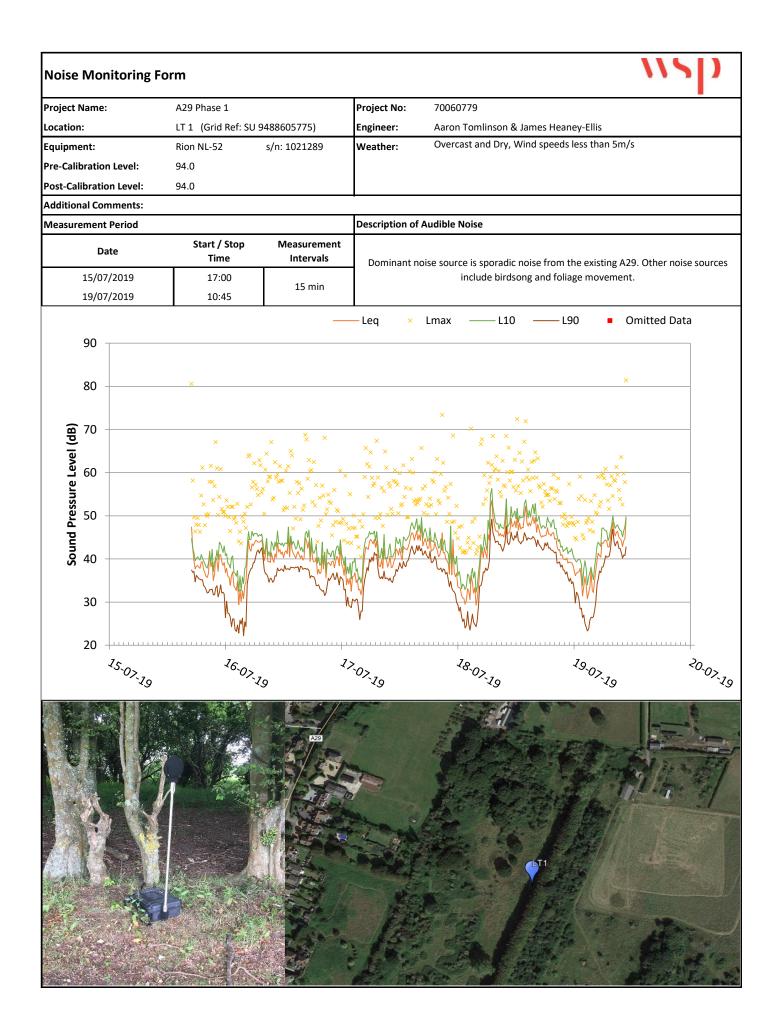
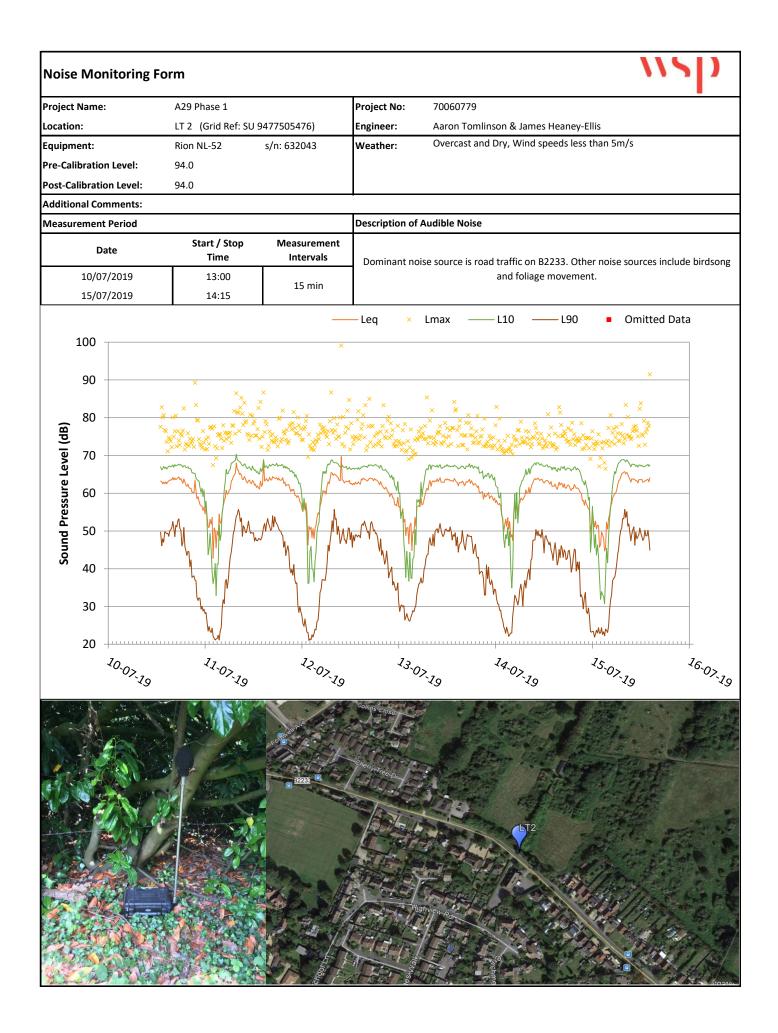
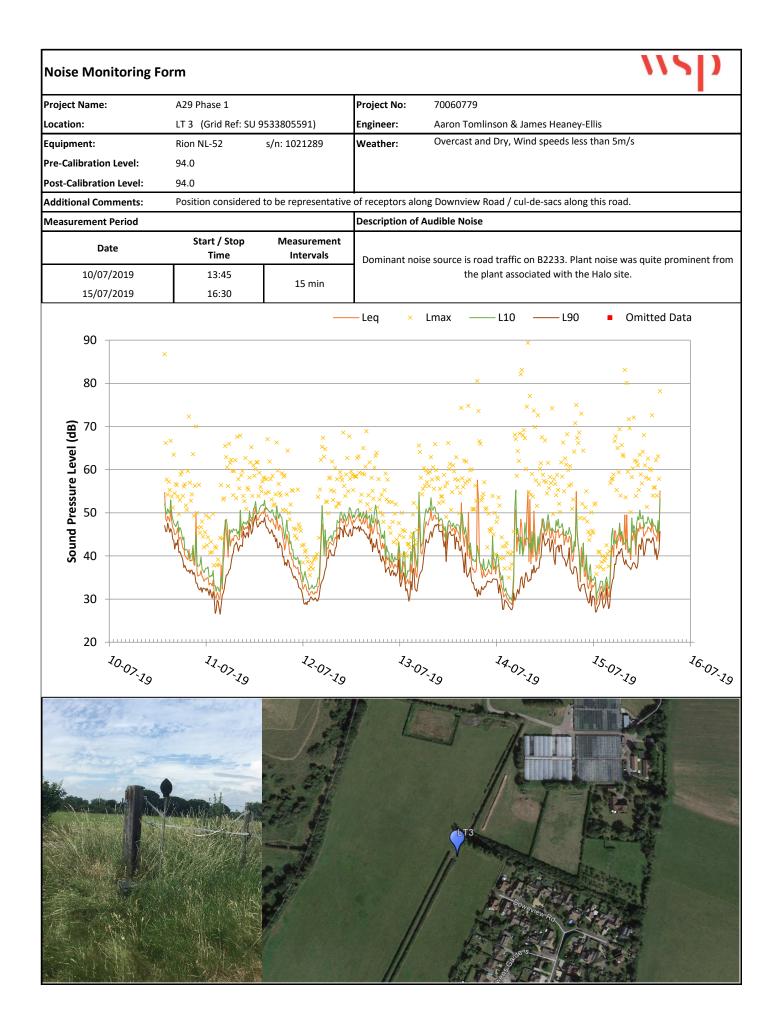
vsp

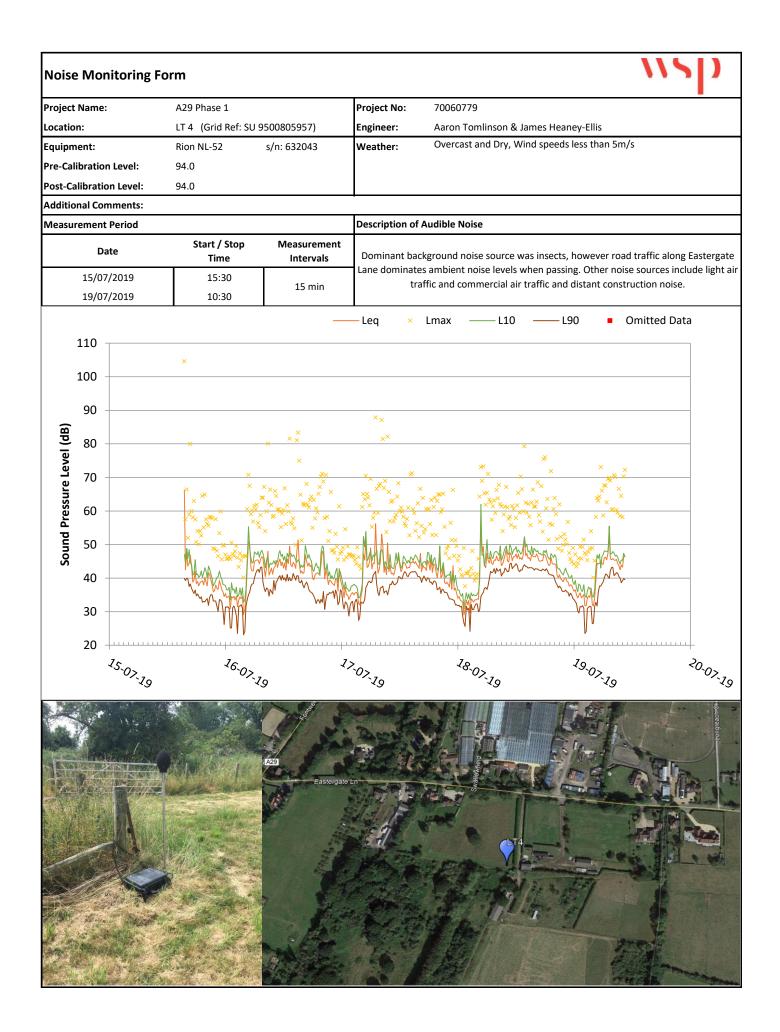
APPENDIX 7.1 - NOISE MONITORING FORMS

Not updated









| ject Name: | A29 Phase 1 | | Project No: | | | | 70060779 |
|-----------------------------|---------------------------|------------------|------------------|-------------------|------------------|------------------|---|
| ation: | ST 1 (Grid Ref: SU 951270 | 05578) | Engineer: | | | | Aaron Tomlinson & James Heaney-Ellis |
| ipment: | Rion NL-52 (s/n: 1021288 | 8) | General Weat | ther Descripti | ion: | | Overcast and Dry, Wind speeds less than 5m/s |
| -Calibration Level: | 94.0 | | | | | | |
| t-Calibration Level: | 94.0 | | | | | | |
| litional Comments: | | | - | | | | |
| asurement Period | Weather | | Statistical No | ise Levels / dl | В | | Description of Audible Noise |
| Date/Time Elapsed Minute | | Temperature (°C) | L _{Aeq} | L _{Amax} | L _{A10} | L _{A90} | |
| 10/07/2019 13:20 15.00 | | 19 | 43.3 | 63.4 | 44.9 | 39.3 | Road traffic noise barely audible, some distant sawing audible |
| 10/07/2019 16:22 15.00 | | 19 | 42.0 | 61.9 | 43.4 | 38.2 | Road traffic noise barely audible |
| 11/07/2019 08:45 15.00 |) < 5 m/s | 19 | 40.0 | 55.9 | 43.1 | 35.5 | Road traffic noise faintly autible, some light aircraft passby overhead |
| | | | | | ST1 | | |

| Noise Monitoring Forn | n | | | | | | | usp |
|-------------------------|--------------------|-------------------------|------------------|------------------|-------------------|------------------|------------------|--|
| Project Name: | | A29 Phase 1 | | Project No: | | | | 70060779 |
| Location: | | ST 2 (Grid Ref: SU 9521 | 305119) | Engineer: | | | | Aaron Tomlinson & James Heaney-Ellis |
| Equipment: | | Rion NL-52 (s/n: 102128 | 38) | General Wea | ther Descripti | on: | | Overcast and Dry, Wind speeds less than 5m/s |
| Pre-Calibration Level: | | 94.0 | | | | | | |
| Post-Calibration Level: | | 94.0 | | | | | | |
| Additional Comments: | | | | - | | | | |
| Aeasurement Period | | Weather | | Statistical No | oise Levels / dE | 8 | | Description of Audible Noise |
| Date/Time | Elapsed Minutes | Wind Speed (m/s) | Temperature (°C) | L _{Aeq} | L _{Amax} | L _{A10} | L _{A90} | |
| 10/07/2019 13:45 | 15.00 | < 5 m/s | 19 | 70.7 | 87.7 | 75.1 | 49.7 | Road traffic noise dominant from B2233 |
| 11/07/2019 09:15 | 15.00 | < 5 m/s | 19 | 70.8 | 90.3 | 74.8 | 52.4 | Road traffic noise dominant from B2233 |
| | | | | | ST | 2 | | |

| Noise Monitoring Form | | | | | | | | wsp |
|-------------------------|--------------------|--------------------------|------------------|------------------|--|------------------|------------------|---|
| Project Name: | | A29 Phase 1 | | Project No: | | | | 70060779 |
| ocation: | 9 | GT 3 (Grid Ref: SU 94450 | 05670) | Engineer: | | | | Aaron Tomlinson & James Heaney-Ellis |
| quipment: | I | Rion NL-52 (s/n: 102128 | 8) | General Wea | ther Description | on: | | Overcast and Dry, Wind speeds less than 5m/s |
| Pre-Calibration Level: | 9 | 94.0 | | | | | | |
| Post-Calibration Level: | 9 | 94.0 | | | | | | |
| Additional Comments: | | | | = | | | | |
| Measurement Period | | Weather | | Statistical No | oise Levels / dE | 3 | | Description of Audible Noise |
| Date/Time | Elapsed Minutes | Wind Speed (m/s) | Temperature (°C) | L _{Aeq} | L _{Amax} | L _{A10} | L _{A90} | |
| 10/07/2019 12:15 | 15.00 | < 5 m/s | 19 | 65.9 | 84.5 | 69.5 | 53.0 | Road traffic noise dominant from A29, distant construction noise also audible |
| 10/07/2019 15:00 | 15.00 | < 5 m/s | 19 | 63.3 | 78.4 | 67.2 | 51.4 | Road traffic noise dominant from A29, distant construction noise also audible |
| arre | It Close | | NUMBER RE | | Former Contraction of the second seco | T3 2° | | Collins Close Cherry-Firee-Dz |

| Noise Monitoring Form | | | | | | | | usp |
|-------------------------|--------------------|-------------------------|------------------|------------------|-------------------|-------------------|------------------|--|
| Project Name: | A | 29 Phase 1 | | Project No: | | | | 70060779 |
| ocation: | ST | Г 4 (Grid Ref: SU 94760 | 06229) | Engineer: | | | | Aaron Tomlinson & James Heaney-Ellis |
| quipment: | Ri | ion NL-52 (s/n: 102128 | 38) | General Wea | ther Descripti | on: | | Overcast and Dry, Wind speeds less than 5m/s |
| Pre-Calibration Level: | 94 | 4.0 | | | | | | |
| Post-Calibration Level: | 94 | 4.0 | | | | | | |
| Additional Comments: | | | | - | | | | |
| Aeasurement Period | w | /eather | | Statistical No | oise Levels / di | } | | Description of Audible Noise |
| | Elapsed Vinutes | Wind Speed (m/s) | Temperature (°C) | L _{Aeq} | L _{Amax} | L _{A10} | L _{A90} | |
| 10/07/2019 12:45 | 15.00 | < 5 m/s | 19 | 69.0 | 84.1 | 73.5 | 48.4 | Road traffic noise dominant from A29 |
| 10/07/2019 15:50 | 15.00 | < 5 m/s | 19 Ware-Er | 70.2 | 84.6 | 74.3 | 53.7 | Road traffic noise dominant from A29 |
| | | Mentra | | | Formentine | A ² ST | 4 Wane | |





0653

Date of Issue: 07 January 2019

Issued by: ANV Measurement Systems Beaufort Court 17 Roebuck Way Milton Keynes MK5 8HL Telephone 01908 642846 Fax 01908 642814 E-Mail: info@noise-and-vibration.co.uk Web: www.noise-and-vibration.co.uk Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Certificate Number: UCRT19/1022

| 1 | of | 2 | Pages | |
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| | | / | / | |
| | 1 | / | . / | |
| | K | V A | test. | |
| 1 | | - | | |
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| | 1 | 1 of | 1 of 2 | 1 of 2 Pages |

Customer

WSP UK Ltd 3rd Floor, Kings Orchard 1 Queen Street Bristol BS2 0HQ

| Order No. | 20084040 | | | |
|----------------------|-----------------|---|-----------------|---------------------------|
| Description | Sound Level Me | eter / Pre-amp / Microp | hone / Associ | ated Calibrator |
| Identification | Manufacturer | Instrument | Туре | Serial No. / Version |
| | Rion | Sound Level Meter | NL-52 | 01021289 |
| | Rion | Firmware | | 1.8 |
| | Rion | Pre Amplifier | NH-25 | 21331 |
| | Rion | Microphone | UC-59 | 04345 |
| | Rion | Calibrator | NC-74 | 00830766 |
| | | Calibrator adaptor ty | pe if applicab | le NC-74-002 |
| Performance Class | 1 | | | |
| Test Procedure | TP 2.SLM 6167 | 2-3 TPS-49 | | |
| | Procedures from | IEC 61672-3:2006 were | used to perform | n the periodic tests. |
| Type Approved to IEC | 61672-1:2002 | YES Approva | l Number | 21.21 / 13.02 |
| | | re is public evidence that n evaluation tests of IEC 6 | | uccessfully completed the |
| Date Received | 03 January 201 | 9 AN | V Job No. | UKAS19/01011 |
| Date Calibrated | 07 January 201 | 9 | | |

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

| Previous Certificate | Dated | Certificate No. | Laboratory |
|----------------------------|------------------------------|------------------------------|--|
| | 11 January 2017 | UCRT17/1012 | 7623 |
| This certificate is issue | d in accordance with the | laboratory accreditation | requirements of the United Kingdom |
| Accreditation Service. I | t provides traceability of | measurement to the SI | system of units and/or to units of |
| measurement realised a | t the National Physical La | aboratory or other recogni | ised national metrology institutes. This |
| certificate may not be rep | produced other than in full, | except with the prior writte | n approval of the issuing laboratory. |

UKAS Accredited Calibration Laboratory No. 0653

Certificate Number UCRT19/1022 Page 2

of 2 Pages

| | struction manual and | | | the sound lev | els inc | licated. | |
|----------------------------|---|------------------|--------------|------------------|----------|---------------|-----------|
| SLM instruction manual | | | 2 / NL-52 | | | | |
| SLM instruction manual | | 11- | 03 | | | | |
| SLM instruction manual | source | Manufa | octurer | | | | |
| Internet download date i | applicable | N/. | A | | | | |
| Case corrections availab | le | Ye | s | | | | |
| Uncertainties of case co | rrections | Ye | s | | | | |
| Source of case data | | Manufa | acturer | | | | |
| Wind screen corrections | available | Ye | s | | | | |
| Uncertainties of wind sc | | Ye | | | | | |
| Source of wind screen d | | Manufa | acturer | | <u> </u> | | |
| Mic pressure to free field | | Ye | | | | | |
| Uncertainties of Mic to F | | Ye | | | | | |
| Source of Mic to F.F. co | | Manufa | | | - | | |
| Total expanded uncertai | | | | 2002 Yes | - | | _ |
| Specified or equivalent (| | Spec | | | | | |
| Customer or Lab Calibra | | Customers | | | | | |
| Calibrator adaptor type i | applicable | NC-74 | | | | | |
| Calibrator cal. date | | 04 Janua | | | | | |
| Calibrator cert. number | | UCRT1 | 9/1013 | | | | |
| Calibrator cal cert issued | l by | 065 | 53 | | | | |
| Calibrator SPL @ STP | | 93.99 | dB | Calibration | referen | ce sound pre | ssure lev |
| Calibrator frequency | | 1002.65 | i Hz | Calibration | check f | requency | |
| Reference level range | | 25 - 130 |) dB | | | | |
| Accessories used or cor | rected for during calib | ration - | Wind Shie | ld WS-10 | | | |
| Note - if a pre-amp exte | | | | | he pre- | amp. | |
| Environmental condition | | Start | | End | 7 | | |
| Environmental condition | Temperature | 23.21 | | 23.50 | ± | 0.40 °C | 1 |
| | Humidity | 34.2 | | 36.6 | ± | 3.00 %RH | |
| | Ambient Pressure | 102.21 | | 102.19 | ± | 0.03 kPa | |
| | | | 10 | | <u> </u> | 0.00 KFa | _ |
| Response to associated | | | | | | | |
| Initial indicated leve | | dB | | I indicated leve | | 94.0 | dB |
| The uncertainty of the as | sociated calibrator su | ipplied with the | e sound le | vel meter ± | - | 0.10 | dB |
| Self Generated Noise | This test is currently | y not performe | ed by this L | .ab. | | | |
| Microphone installed (if | | | | N/A | dB | A Weighting | |
| Uncertainty of the micro | phone installed self ge | enerated noise | • ± | N/A | dB | | |
| Microphone replaced wit | h electrical input device | ce - | UR = Und | er Range indic | ated | 1 | |
| Weighting | A | Ċ | | | Z | | |
| | 11.5 dB UR | 16.3 | dB UR | 22.1 | dB | UR | |
| Uncertainty of the electri | Construction and a second s | | | 0.12 | dB | | |
| | | | | | - 20- | | |
| he reported expanded | uncortainty is based a | n a standard i | incortaint | multiplied by | 0.00 | ano factor k- | -2 provid |

a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

A Patel

END

Calibrated by: **Additional Comments** None





Date of Issue: 13 September 2017

| Issued by: |
|--|
| ANV Measurement Systems |
| Beaufort Court |
| 17 Roebuck Way |
| Milton Keynes MK5 8HL |
| Telephone 01908 642846 Fax 01908 642814 |
| E-Mail: info@noise-and-vibration.co.uk |
| Web: www.noise-and-vibration.co.uk |
| Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems |

Certificate Number: UCRT17/1780

| Pages | of | 1 | Page | |
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| | | | ed Signatory | Approved |
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| 2 | An | V. | | |
| / | -/ | 7-1 | 1 | |
| | | | v | K. Mistry |
| | | | y | K. Mistry |

Customer

WSP UK Ltd 3rd Floor,Kings Orchard 1 Queen Street Bristol BS2 0HQ

| Order No. | 20052621 | | | | | |
|----------------------|---|----------------|---------------|---------------|----------|----------------------|
| Description | Sound Level Me | eter / Pre-amp | / Microphor | ne / Associa | ated Ca | alibrator |
| Identification | Manufacturer | Instrument | | Туре | | Serial No. / Version |
| | Rion | Sound Leve | el Meter | NL-52 | | 00632043 |
| | Rion | Firmware | | | | 1.8 |
| | Rion | Pre Amplifi | er | NH-25 | | 32071 |
| | Rion | Microphone | • | UC-59 | | 05210 |
| | Brüel & Kjær | Calibrator | | 4231 | | 3002998 |
| | | Calibrator a | adaptor type | if applicabl | е | UC 0210 |
| Performance Class | 1 | | | | | |
| Test Procedure | TP 2.SLM 6167 | 2-3 TPS-49 | | | | |
| | Procedures from | IEC 61672-3:2 | 2006 were use | ed to perform | the pe | riodic tests. |
| Type Approved to IEC | 61672-1:2002 | YES | Approval N | umber | 21.21 | / 13.02 |
| | If YES above ther applicable pattern | | | | iccessfi | Illy completed the |
| Date Received | 11 September 2 | 2017 | ANV | Job No. | UKAS | S17/09476 |
| Date Calibrated | 13 September 2 | 2017 | | | | |

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

| Previous Certificate | Dated | Certificate No. | Laboratory | | | | | |
|--|---------------------------------|-------------------------------|---|--|--|--|--|--|
| | 17 September 2015 | TCRT15/1254 | ANV Measurement Systems | | | | | |
| This certificate is issue | d in accordance with the | e laboratory accreditation | requirements of the United Kingdom | | | | | |
| Accreditation Service. It j | provides traceability of mea | asurement to the SI system | of units and/or to units of measurement | | | | | |
| realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not | | | | | | | | |
| be reproduced other thar | n in full, except with the pric | or written approval of the is | suing laboratory. | | | | | |

UKAS Accredited Calibration Laboratory No. 0653

Certificate Number UCRT17/1780

Page 2 of

2 Pages

| | | | _ | | _ | | |
|------------------------------|------------------------|----------------------|----------|----------------|-----------|----------------|--------------|
| Sound Level Meter Insti | ruction manual an | d data used to adi | ust the | sound leve | els ind | icated. | |
| SLM instruction manual tit | | | | | | | |
| SLM instruction manual re | f / issue | 11-03 | | | | | |
| SLM instruction manual so | ource | Manufacture | r | | | | |
| Internet download date if a | pplicable | N/A | | | | | |
| Case corrections available | | Yes | | | | | |
| Uncertainties of case corre | ections | Yes | | | | | |
| Source of case data | | Manufacture | r | | | | |
| Wind screen corrections a | vailable | Yes | | | | | |
| Uncertainties of wind scree | en corrections | Yes | | | | | |
| Source of wind screen dat | а | Manufacture | r | | | | |
| Mic pressure to free field o | orrections | Yes | | | | | |
| Uncertainties of Mic to F.F | . corrections | Yes | | | | | |
| Source of Mic to F.F. corre | | Manufacture | | | | _ | |
| Total expanded uncertaint | | ements of IEC 6167 | 2-1:200 | 2 Yes | | | |
| Specified or equivalent Ca | | Specified | _ | | | | |
| Customer or Lab Calibrato | | Lab Calibrato | r | | | | |
| Calibrator adaptor type if a | pplicable | UC 0210 | | | | | |
| Calibrator cal. date | | 07 September 2 | 017 | | | | |
| Calibrator cert. number | | UCRT17/1768 | | | | | |
| Calibrator cal cert issued b | у | 0653 | | | | | |
| Calibrator SPL @ STP | | 94.13 | dB | Calibration re | eferenc | ce sound pre | ssure level |
| Calibrator frequency | | 999.96 | | Calibration c | | | |
| Reference level range | | 25 - 130 | dB | | incont in | oquonoj | |
| Accessories used or corre | cted for during calib | ration - Wind | Shield V | NS-10 | | | |
| Note - if a pre-amp extens | | | | | e pre-a | amp. | |
| Environmental conditions | | Start | 1 | End | 1 | | |
| | Temperature | 20.48 | | 20.84 | ± | 0.20 °C | 1 |
| | Humidity | 53.1 | | 49.3 | ± | 3.00 %RH | - |
| | Ambient Pressure | 98.83 | | 98.91 | + | 0.03 kPa | - |
| Response to associated C | | | | | - | 0.00 M a | 1 |
| Initial indicated level | 94.2 | | | | - | 04.4 | |
| The uncertainty of the ass | | | | dicated level | | 94.1 | dB dB |
| | (7) | | | | | 0.10 | dВ |
| Self Generated Noise | This test is currently | y not performed by t | his Lab. | | | | |
| Microphone installed (if re | | | | N/A | | A Weighting | |
| Uncertainty of the microph | | | | N/A | dB | | |
| Microphone replaced with | electrical input devi | | Under F | Range indica | ted | | |
| Weighting | Α | C | | | Z | | |
| 10 | | 15.4 dB | UR | 21.5 | dB | UR | |
| Uncertainty of the electrica | | | | 0.12 | dB | | |
| The reported expanded ur | certainty is based o | n a standard uncert | ainty mu | ultiplied by a | covera | age factor k = | 2, providing |

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

Calibrated by: A Patel

Calibrated by: A Patel Additional Comments None





Date of Issue: 12 September 2017

Issued by: ANV Measurement Systems Beaufort Court 17 Roebuck Way Milton Keynes MK5 8HL Telephone 01908 642846 Fax 01908 642814 E-Mail: info@noise-and-vibration.co.uk Web: www.noise-and-vibration.co.uk Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Certificate Number: UCRT17/1777

| | Page | 1 | of | 2 | Pages | |
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| Approved S | Signatory | | | | | |
| | | 1 | \vee | / | / | |
| | | C. | No | 1 | | |
| | | | / | 1 | | |
| K. Mistry | | | L | | | |
| rt. Ivnou y | | | | _ | _ | _ |

Customer

WSP UK Ltd 3rd Floor,Kings Orchard 1 Queen Street Bristol BS2 0HQ

| Order No. | 20052621 | | | | | | |
|----------------------|--|---|-----------------|--------------------------|--|--|--|
| Description | Sound Level Meter / Pre-amp / Microphone / Associated Calibrator | | | | | | |
| Identification | Manufacturer | Instrument | Туре | Serial No. / Version | | | |
| | Rion | Sound Level Meter | NL-52 | 01021288 | | | |
| | Rion | Firmware | | 1.8 | | | |
| | Rion | Pre Amplifier | NH-25 | 21330 | | | |
| | Rion | Microphone | UC-59 | 08198 | | | |
| | Brüel & Kjær | Calibrator | 4231 | 3002998 | | | |
| | | Calibrator adaptor typ | pe if applicabl | e UC 0210 | | | |
| Performance Class | 1 | | | | | | |
| Test Procedure | TP 2.SLM 6167 | 2-3 TPS-49 | | | | | |
| | Procedures from | IEC 61672-3:2006 were u | used to perform | n the periodic tests. | | | |
| Type Approved to IEC | 61672-1:2002 | YES Approval | Number | 21.21 / 13.02 | | | |
| | | re is public evidence that t n evaluation tests of IEC 6 | | ccessfully completed the | | | |
| Date Received | 11 September 2 | 2017 AN | V Job No. | UKAS17/09476 | | | |
| Date Calibrated | 12 September 2 | 2017 | | | | | |

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

| Previous Certificate | Dated | Certificate No. | Laboratory |
|----------------------------|---------------------------------|------------------------------|--|
| | 04 November 2015 | TCRT15/1301 | ANV Measurement Systems |
| This certificate is issue | ed in accordance with th | e laboratory accreditation | n requirements of the United Kingdom |
| Accreditation Service. It | provides traceability of mea | asurement to the SI system | m of units and/or to units of measurement |
| realised at the National I | Physical Laboratory or othe | er recognised national me | trology institutes. This certificate may not |
| be reproduced other that | n in full, except with the prid | or written approval of the i | ssuing laboratory. |

UKAS Accredited Calibration Laboratory No. 0653

Certificate Number UCRT17/1777

Page 2

of 2 Pages

| Sound Level Meter Instruction manua | al and data used to adi | ust the s | ound lev | els ind | icated. | |
|--|----------------------------|-----------|--------------|----------|-------------------|--------------|
| | evel Meter NL-42 / NL | | | | | |
| SLM instruction manual ref / issue | 11-03 | | | | | |
| SLM instruction manual source | Manufacture | | | | | |
| Internet download date if applicable | N/A | | | | | |
| Case corrections available | Yes | | | | | |
| Uncertainties of case corrections | Yes | | | | | |
| Source of case data | Manufacture | | | | | |
| Wind screen corrections available | Yes | | | | | |
| Uncertainties of wind screen corrections | Yes | | | | | |
| Source of wind screen data | Manufacture | | | | | |
| Mic pressure to free field corrections | Yes | | | | | |
| Uncertainties of Mic to F.F. corrections | Yes | | | | | |
| Source of Mic to F.F. corrections | Manufacture | | | | | _ |
| Total expanded uncertainties within the r | | 2-1:2002 | Yes | | | |
| Specified or equivalent Calibrator | Specified | | | | | |
| Customer or Lab Calibrator | Lab Calibrato | r | | | | |
| Calibrator adaptor type if applicable | UC 0210 | | | | | |
| Calibrator cal. date | 07 September 2 | 017 | | | | |
| Calibrator cert. number | UCRT17/1768 | | | | | |
| Calibrator cal cert issued by | 0653 | | | | | |
| Calibrator SPL @ STP | 94.13 | dB C | alibration r | referen | ce sound p | ressure leve |
| Calibrator frequency | 999.96 | | alibration | | | |
| Reference level range | 25 - 130 | dB | | | | |
| Accessories used or corrected for during | calibration - Wind | Shield W | S-10 | | | |
| Note - if a pre-amp extension cable is list | ed then it was used betw | een the S | LM and the | ne pre-a | amp. | |
| Environmental conditions during tests | Start | F | nd | 1 | | |
| Temperature | 21.91 | | 1.70 | ± | 0.20 °C | |
| Humidity | 45.2 | | 3.3 | ± | 3.00 %R | 2H |
| Ambient Press | | | 9.58 | ±. | 0.03 kPa | |
| Response to associated Calibrator at the | sur o | - | | | 0.00 10 0 | <u></u> |
| | | | antod love | J. | 94.1 | dP |
| | | | cated leve | | 0.10 | dB dB |
| The uncertainty of the associated calibra | | | Ierel T | 1 | 0.10 | UD |
| | rrently not performed by t | | 1/ 6 | | A 147 1 1 1 1 1 | |
| Microphone installed (if requested by cus | | | N/A | | A Weightin | 9 |
| Uncertainty of the microphone installed s | elt generated noise ± | | N/A | dB | 1 | |
| Microphone replaced with electrical input | device - UR = | Under Ra | ange indica | ated | | |
| Weighting A | C | | | Z | | |
| 11.6 dB U | JR 17.1 dB | UR | 22.3 | dB | UR | |
| Uncertainty of the electrical self generate | ed noise ± | C | .12 | dB | | |
| Uncertainty of the electrical self generate The reported expanded uncertainty is ba | | 1. | | |] age factor / | k=2, pro |

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

| END | с накожающима на славащие и и национа е на населението на славото на сели на собласти на собласти и на сели и н |
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Calibrated by: A Patel Additional Comments None





Date of Issue: 04 January 2019

Issued by: ANV Measurement Systems Beaufort Court 17 Roebuck Way Milton Keynes MK5 8HL Telephone 01908 642846 Fax 01908 642814 E-Mail: info@noise-and-vibration.co.uk Web: www.noise-and-vibration.co.uk Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Certificate Number: UCRT19/1013

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Customer WSP UK Ltd 3rd Floor, Kings Orchard 1 Queen Street Bristol BS2 0HQ

| Order No. | 20084040 | | | |
|----------------|-----------------------------|---------------------------------|-----------------------|-------------------------------|
| Test Procedure | Procedure TP | 1 Calibration of Sou | Ind Calibrators | |
| Description | Acoustic Calibr | ator | | |
| Identification | <i>Manufacturer</i> Rion | <i>Instrument</i> Calibrator | <i>Model</i> NC-74 | <i>Serial No.</i> 00830766 |

The calibrator has been tested as specified in Annex B of IEC 60942:2003. As public evidence was available from a testing organisation (PTB) responsible for approving the results of pattern evaluation tests, to demonstrate that the model of sound calibrator fully conformed to the requirements for pattern evaluation described in Annex A of IEC 60942:2003, the sound calibrator tested is considered to conform to all the class 1 requirements of IEC 60942:2003.

| ANV Job No. | UKAS19/01011 | |
|----------------------|--|--|
| Date Received | 03 January 2019 | |
| Date Calibrated | 04 January 2019 | |
| Previous Certificate | Dated Certificate No. Laboratory | 18 January 2018 UCRT18/1044 0653 |

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Measurements

The sound pressure level generated by the calibrator in its WS2 configuration was measured five times by the Insert Voltage Method using a microphone as detailed below. The mean of the results obtained is shown below. It is corrected to the standard atmospheric pressure of 101.3 kPa (1013 mBar) using original manufacturers information.

| Test Microphone | Manufacturer | Туре |
|-----------------|--------------|------|
| | Brüel & Kjær | 4134 |

Results

The level of the calibrator output under the conditions outlined above was

0.10 dB rel 20 µPa 93.99 \pm

Functional Tests and Observations

| The frequency of the sound produced was | 1002.65 Hz | ± | 0.13 Hz |
|---|------------|---|------------------|
| The total distortion was | 1.25 % | ± | 6.7 % of Reading |

During the measurements environmental conditions were

| Temperature | 23 | to | 24 °C |
|---------------------|-------|----|-----------|
| Relative Humidity | 29 | to | 36 % |
| Barometric Pressure | 103.2 | to | 103.3 kPa |

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

The uncertainties refer to the measured values only with no account being taken of the ability of the instrument to maintain its calibration.

A small correction factor may need to be applied to the sound pressure level quoted above if the device is used to calibrate a sound level meter which is fitted with a free-field response microphone. See manufacturers handbook for details.

| | END | |
|---|-----|----|
| Note: | | |
| Calibrator adjusted prior to calibration? | NO | |
| Initial Level | N/A | dB |
| Initial Frequency | N/A | Hz |
| Additional Comments | | |

None

Calibrated by: B. Bogdan