

WWW.SAXUM.US



SAXUM
Engineered Solutions



CEMENT QUALIFICATIONS

PROJECTS & EXPERIENCE

OFFICES

ENGINEERING AND EPCM CAPABILITIES ALL AROUND THE WORLD



ARGENTINA
TUCUMAN
BUENOS AIRES

BRAZIL
BELO HORIZONTE

UNITED STATES
DALLAS, TX

AUSTRALIA
PERTH



SAXUM in its continuous improvement process has adapted all the procedures to the highest international requirements with the ISO 9001:2015 quality certification.

ENGINEERING

WE OFFER KEY DISCIPLINES FOR PLANT DESIGN



PROCESS ENGINEERING FOR THE CEMENT & LIME INDUSTRIES

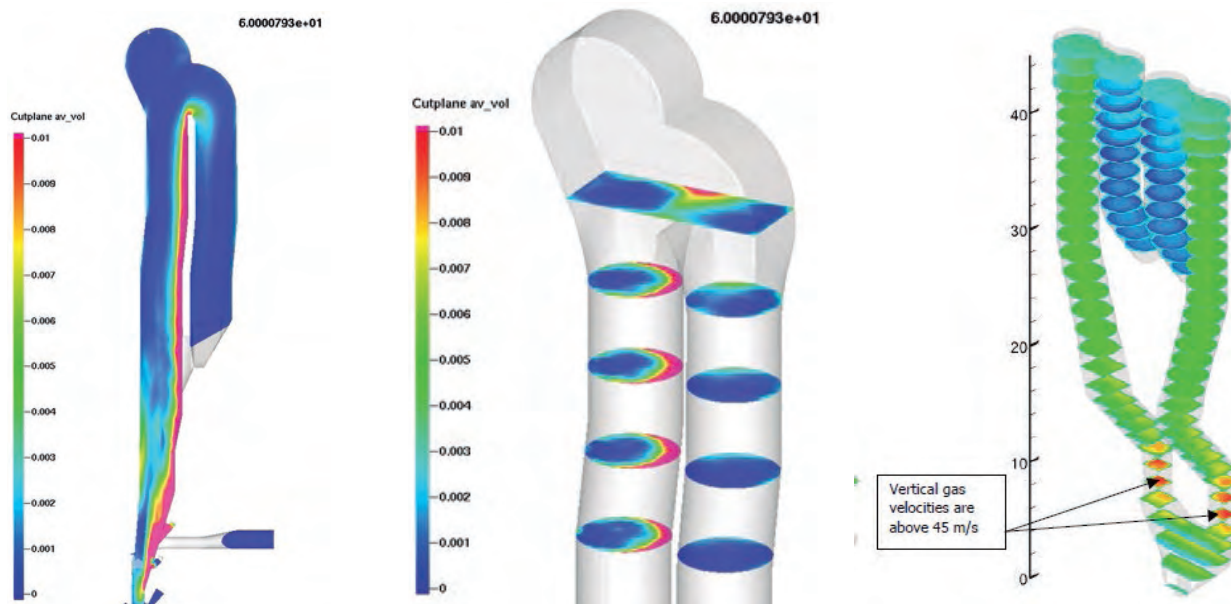
MECHANICAL ENGINEERING (PLANT DESIGN, PIPING, PROCESS GAS HANDLING, ENVIRONMENTAL CONTROLS, NUISANCE DUST COLLECTION AND MATERIALS HANDLING, CRUSHING AND GRINDING SYSTEMS)

CIVIL AND STRUCTURAL ENGINEERING

ELECTRICAL, INSTRUMENTATION & CONTROL ENGINEERING

ENGINEERING

CFD FOR ALTERNATIVE FUELS ASSESSMENT



Computational Fluid Dynamics Analysis (CFD) are performed at SAXUM at the highest level of quality, in the following industrial problems:

CO-PROCESSING STUDIES FOR THE CEMENT INDUSTRY

In this case, the main application is the evaluation of the efficiency of using alternative fuels in the pyro-process area of clinker production plants. The goal is to determine the optimal injection point of the alternative fuel in the pre-calciner and the ratio of the alternative fuel to be used.

SOILS SLOPE STABILITY ANALYSIS FOR THE MINING INDUSTRY

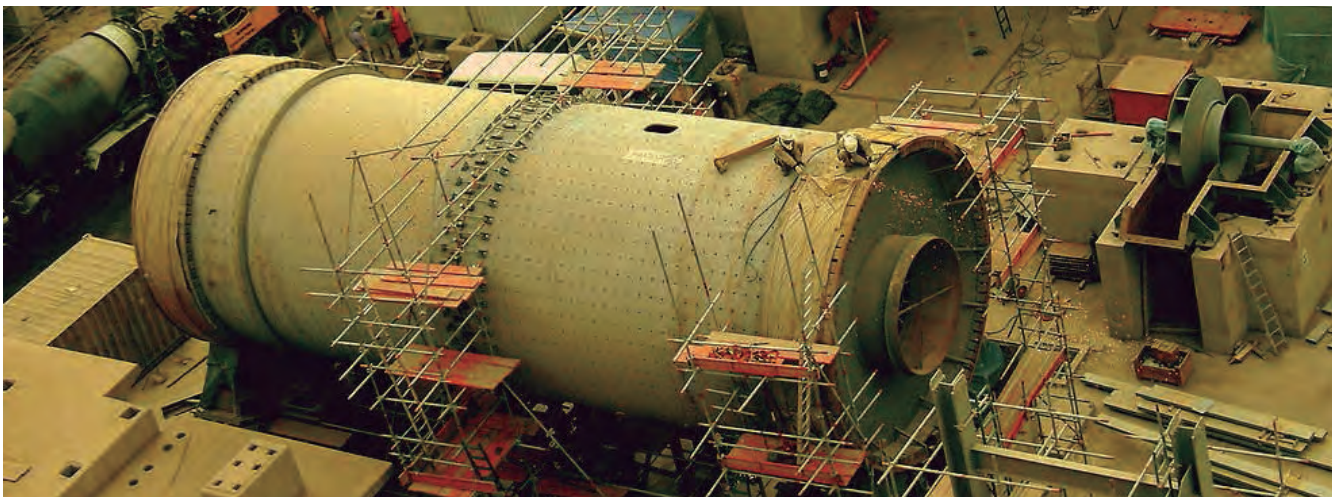
CFD analysis with fluid-solid interaction is considered for the evaluation of infiltration lines in porous media like soils in the slopes of tailing dams and their consequences in the overall slope stability.

STRESS ANALYSIS IN PIPING SYSTEMS

CFD analysis with fluid-solid interaction is also used by SAXUM to evaluate resulting stress distributions in piping systems under consideration of the real hydraulic properties of the fluid, its pressure, and the temperature conditions. These analyses give rise to the selection of the optimal designs of piping systems in industrial applications.

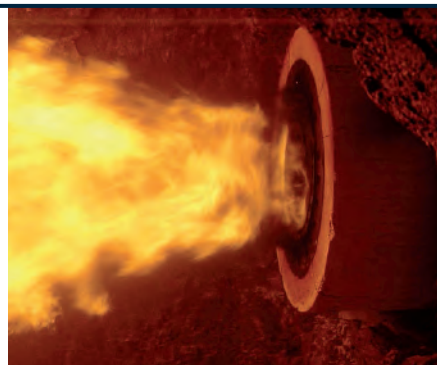
ENGINEERING

PROCESS ENGINEERING FOR THE CEMENT INDUSTRY



PROCESS OPTIMIZATION

- Solution of chronic problems
- Performance of mass and heat balances
- Improvement of equipment performance
- Identification of bottlenecks and opportunities for improvement.
- Comparison with “World Class” ratios
- Recommendations for changes to the process
- Chemical and mechanical process engineering. Mass and Heat balances.



“IN SITU” IMPROVEMENTS

- Operational troubleshooting in a practical way
- Process calculations
- Product improvements studies
- Alternative fuels and materials optimization
- Commissioning

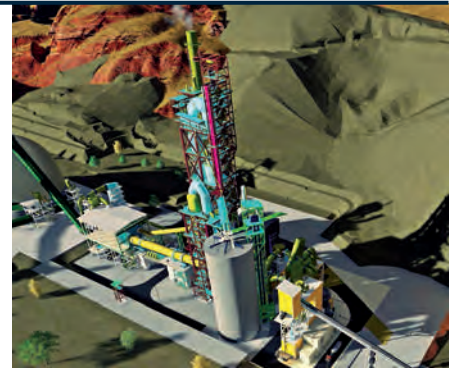


ENGINEERING

PROCESS ENGINEERING FOR THE CEMENT INDUSTRY

BENCHMARKING

- Key Performance Indicators (KPIs) tested by the world's largest cement producers.
- Databook with clear and standardized definitions
- Comparisons with “World Class” operations
- Base to implement continuous improvement systems.



FEASIBILITY STUDIES

- Best technology recommendation
- CapEx and OpEx estimates
- Technical-economic evaluation
- Use of existing equipment
- Facilities upgrading



TRAINING & PROGRAMS

- Basic program of introduction to the cement industry (modular)
- Advanced tailored made programs



ENGINEERING

MECHANICAL ENGINEERING & PLANT DESIGN



SYSTEMS INTEGRATION WITH MULTIPLE VENDORS

PLANT LAYOUTS

GENERAL ARRANGEMENTS

EQUIPMENT TECHNICAL EVALUATIONS

EQUIPMENT SIZING AND CAPACITY DETERMINATION

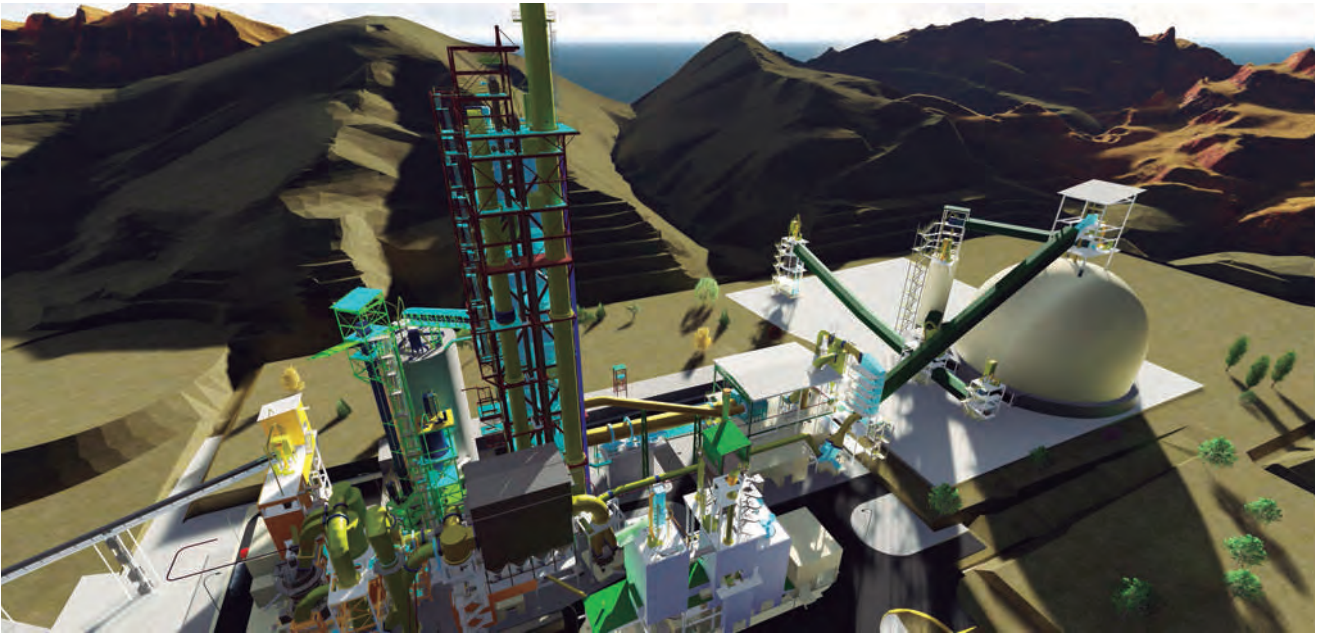
EQUIPMENT AND INSTALLATION SPECIFICATIONS

DUCTWORKS

ENGINEERING DESIGN: PIPING SYSTEMS - MATERIAL HANDLING SYSTEMS
PROCESS EQUIPMENT LAYOUTS

ENGINEERING

CIVIL & STRUCTURAL ENGINEERING



- STRUCTURAL ANALYSIS & DESIGNS (INCLUDING HIGH SEISMIC & HURRICANE ZONES) FOR INDUSTRIAL PLANTS
- EVALUATION AND IMPLEMENTATION OF GEOTECHNICAL REPORTS
- STRUCTURAL DESIGN BASED ON VIBRATION MITIGATION
- DYNAMIC FOUNDATION ANALYSIS
- STRUCTURAL RELIABILITY STUDIES
- STRUCTURAL PATHOLOGY STUDIES
- DESIGN OF REINFORCED CONCRETE AND STEEL STRUCTURES
- CONCRETE AND METAL DOMES
- CONCRETE SILOS AND BUNKERS
- STEEL BINS AND HOPPERS
- TUNNELS AND UNDERGROUND STRUCTURES

ENGINEERING

ELECTRICAL ENGINEERING



POWER DISTRIBUTION SYSTEMS

INSTRUMENTATION AND CONTROLS

HMI INTERFACE COORDINATION

PLC PROGRAMMING

MOTORS (MEDIUM VOLTAGE AND LOW VOLTAGE)

MEDIUM VOLTAGE STARTERS AND BREAKERS

TRANSFORMERS

MOTOR CONTROL CENTERS

SHORT CIRCUIT ANALYSIS

POWER STUDIES

ENGINEERING

AUTOMATION & CONTROL ENGINEERING



CONTROL SYSTEM DESIGN (PCS, DCS, PLCS, RIOS)

COMMUNICATION SYSTEM DESIGN (RACKS, SWITCHES, SEVERS, PATCH PANEL)

SCADA SUPPORT (SCREENS, CAPABILITIES, SYSTEMS)

SELECTION & SPECIFICATION OF CONTROL & COMMUNICATION EQUIPMENT

CCTV DESIGN

DELIVERABLES

PROCESS CONTROL ARCHITECTURE

COMMUNICATION NETWORK

INPUT AND OUTPUT LIST

CONTROL AND COMMUNICATION PANEL LAYOUT

CONTROL AND COMMUNICATION WIRING DIAGRAMS

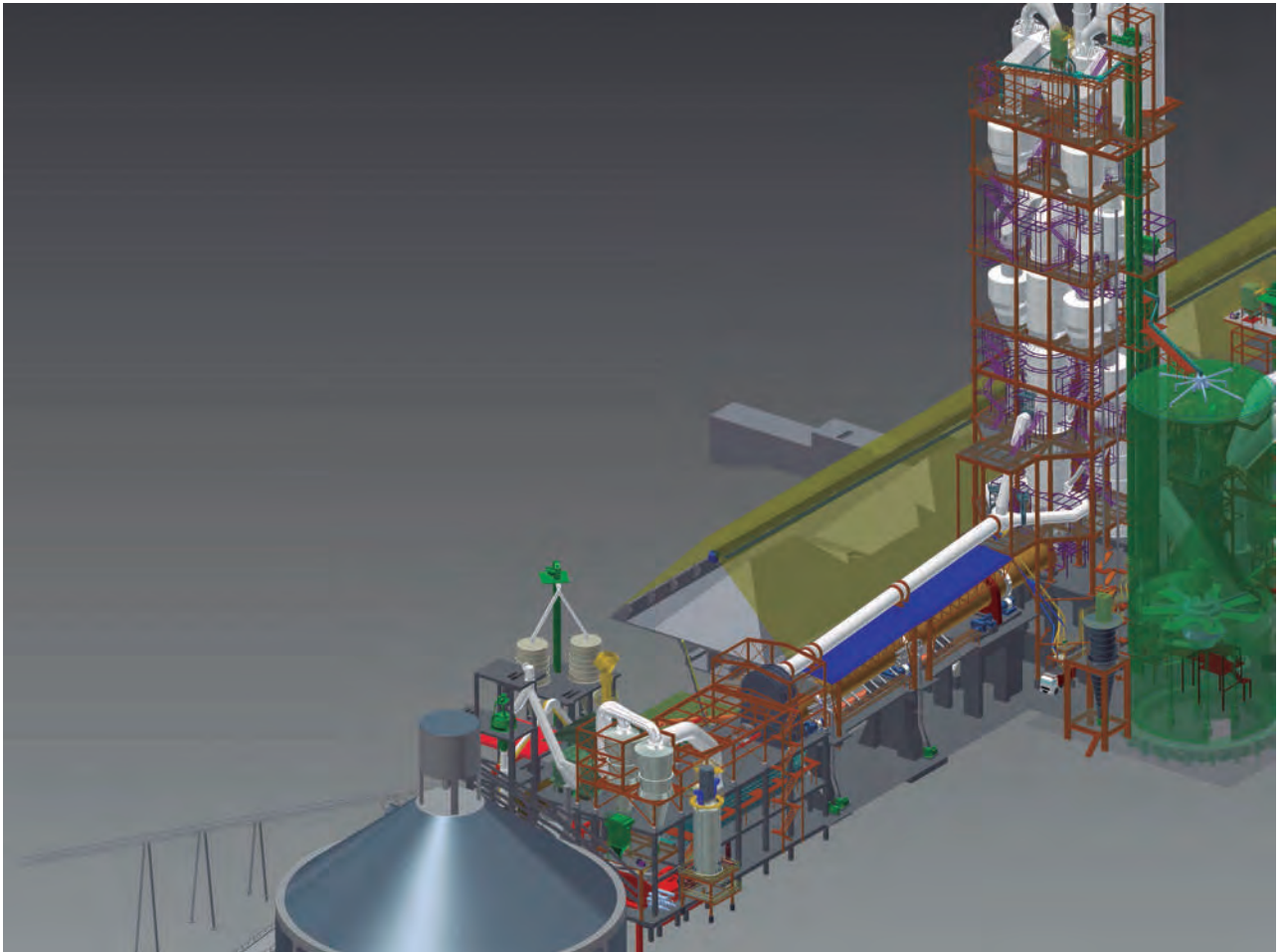
TECHNICAL SPECIFICATION AND DATA SHEETS

LOOP DIAGRAMS

CONTROL NARRATIVE/FUNCTIONAL DESCRIPTION

ENGINEERING

3D MODELLING FOR FULL PROJECT INTEGRATION



INTEGRATION OF EQUIPMENT ENGINEERING WITH THE CIVIL,
MECHANICAL FABRICATION AND ELECTRICAL ENGINEERING

SHOP DRAWING REVIEWS

FABRICATION SHOP INSPECTIONS

COORDINATION OF MATERIALS FABRICATION FOR CONSTRUCTION
AND DELIVERIES TO THE JOB SITES

PROJECTS



GCC - Rapid City Plant, South Dakota, USA

ENGINEERING AND SITE SUPERVISION SERVICES FOR THE UPGRADE OF GCC CEMENT PLANT

SAXUM scope of work: developement of the engineering designs and the project control during the construction phase of these projects. Perform the designs (from conceptual to detailed solutions) in all different disciplines, including Mechanical, Civil, Structural, Electrical and Instrumentation engineering. In parallel, SAXUM is developing/defining all needed data sheets and specifications for purchasing the required equipment and construction/erection works.

PROJECTS

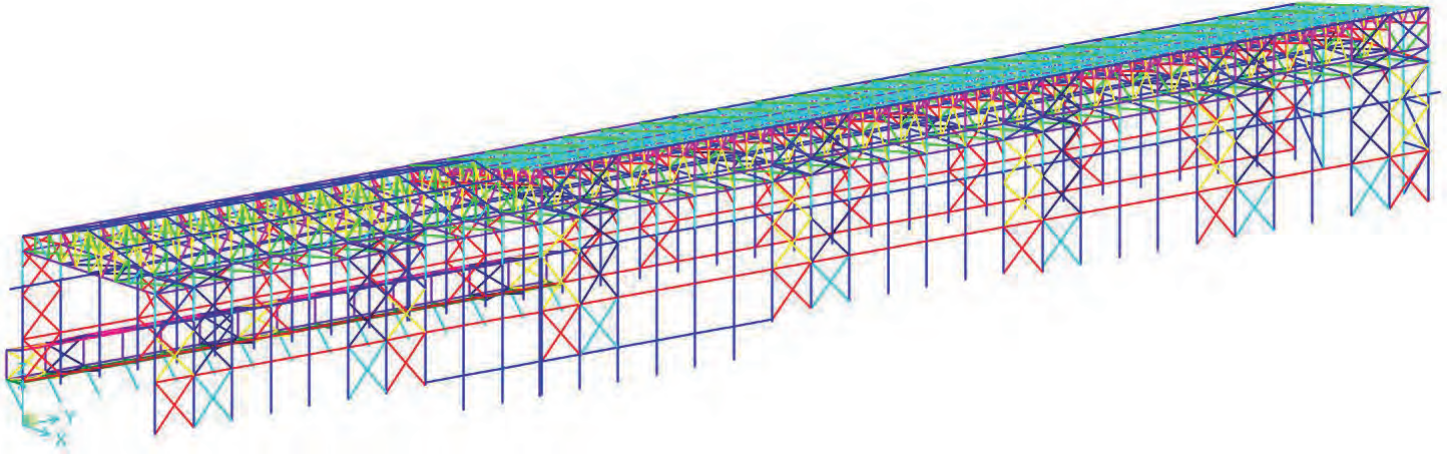


GIANT Cement – Elementia Group Harleyville, South Carolina, USA

FINISH MILL #2, MATERIAL HANDLING AND BULK LOADOUT SYSYEMS UPGRADES

SAXUM scope of work: performance of the overall Owner's Engineers role for the project which included over six months of project management, project controls, civil/structural, mechanical and electrical engineering on-site services as well as construction/erection assistance and support; in addition, on GIANT's behalf, SAXUM reviewed the OEM's project schedule and interfaced with the contractors throughout the project, including commissioning.

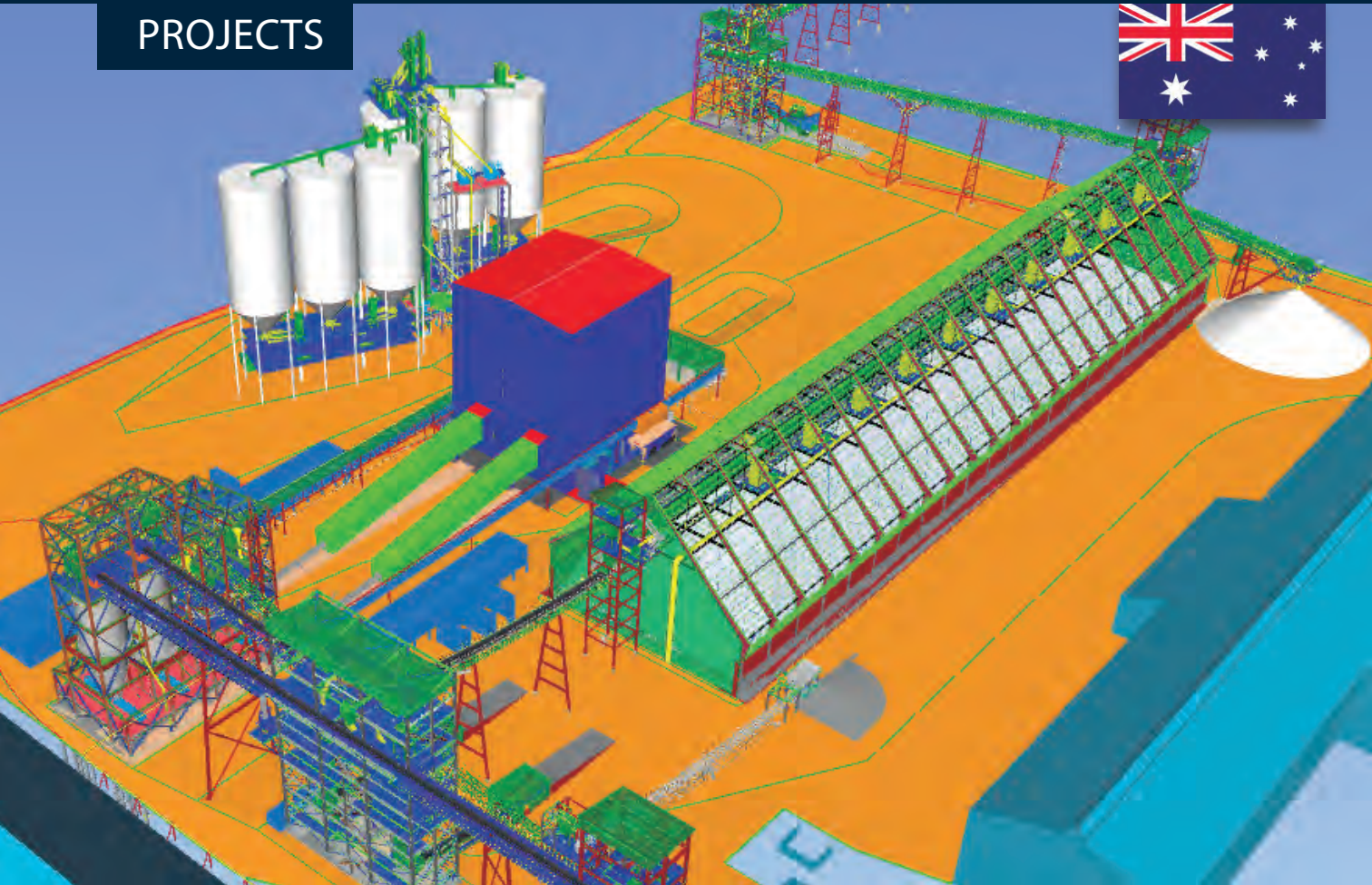
PROJECTS



BUZZI UNICEM - Pryor Cement Plant - Oklahoma, USA

SAXUM scope of work: The BUZZI cement plant in Pryor, Oklahoma has a storage hall with an overhead crane that had serious structural concerns which limited the operation of the crane. SAXUM performed a field evaluation and a structural study to assist BUZZI in its objective to restore full use of the storage building and crane operation. An accurate mathematical model was utilized to provide insight for the building's structural reinforcement needs in order to eliminate beam and column issues. From this analysis, SAXUM was able to provide repair recommendations, a repair budget, and a revision to construction drawings for building reinforcement.

PROJECTS



Kwinana Grinding Plant Upgrade - Western Australia

SAXUM scope of work: Multi disciplinary engineering for the balance of the plant Kwinana Grinding Plant Upgrade at Western Australia. SOW included the process, civil, structural, mechanical, piping, electrical, and instrumentation design required for the manufacture, supply, installation and commissioning of the grinding and storage upgrade works to the Kwinana operations.

PROJECTS



Capitol Aggregates Cement Plant - TX - USA

SAXUM scope of work: Project Management and Site Supervisor services for the upgrade project at Capitol Aggregates Cement Plant located in San Antonio, Texas - USA.

PROJECTS



Maceo Project - FLSmidth CEMEX - Colombia

ENGINEERING SERVICES FOR CEMEX MACEO PROJECT

SAXUM scope of work: Project integration, electrical and structural engineering and basic and detailed designs levels for the Greenfield project for the clinker and cement plant in Maceo, Colombia. Engineering document stamping and sign-off by Registered Engineers in Colombia.

PROJECTS

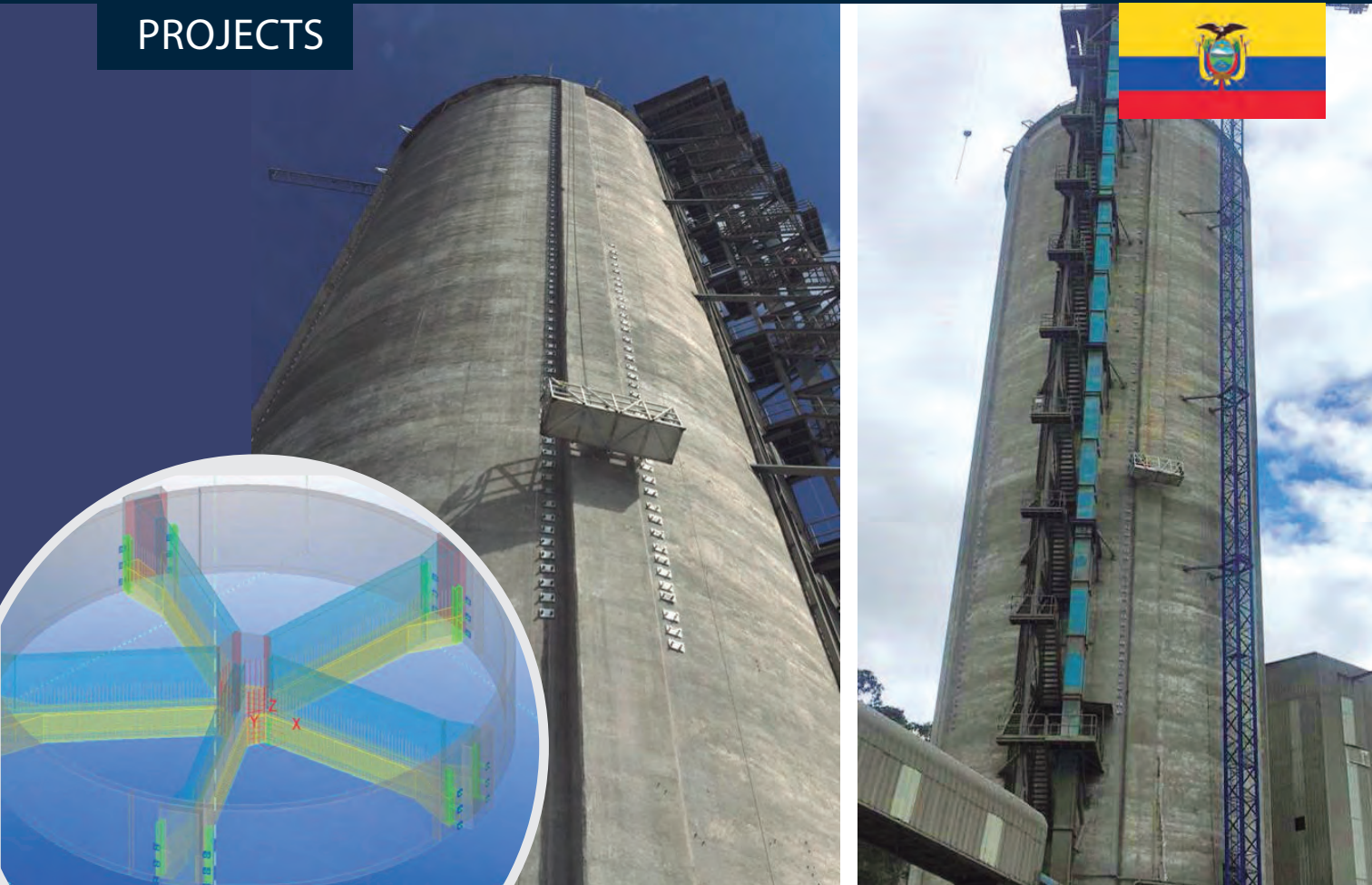


Intercement - Cubatao project - Brazil

MULTI DISCIPLINARY ENGINEERING SERVICES FOR CUBATAO PROJECT

SAXUM scope of work: Greenfield cement grinding project in Sao Paulo area. Conceptual, basic and detailed engineering, covering all project disciplines (Process, Mechanical, Structural, Electrical, Instrumentation & Control engineering) and all project areas for the 140 t/h grinding line.

PROJECTS

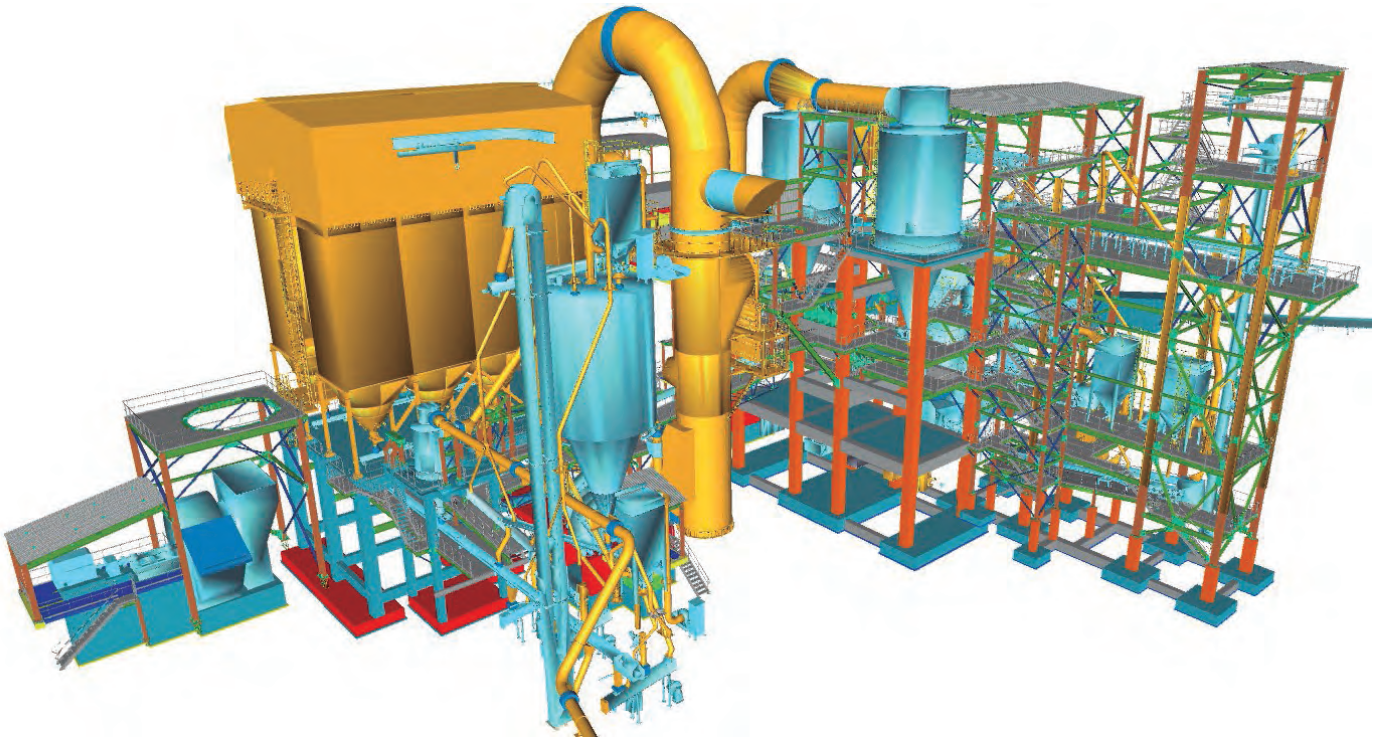


UCEM - Chimborazo Plant - Ecuador

DAMAGED CEMENT MULTI-CHAMBER SILO: ASSESSMENT OF STRUCTURAL PATHOLOGY AUSES & DESIGN OF REPAIR PROCEDURE

SAXUM scope of work: Development of the structural reinforcement design to repair the structural pathology presented by the radial walls and their connections of the 15,000-ton capacity multi-chamber silo. Chimborazo Plant in Riombamba Ecuador.

PROJECTS



Moncada - New Cement Production Line - Cuba

ENGINEERING AND SITE SUPERVISION SERVICES

SAXUM scope of work: Project integration and Civil/Structural engineering services for several plant areas of the New Cement Production Line of 3.500 TPD– Greenfield Project Moncada, Cuba.

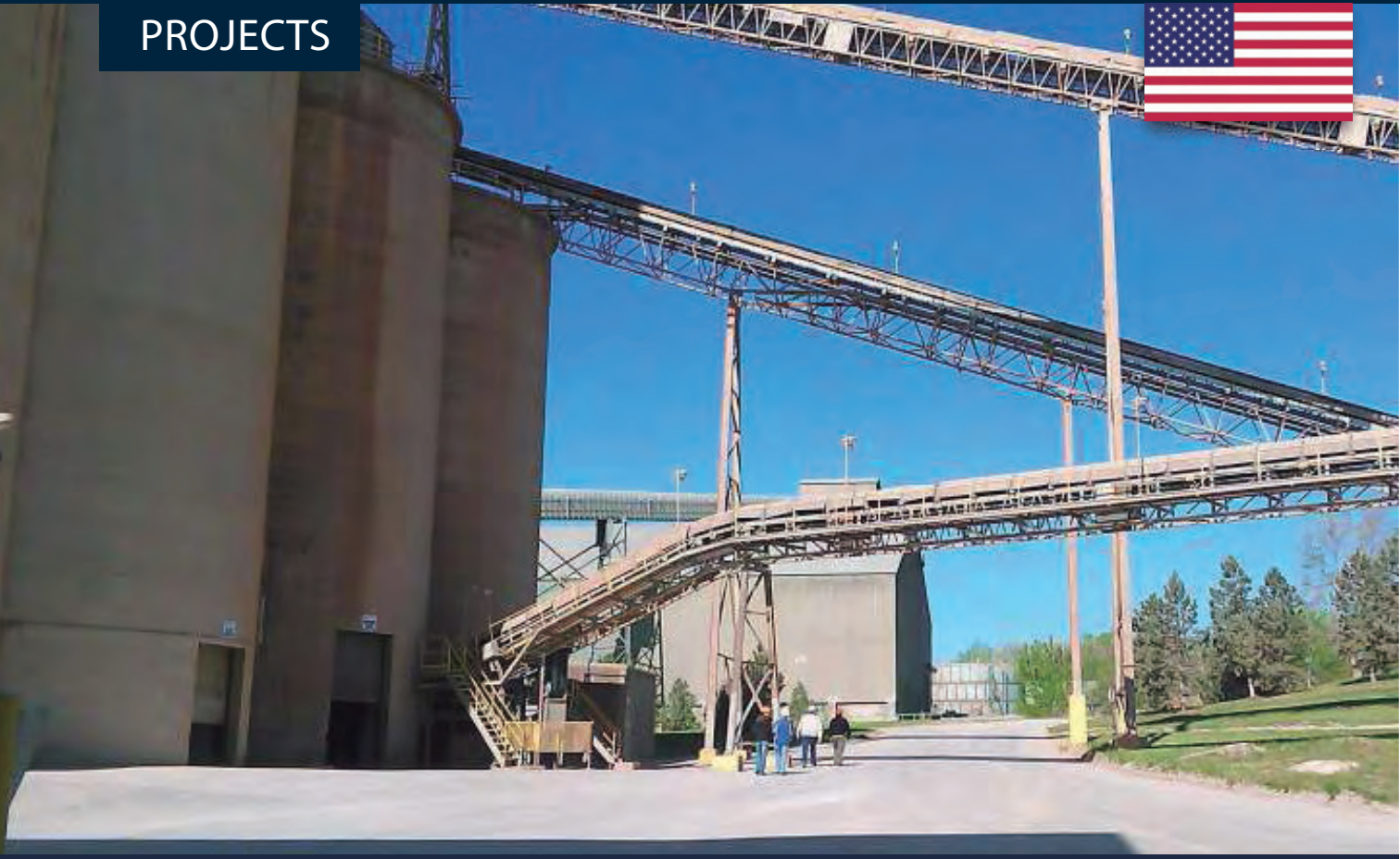
PROJECTS



GCC Cement Plant - Odessa, USA

SAXUM scope of work: Mechanical and Structural engineering for downcomer redesign including fabrication drawings. The engineering analysis by SAXUM was focused on the analysis of the thermo mechanical flow, the definition of the new supporting conditions and the global stability of all structural components of the downcomer at the GCC Production Plant, located at Odessa, Texas.

PROJECTS

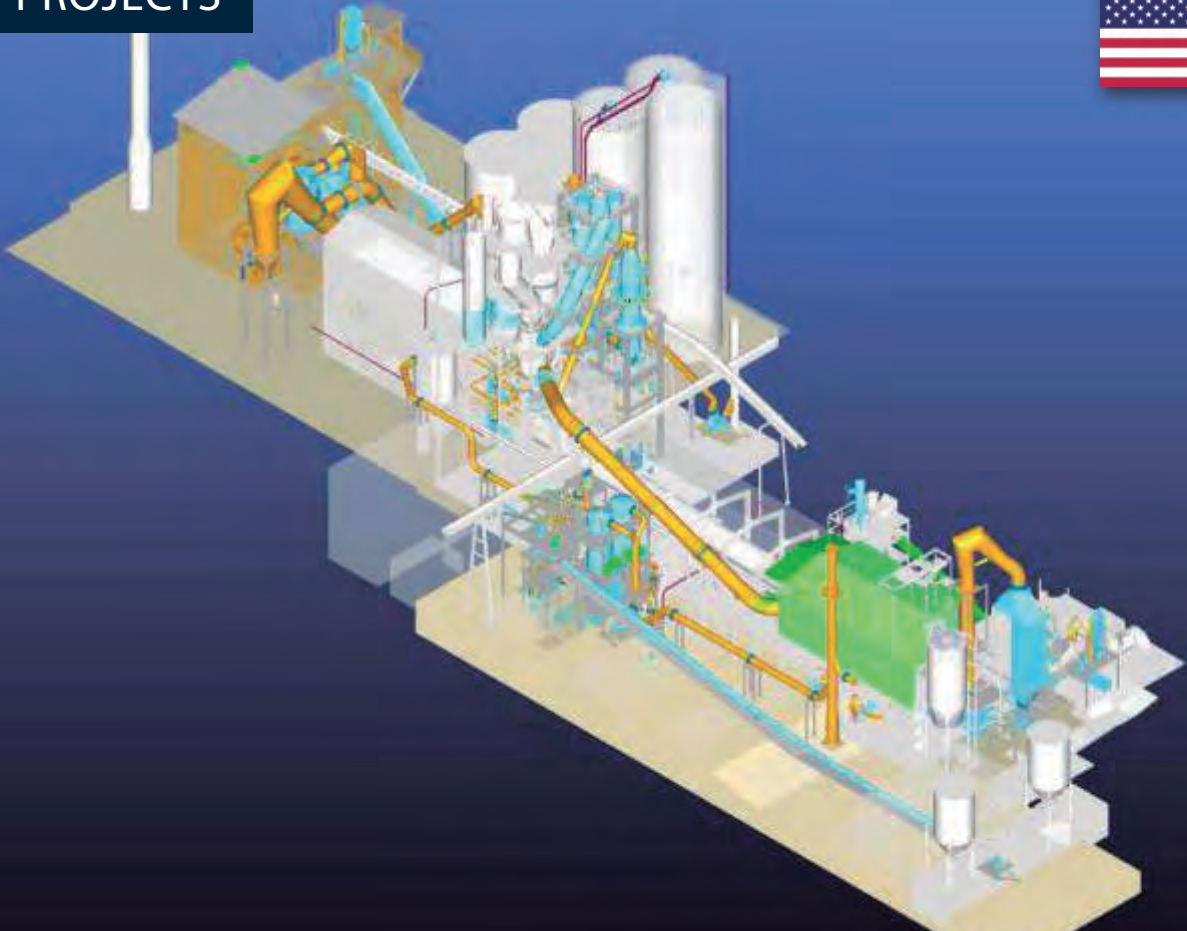


GCC - Rapid City Plant - South Dakota, USA

VERIFICATION OF STRUCTURAL SAFETY CONDITION OF EXISTING HOMO-SILO BATTERY AND DESIGN OF OPTIMAL REINFORCEMENT SOLUTIONS

SAXUM scope of work: Evaluation of current safety conditions of the structures and foundations of the homogenization silo battery at Rapid City, SD, plant. Based on site evaluations, accurate and detailed mathematical models were developed by SAXUM which allowed précised evaluations of silo safety conditions and, moreover, of the optimal reinforcements and modifications to the structures that need to be performed to improve silo safety conditions attending current codes and standards. SAXUM services in this project also included the mechanical designs of the new loading and unloading systems of the homo silos.

PROJECTS



GCC - Rapid City Plant - South Dakota, USA

ENGINEERING AND SITE SUPERVISION SERVICES FOR PLANT UPGRADE PROJECT

SAXUM scope of work: Conceptual and detailed complete civil/structural engineering of the GCC cement plant upgrade through FLS, the main equipment provider. SAXUM services also include the sign-off and stamping of all related detailed designs of structures and foundations.

PROJECTS



6.1. Foundation Ring:

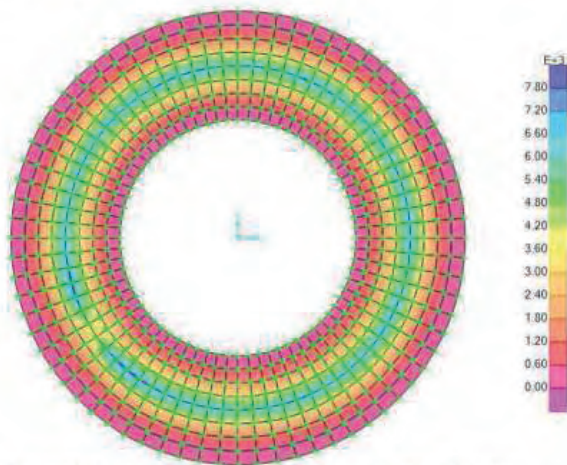


Figure 10: Envelope maximum Bending Moment radial (KN.m/m)

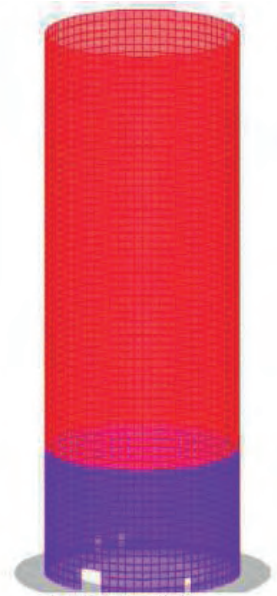


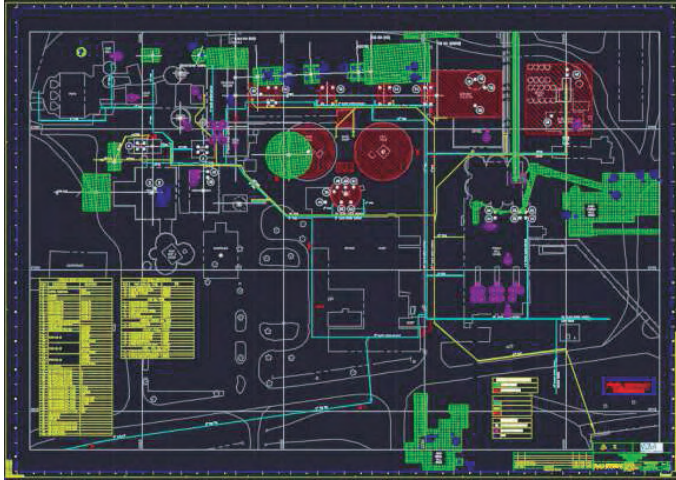
Figure 7: 3D View

Votorantim North America - St Mary's Cement

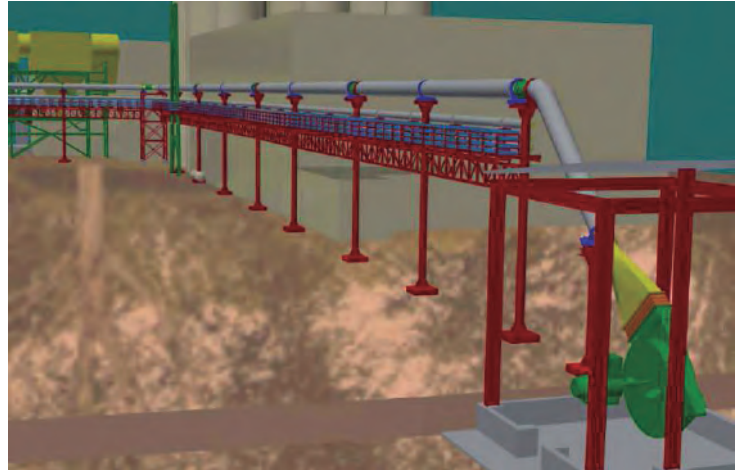
UPGRADE PROJECT AT CHARLEVOIX PLANT, MICHIGAN - USA

SAXUM scope of work: Engineering services for new raw mill blending silo and for the new clinker cooler stack including mechanical and structural design documents.

PROJECTS



Water System – Plant Layout



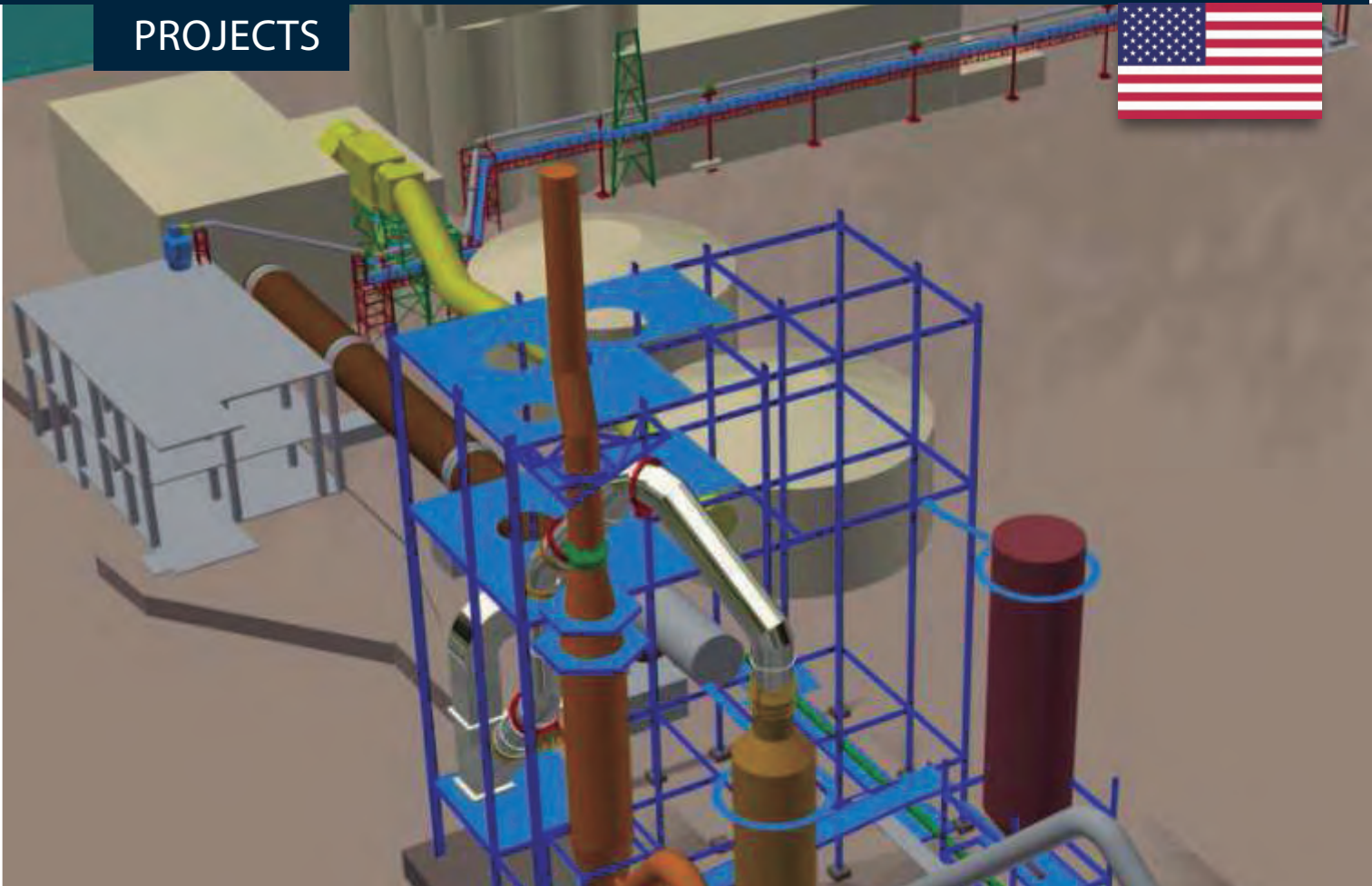
Hot Gases Duct

Votorantim North America - St Mary's Cement

HOT GASES DUCT - AIR & WATER UTILITIES CHARLEVOIX PLANT, MICHIGAN - USA

SAXUM scope of work: Basic and detailed engineering in mechanical and structural discipline for the new hot gas duct from the clinker cooler to the coal mill and for the related air & water utilities for the plant upgrade project of St Mary Cement at Charlevoix.

PROJECTS



Votorantim North America - St Mary's Cement

BY-PASS DUCT CHARLEVOIX PLANT, MICHIGAN - USA

SAXUM scope of work: Complete basic and detailed mechanical and structural engineering, drawing sign off and stamping, for the new Process By-Pass Duct, to be installed in the St. Mary's Cement plant as part of the plant upgrade project

PROJECTS



Votorantim - Salto de Pirapora project - Brazil

NEW CEMENT LIME

SAXUM scope of work: Mechanical and Structural engineering. Project Integration. Development of project 3D Model. Review of vendors engineering attending Owner's design criteria.

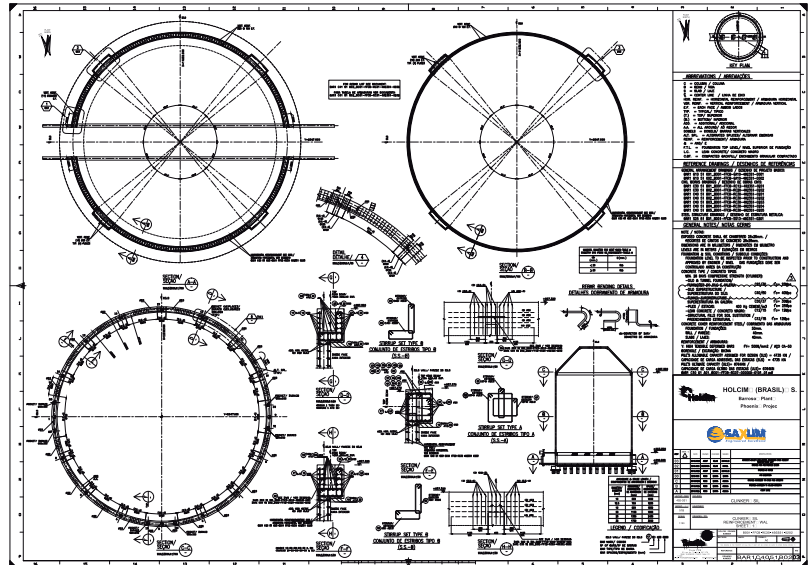
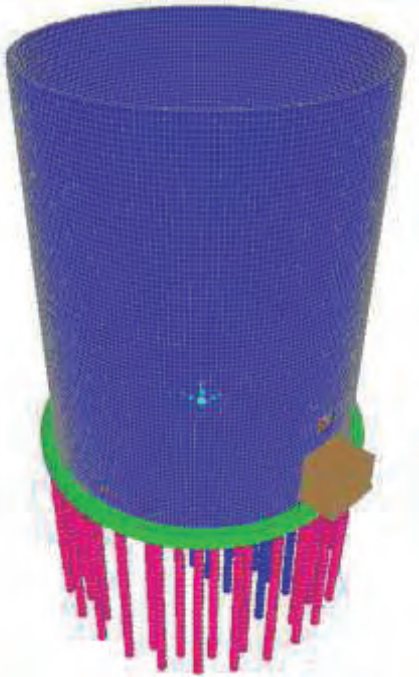
PROJECTS



Lafarge Holcim - Brazil

SAXUM scope of work: Feasibility study for clinker production capacity upgrade.
Conceptual engineering and CapEx estimate.

PROJECTS



Lafarge Holcim - Barroso Project - Brazil

SAXUM scope of work: Electrical and structural detailed engineering for new clinker silo with 35.000 tons capacity.

PROJECTS



Argos - Columbus Project - USA

MULTIDISCIPLINARY ENGINEERING AND SITE SUPERVISION SERVICES

SAXUM scope of work: Mechanical, electrical and structural engineering services for the new cement lime of ARGOS at Cartagena, Colombia. SAXUM services were complemented with project manager and site supervision services. In this project, SAXUM was awarded with the “210 ASOCRETO - Excellence in Concrete Award”.

PROJECTS



Carlportland - Mojave Project - California

ENGINEERING SERVICES FOR RAW MILL FEED AT MOJAVE PROJECT

SAXUM scope of work: SAXUM performed Civil/Structural, Piping and Electrical Basic and Detailed Engineering services in the Raw Mill Feed and Mill proper areas for the FLS CalPortland Mojave Project in California.

PROJECTS



Companhia Siderúrgica Nacional - Arcos Plant - Brazil

NEW 6500 T/DAY CLINKER PRODUCTION LINE - ARCOS PLANT

SAXUM scope of work: Mechanical, Electrical, I/C and Civil/Structural engineering. Bid packages issuing and Vendors technical proposals analysis. Site supervision and technical office services for RFI during construction.



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