SECTION 010150
GENERAL REQUIREMENTS

PART 1 – SUMMARY OF WORK

1.1 DESCRIPTION

A. Work for this project requires the contractor to be responsible for supplying all labor, materials, equipment, utilities, miscellaneous items, freight and delivery and all necessary valid licenses for the work summarized as follows:

1. Remove and replace existing exterior walk-in freezer including shell, floor, mechanical equipment, lighting, access door, equipment disconnects. Replace branch circuit components to include conduit/boxes/enclosures, conductors, overcurrent protective devices that do not function correctly or do not meet most recent NFPA 70 requirements, or as required for new equipment specifications.
2. Salvage existing storage racks in cooler and freezer and re-install in new cooler and freezer.
3. Provide manufacturer load calculations, equipment and material submittals, shop and coordination drawings for approval in accordance with action submittals paragraphs in this SOW prior to procurement of equipment.
   a. Load calculations shall be in accordance with industry best practices and be consistent with the proposed equipment, cooler shell, and stored materials, use, and temperature.
   b. Shop drawings shall include actual dimensions and be coordinated with building constraints.
4. Provide third party electrical inspection in accordance with 010150 1.9A prior to final inspection/acceptance. Electrical inspection shall start at the panelboard powering the branch circuit or feeder supplying the walk-in freezer and terminate at final connection to refrigeration equipment and other cooler/freezer electrical connections.
5. Remove and legally dispose of existing walk-in freezer, refrigerants, equipment, and accessories not re-used for new systems.

1.2 LOCATION

A. This project is located at the Oconaluftee Job Corps Civilian Conservation Center located 4.5 miles from Cherokee, North Carolina in Swain County. The address is 502 Oconaluftee Job Corps Rd, Cherokee, NC 28719. Driving instructions can be obtained from the Center by calling 573-222-3537.

1.3 WORK HOURS

A. Work hours for this project are between 8:00 AM-4:30 PM Monday through Friday.

1.4 USE OF PREMISES

A. Confine constructions operations to immediate area of work. Do not disturb portions of Project site beyond areas in which the Work is indicated.

B. Government will occupy site and buildings during entire construction period. Cooperate with Government during construction operations to minimize conflicts and facilitate Government usage. Perform the work so as not to interfere with Government's day-to-day operations.

C. Keep driveways, parking areas, loading areas and entrances to buildings clear and available to Government, Government's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Government.

1.5 DEFINITIONS

A. The following terms in any combination relating to the installation of products/materials: install, furnish, provide, or similar statements; mean that the contractor is responsible for the procurement and installation of the products unless it is specifically designated as either a government furnished item, supply only product, or spare.

1.6 INCIDENTAL CONSTRUCTION

A. Performance of the specific tasks indicated in the plans and specifications may require incidental construction including that is not specifically included in drawings and specification but not limited to: provision of temporary shoring or supports, installation and subsequent removal of temporary access points, removal and reinstallation or relocation of items not designated for replacement as required for work or equipment clearance or as a precautionary protective measure. Disconnection of supporting or interconnection equipment between different systems and reconnection to new equipment as applicable to specific project requirements; examples include but are not limited to: fire alarm components and interconnection/control for HVAC air handling equipment, cleaning chemical equipment for dishwashers, electric bonding for conductive water piping replacement, etc. In all cases the contractor shall be responsible for removal of temporary works, reinstallation of temporarily relocated items, or reconstruction of items selectively demolished for incidental construction purposes in a neat workman like manner, that matches existing finishes, quality standards, and code requirements unless the Contracting Officer specifically authorizes incidental construction to be incorporated into the finished work or items removed for coordination purposes to not be re-installed or reconstructed. The Contractor shall provide turn-key fully operational and finished installations unless the drawings and specifications specifically indicate otherwise.

1.7 STANDARDS AND CODES

A. All contract work shall adhere to the most recent version of:
   1. All the International Code Council Family of codes (ICC) e.g. International Building Code (IBC), International Fire Code (IFC), and International Mechanical Code (IMC).
   2. All National Fire Protection Association (NFPA) codes and Standards e.g. , NFPA 70: National Electrical Code (NEC), NFPA 1: Fire Code, and NFPA 101- Life Safety Code.
   3. Architectural Barriers Act Standards (ABA or ABAAS).
   4. Product Manufacturer's installation instructions.

1.8 QUALIFICATIONS

A. When applicable to specific contract work items:
   1. Electrical work shall be performed by journey level electricians licensed in the State of contract performance or trainees/apprentices working under the direct supervision of State-licensed electrical supervisors (or State equivalent).
   2. Plumbing work shall be performed by journey level plumbers licensed in the State of contract performance or trainees/apprentices working under the direct supervision of State-licensed plumbing supervisors (or State equivalent).

1.9 ELECTRICAL INSPECTIONS

A. This Federal contract is exempt from State permitting requirements. However, electrical work must be inspected by a third-party Inspector who is either State-licensed or ICC-certified. The Contractor will arrange for the inspection and pay any fees required for the inspection and associated report; arrangement may include completion and submission of load calculations, permit applications, and any other required coordination. The Inspector does not have any jurisdictional authority on Federal projects. The USFS is the jurisdiction having authority. The inspection will be based on the most recent version of the NFPA 70 National Electric Code (NEC) and currently adopted State codes. A list of deficiencies with corresponding code reference is to be provided in a report signed by the inspector. The addressee in the report is to be the Job Corps Center. The Inspector will provide a copy of their current inspection credentials with the inspection report. The Contractor will submit the report to the COR. The CO will determine which deficiency/violations will be enforced for the Contractor to fix.

1.10 WORK RESTRICTIONS

A. Smoking is permitted on campus only in the designated smoking area.

1.11 SCHEDULE OF ITEMS

A. Schedule of Items:

1. Provide pricing for all items listed in the Schedule of Items.
2. Contract award will be made for all Base Items.
3. Optional Items may or may not be awarded, depending on funding availability.

B. Base Items (BI):

1. ***Base Item No. 1 –Replace Walk-in Freezer***

a. Measurement: This item is measured as a Lump Sum quantity.
b. Payment: The contract lump sum price as shown in the Schedule of Items includes all materials, equipment, labor and incidentals to remove existing walk-in freezer and associated equipment and replace with new of the same nominal plan dimensions with refrigeration equipment sized by cooler manufacturer for intended use. Salvage and re-use existing rack system. Replace branch circuit components as required for current code and for new equipment needs. Provide third-party inspection of the electrical work.
c. Deficiencies: #NA.

PART 2 – PROJECT SCHEDULE

2.1 PROJECT SCHEDULE

ITEM*	REQUIRED DUE DATE (calendar days)
Pre-Construction Conference	Within 10 days of Award (virtually)
Bonds	10 days after Award
Notice To Proceed (NTP)	Issued after Pre-Construction Conference (insurance and bonds acceptance required prior to NTP)
Action and Informational Submittals	12 days after NTP (CORs have 12 days to return)
Progress Reports	Every 7 days after NTP is issued.

Closeout Submittals	Prior to CO acceptance of project
Contract Release form and final pay request	10 days after CO acceptance of project

* All items above must be included in Contractor's construction schedule

PART 3 – SUBMITTAL PROCEDURES

3.1 DEFINITIONS

A. Action Submittals: Written and graphic information that requires Government approval.

B. Informational Submittals: Written information that does not require Government approval. Submittals may be rejected for not complying with requirements.

3.2 PROCEDURES

A. Contractor Responsibilities
1. Review each submittal and check for compliance with the Contract Documents.
2. Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.
3. Include the following information on label or cover sheet for processing and recording action taken:
   a. Project name.
   b. Date.
   c. Name and address of Contractor.
   d. Name of manufacturer.
   e. Unique identifier, including revision number.
   f. Number and title of appropriate Specification Section.
   g. Drawing number and detail references, as appropriate.
   h. Date of Contractor's approval.
   i. Statement certifying that submittal has been reviewed, checked, and approved by the Contractor for compliance with the Contract Documents.
4. The Government will not review submittals that do not bear Contractor's approval and will return them without action.
5. Unless additional copies are required for final submittal, and unless the Contracting Officer (CO) observes noncompliance with provisions of the Contract Documents, initial submittal may serve as final submittal.
6. Submittals must be submitted in electronic PDF format. Submit to CO via email or electronic file transfer site.

7. Only final submittals with mark indicating action taken by Government are to be used for construction.
8. Submittals not required by the Contract Documents will not be reviewed and may be discarded.

B. Processing Time: Time for review shall commence on CO's receipt of submittal.
1. Initial Review: Government will review initial submittal within 12 calendar days. Additional time may be needed if processing must be delayed to permit coordination with subsequent submittals. CO will advise Contractor when a submittal being processed must be delayed for coordination.
2. Resubmittals: If resubmittal is necessary, it will be resubmitted within 3 calendar days, and reviewed by the Government within 3 calendar days.

3.3 ACTION SUBMITTALS

A. Prepare and submit Action Submittals required in the Technical Specifications in this contract, if applicable, and as indicated at the end of this subsection.

B. Collect information into a single submittal for each element of construction and type of product or equipment.
1. Mark up each submittal to show which products and options are applicable.
2. Include the following information, as applicable:
   a. Manufacturer's written recommendations.
   b. Manufacturer's product specifications.
   c. Manufacturer's installation instructions.
   d. Manufacturer's catalog cuts.
   e. Wiring diagrams showing factory-installed wiring.
   f. Compliance with recognized trade association standards.
   g. Compliance with recognized testing agency standards.

C. Required Action Submittals
1. Product Data: See Technical Specification Sections

3.4 INFORMATIONAL SUBMITTALS

A. Prepare and submit Informational Submittals required in the Technical Specifications in this contract, if applicable, and as indicated below:

B. Required Informational Submittals:
1. Accident Prevention Plan.
2. Construction Schedule.
3. Current licensure and/or certifications for individuals indicated in QUALIFICATIONS paragraph above or as required in individual technical sections.

3.5 PROGRESS REPORTS

A. The contractor shall prepare and submit weekly progress reports during the course of construction. The reports shall include a narrative description of work in progress and completed during the week with a note on any delays not accounted for in the approved progress schedule. Photos of the work in place shall also be included; photos should consist of both macro (close up detail –e.g. to demonstrate finish quality or equipment data plate) and overview photos that demonstrate the construction phase, larger areas of work in the context of the surrounding area. Photos shall document key construction areas e.g. primary structural member installation, utilities that will be covered by later construction, any damage discovered or caused by the construction and shall be annotated with location information. A substantial completion report shall also be submitted documenting fulfillment of contract requirements. If a punchlist is created; the Contractor shall provide a punchlist completion report prior to contract closeout.

3.6 CLOSEOUT SUBMITTALS

A. Prepare and submit Closeout Submittals, as follows:
   1. See Technical Specification Sections.
   2. One-Year Warranty on Entire Project as required by FAR 52.246–21
   3. Project Record Documents.

PART 4 – TEMPORARY FACILITIES AND CONTROLS

4.1 USE OF UTILITIES

A. Utilities: Use of Government existing facilities will be permitted without metering and without payment of use charges, as long as facilities are cleaned and maintained in an acceptable condition. At Substantial Completion, restore these facilities to condition existing before initial use. The following are available for use by the contractor: water, and electrical power services. The following are not available: telephone service. The contractor is expected to provide whatever phone service he deems necessary for the duration of the project.

4.2 SANITARY FACILITIES

A. Sanitary facilities are available for use by the Contractor. Facilities must be cleaned and maintained daily.

4.3 STAGING AND STORAGE

A. Coordinate on-site staging and storage requirements with the Center Point of Contact or the Contracting Officer Representative (COR).

4.4 CONSTRUCTION WASTE DISPOSAL FACILITIES

A. Provide waste-collection containers in sizes adequate to handle waste from construction operations. Containerize and clearly label hazardous, dangerous, or unsanitary waste materials separately from other waste. Use of Government waste containers will not be permitted.

4.5 SAFETY AND ENVIRONMENTAL PROTECTION

A. Environmental Protection: Contractor shall provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

B. Barricades, Warning Signs, and Lights: Comply with the national or state Manual on Uniform Traffic Control Devices (MUTCD) for erecting structurally adequate barricades, paint with appropriate colors, graphics, and warning signs/lights to inform personnel, students, and the public of possible hazards.

C. Fire Protection.
   1. Store combustible materials in containers in fire-safe locations.
   2. Maintain unobstructed access to fire extinguishers, fire hydrants, fire-protection facilities, stairways, and other access routes for firefighting. Prohibit smoking in hazardous fire-exposure areas.
   3. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition.

PART 5 – EXECUTION REQUIREMENTS

5.1 EXAMINATION

A. Before beginning work, examine areas and document existing conditions. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

B. Field verify all new and existing dimensions affecting the work of this contract before ordering products.

C. Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to CO. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

5.2 INSTALLATION

A. Locate the Work and components of the Work accurately, in correct alignment and elevation to fit with existing construction.

B. Make vertical work plumb and make horizontal work level.

C. Install per manufacturer's written instructions and recommendations.

5.3 PROGRESS CLEANING

A. Clean Project site and work areas daily, including common areas. Dispose of materials lawfully.
   1. Comply with NFPA 241 requirements for removal of combustible waste materials and debris.
   2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F (27 deg C).

B. Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

5.4 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide protection and maintain conditions that ensure installed Work does not get damaged or deteriorated prior to Substantial Completion.

5.5 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.
   1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

PART 6 – CLOSEOUT PROCEDURES

6.1 SUBSTANTIAL COMPLETION

A. Definition of Substantial Completion: The Date certified by the CO when construction is sufficiently complete, in accordance with the Contract Documents, so the Government can occupy or utilize the Work or designated portion thereof for the use for which it is intended, as expressed in the Contract Documents.

B. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
   1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
   2. Advise the CO of pending insurance changeover requirements.

3. Submit specific warranties, workmanship bonds, final certifications, and similar documents.
4. Obtain and submit releases permitting Government unrestricted use of the Work and access to services and utilities.
5. Deliver tools, spare parts, extra materials, and similar items to location designated by Government. Label with manufacturer's name and model number where applicable.
6. Complete startup testing of systems.
7. Submit changeover information related to Government occupancy, use, operation, and maintenance.
8. Complete final cleaning requirements, including touchup painting.
9. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

C. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, CO will either proceed with inspection or notify Contractor of unfulfilled requirements. CO will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by CO, that must be completed or corrected before certificate will be issued.
   1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
   2. Results of completed inspection will form the basis of requirements for Final Completion.

6.2 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
   1. Submit certified copy of CO's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by CO. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
   2. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
   3. Instruct Government personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspections: Submit a written request for final inspection for acceptance. On receipt of request, CO will either proceed with inspection or notify Contractor of unfulfilled requirements. CO will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

6.3 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit two copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

6.4 PROJECT RECORD DOCUMENTS

A. General: Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for CO's reference during normal working hours.

B. Provide Draft of Project Record Drawings at Substantial Completion. CO will return reviewed copy. Provide Final Project Record Drawings at Final Completion.

C. Record Drawings: Maintain and submit one set of blue- or black-line white prints of Contract Drawings and Shop Drawings.

1. Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.

   a. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.
   b. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.

2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
3. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
4. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.

6.5 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

C. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
   1. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
   2. Remove tools, construction equipment, machinery, and surplus material from Project site.
   3. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

D. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 010150

SECTION 017329 – CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RESPONSIBILITIES

A. If the Project involves a General Construction Contractor, the General Construction Contractor shall be responsible for the cutting of openings with area equal to or greater than thirty-six (36) square inches. The cutting of openings with area less than thirty-six (36) square inches shall be the responsibility of the Separate Prime Contractor whose work requires the cutting. The General Construction Contractor shall be responsible for all patching work, regardless of the size of the opening.

B. If the cutting of openings into newly constructed walls, partitions, floors, or ceilings is required due to lack of coordination between Separate Prime Contractors, or due to ill-timed or defective work by one or more Separate Prime Contractors, the Separate Prime Contractor primarily responsible for the lack of coordination or the ill-timed or defective work shall bear all costs involved in cutting and patching. The Government may direct the General Construction Contractor to actually perform the cutting and patching.

C. If the Project does not involve a General Construction Contractor, cutting and patching shall be the responsibility of the Separate Prime Contractor whose work requires the cutting. The Contractor shall employ competent individuals, approved by the Government, to do the cutting and patching.

1.2 SUBMITTALS

A. When cutting and patching procedures are required to be approved prior to the work, the Contractor shall submit a plan for cutting and patching well in advance of the work. The submittal shall describe the procedures and request approval to proceed. The submittal shall include the following, as applicable and be submitted per 010150 Submittal procedures.
   1. A description of the limits of cutting and patching required, how it is to be performed, and why it cannot be avoided.
   2. A description of the anticipated results in terms of changes to existing construction, including changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.
   3. A listing of products to be used and firms or entities that will perform work.
   4. Identification of the dates when cutting and patching is to be performed.
   5. Identification of any utilities that will be distributed or affected, including those that will be relocated and those that will be temporarily out of service, and an indication of how long service will be disrupted.
   6. Where cutting and patching involves addition of reinforcement to structural elements, details and engineering calculations to show how reinforcement is integrated with the original structure.

B. Approval by the Government to proceed with cutting and patching does not waive the right of the Government to later require complete removal and replacement of any part of the work found to be unsatisfactory.

1.3 MATERIALS

A. Materials used shall be identical to existing materials.

B. If identical materials are not available or cannot be used where exposed surfaces are involved, materials used shall match existing adjacent surfaces to the fullest extent possible with regard to visual effect.

C. All materials used shall have installed performance equal or greater than that of existing materials.

D. All materials used shall be compatible with adjacent existing materials and shall have no deleterious effect on the existing construction.

1.4 INSPECTION

A. Before cutting existing surfaces, the Contractor shall examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

B. The Contractor shall avoid any unsafe or unsatisfactory conditions, and if unsafe or unsatisfactory conditions are encountered, corrective action shall be taken before proceeding.

1.5 PREPARATION

A. Work to be cut shall be provided with temporary support.

B. Existing construction shall be protected during cutting and patching to prevent damage by cutting and patching operations.

C. Protection from adverse weather conditions shall be provided for portions of the project that might be exposed during cutting and patching operations.

D. Cutting and patching operations shall be conducted so as to avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

E. The Contractor shall take all precautions necessary to avoid cutting existing pipe, conduit, or ductwork that serve the facility and are scheduled to be removed or relocated, until provisions have been made for bypass installations.

1.6 PERFORMANCE, GENERAL

A. Skilled workmen shall be employed to perform cutting and patching.

B. Cutting and patching shall be undertaken at the earliest feasible time and completed without delay.

C. Cutting, fitting, and patching for installation of components or the performance of other construction activities shall be performed so as to restore surfaces to their original condition.

D. Openings shall be temporarily covered when not in use.

E. Where excavating and backfilling are required, the Contractor shall comply with requirements of applicable sections of the Technical Specifications.

F. For utility services shown or required to be removed, relocated, or abandoned, the Contractor shall ensure the utility service is shut off or not active prior to performing any work on the system. If the utility service requires continued operation during the Work, the Contractor shall by-pass the service before cutting service pipe or conduit. Any pipe or conduit that is to remain shall be sealed with a cap, valve, or plug to prevent entrance of moisture or other foreign matter.

1.7 PERFORMANCE, CUTTING

A. Cutting of existing construction shall be performed using methods least likely to damage elements to be retained or adjoining construction. Where possible, proposed procedures shall be reviewed with the original installer and shall comply with the original installer's recommendations.

B. Where cutting is required, hand or small power tools designed for sawing or grinding shall be used. Hammering and chopping shall not be done. Holes and slots shall be cut neatly to the size required with minimum disturbance of adjacent surfaces.

C. To avoid marring existing finished surfaces, cutting or drilling shall be done from the exposed or finished side into concealed surfaces.

D. A cutting machine such as a carborundum saw, or diamond core drill shall be used to cut through concrete and masonry.

1.8 PERFORMANCE, PATCHING

A. Patching shall be performed with durable seams that are as invisible as possible. Patching shall meet specified tolerances.

B. Where feasible, patched areas shall be inspected and tested to demonstrate integrity of the installation.

C. Exposed finishes of patched areas shall be restored, and finished restoration shall be extended into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

D. Where patching occurs in a smooth painted surface, the final paint coat shall be extended over entire wall plane (wall corner to corner) containing the patch. The patched area itself shall receive a primer and second coat.

E. Where the removal of walls or partitions extends from the new space into another existing space, the floor and wall surfaces in the new space shall be patched and repaired to provide an even surface of uniform color and appearance. If uniform color and appearance cannot be achieved, the existing floor and wall coverings in the existing space shall be removed and replaced with new materials.

F. Existing ceilings shall be patched, repaired, or re-hung as necessary to provide an even plane surface of uniform appearance.

1.9 COORDINATION

A. Structural elements shall not receive any cutting and patching that would reduce their load-carrying capacity or load-deflection ratio. Structural elements include:
1. Foundation construction
2. Bearing and retaining walls
3. Structural concrete
4. Structural steel
5. Lintels
6. Structural decking
7. Stair systems
8. Miscellaneous structural metals
9. Exterior curtain wall construction
10. Equipment supports.
11. Piping, ductwork, vessels, and equipment
12. Structural systems of Special Construction in the Technical Specifications

B. Safety-related components and operating elements shall not receive cutting and patching in a manner that would result in reducing their capacity to perform as intended, result in increased maintenance, or result in decreased operational life or safety. For those components and elements covered by a warranty, the Contractor shall coordinate cutting and patching with the warranting party, and the cutting and patching shall not void the warranty. Safety-related components and operating elements include:
1. Shoring, bracing, and sheeting.
2. Primary operational systems and equipment
3. Air or smoke barriers
4. Water, moisture, or vapor barriers
5. Membranes and flashings
6. Roofing systems and membranes
7. Fire protection systems
8. Noise and vibration control elements and systems
9. Control systems
10. Communication systems
11. Conveying systems
12. Electrical wiring systems
13. Special Construction specified in the Technical Specifications

C. Visually-exposed components and construction that is exposed on the exterior or exposed in occupied spaces shall not receive cutting and patching in a manner that will reduce the building's aesthetic qualities or result in visual evidence of cutting and patching. If possible, the original installer or fabricator shall be retained to cut and patch the following categories of exposed work:
   1. Processed concrete finishes.
   2. Ornamental metal
   3. Matched-veneer woodwork.
   4. Window wall system
   5. Stucco and ornamental plaster
   6. Acoustical ceilings
   7. Carpeting
   8. HVAC enclosures, cabinets, or covers.
   9. If it is not possible to engage the original installer or fabricator, another recognized, experienced, and specialized firm shall be engaged.
   10. For those components and construction covered by a warranty, the Contractor shall coordinate cutting and patching with the warranting party, and the cutting and patching shall not void the warranty.

D. The General Construction Contractor shall be responsible for removing, storing, and replacing removable ceilings where work is to be provided above an existing removable ceiling not indicated for replacement.

1.10 CLEANING AND RESTORATION

A. Thorough cleaning shall be performed for areas and spaces where cutting and patching is performed or used as access.

B. Paint, mortar, oils, putty, and items of similar nature shall be completely removed.

C. Piping, conduit, and similar features shall be thoroughly cleaned before painting or other finishing is applied.

D. Pipe covering and insulation damaged incidental to cutting and patching shall be restored to its original condition.

PART 2 - PRODUCTS

2.1 (NOT USED)

PART 3 - EXECUTION

3.1 (NOT USED)

END OF SECTION 017329

SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. The Work of this Section Includes:

1. Demolition and removal of selected portions of exterior or interior of building or structure and site elements.
2. Removal of existing items for reinstallation.

B. Related Requirements:

1. Section 010150 "General Requirements" for restrictions on use of the premises, Government-occupancy requirements, and phasing requirements.
2. Section 017329 "Cutting and Patching" for cutting and patching procedures.

1.2 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.3 INFORMATIONAL SUBMITTALS

A. Survey of Existing Conditions: Submit survey.

B. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.

C. Schedule of selective demolition activities with starting and ending dates for each activity.

1.4 FIELD CONDITIONS

A. Government will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Government's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Government as far as practical.

C. Notify Contracting Officer of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials:

1. It is not expected that hazardous materials will be encountered in the Work.

a. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Contracting Officer.

E. On-site sale of removed items or materials is not permitted.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSP A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs or video.

1. Inventory and record the condition of items to be removed for salvage or reinstallation. Photograph or video conditions that might be misconstrued as damage caused by removal.
2. Photograph or video existing conditions of adjoining construction including finish surfaces, that might be misconstrued as damage caused by selective demolition operations or removal of items for salvage or reinstallation.

3.2 PREPARATION

A. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

B. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Contracting Officer, items may be removed to a suitable, protected storage location and reinstalled in their original locations after selective demolition operations are complete.

3.3 UTILITY SERVICES AND BUILDING SYSTEMS

A. Existing Services/Systems to Remain: Maintain utilities and building systems and equipment to remain and protect against damage during selective demolition operations.

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utilities and building systems serving areas to be selectively demolished.

1. Arrange to shut off utilities with utility companies.
2. If disconnection of utilities and building systems will affect adjacent occupied parts of the building, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to those parts of the building.
3. Demolish and remove existing building systems, equipment, and components indicated on Drawings to be removed.

    a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
    b. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
    c. Equipment to Be Removed: Disconnect and cap services and remove equipment and components.

4. Abandon existing building systems, equipment, and components indicated on Drawings to be abandoned in place.

    a. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
    b. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

5. Remove and reinstall/salvage existing building systems, equipment, and components indicated on drawings to be removed and reinstalled or removed and salvaged:

    a. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment and components; when appropriate, reinstall, reconnect, and make equipment operational.
    b. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and components and deliver to Government's designated representative.

3.4 SALVAGE/REINSTALL

A. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

3.5 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
4. Maintain fire watch during and for at least 1 hours after flame-cutting operations.
5. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn demolished materials.

3.7 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 114113 – WALK-IN COOLERS AND FREEZERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Type Walk-In Freezers.
   2. Walk-In Refrigeration Equipment and Accessories

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Provide plan and elevation view shop drawings. Coordinate drawings with field verified existing building dimensions.
   1. Notes:
      a. Desired freezer sizes are approximately equal to existing.
      b. Existing walk-in is located on an elevated concrete pad with a concrete ramp up to the entrance. Coordinate proposed freezer to fit on existing pad with door aligned with existing ramp.

C. Load Calculations: Furnish manufacturer load calculations with refrigeration equipment sizing and submittals.

D. Sustainable Design Submittals:

   1. Comply with U.S. Department of Energy (DOE) energy conservation standards for Walk-in Coolers and Freezers – 10 CFR 431.306 and International Energy Conservation Code. Include calculated Annual Walk-In Energy Factor (AWEF) for cooler and freezer sections and associated equipment.

1.3 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type walk-in.

B. Walk-In Labeling: Certified and labeled by testing agency acceptable to authorities having jurisdiction.
   1. NSF/ANSI 7.
   2. UL Listed Doors, UL Classified Panels for Surface Burning Characteristics.

C. Source quality-control reports.

D. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

B. Provide proof of purchase and/or other required documentation for manufacturer warranty including specified extended warranties.

C. Provide Project Completion Report including brief narrative of modifications made to existing systems and photos of all installed work – Cooler shells, specified accessories, mechanical components, and electrical connections.

D. Field Quality Control Reports.

1.5 COORDINATION

A. Coordinate new coolers with existing interior space constraints.

1.6 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of combination type walk-in cooler and freezer that fail in materials or workmanship within specified warranty period.

1. Warranty Periods: From date of Substantial Completion.

a. Walk-In Freezer:
1) Panels – Limited 10-year parts.
2) Refrigeration/Split-System Compressor – Limited 5-year parts (base 1-year + 4- year optional).

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by an NRTL, and marked for intended location and use.

B. NSF Compliance: Fabricate and label cooler to comply with NSF/ANSI7.

C. Walk-Ins: Shall comply with current DOE Annual Walk-In Energy Factor metrics (AWEF).

D. Walk-in Freezers:

1. Basis-of-Design Product: Leer, Soft Rail Box. BOD product salient features indicate the minimum level of performance and required/specified features, other manufacturers may be submitted but the specified minimum salient features are required to be met.
2. Description: Remove and dispose of the existing walk-in freezer and associated mechanical equipment and furnish and install new walk-in freezer in the same location

with evaporator and condensing unit, specified accessories, and all other items for a fully functional walk-in freezer. Existing freezer exterior dimensions are approximately 70” x 139” x 90” h. Interior dimensions are 62” x 81.75” x 81.75”h. The Contractor shall verify existing space dimensions and coordinate with submittals. New freezer shall be approximately equal to but not smaller than the existing size with a layout and door sizes matching the existing cooler/freezer being replaced except as otherwise specified. All products shall be coordinated by the walk-in manufacturer and submitted as a fully coordinated finished product. Refrigeration equipment shall be sized by the manufacturer and coordinated with the cooler box submittals, existing conditions, and intended usage (food storage).

3. Walk-In Freezer Construction.

   a. Walk-ins are of tongue and groove panelized construction with insulated floor, ceiling, and wall panels with NSF 7 construction. Cooler and freezer have dedicated refrigeration equipment. Provide with heated pressure relief ports.

   b. Electrical:
      1) Provide 120V, 1PH, 60Hz single point electrical connection for 120V electrical connections.
      2) Building Electrical Service: 120/208V, 4-wire, 3-Phase.

   c. Wall and Ceiling Panels: Wall and Ceiling Panels: Each panel shall consist of an inner and outer metal skins, an insulation core, and be equipped with cam-action locking devices. The locking devices shall be operable from inside the walk-in. Cam plug buttons are provided to cover the holes after assembly is complete. Construction shall be as approved by the NSF International and shall bear the NSF® Seal of Approval. All panels shall be connected to one another by placing the tongue of the insulation core of one panel into the groove of the core insulation of the adjacent panel. The resultant tongue and groove joint shall be sealed at both sides by double barreled NSF® approved gaskets. No wood shall be permitted in the manufacture of the tongue and groove panel profile.
      1) Insulation: Foamed-in-place polyurethane.
         a) Thickness: 4.25” nominal.
         b) Min. Total R-Value: R-32 Freezer.
         c) Maximum Flame Spread Index: <75.
         d) Maximum Smoke Development Index: <450.
         e) Vapor Transmission: <1 perm.
      2) Interior and Exterior Finishes: 22-gauge minimum thickness, type 304 or 316 smooth stainless steel.

   d. Floor Panels: Floors shall be prefabricated insulated floor with foamed-in place tongue and groove rails, cam-action locking fasteners, and NSF approved gaskets and finishes. Provide level adjustment to match field verified slab recess height for flush transition to kitchen tile floor.
      1) Insulation: Foamed-in-place polyurethane.
         a) Thickness: 4.25” nominal.
         b) Min. Total R-Value: R-32 Freezer.
         c) Maximum Flame Spread Index: <75.
         d) Maximum Smoke Development Index: <450.
         e) Vapor Transmission: <1 perm.

2) Floor Finish: 16-gauge minimum thickness, type 304 or 316 smooth stainless steel.
3) Floor Load Capacity: 800 lbs. per ft2.

e. Doors: Provide pre-hung flush-mounted service doors for both sections of the combination cooler. Flush-mounted, in-fitting type.
1) Door Construction: Steel framed with foamed in place insulation and metal finishes.
2) Size: 36”x78” assumed, contractor to verify existing conditions for swing clearances.
3) Gaskets:
a) Top and Side: Thermoplastic, bellows-type with magnetic core.
b) Bottom: Adjustable, double-blade rubber sweep.
4) Threshold: 16-gauge stainless steel.
5) Insulation: Foamed-in-place polyurethane.
a) Minimum R-Value: Cooler: R-25, Freezer: R-32.
b) Maximum Flame Spread Index: <75.
c) Maximum Smoke Development Index: <450.
d) Vapor Transmission: <1 perm.
6) Door Finish: 22-gauge, type 304 or 316, stainless steel.
7) Hinges: Heavy-duty, spring-loaded, cam-lift hinges.
8) Latches: Lockable heavy-duty latch and strike assembly, with inside release always active.
a) Brushed-Chrome, anti-microbial finish.
b) Freezer and Cooler keyed alike.
9) Closer: Hydraulic, chrome-plated.
10) Heat Wires: Freezer doors are fitted with anti-condensate heat wire kit.

f. Accessories: Furnish and install new coolers and freezers with the following accessories.
1) Lighting: LED Vapor-Proof, shatter-proof light fixtures, UL Listed, NEMA 4X, rated to operate at freezer and cooler temperatures.
a) Electrical: 120V, 1PH, 60Hz.
b) Color Temperature: 4,000K.
c) CRI: 80+.
d) Lumens: 4,000+.
e) Control: Toggle switch on exterior wall, with indicator light.
2) Strip Curtain: Install strip curtains for freezer and cooler door openings.
a) -40º F rated clear flexible vinyl or polar strip curtains.
3) Temperature Monitoring and Alarm: Coordinate as required with refrigeration controls. Provide digital thermometer with audible alarm for temperature and door ajar alerts. 120V w/ battery backup. Temperature monitoring and alarm shall be provided for both cooler and freezer sections.
4) Kick Plate: Install diamond plate aluminum or stainless-steel kick plate on doors.

E. Walk-In Split System Refrigeration Equipment:

1. Furnish and install split system refrigeration systems for cooler and freezer with standard controls and refrigerant that is compliant with current Federal Energy Management Program (FEMP) DOE requirements at the time of contract award.
a. Design Outdoor Temperature

1) Nearest weather station: Macon County, NC.
2) 0.4%
   a) Cooling DB: 88.8º F.
   b) Cooling MCWB: 69.5º F.
   c) Evaporation WB: 73.9º F.
   d) Evaporation MCDB: 82.9º F.
3) 50 year return interval max temperature:
   a) DB: 100.8º F.
   b) WB: 80.1º F.

b. Design Cooling Temperatures:
   1) Freezer: -10º F.

c. Electrical: Building has 120/208V, 4-wire, 3-Phase power, existing freezer condensing units are powered by branch circuits with 20A 3-pole and 15A 3-pole breakers respectively. Coordinate new equipment with building power, modify existing circuits as required for code compliance and new equipment requirements.

d. Outdoor door units shall be air-cooled with electric defrosts.
   1) Cabinet: Painted or galvanized steel.
   2) Service valves and charging ports.
   3) Factory leak tested.
   4) Coil protection grill.
   5) Filter drier and site glass.
   6) Crankcase heater.
   7) Low ambient kit.
   8) Fused disconnect.

e. Indoor Unit Cooler:
   1) Cabinet:
      a) Corrosion resistant cabinet construction.
      b) Hinged or removable access panels.
      c) NFS and UL sanitation rated fan guards.
   2) Coil:
      a) Aluminum fins with copper tubes.
      b) Provision for defrost with associated controls. Air defrost is acceptable for refrigerator, electric heater for automatic defrost in freezer.
   3) Motors:
      a) EC motor.
      b) Permanently lubricated with thermal overload protection.
   4) Drain Pan:
      a) Hinged or removable with defrost heaters and drain holes coordinated with drain piping.

f. Linesets: Provide insulated refrigerant linesets with filter dryer and aluminum jacket.

g. Condensate Drains: Provide new condensate drainage, with freeze protection; plumb in accordance with the International Plumbing Code.

h. Furnish new disconnects for outdoor units, adhere to NFPA 70 requirements and the refrigeration equipment manufacturer's instructions.

i. Refrigeration Controls: Provide with refrigeration controls coordinate with room temperature, alarm system, defrost cycles, pressure controls, and short cycle prevention.

PART 3 -

PART 4 - EXECUTION

4.1 INSTALLATION OF WALK-IN FREEZERS

A. Level floor slab in accordance with walk-in manufacturers' tolerance requirements. Install walk-ins level and plumb, in accordance with referenced standards. Maintain manufacturer's recommended clearances. Arrange units so controls and devices needing service are accessible.

B. Install refrigeration equipment in accordance with manufacturer's instructions. Provide all tests and startup procedures recommended by cooler manufacturer. Document and submit as indicated in Field Quality Control section and submit in accordance with Closeout Submittals section.
   1. Provide supports for refrigeration equipment as required by walk-in and refrigeration equipment manufacturers.

C. Connect to building electrical system, modify branch circuit components as required for current NFPA 70 compliance.

4.2 FIELD QUALITY CONTROL

A. Perform tests and inspections.

   1. Leak Test: After installation test for leaks. Repair leaks and retest until no leaks exist.
   2. Operational Test: After electrical circuitry has been energized, start units to confirm proper operation.
   3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
   4. Coordinate for third-party inspection of branch circuit and electrical connection and submit report in accordance with Specification Section 010150.

B. Prepare test and inspection reports.

4.3 DEMONSTRATION

A. Train Government's maintenance personnel to adjust, operate, and maintain cooler/freezer, refrigeration equipment, and alarms.

END OF SECTION 223400

SECTION 260100
COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes requirements for basic electrical materials and methods and includes:
   1. Electrical removal, extension, installation.
   2. Cleaning of existing Electrical Equipment.

1.2 WORK INCLUDED

A. As specified and as shown, furnish, install, test, and place in satisfactory and successful operation all equipment, materials, devices, and necessary appurtenances to provide a complete and operable electrical system. The work also includes the completion of those details of electrical work not mentioned or shown which are necessary for the successful operation of all electrical systems.

1.3 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specifications, apply to Division 26 Sections.

1.4 QUALITY ASSURANCE

A. Worker's Qualifications: All electrical work shall be performed by Utah State licensed electricians or under the direct supervision of a Utah State licensed electrician.

B. Codes and Regulations:
   1. All work shall meet requirements of governing codes and regulations, NFPA 70-2020 (NEC), and NESC.
   2. Advise the Contracting Officer of conflicting codes or conflicts between codes and drawings and specifications.
   3. When the requirements of specifications or drawings are more stringent than the codes, regulations, or standards, the specifications or drawings shall prevail.
   4. The electrical installation shall meet the requirements of NECA Standard of Installation, except where otherwise specified.

C. UL Listing:
   1. All electrical materials and equipment shall meet requirements of the applicable standards of UL if UL standards exist for such materials and equipment.
   2. The UL authorized listing mark is acceptable as evidence that the materials meet this requirement.

3. In lieu of UL authorized listing mark, the Contractor may submit independent proof satisfactory to the Contracting Officer that the materials meet the standards.
4. Materials and equipment shall be installed only for their intended operational purpose.

D. Standard Products: Provide only new electrical equipment of current standard design.

1.5 INTENT OF CONSTRUCTION DRAWINGS

A. Electrical drawings do not attempt to show complete details of building construction that affect installation. Diagrams are schematic only and do not necessarily show physical arrangement of equipment. Refer to drawings of other trades for additional details that affect work.

B. Conduit, conductor and ground connections are shown diagrammatically only. Layout does not necessarily show total number of conduits or conductors for circuits required and should not be used for obtaining quantities for linear runs of conduits or wires. Locations of indicated runs are not intended to show actual routing of conduits. Provide additional conduits and wire wherever needed to complete installation of specific equipment furnished.

C. Locations of outlets, switches, and junction boxes on drawings are approximate and may be distorted for clarity in representation.

D. Install electrical outlets and other equipment clear of and in proper relation to radiators, ducts, grilles, pipes, and other equipment, and items such as cabinets and counters.

E. Changes such as offsetting conduit runs, moving outlets, or other minor changes necessary to facilitate installation shall be made at no additional expense to the Government.

1.6 COORDINATION

A. Coordinate chases, slots, inserts, sleeves, and openings for electrical supports, raceways, and cable with general construction work.

B. Coordinate electrical work with the work of the various trades on the project.

1.7 SUBMITTALS

A. As specified in Division 1 Section “Submittal Procedures.”
1. Product Data: Submit manufacturer’s product literature for the following items:
a. Service Entrance Equipment.

B. Panel Directories- Draft and Final.

C. Closeout Submittals: As specified in “Closeout Procedures” paragraph in Division 1 Section “General Requirements”.

1. Field quality test reports.

PART 2 – PRODUCTS

PART 3 – EXECTION

3.1 ELECTRICAL REMOVAL AND EXTENSION OF EXISTING ELECTRICAL WORK

A. Disconnect, demolish, and remove electrical systems, equipment, and components indicated to be removed.

1. Circuits to Be Removed: Remove portion of circuits, including conductors and conduit, indicated to be removed to source of supply. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets which are not removed.
2. Equipment to Be Removed: Disconnect equipment. Remove circuit to source of supply where circuit is indicated to be removed. Temporarily terminate conductors in a safe manner where circuit will be reattached to new equipment or devices. Remove equipment.
3. Equipment to Be Removed and Reinstalled: Disconnect and remove circuit to source of supply. Remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
4. Equipment to Be Removed and Salvaged: Disconnect and remove circuit to source of supply. Remove equipment and deliver to Government.

B. Verify that abandoned wiring and equipment serve only abandoned facilities. Maintain electrical continuity to remaining wiring and equipment.

C. If during construction electrical conductors, conduits, or equipment to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.

D. Disconnect electrical systems in ceilings scheduled for removal.

E. Existing Electrical Service: Maintain existing systems in service until new systems are accepted. Disable systems only to make switchovers and connections. Notify the Contracting Officer at least 36 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.

F. Where the reuse of existing conduits, outlets, junction boxes, etc. is permissible, make certain that the wiring for them is continuous from outlet to outlet.

G. Provide temporary wiring and connections to maintain existing systems in service during construction.

H. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.

I. Repair adjacent construction and finishes damaged during demolition and extension work. Provide modifications to assure that circuits or systems wiring shall not pass through outlet or junction boxes that may be rendered inaccessible by changes made to the building.

J. Connect new work to existing work in a manner that will assure proper raceway grounding throughout in conformance with the National Electrical Code.

K. Removed conduits, wire, devices, fixtures, etc. is the property of the Contractor unless otherwise noted.

A. Panelboards: Replace circuit breakers damaged during construction and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.

3.2 CUTTING AND PATCHING

A. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces required to permit electrical installations. Perform cutting by skilled mechanics of trades involved.

B. Repair, refinish and touch up disturbed finish materials and other surfaces to match adjacent undisturbed surfaces.

3.3 ELECTRICAL EQUIPMENT CLEANING

A. De-energize equipment.

B. Allow any hot surface to cool before proceeding.

C. Follow instructions from original equipment manufacturer for specific cleaning protocols.

D. Close all openings before applying any cleaning agents.

E. Cleaning agents used must be easily removable, non-flammable inert to the material being cleaned, easily driable, environmentally friendly and non-toxic, and must not interfere with the electrical/mechanical function of the equipment being cleaned.

F. Vacuum cleaning should use gentle suction, contain no metallic parts, and should not damage any of the electrical equipment or insulation. Compressed air cleaning methods are not recommended for interior use, as they can spread contamination further.

3.4 ELECTRICAL EQUIPMENT INSTALLATION

A. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom.

B. Materials and Components: Install level, plumb, and parallel and perpendicular to other building systems and components, unless otherwise indicated.

C. Equipment: Install to facilitate service, maintenance, and repair or replacement of components. Connect for ease of disconnecting, with minimum interference with other installations.

D. Right of Way: Give to raceways and piping systems installed at a required slope.

3.5 ELECTRICAL SUPPORTING DEVICE APPLICATION

A. Damp Locations and Outdoors: Use hot-dip galvanized materials or nonmetallic, slotted channel system components.

B. Dry Locations: Use steel materials.

C. Strength of Supports: Adequate to carry present and future loads, times a safety factor of at least four with, 200-lb minimum design load for each support element.

D. Clean cuts and welds. Coat unpainted surfaces with cold application zinc galvanizing. Coat cuts and welds on painted surfaces with zinc chromate primer and finish to match existing paint.

3.6 SUPPORT INSTALLATION

A. Arrange supports to prevent misalignment during wiring installation.

B. Support parallel runs of horizontal raceways together on trapeze- or bracket-type hangers.

C. Group related conduits and support using conduit rack. Construct rack using steel channel. Size so capacity can be increased by a 25 percent in the future.

D. Support individual horizontal single raceways with separate, malleable-iron pipe hangers or clamps except use spring-steel fasteners for 1-1/2-inch and smaller single raceways above suspended ceilings and for fastening raceways to slotted channel and angle supports.

E. Install sleeves for cable and raceway penetrations of concrete slabs and walls unless core-drilled holes are used. Install sleeves for cable and raceway penetrations of masonry and fire-rated gypsum walls and of all other fire-rated floor and wall assemblies. Install sleeves during erection of concrete and masonry walls.

F. Do not support conduit with wire or perforated pipe straps. Do not attach conduit or supports to ceiling support wires.

G. Secure electrical items and their supports to building structure, using the following methods unless other fastening methods are indicated:
   1. Wood: Wood screws or screw-type nails.
   2. Gypsum Board: Toggle bolts. Seal around sleeves with joint compound, both sides of wall.
   3. Fasteners for Damp, Wet, or Weather-Exposed Locations: Stainless steel.
   4. Fasteners: Select so load applied to each fastener does not exceed 25 percent of its proof-test load.

3.7 IDENTIFICATION MATERIALS AND DEVICES

A. Install at locations for most convenient viewing without interference with operation and maintenance of equipment.

B. Coordinate names, abbreviations, colors, and other designations used for electrical identification with corresponding designations indicated in the Contract Documents or required by codes and standards. Use consistent designations throughout Project.

C. Self-Adhesive Identification Products: Clean surfaces before applying.

D. Nameplates: Identify panels, motor starters, control points, and disconnect switches.
   1. Remotely Mounted Controls: Identify the equipment controlled.
   2. Panels: Identify panel number, feeder number, and voltage of panel bus.
   3. Safety Switches, Relays, and Motor Starters: Identify equipment controlled and circuits from which they are fed.

E. Wire Markers: Install at each end of each wire interconnecting between such items as control panels, sensors, and control devices. Wire markers shall correspond to control wire numbers on schematic diagrams.

F. Tag and label circuits designated to be extended in the future.

G. Install warning labels on panels, disconnects, and other devices as required by NFPA 70.

3.8 RECEPTACLES

A. Mounting heights to centerline of outlet box or receptacle: install at heights shown on drawings.

B. Remove fiber washers on mounting screws before installing device.

3.9 INSPECTION

A. Demonstrate that electrical work operates satisfactorily and in accordance with the requirements of the drawings and specifications. Before final inspection, remove the front covers on all panelboards and wire gutters. Replace covers after the final inspection is completed.

3.10 TESTING

A. Notify Contracting Officer at least 48 hours before inspection and testing. Perform tests and inspections in the presence of the Contracting Officer. Prepare report for each test signed by Installer, General Contractor, and Contracting Officer.

B. General: See individual specification sections for test requirements.
   1. Furnish instruments and provide qualified personnel to perform tests in accordance with the drawings and specifications.
   2. Operate electrical equipment within the ranges specified by manufacturer.
   3. Correct defects revealed by the tests.

END OF SECTION 260100

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SECTION 260500
CONDUCTORS, CABLES, AND RACEWAYS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Raceways.
2. Building wire and connectors.

1.2 SUBMITTALS

A. As specified in "Submittal Procedures" paragraph in Division 1 Section "General Requirements":

1. Product Data: Submit manufacturer's product literature for the following items:

a. Conduit, raceways, and fittings.
b. Wire and cable.

B. Closeout Submittals: As specified in "Closeout Procedures" paragraph in Division 1 Section "General Requirements":

1. Submit feeder test results.
2. Submit log of torque values.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70.

B. Comply with NFPA 70 for components and installation

C. Provide products that are UL listed and labeled.

PART 2 – PRODUCTS

2.1 RACEWAYS

A. Metal Conduit:

1. RMC: UL 6 rigid metal conduit; hot dipped galvanized rigid steel; ANSI C80.1 with threaded fittings.

2. IMC: Intermediate metal conduit; ANSI C80.6, hot-dipped galvanized, with threaded fittings.
3. Fittings and Conduit Bodies: ANSI/NEMA FB 1; material to match conduit.
4. EMT: UL 797 electrical metallic tubing; ANSI C80.3, zinc-coated steel.
   a. Fittings and Conduit Bodies: ANSI/NEMA FB 1; steel compression or set screw type.
5. Bushings: Insulated type bushings designed to prevent abrasion of wires without impairing the continuity of the conduit grounding system comprised of rigid steel conduit. Provide locking type grounding bushings with a feed-through compression lug.
6. Sealing Fittings: Threaded, zinc or cadmium coated, cast or malleable iron type for steel conduits. Provide continuous drain type when fittings are used to prevent passage of water vapor.

B. Non-Metallic Conduit:
   1. RNC: Rigid nonmetallic conduit; NEMA TC 2, Schedule 40 or 80 PVC, with NEMA TC3 fittings.

2.2 BUILDING WIRE AND CABLE

A. General: 600V, UL-listed building wires and cables.

B. Thermoplastic-Insulated Building Wire: NEMA WC 5.

C. Rubber-Insulated Building Wire: NEMA WC 3.

D. Feeders and Branch Circuits: Copper, stranded conductor, 600 volt insulation, Type THHN/THWN, XHHW, USE, or UF depending on application.

E. Multiconductor Cable: Comply with NEMA WC 70 for armored cable Type AC, metal-clad cable Type MC, mineral-insulated metal sheathed-cable Type MC, Type SO, with ground wire.

F. Wire Connectors and Splices: Units of size, ampacity rating, material, type, and class suitable for service indicated.

2.3 LIGHTING WIRE AND CABLE

A. General: 600V, UL-listed building wires and cables

B. Thermoplastic-Insulated Building Wire: NEMA WC 5.

C. Copper, stranded conductor, 600 volt insulation, Type THHN/THWN for lighting circuits.

2.4 CONNECTORS AND SPLICES

A. UL-listed, factory-fabricated wiring connectors of size, ampacity rating, material, type, and class for application and service indicated.

B. Electrical Tape: Plastic tape, 8.5 mils maximum thickness, 1,000,000 ohm minimum insulation resistance, oil resistant vinyl backing, oil-resistant acrylic adhesive, incapable of supporting combustion per ASTM D-568 Test Method B.

PART 3 – EXECUTION

3.1 RACEWAY APPLICATION

A. Minimum Conduit Size, unless otherwise shown or specified:

1. Homeruns:

   a. Above Accessible Ceilings: 1/2-inch.
   b. Below Grade or Slab: 3/4-inch minimum.

2. Branch Circuits After First Junction Point: 1/2-inch.

B. Outdoor Locations, Above Grade: RMC.

C. Outdoor locations, Underground: RNC Schedule 80 PVC.

D. Outdoor locations, motor/equipment connections: LFMC.

E. Under concrete: RNC Schedule 80 PVC.

F. Wet and Damp Locations: RMC.

G. Dry Locations:

1. Exposed: Use IMC if subject to damage below 8-feet, otherwise use EMT.
2. Concealed in Walls or Ceilings: EMT.
3. TIG Welder: RMC.

3.2 RACEWAY INSTALLATION

A. Install raceways in accordance with NECA “Standard of Installation” and manufacturer’s recommendations.

B. Arrange raceways to maintain headroom and present neat appearance.

C. Route exposed raceways and raceways installed above accessible ceilings parallel and perpendicular to walls.

D. Conceal raceways and cables, unless otherwise indicated, within finished walls, ceilings, and floors.

E. Run raceway plumb, level, and in a direct line, with long sweeping bends and offsets. Make changes in direction of raceway with symmetrical bends or metal fittings.

F. Keep legs of raceway bends in the same plane and keep straight legs of offsets parallel.

G. Maintain 12-inch clearance between conduit and surfaces with temperatures exceeding 104^0F.

H. Use conduit hubs or sealing locknuts to fasten conduit to sheet metal boxes and cast boxes in damp and wet locations.

I. Install no more than equivalent of four 90-degree bends between boxes. Use conduit bodies to make sharp changes in direction.

J. Install signal system raceways with a maximum of two 90-degree bends. Add pull boxes where necessary to accomplish this.

K. Avoid moisture traps. Provide junction box with drain fitting in low points in raceway systems.

L. Join nonmetallic conduit using cement as recommended by manufacturer.

M. Provide suitable fittings to accommodate expansion and deflection where raceway crosses control and expansion joints.

N. Provide expansion joints as necessary for RNC conduit.

O. Seal wall and roof penetrations weathertight.

P. Grout around conduit tie-ins entering building walls. Where conduit enters buildings, seal openings with duct seal to prevent circulation of air or moisture.

Q. Securely mount raceway using manufactured supports, connectors, and securing devices.

3.3 WIRE AND CABLE METHODS

A. Der-ate conductor ampacities based on the NEC when more than three current carrying conductors are installed in one raceway.

B. Conductor Size:

1. Meet requirements of NFPA 70 or the sizes shown on the drawings if larger. Use no wire smaller than No. 12 AWG for power and lighting circuits, and no smaller than No. 16 AWG for control wiring.
2. Use No. 10 AWG conductor for 20 ampere, 120 volt branch circuit home runs longer than 75 feet.
3. Use no wire smaller than No. 12 AWG for lighting circuits.

C. Wire and Cable Application: Use wiring and cabling methods specified below unless otherwise indicated in drawings to the extent permitted by applicable codes.
1. Concealed Interior Feeders and Branch Circuits: THHN-THWN single conductors in raceway, Armored-cable Type AC, or Metal-clad-cable Type MC.
2. Exposed Interior Locations: THHN-THWN single conductors in raceway, Armored-cable Type AC, or Metal-clad-cable Type MC.
3. Exterior Locations: THHN-THWN single conductors in raceway.

D. Color Coding:

1. Factory color-code wires No. 8 AWG and smaller.
2. Color code wire No. 6 AWG and larger with color tape at least 6-inches at exposed ends and at every accessible junction box.
3. Color Code for 120/240 volt System:

a. Phase A: Black.
b. Phase B: Red.
c. Neutral: White.
d. Ground: Green.

4. Color Code: For 208/120 volt system as follows:

a. Phase A: Black.
b. Phase B: Red.
c. Phase C: Blue.
d. Neutral: White:
e. Ground: Green.

3.4 WIRE AND CABLE INSTALLATION

A. Taps and Splices:

1. Permitted only in junction or outlet boxes.
2. Use insulated spring wire connectors with plastic caps for No. 10 AWG and smaller.
3. Use split bolt connectors for copper wire splices and taps for No. 8 AWG and larger. Tape uninsulated conductors and connectors with electrical tape to 150 percent of the insulation value of conductor.

4. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

B. Place an equal number of conductors for each phase of a circuit in same raceway or cable. Pull all conductors into a raceway at the same time.

C. Torque test conductor connections and terminations to manufacturer's recommended values. Mark all torqued lugs with sharpie type marker indicating torque value. Submit written log of torque values to Contracting Officer.

D. Cable Installation:

1. Do not use cable as flexible connection to motors or other vibrating equipment.
2. Run concealed cable parallel and perpendicular to building elements at right angles. Run parallel cable runs together. Run high and tight to structure.
3. Support cable every four feet and within 12 inches of every outlet box, junction box, cabinet, of fitting.

E. Install a separate neutral for lighting branch circuits serving electronic ballasts.

F. Install neutral conductor of 120/208 volt multi-wire branch circuits, one size larger than the phase conductors.

G. Label phase, neutral, and ground conductors with corresponding circuit numbers at panelboard, junction, and outlet boxes.

3.5 FIELD QUALITY CONTROL

A. Notify Contracting Officer at least 48 hours before inspection or testing. Perform tests in the presence of the Contracting Officer. Prepare test report for each test, signed by Installer, General Contractor, and Contracting Officer.

B. Test wires and cable for electrical continuity and for short-circuits prior to energizing circuits.

END OF SECTION 260500