ENIGMA TECHNICAL SOLUTIONS
www.EnigmaTechnicalSolutions.com

REVERSE OSMOSIS MOBILE EXPEDITIONARY SYSTEM (ROMES)





PRESENTED BY:
Dr Hj Al-Shafiq Bin Abdul Wahid
PhD (Mechanical Engineering)
Chief Executive Officer

ENIGMA TECHNICAL SOLUTIONS
www.EnigmaTechnicalSolutions.com

AGENDA

1. INTRODUCTION
2. DESIGN OF REVERSE OSMOSIS (RO) SYSTEM
3. TYPES OF RO SYSTEMS
4. TYPES OF MOBILE RO SYSTEM (ROMES)
5. ROMES 10 SW/BW AND ROMES 20 SW/BW
6. KS INTERNATIONAL RO SYSTEM
7. ROMES SYSTEM DETAILS
8. OPTIONS TO SUIT CUSTOMER'S NEEDS
9. PAST AND PRESENT EFFORTS
10. CONCLUSION
11. Q & A





ENIGMA TECHNICAL SOLUTIONS
www.EnigmaTechnicalSolutions.com

INTRODUCTION OF A MOBILE REVERSE OSMOSIS SYSTEM

- To produce clean potable water, safe for human consumption including drinking, cooking and washing.
- Reduces dependency on clean water from authorities.
- Immediate availability for emergencies and natural disasters including floodings , pipe leakages, landslide etc.
- Supports short, medium and long -duration field deployment and enforcement missions.
- Support hard -to reach areas, provide water security and free from sabotage, suitable for various water sources.
- Support mobile & field operations in remote areas, at sea, temporary establishments, etc.





ENIGMA TECHNICAL SOLUTIONS
www.EnigmaTechnicalSolutions.com

DESIGN OF RO SYSTEM (SCHEMATIC DIAGRAM)



GENERATOR SET



Backup
(From SWITCHBOARD)



RO ELECTRICAL
CONTROL PANEL



MEDIA
FILTER

IRON
FILTER



CATRIDGE
FILTER

MEMBRANE
MODULE



ULTRAVIOLET /
STERILIZER





P TDS METER



PRODUCT
WATER TANK

REJECT WATER



FEED WATER PUMP

RIVER/STREAM
POND/LAKE

ENIGMA TECHNICAL SOLUTIONS
www.EnigmaTechnicalSolutions.com

TYPES OF REVERSE OSMOSIS SYSTEMS

SOURCE OF WATER	SOLUTIONS
River, pond, drain, flood water,tube well	Brackish Water RO System
Islands,river mouth, jetty,onboard ships or offshore platforms	Sea Water RO System







KD LAKSAMANA MUHAMMAD AMIN


STATION MIKE : MATANANI ISLAND

ENIGMA TECHNICAL SOLUTIONS
www.EnigmaTechnicalSolutions.com

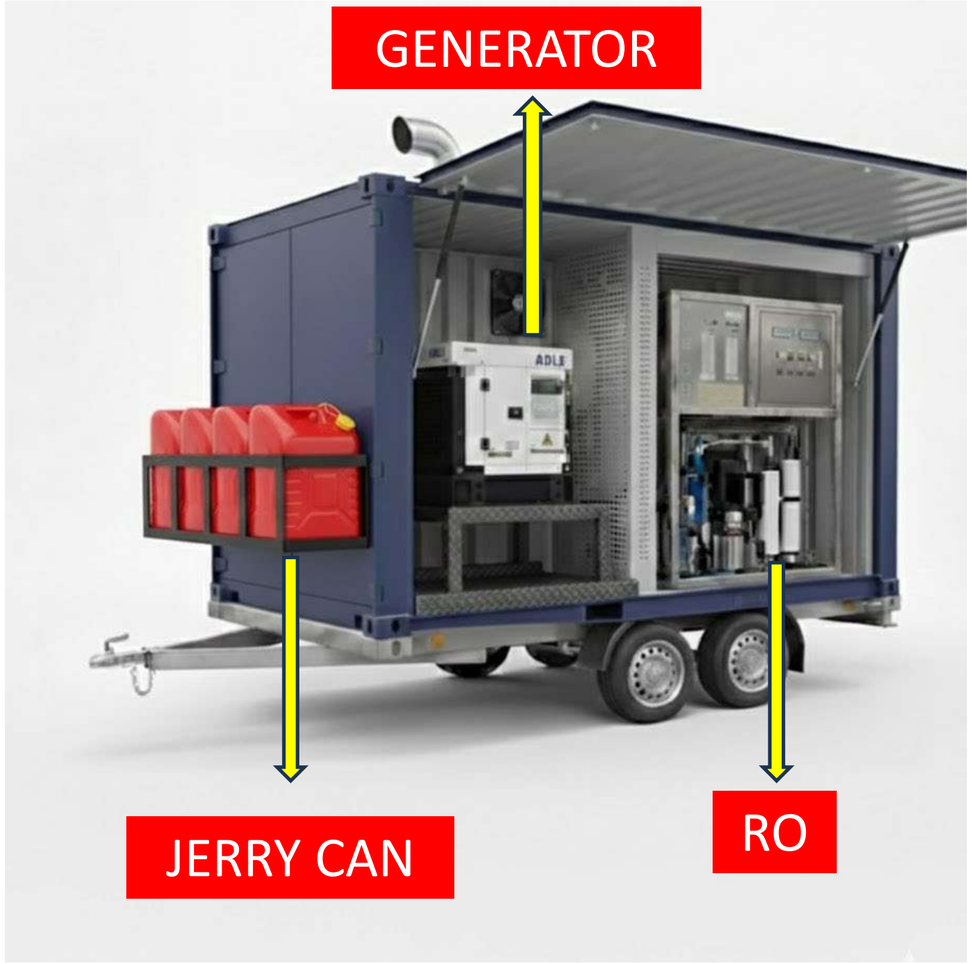
TYPES OF MOBILE RO SYSTEM (ROMES)

CRITERIA	20ft Container (ROMES 20)	10ft Container (ROMES 10)
Water Storage	Built-in Fresh Water Tank	Portable Fresh Water Tank
Mission	Longer-Term Operation, Remote Locations, but with easier access	Shorter-Term Operation, Remote Locations, with harder access
Mobility & Deployment	Fairly Easy to transport by trailer, barge or ship	Easier to transport, by trailer, barge, ship, aircraft
Type	Mobile and Permanent	Mobile and Permanent

Note : Larger sizes of RO systems are available for various applications e.g. 40 ft container, 20 ft container with external storage tank etc . **We produce customized design** according to mission, space limitations, applications etc .

ENIGMA TECHNICAL SOLUTIONS
www.EnigmaTechnicalSolutions.com

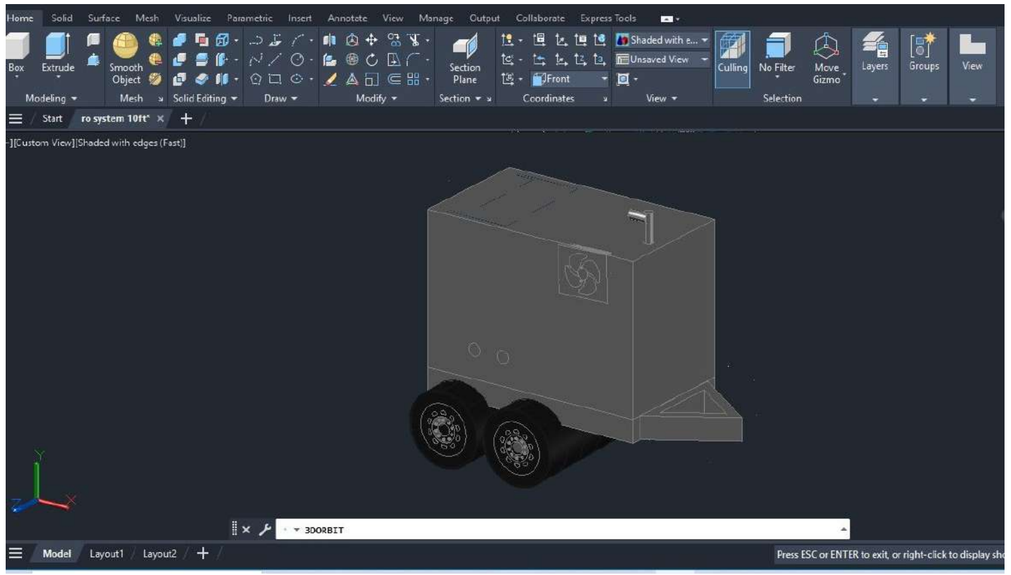
10FT CONTAINER DESIGN
(ROMES 10 SW & ROMES 10 BW)

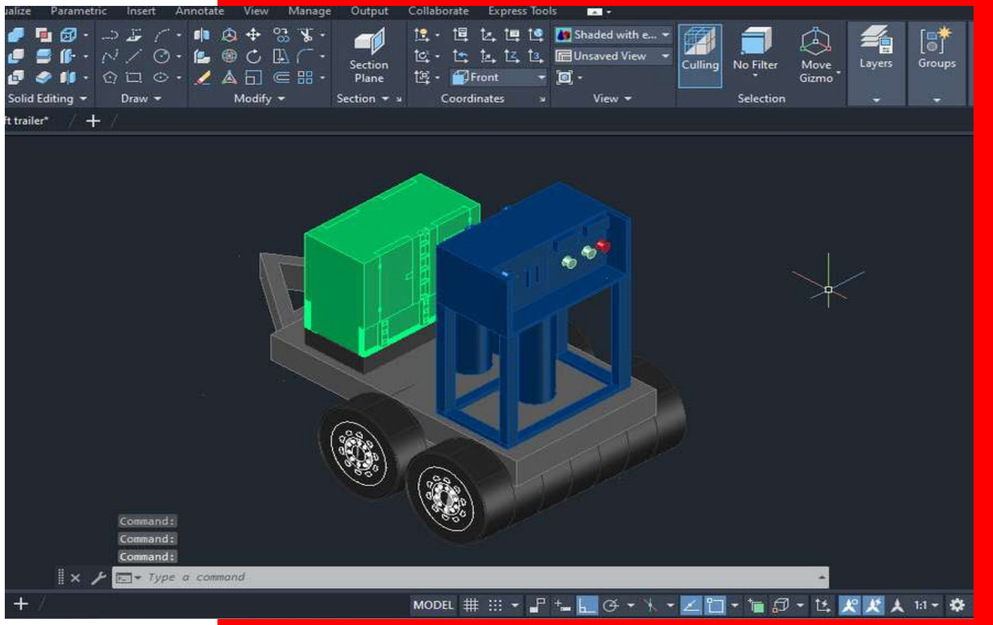


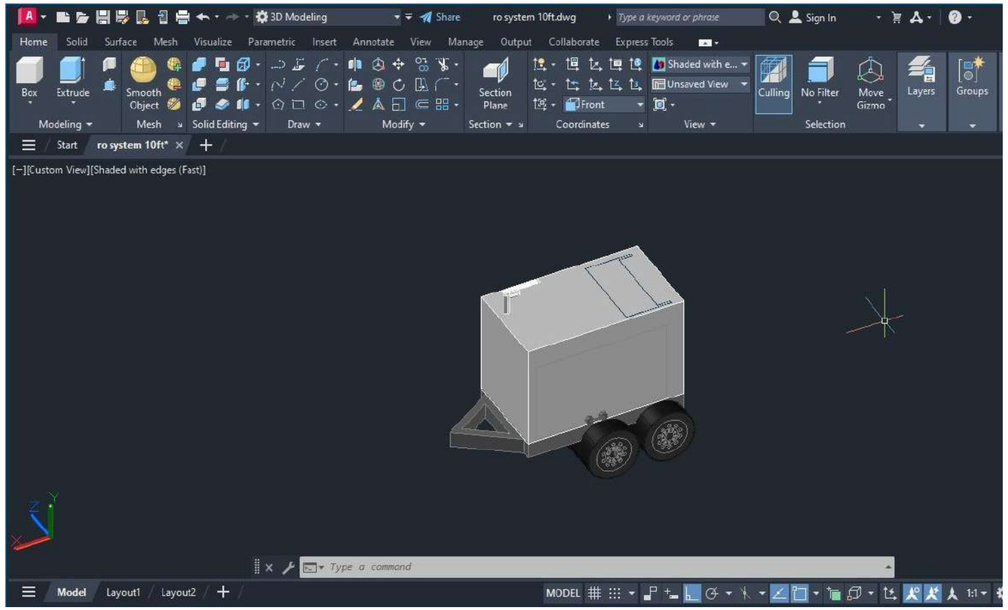


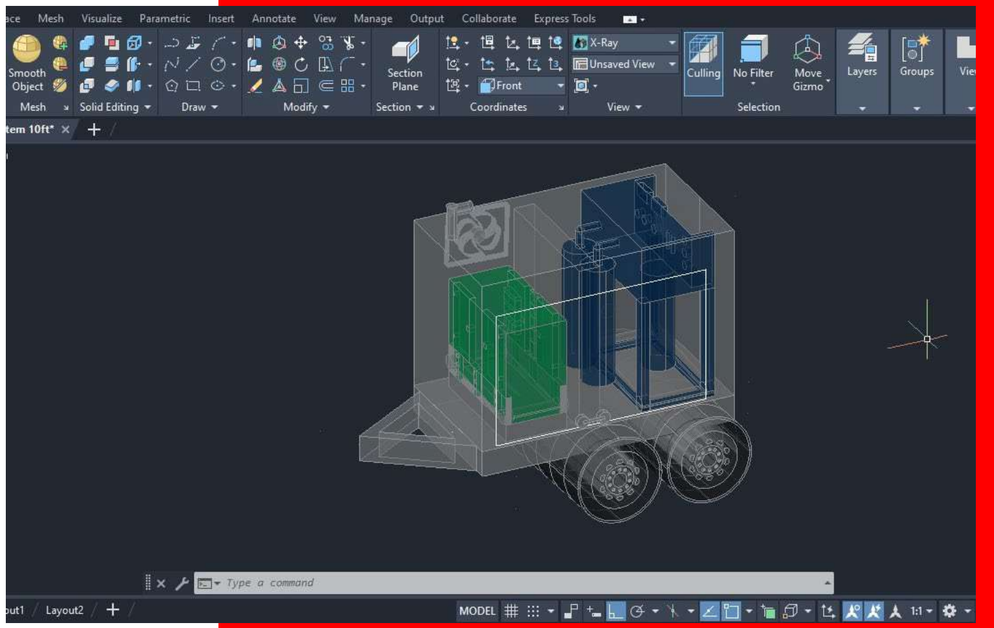
ENIGMA TECHNICAL SOLUTIONS
www.EnigmaTechnicalSolutions.com

DETAILED TECHNICAL DRAWING 10FT









ROMES 10 SW
&
ROMES 10 BW

ENIGMA TECHNICAL SOLUTIONS
www.EnigmaTechnicalSolutions.com

PORTABLE W ATER TANK





WEIGHT FOR 5000 LITRES WATER BLADER: 25KG BARE
FOLDED DIMENSION: 50cm (L) x 50cm (W) x 30cm (H)

ENIGMA TECHNICAL SOLUTIONS
www.EnigmaTechnicalSolutions.com

20FT CONTAINER DESIGN (ROMES 20 SW & ROMES 20 BW)





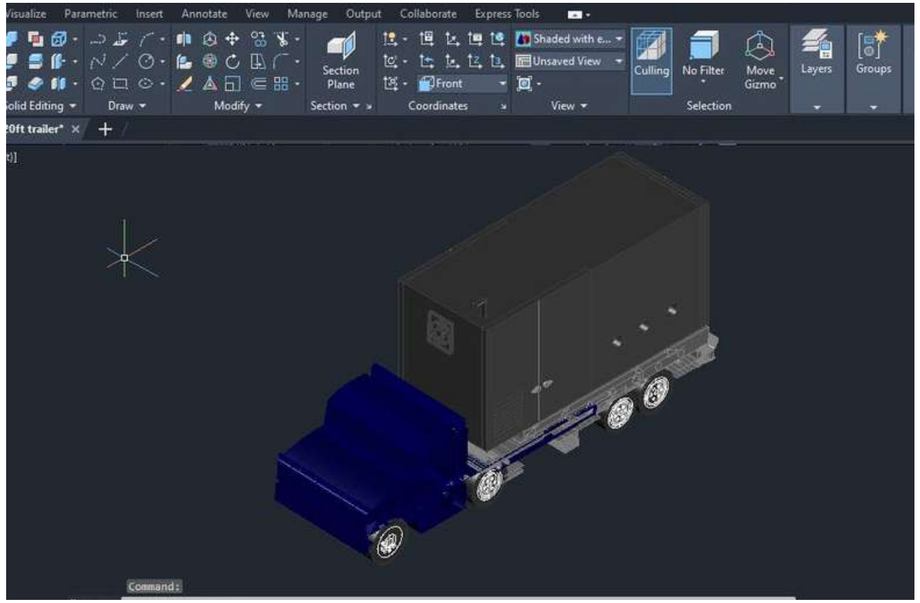
ENIGMA TECHNICAL SOLUTIONS
www.EnigmaTechnicalSolutions.com

20FT CONTAINER DESIGN (ROMES 20 SW & ROMES 20 BW)

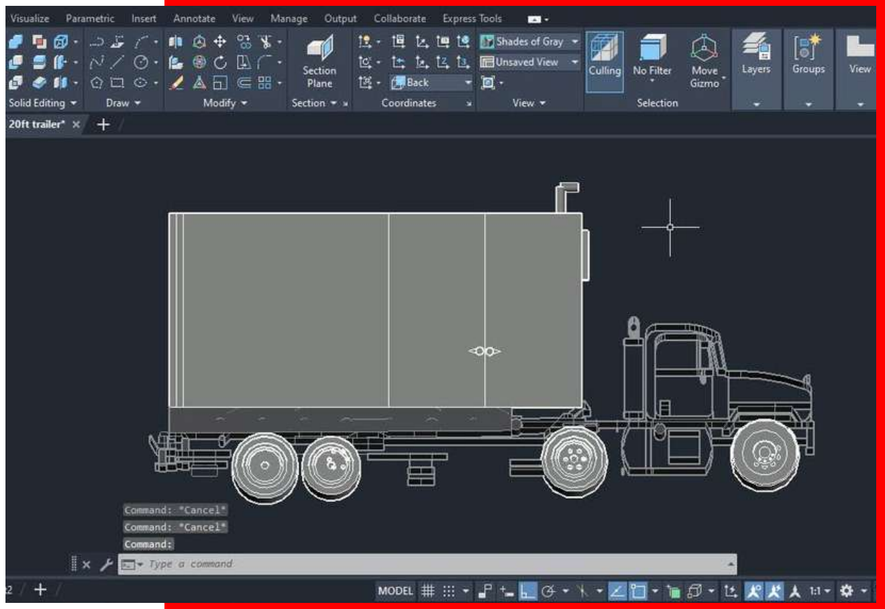


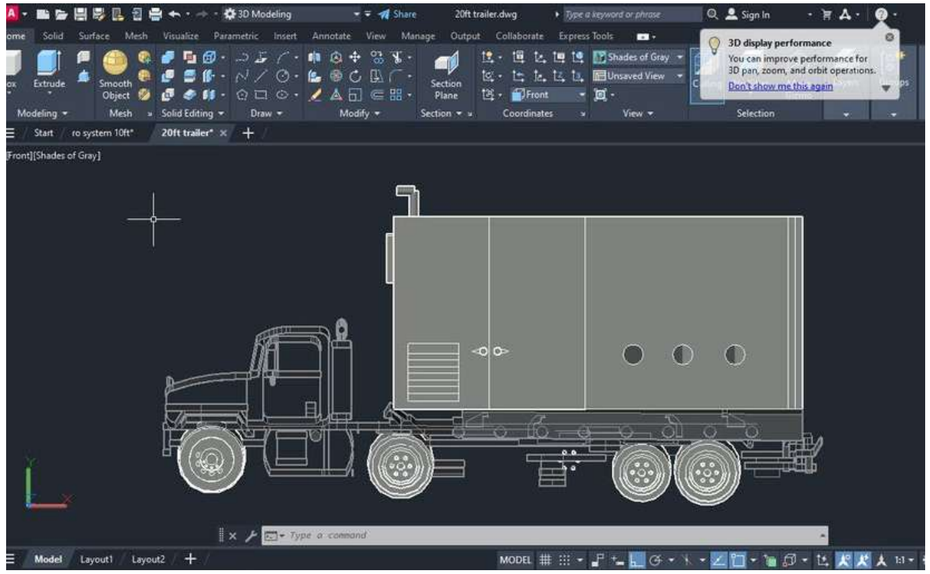


ENIGMA TECHNICAL SOLUTIONS
www.EnigmaTechnicalSolutions.com

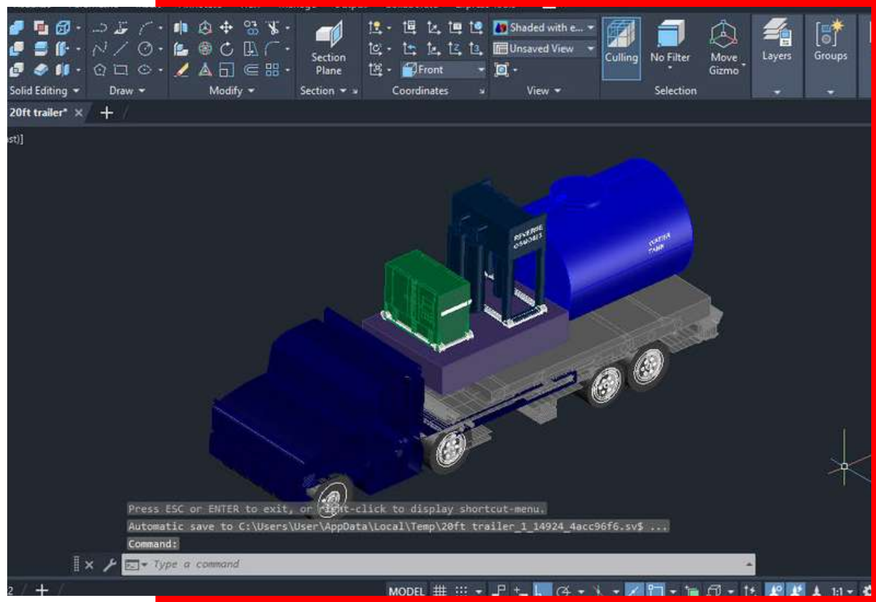


DETAILED TECHNICAL DRAWING 20FT





ROMES 20 SW
&
ROMES 20 BW



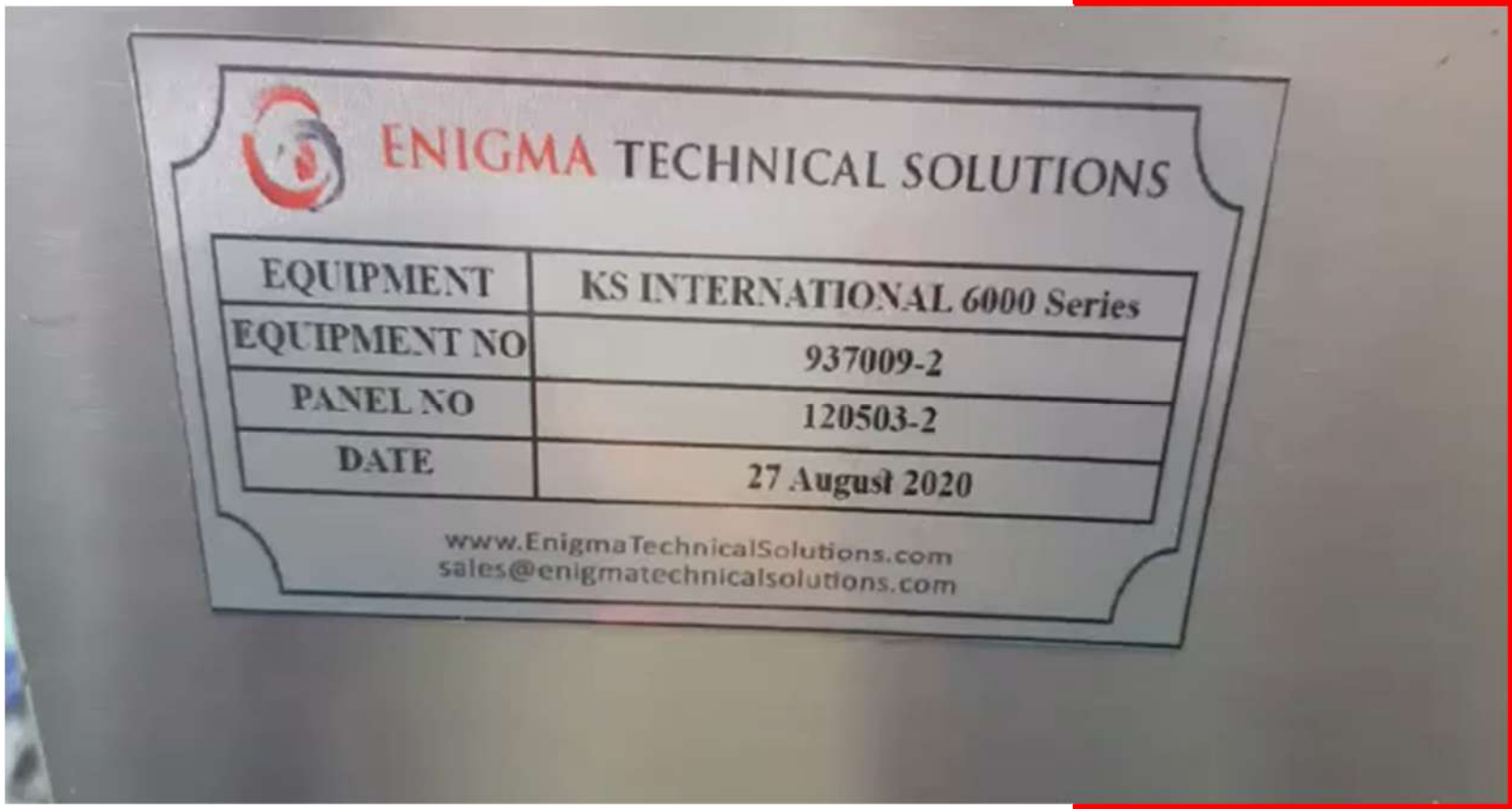
ENIGMA TECHNICAL SOLUTIONS
www.EnigmaTechnicalSolutions.com

KS INTERNATIONAL RO SYSTEM ™

SERIES	TYPE	ADVANTAGES	CERTIFICATIONS/ INSPECTIONS	TRACKRECORD
1000 SERIES TO 50000 SERIES OR MORE 1 TON/DAY TO 50 TON/DAY OR MORE	**BRACKISH WATER** REVERSE OSMOSIS (BWRO) **SEAWATER REVERSE** OSMOSIS (SWRO)	• LOCAL INDIGENOUS PRODUCT ™ • FAST AND COMMERCIALLY VIABLE SUPPORTABILITY • COMMONALITY WITH OTHER CLIENTS LOCALLY • LONG-LASTING • REDUNDANCY WITH FUEL AND ELECTRICITY • LOCALLY DESIGNED AND MANUFACTURED, WITH MAINTENANCE IN MIND	• SIRIM-QAS • SHIP CLASSIFICATION MALAYSIA (SCM) • RMN • PDRM • MMEA • VARIOUS UNIVERSITIES • VARIOUS SHIPYARDS	**SHIPS** • KD SRI PERLIS, KD LAKS MUHD AMIN, KD PAUS, KD SRI JOHOR, KD SUNDANG, KD PANAH. **ISLANDS** • STESEN UNIFORM, STESEN MIKE, STESEN SIERRA, STESEN PAPA, STESEN LIMA **FACTORY** • MINERAL WATER FACTORY (VARIOUS)

ENIGMA TECHNICAL SOLUTIONS
www.EnigmaTechnicalSolutions.com

KS INTERNATIONAL™ (6000 SERIES)



ENIGMA TECHNICAL SOLUTIONS
www.EnigmaTechnicalSolutions.com

TYPE OF GENERATORS

LUTIAN (CHINA)	BRACKISH WATER (ROMES BW RO) 5 - 10 TON/DAY	• LOW MAINTENANCE • LOW FUEL CONSUMPTION • EASY TO START • ECONOMICAL PRICE • WEIGHT: 165KG	
ABLE POWER (AUSTRALIA)	BRACKISH WATER (ROMES BW RO) 20 – 50 TON/DAY SEAWATER (ROMES SW RO) 5 – 20 TON/DAY	• LONG-LASTING • FUEL EFFICIENT • SILENCE & HEAVY DUTY • WIDELY USE AT SITE OPEN AREA • WEIGHT: 605KG	

ENIGMA TECHNICAL SOLUTIONS
www.EnigmaTechnicalSolutions.com

ROMES BW RO SYSTEMS (VARIOUS SERIES)					
Product Water Capacity/Dimension	Power Supply (Genset)	Weight (kg)	Water Full Consumption Per Person	Total Beneficiary (Person)	Total Beneficiary Drinking & Cooking Only (10 l/person)
5 ton/day (5.000l) 1.5m (L) x 1.5m (W) x 1.5m (H)	230V/1pH/50 Hz/1.1kW	170	100liter	50	500
10ton/day (10,000l) 1.5m (L) x 1.5m (W) x 1.5m (H)	230V/1pH/50 Hz/1.5kW	185	100liter	100	1000
20ton/day (20,000l) 1.8m (L) x 1.5m (W) x 1.5m (H)	415V/3pH/50 Hz/3.0 kW	230	100liter	200	2000
50ton/day (50,000l) 2.0m (L) x 1.5m (W) x 1.5m (H)	415V/1pH/50 Hz/5.0kW	380	100liter	500	5000

NOTE:

Sources: Water Consumption in a Household – WHO, GENAQ (26 Januari 2025)

ENIGMA TECHNICAL SOLUTIONS
www.EnigmaTechnicalSolutions.com

ROMES SW RO SYSTEMS (VARIOUS SERIES)					
Product Water Capacity/Dimension	Power Supply (Genset)	Weight (kg)	Water Full Consumption Per Person	Total Beneficiary (Person)	Total Beneficiary Drinking & Cooking Only (10 l/person)
5 ton/day (5,000l) 0.8m (L) x 0.7m (W) x 1.8m (H)	415V/3pH/50Hz /5.5kW	200	100liter	50	500
10ton/day (10,000l) 11.2m (L) x 0.7m (W) x 1.6m (H)	415V/3pH/50Hz /7.5kW	300	100liter	100	1000
15ton/day (15,000l) 1.2m (L) x 1.15m (W) x 1.4m (H)	415V/3pH/50Hz /7.5kW	400	100liter	150	1500
20ton/day (20,000l) 2.0m (L) x 1.2m(W) x 1.8m(H)	415V/3pH/50Hz /9.0kW	450	100liter	200	2000

NOTE:

Sources: Water Consumption in a Household – WHO, GENAQ (26 Januari 2025)

ENIGMA TECHNICAL SOLUTIONS
www.EnigmaTechnicalSolutions.com

DIMENSIONS

EQUIPMENT	DIMENSION
GENERATOR (LUTIAN)	0.95m (L) x 0.6m (W) x 0.8m (H)
GENERATOR (ABLE POWER)	1.4m (L) x 0.7m (W) x 1.1m (H)
BUILT-IN WATER TANK	2m (L) x 1.9m (W) x 1.7m (H)
PORTABLE WATER TANK (5000L)	2.5m (L) x 2m (W) x 1m (H)
CONTAINER 10FT	6m (L) x 2m (W) x 2m (H)
CONTAINER 20FT	3m (L) x 2m (W) x 2m (H)

ENIGMA TECHNICAL SOLUTIONS
www.EnigmaTechnicalSolutions.com

OPTIONS AVAILABLE TO SUIT CUSTOMERS NEEDS

OPTIONS	CONTRACT TERMS AND CHARGES
Contract of ROMES Units	• Outright Purchase • Provided “as and when” needed • Per Day/Month/Year • GOCOM • Per liter of water supplied
Rental of ROMES Units	• Provided “as and when” needed • Per Day/Month/Year • Own operated or Company Operated and Maintained
Turnkey	• To construct Infra for permanent establishment • To construct pipings and storage for permenant or semi-permanent establishment • Supply of ROMES • Commissioning of complete system

ENIGMA TECHNICAL SOLUTIONS
www.EnigmaTechnicalSolutions.com

PAST AND PRESENT EFFORTS

PDRM	• Visit by Dato' Seri Sahabudin to KD Sri Perlis to inspect the KS International RO System installed. • Visit by various PDRM units to ENIGMA workshop.
Combined Unit (ESSCOM)	• Recommended by ESSCOM to KDN for water supply contract to remote posts under ESSCOM
TLDM	• Continuous New Supply and MRO of supplied RO Systems.





KOMANDER EASTERN COMMAND
EASTERN SABAH SECURITY COMMAND [ESSCOM]
KEMENTERIAN DALAM NEGERI
LOT 1-4, CIRCULAR BLOCK B
HARBOUR TOWN COMMERCIAL COMPLEX
JALAN PANTAI
91100 LAHAD DATU, SABAH

Tel: 089-863585/013
Faks: 089-863587
Web: http://www.esscom.gov.my

No Ruj : ESSCOM/URUSETIA/100-8
Tarikh: 01 November 2022

Yang Berbahagia Dato' Sri Wan Ahmad Dahlan bin Haji Abdul Aziz
Ketua Setiausaha
Kementerian Dalam Negeri
Aras 12, Blok D1, Kompleks D,
Pusat Pentadbiran Kerajaan Persekutuan
62546 **PUTRAJAYA**

Yang Berbahagia Dato' Sri,

SOKONGAN KEPADA PERMOHONAN ENIGMA *TECHNICAL SOLUTIONS* SDN BHD BAGI SISTEM PEMBUATAN AIR TAWAR JENIS *REVERSE OSMOSIS* (RO)

Dengan hormatnya saya ingin menarik perhatian Yang Berbahagia Dato' Sri kepada perkara di atas.

2. Berlanjutan dengan perkara tajuk, sepertimana persembahan produk syarikat oleh **ENIGMA *Technical Solutions* SDN BHD** kepada ESSCOM pada 12 Oktober 2022. ESSCOM secara khususnya memperakui dan mengambil maklum terhadap keupayaan produk yang telah dipersembahkan. Semasa persembahan terdapat beberapa soalan yang telah dijawab sepenuhnya dengan penerangan lanjut yang memuaskan.

3. Sukacita dimaklumkan bahawa kami amat berpuas hati dengan persembahan tersebut serta sistem pembuatan air tawar yang dicadangkan amat bersesuaian dan menepati kehendak dan keperluan ESSCOM.

4. Oleh itu, ESSCOM menyokong penuh hasrat **ENIGMA *Technical Solutions* SDN BHD** untuk membekal, memasang, mengujiguna dan pentauliahan produk tersebut. Di samping itu juga melatih pegawai dan anggota kami yang mengendalikan produk-produk tersebut serta membuat penyelenggaraannya dari masa ke semasa.

Sekian, terima kasih.

"BERSAMA-SAMA MENJANA KESEJAHTERAAN"

(DATUK HAMZAH BIN HAJI AHMAD) DCP
Komander *Eastern Command*



Visit by PDRM Bukit Aman and various PDRM units





Courtesy Call and Presentations Commander ESSCOM



ENIGMA TECHNICAL SOLUTIONS
www.EnigmaTechnicalSolutions.com

PROPOSED MOBILE RO SYSTEMS



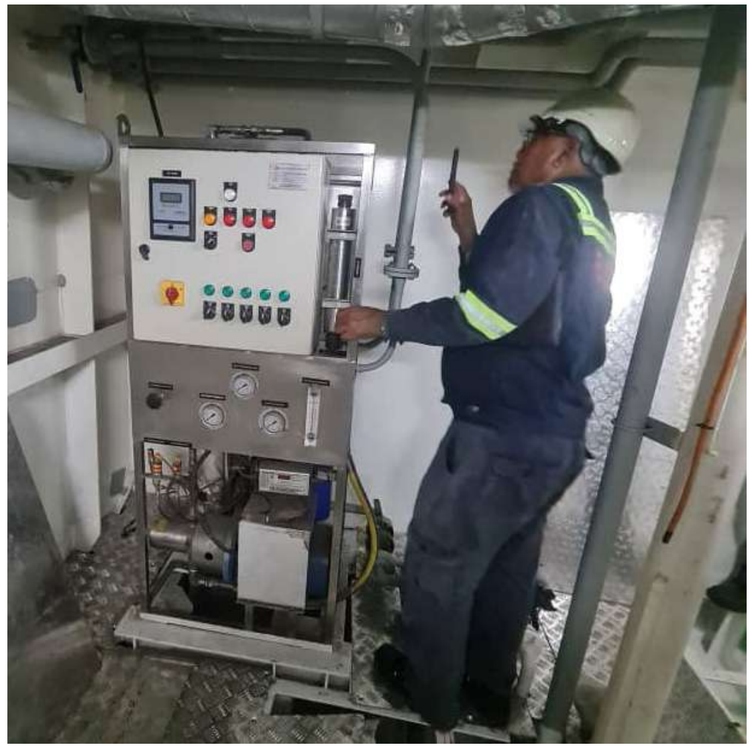


ROMES 10 & ROMES 20 MOBILITY FOR PDRM

ENIGMA TECHNICAL SOLUTIONS
www.EnigmaTechnicalSolutions.com

THANK YOU







Maintenance, Repair and Overhaul (MRO) of RO Systems by ENIGMA Team

ENIGMA TECHNICAL SOLUTIONS
www.EnigmaTechnicalSolutions.com

Q & A