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# **INDUSTRIAL PLANTS**

## **Chapter two:**

**Procedures and standards for the design,  
implementation, testing and delivery of equipment in  
public and private work in the national**

**DOUBLE DEGREE MASTER IN**

**“PRODUCTION ENGINEERING AND MANAGEMENT”**

**CAMPUS OF PORDENONE - UNIVERSITY OF TRIESTE**

## Generalities, definitions and reference regulations

Companies can be classified according to various criteria:

- economic activity;
- to the scope;
- the economic entity (employee);
- the legal entity (entrepreneur);
- to the size.

Companies related to economic activity are classified as:

- **delivery**: all companies are part of family, private associations and the Government, who provide and consume good and service;
- **production**: includes all companies that buy and produce goods and services (business);
- **made public**: the groups belonging the previous two classes (State, Region, Province, Municipally, Local Health, etc.)

## Generalities, definitions and reference regulations

The creation, growth and distribution of value to classify companies in:

- **family**: pursues its goal through non-economic and economic values;
- **non profit**: there are companies that are not profit oriented subjective;
- **mutual**: include cooperatives, mutual insurance companies and associations of cooperatives;
- **of production or enterprise**: its main purpose directed the production and distribution of wealth and indirectly as a secondary purpose the satisfaction of human needs;
- **public**: responsible to meet the public needs and creates, distributes and adds value to the community by involving other stakeholders (suppliers, officers, servants, customers, competitors, etc.).

## The design process of the project

The design of public works is divided into three stages:

- a) **preliminary design**, which allows a maximum of economic evaluation of the works;
- b) **definitive design**, which allows an accurate evaluation of the economic times and costs of execution;
- c) **executive design**, which allows the construction site of the works.

## The design process of the project

The parts that characterized the preliminary project are:

a) the **report illustrative**

it contains:

- a description of the project;
- the explanation of the reasons for choosing the proposed solution and the illustration of the problems;
- the exposure of the feasibility of the project in relation to the constraints;
- the ascertaining the availability of sites and buildings;
- the addresses for subsequent preparation of a final project;
- the time schedule of the various phases of the design, acceptance, implementation and testing of the intervention;
- the information necessary to ensure the use of existing services.

It gives guidance on the circumstances resulting from the drawings.

## The design process of the project

The parts that characterized the preliminary project are:

- a) the **report illustrative**
  - time schedule

C2: Cronoprogramma												
Anno 1 – 2010-2011												
Azioni	Mese 1	Mese 2	Mese 3	Mese 4	Mese 5	Mese 6	Mese 7	Mese 8	Mese 9	Mese 10	Mese 11	Mese 12
	Set.	Ott.	Nov.	Dic.	Gen.	Feb.	Mar.	Apr.	Mag.	Giu.	Lug.	Ago.
Azione A												
Azione B	a											
	b											
Azione C	a											
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	c											
	d											
	e											
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Azione D	a											
	b											
Azione E	a											
	b											

Anno 2 – 2011-2012												
Azioni	Mese 13	Mese 14	Mese 15	Mese 16	Mese 17	Mese 18	Mese 19	Mese 20	Mese 21	Mese 22	Mese 23	Mese 24
	Set.	Ott.	Nov.	Dic.	Gen.	Feb.	Mar.	Apr.	Mag.	Giu.	Lug.	Ago.
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Azione D	a											
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Azione E	a											
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## The design process of the project

The parts that characterized the preliminary project are:

b) the **technical report**

It shows the technical studies of the first approximation with information on minimum requirements that should characterize the project;

c) the **pre-feasibility study of environmental**

It is prepared to find solutions that promote environmental improvement;

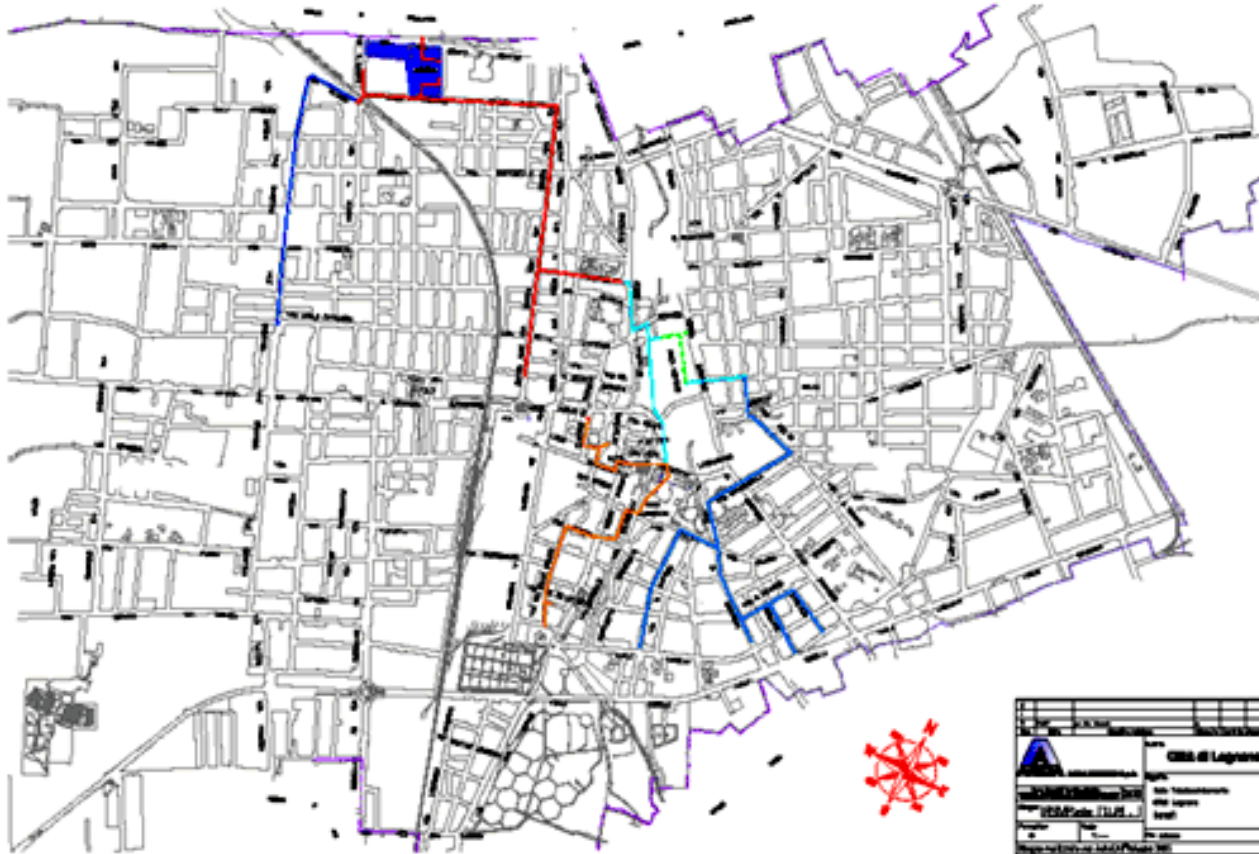
d) the **conceptual graphs**

They are included in the preliminary project must be presented in a suitable scale and with appropriate dimension. Depending on the type of the project are composed of different processed according to point or mesh works.

## The design process of the project

The parts that characterized the preliminary project are:

d) the **schemes graph**



Planimetry of a district heating network of the city of Legnano



## The design process of the project

The parts that characterized the prelinarly project are:

- e) the **summary calculation of expenditure**  
It is made with reference to the cost of the project and additional funds available to the contracting authority figure
- f) the **special performance contract**  
This document is only required if the plan relates to public works or to be put to the tender of a contract contest or a public works concession

## The design process of the project

The parts that characterized the definitive project are:

a) the **descriptive report**

This report has as its aim to provide clarification to demonstrate compliance with the aims of the demonstration the compliance of the project at purpose of the intervention, compliance with the prescribed quality, the resulting costs and benefits expected

b) the **geological, geothermal, hydrogeological and hydraulic report**

c) the **technical and specialist report**

This report clarifies the solutions adopted for specialized problems

d) the **environmental impact study**

This study is realized when the right conditions are provided by Legislative Decree 152/06 as amended by subsequent Legislative Decrees 4/2008 e 128/2010 with the programmatic, design and environmental framework

## The design process of the project

The parts that characterized the definitive project are:

e) the **environmental feasibility study**

It shows the necessary steps to environmental redevelopment and land area by the construction work, starting from the information already provided in the preliminary project, taking account of constraints in the area concerned and must permit the release of all approvals and authorizations needed in environmental matters.

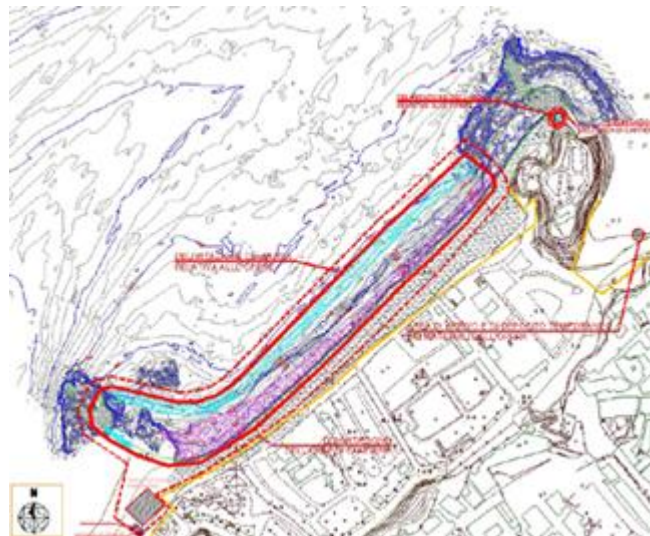


Figure shows an environmental feasibility study of a sewerage for wastewater white

## The design process of the project

The parts that characterized the definitive project are:

f) the **elaborate graphs**

They describe the main characteristics of the work to be carried

g) the **preliminary calculations of structures and facilities**

They must enable the sizing and specification of the facilities and plants;

h) the **specification descriptive and performance of technical elements**

It contains information about all the envisaged performance content in the project, with particular reference to the technical elements and architectural embellishment;

i) the **particle plant of expropriation**

It is drawn up according to the cadastral maps and includes the necessary expropriation and enslavement to the passage of roads and waterways.

## The design process of the project

The parts that characterized the definitive project are:

j) the **summary estimate of the intervention**

It is drawn through a bill of quantities estimated they are applied to the unit prices of work required.

## The design process of the project

The parts that characterized the executive project are:

a) the **general report**

It describes in detail the work to be carried out, referring to the elaborate graphs, and the criteria used for design choices in order to fulfill the requirements of the final project;

b) the **specialistic report**

The geological, geothermal, hydrogeological and hydraulic report illustrate the solutions adopted and, if necessary, for the detailed aspects of implementation and maintenance of the work;

c) the **elaborate graphs**

d) the **executing calculations of structures and plants**

They must enable the sizing of structures and plants, and should be performed with respect to the operating situation. In addition, they must be clearly stated criteria and calculations used to allow immediate confirmation.

## The design process of the project

The parts that characterized the executive project are:

e) the **maintenance plan**

It has as its goal to provide the maintenance over time of the characteristics and features of the work consists of the user manual, maintenance manual and maintenance program;

f) the **security and coordination plants**

They are of elaborate attachments to the executive projects that have as its goal the minimize possible the inherent risks to working and are made after risks assessment, and contain the operational requirements to be implemented with relative costs;

g) the **time schedule**

h) the **list of unit prices**

It is made considering those used in the summary estimate of the work present in the final project, except for additions that are necessary.

## The design process of the project

The parts that characterized the executive project are:

i) the **computation metric estimated** and the **economic framework**

j) the **scheme of contract**

Its mandate is to regulate relations between the contracting authority and executing company (contractor), with particular reference to the terms of implementation and penalties, the program of works, the suspension and resumption of work, the cost of the contractor, accounts of work to size or body, the liquidation of payments due to the controls, the procedures and time limits for testing, and methods for settling disputes;

k) the **contract special of tender**

It regards the technical requirements to be applied the realization of project



## The process of awarding the project

The methods are:

- the **open procedure (public enlightenment)**  
Call for tender or procedure to public evidence, you may attend all the companies that request it, provided they have the requirements of the type of work or amount that is determined by the contract (at measure, at body, mixed);
- the **restricted procedure (private bidding)**  
It's a race in which they are invited to attend only the subject (which is why it is private) that are considered suitable, based on an assessment at the outset, to conclude the contract. In this case is the Administration to define the schema bargaining, to which the private can not negotiate the contents of the contract

## The realization path of the project

Are considered:

- the verbal of handover works
- the manual of works director
- the journal works
- the booklet of measures of works
- the booklet of measures of supplies
- the weekly lists
- the register accounting
- the summary of register accounting
- the state of work progress
- the certificates of payment of installments of advance payment
- the register of payments
- the state and the final account of the works
- the minutes of the process of suspension and resumption of work
- the request for extension

## The realization path of the project

Are considered:

- the minutes of the coordination of new prices
- the relationship on accidents to persons and damage to property
- the minutes of the process of assessment of damage to the works by carelessness or force majeure
- the service orders
- the changes, increase and decrease of the work - the dissolution of the contract
- the expertises of variant and supplementary - acts of submission
- the disputes for the Administration and the contractor
- the termination of contracts for fraud, gross negligence or contravention of the terms. serious irregularities and delays in the execution of the work - running for office - supply and subcontracting
- the certificate of completion of works
- the occupation of a property before the test - safe delivery

## The realization path of the project

Completed its work and compiled the final state, we can finally move to the final liquidation of the work. You can have:

- a) **notices opponendum**: ordered the testing, the Administration gives public notice, inviting creditors to the contractor for the permanent or temporary occupation of buildings and related damage in order to present the titles of their claims within a fixed period;
- b) **certificate of social insurance**: before doing the test is passed the notice of completion of work at Labour Inspectorate, and at INAIL and INPS and the total amount of work that took place in order to find the regularity of the firm's position in respect of the obligations insurance;
- c) **certificate for the sale of receivables to third parties by the contractor**;

## The realization path of the project

Completed its work and compiled the final state, we can finally move to the final liquidation of the work. You can have:

- d) **report of the director of the work on the final bill**: contains all data and information necessary to test for assessing the proper conduct of the work from project up to completion of works;
- e) **certificate of regular execution**: compiled by the chief engineer of contracting administration, replacing the test certificate for all jobs up to 500,000 €, for work of greater extent, but not exceeding one million euros, is faculty of the procuring entity replace the test with this certificate;
- f) **confidential report of the direction of the work on the requests for higher compensation advanced by the firm.**

## The path of testing of project

The testing of a work is intended to verify and certify whether:

- a) the work was performed in a workmanlike manner and according to established technical requirements;
- b) the work was performed under the contract and variants duly approved;
- c) the values resulting from the accounts and documents match between them;
- d) the remuneration set prices and allocated in the final settlement are governed by contract;
- e) in the management of works in economics has taken care of the interests of the Administration;
- f) the expropriation procedures to be borne by the contractor have been completed promptly and diligently.

## The path of testing of project

The tester must write three different documents (act of testing):

- a) **the process of verbal of visit**
- b) **the report on the results of the visit (report of testing)**
- c) **the inspection certificate**

There are other documents:

- **the confidential report on applications to higher compensation**

## The path of testing of project

Other **administrative measures, to subsequent testing**, is detected during testing:

- a) the process of verbal of visit (original and copies);
- b) the report on the results of the visit (in original in tax disc and copies);
- c) the inspection certificate (original in tax disc and copies);
- d) eventual certificate of the chief engineer of the Administration for the corrections ordered by the tester;
- e) the judgment reserved on the conduct of work by the firm (in a sealed envelope);
- f) the confidential report on applications to higher compensation advanced by the firm in depending of the work and observations of the contractor to the test certificate.



## The path of testing of project

The Administration has the power to make a new testing until did not exist until **the approval of the acts of testing**, but assuming that the Administration accepts the conclusions of the test on the regular execution of the work it must take the measure approving.

## Safety and testing of technological systems

You must do:

- **declaration of conformity**

Is the certification confirming that the plant is built according to current standards and represents the set of documents to be issued by the installing firm