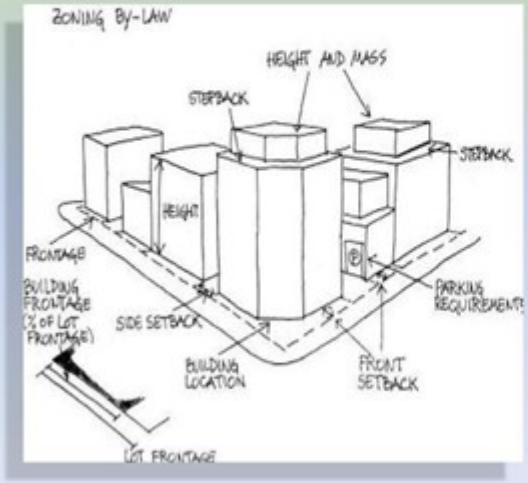
AIMS & OBJECTIVES OF LAYOUT PLANNING

HEALTH	CONVENIENCE	BEAUTY
•To create and promote healthy conditions and environments for all the people – •To make right use of the land for the right purpose by zoning •To ensure orderly development •To avoid encroachment of one zone over the other	• Social, economical, Cultural and recreational amenities etc. •Recreational amenities – open spaces, parks, gardens & playgrounds, town halls stadiums, community centers, cinema houses, and Theatres	• To preserve the individuality of the Town • To preserve the aesthetics in the design of all elements of town or city plan,
HEALTH 	CONVENIENCE 	BEAUTY 

Layout Planning

- Layout/Building Bye-Laws are tools used to regulate coverage, height, building bulk, and architectural design and construction aspects of buildings so as to achieve orderly development of an area. They are mandatory in nature and serve to protect buildings against fire, earthquake, noise, structural failures and other hazards.
- In India, there are still many small and medium sized towns which do not have building bye-laws and in the absence of any regulatory mechanism, such towns are confronted with excessive coverage, encroachment and haphazard development resulting in inconvenience for the users, and disregard for building aesthetics, etc.,

Layout/Building Bye -Laws



Importance of Layout/Building By Bye -Laws

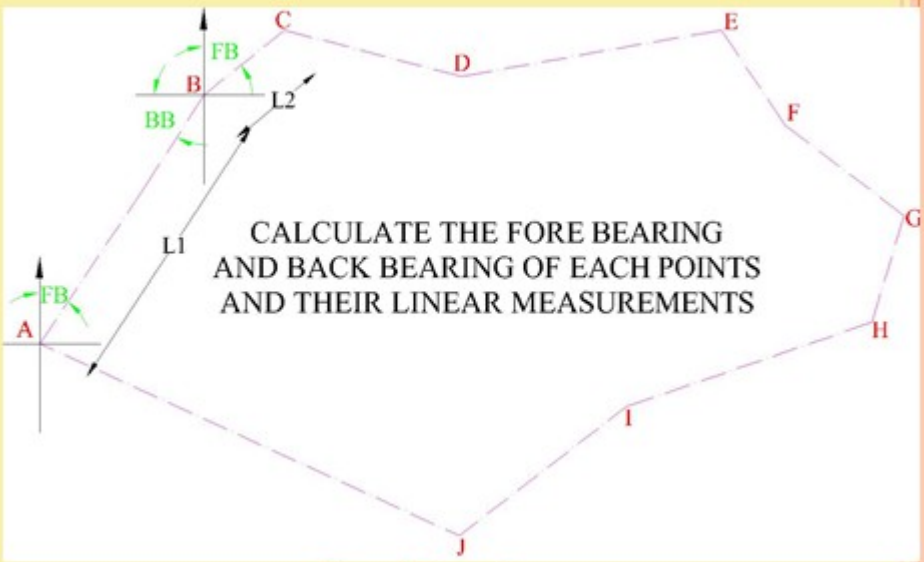
- The buildings must get sufficient sunshine, air and ventilation.
- Open spaces should be well planned.
- The buildings should create better environment.
- The buildings should be located in healthy surroundings and should have an aesthetic appearance.
- But to achieve all this, there has to be a suitable regulations or what are know as model building bye laws, enforced strictly by the authorities, and followed by the builders honestly and truthfully.

Works to be carried out

1. Reconnaissance survey and fixation of boundary.
2. Calculation of the area by closed traversing using chain and tape.
3. Checking the difference in elevation between end points of total area using Dumpy level.
4. Development of layout plan in Auto Cad as per Bye-laws.
5. Marking of different components on ground as per layout plan.

RECONNAISSANCE SURVEY AND
FIXATION OF BOUNDARY

PLOTTING AND CALCULATION OF THE AREA OF A CLOSED TRAVERSING USING COMPASS AND TAPE.

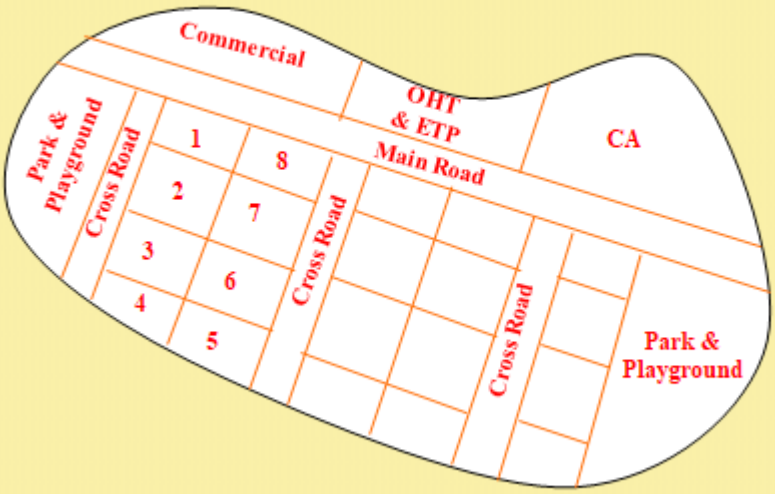


Closed Traversing

MARKING OF DIFFERENT COMPONENTS ON GROUND AS PER LAYOUT PLAN

Marking the Components

Marking the Different Components of Layout plan



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