

ขั้นตอนการทดสอบ

เครื่องสูบน้ำแบบเคลื่อนที่ระบบไฮดรอลิค

รุ่น NIT AFP24-Q1500H4N800 ขนาด 24 นิ้ว

บริษัท นำพลอินเตอร์เทรด จำกัด

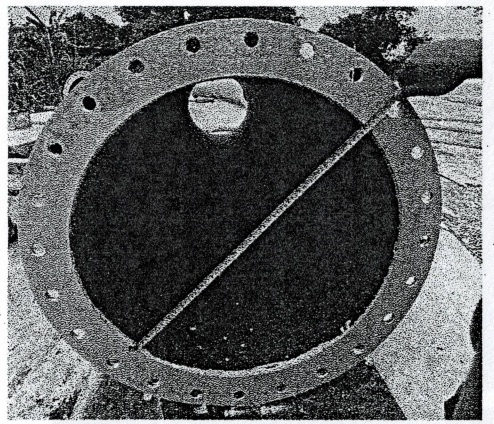
90/1-4 ถนนพระร่วง ตำบลในเมือง อำเภอเมือง จังหวัดพิษณุโลก 65000

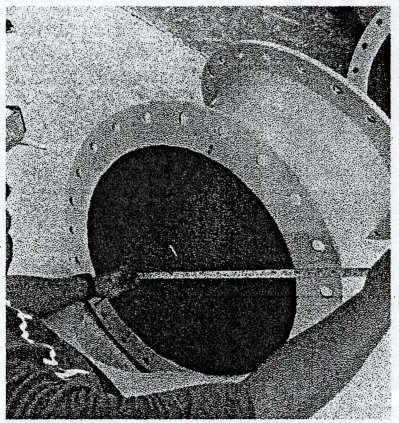
Tel. 055-283-111-5, Fax. 055-283526-7

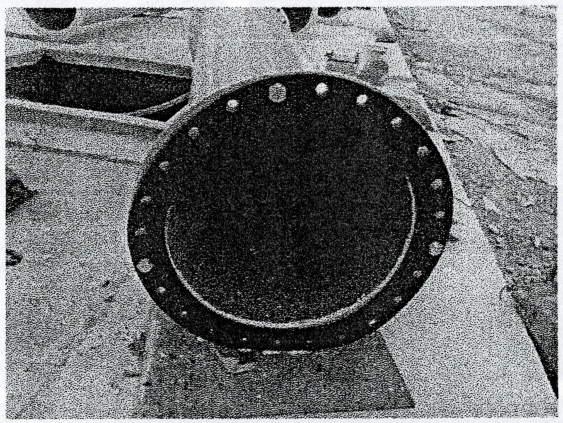
Website : www.numpol.co.th

E-mail : nitnumpol@gmail.com, info@numpol.co.th

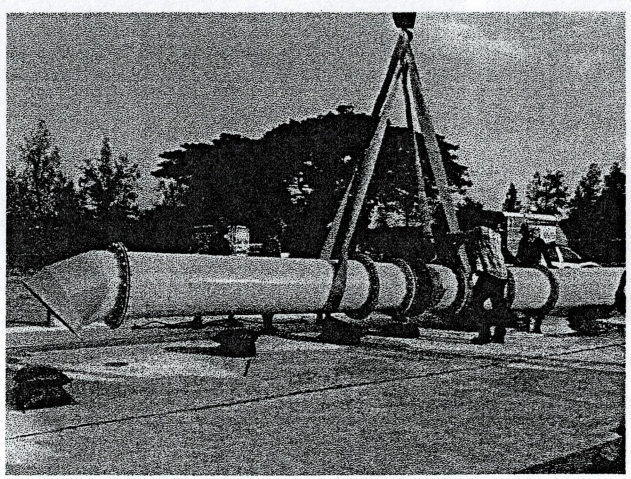
การวัดขนาดท่อและการเตรียมการประกอบท่อเพื่อให้สอดคล้องกับพื้นที่หน้างาน

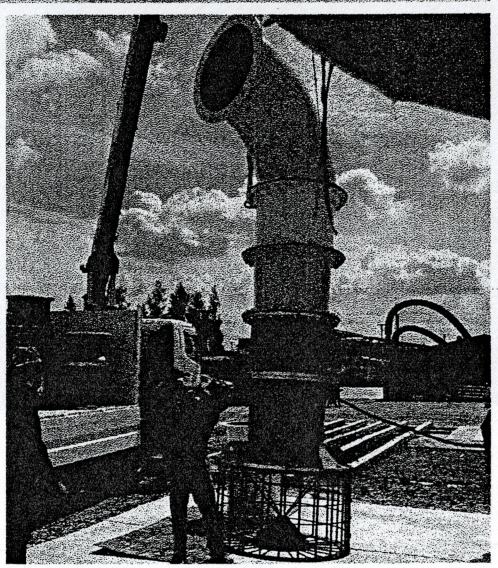






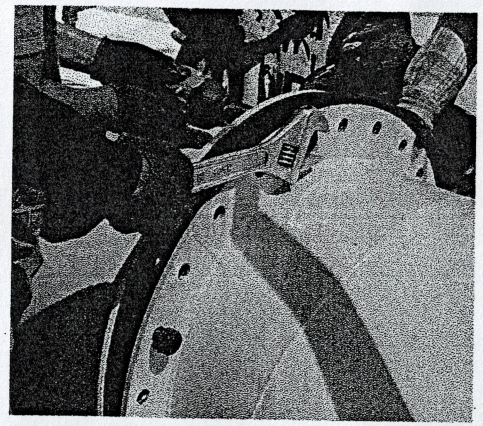




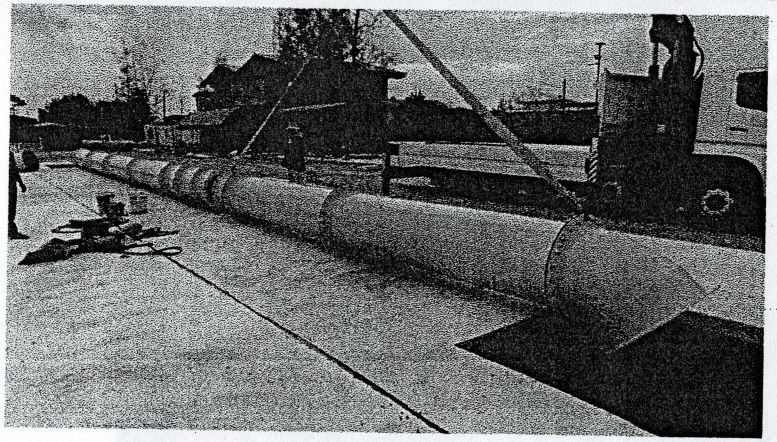


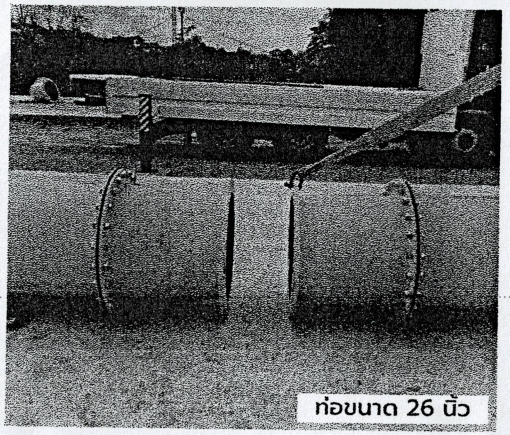
การประกอบท่อ

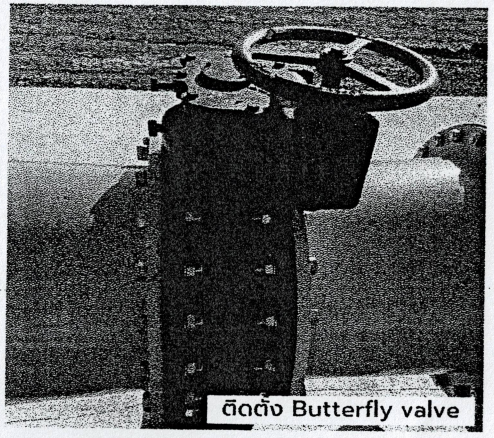

สกรูขนาด M24







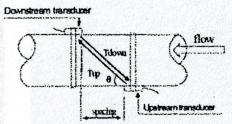

ท่อขนาด 26 นิ้ว


ติดตั้ง Butterfly valve

การติดตั้งอุปกรณ์การวัดอัตราการไหลของน้ำ

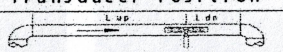
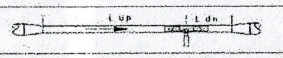
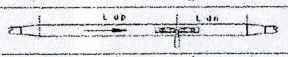
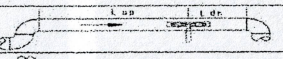
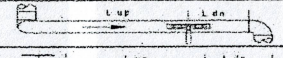
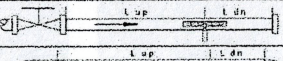
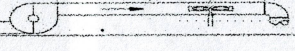


$$V = \frac{MD}{\sin 2\theta} \times \frac{\Delta T}{T_{up} \bullet T_{down}}$$

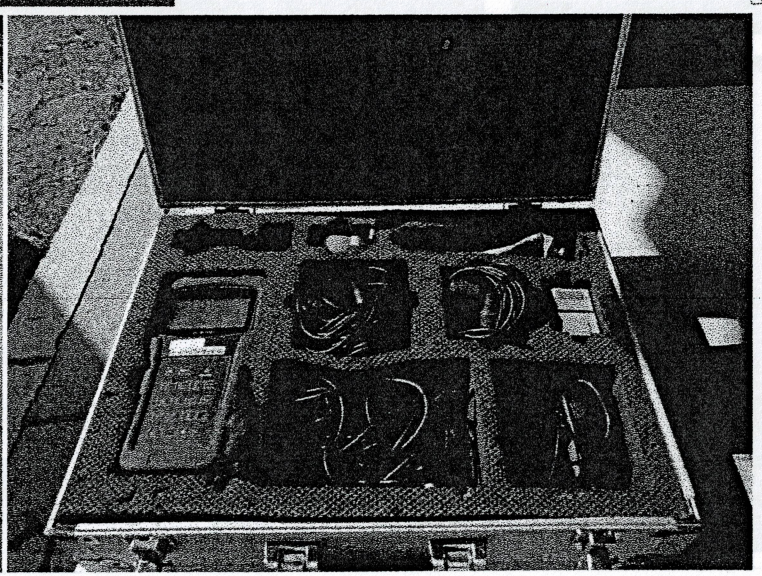


Where

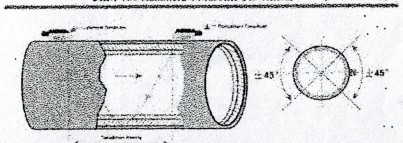
θ is the include angle to the flow direction
M is the travel times of the ultrasonic beam
D is the pipe diameter
Tup is the time for the beam from upstream transducer to the downstream one
Tdown is the time for the beam from downstream transducer to the upstream one
ΔT=Tup –Tdown

Piping Configuration and Transducer Position	Upstream Dimension L up x Diameters	Downstream Dimension L dn x Diameters
	10D	5D
	10D	5D
	10D	5D
	12D	5D
	20D	5D
	20D	5D
	30D	5D



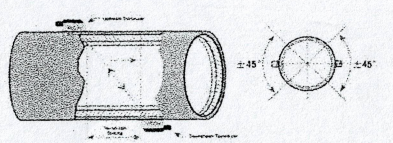


CLM-700 Handheld Ultrasonic Flowmeter - 12 -

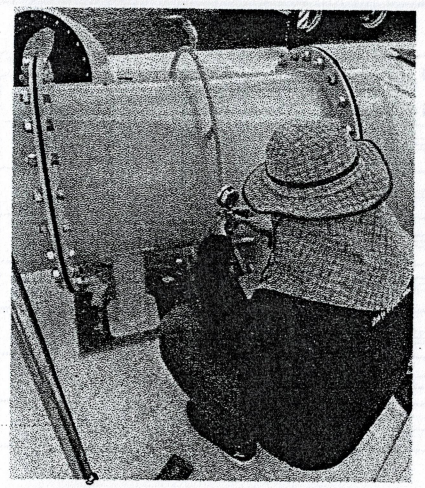


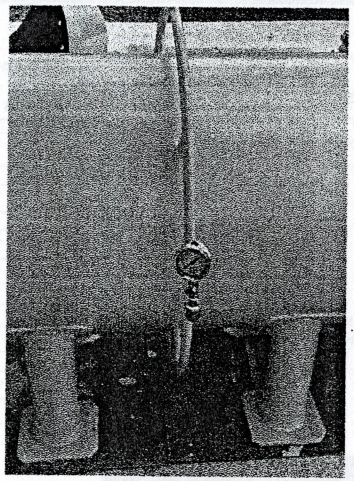
§2.7.3 Z-method Installation

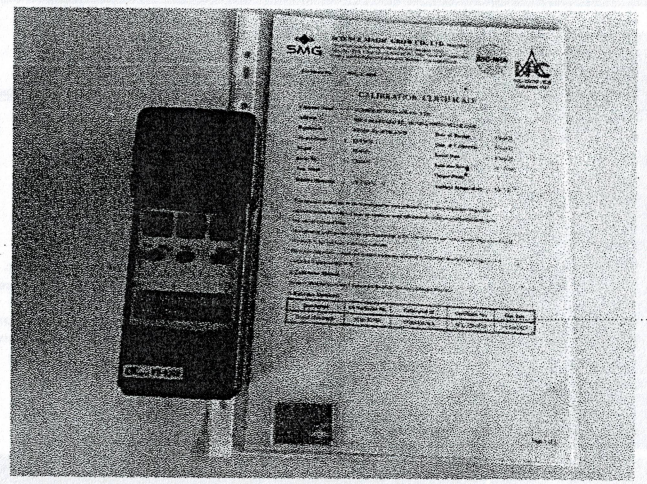
Z-method is commonly used when the pipe diameter is above 200mm.

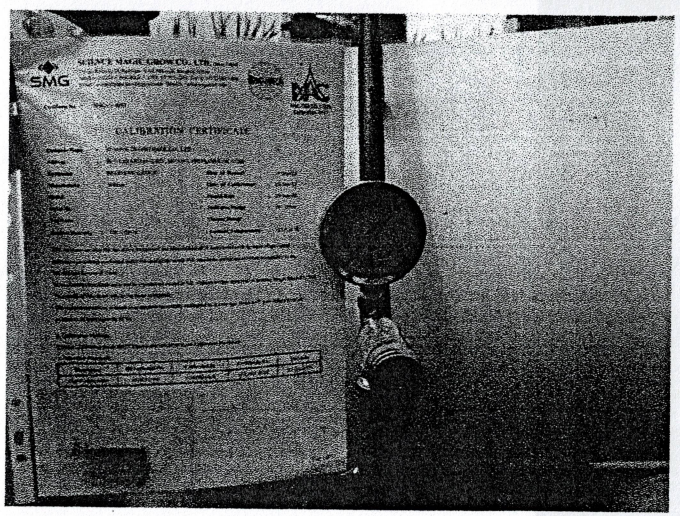


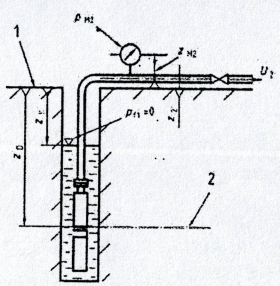
การติดตั้งเครื่องมือวัด PRESSURE METER











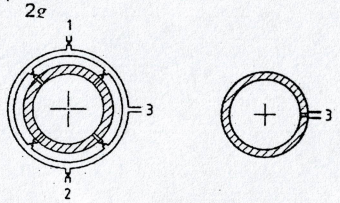
1 Reference plane
2 NPSH datum plane

$$H_1 = z_{1'}$$

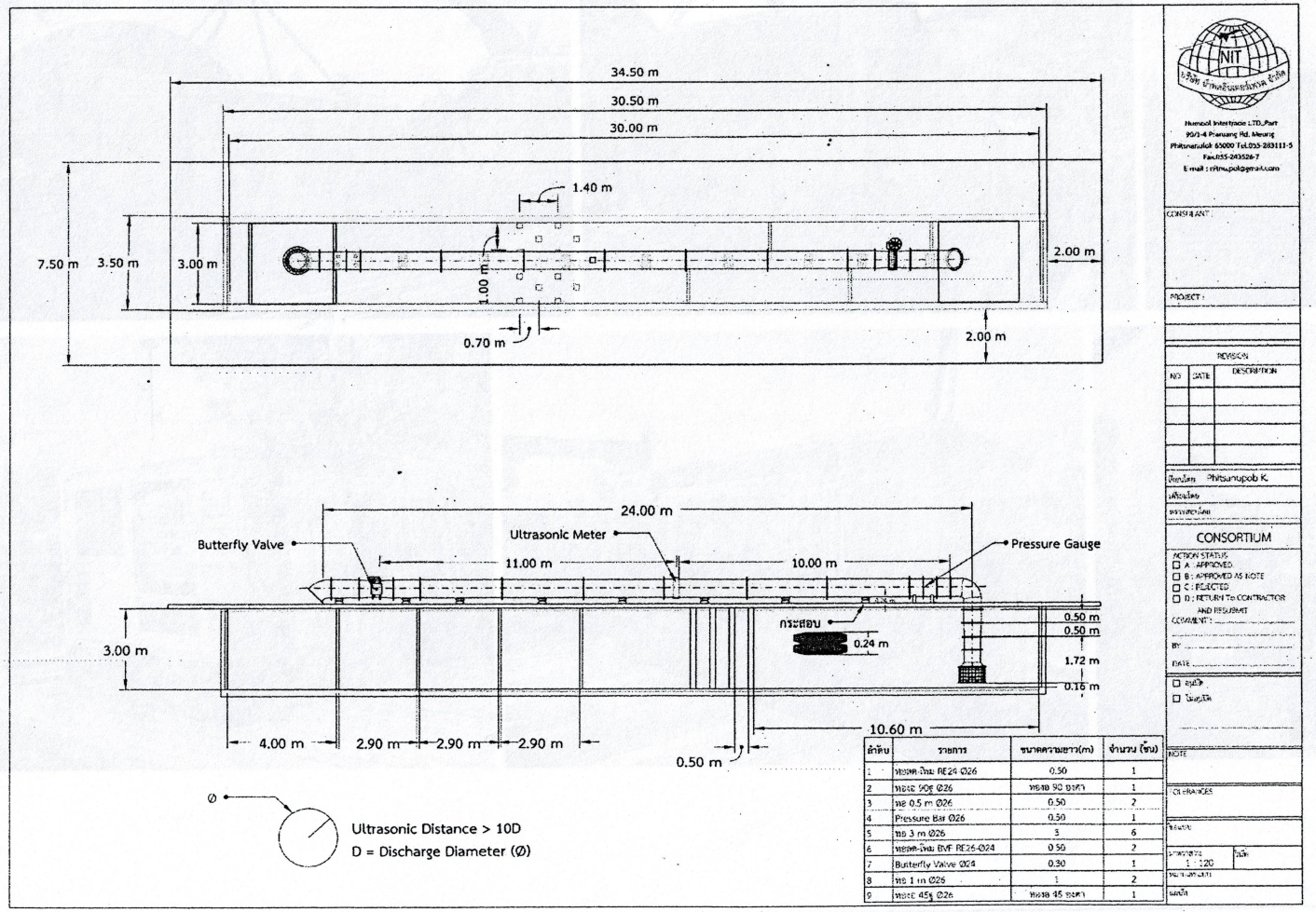
$$H_2 = z_{2'} + \frac{p_{M2}}{\rho g} + \frac{\rho_{f2}}{\rho}(z_{M2} - z_{2'}) + \frac{U_2^2}{2g}$$

$$H = z_{2'} - z_{1'} + \frac{p_{M2}}{\rho g} + \frac{\rho_{f2}}{\rho}(z_{M2} - z_{2'}) + \frac{U_2^2}{2g}$$

1 Vent
2 Drain
3 Connecting pipe to the pressure measuring instrument



แบบบ่อที่ใช้ในการทดสอบ



ลำดับ	รายการ	ขนาดความยาว(m)	จำนวน (ชิ้น)
1	ท่อPP-โกย RE24 Ø26	0.50	1
2	ท่อPE 90E Ø26	ท่อPP 90 ยังไง	1
3	ท่อ 0.5 m Ø26	0.50	2
4	Pressure Bar Ø26	0.50	1
5	ท่อ 3 m Ø26	3	6
6	ท่อPP-โกย BVF RE26-024	0.50	2
7	Butterfly Valve Ø24	0.30	1
8	ท่อ 1 m Ø26	1	2
9	ท่อPE 45E Ø26	ท่อPP 45 ยังไง	1

Nimpol Intertrade LTD.,Part
99/3-4 Pranuang Rd. Meuang
Phitsanulok 65000 Tel.055-283111-5
Fax.055-243526-7
E-mail : nimpolpat@gmail.com

CONSULTANT :

PROJECT :

REVISION

NO	DATE	DESCRIPTION

ผู้จัดทำโดย Phitsanupob K.

CONSORTIUM

ACTION STATUS
- A : APPROVED
- B : APPROVED AS NOTE
- C : REJECTED
- D : RETURN To CONTRACTOR AND RESUBMIT

COMMENT :

BY :

DATE :

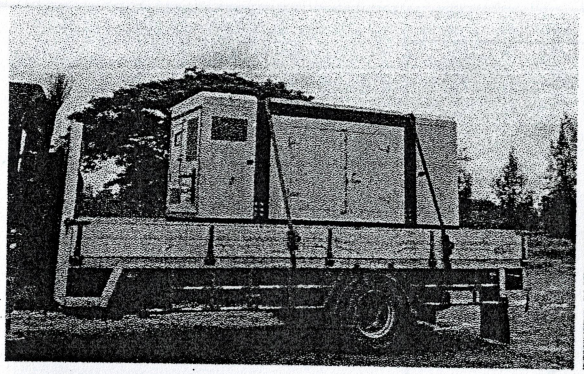
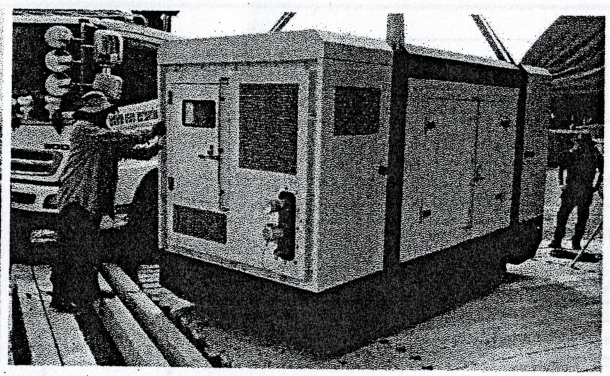
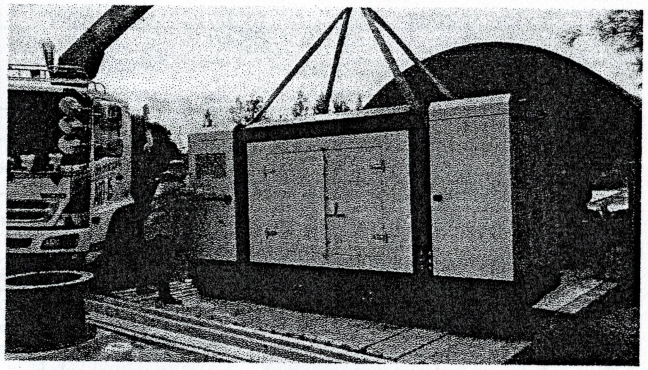
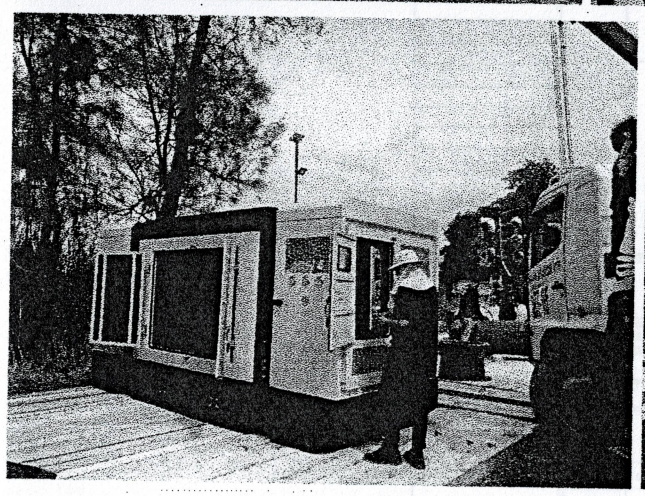
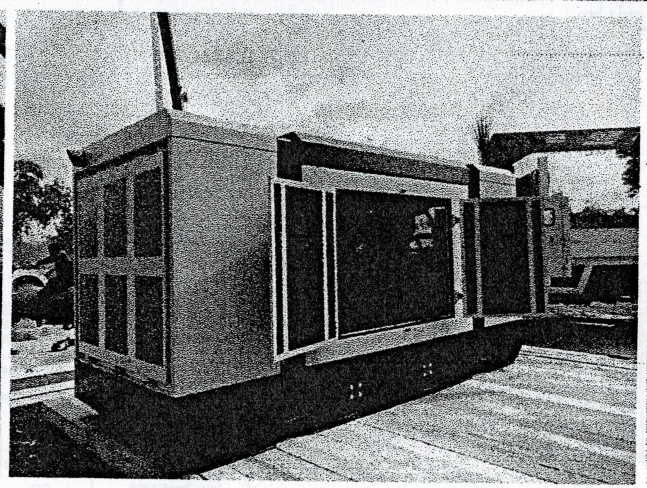
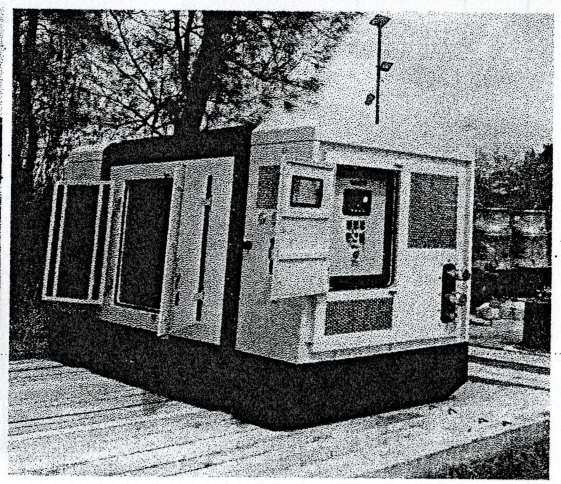
NOTE

CLEARANCES

SCALE : 1 : 120

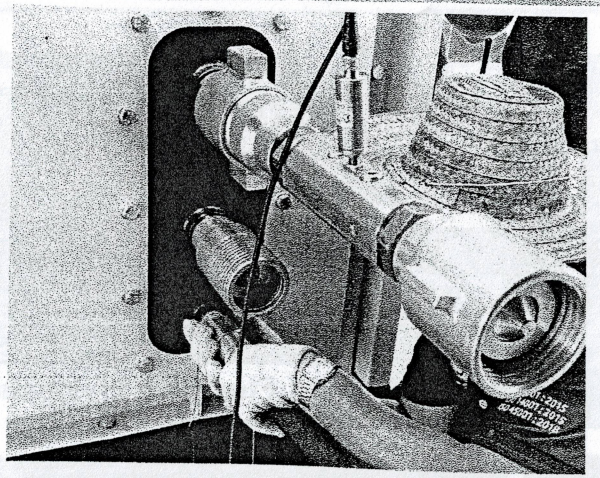
DRAWING NO.

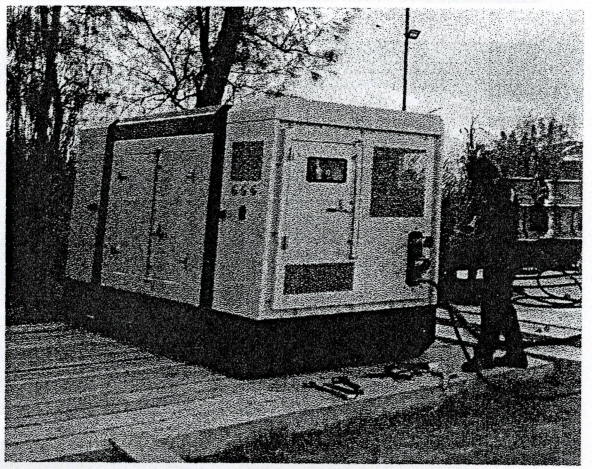
การขนส่งและติดตั้ง Power Unit

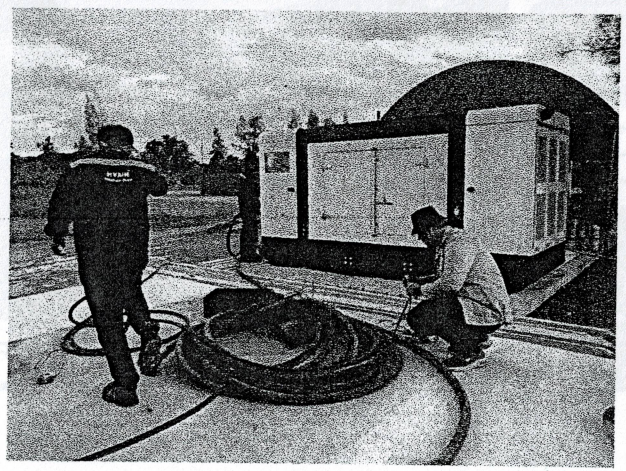







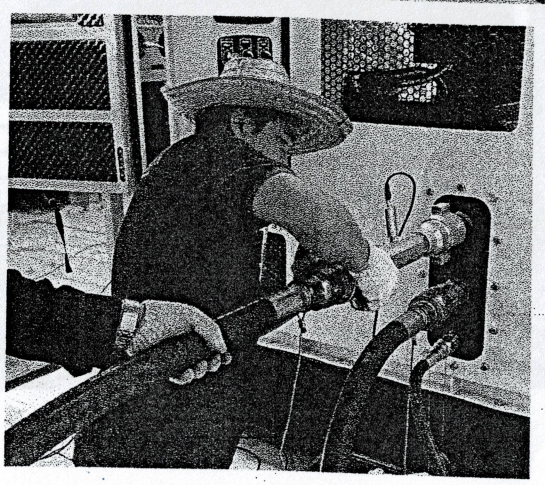
การติดตั้งอุปกรณ์ไฮดรอลิค

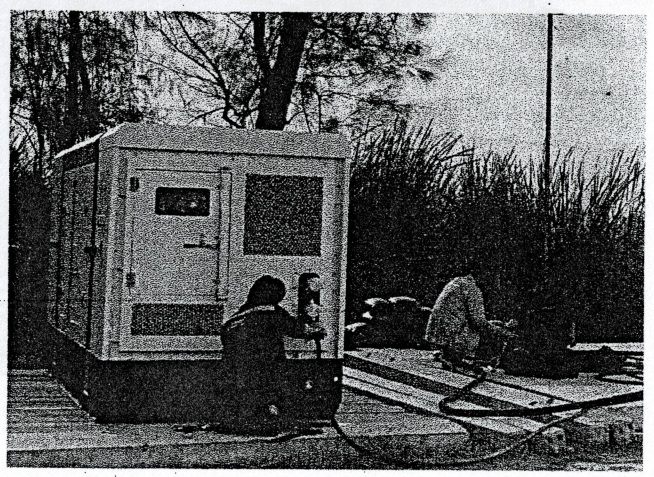




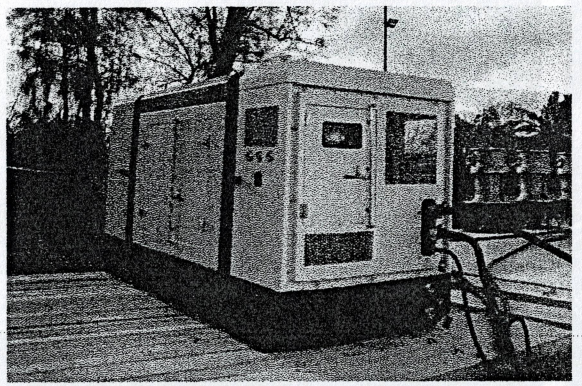


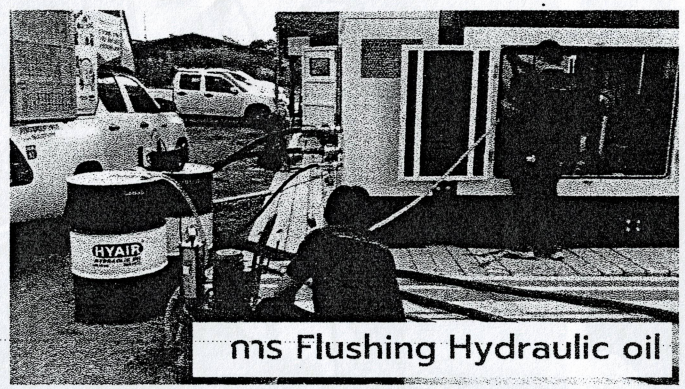




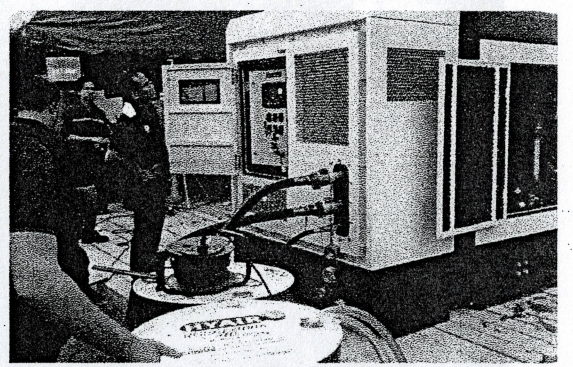


การเตรียมความพร้อมของระบบไฮดรอลิค

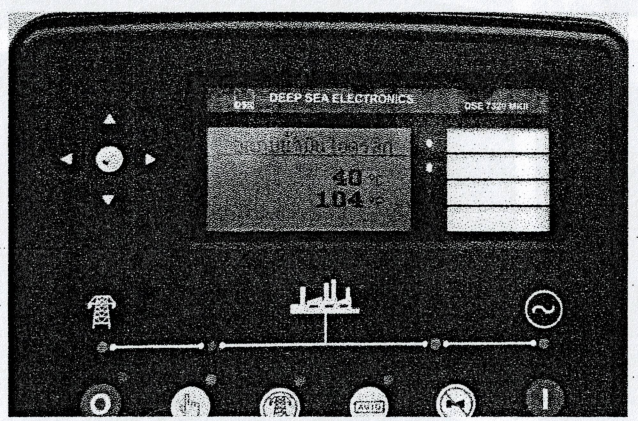




การ Flushing Hydraulic oil



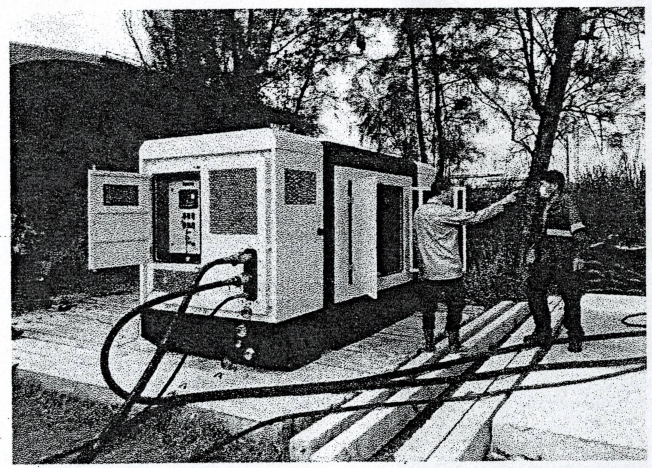






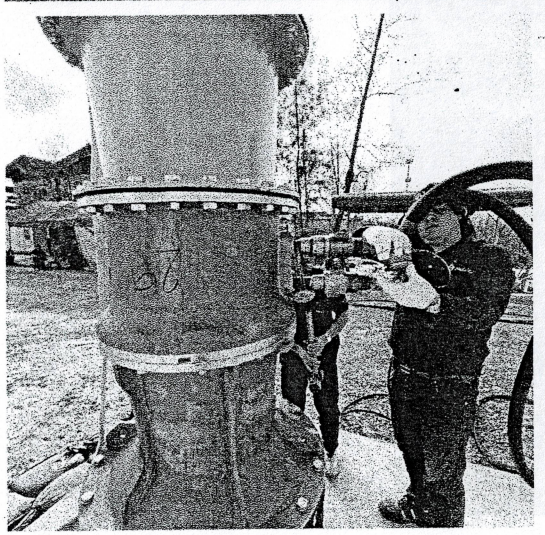
ตรวจสอบแรงดันไฮดรอลิค

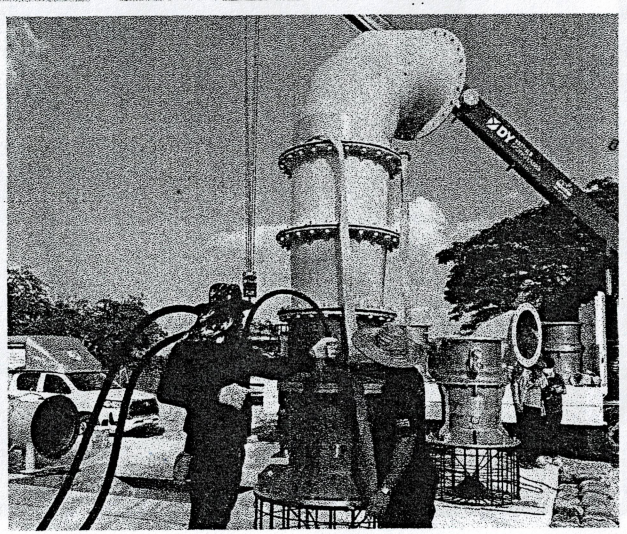
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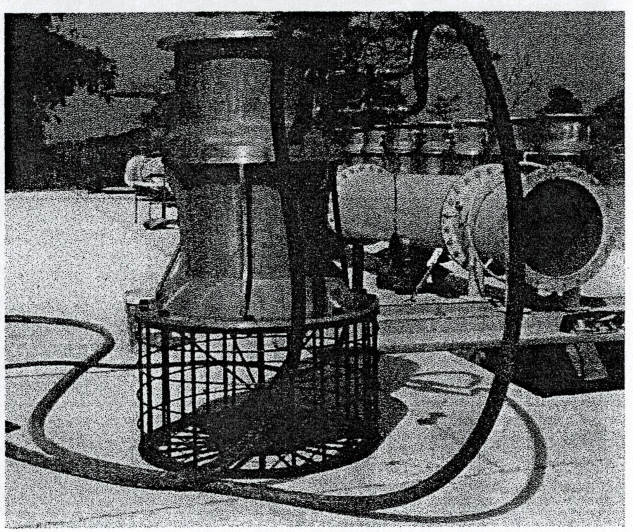




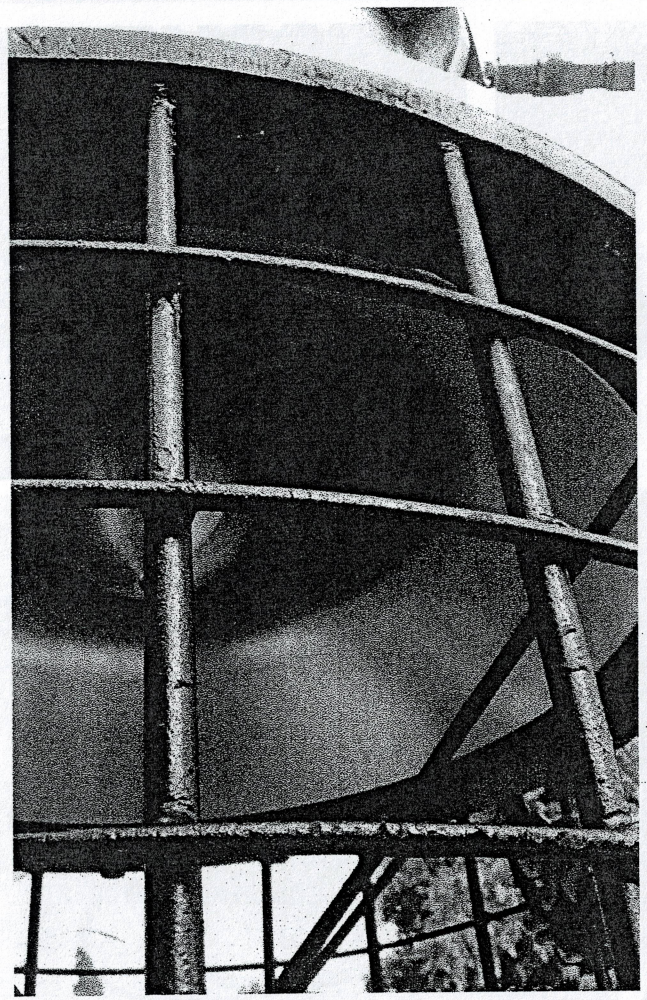






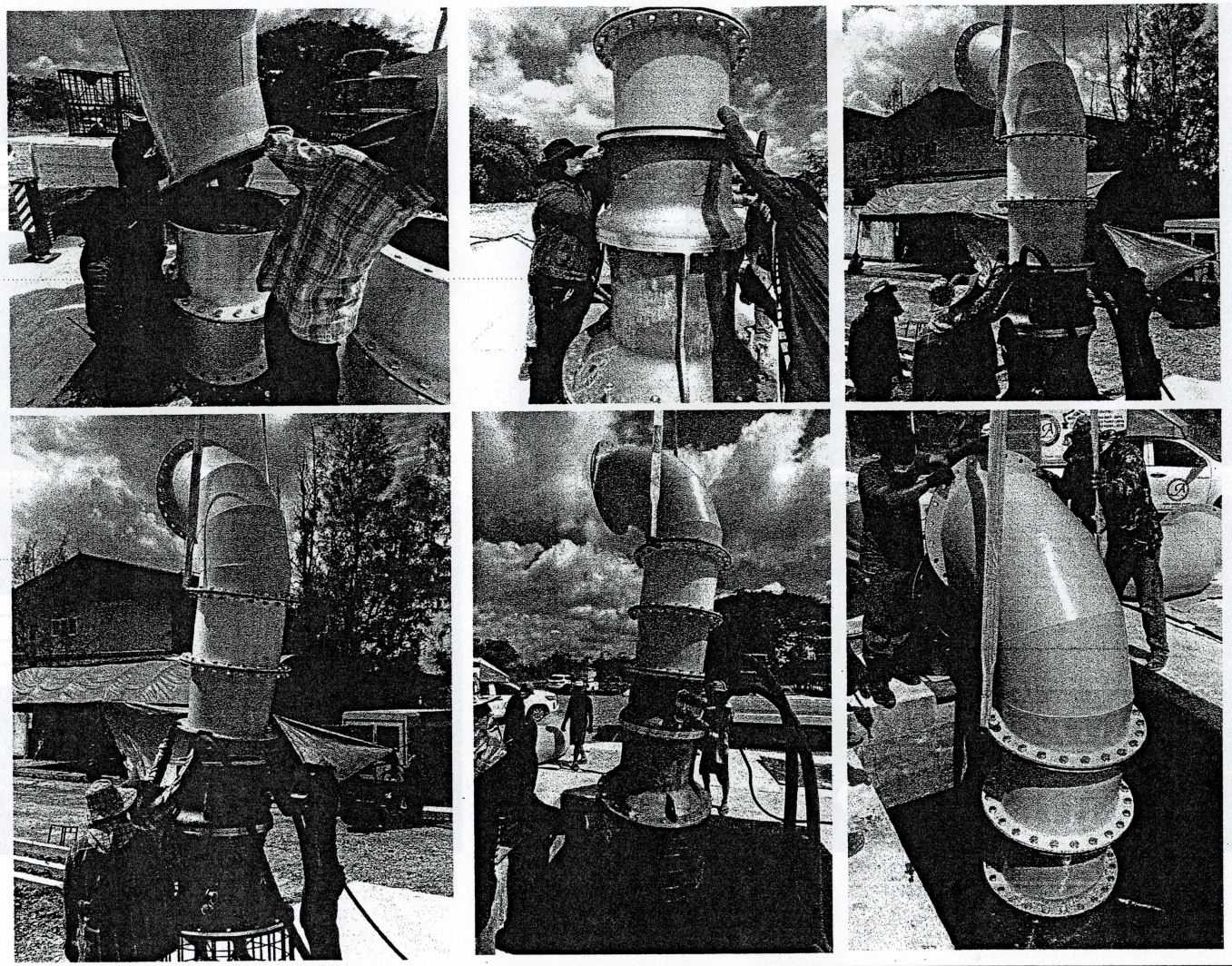


การทดสอบโดยไม่มีภาระโหลด (Dry Test)

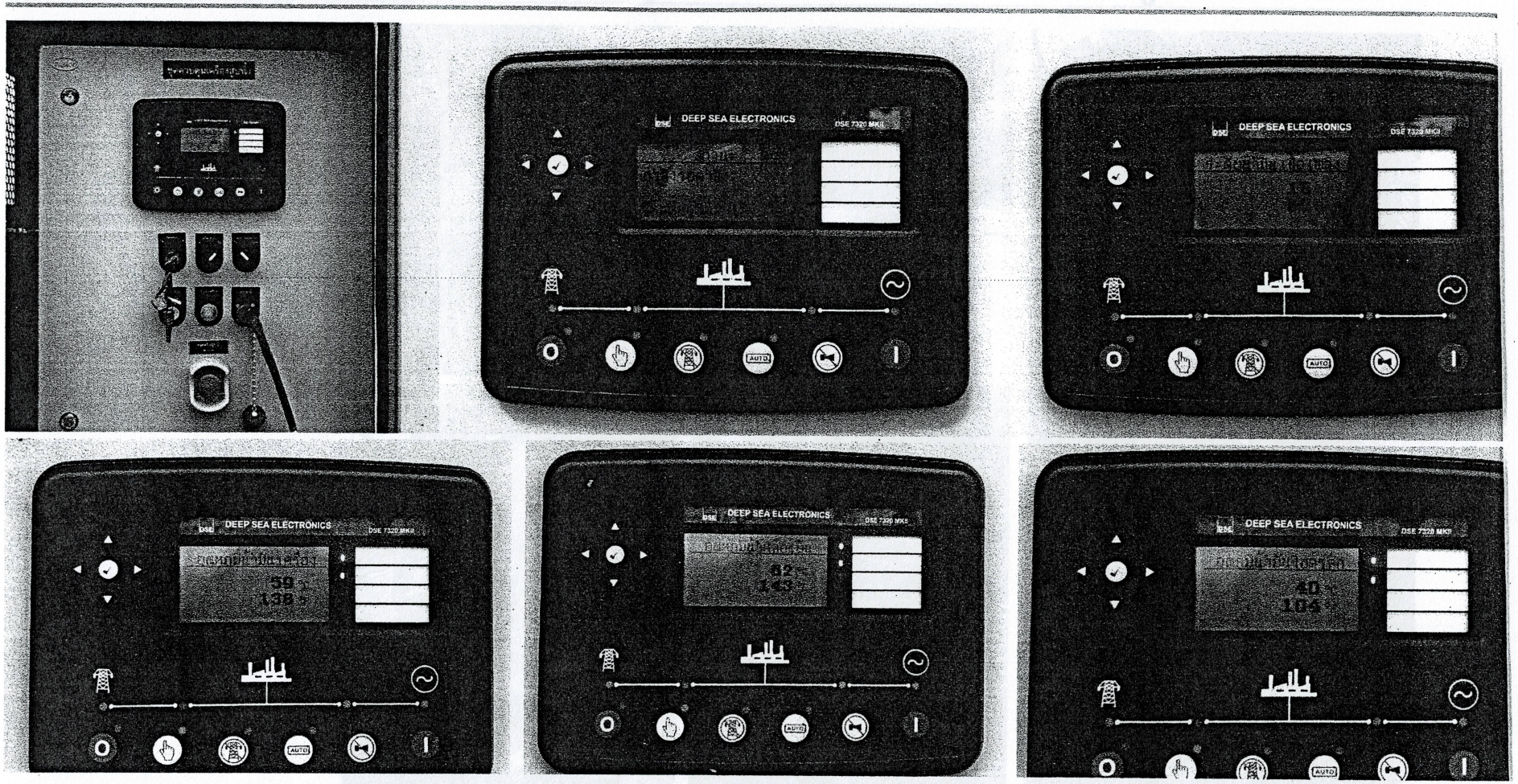




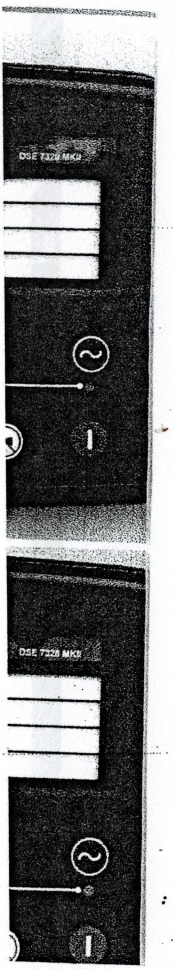
การติดตั้งหัวสูบลงประจำตำแหน่งการใช้งาน

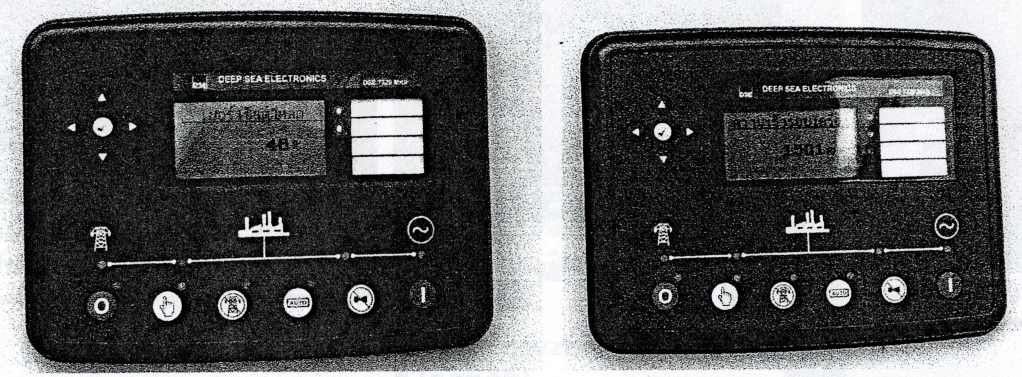


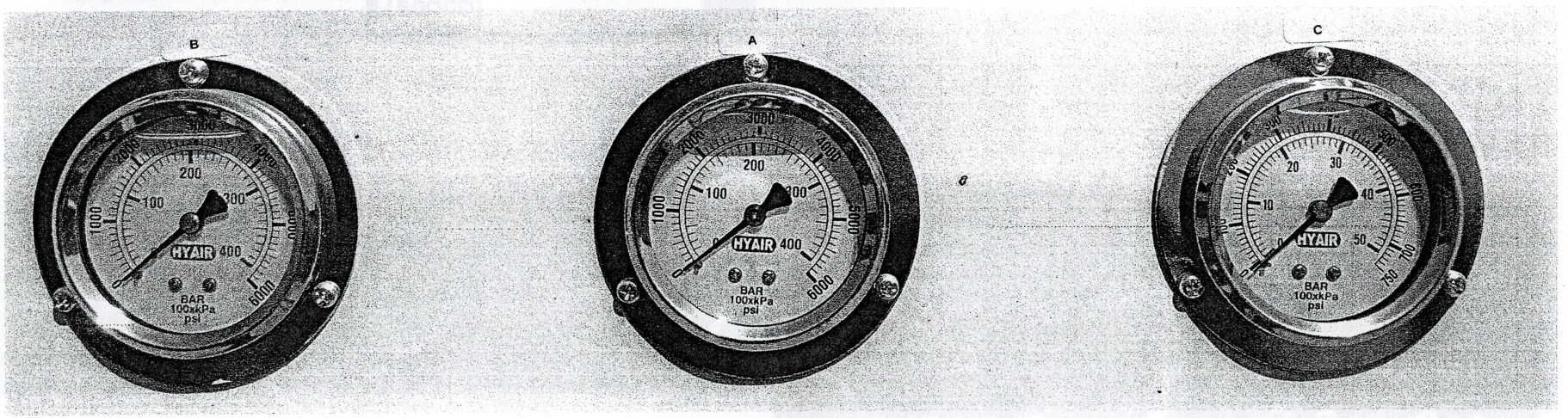
การตรวจสอบความพร้อมก่อนเริ่มต้นใช้งาน



การตรวจสอบความพร้อมก่อนเริ่มต้นใช้งาน





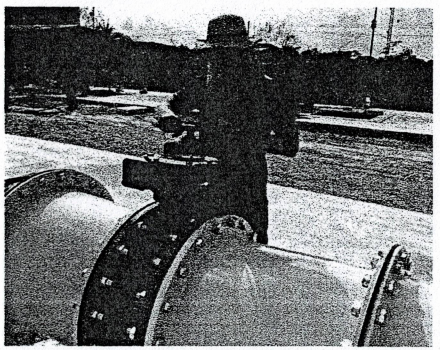


แรงดันที่ใช้งาน B ไม่เกิน 300 BAR

แรงดันที่ใช้งาน A ไม่เกิน 50 BAR

แรงดันที่ใช้งาน C ค่ามาตรฐานที่ 17-25 BAR

การเริ่มต้นการทดสอบ

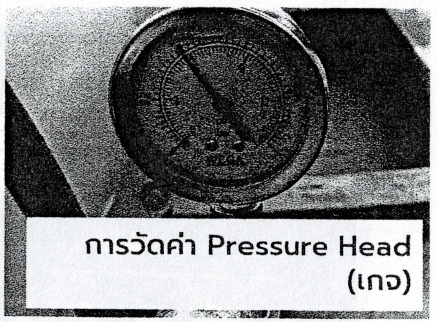




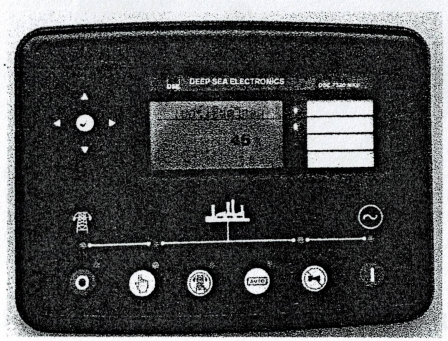
การวัดค่าอัตราการไหล

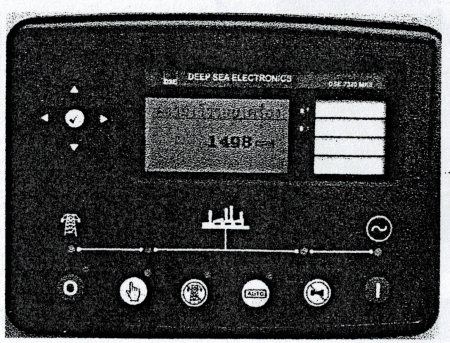


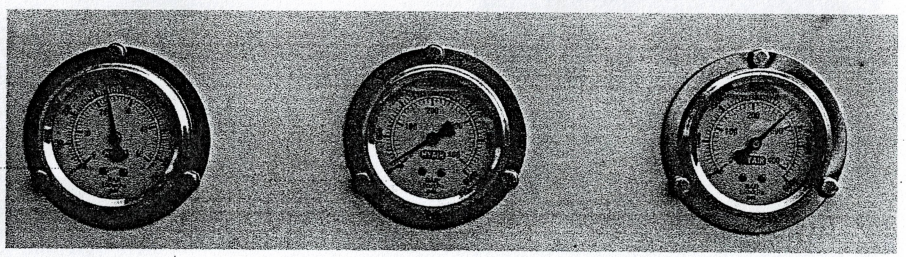
การวัดค่า Pressure Head (ดิจิตอล)



การวัดค่า Pressure Head (เกจ)



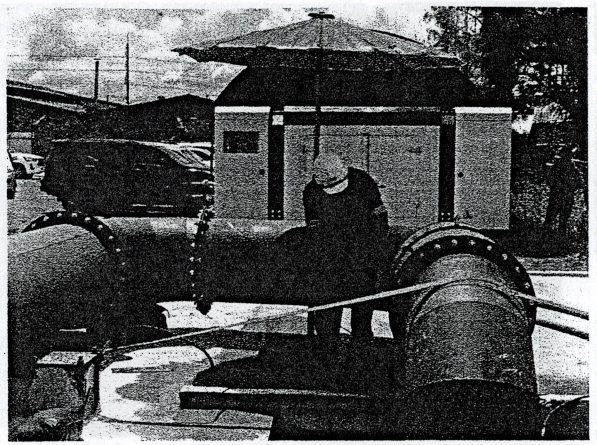


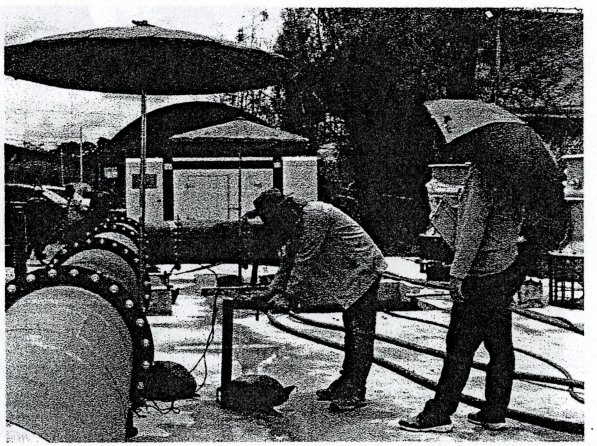


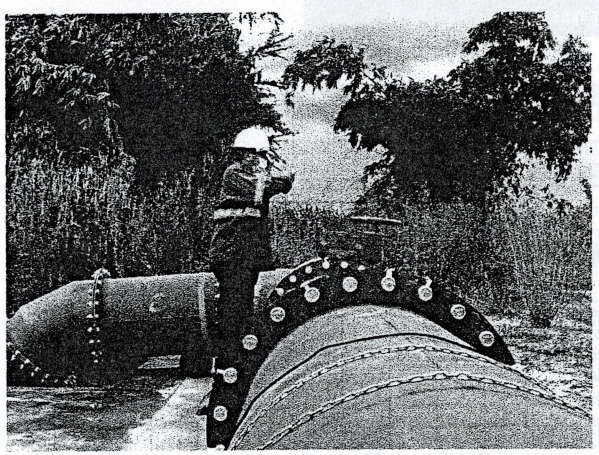
สถานะแรงดันใน Hydraulic Hose

การบันทึกผลการทดสอบ











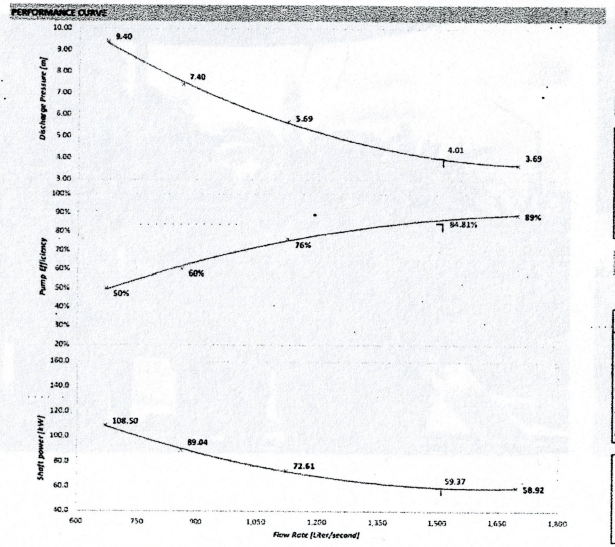


การสรุปผลการทดสอบ









INSPECTION CERTIFICATE: PUMP PERFORMANCE TEST

Company Name: Numpol Intertrade [NIT] **Date:** 5/10/2022

TEST EQUIPMENT:

	Description	Serial no.	Type	Remark
1	Engine system	-	Diesel Engine	FPT C87ENTX20.00A800 354HP
2	Hydraulic Pump	-	Piston Pump	Danfoss H1P250 ,Hydac PPV 250-280
3	Hydraulic Motor	-	Vane Motor	Rexroth MV037/426CC
4	Water pump	AFP24-Total Lot-082022	Axial Flow Pump	NIT-AFP24-Q1500H4N800

PERFORMANCE TEST:

Performance test and acceptance criteria according: ISO9906 gr.18

Description:	Required data:	Actual test data:	Tolerance:
Pump speed [rpm]	800	795	0.6%
Capacity [l/s]	1,500	1,510	0.7%
Discharge Pressure [m]	4.00	4.008	0.2%
Shaft power [kW]	58.86	59.37	0.9%
Pump efficiency [%]	85.15%	84.81%	0.4%

Pump	Flow Rate (Q)	[l/s]	1,510
	Discharge Pressure (H)	[m]	4.01
	Discharge Diameter (D)	[mm]	650
	Rotational Speed (n)	[rpm]	795

Hydr.	Line Pressue	[bar]	280
	Flow Rate	[l/min]	300
	Hydraulic Temp.	[°C]	51
Pump is tested with water of:		[°C]	27

ผลการทดสอบ



INSPECTION CERTIFICATE : PUMP PERFORMANCE TEST

Company Name: Numpol Intertrade (NIT) Date: 9/10/2022

TEST EQUIPMENT:

	Description	Serial no.	Type	Remark
1	Engine system	057667	Diesel Engine	FPT C87ENTX20.00A800 35-kW
2	Hydraulic Pump	N214900909	Piston Pump	Danfoss H1P250
3	Hydraulic Motor	44812933	Vane Motor	Rexroth MV037/426CC
4	Water pump	AFP24-01/22-08222	Axial Flow Pump	NIT-AFP24-Q1500H4N800

PERFORMANCE TEST:

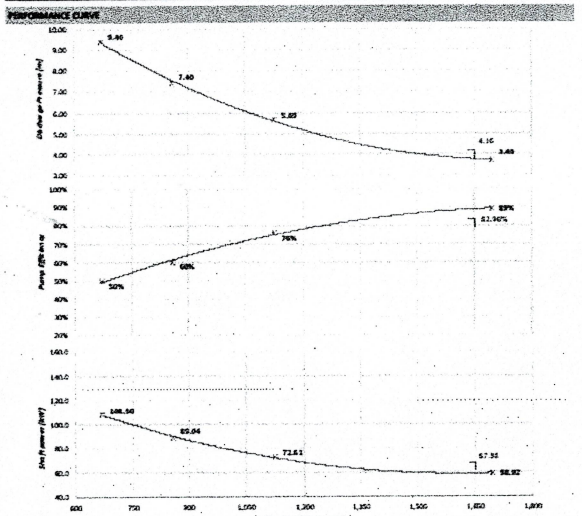
Performance test and acceptance criteria according: ISO9906 gr.1B

Description:	Required data:	Actual test data:	Tolerance:
Pump speed [rpm]	800	782	2.25%
Capacity [l/s]	1,500	1,650	10.00%
Discharge Pressure [m]	4.00	4.16	4.04%
Shaft power [kW]	58.56	67.38	14.44%
Pump efficiency [%]	85.15%	82.90%	2.58%

Pump			
	Flow Rate [Q]	[l/s]	1,650
	Discharge Pressure (H)	[m]	4.16
	Discharge Diameter [D]	[mm]	650
	Rotational Speed (n)	[rpm]	782

Motor			
	Line Pressure	[bar]	280
	Flow Rate	[l/min]	300
	Hydraulic Temp.	[°C]	51
	Pump is tested with water of:	[°C]	27

PERFORMANCE CURVE



ACCEPTANCE

Above mentioned data reviewed and accepted: Numpol Intertrade Co., Ltd. Inspection by:

Date:

Certificate No : 5005422-1

BANGKOK : 12/10/2022

CERTIFICATE OF INSPECTION

CLIENT : Numpol Intertrade Co., Ltd.
90/1-4 Praruang Road, Muang, Phitsunulok 65000 Thailand

ITEM INSPECTED : Axial Pump
Model No. NIT-AFP24-Q1500H4N800
Serial No. AFP24-02/22-08222

PLACE OF INSPECTION : Site Rangsit-Nakhon-Nayok Klong 9 Rd., Bung Sanan, Thanyaburi, Pathum Thani 12110 Thailand

DATE OF INSPECTION : October 5th, 2022

This is to certify that our inspector attended the above premises for the purpose of carrying out inspection for witness performance testing of Axial Pump.

TEST EQUIPMENT: Power Unit

	Description	Serial No.	Type/Model	Remark
1	Engine System	057667	Diesel engine (C87ENTX20.00A800)	FPT Industrial S.p.A
2	Hydraulic Pump	N214600009	Piston Pump	Danfoss
3	Hydraulic Motor	44812937	Vane motor (MV037/426CC)	Rexroth

Line Pressure [bar]	Flow Rate [l/min]	Hydraulic Temp. [°c]	Water tested Temp.[°c]
280	300	51	27

PERFORMANCE TEST RECORD:

Description	Required Specification	Actual Data	Tolerance
Rotation speed [rpm]	800		
Flow rate [l/s]	1500		
Discharge pressure [m]	4.0		
Shaft power [kW]	58.56		
Pump efficiency [%]	85.15		

CONCLUSION

Based on the finding of General running test was carried out on the above Axial Pump in our presence and found them to be operating smoothly and working satisfactory.

This certificate represents our inspection at time and place of inspection only.

Attachment: Annex- I: Performance curve

SGS (Thailand) Limited

Any holder of this document is advised that the information contained hereon is limited to visual examination of the safety and readily accessible portions of the consignment only.

In accordance with Client's instructions, the Company's involvement has been limited to witnessing/observing a third party's intervention(s) at the third party's laboratory/test house or other facilities and installations used for the intervention(s). The Company's sole responsibility was to be present at the time of the third party's intervention(s) to forward the results, or confirm the occurrence, of the intervention(s). The Company is not responsible for the condition or calibration of apparatus, instruments and measuring devices used, the analysis methods applied, the qualifications, actions or omissions of the third party's personnel or the analysis results.

This certificate does not relieve sellers/suppliers from their contractual responsibilities with regard to quality/quantity of this delivery nor does it prejudice buyer's right of claim toward sellers/suppliers for compensation for any apparent and/or hidden defects not detected during our inspection or occurring thereafter or inspection or occurring thereafter.

SGS (Thailand) Limited
Industries and Environment
100 Nanglinchee Road, Chongnonsee Yannawa, Bangkok 10120 Thailand
TEL :66 2 678 18 13 FAX : 66 2 678 06 22
E-Mail : ind.thailand@sgs.com

Prapawadee Sittikoon