SAXUM Engineered Solutions

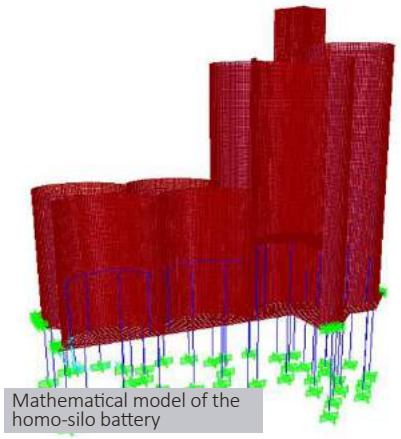
EXTERNAL BULLETIN FOR OUR CLIENTS

CONNECTION

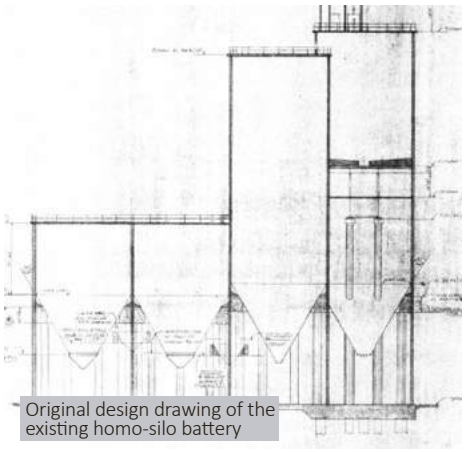
Issue #178- May 2017

PROJECTS - **GCC USA**

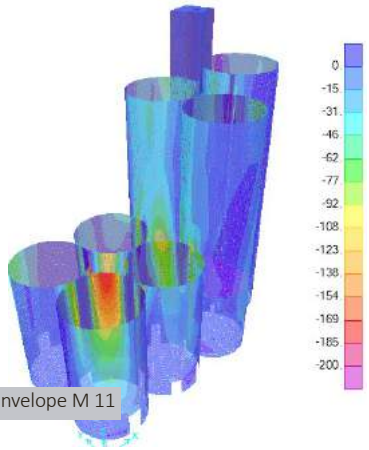
Structural verification analysis and design of optimal reinforcement solutions for Homo-Silo battery



Mathematical model of the homo-silo battery



Original design drawing of the existing homo-silo battery



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SAXUM has performed specialized technical services related to the structural verification analysis of the existing homogenization silo battery in the Rapid City plant of GCC. The verification study involved also the design of an integral survey campaign to evaluate current mechanical features of the structural materials on the silo walls, roof, foundations, etc., as well as the identification of eventual cracks and fractures in the different structural components of the homogenization silos.

Based on the results of the surveys and of the structural verification study, SAXUM performed further analysis to determine and design the optimal reinforcement solutions of all silo components. For this purpose, the gravitational loads transmitted by the new loading and unloading equipments were considered, as well as the specifications of the latest ACI code.

SAXUM's scope of work in this project included:

- Issuing of the technical specifications for the survey campaign as well its supervision,
- Development of the verification analysis based on mathematical models and on the results of the surveys,
- Issuing of the Diagnostic Report on the Structural Safety Conditions of the structural components of the homo-silo battery at Rapid City plant of GCC,
- Technical Specifications and datasheets for the new Air-slide System for the Homogenization Process in the Homo-Silo, attending the requirements of current piro-process upgrade at Rapid City plant,
- Technical Specifications and datasheets for the new Air-slide system for the discharge process in the homo-silo,
- Update of the homo-silo General Arrangement drawings,
- Technical Report with description of the proposed structural reinforcements,
- Issued for construction drawings of the required reinforcements and new platforms,
- Calculation report and PE stamping ■

PROJECTS - **LAFARGE HOLCIM USA**

Engineering for the SynGyp Project of LAFARGE-HOLCIM USA

The Lafarge-Holcim plant in Midlothian, TX, USA, required engineering support to design the required modifications of 2 existing steel finish mill feed tanks to accommodate the extra weight by replacing the original cones of the tanks. Besides the added weight of the equipment, over 15 years of operational wear and tear observed during tank inspection had to be accounted for the analysis and design of the required reinforcements to the structural tank supports.

Lafarge-Holcim awarded SAXUM out of its engineering office in Irving, TX, USA, to develop the engineering services and designs associated to this SynGyp project. For this purpose, a 3D Mathematical Model based on the Finite Element Method was generated to verify the structural safety conditions of the tank supports and, then, to design the most appropriate reinforcements and additional structural supports to sufficiently withstand operational loads and environmental elements. The installation of the bin discharger allowed for the successful transport of synthetic gypsum onto the feed belts ■

PROJECTS- **SOBOCE**

Optimization of the Cement Raw-Mill Operation for SOBOCE

SOBOCE, at the Viacha plant, has a raw meal grinding mill which feeds its Allis Chalmer and FLS1 kilns; this grinding operation is performed through a ball mill with a 1st generation dynamic separator.

The separator blades, with the typical design of its generation, are based on the air current which separates the particles different sizes uniformly along the main separator axis; SAXUM verified that the particle distribution along that axis was not uniform which led to the optimization of the separator air flow by redesigning the blades which significantly improved the separation efficiency.

SAXUM'S proposed blade redesign was performed which reduced the circulating load of the separator and in turn increased the separator output; this fast and low cost solution increased the mill output by approximately 9%. Furthermore, this low risk solution did not adversely affect the raw meal mill nor the kilns and was carried out on a short mill stoppage lasting less than 8 hours■

PROJECTS- **Mansfield Mineral S.A.**

Engineering and CapEx Estimate for the Lindero Gold Mining Project in Argentina

SAXUM sevices have been secured by Fortuna Silver to review and update their recently acquired Lindero Gold Mining Project, located in Salta Province, North-western Argentina. For this purpose SAXUM is developing the following activities that will allow a complete project review and Capital Expenditures (CAPEX) estimate.

Trade-off studies to define design criteria for:

- o Power Generation
- o Dust Control at Crushing System
- o Civil /Structural design for major structures.
- o Retaining Walls
- o Water PIpeline

• Review and development of all needed Mechanical, Civil/Structural, Electrical and Automation & Control Basic Engineering for the Lindero Project Update.

•Coordination and Integration of all engineering developed by third parties involved in the project■

THE COMPANY

Mr. Eloy Amarante: Project Director South America and Cement Project Manager

Mr. Eloy Amarante is SAXUM Project Director South America. He has an extensive experience in the management of multidisciplinary engineering teams for cement projects located in different countries of the Americas. Provided with a very strong background in the mechanical design of cement facilities and in the technology of this industry, his efficient Managerial action of engineering teams for cement projects is strongly supported by a deep technical knowledge of the industry.

As Project Director South America and Cement Project Manager of SAXUM, he is in charge of the south American Team of Engineering Project Managers of our Company and, in this framework, of our client satisfaction with SAXUM's engineering project development. When acting as Cement Project Manager, he is responsible for the overall quality of the projects under his direct control. This includes the fulfilment of Project Schedule, the compatibility of SAXUM's designs with project General Arrangements, and the quality of SAXUM's deliverables. Eloy is highly focused to project objectives. This personal feature is permanently recognized by our clients.
At SAXUM, Eloy developed the engineering management of important and large projects such as the 6.500 TPD new clinker line of CSN in Arcos plant, MG, Brazil, the greenfield project Maceo for CEMEX in Mexico, the cement line upgrade for GCC's plant at Rapidcity, SD, USA, the new vertical mills for cement of CSN in Arcos plant, MG, Brazil, the new cement line of Cemento Chimborazo in Ecuador, etc. Eloy started working at SAXUM in 2010. Previously he was Engineering Supervisor of Intercement.

SAXUM Engineered Solutions is highly proud of having Eloy Amarante in its team of managers■

NEWS- **IEEE-IAS/PCA Conference**

Join us in Calgary, Alberta, Canada for the 58th IEEE-IAS/PCA Cement Industry Technical Conference 2017

We are pleased to invite you to visit our **BOOTH 313** at the IEEE-IAS/PCA Cement Conference. It will be an excellent opportunity to present you SAXUM's capabilities in your cement projects.

May 2017

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Calgary, Canada

CONNECTION is a newsletter published by SAXUM Engineered Solutions for its clients

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