

# **COMPLETION REPORT**

ON

CONSTRUCTION OF WATER SUPPLY FACILITIES

FOR

RURAL WATER SUPPLY COMPONENT

OF

THE STUDY FOR WATER RESOURCES MANAGEMENT

AND RURAL WATER SUPPLY IMPROVEMENT

IN THE REPUBLIC OF YEMEN

JULY 2007

AHMED ALI MAHDI OFFICE  
FOR TRADING AND CONTRACTING

## 0. Table of Contents

1	Summary of Project	.....	1
2	Project Implementation Structure	.....	2
3	Actual Work Schedule	.....	3
4	Principal Activity and Work Record	.....	4
5	List of Equipment and Main Materials	.....	10
6	Photographs of Constructed Facilities	.....	13

### Annex

1	Completion Drawings
2	Minutes of Regular Meetings
3	Instruction
4	Catalogs of Equipment and Material

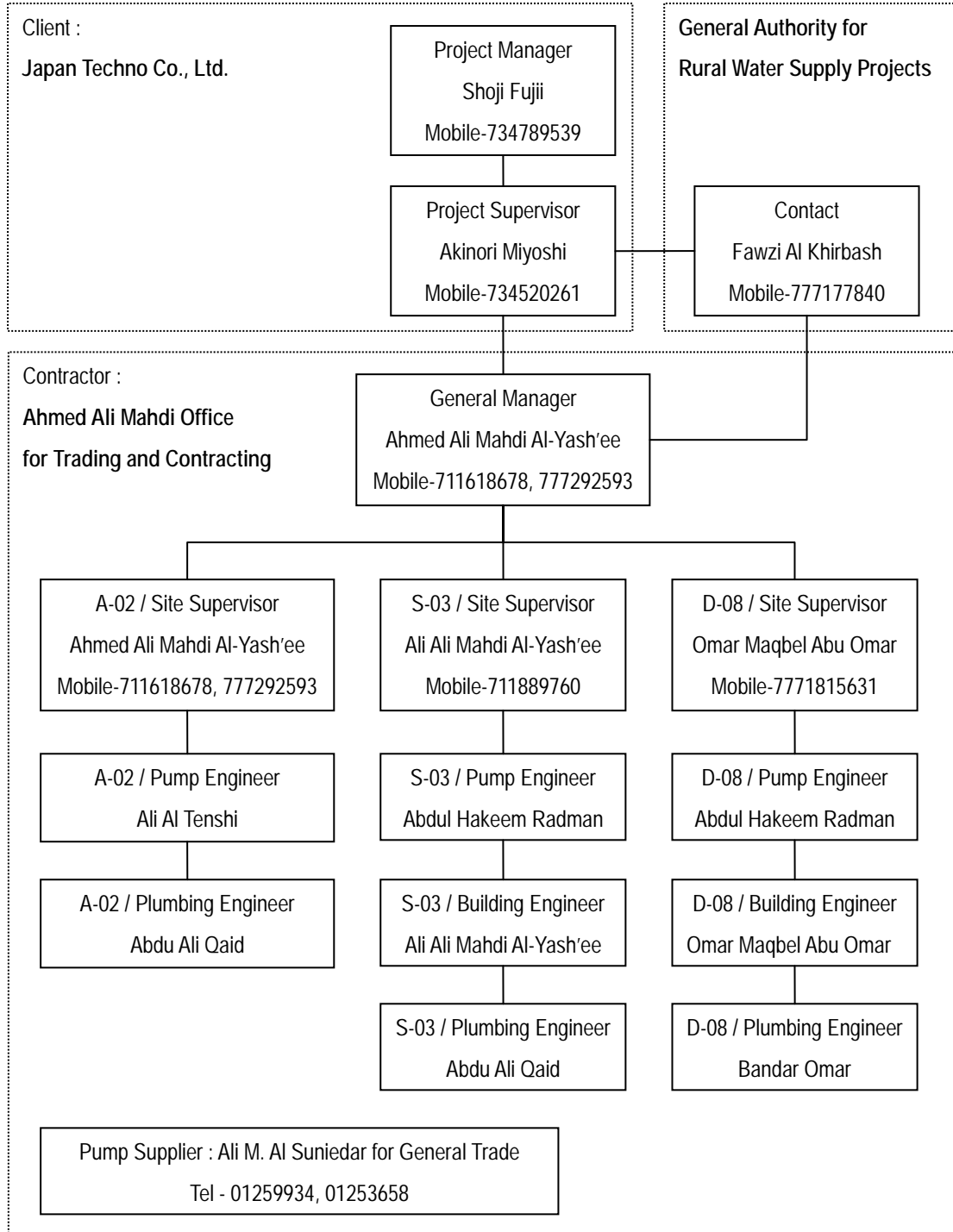
## 1. Summary of Project

Contract Title	: Construction of Water Supply Facilities for Rural Water Supply Component of The Study for Water Resources Management and Rural Water Supply Improvement in the Republic of YEMEN
Name & Address of the Client	: Japan Techno Co. Ltd. SBS Hills III, 10-4, 4-Chome, Yoga, Setagaya-ku, Tokyo 158-0097, JAPAN
Name & Address of the Contractor	: Ahmed Ali Mahdi Office for Trading and Contracting Al Hassabah, Maintenance Street, beside Owsan School, Sana'a, the Republic of YEMEN
Date of Tendering	: 25 <sup>th</sup> April, 2007
Date of Contract	: 26 <sup>th</sup> April, 2007
Date of Completion	: 4 <sup>th</sup> July, 2007
Contract Price	: US\$220,000.-
Site Name and Location	: A-02 / Jabal Al Taraf, Al Mahweet District, Al Mahweet Governorate S-03 / Al Kharaba, Bany Matal District, Sana'a Governorate D-08 / Masneat Abdul Aziz, Mafa'a District, Dhamar Governorate

### List of Facilities

A-02 / Jabal Al Taraf		Unit
1	Pumping Unit (Vertical Shaft Pump and Diesel Engine) for Well	1
2	Pumping Unit (Horizontal Pump and Diesel Engine) for Booster	1
S-03 / Al Kharaba		Unit
1	Pumping Unit (Submersible Motor Pump and Engine Generator) with Accessories	1
2	Pump House with Pump Pit	1
3	Ground Water Tank (50m <sup>3</sup> )	1
4	Pumping Main (3")	1,333m
5	Distribution Main (3/4" to 3")	4,363m
6	Public Fountain	13
D-08 / Masneat Abdul Aziz		Unit
1	Pumping Unit (Submersible Motor Pump and Engine Generator) with Accessories	1
2	Rehabilitation of Existing Pump House	1
3	Rehabilitation of Existing Ground Water Tank (25m <sup>3</sup> )	1
4	Pumping Main (3")	2,133m
5	Distribution Main (3/4" to 3")	1,617m
6	Public Fountain	2

## 2. Project Implementation Structure



### 3. Actual Work Schedule

	April		May							June						July
	30	5	10	15	20	25	31	5	10	15	20	25	30	4		
<b>A-02 / Jabal Al Taraf</b>																
1 Mobilization & Demobilization																
2 Installation of Pumping Unit for Well																
3 Installation of Pumping Unit for Booster																
<b>S-03 / Al Kharaba</b>																
1 Mobilization & Demobilization																
2 Installation of Pumping Unit																
3 Construction of Pump House																
4 Construction of Water Tank (50m <sup>3</sup> )																
5 Installation of Pumping Main																
6 Installation of Distribution Main																
7 Construction of Public Fountain																
<b>D-08 / Masneat Abdul Aziz</b>																
1 Mobilization & Demobilization																
2 Installation of Pumping Unit																
3 Rehabilitation of Existing Pump House																
4 Rehabilitation of Existing Water Tank (25m <sup>3</sup> )																
5 Installation of Pumping Main																
6 Installation of Distribution Main																
7 Construction of Public Fountain																
<b>Test Operation and Inspection</b>																

#### 4. Principal Activity and Work Record

Site: A-02 / Jabal Al Taraf

		Principal Activity and Work	Remarks	
APRIL, 2007	25	Wed	Tender	
	26	Thu	Contract	
	27	Fri		
	28	Sat		
	29	Sun	Commencement of Works	
	30	Mon	Site Transfer	
MAY, 2007	1	Tue		Labor Day
	2	Wed		
	3	Thu		
	4	Fri		
	5	Sat		
	6	Sun		
	7	Mon		
	8	Tue		
	9	Wed		
	10	Thu		
	11	Fri		
	12	Sat		Regular Meeting
	13	Sun		
	14	Mon		
	15	Tue		
	16	Wed		
	17	Thu		
	18	Fri		
	19	Sat		
	20	Sun		
	21	Mon		
	22	Tue		Re-Unification Day
	23	Wed		Regular Meeting
	24	Thu		
	25	Fri		
	26	Sat		
	27	Sun		
	28	Mon		
	29	Tue	Approval of pumping unit	
	30	Wed		Regular Meeting
	31	Thu		
JUNE, 2007	1	Fri		
	2	Sat		
	3	Sun		
	4	Mon		
	5	Tue		
	6	Wed		Regular Meeting
	7	Thu		
	8	Fri		
	9	Sat		
	10	Sun		
	11	Mon		
	12	Tue		
	13	Wed		
	14	Thu		
	15	Fri		
	16	Sat		Regular Meeting
	17	Sun		
	18	Mon	Inspection of pumping unit before the delivery	
	19	Tue	Installation of pumping unit	
	20	Wed	Installation of pumping unit	
	21	Thu		
	22	Fri		
	23	Sat	Warm up of diesel engines	Regular Meeting
	24	Sun	Warm up of diesel engines	
	25	Mon	Warm up of diesel engines	
	26	Tue	Warm up of diesel engines	
	27	Wed	Test operation. Bearing's defect inside gear box	
	28	Thu		
	29	Fri		
	30	Sat	Inspection of bearing inside gear box at workshop	Regular Meeting
JULY, 2007	1	Sun	Re-installation of gear box. Test operation	
	2	Mon	Test operation	
	3	Tue	Inspection	
	4	Wed		

		Principal Activity and Work	Remarks	
APRIL, 2007	25	Wed	Tender	
	26	Thu	Contract	
	27	Fri		
	28	Sat		
	29	Sun	Commencement of Works	
	30	Mon		
MAY, 2007	1	Tue		Labor Day
	2	Wed	Site Transfer	
	3	Thu		
	4	Fri		
	5	Sat	Site camp was built.	
	6	Sun		
	7	Mon		
	8	Tue	Construction of access road to tank site by local council.	
	9	Wed	Concrete work for footings of pump house.	
	10	Thu	Concrete work for underground beams of pump house	
	11	Fri		
	12	Sat	Concrete work for columns of pump house. Broken stone for tank basement	Regular Meeting
	13	Sun		
	14	Mon	Installation of pumping main was finished.	
	15	Tue		
	16	Wed	Masonry work by concrete block wall of pump house	
	17	Thu		
	18	Fri		
	19	Sat	Concrete work for basement of tank	
	20	Sun	Concrete work for roof of pump house	
	21	Mon		
	22	Tue		Re-Unification Day
	23	Wed		Regular Meeting
	24	Thu	Concrete work for wall and roof of tank	
	25	Fri		
	26	Sat	Installation of distribution pipe was finished.	
	27	Sun		
	28	Mon		
	29	Tue	Approval of pumping unit	
	30	Wed	Installation of door and windows of pump house	Regular Meeting
	31	Thu		
JUNE, 2007	1	Fri		
	2	Sat		
	3	Sun		
	4	Mon	Revision of pump due to the unavailability	
	5	Tue		
	6	Wed		Regular Meeting
	7	Thu	Plastering work for pump house	
	8	Fri		
	9	Sat	Plastering work for tank. Construction of public fountain was finished.	
	10	Sun	Installation of pumping unit	
	11	Mon	Warm up of engine generator	
	12	Tue	Warm up of engine generator	
	13	Wed	Test operation and flow examination	
	14	Thu		
	15	Fri		
	16	Sat		Regular Meeting
	17	Sun	Painting work for pump house and tank	
	18	Mon	Test operation and flow examination	
	19	Tue		
	20	Wed		
	21	Thu		
	22	Fri		
	23	Sat		Regular Meeting
	24	Sun		
	25	Mon		
	26	Tue	Painting of national flags	
	27	Wed		
	28	Thu		
	29	Fri		
	30	Sat		Regular Meeting
JULY, 2007	1	Sun		
	2	Mon	Inspection	
	3	Tue		
	4	Wed		

		Principal Activity and Work	Remarks	
APRIL, 2007	25	Wed	Tender	
	26	Thu	Contract	
	27	Fri		
	28	Sat		
	29	Sun	Commencement of Works	
	30	Mon		
MAY, 2007	1	Tue		Labor Day
	2	Wed		
	3	Thu	Site Transfer	
	4	Fri		
	5	Sat		
	6	Sun		
	7	Mon		
	8	Tue		
	9	Wed		
	10	Thu	Site camp was built.	
	11	Fri		
	12	Sat		Regular Meeting
	13	Sun		
	14	Mon		
	15	Tue		
	16	Wed		
	17	Thu		
	18	Fri		
	19	Sat		
	20	Sun		
	21	Mon		
	22	Tue		Re-Unification Day
	23	Wed		Regular Meeting
	24	Thu	Installation of pumping main was finished.	
	25	Fri		
	26	Sat		
	27	Sun		
	28	Mon	Installation of distribution pipe was finished.	
	29	Tue	Approval of pumping unit	
	30	Wed		Regular Meeting
	31	Thu		
JUNE, 2007	1	Fri		
	2	Sat		
	3	Sun	Construction of public fountain was finished.	
	4	Mon	Revision of pump due to the unavailability	
	5	Tue	Installation of pumping unit	
	6	Wed	Warm up of engine generator	Regular Meeting
	7	Thu	Warm up of engine generator	
	8	Fri		
	9	Sat	Test operation and flow examination	
	10	Sun		
	11	Mon		
	12	Tue	Test operation and flow examination	
	13	Wed		
	14	Thu		
	15	Fri		
	16	Sat	Rehabilitation work for pump house was finished.	Regular Meeting
	17	Sun		
	18	Mon		
	19	Tue		
	20	Wed		
	21	Thu	Rehabilitation work for tank was finished.	
	22	Fri		
	23	Sat		Regular Meeting
	24	Sun	Inspection	
	25	Mon		
	26	Tue		
	27	Wed		
	28	Thu		
	29	Fri		
	30	Sat		Regular Meeting
JULY, 2007	1	Sun		
	2	Mon		
	3	Tue		
	4	Wed		



## 5. List of Equipment and Main Materials

Site: A-02 / Jabal Al Taraf

	Equipment and Materials	Product or Specification	Remarks
<b>Pumping Unit for Well</b>			
1	Vertical Shaft Pump for Well	Caprari/P6C/3/14/20A, Italy (6 impellers removed from P6C/3/20/20A)	See the attached
2	Drive Unit	Caprari/R26/3L/20, R/1:1.8, Italy	See the attached
3	Column Pipe	Carbon Steel/D3"/Flange/3mL	
4	Diesel Engine	MVM/D229-6, Brazil	See the attached
5	Cardan Shaft	CSN/Top-Quality, Germany	
6	Gate Valve beside pump	Al Hababi, GVP/BS5163/PN16/DN3", Italy	
7	Check Valve beside pump	Al Hababi, GVP/BS5153/PN16/DN3", Italy	
8	Water Meter beside pump	Kent/PN16/DN80mm(3inch)	
9	Presssure Gauge beside pump	Wika/40bar/EN837-1, Germany	
10	Flange for pipe	BS4504/PN16/DN3", Japan	
11	Galvanized Steel Pipe	D3", Zenith/BS-M, India	See the attached
<b>Pumping Unit for Booster</b>			
12	Horizontal Pump for Booster	Panelli/PMO40-65/8, Italy (4 impellers removed from PMO40-65/12)	See the attached
13	Diesel Engine	MVM/D229-6, Brazil	See the attached
14	Gear Box	Techno Drive/BD290/150, Twin Disc/RM120, R/0.67S, Italy	See the attached
15	Cardan Shaft	CSN/Top-Quality, Germany	
16	Gate Valve beside pump	Al Hababi, GVP/BS5163/PN16/DN3", Italy	
17	Check Valve beside pump	Al Hababi, GVP/BS5153/PN16/DN3", Italy	
18	Water Meter beside pump	B-Meters/PN16/DN80, Italy	
19	Presssure Gauge beside pump	Wika/40bar/EN837-1, Germany	
20	Flange for pipe	BS4504/PN16/DN3", Japan	
21	Galvanized Steel Pipe	D3", Zenith/BS-M, India	See the attached

Site: S-03 / Al Kharaba

	Equipment and Materials	Product or Specification	Remarks
1	Submersible Motor Pump	Panelli/140PX13-24, Italy	See the attached
2	Motor for pump	Franklin Electric	See the attached
3	Column Pipe	Galvanized Steel/D3"/Flange/6mL	
4	Control Panel	Panelli/Direct, Italy	
5	Engine Generator	Bruno/G51P, Alternator:Leroy-Somer, Engine:Perkins	See the attached
6	Gate Valve beside pump	Al Hababi, GVP/BS5163/PN16/DN3", Italy	
7	Check Valve beside pump	Al Hababi, GVP/BS5153/PN16/DN3", Italy	
8	Water Meter beside pump	Kent/PN16/DN80	
9	Presssure Gauge beside pump	Empco/40bar	
10	Flange for pipe	BS4504/PN16/DN3", Japan	
11	Galvanized Steel Pipe for Pumping Main	Zenith/BS-M/D3", India	See the attached
12	Galvanized Steel Pipe for Distribution Main	Zenith/BS-M/D3/4 to 3", India	See the attached
13	Gate Valve along Distribution Main	UK Product	
14	Cement	Portland Cement/BS12, Amran	
15	Sand	Nehm, Sana'a	
16	Gravel	Bany Hushes, Sana'a	
17	Reinforcing Steel Bar	Turkish Product	
18	Water for Concrete and Mortar	from Private Well	
19	Concrete Mixing Ratio	C1:S2:G3	
20	Water Meter for Public Fountain	ABB/D1"	
21	Gate Valve for Public Fountain	UK Product	
22	Tap for Public Fountain	D3/4", Italy	

Site: D-08 / Masneat Abdul Aziz

	Equipment and Materials	Product or Specification	Remarks
1	Submersible Motor Pump	Panelli/140PX13-24, Italy	See the attached
2	Motor for pump	Franklin Electric	See the attached
3	Column Pipe	Galvanized Steel/D3"/Flange/6mL	
4	Control Panel	Panelli/Direct, Italy	
5	Engine Generator	Bruno/G51P, Alternator:Leroy-Somer, Engine:Perkins	See the attached
6	Gate Valve beside pump	Al Hababi, GVP/BS5163/PN16/DN3", Italy	
7	Check Valve beside pump	Al Hababi, GVP/BS5153/PN16/DN3", Italy	
8	Water Meter beside pump	B-Meters/PN16/DN80, Italy	
9	Presssure Gauge beside pump	Empcco/40bar	
10	Flange for pipe	BS4504/PN16/DN3", Japan	
11	Galvanized Steel Pipe for Pumping Main	Zenith/BS-M/D3", India	See the attached
12	Galvanized Steel Pipe for Distribution Main	Zenith/BS-M/D3/4 to 3", India	See the attached
13	Gate Valve along Distribution Main	UK Product	
14	Cement	Portland Cement/BS12, Amran	
15	Sand	Nehm, Sana'a	
16	Gravel	Bany Hushes, Sana'a	
17	Reinforcing Steel Bar	Turkish Product	
18	Water for Concrete and Mortar	from Private Well	
19	Concrete Mixing Ratio	C1:S2:G3	
20	Water Meter for Public Fountain	ABB/D1"	
21	Gate Valve for Public Fountain	UK Product	
22	Tap for Public Fountain	D3/4", Italy	

## 6. Photographs of Constructed Facilities (A-02 / Jabal Al Taraf)



Vertical Shaft Pump for Well before Replacement



Diesel Engine for Well before Replacement



Horizontal Pump for Booster before Replacement



Diesel Engine for Booster before Replacement



Foundation after Removal of Diesel Engine for Well



Foundation after Removal of Pumping Unit for Booster



New Vertical Shaft Pump for Well



Installation of New Vertical Shaft Pump for Well



Installation of New Column Pipe for Well



Installation of New Drive Unit for Well



Installed Vertical Shaft Pump and Accessories for Well



Installed Diesel Engine for Well



Installed Horizontal Pump and Accessories for Booster



Installed Diesel Engine for Booster



Water Flowing in Existing Ground Water Tank

## 6. Photographs of Constructed Facilities (S-03 / Al Kharaba)



Site Camp



Galvanized Steel Pipe in Stock Yard



Rebar Bending at Stock Yard



Cement for Concrete



Sand for Concrete



Gravel for Concrete



Reinforced Concrete Work for Underground Beam of Pump House



Reinforced Concrete Work for Column of Pump House



Masonry Work by Concrete Block for Wall of Pump House



Reinforced Concrete Work for Beam and Roof of Pump House



Reinforcing Rebar for Beam and Roof of Pump House



Door and Windows for Pump House



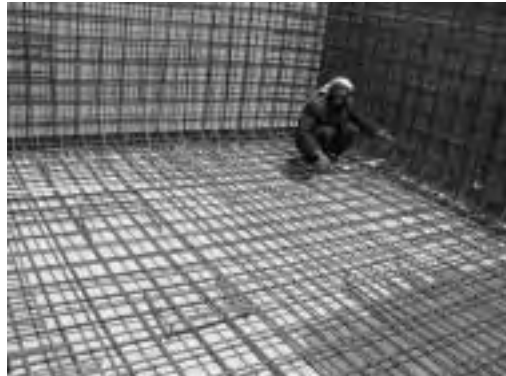
Plastering Work for Pump House



Constructed Pump House and Pit



Crushed Stone for Foundation of Ground Water Tank (50m<sup>3</sup>)



Reinforcement Placing for Floor of Ground Water Tank (50m<sup>3</sup>)



Concrete Casting for Floor of Ground Water Tank (50m<sup>3</sup>)



Formwork for Wall of Ground Water Tank (50m<sup>3</sup>)



Concrete Casting for Wall and Roof of Ground Water Tank (50m<sup>3</sup>)



Concrete Compacting for Wall of Ground Water Tank (50m<sup>3</sup>)



Ground Water Tank (50m<sup>3</sup>) after Concrete Work



Ground Water Tank (50m<sup>3</sup>) after Plastering Work



Constructed Ground Water Tank (50m<sup>3</sup>)



Water Flowing in Constructed Ground Water Tank (50m<sup>3</sup>)



Installation of Pumping Main (3")



Installed Pumping Main (3")



Installation of Distribution Main (1.5")



Valve Chamber along Distribution Main



Constructed Public Fountain



Constructed Public Fountain



Constructed Public Fountain



Constructed Public Fountain





Submersible Motor Pump



Installation of Submersible Motor Pump



Installation of Electric Wire and Water Level Probe



Installation of Column Pipe



Inside Pump Pit (after Installation of Pump and Pipe)



Accessories (Pressure Gauge, Water Meter, Check and Gate Valves)



Diesel Engine Generator (45kVA)



Control Panel for Pump

## 6. Photographs of Constructed Facilities (D-08 / Masneat Abdul Aziz)



Existing Pump House constructed by Community



Well inside Existing Pump House



Existing Pump House under Rehabilitation



Rehabilitated Existing Pump House



Existing Ground Water Tank (25m<sup>3</sup>) constructed by GARWSP



Rooftop of Existing Ground Water Tank (25m<sup>3</sup>)



Water Leakage of Existing Ground Water Tank (25m<sup>3</sup>)



Rehabilitated Inside of Existing Ground Water Tank (25m<sup>3</sup>)



Rehabilitated Existing Ground Water Tank (25m<sup>3</sup>)



Rehabilitated Rooftop of Existing Ground Water Tank (25m<sup>3</sup>)



Pipeline in Stock Yard



Installed Pumping and Distribution Main to/from Water Tank



Installed Pumping and Distribution Main



Installed Distribution Main



Fountain at Mosque



Gate Valve and Water Meter beside Fountain at Mosque



Submersible Motor Pump



Installation of Submersible Motor Pump



Installation of Column Pipe



Installation of Electric Wire and Water Level Probe



Column Pipe to be installed



Diesel Engine Generator (45kVA)



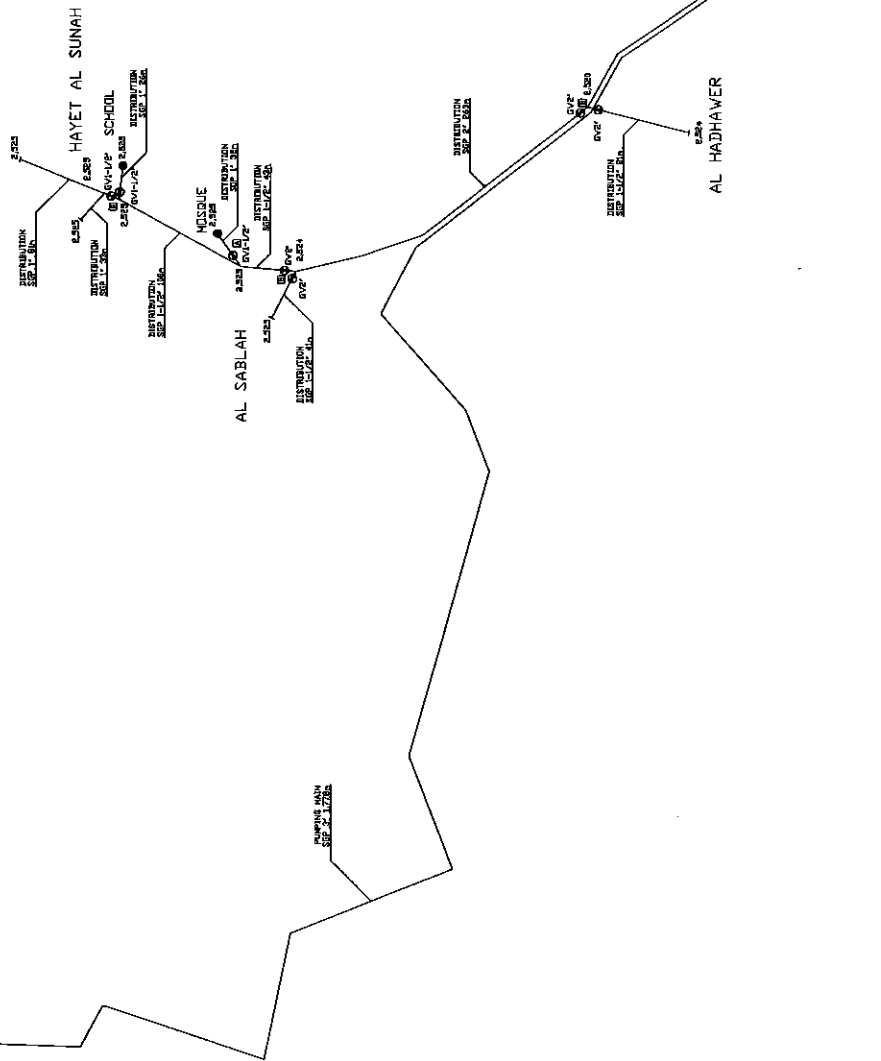
Accessories (Pressure Gauge, Water Meter, Check and Gate Valves)



Control Panel for Pump



WATER TOWER  
CONSTRUCTION NO. 21904



LEGEND

□	WATER TOWER
⊙	PUMP HOUSE
⊠	VALVE BOX (V)
⊞	VALVE BOX (G)
⊚	GATE VALVE



RURAL WATER SUPPLY COMPONENT OF  
THE STUDY FOR WATER RESOURCES MANAGEMENT  
AND RURAL WATER SUPPLY IMPROVEMENT  
IN REPUBLIC OF YEMEN  
CONSTRUCTED FACILITIES LAYOUT 1  
D-08, MSHMEAT ABDUL AZIZ  
DRAWING NO. 1-ANNEX-2 DATE - JULY 2007  
AHMED ALI MAHDI OFFICE FOR TRADING AND CONTRACTING  
DRAWN WITH SUPPORT FROM JAPAN TECHN CO., LTD

# MINUTES OF 1<sup>st</sup> REGULAR MEETING

Date: am9:00- 12/5/2007

## 1. ATTENDANCE AND PLACE

Name	Position
Fawzi Al-Khirbash	Director of International Cooperation Department, GARWSP
Akinori Miyoshi	Client, Representative, Japan Techno Co., Ltd.
Ahmed Ali Mahdi	Contractor, Director

Place : JICA Study Team office in GARWSP

## 2. PROGRESS AND PLAN

### Site: A-02 / Jabal Al-Taraf

Work Item	Progress 5 - 11 May	Plan 12 - 18 May
Mobilization and Demobilization	Site transfer was conducted.	-
Pumping Unit and Accessories	-	Final specification to be confirmed
Booster Unit and Accessories	-	Final specification to be confirmed

### Site name: S-03 / Al-Kharaba

Work Item	Progress 5 - 11 May	Plan 12 - 18 May
Mobilization and Demobilization	Site transfer was conducted. Site camp was located at school. 2 Supervisors and labors were allocated, 10 for construction, 5 for piping work and 2 drivers Access road was constructed by the community	-
Pumping Unit and Accessories	-	Final specification to be confirmed
Construction of Pump House	Some materials (cement, gravel, sand, steel bars and etc) were delivered. Reinforced concrete foundation completed.	Delivery of some materials (concrete blocks and etc) Reinforced concrete work for column and roofing, concrete block masonry for wall, and so on.
Construction of Ground Water Tank	Excavation of foundation and gravel paving.	Leveling concrete, Reinforced concrete work for foundation
Piping Work for Pumping Main	All pipes were delivered. More than 300mL has been installed.	Completion of installation of pipes

Piping Work for Distribution Main	All pipes were delivered.	Starting installation of pipes
Construction of Public Tapstand	-	-

**Site: D-08 / Maesneat Abdul Aziz**

<b>Work Item</b>	<b>Progress 5 - 11 May</b>	<b>Plan 12 - 18 May</b>
Mobilization and Demobilization	Site Transfer was conducted.	-
Pumping Unit and Accessories	-	Final specification to be confirmed
Construction of Pump House (Maintenance only)	-	-
Construction of Ground Water Tank (Maintenance only)	-	-
Piping Work for Pumping Main	-	Delivery of pipes.
Piping Work for Distribution Main	-	Delivery of pipes.
Construction of Public Tapstand	-	-

**3. TOPICS**

- Pump specification will be confirmed by the Client and be informed to the Contractor.
-



## MINUTES OF 2<sup>nd</sup> REGULAR MEETING

Date: am9:00- 23/5/2007

### 1. ATTENDANCE AND PLACE

Name	Position
Fawzi Al-Khribash	Director of International Cooperation Department, GARWSP
Akinori Miyoshi	Client, Representative, Japan Techno Co., Ltd.
Ahmed Ali Mahdi	Contractor, Director

Place : JICA Study Team office in GARWSP

### 2. PROGRESS AND PLAN

Site: A-02 / Jabal Al-Taraf

Work Item	Progress 12 - 22 May	Plan 23 – 30 May
Mobilization and Demobilization	-	-
Pumping Unit and Accessories	Final specification was confirmed and instructed by the Client. Catalog with specification was submitted to the Client.	Specification submitted will be checked and approved by the Client, and the unit will be procured.
Booster Unit and Accessories	Final specification was confirmed and instructed by the Client. Catalog with specification was submitted to the Client.	Specification submitted will be checked and approved by the Client, and the unit will be procured.

Site name: S-03 / Al-Kharaba

Work Item	Progress 12 - 22 May	Plan 23 – 30 May
Mobilization and Demobilization	-	-
Pumping Unit and Accessories	Final specification was confirmed and instructed by the Client. Catalog with specification was submitted to the Client.	Specification submitted will be checked and approved by the Client, and the unit will be procured.
Construction of Pump House	Reinforced concrete work for columns, beams and roof was finished. Concrete block masonry for wall was finished.	Reinforced concrete work for floor will be conducted. Door and windows will be installed.
Construction of Ground Water Tank	Leveling concrete work was finished. Reinforced concrete work for floor was finished.	Reinforced concrete work for wall and roof will be conducted.

	Steel rebar work for wall is in progress.	
Piping Work for Pumping Main	Installation of pipes was completed.	-
Piping Work for Distribution Main	Installation of D2.5" and D2" pipes was completed. Installation of D1.5" pipes is in progress.	D1.5", D1" and D3/4" pipes will be installed.
Construction of Public Tapstand	-	-

**Site: D-08 / Maesneat Abdul Aziz**

<b>Work Item</b>	<b>Progress 12 - 22 May</b>	<b>Plan 23 - 30 May</b>
Mobilization and Demobilization	Site camp was located. 2 Supervisor and labors were allocated, 10 for construction, 5 for piping work and 3 drivers.	-
Pumping Unit and Accessories	Final specification was confirmed and instructed by the Client. Catalog with specification was submitted to the Client.	Specification submitted will be checked and approved by the Client, and the unit will be procured.
Construction of Pump House (Maintenance only)	Maintenance work is in progress.	Maintenance work will be continued.
Construction of Ground Water Tank (Maintenance only)	-	Maintenance work will be started.
Piping Work for Pumping Main	Installation of pipes is in progress.	Installation of pipes will be completed.
Piping Work for Distribution Main	-	Installation of pipes will be started.
Construction of Public Tapstand	-	-

**3. TOPICS**

- Level indicator for water tank is not necessary.
- Outside ladder for water tank can be removal type if village wish.

# MINUTES OF 3<sup>rd</sup> REGULAR MEETING

Date: am9:00- 30/5/2007

## 1. ATTENDANCE AND PLACE

Name	Position
Fawzi Al-Khirbash	Director of International Cooperation Department, GARWSP
Akinori Miyoshi	Client, Representative, Japan Techno Co., Ltd.
Ahmed Ali Mahdi	Contractor, Director

Place : JICA Study Team office in GARWSP

## 2. PROGRESS AND PLAN

**Site: A-02 / Jabal Al-Taraf**

Work Item	Progress 23 - 29 May	Plan 30 May - 7 June
Mobilization and Demobilization	-	-
Pumping Unit and Accessories	Specification submitted was approved by the Client.	The unit will be procured by the Contractor.
Booster Unit and Accessories	Specification submitted was approved by the Client..	The unit will be procured by the Contractor.

**Site name: S-03 / Al-Kharaba**

Work Item	Progress 23 - 29 May	Plan 30 May - 7 June
Mobilization and Demobilization	-	-
Pumping Unit and Accessories	Specification submitted was approved by the Client.	The unit will be procured and installed by the Contractor.
Construction of Pump House	Reinforced concrete work for floor was finished.	Door and windows will be installed.
Construction of Ground Water Tank	Reinforced concrete work for wall and roof was finished.	Curing
Piping Work for Pumping Main	Concrete pipe supports are under construction.	Concrete pipe supports will be constructed.
Piping Work for Distribution Main	D1.5” and D1” pipes were installed.	D3/4” pipes will be installed. Concrete pipe supports and valve chambers will be constructed.
Construction of Public Tapstand	-	Concrete public tapstands will be constructed.

**Site: D-08 / Maesneat Abdul Aziz**

<b>Work Item</b>	<b>Progress 23 - 29 May</b>	<b>Plan 30 May - 7 June</b>
Mobilization and Demobilization	-	-
Pumping Unit and Accessories	Specification submitted was approved by the Client.	The unit will be procured and installed by the Contractor.
Construction of Pump House (Maintenance only)	Maintenance work is in progress.	Maintenance work will be continued.
Construction of Ground Water Tank (Maintenance only)	-	Maintenance work will be started.
Piping Work for Pumping Main	Installation of pipes was finished. Concrete pipe supports are under construction.	Concrete pipe supports will be constructed.
Piping Work for Distribution Main	Installation of all pipes was finished.	Concrete pipe supports and valve chambers will be constructed.
Construction of Public Tapstand	-	Concrete public tapstands will be constructed.

### 3. TOPICS

## MINUTES OF 4<sup>th</sup> REGULAR MEETING

Date: am10:00- 6/6/2007

### 1. ATTENDANCE AND PLACE

Name	Position
Fawzi Al-Khirbash	Director of International Cooperation Department, GARWSP
Akinori Miyoshi	Client, Representative, Japan Techno Co., Ltd.
Ahmed Ali Mahdi	Contractor, Director

Place : JICA Study Team office in GARWSP

### 2. PROGRESS AND PLAN

**Site: A-02 / Jabal Al-Taraf**

Work Item	Progress 30 May - 5 June	Plan 6 - 13 June
Mobilization and Demobilization	-	-
Pumping Unit and Accessories	-	The unit will be procured by the Contractor.
Booster Unit and Accessories	-	The unit will be procured by the Contractor.

**Site name: S-03 / Al-Kharaba**

Work Item	Progress 30 May - 5 June	Plan 6 - 13 June
Mobilization and Demobilization	-	-
Pumping Unit and Accessories	-	The unit will be procured and installed by the Contractor.
Construction of Pump House	Door and windows were installed.	Plastering for wall will be done. Concrete foundation for well will be constructed.
Construction of Ground Water Tank	Curing finished and wooden frames were removed.	-
Piping Work for Pumping Main	Concrete pipe supports were constructed.	-
Piping Work for Distribution Main	All pipes were installed. Concrete pipe supports and valve chambers are under construction.	All concrete pipe supports and valve chambers will be constructed.
Construction of Public Tapstand	Public tapstands are under constructed.	All public tapstands will be constructed.

**Site: D-08 / Maesneat Abdul Aziz**

<b>Work Item</b>	<b>Progress 30 May - 5 June</b>	<b>Plan 6 - 13 June</b>
Mobilization and Demobilization	-	-
Pumping Unit and Accessories	The unit was procured and installed by the Contractor.	Pipe fixing and adjustment will be done.
Construction of Pump House (Maintenance only)	Maintenance work is in progress. Plastering and floor concrete casting were finished.	Maintenance work (painting, etc) will be continued.
Construction of Ground Water Tank (Maintenance only)	-	Maintenance work will be started.
Piping Work for Pumping Main	Concrete pipe supports were constructed.	-
Piping Work for Distribution Main	Concrete pipe supports were constructed and valve chambers are under construction.	Valve chambers will be constructed.
Construction of Public Tapstand	-	Concrete public tapstands will be constructed.

**3. TOPICS**

## MINUTES OF 5<sup>th</sup> REGULAR MEETING

Date: am10:00- 16/6/2007

### 1. ATTENDANCE AND PLACE

Name	Position
Fawzi Al-Khirbash	Director of International Cooperation Department, GARWSP
Akinori Miyoshi	Client, Representative, Japan Techno Co., Ltd.
Ahmed Ali Mahdi	Contractor, Director

Place : JICA Study Team office in GARWSP

### 2. PROGRESS AND PLAN

**Site: A-02 / Jabal Al-Taraf**

Work Item	Progress 6 - 15 June	Plan 16 – 22 June
Mobilization and Demobilization	-	-
Pumping Unit and Accessories	-	The unit will be procured and installed. Pipes and valves will be fixed.
Booster Unit and Accessories	-	The unit will be procured and installed. Pipes and valves will be fixed.

**Site name: S-03 / Al-Kharaba**

Work Item	Progress 6 - 15 June	Plan 16 - 22 June
Mobilization and Demobilization	-	-
Pumping Unit and Accessories	The unit was procured and installed. Pipes and valves were fixed.	Pump operation will be adjusted.
Construction of Pump House	Plastering for wall was done. Concrete foundation for well was constructed.	Painting of wall will be done.
Construction of Ground Water Tank	Plastering for wall and installation of pipes and valves were done.	Painting of wall will be done.
Piping Work for Pumping Main	Water leakage was not found during pump operation.	-
Piping Work for Distribution Main	Valve chambers were constructed. Water leakage was not found during pump operation.	Some chambers will be repaired.
Construction of Public Tapstand	Public tapstands were constructed.	Some tapstands will be repaired.

**Site: D-08 / Maesneat Abdul Aziz**

<b>Work Item</b>	<b>Progress 6 - 15 June</b>	<b>Plan 16 - 22 June</b>
Mobilization and Demobilization	-	-
Pumping Unit and Accessories	Pipes and valves were fixed.	Pump operation will be adjusted.
Construction of Pump House (Maintenance only)	Maintenance works were completed.	-
Construction of Ground Water Tank (Maintenance only)	Maintenance work is under progress.	Maintenance work will be finished.
Piping Work for Pumping Main	Water leakage was not found during pump operation.	-
Piping Work for Distribution Main	Valve chambers were constructed. Water leakage was not found during pump operation.	-
Construction of Public Tapstand	Concrete public tapstands were constructed.	-

### **3. TOPICS**

- Prior to pump unit installation in A-02, Jabal Al Taraf, an existing well pump shall be removed under responsibility of local council or GARWSP.
- Water leakage was found at existing ground water tank constructed by GARWSP.



# MINUTES OF 6<sup>th</sup> REGULAR MEETING

Date: am10:00- 23/6/2007

## 1. ATTENDANCE AND PLACE

Name	Position
Fawzi Al-Khirbash	Director of International Cooperation Department, GARWSP
Akinori Miyoshi	Client, Representative, Japan Techno Co., Ltd.
Ahmed Ali Mahdi	Contractor, Director

Place : JICA Study Team office in GARWSP

## 2. PROGRESS AND PLAN

Site: A-02 / Jabal Al-Taraf

Work Item	Progress 16 - 22 June	Plan 23 – 29 June
Mobilization and Demobilization	-	-
Pumping Unit and Accessories	The unit was procured and installed. Pipes and valves were fixed.	Concrete for foundation and basement will be cured. Test operation
Booster Unit and Accessories	The unit was procured and installed. Pipes and valves were fixed.	Concrete for foundation and basement will be cured. Test operation

Site name: S-03 / Al-Kharaba

Work Item	Progress 16 - 22 June	Plan 23 – 29 June
Mobilization and Demobilization	-	-
Pumping Unit and Accessories	-	Test operation
Construction of Pump House	Painting of wall was done.	-
Construction of Ground Water Tank	Painting of wall was done.	Painting of national flags will be done.
Piping Work for Pumping Main	-	-
Piping Work for Distribution Main	Some chambers and leakage were repaired.	Some chambers and leakage will be repaired.
Construction of Public Tapstand	Some tapstands were repaired.	Some tapstands will be repaired.

**Site: D-08 / Maesneat Abdul Aziz**

<b>Work Item</b>	<b>Progress 16 - 22 June</b>	<b>Plan 23 - 29 June</b>
Mobilization and Demobilization	-	-
Pumping Unit and Accessories	-	Test operation
Construction of Pump House (Maintenance only)	-	-
Construction of Ground Water Tank (Maintenance only)	Maintenance work was finished.	-
Piping Work for Pumping Main	-	-
Piping Work for Distribution Main	-	-
Construction of Public Tapstand	-	-

**3. TOPICS**

- Final inspection for all 3 sites is scheduled from 30/June (Sat) to 3/July (Tue).

## MINUTES OF 7<sup>th</sup> REGULAR MEETING

Date: am12:00- 30/6/2007

### 1. ATTENDANCE AND PLACE

Name	Position
Fawzi Al-Khirbash	Director of International Cooperation Department, GARWSP
Akinori Miyoshi	Client, Representative, Japan Techno Co., Ltd.
Ahmed Ali Mahdi	Contractor, Director

Place : JICA Study Team office in GARWSP

### 2. PROGRESS AND PLAN

Site: A-02 / Jabal Al-Taraf

Work Item	Progress 23 - 29 June	Plan 30 June - 4 July
Mobilization and Demobilization	-	-
Pumping Unit and Accessories	Concrete for foundation and basement was cure. Test Operation	-
Booster Unit and Accessories	Concrete for foundation and basement was cure. Test Operation but defect was found with bearing of gear box.	Bearing will be replaced by new and genuine one. Test Operation with training to village operator.

Site name: S-03 / Al-Kharaba

Work Item	Progress 23 - 29 June	Plan 30 June - 4 July
Mobilization and Demobilization	-	-
Pumping Unit and Accessories	Test operation	Test Operation with training to village operator.
Construction of Pump House	-	-
Construction of Ground Water Tank	National flags were painted.	-
Piping Work for Pumping Main	-	-
Piping Work for Distribution Main	Some chambers and leakage were repaired.	Some chambers and leakage will be repaired.
Construction of Public Tapstand	Some tapstands were repaired.	Some tapstands will be repaired.

**Site: D-08 / Maesneat Abdul Aziz**

<b>Work Item</b>	<b>Progress 23 - 29 June</b>	<b>Plan 30 - 4 July</b>
Mobilization and Demobilization	-	-
Pumping Unit and Accessories	-	Test Operation with training to village operator.
Construction of Pump House (Maintenance only)	-	-
Construction of Ground Water Tank (Maintenance only)	-	Paint of wall again. Replacement of ladder
Piping Work for Pumping Main	-	-
Piping Work for Distribution Main	-	-
Construction of Public Tapstand	-	-

**3. TOPICS**

- Guarantee period for the gear box of booster unit in A-02 will be 2 or 3 years because of parts replacement, suggested by pump supplier.
- Final inspection for all 3 sites is scheduled from 3<sup>rd</sup> to 5<sup>th</sup> of July.



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E-mail : jat-tyo@jat.co.jp

15<sup>th</sup> May, 2007

## INSTRUCTION

We inform you of the revised design specification of pump and booster units as below. The extra cost due to this design modification shall be paid by the Contractor.

Code	Site Name	Unit	Pumping Rate (lit/sec)	Total Head (m)	Column Pipe (m)	Standby Pipe (m)
A-02	Jabal Al Taraf	Pumping Unit	4.4	166	44	12
		Booster Unit	4.4	208	-	-
S-03	Al Kharaba	Pumping Unit	2.3	198	79	12
D-08	Maesneat Abdul Aziz	Pumping Unit	2.0	210	100	12

\* Column pipe length is equal to pump suction (installation) depth from ground level.

It'd be appreciated if you comply with this specification. Thank you very much for your cooperation.

Akinori Miyoshi  
Member of JICA Study Team  
Japan Techno Co., Ltd.



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E-mail : jat-tyo@jat.co.jp

4<sup>th</sup> June, 2007

## INSTRUCTION

In accordance with a request by the Contractor and pump supplier, we inform you of the revised design specification of pump as below. The extra cost due to this design modification shall be paid by the Contractor or pump supplier.

Due to the availability of pump and also the difficulty to remove impellers and assure the quality by supplier, the Contractor and supplier requested to select an available pump "Panelli/140PX13/24" without removal of impellers for both sites S-03 and D-08. So we verified the appropriateness of using this pump with hydraulic calculation, and confirmed that this pump can be used with some modifications of design specification.

### Previous Design Specification

Code	Site Name	Unit	Pumping Rate (lit/sec)	Total Head (m)	Column Pipe (m)	Standby Pipe (m)
A-02	Jabal Al Taraf	Pumping Unit	4.4	166	44<45>	12
		Booster Unit	4.4	208	-	-
S-03	Al Kharaba	Pumping Unit	2.3	198	79<84>	12
D-08	Maesneat Abdul Aziz	Pumping Unit	2.0	210	100<102>	12

\* Column pipe length is equal to pump suction (installation) depth from ground level.

### Revised Design Specification

Code	Site Name	Unit	Pumping Rate (lit/sec)	Total Head (m)	Column Pipe (m)	Standby Pipe (m)
A-02	Jabal Al Taraf	Pumping Unit	4.4	166	44<45>	12
		Booster Unit	4.4	208	-	-
S-03	Al Kharaba	Pumping Unit	3.4	217	90	12
D-08	Maesneat Abdul Aziz	Pumping Unit	3.0	233	113<114>	12

\* Column pipe length is equal to pump suction (installation) depth from ground level.

Thank you very much for your cooperation.

Akinori Miyoshi  
Member of JICA Study Team  
Japan Techno Co., Ltd.

ALI MAL SUNIEDAR For General Trade

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علي محمد أحمد السنيدار للتجارة العامة

المركز الرئيسي : الجمهورية اليمنية

صنعاء - شارع القيادة

أمام نافورة وزارة الدفاع

ص. ب. : ٨٦٤٧

تليفون : ٢٥٣٦٥٨ / ٢٥٩٩٣٤

فاكس : ٢٥٤٩٢٨

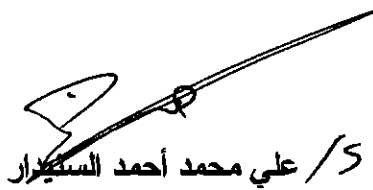
تلفون سيار : ٧٣٧٩٤٠٨٨

التاريخ : ٢٠٠٧ / ٥ / ١٥ م

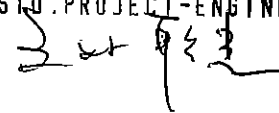
عرض سعر

المواصفات الفنية لوحدة الضخ الكهربائية الغاطسة  
لمشروع مياه جبل الطرف المحويت والمكونة من وحدة ضخ عمودية صبره مع محرك ديزل

السعر الإجمالي بالبيورو الأوربي	السعر الوحدة بالبيورو الأوربي	الكمية	التفاصيل	م
		١	مضخة كبراري موديل P6C/14 دورة المروحة ٢٦٥٠ د/د الإنتاجية عند ١٦٦ متر - ٤,٤ لتر/ثانية	١
		١٩	قصيب كبراري ٣ هـ كاملة تركيب ٤٤ متر + ١٢ متر احتياط	٢
		١	راس صبره كبراري دورتين الأربع R26	٣
		١	محرك صبره ديزل MWM موديل D229-6	٤
		١	توابع خاصة بالمضخة مع أجور نقل وتركيب وتشغيل	٥
			الإجمالي ( )	

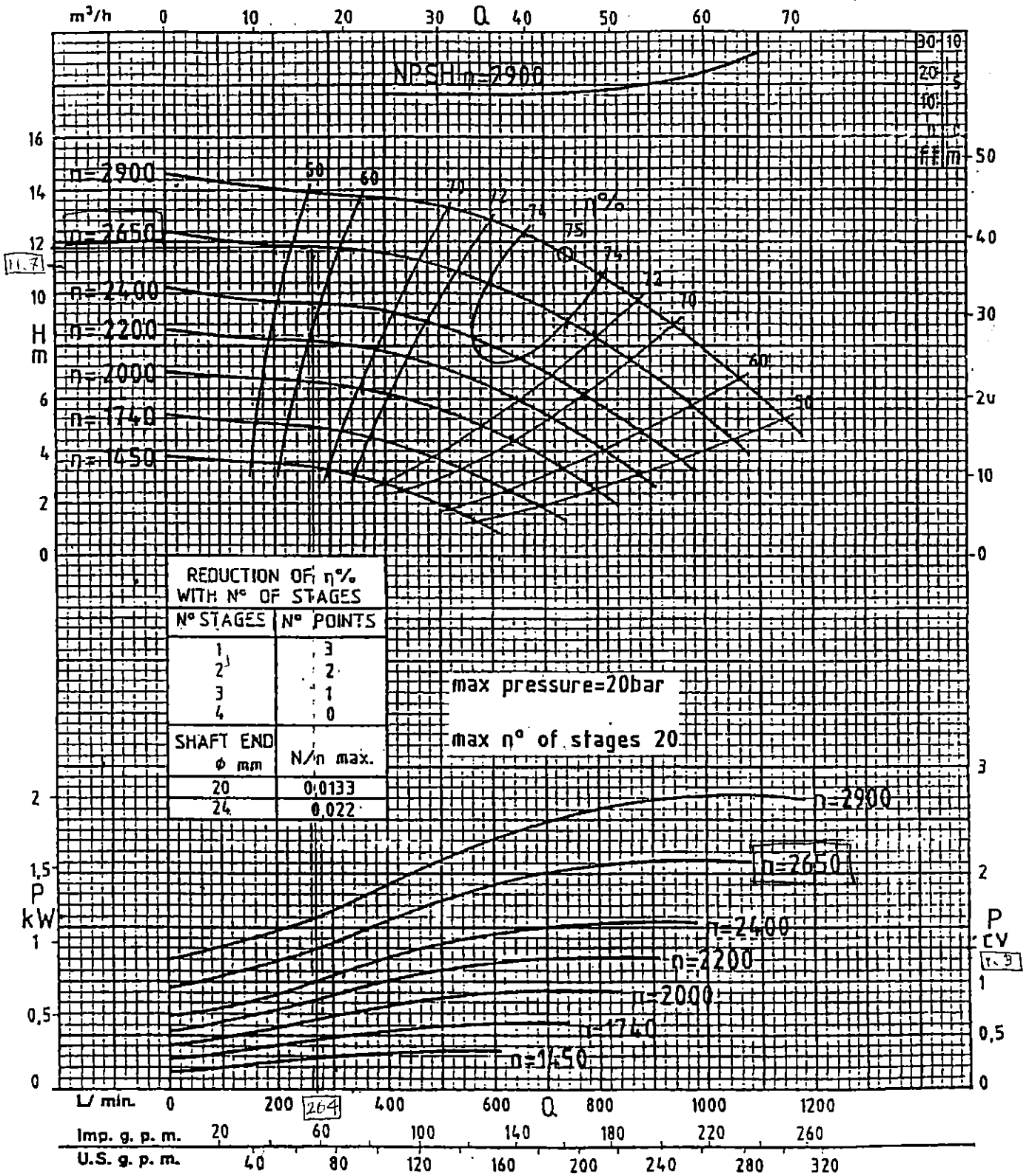
  
علي محمد أحمد السنيدار / ٥

APPROVED ON 29 MAY 2007  
BY AKINORI MIYOSHI  
JAPAN TECHNO CO., LTD.  
RESID. PROJECT-ENGINEER



IMPELLER A

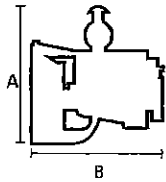
n = 1450 + 2900



<b>H</b> - Pres. Man. totale Hauteur manométrique totale Manometrische Förderhöhe Total manometric head	<b>Q</b> - Portata Débit Fördermenge Capacity	<b>P</b> - Potenza assorbita Puissance absorbée Kraftbedarf Input	<b>η%</b> Rendimento Rendement Wirkungsgrade Efficiency	<b>n</b> - Giri al min. Tours/min. Drehzahl u/min. r. p. m.	Tolleranze ISO 2548 Tolérances CLASSE C Zulässigen Abweichungen Tolerances
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# Special Applications Business Unit

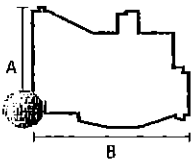


Engine Model			4.10TCA	6.10T	6.10TCA
Air Intake			Turbo Aftercooler	Turbo	Turbo Aftercooler
Disposition / Cylinders			L 4	L 6	L 6
Bore x Stroke			mm 103x129	103x129	103x129
Total Displacement			liter 4.3	6.45	6.45
Compression Ratio			16,3:1	16:1	16:1
Continuous Power	A 1500	kW (cv)	79 (108)	100 (136)	121 (165)
		kVA	#87	#114	#138
	A 1800	kW (cv)	96 (131)	121 (165)	143 (195)
		kVA	#104	#138	#163
Fuel Stop Power	A 2500	kW (cv)	-	121 (164)	143 (195)
	A 1500	kW (cv)	88 (120)	110 (150)	132 (180)
		kVA	#97	#125	#150
	A 1800	kW (cv)	107 (145)	132 (179)	158 (215)
		kVA	#116	#150	#180
	A 2500	kW (cv)	103 (140)*	132 (180)	158 (215)
Dry Weight			kg 515	631	649
Dimensions					
	Height (A)	mm	1160	1540	1540
	Length (B)	mm	1170	1513	1513
	Width (C)	mm	860	940	940

# kVA: Reference Values

\* Under consult

According to DIN 6271 / ISO 3046



Engine model			D229-3	D229-4	D229-6	TD229-EC-6
Air Intake			Natural	Natural	Natural	Turbo
Disposition/ Cylinders			L 3	L 4	L 6	L6
Bore x Stroke			mm 102x120	102x120	102x120	102x120
Total Displacement			liter 2.94	3.92	5.88	5.88
Compression Ratio			17:1	17:1	17:1	15,9:1
Continuous Power	A 1500	kW (cv)	27 (37)	36 (49)	55 (75)	74 (101)
		kVA	#28	#39	#61	#83
	A 1800	kW (cv)	33 (45)	44 (60)	66 (90)	92 (125)
		kVA	#35	#48	#73	#103
Fuel Stop Power	A 2500	kW (cv)	37 (50)	49 (67)	74 (100)	104 (141)
	A 1500	kW (cv)	30 (41)	40 (54)	61 (83)	81 (110)
		kVA	#31	#43	#67	#91
	A 1800	kW (cv)	37 (50)	49 (67)	73 (99)	101 (137)
		kVA	#40	#54	#81	#114
	A 2500	kW (cv)	40 (55)	54 (73)	81 (110)	114 (155)
Dry Weight			kg 370	445	570	620
Dimensions						
	Height (A)	mm	907	938	1059	1134
	Length (B)	mm	964	1092	1351	1420
	Width (C)	mm	680	680	680	680

# kVA: Reference Values

According to DIN 6271 / ISO 3046

MOTORES



BRASIL

POWERFUL AND RELIABLE

Tel: +55-11-3882.3453 www.mwm.com.br e-mail: mwm@mwm.com.br Av. Nações Unidas, 22.002 04795.915 São Paulo SP Brazil

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

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علي محمد أحمد السنيدار للتجارة العامة  
المركز الرئيسي : الجمهورية اليمنية  
صنعاء - شارع القيادة  
أمام نافورة وزارة الدفاع  
ص. ب. : ٨٦٤٧  
تليفون : ٢٥٣٦٥٨ / ٢٥٩٩٣٤  
فاكس : ٢٥٤٩٢٨  
تلفون سيار : ٧٣٧٩٤٠٨٨

التاريخ : ٢٠٠٧ / ٥ / ١٥ م

### عرض سعر

المحترم

الأخ / احمد علي مهدي

بعد التحية ،،،

المواصفات الفنية لوحدة الضخ الأفقية المتكاملة مع المحرك الديزل  
لمشروع مياه جبل الطرف المحويث

وحدة ضخ أفقية بنيلي إيطالية الصنع مع محرك ديزل وجميع التوابع  
بقدره رفع ٢٠٨ متر وبينتاجية ٤,٤ لتر / ثانية

١- مضخة أفقية ماركة بنيلي الإيطالية الصنع

الموديل	PMO40-65/8	مادة المراوح	حديد زهر	الكفاءة للمضخة	%60
قدرة الرفع الكلي المطلوب للمضخة	٢٠٨ متر	الإنتاجية عند الرفع المطلوب	٤,٤ لتر / ثانية	السرعة	٢٦٥٠ د/د
قدرة المضخة	٢٤ حصان	قطر المضخة	١٥٥ ملم		

٢- محرك صبره ديزل

موديل المحرك	D229-6	ماركة المحرك	MWM	بلد الصنع	برازيلي
قدرة المحرك	١١٠ حصان	مزود بجبر بوكس	1:1.5	نظام التبريد	مائي
دورة المحرك	١٨٠٠ د/د				

٣- الملحقات الخاصة بالمضخة : مع جميع التوابع الخاصة بالمضخة

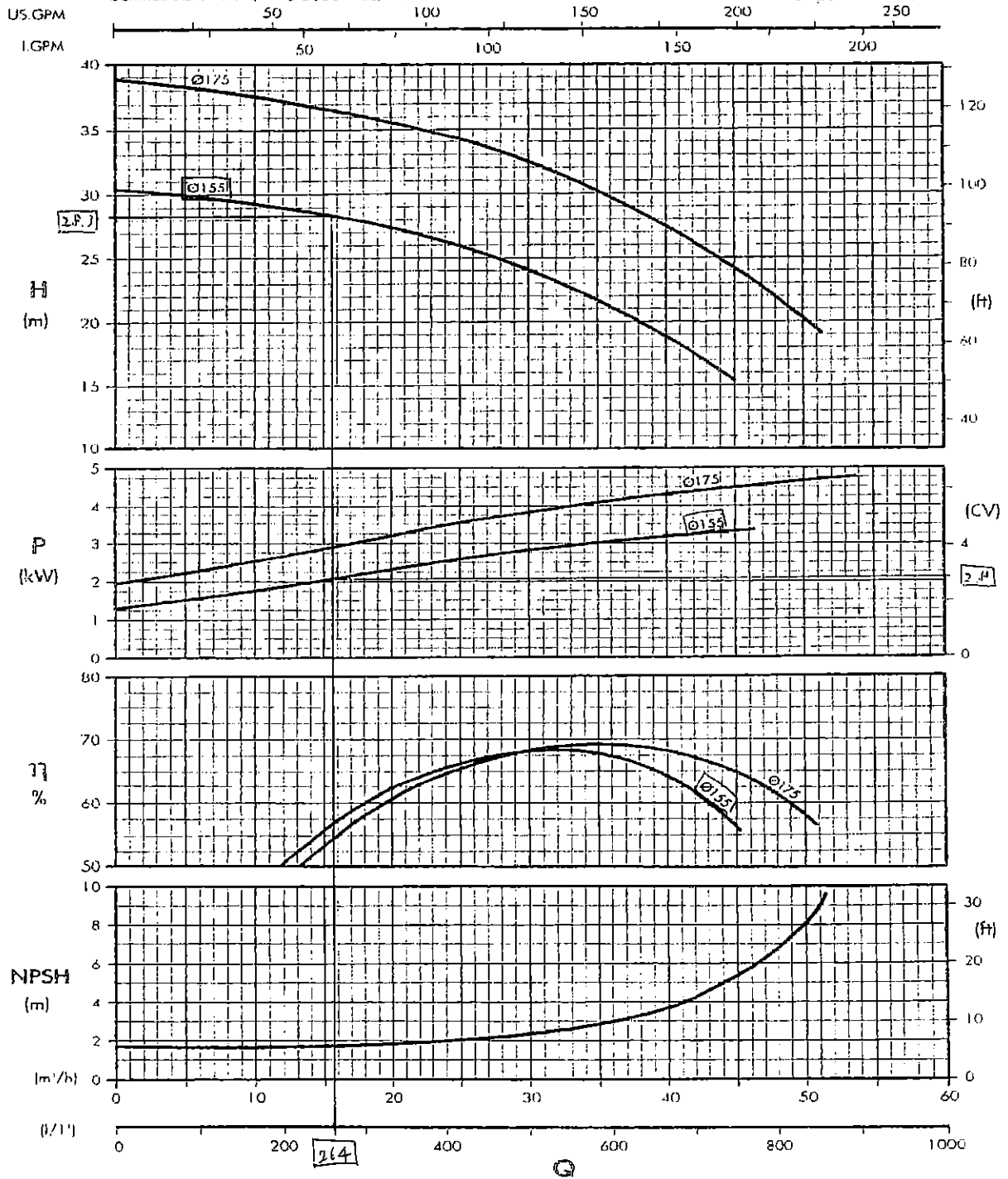
٤- قيمة العرض

يورو أوربي	إجمالي القيمة

APPROVED ON 29 MAY 2007  
BY AKINORI MIYOSHI  
JAPAN TECHNO CO., LTD.  
RESID. PROJECT-11 MEER

Curve caratteristiche a 2650 giri/min  
 Characteristic curves at 2650 r.p.m.  
 Courbes caractéristiques à 2650 trs/min

Pompa multicellulare  
 Multistage pumps  
 Pompe multi-étages



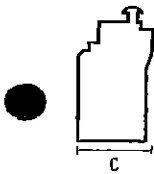
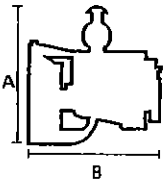
Curva caratteristica per ogni titolo del liquido p.p.t. - Power characteristics for each liquid p.p.t. - Courbes caractéristiques pour chaque titre des liquides p.p.t.

PANELLI s.r.l.  
 Sede Legale e Operativa : Via Rana,63 - Zona Ind. D5 - 15047 Spinetta M.go (AL)  
 Phone: +39 0131.619506 r.a. - Fax: +39 0131.618593 - Fax Commercial Dept.: +39 0131 619017  
 E-mail: panelal@tin.it - www.panellipumps.it

# Special Applications Business Unit

**MWM**

**1.5 SÉRIE**



Engine Model		4.10TCA	6.10T	6.10TCA
Air Intake		Turbo Aftercooler	Turbo	Turbo Aftercooler
Disposition / Cylinders		L 4	L 6	L 6
Bore x Stroke	mm	103x129	103x129	103x129
Total Displacement	liter	4.3	6.45	6.45
Compression Ratio		16,3:1	16:1	16:1
Continuous Power	A 1500	kW (cv) kVA	79 (108) #87	100 (136) #114
	A 1800	kW (cv) kVA	96 (131) #104	121 (165) #138
	A 2500	kW (cv)	-	121 (164)
Fuel Stop Power	A 1500	kW (cv) kVA	88 (120) #97	110 (150) #125
	A 1800	kW (cv) kVA	107 (145) #116	132 (179) #150
	A 2500	kW (cv)	103 (140)*	132 (180)
Dry Weight	kg	515	631	649
Dimensions	Height (A)	mm	1160	1540
	Length (B)	mm	1170	1513
	Width (C)	mm	860	940

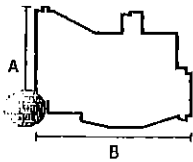
# kVA: Referência Valores

\* Under consult

According to DIN 6271 / ISO 3046

**MWM**

**229**



Engine model		D229-3	D229-4	D229-6	TD229-EC-6
Air Intake		Natural	Natural	Natural	Turbo
Disposition/ Cylinders		L 3	L 4	L 6	L 6
Bore x Stroke	mm	102x120	102x120	102x120	102x120
Total Displacement	liter	2.94	3.92	5.88	5.88
Compression Ratio		17:1	17:1	17:1	15,9:1
Continuous Power	A 1500	kW (cv) kVA	27 (37) #28	36 (49) #39	55 (75) #61
	A 1800	kW (cv) kVA	33 (45) #35	44 (60) #48	66 (90) #73
	A 2500	kW (cv)	37 (50)	49 (67)	74 (100)
Fuel Stop Power	A 1500	kW (cv) kVA	30 (41) #31	40 (54) #43	61 (83) #67
	A 1800	kW (cv) kVA	37 (50) #40	49 (67) #54	73 (99) #81
	A 2500	kW (cv)	40 (55)	54 (73)	81 (110)
Dry Weight	kg	370	445	570	620
Dimensions	Height (A)	mm	907	938	1059
	Length (B)	mm	964	1092	1351
	Width (C)	mm	680	680	680

# kVA: Referência Valores

According to DIN 6271 / ISO 3046

MOTORES

**MWM**

BRASIL

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POWERFUL AND RELIABLE

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المركز الرئيسي : الجمهورية اليمنية  
صنعاء - شارع القيادة  
امام نافورة وزارة الدفاع  
ص. ب. : ٨٦٤٧  
تليفون : ٢٥٣٦٥٨ / ٢٥٩٩٣٤  
فاكس : ٢٥٤٩٢٨  
تلفون سيار : ٧٣٧٩٤٠٨٨

التاريخ : ٢٩ / ٥ / ٢٠٠٧ م

**عرض سعر**

المواصفات الفنية لوحدة الضخ الكهربائية الغاطسة  
لمشروع مياه الخرابية صنعاء والمكونة من وحدة ضخ غاطسة متكاملة مع جميع التوايح

١- مضخة :- نوع بنيلي الإيطالية الصنع

الموديل	140PX13/19 → 24	القطر الخارجي للمضخة	٦ بوصة	عدد المراوح	19 → 20
مادة المراوح	استنلس استيل	الإنتاجية عند الرفع المطلوب	٢,٣ لتر / ثانية → 3.4	السرعة	٢٩٠٠ د/د
قوة الرفع الكلي المطلوب للمضخة	١٩٨ متر → 177				

٢- المحرك :- نوع فرنكلين

قدرة المحرك	١٥ اخليل	نوع الحماية	IP68	الجهد والتردد	٢٨٠ فولت / ٥٠ هرتز
سرعة المحرك	٢٩٠٠ د/د	القطر للمحرك	٦ بوصة	الكفاءة	٩٠%

٣- لوحة التحكم والتشغيل :- لوحة قدرة ١٥ اخليل ايطالية الصنع ومزودة بجميع اجهزة الحماية اللازمة والإشارات المنبهة لجميع حالات المضخة المختلفة مع اجهزة قياس والمفاتيح التي تضمن سلامة المضخة .

٤- القصيب :- سوف يتم تركيب ٧٩ متر + ١٢ متر احتياط

نوع القصيب	ابو صحن غير قابل للصدأ	طول القصيب	٦ متر
قطر القصيب	٣ هنش	عدد القصيب	١٦ → 17

مع الملحقات الخاصة بالقصيب

٥- كيبيل كهربائي :- ايطالي الصنع ، بطول ١٠٠ متر مساحة المقطع ١٦×٣ ملم ٢ .

٦- كيبيل حساس :- ايطالي الصنع ١×١,٥ ملم ٢ و بطول ١٠٠ متر .

٧- الملحقات الخاصة بالمضخة :-

صمام عدم رجوع ٥٣ - محبس بوابي ٥٣ - عداد ماء ٥٣ - ساعة قياس الضغط ٤٠ بار

٨- المولد الكهربائي :-

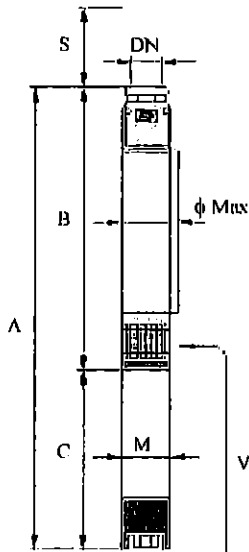
نوع الدينامو الكهربائي	LEROY SOMER	موديل المولد	G51P	نظام التبريد	مائي
قدرة المولد	45KVA	الجهد الكهربائي والذنبية	(400-230)V 50HZ	دورة المولد	1500RPM
نوع المحرك	PERKINS	موديل المحرك	1103A33TG1	الكفاءة	0.8
الشركة المصنعة	BRUNO ITALY	مع طبلون خاص بالمولد مزود بجميع الحمائيات			

٩- قيمة العرض

يورو اوردبي	اجمالي القيمة

APPROVED ON 29 MAY 2007  
BY AKINORI MIYOSHI  
JAPAN TECHNO CO., LTD.  
RESND. PROJECT-ENGINEER

**RADIALE**



**H =** Proveziona mmomatich totala in m. Da 30 a 420 m  
**Q =** Portata in litri. Da 50 a 300 litri  
 η % = Rendimento della pompa. Max 67%  
**NWst =** Assorbimento per stadio. Max 0,46  
 Max contenuto di sabbia in sospensione 250 g/lmc

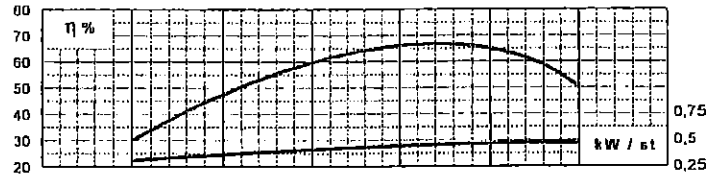
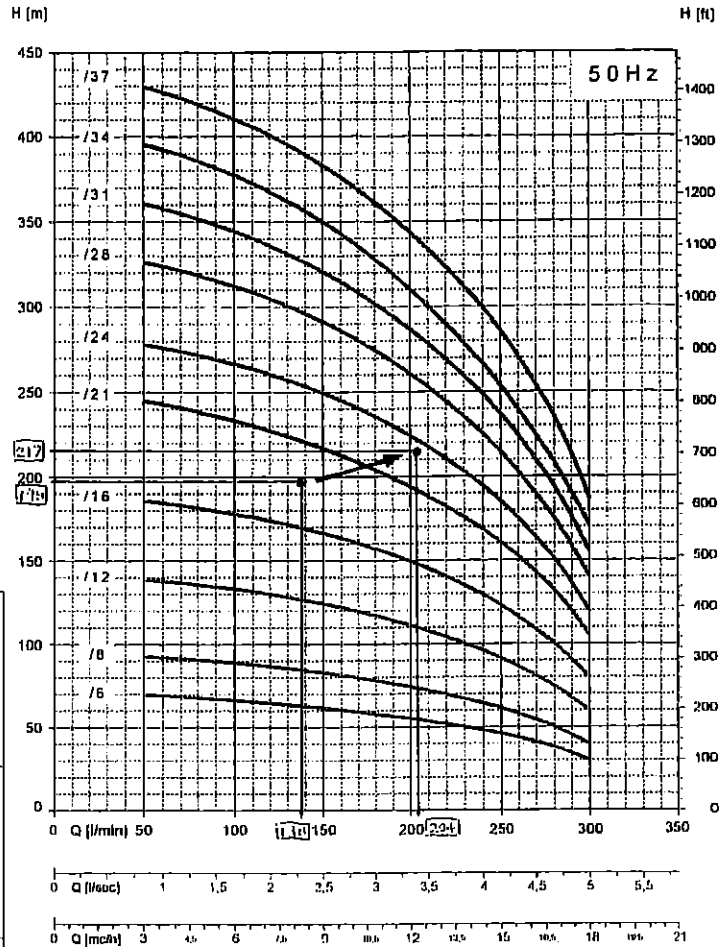
**S =** Battente minimo 1 m

**H =** Total manometric head in m. From 30 to 420 m  
**Q =** Capacity in l/min. From 50 to 300 l/min  
 η % = Pump efficiency. Max 67%  
**NWst =** Stage Absorption. Max 0,46  
 Max suspension of sand content 250 g/lmc

**S =** Minimum head 1 m

**H =** Hauteur manométrique totale en m. De 30 à 420 m  
**Q =** Débit en litres. De 50 à 300 litres  
 η % = Rendement de la pompe. Max 67%  
**NWst =** Absorption par étage. Max 0,46  
 Contenu max de sable en suspension 250 g/lmc

**S =** Niveau minimum 1 m

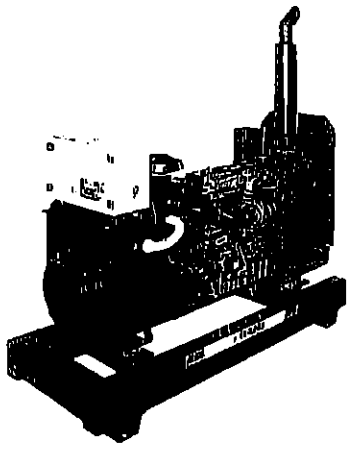


Dimensioni di Ingombro e peso Overall dimensions and weights Dimensions d'englobement et poids									
Tipo Type	A mm	D mm	C mm	DN	M mm	φ max mm	M kg	P kg	
140 PX13 / 8	1310	690	623	2" 1/2	90	144	10,5	16	
140 PX13 / 8	1340	775	505	2" 1/2	145	144	41	17	
140 PX13 / 12	1520	930	690	2" 1/2	145	144	44	21	
140 PX13 / 16	1700	1000	620	2" 1/2	145	144	48	20	
140 PX13 / 21	2012	1202	730	2" 1/2	145	144	60	31	
140 PX13 / 24	2128	1300	730	2" 1/2	145	144	60	34	
140 PX13 / 28	2404	1554	850	2" 1/2	145	144	72	38	
140 PX13 / 31	2522	1672	930	2" 1/2	145	144	72	42	
140 PX13 / 34	2626	1788	1010	2" 1/2	145	144	78	45	
140 PX13 / 37	2810	1900	910	2" 1/2	145	144	70	49	

Tipo - Type	Motore Motor			Q = PORTATA - CAPACITY - DEBIT							
	V 300			l/min	0	50	100	150	200	250	300
	kw	HP	A	l/sec	0	0,8	1,7	2,5	3,4	4,2	5
140 PX13 / 8	3	4	6,7	72	70	67	62	56	46	30	
140 PX13 / 8	4	5,5	10	96	93	89	83	74	61	40	
140 PX13 / 12	5,5	7,5	12,5	144	139	133	125	112	92	60	
140 PX13 / 16	7,5	10	17	192	186	178	166	149	122	80	
140 PX13 / 21	11	15	24,5	252	244	233	218	195	161	105	
140 PX13 / 24	11	15	24,5	288	278	266	250	223	184	120	
140 PX13 / 28	15	20	32	336	325	311	291	260	214	140	
140 PX13 / 31	15	20	32	372	360	344	322	288	237	155	
140 PX13 / 34	18,5	25	40	408	394	377	354	316	260	170	
140 PX13 / 37	18,5	25	40	444	429	411	385	344	283	185	

**MOTORI DIESEL RAFFREDDATI AD ACQUA - WATER COOLED DIESEL ENGINES - MOTEURS DIESEL REFRIGERES PAR EAU**  
**1200V 50 Hz - S: 700 KVA - cosφ 0,8 - 400/230V**  
**1500V 50 Hz - S: 750 KVA - cosφ 0,8 - TENSIONI A RICHIESTA - VOLTAGE UPON REQUEST - VOLTAGES SUR DEMANDE**

powered by **Perkins**



Modello Model Modèle	50 Hz		60 Hz		Caratteristiche motore / engine features Caractéristiques moteur					Sorbitolo Tank Réservoir L	Dimensioni Size Dimensions (LxWxH) cm	Peso Weight Poids Kg	Quadro standard Standard panel Coffret standard	Quadro automatico Automatic panel Coffret automatique (OPTION)				
	KVA max cont.	KVA	KVA max cont.	KVA	Marca e Tipo Make and Type Marque et type	Regolatore Governor Régulateur	Cilindri Cylinders Cylinders	Aspirazione Aspiration Aspiration	cm <sup>3</sup>						kWm	Cons. 70% (lit)		
1161P	10	9	12	11	Perkins 403C-11 G	mec	3	N	1131	8,5	10,4	1,8	2,2	43	120x70x110	440	QM 120	Q 410S
1162P	14,5	13	17	15,5	Perkins 403C-15 G	mec	3	N	1496	12	14,4	2,6	3	43	120x70x110	450	QM 120	Q 410S
1163P	22	20	25	22,5	Perkins 404C-22 G	mec	4	N	2216	10,5	20,7	3,8	4,3	47	134x70x113	500	QM 120	Q 410S
1164P	33	30	36	35	Perkins 1103 A 33 G1	mec	3	N	3300	20,2	33,2	4,0	5,9	52	150x77x125	650	QM 120	Q 410S
1165P	50	45	59	53	Perkins 1103 A 33 TG1	mec	3	T	3300	41,3	48,9	7,3	0,5	52	150x77x130	802	QM 120	Q 4400
1166P	66	60	75	68	Perkins 1103 A 33 TG2	mec	3	T	3300	53,8	61,2	9,5	10,7	67	150x77x130	850	QM 120	Q 4400
1167P	71,5	65	83,6	76	Perkins 1104 A 44 TG1	mec	4	T	4400	50,7	68,6	10,1	11,9	77	165x77x130	850	QM 120	Q 4400
1168P	88	80	100	90	Perkins 1104 A 44 TG2	mec	4	T	4400	71	88	12,5	15,1	85	185x77x130	860	QM 120	Q 4400
1169P	105	95	121	110	Perkins 1104 C 44 TAG2	ele	4	T	4400	89	108	15	18	85	185x77x130	930	QM 120	Q 4400
1170P	150	136	165	150	Perkins 1006 TAG	ele	6	T	5990	121	134	20,1	24,4	100	230x77x144	1200	QM 120	Q 4400
1171P	165	150	***	***	Perkins 1006 TAG2	ele	6	T	5990	129	***	23,2	***	100	230x77x144	1500	QM 120	Q 4400
1172P	229	208	253	230	Perkins 1306C - E07 TAG3	ele	6	T	8700	100	201	30,4	34,5	230	250x95x160	1900	QM 120	Q 4400
1173P	275	250	***	***	Perkins 1306C - E07 TAG6	ele	6	T	8700	210	***	37,8	***	250	260x95x170	2050	QM 120	Q 4400
1174P	400	350	438	400	Perkins 2306C - E14 TAG2	ele	6	T	14600	304	348	51,0	64	295	300x110x195	2850	QM 120	Q 4400
1175P	450	400	500	438	Perkins 2306C - E14 TAG3	ele	6	T	14600	344	376	57,5	70,1	302	308x110x197	2900	QM 120	Q 4400
1176P	500	450	625	563	Perkins 2806C - E16 TAG1	ele	6	T	15800	387	478	66,8	79,4	470	340x130x210	3400	QM 120	Q 4400
1177P	550	500	688	625	Perkins 2806C - E16 TAG2	ele	6	T	15800	430	532	73,2	85,3	470	340x130x210	3500	QM 120	Q 4400
1178P	630	550	750	687	Perkins 2806C - E18 TAG1	ele	6	T	18100	473	591	80,6	104,5	505	332x154x221	3750	QM 120	Q 4400
1179P	700	650	***	***	Perkins 2806C - E18 TAG2	ele	6	T	18100	559	***	101	***	514	332x154x221	4000	QM 120	Q 4400

Gruppi elettrogeni non destinati ad utilizzo in ambiente. Rumorosità non conforme alla normativa 2000/14/CE.  
 Generating sets not for outside use. Noise level not compliant with European rule 2000/14/CE.  
 Groupes électrogènes non prévus pour un usage en plein air. Niveau sonore non conforme à la directive 2000/14/CE.

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صنعاء - شارع القيادة  
امام تافورة وزارة الدفاع  
ص. ب : ٨٦٤٧  
تليفون : ٢٥٣٦٥٨ / ٢٥٩٩٣٤  
فاكس : ٢٥٤٩٢٨  
تلفون سيار : ٧٣٧٩٤٠٨٨

التاريخ : ٢٠٠٧ / ٥ / ١٥ م

**عرض سعر**

المواصفات الفنية لوحدة الضخ الكهربائية الغاطسة  
لمشروع مياه مصنعه ذمار والمكونة من وحدة ضخ غاطسة متكاملة مع جميع التوايح

١- مضخة :- نوع باتيلي **PANELLI** الإيطالية الصنع

الموديل	140PX13/20 (→ 24)	القطر الخارجي للمضخة	٦ بوصة	الكفاءة للمضخة	٦٥%
عدد المراوح	20	السرعة	٢٩٠٠ د/د		
قوة الرفع الكلي المطلوب للمضخة	٢١.٠ متر (→ 2.33)	الإنتاجية عند الرفع المطلوب	٢ لتر / ثانية (→ 3)	المراوح	استتلس استيل

٢- المحرك :- نوع فرنكلين

قدرة المحرك	١٥ اخليل	نوع الحماية	IP68	الجهد والتردد	٣٨٠ فولت / ٥٠ هرتز
سرعة المحرك	٢٩٠٠ د/د	القطر للمحرك	٦ بوصة	الكفاءة	٩٠%

٣- لوحة التحكم والتشغيل :- لوحة قدرة ١٥ اخليل إيطالية الصنع ومزودة بجميع أجهزة الحماية اللازمة والإشارات المنبهة لجميع حالات المضخة المختلفة مع أجهزة قياس والمفاتيح التي تضمن سلامة المضخة .

٤- القصب :- سوف يتم تركيب ١٠٠ متر + ١٢ متر احتياط

نوع القصب	ابو صحن غير قابل للصدأ	طول القصب	٦ متر
قطر القصب	٣ هنتش	عدد القصب	١٩ (→ 21)
مع الملحقات الخاصة بالقصب			

٥- كيبيل كهربائي :- ايطالي الصنع ، بطول ١٢٢ متر مساحة المقطع ١٦×٢ ملم ٢ .

٦- كيبيل حساس :- ايطالي الصنع ١ × ١.٥ ملم ٢ و بطول ١٢٢ متر .

٧- الملحقات الخاصة بالمضخة :-

صمام عدم رجوع ٥٣ - محبس بوابي ٥٣ - عداد ماء ٥٣ - ساعة قياس الضغط ٤٠ بار

٨- المولد الكهربائي :-

نوع الدينامو الكهربائي	LEROY SOMER	موديل المولد	G51P	نظام التبريد	مائي
قدرة المولد	45KVA	الجهد الكهربائي والذبذبة	(400-230)V 50HZ	دورة المولد	1500RPM
نوع المحرك	PERKINS	موديل المحرك	1103A33TG1	الكفاءة	0.8
الشركة المجمع	BRUNO ITALY	مع طلبون خاص بالمولد مزود بجميع الحماية			

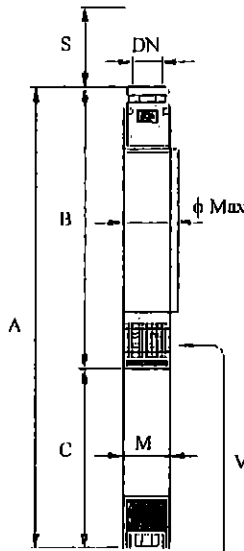
٩- قيمة العرض

إجمالي القيمة	يورو أوربي

29 MAY 2007  
APPROVED ON  
BY AKINORI MIYOSHI  
JAPAN TECHNO CO., LTD.  
RES.D. PROJECT ENGINEER



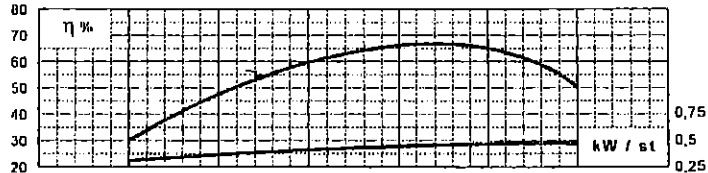
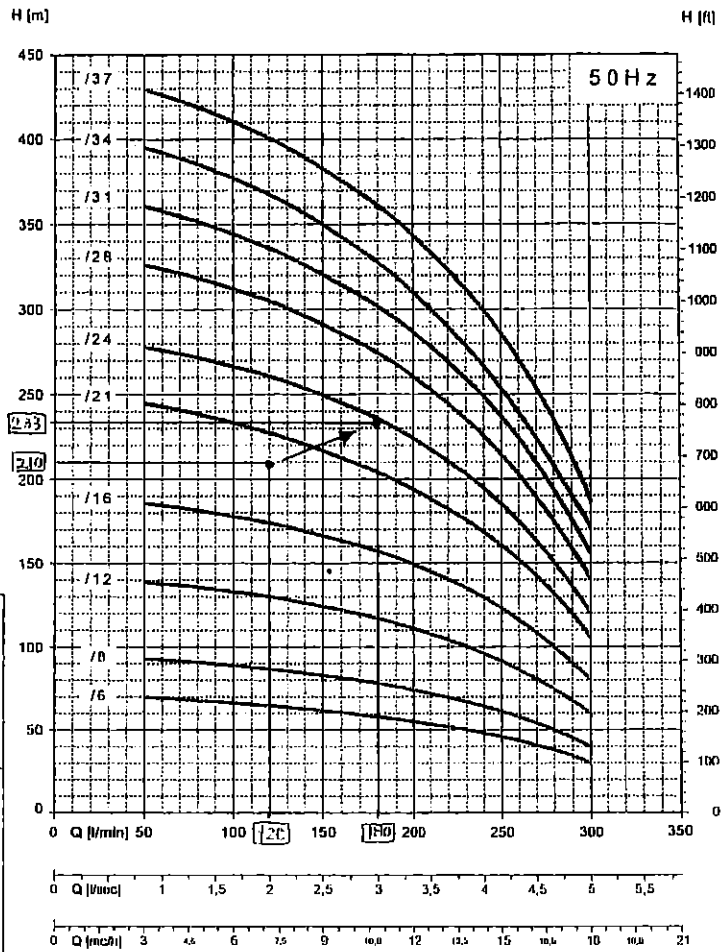
**RADIALE**



**H =** Provenienza manometrica totale in m. Da 30 a 420 m  
**Q =** Portata in litri. Da 60 a 300 l/min  
**η % =** Rendimento della pompa. Max 67%  
**AWst =** Assorbimento per stadio. Max 0,46  
 Massimo contenuto di sabbia in aspirazione 250 g/mc  
**S =** Bullante minimo 1 m

**H =** Total manometric head in m. From 30 to 420 m  
**Q =** Capacity in l/min. From 60 to 300 l/min  
**η % =** Pump efficiency. Max 67%  
**AWst =** Stage Absorption. Max 0,46  
 Max suspension of sand contents 250 g/mc  
**S =** Minimum head 1 m

**H =** Hauteur manométrique totale en m. De 30 à 420 m  
**Q =** Débit en litres. De 60 à 300 l/min  
**η % =** Rendement de la pompe. Max 67%  
**AWst =** Absorption par étage. Max 0,46  
 Contenu max de sable en suspension 250 g/mc  
**S =** Niveau minimum 1 m



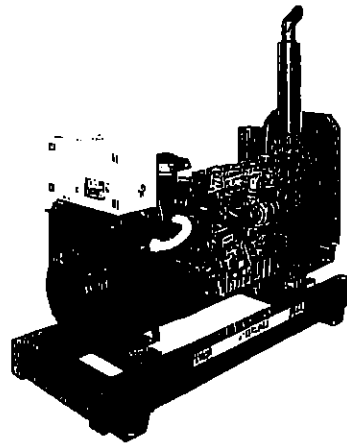
Dimensioni di ingombro e pesi  
Overall dimensions and weights  
Dimensions d'encombrement et poids

Tipo/Type	A mm	B mm	C mm	DN	M mm	φ max mm	M kg	P kg
140 PX13 / 16	1318	096	823	2" 1/2	90	144	18,5	15
140 PX13 / 18	1340	775	505	2" 1/2	145	144	41	17
140 PX13 / 12	1520	030	590	2" 1/2	165	144	44	21
140 PX13 / 15	1700	1085	620	2" 1/2	145	144	40	20
140 PX13 / 21	2012	1282	730	2" 1/2	145	144	80	31
140 PX13 / 24	2128	1398	730	2" 1/2	145	144	00	34
140 PX13 / 28	2404	1554	850	2" 1/2	145	144	72	38
140 PX13 / 31	2522	1672	050	2" 1/2	145	144	72	42
140 PX13 / 34	2688	1788	910	2" 1/2	145	144	78	45
140 PX13 / 37	2816	1900	910	2" 1/2	145	144	78	48

Tipo - Type	Motore Motor Moteur			Q = PORTATA - CAPACITY - DEBIT						
	v 380			H [m]						
	kw	HP	A	l/min	0	50	100	150	200	250
140 PX13 / 16	3	4	6,7	0	0,8	1,7	2,5	3,4	4,2	5
140 PX13 / 18	4	5,5	10	0	3	6	9	12	15	18
140 PX13 / 12	5,5	7,5	12,5	72	70	67	62	56	46	30
140 PX13 / 15	7,5	10	17	96	93	89	83	74	61	40
140 PX13 / 21	11	15	24,5	144	139	133	125	112	92	60
140 PX13 / 24	11	15	24,5	192	186	178	166	149	122	80
140 PX13 / 28	15	20	32	252	244	233	218	195	161	105
140 PX13 / 31	15	20	32	288	278	266	250	223	184	120
140 PX13 / 34	18,5	25	40	336	325	311	291	260	214	140
140 PX13 / 37	18,5	25	40	372	360	344	322	288	237	155
	10,5	14	20	408	394	377	354	316	260	170
	10,5	14	20	444	429	411	385	344	283	185

**MOTORI DIESEL RAFFREDDATI AD ACQUA - WATER COOLED DIESEL ENGINES - MOTEURS DIESEL REFRIGERES PAR EAU**  
**500 kVA max - 50 HZ - 5+700 KVA - cos φ 0,8 - 400/230V**  
**800 kVA max - 60 HZ - 6/3+750 KVA - cos φ 0,8 - TENSIONI A RICHIESTA - VOLTAGE UPON REQUEST - VOLTAGE SUR DEMANDE**

powered by **Perkins**



500 kVA max  
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50 Hz		60 Hz		Caratteristiche motore / engine features Caractéristiques moteur										Serbatoio Tank Réservoir Ll	Dimensioni Size Dimensions (LxWxH) cm	Peso Weight Poids Kg	Gruppi standard Standard panel Control standard	Gruppi automatico Automatic panel Control automatico (H/110)h
kVA max	kVA cont.	kVA max	kVA cont.	Marca e Tipo Make and Type Marque et type	Regolatore Governor Régulateur	Cilindri Cylinders Cylinders	Aspirazione Aspiration Aspiration	cm <sup>3</sup>	kWm	Cons. 70% (l/h)	1500 rpm	1800 rpm	1500 rpm					
10	9	12	11	Perkins 403C-11 G	mec	3	N	1131	8,5	10,4	1,8	2,2	43	120x70x110	440	QM 120	Q 410S	
14,5	13	17	15,5	Perkins 403C-16 G	mec	3	N	1496	12	14,4	2,6	3	43	120x70x110	450	QM 120	Q 410S	
22	20	25	22,5	Perkins 404C-22 G	mec	4	N	2216	10,5	20,7	3,0	4,3	47	134x70x113	500	QM 120	Q 410S	
33	30	38	35	Perkins 1103 A 33 TG1	mec	3	N	3300	20,2	33,2	4,8	5,9	52	150x77x125	650	QM 120	Q 410S	
50	45	59	53	Perkins 1103 A 33 TG1	mec	3	T	3300	41,3	48,9	7,3	8,5	52	150x77x130	802	QM 120	Q 4400	
66	60	75	68	Perkins 1103 A 33 TG2	mec	3	T	3300	53,0	61,2	9,5	10,7	67	150x77x130	850	QM 120	Q 4400	
71,5	65	83,6	76	Perkins 1104 A 44 TG1	mec	4	T	4400	58,7	68,6	10,1	11,9	77	165x77x130	850	QM 120	Q 4400	
88	80	100	90	Perkins 1104 A 44 TG2	mec	4	T	4400	71	80	12,5	15,1	85	185x77x130	860	QM 120	Q 4400	
105	95	121	110	Perkins 1104 C 44 TAG2	ele	4	T	4400	89	100	15	18	85	185x77x130	930	QM 120	Q 4400	
150	136	165	150	Perkins 1000 TAG	ele	6	T	5990	121	134	20,1	24,4	100	230x77x144	1200	QM 120	Q 4400	
165	150	***	***	Perkins 1000 TAG2	ele	6	T	5990	129	***	23,2	***	100	230x77x144	1500	QM 120	Q 4400	
229	208	253	230	Perkins 1300C - E07 TAG3	ele	6	T	8700	100	201	30,4	34,5	230	250x95x160	1900	QM 120	Q 4400	
275	250	***	***	Perkins 1300C - E07 TAG6	ele	6	T	8700	218	***	37,8	***	250	260x95x170	2050	QM 120	Q 4400	
400	350	438	400	Perkins 2300C - E14 TAG2	ele	6	T	14600	304	348	51,0	64	295	300x110x195	2050	QM 120	Q 4400	
450	400	500	438	Perkins 2300C - E14 TAG3	ele	6	T	14600	344	376	57,5	70,1	302	308x110x197	2900	QM 120	Q 4400	
500	450	625	563	Perkins 2800C - E16 TAG1	ele	6	T	15800	387	478	66,8	79,4	470	340x138x210	3400	QM 120	Q 4400	
550	500	688	625	Perkins 2800C - E16 TAG2	ele	6	T	15800	430	532	73,2	85,3	470	340x138x210	3500	QM 120	Q 4400	
630	550	750	687	Perkins 2000C - E18 TAG1	ele	6	T	18100	473	591	80,6	104,5	505	332x154x221	3750	QM 120	Q 4400	
700	650	***	***	Perkins 2800C - E18 TAG2	ele	6	T	18100	559	***	101	***	514	332x154x221	4000	QM 120	Q 4400	

Gruppi elettrogeni non destinati all'uso esterno. Non conformi alla normativa 2000/14/CE.  
 Generating sets not for outside use. Not in compliance with European rule 2000/14/CE.  
 Groupes électrogènes non prévus pour un usage en plein air. Non conformes à la directive 2000/14/CE.

APPROVED ON 02 MAY 2007  
BY AKINORI MIYOSHI  
JAPAN TECHNO CO., LTD.  
RESID. PROJECT-ENGINEER

## Product Catalogue

# Hussein A. Al-Hababi & Bro. Co.

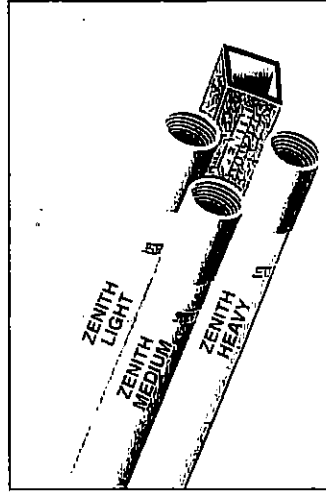
Tel (+967-1-215192-215194-215195)

Fax (+967-1-215187)

### BLACK AND HOT DIPPED GALVANISED STEEL PIPES ASTM A-53 GRADE A & B (SCH 40)

NOMINAL BORE	OUTSIDE DIAMETER	WALL THICKNESS	BLACK PIPES PLAIN END		WEIGHT		NO. OF PIECES PER BUNDLE				
			mm	inch	kg/mtr	lbs/ft.					
15	21.3	0.840	2.77	0.109	1.27	0.65	2592	1.53	0.69	2-57	123
20	26.7	1.050	2.87	0.113	1.69	1.13	1945	1.77	1.15	1555	91
25	33.4	1.315	3.38	0.133	2.50	1.66	1311	2.61	1.75	1259	53
32	42.2	1.660	3.56	0.140	3.39	2.27	967	3.53	2.37	930	42
40	48.3	1.900	3.68	0.145	4.05	2.72	610	4.20	2.82	750	36
50	60.3	2.375	3.91	0.154	5.44	3.65	603	5.63	3.79	583	25
65	73.0	2.875	5.16	0.203	6.63	5.79	380	5.87	5.95	370	16
80	88.9	3.500	5.49	0.216	11.29	7.58	291	11.58	7.78	263	14
90	101.6	4.000	5.74	0.226	13.57	9.11	242	13.90	9.34	236	12
100	114.3	4.500	6.02	0.237	16.07	10.79	204	16.44	11.05	200	10
125	141.3	5.560	6.55	0.258	21.77	14.62	151	22.23	14.94	148	8
150	168.3	6.625	7.11	0.280	28.26	18.97	116	28.82	19.37	114	7
200	219.1	8.925	8.18	0.322	42.55	29.55	77	43.28	29.05	76	5

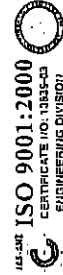
Tolerances : THICKNESS : ±12.5 %, WEIGHT : (±) 10%. DIAMETER : 1% & below : ± 1.64 (0.4mm)  
2% & above : ± 1%



# ZENITH

## STEEL PIPES

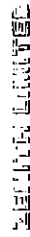
*Always the best!*



### TECHNICAL DATA OF BLACK STEEL PIPES TO DIN 2440

NOMINAL BORE	OUTSIDE DIAMETER	WALL THICKNESS	WEIGHT OF BLACK PIPES		PIPES PER BUNDLE
			PLAIN ENDED	SCREWED & SOCKETED	
15	21.3	2.65	1.22	1.23	127
20	26.9	2.65	1.58	1.59	91
25	33.7	3.25	2.44	2.46	61
32	42.4	3.25	3.14	3.17	61
40	50.3	3.25	3.61	3.65	37
50	60.3	3.65	5.10	5.17	37
65	76.1	3.65	6.51	6.63	19
80	88.9	4.05	8.47	8.54	19
100	114.3	4.50	12.1	12.4	10
125	139.7	4.85	16.2	16.7	10
150	165.1	4.85	19.2	19.8	7

Tolerances :	Thickness	(±) 12.5 %
Weight	Single tube (±) 10%	
Length	10 Tons Consignment (±) 7.5%	
Galvanising	6m (-) 100 (+) 30mm	
	According to DIN 2444	



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Mumbai-400 021, India. • Tel. : 0091-22-2282 1122 • Fax : 0091-22-2285 5743  
e-mail : exports@zenithsteelpipes.com • website : www.zenithsteelpipes.com

**TECHNICAL DATA OF BLACK AND GALVANISED STEEL PIPES CONFORMING TO BS : 1387 OF 1985**

CLASS	NOMINAL BORE		OUTSIDE DIAMETER		WALL THICKNESS		WEIGHT OF BLACK PIPES				WEIGHT OF GALVANISED PIPES (CALCULATED)				NO. OF PIPES PACKED PER STANDARD BUNDLE (1 TONNE APPROX.)			
	MAX.		MIN.		mm		PLAIN ENDED		SCREWED & SOCKETED		PLAIN ENDED		SCREWED & SOCKETED					
	Inch	mm	Inch	mm	Inch	mm	kg/mtr	mtr/ton	ft/ton	kg/mtr	mtr/ton	ft/ton	kg/mtr	mtr/ton		ft/ton		
L I G H T (A)	1/2	15	0.843	21.4	0.827	21.0	0.079	2.00	0.956	1046	3432	1.000	1000	3281	1.007	993	3258	160
	3/4	20	1.059	26.9	1.039	26.4	0.091	2.30	1.390	719	2359	1.440	694	2277	1.460	685	2247	110
	1	25	1.331	33.8	1.307	33.2	0.102	2.60	2.000	500	1640	2.060	485	1591	2.090	478	1568	80
	1 1/4	32	1.673	42.5	1.650	41.9	0.102	2.60	2.540	389	1276	2.640	379	1243	2.660	373	1224	61
	1 1/2	40	1.906	48.4	1.882	47.8	0.114	2.90	3.270	310	1017	3.350	298	978	3.400	294	965	51
	2	50	2.370	60.2	2.346	59.6	0.114	2.90	4.060	241	791	4.220	237	778	4.300	233	764	37
	2 1/2	65	2.991	76.0	2.961	75.2	0.124	3.20	5.930	172	564	5.890	170	558	6.020	166	545	27
	3	80	3.492	88.7	3.461	87.9	0.124	3.20	6.720	149	489	6.890	145	476	7.100	141	463	24
	4	100	4.484	113.9	4.449	113.0	0.142	3.60	10.000	100	328	10.030	100	328	10.280	97	318	16
	M E D I U M (B)	1/2	15	0.854	21.7	0.831	21.1	0.102	2.60	1.220	826	2710	1.250	800	2625	1.260	794	2605
3/4		20	1.071	27.2	1.047	26.6	0.102	2.60	1.570	641	2103	1.620	617	2024	1.640	610	2001	100
1		25	1.346	34.2	1.315	33.4	0.124	3.20	2.430	412	1362	2.490	402	1319	2.510	398	1306	65
1 1/4		32	1.689	42.9	1.657	42.1	0.124	3.20	3.130	319	1047	3.200	312	1024	3.230	310	1017	51
1 1/2		40	1.921	48.8	1.890	48.0	0.124	3.20	3.610	277	908	3.680	272	892	3.720	268	883	44
2		50	2.394	60.8	2.364	59.8	0.142	3.60	5.100	196	643	5.170	193	633	5.250	190	623	30
2 1/2		65	3.076	76.6	3.069	75.4	0.142	3.60	6.550	156	512	6.610	151	495	6.730	149	489	24
3		80	3.524	89.5	3.469	88.1	0.157	4.00	8.540	117	384	8.580	117	384	8.760	114	374	19
4		100	4.524	114.9	4.461	113.3	0.177	4.50	12.500	82	269	12.500	80	262	12.690	79	259	14
H E A V Y (C)		5	125	5.535	140.6	5.461	138.7	0.197	5.00	16.900	60	197	17.100	58	194	16.940	59	194
	6	150	6.539	166.1	6.461	164.1	0.197	5.00	19.700	51	167	20.300	49	164	20.100	50	164	7
	1/2	15	0.854	21.7	0.831	21.1	0.124	3.20	1.440	694	2277	1.490	671	2202	1.500	667	2188	110
	3/4	20	1.071	27.2	1.047	26.6	0.124	3.20	1.870	595	1755	1.930	578	1700	1.950	573	1693	80
	1	25	1.346	34.2	1.315	33.4	0.157	4.00	2.940	340	1115	2.960	338	1109	3.040	329	1079	55
	1 1/4	32	1.689	42.9	1.657	42.1	0.157	4.00	3.830	261	866	3.830	256	840	3.930	254	833	44
	1 1/2	40	1.921	48.8	1.890	48.0	0.157	4.00	4.390	226	748	4.420	225	741	4.530	221	725	37
	2	50	2.394	60.8	2.364	59.8	0.177	4.50	6.190	162	531	6.260	160	525	6.400	156	512	27
	2 1/2	65	3.016	76.6	2.969	75.4	0.177	4.50	7.530	126	413	8.050	124	407	8.230	121	397	20
	3	80	3.524	89.5	3.469	88.1	0.197	5.00	10.500	97	318	10.500	95	312	10.710	93	307	16
4	100	4.524	114.9	4.461	113.3	0.213	5.40	14.500	59	226	14.500	58	223	14.990	57	220	12	
5	125	5.535	140.6	5.461	138.7	0.213	5.40	17.900	56	184	18.400	54	177	18.630	54	177	10	
6	150	6.539	166.1	6.461	164.1	0.213	5.40	21.300	47	154	21.900	46	151	22.220	45	148	7	

Tolerances : THICKNESS Light Tube -8%, Medium and Heavy Tubes +10% & -8%. WEIGHT : Single Tube +10% & -8%, Quantity - 150 metres and above of one size & class -4%. LENGTH - 6 metres ±0.05 metres

**TECHNICAL DATA OF BLACK AND GALVANISED STEEL PIPES CONFORMING TO BS EN 39: 2001**

SIZE	THICKNESS		NOMINAL MASS		METERS/TONNE		FEET/TONNE		NO. OF PIPES PER BUNDLE (1 TONNE APPROX.)
	MM	INCH	BLACK PLAIN END	GALVANISED PLAIN END	METERS	METERS	FEET	FEET	
48.3	1.9	4.0	4.37	4.68	229	223	751	732	37
45.3	1.8	3.2	3.55	3.67	251	242	822	802	45

Tolerances : Outside Diameter : ±0.5 mm  
 Thickness : -10%  
 Nominal mass : -7.5%

Standard length 6.10 metres ±0.05 metres or as per customer's requirements

## 15. محاضرات اجتماعات تسليم مشروع إمداد المياه

1-15	جمعية مستخدمي مياه جبل الطرف
2-15	جمعية مستخدمي مياه الخرابة
3-15	جمعية مستخدمي مياه مصنعة عبد العزيز

محضر تسليم مشروع مياه جبل الطرف

إلى جمعية مستخدمي مياه مشروع جبل الطرف

انه في يوم الأربعاء الموافق ٨ / ٨ / 200٧م تم تسليم مشروع مياه جبل الطرف قرية جبل الطرف عزلة جبل الطرف مديرية المعية المحافظة الحوت والمكون من العناصر التالية :

م	مكونات المشروع	الجهة الممولة/ المساهمة
١-	محطته عموديه نوع كيراري	الحكومة اليابانية
٢-	محرك ديزل نوع MWM	" "
٣-	محطته أفقية	" "
٤-	محرك ديزل نوع MWM	" "

وقد تم تسليم المشروع متكاملًا وسليماً حسب المواصفات والدراسات من قبل فريق الخبراء التابع للمحكمة لسياسة المياه إلى الجمعية ممثلة برئيسها الأخ / أحمد عبد الحماد / ويعتبر هذا إقرار والتزام جهات الاستلام بعدم استعمال مياه المشروع لأي أغراض زراعية أو تجارية سوى كانت خاصة أو عامة وان لا تستعمل مياه المشروع إلا لأغراض الشرب والاستعمالات المنزلية وتزويد المرافق العامة مثل المساجد والمدارس والوحدات الصحية وبحسب إمكانيات المشروع كما يعتبر هذا التزام على جمعية مستخدمي المياه المنتخبة من قبل السكان المستفيدين في المحل وعلى المجلس المحلي في المديرية الإشراف على إدارة المشروع وعلى الجمعية ضمانات التشغيل المستمر وتوفير قطع الغيار والصيانة اللازمة للمشروع وتحديد الموارد المالية له وبهذا يعتبر المشروع تحت تصرف ومسؤولية الجمعية ولن تتدخل الهيئة مستقبلاً إلا إذا أخلت الجمعية بشروط سوء استعمال المياه وإدارة المشروع أو عند استغلاله لغير المصلحة العامة وعند ذلك يحق للمجلس المحلي التدخل لتغيير الإدارة وتكليف لجنة مؤقتة لإدارة المشروع لحين إجراء انتخابات جديدة .

والله ولي الهداية والتوفيق

رئيس جمعية مستخدمي المياه لمشروع جبل الطرف  
 أحمد عبد الحماد

مدير عام فرع الهيئة بالمحافظة  
 محمد علي

رئيس المجلس المحلي بالمحافظة  
 محمد علي

رئيس الهيئة العامة لمشاريع مياه الريف

محضر تسليم مشروع مياه ..... خرابه حبيب

إلى جمعية مستخدمي مياه مشروع ..... خرابه حبيب

انه في يوم السبت ..... الموافق ٤ / ١١ / 200٧م تم تسليم مشروع مياه خرابه حبيب .....  
 قرية الخرابه ..... عزلة بنه الراعي ..... مديرية بنه مطر ..... محافظة صنعاء  
 والمكون من العناصر التالية :

م	مكونات المشروع	الجهة الممولة/ المساهمة
١	خزان سعة ٢٥٠ م <sup>٣</sup>	الحكومة اليبانية
٢	مخطوطات ورسالة منسقة الأقطار	" "
٣	فناهل عامه	" "
٤	غرفه ضخ	" "
٥	صهارض ضخ	" "
٦	مصنعه كهربائيه غاطه	" "
٧	مولد كهربائي	" "

وقد تم تسليم المشروع متكاملًا وسليماً حسب المواصفات والدراسات من قبل فريق الدراسة التابع للوكالة اليابانية للتعاون الدولي  
 إلى الجمعية ممثلة برئيسها الأخ / خاضل باعاجي الله عونه ..... وبحضور ممثل المجلس المحلي  
 الأخ / ..... يعتبر هذا إقرار والتزام جهات الاستلام بعدم استعمال مياه  
 المشروع لأي أغراض زراعية أو تجارية سوى كانت خاصة أو عامة وان لا تستعمل مياه المشروع إلا لأغراض الشرب  
 والاستعمالات المنزلية وتزويد المرافق العامة مثل المساجد والمدارس والوحدات الصحية وبحسب إمكانية المشروع كما  
 يعتبر هذا التزام على جمعية مستخدمي المياه المنتخبة من قبل السكان المستفيدين في المحل وعلى المجلس المحلي في  
 المديرية الإشراف على إدارة المشروع وعلى الجمعية ضمانة التشغيل المستمر وتوفير قطع الغيار والصيانة اللازمة  
 للمشروع وتحديد الموارد المالية له وبهذا يعتبر المشروع تحت تصرف ومسؤولية الجمعية ولن تتدخل الهيئة مستقبلاً  
 إلا إذا أخلت الجمعية بشروط سؤ استعمال المياه وإدارة المشروع أو عند استغلاله لغير المصلحة العامة وعند ذلك يحق  
 للمجلس المحلي التدخل لتغيير الإدارة وتكليف لجنة مؤقتة لإدارة المشروع لحين إجراء انتخابات جديدة .

والله ولي الهداية والتوفيق



محضر تسليم مشروع مياه .....

إلى جمعية مستخدمي مياه مشروع .....

انه في يوم ..... الموافق ٣١ / ٧ / 200٧م تم تسليم مشروع مياه .....

قرية ..... عزلة ..... مديرية ..... محافظة .....  
والمكون من العناصر التالية :

م	مكونات المشروع	الجهة الممولة/ المساهمة
١	خزانات أرضية ٢٥ متر مكعب	الجمعية
٢	خطوط تنقيح	الحكومة اليمنية
٣	نقطة تنقيح	الأهالي
٤	جدران تنقيح	الحكومة اليمنية
٥	صناديق عامة	الحكومة اليمنية

وقد تم تسليم المشروع متكاملًا وسليماً حسب المواصفات والدراسات من قبل .....

إلى الجمعية ممثلة برئيسها الأخ / .....  
الأخ / ..... ويعتبر هذا إقرار والتزام جهات الاستلام بعدم استعمال مياه المشروع لأي أغراض زراعية أو تجارية سوى كانت خاصة أو عامة وان لا تستعمل مياه المشروع إلا لأغراض الشرب والاستعمالات المنزلية وتزويد المرافق العامة مثل المساجد والمدارس والوحدات الصحية وبحسب إمكانيات المشروع كما يعتبر هذا التزام على جمعية مستخدمي المياه المنتخبة من قبل السكان المستفيدين في المحل وعلى المجلس المحلي في المديرية الإشراف على إدارة المشروع وعلى الجمعية ضمانة التشغيل المستمر وتوفير قطع الغيار والصيانة اللازمة للمشروع وتحديد الموارد المالية له وبهذا يعتبر المشروع تحت تصرف ومسؤولية الجمعية ولن تتدخل الهيئة مستقبلاً إلا إذا أخلت الجمعية بشروط سوء استعمال المياه وإدارة المشروع أو عند استغلاله لغير المصلحة العامة وعند ذلك يحق للمجلس المحلي التدخل لتغيير الإدارة وتكليف لجنة مؤقتة لإدارة المشروع لحين إجراء انتخابات جديدة .

والله ولي الهداية والتوفيق

رئيس جمعية مستخدمي المياه لمشروع .....  
مدير عام فرع الهيئة بالمحافظة .....  
رئيس المجلس المحلي بالمحافظة .....  
رئيس الهيئة العامة لمشاريع مياه الريف .....