



**WSB Group Limited**

**CyrusOne Data Centre, 1 Boulevard Arago, Wissous, France**

**2021 Lightning Protection Installation**

**& Certification Works**

**2021 Compiled Installation Report**

**For the attention of: Mr Ian Patilla**

**Completion Date: 6<sup>th</sup> March 2021**



ISO 9001 ISO 14001  
ISO 45001



Membership No.  
M40901019



Membership No.  
N00030591



|                    | Name          | Title              | Initial | Date       |
|--------------------|---------------|--------------------|---------|------------|
| <b>Approved By</b> | Leigh Holford | Managing Director  | LH      | 19/03/2021 |
| <b>Compiled By</b> | Gary Moss     | Technical Director | GM      | 19/03/2021 |

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19<sup>th</sup> March 2021

Project Reference: GM/LH/13539

WBS Group Limited  
Unit 7 Acton Street  
Long Eaton  
Nottingham  
NG10 1FT

**For the attention of: Mr Ian Patilla**

Dear Sir,

**RE: 2021 LIGHTNING PROTECTION INSTALLATION AND CERTIFICATION WORKS  
CYRUSONE DATA CENTRE, WISSOUS, FRANCE**

Further to our visit to site regarding the aforementioned project, may we confirm that the installation works of 2 No. supplementary IONIFLASH MACH NG60 terminal heads (integrated into the system) to offer supplementary protection to the building and adjacent phase 1 installation are now complete.

Please find enclosed our installation report sheets, together with our valid Test Certificates and Calibration Certificate for the test instruments used.

We trust that all installation works have been undertaken to your satisfaction and look forward to being of service to you in the future.

Trusting the above meets with your approval, please do not hesitate to contact us should you require any further help or information.

Yours faithfully,

Gary Moss  
Technical Director

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## Legend

-  ESE Air Terminal
-  30x2mm Roof Conductor Tape
-  Down Conductor / Change of Level Conductor Tape
-  Earth Position

## Date

19th March 2021

## Client

WBS Group Limited

## Site

CyrusOne Data Centre  
Wissous, France

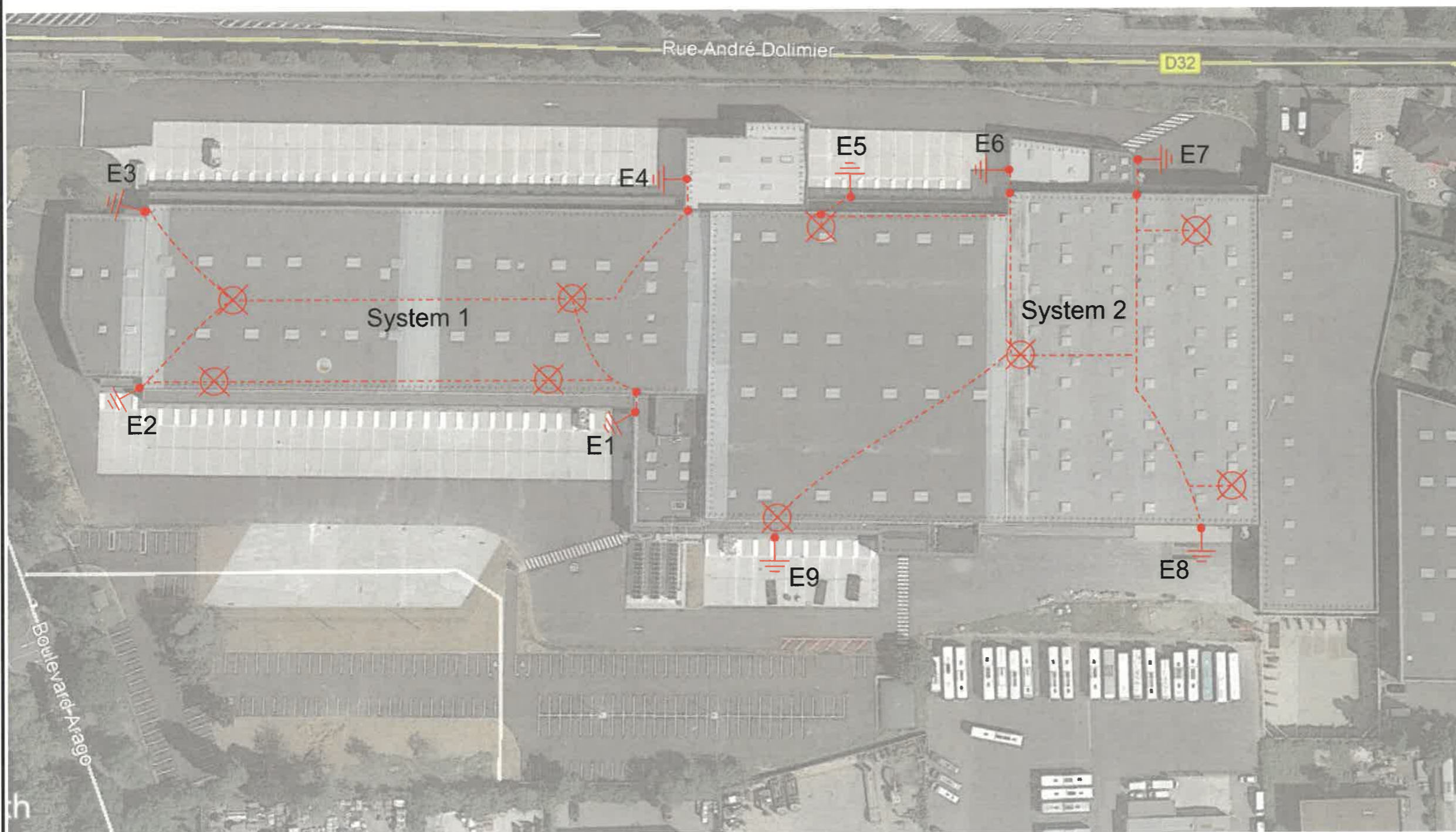
## Drawing No.

HSC-GM-9008A

## Title

Basic Site Plan  
Indicating Installation  
of ESE Lightning  
Protection Systems

Not to Scale





PASS

LIGHTNING PROTECTION SYSTEMS | EARTHING | ELECTRONIC SYSTEMS PROTECTION

**CERTIFICATE OF TEST – TEST RESULT: PASS**


|                    |  |                           |                             |
|--------------------|--|---------------------------|-----------------------------|
| Client:            | WBS Group Limited  |                           |                             |
| Site:              | CyrusOne Data Centre, Wissous, France  |                           |                             |
| Structure Tested:  | Main Building – System 1   |                           |                             |
| Test Date:         | 6 <sup>th</sup> March 2021   | Issue Date:               | 19 <sup>th</sup> March 2021 |
| Air Termination:   | <p>4 No. ESE air terminals have been installed throughout this area comprising of 2 No. originally installed P30 Pulsars, each mounted on a 4m support pole, which provides a radii of protection (Rp) to cover major part of the structure and 2 No. newly installed Mach NG60 terminal heads, each mounted on a 5m support pole, to increase the radii of protection (Rp) to provide an adequate zone of coverage to protect the newly installed (Phase 1) plant and equipment, in compliance with the guidelines of NF C 17-102.</p> <p>Each Early Streamer Emission lightning terminals have been interconnected using 30x2mm tinned copper tape and secured throughout the roof areas using purpose designed cement filled plastic weighted securing clips.</p> |                           |                             |
| Down Conductor:    | A total of 4 No. 30x2mm tinned copper down conductors have been installed throughout the perimeter, secured back to the building fabric using purpose designed metallic securing clips, utilised to form the conductive discharge of the down conductor network to the mass of earth, complete with strike counters incorporated into each down conductor.   |                           |                             |
| Earthing Network:  | Deep driven steel rods/plates were found to have been installed as part of the original installation, surmounted by a purpose designed inspection chamber at ground level.   |                           |                             |
| Project No.:       | GM/LH/13539B   | Test Engineer:            | Mr. J. Britten              |
| Ground Conditions: | Dry  | Atmospheric Conditions:   | Sunny                       |
| Test Method:       | Simplified   | Building Height (Approx): | 12m                         |

We certify that the lightning protection system installed throughout the above establishment has been tested and visually inspected in accordance with the guidelines of NF C 17-102: 2011.

In accordance with the guidelines of NF C 17-102 Standard, the lightning protection system requires a test and visual inspection to be carried out at intervals not exceeding 12 months. Additionally, electrical testing of the system has been carried out in accordance with the requirements of the aforementioned Standard guidelines against a maximum permitted reading of **40.0 ohms**. The earth resistance measurements obtained are as follows:

|                                     | Reading        | Ground   |                                 | Reading        | Ground   |       | Reading        | Ground   |       | Reading       | Ground   |
|-------------------------------------|----------------|----------|---------------------------------|----------------|----------|-------|----------------|----------|-------|---------------|----------|
| EP 1                                | 11.72 $\Omega$ | Concrete | EP 2                            | 8.93 $\Omega$  | Concrete | EP 3  | 13.79 $\Omega$ | Concrete | EP 4  | 27.3 $\Omega$ | Concrete |
| EP 5                                | -              | -        | EP 6                            | -              | -        | EP 7  | -              | -        | EP 8  | -             | -        |
| EP 9                                | -              | -        | EP 10                           |                |          | EP 11 |                |          | EP 12 |               |          |
| EP 13                               |                |          | EP 14                           |                |          | EP 15 |                |          | EP 16 |               |          |
| EP 17                               |                |          | EP 18                           |                |          | EP 19 |                |          | EP 20 |               |          |
| Overall Product Value:              | 0.30 $\Omega$  |          | Next Test & Inspection Due:     | January 2022   |          |       |                |          |       |               |          |
| Equipotential Connection Installed? | Yes – 35mm     |          | Surge Protection Device Fitted? | Unidentifiable |          |       |                |          |       |               |          |

|                  |                       |                   |                         |
|------------------|-----------------------|-------------------|-------------------------|
| Test Instrument: | Kyoritsu Earth Tester | Model:            | 4105A                   |
| Calibration No.: | W8232352              | Calibration Date: | 25/09/2020 – 25/09/2021 |

|  |   |  |   |
|--|---|--|---|
| Written By:<br>Mr. Gary Moss<br>Technical Director |  | Approved By:<br>Mr. Leigh Holford<br>Managing Director |  |
|--|---|--|---|

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Southern Office – 2 Angel Square, London, EC1V 1NY  
Northern Office – Bilston Glen Business Centre, 6 Dryden Road, Midlothian, EH20 9LZ

Tel: 0115 9657400  
Tel: 0126 8767746  
Tel: 0131 4481009

PASS



PASS

LIGHTNING PROTECTION SYSTEMS | EARTHING | ELECTRONIC SYSTEMS PROTECTION

## CERTIFICATE OF TEST – TEST RESULT: PASS

|                   |                                       |             |                             |
|-------------------|---------------------------------------|-------------|-----------------------------|
| Client:           | WBS Group Limited                     |             |                             |
| Site:             | CyrusOne Data Centre, Wissous, France |             |                             |
| Structure Tested: | Main Building – System 1              |             |                             |
| Test Date:        | 6 <sup>th</sup> March 2021            | Issue Date: | 19 <sup>th</sup> March 2021 |

|                             |   |
|-----------------------------|---|
| Report Findings & Comments: | <p>Following the installation of the 2 No. additional ESE Terminal Heads, we confirm that adequate protection has been afforded to increase the radii of protection to provide an adequate zone of coverage to protect the newly installed Plant and Equipment of the Phase 1 installation but should additional phases include the installation of supplementary plant etc, then this will need to be considered based upon the actual installations being undertaken throughout the various areas of the site.</p> <p>Earth impedance readings obtained at the time of our inspection survey are clearly below the maximum recommended (40.0 ohms) permissible, in accordance with the guidelines of NF C 17-102.</p> |
|-----------------------------|---|

|                  |  |
|------------------|--|
| Recommendations: | None – An Improved Installation in compliance with the guidelines of NF C 17-102 has been installed. |
|------------------|--|

|           |                |
|-----------|----------------|
| Costings: | Not Applicable |
|-----------|----------------|

|            |   |
|------------|---|
| Standards: | This record shows that this Installation does comply with the applicable standard guidelines of NF C 17 – 102 at the time of this test. |
|------------|---|

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PASS



PASS

LIGHTNING PROTECTION SYSTEMS | EARTHING | ELECTRONIC SYSTEMS PROTECTION

**CERTIFICATE OF TEST – TEST RESULT: PASS**

|                    |  |                           |                             |
|--------------------|--|---------------------------|-----------------------------|
| Client:            | WBS Group Limited  |                           |                             |
| Site:              | CyrusOne Data Centre, Wissous, France  |                           |                             |
| Structure Tested:  | Main Building – System 2   |                           |                             |
| Test Date:         | 6 <sup>th</sup> March 2021   | Issue Date:               | 19 <sup>th</sup> March 2021 |
| Air Termination:   | <p>5 No. ESE air terminals have been installed throughout this area of the structure, each mounted on a 5m support pole. Due to the location of the terminal heads we are unable to confirm size of head installed, therefore have made an assumption that these are P30 Pulsars, which provides an adequate radii of protection (Rp) to cover major part of the structure, in compliance with the guidelines of NF C 17-102.</p> <p>Each Early Streamer Emission lightning terminals have been interconnected using 30x2mm tinned copper tape and secured throughout the roof areas using purpose designed cement filled plastic weighted securing clips.</p> |                           |                             |
| Down Conductor:    | A total of 5 No. 30x2mm tinned copper down conductors have been installed throughout the perimeter, secured back to the building fabric using purpose designed metallic securing clips, utilised to form the conductive discharge of the down conductor network to the mass of earth, complete with strike counters incorporated into each down conductor.   |                           |                             |
| Earthing Network:  | Deep driven steel rods/plates were found to have been installed as part of the original installation, surmounted by a purpose designed inspection chamber at ground level.   |                           |                             |
| Project No.:       | GM/LH/13539B   | Test Engineer:            | Mr. J. Britten              |
| Ground Conditions: | Dry  | Atmospheric Conditions:   | Sunny                       |
| Test Method:       | Simplified   | Building Height (Approx): | 12m                         |

We certify that the lightning protection system installed throughout the above establishment has been tested and visually inspected in accordance with the guidelines of NF C 17-102: 2011.

In accordance with the guidelines of NF C 17-102 Standard, the lightning protection system requires a test and visual inspection to be carried out at intervals not exceeding 12 months. Additionally, electrical testing of the system has been carried out in accordance with the requirements of the aforementioned Standard guidelines against a maximum permitted reading of **40.0 ohms**. The earth resistance measurements obtained are as follows:

|       | Reading | Ground   |       | Reading | Ground   |       | Reading | Ground |       | Reading | Ground |
|-------|---------|----------|-------|---------|----------|-------|---------|--------|-------|---------|--------|
| EP 1  | -       | -        | EP 2  | -       | -        | EP 3  | -       | -      | EP 4  | -       | -      |
| EP 5  | 5.14 Ω  | Concrete | EP 6  | 4.38 Ω  | Concrete | EP 7  | 3.12 Ω  | Tarmac | EP 8  | 3.31 Ω  | Gravel |
| EP 9  | 4.17 Ω  | Concrete | EP 10 |         |          | EP 11 |         |        | EP 12 |         |        |
| EP 13 |         |          | EP 14 |         |          | EP 15 |         |        | EP 16 |         |        |
| EP 17 |         |          | EP 18 |         |          | EP 19 |         |        | EP 20 |         |        |

|                                     |   |                                 |                |
|-------------------------------------|---|---------------------------------|----------------|
| Overall Product Value:              | 0.30 Ω                                    | Next Test & Inspection Due:     | March 2022     |
| Equipotential Connection Installed? | Yes – 35mm <sup>2</sup> Bare Copper Cable | Surge Protection Device Fitted? | Unidentifiable |

|                  |                       |                   |                         |
|------------------|-----------------------|-------------------|-------------------------|
| Test Instrument: | Kyoritsu Earth Tester | Model:            | 4105A                   |
| Calibration No.: | W8232352              | Calibration Date: | 25/09/2020 – 25/09/2021 |

|  |   |  |   |
|--|---|--|---|
| Written By:<br>Mr. Gary Moss<br>Technical Director |  | Approved By:<br>Mr. Leigh Holford<br>Managing Director |  |
|--|---|--|---|

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PASS



PASS

LIGHTNING PROTECTION SYSTEMS | EARTHING | ELECTRONIC SYSTEMS PROTECTION

## CERTIFICATE OF TEST – TEST RESULT: PASS

|                             |  |             |                             |
|-----------------------------|--|-------------|-----------------------------|
| Client:                     | WBS Group Limited  |             |                             |
| Site:                       | CyrusOne Data Centre, Wissous, France  |             |                             |
| Structure Tested:           | Main Building – System 2   |             |                             |
| Test Date:                  | 6 <sup>th</sup> March 2021   | Issue Date: | 19 <sup>th</sup> March 2021 |
| Report Findings & Comments: | <p>The lightning protection system installed throughout this part of the establishment (as indicated on the enclosed installation drawing), consists of 5 No. ESE lightning protection systems all interconnected via a matrix of roof conductors.</p> <p>We confirm that an adequate radii of protection has been afforded throughout the installation but should additional phases include the installation of supplementary plant etc, then this will need to be considered based upon the actual installations being undertaken throughout the various areas of the site.</p> <p>Earth impedance readings obtained at the time of our inspection survey are clearly below the maximum recommended (50.0 ohms) permissible, in accordance with the guidelines of NF C 17-102.</p> |             |                             |
| Recommendations:            | None – A substantial lightning protection system was found to be installed in compliance with the guidelines of NF C 17-102. has been installed.   |             |                             |
| Costings:                   | Not Applicable   |             |                             |
| Standards:                  | This record shows that this Installation does comply with the applicable standard guidelines of NF C 17 – 102 at the time of this test.  |             |                             |




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**Tel: 0131 4481009**

PASS



## Legend

-  Original ESE Installs Radii of Protection
-  New ESE Installs Radii of Protection
-  ESE Air Terminal

## Date

19th March 2021

## Client

WBS Group Limited

## Site

CyrusOne Data Centre  
Wissous, France

## Drawing No.

HSC-GM-9008

## Title

Basic Site Plan  
Indicating Locations  
of ESE Terminals  
Radii of Protection

Not to Scale



# **Calibration Certificate**

# CERTIFICATE OF CALIBRATION

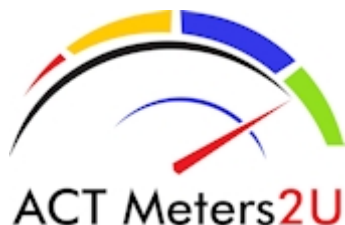
**Issued By** Associated Calibration & Training Ltd

**Date of Issue** 25 September 2020

**Certificate Number**

ACT31536

Page 1 of 2 Pages



**Associated Calibration & Training Ltd**  
**Unit 12, North Staffs Business Park**  
**Stoke-on-Trent**  
**ST6 4BF**  
**Tel: 01782 827018**

Approved Signatory

☐ C. Byrne ☐ A.J. Corbishley ☐ N.M. Hancock ☐ P.G. Casey

**Customer :** Horizon  
Unit 7, Burma Road  
Nottinghamshire NG21 0RT

**Date Received :** 23 September 2020

|                     |                     |                                |              |          |
|---------------------|---------------------|--------------------------------|--------------|----------|
| <b>Instrument -</b> | System ID :         | ID42547                        | Job Number : | L48962-1 |
|                     | Description :       | Earth Tester (3 Wire low Amps) |              |          |
|                     | Manufacturer :      | Kewtech                        | Site :       |          |
|                     | Model Number :      | 4105A                          | Location :   |          |
|                     | Serial Number :     | W8232352                       |              |          |
|                     | Procedure Version : | 848 1.20                       |              |          |

## Environmental Conditions

|                     |              |                   |              |
|---------------------|--------------|-------------------|--------------|
| Temperature :       | 21°C +/- 3°C | Mains Voltage :   | 240V +/- 10V |
| Relative Humidity : | 50% +/- 15%  | Mains Frequency : | 50Hz +/- 1Hz |

## Comments

The Instrument was allowed to stabilise before calibration.

## Traceability Information

| <i>Instrument description</i>    | <i>Serial number</i> | <i>Certificate number</i> | <i>Cal. Date</i> | <i>Cal. Period</i> |
|----------------------------------|----------------------|---------------------------|------------------|--------------------|
| 3200A Electrical Test Calibrator | M1370L14             | ACT26551                  | 21/02/2020       | 52                 |
| Fixed Resistor Unit              | ACT184               | ACT24643                  | 12/11/2019       | 52                 |

**Calibrated By :** A.J. Corbishley

**Date of Calibration :** 25 September 2020

This certificate provides traceability of measurement to recognised National Standards, and to the units of measurement realised at the National Physical Laboratory or other recognised National Standards laboratories.

Copyright of this certificate is owned by the issuing laboratory and may not be reproduced except with the prior written approval of the issuing laboratory. This certificate complies with the requirements of BS EN ISO 10012:2003.

# CERTIFICATE OF CALIBRATION

Certificate Number  
ACT31536

Page 2 of 2 Pages

| Test Title         | Tolerance | Applied Value | Reading | Pass/Fail |
|--------------------|-----------|---------------|---------|-----------|
| General Condition  |           |               |         |           |
| Screen Display     | ---       | ---           | Pass    |           |
| Terminal Condition | ---       | ---           | Pass    |           |
| Switches Controls  | ---       | ---           | Pass    |           |
| Resistance         |           |               |         |           |
| 20 Ohms            | 1Ω        | 1.00Ω         | 0.87Ω   | Pass      |
| 20 Ohms            | 1.2Ω      | 10.00Ω        | 10.00Ω  | Pass      |
| 200 Ohms           | 2.3Ω      | 100.0Ω        | 100.0Ω  | Pass      |
| 2000 Ohms          | 23Ω       | 1 000Ω        | 1 000Ω  | Pass      |

End of results

## Uncertainties

Resistance 0 to 10MOhms 0.005% ± 1digit: 10Mohms to 1Gohm 0.4% ± 1 digit