

REF: AUTORIZA CARGO BANCARIO POR  
IMPORTACION QUE SE INDICA.

RES. I.N.H. Nº 000572 EXENTA

SANTIAGO, 16 DIC. 2011

**VISTOS:** Las necesidades del Servicio; el Oficio INH Nº 582 del 13.12.2011 ; la Ley Nº 19.886 de Compras y Contratación Pública, la Resolución Nº 1600/2008 de la Contraloría General de la República; el Decreto Supremo Nº 930/1967 del M.O.P., que crea el Instituto Nacional de Hidráulica, la Ley Nº 20.481 de Presupuestos para el Sector Público vigente para el año 2011, el Decreto Nº 972/2008 del MOP que nombra Director Ejecutivo del INH, las atribuciones propias de mi cargo, y

**CONSIDERANDO:**

- Que, el INH es un servicio de alta especialización en el ámbito de la ingeniería hidráulica,
- Que, para el desarrollo de los proyectos que terceros le demanden, requiere de instrumental de precisión de alta tecnología generalmente no existente en Chile,
- Que, el instrumento requerido es 1 (un) sistema generador de oleaje
- Que la Firma DHI posee el instrumento señalado anteriormente.
- Que se hace necesario importar tal instrumento a la firma DHI.

**RESUELVO:**

1.- **AUTORIZASE** Cargo Saldo Carta de Crédito por importación de lo que se indica a continuación a DHI, Holmens Kanal 2-12 Denmark N° Cuenta 41804360163369;

**Detalle Producto :**

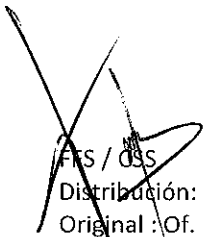
Sistema de Generador de Oleaje

Destino : División de Estudios.

2.- **PAGUESE** la cantidad de \$ 5.734.821.- ( Cinco millones setecientos treinta y cuatro mil ochocientos Veintiún Pesos), por saldo importación carta de crédito.

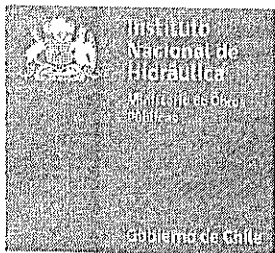
3.- **IMPUTESE** el gasto al Subtítulo 29.05.002 " Maquinarias y Equipos para Producción" del Presupuesto vigente del Instituto Nacional de Hidráulica, para el año 2011.

**ANÓTESE, COMUNÍQUESE Y ARCHÍVESE.**

  
FIS / OSS  
Distribución:  
Original : Of. Partes

Copia 1 : Contabilidad y Finanzas

  
ALFREDO IVAN CUTIÉRREZ MERA  
INGENIERO CIVIL  
DIRECTOR EJECUTIVO



0582

OFICIO I.N.H. N° \_\_\_\_\_

MAT: CARGO SALDO FACTURA PROFORMA S/N.

SANTIAGO, 13 DIC. 2011

DE: IVAN GUTIERREZ VERA  
DIRECTOR EJECUTIVO – INSTITUTO NACIONAL DE HIDRÁULICA

A: LUIS PIZARRO CUETO  
EJECUTIVO DE COMERCIO EXTERIOR – BANCO ESTADO

De mi consideración:

El Instituto Nacional de Hidráulica RUT N° 61.211.000-K, necesita comprar a la firma DHI 1 (un) Sistema Generador de Oleaje a la Firma DHI, por lo que necesita cargar el saldo de la factura Proforma S/N .

Para efectuar esta compra, quien suscribe solicita a esa Gerencia Comercial lo siguiente :

- Compra de EUR por 8.282.- Saldo carta de crédito a favor de DHI .
- Banco : Danske Bank.
- Dirección : Holmens Kanal 2 – 12 Denmark
- N° de Cuenta : 41804360163369
- Swift code : DABA DKKK

De acuerdo a lo anterior este Instituto autoriza a la Gerencia Comercial a cargar en la Cuenta Corriente N° 9720073 en m/n, Banco Estado, Peñaflor, el equivalente al total de Euros 8.282.-

Saluda atentamente a usted,

FERNANDO FIGUEROA SOTO  
JEFE DE ADMINISTRACION Y FINANZAS

HERNAN PROVOSTE VERGARA  
APODERADO

IVAN GUTIERREZ VERA  
DIRECTOR EJECUTIVO INH

FFS/CSS

Distribución:

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Copia 1: Contabilidad y Finanzas



**Cartola en Línea de Cuenta Corriente**



Detalle de su Cartola :

<b>Identificación de la Cuenta</b>	<b>Razón Social</b>	<b>RUT</b>
000-0-972007-3	INST NAC DE HIDRAULICA	61.211.000-K

<b>Usuario Conectado</b>	<b>Rol</b>	<b>Fecha - Hora</b>
CHRISTIAN SILVA SEPULVEDA	USUARIO	15/12/2011 - 17:54:51

<b>Saldo contable inicial \$</b>	57.290.667
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Detalle de sus movimientos :

Fecha	Sucursal	N° Operación	Descripción	Cheques/Cargos \$	Depositos/Abonos \$	Saldo \$
15/12	TALAGANTE	4854108	CHEQUE PAGADO POR CAJA	700.000	0	47.127.958
15/12	0093	4419299	CHEQUE PAGADO POR CAJA	200.000	0	47.827.958
15/12	STGO. PRINCIPAL	<u>4419293</u>	CHEQUE RECIBIDO EN CANJE DE BANCO	149.946	0	48.027.958
15/12	STGO. PRINCIPAL	<u>4419256</u>	CHEQUE RECIBIDO EN CANJE DE BANCO	3.613.906	0	48.177.904
14/12	0002	1381	CAMBIOS INTERNACIONALES	1.468	0	51.791.810
14/12	0002	1381	CAMBIOS INTERNACIONALES	6.905	5.734.821.00	51.793.278
14/12	0002	1381	CAMBIOS INTERNACIONALES	7.727		51.800.183
14/12	0002	1381	CAMBIOS INTERNACIONALES	5.718.721		51.807.910
14/12	STGO. PRINCIPAL	🔍	DEPOSITO CON DOCUMENTOS	0		102.222
14/12	STGO. PRINCIPAL	🔍	DEPOSITO CON DOCUMENTOS	0	504.892	57.424.409
14/12	STGO. PRINCIPAL	1720	PROVISION FONDOS EN LINEA CONVENIOS	49.461	0	56.919.517
14/12	STGO. PRINCIPAL	1720	PROVISION FONDOS EN LINEA CONVENIOS	294.368	0	56.968.978
14/12	STGO. PRINCIPAL	<u>4089084</u>	CHEQUE RECIBIDO EN CANJE DE BANCO	27.321	0	57.263.346
<b>subtotales \$</b>				<b>10769823</b>	<b>607114</b>	

Resumen :

<b>Saldo contable \$</b>	47.127.958
<b>Retenciones 1 día \$</b>	0
<b>Retenciones 2 días \$</b>	0

<b>Retenciones n días \$</b>	0
<b>Retenciones varias \$</b>	0
<b>Saldo disponible \$</b>	47.127.958
<b>Saldo Total \$</b>	47.127.958

**Notas:**

1. Saldo disponible total = Saldo disponible Cuenta Corriente + Saldo disponible Línea de Crédito.
2. Información referencial, sujeta a confirmación.



By e-mail (erosa@inh.cl)

Instituto Nacional de Hidráulica  
Laboratorio de Hidráulica  
Of Nataniel Cox 31  
3° Piso  
833-0165 Santiago  
Chile

Att: Mr Enrique Rosa

Agern Allé 5  
DK-2970 Hørsholm  
Denmark

Tel: +45 4516 9200  
Fax: +45 4516 9292  
juf@dhiigroup.com  
www.dhiigroup.com

Ref: 11805174-P INH PI-2  
Init: juf/ybr/pot/MTT

Date: 05 November 2010

**Pro Forma Invoice**  
*Wave Generating System for Shallow Water Wave Basin*

Item #	Qty	Description	Price (EUR)
1	1 set	<p><b>DHI Basin Wavemaker Type 040/BE</b> Piston type, movable wavemaker with electric drive system complete. For generation of random and regular long-crested (2D) waves.</p> <p>Complete with dip galvanised wavemaker frame (with built-in rear side wave absorber) and paddle, and electric drive linear actuator with position feedback transducer and AC servo motor; including motor control and power supply module in mobile cabinet, and remote control cable (30m).</p> <p>The offered wavemaker can be synchronised with Client's existing DHI wavemaker with hydraulic drive system.</p> <p>Mains power cable is exclusive.</p> <p>Paddle dimensions: - width 5.50m - height 0.73m - stroke 0.40m</p> <p><i>For performance and other details, see Enclosure 1 and brochure.</i></p> <p><i>Related brochure:</i> - "DHI Movable 2D Basin Wavemaker Type 040/BE"</p>	63,515.-
2	1 set	<p><b>DHI Standard Wavemaker Servo Controller Type 414/1</b> For servo control of wavemaker / electric drive actuator. Including:</p> <ul style="list-style-type: none"><li>- Servo amplifier module DHI Type 114</li><li>- Standard cabinet w/ power supply DHI Type 101E</li><li>- Control cable (30m)</li></ul> <p><i>Related brochures:</i> - "DHI Servo Amplifier 114" - "DHI Standard Cabinet"</p>	4,035.-

DHI



Item #	Qty	Description	Price (EUR)
3	1 set	DHI Wave Meters Including: - 5 Nos wave amplifier module Type 108 - 5 Nos wave gauge Type 201/50; length 0.5m - 5 Nos wave meter cable Type 252/30; length 30m  Related brochure: - "DHI Wave Meter"	11,015.-
4	Lot	Optional: Assistance on Installation and running-in at INH, Chile Up to three days by DHI Engineer immediately after arrival of goods.	
-	Lot	Packing (containerised) and Handling	EUR 7,500.- 1,850.-
Total EXW DHI (excl. options).....			EUR 80,415.-
Ocean Freight and Insurance			2,400.-
Total CIF Valparaiso Sea Port (excl. options).....			EUR 82,815.-

### General Conditions

Terms	CIF, Incoterms 2000
Currency	Euros (EUR)
Validity	P/I valid for ordering before 15 January 2011 and opening of L/C before 25 January 2011
Taxes and Duties	Exclusive outside of Denmark
Delivery	Goods will be despatched approximately twenty (20) weeks after receipt of order and valid L/C.
Payment	By confirmed, irrevocable L/C opened through a Danish bank or as negotiated
Warranty	The offered equipment is warranted against defects in materials and workmanship until one year after date of installation or until 14 months after dispatch from Denmark, whichever date comes first. In case of damage, the buyer shall notify DHI in writing as soon as a defect has been established. Failure to do so could result in repair charges being levied by DHI. Defective parts are repaired or replaced at the discretion of DHI. In case of repair or replacement done at DHI, the buyer shall dispatch to DHI the defective parts as advised by DHI and shall pay shipment cost to DHI. DHI will pay return shipment costs. The warranty does not cover accidental damages and will be clarified as null and void if unauthorised repairs are carried out. DHI will not cover damages or defects, which arise from bad maintenance or from incorrect or unauthorised installation or use of the equipment. DHI cannot be held liable for any consequential damage or loss.
Ambient Conditions	The equipment is only for indoor use and in sweet water only.

Hørsholm, 05 November 2010  
DHI

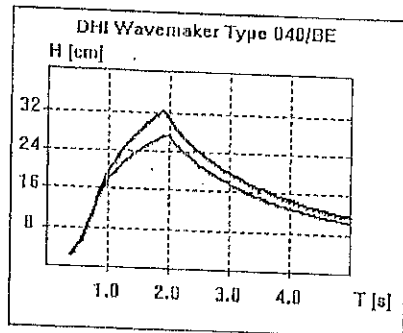


Enclosure 1  
INH, Chile

### DHI Basin Wavemaker Type 040/BE

#### Wavemaker Performance

The maximum wave height versus wave period (regular waves) at water depths of 0.4m and 0.6m for the proposed wavemaker is shown in the graph below.



The performance is identical to that of the hydraulic driven wavemaker previously supplied to INH by DHI.

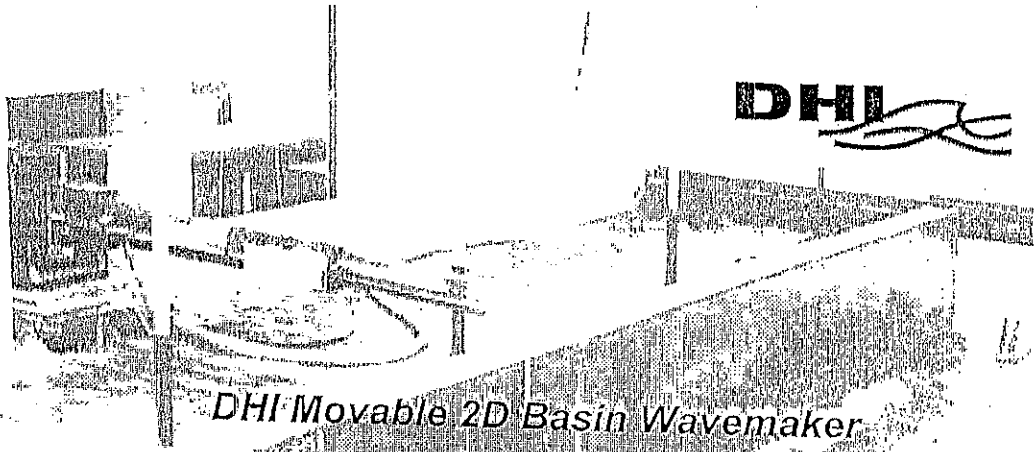
The proposed new (electric drive) wavemaker can be run in synchronicity with INH's hydraulic wavemaker.

#### Wavemaker Design and Preparations

At large performance, the wavemaker needs to be kept in position either by anchors into the concrete floor or by ballast on top of the wavemaker.

A wave absorber is built into the wavemaker frame to limit splashing of water from the paddle rear side.

*DHI reserves the right to introduce without notice changes that do not alter the performance or longevity of the equipment.*



## DHI Movable 2D Basin Wavemaker

### Introduction

DHI Movable 2D Basin Wavemaker is a powerful, easy-to-use precision wavemaker for wave generation in coastal basins. The system offers generation of an irregular, regular long crested, 2D wave condition.

Due to its flexibility and modularity it offers a highly versatile solution for users. The sturdy and proven design and the carefully selected components ensure its long life.

### Wave Generating System

DHI Movable 2D Wavemaker is part of the overall DHI Wave Generating System which comprises:

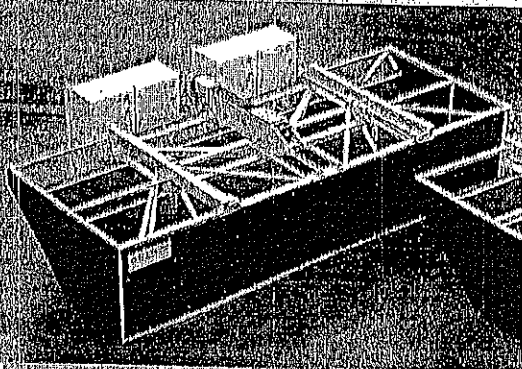
- Wavemaker with Servo Actuator
- Electronic Servo Controller
- DHI Wave Synthesizer software and I/O hardware for PC

### Design

DHI Movable 2D Wavemaker is of the piston type with the vertical wave paddle oscillating horizontally. The wavemaker is available in several standard sizes or variations are tailored for customers' special requirements. Any number of wavemaker units may be operated synchronously providing almost infinite wave fronts.

### Servo Actuator

The servo actuator is mounted at the centre of the wavemaker frame by a rigid, yet flexible suspension. The system features a linear drive actuator. An electric drive system is standard but hydraulic systems may also be offered. The electric system uses a high response AC brushless servo motor with internal and external speed torque and position feedback for superior control accuracy and safety.



DHI Movable 2D Basin Wavemaker

## Specifications

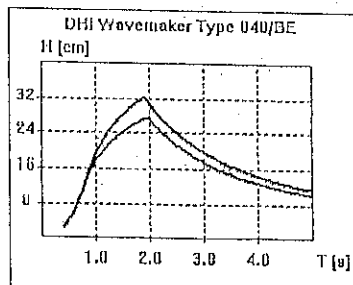
### Wavemaker Frame

<b>Type:</b>	Movable, piston type wavemaker for generation of random or regular long-crested (2D) waves			
<b>Main Dimensions:</b>	Paddle width	5.50m	Weight	1,200kg (approx)
	Paddle height	0.73m		
	Paddle stroke	0.40m		
<b>Design:</b>	The moving wave paddle is suspended inside the main frame by ball bearings from twin hardened steel axles.			
<b>Absorber:</b>	Built-in rear side absorber to eliminate splashing of water			
<b>Materials:</b>	Hot-dip galvanized, full-welded steel frame with water resistant plywood boards. Paddle moving on dirt & spray protected hardened steel axles			

### Electric Drive System

<b>Type:</b>	Linear drive precision actuator with AC brushless servo motor.		
<b>Actuator:</b>	Linear drive actuator of sliding guide type with aluminum casing. Drive by ball screw and screw ball nut. Ball screw-driven carriage on top of actuator; connects to wave paddle by twin rods and ball bearing links. Shock load and vibration resistant. Long-term lubricated. Bell house flange for motor acting directly on ball screw without any gear. Nominal stroke 400mm.		
<b>AC Motor:</b>	The brushless AC motors used by DHI are among the most advanced brushless motors with low rotor weight and inertia to ensure high dynamic response and long lifetime. Both motor and linear actuators are oversized for extension of lifetime. The position and velocity feedback are provided for internally. Additionally, an external absolute position transducer is provided. The motor controller provides thermal protection and torque limit protection. The motor system is maintenance free. The motor controller and power supply are rack mounted inside a closed cabinet for mounting behind the wavemaker.		
<b>Motor Specifications:</b>	Motor:	Yaskawa SGMGH-30D	Rack dimensions:
	Controller:	Yaskawa SGD3-30DE	HxWxD: 0.6x0.6x0.6m
	Rated Output:	3.0 kW	
	Rated Torque:	18.6 Nm	
	Rated/Max Speed:	1,500/3,000 rpm	
	Power:	3x400 VAC (50 Hz), Neutral and PE	
		6.8 kVA, min 9.8 A per each phase	
	Protection:	IP65	

### System Performance:



Maximum wave height (H) versus wave period (T) of regular waves; water depths: 0.5m (red) and 0.4m (black)

DHI reserves the right to change without prior notice specifications that will have no influence on performance or lifetime

DHI  
 Agern Allé 5  
 DK-2970 Hørsholm  
 Denmark

Tel: +45 4516 9200  
 Fax: +45 4516 9292  
 e-mail: mtl@dhigroup.com

www.dhigroup.com

08/08



By e-mail (erosa@inh.cl)

Instituto Nacional de Hidráulica  
Laboratorio de Hidráulica  
Of. Nataniel Cox 31  
3° Piso  
833-0165 Santiago  
Chile

Att: Mr Enrique Rosa

Agern Allé 5  
DK-2970 Hørsholm  
Denmark

Tel: +45 4516 9200  
Fax: +45 4516 9292  
juf@dhtgroup.com  
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Hørsholm, 05 November 2010  
DHI

Jesper Fuchs  
Head, Model Testing Technology