

G4C Wales

Cardiff International White Water Centre

Indoor Surfing

23rd October 2013

ADEILADU
ARBENIGRWYDD
YNG NGHYMURU



CONSTRUCTING
EXCELLENCE
IN WALES

Agenda

- 6.00pm - Welcome G4C Wales
- 6.05pm - Jon Williams – WRW Construction
- 6.15pm - Chris Lynn – Troup Bywaters + Anders
- 6.25pm - Chris Hadfield – CIWW
- 6.40pm – Flowrider demonstration
- 6.55pm - Business card draw
- 7.00pm - Refreshments & Networking
- 7.30pm - Close



Andrew Gibson

Chair

G4C Wales

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Adeiladu ar Ansawdd - Building on Quality

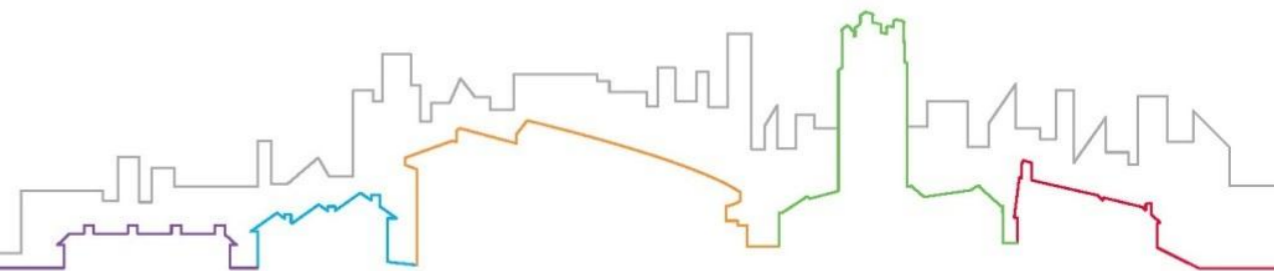


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www.wrw.co.uk

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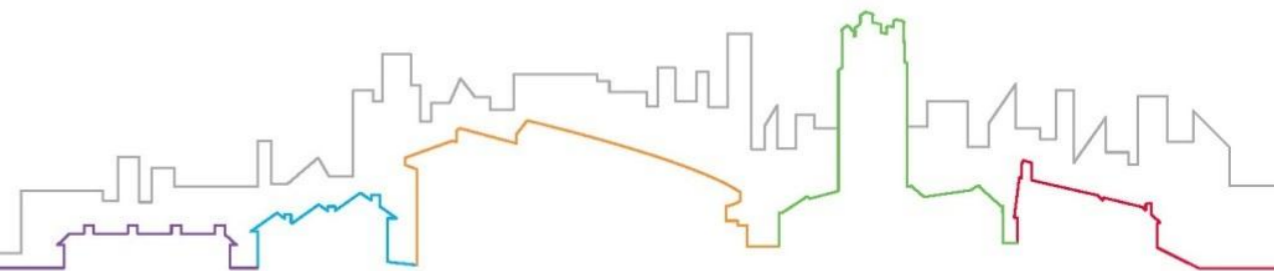


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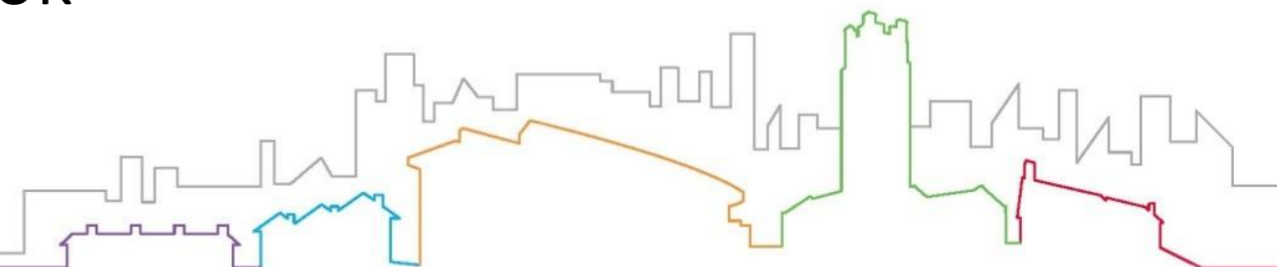
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Project Overview

- ❑ £1.88m JCT Design and Build Contract
- ❑ 46 Week Build Period
- ❑ Procured through SEWSCAP Framework
- ❑ Cardiff County Council acted as Client
- ❑ Contractor led design team
 - Austin Smith Lord, Bingham Hall Partnership, Troup Bywaters and Anders
- ❑ First purpose built Flowrider[®] facility in the UK



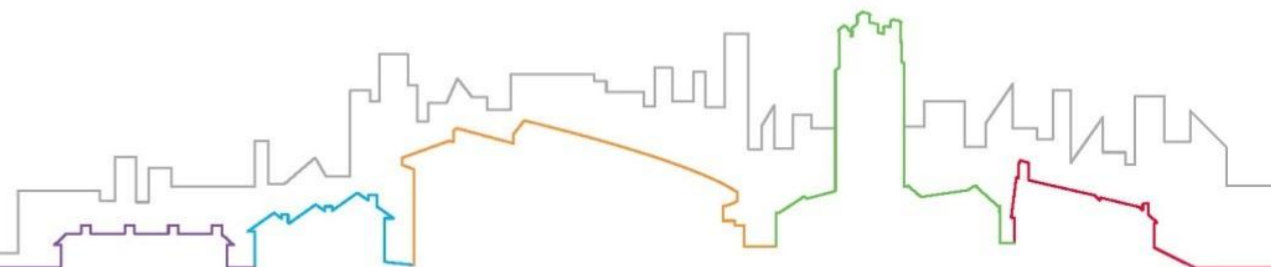
Challenges

❑ Location

- Existing pile location due to remediated land
- Working on a live site
- Working on a constrained site

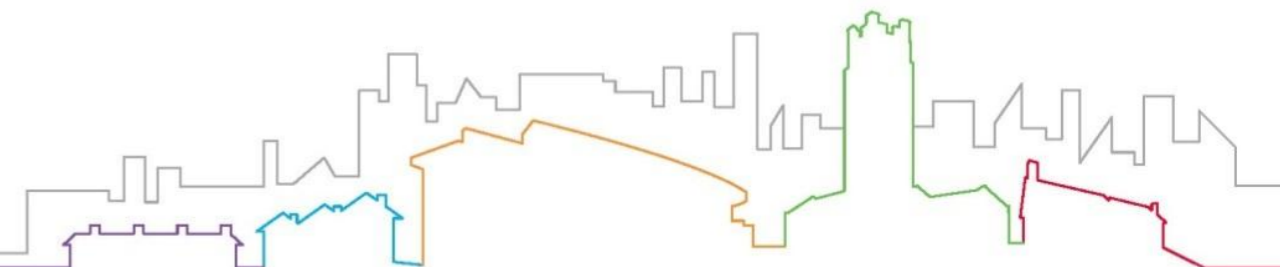
❑ Specialist Equipment

- Canadian parent company + UK reseller + construction contract = Confusion



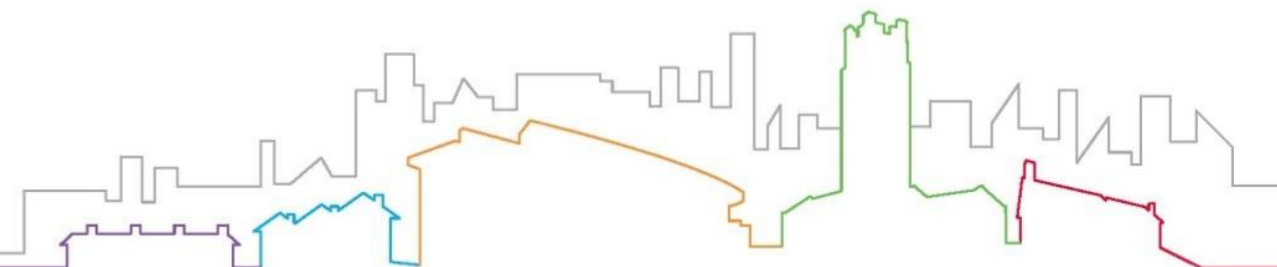
Challenges

- ❑ Live and constrained site
 - Utilised Hoard-it[®] closed panel board system
 - Security gates and manned entrance
 - Clear signage



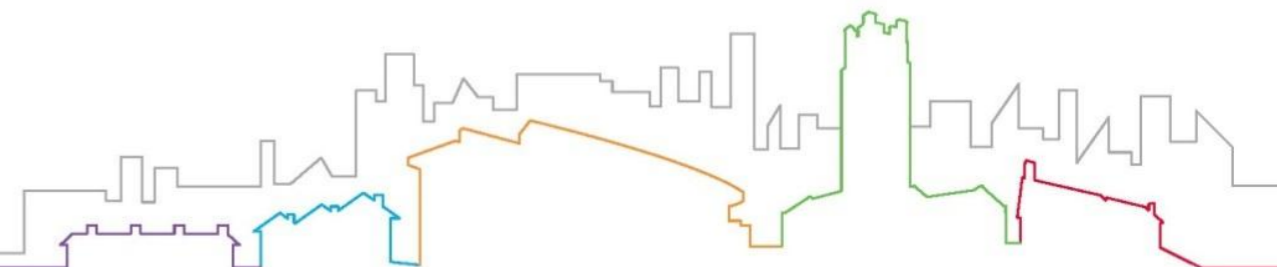
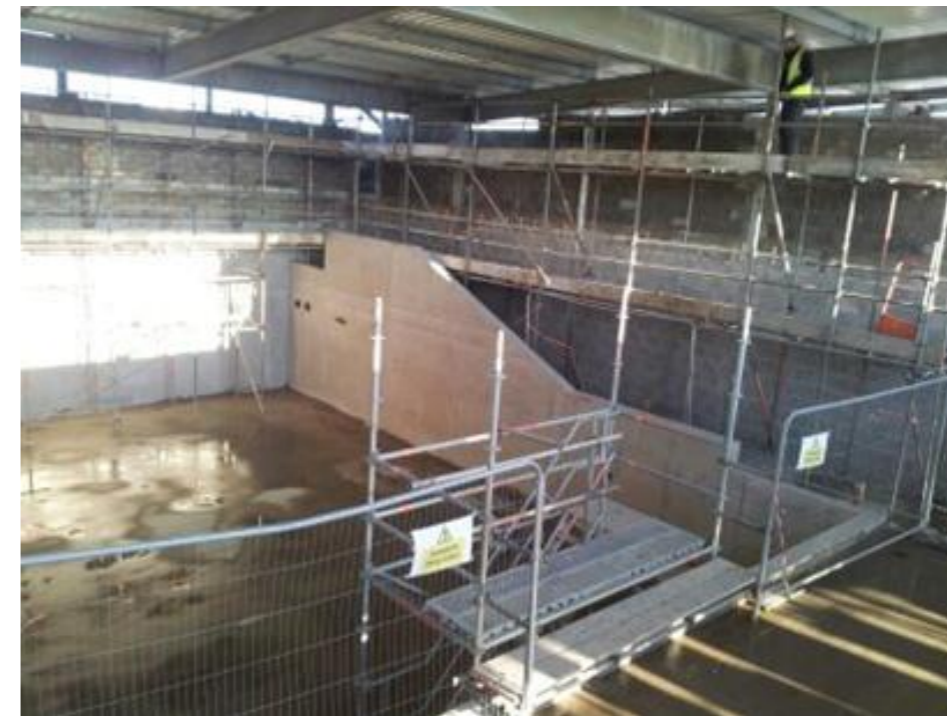
Challenges

- ❑ Live and constrained site
 - Heras fencing once developed for safe public viewing
 - Stacked Cabins due to space premium
 - Clear signage



Challenges

- ❑ Specialist Install – The Flowrider
 - Pre determined fixing points - avoid reinforcement
 - The pit comes first!



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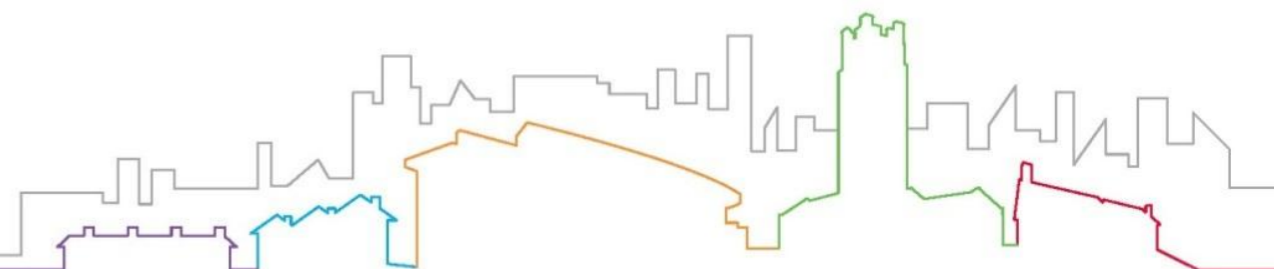


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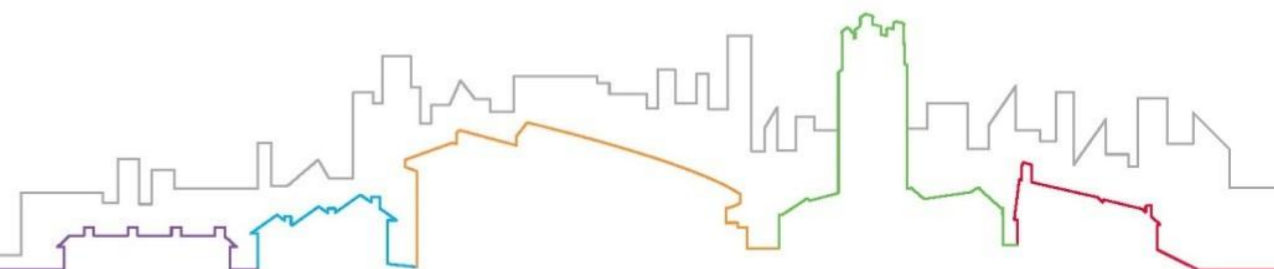


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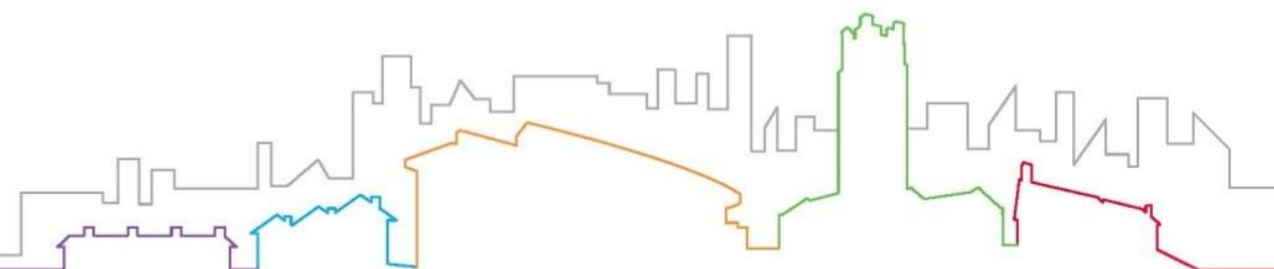


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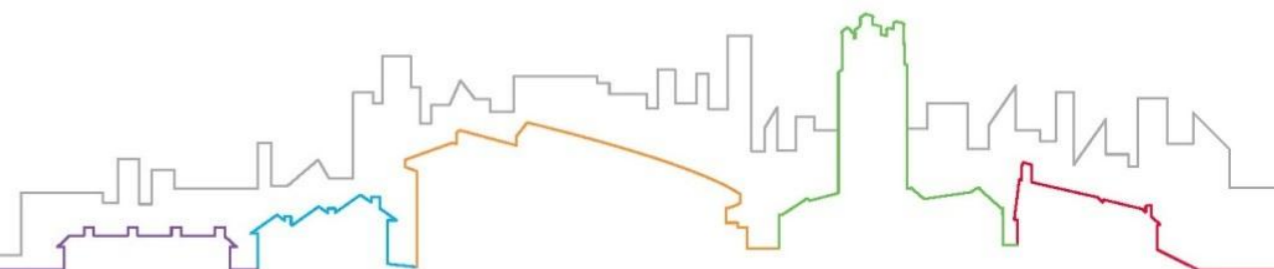


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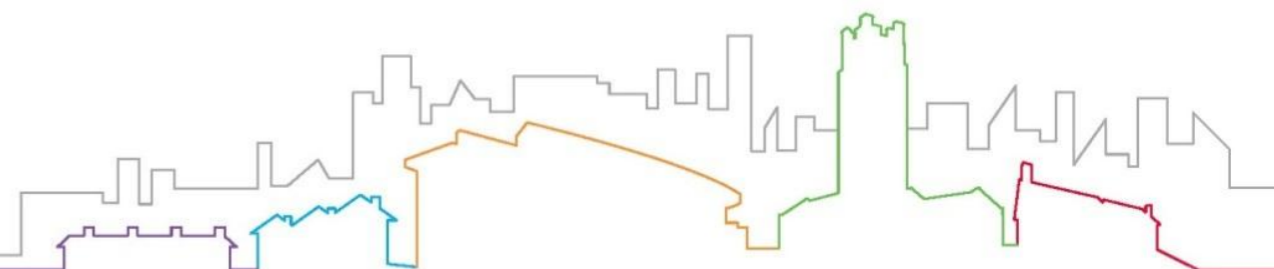


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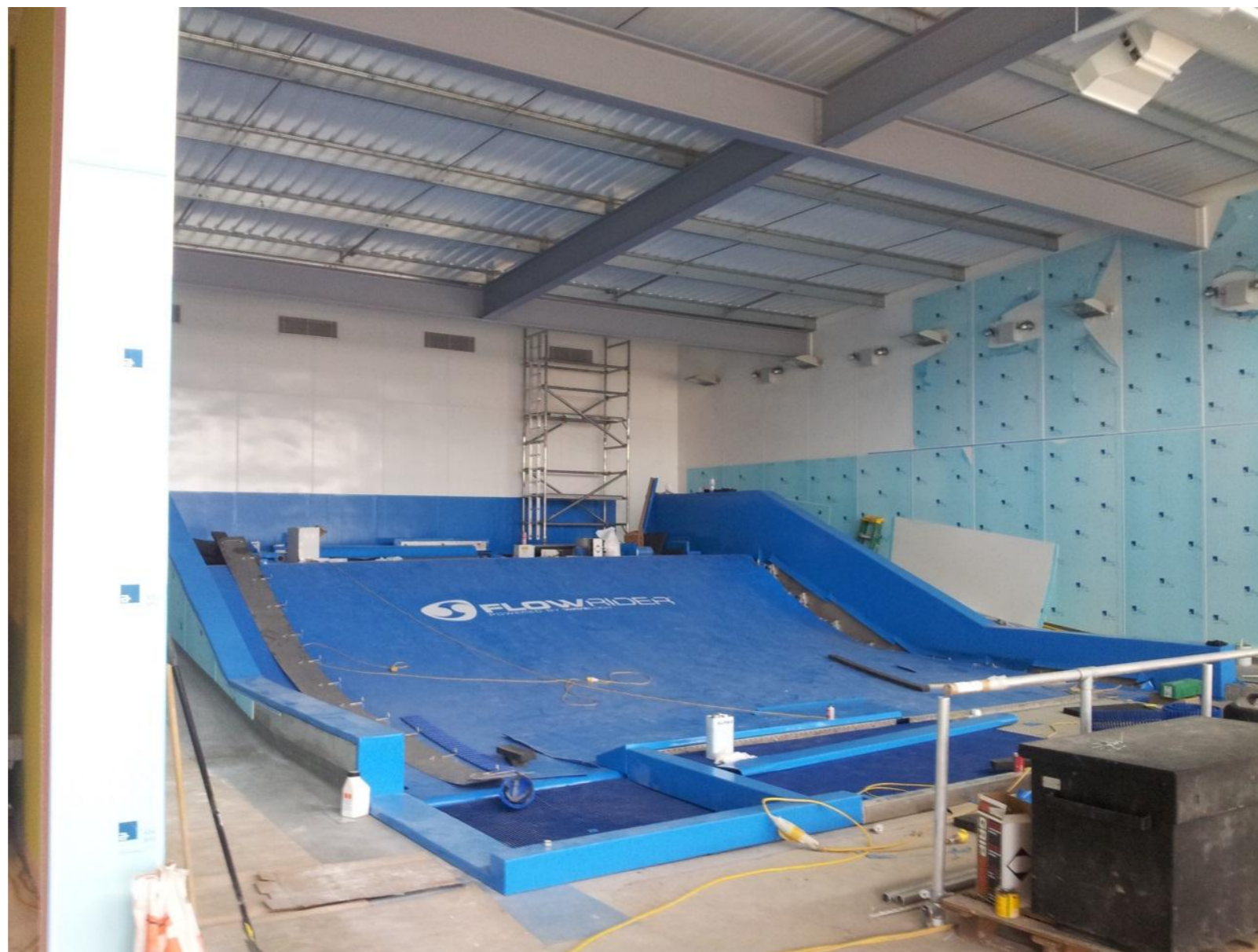


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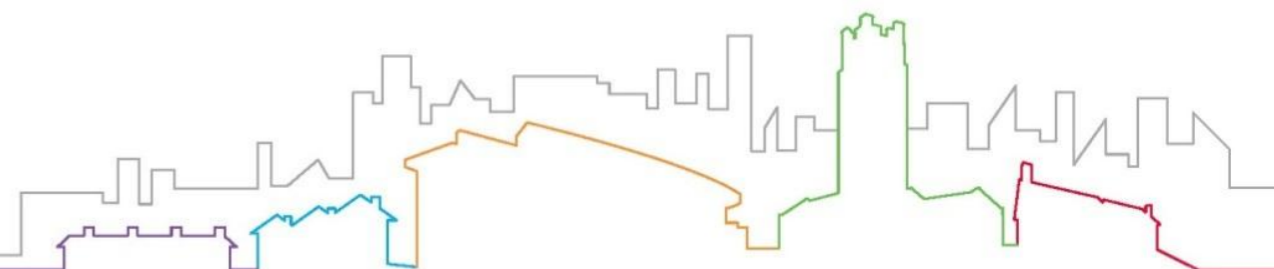


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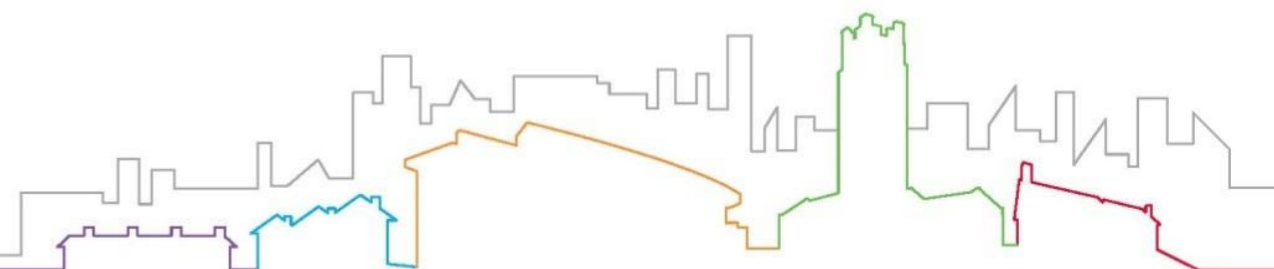


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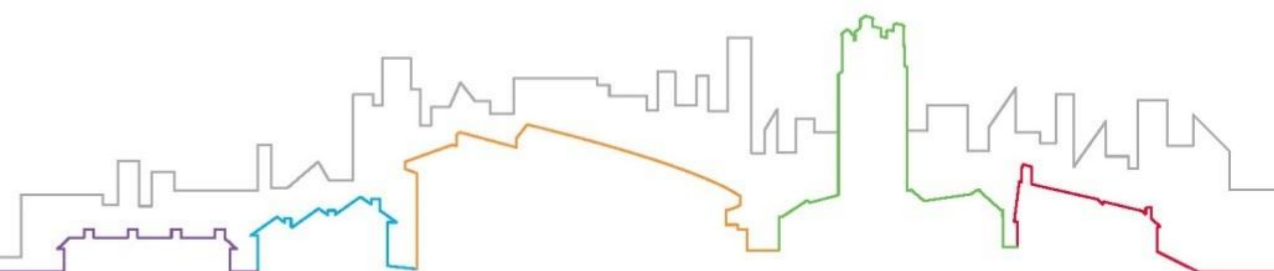


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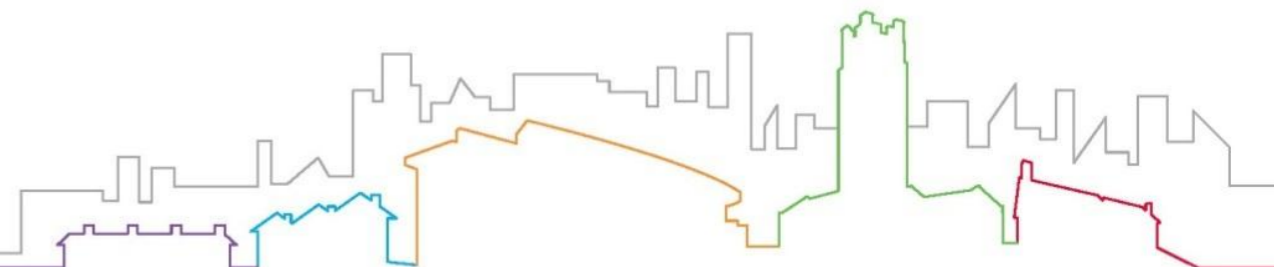


Economic Drivers

❑ Project was subject to measurement using Welsh Government Sustainable Benefits Tool and SEWSCAP Project deliverables

- 62% of spend within Welsh Companies (Flowrider accounted for 28%)
- Of 62%, 98% spent with Welsh SME's (43 of 45 Companies)
- £3,123,370 Generated for the Welsh Economy

❑ Since Completion WRW continues to support CIWW as a Commercial Partner





TROUP
BYWATERS
+ ANDERS

Working together

Bringing buildings to life

Chris Lynn

Project Director - Mechanical, Electrical & Energy Systems

Introduction











Dod â adeiladau i fywyd | Bringing Buildings to Life

TROUP
BYWATERS
+ ANDERS



MECHANICAL

- Water supplies
- Heating
- Ventilation
- Air conditioning
- Hot and cold water
- Above ground drainage

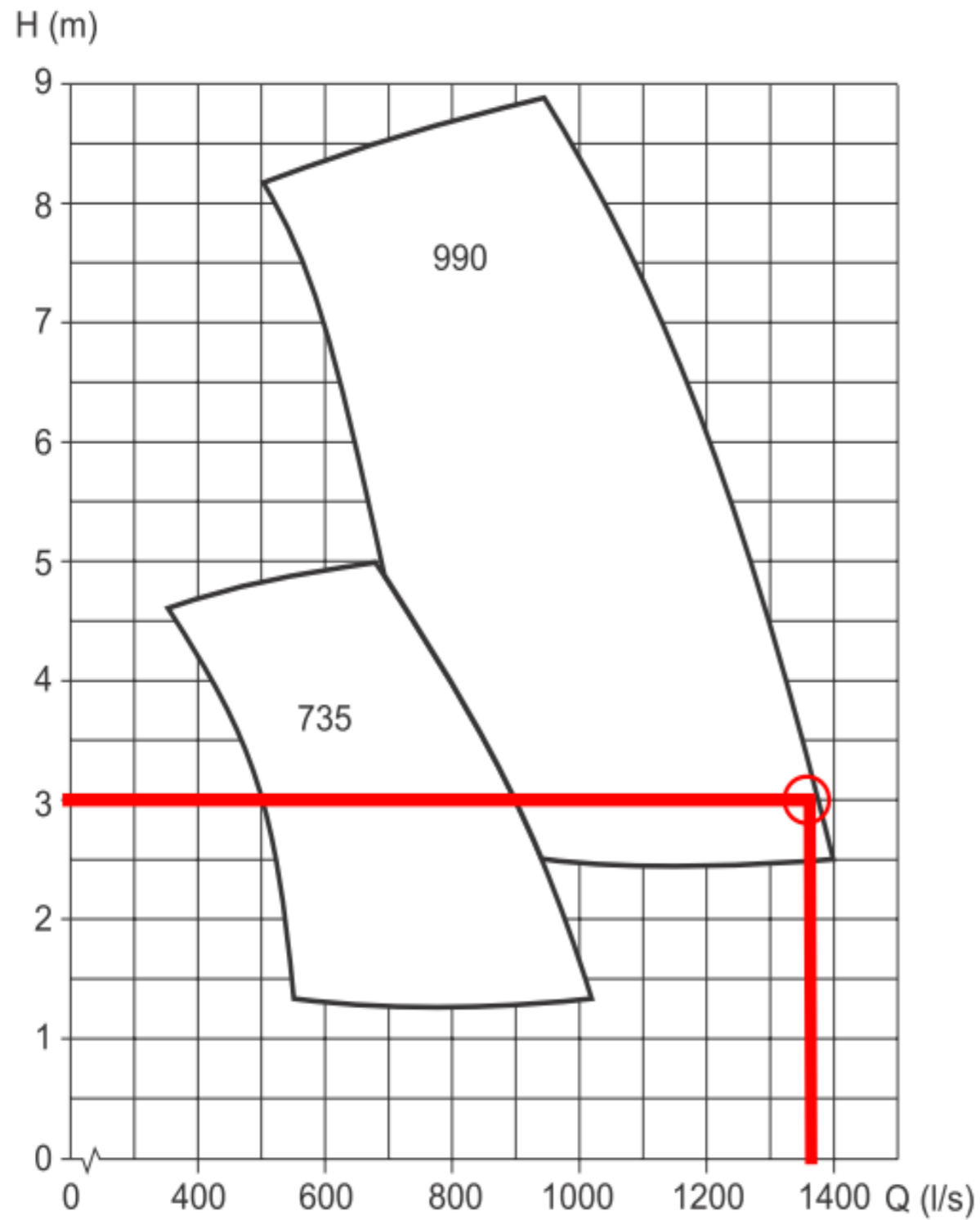
ELECTRICAL

- Power supplies
- Small power
- Lighting & emergency lighting
- Fire detection & alarms
- Security
- Lightning protection

ENERGY

- Energy analysis
- Building Thermal analysis/modelling
- Building Regulations compliance (Part L, power & fuel conservation)
- Low and Zero Carbon Technologies

Water Flow



Each pump = $1.38 \text{ m}^3/\text{sec}$
Total flow = $2.76 \text{ m}^3/\text{sec}$



Water Flow

Each pump = $1.38 \text{ m}^3/\text{sec}$
Total flow = $2.76 \text{ m}^3/\text{sec}$



+



=

every
second

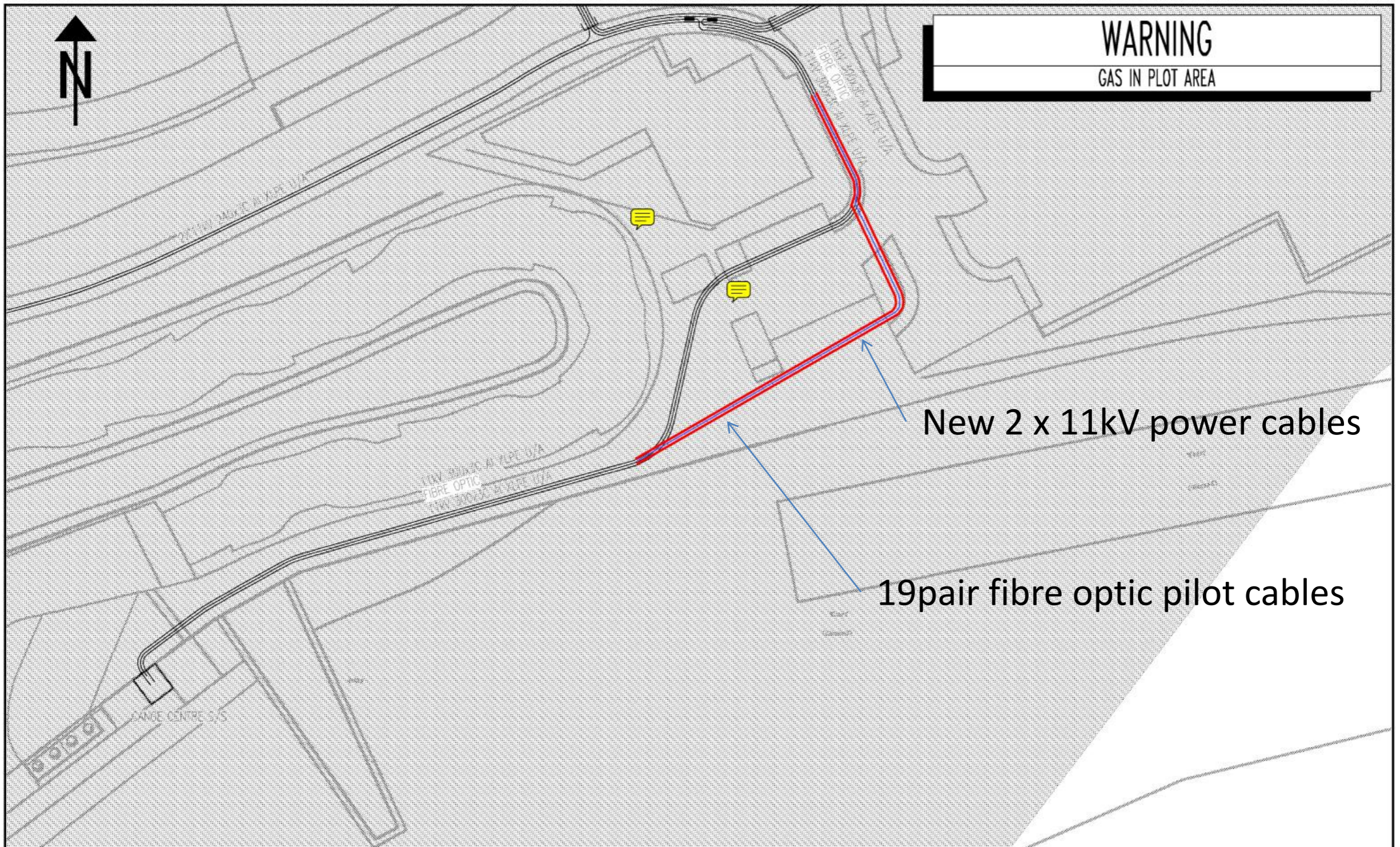
Boot capacity of a large
estate car = 1.6 m^3

Water Supply

- Water storage tank of circa 221,000 litres
- Backwash process programmed to occur out of hours satisfying Welsh Water restrictions and responding to dirty filters.
- 'Top-up' water to replenish tank.



Electrical Power



New 2 x 11kV power cables

19pair fibre optic pilot cables

WARNING
GAS IN PLOT AREA

NORMAL DEPTH TO THE TOP OF THE CABLE WHEN LAID				
	services	lv.	h.v.	e.h.v.
FOOTPATH	0.40m	0.45m	0.60m	0.75m
ROAD CROSSING	0.60m	0.60m	0.75m	0.80m
lv./services	- up to 1000V.			
h.v.	- over 1000V. to 11,000V.			
e.h.v.	- 22,000V. to 132,000V.			

WARNING

There may have been subsequent alterations to the surface levels. Trial holes must be taken to determine positions and depth of cables. BS 1044 Part 4P Booklets from the Health and Safety Executive - Avoiding Danger from Buried Cables - should be consulted before commencing excavation work. (available from HNSO)

WHEN WORKING IN THE VICINITY OF OVERHEAD LINES THE HEALTH AND SAFETY GUIDANCE NOTE 656 SHOULD BE CONSULTED. (AVAILABLE FROM HNSO)

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Registered in Scotland No 117119
Registered Office: Investment House
210 Dundas Road,
Perth, PH1 9AQ

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Scottish and Southern Energy

H.V. MAINS RECORD
Mapping Services Unit
01256 337294

Grid Ref: ST17967280
Scale: 1:500
Date: 02/04/2012

Electrical Details of Project:

Substation Rating: 1,500 kVA

Type of motor starting:

Variable Frequency Drives (i.e. VFD).

Special Scottish & Southern Electricity (SSE)

Requirement:

- Restrictions on Starting of Pumps/Motors
- Six motors (4 x 350kW existing and 2 x 90kW proposed)

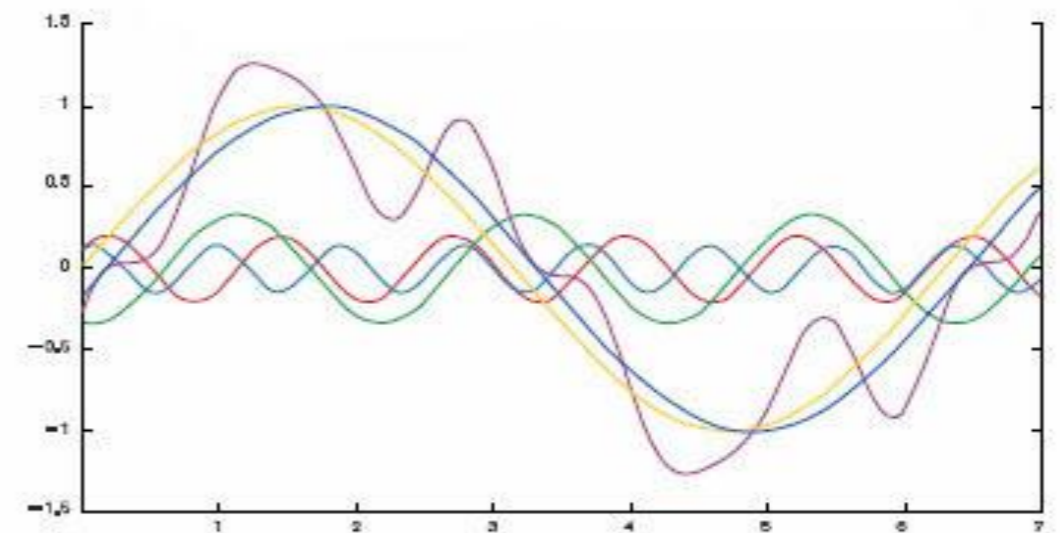
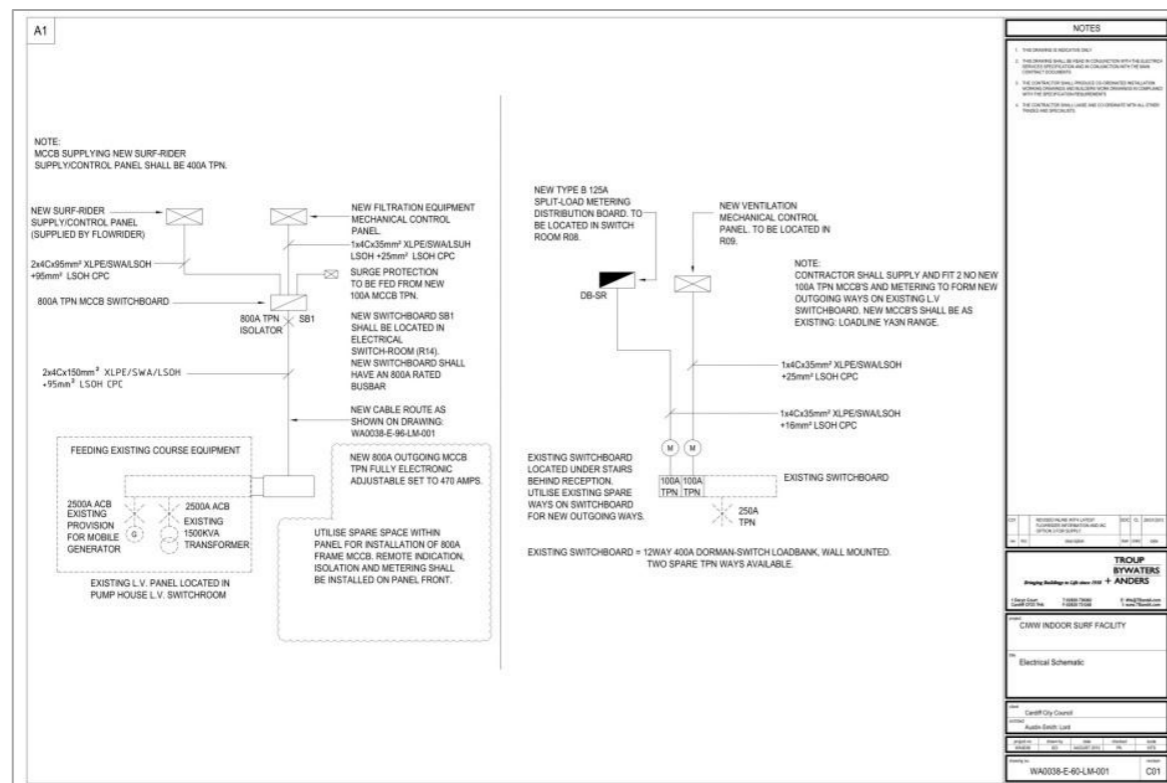


Achieving SSE Requirements:

- Discussions with users
- Controls programmed to 'lock off' the 4th existing 350kW pump while the 2 new 90kW pumps are in operation
- Protects the transformer from overload and systems fluctuations back on to the national power grid.

Harmonic Distortion Limits:

- Electricity Association Engineering Recommendation G5/4 "Planning levels for harmonic voltage distortion and the connection of non-linear equipment to transmission systems and distribution networks in the United Kingdom".



Electrical waveform with harmonic distortion

- 4no. existing 350kW pumps fitted with Harmonic Filters on each individual pump
- Harmonics distortion survey undertaken
- Additional 2no. new 90kW pumps (for the Flowrider) would exceed permitted limits (EA G 5/4).
- This necessitated the requirement for harmonic filtration of the 2 new pumps.
- Passive filters selected as optimum cost efficient method

Thank You

Troup Bywaters + Anders

3 Park Place

Cardiff

CF10 3DP

 +44 (0) 029 2000 3760

www.tbanda.com

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