ASBUILT
A Smarter World. Digitally.

Griffith Hospital

Environmental Monitoring

Summary Report

ADCO Constructions

Prepared by asBuilt Digital
19th January 2023

PRIVATE & CONFIDENTIAL

1. Environmental Monitoring

asBuilt has been engaged to supply continuous monitoring for Environmental Sensors for the Griffith Hospital Station project in GriffithNSW. Online monitoring is provided via the asBuilt Vault platform.

1.1. VIBRATION MONITORING

asBuilt has supplied Adroit Vibration monitoring equipment which has been Adroit vibration sensors measure vibration levels received on structures from construction in accordance with DIN standard 4150-3:2016. The sensor has been set to the most sensitive amplitude measurement in accordance with the DIN Standard (5mm/s in each plane) for cosmetic damage. They also record the same frequency range against human comfort levels but these have not been isolated in this report.

Each minute, the sensor outputs on the maximum amplitude of any frequency range within the 1-600Hz range. This maximum deflection is shown as a point on the output tables. To offer the best sample rate, the sensor is connected to mains power. There is a batter back-up on board to record with minor power outages. Other specifics of the sensor are:

- Meets DIN4150-3 standard
- Transducer type: Industrial MEMS Accelerometer
- Number of channels: 3-axis
- Frequency range: 1 to 600 Hz
- Measurement Range: +/- 1000 mm/s
- Resolution: 0.05 mm/s
- Environmental rating: IP65

Fig 1 – the relative site location of the Vibration monitor is GPS referenced and located in the position shown on the attached diagram

Fig 2 – The Vibration sensor is installed on a concrete block at the base of the permanent noise barrier near the imaging department. It needs to be installed level in all 3 planes (x, y, & z) to ensure that correct amplitude and velocity measurements will be recorded correctly.

The vibration sensor was turned on using site temporary power on 29 June 2022.

1.2. MONTHLY DEFLECTION RECORDINGS

Each day, deflections in all 3 planes (x, y & z) are recorded. The graphs below are available as a separate daily feed (recorded and stored in Vault) or can be combined to give a monthly view across a 24 hour cycle. The % deflection stored

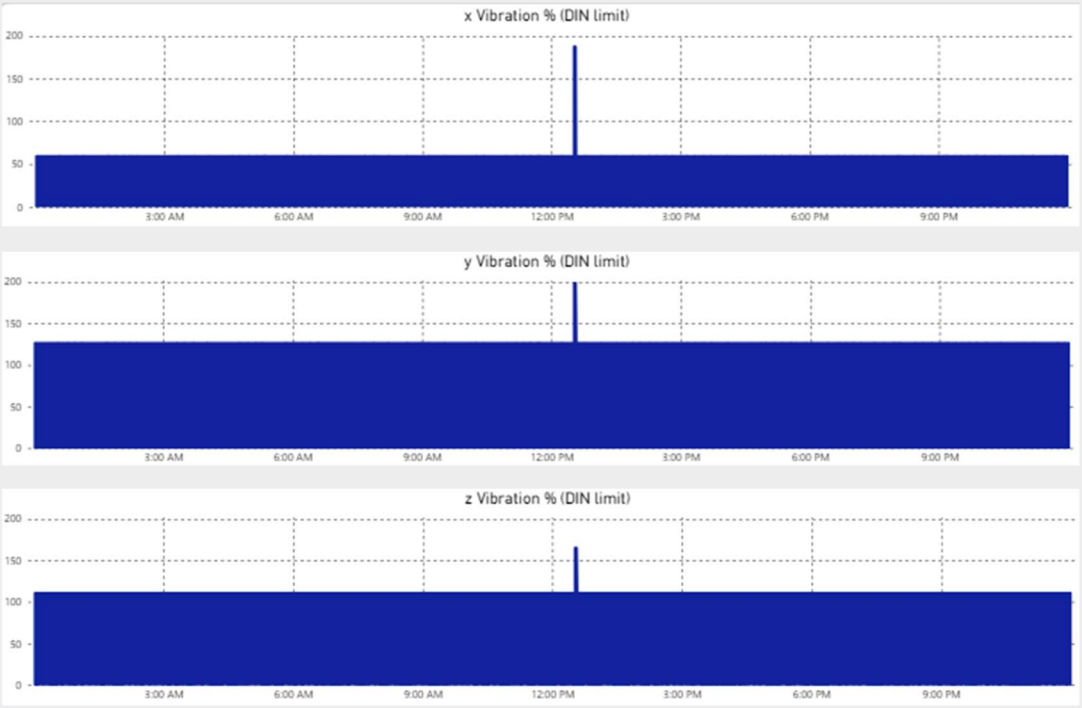
DECEMBER 2023

The monthly output graphs for each plane are shown here. The maximum deflection recorded in each axis were:

X = 187.55% (9.377mm/s)

Y = 198.99% (9.949mm/s)

Z = 165.38% (8.269mm/s)



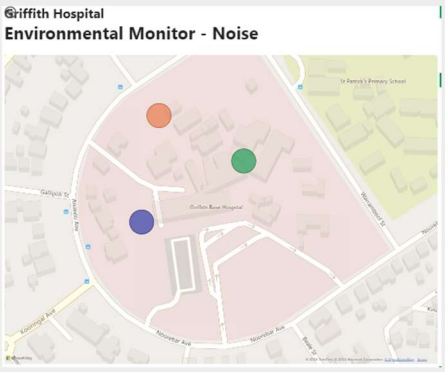
NOTE:

The vibration monitor for Medical Imaging recording recommenced 15th December 2023 after the fault that caused the malfunction was identified and fixed. As the sensor was powered on before final installation the installation of the fixing bolts appears to have been recorded by the sensor resulting in the recorded maximum levels on 15th December. The average max reading for the time after install after the spike was removed was 1.52% or 0.076 mm/s which is inline with historic recordings and expected as activities on site reduced for the New Year break.

1.3. NOISE MONITORING

asBuilt has supplied Netvox R718-PA7 noise sensors which are dBA weighted and operate on a LoRaWAN frequency range. These basic noise monitors provide a level of record which senses noise level at a certain location and provides a continuous sample rate on mains power. The intent of installing the noise monitors was to provide ADCO a sample system whereby construction activity could be recorded and in the event of a complaint, allow some isolation of noise generating area.

The noise sensors were installed and started recording data from 10th May 2022.

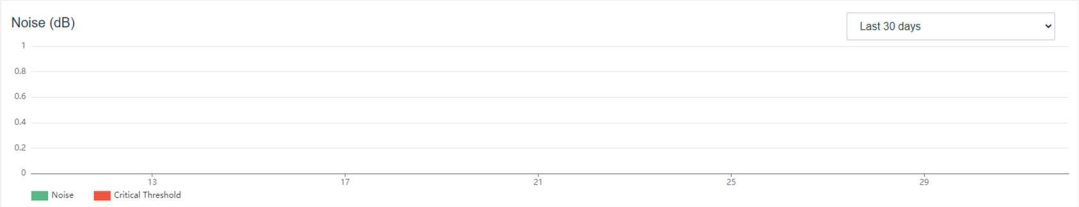


The monitor takes a sample of noise every 10s and records the output data in a graphical format via the asBuilt Vault platform. The Max and Min values for noise are then recorded and shown in the graphs below.

Fig 4 shows the GPS locations of the 3 noises sensors at the site.

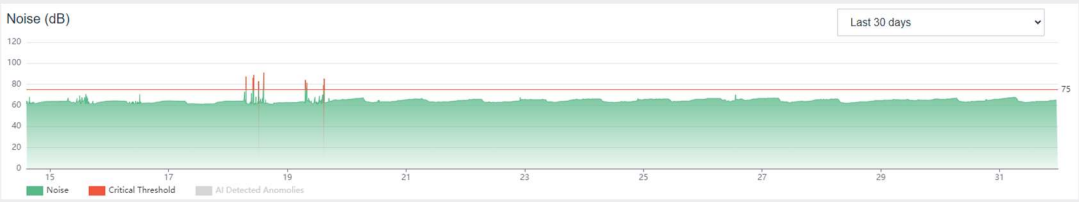
Fig 5, 6 & 7 show the locations of noise monitors NOISAU-009, 008 & 005 on site.

NOISE READINGS FROM NOISAU-005 – MEDICAL IMAGING



Noise recordings ceased on 3rd November due to unforeseen power loss, ADCO have identified the cause and have actions in place to have back online. The noise readings from sensor NOISAU-005, located near the scanning department showed was not available for the month of December a peak noise value of N/A on N/A

NOISE READINGS FROM NOISAU-008 – STAFF ACCOMMODATION



The noise readings from sensor NOISAU-008N, located near Residents boundary on Animoo Ave showed a peak noise value of 90.9dB on 18th December 2023.

NOISE READINGS FROM NOISAU-009 – SITE SHEDS

The noise readings from sensor NOISAU-009, located near the ADCO Site Sheds showed a peak noise value of 69.7dB on 13thth December 2023.

1.4. WEATHER RECORD

asBuilt has been recording Bureau of Meteorology (BOM) feeds for weather at Griffith airport since 17th February 2022. On 5th August, the feed from the ADCO site-based weather station started to produce data that was overlaid with BOM data to give a comparative record. This a useful comparator as the closest industry recognised BOM feed can sometimes be several kilometres from the construction site. asBuilt records 4 main interest areas from the BOM feeds across the country.

- Temperature
- Wind Speed
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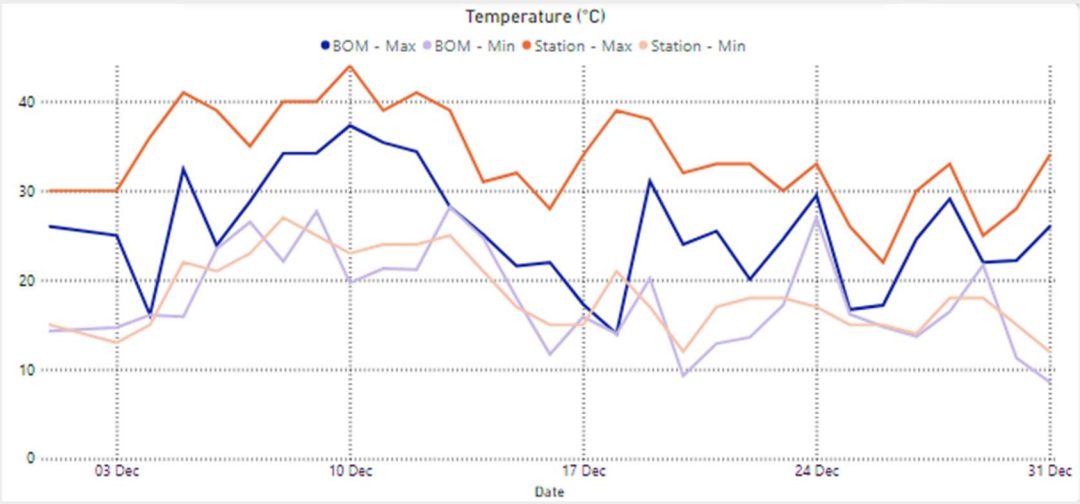
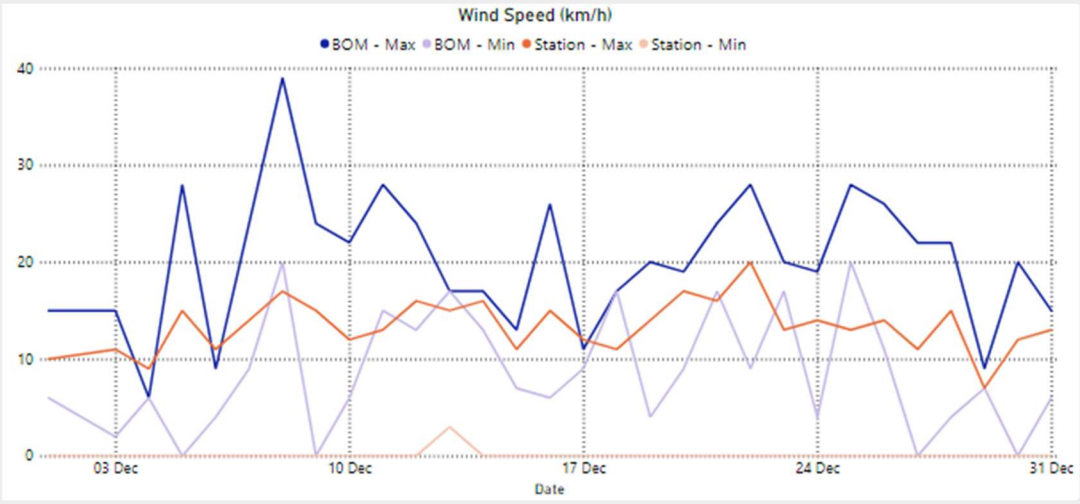
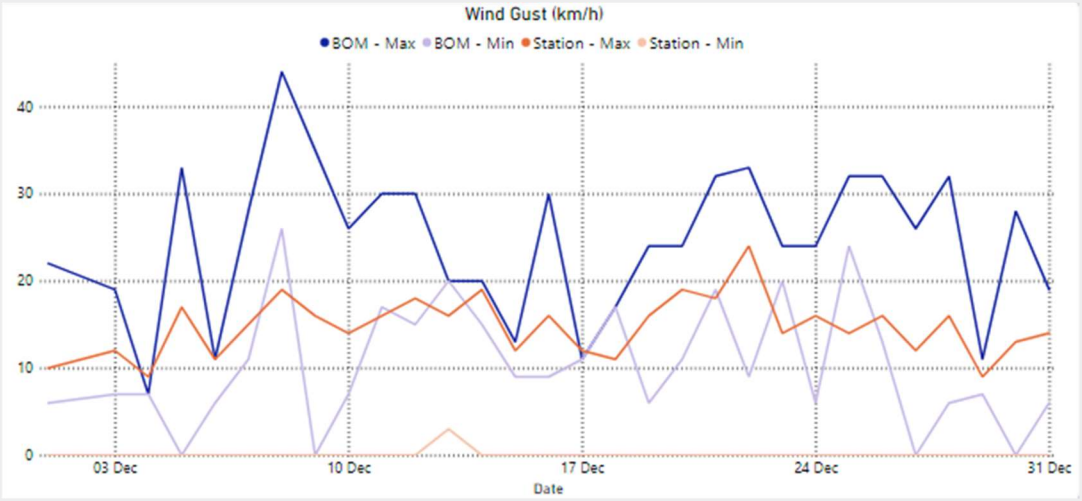
- Rainfall

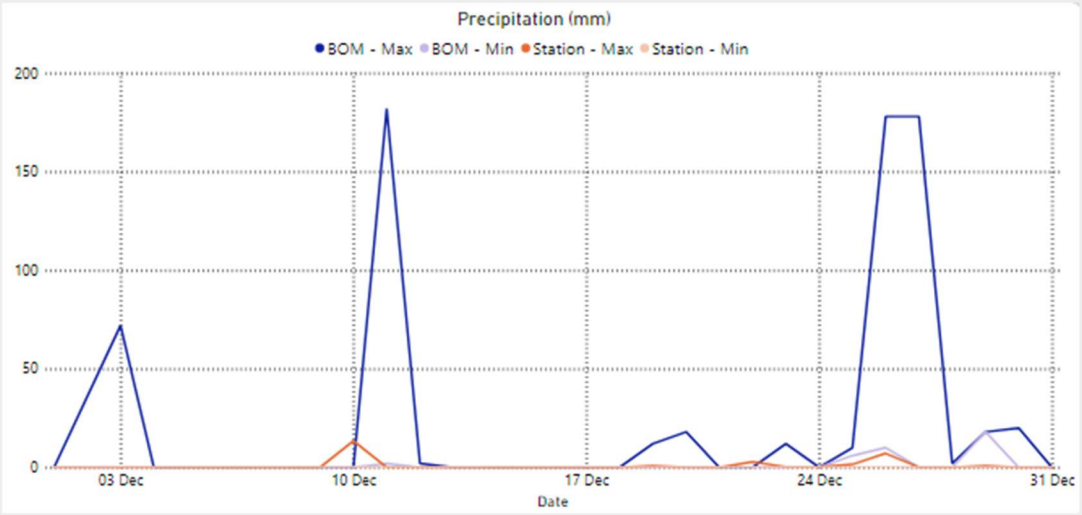
This has been known to deliver a different record of local weather experience at site and can be useful in forming construction claims for weather events. It can also be a useful record for other events at site other than weather when establishing a qualitative record (e.g. a concrete pour or material exposure to elements on site). A sample is recorded every 20 min from the BOM feed, but the graphs below only show daily maximums. More granular data can be provided upon request.

The PURPLE line in the below graphs indicated measurements from the BOM Feed. The ORANGE lines indicate the site based weather station feed.









About asBuilt

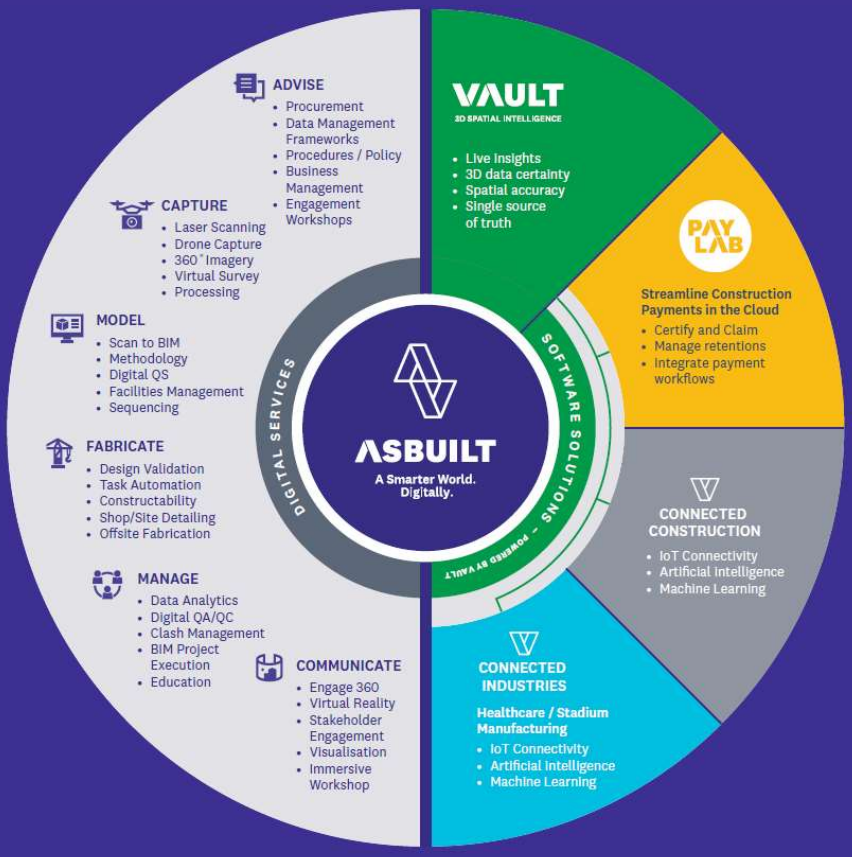
Established in 2012 and entrusted by major blue-chip brands, asBuilt are Digital Engineering Experts and one of the largest and most experienced, independent specialist Building Information Modelling (BIM) consultancies in Australasia.

asBuilt has developed unique workflows and customised software that enables stakeholders to align and collaborate in a structured digital environment.

Our Purpose: A Smarter World. Digitally.

asBuilt are on a mission to help the construction industry digitally transform. We enable multiple streams of built data to unite – as a digital twin. Infrastructure becomes digital. It is clickable, analysable and tells a story.

In this smart form it can: connect people, communicate, learn, and forecast.



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ADCO Constructions

Prepared by asBuilt Digital
1st February 2024

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The vibration sensor was turned on using site temporary power on 29 June 2022.

1.2. MONTHLY DEFLECTION RECORDINGS

Each day, deflections in all 3 planes (x, y & z) are recorded. The graphs below are available as a separate daily feed (recorded and stored in Vault) or can be combined to give a monthly view across a 24 hour cycle. The % deflection stored

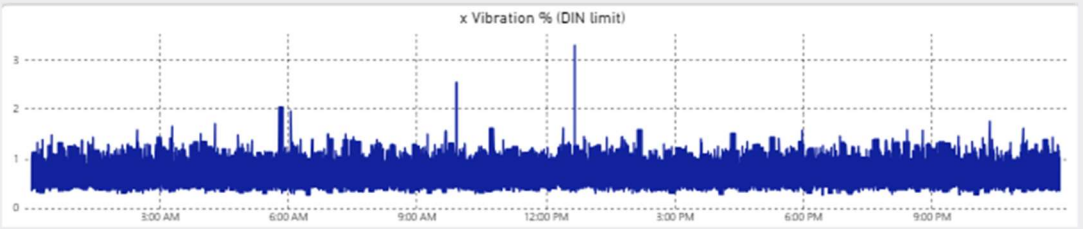
JANUARY 2024

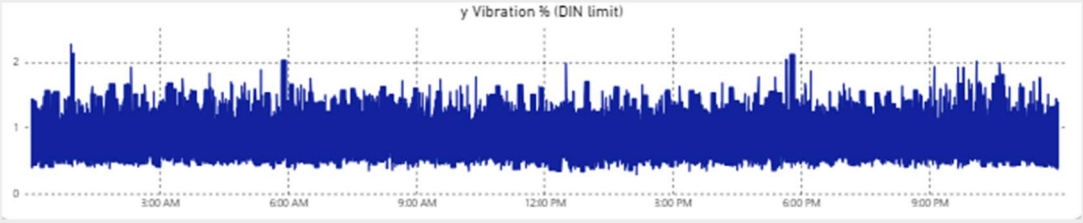
The monthly output graphs for each plane are shown here. The maximum deflection recorded in each axis were:

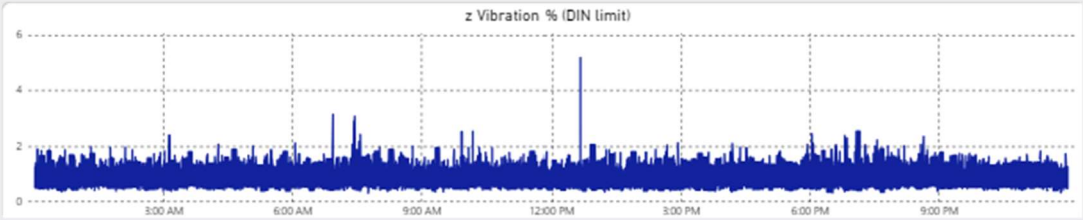
X = 3.29% (0.165mm/s)

Y = 2.27% (0.114mm/s)

Z = 5.18% (0.259mm/s)







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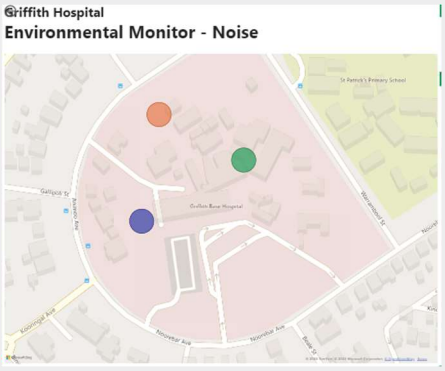
The noise sensors were installed and started recording data from 10th May 2022.



The monitor takes a sample of noise every 10s and records the output data in a graphical format via the asBuilt Vault platform. The Max and Min values for noise are then recorded and shown in the graphs below.

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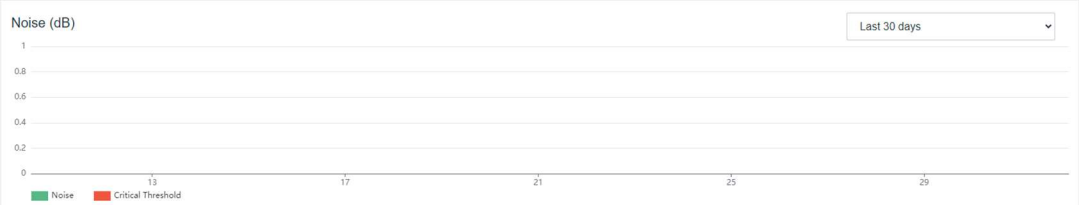
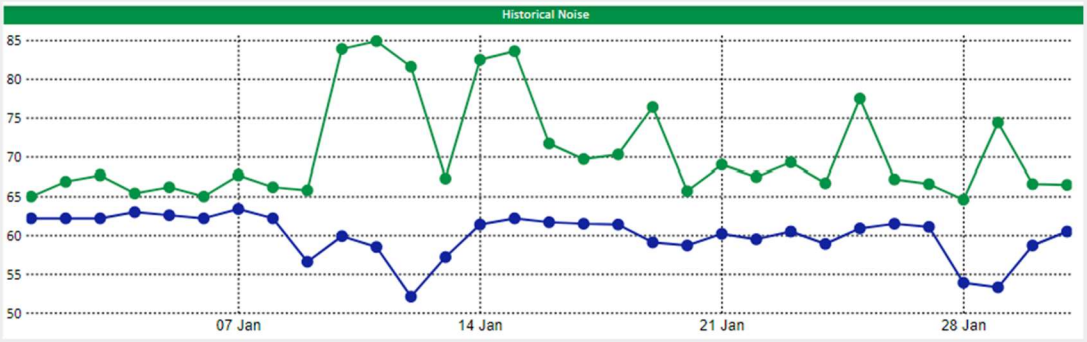
NOISE READINGS FROM NOISAU-005 – MEDICAL IMAGING



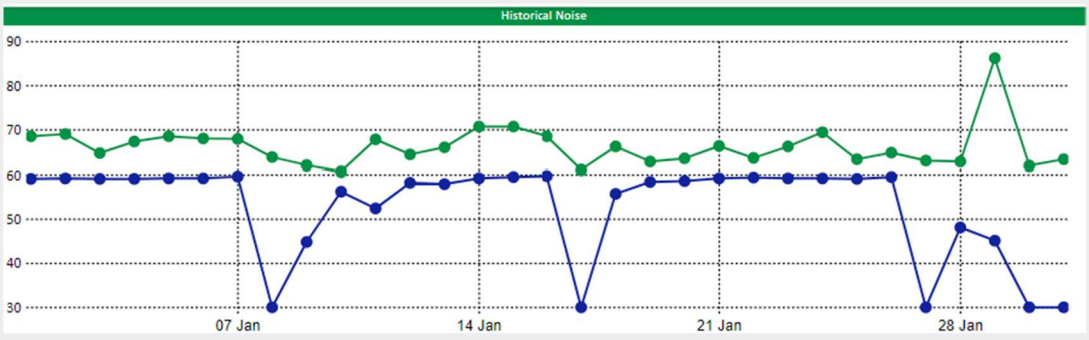
Noise recordings ceased on 3rd November due to unforeseen power loss, ADCO have identified the cause and have actions in place to have back online. The noise readings from sensor NOISAU-005, located near the scanning department showed was not available for the month of December a peak noise value of N/A on N/A

NOISE READINGS FROM NOISAU-008 – STAFF ACCOMMODATION



The noise readings from sensor NOISAU-008N, located near Residents boundary on Animoo Ave showed a peak noise value of 84.9dB on 11th January 2024.

NOISE READINGS FROM NOISAU-009 – SITE SHEDS



The noise readings from sensor NOISAU-009, located near the ADCO Site Sheds showed a peak noise value of 86.2dB on 29th January 2024.

1.4. WEATHER RECORD

asBuilt has been recording Bureau of Meteorology (BOM) feeds for weather at Griffith airport since 17th February 2022. On 5th August, the feed from the ADCO site-based weather station started to produce data that was overlaid with BOM data to give a comparative record. This a useful comparator as the closest industry recognised BOM feed can sometimes be several kilometres from the construction site. asBuilt records 4 main interest areas from the BOM feeds across the country.

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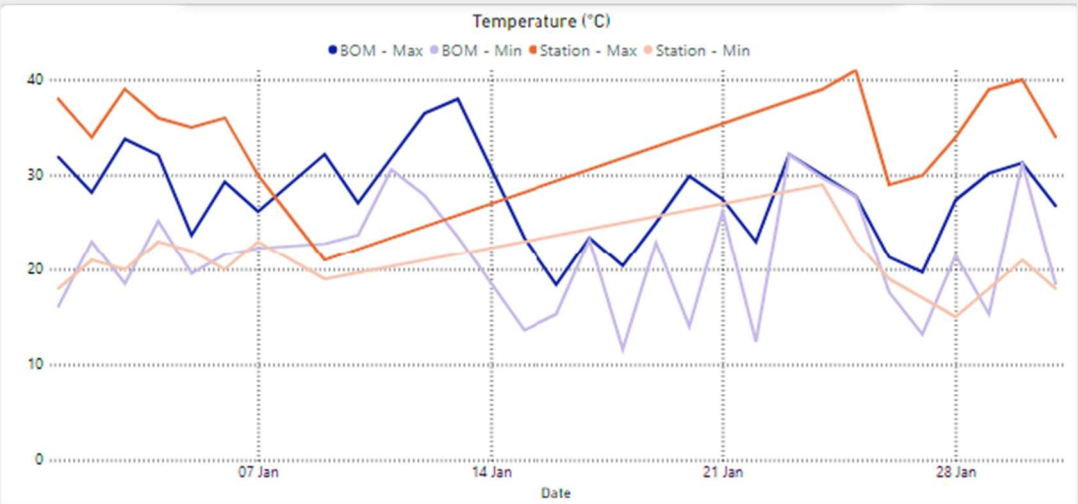

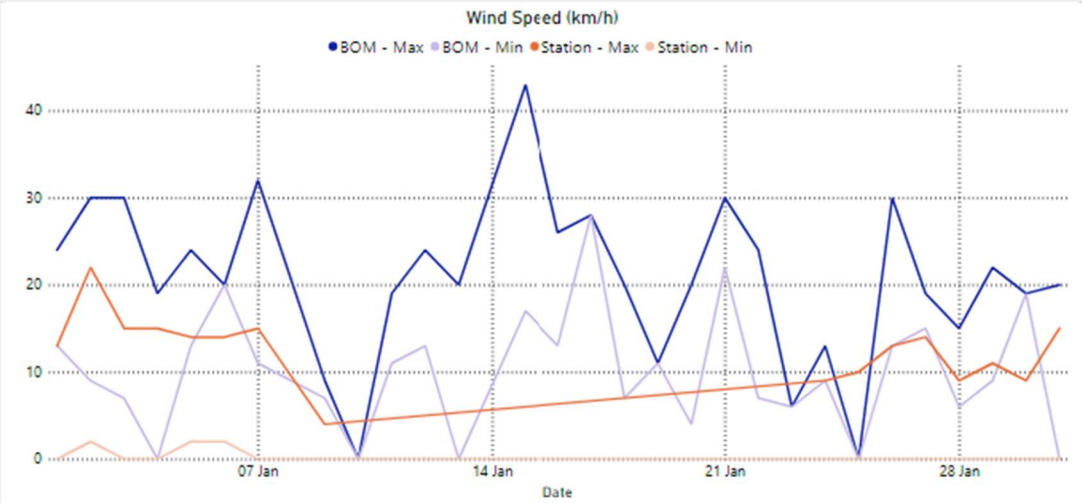

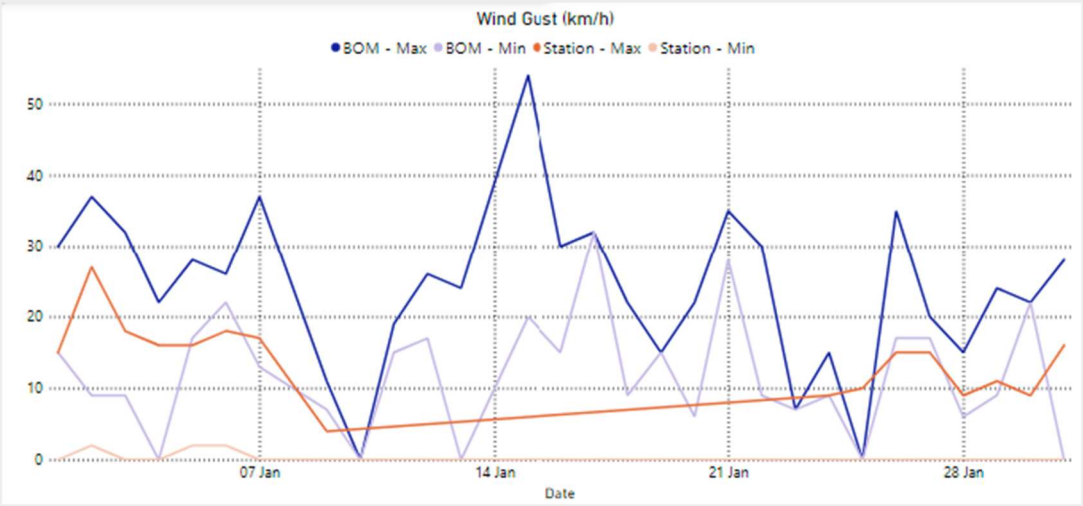

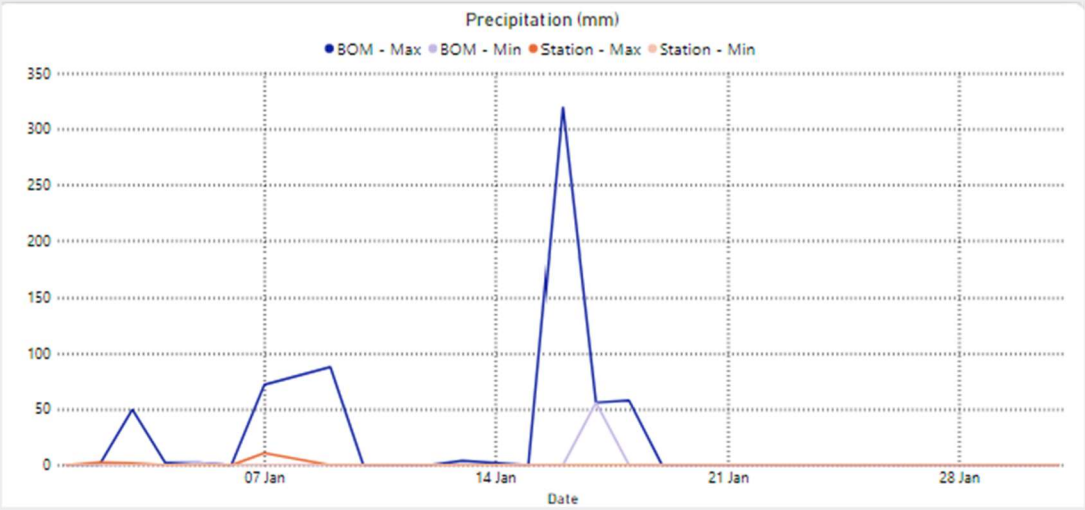

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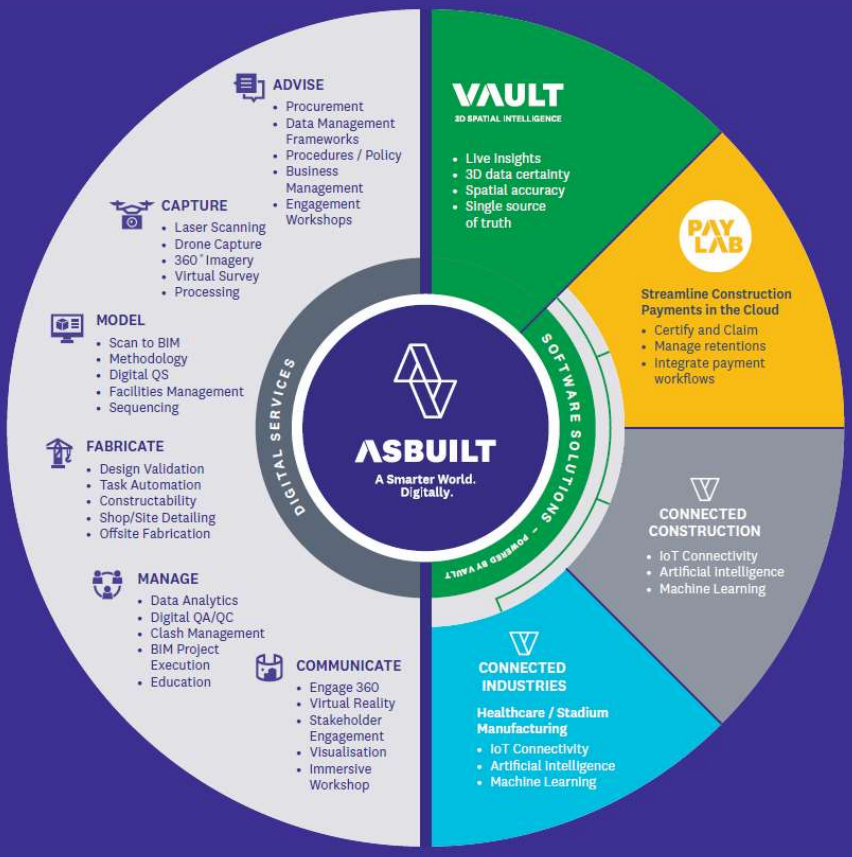

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Griffith Hospital

Environmental Monitoring

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Prepared by asBuilt Digital
6th March 2024

PRIVATE & CONFIDENTIAL

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FEBRUARY 2024

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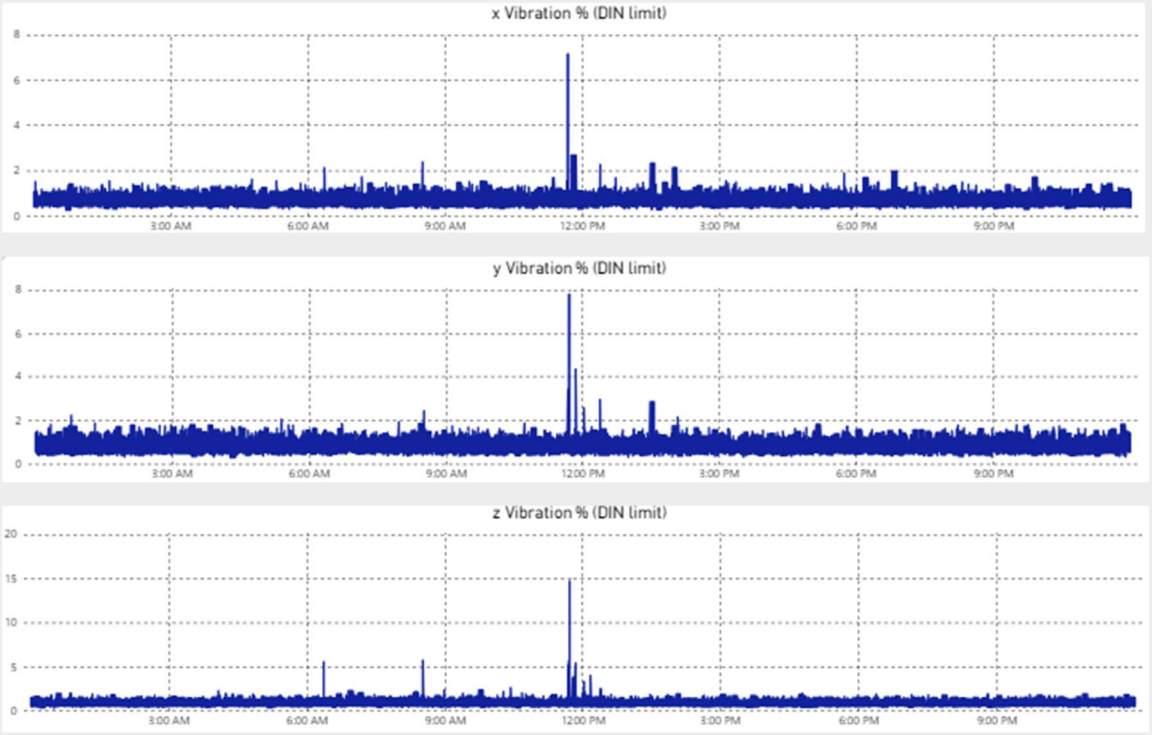
X = 7.14% (0.357mm/s)

Y = 7.79% (0.389mm/s)

Z = 14.72% (0.736mm/s)



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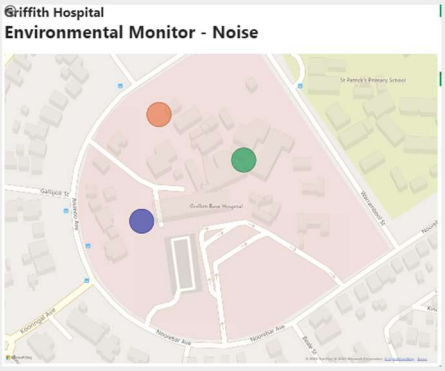

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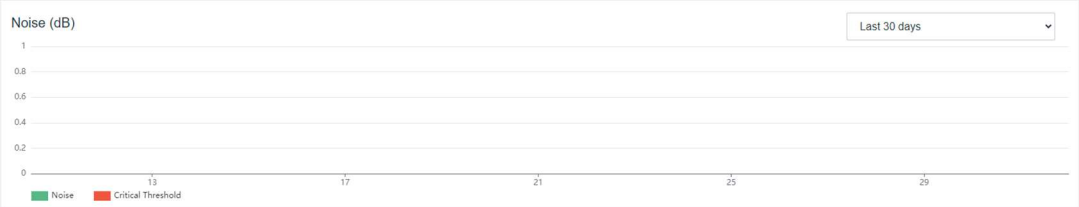

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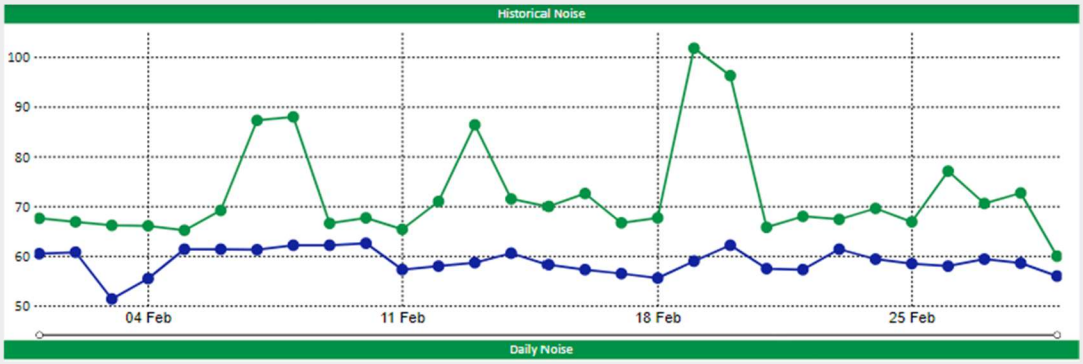
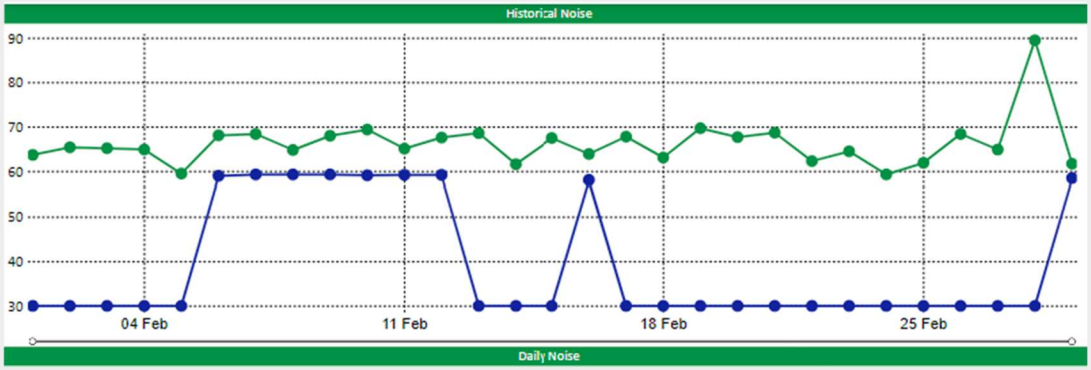
NOISE READINGS FROM NOISAU-008 – STAFF ACCOMMODATION



The noise readings from sensor NOISAU-008N, located near Residents boundary on Animoo Ave showed a peak noise value of 101.8dB on 19th February 2024.

NOISE READINGS FROM NOISAU-009 – SITE SHEDS



The noise readings from sensor NOISAU-009, located near the ADCO Site Sheds showed a peak noise value of 89.5dB on 28th February 2024.

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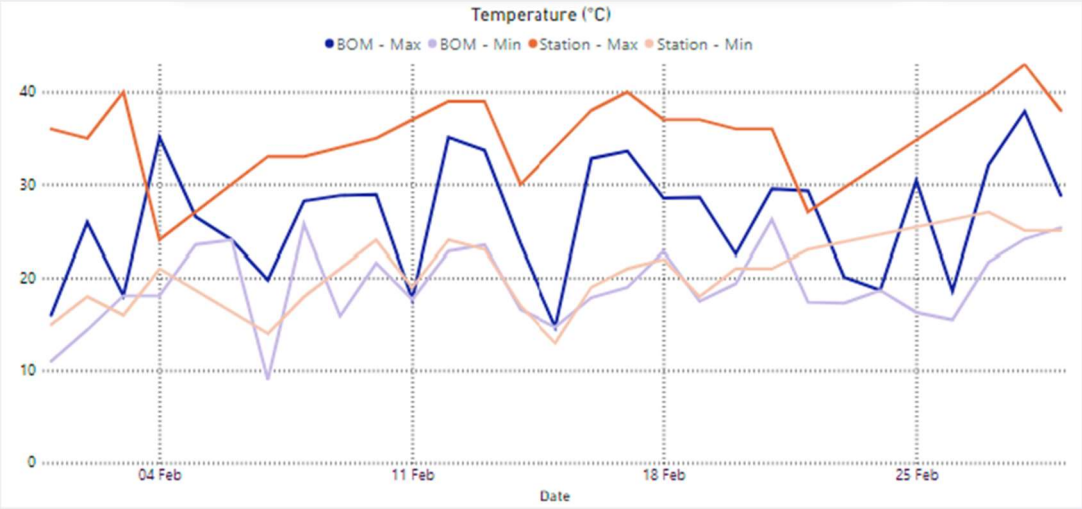

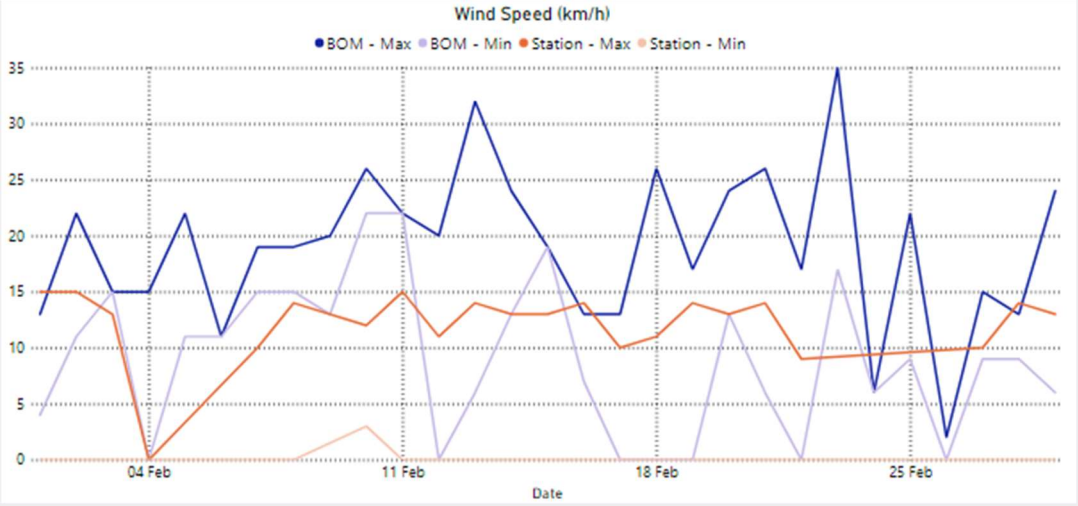

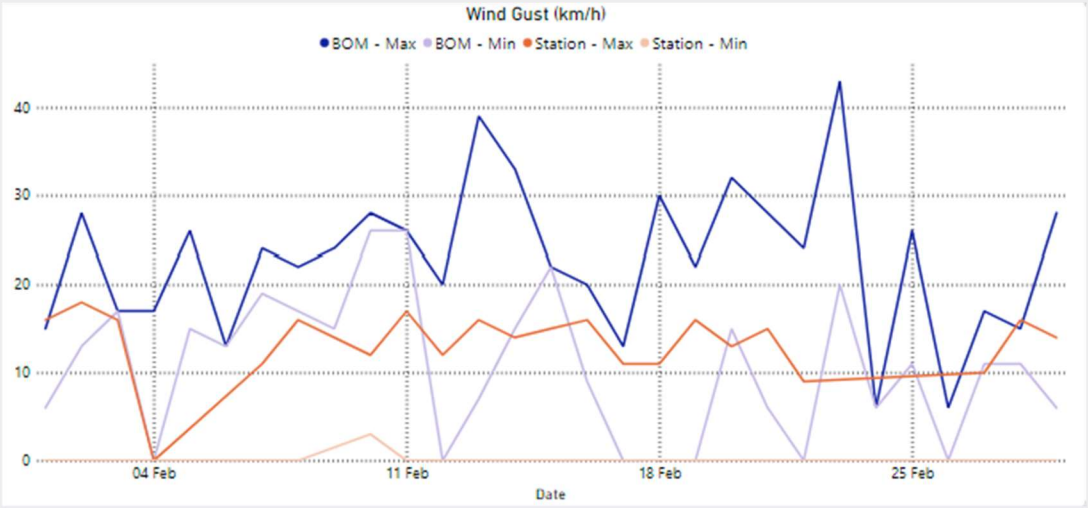

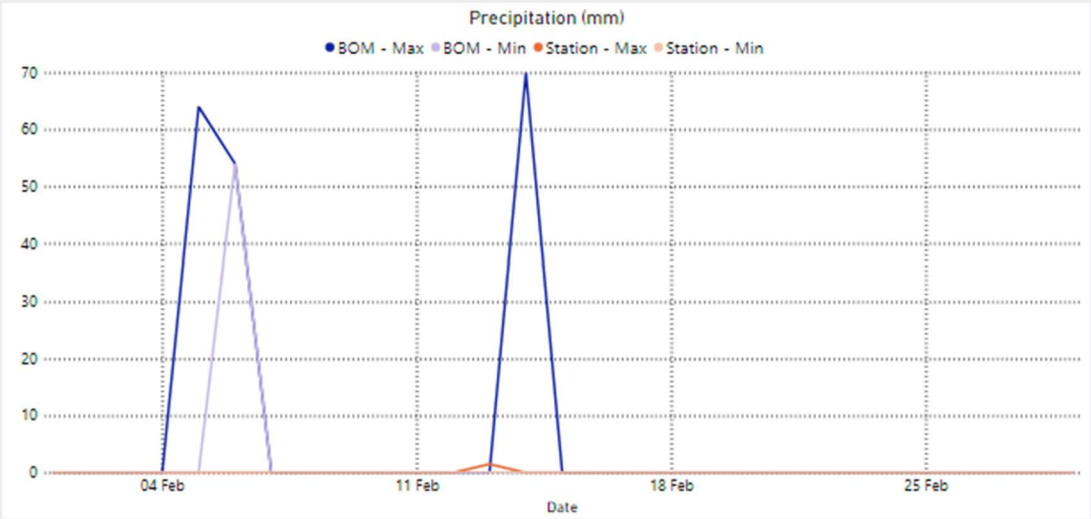

About asBuilt

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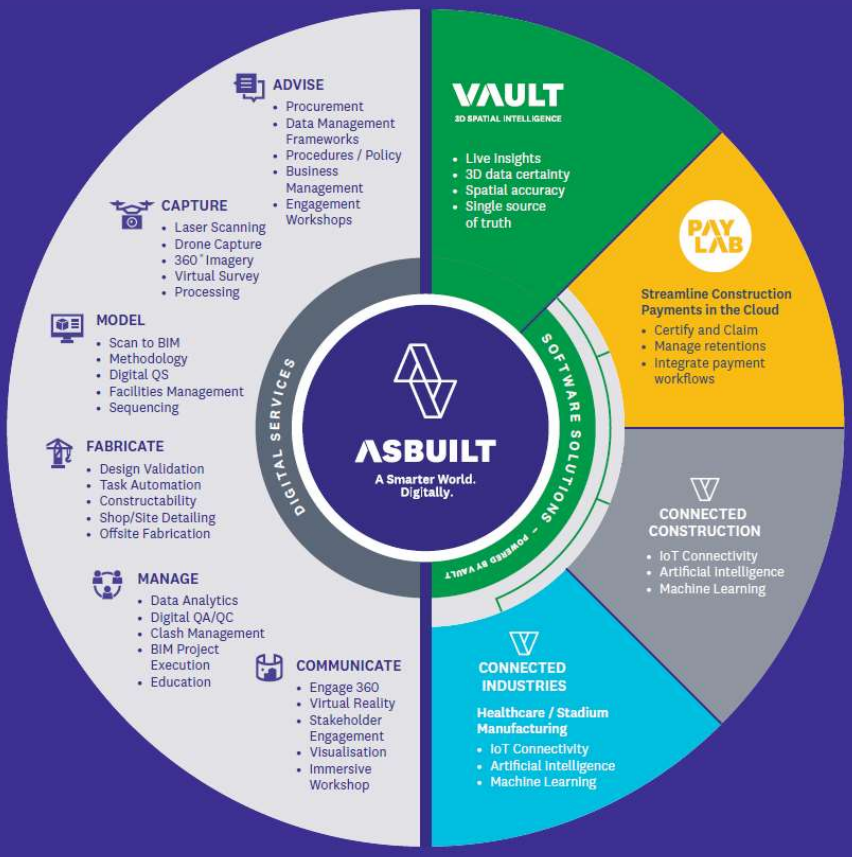

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Griffith Hospital

Environmental Monitoring

Summary Report

ADCO Constructions

Prepared by asBuilt Digital
31st May 2024

PRIVATE & CONFIDENTIAL

1. Environmental Monitoring

asBuilt has been engaged to supply continuous monitoring for Environmental Sensors for the Griffith Hospital Station project in GriffithNSW. Online monitoring is provided via the asBuilt Vault platform.

1.1. VIBRATION MONITORING

asBuilt has supplied Adroit Vibration monitoring equipment which has been Adroit vibration sensors measure vibration levels received on structures from construction in accordance with DIN standard 4150-3:2016. The sensor has been set to the most sensitive amplitude measurement in accordance with the DIN Standard (5mm/s in each plane) for cosmetic damage. They also record the same frequency range against human comfort levels but these have not been isolated in this report.

Each minute, the sensor outputs on the maximum amplitude of any frequency range within the 1-600Hz range. This maximum deflection is shown as a point on the output tables. To offer the best sample rate, the sensor is connected to mains power. There is a batter back-up on board to record with minor power outages. Other specifics of the sensor are:

- Meets DIN4150-3 standard
- Transducer type: Industrial MEMS Accelerometer
- Number of channels: 3-axis
- Frequency range: 1 to 600 Hz
- Measurement Range: +/- 1000 mm/s
- Resolution: 0.05 mm/s
- Environmental rating: IP65

Fig 1 – the relative site location of the Vibration monitor is GPS referenced and located in the position shown on the attached diagram

Fig 2 – The Vibration sensor is installed on a concrete block at the base of the permanent noise barrier near the imaging department. It needs to be installed level in all 3 planes (x, y, & z) to ensure that correct amplitude and velocity measurements will be recorded correctly.

The vibration sensor was turned on using site temporary power on 29 June 2022.

1.2. MONTHLY DEFLECTION RECORDINGS

Each day, deflections in all 3 planes (x, y & z) are recorded. The graphs below are available as a separate daily feed (recorded and stored in Vault) or can be combined to give a monthly view across a 24 hour cycle. The % deflection stored

MARCH 2024

No recordings available due to technical fault on site. ADCO were able to resolve with their Electrical Contractors in April with recordings able to recommence 9th April 2024

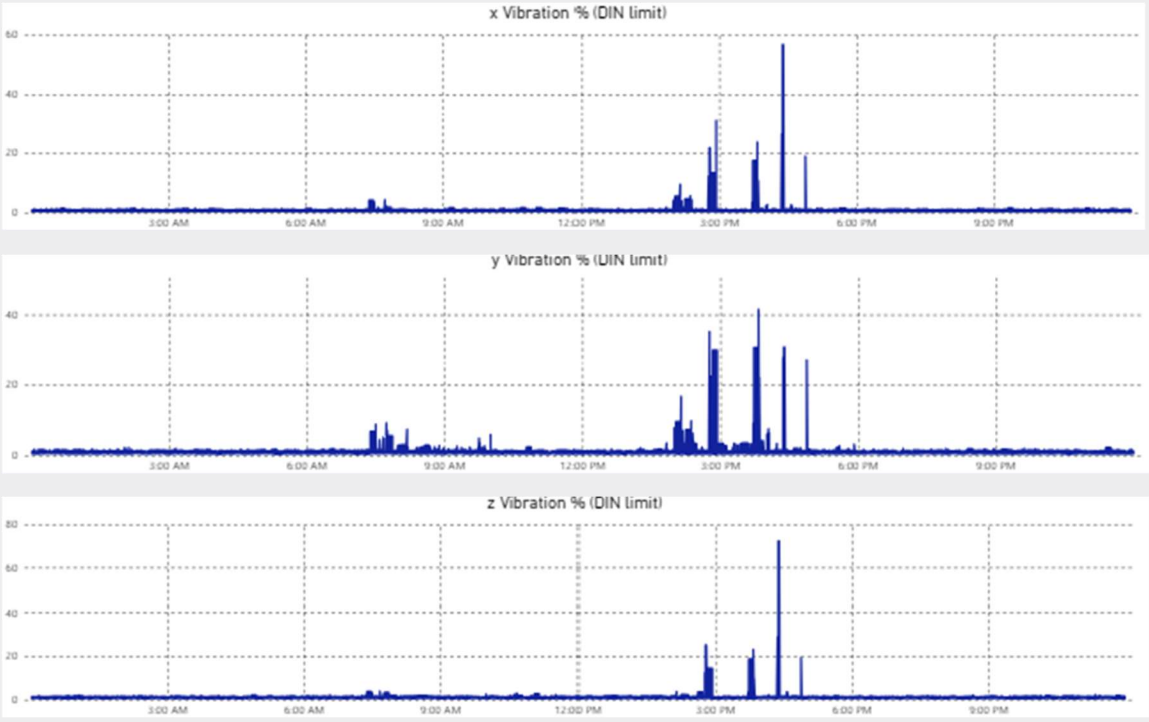
APRIL 2024

The monthly output graphs for each plane are shown here. The maximum deflection recorded in each axis were:

X = 56.6% (2.830mm/s)

Y = 41.5% (2.075mm/s)

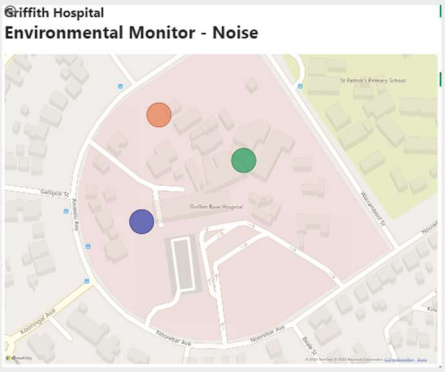
Z = 72.28% (3.614mm/s)



1.3. NOISE MONITORING

asBuilt has supplied Netvox R718-PA7 noise sensors which are dBA weighted and operate on a LoRaWAN frequency range. These basic noise monitors provide a level of record which senses noise level at a certain location and provides a continuous sample rate on mains power. The intent of installing the noise monitors was to provide ADCO a sample system whereby construction activity could be recorded and in the event of a complaint, allow some isolation of noise generating area.

The noise sensors were installed and started recording data from 10th May 2022.

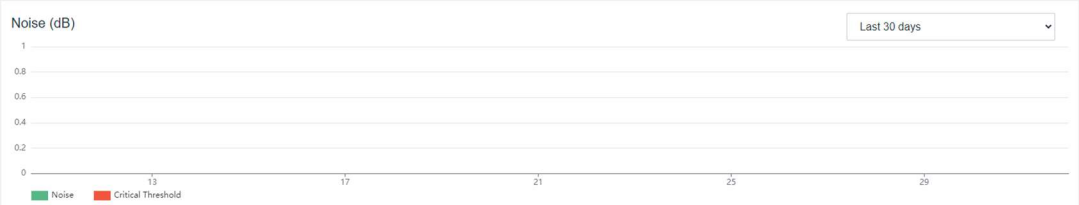


The monitor takes a sample of noise every 10s and records the output data in a graphical format via the asBuilt Vault platform. The Max and Min values for noise are then recorded and shown in the graphs below.

Fig 4 shows the GPS locations of the 3 noises sensors at the site.

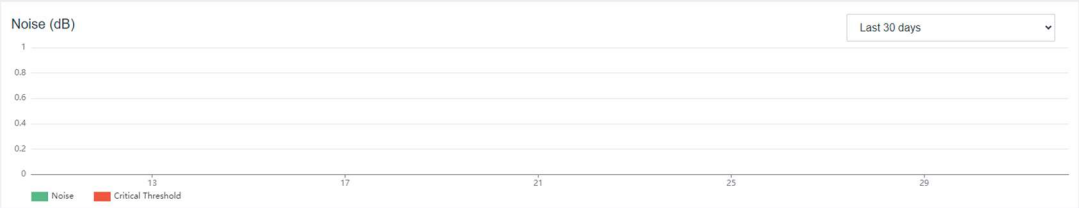
Fig 5, 6 & 7 show the locations of noise monitors NOISAU-009, 008 & 005 on site.

NOISE READINGS FROM NOISAU-005 – MEDICAL IMAGING MARCH & APRIL



Noise recordings ceased on 3rd November due to unforeseen power loss, ADCO have identified the cause and have actions in place to have back online. Further technical dificaulties have been identified and a new device is required.

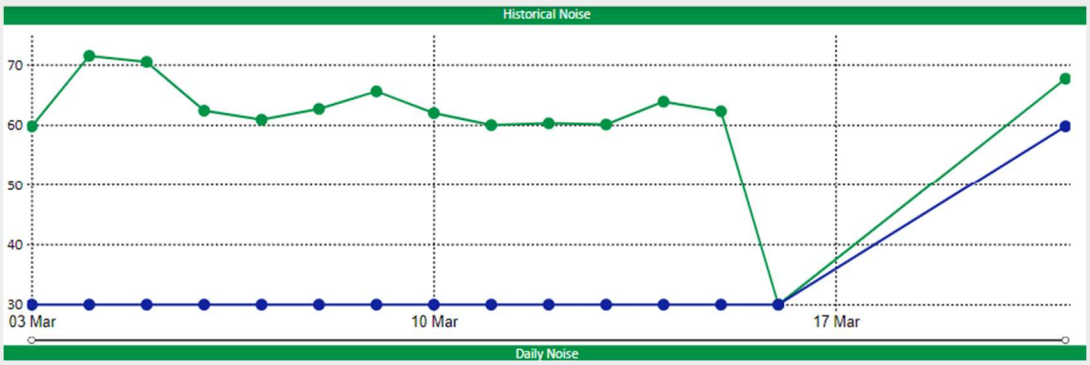
NOISE READINGS FROM NOISAU-008 – STAFF ACCOMMODATION MARCH & APRIL



The noise readings from sensor NOISAU-008N, seased due to Technical Dificulties ADCO is working to identify cause and rectify.

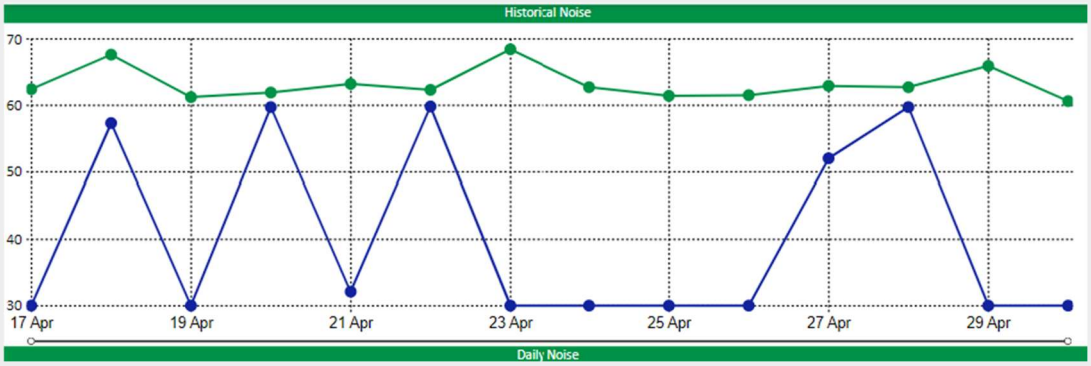
NOISE READINGS FROM NOISAU-009 – SITE SHEDS

MARCH 2024



The noise readings from sensor NOISAU-009, located near the ADCO Site Sheds showed a peak noise value of 71.5dB on 4th March 2024.

APRIL 2024



The noise readings from sensor NOISAU-009, located near the ADCO Site Sheds showed a peak noise value of 68.4dB on 23rd April 2024.

1.4. WEATHER RECORD

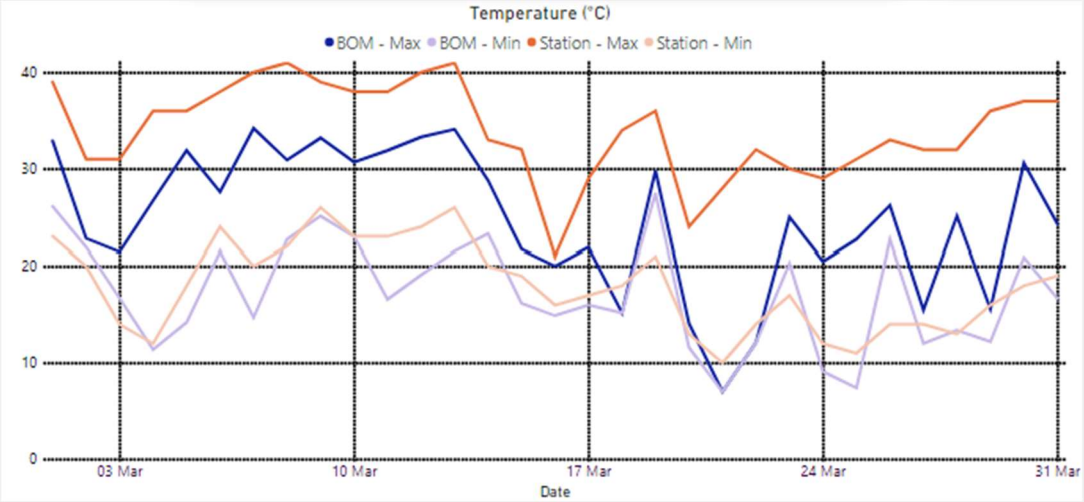
asBuilt has been recording Bureau of Meteorology (BOM) feeds for weather at Griffith airport since 17th February 2022. On 5th August, the feed from the ADCO site-based weather station started to produce data that was overlaid with BOM data to give a comparative record. This a useful comparator as the closest industry recognised BOM feed can sometimes be several kilometres from the construction site. asBuilt records 4 main interest areas from the BOM feeds across the country.

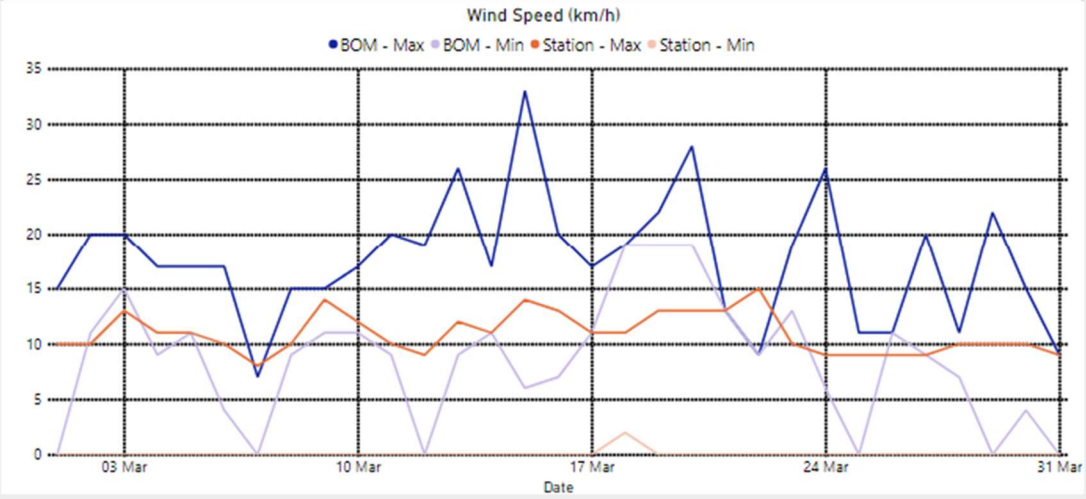
- Temperature
- Wind Speed
- Wind Gusts
- Rainfall

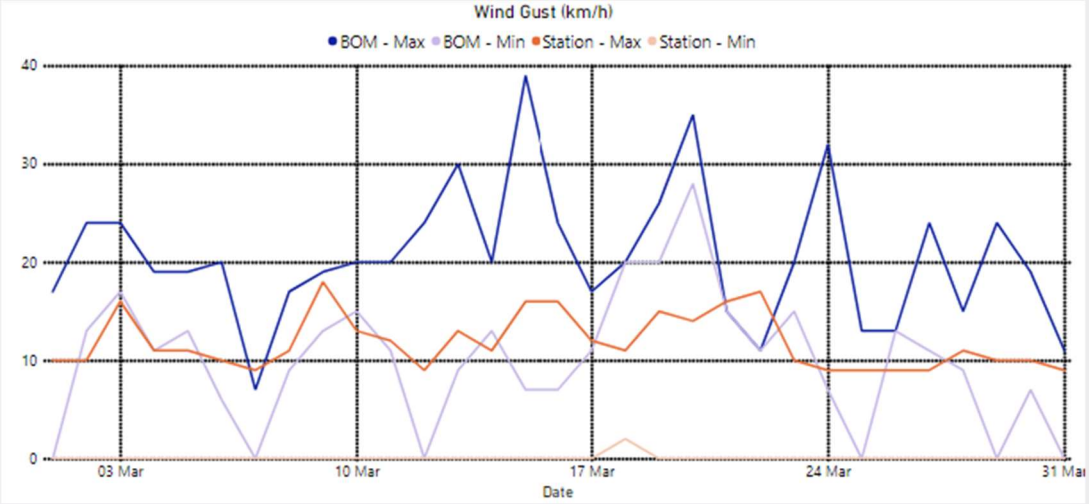
This has been known to deliver a different record of local weather experience at site and can be useful in forming construction claims for weather events. It can also be a useful record for other events at site other than weather when establishing a qualitative record (e.g. a concrete pour or material exposure to elements on site). A sample is recorded every 20 min from the BOM feed, but the graphs below only show daily maximums. More granular data can be provided upon request.

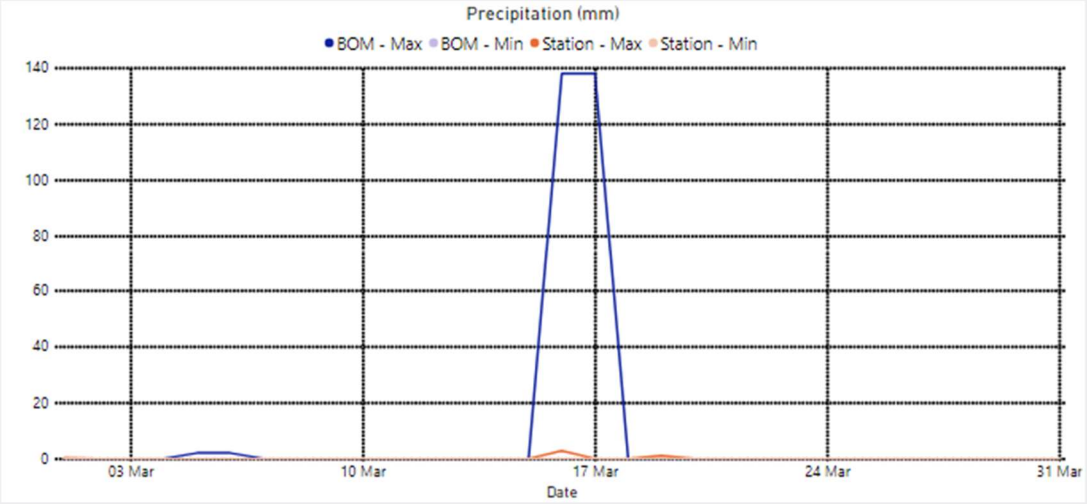
The PURPLE line in the below graphs indicated measurements from the BOM Feed. The ORANGE lines indicate the site based weather station feed.

MARCH 2024

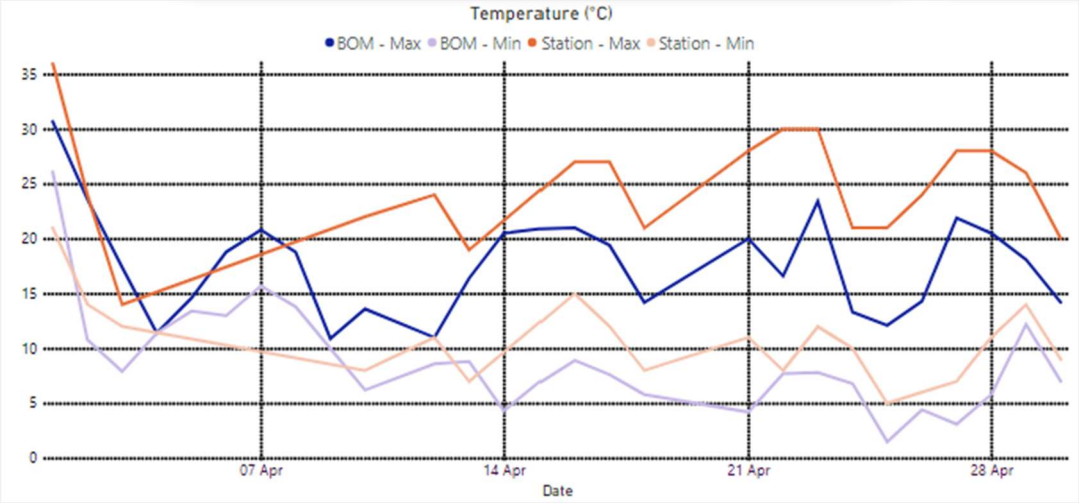


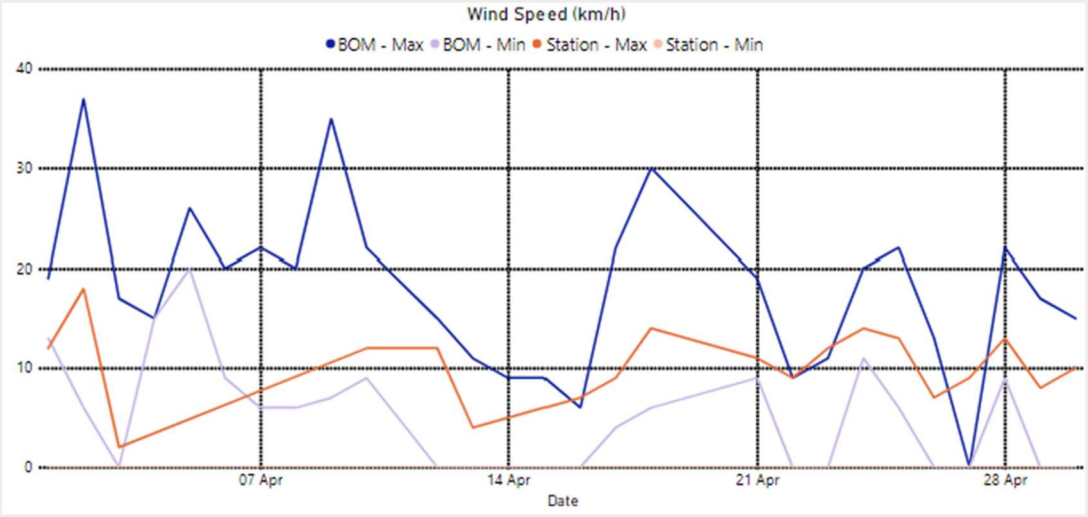


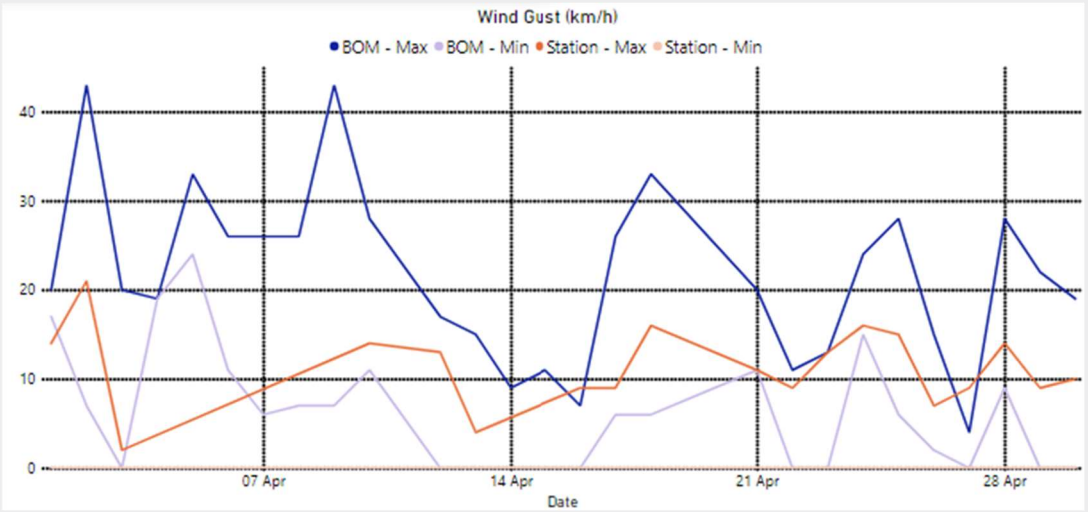


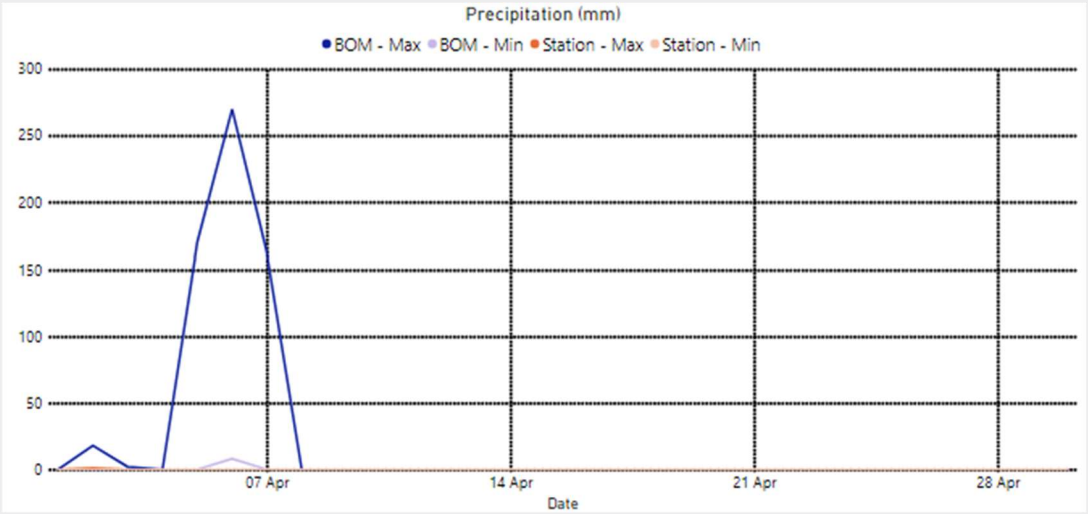


APRIL 2024









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Griffith Hospital

Environmental Monitoring

Summary Report

ADCO Constructions

Prepared by asBuilt Digital
4th June 2024

PRIVATE & CONFIDENTIAL

1. Environmental Monitoring

asBuilt has been engaged to supply continuous monitoring for Environmental Sensors for the Griffith Hospital Station project in GriffithNSW. Online monitoring is provided via the asBuilt Vault platform.

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Each minute, the sensor outputs on the maximum amplitude of any frequency range within the 1-600Hz range. This maximum deflection is shown as a point on the output tables. To offer the best sample rate, the sensor is connected to mains power. There is a batter back-up on board to record with minor power outages. Other specifics of the sensor are:

- Meets DIN4150-3 standard
- Transducer type: Industrial MEMS Accelerometer
- Number of channels: 3-axis
- Frequency range: 1 to 600 Hz
- Measurement Range: +/- 1000 mm/s
- Resolution: 0.05 mm/s
- Environmental rating: IP65

Fig 1 – the relative site location of the Vibration monitor is GPS referenced and located in the position shown on the attached diagram

Fig 2 – The Vibration sensor is installed on a concrete block at the base of the permanent noise barrier near the imaging department. It needs to be installed level in all 3 planes (x, y, & z) to ensure that correct amplitude and velocity measurements will be recorded correctly.

The vibration sensor was turned on using site temporary power on 29 June 2022.

1.2. MONTHLY DEFLECTION RECORDINGS

Each day, deflections in all 3 planes (x, y & z) are recorded. The graphs below are available as a separate daily feed (recorded and stored in Vault) or can be combined to give a monthly view across a 24 hour cycle. The % deflection stored

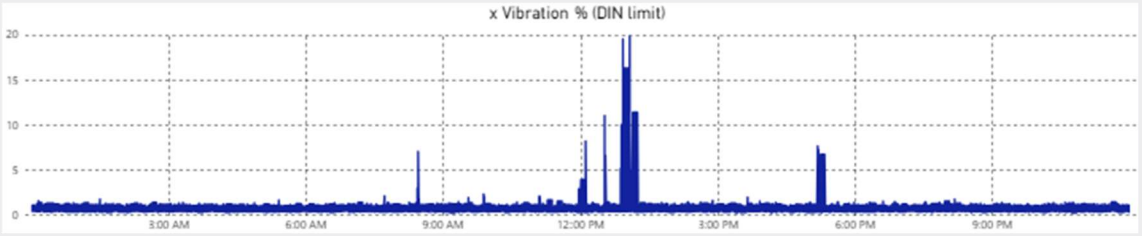
MAY 2024

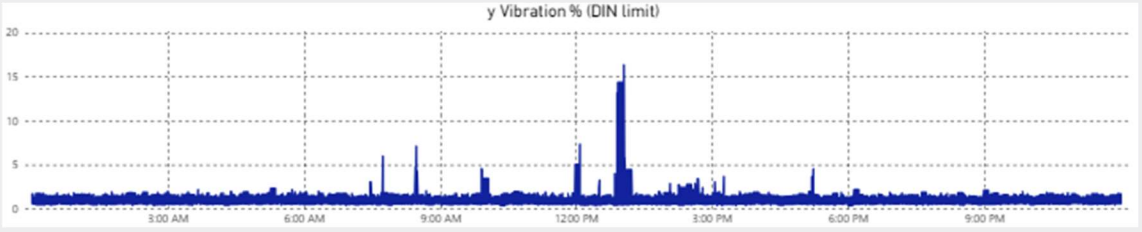
The monthly output graphs for each plane are shown here. The maximum deflection recorded in each axis were:

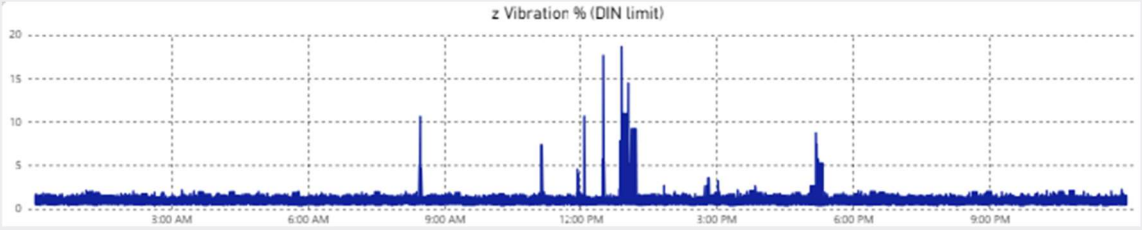
X = 19.84% (0.992mm/s)

Y = 16.31% (0.816mm/s)

Z = 18.66% (0.933mm/s)







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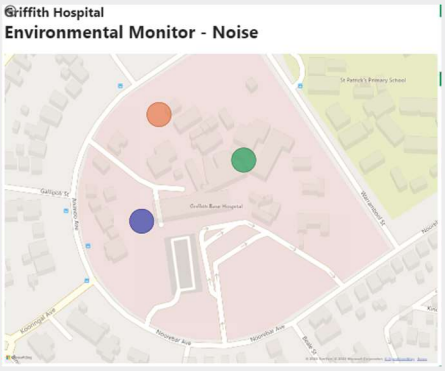
The noise sensors were installed and started recording data from 10th May 2022.

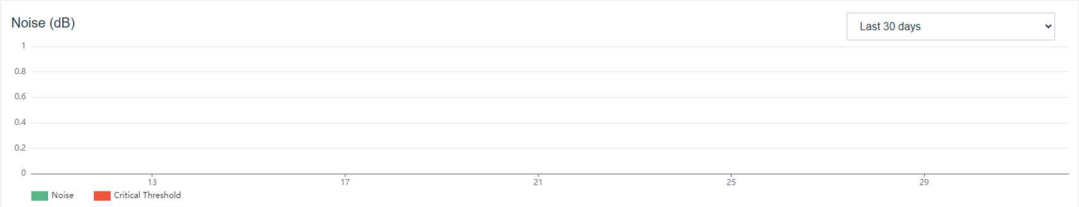


The monitor takes a sample of noise every 10s and records the output data in a graphical format via the asBuilt Vault platform. The Max and Min values for noise are then recorded and shown in the graphs below.

Fig 4 shows the GPS locations of the 3 noises sensors at the site.

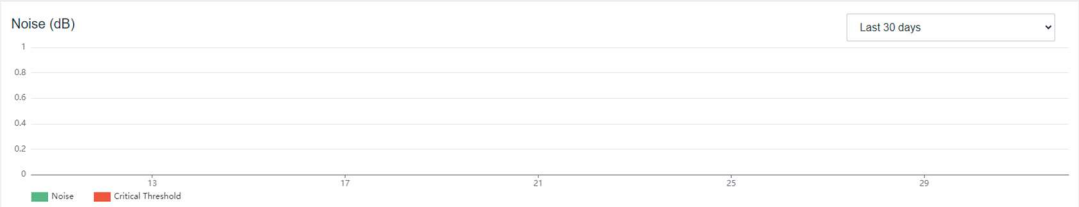
Fig 5, 6 & 7 show the locations of noise monitors NOISAU-009, 008 & 005 on site.

NOISE READINGS FROM NOISAU-005 – MEDICAL IMAGING MAY



Noise recordings ceased on 3rd November due to unforeseen power loss, ADCO have identified the cause and have actions in place to have back online. Further technical difficulties have been identified and a new device is required.

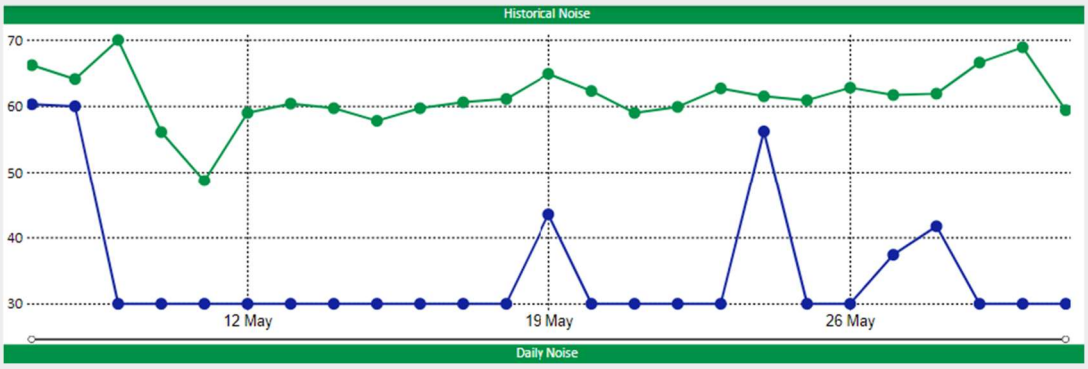
NOISE READINGS FROM NOISAU-008 – STAFF ACCOMMODATION MAY



The noise readings from sensor NOISAU-008N, ceased due to Technical Difficulties ADCO is working to identify cause and rectify.

NOISE READINGS FROM NOISAU-009 – SITE SHEDS

MAY 2024



The noise readings from sensor NOISAU-009, located near the ADCO Site Sheds showed a peak noise value of 70.0dB on 9th May 2024.

1.4. WEATHER RECORD

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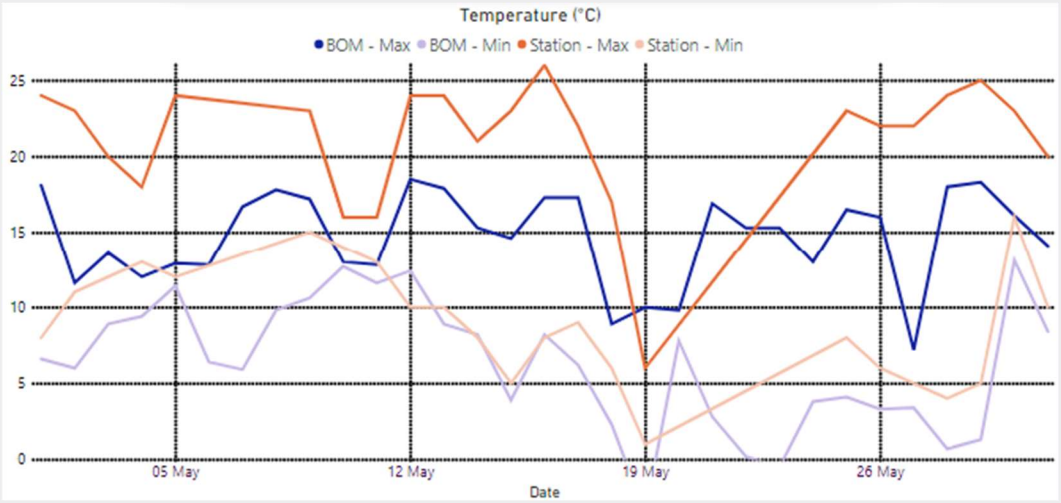
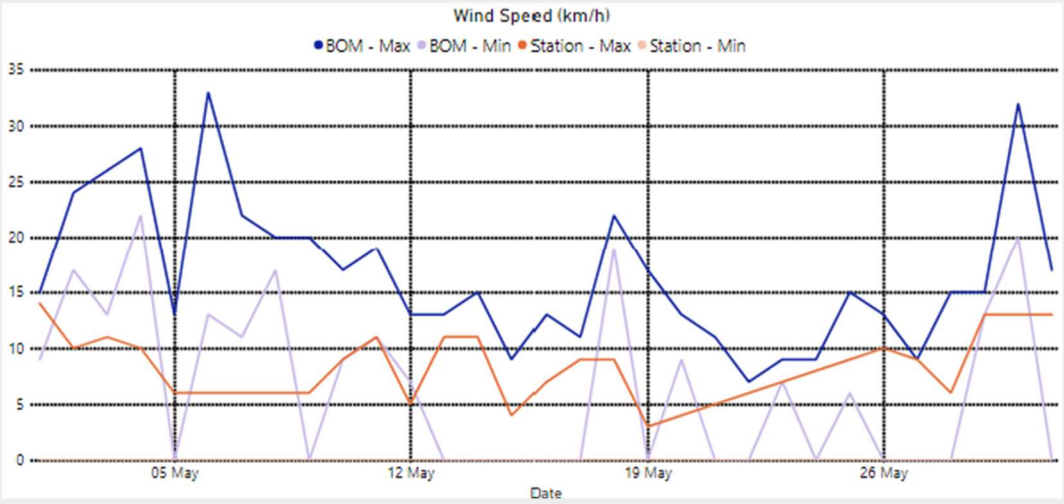
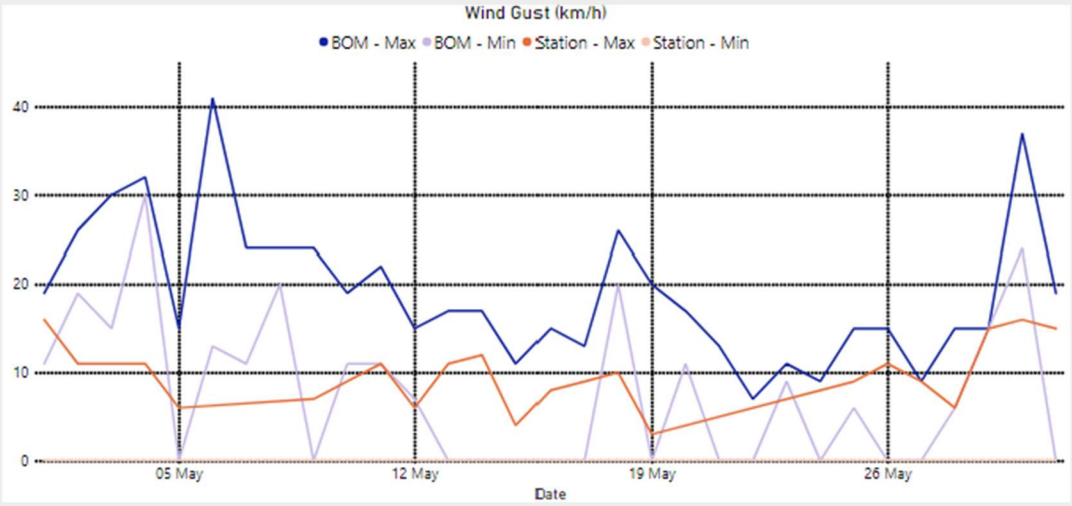
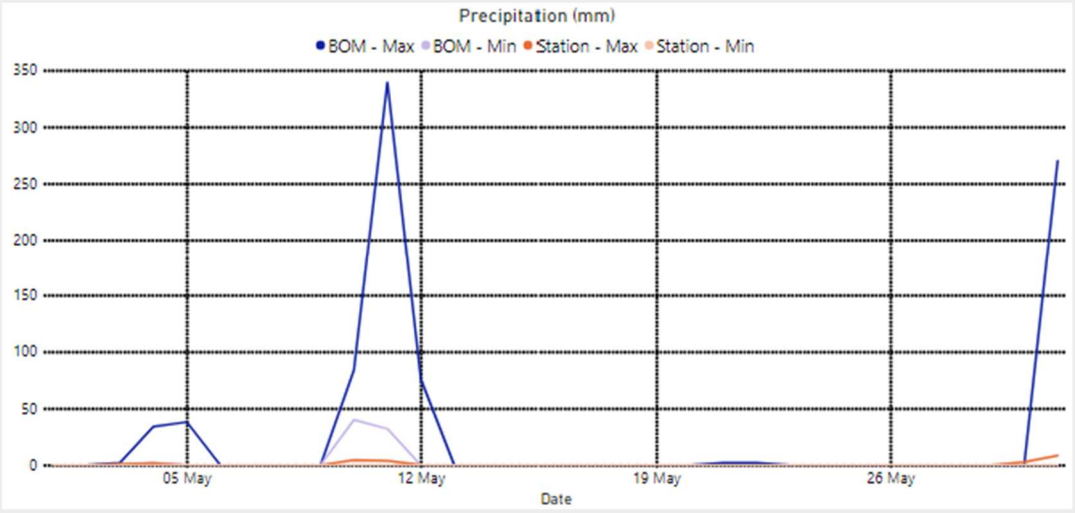
MAy 2024









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