

Draft Specifications for

HEX Beamline Satellite Building Building 742

July 31, 2018



Brookhaven National Laboratory
Brookhaven Science Associates
Facilities & Operations Directorate
Modernization Project Office
Upton, NY 11973



ESH&Q Risk Level: Moderate (A2-Major)
Designer: B. McCaffrey
Manager: B. McCaffrey

Specification 13699 Rev. 0
FY19
Account XXXXX/XXXXX

STATEMENT OF WORK

In general, work consists of, but is not limited to, construction of an approximately 3,850 square-foot metal-fabricated building and concrete structure for the High-energy Engineering X-Ray scattering (HEX) beamline at the National Synchrotron Light Source II (NSLS-II) facility at Brookhaven National Laboratory (BNL). The building construction will include site/ civil work, concrete foundations, structural framing, ventilation systems, extension of existing fire protection and detection systems, electrical items, acoustical ceiling, doors, windows, and painting. The concrete structure, or “hutch”, construction will include all forming and placing of concrete, as well as installation of wall labyrinths and lead-lined doors.

Notes:

1. All work inside of adjacent Building 740 is in a **Radiological Controlled** area. See Section 000800, Article E for training requirements. The Contractor is required to be escorted by BSA personnel for any preliminary job walk-throughs. Upon award of the Bid Contract, the Contractor must have all pertinent training requirements completed to satisfaction prior to entering Building 740 and the project work area(s).
2. Refer to Section 000800 Article A for critical milestone dates.
3. There are hazards to consider in this area such as, but not limited to, confined space regulations, working in a radiologically controlled area, and working around others working in the same building/facility, etc.
4. See Section 011000 Article D for related work that is not part of this Contract.

DRAWING INDEX

Number	Title	Date
<u>Contract Drawings</u>		
13699-TI	Title Sheet	7/31/2018

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DIVISION 00 – WORK EXECUTION REQUIREMENTS

SECTION 000700 – GENERAL CONDITIONS

A. The General Conditions:

1. Where any article, paragraph or subparagraph in said documents is supplemented by one of the following paragraphs, the provisions of such article, paragraph or subparagraph shall remain in effect and the supplemental provisions shall be considered as added thereto.
2. Where any article, paragraph, or subparagraph in said documents is amended, voided or superseded by any of the following paragraphs, the provisions of such article, paragraph or subparagraph not so amended, voided, or superseded shall remain in effect.

B. Execution and Correlation:

1. All work mentioned or indicated in the Contract Documents shall be performed by the Contractor as part of this Contract unless it is specifically indicated in the Contract Documents that such work is to be done by others.
2. Should the Drawings or the Specifications disagree in themselves, with regard to quality or quantity, the Contractor shall provide the better quality or greater quantity of work and/or materials unless otherwise directed by written modifications to the Contract in accordance with applicable provisions of these Conditions.
3. The Contractor, and all Subcontractors, shall refer to all of the Drawings, including those showing primarily the work of the mechanical, electrical and other specialized trades, and to all of the Sections of the Specifications, and shall perform all work reasonably inferable therefrom as being necessary to produce the indicated results.
4. All indications or notations which apply to one of a number of similar situations, materials or processes shall be deemed to apply to all such situations, materials, or processes wherever they appear in the Work, except where a contrary result is clearly indicated by the Contract Documents.

C. Definitions:

1. As used in these Specifications, the following have the meaning shown opposite each:
 - a. BSA – Brookhaven Science Associates, operator of Brookhaven National Laboratory, and its authorized representatives of various Divisions and Departments.
 - b. FOD – BSA's Facilities & Operations Directorate.
 - c. MPO – BSA's Modernization Project Office and its authorized representative.

- d. PPM – Procurement and Property Management Division and its authorized representative.
 - e. BNL Site – Land occupied by Brookhaven National Laboratory, in Brookhaven Township, Suffolk County, New York.
 - f. Site – Immediate area of BNL Site assigned to Contractor for performance of work.
 - g. Work or Project – Includes but is not limited to all labor, materials, tools, and equipment required and reasonably inferred by Contract to complete all construction.
 - h. Contractor – Person or entity identified in Lump Sum Contract and responsible for completion of all work.
 - i. Subcontractor – Person or entity directly contracting with Contractor including one who furnishes material worked to a special design according to Drawings and Specifications, but not including one who merely furnishes materials not so worked.
2. Wherever the terms "shown on drawings" are used in the Specifications, they shall mean "noted", "indicated", "scheduled", "detailed", or any other diagrammatic or written reference made on the drawings.
 3. Wherever the terms "Provide" or "Provided" are used in these Specifications, they shall mean "FURNISH AND INSTALL". The term "Furnish" shall mean "to fit out and/or supply" material required for project use. The term "INSTALL" shall mean "set", "connect", "erect", "apply" or to "otherwise fix into position for use".
 4. Wherever the terms "material" or "materials" are used in the Specifications, they shall mean any "product", "equipment", "device", "assembly" or "item" required under the contract, as indicated by trade or brand name, manufacturers' name, standard specification reference or other description.
 5. The terms "approved" or "approval" shall mean the written approval of MPO.
 6. The terms "directed", "required", "permitted", "ordered", "designated", "prescribed" and similar words shall mean the direction, requirement, permission, order, designation or prescription of MPO; the terms "approved", "acceptable", "satisfactory" and similar words shall mean approved by, acceptable or satisfactory to MPO; and the terms "necessary", "reasonable", "proper", "correct" and similar words shall mean necessary, reasonable, proper, or correct, in the judgement of MPO and/or BSA.
 7. "Piping" includes in addition to pipe or tubing, all fittings, flanges, unions, valves, strainers, drains, hangers and other accessories relative to such piping.

"Concealed" means hidden from sight in chases, furred spaces, shafts, hung ceiling, embedded in construction or in crawl spaces.

"Exposed" means not installed underground or "concealed" as defined above.

"Invert Elevations" means the inside bottom of pipe.

"New" shall mean manufactured within the past twenty-four (24) months and never before used.

D. Review and Intent of Contract Documents:

1. The Contractor shall, prior to starting the work on any single portion and at frequent intervals during the progress of the work, carefully study and compare the General Documents, General Conditions, Drawings, Specifications, Addenda and other Contract Documents and shall at once report to MPO any error, inconsistency or omission he may discover.
2. Any necessary change shall be ordered as provided in the General Terms and Conditions Article titled CHANGES, and Section 012600.

E. Specifications and Standards:

1. Applicable codes and standards for material furnished and work installed shall include all state laws, local ordinances, requirements of governmental agencies having jurisdiction, and applicable requirements of the latest editions of the following codes and standards including but not limited to:

ADA	Americans with Disabilities Act
BSA ES&H	BSA Environment, Safety and Health Standards
BSA RCM	BSA Radiation Control Manual
NYS DOT	New York State Department of Transportation, Office of Engineering, Standard Specification, Construction and Materials.
NEC	National Electrical Code
OSHA	Occupational Safety & Health Administration
EPA	Environmental Protection Agency
CFR	Code of Federal Regulations
FED-STD	Federal Standard
FS	Federal Specification
ASSE	American Society of Sanitary Engineers
NFPA	National Fire Protection Association NFPA-101.
NYSBC	Building Code of New York State
NYCRR	New York State Codes, Rules and Regulations
UL	Underwriter's Laboratories
NEMA	National Electric Manufacturers Association
ASHRAE	American Society of Heating, Refrigeration and Air Conditioning

ASME	American Society of Mechanical Engineers
ANSI	American National Standards Institute
ASA	American Standards Association
AWWA	American Water Works Association
NBS	National Bureau of Standards
FM	Factory Mutual
SCDH	Suffolk County Department of Health
ASTM	American Society for Testing and Materials

In case of conflict, MOST STRINGENT codes will govern.

2. Where specific performance requirements are listed herein, it is the intent of this Specification that all manufacturers, fabricators, suppliers, installers, contractors, subcontractors, specialty and sub-subcontractors will provide services satisfying these requirements whether mentioned by trade or manufacturer's name or submitted for approval as a substitute.
3. Where no explicit quality or standards for materials or workmanship are established for work, such work shall be of such quality consistent with industry standards and of the construction quality established for the Project generally. Conform to specified manufacturer's published specifications and installation instructions unless otherwise specified or indicated.
4. Meet requirements of BSA Standards-Based Management System <http://public.bnl.gov/docs/sbms/default.aspx> ; ES&H Standards and other applicable SBMS standards, and all other codes and standards specified. In cases of conflict, the standard providing the greater protection shall govern.
5. BNL is an ISO 14001 certified laboratory. It shall be the duty and the responsibility of the Contractor and his subs to comply with the BSA standards and procedures in the area of environmental control, hazardous waste generation, spill prevention, and all other standards specified herein.
6. Copies are available for reference at MPO.
7. Volatile Organic Compounds (VOC's) and their emissions are controlled under the New York Codes, Rules and Regulations of the State of New York. Architectural surface coatings must comply with 6NYCRR Part 205. Coating lines must comply with 6NYCRR Part 228.
 - a. For the purpose of the BNL location, Nassau, Suffolk, Westchester and Rockland Counties fall under the compliance rules of the New York City metropolitan area.
 - b. All coatings and coated products to be used in the work, shall comply with the appropriate rules and regulations.

8. Federal agencies, to the extent practicable, are required to amend procurement practices so as to minimize the purchase of products manufactured with ozone depleting substances. The Contractor shall, therefore, provide materials that use low or non-ozone depleting substances during their manufacture and/or installation. Materials that do not comply shall be identified in the contractor's submittal for approval.
9. Federal agencies, to the maximum extent possible, are required to use recovered materials in construction products and manufactured materials. Specific products using recovered materials are covered within the applicable Specification sections.

F. Drawings:

1. Drawings are generally done to scale as noted. Contractor shall not, however, scale the drawings for establishing dimensions and/or layout. Scaling of drawings by Contractor shall be at Contractor's own risk. Dimensions indicated on the documents shall be used. Request clarification if discrepancies noted.
2. Drawings of existing buildings and building site are available for reference at MPO office.
3. The Contractor shall not perform any portion of the Work at any time without Contract Documents or, where required, approved Shop Drawings, Product Data or Samples for such portion of the Work as stipulated in BSA LLC, General Terms and Conditions for Construction and Labor Hour Agreements, Article titled: Clauses Incorporated by Reference, "Specifications and Drawings for Construction."
4. Should the Contractor elect to release work for purchase, fabrication or installation without these submittal approvals, it shall be at his own risk and expense should the work be subsequently disapproved.
5. The Contractor shall give MPO timely notice of any additional design drawings, specifications, or instructions required to define the Work in greater detail, or to permit the proper progress of the Work and MPO will provide such information with reasonable promptness so as to cause no delay in the Work.
6. Whenever the Contractor proposes a substitution for a specified item of the work, MPO may require said Contractor to produce reasonable evidence that a material meets such requirements, such as certified reports of past tests by qualified testing laboratories, reports of studies by qualified experts, or other evidence which, in the opinion of MPO, would lead to a reasonable certainty that any material used, or proposed to be used, in the Work meets the requirements of the Contract Documents. All such data shall be furnished at said Contractor's expense. Coordinate with Section 016000 "Product Requirements".

7. The Contract Documents are intended to produce a facility of consistent character and quality of design. All components of the project including visible items of mechanical and electrical equipment have been selected to have a coordinated design in relation to the overall appearance of the project. MPO shall judge the design and appearance of proposed substitutes on the basis of their suitability in relation to the overall design of the project.

G. Work Permits:

1. The work of this Contract is controlled by the requirements of BSA Standards-Based Management System <http://public.bnl.gov/docs/sbms/default.aspx> ; “Work Planning and Control for Experiments and Operations,” latest edition, and Facilities and Operations Procedure DF-ESH-008 “Construction Work Planning and Control Systems.”
2. A Work Permit, prepared by BSA, will identify the anticipated hazards and controls associated with the work. The Contractor shall participate in the review of this permit to identify their means and methods as well as any hazards that may be caused by the work. The final permit shall be signed by BSA and the Contractor and shall be posted or on hand at the project site. By signing the Work Permit, the Contractor indicates that they understand the hazards of the job and the permits required.
3. The Work Permit shall be used by the Contractor and all subcontractors to develop task-specific PHAs for the work.
4. All Contractor personnel, Subcontractor, and lower tiered contractors shall sign the work permit to acknowledge that they have been briefed.
5. The Contractor’s Safety Representative shall brief all visitors and BNL trades to the site on the applicable sections of the work permit and all current work activities and their safety requirements.
6. A Tool Box Meeting shall be held by the Contractor to discuss any requirements noted on the Work Permit with all Contractor and Subcontractor personnel assigned to the Work. A Tool Box Meeting Log shall be kept on the Job Site and be available for auditing by BSA.

H. Notice to Proceed:

1. The Contractor shall not knowingly, without formal notice from MPO, prematurely commence operations on the BNL Site. The Notice to Proceed will not be issued by MPO prior to receipt, by PPM, of all required bonds and insurance documents, and prior to receipt, and approval by Modernization Project Office, of the required Safety Plan.
2. The Notice to Proceed will be issued, in accordance with Article 1 above, along with a BSA Integrated Safety Management (ISM) Flowdown Form. This form shall be completed by every Subcontractor to be used on this Project and returned to MPO, by the Contractor, as part of the requirements of Section 013000, “Submittal Procedures,” Article A.2, “Administrative Submittals.”
3. Work may proceed, however, in the preparation and submittal of required submissions and the ordering of materials and equipment that do not require prior approval by MPO.

I. Use of Site:

1. The right of possession of the premises and the improvements made thereon by the Contractor shall remain at all times in BNL. The Contractor's right to entry and use thereof arises solely from the permission granted by BSA under the Contract Documents.
2. The Contractor shall confine the use of the premises for all purposes, to the areas occupied by the construction and related storage areas as and if shown.
3. The Contractor shall repair or replace any existing trees, shrubbery or other planting damaged by operations and/or workmen employed in performance of the contract.
4. It shall be the responsibility of the Contractor to provide necessary and required security measures to safeguard the construction site and materials, both stored and installed, from theft, vandalism and intrusion of unauthorized persons during all working hours, non-working hours, weekends and holidays.

J. Work Hours:

1. The Contractor shall perform all work on weekdays, excluding BSA holidays, between 8:00 a.m. and 5:00 p.m., unless otherwise specified or approved. The BSA holiday list is available upon request.
2. Notify MPO 24 hours in advance to request approval to work outside of the above working hours. Advise MPO of all planned activities and submit a list of all contractor and subcontractor employees who are expected on-site during the off-hour period. All employees working during off-hours must possess a valid BSA contractor employee photo identification badge.
3. If off-hours work request is approved, MPO will notify BNL Police Headquarters and the Main Gate of the days and hours that work is planned. Failure to notify MPO will be cause for BNL Police to deny access to the job-site.

K. Contractor Training Requirements:

1. Contractor Vendor Orientation

- a. All Contractor and Subcontractor employees are required to attend BSA's Contractor/Vendor Orientation Training (CVO) on their first day on site. CVO is a one and one-half (1-1/2) hour overview of BSA and OSHA safety requirements. The orientation is offered 8:30 a.m. weekdays in Building 902. The CVO procedure is as follows:

- 1) Each worker should be individually registered online using the Guest Registration form on the following website: <https://guest.bnl.gov/guestRegist.asp>. Registration is required to be completed at least 1 full business day in advance of arrival for all naturalized U.S. Citizens. Registration for a foreign national (including Legal Permanent Residents) may require anywhere from 7 – 90 calendar days.

- 2) Upon submitting the online form, the worker will receive an email containing a GR Number; this number is only a tracking number. When the submission is fully approved, they will receive another email assigning a final Identification Number. Each worker should bring a printout of their approval email to BNL and present it at the Main Gate entrance to facilitate site access.
 - 3) Upon arriving at BNL, workers are to report to Building 902 for CVO. Upon completion of the orientation, workers must proceed to the Badging Office, Bldg. 400, to obtain the employee identification badge. This safety orientation will be valid for a maximum period of one year. Satisfactory completion will be indicated by issue of employee identification badge.
- b. Any Contractor, Subcontractor and/or worker without proper CVO training cannot perform work or their contractual duties at BNL. Violators will be stopped and dismissed from site until CVO training is satisfactorily completed.

2. Electrical Training

- a. All Contractor, Subcontractor, and lower tiered contractor employees who may be required to “Work On or Near” electrical circuits within the BNL electrical distribution system are required to complete BSA’s Electrical Safety I training course (ES1). This course is available on the Web at <https://www.bnl.gov/training/courses/web> (Contractor shall first register and receive a BSA Guest registration number to access the training webpage. See Contractor Vendor Orientation, Specification Section 000700.K.1.), and is valid training for one (1) year.
- b. In addition to completing the ES1 course, each organization’s electrical work Foreman/ Supervisors must discuss NFPA 70E requirements and specific hazard and risk information with their staff. This job briefing should discuss specific electrical work procedures, protective equipment requirements and departmental contacts at the local application level. BSA can provide a document that can be used as guidance for this discussion. This job level discussion can be informal but a record of this briefing shall be documented.
- c. LOTO training shall be required for all Contractor, Subcontractor, and lower tier contractor employees who “Work on or Near” systems or components requiring LOTO. This training requires an initial BNL classroom course which reviews the requirements and is valid for 1 year. After expiration of the initial course it may be updated yearly on the web. Following the initial classroom or web-based training class, a LOTO Job Performance Measure (JPM) shall be held to determine the workers ability to apply the LOTO correctly with the correct devices. Contractor should review the BSA SBMS Subject Area <http://public.bnl.gov/docs/sbms/default.aspx> on LOTO to ensure that all training requirements are met.

- d. Contractors shall provide LOTO Authorizing Letters of Qualified Workers that he authorizes to “Work On or Near” and perform LOTO. The Contractor shall also complete 3 Testing and Trouble Shooting Permits (TTVM) 1,2,3 for each Authorized electrical worker. The forms are available upon request from the BNL point of contact.
 - e. Contractor and Subcontractor employees who may be required to “Work On or Near” electrical circuits and who have not taken BSA Electrical Safety 1, the web-based BSA Electrical Safety 1, LOTO, proof of training for NFPA 70E briefing, or supplied TTVM permits or Authorizing Letters will not be allowed to perform such work until they have done so.
 - f. All Contractor, Subcontractor, and lower tiered contractor employees that “Work On or Near” electrical circuits shall have taken and passed a CPR and First Aid training program either from the American Heart Association, American Red Cross, or Local 25 IBEW. Proof must be provided to the BNL point of contact.
3. Welding
- a. All Contractors who will perform welding on BNL property shall complete “Electrical Safety for Welders” (TQ-Weld), <https://www.bnl.gov/training/courses/web> (Contractor shall first register and receive a BSA Guest registration number to access the training webpage. See Contractor Vendor Orientation, Specification Section 000700.K.1.). The class is online.
4. At the discretion of BSA, and as BSA recordable activities deem necessary, retraining and/or additional training may be required.
- L. Pre-Construction Meeting:
1. MPO will set up a Pre-Construction Meeting, at which time the ES&H issues, Safety Awareness issues, Submittal procedures, and Site Organization procedures will be addressed. The Contractor's Superintendents, Supervisors and Foreman are required to attend the Pre-Construction Meeting.
- M. Construction Schedule and Notification:
1. Within three (3) weeks after signed Contract, submit, directly to MPO, a detailed work schedule showing the work being completed by the Contract completion date. Coordinate with Section 013000 "Submittal Procedures".
 2. MPO must be notified and made aware of all construction work in progress. MPO will provide appropriate telephone extension numbers for notifications.
 3. When construction has not been previously scheduled, notify MPO Construction Inspector each day before 8:30 a.m. of planned activities.

4. Special scheduling, when appropriate, will be agreed upon at a meeting, set up by MPO, to prepare a rough work schedule. The Contractor shall respond, within one (1) week, with a formal work schedule.
5. When work falls behind schedule due to Contractor's fault or negligence, the Contractor shall increase all labor and overtime to assure completion within schedule.
6. Do not utilize workers or materials which would cause work stoppage on BNL Site.
 - a. Radiation Generating Devices are of special concern. The following industrial equipment, known to contain radiological sources or able to generate radiation, if brought to the BNL Site, require the Contractor to notify the Project Manager, in advance, and require a Radiological Work Permit to be approved prior to their use on site. RWPs require Health Physics review.
 - 1) Radiography Equipment
 - 2) Moisture Density Gauges
 - 3) Soil Density Gauges
 - 4) X-Ray Equipment
7. BSA will utilize all available contractual remedies to enforce schedule compliance. Should the Contractor encounter delays caused by BNL, it is the Contractor's responsibility to promptly notify the contracting officer and to request an extension of the contract compliance date.

N. Contractor Coordination Expectations:

1. Arrange and coordinate work, be responsible for acts and omissions of all parties involved in the work, be responsible for satisfactory performance of all work, ensure that each trade is fully informed of full extent of work required. Work of a trade is not necessarily limited to the Drawing or Specification page describing the work to be done by that trade.
2. Coordinate installation of all equipment and shop fabricated material, including that supplied by BSA. BSA assumes no responsibility for contractual relations between Contractor and other parties.
3. Coordinate and schedule all work with all BSA activities and operations through MPO.

O. Transport and Traffic:

1. Schedule, confine, and perform work, as directed, so as not to interfere with BNL traffic on existing roads, walks, parking and other paved areas. Park all vehicles in designated parking areas. Load and unload vehicles where directed. Comply with all BSA traffic regulations.

2. In transporting materials and equipment, use designated roads and railroad on BNL Site. Obtain information concerning these facilities from MPO. When necessary to maintain work schedule, ship all materials, including Subcontractors' items, from point of origin to BNL Site by direct means equal to, or better than, express service.
3. In transporting radioactive materials and waste, or hazardous waste, a DOE-MCAP approved transporter must perform the transportation. The MPO Waste Management Representative will coordinate all shipments of radioactive materials and waste, or hazardous waste.
4. Shipments requiring a manifest (radioactive or hazardous) shall be prepared by a qualified broker. The broker shall sign as the shipper of record for radioactive shipments, with a qualified BSA Waste Management Representative approving the document. A Hazardous Waste Manifest shall be prepared by a qualified broker and signed by a BSA Waste Management Representative.
5. Obtain property pass through MPO for removal of Contractor's materials and equipment from BNL Site. Schedule removals during specified work hours.

P. Open Flame Operations:

1. It shall be the duty and responsibility of the Contractor performing any cutting or welding to comply with the provisions of BSA Standards-Based Management System <http://public.bnl.gov/docs/sbms/default.aspx>; ES&H Standards, and the National Fire Protection Association's National Fire Codes pertaining to such work. The Contractor shall read and be familiar with the provisions of these standards and codes. The Contractor shall be responsible for all damages resulting from failure to so comply.
2. Notify MPO forty-eight (48) hours in advance of cutting, welding, or similar open flame operations.
3. Provide any required fire watch and take all required precautions where directed.
4. MPO will make arrangements for a Cutting/Welding Permit. No open flame operations shall proceed prior to the issuance of the written Cutting/Welding Permit nor shall work continue after expiration date of permit.

Q. Protection of Property:

1. Contractor shall be responsible for the security of property within the Work Site.
2. Protect, with whatever means and methods required, all new and existing property from damage by and as a result of work in this Contract as approved, including disappearance. Refer to BSA LLC, General Terms and Conditions for Construction and Labor Hour Agreements, Article titled: Contractor's Responsibilities.
3. Repair, refinish, replace and otherwise correct all damage, and replace any missing materials, as directed and approved by MPO.

R. Service and System Interruptions:

1. Do not interrupt service until directed. Notify MPO two (2) weeks in advance of all proposed service interruptions unless otherwise specified or directed.
2. Keep all interruptions to a minimum. Complete all possible prior work and prefabrication, and have all labor and materials on Site, as approved, prior to interruption.
3. Do not modify, disconnect and, in any way, impair fire protection and detection systems without approval.
4. Notify MPO forty-eight (48) hours in advance of all work on fire protection systems.

S. Cutting, Patching, and Penetrations:

1. Cut, drill, alter, remove, and replace all existing construction as required for performance of work. Patch and finish all changed and damaged work to match existing construction as approved.
2. Seal all penetrations through fire rated systems with an approved fire and/or smoke stop material, Hilti North American Fire Stopping Systems, or equal as approved by MPO, capable of maintaining the level of fire protection of the wall, partition, floor or ceiling penetrated.
 - a. Systems selected shall be appropriate for the joint and/or penetration involved, such as floor to floor, wall to wall, floor to wall, head of wall, and whether there is movement or no movement capability.

T. Job Meetings:

1. Job meetings will be held at the job site at least monthly unless otherwise designated by MPO.
2. The Contractor and his field superintendent, and the subcontractors or vendors whose presence is necessary, shall attend job meetings.
3. Decisions, instructions and interpretations agreed upon at such meetings will be recorded in a "Memorandum of Meeting" prepared by MPO and furnished to the Contractor and each attendee for necessary action.

U. Salvage:

1. Salvage is that material and equipment, as defined in the Specifications, to be removed by the Contractor from the Project facility, but is to remain the property of BSA.
2. Remove all specified salvageable material and equipment and pass it through the vehicle radiation monitor. Place, where directed by, and turn over to, MPO, on the BNL Site.
3. Remove all non-salvageable material and equipment and legally dispose of same off the BNL Site.

4. All removed salvageable material and equipment, as defined in the Specifications, shall remain property of BSA.
5. All removed non-salvageable materials and equipment shall pass through the vehicle radiation monitor prior to exiting the BNL site.

V. Construction Waste Management:

1. Waste and demolition materials shall be segregated into disposal categories:
 - a. Radioactive waste is any refuse, solid or liquid, that must be managed for its radioactive content.
 - b. Hazardous waste is any refuse, solid or liquid, that is a by-product of processes/activities that can pose a hazard to health or environment that must be managed for its hazardous nature (usually listed by EPA).
 - c. Mixed waste is any refuse that contains both Low-Level Radioactive Waste (LLRW) as well as hazardous waste.
 - d. Non-hazardous waste is any refuse, other than construction debris, that is considered industrial or special in nature (oil, anti-freeze, etc.). The BSA Standards-Based Management System (SBMS) <http://public.bnl.gov/docs/sbms/default.aspx> contains the full descriptions.
 - e. Universal waste is any battery containing hazardous constituents such as mercury/lithium/lead/nickel cadmium, certain pesticides, as well as mercury-containing thermostats and fluorescent lamps and tubes.
 - f. Construction rubbish and debris is any refuse as a result of the normal construction or earth clearing activity such as packing and shipping materials, discarded lumber and wood materials, metals, insulation, gypsum board, piping, electrical scrap, tree branches, roots, and sweepings.
2. Radioactive waste and mixed waste disposal will be coordinated by the MPO Waste Management Representative, Edward Richards, (631) 344-7251.
3. Hazardous waste and mixed waste shall be disposed of by the Contractor at the BSA Waste Management Facility, or at an approved off-site facility coordinated by the MPO Waste Management Representative.
4. Universal waste shall be disposed of by the Contractor at the BSA Waste Management Facility, or at an approved off-site facility coordinated by the MPO Waste Management Representative.
5. Non-hazardous waste shall be disposed of by the Contractor at the BSA Waste Management Facility, or at an off-site disposal facility approved by BSA.
6. Construction rubbish and debris shall be disposed per Section 017419.

END OF SECTION 000700

DIVISION 00 – WORK EXECUTION REQUIREMENTS
SECTION 000800 – SUPPLEMENTARY CONDITIONS

A. Critical Milestones:

1. This project is one where critical milestones are required to be met. The contract completion date shall be adhered to, as well as any established as critical.
2. Substantial Completion is the stage in the progress of the Work when the Work or a designated portion thereof is sufficiently complete, as determined by MPO in accordance with the Contract Documents, so as to be able to be occupied or utilized for its intended use.
3. Critical dates that must be met are as follows:
 - a. Substantial work completion of all contractual duties on or before July 20, 2020.
 - 1) All scope and services associated with the building construction, concrete hutch construction, and related contract drawings.
 - 2) The Contractor will be required to complete all punch-list items, within four (4) weeks of BSA provided punch list.
 - b. Other work, performed by separate Contracts and organizations, will occur simultaneously or prior to and after this Contract's construction period. Coordination between the Contractor and MPO will be crucial and essential to prevent any work conflicts between the Contractor and others on site. If conflicts occur or are foreseen, the MPO Project Manager shall be notified immediately for resolution.

B. BSA -Supplied Items:

1. BSA will supply certain pre-purchased items; for example, mechanical equipment, as listed herein. Provide support systems to receive the equipment at the project site, and mechanical and electrical connections.
2. BSA will arrange and pay for delivery to the project site in accordance with the Contractor's Construction Schedule, and inspect deliveries with the Contractor for damage.
3. If items are damaged, defective or missing, BSA will arrange for replacement. BSA will arrange for manufacturer's field services, and delivery of warranties and bonds to the Contractor. BSA will account for time to replace items and an extension to the Contractor's construction schedule or contract will be issued dependent upon the time delay anticipated.
4. The Contractor shall designate delivery dates in the Contractor's Construction Schedule and shall receive, unload and handle items at the site. The Contractor is responsible for protecting items from damage, including damage from exposure to the elements, and for repair or replacement of items damaged as a result of his operations.

5. Shop Drawings and Manufacturer's Data will be available at MPO.
6. Check all items in presence of MPO Construction Services Representative to ensure they are complete with all parts and appurtenances, and free from damage. Relocate items from point of delivery on the project site and completely install and connect. Handle all items with care.
7. List of BSA -Supplied items:
 - a. TBD

C. Safety Requirements:

1. All Contractor and Subcontractor employees are required to attend BSA's Contractor/Vendor Orientation Training (see Section 00700, General Conditions).
2. MPO will arrange and ESH&Q Division will provide additional safety instructions, as required. All personnel shall conform to special requirements for wearing thermoluminescent dosimeters (TLDs), personal protective equipment, protective clothing, respirators, and other safety measures as required. TLDs, only, will be provided by BSA at no charge, unless otherwise specified.
3. Refer to Section 000900 for Site and Construction Safety requirements.

D. Industrial Hygiene Monitoring:

1. Refer to Section 000900 for Industrial Hygiene Monitoring requirements.

E. Contractor Radiological Training:

1. All workers entering Bldg. 740 shall have completed at a minimum General Employees Radiological Training General Employee Radiological Training (TQ-GERT).
2. Completion of the course qualifies an individual to receive personnel dosimetry and enter Controlled Areas within Building 740 without a trained escort.
3. The course is a web-based course.

F. NSLS-II Facilities Specific ESH Training:

1. All Contractor and Subcontractor employees are required to complete a NSLS-II Facilities Specific ESH Briefing Training (PS-ESH-FAC-BRIEF).
2. The course is a web-based course.

G. Welding Inspections:

1. Radiographic examination of welds shall not be performed by the Contractor.

2. BSA reserves the right to perform radiographic (x-ray) welding inspections on any welds performed by the Contractor under this contract that appear, after visual inspection, not to comply with the Specifications.

H. Confined Space

1. A portion of this scope of work will be performed within a confined space work area. This is a specific categorization by BSA only. However, the Contractor shall be responsible for assessing the confined space and developing the proper program requirements set forth by SBMS <http://public.bnl.gov/docs/sbms/default.aspx> and BSA ES&H Committee. The Contractor is responsible for ensuring the proper Confined Space program whether it is the Contractor's own program or one following SBMS. See Section 000900 for further information.

I. Schedule of Values:

1. The Contractor shall submit no later than 2 weeks after contract signing the following Schedule of Values breakdown. Separate the Construction Safety costs from the cost figure for General and Special Conditions, and list separately:
 - a. General and Special Conditions
 - b. Bond
 - c. Occupational Medicine Program
 - d. Site and Construction Safety
 - e. BSA Training Requirements
 - f. Shop Drawings & Submittals
 - g. Chilled Glycol System
 - h. Piping & Equipment Insulation
 - i. Glycol System Controls
 - j. Gaseous Fire Suppression System Design and Layout
 - k. Gaseous Fire Suppression System Labor and Material
 - l. Fire Detection System Design and Layout
 - m. Fire Detection System Labor and Material
 - n. As-Built Drawings
 - o. Close-Out Documentation

J. Unit Prices:

1. The Contractor shall submit no later than 2 weeks after contract signing the following unit price breakdown.

2. Unit prices to be used as the basis for changing quantities of work items from those indicated by the contract documents. Upon written instruction from PPM and MPO, the following unit prices shall prevail:

	Work Added	Work Deleted
1. <u>6"Ø grooved steel Sch. 40 piping per linear foot.</u>	\$ _____	\$ _____
2. <u>4"Ø grooved steel Sch. 40 piping per linear foot.</u>	\$ _____	\$ _____
3. <u>3"Ø grooved steel Sch. 40 piping per linear foot.</u>	\$ _____	\$ _____

K. Special Service Interruptions:

1. Refer to Section 000700, General Conditions, Article titled Service and System Interruptions.
2. Service interruptions may occur only when permitted during scheduled shutdowns.
3. Scheduled shutdowns normally occur between 8:00 AM and 4:00 PM Monday through Friday.
4. Notify MPO two (2) weeks in advance of all proposed service interruption unless otherwise specified or directed.
5. All materials, prefabricated where directed, and labor must be on Site before a shutdown will be permitted.
6. Increase labor force, use overtime or both, as directed, to insure completion of work in specified time. Include all overtime costs required to complete installation.
7. Work requiring a power shutdown, must be completely installed, tested, and ready for use in a period not to exceed time specified by MPO.

END OF SECTION 000800

DIVISION 00 – WORK EXECUTION REQUIREMENTS
SECTION 000900 – SITE AND CONSTRUCTION SAFETY

A. General:

1. The Contractor is solely responsible for Construction Safety for the duration of this Contract.
2. All Contractor's operations shall be in accordance with all applicable safety statutes, requirements and standards, including, but not limited to, the Federal Occupational Safety and Health Administration (OSHA), this document, and applicable sections of the Department of Energy's 10 CFR 851 Worker Safety and Health.
3. BSA will not tolerate non-adherence to safety requirements under this Contract. Failure to comply will result in BSA's direction to stop work in accordance with BSA LLC, General Terms and Conditions for Construction and Labor Hour Agreements, Article titled: Compliance with 10 CFR 851 and BSA's Worker Safety and Health Program. Non-compliance could also mean the barring of the violating individuals from the BNL Site. Repeated safety violations may also result in a permanent Work Stoppage under the same Article.
4. A verbal or written Stop Work Order may be imposed by BSA for specific work activities when site conditions are created or exist that pose unacceptable risks or imminent danger. In addition, actions perceived by BSA to be in flagrant disregard of established safety and environmental requirements will be cause for Stop Work actions to be taken. Some examples of justification to take this action, include, but are not limited to the following:
 - a. Workers who have not attended the BSA -required CVO Orientation Safety Seminar prior to work on BNL property.
 - b. Failure to follow Contractor's HASP requirements.
 - c. No BSA -accepted Contractor Safety Representative or Alternate on the work site.
 - d. Failure to develop or implement the required Phase Hazard Analysis (PHA) plans.
 - e. No BSA-accepted Contractor's PHA reviewed by all parties involved with such work prior to commencing activities.
 - f. Contractor performs physical work associated with a safety risk or task not accepted by a PHA plan. This includes the use of materials that require the review of SDS sheets.
 - g. Contractor performs work without proper permits in place beforehand.
5. BSA reserves the right to refuse access to the Project Site, or require immediate removal from the Project Site, any individual violating or alleged to have violated established site safety or Security regulations.

6. All debris, or other material or substances that constitutes a hazard, in any form, liquid or solid, shall be cleaned off floors and other walking/working surfaces daily, (indoors or outdoors), or as often as necessary as conditions change/develop.

B. Health and Safety Plan (HASP):

1. The Contractor shall operate the construction site under this contract in accordance with a HASP that has been accepted by BSA.
2. The Contractor shall prepare and submit a detailed Construction HASP within two (2) weeks of the Contract signing and before the commencement of any physical work on site. The HASP Outline/Template is available on the BNL Construction Safety Subject Area <http://public.bnl.gov/docs/sbms/default.aspx> web page, a copy of the Template can also be requested through the BSA Contract Administrator. It is the Contractor's sole responsibility to fully develop an acceptable HASP for submittal to BSA.
3. The Contractor shall make any revisions and corrections that are noted upon review of the HASP by BSA, and, when accepted, resubmit three (3) printed copies and one (1) electronic copy of the HASP in PDF format to the BSA Technical Representative for distribution.
4. The HASP shall be revised as necessary to reflect changing hazard conditions.
5. While an acceptable HASP is a contractual requirement and BSA undertakes to review the same for compliance, BSA is not obligated to accept such program, and neither the initial review nor any subsequent acceptance of the HASP by BSA shall mean that any omission or error contained in the HASP is waived by BSA or shall relieve the contractor of its obligations to conduct the project in an entirely safe manner and in accordance with all applicable safety statutes, requirements and standards.

C. HASP Document Organization / Requirements:

1. The HASP shall be organized as per the BSA HASP Outline/Template, which provides the minimum requirements for the HASP. The Outline/Template is available on the BNL Construction Safety Subject Area web page, a copy of the Template can also be requested through the BSA Contract Administrator.
2. Cover page shall include name of Contractor, name of Project, Contract number, revision number, date of revision(s), name and signature of Contractor Safety Representative approving the HASP.
3. Table of contents listing all Sections and Exhibits.
4. A brief description of the Project.
5. Organization chart of Contractor and Subcontractor personnel responsible for implementing the HASP and their duties and responsibilities. The chart shall show the reporting relationship and integration of the Safety Representative and Alternate with all personnel,

including top level managers; responsible for implementing the Health and Safety Plan, (HASP), Program. The chart will also show reporting relations of Competent Persons as defined in this section.

6. The HASP shall include but not be limited to the following information and requirements as applicable to the project:
 - a. Compliance Letters
 - 1) The contractor shall submit a letter or certificate of compliance indicating that the Contractor is aware of, and has reviewed, and will comply with, the safety regulations of the OSHA Standards (29 CFR 1910 & 1926), Standard for Electrical Safety in the Workplace (NFPA 70E), DOE Worker Safety & Health Program (10 CFR 851), F&O Directorate's ES&H Procedures, BSA Standards-Based Management System (SBMS) <http://public.bnl.gov/docs/sbms/default.aspx> , and all other federal, state and local environmental, safety and health requirements applicable to the scope of work. (Contact the Contract Administer for access to or copies of applicable F&O and SBMS documents for this contract.) The letter shall be signed by an Officer of the Contractor's company that shall include signatures of all Subcontractors, (continuously updated as they are retained by the Contractor).
 - 2) A copy of one of the following:
 - a) A copy of the company record of past injury, accident, fire and property damage experience, including motor vehicle, for the previous two (2) years, Experience Modification Rate (EMR) from Insurance Broker for previous (2) years, and Environmental Citations/Violations received for the last five years, if any, or
 - b) Contractor's OSHA 300 Logs for the current year and past three years, EMR from Insurance Broker for previous (2) years, and a list of OSHA and Environmental Citations/Violations received for the last three years, if any.
 - b. Statement of Accident Prevention Program: Include a thorough description of the Contractor's safety program including, but not limited to, the following as it applies to this Project:
 - 1) Personal Protective Equipment (PPE): BSA has PPE requirements for work on the Project. Mandatory items shall be worn at all times as determined through the HASP. These PPE requirements include, but are not limited to:
 - a) ANSI Compliant Z87.1 – Eye Protection (Mandatory): Grinding, chipping or other similar particle producing operations shall also require a face shield.

- b) ANSI Compliant Z89.1 1997 – Head Protection (Mandatory): SEI certified hard hats meeting the requirements for Type I Class E protection shall be properly worn and maintained (i.e., no bump caps or cowboy type hard hats).
 - c) ANSI/ISEA 107-2004, Class 2 Compliant High Visibility Reflective Apparel or Safety Vests (Mandatory): All Contractor employees shall wear flame retardant safety vests that have 360-degree reflective visibility; the front of the vest may be fitted with a transparent plastic pocket, flush mounted, to accommodate the BNL photo ID. The Contractor and all Subcontractors shall utilize safety vests with a label on the front and back identifying them as a “Contractor”.
 - (1) A specific variance may be granted for not wearing Hi-Vis reflective vests that involves hot work activities i.e. welding, grinding, brazing etc, This variance must be evaluated and authorized, in writing, by BSA. Vests can be obtained from and are manufactured by:
 - (a) The Industries for the Blind of New York State, 296 Washington Avenue Extension, Albany, New York 2203-5316, Tel. (800) 421-9010, Fax (518) 456-3587.
 - d) ANSI Z41-1991 Compliant Foot Protection (Mandatory): Shoes shall be durable and in good condition without breaks or splits, be at least six inches high, be equipped with a safety toe, and be completely laced or buckled. The shoes shall have defined heels that are no more than one inch high, (sneakers/gym shoes are prohibited). The sole of the footwear shall provide good traction under slippery conditions.
 - e) Minimal Acceptable Clothing for Construction Work (Mandatory): Long pants, short-sleeved shirts, (4-inch sleeve minimum).
 - f) Other PPE as required by Contractor’s scope of work, HASP, OSHA, DOE, and BSA.
- 2) Contractor Safety Representative
- a) The Contractor shall assign an individual employed by the Contractor as Safety Representative, and one (1) Alternate. The Contractor Safety Representative and Alternate will be responsible for safety on the job site whenever work is being conducted. Representative or Alternate shall be immediately available and present on the Construction Site whenever construction activities are being performed, otherwise work will not be conducted. These individuals shall be named in the HASP.
 - b) The Contractor shall submit to BSA for acceptance the documentation that describes the qualifications of the proposed candidates for Safety Representative and Alternate for the awarded scope of work. Prior to

acceptance, BSA may interview the candidate for Safety Representative or Alternate. The submitted documentation shall include for a 5-year period, a description of the duties, responsibilities, accomplishments and safety record of preceding assignments from which the candidate has gained effective safety engineering experience. The Contractor shall not change the accepted Safety Representative or Alternate without receiving BSA's acceptance of the replacement. The Safety Representative and Alternate shall be subject to BSA's continuing acceptance.

- c) A Multi-Discipline Contractor Safety Representative and Alternate shall:
 - (1) have completed the "30-Hour OSHA Compliance for the Construction Industry" Outreach construction safety course;
 - (2) have a working knowledge of the 29 CFR 1926 construction safety standards and 29 CFR 1910 General Industry standards as referenced by the construction safety standards
 - (3) have a working knowledge of the requirements of 10 CFR 851 as they relate to construction safety; and
 - (4) demonstrate the ability to effectively supervise and assure the safety of the type of work for which they will be responsible.
 - d) A Single-Discipline Contractor Safety Representative and Alternate shall:
 - (1) have completed the "30-Hour OSHA" Construction Outreach course, and
 - (2) demonstrate their ability to effectively supervise the type of work for which they will be responsible.
 - e) The Contractor Safety Representative shall maintain a daily site Safety Log for all project site safety matters. All safety-related activities including safety deficiencies and corrective actions taken shall be included in the Log. The Log shall be updated and signed daily reflecting safety issues by the designated Safety Representative. This Log shall be maintained on site and be available for BSA's review. It must also accompany the Safety Representative to Project progress meetings for discussion. Whenever the Safety Representative is not present, the responsibilities of maintaining the safety Log shall be that of the assigned Safety Alternate.
- 3) Competent Person(s)
- a) Specific identification of "Competent Person(s)" is per OSHA. The Competent Person(s) qualifications include, but are not limited to, formal Construction Safety Awareness courses taken, applicable to the nature of this Project, and where applicable, the method of accomplishment in a specific plan, i.e. fall

protection, excavation, etc. Competent Person must have had formal, documented training, have knowledge of existing standards, and have authority to take actions deemed necessary.

- (1) A “Competent Person” certification is not achieved by successfully completing a 10- or 30-hour Construction Outreach Safety training course. It is through specialized courses of instruction for that particular field or topic.
 - (2) A “Competent Person” shall have the authority to stop the work if an unsafe condition develops or an unsafe act is occurring.
- b) Competent Person(s) shall be designated in the HASP.
 - c) Competent Person(s) shall be designated by the Contractor’s Safety Representative to oversee safety matters in an individual group performing work at individual work locations. They may be Subcontractor personnel and have other Project responsibilities in addition to their safety function. They shall be familiar with the work being performed, shall have appropriate OSHA-related training, be familiar with the hazards to be encountered at the particular Work Site, and shall be capable of being designated as the OSHA-defined “Competent Person”.
 - d) An interview may be required with BSA to establish their competency and to secure the BSA’s acceptance/concurrence prior to their assignment as a Competent Person.
- 4) Inspections
- a) A written program to provide for the frequent (daily), written inspections and reporting of job site conditions relating to safety.
 - b) A written program to document corrective actions and follow-up inspections shall be as follows:
 - (1) Inspector to identify item(s) that require corrective action.
 - (2) Inspector to notify Contractor and appropriate BSA parties involved in writing.
 - (3) Contractor to submit proposed corrective action measures to Engineer in writing for approval.
 - (4) Contractor to make approved measures relating to the corrective action and notify inspector upon completion.
 - (5) Follow-up inspection to be performed and reviewed by inspector and documented in writing.

These documents shall be available for inspection by BSA upon request.

- 5) Walking and Working Surfaces
- a) A written program describing the design, maintenance, protection and inspection of walking and working surfaces in compliance with the fall protection requirements of 29CFR1926 Subpart M.
 - b) All workers on a working/walking surface 6 feet or more above a lower level shall be protected from falling by a guardrail system, a safety net system, or personal fall arrest system. This 6 feet requirement also applies to Steel Erection. The other requirements of 29CFR 1926 Subpart R apply to Steel Erection.
 - c) Where a guardrail system is employed, and a controlled access zone has been established for leading edge work, the control line may be used in lieu of a guardrail system along the edge that parallels the leading edge as described in the written and accepted site-specific fall protection program. The program shall include the designation of the “Competent Person”. The Contractor’s “Competent Person” shall have been formally trained in ANSI fall protection standards and safety, and have authority to take actions deemed necessary. See Section on “Competent Person(s)” in this section.
- 6) Contractor/Subcontractor Responsibilities
- a) The Contractor shall include, and shall require the compliance with, all the applicable safety requirements of this contract in all contracts with all tiers of Subcontractors. The Contractor is totally responsible for the safety performance and compliance of subcontractors of any tier.
 - b) Prior to the start of work, a pre-construction meeting shall be scheduled by the Contractor with his subcontractors to review specific safety requirements of the project, including the HASP. The meeting will also include the following:
 - (1) That BSA will not tolerate non-adherence to safety and environmental requirements under this Contract, including the HASP. Failure to comply will result in BSA’s direction to stop work in accordance with the Article titled: Compliance with 10 CFR 851 and BSA’s Worker Safety and Health Program. Non-compliance could also mean the barring of the violating individuals from the BNL Site. Repeated safety violations may also result in a permanent Work Stoppage under the same Article.
 - (2) A verbal or written Stop Work Order may be imposed by BSA for specific work activities when site conditions are created or exist that pose unacceptable risks or imminent danger.

- (3) BSA reserves the right to refuse access to the Project Site, or require immediate removal from the Project Site, any individual violating or alleged to have violated established site safety, environmental, or Security regulations.
- (4) All debris, or other material or substances that constitutes a hazard, in any form, liquid or solid, shall be cleaned off floors and other walking/working surfaces daily, (indoors or outdoors), or as often as necessary as conditions change/develop.

c. Safety Training and Communication

- 1) A written program describing the training employees in the recognition and avoidance of unsafe conditions and in the safety regulations applicable to this Project.
- 2) The conducting of informal “tool box” safety and health training sessions at least weekly for all employees on the worksite. Depending on the size and nature of the project, this may be accomplished in single or multiple sessions and may address different topics for different work crews. Documentation of all “tool box” training sessions shall be prepared by the Contractor and annotated with the date, time, and names of all employees in attendance.
- 3) Provisions through meetings, established contacts, documents or other means, for the mutual exchange of information with Contractor and Subcontractor personnel on:
 - a) Changes in scope of work
 - b) Recognized hazards
 - c) Identified inspection deficiencies
 - d) Future phases of work
 - e) Potential problem areas
 - f) Coordination of crafts/trades
- 4) A written program to ensure that all employees and Subcontractors have been properly trained for the hazards anticipated on this project as specified in the Phase Hazard Analysis. Severe or repetitive safety violations shall be cause for permanent removal from the job site.
- 5) A written program to establish and implement a drug and alcohol-free workplace program.
 - a) A single violation of this program shall result in the offending individual being removed from the job-site and recommendation for participation in an

approved drug abuse assistance or rehabilitation program, and/or reporting to the civil authorities for criminal prosecution. BSA's Contracting Officer shall be notified in writing within 10 days after receiving notice of an employee's or subcontractor employee's conviction under a criminal drug statute for a violation occurring in the workplace. Notification shall include the position title of the employee and the appropriate personnel action to be taken within 30 days under the requirements of this program.

- b) The program shall include ongoing mandatory documented drug-free awareness training, intervention procedures, and program enforcement.
- c) The program shall include pre-hiring and random and post accident drug and alcohol testing.
- d) The program shall identify the individual responsible for implementing this program.

d. Hazard Communication

- 1) A written hazard communication program to inform employees and all sub-contractor employees of known chemical hazards that may exist in the workplace in compliance with OSHA 29 CFR 1910 Subpart Z. This program shall apply to chemicals known to be present in the workplace in such a manner that employees may be exposed under normal conditions, non-routine tasks, or foreseeable emergencies.
- 2) The program shall address labels and other forms of warning, Material Safety Data Sheets (MSDS) and employee information and training, a listing of hazardous chemicals known to be present in the workplace, methods for informing employees of hazards of non-routine tasks, and methods for informing employees and subcontractor employees of hazards they may be exposed to while working on the Project.
- 3) Signs: When the contractor needs to identify an area, process, or piece of equipment as hazardous with a sign, the sign used must be compliant with OSHS requirements for Signal Word, colors, and message as cited in 29CFR1926.200 and ANSI standards incorporated by reference (Z35.1-1968 Figure 1 or ANSI Z535.2-2011 Figures 1 to 13.)
- 4) Tags: When the contractor needs to identify a piece of equipment as hazardous with a tag, the tags used must be compliant with OSHA requirements for Signal Word, colors, and message as cited in 29CFR1926.200 and standards incorporated by reference (ANSI Z35.1-1968 Figure 1 to 4 or ANSI Z535.2-2011 Figures 1 to 8.)

5) Barricades: When the contractor needs to identify an area as hazardous by installing a barricade, the barricade must be compliant with the following BNL Policy:

a) For areas with immediate hazards presenting a threat of death or serious injury, use only the wording: DANGER DO NOT ENTER. Any of the following may be used, but alternative messages or colors are not permitted:

- (1) A red barricade tape printed in white or black lettering: DANGER DO NOT ENTER.
- (2) A red cord with a sign containing DANGER DO NOT ENTER in white lettering on a red background.
- (3) Fencing with a sign containing DANGER DO NOT ENTER in white lettering on a red background.

If the barricade will be left unattended, attach a tag or wording to the sign that describes the hazard, contact information, and date the barricade was installed.

b) For areas with potential hazards or unsafe practices presenting a lesser threat of employee injury, use only the following wording: CAUTION ENTRY REQUIRES PERMISSION. Any of the following methods may be used, but alternative messages or colors are not permitted:

- (1) A yellow barricade tape printed in black lettering: CAUTION ENTRY REQUIRES PERMISSION. Tape is available as a special order from Northern Safety Co. Part #94393.
- (2) A yellow cord with a sign containing CAUTION ENTRY REQUIRES PERMISSION in black lettering on a yellow background.
- (3) Fencing with a sign containing CAUTION ENTRY REQUIRES PERMISSION in black lettering on a yellow background.

If the barricade will be left unattended, attach a tag or wording to the sign that describes the hazard, contact information, and date the barricade was installed.

e. Emergencies: Fire, Medical, Environmental and Accidents

1) A written program for response to emergencies, including emergency notification. The program shall address injury reporting, first aid, notification of BSA emergency and project personnel, and accident and injury investigation. The program shall also address fire protection and prevention, including hot work permits, fire watches, and fire extinguishers, in conformance with 29 CFR 1926 Subparts F and J. The Contractor shall identify and post indoor and outdoor assembly area locations and evacuation routes from the Project Site.

- 2) The Contractor shall have a program to protect the environment, to include spill prevention and response. The contractor is responsible to immediately notify BSA project/safety personnel of all injuries, and to conduct a thorough and timely accident investigation, determine the cause(s), and implement corrective and preventive measures. The Laboratory reserves the right to monitor all such investigations and causal analysis processes for all recordable injuries, and further reserves the right to conduct its own investigations.

f. Excavations

- 1) If applicable, a written program is required describing the design, maintenance, protection and inspection of excavations in compliance with 29 CFR 1926 Subpart P. The program shall include the designation of the “Competent Person”. The Contractor’s Competent Person shall have been formally trained in OSHA excavation standards and safety, and have authority to take actions deemed necessary. See Section on “Competent Person(s)” in this section.
- 2) The Contractor shall submit to BSA for acceptance the documentation that describes the qualifications of the proposed candidate(s) for Competent Person. The program shall ensure all personnel engaged in work within excavations are trained on current project-specific excavation hazards prior to start of each shift.
- 3) The soil at BNL is classified as Class C soil, and the excavation safety program shall comply with the requirements for that soil classification.

g. Concrete and Masonry Penetrations

- 1) If applicable, the Contractor shall ensure safe penetration into or through any existing concrete or masonry surface.
- 2) BSA SBMS <http://public.bnl.gov/docs/sbms/default.aspx> and F&O Directorate’s Policies and Procedures https://fosteq.bnl.gov/FO_Procedures/ shall be followed, including the completion of appropriate Penetration Permits and the provision and use of utility locating/detecting equipment. The Contractor shall provide trained “Authorized Employees” and shall submit, for MPO review and approval, the name and type of the utility locating/detecting equipment to be used, as well as the names of the trained personnel who will perform the locating task with this equipment and who will execute the penetration work.
- 3) Non-aggressive penetrations cannot be executed without first using utility locating/detecting equipment and obtaining approval by MPO.
- 4) Aggressive penetrations cannot be executed without first using utility locating/detecting equipment followed by the completion and approval of a MPO Aggressive Penetration Permit.

h. Electrical Safety

- 1) A program is required certifying the safe operating condition, and assuring the proper maintenance of, permanent and/or temporary light, power and electrical equipment, including protective devices (GFCI) for portable electric tools, in conformance with 29 CFR 1926 Subpart K.
- 2) Working on or near energized electrical circuits will only be allowed when all methods available to perform the work in a de-energized state have been evaluated and determined to be infeasible. Working on or near energized conductors is subject to the restrictions and provisions of the Standard for Electrical Safety in the Workplace (NFPA 70E), and MPO Procedure DF-ESH-102 Electrical Safety https://fosteq.bnl.gov/FO_Procedures/ .
- 3) All Contractor and Subcontractor employees who work on or near energized parts as defined in NFPA 70E shall complete the BSA Electrical Safety 1 Training Course. The course is available on the Web at <https://www.bnl.gov/training/courses/web> (Contractor shall first register and receive a BSA Guest registration number to access the training webpage. See Contractor Vendor Orientation, Specification Section 000700.K.1.), and is valid for one (1) year. In addition to completing this course, each organization’s Electrical Work Supervisor must discuss the “Standard for Electrical Safety in the Workplace” (NFPA 70E) requirements and specific hazard(s) and risk information with their staff. This job briefing shall discuss specific electrical work procedures, protective equipment requirements, and departmental contacts at the local application level. This job level discussion can be informal; however, a record of this briefing shall be documented. The Contractor shall ensure that all employees and subcontractor employees who may be required to “Work On or Near” electrical circuits within the BNL AC Distribution System and all associated equipment are trained and authorized employees. A “trained and authorized employee” is deemed to be an individual who has been qualified in the skills and knowledge related to the service, maintenance, construction and/or operation of electrical equipment and installations, and has received safety training on the hazards involved, including the wearing of the appropriate PPE.
- 4) The Contractor shall provide documentation which clearly indicates the qualifications and training of all employees performing such work.
- 5) All Contractor and Subcontractor employees that “Work On or Near” electrical circuits shall have taken and passed a CPR training program that has been accepted by BSA.
- 6) The Contractor will arrange for the issuance of a “Working On or Near” Permit as required by DF-ESH-102 Electrical Safety https://fosteq.bnl.gov/FO_Procedures/ . The Contractor shall give BSA a minimum of 48 hours notice of any requirement to

“Work On or Near” to allow time for the BSA permitting process. “Working On or Near” operations that only involve testing, diagnostic work, and/or service tasks on equipment for voltages less than 600 Volts AC-to-ground may be covered by a Testing, Troubleshooting, and Voltage measuring Electrical Energized Permit, which may also cover the entire project period up to a maximum of one year. Operations involving “Working On or Near” for voltages greater than 50 Volts AC-to-ground may require a specific “Working On or Near” Permit for each work situation required. Work may only proceed when the “Working On or Near” Permit is completed and all parties performing the work have been informed of the hazards involved and the PPE to be worn. An authorized Supervisor from the Contractor who is performing the work and a BSA-designated Manager must sign the permit before any work can be performed.

i. Mobile Equipment Program

- 1) A program is required certifying the safe operating condition of, and assuring the proper maintenance of, earth-moving equipment, cranes, vehicles and other such heavy equipment if applicable, including an environmental protection spill prevention plan, in conformance with 29CFR 1926 Subparts N and O.
- 2) A Rigging Plan shall be submitted in conformance with 29 CFR1926.251 and the BNL Construction Safety Subject Area as a part of the HASP and in accordance with the conditions noted in the Supplementary Conditions clause, “SHOP DRAWINGS, MANUFACTURERS DATA, AND SAMPLES” whenever this equipment is to be used on Site. Incremental submission of the Rigging Plan is acceptable, but in no case shall be submitted less than four (4) working days prior to any scheduled lift. Acceptance of the Rigging Plan by BSA is required prior to the commencement of any lift.

j. Fall Protection

- 1) If applicable, a written program certifying that all temporary staging, platforms, scaffolding, planking, bracing, scaffold towers and walkway work are to be designed, erected, used, maintained, and dismantled in accordance with OSHA 29 CFR 1926 Subpart L, and BSA SBMS <http://public.bnl.gov/docs/sbms/default.aspx>.
- 2) The Contractor’s Competent Person shall have been formally trained in scaffold standards and safety, and shall assure that all personnel engaged in the erection and/or dismantling of scaffolding meet the definition of a “Competent Person”. See Section on “Competent Person(s)” in this section.
- 3) Scaffolds shall be physically tagged as to their condition and verified by the “Competent Person” on a daily basis, when they are being used. The scaffold tagging system shall include:

- a) Green Tag: To be placed on all scaffolds at all access points by the designated competent person indicating that the completed scaffold complies with all regulatory requirements.
 - b) Yellow Tag: To be placed on all scaffolds at all access points by the designated competent person indicating that the scaffolds are structurally sound, but an accessory such as a handrail cannot be installed due to the location of the scaffold, or the nature of the work to be performed. Other forms of fall protection are required on all yellow-tagged scaffolds.
 - c) Red Tag: To be placed on scaffolds by the designated competent person on scaffolds that are damaged, defective, being constructed or dismantled indicating that no access is permitted by personnel not authorized to erect, dismantle or make repairs to scaffolds and in a visible location, preferably at the access points.
- 4) The Contractor’s scaffold “Competent Person” shall also assure that all personnel working on or from the scaffolds have been trained in the proper procedures and precautions while using the scaffolding. Tool Box training at the Site is acceptable.
- k. Lockout/Tagout Program
- 1) A Lock-Out/Tag-Out program shall comply with OSHA 29 CFR 1926.417 and 29 CFR 1910.147, and BSA’s LOTO Subject Area <http://public.bnl.gov/docs/sbms/default.aspx> .
 - 2) Lock-Out/Tag-Out is the required method of control when performing service, maintenance, or construction around any machinery where personnel could be injured by startup of the equipment or release of stored energy. Sources of energy shall include, but not limited to, mechanical (kinetic/potential), electrical, electromagnetic, chemical, thermal, hydraulic, and pneumatic.
 - 3) Contractor shall provide his own locks in compliance with the BSA LOTO Subject Area, lockout devices, and red tags for Lock-Out/Tag-Out of energy sources(s). A logbook shall also be maintained and kept in a designated area assigned by BSA.
- l. Hot Work (Welding/Cutting & Open Flame Operations)
- 1) Proper cutting/welding permits shall be obtained from the BSA Construction Inspector. The contractor will participate in the review for the permit and comply with all requirements on the permit. Cease operations if permit conditions cannot be met.
 - 2) Requirements of the SBMS Fire Safety Subject Area <http://public.bnl.gov/docs/sbms/default.aspx> shall be observed.

- 3) Hot Work Permits are required for:
 - a) Welding and allied processes;
 - b) Heat treating by use of open flame;
 - c) Grinding;
 - d) Thawing pipe by open flame or resistance from electrical current flowing through the pipe;
 - e) Powder-driven anchors;
 - f) Hot riveting;
 - g) Thermite welding;
 - h) Brazing, braze welding, silver solder and soldering;
 - i) Similar applications producing or using a spark, flame, or heat.
- m. Confined Space Entry
 - 1) When Confined Space Entry is required, the Contractor shall have a written Confined Space Entry Program which complies with OSHA 29 CFR 1910.146 and BNL Confined Space Subject Area <http://public.bnl.gov/docs/sbms/default.aspx> .
 - a) The program shall require the “Competent Person” (as defined by OSHA) to:
 - (1) Establish procedures and practices for safe entry.
 - (2) Have air monitors to check concentration of oxygen, explosive/flammable gases and the specific contaminants of concern (e.g. hydrogen sulfide in sewer utility holes).
 - (3) Test and monitor conditions to identify and evaluate hazards.
 - (4) Prevent unauthorized entry.
 - (5) Station an attendant outside permit spaces during entry.
 - (6) Post procedures to summon rescuers and prevent unauthorized personnel from attempting rescue.
 - (7) Develop a system for preparing, issuing, using, and canceling entry permits.
 - b) Permits are required to include an identification of the confined space, its hazards, a list of authorized entrants, the purpose of their entry, and the date and duration of their permits; the current attendants and entry supervisor; and both the results of tests performed and any measures necessary to isolate the permit space and eliminate or control the hazards. The permit must also describe the acceptable entry conditions, emergency equipment and the means to summon rescue and emergency services.

- c) Authorized entrants into confined spaces must be effectively trained to be aware of any hazards they may face and be able to recognize signs and symptoms of exposure. They must also be familiar with any emergency equipment in the confined space.
- n. Respiratory Protection & Exposure Monitoring
- 1) All work on this Project with regard to, and of, the conditions listed must be done within the occupational exposure limits for Industrial Hygiene hazards set in OSHA 29 CFR 1926, 29 CFR 1910, and ACGIH *Threshold Limit Values*® (see BSA LLC, General Terms and Conditions for Construction and Labor Hour Agreements, Article titled: Compliance with 10 CFR 851 and BSA’s Worker Safety and Health Program). Compliance with the OSHA Permissible Exposure Limits and American Conference of Governmental Industrial Hygienists (ACGIH) *Threshold Limit Values*® shall be determined by representative personnel exposure monitoring and dosimetry conducted by the Contractor and his Industrial Hygienist. Monitoring shall be continuously performed during the total duration of the hazardous condition. The details of the project’s exposure monitoring equipment, methods, and monitoring strategy shall be included in the Contractor’s Environmental, Health and Safety Plan. Conditions that require industrial hygiene monitoring include, but are not limited to:
 - a) Asbestos
 - b) Beryllium
 - c) Working with Chemicals, Adhesives, or Lead
 - d) Release of Silica (grinding, drilling, core boring, jackhammering of concrete, masonry, mortar, etc.)
 - e) Confined Spaces
 - f) Heat Stress
 - g) Carcinogens
 - h) Noise and Hearing Conditions
 - i) RF/Microwave/Non-Ionizing Radiation
 - j) Static Magnetic Fields
 - 2) The Contractor is required to provide qualified monitoring and hazard assessment personnel (per DOE G440.1-3 *Occupational Exposure Assessment*) to conduct all Industrial Hygiene monitoring.

- 3) The Contractor is required to conduct monitoring with calibrated equipment using NIOSH or OSHA approved methods, and to have analysis conducted by an American Industrial Hygiene Association (AIHA) Proficiency Analytical Testing certified laboratory or by National Institute of Standards and Technology (NIST) traceable calibrated direct reading instrumentation. All instrumentation used for surveys shall have been calibrated in compliance with the manufacturer's specification prior to use in the field.
 - 4) Copies of all equipment calibration, field sampling sheets, laboratory analysis reports, and hazard assessment evaluation reports are to be provided to MPO, in accordance with the Shop Drawings, Manufacturers Data, and Samples Section above.
- o. Phase Hazard Analysis Program
- 1) The Phase Hazard Analysis (PHA) shall provide BSA with a defined plan of action for identified hazards and comprehensive prevention methods for exposures to workers, the BNL populous/public, and property. The PHA shall identify the specific tasks to be completed, including access, egress, set-up and breakdown, under all expected or created environmental conditions. It shall include the method of work for completing these tasks, associated work hazards, and the corresponding equipment and methods that will be used to prevent loss to persons or property for all contracted work, including that of Subcontractors.
 - 2) Subcontractors may develop their own PHA's and forward them to the General Contractor for their written approval, who will then forward the PHA's to BSA for acceptance.
 - 3) The PHA shall be used as the basis for Contract coordination items and safety planning discussions in the Construction Management process.
 - 4) BSA requires a minimum of 5 working days to review the Contractor's submitted PHA's.
 - 5) Work shall not proceed on a task until the PHA has been accepted in writing by BSA.
 - 6) Assistance in developing effective PHA's is available from the BSA Construction Safety Engineering Staff.
 - 7) All workers shall comprehend the scope of work and safety instructions required to perform the job. All workers employed by the Contractor and all Sub-Contractors shall acknowledge, in writing, that they have read and understood the HASP and all subsequently accepted modifications and PHAs. If workers cannot read or speak English or are hearing impaired, an interpreter shall be provided by the Contractor to ensure that the scope of work, information regarding hazards

associated with the work-site, and safety requirements are relayed to them in a manner in which they can understand. The interpreter shall sign that he has explained the plan, and shall be at the work-site whenever these workers are on the job. The accepted HASP and all subsequently accepted modifications and PHAs shall be available at the job site to all Contractor and Sub-Contractor employees for review.

p. Sources of Radiation

- 1) Lasers brought onto the BNL site must be reviewed by the BSA Laser Safety Officer. Only lasers which are Class 2, 3A, or 3R, will be permitted on the construction site.
- 2) Only qualified and trained employees will be assigned to install, adjust, and operate laser equipment. Proof of qualification of the laser equipment operator will be available and in possession of the operator at all times. (Name of Contractor) will have the training documentation on file or it will be readily available.
- 3) Areas in which lasers are used will be posted with standard laser warning placards.
- 4) Only those devices labeled as Class 2 or 3a, or 3r (no greater than 5 milliwatts) will be used.
- 5) Areas in which lasers are used will be posted with standard laser warning placards. These can be obtained from the BSA Laser Safety Officer.
- 6) Beam shutters or caps will be utilized, or the laser turned off, when laser transmission is not actually required. When the laser is left unattended for a substantial period of time, such as during lunch hour, overnight, or at change of shifts, the laser will be turned off. Consideration to best mitigate laser beam transmissions to passing motorists will be evaluated.
- 7) When it is raining or snowing, or when there is dust or fog in the air, the operation of laser systems will be prohibited where practicable; in any event, employees will be kept out of range of the area of the source and target during such weather conditions.
- 8) Laser unit in operation should be set up above the heads of the employees, when possible.

q. Occupational Medicine Program

- 1) A written program describing the comprehensive occupational medicine services provided to each of the Contractor employees and subcontractor employees who: work at BNL for 30 or more days in a 12 month period; or work for any length of

time at BNL and are required by statute to be enrolled in a medical or exposure monitoring program. The services shall be provided by an occupational medicine provider (“OMP”) that:

- a) Plans and implements the occupational medicine services
 - b) Is under the direction of a physician licensed in the state of New York.
 - c) Is staffed by health care professionals with valid New York State licenses in their respective professions.
- 2) These services shall be fully compliant with all provisions of Section 8 (“Occupational Medicine”) of Appendix A of the Federal Regulation 10 CFR 851.
 - 3) The contractor shall provide a written acknowledgement signed by the OMP that the medical surveillance and medical certification to be provided will be in compliance with OSHA, DOE or other statutory or contractual requirements, and will be fully compliant with the provisions of Section 8 (Occupational Medicine) of Appendix A of the Federal Regulation 10 CFR 851.

END OF SECTION 000900

DIVISION 01 – GENERAL REQUIREMENTS

SECTION 011000 – SUMMARY OF WORK

A. General:

1. Works to be performed are as indicated in the Contract Documents that consist of the following:
 - a. Drawings titled “HEX Beamline Satellite Building” dated July 31, 2018.
 - b. Form of Contract (Latest Revision)
 - c. BSA LLC, General Terms and Conditions for Construction and Labor Hour Agreements (Latest Revision)
 - d. Specifications for “HEX Beamline Satellite Building”
2. In case of discrepancies within the terms of the specifications themselves, the matter shall be promptly submitted to the Contracting Officer in accordance with BSA LLC, General Terms and Conditions for Construction and Labor Hour Agreements.

B. Project Description:

1. The Project primarily consists of construction of an approximately 3,850 square-foot metal-fabricated building and concrete structure for the High-energy Engineering X-Ray scattering (HEX) beamline.

C. Scope:

In general, work consists of, but is not limited to, site/ civil work, concrete foundations, structural framing, ventilation systems, extension of existing fire protection and detection systems, electrical items, acoustical ceiling, doors, windows, and painting. The concrete structure, or “hutch”, construction will include all forming and placing of concrete, as well as installation of wall labyrinths and lead-lined doors.

D. Work Under Separate Contracts:

1. Other contracts will be let and run concurrently and shall interface with the Contract. The Bidder and the Contractor are responsible for the proper assessment of the information that has a bearing on the scope of work on this Contract and obtaining clarification where necessary.

E. Contractor Use of Premises:

1. Limit use of the premises to construction activities in areas indicated; allow for BSA occupancy and use by the public.

2. Confine operations to areas within Contract limits indicated. Portions of the site beyond areas in which construction operations are indicated are not to be disturbed.
3. Keep driveways and entrances clear at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize requirements for storage of materials.

F. Use of the Existing Building:

1. Maintain the existing building in a weathertight condition throughout construction. Repair damage caused by construction operations. Take precautions necessary to protect the building and occupants during the construction period.

G. Partial Occupancy:

1. BSA reserves the right to occupy and place and install equipment in completed areas prior to Substantial Completion provided such occupancy does not interfere with completion of the Work. Placing of equipment and partial occupancy shall not constitute acceptance of the total Work.
2. Partial Occupational Readiness Review will be executed for each portion of the Work to be occupied prior to total BSA occupancy.

H. BSA-Furnished Items:

1. BSA will provide certain pre-purchased items such as mechanical equipment, as listed below. Provide support systems to receive the equipment, and mechanical and electrical connections.
2. BSA will arrange and pay for delivery in accordance with the Contractor's Construction Schedule, and inspect deliveries for damage.
3. If items are damaged, defective or missing, BSA will arrange for replacement. BSA will arrange for manufacturer's field services, and delivery of warranties and bonds to the Contractor.
4. The Contractor shall designate delivery dates in the Contractor's Construction Schedule and shall receive, unload and handle items at the site. The Contractor is responsible for protecting items from damage, including damage from exposure to the elements, and for repair or replacement of items damaged as a result of his operations.
5. List of BSA furnished items:
 - a. TBD.

END OF SECTION 011000

