MEPNN Supplier Scouting Opportunity Synopsis

Section 1: General Information

Scouting Number	2025-320
Item to be Scouted	BABA Compliant Panelboards
Days to be scouted	26
Response Due By	09/29/2025
Description	BABA Compliant: RP2 Panelboard L1A Panelboard M2 Circuit Board

Section 2: Technical Information

Type of supplier being sought	Other
Details	BABAA-compliant self-certified manufacturers
Reason	BABA
Describe the manufacturing processes (elaborate to provide as much detail as possible)	Domestic components in each of the BABAA compliant manufactured products must exceed 55% of the total component cost and be assembled in the United States.
Provide dimensions / size / tolerances / performance specifications for the item	See attached specs and mechanical schedule for more information.
List required materials needed to make the product, including materials of product components	See attached specs and mechanical schedule for more information.
Are there applicable certification requirements?	Yes
Details	Build America, Buy America Act (BABAA) compliant
Are there applicable regulations?	Yes
Details	Must be able to submit BABAA manufactured product self-certification manufactured product letter that details a compliant product.
Are there any other stndards, requirements, etc.?	No
Additional Technical Comments	See attached specs and mechanical schedule for more information.

Section 4: Business Information

Estimated potential business volume	TBD post selection. Cost should be the best available, and cannot increase the project cost by 25%.
Estimated target price / unit cost information (if unavailable explain)	TBD post selection. Cost should be the best available, and cannot increase the project cost by 25%.
When is it needed by?	Q1 2026
Describe packaging requirements	Must arrive undamaged
Where will this item be shipped?	Colorado

Additional Comments

Is there other information you would like to include?	Nationwide Search Provide written documentation in response to the Supplier Scouting request of being a current Build America Buy America Act Panelboard manufacturer with experience in manufacturing the system components, meeting the product performance requirements. Information on BABAA compliance requirements can be found at the Made in America Office link https://www.madeinamerica.gov/.

SECTION 26 0500 - COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 INSTALLATION

A. The electrical installation shall be in compliance with the requirements of the City of Arvada, CO, OSHA, NEC and the rules, regulations and requirements of the power company supplying power to the buildings.

1.2 WORK INCLUDED

A. General: Provide the work included in accordance with the Contract Documents.

B. Provide all labor, materials, equipment, tools, appliances, auxiliaries, services, hoisting, scaffolding, support, supervision, and Project Record Documents, and perform all operations for the furnishing and installing of the complete electrical system, including but not limited to the work described hereinafter.

C. The electrical work is shown schematically on the Drawings to indicate the general system arrangement and configuration. The work of this Division shall include coordination with the work of other Divisions of the Specifications and the Contract Documents so as to provide a complete and operational system capable of being readily operated and maintained, including approved re-arrangement of the systems and equipment and re-r

D. outing of distribution services to enable the complete system to fit within the confines of the allotted electrical spaces, all to the satisfaction of the Architect/Engineer or as directed by the Architect/Engineer.

E. The work includes, but is not limited to the following:
   1. Equipment supports and miscellaneous steel for electrical equipment.
   2. Vibration isolation for the electrical installation.
   3. Temporary power and lighting system.
   4. Exterior and site lighting.
   5. Distribution feeders.
   6. Complete 120/208 volt light and power distribution system, including emergency system.
   7. Lighting fixtures, lamps, convenience outlet systems, and miscellaneous wiring devices.
   8. Motor power wiring.
   9. Miscellaneous electrical equipment and system, unless otherwise noted.
   10. Balancing loads.
   11. Grounding system.
   12. Mechanical system connections.
   13. Sealing of sleeves and other electrical openings.
   14. Electrical heaters: baseboard, cabinet and unit types.
   15. Lighting control system.
   16. Kitchen and laundry equipment connections.
   17. Elevator equipment connection.

1.3 CODES AND FEES

A. General: Comply with Codes in accordance with the Contract Documents.

B. The electrical installation and the Contractor shall comply fully with all city, county and state laws, ordinances and regulations applicable to electrical installations.

C. All equipment shall be equal to or exceed the minimum requirements of NEMA, and IEEE, and UL.

D. Should any change in Drawings or specifications be required to comply with governmental regulations, the Contractor shall notify Architect/Engineer prior to execution of the work. The work shall be carried out according to the requirements of such code in accordance with the instruction of the Architect/Engineer and at no additional cost to the Owner.

1.4 FEES

A. All local fees and permits and services of inspection authorities shall be obtained and paid for by the Contractor. The contractor shall cooperate fully with local utility companies with respect to their services. Contractor shall include in his bid, any costs to be incurred relative to power service (primary and/or secondary) and telephone service.

1.5 PROJECT RECORD DOCUMENTS

A. General: Provide Project Record Documents of Electrical Work in accordance with the Contract Documents.

B. During construction keep an accurate record of all deviations between the work as shown on Drawings and that which is actually installed. Keep this record set of prints at job site for review by the Architect/Engineer.

C. Upon completion of the installation, obtain from the Architect a complete set of the latest revision of full size electrical plans. Enter therein, in a neat and accurate manner, a complete record of all revisions to the original Drawings as actually installed. The cost for making the required change shall be borne by this Contractor. Submit one (1) set of blue line prints of these revised plans to the Architect/Engineer for review.

D. Provide as-built panel schedules upon completion of the work.

E. Coordinate Record Documents requirements with Division 1 of the contract documents.

1.6 MATENANCE MANUALS

A. Refer to Division 1 of the Contract Documents for Maintenance Manual Requirements.

1.7 COORDINATION OF THE WORK

A. Certain materials will be provided by other trades. Examine the Contract Documents to ascertain these requirements.

B. Carefully check space requirements with other trades and the physical confines of the area to insure that all material can be installed in the spaces allotted thereto including finished suspended ceilings. Make modifications thereto as required and approved.

C. Transmit to other trades all information required for work to be provided under their respective Sections in ample time for installation.

D. Wherever work interconnects with work of other trades, coordinate with other trades to insure that all trades have the information necessary so that they may properly install all the necessary connections and equipment. Identify all items of work that require access so that the ceiling trade will know where to install access doors and panels.

E. Consult with other trades regarding equipment so that motor controls are of the same manufacture.

F. Due to the type of the installation, a fixed sequence of operation is required to properly install the complete system. Coordinate, project and schedule work with other trades in accordance with the construction sequence.

G. The locations of lighting fixtures, outlets, panels and other equipment indicated on the Drawings are approximately correct, but they are understood to be subject to such revision as may be found necessary or desirable at the time the work is installed in consequence of increase or reduction of the number of outlets, or in order to meet field conditions or to coordinate with modular requirements of ceilings, or to simplify the work, or for other legitimate causes.

H. Exercise particular caution with reference to the location of panels, outlets, switches, etc., and have precise and definite locations approved by the Architect/Engineer before proceeding with the installation.

I. The Drawings show only the general run of raceways and approximate location of outlets. Any significant changes in location of outlets, cabinets, etc., necessary in order to meet field conditions shall be brought to the immediate attention of the Architect/Engineer and receive his approval before such alterations are made. All such modifications shall be made without additional cost to the Owner.

J. Obtain from the Architect/Engineer in the field the location of such outlets or equipment not definitely located on the Drawings.

K. Circuit "tags" in the form of arrows are used where shown to indicate the home runs of raceways to electrical distribution points. These tags show the circuits in each home run and the panel designation. Show the actual circuit numbers on the finished record tracing and on panel directory card. Where circuiting is not indicated, Electrical Subcontractor must provide required circuiting in accordance with the loading indicated on the drawings and/or as directed.

L. The Drawings generally do not indicate the exact number wires in each conduit for the branch circuit wiring of fixtures, and outlets, or the actual circuiting. Provide the correct wire size and quantity as required by the indicated circuiting and/or circuit numbers indicated and control wiring diagrams, if any, specified voltage drop or maximum distance limitations, and the applicable requirements of the NEC.

M. Adjust location of conduits, panels, equipment, pull boxes, fixtures, etc. to accommodate the work to prevent interferences, both anticipated and encountered. Determine the exact route and location of each raceway and busway prior to fabrication.
   1. Right of Way: Lines which pitch have the right-of-way over those which do not pitch. For example: steam, condensate, and plumbing drains normally have right-of-way. Lines whose elevations cannot be changed have right-of-way over lines whose elevations can be changed.
   2. Make offsets, transitions and changes in direction to raceways and busway and as required to maintain proper head room in pitch of sloping lines whether or not indicated on the Drawings.

N. Wherever the work is of sufficient complexity, prepare additional Detail Drawings to scale similar to that of the bidding Drawings, prepared on tracing medium of the same size as Contract Drawings. With these layouts, coordinate the work with the work of other trades. Such detailed work to be clearly identified on the Drawings as to the area to which it applies. Submit for review Drawings clearly showing the work and its relation to the work of other trades before commencing shop fabrication or erection in the field.

O. Contractor shall furnish services of an experienced superintendent, who shall be in constant charge of all work, and who shall coordinate his work with the work of other trades. No work shall be installed before coordinating with other trades.

1.8 EXAMINATION OF SITE

A. Prior to the submitting of bids, the Contractor shall visit the site of the job and shall familiarize himself with all conditions affecting the proposed installation and shall make provisions as to the cost thereof. Failure to comply with the intent of this paragraph will in no way relieve the contractor of performing all necessary work shown on the Drawings.

1.9 PROGRESS OF WORK

A. The Contractor shall order the progress of his work so as to conform to the progress of the work of other trades and shall complete the entire installation as soon as the conditions of the building will permit. Any cost resulting from the defective or ill-timed work performed under this section shall be borne by the Contractor.

1.10 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Ship and store all products and materials in a manner which will protect them from damage, weather and entry of debris. If items are damaged, do not install, but take immediate steps to obtain replacement or repair. Any such repairs shall be subject to review and acceptance of the Architect/Engineer.

B. Delivery of Materials: Deliver materials (except bulk materials) in manufacturer's unopened container fully identified with manufacturer's name, trade name, type, class, grade, size and color.

C. Storage of Materials, Equipment and Fixtures: Store materials suitably sheltered from the elements, but readily accessible for inspection by the Architect/Engineer until installed. Store all items subject to moisture damage in dry, heated spaces.

1.11 EQUIPMENT ACCESSORIES

A. Establish sizes and location of the various concrete bases required. Coordinate with General Contractor and provide all necessary anchor bolts together with templates for holding these bolts in position.

B. Provide supports, hangers and auxiliary structural members required for support of the work.

C. Furnish and set all sleeves for passage of raceways through structural, masonry and concrete walls and floors and elsewhere as will be required for the proper protection of each raceway and busway passing through building surfaces.

D. Wall mounted equipment may be directly secured to wall by means of steel bolts. Groups or arrays of equipment may be mounted on adequately sized steel angles, channels, or bars. Prefabricated steel channels providing a high degree of mounting

flexibility, such as those manufactured by Kindorf, Globe-Strutt and Unistrut, may be used for mounting arrays of equipment.

1.12 EXCAVATION, TRENCHING, AND BACKFILLING

A. Comply with requirements specified in Division 31.

B. Minimum Depths of conduits shall be per code, local utility and local authority having jurisdiction.

1.13 NOMINAL MOUNTING HEIGHTS (UNLESS OTHERWISE NOTED)

A. Unless otherwise noted or required because of special conditions, locate outlets as follows:
   1. Heights listed are from finished floor to center of device. Verify exact locations with the Architect/Engineer before installation.
      a. Convenience and signal outlets: 18 inches unless otherwise noted.
      b. Lighting Switches: 48 inches
      c. Disconnect Switches and Motor Controllers: 60 inches
      d. Wall Telephone Outlets: 48 inches
      e. Above counter convenience outlets: 42 inches (verify with Architect prior to rough-in)
      f. Strobes: 6'-8" or 6" below ceiling - whichever is lower.
      g. Horn/Strobes: 6'-8" or 6" below ceiling - whichever is lower.
      h. Mini-Horns: 6'-8" or 6" below ceiling - whichever is lower.
      i. Doorbell: 48 inches
      j. Card key access reader: 48 inches
      k. Fire alarm pull station: 48 inches
      l. Disposal switch: 42 inches (verify with Architect prior to rough-in)
      m. Light fixtures: Refer to luminaire schedule on drawings.

1.14 DEMOLITION AND CONTINUANCE OF EXISTING SERVICES

A. All existing electrical services not specifically indicated to be removed or altered shall remain as they presently exist.

B. Should any existing services, etc., interfere with new construction, the Contractor shall (after obtaining written approval from the Architect/Engineer) alter or reroute such existing equipment to facilitate new construction.

C. Under no circumstances shall existing services, etc., be terminated or altered unless deemed necessary by the Architect/Engineer or specified herein; also, prior to altering any existing situation, the Contractor shall notify the Owner in writing giving two (2) weeks advance notice of planned alteration.

D. It shall be solely the Contractor's responsibility to guarantee continuity of present facilities (with respect to damage or alteration due to new construction) and any unauthorized alteration to existing equipment shall be corrected by the Contractor to the Architect/Engineer's satisfaction at the Contractor's expense.

1.15 CLEANING UP

A. Contractor shall take care to avoid accumulation of debris, boxes, crates, etc., resulting from the installation of his work. Contractor shall remove from the premises each day all debris, boxes, etc., and keep the premises clean, subject to the Architect/Engineer's instructions, which shall be promptly carried out.

B. Contractor shall clean all fixtures and equipment at the completion of the project.

C. All switchboards, panelboards, wireways, trench ducts, cabinets, enclosures, etc shall be thoroughly vacuumed clean prior to energizing equipment and at the completion of the project. Equipment shall be opened for observation by the Architect/Engineer as required.

1.16 WATERPROOFING

A. Avoid, if possible, the penetration of any waterproof membranes such as roofs, machine room floors, basement walls, and the like. If such penetration is necessary, perform it prior to the waterproofing and furnish all sleeves or pitch-pockets required. Advise the Architect/Engineer and obtain written permission before penetrating any waterproof membrane, even where such penetration is shown on the Drawings.

B. If Contractor penetrates any walls or surfaces after they have been waterproofed, he shall restore the waterproof integrity of that surface at his own expense and as directed by the Architect/Engineer.

1.17 SUPPORTS

A. Support work in accordance with the best industry practice and the following.

B. Include supporting frames and racks extending from floor slab to ceiling slab for work indicated as being supported from walls where the walls are incapable of supporting the weight. In particular, provide such frames or racks in electric closets.

C. Include supporting frames or racks for equipment, intended for vertical mounting, which is required in a free standing position.

D. Supporting frames or racks shall be of standard angle, standard channel or specialty support system steel members. They shall be rigidly bolted or welded together and adequately braced to form a substantial structure. Racks shall be of ample size to assure a workmanlike arrangement of all equipment mounted on them.

E. Nothing, (including outlet, pull and junction boxes and fittings) shall depend on electric conduits, raceways, or cables for support, except that threaded hub type fittings having a gross volume not in excess of 100 cubic inches may be supported by heavy wall conduit, where the conduit in turn is securely supported from the structure within five inches of the fittings on two opposite sides.

F. Nothing shall rest on, or depend for support on, suspended ceiling media (tiles, lath, plaster, as well as splines, runners, bars and the like in the plane of the ceiling).

G. Provide required supports and hangers for conduit, equipment, etc., so that loading will not exceed allowable loadings of structure.

1.18 FASTENINGS

A. Fasten electrical equipment and devices to building structure in accordance with the best industry practice and the following.

B. As a minimum procedure, where weight applied to the attachment points is 100 pounds or less, fasten to building elements of:
1. Wood - with wood screws.
2. Concrete and solid masonry - with bolts and expansion shields.
3. Hollow construction - with toggle bolts.
4. Solid metal - with machine screws in tapped holes or with welded studs.
5. Steel decking or subfloor - with fastenings as specified below for applied weights in excess of 100 pounds.

C. As a minimum procedure, where weight applied to building attachment points exceeds 100 pounds, but is 300 pounds or less, conform to the following:

1. At concrete slabs utilize 24" x 24" x ½" steel fishplates on top with through bolts. Fishplate assemblies shall be chased in and routed flush with the top of slab screed line, where no fill is to be applied.
2. At steel decking or subfloor for all fastenings, utilize through bolts or threaded rods. The tops of bolts and rods shall be set at least one inch below the top fill screed line and routed in. Suitable washers shall be used under bolt heads or nuts. In cases where the decking or subfloor manufacturer produces specialty hangers to work with his decking or subfloor such hangers shall be utilized.

D. Where weight applied to building attachment points exceeds 300 pounds, coordinate with and obtain approval of Architect and conform to the following:
1. Utilize suitable auxiliary channel or angle iron bridging between building structural steel elements to establish fastening points. Bridging members shall be suitably welded or clamped to building steel. Utilize threaded rods or bolts to attach to bridging members.

E. Floor mounted equipment shall not be held in place solely by its own dead weight. Include floor anchor fastenings in all cases.

F. For items which are shown as being ceiling mounted at locations where fastening to the building construction element above is not possible, provide suitable auxiliary channel or angle iron bridging tying to the building structural elements.

1.19 SUBSTITUTIONS OF MATERIALS OR EQUIPMENT

A. Wherever the word "for approval" or "approved" are used in regard to manufactured specialties, or wherever it is desired to substitute a different make or type of apparatus for that specified, submit all information pertinent to the adequacy and adaptability of the proposed apparatus and secure Architect/Engineer's acceptance before apparatus is ordered.

B. All requests for substitution of materials or equipment shall be made by the Contractor within thirty (30) days after the execution of the Owner/Contractor Agreement. No requests for substitution will be accepted prior to execution of the Owner/Contractor agreement or from anyone other than the successful Contractor.

C. Wherever operating results such as quantity delivered, or the like are specified, or a definite make and size apparatus is specified, for which such quantities are readily determinable - the make and size of apparatus which is proposed using must conform substantially (in regard to the operating results) to the quantities specified or implied. Same shall apply to important dimensions relating to operation of apparatus in coordination with the rest of the system, or to properly fitting it into available space conditions. Any substitution of equipment or apparatus shall include all necessary revisions, as required to complete the installation.

D. Acceptance of substitutions for equipment specified herein will not be given merely upon submission of manufacturers' names and will be given only after receipt of complete and satisfactory performance data covering a complete range of operating conditions in tabular and graphical form. Furnish complete and satisfactory information relative to equipment dimensions, weight, etc. Acceptance of all equipment specified or shown on the Drawings, or substitutions submitted for that specified or shown on the Drawings, will be granted if such equipment, in the opinion of the Architect/Engineer, conforms to the performance requirements, space conditions, weight requirements and quality requirements. Any additional construction and design costs incurred as a result of any accepted substitution shall be borne by this Contractor. The opinion and judgement of the Architect/Engineer shall be final, conclusive and binding.

1.20 SUBMITTAL LIST

A. All submittals shall have the name and contact information (email address, mailing address and phone number) of the Electrical Contractor's Project Manager and the Supplier. Submittals without this information will be returned without review.

B. Within thirty (30) days after date of execution of Owner/Contractor Agreement, submit for review and acceptance a list of all material and equipment manufacturers whose products are proposed, as well as names of all subcontractors whom this trade proposes to employ.

C. Any requests for substitutions of equipment or materials must be submitted and returned prior to submitting the Submittal List. Only specified or accepted manufacturers or suppliers shall appear on the Submittal List.

D. The complete Submittal List must be reviewed and accepted by the Architect/Engineer prior to submittal of shop drawings. No shop drawings will be processed without an accepted Submittal List.

E. The Submittal List shall include all material, systems and equipment as listed herein.

1.21 SHOP DRAWINGS

A. Prepare and submit detailed shop drawings for materials, systems and equipment as listed herein, including locations and sizes of all openings in floor decks, walls and floors.

B. The work described in any shop drawing submission shall be carefully checked for all clearances (including those required for maintenance and servicing), field conditions, maintenance of architectural conditions and proper coordination with all trades on the job. Each submitted shop drawing shall include a certification that all related job conditions have been checked and that no conflict exists.

C. All drawings shall be submitted sufficiently in advance of field requirements to allow ample time for checking and resubmitting as may be required. All submittals shall be complete and contain all required and detailed information.

D. Acceptance of any submitted data or shop drawings for material, equipment apparatus, devices, arrangement and layout shall not relieve Contractors from responsibility of furnishing same of proper dimensions and weight, capabilities, sizes, quantity, quality and installation details to efficiently perform the requirements and intent of the Contract. Such acceptance shall not relieve Contractor from responsibility for errors, omissions or inadequacies of any sort on submitted data or shop drawings.

E. Each shop drawing shall contain job title and reference to the applicable drawing and specification article.

F. Individual shop drawing submittals shall be provided for each specific material, system or equipment as identified herein. Submittals provided in other than this manner will be returned without review.

G. Each equipment submittal shall substantiate conformance to the specification by supplying a document indicating equipment submitted meets or exceeds each line item in the specification or exception taken. Submittals provided without this information will be returned without review.

H. All nameplate data shall be complete at time of equipment submittals - refer to Section 260060 for identification requirements.

I. For each room or area of the building containing switchboards, panelboards, motor control centers, transformers, emergency generators, dimming cabinets, sound systems cabinets, busway telephone backboards, signal system backboards, fire alarm terminal cabinets, fire alarm control panels, consoles, etc. the following is required to be submitted for review and acceptance at the time of the equipment submittal.

1. Floor Plans

   Plan reviews (including sections and elevations when requested) for the equipment indicated in the exact location in which it is intended to be installed. These plans shall be of a scale not less than 1/4" = 1'-0". They shall be prepared in the following manner.

   a. Indicated the physical boundaries of the space including door swings and ceiling heights and ceiling types (as applicable).
   b. Illustrate all electrical equipment proposed to be contained therein. Include top and bottom elevations of all electrical equipment. The drawings must be prepared utilizing the dimensions contained in the individual equipment submittals.
   c. Illustrate all other equipment therein such as conduits, detectors, luminaires, ducts, registers, pullboxes, wireways, structural elements.
   d. Note the operating weight of each piece of equipment.
   e. Note the heat release from each piece of electrical equipment in terms of BTU per hour. This information shall be that which is supplied by the respective manufacturers.
   f. Illustrate all concrete pads, curbs, etc
   g. Note all code clearances from all equipment by dimensions.
   h. Indicate maximum normal allowable operating temperature for each piece of equipment (as per each respective manufacturer's recommendation).
   i. On engine generator layout plans, indicate position of radiator and direction of air movement and provide manufacturer's signed statement that engine will operate within approved temperature ranges as shown on the plans.

2. Equipment Removal Routes

   a. Provide in conjunction with the above, a set of reproducible documents from the then current Contract Documents indicating the methods of equipment removal for all major pieces of equipment.
   b. Indicate on floor plans by means of arrows, the complete path for eqiupment removal.
   c. Where equipment will be required to be hung temporarily from a slab or beam, note same on the submission including the weight of the equipment to be hung and the weight of the hoisting equipment.
   d. Note all heights of conduits, ductwork, link beams, doorways, transoms, piping, etc. in the proposed path assuring that adequate headroom is provided.

J. Shop Drawing Submittals shall be provided for the applicable equipment.

1. Wire and Cable (26 0519)
2. Wiring Devices (26 2726)
3. Panelboards (26 2416)
4. Load Centers (26 2417)
5. Disconnect Switches (26 2816)
6. Fuses (26 2813)
7. SPD (26 4300)
8. Switchboards (26 2413)

9. Grounding (26 0526)
10. Luminaires and Accessories (26 5000)
11. Lighting Control (26 0923)

1.22 TEMPORARY LIGHTING STANDARDS

A. Except as modified by governing codes and by the Contract Documents, comply with the latest applicable provisions and latest recommendations of the following:
1. Local Utility Company.
2. Federal Public Law PL-91-596 cited as the Williams-Steifer Occupational Safety and Health Act of 1970.

PART 2 - PRODUCTS

2.1 GENERAL

A. If products and materials are specified or indicated on the Drawings for a specific item or system, use those products or materials. If products and materials are not listed in either of the above, use first class products and materials, subject to approval of Shop Drawings where Shop Drawings are required or as approved in writing where Shop Drawings are not required.

B. All equipment capacities, etc., are listed for job site operating conditions. All equipment sensitive to altitudes or ambient temperatures to be derated and method of derating shown on Shop Drawings. Where operating conditions shown differ from the laboratory test conditions, the equipment to be derated and the method of derating shown on Shop Drawings.

2.2 TEMPORARY LIGHTING AND POWER

A. The Contractor shall make all necessary arrangements with the Owner for the new installation of temporary lighting and power services tailored for this project and the setting of temporary meters in accordance with the Utility Company's requirements. He shall pay for the installation and maintenance of all temporary light and power wiring, including, but not limited to conduits, wire, switches, fuse boxes, receptacles, distribution panel boards, fused disconnect switches, ground fault interruption equipment, fixtures, lamps, fuses and any other incidental material and/or equipment required to provide efficient illumination and power as required by O.S.H.A. and all other authorities having jurisdiction for all areas of the site where work will be performed by the Contractor, his subcontractors, or any other contractors.

B. Furnish and install one complete set of 100 watt lamps, including those required for trailers and/or temporary offices. He shall also furnish and install one complete set of fuses for temporary light and power services, as required. The replacement of burned out and broken lamps shall be carried out by those using the trailers and/or offices.

C. Temporary power circuits and outlets, etc. shall be provided in accordance with the power requirements of the various horsepower ratings of the equipment to be installed under all contracts and for temporary motors, elevators, etc. Temporary power required for motor operated tools and appliances to be used by various contractors in construction work, and not to be a part of the permanent equipment shall be provided.

2.1 TESTING AND ACCEPTANCES

A. General

1. Provide all labor, premium labor and materials required by shop and field testing as specified in the Contract Documents and as required by the authorities having jurisdiction.

B. Systems

1. The following systems are to be tested, inspected and certified.

a. Wire and Cable (600 Volts and Below)

(1) Inspect all splices and terminations and make mechanically and electrically tight during a fifteen (15) day period immediately prior to final acceptance of the work.

(2) Perform standard 600 volt insulation test with "megger" tester on all service and feeder conductors. Submit certification to the Architect/Engineer.

(3) Minimum Test Requirements:

(a) Wire and cable rated for 600 volts shall be tested with a 500 V megohmmeter and shall test at least 25 megohms for lengths less than 1000 feet.

b. Motor Controllers

(1) Submit with certification in tabular form a complete listing of all motors on the project for which motor controllers have been furnished. Include on this listing, the nameplate full load amperes of each motor and the size overload heaters installed in each motor controller.

c. Motors

(1) Test all motors under load and verify that motor rotation is correct.

d. Switchboards and Motor Control Centers

(1) At the completion of the work each switchboard and motor control center shall be field tested in the presence of the Architect/Engineer. Tests to be conducted by the service organization of the manufacturer.

(2) Tests shall include the following:

(a) Operation of each disconnecting means under load.

(b) Operation of all metering equipment.

(c) Operation of all alarm devices.

(d) Operation of all key interlocks.

(3) The manufacturer shall observe all cable bracing both incoming and outgoing and certify that same is provided in accordance with the manufacturers recommendations.

(4) The ground fault system shall be set at the level specified by the switchboard supplier. Each system shall be tested by checking coordination between ground fault and phase to ground fault of a 1 P-20 ampere lighting branch circuit.

(5) Bus work shall be retorqued in accordance with manufacturer's recommendations. Submit certification of same.

(6) After installation and building occupation, a complete infrared scan shall be made of all current carrying parts to detect loose or poor electrical connections. All connections shall be tightened until satisfactory scan results have been obtained.

e. Fire Alarm and Detection System

(1) All wiring must be inspected and tested to insure that there are not grounds, opens or shorts. The minimum allowable resistance between any two conductors and ground is ten (10) megohms as measured with a 500 volt megger after all conduit, conductors, detector bases, etc. have been installed, but before the detector

devices are plugged into the bases or end-of-line devices installed.

(2) The Contractor must perform all electrical and mechanical tests required by the equipment manufacturer's form. All test and report cost must be in the Contract price. A checkout report is to be prepared by the technician and submitted in triplicate with the equipment manufacturer. The report is to include, but not limited to:

(a) A complete list of installed and wired devices.
(b) Indication that all equipment is properly installed and functions and conforms with these specifications.
(c) Tests of individual zones as applicable.
(d) Serial numbers, locations by zone and model number for each measured in place.
(e) Voltage (sensitivity) settings for each ionization detector as measured in place.
(f) Response time on detectors.

(3) Contractor shall submit a certified report indicating the following:

(a) Operating all manual stations and all detectors that can be reset.
(b) Verifying line supervision of each initiating and indicating circuit.
(c) Verifying the operation of each initiating circuit.
(d) Verifying the operation of all indicating devices.
(e) Verifying the operation of all alarm initiated functions.
(f) Verifying full operation of the F.A.C.P.

f. Ballasts

(1) Submit manufacturer's certification that ballasts and transformers for discharge type lamps comply with the latest energy code specifications which have been issued.

g. Air Handling Plenums and Luminaires

(1) For recessed luminaires to be mounted in ceilings utilized as air handling plenums, submit manufacturer's certification that they, together with external connections, are suitable for the purpose.

h. Emergency Battery System, Packs and Quartz Standby Units

(1) Each emergency battery pack and system shall be shown to operate satisfactory. This shall be accomplished by the use of the unit mounted test switch as one test. The second test shall be interruption of power to the unit.

(2) Quartz standby lamps in H.I.D. luminaires shall be tested to show proper operation by testing as listed above.

i. Grounding System

(1) Upon completion of the electrical grounding system, the contractor shall test the grounding system for stray currents, grounds, shorts, etc. These tests shall be performed with approved instruments. Contractor shall submit in writing to Architect/Engineer a letter indicating the ohmic resistance of the service grounds (25 ohm maximum) and a statement that the grounding system is free of all defects, stray currents, shorts, etc.

C. Calibration

1. Calibrate and adjust all components requiring same as directed, in accordance with manufacturer's procedures and recommendations or as required, for the following categories of equipment.

a. Switchboards.
b. Lighting fixtures (lamp positions, reflector positions, etc., as required).

2. Provide overloads in all motor starters, in accordance with motor nameplate data and as recommended by the manufacturer.

PART 3 - EXECUTION

3.1 EXECUTION OF THE WORK - GENERAL

A. These specifications call out certain duties of the Contractor. They are not intended as a material list of items required by the Contract.

B. This division of the specification covers the electrical systems of the project. It includes work performed by the electrical trades as well as trades not normally considered as electrical trades.

C. Provide all items and work indicated on the Drawings and all items and work called for in this division of the specification in accordance with the conditions of Division One - General Requirements, of the Contract Documents. This includes all incidentals, equipment, appliances, services, hoisting, scaffolding, supports, tools, supervision, labor, consumable items, fees, licenses, etc., necessary to provide complete systems. Perform start-up and checkout on each item and system to provide fully operable systems.

D. Comply with all provisions of the Contract Documents including Division 1, General Conditions, and Supplementary General Conditions of the specifications.

E. Certain terms such as "shall, provide, install, complete, start up" are not used in some parts of these specifications. This does not indicate that the items shall be less than completely installed or that systems shall be less than complete.

F. Examine and compare the Electrical Drawings and Specifications with the Drawings and Specifications of other trades, and report any discrepancies between them to the Architect/Engineer and obtain from him written instructions for changes necessary in the work. At time of bid the most stringent requirements must be included in said bid. Install and coordinate the electrical work in cooperation with other trades installing interrelated work. Before installation, make proper provisions to avoid interferences in a manner approved by the Architect/Engineer. All changes required in the work of the Contractor, caused by his neglect to do so, to be made by him at his own expense.

G. It is the intent of the Drawings and Specifications to provide a complete workable system ready for the Owner's operation. Any item not specifically shown on the Drawings or called for in the Specifications, but normally required to conform with the intent, are to be considered a part of the Contract.

H. These Specifications are basically equipment and performance Specifications. Actual installations shall be as shown on the Drawings. Installations and details shown on the Drawings shall govern where these differ from the Specifications.

I. All materials furnished by the Contractor shall be new and unused (temporary lighting and power products are excluded) and free from defects. All materials used shall bear the Underwriters' Laboratory, Inc. label provided a standard has been established for the material in question.

J. All products and materials to be new, clean, free of defects and free of damage and corrosion.

K. No exclusion from, or limitation in, the symbolism used on the Drawings for electrical work or the languages used in the Specifications for electrical work shall be interpreted

as a reason for omitting the accessories necessary to complete any required system or item of equipment.

L. The use of words in the singular shall not be considered as limiting where other indications denote that more than one item is referred to.

M. Except for conduit, conduit fittings, outlet boxes, wire and cable, all items of equipment or material shall be the product of one manufacturer throughout. Multiple manufacturers will not be permitted.

3.2 Follow manufacturer's instructions for installing, connecting and adjusting all equipment. Provide one copy of such instructions to the Architect/Engineer before installing any equipment. Provide a copy of such instructions at the equipment during any work on the equipment. Provide all special supports, connections, wiring, accessories, etc.

3.3 Use mechanics skilled in their trade for all work.

3.4 Keep all items protected before and after installation. Clean up all debris.

3.5 Perform all tests required by local authorities in addition to tests specified herein, such as life safety systems.

3.6 Applicable equipment and materials to be listed by Underwriters' Laboratories and Manufactured in accordance with ASME, NEMA, ANSI or IEEE standards and as approved by local authorities having jurisdiction.

3.7 Before commencing work, examine all adjoining, underlying, etc., work on which this work is in any way dependent for perfect workmanship and report any condition which prevents performance of first class work. Become thoroughly familiar with actual existing conditions to which connections must be made or which must be changed or altered.

3.8 TEMPORARY LIGHTING

A. Irrespective of the working hours for the electricians, the Electrical Contractor shall maintain and pay the entire regular and overtime labor cost of keeping the temporary light and power system energized from a period of 15 minutes before the established starting time of the building trade which starts work earliest to a period of 15 minutes after the established stopping time of the trade which stops work latest. This shall apply to every working day of the week during the life of the contract, unless otherwise directed, or until such time that the maintenance of the temporary light and power system is no longer required by reason of the activation of and use of the permanent light and power systems.

B. Should this Contractor or any contractor require temporary light or power, or both, before or after the hours set forth in the preceding paragraphs, this Contractor or other contractors shall pay the extra cost of keeping the systems energized and in serviceable condition.

C. Remove the temporary light and power systems, when directed. This Contractor shall replace and make good all damage to the permanent parts. Under no circumstances shall temporary wiring be left in finished hung ceiling space.

D. When the permanent lighting and power systems are installed and operational, this Contractor shall make the change-over. The cost of making the change-over of the electrical services from the temporary lines to service from permanent lines shall be borne by this Contractor.

3.1 TESTING AND ACCEPTANCES

A. Notify the Architect/Engineer seven (7) days prior to the testing dates. If the Architect/Engineer so elect not to witness a specific test a statement of certification must be forwarded to the Architect/Engineer for approval.

B. Conduct tests at a time agreeable to the Architect/Engineer. Provide premium labor as necessary.

C. Products which are found defective or do not pass such tests shall be removed and replaced at the Contractor's expense. Tests shall be repeated.

D. Conduct all test required by the authorities having jurisdiction.

END OF SECTION