Lafarge India Limited

Proposal for Operations Audit and Techno-Economic Feasibility Study (TEFR)

Proposal Nr: Q – 42/ 16-17
Dated: May 24, 2016

HOLTEC CONSULTING PRIVATE LIMITED

1. PREAMBLE

Lafarge India Limited (LIL) is interested in carrying out an operations audit of their existing clinkerisation unit at Chittorgarh to explore the de-bottlenecking possibilities. Additionally, **LIL** also intends to carry out a Techno Economic Feasibility Study (TEFR) for a 5,000 tpd (Clinker) Brownfield expansion at the same location i.e. Chittorgarh, Rajasthan. **LIL** has invited **HOLTEC** to offer their terms and conditions for the aforesaid assignment.

Incorporated in 1967, **Holtec Consulting Private Limited (HOLTEC)** is an ISO-certified advisory, primarily positioned to service the entire gamut of consulting needs of the global cement industry. Its portfolio spans services in all disciplines of Engineering, Business Consulting, Geology & Mining, Project & Construction Management, Environment Management, Performance Enhancement, Logistics, etc. In addition, **HOLTEC** operates and manages cement plants globally and also provides solutions encompassing the integrated delivery of services & products through its two wholly-owned subsidiaries, Holtec Global Solutions FZE operating from Sharjah, U.A.E. and Holtec Global Solutions Private Limited, headquartered in India.

HOLTEC's ensemble of 900+ clients, in 90+ countries, includes cement producers, equipment & service providers, EPC & construction firms, infrastructure developers, investing & funding bodies and all other relevant stakeholders. Since its inception, **HOLTEC** has delivered significant value to its clientele through 4,000+ consulting assignments executed by its multi-disciplinary staff with an experience inventory of 6,300+ man-years.

2. OBJECTIVE

Operations Audit

The key objectives sought to be addressed through the proposed improvement intervention are:

- To explore potential capacity for further capacity enhancement
- To improve the plant key performance parameters including power & fuel consumption
- To identify and improve the overall performance of plant interims of capacity utilization and availability of each section.

Techno Economic Feasibility Study (TEFR):

The objective of the study is to determine the technical feasibility and financial viability of such a project after taking into consideration:

- The qualitative & quantitative adequacy of raw material that it expects to utilize
- Its location, infrastructure and access to various inputs necessary for cement manufacture
- Its competitiveness in markets that it targets to serve
- Project Technical Concept
- The project investment and operating costs
- Its revenue stream and profitability

3. SCOPE OF WORK

Operations Audit

Site Visits

7-8 days plant visit made by a 3 – 4 member multi-functional team from HOLTEC

Scope of Work

Situation Analysis

This would comprise of a detailed audit of cement plant operations with the objective of assessing existing performance and the bottlenecks thereof. The following areas would be covered:

- Existing plant & equipment with respect to specifications, potential output, maintenance condition, etc., encompassing:
  - Raw material crushing system, pre-homogenization and storage (including limestone and correctives)
  - Raw material grinding system, homogenization and storage
  - Kiln feed, pre-heater, pre-calciner, kiln and cooler
  - Fuel handling, storage and feeding system
  - Clinker transport and storage
  - Major Process fans
- Process measurements for heat, mass and gas balance in the clinkerisation section. The measuring instruments shall be carried along by **HOLTEC** team from India. In addition the instruments available in the plant may also be used after verifying the calibration status.
- Appropriateness of the limestone mix, the raw mix, the fuel mix and the product mix.
- Consumption rates for various raw materials, key consumables and energy inputs (fuel and power).
- Operational bottlenecks and constraints inhibiting plant performance.
- Assessment of key plant performance indicators.
- Improvement initiatives, current and planned.

Recommendations and Implementation Assistance

A set of Action Plans would be formulated, each of which, other than its reference **No**., its **Name** and the process **Area** it alludes to, would detail the **Observations** initiating it, a brief **Description**, its **Applicability** to particular production line, the **Expected Benefits**, the proposed **Timing for Implementation**, the **Major Job Activities** involved in its execution, its **Duration**, the **Capex** involved, the **Payback** period expected, any relevant **Remarks** and elucidating **References**, if any. These Action Plans, other than spanning all relevant unit operations, shall include:

- Operational de-bottlenecking to enhance equipment availability and outputs within the design parameters.

- Design of suitable limestone mix, raw mix and fuel mix to achieve prescribed quality standards, economically.
- Potential plant capacity.
- Recommendations for modifications/additions/alternations required in various sections/equipment/auxiliaries to achieve potential plant capacity and improved performance under the following scenarios:
  - With marginal investment (Investment requiring less than 2 year payback)
  - With major investment
- Enunciation of measures in terms of both system design and operating practice for conserving energy.
- Improving consumption rates and key performance indicators.
- Estimation of capital costs for implementing various recommendations, benefits, payback/ return on investment (where relevant) and consequent prioritization
- Estimation of the time required for implementing various recommendations and the plant downtime caused, if any.
- On submission of the Plant Audit Report, **LIL** could, at applicable per diem rates, give requisition for the services of **HOLTEC's** specialists to assist in the implementation of the without investment recommendations

Approach and Methodology

The assignment approach and methodology would primarily cover the following:

- **Data Collection**
  Information, as specified in COVERAGE, collected in the course of about 7-8 days plant visit made by a 3 – 4 member multi-functional team from **HOLTEC**. The team would carry its own measuring instruments, to the extent possible.
- **Data Analysis**
  This stage of the assignment would involve the in-depth analysis of the data collected. This would establish the improvement areas in terms of both, systems and operating practices/ norms.
- **Recommendations**
  The data analysis would lead to the formulation of the measures and recommendations for the performance enhancement in the plant.
- **Implementation Assistance**
  On submission of the Plant Audit Report, **LIL** could, at an additional cost, give requisition for the services of **HOLTEC** to assist in the implementation of the without investment recommendations.

Techno Economic Feasibility Study (TEFR):

The envisaged scope of work of work is as follows:

Site Visits

Visit to Chittorgarh plant site a 2 member specialist team for a period of 2-3 days. No market visit is envisaged.

Detailed Analysis

Analyze the data for formulation of the project concept and study of the Techno-Economic feasibility of the project under the following broad heads.

Raw Materials and Utilities

- Study the available data on limestone deposit including the Geological Prospecting Report and data provided by **LIL.**
- Study the availability, quality and requirements of correctives/ additives and fuel
- Recommend a preliminary raw mix keeping in view of the quality of limestone, correctives and fuel
- Indicate broad concepts of mineability of limestone and estimation of the likely capital and limestone raising costs
- Recommend further prospecting required in case the geological data available are found inadequate/ incomplete

Location and Infrastructure

- Study the availability of the necessary infrastructure facilities for the proposed cement plant such as:
  - Land
  - Utilities
  - Manpower
  - Transport such as road, rail and sea
  - Social amenities
- Study the local site conditions such as climate, terrain, topography, seismology, for the proposed project.
- Study the selected sites for the plant keeping in view the following:
  - Availability of infrastructural facilities
  - Minimum environmental Impact on the Surroundings
  - Access to market(s)

Achievable Sales Volumes and Ex-Factory Realization

Market analysis is not part of this study, thus, **LIL** will provide the following:

- Forecasted achievable sales volumes and future capacity utilization for the proposed cement plant
- Average price and average ex-factory realization for the project

Logistics

Inbound Logistics

A detailed analysis of inbound logistics including mode of transport, logistics requirement, break-up of landed cost will be provided for the following:

- Raw Materials
- Fuel
- Additives & Correctives

Outbound Logistics

- Review the product (cement) transportation requirements to the market areas based on available transportation modes from the project site

Project Technical Concept

- Recommend broad sizing of the major equipment and storages.
- Recommend requisite energy conservation and pollution control measures.
- Prepare a layout and preliminary flow – sheet based on the technical concept outlined above and in line with existing plant layout.
- Recommend the basic electrical and instrumentation engineering concepts.
- Enumerate the broad features of the major electrical and instrumentation items involved.
- Suggest a broad scheme for power distribution.
- Estimate additional power requirement for the proposed expansion project and recommend optimum size captive power plant.
- Suggest suitable concepts for civil engineering designs based on the factors such as topography, climatology, seismology, etc.

Human Resources

- Assess the requirement of manpower at various levels during construction stage of the project
- Assess the requirement of staff and workers at various levels for efficient running of for the cement plant
- Suggest suitable organizational structure for the proposed project

Implementation Planning

- Prepare a bar chart for the project implementation for the cement plant
- Enumerate the critical activities, which would have a bearing on the realization of the schedule described above

Financial Appraisal

- Assess the total capital cost for the project through block estimates and based on the technical concept discussed above for major plant and machinery, civil structures, power distribution equipment.
- Assume a suitable financing pattern (Debt: Equity) in consultation with **LIL.**
- Prepare an estimate of the working capital requirements.
- Identify the possible incentives, which may be available to such a project.
- Assess the total cost of production based on **HOLTEC** database and site visit for the proposed project, to the extent applicable:
    - Cost of raw materials and consumables

- Cost of utilities
- Cost of wages/ salaries and plant overheads
- Financial charges
- Depreciation
- Selling expenses, packaging
- Any other

➢ Ascertain the profitability for the project based on the estimated revenue stream for operating cost.

➢ Assess the financial viability of the project based on the internal rate of return on investment/ equity, payback period, break-even point, the Debt-Service Coverage Ratio, etc. Estimate the projected cash flow statement, profit & loss statement and balance sheet for the project.

➢ Conduct a sensitivity analysis on the break-even point with respect to changes in the capital cost, variable costs, fixed cost and the sale price.

4. TIME SCHEDULE

Operations Audit

The assignment would commence as soon as the work order and initial payment are received.

The timelines for various activities in the assignment will be as follows:

- Mobilization : Within 1 week of receipt of work order, advance payment
- Plant Visit : Within 2 weeks after advance payment
- Draft Report Submission : 8 weeks after the Plant Visit
- Final Report : 2 weeks after the receipt of comments on draft report

Techno Economic Feasibility Study (TEFR):

The assignment would commence as soon as the work order and initial payment are received.

The timelines for various activities in the assignment will be as follows:

- Mobilization : Within 1 week of receipt of work order & initial payment.
- Site Visit : 2-3 days
- Draft TEFR : 6 weeks after the site visit.
- Final TEFR : 2 weeks after receiving comments on the draft report

Note: *In case no comments are received on the draft report within two weeks, the draft report will be finalized as final Report and final invoice will be raised.*

5. DELIVERABLES

Operations Audit

HOLTEC will submit 1 hard + 1 soft copy of a **Plant Operation Audit Report** with its findings and recommendations. This will include:

- Preamble including Introduction and Methodology
- Brief Plant Description and review of Current & Planned Improvement Initiatives
- Area-wise Action Plans preceded by a Master List
- Improvements Expected in the areas stated under the section on "Objectives" from the simultaneous implementation of the above Action Plans.

Techno Economic Feasibility Study (TEFR):

Three (3) hard copies and one soft copy (in PDF) of the final TEFR, incorporating comments received from the **LIL** on the draft report.

6. EXCLUSIONS

- Assessment of limestone deposits and related consultancy services.
- Geo-technical Investigations/ studies.
- Hydrological studies
- Testing of material
- Study relating to captive power plant e.g. TEFR for CPP
- Tie-up for blending material sources
- Assistance in dealing with financial institutions.
- Direct liaison with the statutory and regulatory agencies
- The basic and detailed engineering activities for the project.
- EIA/EMP studies/ Clearances
- Domestic and export market study
- Actual preparation of samples and testing of input materials, fuel, air and water
- Implementation of the Action Plans involving capital investment, including any basic and detailed engineering activities for such recommendations
- Any scope not covered under section 3 of this proposal.

7. FEES

7.1 **LIL** shall pay to **HOLTEC** the following fixed fee for the scope of work mentioned in para 3:

- **Operations Audit: Rs. 15.50 Lakhs (Indian Rupee Fifteen Lakhs and Fifty Thousand only)**
- **Techno-Economic Feasibility Study: Rs. 13.15 Lakhs (Indian Rupee Thirteen Lakhs and Fifteen Thousand only)**

Travel Cost from Delhi to Chittorgarh and back for the initial site visit for both assignments is included in the fees above. **LIL** will provide local conveyance, boarding and lodging.

7.2 Man-days costs for the initial site visit is included in the above fees. For additional visits, if required, **LIL** shall pay the Per Diem fee as per prevailing Per Diem Schedule of **HOLTEC** at that time along with expenses at actual on travel, boarding, lodging, conveyance, telecom and other incidentals as may be incurred by **HOLTEC**'s team.

A copy of current per diem fee schedule is enclosed as **Annexure I.**

7.3 Service tax shall also be payable as applicable at the time of payment on all payments of fees and reimbursable

8. TERMS OF PAYMENT

8.1 The base fee mentioned in para 7.1 above along-with service tax will be paid to **HOLTEC** as indicated below:

Operations Audit

- ⇒ 1st payment along with the order : 50% + Service Tax
- ⇒ On submission Draft TEFR : 40 % + Service Tax
- ⇒ On Submission of Final TEFR : 10% + Service Tax

Techno Economic Feasibility Study (TEFR):

- ⇒ 1st payment along with the order : 50% + Service Tax
- ⇒ On submission Draft TEFR : 40 % + Service Tax
- ⇒ On Submission of Final TEFR : 10% + Service Tax

8.2 The expenses mentioned in para 7.2 above would be paid to **HOLTEC** along with applicable service tax, as soon as they are incurred based on invoices submitted by **HOLTEC.**

8.3 All payments shall be made within 7 days from the date of invoice from **HOLTEC's** office by direct transfer to designation Bank in New Delhi, favoring A/c of **HOLTEC Consulting Private Limited**".

9. OBLIGATIONS OF LIL

9.1 Assistance in collecting necessary requisite details regarding plant site, infrastructure, etc.

9.2 Access to data logs and other information, pertinent to the assignment

9.3 Access to equipment for taking process measurements.

9.4 In order to preclude duplication of efforts, any information already collected by **LIL** may be provided to **HOLTEC** at the start of the assignment. These, of course would be verified, in the course of the visit.

9.5 **LIL** shall provide the data/ resources from time to time for execution of the assignment**.**

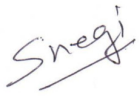
9.6 Assistance in organizing visits to the proposed plant site.

9.7 Accommodation, conveyance and other infrastructural support required by the **HOLTEC** team during the course of the site visit.

10. VALIDITY

The offer shall be valid upto 30th June 2016.

For HOLTEC CONSULTING PRIVATE LIMITED



Shalini Negi
Group Manager
Business Consulting

Annexure I

HOLTEC CONSULTING PRIVATE LIMITED

PER-DIEM/ MAN-MONTH RATES FOR INDIAN PROJECTS
Effective from 01 April 2016
(Subject to revision on 01 April 2017)

Rate Group	Category of Personnel	Designations	Per-Diem Rate (Rs.)	Man-Month Rate (Rs.)
1	Head of Departments	Chief Gen. Managers, Sr. Gen. Managers, Gen. Managers, Sr. Advisors	21,000	462,000
2	Senior Consulting / Design Staff	Addl. Gen. Managers, Dy. Gen. Managers, Group Managers, Advisors	17,800	391,600
3	Consulting / Design staff	Dy. Group Managers, Managers, Dy. Managers	15,100	332,200
4	Junior Consulting/ Design Staff	Asstt. Managers, Project Executives, Design Executives, Asstt. Project Executives, Sr. Designers, Designers, Asstt. Designers.	9,200	202,400

Notes:

1. Director's time, if required, shall be charged at Rs. 30,000 per day.
2. The following expenses shall be reimbursed at actuals and are excluded from the above:
   - ⇨ Travel and related Expenses
   - ⇨ Associated Expenses during transit and/ or at destination, including boarding, lodging and conveyance.
   - ⇨ Miscellaneous Expenses including (but not limited to) telephone calls, faxes, emails, and the like.
3. "Headquarters" means Delhi or any other place where the concerned personnel may be stationed.
4. The chargeable time shall include total time between the hour of leaving the Headquarters to the hour of reaching the Headquarters, including the travelling and transit time.
5. For all outstation assignments, HOLTEC's personnel shall normally work 8 hours per day and up to a maximum of 48 hours per week. Any overtime work beyond this shall be adequately compensated @ 1.35 times the normal rate on hourly basis.
6. Any duties, taxes, cess, etc. that may be levied from time to time by Central / State Governments or any other statutory authority shall be payable by the customer in addition to the rates mentioned above.
7. Directors shall travel by Air (Executive Class) / Train (AC- I). Persons from Rate Groups 1,2,3 shall travel by Air/Train (AC-I) and those from Rate Group 4 shall travel by Air/Train (AC-II).
8. For visits outside India 150% of the above rates shall be applicable.

For HOLTEC CONSULTING PRIVATE LIMITED

MANAGING DIRECTOR