

**ANNEX  
BETWEEN  
THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
AMES RESEARCH CENTER  
AND  
THE BOEING COMPANY  
UNDER SPACE ACT UMBRELLA AGREEMENT NO. 29380, DATED 4/27/2020  
FOR  
WIND TUNNEL TESTING  
(ANNEX NUMBER 4)**

**ARTICLE 1. PURPOSE**

This Annex Four on the Reimbursable Space Act Umbrella Agreement SAA2-403460 (the “Umbrella Agreement”) between The Boeing Company (“Boeing” or “Partner”) and NASA Ames Research Center (“NASA” or “NASA ARC”) shall be for the purpose of performing an aerodynamic wind tunnel test of a test article in the NASA ARC Unitary Plan Wind Tunnel (UPWT) to obtain aerodynamic performance data. The model would be run in both the 11x11-Foot Transonic Wind Tunnel (“TWT”) and the 9x7-Foot Supersonic Wind Tunnel (“SWT”) legs of the UPWT.

The legal authority for this Annex, consistent with the Umbrella Agreement, is in accordance with the Space Act, Other Transactions Authority (OTA), 51 U.S.C. § 20113(e).

**ARTICLE 2. RESPONSIBILITIES**

A. NASA ARC will use reasonable efforts to:

1. Provide use of NASA ARC's TWT, SWT, and associated preparation facilities to perform a wind tunnel test that meets the testing conditions desired by Boeing.
2. Provide use of its existing instrumentation and model support hardware from NASA ARC's inventory associated with the UPWT facility as needed. This will include provisions of labor and materials necessary to plan, prepare, and perform testing, and provide data analysis support.
3. Deliver reduced wind tunnel data to Boeing after completion of final test program.

B. Partner will use reasonable efforts to:

1. Provide wind tunnel test models with supporting documentation that meets NASA ARC's wind tunnel model safety criteria.
2. Provide model interface hardware to NASA that meets NASA ARC's safety criteria, unless compatible interface hardware already exists in NASA ARC's inventory.
3. Provide instrumentation and/or data systems that are not part of NASA ARC's existing inventory if needed. Where required, these components/systems shall be compatible with the NASA ARC Standard Data System.

4. Provide a test plan that includes a prioritized run matrix to indicate: model and control surface settings; model angle of attack; Mach number; other desired tunnel conditions; and acceptable tolerance levels.
5. Provide personnel and additional hardware to perform test coordination; model configuration changes and customer-supplied instrumentation; and data system support.

**ARTICLE 3. SCHEDULE AND MILESTONES**

The planned major milestones for the activities for this Annex defined in the "Responsibilities" Article are as follows:

<b>Milestone</b>	<b>Schedule</b>
Final Wind Tunnel Requirements Defined (Boeing)	30 days prior to SWT entry
Receipt of Models and interface hardware NASA ARC (Boeing)	Two weeks prior to SWT entry
Enter 9x7-Foot SWT for Testing (Both Parties)	On or about August 7, 2023
Enter 11x11-Foot TWT for Testing (Both Parties)	On or about September 4, 2023
Completion of Wind Tunnel Testing (Both Parties)	On or about 4 weeks after TWT tunnel entry
Transmittal of Reduced Wind Tunnel Data to Partner (NASA)	Within two weeks after test completion of final test program

**ARTICLE 4. FINANCIAL OBLIGATIONS**

Partner agrees to reimburse NASA an estimated cost of \$9,679,009 for NASA to carry out its responsibilities under this Annex. Each payment shall be marked with Ames, Annex Four, SAA2-403460-4.

- A. NASA will not provide services or incur costs beyond the current funding. Although NASA has made a good faith effort to accurately estimate its costs, it is understood that NASA provides no assurance that the proposed effort under this Annex will be accomplished for the estimated amount. Should the effort cost more than the estimate, Partner will be advised by NASA as soon as possible. Partner shall pay all costs incurred and have the option of canceling the remaining effort, or providing additional funding in order to continue the proposed effort under the revised estimate. Should this Annex be terminated, or the effort completed at a cost less than the agreed-to estimated cost, NASA shall account for any unspent funds within six months after completion of all effort under this Annex, and promptly thereafter, at Partner's option return any unspent funds to Partner or apply any such unspent funds to other activities under the Umbrella Agreement. Return of unspent funds will

be processed via Electronic Funds Transfer (EFT) in accordance with 31 C.F.R. Part 208 and, upon request by NASA, Partner agrees to complete the Automated Clearing House (ACH) Vendor/Miscellaneous Payment Enrollment Form (SF 3881).

#### ARTICLE 5. INTELLECTUAL PROPERTY RIGHTS - DATA RIGHTS

- A. Data produced under this Annex which is subject to paragraph C. of the Intellectual Property Rights - Data Rights Article of the Umbrella Agreement will be protected for the period of two years.
- B. Under paragraph H. of the Intellectual Property Rights - Data Rights Article of the Umbrella Agreement, Disclosing Party provides the following Data to Receiving Party. The lists below may not be comprehensive, are subject to change, and do not supersede any restrictive notice on the Data provided.
1. Background Data: The Disclosing Party's Background Data, if any, will be identified in a separate technical document.
  2. Third Party Proprietary Data: The Disclosing Party's Third Party Proprietary Data, if any, will be identified in a separate technical document.
  3. Controlled Government Data: The Disclosing Party's Controlled Government Data, if any, will be identified in a separate technical document.
  4. The following software and related Data will be provided to Partner under a separate Software Usage Agreement: None

#### ARTICLE 6. TERM OF ANNEX

This Annex becomes effective upon the date of the last signature below ("Effective Date") and shall remain in effect until the completion of all obligations of both Parties hereto, or one year from the Effective Date, whichever comes first, unless such term exceeds the duration of the Umbrella Agreement. The term of this Annex shall not exceed the term of the Umbrella Agreement. The Annex automatically expires upon the expiration of the Umbrella Agreement.

#### ARTICLE 7. RIGHT TO TERMINATE

Either Party may unilaterally terminate this Annex by providing thirty (30) calendar days written notice to the other Party.

#### ARTICLE 8. POINTS OF CONTACT

The following personnel are designated as the Points of Contact between the Parties in the performance of this Annex.

Management Points of Contact

NASA Ames Research Center  
Nahri Ahn

The Boeing Company  
Eric Werner

Agreement Manager  
Moffett Field, CA 94035  
Phone: (650) 604-1179  
nahri.i.ahn@nasa.gov

Flight Systems Manager  
6300 James S McDonnell Blvd  
St. Louis, MO 63134  
Phone: (314) 777-4415  
eric.l.werner@boeing.com

Technical Points of Contact

NASA Ames Research Center  
Maureen Delgado  
Wind Tunnel Division Chief  
Mail Suite: 227-5  
Moffett Field, CA 94035  
Phone: 650-604-1620  
maureen.e.delgado@nasa.gov

The Boeing Company  
Matthew Roode  
Associate Technical Fellow - Propulsion  
6300 James S McDonnell Blvd  
St. Louis, MO 63134  
Phone: (314) 232-0329 / (314) 777-4416  
Matthew.J.Roode@boeing.com

ARTICLE 9. MODIFICATIONS

Any modification to this Annex shall be executed, in writing, and signed by an authorized representative of NASA and the Partner. Modification of an Annex does not modify the terms of the Umbrella Agreement.

ARTICLE 10. SIGNATORY AUTHORITY

The signatories to this Annex covenant and warrant that they have authority to execute this Annex. By signing below, the undersigned agrees to the above terms and conditions.

**NATIONAL AERONAUTICS AND  
SPACE ADMINISTRATION  
AMES RESEARCH CENTER**

**THE BOEING COMPANY**

BY: \_\_\_\_\_  
Eugene Tu  
Center Director

BY: Amy L Moen  
Amy L Moen  
Boeing Procurement Agent

DATE: \_\_\_\_\_

DATE: 6/27/2023