

## Optical Fibre Infrastructure - The Lancaster Way

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## Optical fibre properties

- Single mode 9/125  $\mu\text{m}$ 
  - The ‘superhighway’ 10Gbs<sup>-1</sup> CWDM/DWDM
  - 1310/1550 nm wavelength
- Multimode 62.5/125  $\mu\text{m}$ 
  - regarded as legacy, still useful at 1310 nm
- Multimode 50/125  $\mu\text{m}$ 
  - 10Gbs<sup>-1</sup> at 850 nm with OM3 grade fibre

## The Problem

- Legacy infrastructure
- Mixture of fibre types
- Mixed connector types
- Unknown fibre type
- Lack of documentation - connectivity and physical route
- Limited capacity



## The Solution

- New infrastructure
- 2km 9-way main duct
- 35km bulk cable
- 120 fibres per cable
- 96 sm 24mm
- 2 optical distribution frames
- standardise to LC



The Lancaster campus



Duct route as installed



### Ducting methods

- Main duct only
- Lower up front costs
- Greater cable count
- Cable damage likely during installation removal
- Duct and sub duct
- Higher up front costs
- Reduced cable count
- Additional protection
- No risk of damage during cable install/replacement

### Cable

- Combined single/multimode bulk cable
- 96 single mode fibres 12 per tube
- 24 multimode fibres 12 per tube
- Internal/external grade cable

Damaged sub duct due to ingress of concrete during chamber building



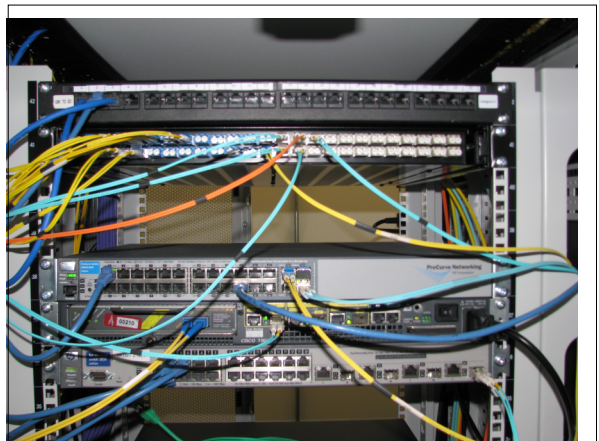
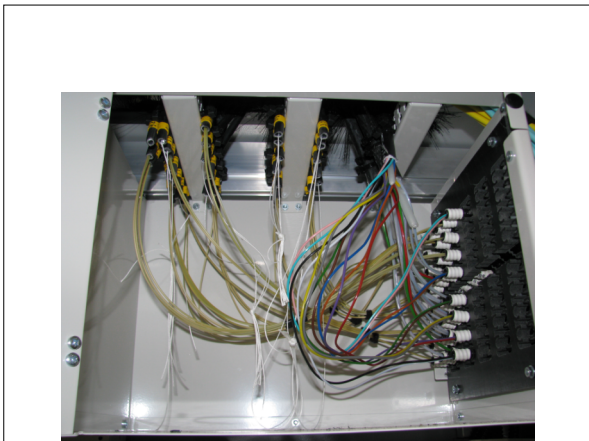
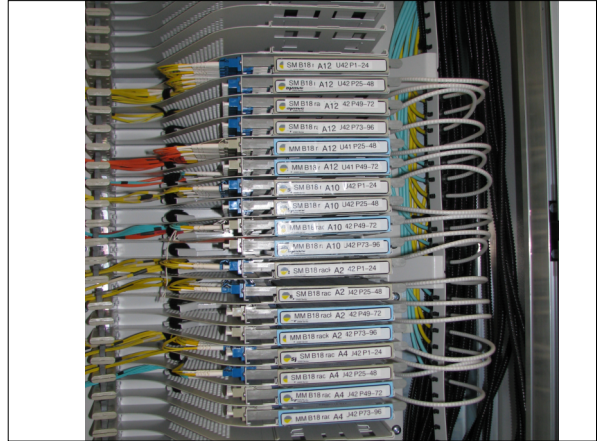
## Additions

- Limited capacity - 36 bulk cables
- Pressure to use infrastructure for minor links
- Devise sustainable solution
- Reserve 1 sub duct and add additional chambers - splice

## Building internals

- Fibre infrastructure is a long term investment
- Building internals change relatively frequently
- Aggregation comms - allow rack replacement
- Main comms - terminate fibre away from end point
- Flexible solution from termination to final end point





## Off Campus Sites

- New Roads and Street works Act 1991
- Section 50 private pipeline licence
- No telco required
- Street works co-ordinator
- Co-ordination meetings
- As built drawings on the gazetteer

## What have we learned?

- Employ specialist contractor
- Background research
  - observe BT, C&W, Virgin Media
  - actually understand hardware specifications
- Get involved
- Trust your instincts

## Conclusions

- Successful
  - After testing phase no faulty fibres found.
  - Reduced time to deploy
- Future proof
  - 10-15% capacity carries current network
- Multi use
  - Carries CCTV, fire alarm, barrier control etc

Thank you