

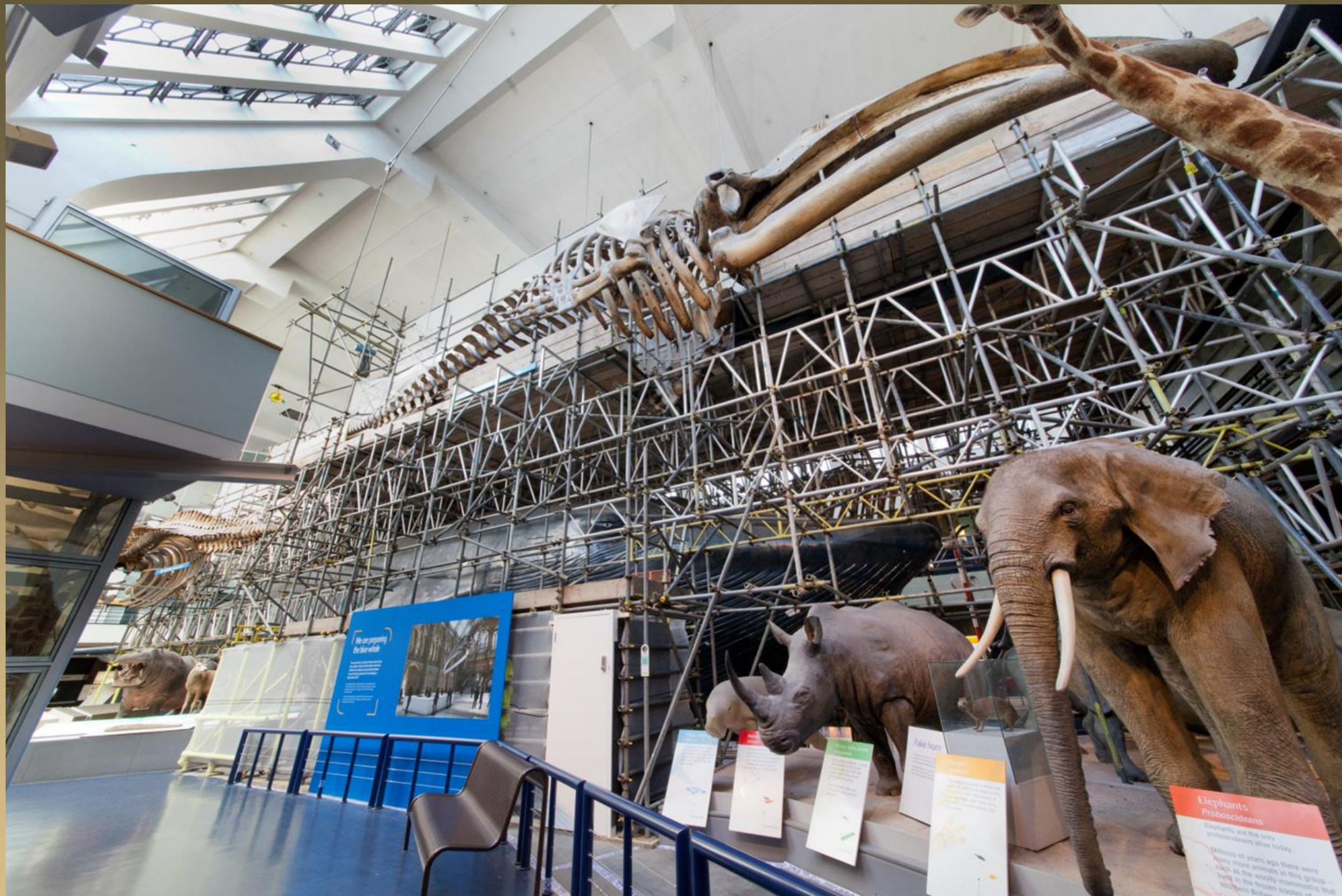
Teaching Old Bone New Tricks: Dismantling and Re-mounting NHM's Blue Whale Skeleton

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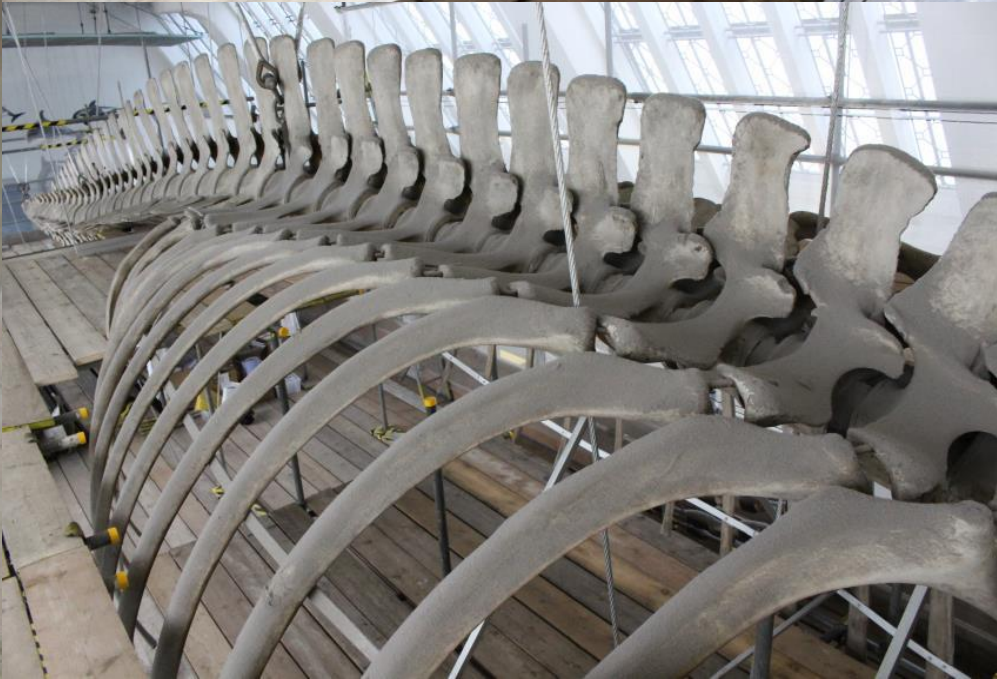




We are preparing for the winter

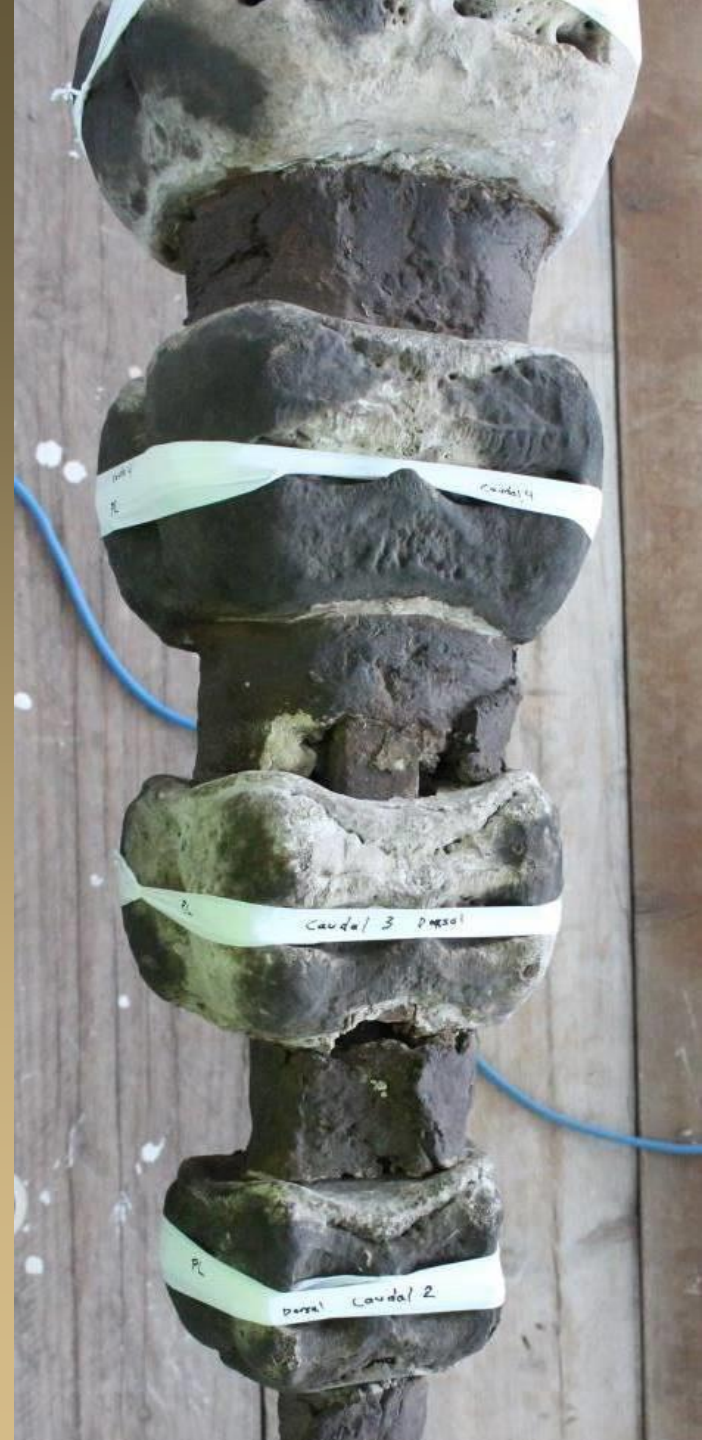
Elephants Proboscideans
Elephants are the only proboscideans alive today.
Millions of years ago there were many more animals in this group - living in the frozen wastelands of southern Britain.

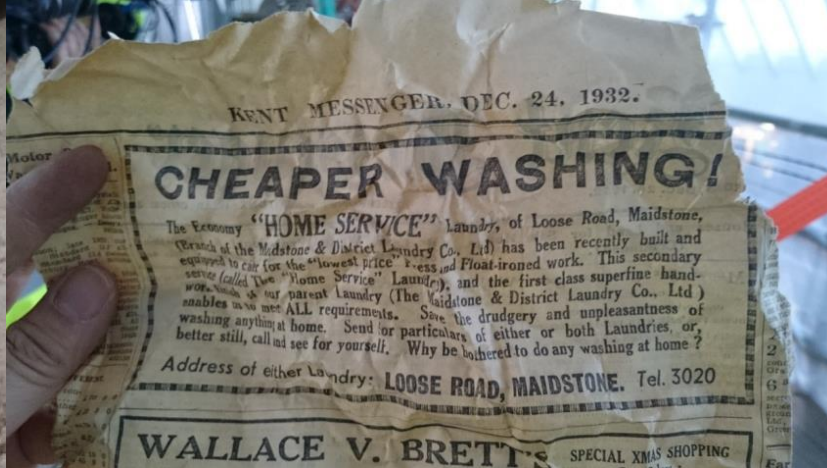
Feline hom



Cracks
Friable areas
Delaminating areas
Large areas of loss



























Remedial Treatments

- ◆ Further Cleaning
- ◆ Consolidation
- ◆ Repairs
- ◆ Loss Compensation
- ◆ Reconstruction

Key Challenges

- 1 Temporary Facility.**
- 2 Planning and Engineering**
- 3 Utilizing only the pre-existing holes in the skeleton for new mount.**
- 4 Suspending the skeleton from wrought iron arches in a historic building with a limited load capacity.**
- 5 The armature could only increase 10% in weight do to arch load limits.**



Temporary Facility

- 1 Finding a temporary workshop with high ceilings**
- 2 Adequate storage.**
- 3 Fabrication space.**
- 4 Secure Location.**
- 5 Material handling.**
- 6 Ability to isolate work space from others.**



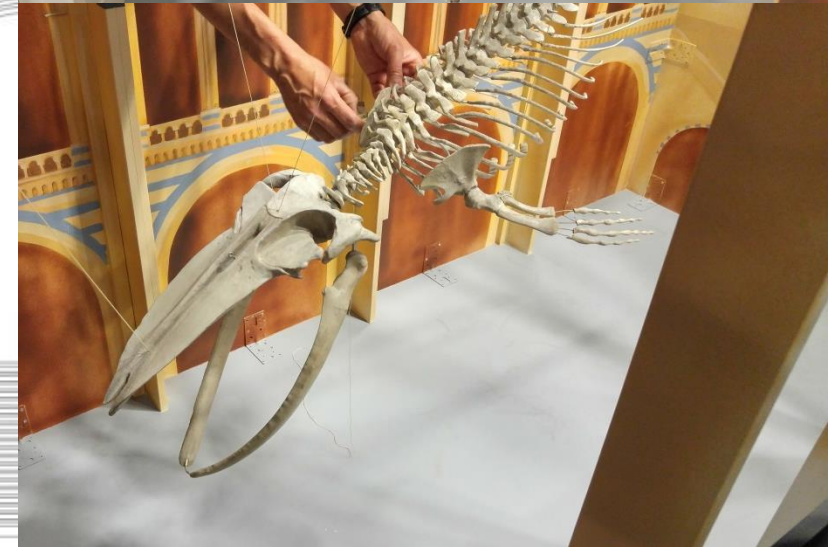
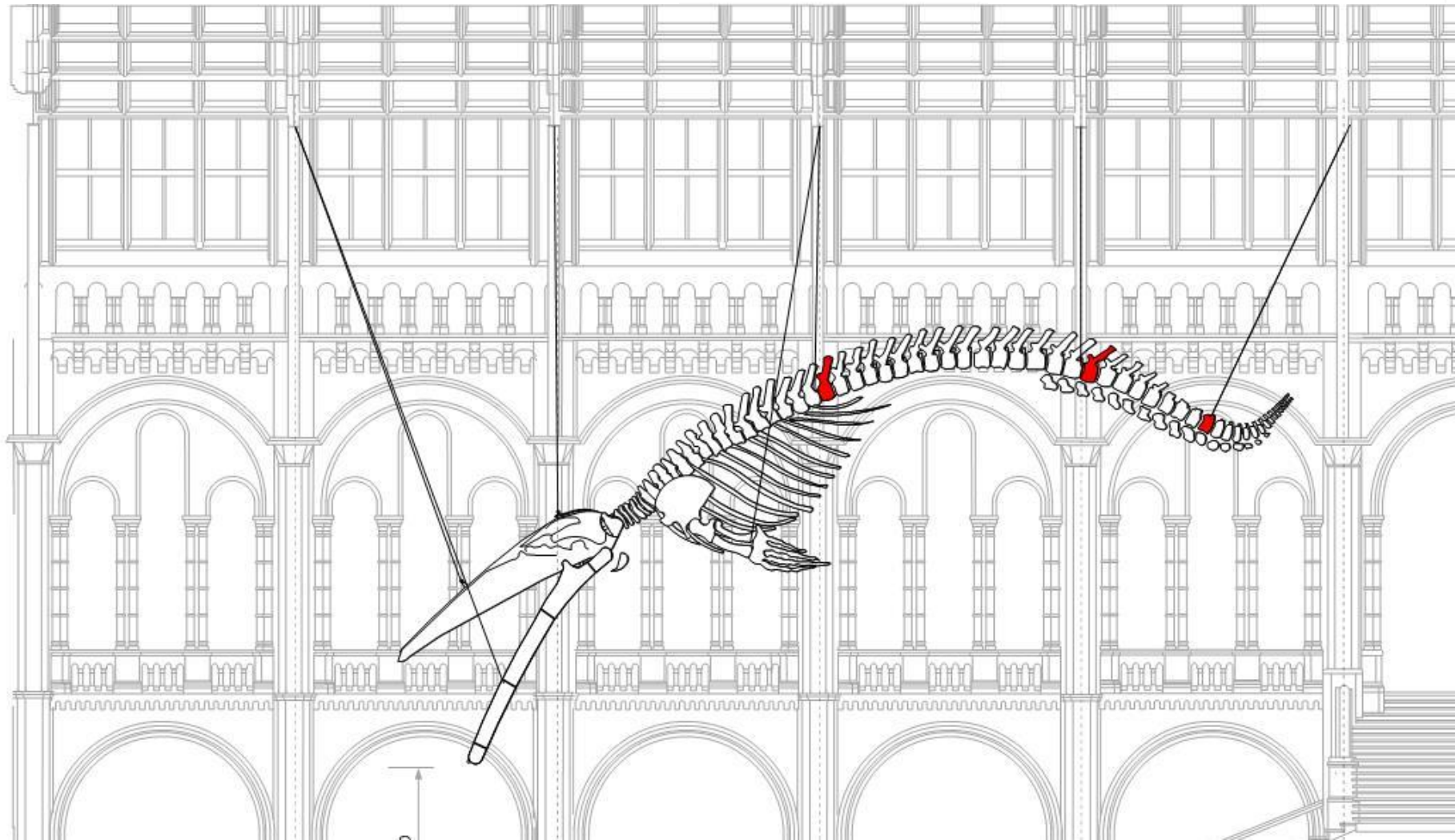
Facility Bicester Heritage

- 1 Isolated work space
- 2 Temporary HVAC was added
- 3 Intrusion Security System
- 4 CCTV
- 5 Portable Generator for upgraded power
- 6 Certification of existing overhead hoist

Photo courtesy of Natural History Museum

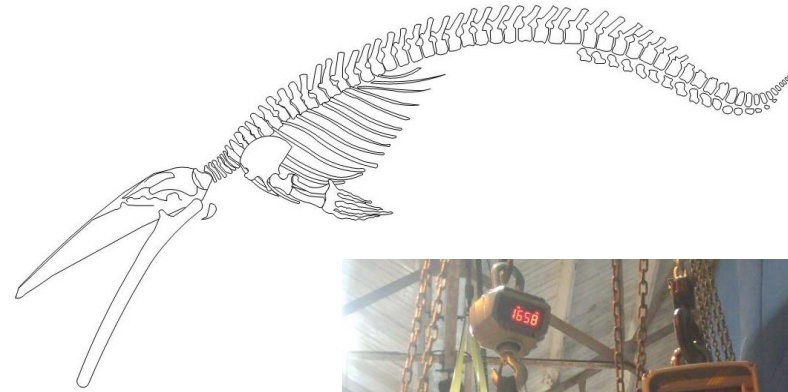


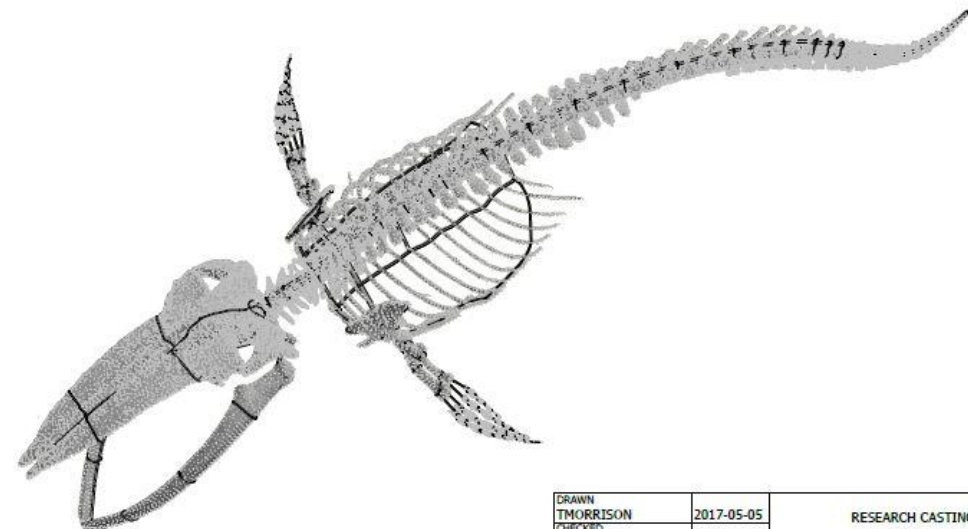
Planning and Engineering



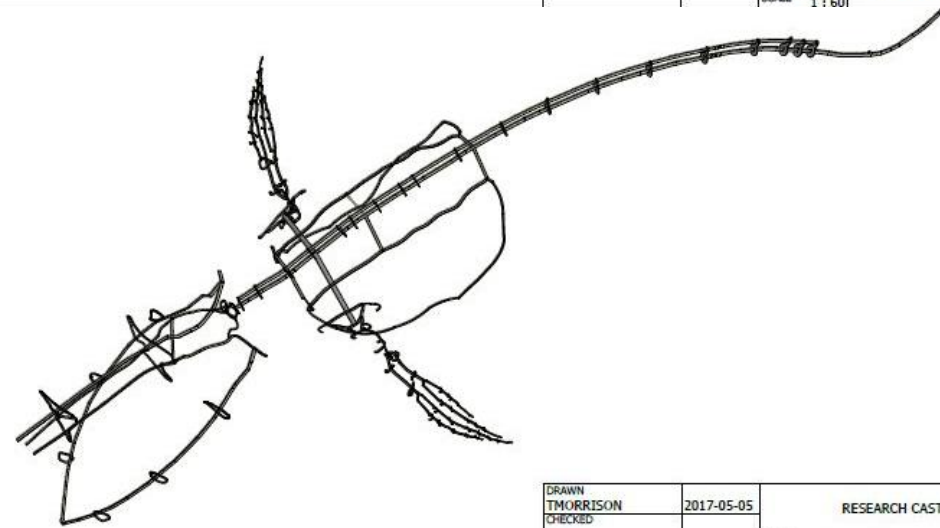
Planning and Engineering

- 1 Create a two dimensional pose drawing.**
- 2 3D print a model from existing files**
- 3 Assemble 1/8 scale model of blue whale based on two dimensional pose.**
- 4 Begin discussions of engineering requirements related to the building arches load limits.**
- 5 Begin concept for new armature using only existing holes in skeleton. Allow for hinged joints, to limit stress on the arches while the assembled blue whale is hoisted into position**
- 6 Fabricate small section of armature based on concept.**
- 7 Structural engineering was ongoing through the armature fabrication.**
- 8 Test lift to verify point loading on each of the arches was done at the Bicester facility prior to the installation at the NHM.**





DRAWN TMORRISON	2017-05-05	RESEARCH CASTING INTERNATIONAL		
CHECKED		TITLE		
QA		ASSEMBLY W/ SKELETON		
MFG				
APPROVED				
		SIZE B	DWG NO NHM-L BLUE WHALE	REV
		SCALE 1:60	SHEET 1 OF 9	



DRAWN TMORRISON	2017-05-05	RESEARCH CASTING INTERNATIONAL		
CHECKED		TITLE		
QA		FULL ASSEMBLY		
MFG				
APPROVED				
		SIZE B	DWG NO NHM-L BLUE WHALE	REV
		SCALE 1:60	SHEET 2 OF 9	

Fabrication



Key Components



Skeleton Articulation







Skull Armatures

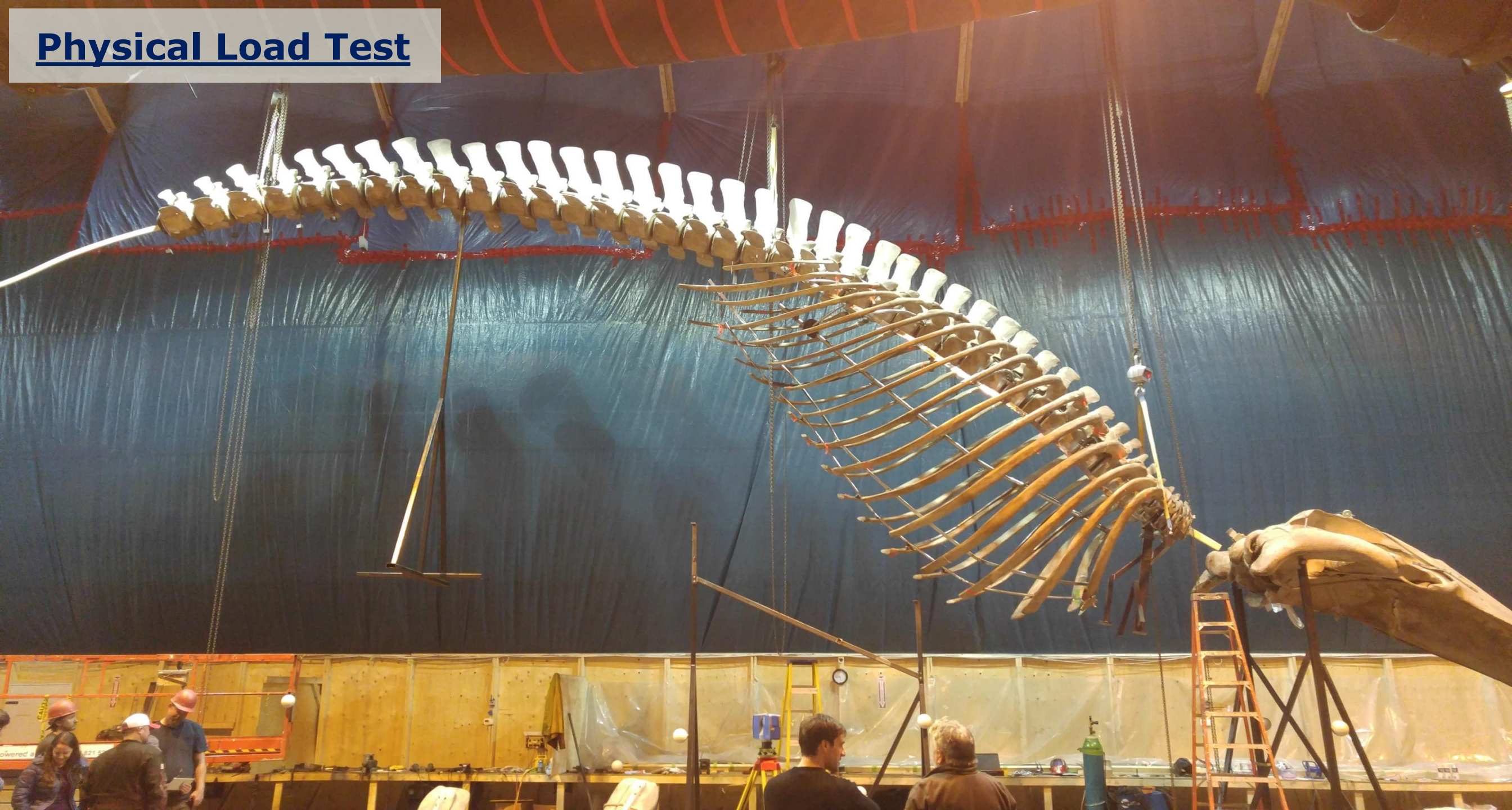




Blacksmithed Armatures



Physical Load Test





Onsite Installation





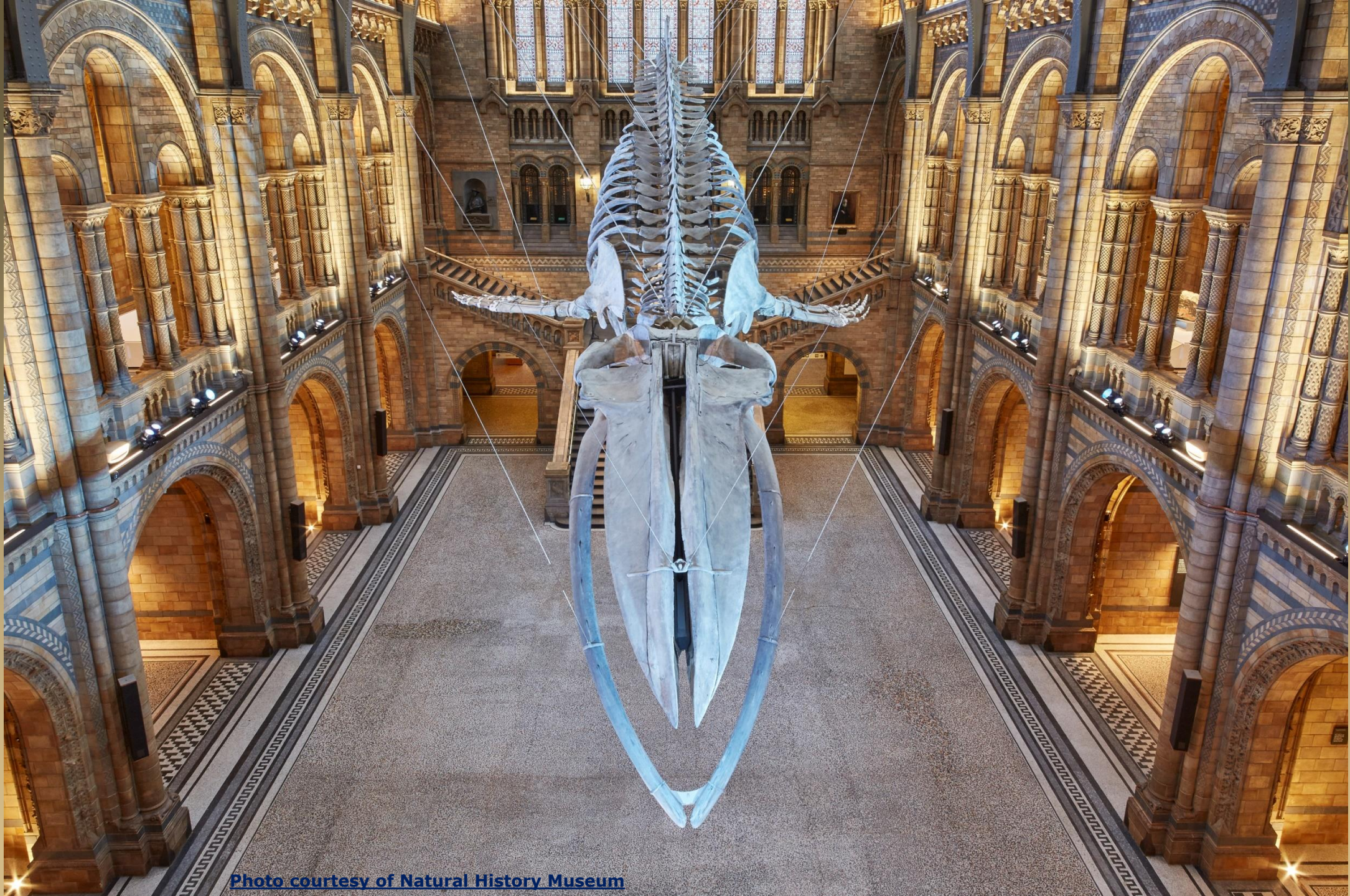
Rigging











[Photo courtesy of Natural History Museum](#)



[Photo courtesy of Natural History Museum](#)

Acknowledgments

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