Scope of Work and Schedule for Mitigation of the Rocket Engine Test Facility, NASA Glenn Research Center

Hardlines Design Company
December 17, 2001

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Introduction

This Scope of Work provides services to document the historic significance of the Rocket Engine Test Facility (RETF) located at NASA Glenn Research Center (NASA GRC) in Cleveland, Ohio. The RETF, a National Historic Landmark, is proposed to be demolished to make way for a new runway for the adjacent Cleveland Hopkins International Airport. This Scope of Work clarifies services to be provided by Hardlines Design Company and its subconsultants to mitigate the proposed demolition of the RETF. Demolition of the RETF is currently anticipated to take place in 2002. An existing Memorandum of Agreement (MOA) among the FAA, Ohio Historic Preservation Office (SHPO), NASA, and the Advisory Council for Historic Preservation outlines mitigation measures for the RETF. The City of Cleveland was an invited signatory of the MOA. This scope and schedule responds to provisions of Section II.B.1 covering Historic American Engineering Record (HAER) Documentation, Section II.B.2 covering additional mitigation documentation, and Section III covering Salvage and Curation. Based on stipulations of the MOA, the services outlined in this document include Historic American Engineering Record (HAER) documentation, and additional mitigation measures such as production of videos covering the history of the RETF, development of an RETF website, production of a peer-reviewed history of the facility, and other items. This Scope of Work provides for HAER Level I documentation for the RETF.

This Scope of Work does not include Stipulation II.3.C identified in the MOA relative to the Tensile Strength Testing Machine. If the Machine is determined to be eligible, then that work will be included in a separate, subsequent Scope of Work.

SECTION 1
SCOPE OF WORK

PRODUCT REVIEW AND DISTRIBUTION

Product Review

Hardlines Design Company (HDC) will distribute all draft review products to the appropriate parties. All review periods will consist of up to 30 working days. NASA GRC shall consolidate all NASA review comments and submit them to HDC. Figure 1 below graphically depicts the process of review product distribution and review comment submission. Table 1 contains a quantity summary of review products for review submittals.

Figure 1: Review product distribution and review comment submission process.

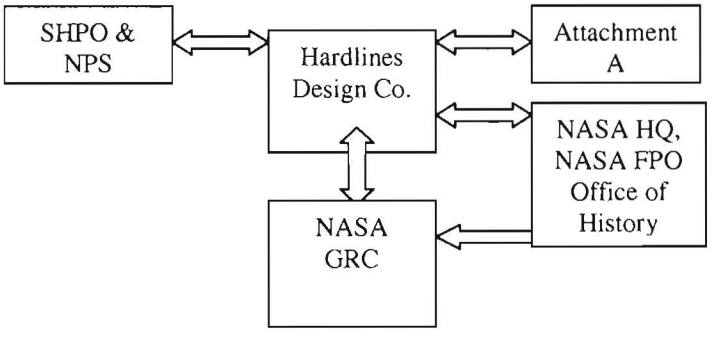

Table 1: MOA Draft Product Review Distribution Summary

MOA Ref.	PRODUCT		HDC Submit to 10 NASA Review Team Members	HDC Submit to SHPO	HDC Submit to NPS	HDC Submit to Attachment A	TOTAL
II.B.1	Draft HAER Documentation Report and Drawings	Elec. Copy, photos & archival copy	10 electronic copies	1 electronic and 1 hard copy	1 archival hard copy*	0	13
II.B.2	Draft RETF Records Finding Aid	Elec. Copy	10	1	0	0-6**	11-17
	Draft copy of Videotaped Interviews		10 VHS Copies	1 VHS copy	0	0-6	11-17
	Draft Interview Transcriptions	Elec. Copy	10	1	0	0-6	11-17
	Draft Peer-Reviewed Written History	Elec. Copy	10	1	0	0-6	11-17
	Web-based Presentation (CD-ROM)		10	1	0	0-6	11-17
	Museum Display Design Layout		10	1	0	0-6	11-17
	Interactive History Lesson Program (CD-ROM)		10	1	0	0-6	11-17
	20 minute Videotaped Program (VHS tape)		10	1	0	0-6	11-17
	5 minute Videotaped Program (VHS tape)		10	1	0	0-6	11-17
III	Salvage and Curation Report	Elec. Copy	10	1	0	0-6	11-17

**Only two sets of archival photographic prints will be generated. One copy will be submitted to NPS for draft review. The second set of prints will be submitted to SHPO at the end of the project.*

***By the time the Scope of Work is finalized, the City of Cleveland will have determined the number of Attachment A parties that will be reviewing products in MOA Section II.B.2. The number of participating Attachment A parties will be determined at the start of the project, additional review parties will not be added once work is underway. All Attachment A Review parties wishing to participate must express their desire to do so by December 21, 2001.*

NASA TEAM Distribution List to receive 1 electronic copy of DRAFT submittals for Review:

Joseph.E.Morris@grc.nasa.gov
Kevin.P.Coleman@grc.nasa.gov
Richard.S.Kalynchuk@grc.nasa.gov
Linda.A.Norberg@grc.nasa.gov
Neal.F.Wingenfeld@grc.nasa.gov
kkumor@hq.nasa.gov (NASA FPO)
ahostyk@hq.nasa.gov (NASA HQ)
roger.launius@hq.nasa.gov (NASA Office of History)
David.Melton@hq.nasa.gov (NASA HQ)
Roland.Ridgway@hq.nasa.gov (NASA Records Manager)

Final Product Distribution

After review comments have been addressed by all parties and peer reviewers, HDC will submit the final products to the appropriate parties as required in the MOA. HDC will submit copies of final products to parties listed in the MOA, Attachment A, who provided review comments as required in MOA Stipulation II.B.7. Table 2 displays a quantity summary of final products to be submitted. NASA will maintain ownership of all final product copyrights, although it should be noted that HAER documentation is part of the public record, and not subject to copyright.

Table 2: MOA Final Product Distribution Summary

NPS = National Park Service CLC = Cleveland Landmarks Commission

MOA Ref.	PRODUCT		City	NASA GRC	SHPO	NASA HQ	NPS	CLC	Attachment A	TOTAL
II.B.1	HAER Documentation Report and Drawings		2	2	2	2	1	2	0	11
II.B.2 & II.B.8	RETF Records Finding Aid		2	2	2	2	0	0	0-6	8-14
	VHS copy of Videotaped Interviews		2	2	2	2	0	0	0-6	8-14
	Interview Transcriptions	Hard copy	1	1	1	1	0	0	0-6	4-10
		Elec. Copy	1	1	1	1	0	0	0-6	4-10
	Interview Release Forms		0	1	0	0	0	0	0	1
	Peer-Reviewed Written History	Hard copy	2	1000	2	2	0	0	0-6	1006-1012
		Elec. Copy	1	1	1	1	0	0	0-6	4-10
	Web-based Presentation (disk)		0	1	1	1	0	0	0-6	3-9
	20 minute Videotaped Program		2	100	2	2	0	0	0-6	106-112
	5 minute Videotaped Program		2	100	2	2	0	0	0-6	106-112
III	Salvage and Curation Report	Elec. Copy	1	1	1	1	0	0	0-6	4-10

HAER LEVEL I PHOTOGRAPHY, TEXTUAL DOCUMENTATION, AND DRAWINGS

This section describes services to complete HAER documentation of the RETF as specified in Section II.B of the MOA, and in a letter dated October 11, 2001 issued by Mr. Brian McCutchen of the National Park Service (NPS) Midwest Regional Office. In general, NPS has made a decision that many aspects of the HAER documentation, especially HAER drawings, will record the facility as it existed during the time that the stand was contributing significant research and information to the U.S. effort to send a manned mission to the moon, specifically between the dates 1957 and 1969.

HAER Level I Photography:

Field Photography:

Hardlines Design Company (HDC) will provide a maximum of fifty (50) newly-taken photographic views of the RETF. These photographs will be produced to HAER standards, and will consist of one 4"x 5" photographic negative per view, and two 4"x 5" photographic prints per view. The allocation of the 50 photographic views has been, to a large degree, mandated by NPS in Mr. McCutchen's letter of October 11, 2001. NPS has provided the following specifications in terms of the HAER photography for RETF.

> "Exterior photographs for each of the structures encompassing the project area will include the following:
>
> - A minimum of one photograph of each structure recording its relationship to the facility
> - A minimum of two photographs of each structure, recording the spatial relationship between the structure and its immediate site.
> - A front elevation of each structure
> - A perspective photograph of the front elevation and one side elevation of each structure
> - A perspective photograph of the rear elevation and other side elevation of each structure
> - Photographs as required to record significant exterior architectural and construction details which are not shown in other photographs. The cooling/spray system and the complex piping system that connects the half-million gallon fuel tank to the rocket test building are such details that may need further photo documentation
>
> Interior photographs (will also be provided) for each of the structures of the Rocket Engine Test Facility.
>
> - Photographs required to record overall interior views
> - Photographs as required to record typical interior spaces and spatial relationships.
> - Photographs as required to document significant interior architectural and construction details that are not shown in other photographs" (end of NPS quote)

Views specifically mandated by the above HAER recommendations will be completed by the HDC photographer and historian according to the specifications in the October 11 letter. Photographs related to less specific areas of the HAER specifications, such as the requirements for views of significant interior and exterior features will be determined in the field by HDC and appropriate NASA personnel. At the request of NASA, HDC will also provide NASA with a CD/ROM containing the HAER field views in electronic form (300dpi at 4x5in.) using a standard .tiff or .jpg format. An photograph index will be produced and will appear in the HAER report.

Section I.C.1 of the MOA identifies the RETF buildings as NASA GRC Buildings 202 (including test stands A and B), 205, 206, 206A, 100, and an Observation Blockhouse. NPS also indicated that the HAER documentation should focus more heavily on RETF facilities dating to 1957-1969, specifically Buildings 202, 205, 206, 100, and the Observation Blockhouse. Each of these five buildings will receive six photographic views that conform to the specific views (i.e. exterior perspectives, front elevation views, etc.) mandated by NPS. Two views will also be taken of Building 206A. This will take up 32 of the 50 field views planned by HDC. Of the remaining views, at least one interior view will be taken of each of the RETF buildings present during the 1957-1969 era, for a total of five (5) views. The remaining thirteen (13) views will be allocated to views of features and equipment that are not visible in the other views. Three additional interior views each will be taken of Buildings 202 and 100. The remaining seven (7) views will be allocated, as determined by HDC and appropriate NASA personnel in the field, to showing important exterior views that were not covered in the overall building photos.

Large Format Photographic Copy Work:

The Imaging Technology Center (ITC) at NASA GRC will produce 50 photographic copies of NASA historic photographs that will be added to the 50 field shots completed by HDC. NASA GRC Imaging Technology Center will produce one inter-negative and two prints of each historic view. The NASA GRC Imaging Technology Center will be responsible for seeing that its photographs are produced, developed, and printed according to HAER standards. HDC will add the 50 historic views to the HAER photo list, and will provide mount cards and negative sleeves, and will label these items according to HAER standards. The negatives for the copy work will be 4" x 5" format, but the prints will be 8" x 10" enlargements.

NASA GRC ITC will also produce fifteen (15) to eighteen (18) large format photographic copies of construction drawings associated with RETF. The photography will be completed with 4" x 5" large format negatives and 8" x 10" enlargement prints. HDC will select the drawings to be photographed. For each of the RETF buildings, including Buildings 202, 205, 206, 206A, 100, and the Observation Blockhouse, ITC will produce photographic copies of three drawing sheets per building, if available. The sheets will consist of one sheet of floor plans, one sheet of site plans, and one sheet of section drawings, per building. If at least two such sheets are not available for the smaller RETF buildings, another sheet covering that building will be substituted. NASA ITC will follow the format specified in the October 11, 2001 NPS specifications for this project, in that the prints will conform to HAER specifications in terms of paper and developing processes. One negative and two prints will be produced for each copy work view. HDC will be responsible for HAER-quality mounting and labeling of the prints and negatives produced by NASA GRC ITC and for composing a photo list for these items. ITC will be responsible for assuring that the actual photographic prints and negatives meet HAER

standards. Any requirements for additional photography above 50 field shots and the 65-68 copy work shots will result in a change order to HDC's contract, and will be negotiated between HDC and the City.

HAER Level I Text

The following information is quoted from the NPS RETF HAER recommendation letter dated October 11, 2001:

> A Narrative Format will be prepared, placing the NASA Rocket Engine Test Facility in historical context of the technological development of light weight, regeneratively cooled hydrogen engine, and its importance in man's early exploration of space. Written documentation will follow the guidelines established in the draft "Manual for Editing HABS/HAER Documentation," and the "Recording Historic Structures and Sites for the Historic American Engineering Record." The relationship of the NASA Rocket Engine Test Facility to the advancement of space exploration will be explored, and the history will explain why the Rocket Engine Test Facility possesses national significance. All elements that contribute to the property's significance will be identified. The function of the "Narrative Format" is to establish an overview of the facility as a collective whole and will include the following information:
>
> 1.Physical context of the facility and its relationship to the NASA Glenn Research Facility, the Cleveland Hopkins International Airport, the Cleveland region, and related NASA research and testing facilities that contributed to the early development of America's early space exploration.
>
> 2. Historical context of the Rocket Engine Test Facility and its relationship to the historical developments of rocket propulsion and America's early years of space exploration. The context will also address the impact and influence of the Rocket Engine Test Facility on the development of the Cleveland Hopkins International Airport.
>
> 3. Specific History of the Rocket Engine Test Facility, including dates of initial planning and development; significant commercial and historical events associated with the facility, businesses, associations, or activities established or initiated by the NASA; significant associated individuals; and academic and commercial institutions associated with the facility.
>
> 4. Physical description of the Rocket Engine Test Facility both currently, and its overall evolution from initial development to the present. The description will include changes made to the landscape, and include the entire complex comprising the historic facility. Measured drawings will document largely the specified period of significance, rather than present, as-is conditions.
>
> 5. Description of the processes and experimentation of early rocket engine testing at Rocket Engine Test Facility.

Additional specific site histories and physical descriptions, each detailed and of suitable length considering the complexity and historical aspects of the structure, will be prepared for each structure to be demolished or altered that date from the period of historical significance. These include:

GRC Building 100
GRC Building 202 (test stands A & B and associated scrubber facility)
GRC Building 205
GRC Building 206
GRC Observation Blockhouse

The contractor will consult the large volume of information on the Rocket Engine Test Facility archived by NASA at the Glenn Research Center and other affiliated archives. Such extensive collections include various departmental records, correspondence, inventories, reports, photographs, maps, drawings, and blueprints.

It is understood that a thorough, detailed history of the NASA Glenn Research Center Rocket Engine Test Facility will be submitted in book form as an addendum to the HAER project.

(end of section quoted from NPS letter)

The NPS recommendations clearly require the HAER narrative to be a comprehensive history and description of the RETF and its historic context. This narrative will be approximately 90 pages in length, (about 47 text pages) , and will conform to HAER Level I Narrative Report Standards. The narrative will include text, bibliography, notes, photo key, photo index, and Xerox reproductions of selected historic construction drawings of the RETF within the 90 page limit for the document. The report will be formatted as a HAER report for a complex of buildings, and will actually consist of six reports, an introductory context report for RETF as a whole and five individual HAER reports, with each report covering one of the buildings or structures present during the time RETF was contributing to research used to achieve human space flight to the moon. While post-Apollo structures associated with the RETF will be discussed as part of the overall discussion of the history and development of the facility, separate history and description reports will only be written for buildings associated with RETF research for the manned space flight to the moon, which was completed from 1957-1969. These structures are Buildings 100, 202 (A Stand & Scrubber), 205, 206, and the Observation Blockhouse.

The following outline is proposed for the report organization and content:

CONTEXT

5 Pages Overall Description	5
12 Pages Context History	12
2 Pages Photo Key and List	2
Site Plans, Xerox Reproductions of General Construction Drawings	5
TOTAL	**24**

BUILDING 100	
2 Pages Overall Description	2
3 Pages History	3
3 Pages Photo Key and List	3
Xerox Reproductions of Construction Drawings	4
TOTAL	**12**
BUILDING 202	
Five Page Description, Eight Page History	13
Photo Key, Photo List	3
Xerox Reproductions of Construction Drawings	8
TOTAL	**24**
BUILDING 205	
One Page Description, Three Pages History	4
Photo Key, Photo List	3
Xerox Repros of Construction Drawings	4
TOTAL	**11**
BUILDING 206	
One Page Description, Three Page History	4
Photo Key, Photo List	3
Xerox Repros of Construction Drawings	4
TOTAL	**11**
OBSERVATION BLOCKHOUSE	
One Page Description, Two Page History	3
Photo Key, Photo List	2
Xerox Repros of Construction Drawings	2
TOTAL	**8**
TOTAL PAGES	**Approximately 90**
TEXT PAGES	**Approximately 47**

The text will be formatted according to HAER standards. Sources for the HAER report will include records of the NASA GRC, construction record drawings, base real estate records, base histories, and possibly other sources. The report will also draw heavily on whatever research is available from the effort to produce the peer-reviewed history that is also to be completed for this project, with the understanding that the HAER report will be completed before the peer-reviewed history is finished.

The format of the report will include an overall context report that will summarize the history and significance of the facility, and explain the relationship between various facilities within the complex. Brief mention of Building 206A will also be included in this section. This main report will be sufficient to establish the historic context for the HAER report. Each of the five major 1957-1969 structures of the facility will then be covered under separate reports. Each of these

facilities will have its own HAER letter designation. Separate reports will be produced with history and description covering the following RETF structures: Building 100, 202, 205, 206, and the Observation Blockhouse. It is anticipated that the reports covering Building 202 (particularly A-Stand) and Building 100 will be extensive, while subsections for other structures associated with the complex will be brief.

One printed (1) copy of the peer-reviewed history will be submitted to NPS at the time that the peer-reviewed history is completed. The copy of this longer, more detailed history will supplement the information provided in the RETF HAER report, but is not intended as a substitute for a thorough, well-researched HAER Level I report. A regular bound production copy of the peer-reviewed history will be submitted to NPS, this history will not be re-formatted to conform to HAER standards. It is assumed that the original HAER report and drawings will satisfy the requirement for a report that conforms to HAER Level I standards.

Deliverable Items and Submissions:

HDC will submit one (1) electronic copy in MS Word format to various review parties, and one archival hard copy of the report to NPS according to Table 1. The hard copy will include one set of 4"x 5" contact prints of the photographs mounted on HAER standard mount cards. HDC will distribute the archival copy of the draft report to NPS, and electronic copies to the ten NASA review team members listed in this scope of work. One (1) hard and one (1) electronic copy will also be distributed to SHPO. The NPS and NASA reviewers shall have a 30 working-day review period. NASA GRC shall consolidate all NASA review comments and submit them to HDC. NASA is being given a courtesy review of the HAER text, and it is expected that the NASA comments will be geared towards assuring that the report is factually and technically accurate, and not towards making major structural changes.

If NPS accepts the photographs, this will constitute the final acceptance of the photographic portion of the HAER documentation. It is assumed that an archival hard copy of the text, and original photographs and negatives will be submitted to NPS. HDC will retain one set of prints at this time so that HDC can use these photos to produce the revised and final copies of the HAER report.

Any comments resulting from this review will be addressed by HDC during a 60-day period. HDC will submit the final HAER documentation report to the following parties as specified in MOA Stipulation II.B.1.e and as outlined in Table 2:

- HAER-NPS: One (1) original set including report on archival paper, original photo negatives and prints, one copy of field notes
- NASA GRC: Two (2) archival copies
- NASA HQ Office of History: Two (2) archival copies
- SHPO: Two (2) archival copies
- City of Cleveland: Two (2) archival copies
- Cleveland Landmarks Comm.: Two (2) archival copies

This submission of the HAER documentation will serve as the final report. Upon final HAER approval of the text, photos and drawings, NASA will request approval of the National Park Service and the Ohio Historic Preservation Office for the de-listing and demolition of the RETF. Upon receipt of this approval, the City of Cleveland will initiate a letter to NASA requesting a license agreement to allow the demolition of the RETF.

A post-RETF demolition "addendum" to the HAER Level I report will consist of one (1) standard non-archival bound production copy of the peer-reviewed history that is being produced as part of this project. This copy of the peer-reviewed history will not be re-formatted to fit HAER standards.

HAER Drawings

Since this project involves HAER Level I documentation, HDC will produce HAER format drawings of the RETF. HDC will produce 12 sheets that will primarily record the condition of the RETF during its period of significance to development of technology needed for the manned moon space flight program, which is roughly from 1957-1969. Site plans showing the 1969 historic conditions and the existing conditions will be included in the HAER drawings.

Existing construction drawings will be used as sources to produce a full set of HAER drawings. Research copies of RETF construction drawings or historic photographs needed to produce the HAER drawings will be copied at NASA GRC, and NASA will be directly reimbursed for these copy expenses by the City. The specific measured drawing sheets will be produced according to NPS specifications that are listed in this scope of work, and it is assumed that the NPS list will be closely adhered to. All drawings will be produced and printed using AutoCAD, but conforming to HAER standards. Ink on Mylar hand drawings or renderings are not included in this scope, and requests for hand rendered ink drawings will result in a change order. All drawings will conform to HAER standards in terms of technique, materials, and design, and final AutoCAD drawings will be printed on HAER quality Mylar. HDC has completed a large number of HAER drawings in the past, including ones created with AutoCAD, and we are very familiar with HAER graphics standards.

It is anticipated that draft sketch layouts of the drawings will be submitted to NPS within about 1 month of the beginning of fieldwork. It is expected that any major changes to drawing layouts, compositions, or view angles, etc. will be made at that point. Drawing layout sketches will then be changed by HDC based on NPS comments. After comments on the layout sketches have been completed, only technical corrections such as changes in building details, representations of equipment, labeling, or text will be considered for later drafts of the drawings.

Once the major elements of the drawings have been laid out and drawn in AutoCAD, a fifty percent submission of the drawings will be made to NPS. At this time, NASA will be given an opportunity for a courtesy review for technical accuracy. HDC will alter technical details and text at this time based on NASA comments to ensure the accuracy of the drawings. However, HDC will not make major structural changes at this stage, such as the composition of the drawings, or the angle of view of buildings or facilities in the drawings.

Once NPS and NASA comments on the fifty percent submission have been addressed, production will begin on a full set of draft drawings, which will include all graphic and text elements. These completed draft HAER AutoCAD drawings will be submitted to NPS for review six (6) months after the beginning of fieldwork. NPS shall then review a submission of these full draft drawings, and make appropriate comments primarily focused on accuracy of details and text. Major changes to subject matter, view angles, or composition will not be accepted at this stage. It is anticipated that this review will take approximately thirty (30) working days, and that HDC will have sixty (60) days to address the comments. A final set of drawings will be issued once NPS comments have been addressed by HDC.

The following list of HAER drawing sheets has been mandated by NPS:

1. Title Sheet with small regional map, state location map, statement of significance, and a project credit statement (one sheet)

2. Existing Conditions Site Plan locating all major RETF structures from the period of historical significance to manned moon space flight technology development (1957-1969), plus buildings, transportation routes, piping systems, walkways and paths added to

the facility after 1969. The purpose of this drawing is to represent the existing conditions of the RETF facility so that it may be compared with site plans and other graphics that depict the RETF as it appeared from 1957-1969. (one sheet)

3. Historic Conditions Site Plan. This plan will show all of the elements indicated in the Existing Conditions Site Plan, but it will represent the facility as it existed during the period of significance (1957-1969). (one sheet)

4. Process Sheets. HDC will produce two drawing sheets that will explain processes associated with mission control, fuel supply, cooling scrubbers, and overall rocket engine testing. The purpose of these drawings will be to make a connection between physical features of the RETF and the activities that took place there. (two sheets).

5. Individual axon drawings Building 100, and Building 202 (including A-Stand and scrubber facility). These drawings will present a peel-away perspective that will explain and emphasize how the facility operated from 1957-1969. (two sheets)

6. Floor Plans of Major RETF Buildings present during the period 1957-1969. One individual plan drawing sheet will be produced for each of the following facilities: Building 100, 202 (A-Stand and Scrubber facility), 205, 206, and the Observation Blockhouse. The plans will reflect conditions as they existed from 1957-1969. (five sheets)

It is assumed that the primary sources for these drawings will be historic construction drawings, and that only a relatively small amount of field measurement will be necessary, since the purpose of the majority of these drawings is not to document the existing conditions of the RETF, but its condition during the period ca. 1957-1969.

Copies of the drawing layout sketches will be submitted to NPS only. After review of the sketches, HDC will make requested alterations and begin production of the HAER drawings on AutoCAD. Once production is well underway, and the most important major elements of each drawing have been drawn in, HDC will submit a 50% submission to NPS, and will also give NASA an opportunity for a courtesy review to ensure technical accuracy. This level will allow NPS to determine if the appropriate level of detail is being shown in the drawings to meet HAER standards, and will allow NASA to review technical accuracy. After revisions are completed based on this review, full draft AutoCAD drawings will be completed, including texts. These drawings will be submitted to NPS. A thirty (30) working day period will be allowed for review of the drawings. After this review period, starting on the date of HDC's receipt of comments on the drawings, HDC will have sixty (60) days to make revisions to the drawings. NPS comments at this stage of the project should take the form of corrections of technical details or revisions to the drawing texts. Major changes such as the shifting of the angle of isometric views, major changes to the compositions or layouts of the drawings, or requests to alter the subjects or facilities covered in the drawings will not be accepted at this stage. NPS will be the ultimate arbiter in all issues concerning the HAER drawings.

To keep this portion of the project on schedule, comments on the drawings must be submitted within thirty (30) working days of the submittal of the drawings by HDC. If no comments are received at the end of thirty working days, HDC will assume that the parties in question have no comments and have accepted the drawings as they were originally submitted by HDC. No comments will be accepted from any parties after the close of the thirty working day window of comment.

Deliverable Items and Submissions:

HDC will submit one (1) copy of the layout sketches for the drawings to NPS. The 50% submission will be made to NPS and the ten NASA review team members. After a thirty (30) working day review period, HDC will revise the drawings as indicated by NPS and NASA comments. Six months after the notice to proceed on the field and research portion of the project has been issued, HDC will submit completed drawings to NPS. After a thirty (30) working day review period by NPS, if there are comments to address, HDC will have sixty (60) days to revise the drawings, and after sixty (60) days the final drawings will be resubmitted on archival Mylar to NPS. The following parties will receive copies of the final drawings:

- HAER-NPS: One (1) original set on archival Mylar
- NASA GRC: Two (2) archival Mylar copies
- NASA HQ Office of History: Two (2) archival Mylar copies
- SHPO: Two (2) archival Mylar copies
- City of Cleveland: Two (2) archival Mylar copies
- Cleveland Landmarks Comm.: Two (2) archival Mylar copies

Overall HAER Packaging and HAER Numbers

This documentation will be formatted as a HAER complex. An individual HAER overview/context report will be produced and packaged covering the overall history and context of the entire facility. Documentation associated with each of the 1957-1969 buildings of the RETF will be packaged as separate reports. The overview/context report will receive a general HAER number, and each of the five buildings covered in individual reports will receive a unique letter designation within the general HAER number. For example, the overall complex might be given the HAER number OH-276 (this is just an example, not the real number), and Building 100 might then be designated as HAER OH-276-A, while Building 202 might be OH-276-B, and so on.

All HAER numbers and official names for the various facilities of RETF will be assigned by NPS. HDC will contact NPS at the beginning of field work for the HAER portion of the project to obtain HAER numbers and to clarify the historic names of each of the facilities. All final documentation that will be submitted to NPS including photographs, reports, and drawings, will be produced on archival materials that conform to HAER standards and regulations.

CATALOGING RECORDS OF THE RETF

This section of the scope responds to Section II.B.2.a of the MOA.

Sorting and Filing:

HDC will organize, preserve, and catalog 60 linear feet of RETF textual records. HDC, working with History Enterprises Inc., will organize, preserve and catalog all photographs, films and videos of the RETF. Documents will be separated into 2 separate categories and box sets consisting of records and non-records. Records are considered original documentation that will eventually be transferred to the National Archives and Records Administration (NARA) and Non-Records would consist of copies of documents, technical publications, trade journals, etc. This will be accomplished with the guidance of the GRC Records Manager or other GRC staff members. Non-Records will be handled identical to Records, with the exception that they will eventually be kept at NASA instead of being transferred to NARA. NASA will provide Government records storage boxes and box labels. HDC/History Enterprises will provide the acid-free folders. The total base amount of textual records to be sorted is 60 linear feet. Additional textual records beyond 60 linear feet can be added to this SOW on an hourly or per linear foot basis, after examination of the records in question by HDC/History Enterprises personnel.

Work will include preparation of a finding aid to facilitate use of the archives and transfer to NARA in Chicago, IL. The records will be processed according to standard NARA archival practice, using acid-free boxes and folders. All boxes will be numbered and cross-referenced with the finding aid. NASA GRC will provide official Government record boxes and the appropriate labels. In addition to the finding aid provided, HDC/History Enterprises will prepare a NASA Form C-277, Records Transmittal and Receipt, which will list the contents of the Record and Non-Record boxes. This service covers basic organization of existing folders, not the exhaustive cataloging of each item within each folder.

The finding aid for photographs, film and videos will include specific information, if available, on identifying the picture, where it is, what it is, who is in it, etc. Six retirees selected to complete interviews for this project will be given a one-time opportunity after conclusion of the interviews to identify persons/things in historic RETF photographic prints. Retirees will be compensated, if desired, for three hours of photo identification work at the rate of $50.00 per hour. Any time spent by retirees working with the photographs that is over the three hour limit will be considered volunteer time and will not be compensated. HDC will contact retirees and make arrangements for the photo identification sessions. This is a one-time effort. If any or all retirees decline to participate in the photo identification, the City and HDC will not be responsible for locating, identifying or contacting additional retirees to replace the parties who declined to participate.

Deliverable Items and Submissions:

NASA shall be responsible for arranging inspections of accessioned records as required. HDC will submit eleven (11) to seventeen (17) electronic copies of the draft finding aid in a database format favored by NASA for distribution to as per Table 1 for one 30 working-day review period. During this review period, the City shall involve other review parties such as SHPO to the extent that the other parties express an interest to be involved. NASA GRC shall consolidate

all NASA review comments and submit them to HDC. All records identified are property of NASA. There are no shipping charges of Records involved in this work.

Any comments resulting from these reviews will be addressed by HDC during a 60-day period. HDC will submit the final records finding aid to the following parties as specified in MOA Stipulation II.B.8 and in Table 2:

- NASA GRC: Two (2) copies
- NASA HQ Office of History: Two (2) copies
- SHPO: Two (2) copies
- City of Cleveland: Two (2) copies
- Involved Attachment A Parties One (1) copy per party (0-6 total)

The review agencies shall have a final 30 working day review period to make final comments on the finding aid. If no additional comments are made, this will serve as the final finding aid. If final comments are made, HDC will have an additional 30 days to address comments and submit final items.

VIDEOTAPE INTERVIEWS OF INDIVIDUALS ASSOCIATED W/ RETF

This section of the Scope of Work responds to Section II.B.2.b of the MOA, which requires videotape interviews of persons who worked in the RETF and associated research programs during the period of significance for the RETF.

Interview Format:

HDC will conduct six (6) thirty-minute interviews with persons who worked in the RETF or on associated research programs during the period of significance. Four to five Interviews will be conducted at an appropriate interview site at NASA Glenn Research Center, while one to two interviews will be conducted at RETF, and will show retirees identifying components of the RETF and discussing testing procedures. HDC and its subconsultants will coordinate and schedule interviews, and conduct and videotape the interviews. HDC and its subcontractors will also obtain releases from interviewees per NASA history standards. HDC and History Enterprises, Inc. will coordinate with NASA personnel to determine which retirees in the pool are most important to interview. Interviews will be conducted by History Enterprises, Inc., and will be videotaped on DVCAM digital videotape format by NASA Imaging Technology Center (ITC). It is anticipated that questions asked during the interviews will vary widely between interviewees depending on their experiences and involvement with RETF programs and research. Staff of History Enterprises will complete a 1-hour long pre-interview conference with the interviewee before taping begins to determine appropriate questions and approach. Interviews will be transcribed and edited for clarity by History Enterprises, Inc.

The video production effort will include a 2-person crew, broadcast-quality camera, tape stock, lighting, grip, and a sound recording package. Single-camera documentary style composition and lighting techniques will be used to ensure the recorded interviews will meet professional aesthetic and technical requirements. The interview will be assembled and mastered on Betacam SP and on DVD. Editing of the interviews will only be done for inclusion in the 5 and 20 minute videos. To clarify, the unedited interviews will be available once the interviews arte completed, but only on the DVD format. The edited interviews will be only on the VHS format and will not be complete and available until the 5 and 20 minute videos are complete. A production master will be provided in addition to (eight) 8 VHS copies of the edited interviews.

Deliverable Items and Submissions:

HDC will submit eleven (11) to seventeen (17) ½" VHS format copies of the videotaped interviews, along with eleven (11) to seventeen (17) electronic copies of the interview transcripts to review parties per Table 1. The City shall involve other review parties to the extent that the other parties express an interest to be involved. NASA GRC shall consolidate all NASA review comments and submit them to HDC.

At the end of a 30 working day review period, HDC will have 60 days to address any comments. At the end of the 60 days, Hardlines will submit eight (8) to fourteen (14) VHS copies and an electronic file of the videotaped interviews in DVD format of the final videotaped interviews, four (4) to ten (10) final paper copies of the transcripts, and four (4) to ten (10) final electronic copies (MS Word format) of the transcript the for distribution to the following parties as specified in MOA Stipulation II.B.8:

- NASA GRC
- NASA HQ Office of History
- SHPO
- City of Cleveland
- Interested Attachment A Parties (0-6, current number unknown)

NASA GRC will also receive the original release forms signed by the interviewed persons.

The review parties shall have 30 working-days to give final approval for the interviews. If there are any final comments to be addressed after this review period, HDC will have 30 days to address comments and produce a final version of the product. All editing of interviews will be done on the transcribed interviews and editing of the original videotape will only be done with the permission of NASA and the interviewee. Original videotapes will become the property of NASA.

PEER REVIEWED HISTORY OF RETF

This section responds to MOA Section II.B.2.c, which requires a "peer reviewed history" of the RETF to be written, covering the contribution of the RETF to the development of human space flight.

Content of Peer-Reviewed History:

A 100-120-page history in MS Word format will be produced with approximately 250 words per page. The page count does not include the pages for photographs or figures. Thirty (30) photographs or figures will be selected to accompany the history. Photographs will be captioned. Since physical aspects of the RETF will be covered in the HAER study, the focus of the history will be on research programs carried out at the RETF and on the people who contributed to advancing knowledge of rocket fuels and combustion at the NASA Glenn Research Center. The history will assess the significance of the contribution of this research to the exploration of space. The manuscript will be based on original archival research using records in the National Archives and at NASA GRC, and the six oral interviews to be produced as part of this project. In order to produce this level of publication, the researchers will need to spend significant amounts of time reading and sorting documents in NASA's on-site files. The major sections of this work will conform to similar works in the NASA History Series, particularly *Engines and Innovation* by Virginia P. Dawson. This work will begin with an introduction that explains the purpose and scope of the study as well as its contents, describes the method of research and the parameters of study, and presents in an introductory manner the major themes considered in the project. The work will be organized chronologically, with allowance for topical treatment as necessary to explain fully the subject. All writing will be in accordance with acceptable scholarly, literary, and methodological standards as established by the NASA History Division and reflected in earlier NASA history publications and the guide, *Research in NASA History*. Reference notes in this narrative will appear in proper academic style as established in the above and in the most recent *Chicago Manual of Style*. A list of new or special terms and acronyms will be included in a glossary and explained when first appearing in the text. Statistical material will be organized in a readily understandable format. An index will be included after the manuscript reaches the page proof stage.

The resulting history manuscript will adhere to professional standards in history, and include footnotes and bibliographical essay. Eight (8) proof copies and one thousand (1,000) final copies of the final history will be published, and will consist of a soft cover publication with black and white illustrations. The 1,000 copies of the history will be professionally designed and printed in the format of previous NASA-sponsored history publications. The document will be written and researched by History Enterprises, Inc.

Deliverable Items and Submissions:

HDC will submit eleven (11) to seventeen (17) electronic copies of the draft history in MS Word to parties listed in Table 1 for a thirty (30) working-day review period. GRC shall consolidate all NASA review comments and submit them to HDC. For this product, this will consist of NASA's only review, a second NASA review period will not be needed.

At the end of the thirty (30) working-day review period, HDC will have sixty (60) days to address comments. At the end of the sixty (60) days, a four to six month production period will

begin for the 1006-1012 copies of the history. The final 1006-1012 copies will be submitted at the end of the four to six month publishing and production period.

HDC will submit the final written history for distribution to the following parties as specified in MOA Stipulation II.B.8 and Table 2:

- NASA GRC: 1000 paper copies; 1 electronic copy
- NASA HQ Office of History: 2 paper copies; 1 electronic copy
- SHPO: 2 paper copies; 1 electronic copy
- City of Cleveland 2 paper copies; 1 electronic copy
- Interested Attachment A Parties 0-6 paper & electronic copies (exact number currently unknown)

WEB PRESENTATION

This section of the Scope of Work responds to Section II.B.2.d of the MOA, which requires a web-based presentation on the RETF, its research programs, and contribution to human space flight, incorporating photographs, video clips, and written materials for display through the NASA website. This section also covers production of software development for an "Interactive RETF History Lesson" that has been requested by NASA GRC center as part of this package.

Content of Web Presentation:

- History Enterprises Inc. will consult in the development of the content.
- An introduction page consisting of photos, a brief historical summary, and links to other relevant pages and sites.
- A link to the peer reviewed history to be produced as part of this project (possibly PDF format).
- A brief video clip of an A-Stand test (assuming that historic film or video footage is available)
- A photo page consisting of approximately 20 historic photos of RETF
- A link to an interactive RETF History Lesson, also utilized for the Museum Display Kiosk. (The interactive history lesson will also be produced as part of this portion of the project).
- A total of approximately 5-10 web pages, including those listed above.
- Links to the 5 minute and 20 minute video presentations.
- The content of these additional undefined non-video pages is to be defined during web presentation development.
- HDC will coordinate with CSD (Computer Services Directorate) of NASA GRC for compatibility of format and placement into NASA GRC website.
- HDC will coordinate design and content of the RETF Interactive History Lesson with NASA review parties, and, if necessary, with Attachment A parties.

Deliverable Items and Submissions:

HDC will submit eleven (11) to seventeen (17) compact disks with a self-contained version of the website for distribution to review parties for a thirty (30) working-day review period, and eleven (11) to seventeen (17) compact disks of the interactive history lesson. The number of copies submitted will be based on participation from Attachment A parties. The City shall involve other review parties such as SHPO to the extent that the other parties express an interest to be involved. NASA GRC shall consolidate all NASA review comments and submit them to HDC.

At the end of a thirty (30) working-day review period, HDC will have sixty (60) days to address any comments. Once NASA has given final approval for the website, HDC will provide one (1)

compact disk containing the final website to NASA GRC. NASA GRC shall be responsible for installing the completed website onto their computer system. HDC will also provide one (1) compact disk of the interactive history lesson to NASA GRC for installation in the museum display.

Note: because of the extensive length of the peer-reviewed history, it is now expected that a complete draft of this document will not be submitted until one (1) year after the notice to proceed. Since the initial website layout may be developed before that date, a fifteen page "summary" of the research for the peer reviewed history may appear as a link on the website until the final version of the full 120-page document is available, which may not happen until well into until 2003. Since information from the peer reviewed history may be needed to develop the website and interactive history lesson, these products may not be developed until late 2002 or early 2003.

VIDEO PRESENTATIONS

This section of the Scope of Work responds to Section II.B.2.e of the MOA, which requires the production of two videotape programs about the RETF.

Content and Format:

HDC, working with the NASA GRC Imaging Technology Center (ITC) will produce one five minute and one 20 minute video program. The video will be shot on DVCAM format. Copies of the video submitted to NASA for review and as the final product (i.e. 100 copies) will be on ½" VHS tape. The VHS video presentations will be suitable for a video exhibit display, and will be professionally filmed and edited. However, the video will not be formatted to standards required for national broadcast on cable or network television. The video will contain:

- Excerpts from the videotaped interviews
- Clips of archived RETF test footage (if available)
- Additional NASA footage if available
- Videotape of current facility and surroundings
- Narration

HDC and ITC will provide a draft outline, script, and proposed video content in written format for NASA review and approval prior to the commencement of any video production work, other than interviews and shooting video footage at RETF itself. Due to the nature of the work, only minor editing and revisions will be accepted after receipt of draft comments. The video will include music, the creation of special graphics, and computer animated diagrams. Visual design of the video, script and concept development, creation and integration of graphics, narration, and music, and all editing and production will be provided by ITC.

The overall benchmark and model for this video in terms of format, visual appearance, and level of sophistication will be the Plumbrook Reactor Decommissioning Video available on the NASA GRC Plumbrook decommissioning website. The level of production of the video, and the sophistication and amount of sound effects, graphics and computer animation used in the RETF videos will be on par with the Plumbrook decommissioning video.

Voice-over narration in the 20 minute video will be intercut with interviews to tell the story. ITC will also videotape the 3-D scale model using a combination of macrophotographic and camera movement techniques. In addition, a two-person ITC video crew will spend a minimum of two days videotaping the existing condition of the rocket Engine Test Facility. Graphic illustrations and one or two animation sequences will be created (based on script requirements) to enable the audience to gain a better understanding of the facility design and operation. ITC will also conduct searches of NASA GRC's existing motion picture and photographic archives (test footage, hardware documentation, and facility overviews) for RETF imagery to compliment the voice-over narration. ITC will prepare and /or convert these images for use in the video presentation.

In addition, ITC will also conduct searches both within NASA GRC's archive and the archives of other NASA centers to find suitable footage that will illustrate the associated research programs conducted in the RETF and the contributions to the development of human space flight.

ITC will also retain the services of a professional narrator, record the voice-over, digitize the video footage, and perform a non-linear edit including music, sound effects, and digital video effects where appropriate (ITC will obtain all music and stock footage licenses). ITC will complete a rough-cut edit for review and comment. Requested changes will be made and a fine-cut edit will be completed.

A duplication master, production master, and edit master (Betacam SP) of the fine-cut version of the video will be provided by ITC. In addition, 100 VHS copies of the video will be duplicated by ITC. A DVD master will be created including both the 20-minute and 5-minute video and other associated footage.

ITC will also produce a video up to five minutes in length on the history of the Rocket Engine Test Facility. This video will have a faster pace suitable for viewing in a museum style exhibit. A voice-over narrative and limited interviews will tell the history of the Rocket Engine Test Facility. A combination of video footage of the RETF, and the scale model will be intercut with graphic illustrations, archival photographs, and actual test footage.

ITC will select some of the footage digitized for the 20-minute video, record the voice-over narration, and perform a non-linear edit including the use of music, sound effects, and digital video effects where appropriate (ITC will obtain music licenses). A rough-cut will be edited for review and comment. Requested changes will be made and a fine-cut edit will be completed.

A duplication master which will include both a "single play version" of the video and a "continuous loop version" (Betacam SP), protection master, and edit master of the fine-cut version of the video will be provided. In addition, 100 VHS copies of the video will be duplicated. A DVD Master will be created including both the 20-minute and 5-minute video and other footage.

Deliverable Items and Submissions:

HDC and ITC will submit electronic copies (MS Word format) of the draft outline and script for each video to be distributed per Table 1. During this review period, the City shall involve other review parties such as SHPO to the extent that the other parties express an interest to be involved. NASA GRC shall consolidate all NASA review comments and submit them to HDC.

At the end of the review period, HDC and ITC will address comments, and begin work on video production. At the end of the video production period, eleven (11) to seventeen (17) ½" VHS copies of the draft videos will be submitted for a 30 working-day review and approval period as described above. The number of videotapes submitted will depend on the participation of Attachment A parties in reviewing this part of the project.

At the end of a 30 working-day review period, HDC and ITC will address the comments and revisions made to the video during a 60-day period. All review comments must be in keeping with the approved script and outline.

Once revisions are complete, eleven (11) to seventeen (17) copies of the videos will be submitted on ½" VHS tape for distribution for a final 30 working-day review and acceptance period. As before, the number of tapes submitted will depend on Attachment A participation.

These review parties will have thirty (30) working days to give final approval of the videos. At this point, only minor editorial comments will be accepted. At the end of the thirty (30) working days, if no comments are received, production will begin on the final production copies of each video. If minor comments must be addressed, HDC will be allotted thirty (30) days to address these comments before production of the final copies begins. Hardlines will submit the final video presentations in ½" VHS format tapes for distribution to the following parties as specified in MOA Stipulation II.B.8:

- NASA GRC: 100 copies 20-minute video; 100 copies 5-minute video
- NASA HQ Office of History: 2 copies 20-minute video; 2 copies 5-minute video
- SHPO: 2 copies 20-minute video; 2 copies 5-minute video
- City of Cleveland: 2 copies 20-minute video; 2 copies 5-minute video
- Interested Attachment A Parties (currently unknown number, probably 0-6)

A total of 106-112 copies of each of the final videos will be submitted. As is the case with the museum display, extensive information from the peer-reviewed history will be needed to develop the videos. As a result, major production on the videos may not begin until late 2002, since an initial draft of the peer-reviewed history will not be submitted until one (1) year after the notice to proceed. It is anticipated, however, that any filming at the RETF itself will be completed in late 2001 or early 2002, well before the demolition of the structure.

RETF MODEL REHABILITATION

This section of the scope of work addresses section II.B.2.f of the MOA, which requires the rehabilitation of an existing 3-dimensional scale model of the RETF currently owned by NASA.

Cleaning and Renovation:

The RETF Model will be rehabilitated by professional conservators under the direction of Lucarelli Designs and Displays, Inc (Lucarelli). Lucarelli personnel will remove the model from its wall-mounted location and transfer it to the Lucarelli workshop for this rehabilitation work. The model will be cleaned, new labels roughly equivalent to the existing labels will be made and affixed to the model, and the model will be placed in a new case, and a new cast acrylic tamper-proof cover will be placed over the model. Loose or dislodged parts of the model will be re-glued into place. Only professional conservator type cleaning solutions will be used to remove accumulated dirt and debris. Only professional conservator / archival glues, papers, labels, case and cover or other materials will be used. No major alterations will be made to the model. The case and cover for the model will be manufactured by Lucarelli in coordination with this company's production of the RETF museum display.

Deliverable Items and Submissions:

NASA GRC shall coordinate site visits to view the model with any other necessary parties. Upon completion of the renovation, reviewing parties will have 30 working days to view the model. During this review period, the City shall involve other review parties such as SHPO to the extent that the other parties express an interest to be involved. NASA GRC shall consolidate all NASA review comments and submit them to HDC. HDC/Lucarelli will incorporate written comments within 60 days of receipt. HDC will arrange for Lucarelli to move the renovated model, with its new base and cover, to the NASA GRC Visitor Center or other NASA GRC designated area.

MUSEUM DISPLAY

This section of the scope of work responds to Section II.B.2.g of the MOA, which requires preparation of a museum quality display incorporating the five-minute video of RETF and an interactive computer program based RETF history lesson, the scale model, RETF Artifact(s), and display boards with history text and photos.

Size and Format:

HDC, in connection with Lucarelli Designs and Displays (Lucarelli), will design and construct a museum display for the RETF. This display will consist of the following items:

- Per the above scope item, the renovated RETF model fitted into a simple new 48" by 30" case with a new ¼" cast cell acrylic cover. A base will be made so that the model can be displayed on a floor mounted upright position as opposed to its current wall mounted state. The model will be freestanding, so that visitors can walk around to view it. The case will have a birch 3/4" plywood top, sides and bottom finished with high-pressure plastic laminate on all exposed surfaces. The new ¼" cast cell acrylic cover will include tamper proof hardware to fit on the top portion and secure the model. An identification card will be installed within the interior of the shroud.
- One (1) 30" by 30" case with a1/4" cast cell acrylic cover will contain and display relatively small RETF artifact(s). The case will have a birch 3/4" plywood top, sides and bottom finished with high-pressure plastic laminate on all exposed surfaces. The new ¼" cast cell acrylic cover will include tamper proof hardware to fit on the top portion and secure the model. Identification cards will be installed within the interior of the shroud to identify artifacts as necessary.
- RETF Control Room cabinets, panels and gadgets from Building 100 will be utilized in the creation of a Kiosk. This Kiosk will simulate a control room workstation to accommodate two seated persons. The kiosk will have a ¾" birch plywood top, with the side and front finished with high-pressure plastic laminate. The cabinet will have lockable door with concealed hinges to provide access to cabinet interior. The kiosk will contain two 17" TFT monitors within counter top, and one Pentium class PC with CD and DVD-ROM drives. A Happ control trackball and push buttons will be provided for video program operation. Existing RETF Building 100 Control Room salvage panels will be installed with controls to simulate control panels, and components will be wired and installed as needed. The base cabinets will have built-in knee space. There will be a horizontal desk surface, sloping slightly, similar to the existing control room cabinets. The existing control room cabinet panels and graphics (arrows, diagrams, text, pushbuttons, dials, gadgets) will be preserved, refurbished and incorporated into the display with new graphics as required. Panels will be selected based upon their visual interest. Indicator lights will be wired to create visual interest. The kiosk computer will be programmed to display the 5 minute and 20 minute videos, a link to the video record of the interviews, as well as an interactive computer based RETF history lesson. A link will also be provided for the RETF Web Presentation on the internet. The kiosk cabinet body will coordinate with the existing Building 100 cabinet, the model, and the model case.

- Six 48" by 96" back wall modules fabricated with framed panels covered with 14" Luan plywood over ¾" birch framing and finished with laminate on all exterior surfaces. A removable, lockable door will be provided for access into the rear of each module to access electrical and audiovisual components. Existing Building 100 control panels can be flush mounted into these panels and wired to illuminate. 3 21" monitors will be installed and display video from ½ " commercial VHS players. Headers, graphic panels, shelves, and lighting are also included. Color display boards will incorporate historic and current RETF photos, and text, including excerpts from peer-reviewed history text and interviews with individuals associated with RETF and its programs during the period of significance. These boards will consist of color graphics designed on desktop publishing software. Graphics will be printed on large sheets of Kodak vinyl matte-finish photographic paper. Graphics will be adhesive-mounted on "Panel-View" or equal aluminum panels, and covered with a clear coat protective covering.
- A small number of simple surface mounted lighting fixtures to illuminate model, artifact, and boards

Artifact display case and model case will be plain in design (e.g. flush surface, not paneled), with graphic text identifying items and providing directions to visitors. Emblems, logos, or other graphics for the project will be provided as necessary.

The museum display will be designed and built by Lucarelli Designs and Displays. HDC and Lucarelli will coordinate the design of the exhibit with NASA Glenn Research Center staff, and will work with History Enterprises Inc. to develop content for the Museum Display.

The RETF Museum Display will be designed to be relatively modular/flexible due to the uncertainty of its installation location. Although desired at the existing Glenn Visitor Center, the Visitor Center is a small and tightly packed space. To incorporate the RETF Display at the Visitor Center, one or two existing displays would need to be displaced. Another interim option is to locate the RETF Display along a concourse at Cleveland Hopkins International Airport. Another option is that the RETF Display would become a traveling exhibit, loaned to local museums. It is envisioned that the RETF Museum Display will ultimately be moved to either a new Glenn Visitor Center, or to the proposed Transportation Museum near the Great Lakes Science Center on the waterfront in downtown Cleveland.

Two preliminary design sketch options for the display have been generated by Lucarelli Designs and Displays, and are attached as addenda to this Scope of Work.

Deliverable Items and Submissions:

HDC will submit eleven (11) to seventeen (17) design sketches of the Museum Display, one (1) electronic copy of related text and scanned photographs to be included in the Museum Display, for distribution to per Table 1 for one thirty (30) working-day review period. During this review period, the City shall involve parties such as SHPO and Attachment A parties to the extent that the other parties express an interest to be involved. GRC shall consolidate all NASA review comments and submit them to HDC.

At the end of the thirty (30) working-day review period, HDC will have sixty (60) days to address comments. At the end of the sixty (60) days, HDC will submit eleven (11) to seventeen (17) final copies of the Museum Display design, one (1) electronic copy of included material to

review parties. If, after a second thirty (30) working day review period, the review agencies accept the Museum Display and have no additional comments, the production period will begin. Note: extensive information from the peer-reviewed history will be needed to develop the content of this display. Since the initial draft of the peer-reviewed history will be submitted approximately one (1) year after the notice to proceed, the museum display development stage may not take place until winter of 2002, or later.

The museum display will consist of :

- One (1) kiosk with control room workstation, with computer, monitor screens, speakers, cursor ball and buttons, in cabinets with panels and gadgets from Building 100 Control Room
- Kiosk multimedia computer program software ready to run the museum presentation/ interactive lesson (interactive lesson to be provided under "website" section of this scope)
- One (1) cabinet for the RETF model
- One (1) display case for RETF artifact(s)
- Six display units with text, photographs, and possibly salvaged panels from Building 100 control room.
- A small number of simple lighting fixtures for the display, as necessary.

SALVAGE & CURATION REPORT

This section of the scope of work responds to Section III.B and III.C of the MOA, which requires salvage and curation of equipment and artifacts related to the RETF.

Format and Scope:

HDC, the SHPO and NASA GRC representatives have made a preliminary examination of the RETF site and have identified items that will either be salvaged for NASA's research use, for display in Museum Display, or are historical artifacts to be offered for curation. This SOW assumes that only items currently in place at RETF or Building 100 will be analyzed in this report. These items will be identified and documented with digital photography. HDC will produce a 12-18 page salvage and curation report that will include a brief text describing and listing items for salvage, museum display or are historical artifacts to be offered for curation, and containing black and white copies of digital photographs of the items. This report will be modeled in general terms on Gray and Pape's document "Artifact Identification and Assessment, Plum Brook Reactor Facility, Sandusky, Ohio." The artifact list will be largely based on objects identified as significant during the August 16, 2001, site visit at RETF by personnel from NASA, HDC, SHPO, and the City. Based on results of this visit, it is anticipated that a limited number of large objects will be identified for salvage, and that a large number of smaller items such as phones, control panel components, and other objects will be identified and documented in the report. Within this report, HDC will also complete a section that will assist the City in developing a plan to remove and store the items that minimizes damage until disposition of the features is arranged. However, HDC will not be responsible for arranging for or executing removal and storage of the features. These efforts will be implemented and coordinated by the City, working with NASA and SHPO. The City will be responsible for the safe removal and storage of historical artifacts prior to final disposition/curation. The City will perform the removal of the salvage items to a designated storage space.

HDC will be responsible for coordinating with Lucarelli Designs and Displays to identify and reserve artifacts suitable for use in the RETF museum display. HDC and Lucarelli will have the primary responsibility for incorporating any artifacts into the Museum Display.

Linda Norberg of NASA GRC staff will complete the NASA property management process and will be responsible for offering remaining artifacts to NASA Centers and to the Smithsonian Institute. HDC will not be involved in this process.

If some artifacts are not used in the museum display or claimed by NASA or the Smithsonian, they will be excessed by NASA. HDC will then be responsible for contacting Ohio repositories to offer the remaining excessed artifacts. In this case, HDC will submit a single letter to SHPO to cover the 62 museums and repositories covered under the Ohio Historical Society. The items will also be offered to 4-6 other repositories in Ohio that are not affiliated with the Ohio Historical Society. The U.S. Air Force Museum at Wright-Patterson Air Force Base will be included in this list. Other possibilities include COSI and museums in the Cleveland metropolitan area. HDC will not be responsible for arranging for or providing transportation of artifacts to museums or repositories once the items have been claimed. Museums and repositories will be expected to claim the artifacts within 4-6 months after they are offered, to allow the City to avoid incurring costs for long-term storage of the items.

Deliverable Items and Submissions:

A meeting to identify potential artifacts was held on August 16, 2001, and was attended by personnel of HDC, the City of Cleveland, SHPO, NASA GRC, and the NASA Office of History. Notes and photographs from this meeting will be used to guide artifact selection and identification. Based on the meeting, it is anticipated that a large number of artifacts, especially small items, will be identified in the report.

HDC will submit eleven (11) to seventeen (17) electronic copies of the draft salvage and curation report to be distributed per Table 1 for a 30 working-day review period. During this review period, the City will involve other review parties such as SHPO to the extent that the other parties express an interest to be involved. NASA GRC shall consolidate all NASA review comments and submit them to HDC. It is expected that SHPO will closely and actively review this document.

Following a 30 working-day review period, a final salvage and curation report addressing reviewer comments will be produced by HDC after 30 days. Hardlines will submit four (4) to ten (10) electronic copies (MS Word format) of the final salvage and curation to the parties identified in Table 2 of this scope. If no further comments are received, this submission will serve as the final draft of the salvage report. If final comments are received, HDC will have 30 days to address these comments and submit four (4) to ten (10) electronic copies of the report to review parties.

SECTION 2
PROJECT SCHEDULE

RETF DOCUMENTATION SCHEDULE PROPOSAL

Due to the complexity of this project and the need to complete certain elements before others, the project will be phased over a period that is anticipated to slightly exceed two years.

Phase I (December 2001–May 2002) will consist of completing interviews, HAER Level I fieldwork, archival curation, the salvage report, and preliminary research on the peer reviewed history. Phase II (May 2002-December 2002) will consist of completion and review of the HAER Level I report and drawings and a submittal of the peer reviewed history. After completion of Phase II, information from the HAER documentation and the peer reviewed history can be used to develop content for the museum display, website, and videos in Phase III (January 2003-March 2004), and the peer reviewed history can be finalized and published.

Scope of Work Development
- Preliminary scope and schedule submitted July 5, 2001 to NASA and SHPO for review
- On-going discussion of scope and schedule between June 29 and October 31, 2001
- Revised scope of work and schedule submitted October 31, 2001
- Notice to proceed issued upon acceptance of final scope of work and budget (around December 14, 2001)

HAER Level I Documentation
- HAER Level I drawing layout sketches submitted January 14, 2002
- 50% Review of Draft Drawings by NPS around March 14, 2002
- HAER Level I report & drawings submitted June 14, 2002
- Comments Received July 26, 2002
- Deliver Final Drawings and Report August 26, 2002
- NPS Approval of HAER report by October 6, 2002

Interviews
- Tapes/Transcripts submitted June 14, 2002
- Deliver Final Product by October 6, 2002

Curation
- Curated materials available for reviewer inspection June 14, 2002

Salvage Report
- Salvage Report submitted February 14, 2002
- Final Salvage Report submitted April 28, 2002

Museum Exhibit Display/Model
- Detailed exhibit design submitted January 14, 2003
- Revised draft submitted April 23, 2003
- Display and model delivered October 4, 2003

Peer Reviewed History
- Submit document to NASA for review December 14, 2002
- Final draft submitted April 14, 2003
- 1000 copies submitted October 14, 2003

Website

- Submit website and Interactive Program January 14, 2003
- Final product completed April 23, 2003.

Videos

- All on-site filming at RETF to be completed by June 1, 2002
- Initial concept submitted January 5, 2003
- Revised concept submitted April 16, 2003
- Draft videos submitted September 5, 2003.
- Final videos submitted December 17, 2003
- 100 copies of videos delivered March 17, 2004

SCHEDULE ASSUMPTIONS:

- The above schedule assumes that the agencies reviewing draft products will respond within thirty (30) working days of receipt.
- The above schedule also assumes that all reviewers will provide comments in the spirit of the Scope of Work, without significant requests for additional information or substantial format revisions after approval of draft documents.
- Please note that additional cataloging of RETF-related files may push back all other deliverables except the salvage report.
- The project schedule may be delayed by inability to complete fieldwork due to severe weather conditions, specifically heavy lake effect snows, dangerously low temperatures and hazardous road conditions. HDC has the right to call off any field visit if unfavorable weather conditions may put the company's staff at risk to accidental injury.

SECTION 3
MUSEUM DISPLAY RENDERINGS

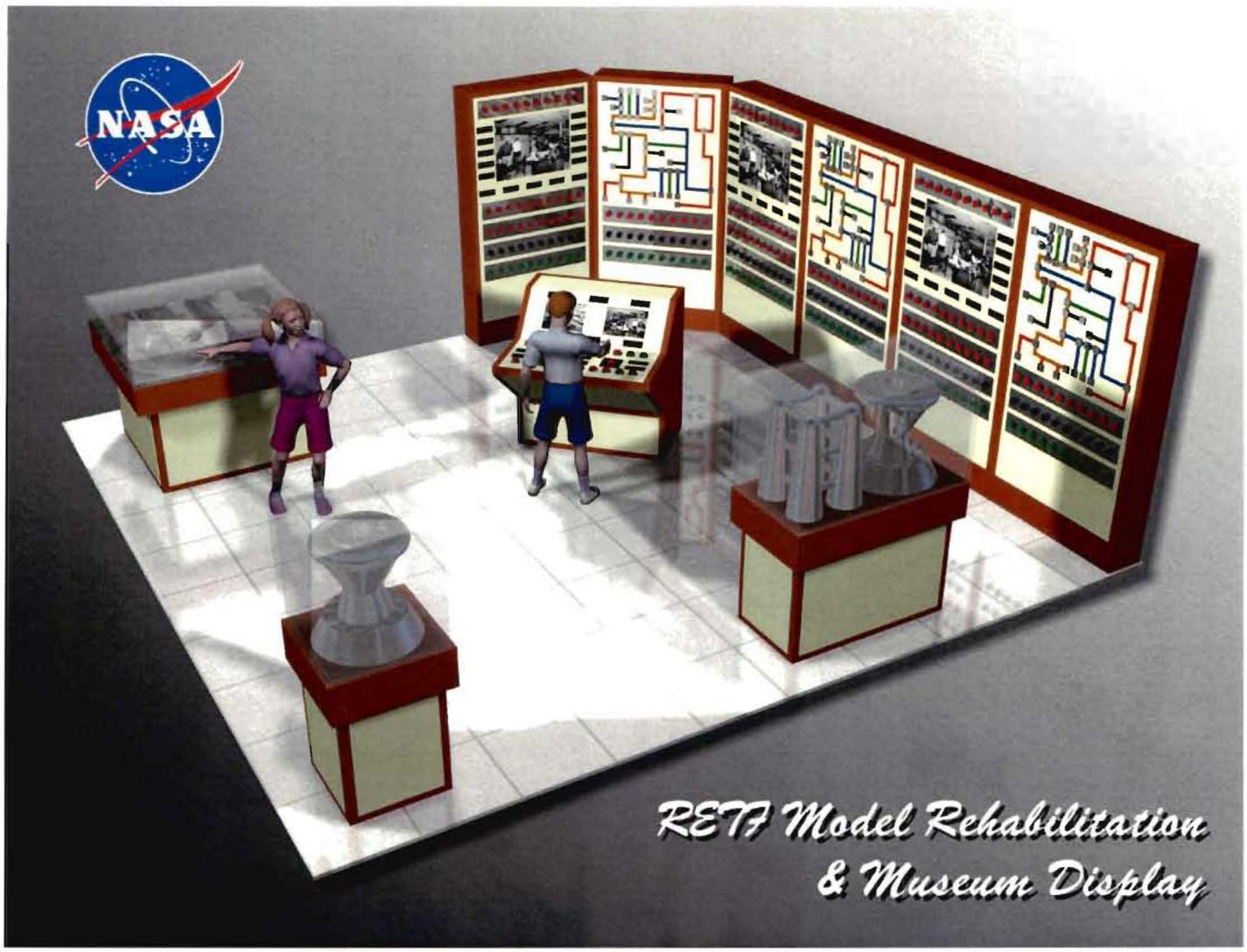

Figure 1: RETF Museum Display Option 1.

Figure 2: RETF Museum Display Option 2.

Progress Report for May and early June 2002. RETF Historic Mitigation
NASA Glenn Research Center
Cleveland Ohio
Hardlines Design Company
June 16, 2002

The following tasks have been completed or started:

HAER DOCUMENTATION:

HAER Large Format Photography

Mr. Roy Hampton and Mr. Jeff Bates traveled to NASA-GRC and completed HAER field photography for RETF according to National Park Service specifications for the project on May 21-22, 2002. Fifty-five large format photographs were taken of the facility, including elevation, perspective, context and interior views of Buildings 100, 202, 205, and 206B. Three shots were also taken of Building 206A. Additional detail shots were taken in Buildings 100 and 202. A significant number of detail and interior shots were taken at Building 202.

Mr. Bates has delivered the photographic prints and negatives to HDC. It is anticipated that 54 of the 55 frames will be suitable for use in the HAER report. Prints and negatives will be labeled and numbered as soon as HAER numbers for the project have been provided. A request was put in to Mr. Brian McCutchen of NPS for HAER numbers early in May 2002. HDC may wait until NASA GRC ITC has completed its large format photographic copywork before submitting the HAER field photos to NPS for review. A second trip to the RETF for additional field photography is not anticipated at this point.

HAER Drawings

HDC architectural staff traveled to GRC and toured the facility with NASA retiree George Repas to get a better understanding of how the facility functioned. HDC planner Stan Popovich pulled construction drawings needed to complete the HAER drawings of RETF, and copies were delivered to HDC. HDC architecture staff began work on the preliminary sketches for the HAER drawings. HDC sent out the sketches to NPS Midwest Region via Federal Express on June 14, 2002 for review. Some changes to the drawing layout specifications were proposed by Mr. Hampton to Brian McCutchen of the National Park Service, but a response has not yet been received from NPS.

HAER Report

Mr. Robert Stewart of Historical Technologies, Inc. made a research visit to NASA GRC from May 28-May 31. He joined in the tour of RETF with George Repas and HDC staff, and researched historic files, photographs, and other materials. It is anticipated that Mr. Stewart will begin work on compiling his research and writing the HAER report in the next month. Mr. Stewart stated that he may need to make a second research trip to GRC in the future, but this has not been scheduled at this point. Mr. Stewart plans to submit his write-up in the first week of October 2002 to HDC in preparation for the official November 15, 2002 submission date for the HAER report.

ARTIFACT/SALVAGE REPORT AND ASSESSMENT

Heather Reinbold and Roy Hampton of HDC made a field visit to NASA GRC on June 4 to complete field work for the artifact identification and assessment. Approximately 115 items were tagged as artifacts, ranging from signage to control panels, rocket nozzles, and the A-Stand in Building 202. HDC also took at least one digital photograph of each item tagged. Paper NASA artifact tags were attached to each item. RETF engineers Neal Wingenfeld and Doug Bewley assisted the HDC field crew in identifying items that were significant in RETF rocket research and the operation of the facility. Mr. Jon Erdmann of Parsons Engineering also assisted the HDC field crew with the assessment. HDC plans to submit the artifact assessment for a pre-review by NASA personnel, (possibly Mr. Wingenfeld and Mr. Bewley) to assure that the report accurately describes artifacts of a highly technical nature. This should make the report more useful to reviewers and agencies that may be interested in accepting some of the artifacts. HDC plans to submit the report for official review on the July 15 deadline.

OTHER TASKS

Funding to cover the significant increases in project scope are in the final stages of approval by the City of Cleveland. The remaining project tasks that have yet to begin include the website, video, records curation, peer-reviewed history, and museum display. Once the additional funding for this project is released, subcontractors in charge of these tasks will be brought under contract and work on some of these tasks will commence, based on the time intervals found in the master project schedule in the project Scope of Work. It is critical that the video offstage and any retiree interviews at the RETF be completed, since these activities must take place before the facility is demolished or before Building 100 is altered.

OVERALL PROGRESS

Overall progress on the project to date has been very good. A number of critical path tasks such as field photography and field work for the artifact salvage report have been completed. NASA personnel at GRC and members of the Airport PMT have been extremely helpful in assisting HDC in completing its tasks. Overall, this project is proceeding very smoothly.

UPCOMING REVIEW DATES

HDC will submit the artifact assessment around June 19-21 to NASA RETF retirees to add technical information on a number of artifacts that were highly technical in nature (this will not be an official review). The artifact assessment report will then be submitted to all appropriate parties for official review on July 15, 2002.

After the artifact report is submitted, the next major review date will be the "50% submission" of HAER drawings, which will take place on August 15, 2002.

Sincerely,

Roy A. Hampton III
Director of Historical Research Services
Hardlines Design Company

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NASA Glenn Research Center
Cleveland Ohio
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