RICS

EUROPEAN GPR ASSOCIATION

3D ENGINEERING SURVEYS LIMITED

Buried Utility Detection Surveys

www.3dengineeringsurveys.com

July 2019

Introduction to 3D Engineering Surveys Ltd

3D Engineering Surveys Ltd is based in the UK an established engineering surveying remote sensing and ground survey provider utilizing the latest laser; GPRS and GPR and Aerial UAV imaging surveying technology to produce highly accurate cartographic and engineering products.

3D Engineering Surveys Ltd are directed by chartered surveyors and is regulated by the Royal Institution of Chartered Surveyors, is a member of the European GPR Society, our UAV department is authorised by the CAA and our QA systems managed to ISO 9001 standards,

Having completed thousands of Kilometres of buried utility surveys for leading engineering consultancies globally 3D Engineering Surveys Ltd has developed a technique utilising a combination of the most up to date technologies to provide the most accurate results possible for our clients.

The industry standard adopted by 3D Engineering Surveys and the RICS is the PAS 128 Buried Utility Standard - www.pas128.co.uk

BSI PAS128

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Surveys to PAS 128 Specification for Underground Utility detection, verification and location

British Standards Institution PAS 128, Specification for underground utility detection, verification and location is the new publicly available specification document which allows the utility survey industry to deliver its services to a recognised level of accuracy. Although it is aimed at the survey practitioner, we understand that our clients need a know how to specify a PAS 128 survey.

Type B - Detection. This is the utility survey element of the PAS employing the use of EM and GPR survey techniques

Services Offered into GCC

3D Engineering Surveys Ltd is now a highly qualified, experienced and has the technology and software to provide the following services;

- **Ground Penetrating Radar and Radio Detection Buried Utility Surveys**
- **CCTV Pipeline Filming and Condition Surveys**

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Methodology Selection

Buried Utility Survey will involve the detection of many different objects, with varying materials sitting within a range of geophysical conditions.

Therefore for a successful detection survey it is necessary to combine information from a variety of techniques and equipment's.

The interpretation of the information provided by our experienced geophysicists and presentation of the findings to our clients ensure that 3D Engineering Surveys Ltd are able to provide unparalleled results within the industry.

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Radio Detection Survey

For the detection of metallic objects (cables) and areas of varying conductivity the Radio Detection Equipment is used

- We operate a RadiodetectionRD8000
- RD8000, the operator can store and review up to 1000 locate records
- 50Hz to 200kHz active frequency bandwidth to enable multiple bandwidth
- 7-8m detection depth.

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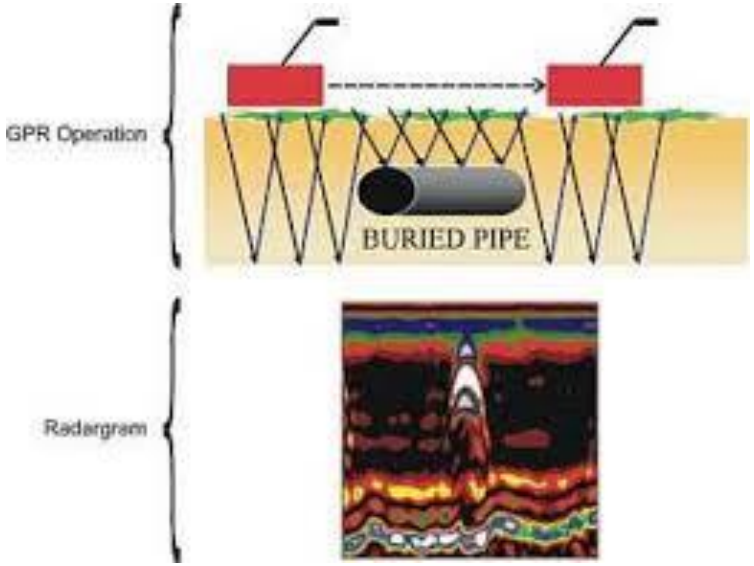
Ground Penetrating Radar

- Opera Duo GPR with Dual frequency antenna
- Electromagnetic radiation in the microwave band (UHF/VHF frequencies)
- Can be used in a variety of media, including rock, soil, ice, fresh water, pavements and structures
- Can detect pipelines and void spaces
- Can detect objects, changes in material, and voids and cracks
- Dry no conductive conditions in Oman ensure optimum penetration of detection – potential of 5m observations



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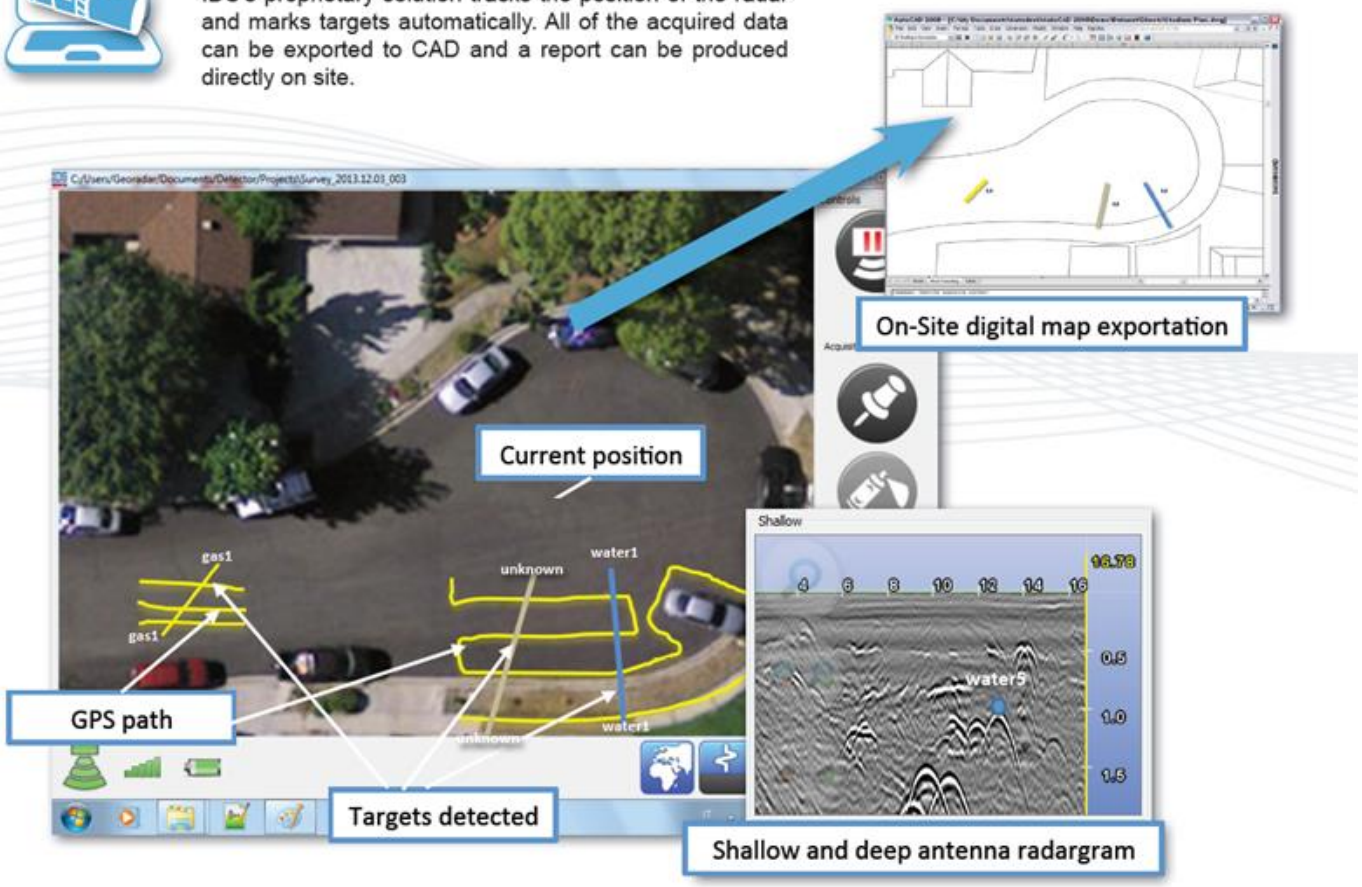
Ground Penetrating Radar

- **IDS Opera Duo GPR with Dual frequency antenna**
- **Grid Line Survey technique with built in GPS positioning system**

Results delivered on site

IDS's proprietary solution tracks the position of the radar and marks targets automatically. All of the acquired data can be exported to CAD and a report can be produced directly on site.



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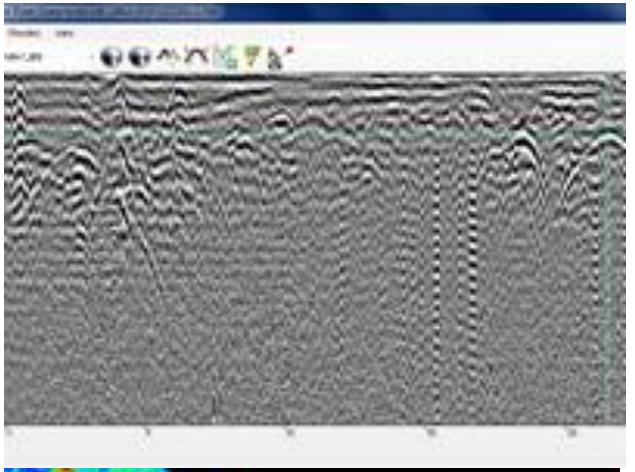
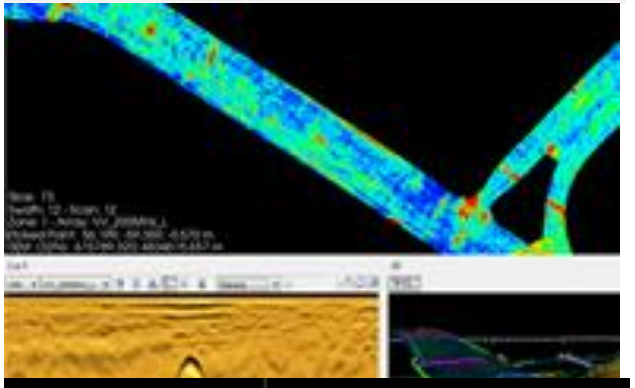
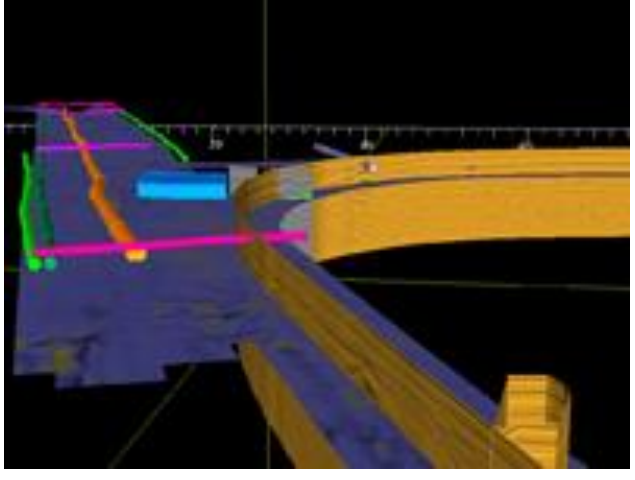
GPR data is post-processed in GRED
HD 3D CAD provides highly interactive and efficient management of large quantities of data. The results can be transferred to CAD (AutoCAD or Microstation) or GIS either by using an interactive link or at the end of the work session; in the latter case, the GEOMAP module automatically generates the final cartographic output.

Additional functions:
CAD, GIS exportation of GPR data and target
Synthetic map (only for the Stream family of products)

All radio detection data is marked in the field and surveyed conventionally, then added to the 3D model.



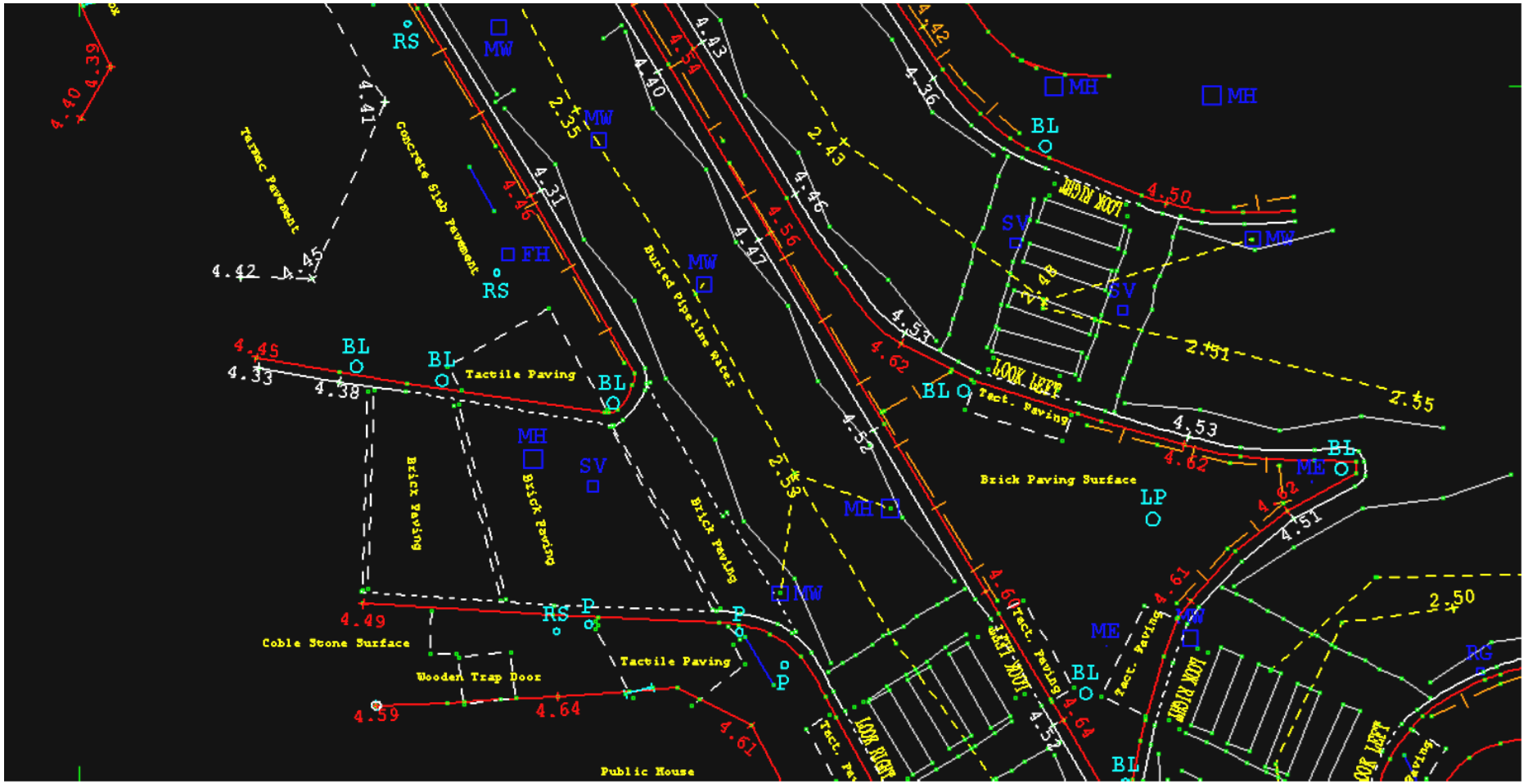




LiDAR, Conventional and GPR

Our results can be displayed within 3D AutCAD drawings combined with above ground structures and features

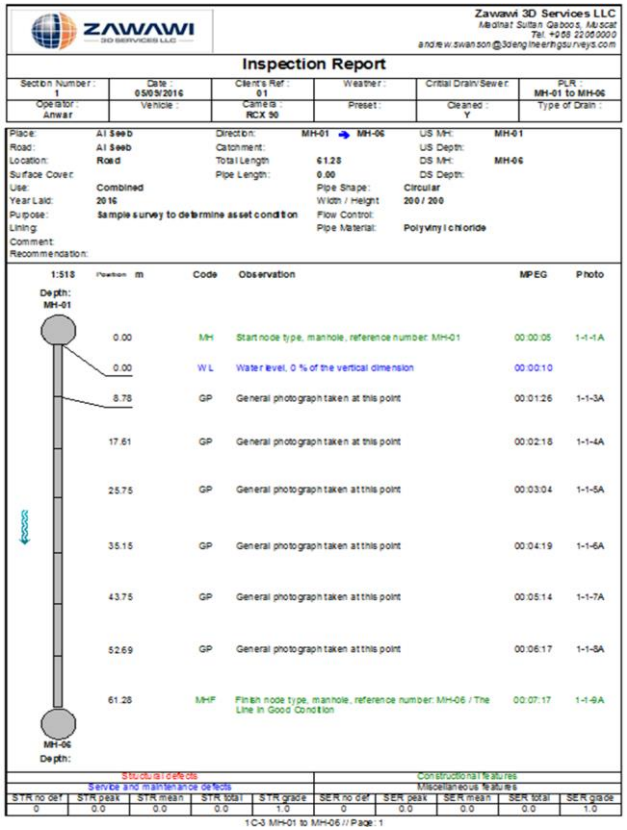
Combination of GPR; GPS and Lidar Survey
Battersea Bridge Road, London 2012 Olympics



CCTV Pipeline Filming & Inspection Surveys

3DES has the hardware and software to complete CCTV filming surveys reporting on the inclination and condition of buried wastewater pipelines

Each video is accompanied with a report offering video pipeline gradient and circumference measurements as well as condition assessment.



ZAWAWI 3D SERVICES LLC

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Inspection Report

Section Number :	Date :	Client's Ref :	Weather :	Critial Drain/Sewer :	PLR :
1	05/09/2016	01			MH-01 to MH-06
Operator :	Vehicle :	Camera :	Preset :	Cleaned :	Type of Drain :
Anwar		RCX 90		Y	

Place:	Al Seeb	Direction:	MH-01 → MH-06	US MH:	MH-01
Road:	Al Seeb	Catchment:		US Depth:	
Location:	Road	Total Length:	61.28	DS MH:	MH-06
Surface Cover:		Pipe Length:	0.00	DS Depth:	
Use:	Combined		Pipe Shape:	Circular	
Year Laid:	2016		Width / Height	200 / 200	
Purpose:	Sample survey to determine asset condition		Flow Control:		
Lining:			Pipe Material:	Polyvinyl chloride	
Comment:					
Recommendation:					

1:518	Position m	Code	Observation	MPEG	Photo
Depth: MH-01					
	0.00	MH	Start node type, manhole, reference number: MH-01	00:00:05	1-1-1A
	0.00	WL	Water level, 0 % of the vertical dimension	00:00:10	
	8.78	GP	General photograph taken at this point	00:01:26	1-1-3A
	17.61	GP	General photograph taken at this point	00:02:18	1-1-4A
	25.75	GP	General photograph taken at this point	00:03:04	1-1-5A
	35.15	GP	General photograph taken at this point	00:04:19	1-1-6A
	43.75	GP	General photograph taken at this point	00:05:14	1-1-7A
	52.69	GP	General photograph taken at this point	00:06:17	1-1-8A
	61.28	MHF	Finish node type, manhole, reference number: MH-06 / The Line in Good Condition	00:07:17	1-1-9A
Depth: MH-06					

Structural defects					Construction features				
Service and maintenance defects					Miscellaneous features				
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

1C-3 MH-01 to MH-06 // Page: 1

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3D SERVICES LLC
EUROPEAN QUALITY

Benefits of Utilities Detection Survey

- Our rates our at 1USD per square meter which is a lot less than the cost of excavation machinery destroying cables and pipelines in an Oil & Gas environment

- 3D Engineering Surveys Ltd is member of the Royal Institute of Chartered Surveyors – the global leader within our industry

- IDS Software ensures our deliverables are compatible with common software packages such as Autocad and Microsation

Previous Clients within Petrochemical Industry Include