
Itemized Engineering, Design and Supervision Activities in civil pipeline projects

The itemized list hereafter is indicative of the basic activities for each phase of the Engineering, design and Supervision of civil sealines.

The items indicated as “by third parties” can be provided through associated specialized professional engineers or companies.

Each phase can be eventually split in separate sub-phases and eventual integrations can be specified/requested by the Client.

We are available to present to the clients a “tailor-made” proposal for the engineering, design and supervision as covered broadly by the above scheme of the present work scheme according to your design and supervision plans.

1. Outline design

The outline design is the first stage of work required for the submission to the Client of the documents necessary to define the project in its general engineering aspects.

For the start of this phase it is required to evaluate all the previous documents and information collected by the Client and to obtain the basic requirements of the project which shall be the base of the development of the design.

It is also needed to definition the scope of work in terms of eventual particular prescriptions by the local Authorities.

The stage includes basically:

- Preliminary evaluation of the main meteomarine characteristics of the area
- Evaluation of the suitability and feasibility of the installation in the proposed area
- Definition of the requirement and specifications of necessary surveys (by third parties)
- Supervision and assistance to the surveys
- Verification of the planimetric position of the marine facilities and evaluation of the coastal structure in the area
- Study of the hydraulic requirements in terms of pipeline diameters and head loss
- Preliminary modeling of the discharge and/or recirculation (by third parties)
- Study of the position of the offshore intake structure and of the diffuser to avoid the recirculation of the thermal waters
- Supply of the documents of the marine facilities for the insertion in the general environmental impact assessment for the power plants
- Sizing of the offshore intake structures, of the pipelines and of the pump and discharge chambers onshore
- Specifications of main materials
- Outline installation Method Statement
- The design report for the material and construction
- Preliminary BoQ (Bill of Quantity) and cost estimate

2. Executive design

The executive design will supply to the Client the design for construction, either as engineering and design for an EPC (Engineering Procurement Construction) project or as final design for a PC (Procurement Construction)

The design will include all the necessary information, drawings, specifications of materials and specifications for installation to permit the client to issue the necessary RO (Request of Offer), orders and/or Contracts.

- Assessment of the project basic and its verification in relation to modifications requested by the Owner, Client or Public Authorities
- Verification and analysis of the information on the local marine environment, with evaluation of the survey data and eventual definition of the opportune survey integrations
- Evaluation of the modelling data and definition of the specifications and follow-up of an updated modelling if opportune in relation to changes in the position of the facilities (updated modelling by third parties)
- Definition of the position/depth of the offshore intake structure and of the discharge and related diffuser
- Definition of the final routes of the sealines and of the land lines
- Hydraulic calculations and definition of the necessary intake/discharge pipeline diameters
- Definition of the intake/pump chamber (IPC) levels and dimensioning of the intake/pump chamber in relation to the equipment to be installed (filters and pumps)
- Design of:
 - offshore intake “head/s” and related chlorination system
 - intake pipeline/s and chlorination line/s
 - connection with the intake/pump chamber and dimensional outlines of the IPC entrance section
 - hydraulic requirements for the cooling water pumps and cooling water lines to the TPP borders [
 - pipelines from the plant border to the coast and outfall with diffuser
 - hydraulic calculation of the diffuser
- Preparation of the drawings necessary for the installation (plan, profile, sections, other as necessary)
- Preparation of specifications for materials and installation in relation to the type of contract (EPC, PC or else)
- Assistance in the RO, technical evaluation of the suppliers and contractors, evaluation of the technical aspect of offers for material and construction

3. Assistance and supervision

- If our Company is not in charge of the engineering and design, for both onshore and offshore piping system, we can provide the control of the basic and executive design in order to confirm the technical choices and indicate the eventual optimization which may result necessary. In general, this is strongly related to the type of piping material used and to the local conditions, particularly as function of soil and bottom characteristics. It should be considered that in several cases it is not possible to apply generalized solutions as recommended by the manuals or as applied in “similar” projects.

We usually intervene in the technical evaluation of the selection of materials and of contractors in order to assure the compliance to the required quality.

We also can take care of the necessary tests for the materials and for the installation.

- We shall point out that the marine section design is covered by regulations which require a particular set of data and a dossier for the presentation to the public Authorities.
The dossier shall include oceanographic, climatologic, lithological and environmental/biological marine data and near-field and far-field diffusion calculation to justify the environmental compliance of the thermal water discharge.
We are available for the follow-up of the necessary surveys and analysis of survey reports and for the assembly of the necessary presentation dossier (with the cooperation of an authorized company).
- It can be provided the supervision services for the materials and equipment, directed to the verification of the material design, the control of the components or of the raw materials, the qualification of the production and the periodical testing and approval reports.
We can provide the supervision of onshore field installation of piping systems, verifying the compliance of the contractor's installation method with the engineering studies (stress analysis report and the fabrication drawings) and the installation specifications and the manufacturer's recommendations, reviewing the installation Inspection and Test Plan, witnessing the installation procedures and the quality control activities according to a pre-planned program as required per ITP and assist with advice, recommendations and technical expertise on problems or subjects regarding engineering or construction matters including but not limited to handling, transporting, storing, installations, damages, leakages, etc. of piping
- For the supervision of offshore pipelines, installation and testing, we provide the qualification of the installation methods and the control the execution of the construction.
The "engineering" supervision includes all the controls necessary to assure that the execution is properly planned and followed up.
In particular, we assure the verification of the technical offer of the marine contractor for completeness and for compliance to the project specification, assist the client for the negotiations with the contractor in order to assure that the contractor will provide the necessary quality, and has sufficient experience/personnel and equipment to provide the completion of the works according to a firm program
In the SOW is included
 - the verification of the installation plan, installation procedures, QA/QC (Quality Assurance/Quality Control) manual, HSE (Health, Safety, Environment) manual, emergency safeguard procedures, etc.; the qualification of the personnel, of the divers and of the marine equipment and the verification of the presence of all the necessary work and navigation certificates.
 - The verification of the site engineering to be provided by the contractor for the installation,
 - The verification of the quality of the material to be provided by the marine contractor and eventual witness of specific tests,
 - The qualification and periodical control of the survey equipment to be used during the installation, a periodical verification of the status of works, analysis and approval of progress reports, etc.,
 - Analysis of the installation techniques for the offshore structures



- Evaluation of the data/reports supplied by the diving supervisors and assembly of the related reports and information.
- Verification of the testing procedures and witness of the hydraulic tests
- Verification of the preparation of the data for the “As Built” report and final verification of the “As Built” report, “As Built” drawings and of the results/report of the “As Built survey”
- For the underwater control of the installation, an independent diving team will be provided by third parties and supervised by our Company.

The diving supervision team is generally be constituted of minimum two divers and one team leader and be equipped with underwater photo and video camera.

The diving supervisors shall provide to control and record the proper execution of the installation.

They will provide the necessary reporting and the daily or weekly progress and installation reports and the editing of pictures and videos to be evaluated by our Company. The same personnel shall provide the control of the respect of navigation and diving safety rules, the presence of all the necessary certificates, control of the vessels signalizations, control of the subcontractor’s workmanship in particular with reference to QA/QC and HSE manuals.