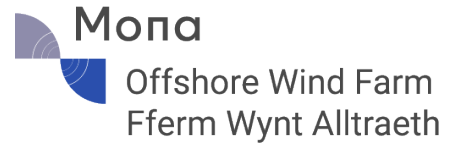




NRW RML2516 Marine Licence Variation

Mona Landfall: Geotechnical Survey
Variation Supporting Information
Document

PREPARED FOR



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ACRONYMS AND ABBREVIATIONS

Acronym	Description
HRA	Habitats Regulations Assessment
JNCC	Joint Nature Conservation Committee
LAT	Lowest Astronomical Tide
MCZ	Marine Conservation Zone
MLA	Marine Licence Application
NRW	Natural Resources Wales
PAD	Protocol for Archaeological Discoveries
SID	Supporting Information Document
SPA	Special Protection Areas
UXO	Unexploded Ordnance
WFD	Water Framework Directive
WSI	Written Scheme of Investigation

1. INTRODUCTION

Mona Offshore Wind Limited are seeking a Variation to Marine Licence RML2516 for a geotechnical survey within the Mona Landfall Survey Area (Figure 2-1). The Marine Licence Variation is being applied for due to a change in survey methodology.

Geotechnical surveys licensed under RML2516 commenced in July 2025. So far, three boreholes have been completed. The licensable activities within RML2516 consist of:

- Up to 12 geotechnical boreholes within the Mona Landfall Survey Area; and
- All boreholes will be backfilled with either bentonite pellets or cement/bentonite powder.

For further information relating to activities licensed under RML2516, please refer to the RML2516 Mona Geotechnical Nearshore Supporting Information Document (SID). This Mona Landfall: Geotechnical Survey Variation SID should be read in conjunction with the RML2516 Mona Geotechnical Nearshore Supporting Information Document.

During borehole acquisition at borehole number 7, on 28th July 2025 two artesian water features (high pressure underground pockets of water) at depth within Devensian Till deposits were encountered, one at ~12 m below seabed level and one at ~14 m - 22.9 m below seabed level. The borehole has penetrated the artesian water feature, and the naturally occurring water is currently flowing up through the drill casing and is being released at a low level onto the jack-up barge, and onto the beach (Figure 2-2).

Current methods licensed under RML2516 allow for all boreholes to be backfilled with either bentonite pellets or cement/bentonite powder. This method has been successful at two borehole locations, but at borehole 7 this backfilling method has been attempted on two occasions and was unsuccessful in providing an effective seal due to the water pressure encountered within the artesian water features at this location. Therefore, following correspondence with NRW Marine Licensing and NRW Advisory teams, on 31st July 2025 a stopper was installed at borehole 7 in an attempt to stop the water flow. However, this has been found to be unsuccessful, and therefore this Variation is being sought for additional methods to backfill borehole locations where required.

The Variation to Marine Licence RML2516 is, therefore, being sought for four additional methods (the Variation) to provide a number of options to backfill firstly borehole 7, but also the remaining boreholes (up to nine boreholes remaining) as back-up options should this situation occur at further borehole locations. These optional methods are intended to provide an effective seal should any one of the proposed methodologies be unsuccessful in backfilling boreholes. The Variation methods include:

- Packer bladder;
- Stopper;
- Cement plugs; and
- Pressurized grouting.

ERM is acting as the agent to obtain the relevant Variation to RML2516.

This document sets out the background and proposed scope of the Variation. These details are provided to inform the marine licensing decision-making process associated with the Mona Landfall Survey Area, in Welsh waters.

2. SURVEY LOCATIONS

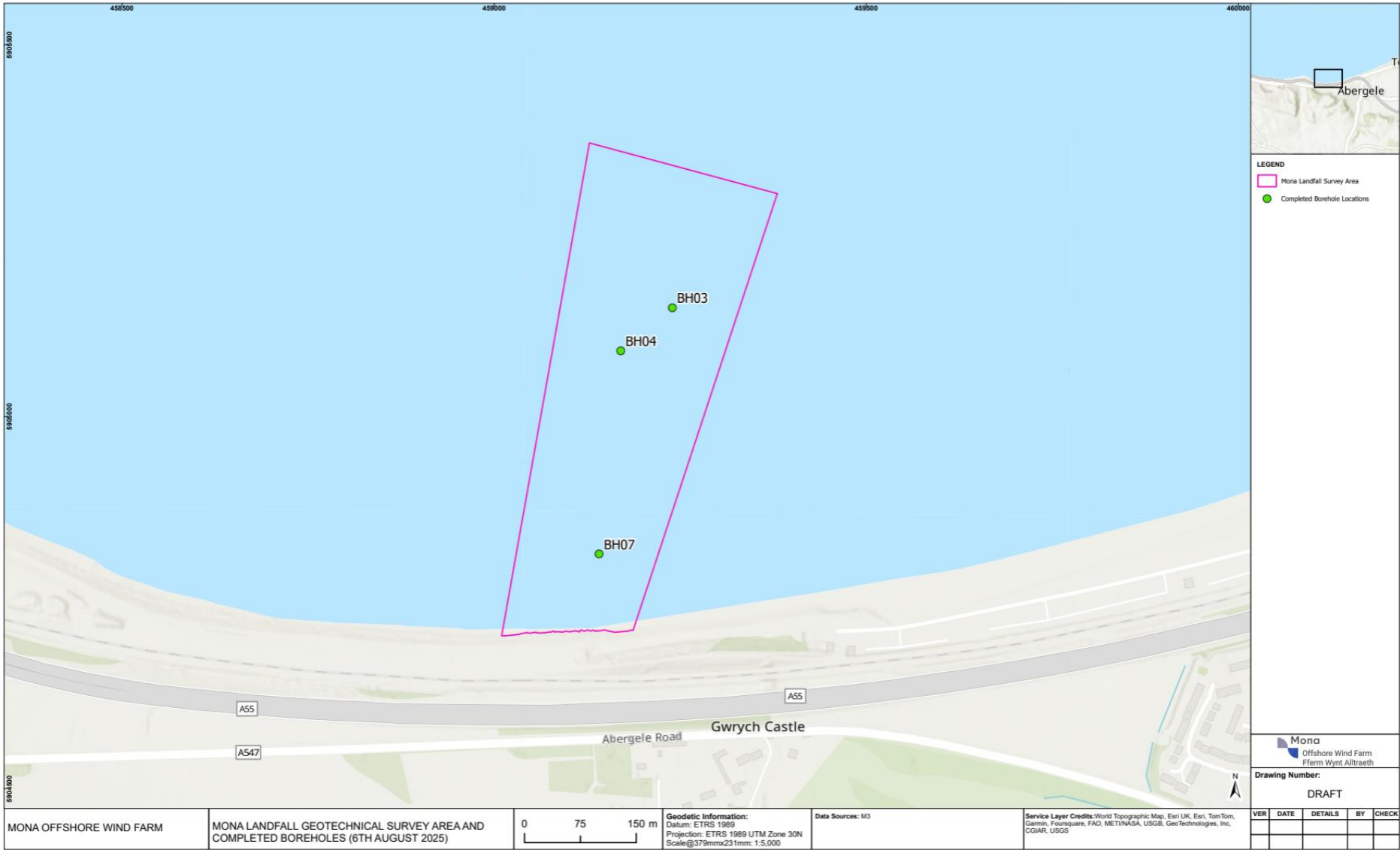
There is no change to the Variation location from RML2516. The works covered under this Variation will be undertaken within the Mona Landfall Survey Area, illustrated in Figure 2-1. The Mona Landfall Survey Area is entirely within Welsh nearshore waters.

The range of nearshore water depths is approximately 1.43 m LAT to 1.94 m LAT at the Mona Landfall Survey Area (LAT = Lowest Astronomical Tide).

FIGURE 2-1 MONA LANDFALL SURVEY AREA



FIGURE 2-2 COMPLETED BOREHOLE LOCATIONS WITHIN THE MONA LANDFALL SURVEY AREA



3. SURVEY METHODS AND VESSELS

A Variation to Marine Licence RML2516 is being sought for four additional optional methods (the Variation) to backfill the remaining boreholes (up to nine boreholes remaining). These are intended to provide an effective seal for the artesian water features encountered during borehole acquisition. It should be noted that any of the four proposed methods may be used at each of the remaining (up to) nine borehole locations. This is in order to provide a number of options to create an effective seal should any one of the proposed borehole backfilling methodologies be unsuccessful.

The four additional backfilling methods are described in Sections 3.1, 0, 0 and 3.4.

The survey vessels proposed for the Variation remain the same as RML2516 and include:

- One Jack-up barge: the Fugro Aran120; and
- Two support vessels: CT Vector and CTV Dakota.

3.1 PACKER BLADDERS

A packer bladder could comprise of a rubber sleeve with a valve made of kevlar strands, with several layers of high elongation neoprene. Full details of the packer bladder specifications and dimensions are provided in Appendix A. This solution has routinely been installed by the contractor as part of land works where artesian water features are encountered.

The following high-level method is proposed for use of packer bladders:

- Bentonite pellets or cement/bentonite powder (licensed under RML2516) will be inserted into the borehole below seabed level, and then the packer bladder will be installed;
- Once the packer bladder, or bladders, is inserted to target depth within the borehole, it is inflated to match the diameter of the borehole to create a seal. During insertion the packer bladder is 85 mm in diameter and can be inflated up to 170 mm in diameter. However, as the diameter of boreholes is up to 102 mm as per RML2516, the inflated packer bladder is unlikely to increase above 102 mm in diameter. The packer bladder will be inflated below seabed level within the borehole so there will be no change to the seabed footprint of the works. More than one packer bladder could be used in a borehole, depending upon the requirements to create a successful borehole seal.
- Further bentonite pellets or cement/bentonite powder (licensed under RML2516) are inserted into the borehole following the packer bladder installation.

The aim is for the packer bladder to provide an effective seal which holds the bentonite pellets or cement/bentonite powder (licensed under RML2516) in place to prevent the backfill materials from flowing up the drill string. The proposal is to leave the packer bladder in situ once installed.

A form of bentonite compound will be considered for backfilling which has a greater swelling capacity.

Where necessary, more than one packer bladder may also be considered for insertion into one borehole if required to create an effective seal.

TABLE 3-1 PACKER BLADDER PARAMETERS

Maximum no. of packer bladders to be installed	No. of remaining boreholes packer bladders may be installed at	Dimensions (mm)	Inflated Diameter (mm)*	Maximum Volume of material to be deposited (m ³) ¹
18	Up to 9	Borehole diameter x 1000mm length	Up to 170	0.18

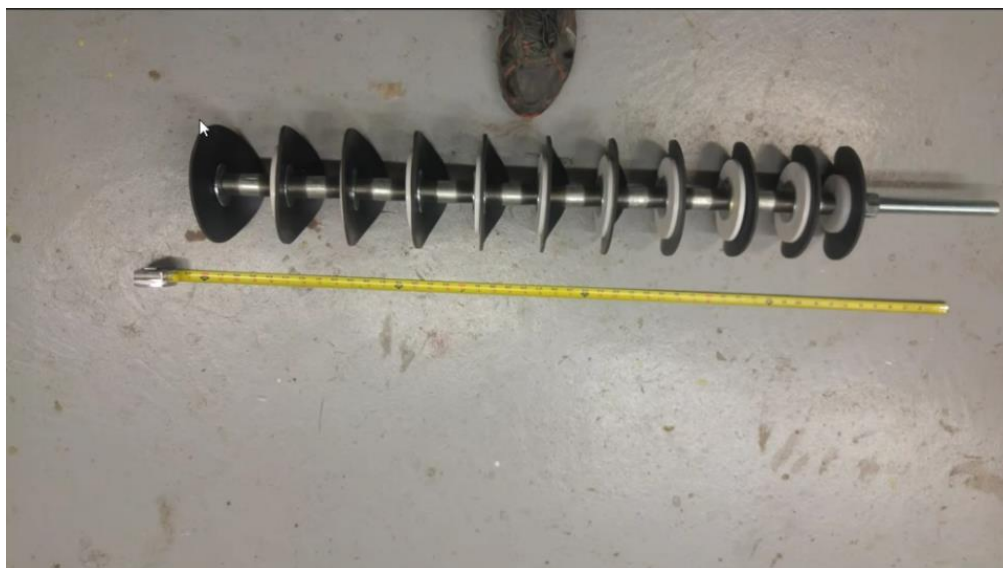
*Inflated diameter will be to the maximum diameter of the borehole, licensed up to 102 mm in RML2516. Therefore, although the packer bladders can be inflated beyond this it is unlikely. All packer bladders will be inflated below seabed level and therefore there will be no change to the seabed footprint.

3.2 STOPPER

A steel/ rubber stopper may be installed down the remaining boreholes to seal the boreholes (Figure 3-1). Please note a steel/ rubber stopper has already been installed at borehole 7. Bentonite pellets or cement/bentonite powder (licensed under RML2516) will be used to backfill the borehole, then the stopper will be pushed down the borehole so that the base of the unit is at the top of backfilled material. The borehole will be monitored and then further bentonite pellets or cement/bentonite powder (licensed under RML2516) will be added to backfill the borehole above the stopper, which will coalesce around the stopper, providing an effective seal.

Fugro have performed this type of installation before on previous projects with success. The proposal is to leave this stopper in situ once installed.

FIGURE 3-1 EXAMPLE OF A PROPOSED STOPPER



¹ Exact quantities to be deposited are unknown as each method is intended to provide an option to create an effective seal should any one of the proposed methodologies be unsuccessful. Therefore, the maximum volume of material to be deposited assumes the method will be used to the full depth (up to 40 m) at each of the (up to) nine remaining borehole locations.

TABLE 3-2 STOPPER PARAMETERS

Maximum no. of stoppers to be installed	No. of remaining boreholes stoppers may be installed at	Nominal Dimension (mm)	Maximum Volume of material to be deposited based on nominal dimension (m ³) ¹
9	Up to 9	Borehole diameter x 1000mm length**	0.09

****The stopper is fabricated to the dimension of the borehole, and its length may vary to suit the vertical extent of any possible artesian feature. Nominally, the stopper will be fabricated to the following specifications: dimension of the hole, with rod length of 1000mm.**

3.3 CEMENT PLUGS

The borehole will be backfilled to an agreed level with inert gravel and then a pre-cast cement or concrete plug will be installed above the gravel layer. Grouting or bentonite pellets or cement/bentonite powder (licensed under RML2516) will be used to backfill the borehole above the cement plug. Finally, a concrete cap will be installed above the layer of grouting or bentonite pellets or cement/ bentonite powder (licensed under RML2516) to seal the borehole.

TABLE 3-3 CEMENT PLUG PARAMETERS

Maximum no. of cement plugs to be installed	No. of remaining boreholes cement plugs may be installed at	Indicative Dimension (mm)	Maximum Volume of material to be deposited (m ³) ¹
18	Up to 9	Borehole diameter x vertical length of any possible artesian feature***	To match dimension of plug

*****Cement plug dimension is to be determined by the diameter of hole and a suitable plug length depending on the vertical extent of any possible artesian feature.**

3.4 PRESSURISED GROUTING

Pressurized grouting involves the injection of a grout mixture under pressure into the borehole to infill voids, to prevent further water ingress and stabilize the borehole. Pressure grouting can be used in combination with packer bladders. Grout mixes would be specifically designed/ selected to ensure proper sealing.

3.5 SURVEY PROGRAMME

The proposed Variation will be undertaken within the current licence period within RML2516, which is 7th July 2025 to 6th July 2026. The Variation will also be subject to the same timeframe restrictions as RML2516, in order to avoid the overwintering period for birds (1st November to 31st March inclusive), as described in Section 4 below.

Currently, the water leak at borehole 7 is still ongoing. Therefore, it is planned to attempt to install a packer bladder from 6th August 2025 onwards on top of the already installed stopper at borehole 7. This Variation application is to support these works.

4. BEST PRACTICE AND PROPOSED MITIGATION METHODS

Best practice and proposed mitigation measures for the Variation remain the same as described within RML2516 Mona Geotechnical Nearshore SID and are as follows:

- The locations of the boreholes will be screened by geophysical survey data acquired in this survey campaign prior to execution of geotechnical activities. Therefore, geotechnical locations will be sited to avoid potential archaeological features and other potential hazards such as UXOs;
- Notice to mariners and kingfisher notifications will be provided and the vessel will display the appropriate navigational signals at all times;
- No discharge to sea of left-over drilling fluid will occur at the end of the drilling programme and only biodegradable drilling fluid will be used, which is commonly used in the marine environment;
- All equipment associated with the works will be removed on completion of the works;
- Bunding, storage facilities and spill kits will be employed to contain and prevent the release of fuel, oils and chemicals associated with the equipment into the marine environment;
- Coatings and treatments will be suitable for use in the marine environment and are used in accordance with best environmental practice;
- All equipment, materials, machinery and PPE used will be in a clean condition prior to their arrival on site, and upon removal from site, to minimise risk of introducing non-native species into the marine environment. See Error! Reference source not found. for more details;
- The International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004 (BWM Convention) best practice measures will be adhered to;
- The existing Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will be updated prior to the surveys proposed to commence in the Spring of 2025;
- The proposed survey works will be undertaken during spring/summer 2025 when sensitive ornithological species will not be present, avoiding the overwintering period (1st November to 31st March inclusive);
- Joint Nature Conservation Committee (JNCC) guidelines for minimising the risk of injury to marine mammals from geophysical surveys will be adhered to; and
- Safety and access around the jack-up vessel will be managed by shoreside personnel who will monitor the perimeter of the jack-up vessel whilst it is in the Mona Landfall Survey Area. This will ensure that access to the beach will not be unduly disrupted whilst ensuring the overall safety and security at the site.

5. POTENTIAL ENVIRONMENTAL IMPACTS

Baseline environmental information within the Mona Landfall Survey Area is provided within Section 7.1 of RML2516 Mona Geotechnical Nearshore SID.

Potential environmental impact pathways are also considered in Section 7.2 of RML2516 Mona Geotechnical Nearshore SID, which concludes No Significant Effects for the geotechnical survey activities licensed under RML2516. This is due to all impacts being considered to be small, temporary and intermittent given the small scale and short duration of the works. Based on this, no cumulative effects are also predicted in RML2516 Mona Geotechnical Nearshore SID.

Other than a change in material to backfill the remaining (up to) nine boreholes, all parameters proposed within the Variation are within the current licensed parameters of RML2516. Therefore, no additional environmental impacts beyond those already considered within RML2516 Mona Geotechnical Nearshore SID are anticipated. The total surface area of seabed impacted will not exceed 21.81 m² as assessed within RML2516 Mona Geotechnical Nearshore SID and there will be no change in contaminants or pollutants associated with the Variation.

5.1 HABITATS REGULATIONS ASSESSMENT SCREENING

As per Section 5, no additional environmental impacts beyond those already considered within RML2516 Mona Landfall Habitats Regulations Assessment (HRA) are anticipated. RML2516 Mona Landfall HRA includes assessment of the Liverpool Bay Special Protection Area (SPA) which directly overlaps with the Mona Landfall Survey Area. As outlined in Section 4, the Variation will be undertaken outside of the overwintering period (1st November to 31st March inclusive). The RML2516 Mona Landfall HRA screening concludes No Likely Significant Effects for any features or designated sites within 50 km of the Mona Landfall Survey Area.

5.2 MARINE CONSERVATION ZONE SCREENING STAGE ASSESSMENT

No Marine Conservation Zones (MCZ) are located within the Mona Landfall Survey Area. The nearest MCZ, Flyde, designated for subtidal sand and subtidal mud, is located 43.85 km to the north of the Mona Landfall Survey Area.

Given the distance to the nearest MCZ, the reasons for designation and the small spatial extent and nature of the proposed survey, no interactions are anticipated with these sites.

5.3 WATER FRAMEWORK DIRECTIVE COMPLIANCE ASSESSMENT

As per Section 5, no additional environmental impacts are predicted beyond those already considered within RML2516 Mona Landfall Water Framework Directive (WFD) Assessment. RML2516 Mona Landfall WFD Assessment concludes there will be no risk to the status or objectives of local WFD water bodies. The impacts assessed have all been determined to have a negligible impact at the scale of the overall water body, and as such, the proposed activities are considered to be compliant with the WFD standards.

6. SUMMARY

Mona Offshore Wind Limited are seeking a Variation to Marine Licence RML2516 for a geotechnical survey within the Mona Landfall Survey Area. The Marine Licence Variation is being sought for four additional methods to backfill the remaining boreholes (up to nine boreholes remaining) in order to provide an effective seal for the artesian water features encountered during borehole acquisition.

The proposed Variation will be undertaken within the current licence period within RML2516: 7th July 2025 to 6th July 2026 and will be subject to the same best practice measures and mitigations as listed within RML2516 and as outlined within Section 4.

Other than a change in material to backfill the remaining (up to) nine boreholes, all parameters proposed within the Variation are within the current licensed parameters of RML2516. Therefore, no additional environmental impacts beyond those already considered within RML2516 Mona Geotechnical Nearshore SID are anticipated.

REFERENCES

- JNCC (Joint Nature Conservation Committee), 2017. JNCC guidelines for minimising the risk of injury to marine mammals from geophysical surveys. Available online at: <https://data.jncc.gov.uk/data/e2a46de5-43d4-43f0-b296-c62134397ce4/jncc-guidelines-seismicsurvey-aug2017-web.pdf> [Accessed December 2024].
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- Welsh National Marine Plan 2019: <https://gov.wales/welsh-national-marine-plan-document> [Accessed December 2024].

APPENDIX A PACKER BLADDER SPECIFICATIONS

Please refer to the separate documents:

- 'Appendix A – Inflatable Packer Specification'; and
- 'Appendix A – Packer Dimensions'.