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

11:30am – 12:30pm
Wednesday 20th November
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.
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.
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.
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 workforce 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
You wouldn’t expect your watch to arrive like this. Why should your drainage stacks be any different?

For more information, visit polypipe.com/terrain-drainage-stacks
POLYPIPE ADVANTAGE
THE BENEFITS
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

- Fuze HDPE loose: 838 Days
- PVC loose: 599 Days
- Cast iron loose: 1153 Days
- Fabricated Fuze HDPE: 378 Days
REPORT – SUPERVISORY DAYS

- Fuze HDPE loose: 264 Supervisory days
- PVC loose: 260 Supervisory days
- Cast iron loose: 263 Supervisory days
- Fabricated Fuze HDPE: 85 Supervisory days
REPORT – SITE LOGISTICS DAYS

- Fuze HDPE loose: 488 Days
- PVC loose: 488 Days
- Cast iron loose: 520 Days
- Fabricated Fuze HDPE: 220 Days
## Existing stack replacement

<table>
<thead>
<tr>
<th></th>
<th>Terrain dB12 Fabricated Stack</th>
<th>Terrain FUZE Fabricated Stack</th>
<th>On-Site Assembled dB12 stack</th>
<th>On-Site Assembled FUZE stack</th>
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</thead>
<tbody>
<tr>
<td>Number of Joints</td>
<td>5</td>
<td>3</td>
<td>12</td>
<td>9</td>
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<tr>
<td>Number of cuts</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
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<td>Installation Time</td>
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<td>3 hours</td>
<td>5 hours</td>
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<tr>
<td>Number of fittings</td>
<td>1 (complete stack supplied)</td>
<td>1 (complete stack supplied)</td>
<td>9</td>
<td>7</td>
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<td>Unique features*</td>
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<td>1</td>
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*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
Large Civil off site structures
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.
APPENDIX 1: 1500mmØ RSTXL Low Flow Channel INSTALLATION PROCESS

1. Low Flow Channel Alignment Jig to suit the channel width (150, 225, 300mm) Polypipe product code: RST150LFCJAT – 150mm
   RST225LFCJAT – 225mm
   RST300LFCJAT – 300mm
   The LFC alignment jig should be orientated with the flat base upwards (as shown.)

2. 1500mmØ RSTXL Low Flow Channel Pipe (LFC)
   Note: the colours used are not representative of the final product but are used purely to differentiate between the different product components.

3. The alignment jig is placed in the fixed pipes channel with 2 metres or less protruding out of the end. The Polypipe supplied alignment jig is the only one specified to perform this function.

4. The pipe to be jointed should be roughly positioned with its channel in alignment with the fixed pipes channel.

“This form is being circulated to advise on an imminent New Product Release, the details of which are outlined within this document.”
OPTION ‘B’: PREFABRICATED TWIN WALL LONGITUDINAL TANK

- 2.1m radius prefabricated Twin Wall pipe offering 150m³ of combined storage over 45m length.
- Access shaft spaced every 10m.
- Built-in structural strength – strapped on concrete pads.
- Easy handling and installation (fusion weld coupling)

- Hydraulically efficient: Built-in low flow channel for self-cleansing, part of the gravity drainage network.

Polypipe RIDGISTORM-XL Low Flow Channel pipe
RXL pre fabricated
## OPTIONS ASSESSMENT

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Option ‘A’: In-situ Reinforced Concrete Silo</th>
<th>Option ‘B’: Twin Wall prefabricated Tank</th>
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<tr>
<td>Maintenance (WPL to comment)</td>
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<td>✔</td>
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<td>Program (BAM to comment)</td>
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