

buildoffsite

Innovation in MEP – delivering customer value

Host: Karen Shanks, Buildoffsite
Speakers: David Bradley, E+I Engineering Group
Phil Henry, Polypipe
Paul Hopps, Apex Wiring
Mark Watkins, NG Bailey







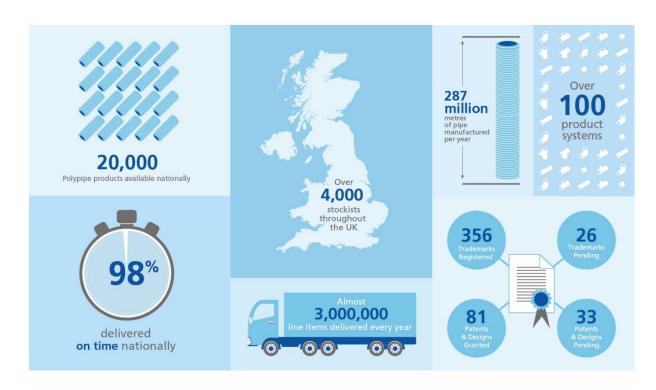


Off Site fabrication

A manufacturers view



Polypipe



POLYPIPE IS ONE OF EUROPE'S
LARGEST MANUFACTURERS
OF PIPING SYSTEMS, WATER
MANAGEMENT SOLUTIONS AND
ENERGY-EFFICIENT VENTILATION
SYSTEMS, DELIVERING
ENGINEERED SOLUTIONS
THAT RESPOND TO A RAPIDLY
CHANGING ENVIRONMENT.



Polypipe –Our Partners











Manualice



Polypipe



Industry challenges

- CITB estimates that the UK will require 224,000 workers over the next 5 years.
- The UK is expected that 220,000 workers will retire in the next 5 years
- Construction industry skills challenge

Fabrication Service



Cost Analysis Overview Report

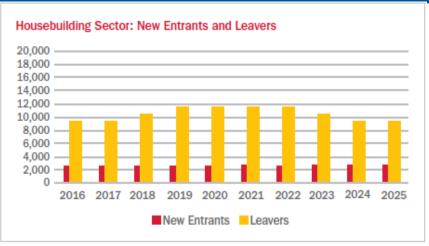
@ Polypipe



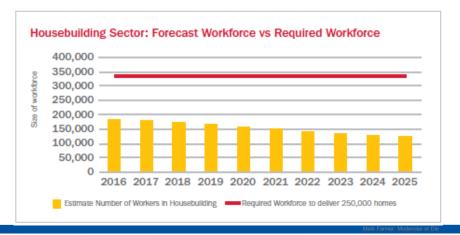


SKILLS SHORTAGE

Our industry is facing a huge skills shortage. There are more people retiring from the construction industry than there are entering. Brexit and the continuous increase in housing demand will only put more pressure on this issue.



Mark Farmer: Modernise or Die





Off site - Considerations

- Cost predictability (material & Labour)
- Detailed design-upfront
- Reduced health & safety risks
- Speed on installation
- Installation pre-testing advantages
- Better use of skilled work force on site

- Detailed information required before fabrication
- Manufacturing and innovation
- 21 days design and fabrication period
- Compatibility of component connections-'Outcomes'
- Understand and agreed language of the digital platform to be used











MAKING A CASE FOR FABRICATED SOLUTIONS -THE REPORT

First ever third party 360 degree review

- Based on typical high rise residential development in London
- 360 apartments over two 22 and 23 storey towers

Sets out:

- Material costs
- Labour costs including:

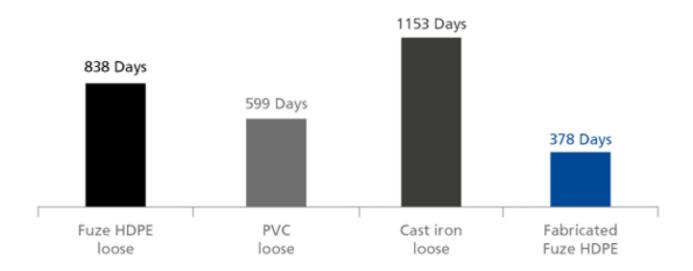
Inductions
Supervision
Equipment

Logistics Tooling Testing



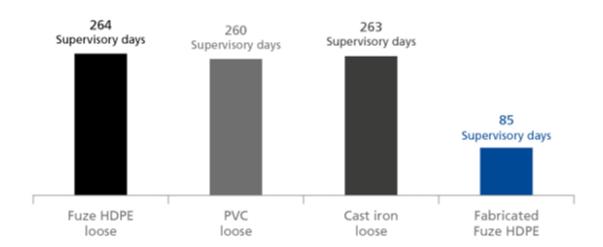


REPORT - BASIC SITE INSTALLATION LABOUR



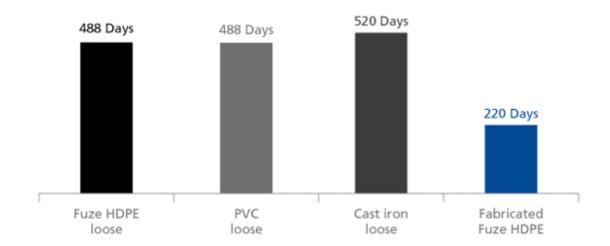


REPORT - SUPERVISORY DAYS





REPORT - SITE LOGISTICS DAYS





Existing stack replacement

	Terrain dB12 Fabricated Stack	Terrain FUZE Fabricated Stack	On-Site Assembled dB12 stack	On-Site Assembled FUZE stack
Number of Joints	5	3	12	9
Number of cuts	1	2	2	3
Installation Time	3 hours	3 hours	5 hours	5 hours
Number of fittings	1 (complete stack supplied)	1 (complete stack supplied)	9	7
Unique features*	3	1	N/A	N/A

^{*}Unique features relates to the ability to create on-site the same stack from standard pipe and fittings without the need for specialized on-site fabrications to enable installation.



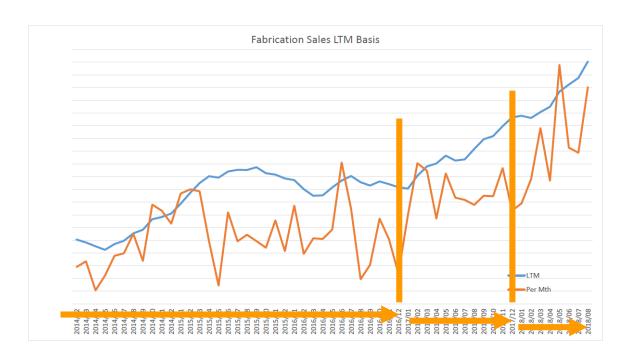
FABRICATION GROWTH

Fabrication sales 2014 to 2018 YTD

2014 - 2016 consistent growth

2017 - doubled growth

2018 - continue to grow







Design and manufacture



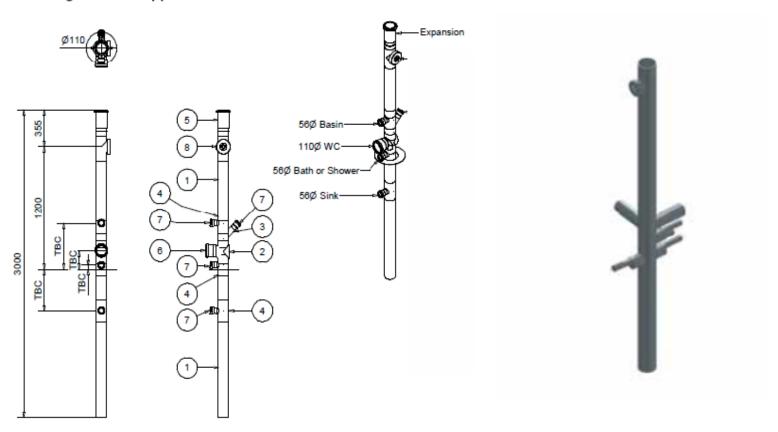
Design and manufacture





Draw it to manufacture it

Image 1: First draft fabricated drainage stack drawing for client approval.





Fabricated review



- Basic site labour HDPE lose
 838 days- HDPE fabricated 378
 days
- Supervision lose 264 days -Fabricated 85 days
- Site logistics HDPE lose 488 days-fabricated 220 days
- Tooling costs reduced
- On site jointing and system testing time reduced 25-30%
- Report based on 360 apartments over 2 residential towers 22 and 23 floors



Critical protection for data centres





Large Civil off site structures





Cobham Project



FOUL WATER STORAGE OPTIONS:

A - IN SITU REINFORCED CONCRETE SILO

B - PREFABRICATED TWIN WALL LONGITUDINAL TANK

DESIGN / SELECTION CRITERIA:

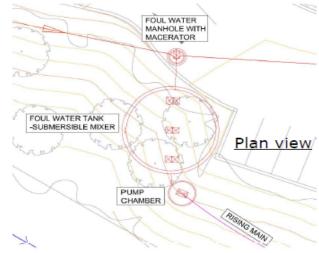
- MAINTENANCE (H&S)
- PROGRAMME
- COST
- BUILDABILITY

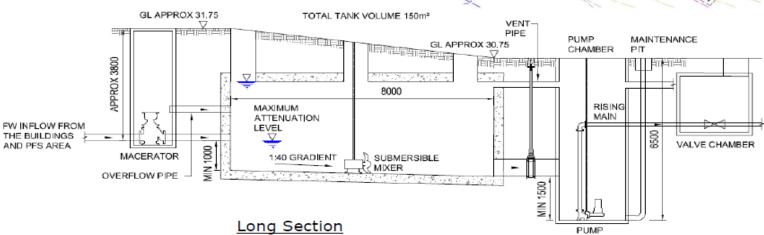


Design options

OPTION 'A': RC SILO TANK

- 8m dia. in-situ RC chamber offering 150m3 of combined storage
- 2.5% sloped base to outfall into separate 6.5m deep Pump Chamber.
- 3 / 4 access points.





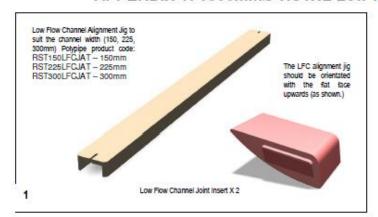


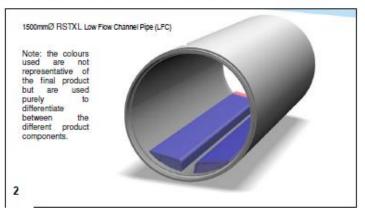
Design options

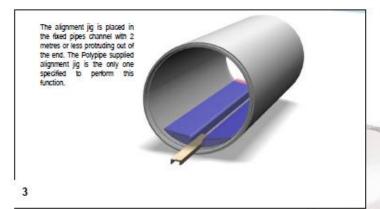
PF07

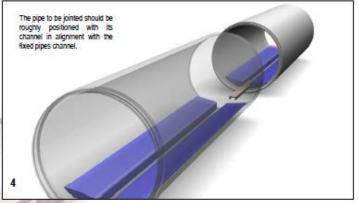
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APPENDIX 1: 1500mm@ RSTXL Low Flow Channel INSTALLATION PROCESS









"This form is being circulated to advise on an imminent New Product Release, the details of which are outlined within this document."

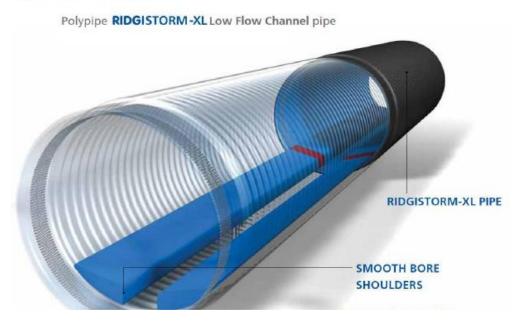


Product design

OPTION 'B': PREFABRICATED TWIN WALL LONGITUDINAL TANK

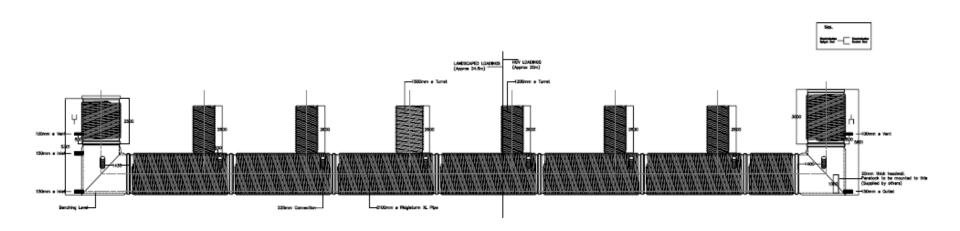
- 2.1m radius prefabricated Twin Wall pipe offering 150m3 of combined storage over 45m length.
- Hydraulically efficient: Built-in low flow channel for self-cleansing, part of the gravity drainage network.

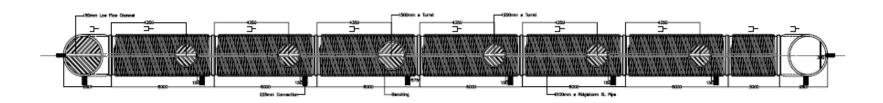
- Access shaft spaced every 10m.
- •Built-in structural strength – strapped on concrete pads.
- Easy handling and installation (fusion weld coupling)





RXL pre fabricated







Design options assessment

OPTIONS ASSESSMENT

Criteria	Option `A': In-situ Reinforced Concrete Silo	Option 'B': Twin Wall prefabricated Tank
Maintenance (WPL to comment)	\checkmark	\checkmark
Program (BAM to comment)	X (est. 7-8 weeks)	(est. 3-4 weeks)
Cost	X (est. £120k)	√ (est. £100k)
Buildability (BAM to comment)	×	\checkmark
OVERALL		✓



Civil bulk storage water tanks



