

December 12, 2019

ADDENDUM NUMBER TWO (2)

Project: Army Combat Fitness Test (ACFT) Overhead Cover
Regional Training Institute (RTI)
Camp Shelby Joint Forces Training Center
Camp Shelby, MS
PN: 28200019
DD/A PN: 19048

FROM: Dean and Dean/Associates Architects, P.A.
4400 Old Canton Road, Suite 200
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(601) 939-7717

The following additions, changes, clarifications and/or substitutions to the Project Drawings as indicated, are hereby made a part of the Contract Documents. **Acknowledge receipt of this Addendum by signing the attached Addendum Signature Page and attaching it to your Bid Form.**

Clarifications:

Item #1: Current Building Codes for project.

1. 2012 International Building code
2. 2011 National Electrical Code
3. Project designed to meet EXORD 219-18 per NG420.

Item #2: Electrical power and transformer.

The General Contractor shall include all fees, expenses and permits required to have the power company provide and set electrical transformer for a complete turn-key power installation.

Specifications:

Item #1: Section 133419, Metal Building Systems, remove existing section and replace with the attached revised section.

1. Clarified code and load requirements
2. Clarified roof panel type and installation
3. Removed roof insulation.

Item #2: Section 261200 – Pad-Mounted Transformers.

Add this section in its entirety.

Item #3: Section 262400 – Panelboards.

Add this section in its entirety.

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Drawings:

Item #1: Sheets A101 - Floor Plan and A201 - Building Elevations.

Current drawings show portal frames at four (4) locations – column line 1 between B & C and E & F, as well as column line 6 between B & C and E & F. Metal building engineers option to provide four (4) portal frames or reduce to two (2) portal frames located at column lines 1 and 6 between columns C & D. Metal building engineer shall provide structural calculations to support the proposed locations.

Item #2: Sheet A103 – Reflected Ceiling Plan and Sheet A201 – Building Elevations and Sections

Remove notes and references to vinyl faced fiberglass roof insulation between roof purlins. Building roof to be non-insulated.

Item #3: Sheet A103 – Reflected Ceiling Plan. Add General note #1 to this sheet to read as follows:

1. General contractor to coordinate locations and installation of light fixtures and ceiling fans shown on electrical drawings with metal building supplier. Contractor to provide painted steel framing that matches metal building framing for required fan supports.

Item #4: Sheet S101 – Contraction Joint Detail. Add the following note adjacent to saw joints detail:

1. Contractor to seal saw cut joints left exposed after installation of turf and rubber flooring with sealant type 1 per spec section 079005.

Item #5: Sheet E001 – Electrical Schedules and Risers

Remove general electrical note #32. Fire alarm not required on this project.

Item #6: Sheet E201 – Floor Plan – Power

Move proposed W.P./GFI outlet from column D-6 to column E-6 to be adjacent to Conex unit.

END OF ADDENDUM NUMBER TWO (2)

Dean and Dean/Associates
architects p.a.


Kenneth A. Oubre, AIA, Vice President



PLEASE ATTACH THIS ADDENDUM TO THE INSIDE FRONT COVER OF EACH SET OF SPECIFICATIONS.

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ADDENDA NUMBER TWO (2)

December 11, 2019

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PROJECT: P/N: 28200019
ARMY COMBAT FITNESS TEST (ACFT)
OVERHEAD COVER
REGIONAL TRAINING INSTITUTE (RTI)
CAMP SHELBY JOINT FORCES TRAINING CENTER
CAMP SHELBY, MS

PURPOSE: A Clarification of Bid Items and Modifications
to Drawings and Specifications

BIDDER: Sign and enclose this signature page with your bid and acknowledge
receipt of this addendum in the appropriate place on the Bid Form.

RECEIVED BY:

(SIGNATURE)

(TITLE)

(COMPANY NAME)

(ADDRESS)

(DATE)

Richard M. Dean, AIA
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1910-1997

End of Addenda #2

SECTION 133419
METAL BUILDING SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Manufacturer-engineered, shop-fabricated structural steel building frame.
- B. Standing Seam Metal roof panels including gutters and downspouts.
- C. Concrete Splashblocks at each downspout.
- D. Steel horizontal beam supports for exercise pull-up bar equipment attachment.

1.02 REFERENCE STANDARDS

- A. AISC 360 - Specification for Structural Steel Buildings; 2016.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.
- C. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2014 (Editorial 2017).
- D. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2010.
- E. ASTM A325M - Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Tensile Strength (Metric); 2013.
- F. ASTM A490 - Standard Specification for Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength; 2014a.
- G. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.
- H. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2014.
- I. ASTM A529/A529M - Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality; 2014.
- J. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process; 2010 (Reapproved 2015).
- K. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2014a.
- L. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018b.
- M. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.
- N. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015, with Errata (2016).
- O. IAS AC472 - Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems; 2017.
- P. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).
- Q. UL 580 - Standard for Tests for Uplift Resistance of Roof Assemblies; Current Edition, Including All Revisions.

1.03 DESIGN REQUIREMENTS

- A. Design members to withstand dead load, and design loads due to pressure and suction of wind calculated in accordance with applicable code. **Metal Building Engineer to follow the 2012 IBC and verify windloading requirements per local site conditions and location.**
- B. Design additional framing members for pull up bar support to allow 1000 lbs of load per 28 foot section of beam for support of pull up bars.

- C. Design members to withstand UL 580 Uplift Class 90.
- D. Add an additional 5 PSF for collateral future hvac loads on roof framing.
- E. Size and fabricate wall and roof systems free of distortion or defects detrimental to appearance or performance.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week before starting work of this section.
- B. The structural framing system of this project is predicated on the use of prefab metal building components. The A/E recognizes that some dimensional variation may occur from one metal building manufacturer to another. However, while minor deviations will likely be deemed permissible, major deviations will not be allowed.
- C. It shall be the responsibility of each bidder to ensure that the necessary degree of customization can be provided by their proposed metal building manufacturer such that the dimensional integrity of the architectural design is preserved. For purposes of clarification, the columns for this project will be allowed to be tapered.
- D. Each bidder is advised that absolutely no change order requests will be considered as a result of any additional cost that may be incurred by metal building manufacturers or the General Contractor to provide and install structural materials that are in keeping with the design intent set forth in the construction documents.
- E. In the event that deviations in the dimensions of metal building components proposed by the manufacturer or General Contractor give rise to the need for revisions to the construction documents for purposes of clarification or coordination, the costs to make such revisions shall be borne by the General Contractor, who must reimburse the Architect on a time and expense basis at their prevailing hourly rates.
- F. It shall be the responsibility of the General Contractor and metal building manufacturer to ensure that the structural frame is sufficient to support any and all rooftop mounted or roof-framing supported equipment as shown in the construction documents. No change order requests shall be considered as a result of failure by the General Contractor and metal building manufacturer to include sufficient monies in their bid price to cover such additional framing - whether in component size, type, or quantity.

1.05 SUBMITTALS

- A. See Division 0 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on profiles, component dimensions, fasteners.
- C. Shop Drawings: Indicate assembly dimensions, locations of structural members, connections and attachments; wall and roof system dimensions, panel layout, general construction details, anchorages and method of anchorage, installation ; framing anchor bolt settings, sizes, and locations from datum, foundation loads; indicate welded connections with AWS A2.4 welding symbols; indicate net weld lengths; provide professional seal and signature.
- D. Manufacturer's Instructions: Indicate preparation requirements, anchor bolt placement .
- E. Erection Drawings: Indicate members by label, assembly sequence, and temporary erection bracing.
- F. Project Record Documents: Record actual locations of concealed components and utilities.

1.06 QUALITY ASSURANCE

- A. Design structural components, develop shop drawings, and perform shop and site work under direct supervision of a Professional Structural Engineer experienced in design of this Work.
 - 1. Design Engineer Qualifications: Licensed in the State in which the Project is located.
 - 2. Conform to applicable code for submission of design calculations as required for acquiring permits.
 - 3. Cooperate with regulatory agency or authority and provide data as requested.
- B. Perform work in accordance with AISC 360 - Specification for Structural Steel Buildings.

- C. Perform welding in accordance with AWS D1.1.
- D. Manufacturer Qualifications: Company specializing in the manufacture of products similar to those required for this project.
 - 1. Not less than 5 years of documented experience
 - 2. Accredited by IAS according to IAS AC472.
- E. Erector Qualifications: Company specializing in performing the work of this section with minimum 3 years experience.

1.07 WARRANTY

- A. Correct defective Work within a five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Metal Buildings:
 - 1. Butler Manufacturing Company: www.butlermfg.com/speclink.
 - 2. Pinnacle Structures - www.pinnaclestructures.com
 - 3. ACI - acibuildingsystems.com -
 - 4. Ceco Building Systems: www.cecobuildings.com/#sle.
 - 5. Nucor Building Systems: www.nucorbuildingsystems.com/#sle.
 - a. Basis of Design: Gulf States Manufacturers, a Nucor Company; Starkville, MS
662-323-8021; www.gsmnucor.com
 - 6. VP Buildings: www.vp.com/#sle.
 - 7. Mid-West Steel Building Company: www.midwestbldg.com
 - 8. Substitutions: See Section 016000 - Product Requirements.

2.02 METAL BUILDING

- A. Single span rigid frame. See drawings.
- B. Bay Spacing: As indicated on drawings.
- C. Primary Framing: Rigid frame of rafter beams and columns, end wall columns, and rigid frame wind bracing.
- D. Secondary Framing: Purlins, and other items detailed.
- E. Roof System: Preformed metal panels oriented parallel to slope, with sub-girt framing/anchorage assembly and insulation, liner panel and accessory components.
- F. Roof Slope: 1 inches in 12 inches.

2.03 MATERIALS - FRAMING

- A. Structural Steel Members: ASTM A572/A572M, Grade 50.
- B. Structural Tubing: ASTM A500/A500M, Grade B cold-formed.
- C. Plate or Bar Stock: ASTM A529/A529M, Grade 50.
- D. Anchor Bolts: ASTM A307, galvanized to ASTM A153/A153M.
- E. Bolts, Nuts, and Washers: ASTM A325 (ASTM A325M), Type 1, galvanized to ASTM A153/A153M, Class C.
- F. Welding Materials: Type required for materials being welded.
- G. Primer: SSPC-Paint 20, zinc rich.
- H. Grout: ASTM C1107/C1107M, Non-shrink type, premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents, capable of developing minimum compressive strength of 2400 psi in two days and 7000 psi in 28 days.

2.04 MATERIALS - ROOF

- A. Standing Seam Metal Roof Panel: Galvalume finish, ASTM A792 or factory baked on Kynar paint finish as required to match finish of adjacent metal building roof and trim - verify onsite.

1. Trapezoidal-Rib, Standing Seam Metal Roof Panels: formed with raised trapezoidal ribs at panel edges and intermediate stiffening ribs symmetrically spaced between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panel and engaging opposite edge of panels.
 2. Coating: Class AZ 50 or heavier.
 3. Gauge: 0.022 -inch nominal thickness
 4. Clips: Manufacturer's standard, floating type to accommodate thermal movement: fabricated from aluminum-zinc alloy-coated steel sheet.
 5. Joint Type: Mechanically seamed, double folded.
 6. Panel coverage: 24 inches
 7. Panel height: 3 inches nom.
 8. Wind uplift: UL 90
 9. Factory applied sealant at each standing seam joint.
 10. Cleats: Manufacturer's standard, mechanically seamed cleats formed from steel sheet.
- B. Steel Sheet: ASTM A792/A792M aluminum-zinc alloy coated to AZ50/AZM150.
- C. Fasteners: Manufacturer's standard type, galvanized to comply with requirements of ASTM A153/A153M,.
- D. Trim, Closure Pieces, Caps, Flashings, Facias: Same material, thickness and finish as exterior sheets; brake formed to required profiles.

2.05 FABRICATION - FRAMING

- A. Fabricate members in accordance with AISC Specification for plate, bar, tube, or rolled structural shapes.
- B. Anchor Bolts: Formed with bent shank, assembled with template for casting into concrete.

2.06 FABRICATION - ROOF ASSEMBLIES

- A. Girts/Purlins: Rolled formed structural shape to receive roofing sheet.
- B. Flashings, Closure Pieces, Fascia: Same material and finish as adjacent material, profile to suit system.
- C. Fasteners: To maintain load requirements and weather tight installation, same finish as cladding, non-corrosive type.

2.07 FINISHES

- A. Framing Members: Clean, prepare, and shop prime. Do not prime surfaces to be field welded.
- B. Exterior Surfaces of Roof panels: Aluminum-Zinc coated on Galvalume steel Sheet ASTM A 792/A 792M Class AZ50 coating designation. system or factory baked on Kynar finish, finish color as selected from manufacturers standard finishes to match adjacent metal building roof and trim.
- C. Paint Finish Application:
 1. Top Coat (exterior)
 - a. Primer: .20-.25 mil
 - b. Top Coat: .70-.80 mil
 - c. Total film thickness: 1 mil
 2. Reverse Coat (interior)
 - a. Primer: .20-.25 mil
 - b. Wash coat backer: .30-.40 mil
 - c. Total film thickness: .50-.65 mil

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that foundation, floor slab, mechanical and electrical utilities, and placed anchors are in correct position

3.02 ERECTION - FRAMING

- A. Erect framing in accordance with AISC 360 - Specification for Structural Steel Buildings.
- B. Provide for erection and wind loads. Provide temporary bracing to maintain structure plumb and in alignment until completion of erection and installation of permanent bracing.
- C. Set column base plates with non-shrink grout to achieve full plate bearing.
- D. Do not field cut or alter structural members without approval.
- E. After erection, prime welds, abrasions, and surfaces not shop primed.

3.03 ERECTION - WALL AND ROOF PANELS

- A. Install in accordance with manufacturer's instructions.
- B. Exercise care when cutting prefinished material to ensure cuttings do not remain on finish surface.
- C. Fasten cladding system to structural supports, aligned level and plumb.
- D. Locate end laps over supports. End laps minimum 2 inches. Place side laps over bearing.
- E. Use concealed fasteners.
- F. Install sealant and gaskets to prevent weather penetration.

3.04 ERECTION - GUTTERS AND DOWNSPOUTS

- A. Rigidly support and secure components. Join lengths with formed seams sealed watertight. Flash and seal gutters to downspouts.
- B. Slope gutters minimum 1/4 inch/ft.
- C. Install splash pads under each downspout.

3.05 TOLERANCES

- A. Framing Members: 1/4 inch from level; 1/8 inch from plumb.
- B. Roofing: 1/8 inch from true position.

END OF SECTION

SECTION 261200

PAD-MOUNTED TRANSFORMERS

PART 1 - GENERAL

1.1 SECTION INCLUDES:

- A. Dry-type pad-mounted distribution transformers.

1.2 RELATED REQUIREMENTS:

- A. Section 03 3000 - Cast-in-Place Concrete: Pads for transformer support.
- B. Section 26 0529 - Hangers and Supports for Electrical Systems.
- C. Section 26 0548 - Vibration and Seismic Controls for Electrical Systems.
- D. Includes requirements for the seismic qualification of equipment specified in this section.

1.3 REFERENCE STANDARDS:

- A. IEEE 386 - IEEE Standard for Separable Insulated Connector Systems for Power Distribution Systems Rated 2.5 kV through 35 kV; 2016.
- B. IEEE C37.47 - IEEE Standard Specifications for High-Voltage (>1000 V) Distribution Class Current-Limiting Type Fuses and Fuse Disconnecting Switches; 2011.
- C. IEEE C57.12.00 - IEEE Standard for General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers; 2015.
- D. IEEE C57.12.01 - IEEE Standard for General Requirements for Dry-Type Distribution and Power Transformers; 2015.
- E. IEEE C57.12.28 - IEEE Standard for Pad-Mounted Equipment -- Enclosure Integrity; 2014.
- F. IEEE C57.12.90 - IEEE Standard Test Code for Liquid-Immersed Distribution, Power, and Regulating Transformers; 2015.
- G. IEEE C57.12.91 - IEEE Test Code for Dry-Type Distribution and Power Transformers; 2011.
- H. IEEE C57.13 - IEEE Standard Requirements for Instrument Transformers; 2016.
- I. IEEE C57.94 - IEEE Recommended Practice for Installation, Application, Operation, and Maintenance of Dry-Type General Purpose Distribution and Power Transformers; 1982 (R2006).

- J. IEEE C57.111 - IEEE Guide for Acceptance of Silicone Insulating Fluid and Its Maintenance in Transformers; 1989 (Reaffirmed 2009).
- K. IEEE C57.121 - IEEE Guide for Acceptance and Maintenance of Less Flammable Hydrocarbon Fluid in Transformers; 1998.
- L. NEMA 260 - Safety Labels for Padmounted Switchgear and Transformers Sited in Public Areas; 1996 (2004).
- M. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems; 2013.
- N. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.4 SUBMITTALS:

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate electrical characteristics and connection requirements, outline dimensions, connection and support points, weight, specified ratings and materials.
- C. Identify mounting conditions required for equipment seismic qualification.
- D. Product Data: Provide electrical characteristics and connection requirements, standard model design tests, and options.
- E. Manufacturer's equipment seismic qualification certification.
- F. Test Reports: Indicate procedures and results for specified factory and field testing and inspection.
- G. Manufacturer's Installation Instructions.
- H. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- I. Manufacturer's Field Reports: Indicate activities on site, final adjustments and overcurrent protective device coordination curves, adverse findings, and recommendations.
- J. Project Record Documents: Include copy of manufacturer's certified drawings.
- K. Maintenance Data: Include maintenance instructions for cleaning methods; cleaning materials recommended; procedures for sampling and maintaining fluid.
- L. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
- M. See Section 01 6000 - Product Requirements, for additional provisions.
- N. Extra Fuses: One of each type and size.

- O. Tools: One each of every special tool required to operate and maintain transformer.

1.5 QUALITY ASSURANCE:

Conform to requirements of NFPA 70.

Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience and with service facilities within 100 miles of Project.

Testing Agency Qualifications: Company member of International Electrical Testing Association and specializing in testing products specified in this section with minimum three years documented experience.

Products: Listed, classified, and labeled as suitable for the purpose intended.

Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.6 DELIVERY, STORAGE, AND HANDLING:

Protect dry-type transformers from moisture by using appropriate heaters as instructed by the manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

ABB/GE: www.geindustrial.com/#sle.

Cooper Power Systems, a division of Eaton Corporation:
www.cooperindustries.com/#sle.

Schneider Electric; Square D Products: www.schneider-electric.us/#sle.

Siemens Industry, Inc: www.usa.siemens.com/#sle.

Substitutions: See Section 01 6000 - Product Requirements.

2.2 DRY-TYPE TRANSFORMERS:

Dry-Type Transformers: IEEE C57.12.01; single phase, pad-mounted, self-cooled transformer unit with solid-cast windings.

Cooling and Temperature Rise: IEEE C57.12.01; Class AA. 220 degree C insulation class with 150 degree C rise over 40 degree C ambient.

2.3 SERVICE CONDITIONS:

Meet requirements for usual service conditions described in IEEE C57.12.00 and for the specified unusual service conditions.

2.4 RATINGS:

Seismic Qualification: Provide transformers and associated components suitable for application under the seismic design criteria specified in Section 26 0548 where required. Include certification of compliance with submittals.

Capacity: 50 kVA.

Primary Voltage: _____ kV delta connected.

Taps: Standard primary taps.

Secondary Voltage: 120/240 volts, wye connected.

Impedance: 5.75 percent maximum.

Basic Impulse Level: 30 kV.

2.5 ACCESSORIES:

Accessories: IEEE C57.12.00 standard accessories.

Tap Changer: Externally-operated type.

Primary Terminations: Bushing wells to IEEE 386; provide three for radial feed. Include bushings for insulated loadbreak connectors.

Primary Terminations: Porcelain insulator with clamp-type connector.

Primary Switching: Fused air switch, gang operated.

Primary Switching: Internal liquid-immersed gang-operated load break switch. Provide two, for primary selective switching.

Primary Overcurrent Protection: Internally-mounted, liquid-immersed, expulsion fuses.

Secondary Terminations: Spade lugs.

Secondary Switching and Overcurrent Protection: Molded case circuit breaker; UL listed.

Other Accessories: Primary lightning arrestors and secondary current transformers to IEEE C57.13.

2.6 FABRICATION:

Conform to the requirements of IEEE C57.12.28.

2.7 FACTORY FINISHING:

Clean surfaces before applying paint.

Apply corrosion-resisting primer to all surfaces.

Apply finish coat of baked enamel paint to 2 mils thick.

Finish Color: Manufacturer's standard dark gray finish.

2.8 SOURCE QUALITY CONTROL:

See Section 01 4000 - Quality Requirements, for additional requirements.

Provide factory tests to IEEE C57.12.90 and IEEE C57.12.00. Include the routine tests as defined in the standards and the following other tests:

Impedance voltage and load loss.

Dielectric tests.

Audible sound level.

Short circuit capability.

Telephone influence factor (TIF).

Zero-phase-sequence impedance voltage.

Temperature rise.

Test insulating liquid samples in accordance with IEEE C57.111.

Make completed unit substation available for inspection at manufacturer's factory prior to packaging for shipment. Notify Owner at least 7 days before inspection is allowed.

Allow witnessing of factory inspections and tests at manufacturer's test facility. Notify Owner at least 7 days before inspections and tests are scheduled.

PART 3 - EXECUTION

3.1 EXAMINATION:

Verify that support pads provided under Section 03 3000 are ready to receive products.

Verify that field measurements are as indicated on shop drawings.

3.2 INSTALLATION:

Install in accordance with IEEE C57.94.

Provide required support and attachment in accordance with Section 26 0529.

Provide required seismic controls in accordance with Section 26 0548.

Install plumb and level.

Install safety labels to NEMA 260.

3.3 FIELD QUALITY CONTROL:

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Inspect and test in accordance with NETA ATS, except Section 4.

C. Perform inspections and tests listed in NETA ATS, Section 7.2. Tests listed as optional are not required.

- D. Dry-Type Transformers:
 - 1. Verify that control and alarm settings on temperature indicators are as specified.
 - 2. Perform a power-factor or dissipation-factor tip-up test on windings greater than 2.5 kV.
- E. Perform excitation-current tests on each phase.
- F. Measure the resistance of each winding at each tap connection.
- G. Perform an applied voltage test on all high- and low-voltage windings-to-ground.
- H. Liquid-Filled Transformers:
 - I. Test dew point of tank gases.
 - J. Perform sweep frequency response analysis tests.
 - K. Perform leakage reactance three phase equivalent and per phase tests.
 - L. If core ground strap is accessible, remove and measure core insulation resistance at 500 volts dc.
 - M. If applicable, measure the percentage of oxygen in the gas blanket.
 - N. Measure insulating liquid's specific gravity and dissipation factor or power factor.

3.4 ADJUSTING:

- A. Adjust primary taps so that secondary voltage is above and within 2 percent of rated voltage.

END OF SECTION

**SECTION 262400
PANELBOARDS**

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK:

- A. Lighting and power panelboards and their installation.

1.2 SUBMITTALS:

- A. Provide shop drawings. Include individual diagram of each panelboard showing all specified requirements.

PART 2 - PRODUCTS

2.1 GENERAL:

- A. Construct panelboards in accordance with latest NEMA and UL standards.
- B. Panelboards to be same manufacturer as other distribution equipment.
- C. Panelboard assembly UL labeled, and UL labeled as Service Entrance Equipment where used for that purpose.
- D. Panelboards to have integrated equipment fault rating equal to interrupting rating of lowest rated overcurrent device.
- E. Panelboards shall be factory assembled.

2.2 PANEL INTERIOR:

- A. Bussing:
 - 1. 98% conductivity copper, silver-plated at joints or equivalent plated 55% conductivity aluminum.
 - 2. Bus assembly designed for a maximum temperature rise of 55 degree C above 40 degree C ambient temperature when carrying rated current.
 - 3. Minimum thickness of bus bars - 3/32".
 - 4. Bussing braced to withstand a fault current equal to the highest device interrupting capacity in the panel.
 - 5. Neutral bus full size copper or aluminum sized on same basis as phase busses and insulated from the cabinet.
 - 6. Arrange bus bar connections so that adjacent vertical circuit protective devices are consecutively connected to phases A, B, and C throughout

panel. Provide full capacity ground bus in each panel cabinet, bolted to cabinet. Where indicated for Isolated Ground, provide second ground bus isolated from cabinet.

B. Cable terminations:

1. Include neutral and ground connections as shown.
2. Make with separate, individual heavy casting aluminum, AL/CU rated lugs, Thomas & Betts, IlSCO, Blackburn or approved equivalent.
3. Use 2 bolt tongue or equivalent connection to bus for #1/0 or larger cables.
4. Securely bolt lugs to bus with bolts, nuts and lock washers.
5. Provide double lugs on main bus where shown.
6. Feed-through lugs (one set of lugs on each end of main vertical bus) is not acceptable unless approved by Architect.

C. Circuit breakers:

1. Molded case, thermal-magnetic, quick-make, quick-break, trip free on faults, thermal-inverse time delay element and magnetic instantaneous trip coil in each ungrounded phase conductor, or approved equivalent solid state trip unit.
2. Engrave breaker ampere rating on handle or trip unit.
3. Furnish multi-pole breakers with internal common trip.
4. Ground fault breakers class "A" type to trip on fault currents of 4-6 ma.
5. Main circuit breakers UL rated for service entrance use.
6. Switch "SWD" rated where required by NEC.

D. Panelboards classified by type over-current protection as follows:

1. BQL Bolted quick-lag circuit breaker distribution, 0-100 ampere branches, with minimum interrupting rating of 22,000 symmetrical amperes at 208 volts. Equivalent to Square "D", NQOD, Siemens NLAB, Cutler-Hammer BB, G.E. NLAB.
2. CCB Heavy duty convertible circuit breaker distribution, 0-800 ampere branches with minimum interrupting rating of 42,000 symmetrical amperes at 208 volts. Equivalent to Square "D", I-Line, Siemens CDP-6, Cutler-Hammer CDP,

G.E. type CCB.

- E. All space in panelboards usable. Panelboard space provided with necessary connections for future installation of overcurrent devices.

2.3 CABINETS:

- A. Code thickness, hot dip galvanized steel or painted with trim and door. Hardware: combination latch and cylinder lock, all keyed the same. Provide celluloid or plastic covered directory card holder on the inside of door. Trim, door and exposed interior shall be finished with factory prime and smooth finish coat of the color selected by Architect. Reinforce cabinets as necessary for service and short circuit rating intended.
- B. Flush or surface as indicated of sufficient size to allow minimum 3" gutter space each side of panel and eight inches (8") at top and bottom, minimum 20" wide. Provide adjustable trim clamp, semi-flush hinges and inside rabbet.
- C. Provide panels with hinged trim construction.

2.4 MANUFACTURERS:

- A. Panelboards manufactured by Siemens, Square D, General Electric, or Cutler-Hammer.

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. Mount panelboards securely to building structure with 3/8" minimum diameter galvanized bolts and inserts number as required for size of panel, but not less than 4. Mount panelboards with centerline 4'-6" approximately above finished floor. Where panels of different heights are mounted adjacent, install top of panel trim at same height above floor. Close all unused openings.
- B. Where two sets of feeder cables are required in panel gutter space, run one set in each side of panel.

3.2 IDENTIFICATION:

- A. Permanently attach nameplates and circuit numbers to panel.
- B. Use horizontal consecutive circuit numbers for lighting and appliance panels unless shown otherwise on panelboard schedules.
- C. Provide typewritten circuit directories describing service of each circuit in Types BQL panels.
- D. Provide laminated plastic nameplate circuit identification for each circuit in Types

CCB panels.

- E. Provide each panelboard with nameplate showing name and voltage.

END OF SECTION