



Royal Botanic Gardens
Kew

Network Installation Solutions Ltd: **Royal Botanic Gardens – Copper & Fibre Rollouts**

Site Address:

Royal Botanic Gardens, Kew, Richmond, TW9 3AE.

About the Client:

Royal Botanic Gardens (RBG) is a world-famous centre for botanical and mycological knowledge. With its two inspiring gardens at Kew in west London and Wakehurst in Sussex, it enchants visitors with the wonder of plant diversity.

NIS Ltd secured a highly competitive public sector advertised framework agreement contract with the Royal Botanic Gardens. This current multi-year framework would secure a sole supplier to undertake all data and fibre optic cabling installations across both sites.

Copper Cabling Rollout:

Prior to this contract NIS Ltd had previously secured a one-off project, again through a tender exercise, to upgrade the Wi-Fi cabling across the Kew site as part of a new wireless rollout. The tender provided an exceptionally difficult challenge given the environments in which works were to be undertaken, consisting of.

- Grade 1 & Grade 2 Listed Buildings.
- Conservatories.
- Visitor Attractions.
- Offices.
- Greenhouses.
- Museums.

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NIS Ltd secured the tender having scored highest in its technical response and providing the best ‘value for money’ pricing structure.

Since securing the new contract, NIS have been undertaking vast quantities of fibre installation works as part of the site’s intentions to upgrade / replace the entire fibre optic backbone from the historic multi-mode solution to a new single-mode network.

Fibre Cabling Rollout:

RBG has many internal fibre connections via cables of different core counts between buildings, and these connections provide Kew and Wakehurst a way to connect all the network connectivity and other services requiring a fibre backbone.

The fibre network has organically grown over several years and due to changes in fibre technology, RBG now had an estate which was a mix of fibre types (Multi-Mode and Single mode) and connectors. Many of the cables were not rodent proof (armoured) and on occasion these cables had been chewed to the point of losing connectivity and suffered heavily with performance issues.

In order to meet the current and future technology advances, RBG needed to upgrade its core network.

The works were undertaken in several phases as detailed below.

Phase 1

NIS were requested to carry out an initial feasibility study/audit of the condition of the existing backbone cabling at the smaller Wakehurst site in Surrey. The purpose of this audit was to establish a baseline need for the upgrade, to identify any major issues with undertaking the installation works and to provide a budget estimate for the anticipated costs. The results of this audit would enable the client to not only approve the planned upgrade of the Wakehurst site, but also the significantly larger Kew Estate in Richmond. The following works were undertaken as part of the audit.

Utilising its highly experienced project management team, NIS Ltd undertook an in-depth audit of the entire Wakehurst Campus fibre backbone. This included.

- Inspecting all fibre cables to assess, the manufacturer, type of cable (Single mode or Multimode), grade of cable (62.5, OM3, OS1) & standard or rodent proof types, core size, termination presentation.
- Testing of all fibre cables to identify any faults or ascertain performance levels
- Checking all fibre routes and identifying if any fibres contain diverse routing, allowing for a failover in the event of any failure to a single fibre.
- Supply a full audit report, highlighting all findings, preparing a recommendation / plan for site-wide improvement options and associated costs of each option for development.

Upon completion of the audit, NIS provided a full set of design recommendations which included.

- Drawings detailing all existing routes and design of new proposed routes, to provide further resilience
- Summary of investigations at each location based on performance levels and type of fibres
- Detailed proposal of remedial works to meet the client’s technology-based requirements
- Photographs of all major duct positions
- Copies of all documented test results

Following the submission and review of the report, quotations had been prepared for the undertaking of all works which have since been undertaken by NIS.

Phase 2

After receiving approval, all fibre upgrade works at the Wakehurst Site were completed which consisted of.

Single mode fibre link between the Stables Plant Room and the Children's Learning Centre
 Single mode fibre link between the Stables Boiler Room and the Mansion Building
 Single mode fibre link between the Orchard Building and the Tractor Workshop
 Single mode fibre link between the Orchard Building and the Potting Shed
 Single mode fibre link between the Orchard Building and the Estates Building
 Single mode fibre link between the Orchard Building and the Supervisor Office
 Single mode fibre link between the MSB Mezzanine and the MSB Server Room

Phase 3

Due to the size of the Wakehurst site, it was feasible for all installations to be undertaken concurrently as part of a single phase of installation works. However, given the significantly larger size of the Kew Estate, in terms of both works scheduling and annual budget restrictions, it was determined that the Kew site must be undertaken within several smaller phases. The first of these phases were to replace the "Core Backbone Links" between the primary buildings across the Kew site. As part of its design input, NIS agreed with Kew to route the new single mode solution in following diverse routes in order to ensure that the new backbone, critical to site-wide operations, would have further disaster recovery / failsafe measures in the event any one core fibre was damaged / went down. Each of these fibres, given the physical size of the Kew site, were of significant length, many exceeding 2km per fibre run. The following fibre locations had been installed.

Single mode fibre link between the HLAA Building and the Museum No 1
 Single mode fibre link between the Jodrell Building and the Aiton House
 Single mode fibre link between the HLAA Building and the Jodrell Building
 Single mode fibre link between the Temperate House and the Museum No 1
 Single mode fibre link between the Victoria Plaza and the Shaft Yard
 Single mode fibre link between the Victoria Plaza and the Museum No 1
 Single mode fibre link between the Palm House and the Shaft Yard
 Single mode fibre link between the Aiton House and the Brentford Gate
 Single mode fibre link between the Stables Building and the ARB Nursery
 Single mode fibre link between the Stables Building and the Grinders Hut
 Single mode fibre link between the Stables Building and the New ARB

Phase 4

Following the completion of the phase 3 works, NIS Ltd then provided surveys and quotes and completed all remaining upgrade works.

Fire Survival Fibre Cabling Rollout:

As a completely separate project to the above, RBG required new backbone infrastructure to be implemented across all buildings upon the Site for the provision of a new fire alert system being installed via a third party. NIS Ltd planned and undertook the installation of a Site wide Unitube Fire-Survival fibre cabling ring covering every building upon the RBG Kew site.

Upon the completion of the installation NIS had installed approximately 20km of the Unitube Fire-Survival fibre cabling, giving the client the full connectivity required to ensure fire safety upon the site.