CHAPTER FOUR

STAGES OF ENGINEERING PROJECTS

4.1 Introduction:

In engineering surveying, we deal with planning, design and consruction of works, both on the surface and underground. At alater stage, surveying techniques are used for dementional control or setting out of designed constructional elements and also for monotring deformation movement.

Surveying is important to the engineer when planning, designing and constructing a project, so all engineer should have a thorough understanding of the limits of accuracy possible in the construction and manufacturing process. This knowledge, combined with an equal understanding of the limits and capabilities of surveying instrumentation and techniques, will enable the engineer to complete the project successfully in the most ecnomical mannar and in the shortest possible time.

There are a number of parameters that effect ofthe study, design and ducumentation of any engineering project, the important requried elements for project study are:

- Serveying studies (map),
- Enviromental studies (soil / water, floods, drains),
- Archology studies,
- Animals studies (fishes),
- Insects studies,
- Shells studies,
- Minerales studies,
- Vegitation studies,
- Climatic studies,

- Sycological studies,
- Social studies.

The design is one of the fields of artistic activity, as it is impossible for any a work of art to emerge without design, In other words, is to develop and position the artwork and estimate what is used in the formulation of the elements and proportions and used to achieve optimal target of this work aspired and this is a common style of our lives and our behavior whether through the creativity of the designer or his choice.

It is found that nature is primary source for the designer to the content of the ammunition infinite elements of different design such as lines and shapes and textures and colors and emptiness, etc. These elements are the change permanent in appearance to the visual and according to what is happening in the nature of the variables, and although it occurs to these elements variables, However; it is governed by the law of nature's eternal growth.

To obtain any product a design good require presence process procedural organization composed of specific steps lead to the identification of this product. From here we can say that the process of design or design behavior: is the set of the procedural steps to be taken towards finding a solution to the problem of a particular design, and the designer to analyze and explains the the shape and formulates a fully aware of the scientific and technological developments in his field and that other filds.

With the accelerated pace of growth and change in the cities widening the fields of vision and analysis and guidance in terms of diagnosing problems and develop solutions. This pace of change began to materialize at different levels of the space environment as a whole or at the level of its constituent systems in particular. Often began to materialize different degrees of change, and this which

contributed significantly to the design complexity of the problems faced by the urban designer.

The complexity of the problems of urban design, it was possible to pass easily on the level of development of appropriate solutions, in the event of the clarity and entrenched and unite theoretical orientations aimed at the treatment, as was the case decades ago, is not far.

Also known as urban design as an integral part of the process of city planning, it is in general and fundamentalsterio design, three-dimensional, and treats at the same time with environmental factors is visual, such as pollution, and the sense of danger or safety and which contribute effectively in the composition of the properties of the study area .

It is the basic attributes of urban design: organize the elements of urban and human actions that are the built environment.

And researchers is that of urban design plan for the provision of an urban environment characterized by processors to the requirements of urban society and urban social, economic and aesthetic and melted down gradually during a long time in the materially system coherent. This gradual regulation of the city can be carried out according to the design process continuous and kinetics dynamic, In order to keep the physical configuration is always in corresponds to the level of a modern living conditions stable.

Process of urban renewal is one of the important practices in the policies of urban design, and so the urban renewal is the process of adapting the urban structure of cities and sectors constantly for the requirements of of modern individuals and society, and will always depend on a specified period on the potential economic, social and artistic the available.

And find projects in urban design, there are a variety of applications and objectives of disparate for individuals and society, which requires the designer urban adoption of scientific method to differentiate between alternatives and working to harmonize the views of specialized and unilateral view of the various actors: the economic and, social, planning, architectural and services.

And can be divided the main axes for differentiation to five main axes, which in turn are divided into detailed studies for the purpose of simplifying the diverse and disparate objectives for the various events. And could be the main axes are the foundations on which to take for the purposes of comparison between alternatives and urban design project as follows:

4.1.1 Social hub, where social studies deals with the following:

- Social relationships and social interaction,
- To maintain the customs and traditions and social values and traditionof which social,

4.1.2 Economic hub, and discusses the economic aspects of the following:

- The economics of land value and the efficiency of investment,
- The economics of structures that are basic networks, technical services, social and consumer,
- **Was commissioned buildings and coordinate spaces foreign** ,

4.1.3Urban axis, and addresses the Urban Structure of the organizational aspects of the following:

- Regulate land use,
- Organizing blocks of buildings and containment space,
- The organization ofthe movement system,

4.1.4Environmental axis, and deal with the environmental indicators of the following:

- Dealing with the visual environment,
- Dealing with the environment, climatic,
- Dealing with the environment,health, pollution.

4.1.5 Executive axis, discusses the following aspects:

- Take actions Programmable Project,
- The ease implementation and the possibility,
- Dealing with controls for implementation as a model,

And from these multiple axes, we find that the need for an urgent action to intensive studies until it is sure of the safety and suitability of the environment to implement any design them and this leads the overall success of project.

4.2 Map:

The maps are the most important pillars of the basic ideas that reflect the engineering and shortcut here simplified sience maps generally in terms of the definition and types and methods of collecting information.

4.2.1 Definition:

As we know that the map is a representation in writing to the After minimization on the surface of the paper two-dimensional each ground or part of the surface of the earth or any other planet, describes the landmarks nature and explain the lives of the people's social and economic, scientific and political over time, and milestones that can be represented on the the map is a symbol and code-point, line code and survying code.

4.2.2 Types of maps:

Maps contain information natural landmarks or artificial, because the map as we know is a geographical database represented by codes, where different types of maps depending on the type of data that covers this map and can divide the types of maps here into three types:

4.2.2.1 Base maps:

This type represents a base for all other species where it is known topographical maps, which are created from information collected surveys direct any of the books of the field and be of a scale large or medium where having produced national bodies or international organizations in the form of organized and accurate is the representation of landmark continent or country or part of the state.

4.2.2.2 Maps deduced:

As this type is dependent on the existing maps in collection and where they are established at various scales from small or medium-scale maps and large example of a navigation maps.

4.2.2.3 Thematic maps:

Where they are compiled from other maps, whether base maps, as well as sources of information map gives the direct survey or information accurate statistical or other information such as aerial photos or satellite images or remote sensing data, and an example of geological maps are compiled from topographic maps and geological survey direct,

as well as maps and geographic distributions, where we find that it highlights the elements of the natural environment and human and interested in the various phenomena associated with the life of the peoples on the earth's surface.

4.2.3 Evolution collect information:

At the beginning of the twentieth century has become urgent need to work different maps of the surface of the earth and helped by the development in means estreophotography and remote sensing, making maps from aerial photography more accurate. This development in technology contributed the development of earth science, geology, geomorphological and land-use maps and it became a sources of information for the use of land and resources, knowledge resource management and the way they commensurate with the spirit of development and the age and by comparing the considerable need the land to deliver food for the population with sources of climate, soil, and water began studies to assess the ground using advanced technology.

The study of distributions of rocks and soil and vegetation, and the population started to a distribution eyes, methods of distribution in kind and mapping led to presence of large quantities of complex information that should be met and that resulted from the survey, and size quantification of this information led to the concealment and obstruction description quantitative information or perhaps a result of the lack of quantitative observations.development in accounting rules to the problem of location and space started to between 1930_1940 AD, these rules parallel with statistical methods and analysis of time-serial mutual.

In the sixties 1960 and existence of the computer and the real potential for quantities in thematic maps, these analyzes spatial not limited to earth scientists only, but town planners and institutions of cadastral need accurate information about the cities, and engineers need information for cities to put roads and canals and estimate cost cutting and filling some places, the police needs to know the spatial distribution of the crimes, health agencies are need to know the distribution of the disease and the patients and types of diseases and their location, trade agencies and companies need to know where commodities and

distributed, Enormous infrastructure and known services and utilities such as water and electricity lines and telephone lines and all you need to codify in the maps and traded in the form of maps.

4.3 Soil:

Creation of maps based on the study of soil factors, soil formation using aerial photos and field survey and laboratory analysis. It aims the soil survey to identify the types of soil in the study area and a statement on the geographical distribution map defines the quality of the soil ma. And supports interpreting aerial photos for the purposes of the soil survey to determine the independent elements, namely:

- Elements related configuration of the earth's surface and include: the earth's surface and slopes and watery discharge and the pattern waterways.
- Elements related to particular characteristics on the surface of the earth, like the shape of canyons and patterns, and the color of the surface of the earth, the natural drainage conditions.
- Elements related to vegetation such as: natural plants, land use, and some special trees.
- Elements related to human activity, such as irrigation and drainage canals, farm boundaries, roads, pattern and locations of installations, and village sites and antiquities.

With the high value of sound and building tendency to exploit very inch of the ground. Whatever the problems of this hand was a pressing need to build here has to be sufficient to study the soil so that the engineer set up building in tact because the proportion of heat the soil based on proper construction was therefore an urgent need to study the types of soil.

4.3.1 Definition ofsoil:

Soil due to call a collation word is old solum. Engineered soil and rocks mean crumbs resulting from erosion and orgasmic and orgasmic materials resulting from the decomposed of plants and animals and humidity and the content of orgasmic solvents and suspensions and metal as well as air located within the soil also in deludes the definition of the soil layer thickness of comminuted earth's crust and is thus a complex mixture of solid material containing liquids and gases and orgasmic ingredients.

4.3.2 Facilitysoil:

Soils arises from the lack of natural rocks and transmit by rivers and rain, wind and snow and the soil is made up through physical and chemical changes in the membership of the rocks. The soil is divided in terms of origin into two kinds:

4.3.2.1 Soil residual:

It consist of the disintegration of rocks by heat and humidity and freezing services and result in the granules disassembled above the original rock (fiery, or sedimentary), granite and basalt or limestone or sandstone, and sometimes reside soil remaining bottom soil movable have deposited above after soil formation residual, and the remaining soil are usually a good basis.

4.3.2.2 Soil movable:

The majority of the soil, a soil borne either snow water of food or wind borne soil is snow to be the first source of good construction materials used in the manufacture of concert and acts of soil and foundations where the soil – borne water and foods are thick layers of soft knit granules in river deltas and in valleys and be more validity to agriculture due to the usability of compression and compressed relative. the soil borne winds either resistance when increasing the

water content and scalable compression, soil and either coarse sand are a few loose resistance, such as those the seas and rivers.

4.3.3 Soil Structure:

Soil is composed of – either a coarse grained soil with a diameter greater than 0.002 mm or also called loose soil like Aldakshum than gravel – sand or fine grained soil with a diameter than 0.002 mm and also called cohesive soil such as silt, clay.

4.3.4 Particle arrangement:

There was tow type of soil depend on its structure:

4.3.4.1 Construction of coarse granular soil:

Composed under the influence of strong attraction ground because the weight of the granules have the effect of care less if the soil is dry and we want the impact a strong attraction between particles due to surface tension.

4.3.4.2 Construction granular soil soft:

Particle board construction consist of soft of his strong attraction to and repulsion between particles due to the small weight and its effects neglected if compared with the total shipments electrostatic and that's where thy space surface areas of the large granules the granules dispersed arrangement depends on the type of cargo on their roofs and it happens when the deposition of particles in fresh water, such as fresh water lakes or soft soil with flocculent building which results in the attraction between particles of different shipment on the surfaces and it happens when the deposition of particles in salty water when the format of river deltas.

4.3.5 Difficult soils:

Is the soil that cause additional problems from the standpoint of engineering as a result of the circumstances of its composition or a change in the environmental conditions surrounding the building on this soil can be difficult because of the relative motion of origin as a result of swelling or landing, for example, the fundamentals engineer must recognize on such soil on the site when the offset.

There are several types of soil with difficult problems and their properties and behavior of the most important:

4.3.5.1 Collapsing soil:

And is defined as soil that can be relatively high stresses with low value drop when the humidity is very low and natural dry density is relatively low. When exposed to high humidity, it quickly matattiy high value decline accompanied by a collapse in the internal composition of the soil. It consists mostly of sand and silt with nestle small clay with some species.

When you increase the humidity drop occurs causing extensive damage to large installations, built on this soil where there are twofactors lead to acollapse of the two:

- Be the installation of soil contains a relatively large proportion of voids.
- To be slim and the humidity is much lower than the degree of saturation.

In addition, should a temporary presence source for the cohesion of the soil helps to resist the strongs hear. As influenced by both the amount and rate of collapse in the clay content of the soil and mineral composition of the constituent materials of the soil and the form of soil particles and size distribution of these particles and the proportion of natural moisture, size and shape of the spaces in the soil and the concentration of ions.

Carnivores and materials which may include gypsum, calcium carbonate and salts and oxides of iron and clay materials.

4.3.5.2 Expansive soil or swelling soil:

There are some types of clay has the ability to plastically bloating when adding water and shrinks when it has this water. The foundations built on this mud cause serious may lead to the complete collapse. The value of this stop bloating my game to increase density and increase the proportion of dry clay mud especially effective such Almntamor Ielenit and low rate of natural moisture. And soil potentially be solid bulge of high value to clip in its dry primary, either in wet condition, they lose those qualities.

When you build on this soil must be taken into account when the design possibilities of movement on the part of the soil and the pressure resulting from the swollen. This is due to the swelling of the soil water absorption by the free clay minerals involved in the installation and especially Almntamor ielenit degree of swelling depends on many different factors, including the type of metal clay and the proportion of presence and density of the soil and the ratio of quality and soil density and the ratio of active-grained clay to non-clay particles and water content and natural vegetation composition of the soil and the soil effort indeed.

If the soil gives the low-power bulge, the facilities are designed and implemented in the usual way. However; if the soil gives the power bulge high it must be careful in the design and implementation of this soil and handle,where this deal boils down to when built upon are as follows:

- Replace the soil viable bulge under the basics.
- Change the nature of the soil viable bulge control the compaction and become wet or former water control or installation by chemicals.

– Work necessary precautions for the origin of so irresistible bloating and be flexible so that the origin of the differential without bloating resist collapse or to build on the foundations of the bottom of a deep region of the bulge effective.

4.3.6 Soft Clay Soil:

Soil is a high compression which low resistance to shear, as well as its low coefficient of textures, and the soil is a common problem when built upon, or deal with it. Where this type of soil causes a significant decline of the facilities built by eight granules of this soil is characterized by feature creep.

Is due out this soil to a single depositional environments riverine or shallow water or lacustris, are located deep deposits of soft clay soil at the mouths of the Nile Delta and in some areas at the northern coast,they are several types including:

4.3.6.1 Normal clay consolided:

It is a soft clay to the average strength and resistance is very weak and has a high sensitivity and if it was an increase in pregnancies resulting decline of great value and to a large extent.

4.3.6.2 Fibrous organic solids:

A soil containing a large amount of organic material, whether or boil the fibers on the body grawiat and the composition of the soil produces weak down under the influence of a large increase in the pregnancy.

4.3.6.3 Peat:

It is the remains incomplete plant smut and composition of spongy been in marshy wetlands therefore be colored black or dark brown.

4.3.6.4 Clay soil organic (muck):

It is a soft clay soil composition most of decaying organic material.

4.3.7 Fills:

mixture of trash and debris and loose soil and backfill is usually due to human may be old or newly backfill. It may be from the rubble of the remains of hominid life may be of exhaust products and factories. Namely that the backfill material varies according to its composition, age, and there are so-called backfill health (saintary land fills) the deposition of waste without causing danger to human health.There is also a bridge rubble as there are types of backfill soil containing natural clays such as cally fill or gravel fill or sand fill and so on. And deposits of waste in the health backfill may contain some materials such as wood, paper and impurities and debris and remnants often and buildings such as brick and stone. And meet the engineer in dealing with the many problems filling the most important landing and the carrying capacity of the soil backfill, and when dealing with the backfill soil should study the following factors:

- Depth reclamation and its changes over the site.
- The nature of the backfill material.
- Age backfill.
- Way be backfilling.
- The depth of natural layered under the rubble.
- The nature and properties of natural layered under the rubble.
- Water and its banks in the arrival of backfill.

There are many methods used to strengthen the backfill soil to increase the bear and cut downs, including:

- Pressure advance.
- Surface compaction.

- Deep compaction.
- Relay stone columns.
- Installation parenteral.

Relay electiroasmoszei and electrochemical methods.

Care must be taken to prevent the incorporation completely filling the unknown nature as well as the backfill resulting from ponds and swamps, or which contains the remains of wood waste and harmful and many.

In cases where voracious layer to absorb the water, it must remove this layer or taking into account the impact of this class where lead to occurrence of the bulge, in general, when dealing with the backfill soil to establish them must care severe studies and research to address the problems of these soils and the possibility of making the decision whether or not to build upon.

4.3.8 Consolidation of Soil:

Movement of structures built on soil load, to the soil beneath it in the form of stresses resulting re-arrangement of soil particles so that converge together or drift from place any happening in the soil (form) and as a result moves the foundation and thus established to the bottom and this is a form of make up the soil. Where the soil take multiple forms of formations, including:

4.3.8.1 Compaction:

It is a process of soil particle to force the convergence and the concomitant decrease in size and expel air.

4.3.8.2 Sclerosis:

If the soil is soft and saturated it when exposed to an increase in stress occurs by the change in volume is accompanied out of water. And the change in size

gradually exit the water with access to the degree of balance when the water stops out.

4.3.8.3 Humidity change:

Some types of clay resized plus or inferiority with increased humidity or lack of it, such as expansive clay that occurs devastating impact on the floors and the elements of humanity.

4.3.8.4 The effect of vegetation:

Influenced by high plasticity of clay crops, especially tree roots. The radius of the circle up the impact of the roots of the trees to the amount greater than the height of the tree.

4.3.8.5 The impact of the low level of ground water:

When the clouds of orchard or any of digging the ground water level will go down in the surrounding soil, causing a settlement in these soils.

4.4 Vegitation:

Applications include multiple ways to use modern technology for remote sensing in various agricultural fields and plant the following operations:

- Survey agricultural areas and identify spaces in various agricultural sessional.
- Estimating the productivity of agricultural land of various crops.
- survey and the study of various types of soil and land to determine its suitability for cultivation.
- Study the distribution of moisture and ground water in the soil to help in the planning and implementation of irrigation and drainage projects and improving agricultural soils.

- The early detection of disease-infected plants and inventory area and limits the spread infestation, and the degree of their impact on the crops and surrounding vegetation.
- Detection of forbidden plants grown legally, such as narcotic plants.

We find that there are two ways of the many ways for remote sensing can be used efficiently, one relies on radiology reflected in the different fields of optical (visible and unvisible) of plant species in agricultural land, using photocopiers air multiple lenses. Another method relies on recording the thermal emission from the plants as a result of various radiations self-infrared long-wave, using electronic device special survey warming, which does not depend on any external lighting and therefore can work at night.

In the first method was found to be characteristic of plants to reflect the rays of light waves outside the visible spectrum may vary completely from reversed to these waves in the visible, in the case of the similarity of some plants similarity fully in shape and color so difficult to distinguish from shed light visible_ the different internal structure of each plant caused a degree of variation in the amount of reflection of light rays from these plants outside the visible range, particularly in the field of near-infrared.

In the second method, we find that it is particularly important due to its remote sensing of agricultural land, and to distinguish between different cultivated, and can be used day or night and without the use of any lighting, and that this method the ability to identify plants infected, and the discovery of some exotic flora hidden within or between dense plantations of trees and forests.this method relies on the ability of each plant to radiation self-infrared thermal long waves, and that an amount commensurate with the temperature of the plant, and with the special vibrations, which vary from plant to plant depending on the composition and size of Physiological papers and ratio of the chlorophyll.

Plants up the heat issue of which the amount of energy more than other plants less heat relatively any slight variation, even for part of the class between the heat plant and another cause was a difference imperceptible in the amount of radiation emitted from the two plants in the field of infrared heat and thus can distinguish between the two, even if similarity in the low pathogenic form and its color outer.

4.5 Services:

Due to the rapid development in the work of sanitary engineering and sanitary wares and the problems of the countries in this field of bad application of the two has become the duty of the engineer to be familiar with all related technology these sciences so that it can maintain the buildings and the environment against damage quick and damage to public health as a result of pollution. Sanitary engineering science used to control initialize infrastructure in the surrounding buildings and sources related to public health and enter in its engineering applications for water works and sanitation outside the buildings. As the science of sanitary wares used in engineering applications for combinations of pipes and sanitary appliances and accessories inside buildings and within the scope of this science to feed the various systems of buildings and water ways in addition to disbursed piped gas supply buildings and garbage.

4.5.1 Water:

The one of sources of waters is:

4.5.1.1 Natural sources of water :

Water is four-fifths of the earth's surface which is in the oceans and seas and rivers, where it is the natural hydrological cycle of the water where the sun evaporating the oceans and seas and becomes a cloud and then rain down the rivers and lakes on the earth's surface and underground water in its interior. And there are three main sources of water and are as follows: -

- First: Rain water
- Second: Ground water
- Third: Surface water
- **First: Rain water:**

Characterized by rain water as little pollution of surface water, as it is often soft any water a few mineral salts. They also also midly acid from the chemical due to the absorption of the water some of the carbon dioxide from the air and are therefore the substance that causes steel or iron pipes may cause corrosion , and melting lead material, especially in the pipes lead with the drinking water collected from rain water solute the a large quantity of carbon dioxide as the lead material dissolved in water is a toxic substance and therefore should not be used in the pipes that pass where rain water.

- **Second: ground water:**

It is stored water in the ground and we can say that 97% of the fresh water in the earth in the groundwater, while 3% of the water present in the surface water, consisting of rivers, lakes and canals _ which not within the these ratios the ice at the north pole or the south.And draws groundwater from the main water aquifers, which are:

A) Rain water seeping into the ground until it reaches the solid layer of soil, which can not seep through them and thus accumulate and rises their level.
B) Rivers and lakes and canals that seeping into the ground, especially when rise waters from the water level in the region of saturation.

The groundwater dissolved the salts of bearing rocks have mineral water varies with the ratio of soluble salts. Correlation exists between surface water and groundwater in the areas where the re-fill underground reservoirs of water from

the cracks. We have on groundwater from the surface of the earth by digging wells or springs.

- **Third: surface water:**

It is water stored above ground and exposed to air and exposed to different environmental factors and that is in the waters of rivers, lakes, seas and canals where it's always contain microorganisms have come from the air or soil or sewrage.

Because of the large difference between specifications rivers freshwater and sea saltwater in the quantities of pollution and dissolved salts in the water must be work purification water to kill microorganisms and especially the harmful and remove some salts own that caused hard water and the by sedimentation or nomination or disinfection or quick mixing for example.

4.5.2 Sewerage in cities:

The water supply for housing a significant impact on the development of systems, sanitary wares, especially when it. was the invention of water flush toilets that neglect box expulsions. May prevent then dry toilets that do not use water, which often emit a bad odors and use toilets instead of water in the cities. In this way, with the continued use of healthy ways to supply drinking water in the latest decline radical in the rate of mortality ratio in the cities.

Construction of sewer pipes sheet in the city just is not a complete solution to get rid of liquid waste because it will make the organic material constituent decompose in the pipes and talked bad odors in addition to the disease as well, especially if were disbursed in rural areas or rivers or lakes or the sea without treatment. Therefore you must enact of laws to prevent throwing of such waste liquid in these places without processed to make sure they are free of pollution-causing diseases.

And generally are at the present time to get rid of liquid waste in the cities through the sewage works in each city, which is based on the compilation and processing of liquid waste and then disposed of engineering an economic health after ensuring that they are free from micro-organisms that cause diseases. And concentrated sewage works in cities in three basic components are the work of compiling liquid wastes and liquid waste processing work and works to get rid of liquid wastes.

4.5.3 Electricity:

Is the electricity one of the sources of energy important and frequently used common in our public life _ where, for example, but not limited to, we touched use permanent electric lights by lamps, electric different shapes and sizes, or used in heating by electric heaters or use in air conditions or used for administration electric appliance such as cleaners, of refrigerators, washing machines ... etc.

And the theory of electricity generation in its simplest form is a use of mechanical energy that may result from the momentum of steam, for example, in a steam turbine or from the momentum of water in the turbine water in the management of electrical generators different, which in turn convert this mechanical energy enormous into electrical energy can be used by as mentioned previously.

And notes that it can transfer electrical energy from this place to the place of its consumption generated by conductors (wires) of copper or aluminum towers loaded with a high aerobic or through a well-insulated electrical cables and underground stretched out.

4.5.3.1 Electrical distribution:

Feeds Electric Company different regions of the country's main supplies power cables that link to the main feed for each region where it is distributed

through the main distribution board for each area which building in the following ways: -

Extend networks of electrical cables taken from the main distribution board for the area to distribution points where by digging service electric underground line play distribution Co. To fund inspection of hand hole placed on the border of lands buildings in the region or street corners in areas of apartment buildings where the power is connected to dig sewerage underground blobs of these specifications determined by the laws electric conduction of each country.

Another way is to extend the power lines upper loaded with poles graduated from the main distribution board and then work to buildings and soldieries' connectors near every building in the area connecting bus way of any cable the building, is usually put near the light meter main cable connection cable the building in the nutritional status of the villa or factory, hospital or school, or .... etc.

As in the case of feeding apartment buildings matched stream electric company upon the arrival of electric cable to the entrance of the building connects directly to the distribution panel and which comes out auxiliary shaft to feed the different floors in the building, or when all the role of the branches of the column riser panel building distribution board subsidiary for the distribution of power on the flats of different and at the entrance flat panel placed other sub-building distribution board service to the apartment.