S P E C I F I C A T I O N S

(ver 08-27-2025)

TABLE OF CONTENTS

SECTION D - PROJECT COORDINATION

SECTION E - PROTECTION OF THE SITE DURING CONSTRUCTION

SECTION F - TEMPORARY CONSTRUCTION FACILITIES

SECTION G - MEETINGS

SECTION H - SUBMISSIONS

END OF TABLE OF CONTENTS

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 010000

SUPPLEMENTARY CONDITIONS FOR CONSTRUCTION

SECTION A - PROJECT SUMMARY AND INFORMATION

1. PROJECT INFORMATION

1.1. Project No. **26604**
Miscellaneous Maintenance Projects at NZP-DC
Smithsonian's National Zoo & Conservation Biology Institute
3001 Connecticut Avenue, NW
Washington, D.C. 20008

1.2 Smithsonian Institution Contacts:

Contracting Officer (CO), address for Fed Ex and UPS delivery:
Smithsonian Institution
Office of Contracting
600 Maryland Avenue, SW, Suite 500E
Washington, DC 20024

Contracting Officer (CO), address for USPS delivery:
Smithsonian Institution
Office of Contracting
MRC 1200
P.O. Box 37012
Washington, DC 20013-7012

Contracting Officer's Technical Representative (COTR), address for Fed Ex and UPS delivery:
Smithsonian Institution
Attn: *COTR* OPDC
General Services Building
National Zoological Park
3001 Connecticut Avenue, NW
Washington, DC 20008

2. SUMMARY OF WORK

2.1. The Smithsonian Institution intends to award a firm fixed-price construction contract to the successful Offeror. The Offeror shall furnish supervision, labor, materials, and equipment needed to do the project work at the Smithsonian National Zoological Park 3001 Connecticut Avenue, NW Washington, DC 20008

2.2. The term "Contract Documents" shall be deemed to include all Contract Clauses, the terms and conditions of the Request for Proposal (RFP), and all drawings and specifications documents including, without limitation, the documents identified in Section 2.3.1. below. All work shall be performed in strict accordance with the Contract Documents as shown, or as may be changed by modification issued by the Contracting Officer. No deviations are permitted unless a change notice is issued and approved in advance by the Smithsonian Institution Contracting Officer.

2.3. Contract Documents includes, without limitation, the Drawings, Specifications and Basis of Design as referenced below:

2.31. Mechanical Drawings-Conservation Biology-1987

a. Drawings, dated 9/28/1987:
Sheets 1 through 10
Provided for reference only

When contractor has completed and checked his work, he or she will contact COTR for an inspection. Contractor shall clean up and dispose all debris associated with job. Contractor will be responsible for all labor, materials, and equipment to complete project.

This brief description, however, shall not, in any way, be construed to limit the Contractor's obligation for compliance with the contract specifications.

2.4. The work includes but is not limited to:

General Conditions

1. The contractor shall field verify all existing conditions, measurements, quantities, etc. for all work, during project walkthrough
2. Coordinate and phase all work to limit the impact to the building's operation.
3. Provide submittals for all new equipment and material being installed, to COTR for approval.
4. Submit project specific safety and logistics plans for all work, for Smithsonian review and approval.
5. Provide pricing for all options included in section 4.1 of this document.
6. Remove and dispose of existing materials related to the job. Recycle all product and provide report following SI waste tracking sheet
7. Clean the work area at the end of each workday.

8. Coordinate with building operations, as needed, for proper controls in order to perform (LOTO) Lockout/Tagout of energy sources that are in place prior to the start of work as needed.
9. Upon completion of the work, provide COTR O&M and as-built documentation for all new equipment installed.

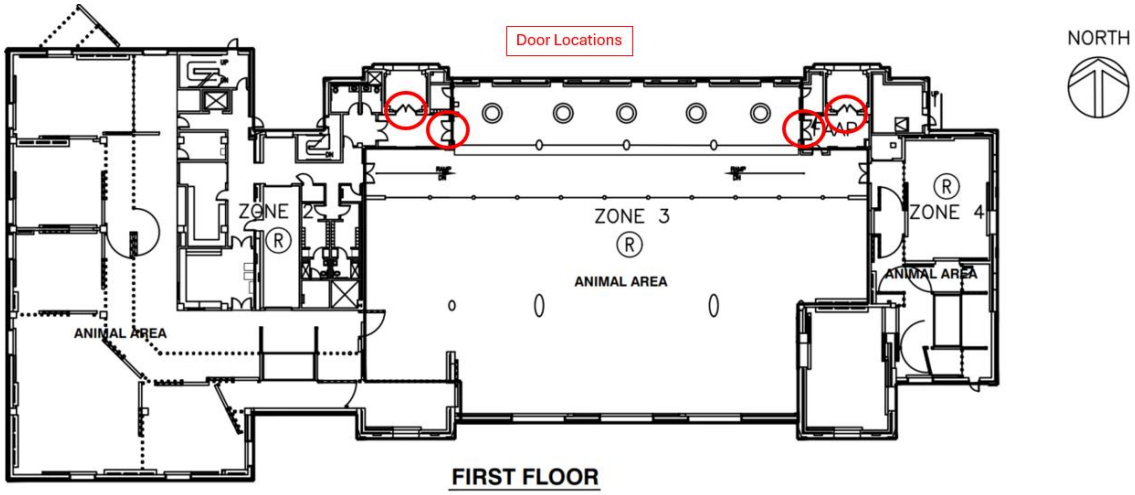
Repair ADA Functionality for Panda House Entrance Doors

1. Restore ADA functionality for the visitor entrance doors to the Panda House.
2. Furnish and install (1) M-Force Automatic Swing Door Operating System or equivalent with the following features:
    a. Surface mounted header case, sized for single door leaf application
    b. Heavy duty low energy ADA operator
    c. (2) wireless push plates per door
    d. (1) "on-off-hold open" three position toggle switch per door
    e. Dark Bronze Anodized Finish
3. Provide power and finalize the installation of the ADA operator pedestal located outside of the Panda House. See photo below.
4. Coordinate and phase all work to limit the impact to the building's operation.
5. Contractor shall be responsible for maintaining access and directing pedestrian traffic flow if work is being performed while the building is open to the public. Means of controlling pedestrian traffic shall be detailed in a project specific safety and logistics plan. Including, but not limited to; barriers, signage, work location, etc.

Replace Elephant House Door Operators and Restore Full Operability

1. Replace defective door hardware on the four (4) sets of double doors that access the Elephant Community Center (ECC).
2. Doors shall be repaired to restore ADA functionality, open and close with nominal resistance, and programmed to hold open in the event of a fire/life safety event.
3. Replacement door hardware shall be properly rated for use in high pedestrian traffic areas.

4. Existing hardware for the four (4) Elephant House Doors includes:
    a. Eight (8) Operator-IQ-M-Force
    b. Four (4) Kit-Controller-IQ-MF/MS Dual
    c. Four (4) BEA PBS451SQST900 Push PL Kit
    d. Four (4) BEA PBS451, 900 MHz wireless kit. Each kit includes:
        i. (2) 4.5 Square Push Plates and Mounting Box
        ii. (2) 900 Transmitters
        iii. (1) 900 Receiver
5. Ensure the sequence of operations for the (4) sets of doors is programmed to open and close automatically in conjunction with the existing Fire Alarm (smoke evac) system.
6. Contractor shall provide submittals for all new equipment for COTR/SI approval.
7. Coordinate and phase all work to limit the impact to the building's operation and guest experience.
8. Contractor shall be responsible for maintaining access and directing pedestrian traffic flow if work is being performed while the building is open to the public. Means of controlling pedestrian traffic shall be detailed in a project specific safety and logistics plan. Including, but not limited to; barriers, signage, work location, etc.



Replace Habitat Access Doors at Great Cat

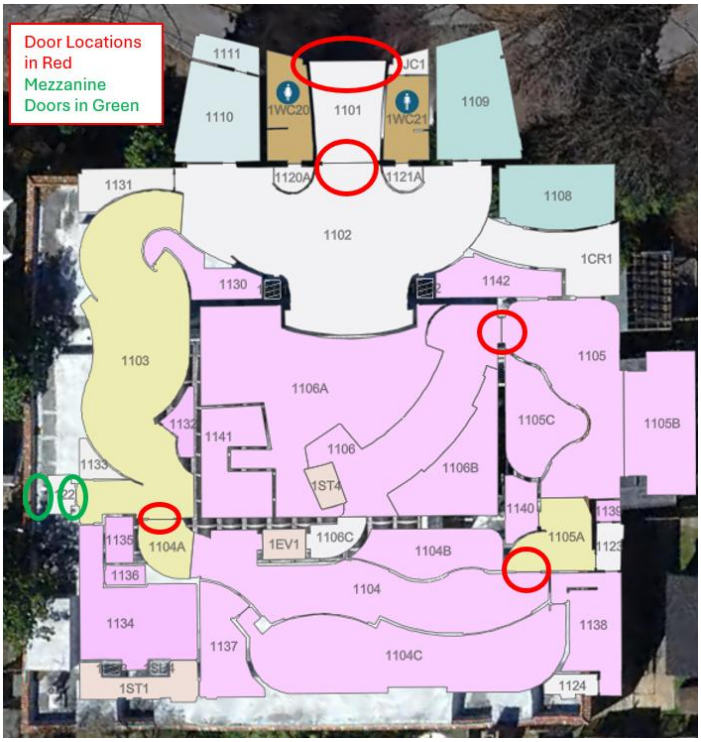
1. Coordinate scheduling with COTR and building operations. Only one yard (2 doors) can be worked on at a time. Animals will be rotated through yards in order to accommodate project work.
2. Replace (6) existing steel doors and frames.
3. Construct a temporary barrier/enclosure at each exposed doorway. Temporary enclosure shall be capable of preventing pests or precipitation from entering the facility overnight.
4. New doors shall be made of 1 ¾", 14-gauge stainless steel, at a minimum.
5. Each door shall include a 10" X 10" wire glass vision panel.

6. New door hardware shall be stainless steel and match the functionality of the existing doors.
7. Disconnect and reconnect existing warning signs wired to the existing doors.
8. Provide adjustment for new doors and hardware to ensure proper functionality.
9. New doors and frames shall be sealed from weather and pest intrusion on both the interior and exterior sides.

Bird House Door Repairs and Modifications

1. Replace failing hardware for the (7) doorways listed below.
2. New closer hardware shall be properly rated for high-traffic doors. Specifications for new hardware included below are intended to be for reference only.
3. Exterior Vestibule:
    a. Replace push buttons with jamb-mounted ‘wave to open’ actuators.
4. Interior Vestibule:
    a. Replace Norton inswing operator with (1) ED100 surface mounted inswing operator, with deep push arm. Dark bronze anodized finish. 4” X 6” cover.
    b. Replace push buttons with (1) single gang and (1) double gang touchless actuators.
5. Aviary 1:
    a. Replace Norton inswing operator with (1) ED100 surface mounted inswing operator. Dark bronze anodized finish. 4” X 6” cover.
    b. Replace push buttons with two (2) double gang touchless actuators.
6. Aviary 1 to Aviary 2
    a. Replace Norton inswing operator with (1) ED100 surface mounted inswing operator. Dark bronze anodized finish. 4” X 6” cover.
    b. Replace push buttons with two (2) double gang touchless actuators.
7. Aviary 2 to Aviary 3
    a. Replace Norton inswing operator with (1) ED250 surface mounted, fine cover, pair operator.
    b. Replace push buttons with (2) MS31 double gang touchless actuators.
8. Mezzanine 1
    a. Replace Norton inswing operator (1) ED250 surface mounted, 4” X 6” dark bronze operator
    b. Replace push buttons with (1) MS31 double gang touchless actuator
9. Mezzanine 2
    a. Replace Norton inswing operator (1) ED250 surface mounted, 4” X 6” dark bronze operator
    b. Replace push buttons with (1) MS31 single gang touchless actuator
10. Utilize existing conduits/pathways and penetrations whenever possible. All new wiring shall be installed in electrical metal tubing (EMT)
11. Contractor shall be responsible for protecting adjacent finishes. Any finishes or fixtures damaged by the project work shall be repaired by the contractor.
12. Contractor shall be responsible for maintaining access and directing pedestrian traffic flow if work is being performed while the building is open to the public. Means of controlling pedestrian traffic shall be detailed in a project specific

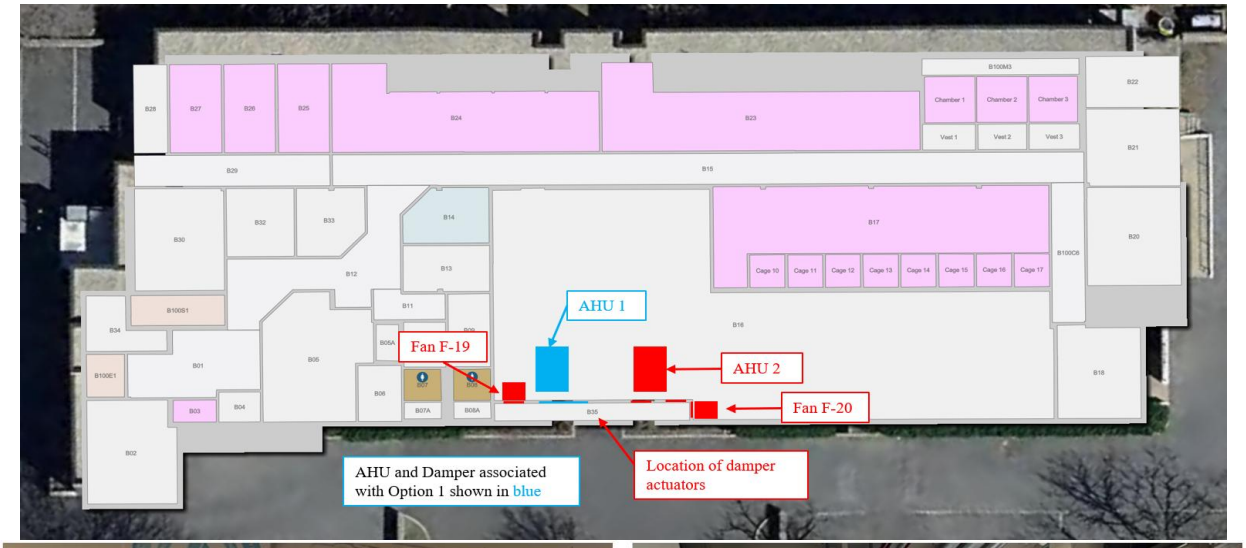
safety and logistics plan. Including, but not limited to; barriers, signage, work location, etc.



Replace AHU2 at Conservation Biology Building

1. Disconnect energy sources and ducts from AHU#2.
2. Demo existing AHU#2 and associated obsolete or defective equipment and piping.
3. All existing piping or ductwork connections that are not being reused shall be cut, capped and made safe.
4. Existing air handler is a York International CS217 SHLP
5. Inspect the existing concrete pad's condition and footprint and make modifications or repairs as needed to accommodate the new AHU.
6. Demo two (2) existing 36" x 36" ventilation fans and associated pneumatic controls, noted as fans F-19 and F-20 on the drawings included at the end of this document.
7. Demo four (4) existing pneumatic damper actuators located in room B35.
8. Install new AHU on existing concrete pad. Replacement unit shall meet requirements of the existing system design. Contractor shall verify system requirements during pre-project walkthrough.
9. Casing construction of the new AHU shall not rely on casing panels for structural integrity. Casing panels shall be 2" double-wall construction with thermal break.
10. Casing for the new unit shall have a minimum thermal resistance (R-value) of 16 hr-ft2-°F/BTU. Exposed insulation is not acceptable.

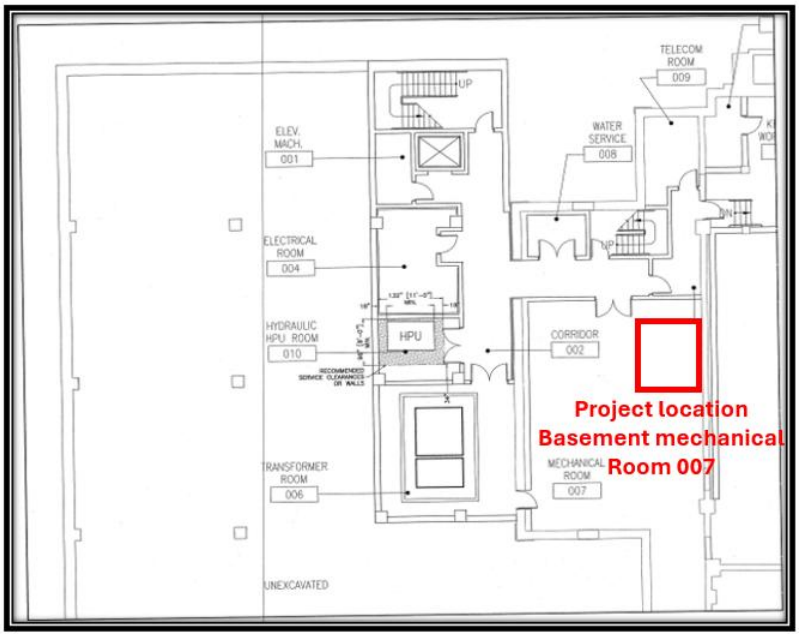
11. Panel assembly shall meet UL standard 1995 for fire safety. Panel insulation shall comply with the requirements of NFPA 90A.
12. Casing panel insulation shall be injected with polyurethane foam. Foam insulation shall be manufactured by EcoMate® or approved equivalent. Rigid foam board panels shall not be used.
13. All exterior and interior casing panels (roof, wall, floor, access door) shall be made of G90 galvanized steel.
14. Insulation system provided shall be resistant to mold growth in accordance with a standardized test method such as UL 181 or ASTM C 1338.
15. Installation shall include replacing isolation valves and associated piping, like in-kind.
16. Reuse existing DDC controls where possible. Any new control points shall be programmed to be controlled by the existing BAS.
17. New AHU shall be equipped with a direct drive motor and UV lighting.
18. New AHU shall be equipped with an externally mounted Variable Frequency Drive (VFD) rated direct drive motor that is internally grounded with a grounding ring and is controlled by the Building Automation System (BAS)
19. Replace two (2) ventilation fans and associated controls, tie new controls into the existing BAS.
20. Replace four (4) existing damper actuators in room B35 with new DDC actuators. New actuators shall be programmed to be controlled by the BAS.
21. Connect new air handler to energy sources and ducts
22. Contractor shall modify or replace the existing ductwork and piping, as needed, to accommodate the AHU replacement.
23. Any existing insulation that is disturbed by the new work shall be replaced like in-kind, including labeling.
24. Utilize existing conduits/pathways and penetrations whenever possible. All new wiring shall be installed in electrical metal tubing (EMT)
25. Install firestop at any penetrations through fire rated assemblies that are created during the new work.
26. Perform testing and balancing (TAB) on new AHU after installation is complete and provide report to COTR.


AHU 1
Fan F-19
AHU 2
Fan F-20
AHU and Damper associated with Option 1 shown in blue
Location of damper actuators


ROTATION
YORK
INTERNATIONAL
ORDER NO.
MODEL NO.
CS217SHLP

Replace Radiant Floor Heat Pump at Elephant House

1. Remove and dispose of WSHP-3 heat pump.
2. Replace the existing water-cooled heat pump system with a new like-in-kind system with copper coils. The replacement shall match the existing system's capacity, configuration, and performance.
3. Provide and replace the following equipment.
    a) (4) 0-240 thermometer with industrial glass thermometer
    b) (4) 0-100 pressure gauges with isolation valve
    c) (4) 2.5 isolation valves
    d) (2) Siemens control valve
    e) (2) 4" balancing valve
    f) (1) 2.5 strainer
    g) (2) 2" balancing valves
    h) (2) 2" isolation valves
    i) (4) flanges adaption copper to black pipe with dielectric adapters.
    j) Insulate all piping and components to match existing.
    k) Install new labels for description and directional flow to match existing.
4. Coordinate with the Building Automation System (BAS) vendor for integration, programming, and graphics.
5. Provide pricing to rebuild or replace an additional pump. Reference options 2 and 3 in section 4.1 of this document for further information.

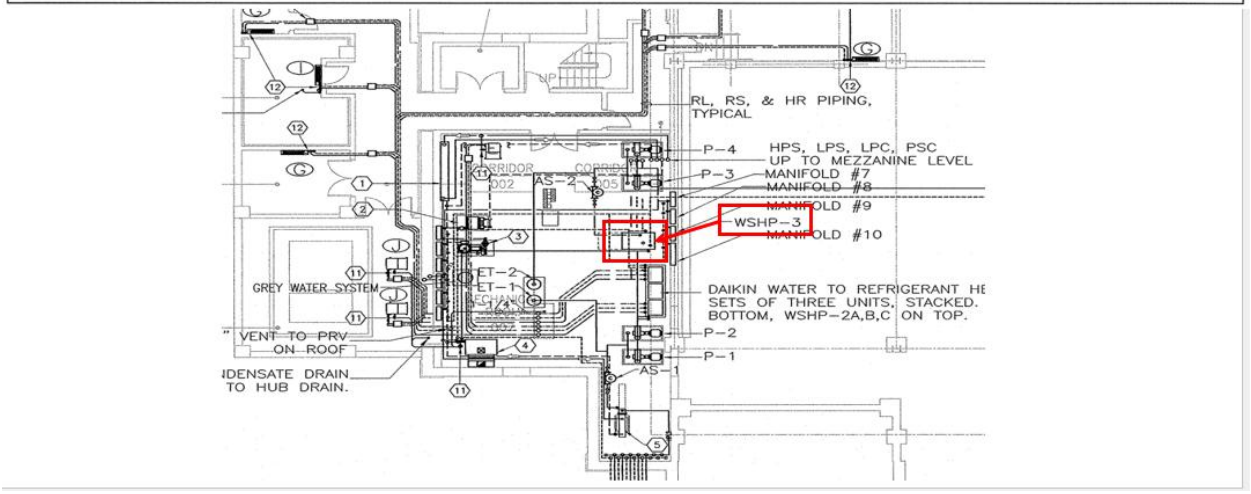


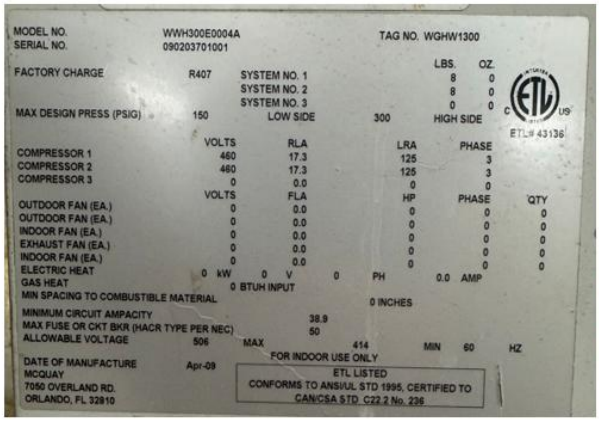
Original design for reference

HEATING ONLY - WATER TO WATER WATER SOURCE HEAT PUMP UNIT SCHEDULE

UNIT TAG	NOM TONS	SOURCE SIDE					LOAD SIDE					COMPRESSOR				ELECTRICAL SERVICE					WATER CONNECTION SIZE, LOAD & SOURCE SUP & RET	UNIT WEIGHT POUNDS	BASIS OF DESIGN
		GPM	P.D. FT-HD	HEATING OPERATION EWT °F	LWT °F	HEAT OF ABSORPTION MBH	GPM	P.D. FT-HD	HEATING OPERATION EWT °F	LWT °F	CAPACITY MBH	QUANTITY	CONTROL RANGE	RLA EACH	REF.	VOLTS	PHASE	MCA	MOCP	INPUT-KW HEATING			
WSHP-3	25	50	17	85.0	74.4	263.8	60	23.8	110.0	121.2	336.8	2	0,50%, 100%	19.2	R-407C	460	3	43.2	60 A	21.39	2"	1,230#	McQUAY MODEL W-GHW-300

NOTES:
1. EQUIPMENT OPERATION SOURCE RATED WATER TEMPERATURE RANGE FOR HEATING: 30 °F – 90 °F
2. PROVIDE WITH CONTROLS TRANSFORMER
3. ALL FLUIDS ARE CLEAN WATER (NO GLYCOL).
4. THE SCHEDULED LOAD SIDE LWT TEMPERATURE AND ASSOCIATED VALUES ARE THE MANUFACTURERS PERFORMANCE DATA. THE ACTUAL LOAD SIDE LWT SET POINT IS 120 °F.
5. EFFICIENCY AT SCHEDULED CONDITIONS: COP = 4.61.






Copper coils
0-100 PSI gauge
Convert to Industrial glass thermometer
FNW
Balancing valve
WSHP RETURN
Strainer
WSHP SUPPLY
Dielectric connecter
Isolation valve
Temperature probe
2" isolation valve
2" Balancing valve
2" Balancing valve

When contractor has completed and checked his work, he or she will contact COTR for an inspection. Contractor shall clean up and dispose all debris associated with job. Contractor will be responsible for all labor, materials, and equipment to complete project.

This brief description, however, shall not, in any way, be construed to limit the Contractor's obligation for compliance with the contract specifications

2.5. Critical Elements of the Work: The successful Contractor shall be fully qualified to install critical elements of the Work. Upon request of the Contracting Officer, bidders shall submit a statement of qualifications to address the following critical elements of the Work:

a. General Contractor and Subcontractor's supervisor shall have a minimum of five (5) years' experience with the materials and processes being installed.

b. Experience with coordinating complex projects within an operating campus.

c. Corporate climate that has a full commitment to the project's Safety Program.

d. Quality Control program that ensures all of the project's exceptions are delivered within contract's conformance requirements. This program should include the contractor's ability to field review documents, implement testing procedures and ensure that the contract standards are fully adhered to.

3. CONTRACT TIME FOR COMPLETION

3.1 Work under this contract shall begin by the Contractor within ten (10) work days after the Notice to Proceed and shall be completed within the total contract time of 180 calendar days. All work, including inspections, testing, correction of deficiencies, and project close-out activities, shall be completed in every respect within the contract time.

3.2 The start date and completion date shall be as stated in the Notice to Proceed issued by the Contracting Officer.

4. SCHEDULE OF OPTIONS FOR BID

4.1. The following is a brief statement of the Work identified for bid options. The complete description of the Work is identified elsewhere in the drawings and specifications.

OPTION 1:

Replacement of AHU #1 and associated pneumatic unit controls with DDC.

1. Demo AHU #1 and associated pneumatic controls
2. Demo pneumatic damper actuator for the 61” x 118” damper associated with AHU #1, located in room B35.
3. Inspect the existing concrete pad’s condition and footprint and make modifications or repairs as needed to accommodate the new AHU.
4. Existing AHU #1 is a York International CS336 SHLP
5. All existing piping or ductwork connections that are not being reused shall be cut, capped and made safe.
6. Install new AHU on existing concrete pad. Replacement unit shall meet requirements of the existing system design. Contractor shall verify system requirements during pre-project site walk.
7. Casing construction of the new AHU shall not rely on casing panels for structural integrity. Casing panels shall be 2” double-wall construction with thermal break.
8. Casing for the new unit shall have a minimum thermal resistance (R-value) of 16 hr-ft2-°F/BTU. Exposed insulation is not acceptable.
9. Panel assembly shall meet UL standard 1995 for fire safety. Panel insulation shall comply with the requirements of NFPA 90A.
10. Casing panel insulation shall be injected with polyurethane foam. Foam insulation shall be manufactured by EcoMate® or approved equivalent. Rigid foam board panels shall not be used.
11. All exterior and interior casing panels (roof, wall, floor, access door) shall be made of G90 galvanized steel.
12. Insulation system provided shall be resistant to mold growth in accordance with a standardized test method such as UL 181 or ASTM C 1338.
13. Encapsulate insulation with sheet metal so that air does not contact insulation. Solid lined double-walled panels insulated with injected foam shall be hermetically sealed at each corner and around their entire perimeter to eliminate airflow through the panel and to eliminate microbial growth potential within the casing wall.
14. Unit shall conform to ASHRAE Standard 111 Class 6 for casing leakage no more than 1% of design airflow at 1.25 times design static pressure up to a maximum of +8 inches w.g. in positive pressure sections and -8 inches w.g. in negative pressure sections down to a minimum of 50 CFM measurable leakage or 5,000
15. design CFM.
16. Provide wall panels and access doors that deflect no more than L/240 when subjected to 1.5 times design static pressure up to a maximum of +8 inches w.g. in positive pressure sections and -8 inches w.g. In negative pressure sections. ‘L’ is the panel-span length, and ‘L/240’ is the deflection at the panel midpoint.

17. Provide floors and roofs that deflect no more than L/240 when subjected to a 300 lb static load at mid-span. 'L' is the panel-span length, and 'L/240' is the deflection at panel midpoint.
18. Contractor shall submit an external condensation performance line provided by the AHU manufacturer, plotted on the psychrometric chart, based on actual test data. Plot shall show the exterior conditions at which unit will sweat given the design supply air temperature. Manufacturer shall clearly indicate whether the design conditions will or will not result in external condensation forming anywhere on the unit exterior. If the unit sweats, indicate where sweating will occur. Unit exterior includes the base, base rail, roof, corners, doors, door frames, and under the cooling coil drain pan.
19. Existing isolation valves and associated piping shall be replaced like in-kind.
20. New air handler shall be equipped with an externally mounted Variable Frequency Drive (VFD) rated direct drive motor that is internally grounded with a grounding ring and is controlled by the Building Automation System (BAS)
21. All existing pneumatic control points associated with AHU #1, including the damper actuator located in room B35, shall be replaced with DDC and programmed to the building's existing BAS.
22. Contractor shall confirm capacity of existing Siemens panel located in Mechanical room B16
23. Connect new air handler to energy sources and ducts
24. Contractor shall modify or replace the existing ductwork and piping, as needed, to accommodate the AHU replacement.
25. Any existing insulation that is disturbed by the new work shall be replaced like in-kind, including labeling.
26. Utilize existing conduits/pathways and penetrations whenever possible. All new wiring shall be installed in electrical metal tubing (EMT)
27. Install firestop at any penetrations through fire rated assemblies that are created during the new work.
28. Perform testing and balancing (TAB) on new AHU after installation is complete and provide report to COTR.
29. Upon completion of the work, provide COTR O&M and as-built documentation for all new equipment installed.

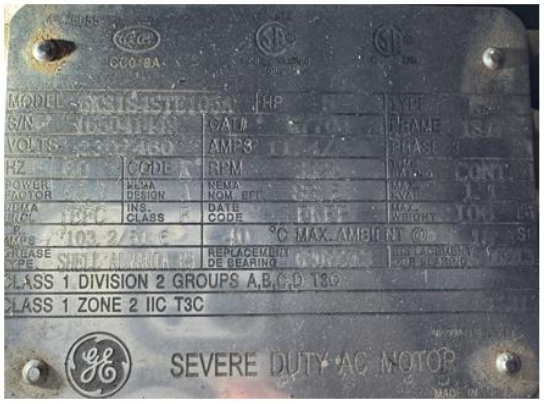
OPTION 2:
Rebuild Radiant Floor Pump #3

1. Remove and transport existing pump to contractor's repair shop and perform a complete rebuild of the pump and motor assembly.
2. Deliver back to elephant house, reinstall, test and confirm pump works as designed.
3. Provide and install (2) 0-240 thermometer with industrial glass thermometer and (4) 0-100 pressure gauges with isolation valves.

OPTION 3:
Replace Radiant Floor Pump #3

1. Replace existing pump and motor assembly. Replacement shall be made like in-kind and match specifications of the existing equipment
2. Test and confirm operability of new pump after the installation is complete.
3. Provide and install (2) 0-240 thermometers with industrial glass thermometer and (4) 0-100 pressure gauges with isolation valve.

Pump #3 photo and data plates



5. SCHEDULE OF UNIT PRICES – NOT USED

6. BIDDER/OFFEROR EXAMINATION OF SITE

6.1. Every effort was made to indicate all work necessary to complete the project as identified. All bidders must carefully examine the premises during the bid period and satisfy themselves as to the extent, nature and location of the work, general and local conditions, particularly those bearing on transportation, disposal, handling and storage of materials, availability of labor, water, electric power, access routes, uncertainties of the weather, type of equipment and facilities needed for the successful execution of the Work.

6.2. Pre-Bid Conference and Site Visit. Before the bid opening date, the COTR will announce a scheduled pre-bid conference and site visit. The purpose of the scheduled meeting is to provide an opportunity for all bidders to review the project site. Any comments, information or discussion during the site visit shall not modify the contract documents. All questions must be submitted in the form of an RFI to the designated representatives on the RFP.

6.3 This project requires special arrangements for access to a non-public area. Access to the site may be restricted at times other than during the scheduled site visit. Coordinate all access with COTR.

7. AVAILABILITY OF DOCUMENTS

7.1. The bidders will be provided electronic versions of drawings and specifications from:

Smithsonian Institution
Office of Planning, Design, and Construction
600 Maryland Avenue, SW., Suite 5001
Washington, DC 20024

7.2. The bidder is responsible for making their own hard copies of the solicitation documents.

SECTION B - SPECIAL PROJECT REQUIREMENTS

8. UNITS OF MEASURE

8.1. All fabrication and installation shall be performed in accordance with the units of measure given in the Contract Documents. Units of measure on this project are Imperial Units.

9. NON-PUBLIC, TENANT AND SECURED SPACES

9.1. Certain tenant spaces, non-public spaces, utility and equipment rooms and other areas related to or used for purposes of storage, conservation, research, curation of SNZCBI collection and artifacts or for scientific research may have restricted access.

9.2. The Contractor shall identify to the COTR as soon as possible, but no less than two (2) workings days in advance, any occupied areas that the Contractor must access that are located outside the limits of the project site. The Contractor shall identify in writing:

9.2.1. Restricted areas to be accessed.

9.2.2. Specific reason for needing access.

9.2.3. Nature of the work to be performed.

9.2.4. Date(s) and hours needed to complete construction work activity.

10. SNZCBI ARTIFACTS AND SCIENTIFIC RESEARCH MATERIALS (NOT USED)

11. PROTECTION OF HISTORIC PROPERTIES

11.1. The project site is located in a designated National Historic Landmark property and requires special attention to the quality of materials selected for installation and workmanship efforts to satisfactorily preserve and restore historic elements and finishes of an historic landmark structure.

11.2. Upon request of the COTR, the Contractor shall submit evidence of technical competence in restoration work for National Historic Landmark structures, including subcontractor resumes, references and photographs or previous similar work.

11.3. Without exception, all original building fabric of the National Zoological Park is designated historic. All work that impacts the building’s fabric share be pre-approved by the COTR prior to the commencement any work.

12. COMMITMENT TO SUSTAINABILITY

This is not a LEED project however Construction Waste Management and Disposal in Section 29 will apply.

12.1. The Smithsonian Institution is a trust instrumentality of the United States (recognized as a tax-exempt organization under Section 501(c)(3) of the Internal Revenue Code) and although not an Executive Branch of the U.S. Government, is committed to planning, designing, constructing, maintaining and operating its owned and leased buildings and facilities consistent with Federal environmental and energy management requirements, as listed in the Smithsonian SF Codes, Standards and Guidelines document, dated February 15, 2012, to the maximum extent practical.

13. COMMISSIONING

13.1. The Smithsonian requires Fundamental Commissioning (as defined by the LEED NC and CI rating systems) of all eligible design and construction projects, even if the project is not eligible to pursue LEED certification.

The Contractor shall coordinate work of different trades, as necessary, with the activities of and the requirements issued by the Smithsonian's Contracted Commissioning Provider, including:

13.1.1. The Commissioning Plan, a resource to identify the strategies, aspects, and responsibilities within the commissioning process for each phase of the project, outlining the overall project schedule, organization, responsibilities, and documentation requirements of the design process. Refer to specific trade commissioning requirements that may be located in other sections of the technical specifications.

13.1.2. The Owner's Project Requirements (OPR), the functional requirements of a project and expectations of the building's use and operation as they relate to systems to be commissioned. The OPR addresses the owner use and requirements, environmental and sustainability goals, energy efficiency goals, indoor environmental quality requirements, equipment, and system expectations, building occupant and operations and maintenance personnel requirements.

13.1.3. Basis of Design (BOD), which includes a narrative description of the design of any systems to be commissioned and any design assumptions.

SECTION C - CONTRACTOR USE OF PREMISES

14. HOURS OF WORK, WORKDAYS AND GOVERNMENT HOLIDAYS

14.1. Work shall be performed, under this contract, during the normal workdays of Monday through Friday, except Smithsonian holidays and special events as specified herein and the normal work hours of <TBD at Pre-construction Meeting>. The SNZCBI opens to the public at 8:00 a.m. daily, and use of public trails, roads, walks, etc. are limited during public hours and during special events. Coordinate with COTR.

14.2. The premises will be continually occupied, requiring that certain work under this contract may need to be performed during periods other than that specified above. All shutdowns and outages must be approved by and coordinated with the COTR and occur between the hours of 10:00 p.m. to 5:00 a.m., unless otherwise approved.

14.3. For each occasion, the Contractor intends to work on Saturdays, Sundays, or Smithsonian holidays or during hours other than those indicated above, the Contractor shall obtain written permission from the COTR, at least three (3) working days in advance.

14.4. Smithsonian Holidays: For holidays that fall on Saturday, the Smithsonian holiday is observed on the previous Friday. For holidays that fall on Sunday, the Smithsonian holiday is observed on the following Monday. The Smithsonian Holidays are listed below. Also see the National Zoological Park website for a listing of special events.

New Year's Day	January 1
Martin Luther King Jr.'s Birthday	January, third Monday
George Washington's Birthday	February, third Monday
Memorial Day	May, last Monday
Juneteenth	June 19
Independence Day	July 4
Labor Day	September, first Monday
Columbus Day	October, second Monday
Veterans' Day	November 11
Thanksgiving Day	November, fourth Thursday
Christmas Day	December 25
President's Inauguration Day	January 20, xxxx

15. CONDITIONS AFFECTING CONTRACTOR'S WORK

15.1. Existing Occupied Spaces: The premises will be occupied by animals and staff during the performance of the Work. The Contractor shall schedule work activities to minimize interruption of occupants and occupied spaces. Efforts will be made to temporarily move employees and contents out of specific areas under construction, as needed, during the times requested by the Contractor. However, the needs of the Smithsonian Institution take precedence and free access for the Contractor cannot always be guaranteed. The Contractor may work in animal areas only in the presence of authorized Smithsonian staff or guard personnel. Areas that will remain occupied includes the grounds of the SNZCBI.

15.1.1 Contractor to develop a work plan that incorporates all elements of paragraph 2.3.

15.1.2 Exhibit closures and shifting of animals between exhibits and holding spaces are to be coordinated with COTR and Animal Care staff with a minimum of 14 days of notice.

15.1.3 Area must be free from any debris, tools, equipment, etc. and animal containment must be in place prior to animals being shifted to that area.

15.1.4 Contractor to confirm prior access daily in primary and secondary containment area unless the area has been fully turned over to the contractor.

15.2. Relocation of Existing Occupants: N/A

15.3. Space for Contractor Use: The space available for Contractor's use shall be coordinated with COTR at the project site. Space allocation and availability are subject to change, at the discretion of the Smithsonian, to meet the needs of all parties requiring access and space within the building, work area, and the surrounding areas.

16. CONTRACTOR CONDUCT, DELIVERIES, HAULING AND ACCESS

16.1. Normal deliveries shall be made between the hours of 6:00 AM and 09:00 AM. The Contractor's materials and equipment shall be delivered, received, receipted for, and handled by the Contractor's personnel.

16.2. Access to the site for on- and off-loading of all material, structures and equipment shall be designated by the COTR .

16.3 SI’s loading docks and delivery areas require special access requests and coordination for contractors use. SI will not accept contractor’s deliveries at the loading dock.

16.4 Comply with **SNZCBI's Motor Vehicle Operations on Walkways**, responsibilities, and procedures for operating motor vehicles on walkways of the National Zoological Park (SNZCBI) in Rock Creek.

16.4.1 **Definitions:**

Walkways. Interior paths on SNZCBI grounds at Rock Creek intended for pedestrian visitors and staff, such as Olmsted Walk, Asia Trail, and American Trial.

Motor vehicle. Any motorized, gas or electric apparatus used to transport personnel or supplies, with the exception of individual motorized electric wheelchairs, or what are commonly known as Electric Control Vehicles (ECVs) and Police Segways.

16.4.2 **Policy**

Any motor vehicles on the grounds shall be operated at a speed considered safe for movement among pedestrians. The posted speed on Zoo public roadways is 25 miles per hour from Connecticut Avenue to the Crossroads, 15 miles per hour from the Crossroads to Adams Mill gate and 10 miles per hour from Adams Mill gate to the Veterinary hospital. Speed limits may be reduced during construction and special events. Caution is required as pedestrians must cross public roadways when walking from parking lots to the Zoo exhibits.

i. Walkways are for the main purposes of providing safe movement of pedestrians throughout the Park's exhibit areas. Vehicular traffic on walkways is restricted to an absolute minimum needed to accomplish the SNZCBI mission. Contractor vehicles whose business requires that they drive on walkways shall proceed with **extreme** caution. Individuals operating vehicles on walkways must remain constantly vigilant and be prepared to react quickly, if necessary.

ii. On walkways, vehicles shall be operated at a safe speed appropriate to the circumstances, never exceeding the equivalent of 5 miles per hour after 09:00 a.m. Prior to 09:00 a.m., vehicles below 26,000 lbs. gross vehicle weight rating (GVWR), may reach a maximum of 10 miles per hour. If installed, the vehicle's headlights and emergency flashers shall be on at all times.

iii. Motor vehicles are prohibited on all zoo walkways between the hours of 09:00 a.m. and 6:00 p.m. year-round, with limited exception (see part 5 below). During the restricted hours between 09:00 a.m. and 6:00 p.m., a police escort shall be requested by contacting the police supervisor on duty at 633-4111. If SNZCBI Police cannot escort the vehicle, the driver

must arrange a pedestrian escort by a suitably trained person to be in front of the vehicle with a safety vest or flag.

iv. Privately owned vehicles (POVs) must be off zoo walk-ways by 7:00 am.

v. All carts (including but not limited to; EZ Go, Gator, Club Car, and Cushman) must use an approved chock to keep the cart secured when not in use.

vi. Any individual operating a motor vehicle on SNZCBI grounds must possess a current valid government issued driver's license.

16.4.3 **Responsibilities**

i. SI Staff ensures that:
   1. Police officers observe and enforce the provisions of this directive.
   2. A police escort is provided whenever possible if needed for safe transit of a vehicle on walkways.
   3. All SI Staff shall take corrective actions when they observe violations of this directive and shall report the violation to the COTR.

16.4.4 **Controlling Traffic on Walkways**

i. Vehicular traffic and parking are prohibited on zoo walkways between the hours of 10:00 am and 6:00 pm each day, with limited exceptions (see below). Deliveries should be scheduled whenever possible before 10:00 a.m. if access to walkways is required.

ii. The following vehicles are permitted on zoo walkways during the period of prohibition if they are escorted by a uniformed SNZCBI Police or other approved escort (who must walk in front of the vehicle wearing a brightly colored safety vest or signaling caution with flags and voice notification).

iii. Police vehicles, as deemed necessary for security or emergency purposes. No escort required.

iv. Park Management and OFEO vehicles responding to an urgent maintenance requirement or an emergency with an escort.

v. Veterinary vehicles responding to an animal emergency or a situation involving animal welfare with an escort.

vi. Any motorized cart needed to perform a vital duty must request approval from the COTR.

vii. Contractors must use vehicles to perform essential services within the prohibited hours must get approval from the COTR. When there is a need to bring in a company trucks, oversized vehicle, i.e., dump-truck, cranes, or other special equipment, at least two walking escorts must be provided. One forward and one aft with flags and safety vests; this also applies whenever this type of equipment has to back-up or perform any other special maneuvers, i.e., loading, unloading, lifting, dumping and so forth outside the designated work area.

viii. SNZCBI Police, SNZCBI and OUSFA senior staff have the authority to stop any motor vehicle operating on a walkway and determine whether or not such operation is in violation of policy.

ix. In instances where the motor vehicle's operations do not meet the criteria for being on the walkway, the Police or SNZCBI Senior Staff member may direct the driver to remove the motor vehicle from the walkway and proceed to the nearest available SNZCBI roadway or street. Failure to comply with this policy, or to follow this sub-part instructions could lead to disciplinary action.

x. The Police may stop and expel from the walkway any vehicle exceeding the speed limit, operating the vehicle in an unsafe manner, or not in compliance with this policy. The following situations create unnecessary risk and will not be tolerated while operating a motor vehicle on pathways in the Zoo:

1. Talking, texting, or using devices that require manual manipulation.
2. Eating or drinking.
3. Smoking by the operator or a passenger in any motor vehicle as referenced in the Smithsonian Directive (SD 209).
4. Exceeding the maximum seating capacity or design of the vehicle.
5. Transporting personnel in cargo area or failure to secure load.
6. Operating any vehicle with a visible or known safety defect.

17. DRESS AND DEPARTMENT

17.1. Contractors' personnel shall be fully and appropriately clothed at all times and shall conduct themselves in a manner appropriate to a public place. The COTR may require removal of any individual from the premises and project for unacceptable dress, demeanor, or disruptive

conduct, if the Contractor superintendent fails to correct conditions in violation of this paragraph.

17.2. The Government reserves the right to exclude or remove from the site or building any employee of the Contractor or Subcontractor as the Government deems incompetent, careless, insubordinate, or otherwise objectionable, or whose continued employment of the work is deemed by the Government to be contrary to public interest.

18. CONTRACTOR PARKING

a) SI will provide one (1) hang tag permit for one (1) parking space for one (1) registered company vehicle to be parked in Lot C at no cost to the contractor. This vehicle must be clearly marked with a company name and/or logo. The hang tag must be hung from the vehicle's rear-view mirror in clear view. Employee should use a SI issued Contractor's Badge for daily lot access.

b) With 48 hours prior notice, the Contractor may request for one (1) vehicle, registered to the company, with identifiable signage to park in the gravel parking lot which is adjacent to Lot C at no cost.

c) Upon request SI will provide up to 15 hang tags on a monthly basis for parking spaces for the contractor's personal vehicles. To obtain the hang tags the contractor must pay in advance with one company check, at rate of $15 per working day. Issued hang tags must be hung from the vehicle's rear-view mirror in clear view. The exact location of the on-campus parking will be determined NZCBI Park Management on a monthly basis.

d) General Parking is available at $30 per day. For arrivals prior to 8:00 AM a parking pass must be purchased online a minimum of one day in advance. After 8:00 AM payments are to me made to parking attendants in the vehicle check-in lot bus lot. Early arrival parking vouchers must be to be printed and displayed in the windshield for identification.

e) All Vehicles not in compliance with NZCBI Parking Requirements are subject to ticketing and towing by the Smithsonian Police. All costs associated with parking violations shall be the sole responsibility of the Contractor's personnel.

19. EATING, DRINKING, SMOKING, AND ILLEGAL SUBSTANCE USE

19.1. Eating and drinking in Smithsonian buildings or leased space will be allowed only in designated areas. Offenders may be subject to removal from the premises and project should the Contractor's Superintendent fail to correct conditions, which, in the opinion of the COTR, violate this clause.

19.2. Gambling and the consumption of alcoholic beverages by the Contractor's personnel is prohibited in all Smithsonian buildings or leased space.

19.3. Smoking, vaping, using E-cigarettes or carrying lighted tobacco products is prohibited in all Smithsonian buildings or leased space, in exhibition and public spaces, in areas where hazardous materials are stored or handled and in areas undergoing construction, renovation or repair. Acceptable areas for smoking are outside of the building, as designated by the Smithsonian Facility Manager, and/or Office of Safety, Health, and Environmental Management (OSHEM).

19.4. The possession, sale and/or use of narcotics or other illegal substances or firearms by Contractor employees are strictly prohibited in all Smithsonian facilities and leased space. Contractor employees are strictly prohibited from working on the project under the influence of alcohol and/or illegal substances. Contractor employees in violation of any of the above prohibitions will be removed from the project.

SECTION D - PROJECT COORDINATION

20. COORDINATION OF TRADES

20.1. The Contractor shall coordinate work of different trades so that interference between mechanical, electrical, architectural, and structural work, including existing services, shall be avoided.

20.2. Refer to MasterSpec (AIA) Division 01 sections on General Commissioning Requirements following this section 010000.

20.3 Where work by separate entities requires off-site fabrication of products and accurate interfacing of materials to produce the required results, the Contractor shall prepare coordination drawings to indicate how work shown on separate shop drawings will be interfaced, intermeshed, and sequenced for installation. Coordination drawings shall be submitted in accordance with the requirements of the "Submissions" section.

20.3.1. Work installed prior to approval of coordination drawings shall be at the Contractor's risk. Subsequent relocations required to avoid interferences shall be made without additional expense to the Smithsonian. If an interference develops, the COTR will decide which work shall be relocated, regardless of which was installed first.

20.4. Installation of equipment and systems shall allow the maximum practical space for operation, repair, removal, and testing, within the limits indicated on the Contract Documents. Pipes, conduit, ducts, and other system components shall be installed as close as possible to ceiling slabs, walls, and columns to minimize space used while accommodating function and maintenance.

21. QUALITY CONTROL

21.1. The Contractor shall provide qualified site personnel responsible for quality control, inspections, testing and re-testing as necessary for all work, including that of Subcontractors, to assure compliance with the contract documents. CQC Representative may be the project's designated supervisor.

21.2. **Testing Requirements: Contractor shall be responsible for all field sampling and in-place testing required by the contract documents.** This statement supersedes all other drawing and specification references to Owner-provided sampling and/or testing.

21.2.1. Independent Testing Laboratory: The Contractor shall provide an independent, commercial testing laboratory to perform all sampling and testing services required. The testing services shall be on- or off-site as required. Submit complete documentation of all tests performed in connection with the construction contract.

21.2.2. Smithsonian Acceptance of Laboratories: Except for factory tests, all field sampling and testing normally performed by commercial laboratories shall be performed

by an independent commercial laboratory employed by the Contractor and accepted by the COTR. The Contractor shall submit the following information to the COTR for approval:

21.2.2.1. Name, registration number and engineering discipline of the Registered Professional Engineer in charge of the laboratory.

21.2.2.2. Affidavit of compliance and certification that the laboratory performs work in accordance with requirements as stated in the contract documents.

21.2.2.3. A list of testing equipment proposed for each test procedure including latest calibration data.

21.2.2.4. A copy of the latest Laboratory Inspection Report by an independent agency with laboratory certification that deficiencies (if any) have been corrected.

21.2.2.5. Names and qualifications of persons actually performing testing and sampling. Changes in personnel shall be approved by the COTR prior to performance of work under this contract.

21.3.4. Test Results: Test results shall cite the contract requirements; the test or analytical procedures used the actual results and include a statement that the item tested or analyzed conforms or fails to conform to specification requirements. The cover sheet for each report shall be conspicuously stamped in large red letters "CONFORMS" or "DOES NOT CONFORM" to the specification requirements, as the case may be. All test reports shall be signed by a testing laboratory representative authorized to sign certified test reports. The Contractor shall arrange for immediate and direct delivery of the signed reports, certifications, and other documentation to the COTR.

21.8. Documentation: The CQC shall prepare the following documentation for systematic inspection, testing, and verification of various aspects of the deliverable project. Documentation should include but not limited to: (1) Establishing Quality Standards, (2)Setting Acceptance Criteria, (3)Implementing Quality Control Measures, (4)Monitoring Process Performance and (5)Identifying Defects and Non-Conformities.

21.8.1 Submittal Review: Prior to submitting information to the Smithsonian, the CQC shall review and sign all submissions. This signature confirms a detailed submittal review for coordination and compliance has been conducted on behalf of the General Contractor.

21.8.2. Daily Reports: The Contractor's Daily Report, as discussed in the section Contractor Correspondence and Daily Reports, shall be signed by the CQC Representative as well as the Superintendent. The CQC Representative's signature certifies that, to the best of his or her knowledge, the report is complete and correct and

that all materials, equipment and work described on the report are following the contract plans and specifications, except as noted otherwise.

21.8.3. Special Inspection and Documentation: Reports of Special Inspections shall be signed by both the CQC Representative and the CQC Specialized Supplemental Person who witnessed the test or inspection certifying compliance with the specific contract requirement.

21.8.4. As-Builts: The CQC Representative shall ensure that all requirements for as-built record drawings and specifications are met. The CQC Representative or Specialized Supplemental Personnel assigned to inspect that particular portion of work shall initial each as-built drawing or technical specification section to certify its accuracy prior to submission in accordance with the Project Close-Out Requirements section.

22. PERMITS, LICENSES & FEES

22.1. The Contractor shall obtain and pay for all applicable permits and licenses required by D.C. regulating agencies, including but not limited to erosion and sediment control, storm water management, water quality as it relates to Rock Creek disturbance, elevator permits, waste containers etc.

22.2. The Contractor shall pay all duties, fees, taxes, and other charges and give all notices necessary and incidental to the due and lawful execution of the work.

22.3. The Contractor shall keep the Smithsonian indemnified against all penalties and liability for breach of provisions of any national, provincial, district or city statute, ordinance or law and the regulations and by-laws of any local or other duly constituted authority, which may be applicable to the Work and with such rules and regulations of public bodies and companies.

22.4. Accessibility for Physically Disabled Persons: The Contractor's shall provide temporary constructions at the site as necessary to maintain access for physically disabled persons. All provisions for temporary access shall be subject to the approval of the COTR.

23. UTILITY SERVICE INTERRUPTIONS AND NEW CONNECTIONS

23.1. Any planned interruption in utility service must be approved by and coordinated through the COTR. The Contractor shall submit a written request as far in advance of scheduled interruption as possible, but no less than two (2) full working days in advance. The Contractor shall make the necessary temporary provisions to supply continuous electrical power, HVAC space conditioning and security as required during periods when service is interrupted.

23.2. Work shall be coordinated to minimize the number and duration of outages.

23.3. All planned shutdowns and outages must occur between the hours of 6:00 p.m. to 6:00 a.m., unless otherwise approved by the COTR.

23.4. The Contractor's work efforts to restore service shall be continuous until the interrupted utility is back in service.

23.5. The electrical power may not be interrupted without advanced coordination with the COTR.

23.6. A fire watch shall be provided for the time periods when fire suppression and detection systems are out of service.

24. SI-FURNISHED ITEMS INSTALLED BY THE CONTRACTOR

24.1. The following items shall be furnished by the Smithsonian for installation by the Contractor as part of this contract:

ITEM	DELIVERY LOCATION
Not Applicable	

24.2. Required delivery dates for all Smithsonian furnished items shall be included in the Contractor's Project Schedule, as discussed in the Schedules and Payments section. Any items requiring delivery within the first sixty (60) days of the project or prior to submission of the Project Schedule shall be identified at the Preconstruction Meeting.

24.3. The COTR will notify the Contractor of scheduled delivery dates no less than two (2) full working days in advance of delivery. The Contractor shall accept delivery of the items on scheduled dates or be responsible for any damage and/or expenses resulting from his failure to take delivery. Promptly upon delivery, the Contractor shall contact the COTR, and they shall jointly inspect the material or equipment for possible shortage or damage. If a shortage or damage is found, the Contractor and the COTR shall submit a report to the Contracting Officer.

24.4. The Contractor shall be responsible for proper storage and protection of items delivered, including all expenses incidental thereto.

24.5. For each item, the Contractor shall receive, sign for receipt, provide additional transportation as necessary, uncrate, assemble, locate in place, and provide complete installation including all connections necessary for operation or use. Installation and connection shall be in accordance with manufacturer's specifications as well as contract documents, including all labor and material required.

25. SALVAGE

25.1. The Smithsonian Institution assumes no responsibility for salvage value or any loss or damage to materials or structures on the site for which the Contractor may have reflected a salvage value in his or her offer.

25.2. Except as specifically stated in the contract documents, construction materials, equipment or other items that are to be removed and neither re-used under this contract nor reserved as property of the Smithsonian Institution shall become the property of the Contractor and shall be removed from the premises by the Contractor.

26. CUTTING, PATCHING AND MATCHING EXISTING WORK

26.1. Existing work shall be cut, drilled, altered, removed, or temporarily removed and replaced as necessary for performance of work under the contract. Work that is replaced shall match similar existing work. Structural members shall not be cut or altered, except where noted on drawings, without authorization of the COTR. Work to remain in place, which is damaged or defaced during this contract shall be restored to match the conditions existing at the time of award of the contract, at no additional cost to the Smithsonian.

26.2. Conditions exposed by removal of existing work that do not match new finishes or align with new work shall be called to the COTR's immediate attention. Necessary corrective work directed by the COTR will be subject to adjustment provisions as stated in the General Conditions of the contract.

SECTION E - PROTECTION OF THE SITE DURING CONSTRUCTION

27. PROTECTION OF THE SITE

27.1. The Contractor shall provide adequate protection for all parts of the building, including interior and exterior surfaces, its occupants, contents, and grounds wherever work under this contract is performed.

27.2. Plan for Protection of the Site: The Contractor shall submit a plan for protection of the site to the COTR for approval. The plan shall be submitted no less than five (5) working days after the Preconstruction Meeting. As a minimum, the Plan shall describe:

27.2.1. Proposed method, location, and construction of temporary enclosures.

27.2.2. Routes of access and egress, including those for people with disabilities.

27.2.3. Location and maintenance of emergency exits.

27.2.4. Methods of protection of existing surfaces and occupants.

27.2.5. Means of connection of temporary enclosures/surfaces to existing historic materials.

27.3. During construction, temporary enclosures shall be constructed to prevent unauthorized access or egress. Dust and fume barriers shall be constructed, as needed, or as determined by the COTR, to seal and isolate the work area from the remainder of the interior areas while the work is in progress. Wood used for protection of the site shall be pressure-impregnated, fire-retardant. All plastic sheeting shall be fire retardant 6-mil polyethylene. Submit product data to the COTR for review and approval.

27.4. The Contractor shall submit information describing the proposed construction of temporary enclosures and methods of installation to the COTR for approval. Any connections to existing structures must be accomplished in such a way as to minimize disturbance of existing surfaces.

28. PROTECTION OF FLORA, FAUNA, AND IRRIGATION SYSTEM

28.1. Flora Protection: The Contractor is expressly prohibited from collecting plant materials on Smithsonian property.

28.2. The Contractor shall not store materials inside the dripline of trees or shrubs. Prior to the start of the work on site, the Contractor shall surround trees within the project site and adjacent areas with a protective 6-foot-high chain link fence located 1 foot minimum outside the drip line.

28.3. Vehicular traffic inside the dripline of trees, on turf areas or on flowerbeds is not permitted without prior approval of the Smithsonian's Department of Horticulture through the COTR. If flowerbeds must be crossed by vehicles, bridging is required. Bridging shall be 4-inch-thick timbers, 2 layers of ¾ inch exterior grade plywood or 2" x 10", or 1" protective plastic

decking such as Bravo mat or equal to help prevent soil compaction of the soil in the lawn areas and flowerbeds. Any turf area used for parking with prior approval as noted above must first be planked by the Contractor.

28.4. Where aerial work is being performed above flower/shrub beds, the Contractor shall protect them with an approved protective framework installed at least 300 mm above the tops of the plant materials. The Contractor shall submit the proposed method of protection to the COTR for approval. Trees and shrubs shall only be tied back with the approval of the COTR.

28.5. Any damage to the existing irrigation systems during construction shall be repaired by the Contractor within two calendar days from when the damage occurred.

28.6. NOT USED

28.7. The Contractor shall bear all costs for repairs to the damaged irrigation system. Where the low voltage control wiring is damaged due to construction, then said wiring shall be replaced from the zone valve to controller. No splicing will be permitted.

28.8. Identification tape, when damaged, shall be replaced with an identification wire from valve to controller.

28.9. All damaged irrigation piping shall be cleared of debris prior to making the connections.

28.10. The Contractor shall bear all costs for replacement of damaged plant materials. Replacement plant materials shall meet the criteria established by the SNZCBI's Department of Horticulture.

28.11. Plant material removed by the Contractor for reuse shall be balled, bagged, and protected in accordance with instructions prepared by the SNZCBI's Department of Horticulture.

28.12. Turf areas damaged during construction shall be repaired by the Contractor by rototilling a minimum depth of 6 inches, backfilled with sandy-loam topsoil. Sod shall be certified sod, none netted and a minimum of one year old. Sod shall be 90:10, consisting of a minimum of three varieties tall fescues and one Kentucky Bluegrass. The SNZCBI's Department of Horticulture, through the COTR, must approve the source of the sod. The Contractor shall bear all costs for these repairs. Suggested sources are:

Oakwood Sod Farm, Inc.
29307 Waller Road
Delmar, MD 21875
Phone: (410) 896-4009
Toll-Free: (800)379-8488

Collins Wharf Sod
25361 Collins Wharf Rd
Eden, MD 21822

Phone: 410-334-6676
Fax: 410-749-3815
cwsod@collinswharfsod.com

Summit Hall Sod Farm
21300 River Road
Poolesville, MD 20837-9114
Phone: 301-948-2900
Fax: 301-349-2668

28.13. The Contractor shall be responsible for the daily removal of trash and construction debris from turf and flower/shrub beds within the limits of construction.

28.14. Any plant material destroyed and/or damaged by the Contractor during construction shall be replaced with like genus and species of the same size, at no additional cost to the Smithsonian. The damaged plant materials must be replaced prior to final payment. The same applies to artifacts or furniture collection pieces. The COTR requires five (5) working days' notice should any of the artifacts or furniture collection need to be removed to facilitate construction.

28.15. Any construction scaffolding on turf and planted beds must be coordinated with the SNZCBI's Department of Horticulture, through the COTR, to ensure that its installation will not damage or destroy existing plant materials or turf area or interfere with daily maintenance of the grounds. Trees may be tied back to permit scaffolding erection, no more than 4 feet if possible. The tying back must be performed by a certified Arborist with the approval of SNZCBI's Department of Horticulture through the COTR. Where scaffolding is necessary to facilitate construction, SNZCBI's Department of Horticulture requires a three (3) workday notice for said work.

28.16. NOT USED

28.17. Fauna Protection: The Contractor is prohibited from hunting, collecting, or feeding animals on Smithsonian property. All food and food wrapping brought on the premises must be properly disposed of in approved containers, which are secured from animals.

28.18. If a generator is placed on the turf, Contractor must have the COTR's approval of its placement. Generator shall be placed on anti-compactor boards. The generator must be placed in a drip containment basin.

28.19. A schedule of values for plant material is not required.

28.20. Use requirements for 28.21 topsoil, 28.22 screened leaf mold, 28.23 soil mix aggregate, and 28.25 ground limestone when any of the following conditions occur:

a) When landscaping is part of the work, but a separate soil spec is not provided
b) When a Contractor has damaged an area that includes soil or landscaping and is to be repaired

c) For backfill as noted under 28.24

28.21. Topsoil: ASTM D 5268, fertile, naturally sandy loam as defined by USDA Handbook no. 18, Figure 38. It shall be natural, surface soil in a friable condition and contain less than 3% subsoil. The topsoil shall be free of hardpan material, stones, and clods larger than ½ inch in diameter, sticks, tree or shrub roots, debris, toxic substances (e.g., Residual herbicides) and other material detrimental to plant growth. The area and the topsoil shall be free of plant or plant parts of undesirable plants such as, but not limited to, Bermuda grass, nut sedge, mugwort, Johnson grass, Quack grass, Canada Thistle, or noxious weeds as set forth in the Federal Seed Act. It shall be certified free of Southern Blight.

28.21.1 Contractor shall notify COTR of location of all sources of the topsoil and furnish the COTR a certified report from the agricultural experiment station or approved agricultural laboratory of an analysis performed not more than 60 days prior to the date of submission. If the topsoil is a mix, it shall be mixed off-site. The topsoil shall be certified to meet the following requirements:

a. Shall be a natural, original surface soil of a sandy loam texture with a mechanical analysis of 60-65% sand, 15-25% silt and 10-15% clay.

b. Shall have at least 2%, but not more than 5%, organic matter.

c. Soil pH shall be 5.5 to pH 6.5 inclusive unless otherwise specified.

d. Soil salinity by electrical conductivity measurement shall not exceed 600 parts per million (ppm) as determined by Black, Editor “Method of Soil Analysis,” Part 2, published by the American Society of Agronomy, 1965.

e. The soil nutrient level shall be greater than 100 lbs./acre of magnesium, 150 lbs./acre of phosphorous and 120 lbs./acre of potassium.

28.21.2. Agricultural limestone at not more than 5 pounds per cubic yard of topsoil may be used to adjust an acidic condition provided it is well mixed in a manner, which does not destroy the structure of the soil.

28.21.3. Topsoil that has been synthesized by blending materials which individually do not meet the requirements of this specification will not be accepted even though the resulting blend meets the organic matter, mechanical analysis, pH, and soluble salts requirements.

28.21.4. The COTR reserves the right to inspect and sample all topsoil at the source and at the time of delivery. These inspections will be made without cost to the Contractor.

28.21.5. Topsoil must not be delivered or handled in a frozen or muddy condition.

28.21.6. Shipment and Delivery - All soil must be approved by the COTR before delivery to the site. Any material not meeting requirements of this specification will be rejected on or after delivery.

28.22. SCREENED LEAF MOLD

As available through Maryland Environmental Services, 2020 Industrial Drive, Annapolis, MD 21401 (301/261-8596) or approved equal, completely composted, and free from all materials such as glass, paper, plastics, etc. Composted sewage sludge shall not be used.

28.23. SOIL MIX AGGREGATE

Aggregate shall be Solite 3/8 as manufactured by Solite Corp., 2508 Chamberlain Avenue, Richmond, VA or approved equal. Lightweight aggregate shall be expanded shale or slate expanded by the rotary kiln process. The aggregate shall meet the requirements of the American Society of Testing Materials C331-81 and C33-80.

28.24. BACKFILL

28.24.1 When existing soil is acceptable for use: Existing topsoil shall be used unless so directed otherwise by the COTR. The following mixture in accordance with the specifications herein, thoroughly mixed by volume shall be used as backfill:

6 parts existing soil
2 parts leaf molds
2 parts Solite #388

28.24.2. When existing soil is not acceptable for use: If so, determined by the COTR that the existing soil is not acceptable for use, the Contractor shall excavate all soil to a depth of 24 inches and disposed of off-site. The following backfill mixture, thoroughly mixed by volume in accordance with the specifications herein, shall replace the excavated soil:

60% sandy loam topsoil
20% Solite #388
20% Composted leaf mold

28.24.3. Backfill shall be mixed off site. If requested, backfill shall be mixed in the presence of the COTR. Backfill must be approved by the COTR before delivery to the job site.

28.25. GROUND LIMESTONE

Lime: ASTM C 602, Class T, agricultural limestone containing a minimum 80% calcium carbonate equivalent with a minimum 99% passing a No. 8 (2.36 mm) sieve and a minimum 75% passing a No. 60 (250 micrometer) sieve.

28.25.1. Provide lime in the form of dolomitic limestone.

29. DEBRIS CONTROL AND DAILY CLEANUP

29.1. The Contractor shall regularly clean up the work areas and shall, at all times, maintain the project in as neat and orderly a manner as is consistent with normal operations. Debris resulting from construction operations shall be removed from the site daily by the Contractor. The Contractor shall keep all access, haul routes and site areas free of dirt, debris and other materials resulting from construction activities.

29.2. Under no circumstances shall any rubbish or waste be dropped or thrown from one level of scaffolding to another or within or outside the building. Rubbish may be lowered by way of chutes, taken down on hoists or lowered in receptacles.

29.3. In addition to a general daily clean-up and removal of rubbish, the Contractor shall immediately prior to final inspection for completion and acceptance, or when directed by the COTR, have all surfaces swept and dusted, and all finished surfaces washed and in a new appearing condition with all stains, soil marks, dirt and other forms of defacement removed.

29.4. Trash receptacles: The Contractor shall provide enclosed trash receptacle(s) in quantity and size necessary to meet project needs, located as approved by the COTR. Trash receptacles shall be placed out of public viewing.

29.5. The Contractor shall recycle, salvage, or otherwise divert from landfills and incinerators, at least 50%, with a goal of at least 75%, by weight (tons), unless otherwise noted, of non-hazardous construction and demolition material. The contractor shall track recycling efforts and diversion rates using the Construction and Demolition Waste Tracking Sheet, attached. Before any work is started, the contractor shall submit a Construction Waste Management Plan, consisting of waste identification and a waste reduction work plan. Waste identification shall indicate anticipated types and quantities of demolition, site-clearing, and construction waste generated by the Work. Include estimated quantities and assumptions for estimates. Waste reduction work plan shall list each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures. With each application for payment, the contractor shall submit the Construction and Demolition Waste Tracking Sheet, attached, with data compiled for the payment period, including receipts from hauler or destination. Before request for substantial completion, the contractor shall submit calculated end-of-Project percentage of waste diverted from landfills and incinerators (recycled, salvaged, or disposed) as a percentage of total waste generated by the Work. With request for final payment, the contractor shall submit actual percentage of waste diverted from landfills and incinerators (recycled, salvaged, or disposed) as a percentage of total waste generated by the Work. Refer to *Construction Waste Demolition Waste Tracking Sheet*, following this section.

29.6. All food and food wrappings brought on the premises must be properly disposed of in approved containers that are secured from animals and pests.

29.7 All project waste must go to licensed disposal or recycling facility such as a C & D Landfill. Contractor shall provide SI (generator) with documentation that all waste has been properly characterized and disposed of in accordance with applicable regulations and defined under the 40 CFR 261.2.

30. DUST AND AIR QUALITY CONTROL

30.1. The Contractor will execute the Work by methods that minimize dust, vapors and gases raised by construction operations. The Contractor will utilize engineering controls and work practices to prevent airborne dust, vapors, gases, and objectionable odors from dispersing into the atmosphere and from being drawn into existing air-intake louvers, ductwork, and adjacent elevator shafts. A work plan of methods and means for this section shall be submitted to the COTR for review and approval.

30.2. Dust barriers shall be erected, where necessary, to protect adjacent areas from dust infiltration as required by the COTR. Dust barriers shall be rigid and visually opaque and shall seal the work area by affixing to the structure on all sides (i.e., ceiling, walls, and floor). Wood used for dust barriers shall be pressure-impregnated, fire-retardant treated lumber. All plastic sheeting shall be fire-retardant 6-mil polyethylene. Submit product data for review and approval to the COTR.

30.3. Means of connection of dust barriers to existing structures shall not damage the building fabric. Details of barriers shall be submitted for approval to the COTR.

30.4. No open fires or burning of trash are permitted.

31. NOISE CONTROL

31.1. The Contractor shall comply with the regulations of the District of Columbia and OSHA Standards 1926.52 and 1910.95 and all other regulations relative to safety noise control.

31.2. Activities that generate excessive noise or vibration and interrupt SNZCBI functions or create public disturbances may be required to be performed during off-hours at the discretion of the COTR.

31.3. The Contractor shall provide sound attenuation to maintain acoustic level below 50 dBA at a distance of 15 m or below 50 dBA in occupied staff areas if less than 15 m away from noise source.

32. VERMIN, PEST, AND RODENT CONTROL

32.1. The Contractor shall use non-chemical means and practices that deter or prevent the introduction of pests into the project site or premises. No chemical means shall be permitted. Contractor’s focus should be NO FOOD DEBRIS on site with mandatory daily cleanup and removal.

33. DRILLING, WELDING TORCH CUTTING AND OTHER OPERATIONS THAT PRODUCE AIRBORNE CONTAMINANTS

33.1. Daily Permits:
When welding, torch cutting or other heating operations are to occur inside existing structures, the Contractor shall obtain a daily **HOT WORK PERMIT**.

During the course of the Work, all existing smoke and heat detectors and sprinklers heads must remain operable. Coverings may be applied to protect them from spray coatings or other hazardous conditions only during the actual operations. Coverings must be removed immediately after the operations have concluded, but at the end of each working day at a minimum. When work produces dust or other airborne contaminants, e.g., spray painting, that could impair existing fire suppression or detection system(s) or when the system itself is otherwise impaired (drained down, etc.), the Contractor shall obtain a daily **FIRE SYSTEM IMPAIRMENT PERMIT**. Each permit must be obtained at least two working days in advance from the COTR and posted at the job site prior to beginning the scheduled work.

33.2. Fire Watch: No welding or torch cutting shall be performed unless adequate fire protection is provided. The Contractor shall maintain a fire watch for the duration of welding, cutting, and heating operations and for at least 30 minutes after the 'hot' work has stopped. A fire extinguisher (minimum 10 pounds, dry-chemical type, typical) shall be on hand when drilling, welding, or cutting.

33.3. Use of Impact Hammers: The use of impact hammers or other equipment causing vibration, noise and dust may be harmful to collection animals and/or building occupants. The Contractor shall request approval from the COTR at least five (5) working days before beginning this type of work to ensure adequate time for notification of building occupants and protection of objects and collections.

33.4 Ventilation: The Contractor shall provide adequate ventilation to prevent air contamination or the accumulation of toxic materials. Take necessary measures to prevent welding fumes from entering mechanical ventilation systems, or passive transfer to adjacent areas. Seal all adjacent ducts and equipment openings with plastic. Where transfer is deemed likely or verified by the COTR, utilize local exhaust ventilation with HEPA filtration to control welding fumes. The Contractor shall submit means and methods for controlling air contamination to the COTR for review and approval.

SECTION F - TEMPORARY CONSTRUCTION FACILITIES

34. CONTRACTOR FIELD OFFICES, TRAILERS, AND SHEDS

34.1. The Contractor shall (may) establish a temporary office at the project site. The Contractor shall provide information about proposed locations of any temporary office, sheds, trailers and staging and storage areas and designation of size, color, and materials to the COTR for approval at least fourteen (14) days prior to mobilization.

34.2. The Contractor may provide his own locking device on the door to the temporary office, trailer or shed. The Contractor shall be solely responsible for the safekeeping and security of the construction facilities, materials, and equipment.

34.3. Upon completion of the Work, the temporary offices, trailers, and sheds shall be removed, and the area returned to its original pre-contract condition.

35. STAGING, STORAGE AND WORK AREAS

35.1. Staging and Storage Areas: The Contractor shall coordinate with the COTR the use of any area proposed for staging and storage of materials and equipment at least five working days prior to mobilization or at the Preconstruction Meeting, whichever is first.

35.2. The Contractor shall provide adequate storage and protection of materials and equipment delivered to the site to prevent theft, weather damage, mold infiltration, moisture damage and other physical damage. The site shall be maintained in a neat and orderly manner as to further minimize hazards to personnel, animals, visitors, materials, and equipment.

35.3. Plan for Staging, Storage & Work Areas: The Contractor shall submit a drawing of areas proposed for construction operations for approval by the COTR at least fourteen (14) days prior to mobilization or at the Preconstruction Meeting, whichever is first. The drawing shall show buildings, utilities, temporary toilet facilities, temporary utility extensions, temporary interior walls and barriers to limit unauthorized intrusion and to control noise and dust, pedestrian walkways, vehicular access, temporary fencing, trailers, sheds, storage areas and the Contract's desired route for access and egress to the premises and to the project site.

35.4. All wood used for temporary, interior construction shall be pressure-impregnated with a "Dricon" treatment or an equal treatment approved by the Smithsonian Institution. All pieces must bear the UL "FR-S" stamp. Intumescent (fire-retardant) paint shall not be used. All plastic sheeting shall be fire retardant 6-mil polyethylene. Submit product data to the COTR for review and approval.

35.5. ~~Interior Protection Barrier: Provide floor to ceiling heavy-duty plastic secured at all edges to create a tight seal between areas of work and areas occupied by collection animals or staff. Include full zip doors or overlapped layers of plastic for staff to move through that create an airtight barrier when closed.~~

35.6 Temporary Chain Link Fencing with Lockable Gates shall isolate the public, SI staff and collection animals in accordance with the contract plans and technical specifications. In the event that all the work area locations are not specifically indicated within the contract documents, the contractor shall identify and implement a safe isolation barrier. All fence sections will be maintained in a new or like new condition. Damaged sections will be removed from site. *Also reference paragraph 51.*

36. SANITARY/TOILET FACILITIES

36.1. Contractors' personnel will be permitted to use designated public restrooms located on the premises, subject to the regulations and control of the COTR. If, in the opinion of the COTR, the Contractors' personnel fail to maintain acceptable dress and conduct appropriate to a public place, permission to use the public restrooms may be rescinded. In the event the project's location warrants temporary facilities the location and quantity of units shall be approved by the COTR.

37. TEMPORARY UTILITY SERVICES AND EXTENSIONS

37.1. Existing electrical and water utilities are available for the Contractor's use as designated by the COTR. Contractor shall implement basic conservation measures or privilege to access will be rescinded.

38. SCAFFOLDING AND PLATFORMS

38.1. The Contractor shall erect temporary scaffolding in accordance with OSHA 29 CFR 1926.451 and ANSI A10.8. The Contractor shall provide landing platforms with stairways or ladders for proper access and egress to all work areas.

38.2. For all frame scaffolding greater than 4 m in height, the Contractor shall submit working drawings to the COTR a minimum of ten (10) working days in advance of scaffolding erection. Working drawings submitted by the Contractor shall be certified by a registered Professional Engineer. Provide additional safety plan and training certifications for any motorized scaffolding or lifts. Provide weight and size of any proposed motorized lifts for approval.

38.3. During non-working hours, the Contractor shall close and lock the scaffolding/lifts with a physical barrier to prevent access by unauthorized persons.

39. PROJECT SIGNS – N/A

SECTION G - MEETINGS

40. PRECONSTRUCTION MEETING

40.1. A Preconstruction Meeting will be scheduled with the Contractor before any work is started at the site. As soon as possible after the Date of Award, the COTR will contact the Contractor to arrange a time, date, and place for the conference. Items to be discussed at the Preconstruction Meeting include, but are not limited to:

40.1.1. Contract Time: Notice to Proceed date and Completion date.

40.1.2. Scheduling and Submittals.

40.1.2.1. Progress Schedule

40.1.2.2. Payment Breakdown Schedule

40.1.2.3. Required Submittals

40.1.3. Mobilization and Staging – Area for Materials and Equipment.

40.1.4. Access to the Premises, Haul Routes, Loading Dock.

40.1.5. Contractor Deliveries.

40.1.6. Security Requirements/List of Contractor's Personnel.

40.1.7. Emergency Procedures and Phone Numbers.

40.1.8. Protection of Site and Premises.

40.1.9. Fire Protection, Safety and Health Requirements.

40.1.10. Utility Interruptions, Rough-in Inspections, Testing.

40.1.11. Applications for Payment.

40.1.12. Pre-Condition Survey of the Site.

40.1.13. Accessibility Requirements.

40.1.14. Sequence of Construction.

40.1.15. Quality Assurance and Inspection of the Contract Work.

40.1.16. Sustainability Requirements.

40.1.17. Building Systems Commissioning.

40.1.18. Quality Control.

40.1.19. Preservation of Wildlife and Natural Resources.

40.2. All of the Contractor's staff and Subcontractors or Suppliers whose presence is necessary or requested by the COTR shall attend the Preconstruction Meeting.

40.3. Coordination Plan: The Contractor shall use the Preconstruction Meeting to develop a Coordination Plan for interaction with other parties working in or using the facility. The plan shall be submitted no less than five (5) working days after the Preconstruction Meeting and shall address interactions with other contractors, tenants, the public and any others making use of the site and surrounding areas. As a minimum it shall include:

40.3.1. Locations of overlap in use of the site by the Contractor and others, including work areas, delivery points, access/egress areas.

40.3.2. Specific items of work by others required to support critical milestones in the Contractor's schedule.

40.3.3. Completion or delivery of work by others that may impact the Contractor's schedule.

40.3.4. Portions of the work that create special hazards or disturbances.

40.3.5. Portions of the work that affect utilities, fire-protection or detection systems or security systems.

40.3.6. Events requiring access to areas outside of the project site or secured spaces.

40.3.7. Protection to be provided by the Contractor for work completed by others either before or during this project.

41. PRE-CONDITION SURVEY OF THE SITE

41.1. After the Preconstruction Meeting and before the start of work on the site, the project site (i.e., building, yards, contents, grounds, and equipment) shall be inspected by the Contractor, major Subcontractors, COTR and other Smithsonian Institution and SNZCBI personnel as may be required for the purpose of verification of the existing conditions. Any damages or defective equipment will be noted at this time and this survey will serve as the basis for the establishment of the pre-contract conditions. The Contractor and Smithsonian Institution will jointly establish the identification of pre-contract conditions.

41.2. Any damage to the buildings, yards, their contents, grounds, or equipment that occurs during the contract period, unless noted as existing during the inspection as specified above shall be repaired to its pre-contract condition by the Contractor at no cost to the Smithsonian. The COTR will determine the adequacy of the repairs as required in the previous paragraph.

41.3. Written and photographic documentation: The Contractor shall prepare photographic presentation report in PDF format to identify all damages or defects of materials, equipment, and the site. The Contractor shall submit report electronically to the COTR before staring any work on site.

41.4 Underground Infrastructure: For the purpose is to prevent damage to underground infrastructure, the contractor shall provide a utility location service for all areas to be excavated. Note: Miss Utility will locate only Washington Gas's Service lines on the NZP campus, all other utilities must be located by the contractor's firm.

42. PROJECT MEETINGS

42.1. Progress Meetings: The COTR will lead regular progress meetings with an interdisciplinary integrated management team consisting of representatives (as required) of the Contractor, Smithsonian, Architect/Engineer, Commissioning Provider, major Subcontractors and other critical Subcontractors and suppliers. The purposes of these meetings are to expedite the work, coordinate and schedule the Work and coordinate the work with Smithsonian activities. Progress meetings shall be held weekly unless otherwise directed by the COTR. The time and place of the meetings will be established at the Preconstruction Meeting. The Contractor shall ensure that all required Subcontractors and suppliers attend the Progress Meetings and the COTR will ensure that all necessary SI personnel attend.

42.2. Special-Topic Meetings: At the discretion of the COTR, additional separate meetings may be scheduled to address issues of quality control, sustainability requirements, coordination between contractors on the premises, coordination with other agencies, scheduling of the work, application for payments, etc. The Contractor's staff and Subcontractors or Suppliers whose presence is necessary or requested by the COTR shall attend.

42.3. Meeting Minutes: The Contractor shall promptly prepare minutes of each meeting and transmit to the COTR, within five (5) working days.

SECTION H – SUBMISSIONS

43. SUBMITTAL DEFINITIONS

43.1. Submittals are defined to include shop drawings, product data, samples and additional data required for submission to the COTR for review and approval prior to incorporation into the work. All documentation transmission shall be electronic, unless otherwise requested.

43.1.1. Shop Drawings: Detailed drawings, schedules, diagrams, and illustrations prepared specifically for this project by the Contractor or any subcontractor, manufacturer, supplier, or distributor to illustrate fabrication and/or installation of a portion of the Work.

43.1.2. Schedule: A detailed tabulation of components, items, or parts to be furnished for use on this project.

43.1.3. Statement: An affirmation prepared by the Contractor, the installer or manufacturer of a material, product, or system, to satisfy a requirement defined in a technical section.

43.1.4. Factory Test Report: A written report of the findings of a test performed by the Contractor on an actual portion of the Work or prototype prepared for this project before it is shipped to the site.

43.1.5. Field Test Report: A written report of the findings of a test performed by the Contractor on a portion of the Work during or after installation.

43.1.6. Certificate of Compliance: A written statement, signed by an authorized official of the manufacturer of a product or system or supplier of a material attesting that the product, system, or material meets the requirements of the contract documents. The certificate of compliance must be dated after the award of this Contract and must name the project and cite the specification section, paragraph, and requirements, which it is intended to address.

43.1.7. Product Data: Illustrations, standard schedules, performance charts, instructions, brochures, diagrams, manufacturer's descriptive literature and catalog information illustrating a material, product or system to be installed on this project, including all data related to LEED requirements, such as recycled and regional content information, Volatile Organic Compound (VOC) product schedules, Forest Stewardship Council (FSC) chain-of-custody documentation and other documentation as requested by the COTR.

43.1.8. Color Charts: Pre-printed brochures showing the color range of a material.

43.1.9. Test Reports: Reports verifying that a material, assembly, system, process, or laboratory meets requirements established in the Contract Documents. Reports shall

indicate compliance by naming and describing the test method and test results. Testing must have occurred within three (3) years of the date of award of this contract.

43.1.10. Samples: Physical examples of materials, equipment, assemblies, or workmanship establishing standards for evaluating finished Work.

43.1.11. Color/Texture Selection Sample: Samples of an available range of textures and/or colors of a material formed of the actual finish material over a substrate identical to that which will be used in the field.

43.1.12. Mock-up: An assembly or sample panel constructed in accordance with specifications to show construction details, finished appearance and/or performance.

43.1.13. Material Safety Data Sheets: Instructions, warnings and recommended and required handling and use procedures for individual hazardous materials published by the product manufacturer.

44. SUBMITTALS AND REVIEWS

44.1. Contractor Responsibility for Submittals: The Contractor shall provide all required submittals, by technical specification section, in accordance with the contract documents. All submittals, with exception of mockups or samples, are to be submitted electronically by email in PDF format. The Contractor shall clearly indicate on the submittal that it has been reviewed by the Contractor and found to meet the project requirements. Any items submitted as substitutions shall be clearly identified as such on the submittal and the transmittal document. If shop drawings show variations from the contract documents because of standard shop practices or for other reasons, the Contractor shall provide a separate, written description of variations along with the submittal. The Contractor shall:

44.1.1. Review each submittal for conformance with requirements of the contract documents and coordination with related work.

44.1.2. Determine and verify all field measurements, required material quantities, method of assembly or erection, installation requirements and proper connection to adjoining materials installed by others.

44.1.3. Assure that all submittals use the appropriate units of measure. All drawings and technical data shall be in SI (metric) units for projects designed in SI units. Preprinted literature in other units shall be accompanied by documentation to show conformance to project requirements.

44.1.4. Transmit all required submittals for a technical specification section at the same time unless prior written waiver of this requirement has been provided by the COTR.

44.1.5. Transmit submittals to the COTR in a logical and orderly sequence in accordance with the Submittal Schedule to prevent project delays or adversely impact work by the Smithsonian Institution or other contractors.

44.1.6. Correct and resubmit submittals according to response from Smithsonian Office of Planning Design & Construction.

44.1.7. Commence work on items requiring submittals only after all related submittals are reviewed and approved by the Smithsonian. All Work shall conform to approved submittals.

44.2. Submittal Schedule and Control Log: The Contractor shall submit, to the COTR, a schedule of work-related submittals using the Smithsonian SF Submittal Log form within *fourteen (14) calendar days after the effective date of the Notice to Proceed. (An electronic Submittal Log form is available upon request.) Submittals shall be listed in the order they are scheduled to be submitted, and the following information shall be given:

44.2.1. Project Name, Project Number, Contractor Name, Contract Number.

44.2.2. Technical Specification Section for each submittal.

44.2.3. Unique Submittal Number.

44.2.4. Description of item to be submitted, as listed in the specifications.

44.2.5. Date item must be submitted to the Smithsonian in order to support the project schedule.

44.2.6. Subcontractor providing submittal (in "Comments" column).

44.3. Quantities for Submittals: Unless otherwise noted in the technical specification, the Contractor shall deliver to the COTR:

44.3.1. Shop Drawings: Submit electronic copy of shop drawings in PDF format. Submittal will be forwarded electronically to the AE for review. After submittal review, submittal will be returned to the Contractor electronically, in PDF format. Submit in DWG format, if requested. Submit reproducible black line prints, if requested.

44.3.2. Product Data, Test Reports, Color Charts, etc. The Contractor will make electronic submittals in PDF format, except for Color Charts. Submit two (2) original Color Charts from each product representative to be retained by the Smithsonian; copies or printouts from the computer will not be accepted. After submittal review, submittal will be returned to the Contractor electronically, in PDF format.

44.3.3. Color/Texture Samples: Submit two (2) samples, minimum size 600 mm by 600 mm, unless otherwise specified. After submittal review, the Smithsonian may retain one (1) sample.

44.3.4. Mock-up and Sample Installations: Unless otherwise specified, minimum size shall be as noted to complete a panel section or normal break in the work.

44.3.5. Written Text Documents, Plans and Reports: Submit electronic copy of written text documents, plans, and reports in PDF format. Submittal will be forwarded electronically to the AE for review. After submittal review, submittal will be returned to the Contractor electronically, in PDF format.

44.4. Submittal Reviews by the Smithsonian: Reviewed submittals will be marked "Approved," "Approved as Noted," "Resubmit" or "Disapproved." Submittal approval by the Smithsonian shall not relieve the Contractor of responsibility for submittal errors, omissions, or deviations from the contract documents. Approval of submissions does not constitute acceptance of substitutions except as covered under sub-paragraph entitled "Contract Requests for Substitutions."

44.5. Submittal Review Period: The Contractor shall transmit, to the COTR, all submittals sufficiently in advance of the time necessary for fabrication and installation to allow for review by the Smithsonian and return to the Contractor, including any time needed for correction and resubmission by the Contractor. The expected time required by the Smithsonian for review of initial submission is 14 calendar days. No extension of the Contract Time will be granted for the Contractor's failure to allow sufficient time for review and processing, including resubmission of items that are initially rejected due to improper submission or non-compliance with the Contract Documents.

44.6. Contractor Requests for Substitutions: Contractor requests for items identified by manufacturer, brand name, make, catalog number, etc. in the contract documents shall be submitted to the Contracting Officer for approval prior to contract award, in accordance with the General Conditions. After award of the contract, contractor requests for substitutions may be considered and accepted by the Smithsonian at the discretion of the Contracting Officer.

44.7. Construction Progress Schedule Submittal: The Contractor shall submit a progress schedule within one (1) calendar day from the date of the Notice to Proceed. No work shall start at the site until the progress schedule has been approved by the COTR. The schedule shall provide a weekly breakdown of activity including interaction between trades and be subdivided in accordance with items of work or areas of the job where the work is to take place. The schedule shall also list equipment, special devices, hardware, products, or other items requiring long lead time, when these items are ordered and the projected delivery dates. The last week of the schedule shall reflect final inspection, testing, and the correction of deficiencies.

45. CRITERIA FOR PRODUCT SELECTION

45.1. To the greatest extent possible, subject to the restrictions of the Buy American Act, provide products, materials, or equipment of a singular generic kind from a single source. Where more than one choice of a product or material is available for Contractor's selection, select an option, which is compatible with other products and materials already selected.

45.2. Provide products complete with accessories, trim, finish, safety guards and other devices and details needed for complete installation for intended use and effect.

45.3. Products, which, by nature of their application, are likely to be needed at a later date for maintenance and repair or replacement work, shall be current models for which replacement parts are available.

45.4. Product selection shall be done in accordance with the following requirements:

45.4.1. Standards, Codes and Regulations: Select from among products that follow the project requirements, as well as with construction standards, all applicable codes and regulations and LEED requirements.

45.4.2. Performance Requirements: Provide products that comply with specific performances indicated and are recommended by the manufacturer (in published product literature or by individual certification) for the application indicated.

45.4.3. Prescriptive Requirements: Provide products that have been produced in accordance with prescriptive requirements, using specified ingredients and components and complying with specified requirements for mixing, fabricating, curing, finishing, testing and other operations in the manufacturing process.

45.4.4. Visual Matching: Where matching with an established sample for color, pattern, and/or texture, the COTR shall determine whether a proposed product matches the sample.

45.4.5. Avoidance of banned materials: The Contractor will commit to not using the following toxic and hazardous materials:

45.4.5.1. Products containing asbestos, urea formaldehyde, polychlorinated biphenyls (PCBs) and/or chlorinated fluorocarbons.

45.4.5.2. Products containing lead content, including older or flux containing more than 0.2 percent lead; domestic water pipe or pipe fittings containing more than 8 percent lead; and paint containing more than 0.06 percent lead.

46. PHOTOGRAPHIC DOCUMENTATION

46.1. The Contractor shall provide digital photographs of the project site and construction activities throughout the progress of the Work, acceptable to the Smithsonian Institution. The COTR shall determine the vantage points from which photographs will be taken.

1. At least 24 color progress photographs shall be taken monthly. The actual number and location of views shall be directed by the COTR. Plus Photographs shall be taken at the start and finish of various elements of construction designated by the COTR.

~~46.2 Data Capture (Laser Scan): Contractor to survey, prepare and submit Point Cloud files at key stages during the construction process including but not limited to, open trenches, rough-in / close-in, project completion, etc. as directed by COTR.~~

~~This survey to be utilized to ensure all As-Built conditions for the project are documented properly. This will include establishing the necessary Survey Control Network throughout the site and scanning as many points as may be required to create a reliable point cloud of all interior and exterior surfaces of the building.~~

~~The required object surface density of scanning shall be a minimum of 6mm (¼"). RGB color shall be mapped to both the exterior and interior scans. Point Cloud data should be broken into separate data sets as directed by COTR and be registered in the same coordinate frame (origin point). Point cloud data to be submitted using Autodesk Recap (.rcp).~~

47. CONTRACTOR CORRESPONDENCE AND DAILY REPORTS

47.1. The Contractor shall correspond with the COTR for all matters related to this construction project, unless otherwise directed. All correspondence shall be signed and dated by the Contractor and shall reference the project, project number and contract number.

47.2. The Contractor shall maintain daily reports using the Smithsonian Institution Contractor's Daily Report form. Reports shall be numbered consecutively, and all sections shall be completed or noted as "not applicable." Reports shall contain detailed remarks each day, including but not limited to progress on the job, problems discovered and discussions with Smithsonian staff. Reports shall be submitted to the COTR each day for the previous workday.

SECTION I - SAFETY, HEALTH, AND FIRE PROTECTION

48. JOB SITE SAFETY

48.1. Safety Coordinator: The Contractor shall designate a person responsible and accountable for personnel safety at both corporate and project level at the project site for the duration of the project. Contracts specifically requiring safety or industrial hygiene personnel shall include a copy of their resumes. Qualifications for the Safety Coordinator shall include the OSHA 30-hour course or equivalent course.

48.2. Job Site Safety Plan: The Contractor shall submit a Jobsite Safety Plan at least 15 calendar days prior to mobilization to the site for approval by the COTR. As a minimum, the plan shall detail the procedures, designated persons, instructions, and reports to be used to assure jobsite safety for all contractors, subcontractors, Smithsonian personnel, the public and others on the site.

48.2.1. Site Specific Safety Plan: Upon award of this contract, the contractor shall provide a Site-Specific Safety Plan (SSSP). The SSSP is a safety and health policy and program document and outlines how the contractor will safely conduct their work. This plan shall be job-specific and shall also address any unusual or unique aspects of the project or activity for which it is written. The SSSP shall interface with the employer's overall safety and health program, and a copy shall be available on the work site. Any portions of the employer's overall safety and health program that is referenced in the SSSP shall be included as appropriate. The plan shall include but not limited to the following:

a. Signature Sheet that must include plan concurrence (e.g., Chief of Operations, Corporate Chief of Safety, Corporate Industrial Hygienist, project manager or superintendent, project safety professional, project QC). Provide concurrence of other applicable corporate and project personnel (Contractor).
b. Background Information that must include Brief project description, description of work to be performed, and location; phases of work anticipated these will require a Job Hazard Analysis (JHA's). OSHA 3071
c. Statement of Safety and Health Policy
d. Responsibilities and lines of Authority
e. Subcontractors and Suppliers
f. Training
g. Safety and Health inspections that include assignment of responsibilities for a minimum daily/weekly job site safety and health inspection during periods of work activity level of technical proficiency needed to perform the inspections, proof of inspector's training/ qualifications.
h. Accident Reporting
i. Plans (programs, procedures) required by the Safety Manual. Based on a risk

assessment of contracted activities and on mandatory OSHA compliance programs, the Contractor shall address all applicable occupational risks and compliance plans. Using the 29 CFR 1926 and/or current and accepted procedures in the EM 385-1-1 as a guide.

j. Risk Management Processes Detailed project-specific hazards and controls shall be provided by a Job Hazard Analysis (JHA) for each major phase/activity of work, including but not limited to work involving confined space, fall protection, trenching/excavation, crane/rigging, steel erection, hot work, protection of the public, scaffolding, and other activities that involve high risk potential.
k. Jobsite supervisor/superintendent shall sign safety plan and JHA submissions with a final approved copies kept on the jobsite for operational references.
l. Project Evaluation for OSHA's silica standard (29 CFR 1926.1153) focuses on reducing exposure to respirable crystalline silica 12.

Key requirements include:

i. Lowering the permissible exposure limit (PEL) from 250 ug/m3 TWA to 50 ug/m3 TWA.
ii. Implementing engineering controls, respiratory protection, a written plan, proper training, ongoing medical surveillance, and oversight by a competent person.

48.3. Occupational Safety and Health: This contract is subject to Title 29 of the Code of Federal Regulations, Part 1910 "Occupational Safety and Health Standards" and Part 1926 "Safety and Health Regulations for Construction" pursuant to the Occupational Safety and Health Act (OSHA) of 1970 administered by the US Department of Labor, Occupational Safety and Health Administration.

48.4. Emergency Assistance: The Contractor shall post, at the site, telephone numbers for reporting emergencies, including the SNZCBI's Police Station, ambulance, police, fire department, gas utility, electric utility, water/sewer utility, poison prevention aid and hazardous-waste handling. This information shall be posted in a conspicuous location within the project area prior to the start of any work at the site.

48.5. Safety Signs: The Contractor shall post legible accident prevention signs in construction areas in accordance with OSHA standards. Safety signs shall conform to ANSI 235.1 and 235.2 Vehicular traffic control devices, barricades and signals shall conform to ANSI D6.1.

48.6. Report of Accident or Illness: In the event of any accident or illness for which medical assistance is required, any criminal action or any fire, the Contractor shall notify the appropriate authority (Ambulance, Police, and Fire Dept.), Smithsonian Security, SNZCBI Police, and the COTR.

48.7. Emergency Evacuation: The Contractor shall post evacuation routes and facility emergency/self-protection plans at the site, train all employees in emergency procedures, and document such training. In the event of a fire, the Contractor shall immediately activate the alarm at the nearest fire alarm pull station and notify SNZCBI Police. Upon the activation of the audible

alarm, the building will be evacuated. No personnel shall reenter the facility until security personnel signal that the building is safe.

48.8. Contractor Personnel to be Contacted: The Contractor shall submit a written list of emergency telephone numbers and names of persons to contact for the General Contractor superintendent and for each major sub-contractor working on the project site. The initial list shall be submitted to the COTR at the Preconstruction Meeting. The list shall be updated and resubmitted to the COTR as needed.

48.9 The Contractor shall be responsible for implementing the approved Plan throughout the duration of the project and shall promptly update the Plan as conditions or regulatory requirements change. Failure to submit or adhere to the approved Plan may be grounds for suspension of work, withholding of payments, or termination of the contract for cause.

49. TOXIC AND HAZARDOUS SUBSTANCES

49.1. The Contractor shall submit to the COTR for approval, at least ten (10) working days prior to their intended use, a written list of toxic and hazardous substances that will be used on the project. The Contractor shall submit a "Material Safety Data Sheet" similar to OSHA Form No. 20 with a Spill Prevention plan and Response Protocols for these substances to identify the following information:

49.1.1. Product Identification.

49.1.2. Hazardous Ingredients.

49.1.3. Physical Data.

49.1.4. Fire and Explosion Hazard Data.

49.1.5. Health Hazard Data.

49.1.6. Emergency and First Aid Procedures.

49.1.7. Reactivity Data.

49.1.8. Spill Prevention and Response Protocols.

49.1.9. Special Protection Information.

49.1.10. Special Precautions.

49.1.11. Volatile Organic Compound (VOC) Content.

49.1.12 Include fluids used within equipment and vehicles operated on site.

49.2. The Contractor will commit to not using the following toxic and hazardous materials:

49.2.1. Products containing asbestos, urea formaldehyde, polychlorinated biphenyls (PCBs) and/or chlorinated fluorocarbons.

49.2.2. Products containing lead content, including solder or flux containing more than 0.2% lead; domestic water pipe or pipe fittings containing more than 8% lead and paint containing more than 0.06% lead.

49.2.3. Chlorofluorocarbon (CFC)-based refrigerants in new base building heating, ventilating, air conditioning and refrigeration (HVAC&R) systems and comprehensive CFC phase-outs when reusing existing base building HVAC equipment.

49.2.4. The Contractor hereby understands that historic properties may contain pre-existing harmful materials and coatings including, but not limited to, arsenic, lead, dioxide, polyvinylchloride (PVC) and asbestos. Upon discovery of hazardous or toxic materials, the Contractor shall alert the COTR immediately.

49.3 The Contractor shall monitor the use of all toxic and hazardous substances to ensure that exposure to their workers from airborne concentration of, or physical contact with, these substances does not exceed applicable regulatory worker health and safety exposure limits.

49.4. The Contractor shall monitor the use of all toxic and hazardous substances to ensure that exposure to Smithsonian Institution and SNZCBI employees and visitors to airborne concentrations of, or physical contact with, these substances is maintained as low as reasonably achievable. Any equipment or technical measures for this purpose must first be approved by the SNZCBI's Safety Office through the COTR. Under no circumstances shall exposure exceed the established Short-Term Exposure Limit or 50% of the established Threshold Limit Values or Permissible Exposure Limits (whichever is less) as specified in either:

49.4.1. "Threshold Limit Values and Biological Exposure Indices" of the American Conference of Governmental Industrial Hygienists, latest revision, or

49.4.2. Title 29 CFR Part 1910, Subpart Z - "Toxic and Hazardous Substances" of the Occupational Safety and Health Standards, latest revision.

49.5. Exposure of the SNZCBI's animals to air-borne or any other physical contact with any toxic or hazardous substance will be prohibited.

49.6. All toxic and hazardous substances and materials used by the Contractor must be removed from the SNZCBI property upon completion of the project.

49.7. The Contractor shall provide methods, means and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances and pollutants produced by construction operations. The removal of contaminated waste shall follow applicable laws and regulations.

49.8. To achieve compliance with the requirements of this section, administration or engineering controls shall first be implemented whenever feasible. When such controls are not feasible to achieve full compliance, protective equipment or other protective measures shall be

used to keep exposure of all persons within the prescribed limits. Descriptions of equipment or technical measures to be used for this purpose must be submitted to the COTR for approval. The Contractor's requirements for compliance with all applicable Local, Federal, and State regulations remain in force.

49.9. The SI may reject any product that poses a high risk of fire or health hazard to staff, visitors, or the building, based on flammability criteria (e.g., low flashpoint) or established toxicity data (e.g., designation as a human carcinogen).

49.10. The Contractor shall submit, to the COTR, a list of the hazardous materials to be stored on site and the manner in which they will be stored. All containers and storage cabinets shall be approved by the COTR and labeled as to hazard and content.

49.11. The SI has made every effort to identify and to notify the Contractor of hazardous materials that may be encountered during the work. However, if suspected asbestos-containing material, lead-based paint, or other suspected hazardous materials are encountered during demolition or other phases of the work, the work involving the suspected material shall cease and the Contractor shall notify the COTR immediately.

50. PERSONAL PROTECTIVE EQUIPMENT

50.1. Personal protective equipment for eyes, face, ears, nose, head, extremities, and/or full body shall be provided, used, and properly maintained by the Contractor whenever necessitated by reasons of hazards encountered in a manner capable of causing illness, injury, or impairment in the function of any part of the body.

50.2. Persons required to use personal protective equipment shall be thoroughly trained. Training programs shall, as a minimum, meet OSHA and EPA requirements where applicable. The Contractor shall submit proof and criteria for employee training as requested.

51. BARRICADES, BARRIERS, AND WALKWAYS

51.1. The Contractor shall provide safety barricades in accordance with the District of Columbia Building Code and applicable OSHA regulations. The Contractor shall also provide barricades, subject to approval by the COTR, to deter passage of persons and/or vehicles into construction areas as specified or necessary.

51.2. The Contractor shall install temporary barriers, in a manner satisfactory to the COTR, to contain and secure the site from unauthorized entry and to minimize the adverse effects of noise, dust and vapors generated by construction activities on surrounding areas. Barriers shall be constructed of pressure-impregnated fire-retardant treated wood, with fire-retardant 6-mil polyethylene, as necessary. Submit all product data to the COTR for review and approval. Also see article 35. Staging, Storage and Work Areas in this specification section.

51.3. If the work interferes with public or employee access to the facility or parts of the facility, as determined by the COTR, the Contractor shall provide personnel barriers and signage to create easily identifiable, accessible (to people with disabilities) walkways around the work. Signs shall be posted at decision points to prevent unnecessary travel along changed routes and to dead ends. The barriers shall be erected and dismantled in phases so that a clear route is always available. The COTR and Contractor personnel shall have access through the barriers to the work areas. The Contractor may use hardware on the barrier doors to prevent entry by unauthorized persons.

51.3.1. Interior barriers shall be of standard drywall partition construction, painted and terminated at the underside of the existing ceilings. All requirements for fire protection shall be maintained.

51.3.2. Exterior barriers shall be of dimensional lumber and plywood, painted on both sides, and supported to prevent overturning. Barriers shall be repainted and maintained as necessary to remain in good condition as long as they are required.

51.4. Unless specifically indicated otherwise, barricades, barriers and associated signs shall be removed upon completion of the Work. The Contractor shall coordinate the dismantling and removal with the COTR.

52. EXISTING FIRE PROTECTION SYSTEMS

52.1. During the course of the Work, all existing smoke and heat detectors and sprinkler heads must remain operable. Coverings may be applied to protect them from spray coatings or other hazardous conditions only during the actual operations. Coverings must be removed immediately after the operations have concluded. Damaged detectors and sprinkler heads shall be replaced immediately by the Contractor at no additional cost to the Smithsonian Institution. The Contractor shall test replaced detectors and sprinklers after installation to the satisfaction of the COTR.

SECTION J – SECURITY REQUIREMENTS

53. GENERAL SECURITY REQUIREMENTS

53.1 The Contractor's personnel must comply with security requirements imposed by the National Zoological Park, including any necessary security clearances. Failure to inspect the site or obtain knowledge of security regulations shall not relieve the Contractor from security requirements or from performance of any part of the work.

53.2. Fourteen (14) days prior to the start of work on the site, the Contractor, after receiving the Notice to Proceed, shall submit to the COTR for approval, a list of the names and addresses of all employees and subcontractor employees who will be working on the site. The list shall identify the Prime Contractor and each subcontractor and trade. It shall be updated as necessary to accurately identify all workers who will be working on the site during the project.

53.3. Provide at the Preconstruction Meeting the name and telephone number of the Contractor's Superintendent and authorized alternate individual who can be reached on a 24-hour basis.

53.4. Notify the COTR prior to disturbing any alarm wiring, devices, systems, etc. Planned disturbances will be coordinated at least three (3) working days in advance of when the work is scheduled. Any alarm wiring, devices or systems that are disturbed for any reason must be reported to the COTR within five (5) minutes of the occurrence. The COTR will determine the procedures for repairing the damage and who will perform the repair work. The Contractor will bear the cost of such repairs.

53.5 The contractor shall provide adequate security to prevent the presence of unauthorized persons on the work site area, and to keep doors secured when not in actual use to ensure the integrity of the barrier as well as for the property security.

53.6. The Contractor is prohibited from hunting, collecting, or feeding animals on Smithsonian property.

53.7. The Contractor is prohibited from feeding, petting, or harassing any SNZCBI animal(s).

54. IDENTIFICATION BADGES

54.1 Key personnel may apply for an SI issued security badge with COTR's approval.

55. SECURITY OF TEMPORARY OPENINGS

55.1. Any temporary opening in the building perimeter or between non-public and public interior spaces must be closed and secured with means acceptable to the COTR at the end of each workday. A clear and safe path shall be maintained at all times to allow visitors entrance into the National Zoological Park and its buildings. The Contractor shall secure his facilities and equipment during non-working times at his own expense. Authorized Smithsonian personnel shall have access to the work site.

56. EXISTING BUILDING ALARM SYSTEMS

56.1 Contractor and COTR shall review work plans prior to starting work to identify alarms and notifications that will be impacted by the scheduled work.

56.2 COTR shall approve all modifications and adjustments to inactivate notifications.

57. SNZCBI POLICE OFFICER DUTY CHARGES N/A

SECTION K - SCHEDULES AND PAYMENTS

58. SCHEDULE OF VALUES

58.1. The Contractor shall submit, to the COTR, a schedule of estimated values of all parts of the work. The breakdown of costs on the Schedule of Values shall follow the divisions used in the project specifications and shall reflect major items and groups of items shown on the Contractor's project schedule. All values shall be in US dollars.

58.2. Wages: The contractor shall verify wages and comply with regulated wage scales, i.e., Davis-Bacon, Service Contract Act, etc.

59. SCHEDULING & PAYMENTS / CRITICAL PATH METHOD

59.1. CPM Scheduling: The work under this project will be scheduled and reported by the Contractor using the Critical Path Method. Submit Project Schedule in both PDF format and original scheduling software format. The approved Project Schedule(s) shall be used by the Contractor for planning, organizing, executing, and directing the work; for monitoring and reporting progress; and for requesting payment for work completed. All costs shall be identified in US dollars.

59.1.1. Order and Inter-Dependence of Activities: The Critical Path Method will be followed to show the order and interdependence of activities and the sequence in which the work is to be accomplished. Each activity shall be tied to all activities that must logically precede or follow it, and all paths shall be continuous through to completion date(s).

59.1.2. Work Breakdown Parameters for Activities: The activities shown on the network diagram shall include construction activities, submittal processing by the Contractor, submittal processing by the Smithsonian, procurement activities for major equipment, fabrication of special materials and equipment, installation of special materials and equipment, inspections, and tests. All field activities that affect progress toward contractually required dates for completion of all or parts of the Work shall be shown. The level of detail shall be such that the duration of any activity will be no longer than ten (10) working days and no activity will have a dollar value exceeding $30,000, except as allowed by prior and specific approval of the COTR. All aspects of the contract activities are to be identified and priced accordingly in the proposal. This is to include, but shall not be limited to, separate pricing for bonds, insurance, CQC related work, etc. As-built drawings and all closeout requirements shall be line item priced.

59.1.3. Cost-loading of Activities: The Project Schedule shall include a dollar value (cost) for each work activity. The cost shall include labor, materials, equipment, small tools, incidentals and a prorated portion of overhead and profit. The sum of all activity costs shall be equal to the total Contract Price. Each activity cost shall be coded with a cost code corresponding to a line item on the Schedule of Values.

59.1.4. Computer Software: The Contractor shall use a computerized CPM scheduling software designed for use on MS computers. The name of the software proposed for use shall be submitted to the COTR, along with literature about the program's capabilities, functions, and operations, demonstrating that the requirements of the entire section entitled "Scheduling of the Work / Critical Path Method" can be met.

59.2. Required Schedules: The Contractor shall prepare and submit a Preliminary Project Schedule, Complete Project Schedule, Condensed Summary Schedule, Progress Schedules, and Recovery Schedules as described below.

59.2.1. Complete Project Schedule: Within 14 calendar days after receipt of Notice to Proceed, the Complete Project Schedule shall be submitted to the COTR for review and approval. The Contractor's submission of the Preliminary Project Schedule shall include one (1) hard along with a PDF and Native File Copy.

59.2.2. Condensed Summary Schedule: Along with each copy of the Complete Project Schedule, the Contractor shall submit to the COTR for approval, a condensed summary version consisting of not more than 250 activities summarizing major work elements.

59.2.3. Progress Schedules: Each month, the Contractor shall prepare a Progress Schedule by inputting all information regarding actual start and actual finish dates, projected through the end of the month, into the computerized Project Schedule. Complete discussion of this requirement is contained in the section "Reporting Progress and Applying for Payment."

59.2.4. Recovery Schedule: If the work falls substantially behind the approved Project Schedule the COTR may require the Contractor to submit a Recovery Schedule in accordance with the Construction Contract Clauses paragraphs relating to "Commencement, Prosecution and Completion of Work." Upon request, the Contractor shall submit a Recovery Schedule to the COTR for approval within ten (10) working days. The requirements set forth herein in the sub-paragraph entitled "Complete Project Schedule," shall apply to all activities shown on the Recovery Schedule.

59.3. Changes Related to Requests for Proposals: For all proposals involving requests for time extensions or other significant changes to schedule, the Contractor shall submit a listing of all the activities affected, added, or deleted (by node numbers). The effect in time and money shall be described for each activity. If, in the opinion of the COTR, the proposed change may impact the completion date(s), the Contractor shall submit a diagram of that portion of the network schedule affected by the changes, along with standard reports for analysis.

59.3.1 Diagrams and reports submitted to illustrate the impact of a proposed change shall show the necessary revisions to activities, along with their costs, durations, and trade responsibilities. Failure to submit such a diagram with a proposal shall constitute a waiver of any claims for time extensions associated with the subject of that proposal.

59.3.2 Modification of activity times shall be agreed to by both the Contractor and the COTR. In the event that agreement on modified activity times cannot be reached, the COTR will direct the specific time adjustments to be entered into the program to determine approved, revised, contract completion dates.

59.4. Response to Application:

59.4.1. Payment shall be made only for progress agreed upon by the COTR, performed on original Contract Work or approved modifications, in accordance with the current, approved Project Schedule. Failure to submit the Application in accordance with the specifications will prevent the processing of payments.

59.4.2. Payments will be issued as identified in the contract documents on record with the Contracting Officer. Any changes of address or requests for wire transfer of progress payments must be made in writing, signed by the Contractor's authorized person, and submitted to the Contracting Officer.

59.5. Reporting Progress and Applying for Payment: Each month, the Contractor shall apply for payment and submit a report of the actual construction progress as follows:

59.5.1. By the 25th of each month, the Contractor and the COTR shall have inspected the work to determine percentages complete for each item, projected through the end of the month. The parties shall attempt to reach agreement on each item, but if they cannot reach an agreement the COTR will determine percent complete.

59.5.2. By the last day of the month, the Contractor shall submit an Application for Payment based on the determined percentages complete for each item. The application shall be submitted in triplicate on the Smithsonian standard Application for Payment form. Each copy of the Application for Payment shall be accompanied by the following:

1. A Progress Schedule identifying the cumulative progress superimposed on the latest revision of the approved Project Schedule. The net progress for the month and applicable dates shall be clearly indicated.
2. A complete set of copies of certified weekly-payroll data for the period.
3. A complete set of monthly progress photos as defined in Article 46 of this Section.
4. A completed monthly waste diversion report.
5. An update to date change order log.

60. ASSIGNMENT OF CLAIMS

60.1. Assignment of Claims are subject to the approval of the Contracting Officer. Any Assignment of Claim or subsequent re-assignment shall meet the requirements of the General Conditions contract clause entitled "FAR 52.232-23 Assignment of Claims."

60.2. All documents for assignments shall be written in the English language and shall be original ink signatures of the Contractor and assignee. All monies shall be identified in US dollars.

SECTION L - PROJECT CLOSEOUT REQUIREMENTS

61. PROJECT CLOSEOUT

61.1. Definition: Project closeout is a scheduled process for fulfillment of remaining contract requirements at the end of the project in preparation for final acceptance, final payment, and normal termination of contract, beneficial occupancy, and establishment of the warranty period.

62. SUBSTANTIAL COMPLETION

62.1. Definition: The date of Substantial Completion of a project or specified part of a project is the date, as confirmed by inspection by the COTR, when the construction is at least 95% complete and ready for beneficial occupancy, so that the Smithsonian can take possession of that area or part of the work. Portions of the work that are specified to be phased for completion, areas required for Smithsonian's use prior to completion of the total project or items of work identified by the COTR as necessary for partial beneficial occupancy may be inspected for substantial completion separately from the rest of the Work.

62.1.1. The Smithsonian Institution reserves the right to occupy or install equipment in completed areas of the building prior to substantial completion provided that such occupancy does not interfere with the completion of the work. Such partial occupancy shall not constitute acceptance of any part of the work.

62.2. Request for Substantial Completion Inspection: The Contractor shall submit a written request to the COTR for an inspection to establish Substantial Completion status. This request shall specify areas or parts of the work to be considered and shall include a listing of all exceptions to the request, that is, items not considered to be substantially complete.

62.3. Submission of Operation and Maintenance Manuals: Prior to requesting Substantial Completion Inspection, the Contractor shall submit, to the COTR, electronic PDF format version of manuals for all systems and equipment, as specified in the technical sections of this specification. shall be organized into suitable volumes of manageable size using the divisions of the Specifications as a guide. Each manual shall have a table of contents and shall be assembled to conform to the table of contents with tab sheets locating each subject. The instructions shall be legible and easy to read. The words "Operation and Maintenance Manual," the name and location of the project, project number, contract number, date, and the name of the general contractor, shall appear on the cover sheet. Data shall be specific to the equipment that is installed and reflect all approved changes and substitutions. Manuals shall include, as a minimum, the following data:

62.3.1. Detailed description of each system and each of its components, including layout showing piping, valves, controls, and other components and including diagrams and illustrations where applicable.

62.3.2. Wiring and control diagrams with data to explain detailed operation and control of each component.

62.3.3. Control sequence describing start-up, operation and shut down.

62.3.4. Procedures for starting, operating, and shut down.

62.3.5. Installation instructions.

62.3.6. Maintenance and overhaul instructions.

62.3.7. Lubricating schedule, including type, grade, temperature range and frequency.

62.3.8. Emergency instructions and safety precautions.

62.3.9. On-site acceptance test results for equipment installed under this contract.

62.3.10. Approved product data, shop drawings and system as-builts.

62.3.11. Copies of approved certifications and laboratory test reports (where applicable).

62.3.12. Notarized copies of warranties (originals to be provided as required by "Warranties and Guarantees").

62.3.13. Written instructions for test procedures.

62.3.14. Performance curves and rating data.

62.3.15. Parts list, including source of supply, recommended spare parts and service organization convenient to Smithsonian.

62.3.16. Name, address, and telephone number of each subcontractor who installed equipment and systems, local representative for each type of equipment and each system.

62.3.17. Other pertinent data applicable to the operation and maintenance of particular systems or equipment and/or other data as specified Divisions 2 through 16 of the Specifications.

62.4. Other Prerequisites for Substantial Completion Inspection: The Contractor shall also complete the following prior to requesting inspection for certification of substantial completion:

62.4.1. Testing and start-up of systems.

62.4.2. Installation of all signage, including accessibility related signs, equipment instructions, identification labels and permanent directional signs.

62.4.3. Submission of spare parts, tools and surplus materials as required in technical specifications. Submit to the COTR an MSDS for each surplus material that contains toxic or hazardous substances. Surplus materials that the SI determines not to retain shall be removed and properly disposed of by the Contractor according to all applicable regulations.

62.4.4. Scheduling of training sessions for Smithsonian personnel.

62.4.5. Removal of all waste, rubbish and temporary facilities and services. Means of access to all areas of the work to be inspected by the COTR shall be maintained.

62.4.6. Disposition of samples and mock-ups not incorporated into the work.

62.4.7. Arrangement for permanent utility connections and billing responsibility transfer to Smithsonian's Office of Facilities Management and Reliability (OFMR).

62.4.8. Arrangement for transfer of security responsibility for the project site and changeover of locks by Smithsonian's Office of Protection Services (OPS).

62.4.9. Hazardous Waste Disposal: Submit copies to the COTR of the following hazardous waste records for hazardous waste generated on SI property and disposed of by contract personnel.

1. Hazardous Waste Manifests
2. Notification and Certification Forms
3. Material Profile Sheet or characterization
4. Container Content Sheets
5. Certificates of Disposal

62.5. Scheduling of the Substantial Completion Inspection: Within seven (7) calendar days after receipt of the Contractor's written request, the COTR will either schedule an inspection or advise the Contractor of work that must be completed or prerequisites that must be met prior to scheduling the Substantial Completion Inspection. In that case, another written request for Substantial Completion Inspection must be submitted when all requirements have been met.

62.6. The Substantial Completion Inspection: The Substantial Completion Inspection will be performed by representatives of the Smithsonian Institution led by the COTR. During the inspection, the COTR will prepare a punch list of deficiencies in the work. If the punch list becomes too extensive the COTR may cancel the inspection and require additional work to be performed for a repeat inspection.

62.6.1. For satisfactory inspection results, the COTR will issue the written punch list to the Contractor as soon as possible after the inspection. Items on the punch list must be completed prior to final acceptance of the total project work.

62.6.2. For unsatisfactory inspection results, the COTR will, within three (3) calendar days, give written notice to the Contractor that the Work or portion of the Work is not substantially complete in accordance with the contract documents and therefore does not meet Substantial Completion status. Requests for re-inspection shall meet all requirements for the original request for Substantial Completion inspection.

62.7. Punch List: Incomplete contract requirements identified during the Substantial Completion Inspection will form an initial basis for a punch list for final acceptance. The Contractor within the Contract Time must complete all punch list items. If additional days are needed to complete the punch list items beyond the Contract Time, then the Contractor shall submit, prior to the end of the Contract Time, a written request to the Contracting Officer stating:

64.7.1. Items requiring additional time.

64.7.2. Amount of time needed to complete each item.

64.7.3. Reasons why the items cannot be completed by the contract completion date.

63. FINAL COMPLETION AND ACCEPTANCE

63.1. Definition: The date of final completion of a project is the date, as confirmed by inspection by the COTR, when the Work is satisfactorily completed and accepted in accordance with the contract documents, as amended and/or modified.

63.2. Request for Final Completion Inspection: When all items on the punch list have been corrected to the satisfaction of the COTR and additional requirements as described below have been satisfied, the Contractor shall submit a written request for Final Completion Inspection.

63.3. Prerequisites for Final Completion: Prior to requesting the inspection for certification of Final Completion, the Contractor shall complete the following:

63.3.1. Submission of a copy of a prior punch-list stating that each item has been completed or otherwise resolved for acceptance.

63.3.2. Provision of Instructions to Smithsonian Personnel -where instructions to Smithsonian personnel are specified in other sections, furnish, without additional expense to the Smithsonian, the services of competent instructors, who will give full instruction in the care, adjustment and operation of the systems and equipment to designated Smithsonian employees.

1. Each instructor shall be familiar with all parts of the system on which he or she is to give instruction and shall be knowledgeable about the systems' operation and required maintenance. Factory trained instructors shall be employed wherever practical and available.

2. Unless otherwise required or approved, the instruction shall be given during the regular work week after the equipment has been accepted and turned over to the Smithsonian for regular operation. Where significant changes or modifications in equipment are made under the terms of the contract, additional instruction shall be provided as may be necessary to acquaint the operating personnel of the changes or modifications. Unless otherwise stated, at least half of the time allocated for instruction shall be "hands-on," using the actual system installed.

3. Upon completion the Contractor shall obtain written acknowledgment from the COTR that the required instruction was completed.

63.3.3. Posting of operating instructions approved by the COTR for each system and each principal piece of equipment. Include wiring and control diagrams showing the complete layout of the entire system including equipment, piping, valves, and control sequence framed under clear laminated plastic and posted where directed by the COTR. Printed or engraved operating instructions for each principal piece of equipment including start-up, proper adjustment, operating lubrication, shut-down safety precautions, procedure in the event of equipment failure and any other necessary items of instruction as recommended by the manufacturer of the unit shall be attached to or posted adjacent to the piece of equipment. Operating instructions exposed to the weather or wet or humid conditions shall be made of weather-resisting materials or shall be suitably framed and enclosed to be weather protected. Operating instructions shall not fade when exposed to sunlight and shall be secured to prevent easy removal or peeling. The Contractor shall coordinate the location of posted instructions with the COTR.

63.3.4. Provision of equipment demonstrations for each equipment item. The Contractor shall coordinate scheduling of all demonstrations through the COTR.

63.3.5. Submission of original warranties for all products, equipment, and systems.

1. The Contractor shall assemble original warranty certificates or notarized copies of warranty certificates executed by the Contractor, Subcontractors, suppliers, and manufacturers in a tab-indexed, three-ring loose-leaf binder with a durable plastic cover. Provide electronic copy, in PDF format, on CD. The table of contents shall identify the item covered, the location of the item, the date of Substantial Completion, expiration date of the warranty and the supplier, vendor and installing contractor. Duplicate notarized copies of warranties shall be provided as required by "Manuals for Operation, Maintenance and As-Built Product Data."

2. Each warranty certificate or bond shall identify the date(s) for:

(1) Substantial Completion status in accordance with project closeout requirements.

(2) Beginning and ending of the warranty period.

(3) The Contractor shall provide any coincidental product warranty, which is available on a product incorporated in the Work, but for which the warranty is not specifically required by the contract documents.

3. Warranty of Construction: The Contractor shall warrant that the work performed under this contract conforms to the contract requirements and is free of any defect in equipment, materials, design furnished, or workmanship performed by the Contractor or any subcontractor or supplier at any tier. Unless otherwise stated in the technical sections of the Specifications, the warranty of the Work shall continue for a period of one (1) year from the date of Final Completion status. If the Smithsonian takes partial occupancy before Final Completion, then the warranty for that portion shall be in effect for a period of one (1) year beginning on the date of Substantial Completion for that portion of the Work.

4. Response Time for Warrantee Items – For all items under the warrantee period that are deemed by the COTR as essential to the 24/7 operations of the facility, the contractor will provide (at no additional cost to SI) emergency response and corrective actions as required (less than 4 hours). Provide 24/7 contact personal.

63.3.6. Submission of construction progress photographs and negatives, property survey and similar final record information.

63.3.7. Arrangement for change-over locks through the COTR and Smithsonian Office of Protection Services as required for security for Smithsonian occupancy.

63.3.8. Submission of evidence of payment and transfer date of utility company accounts for those utilities previously billed to the Contractor during construction, as necessary.

63.3.9. Submission of evidence that all regulatory agency permits, and code requirements have been completed and recorded, as necessary.

63.3.10. Submission of a signed, written statement that no damage has occurred to the site as documented by the pre-condition survey report.

63.3.11. Final clean up, including:

1. Sweep and dust all surfaces and wash all finished surfaces to appear new and free of all stains, soil marks, dirt, and other forms of defacement.

2. Remove labels that are not required as permanent labels.

3. Clean transparent materials, including mirrors and window/door glass, to a polished condition, removing substances that are noticeable as vision-obscuring materials. Replace broken glass and damaged transparent materials.

4. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of dust stains, films, and similar noticeable substances. Except as otherwise indicated, avoid disturbance of natural weathering of exterior surfaces. Restore reflective surfaces to original reflective condition.

5. Wipe surfaces of equipment clean. Remove excess lubrication and other substances.

6. Remove debris and surface dust from limited-access spaces including roofs, plenums, shafts, trenches, equipment vaults, utility access holes, attics, and similar spaces.

7. Wet-mop concrete and clean other hard-surface floors according to manufacturers' recommendations.

8. Vacuum clean carpeted surfaces and similar soft surfaces.

9. Clean plumbing fixtures to a sanitary condition, free of stains including those resulting from water exposure.

10. Clean project site (yard and grounds) of litter and foreign substances. Sweep exterior paved areas to a broom-clean condition; remove stains, petro-chemical spills, and other foreign deposits. Rake grounds, which are neither planted nor paved, to a smooth, even textured surface.

63.4. Inspection of the Work for Final Completion: Upon receipt of the Contractor's written notice that the work has been completed, the COTR will inspect the work to confirm Final Completion status and acceptance of the work. As soon as possible after inspection, the COTR will either provide written acknowledgment of final acceptance or advise the Contractor of work not completed or obligations not fulfilled as required for final completion and acceptance.

63.5. Application for Final Payment:

63.5.1. Application for Final Payment shall be submitted only after Final Acceptance has been certified in writing to the Contractor by the COTR. Application shall include final labor data and progress schedule update.

63.5.2. Final Payment will be approved when Final Acceptance has been certified, and the following conditions have been met:

1. Certification signed and submitted by the Contractor that all contract requirements, including contract modifications, have been met.

2. Final Release of Claims submitted.

3. Release of assignment of claims or consent of surety submitted, as necessary.

4. All security ID badges, and parking permits returned to Smithsonian.

5. As-Built Record Drawings Submitted: During the progress of the work the Contractor shall maintain a complete and up-to-date set of record prints, open to inspection by the COTR at any time. These prints shall provide a complete and accurate as-built record of all changes to the Contract Drawings, including rerouting of runs, relocation of items or control points and all other modifications. The exact location of pipes, conduit, or other features concealed underground, under concrete, in chases or above ceilings shall be shown by perpendicular dimensions from at least two available landmarks. As-built drawings. The As-Built documents shall be made to scale marked "As-Built" and signed and dated by the Contractor. The Contractor shall furnish an electronic copy of as-built record drawings in PDF and DWG formats to the COTR on the same size as the contract drawings, color highlighted, dated, and marked "As-Built." - PROVIDE ALL DATA ON TWO THUMB DRIVE COPIES

6. As-Built Record Survey of Underground Utilities Submitted: If outside or underground utilities are part of the work, the Contractor shall furnish, to the COTR for approval, an acceptable and accurately dimensioned (GIS) survey showing location and elevation of underground storage tanks, all utility lines for water, gas, electrical, sewer, steam, etc., including valves, connections and changes in direction, as installed under the contract, within the property lines and outside the building walls. Points where utility lines emerge from the building shall be located from lot monuments. The survey shall be made to scale and must be marked "As-Built" and signed and dated by the Contractor. The Contractor shall furnish an electronic copy of as-built record drawings in PDF and DWG formats to the COTR on the same size as the contract drawings.

As-Built Record Specifications Submitted: The Contractor shall provide digitally set of project specifications with annotations to identify any changes made during construction, referencing modification numbers, dates and originators of authorizing letters or memos and other sources of changes. Each sheet shall be marked "As-Built" dated by the contractor in MS Word and PDF Format.

SUBMIT TWO COPIES OF ALL REQUIRED DATA ON TWO THUMB DRIVES

SECTION M – BONDING AND INSURANCE

64.1. Bonding: In accordance with IDIQ Contract requirements.
NOTE: The only acceptable method of bonding for the Smithsonian Institution is (1) Bid bond SF-24; Performance Bond SF-25; and Payment Bond SF-25A (U.S. Department of the Treasury Acceptable Surety); (2) Irrevocable Letter of Credit (issued by a member of the Federal Deposit Insurance Corporation); or (3) Cashier's Check.

64.2 Insurance: In accordance with IDIQ Contract requirements.

Construction and Demolition Waste Tracking Sheet:
To be submitted with each application for payment for the payment period, and at project completion with total waste data and total percentage of waste diverted from landfill for entire project period.

Project Name: _____
Start Date: _____
End Date: _____

Material Description	**Disposal date**	**Diverted from Landfill or incinerator? (Y/N)**	**Diversion method (Recycled, Salvaged, etc.)**	**Hauler or Destination (submit receipts)**	**Volume (in cubic feet)**	**Weight (in tons)**
Land Clearing Debris						
Gypsum Wallboard Scrap						
Cardboard						
Paper goods						
Beverage containers						
Assorted Plastic						
Wood Pallets						
Asphaltic Concrete Paving						
Concrete						
Brick						
CMU						
Lumber						
Plywood and OSB						
Wood Paneling						
Wood Trim						
Miscellaneous Metals						
Structural Steel						
Rough Hardware						
Insulation						
Roofing						
Doors and Frames						
Door Hardware						
Windows						
Non-Window Glass						
Glazing						

Material Description	**Disposal date**	**Diverted from Landfill or incinerator? (Y/N)**	**Diversion method (Recycled, Salvaged, etc.)**	**Hauler or Destination (submit receipts)**	**Volume (in cubic feet)**	**Weight (in tons)**
Acoustical Tile						
Carpet						
Carpet Pad						
Demountable Partitions						
Equipment						
Cabinets						
Plumbing Fixtures						
Piping						
Piping Supports and Hangers						
Valves						
Sprinklers						
Mechanical Equipment						
Electrical Conduit						
Copper Wiring						
Light Fixtures						
Lamps						
Lighting Ballasts						
Electrical Devices						
Switchgear and Panel boards						
Transformers						
Other:						
Other:						
Other:						
				Total Diverted		
				Total Not Diverted		
				Total All Waste = Total Diverted + Total Not Diverted		
				% Diversion Rate* = Total Diverted/Total All Waste		

**Percentage Diversion Rate to be compiled after project completion. Minimum Diversion rate is 50%. Goal Diversion rate is 75%.*

END OF SUPPLEMENTARY CONDITIONS FOR CONSTRUCTION