

# Helical News

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## Welcome to ISHF

This is the inaugural issue of *HELICAL NEWS*, the official newsletter of the International Society for Helical Foundations. The Newsletter will be produced twice a year, in January and in July, and will be distributed electronically via email to all ISHF Members. All new ISHF Members will receive back issues of the Newsletter.

The purpose of the ISHF is to promote helical technology as it applies to the design, installation and application of Screw-Piles and Helical Anchors in Civil Engineering Construction. This will be accomplished by keeping the profession up to date on the latest research activities and developments related to Helical Foundations. The Executive Director of the ISHF, and author of the newsletter, is Dr. Alan Lutenecker, Professor of Civil & Environmental Engineering at the University of Massachusetts, Amherst.

The ISHF accepts only Individual Membership and seeks members from academia, public agencies, manufacturers, practicing engineers and contractors but does not accept Corporate Membership. The ISHF operates solely on Individual Membership fees. The ISHF is about the TECHNOLOGY of Helical Foundations and not about individual PRODUCTS avail-

able on the market. Other groups and organizations are available to act on behalf of Manufacturers and Suppliers of Helical Foundations. The ISHF is intended to serve the entire Civil Engineering profession with a focus on providing state-of-the-art information to the profession.

Some may question if there is a need for yet another professional society when there are already some groups that are involved in Helical Foundations. For example, within the Deep Foundations Institute (DFI) there is a Helical Foundations & Tiebacks Committee (HFT). According to the latest Chairman's Report, posted on the DFI website:

"The goal of the committee is to share knowledge and collaborate on initiatives that serve the helical foundations and tiebacks industry through development of universal standards, facilitating research, hosting educational seminars and increasing public awareness."

A quick look at the current Membership List of the HFT, also posted on the DFI website, shows that of a total membership of 37, only 3 members are from Academics. The largest portion of the HFT membership, about 24, is made up of individuals associated with either Manufacturers or Suppliers of heli-

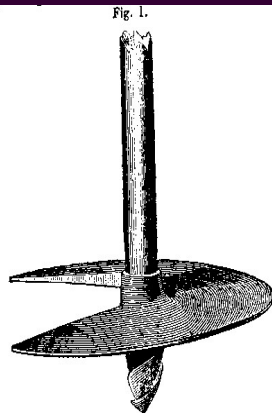
cal products. The remainder of the membership appears to be either from the private sector, either engineers or foundation contractors, and government.

Some of you may also be aware of the Institute of Helical Pile Engineering (IHPEng), which is an organization initiated by three industry providers of Screw-Piles and Helical Anchors; Screwfast Foundations, Ltd., operating in the UK, Piletech Ltd, from New Zealand, and Almita Piling Inc., from Canada. According to their website:

"The IHPEng exists to set and drive world standards for the safe design, manufacture, R&D, and installation of the helical pile in order to insure its long term use and acceptance as a primary foundation choice."

The Helical Pile Association (HPA) is another organization consisting of contractors who install helical piles but are only affiliated with a single manufacturer of Screw-Piles and Helical Anchors.

In contrast to these organizations, which are largely involved in promoting the use of Helical Foundation products, the ISHF will focus on the technology of Screw-Piles and Helical Anchors.



## Technical Bibliography

The ISHF has prepared a bibliography of previously published papers related to Helical Foundations, entitled "TECHNICAL BIBLIOGRAPHY on DESIGN, CONSTRUCTION and PERFORMANCE of SCREW-PILES and

HELICAL ANCHORS". The current edition of the bibliography consists of 17 pages of references from the technical literature, trade magazines and university theses. Active Members receive an electronic version of the Tech-

nical Bibliography. Members who are aware of other papers not included in the Bibliography are asked to provide the reference to the Executive Director for inclusion in the next edition.

## Technical Bibliography Catalog

One of the short-term goals of the Society is the creation of a pdf Catalog of the papers listed in the Technical Bibliography. This is an ambitious project and requires obtaining a good

copy of each paper and then scanning each paper to create an individual pdf file. The files will then be placed onto a flash drive and distributed to Members for personal use. It is

hoped that this Catalog will be available by mid 2011. While this is a time consuming process, it seems worthwhile to make the literature available to researchers and engineers

who may not have full access to papers listed in the Bibliography. Both the Technical Bibliography and the Catalog will be updated annually, as new papers are published.

## New Publications in 2010

One of the principal functions of the ISHF is to keep the profession informed of new work in the area of Screw-Piles and Helical Anchors by adding new publications to the Technical Bibliography. The following new publications appeared in professional journals and conference proceedings in 2010:

### Behavior of Screw-Piles and Helical Anchors

Abdelghany, Y. and El Naggar, M.H., 2010. Monotonic and Cyclic Behavior of Helical Piles Under Axial and Lateral Loading. Proceedings of the 5th International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, pp. 24-29.

Ashkinadze, K., 2010. Study of Residential Foundation Settlements in Edmonton (Canada) by Statistical Data from Screw Pile Underpinning. Proceedings of the 6th Computational Stochastic Mechanics Conference, Rhodes, Greece.

Buhler, R. and Cerato, A., 2010. Design of Dynamically Wind-Loaded Helical Piers for Small Wind Turbines. Journal of the Performance of Constructed Facilities, ASCE, Vol. 24, No. 4, pp. 417-426.

Cherry, J.A. and Souissi, M., 2010. Helical Pile Capacity to Torque Ratios, Current Practice, and Reliability. Geotrends: The Progress of Geological and Geotechnical Engineering in Colorado at the Cusp of a New Decade (GPP 6). Proceedings of the 2010 Biennial Geotechnical Seminar, ASCE, pp. 43-52.

Deardorff, D., Moeller, M. and Walt, E., 2010. Results of an Instrumented Helical Soil Nail Wall. Earth Retention 3, ASCE, pp. 262-269.

El Sharnouby, M.M., and El Naggar, M.H., 2010. Numerical Investigation of the Response of Expansion Anchors Used to Attach Helical Pile Connections to Concrete Foundations. Canadian Journal of Civil Engineering, Vol. 37, pp. 866-877.

Hird, C.C. and Stanier, S.A., 2010. Modeling Helical Screw Piles in Clay Using a Transparent Soil. Proceedings of the 7th International Conference on Physical Modeling in Geotechnics.

Lutenegger, A.J., 2010. Using Helical Screw-Piles for Upgrading Existing Foundations for Urban Revitalization, Proceedings of the International Symposium on Geotechnical Issues in Urban Regeneration, London, England.

Lutenegger, A.J., 2010. Shaft Resistance of Grouted Helical Micropiles in Clay, Proceedings of the International Conference on Micropiles, Washington, D.C.

Maier, J.L. and Oskoorouchi, A.M., 2010. Increasing Lateral Capacity of Helical Piles with Lateral Restraint Devices. Proceedings of the 5th International Conference on Earthquake Engineering and Soil Dynamics.

Merifield, R.S. and Smith, C.C., 2010. The Ultimate Uplift Capacity of Multi-Plate Strip Anchors in Undrained Clay. Computers and Geotechnics, Vol. 37, pp. 504-514.

Merifield, R.S. and Smith, C.C., 2010. The Ultimate Uplift Capacity of Multi-Plate Anchors in Undrained Clay. Soil Behavior and Geo-Micromechanics, ASCE, pp. 74-79.

Mittal, S., Ganjoo, B. and Shekhar, S., 2010. Static Equilibrium of Screw Anchor Pile Under Lateral Load in Sands. Geotechnical and Geological Engineering, Vol. 28, No.5, pp.717-725.

Pilla, D. R. and Tong, X., 2010. Evaluating Historic Structures for Adaptive Re-Use. Structure Magazine, Sept., pp. 14-16.

Tsuha, C. H.C. and Aoki, N., 2010. Relationship Between Installation Torque and Uplift Capacity of Deep Helical Piles in Sand. Canadian Geotechnical Journal, Vol. 47, pp. 635-647.

These papers have been added to the most recent version (2011) of the Technical Bibliography. If Members are aware of other publications that appeared in 2010 not listed above, please contact the Executive Director so they may be included in the Technical Bibliography.

In addition to the papers listed above, which are directly related to Helical Foundations, a number of other papers related to Plate Anchors also appeared:

#### **Behavior of Horizontal and Vertical Plate Anchors**

Deshnukh, V.B., Dewalikar, D.M. and Choudhury, D., 2010. Analysis of Rectangular and Square Anchors in Cohesionless Soils. International Journal of Geotechnical Engineering, Vol. 4, pp. 79-87.

Niroumand, H. and Kassim, K.A., 2010. Experimental Study of Horizontal Anchor Plates in Cohesionless Soils. Electronic Journal of Geotechnical Engineering, Vol. 15, Bundle F, pp. 609-620.

Niroumand, H., Kassim, K.A. and Nazir, R., 2010. Experimental Studies on Horizontal Anchor Plates in Cohesive Soils. Electronic Journal of Geotechnical Engineering, Vol. 15, Bundle H, pp. 879-886.

Niroumand, H., Kassim, K.A. and Nazir, R., 2010. Analytical and Numerical Studies of Vertical Anchor Plates in Cohesionless Soils. Electronic Journal of Geotechnical Engineering, Vol. 15, Bundle L, pp. 1139-1150.

Niroumand, H., Kassim, K.A. and Nazir, R., 2010. Experimental Studies of Horizontal Anchor Plates in Cohesionless Soils. Electronic Journal of Geotechnical Engineering, Vol. 15, Bundle O, pp. 1703-1711.

Niroumand, H. and Kassim, K.A., 2010. Uplift Response of Horizontal Square Anchor Plates in Cohesive Soil Based on Laboratory Studies. Electronic Journal of Geotechnical Engineering, Vol. 15, Bundle Q, pp. 1879-1886.

Niroumand, H., Kassim, K.A. and Nazir, R., 2010. Uplift Response of Horizontal Strip Anchor Plates in Cohesionless Soil. Electronic Journal of Geotechnical Engineering, Vol. 15, Bundle R, pp. 1967-1975.

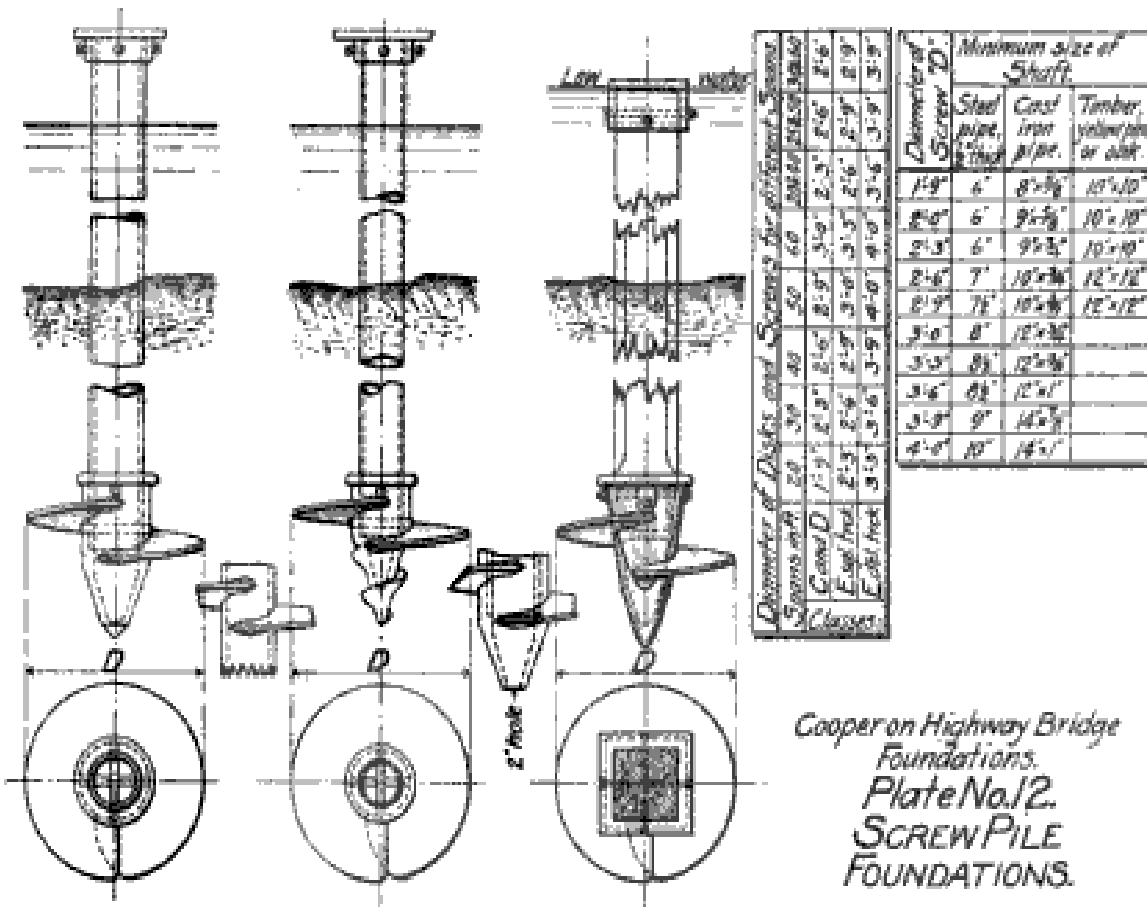
## History Lesson

Most engineers who are familiar with Screw-Piles know that they were the invention of Alexander Mitchell in the mid 1800's. We also know that throughout the late 19<sup>th</sup> and early 20<sup>th</sup> Centuries, Screw-Piles were used extensively to support large railway and

highway bridges. In fact, Screw-Piles were so common during this period that they appear in most engineers' handbooks of the period. The figure below shows an example, taken from "General Specifications for Foundations and Substructures of Highway and Electric

Railway Bridges" by Theodore Cooper, 1902. The various dimensions of shafts and helical plates given in the accompanying table suggest that engineers of this period were used to thinking big, with screw diameters ranging from 1'9" to 4'0".

*Example from  
"General  
Specifications for  
Foundations and  
Substructures of  
Highway and  
Electrical Railway  
Bridges"*



## News Items

Members are encouraged to submit brief news items related to helical research, novel applications of Screw-Piles or Helical Anchors, new publications, etc. to the Executive Director for inclusion in Helical News at: [lutenegg@ecs.umass.edu](mailto:lutenegg@ecs.umass.edu).

NEWSLETTER  
OF THE  
INTERNATIONAL  
SOCIETY FOR  
HELICAL  
FOUNDATIONS

E-mail: luteneegg@ecs.umass.edu

## DFI Committee on Helical Foundations and Tiebacks

The HFT of the DFI holds an annual one-day seminar for presentations related to Helical Foundations. In 2010 the seminar was held on Feb. 1, in Las Vegas, Nev. The following presentations were given:

Title	Presenter	Affiliation
Introduction to Helical Piles and Helical Anchors”	Steve Petres	MacLean-Dixie, Inc.
“Impact of 2009 IBC Helical Pile Design Requirements and C358 on Historical Helical Pile Capacities”	James Cherry	CTL/Thompson, Inc.
“NYC Chance Helical Pile Design Guidelines and Project Case Histories”	Michael Perlow	Danbro Distributors
“MacLean-Dixie Tiebacks vs. NYC Aging Clay Sewer Pipe”	Ron Melworm	Premium Technical Services
“Failures of Helical Piles and Helical Anchors and Associated Lessons Learned”	Howard Perko	Magnum Piering, Inc.
“Helical Tension Anchors at the Shady Hill School in Cambridge, Ma. – Lessons Learned”	Gary Seider	AB Chance/Hubbell Power Systems
“Cyclic Behavior of Fiber Reinforced Polymer Grouted Helical Screw Piles Under Lateral Loading”	Yasser Abdelghany	Highway Department, Ministry of Transportation and Infrastructure
“Helical Piles with Lateral Restraining Devices”	John Maier	Purcell Rhoades and Associates
“High Capacity Helical Piles – A New Dimension for Deep Foundations”	Mohammed Sakr	Almita Manufacturing, Ltd.

Readers will note that all but two of the presentations were made by members of the DFI HFT Committee. Copies of presentations are not generally available but readers may wish to contact presenters to obtain a copy.

## Helical Research

Current research being conducted at the University of Massachusetts is investigating the application of Screw-Pile foundations for solar panel arrays. Issues related to uplift capacity, lateral load capacity, frost heave and economics as compared to other foundation types are being evaluated.

