SAXUM Engineered Solutions

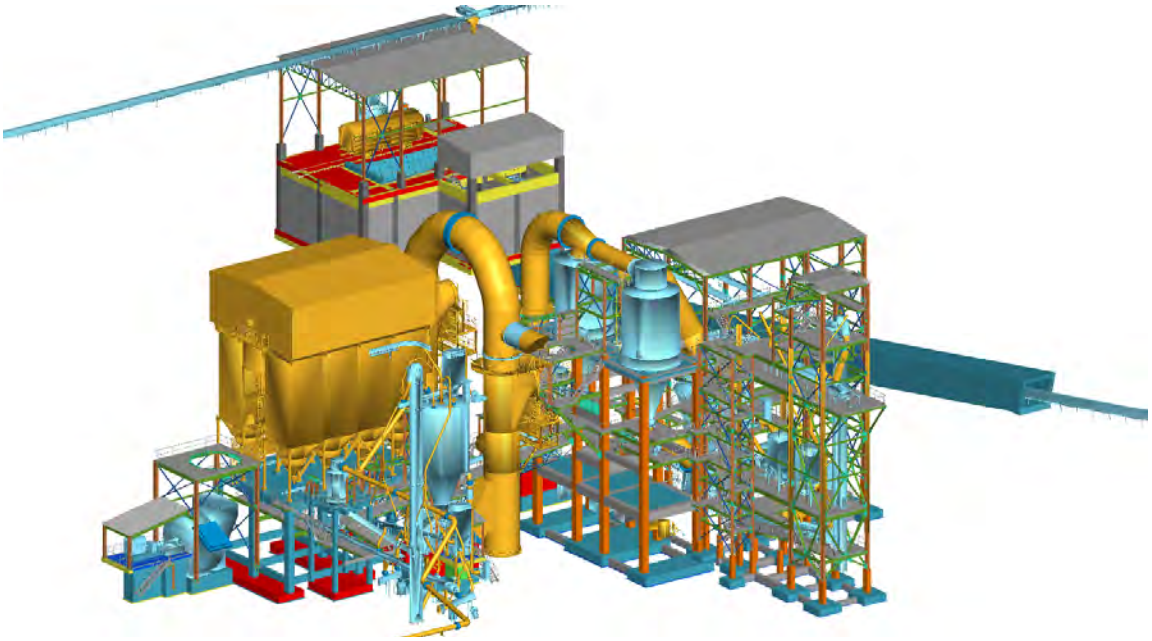
EXTERNAL NEWSLETTER FOR OUR CLIENTS

CONNECTION

Issue #199- Nov 2019

FLSmidth Inc.

Civil/Structural Engineering for the New Cement Line, Moncada Project



FLSmidth Inc. (hereinafter FLS) is a global engineering and equipment supplier to the cement and mineral processing industries. SAXUM has been assigned to participate on the civil & structural designs for the new cement production line of Moncada, Cuba, of 3.500 TPD.

The contract, dated on November 2018, agreed on granting SAXUM the engineering design for the Limestone Building (crusher), Filter Building, Raw Mill Building, Cyclone Building, Mill, Additive Intake, Coal Storage and other concrete and steel structures to be designed according to the Cuban and FLS standards.

SAXUM´s scope of work included the calculation and design of concrete foundations, concrete superstructure and primary/secondary steel structures with all their connection details for the buildings previously listed, to be entirely developed for the buildings previously listed, to be entirely developed in 3D models. These models were directly submitted by SAXUM to the steel workshops for their fabrications.

For the purpose of this project, SAXUM has assigned an experienced team of civil structural professionals and designers, related to both, the steel and concrete structures. SAXUM designs encompassed also the detailing of the concrete foundations as well as the overall integration of the structural designs with the General Arrangement drawings and existing buildings. As of November 2019, this project shows relevant progress, the most important milestones as defined by SAXUM client were fulfilled, and is very close to its completion.

Confidential Client

Prefeasibility Study and CapEx for a New Cement Terminal

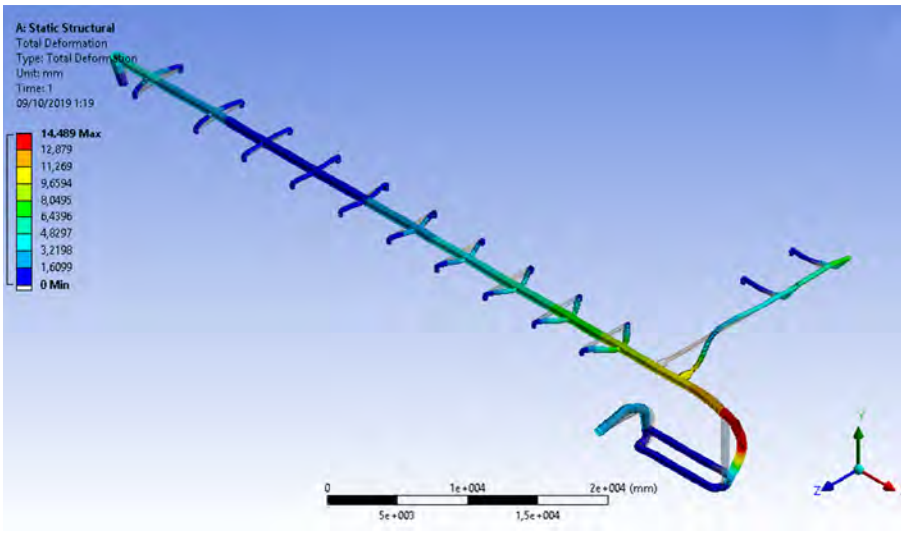
SAXUM recently undertook a project study for a client (confidential) for a new cement terminal design with a capacity of 30,000 tons of cement storage. This study required cement terminal design and operations experience including civil/structural, mechanical, and electrical engineering analysis.

The design included a comparative analysis from both technical and economical point of view, between different cement storage facilities, including silos (made of concrete and steel) and other options. The study also considered a cement unloading system from railcars, cement handling equipment, environmental controls, and all related equipment to handle, store, and distribute cement to customers. There were site specific criteria and limitations considered including receiving and offloading of 20 cement loaded railcars per day.
The design was developed to be integrated into an existing site and operations, without disrupting those operations. This study and the subsequent design drawings showing all the cement terminal layout and structural options allowed the client to determine a site layout for optimum operations and cost efficiency.

LIVENT Corporation

Analysis of Pipe Stresses and Fracture/ Failure causes for Lithium Project in Salta,Argentina

LIVENT Corporation (LIVENT) is a leading company in lithium extraction and purification technologies. The company extracts lithium ore from el Salar del Hombre Muerto in Argentina, where the company has long-term mineral rights.
SAXUM's scope of services in this project included the engineering for the accurate evaluation of the maximum stresses developed in the pipe during operation, the causes of the observed cracks, and the actions/reinforcements that need to be done for the appropriate operation of the pipe. The problem was based on the fact that during the operation the pipeline had a breaking point, observing deformations in the supports. Consequently, SAXUM had to study the cause of the problems and propose the optimal solution.



In this project for LIVENT, SAXUM is curring out the following analyses and activities for accomplishing project objectives:

- Mathematical modeling of the pipe system under considering all thermal and mechanical loading. Accurate consideration of the real boundary conditions of the problem is of high importance. This analysis lead to the evaluation of the maximum stresses and deformations in the different portions of the pipe system.
- Computational Fluid Dynamical Model to determine the resulting stresses and deformations caused by the flux inside the pipe.
- Evaluation of maximum resulting stresses/deformations in the pipe system and comparison with admissible stresses of the pipe constitutive materials,
- For evaluating the maximum admissible stresses in the material that constitutes the pipe system of LIVENT in the its Lithium plant, SAXUM is also performing experimental analysis based on extension tests in both the circumferential and longitudinal directions of the pipes.
- Determine the causes of the cracks and fractures observed in the plant.
- Perform further computational analyses (static and dynamic) to identify the optimal reinforcement design of the pipe system.
- Issuing of the corresponding detailed engineering of the pipe reinforcements
- Assist LIVENT in the implementation of the design solutions.

As of November 2019 SAXUM has completed the activities in the four first items above. This project is planed to be completed in December 2019■

THE COMPANY

SAXUM will be present at the International Seminar of Gold & Silver Mining 2019

The thirteenth edition of the main metal mining symposium in Argentina will be held at the Hotel Panamericano in the City of Buenos Aires on November 26 and 27.

The seminar, which takes place at a key moment at the political and economic level, will have a series of conferences and meetings for leaders and representatives of the sector where the projections of the industry and the country will be analyzed. For this new edition of the International Seminar: Argentina Gold and Silver is expected an influx of more than 300 miners representatives, suppliers, entrepreneurs and large industries and officials from various agencies. During the event, transcendental information for the sector will be disseminated for the beginning of the new national management, as well as key data regarding the macroeconomic policies and topics that are of greatest interest to the mining sector■

We invite you to attend our **Technical Session "Management of mining projects in Argentina"** which will take place on November 27 at 12pm.

Mansfield Minera S.A.

Lindero EPCM Services to Mansfield Minera S.A. Progress Report

The SAXUM team, which works on the Lindero EPCM Project, has been developing its activities according to the schedule, following the milestones established for the construction of the Lindero project.

Great progress is being seen in the third quarter of 2019. Most of the equipment in the crushing area has already been assembled. The tapes are in the culminating part of the installation. Also, for tertiary crushing, the HPGR is ready to be commissioned and the stock pile works is progressing as planned.

Among other advances, the contract highlight are the activities of the contract for the movement of ground and concrete which have been completed. In addition, electromechanical and piping work is progressing at full speed and rapid progress is being made with equipment assemblies in the leach pad area to meet the objective of putting ore reserves in the leachpad by the end of this year. SAXUM is also working with vendors on the site conducting tests and verification of equipment.

In the SART plant area, equipment is being assembled, amongst which the press filters are already mounted. In the agglomeration plant there have been notable advances where 100% of the assembled equipment is already in place, such as bins, agglomerators and feeders (belt feeders).

With respect to the progress of the buildings, the assembly of the SART plant is 80% complete. The metal structure of the ADR plant is 100% finished. The truckshop will be energized and commissioned during the last part of 2019. The chemical laboratory has a 100% progress and is ready for the customer to use it and will culminate, by the end of the year, with the deposit of cyanide preparation.

Recently, the first energization tests were carried out on Medium Voltage lines 1 and 2 that feed the entire crushing and agglomeration area, with their respective electrical rooms■

THE COMPANY

SAXUM's Project Manager of EPCM Services: Néstor Lares

Nestor is an Industrial Engineer and Project manager with a strong leadership profile, focused on developing projects and operations within budget and schedule. Experienced working with projects in Argentina, Brazil, Mexico, and Russia. He has successful experience managing industrial and engineering projects, in highly demanding environments. Experienced working with multicultural, multidisciplinary and intercompany teams of professionals. Great skills for organization, planning and negotiation. Experienced in the execution of field project, field operations, and engineering projects.

Nestor is currently the Project Manager of SAXUM's EPCM services to Lindero. In this position he is in charge of the following activities:

• Coordinate the development of the Detailed Engineering for the construction of the entire roject including Civil, Strcutural, Mechanical, Piping, Electrical and Instrumentation and Architectural for all areas of the plant, excluding the mine and associated roads.

• Coordinate the Procurement services of the project to develop the specifications, bidding process and the purchase of all equipment and services necessary to complete the contruction, start-up and commissioning of the plant.

• Coordinate the Construction Management services of the entire project at different stages with the objective of ensuring, through close monitoring, the coordination and correct execution plan

in accordance with the Master Schedule, CAPEX and updates. Emphasis was placed on following the techinical specifications developed throughout the engineering phases with rigorous measurement and quality control systems■

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

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