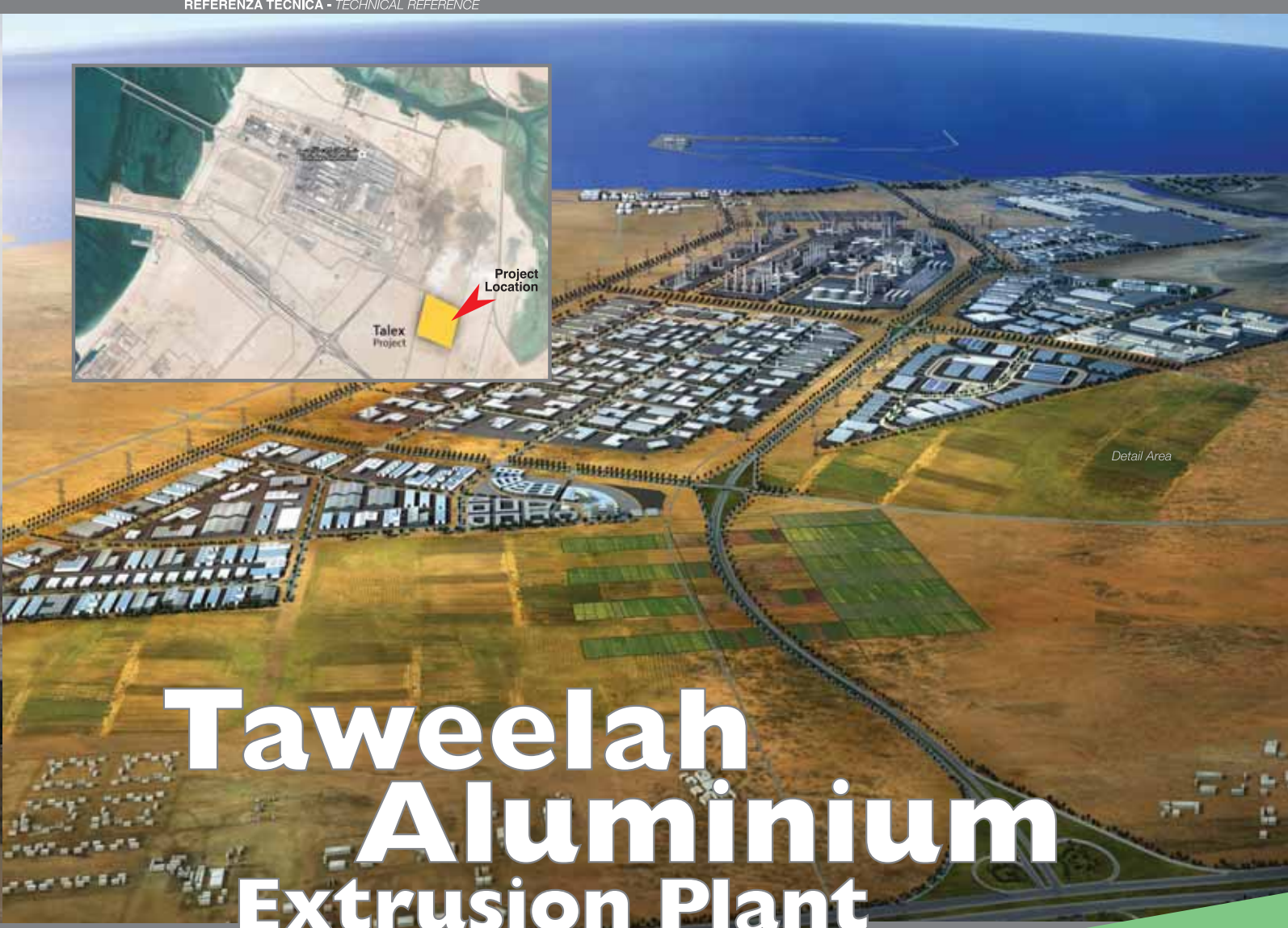


worldwide leader in the foundation engineering field



REFERENZA TECNICA - TECHNICAL REFERENCE



# Taweelah Aluminium Extrusion Plant

Kizad - Abu Dhabi, U.A.E.



**Compattazione Dinamica**  
Dynamic Compaction

**Sostituzione Dinamica**  
Dynamic Replacement

Cliente : Owner :	TAWEELAH ALUMINIUM EXTRUSION COMPANY LLC
Contrattista principale : Main Contractor :	Butec S.A.L.
Durata dei lavori : Duration of work :	2014 (4 months / 4 mesi)
Area : Area :	200,000 sqm / 200.000 m <sup>2</sup>

## Descrizione del progetto

La TALEX è stata costituita per sviluppare e costruire un impianto di estrusione alluminio di ultima generazione con una capacità annua di 50.000 tonnellate metriche, nella zona industriale del porto di Khalifa (KIZAD) ad Abu Dhabi. Si tratta del primo progetto di sviluppo downstream dell'alluminio realizzato a KIZAD. L'impianto TALEX, costruito su una superficie di 200.000 m<sup>2</sup> adiacente alla fonderia di alluminio Emirates Aluminium (EMAL), già oggetto di opere di consolidamento realizzate da TREVI, sarà quindi il primo progetto sulla Hot Metal Road a ricevere metallo fuso dalla EMAL.

L'indagine preliminare ha evidenziato che il terreno era costituito

## Project description

TALEX was set up to develop and build a 50,000 metric tonne per annum capacity, state-of-the-art Aluminium Extrusion plant based at Khalifa Industrial Zone Abu Dhabi (KIZAD). It is the first Aluminum downstream project to be established in KIZAD. TALEX's plant will be built on a 200,000 sqm plot of land adjacent to Emirates Aluminium (EMAL) aluminium smelter that was also subject of ground improvement works by TREVI, and will hence be the first project on the Hot Metal Road to receive liquid metal from EMAL.

According to the preliminary soil investigation results, the soil comprises medium dense sandy materials at the top 2-3 meters



per i primi 2-3 metri da materiali sabbiosi mediamente compatti a cui seguivano **materiali limo-argillosi incoerenti fino profondità di 5 e 7 m** (e punte sporadiche di 9 m) **dal piano campagna. La falda freatica era attestata mediamente a 2-3 m dal piano campagna.**

Si è quindi ritenuto necessario effettuare lavori di consolidamento prima della costruzione dello progetto di sviluppo proposto.

## Parametri di progetto

Capacità portante ammissibile non superiore a 200 KPa per elementi isolati con assestamento totale massimo non superiore a 25 mm.

Coefficiente di sicurezza minimo a liquefazione superiore a 1.

**followed by loose silty/clayey materials down to depths ranging between 5 to 7 m below the natural ground level. At very few locations, this layer reached a depth of up to 9 m. The average water table level is 2-3 m below the natural ground level.**

It was therefore considered necessary to carry-out soil improvement works before the construction of the proposed development.

## Project criteria

An allowable bearing capacity greater than 200 KPa, for isolated footings with maximum total settlement not exceeding 25mm. A factor of safety against soil liquefaction risk greater than 1.

## La soluzione TREVI

Trevi ha proposto una combinazione di **Compattazione Dinamica (DC)** e **Sostituzione Dinamica (DR)** come alternativa più viabile in termini di costi e tempi per migliorare le condizioni del terreno esistente e soddisfare i requisiti del progetto. **Lo strato superficiale, costituito da materiali sabbiosi con una percentuale di fini non superiore al 15%, è stato utilizzato come materiale di riporto per i crateri DC/DR, cosa che ha consentito di ridurre considerevolmente tempi e costi di progetto.**

Per la valutazione delle proprietà raggiunte in corso d'opera (collaudo interno post-trattamento) e al termine dei lavori

## TREVI solution

*A combination of **Dynamic Compaction (DC)** and **Dynamic Replacement (DR)** techniques was proposed by TREVI as the most suitable and economical solution to improve the existing soil conditions and achieve the project requirements. **The surface layer, consisting of sandy materials with fines content not exceeding 15%, was used for backfilling of the DC/DR craters, which allowed a considerable saving in the project schedule and cost.***

*Cone penetration tests (CPT), pressuremeter tests (PMT) and zone load tests (ZLT) were used for assessment of the achieved soil characteristics during improvement process (internal post-*



(procedura QC/QA ufficiale) e per garantire il soddisfacimento dei requisiti di progetto sono state condotte prove penetrometriche statiche (CPT), prove pressiometriche (PMT) e prove di carico locali (ZLT).

**Tutti i lavori di consolidamento, sia quelli del progetto iniziale sia quelli assegnati a TREVI in un secondo tempo, sono stati completati con successo entro il termine previsto.**

*testing) and after works completion (official QA/QC testing) and to ensure that the project requirements were reached.*

***All works were successfully completed within the scheduled time, including original scope and additional areas assigned to TREVI.***



**Taweeh aluminum extension plant and facilities, associated infrastructure, and ancillary buildings**

Division of Mr. Hassan Hossainy  
 Director General  
 Ground Improvement Division  
 P.O. Box 6732  
 Abu Dhabi, U.A.E.  
 E-mail: hassan@taaweeh.com  
 Telephone: +971-2-552-6100  
 Fax: +971-2-552-6111

**From:** Michel MAKOSSI  
 General Representative  
 +971-2-44 35 300  
 +971-20 811 0070  
 +971-2 44 35 302  
 mmako@butec.ae

**Our reference:** BUT 009-174.000  
 23 Dec 14

**Subject:** N/A  
**CERTIFICATE OF COMPLETION**

This letter requires a response:  NO

Dear Sir,

We hereby certify that **Ms SWISSBORING Overseas Piling Corporation** has successfully completed the ground improvement work by installing Dynamic Compaction/Craters Reinforcement technique for our esteemed project **Taweeh Aluminum Extension Plant (TALEX) at Al Taweeh, KIZAD, Abu Dhabi**. The Project commenced on 18<sup>th</sup> Nov 2013 and was completed on 09 July 2014.

**BUTEC** confirms that the work has been carried out in strict compliance set forth with the safety and quality standards of the Project and has met the schedule requirements of the Subcontract.

Furthermore **BUTEC** found **Swissboring's** management very cooperative, safety and quality conscious and result oriented in all approaches and activities throughout the execution of the **Ground Improvement Work**.

**BUTEC** expresses its sincere thanks to **Swissboring** for the **Ground Improvement work**.

Yours faithfully,  
 Michel MAKOSSI  
 Project Manager

Appreciation letters



P.O.Box 3905, Dubai, U.A.E.  
 Tel. +9714 3235311- Fax +9714 3235313  
 e-mail: [tge@trevispa.com](mailto:tge@trevispa.com)  
[www.trevispa.com](http://www.trevispa.com)

5819, via Dismano - 47522 Cesena (FC) - Italy  
 Tel. +39.0547.319311 - Fax +39.0547.318542  
 e-mail: [intdept@trevispa.com](mailto:intdept@trevispa.com)  
[www.trevispa.com](http://www.trevispa.com)