Establis

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Establis Group is an engineering company, specialized in creative design and calculation of building structures, with a good sense of reality. Geldof has subcontracted Establis for the study of the civil works.

Geldof is a worldwide supplier of industrial components and turnkey projects for the storage, handling and processing of solids, liquids and gases. Furthermore, Geldof is also specialised in the construction of storage tanks and pressure vessels. Geldof helps its customers to achieve their strategies in Europe or elsewhere in the world by providing total solutions. Steel is the basis of every device made by Geldof. Supported by integrated project management, business development and an efficient production unit, the company is able on this basis to continually provide top-quality and durable projects.

Geldof serves a wide range of sectors: the oil, gas and energy industries, chemicals, biochemicals and petrochemicals, metal working, mining, the bulk food sector, etc. In this respect, Geldof operates both directly with final customers and via agencies.

Software: Scia Engineer

Biomass Installation Electrabel - Nijmegen, The Netherlands

Introduction

Two years ago, Geldof Metaalconstructie started the engineering and construction of the largest and greenest project in its history: a biomass processing unit for the Electrabel, GDF SUEZ Group, power station in Nijmegen, the Netherlands. Geldof is supplying a total solution for this to Electrabel. Because of the extent of the project and the time pressure Geldof has subcontracted engineering office Establis for the study of the civil works.

About the project

Thanks to the biomass processing unit, the power station in Nijmegen can increase the percentage of biomass burned to 25%, with the emphasis on a greater use of sustainable energy sources. Each year the installation processes 500.000 tonnes of wood dust, as a result of which Electrabel can supply some 200.000 people with green power.

With this project Geldof has demonstrated that it is a prominent player in the field of biomass installations. Thus it provides a total solution in which the energy efficiency of each component is important: from the mechanical transport system to the implementation of the new installation in the already existing power station, from the crushing of the biomass to the carrying out of all safety and operational studies.

The project was massive both from the construction and the engineering point of view. Geldof and Establis opted to execute the stability calculations for the civil part and steel structure in Scia Engineer, considering the complexity of the installation. Geldof built, placed and supervised the placing of more than 500 pile foundations, the construction of the mechanical transport system with a capacity of 600 tonnes per hour, 2 large storage silos each with a capacity of 5.000 m³, the crushing of the biomass into wood dust, the dust removal installation, the pneumatic transport to the 24 burners, all civil engineering work and all electrical aspects. In addition to the mechanical and electrical components, safety was a particular challenge. After all, it's wood dust that is injected into the burners.

One of the greatest challenges of the project was the fact that the existing piles of an older, torn down plant on the construction site, never were removed. There was no information about the bearing capacity of these piles so the decision was made to use new piles for the foundations.

Use of Scia Engineer

Establis used Scia Engineer to make a complete 3D model of the basement under the silos and the foundation of the silos. The load of the biomass on the foundation of the silos is 170 tonnes per m² and the dead load of the silos is 36.2 tonnes per meter. Thanks to the use of Scia Engineer it was possible to try out several different grids for the piles to come to the most economic solution. Every pile has a bearing capacity of 160 tonnes and is used optimal. In total there were 235 piles used for the foundation of the silos.

During the execution of the new piles it became clear that the pile plans of the old piles weren't completely correct and various piles had to be replaced. Once all the piles were executed and measured by a surveyor the 3D model could be finalized and the reinforcement could easily be calculated.

It is common knowledge that dust can be an explosion risk and for this reason special safety measures were studied and developed: from extra compartmentalisation and pressure relief systems through a spark detection system with water nebulisation to the more everyday fire alarm system and fire extinguishing installation.

With this project Geldof and Establis have proven that they are fully committed to a sustainable, ecological and more environmentally aware society and that they have a far-reaching know-how in the field of green energy solutions.

Biomass Installation Electrabel

Nijmegen, The Netherlands

Project information

Owner	Electrabel
General Contractor	Geldof Metaalconstructie
Engineering Office	Establis
Construction Period	From January 2009 to July 2010
Location	Nijmegen, The Netherlands

Short project description

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