

ANNEX  
BETWEEN  
THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
GEORGE C. MARSHALL SPACE FLIGHT CENTER  
AND  
LOCKHEED MARTIN  
UNDER  
SPACE ACT UMBRELLA AGREEMENT  
NO. SAA8-2134592 , DATED 8/5/2021 SAA8-2134592.3

ARTICLE 1. PURPOSE

This Annex shall be for the purpose of conducting and developing lunar regolith dust testing on a representative lunar rover drive motor / gear drive / wheel assembly in a representative lunar thermal-vacuum environment. The testing is intended to assess the durability and performance of the assembly in a lunar regolith environment. The targeted chamber temperature shall be 94° K to 280° K. Performance assessed shall include rolling resistance and seal contamination/wear. The wheel assembly is roughly 0.8 m in diameter.

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

NASA will use reasonable efforts to:

1. Provide a plan for lunar regolith dust testing, instrumentation, and measurement criteria,
2. Procure as needed and provide test chamber, fixturing and equipment, instrumentation, and regolith simulant and provide evidence that test setup is ready for testing,
3. Conduct a technical review meeting to assess progress on goals, and recommend test setup and procedure enhancement and updated test results (provide monthly technical, schedule, and cost) to the partner
4. Provide a final summary report including data from testing to partner.

LOCKHEED MARTIN will use reasonable efforts to:

1. Conduct a kickoff meeting to document developmental goals, identify ground rules and assumptions, and compare test methods, operational range, and measurement criteria for the activity.
2. Conduct an initial technical review meeting for data and results of initial test approaches
3. Procure as needed and provide Unit Under Test (UUT) hardware as well as the spinning circular carousel fixture and regolith distribution system to NASA MSFC.

4. Conduct an initial technical review meeting for data and results of initial testing
5. Conduct a post-test data review
6. Participate in project status meetings and review NASA MSFC monthly status reports.

### ARTICLE 3. SCHEDULE AND MILESTONES

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

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|--|---|
| 1. LM to conduct kickoff meeting to document developmental goals, identify ground rules and assumptions, and compare test methods for the activity   | Effective Date + 14 calendar days (2 weeks) |
| 2. LM to conduct an initial technical review meeting for data and results of initial test approaches   | Milestone 1 + 28 calendar days (4 weeks)    |
| 3. LM to procure as needed and provide Unit Under Test (UUT) hardware as well as the spinning circular carousel fixture and regolith distribution system to NASA MSFC.   | Milestone 1 + 28 calendar days (4 weeks)    |
| 4. NASA MSFC to provide plan for lunar regolith dust testing, instrumentation, and measurement criteria  | Milestone 1 + 42 calendar days (6 weeks)    |
| 5. NASA MSFC to procure as needed and provide test chamber, fixturing and equipment, instrumentation, and regolith simulant and provide evidence that test setup is ready for testing.                                 | Milestone 1 + 56 calendar days (8 weeks)    |
| 6. LM to conduct an initial technical review meeting for data and results of initial testing   | Milestone 1 + 84 calendar days (12 weeks)   |
| 7. NASA MSFC and LM to conduct a technical review meeting to assess progress on goals, and recommend test setup and procedure enhancement and updated test results (to include monthly technical, schedule, and cost). | Milestone 1 + 126 calendar days (18 Weeks)  |
| 8. LM conducts post-test data review.  | Milestone 1 + 168 calendar days (24 weeks)  |
| 9. NASA MSFC to provide a final summary report including data from testing to partner.   | Milestone 1 + 280 calendar days (40 weeks)  |

### ARTICLE 4. FINANCIAL OBLIGATIONS

A. Partner agrees to reimburse NASA an estimated cost of \$313,428.00 for NASA to carry out its responsibilities under this Annex. Each payment shall be marked with SAA8-2134592.3.

B. 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 one year 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:

None

2. Third Party Proprietary Data:

None

3. Controlled Government Data:

None

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 two years 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.

Technical Points of Contact

NASA George C. Marshall Space Flight Center  
Richard A. Cooper  
Test Engineer  
Marshall Space Flight Center, AL 35812  
Phone: 256-544-3544  
richard.a.cooper@nasa.gov

LOCKHEED MARTIN SPACE  
Terry Abel  
MSFC Technical Liaison  
12257 South Wadsworth Blvd.  
Littleton, CO 80125-8504  
Phone: 256-656-5411  
terry.abel@lmco.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  
GEORGE C. MARSHALL SPACE  
FLIGHT CENTER

LOCKHEED MARTIN  
SPACE

BY: \_\_\_\_\_  
Mary E. Koelbl  
Director Engineering Directorate

BY: \_\_\_\_\_  
Melinda McCord  
Subcontract Manager

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

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