ADDENDUM NO. 4

TO:  PLANS AND SPECIFICATIONS FOR STATE OF MISSOURI

TASMG READINESS CENTER
AVCRAD Facility
Springfield, Missouri
PROJECT NO.: T1809-01

Bid Opening Date: 1:30 PM, Thursday, May 28, 2020 (Not Changed from Addendum No. 3)

Bidders are hereby informed that the construction Plans and/or Specifications are modified as follows:

SPECIFICATION CHANGES:

1. Section 033000 – CAST-IN-PLACE CONCRETE

   a. ADD Paragraph 2.4-A.1. as follows:

   1. Products: Subject to compliance with requirements, provide one of the following:

      a. BASF Corp. – Construction Chemicals; MasterKure HD300 WB.
      b. Dayton Superior; Sure Hard Densifier J17.
      c. Euclid Chemical Company (The); an RPM company; Eucosil.
      d. Kaufman Products, Inc; SureHard LS.
      e. Laticrete International, Inc; L&M Seal Hard.

   b. ADD Paragraph 2.5-A.1. as follows:

   1. Products: Subject to compliance with requirements, provide one of the following:

      a. BASF Corp. – Construction Chemicals; MasterKure ER 50.
      b. Dayton Superior; AquaFilm Concentrate J74
      c. Euclid Chemical Company (The); an RPM company; Eucobar.
      d. Kaufman Products, Inc; VaporAid.
      e. Laticrete International, Inc; L&M E-CON.
      f. W.R. Meadows, Inc; EVAPRE.

   c. ADD Paragraph 2.5-F.1. as follows:

   1. Products: Subject to compliance with requirements, provide one of the following:

      a. Dayton Superior; Clear Cure VOC J7WB.
      b. Euclid Chemical Company (The); an RPM company; Kurez DR VOX.
      c. Kaufman Products, Inc; DR Cure.
      d. Laticrete International, Inc; L&M CURE R.
      e. W.R. Meadows, Inc; 1100-CLEAR.

   d. ADD Paragraph 2.5-G.1. as follows:

   1. Products: Subject to compliance with requirements, provide one of the following:
2. Section 072119 – FOAMED IN PLACE INSULATION
   a. ADD Paragraph 3.4-A. as follows:

      A. At ALL roof to wall connections provide spray foam insulation. At metal deck; provide on the underside and in the deck flutes.

3. Section 074113.19 – BATTEN SEAM METAL ROOF PANELS
   a. REVISE Paragraph 2.2-B.1. as follows:

      1. Basis-of-Design Product: Subject to compliance with requirements, provide CENTRIA Architectural Systems (SRS3) product indicated on Drawings. NO SUBSTITUTIONS are permitted.

4. Section 074213.13 – FORMED METAL WALL PANELS
   a. REVISE Paragraph 2.2-B.1. as follows:

      1. Basis-of-Design Product: Subject to compliance with requirements, provide CENTRIA Architectural Systems; Econolap 3/4. NO SUBSTITUTIONS are permitted.

   b. REVISE Paragraph 2.2-C.1 as follows:

      1. Basis-of-Design Product: Subject to compliance with requirements, provide CENTRIA Architectural Systems; MR3-36. NO SUBSTITUTIONS are permitted.

5. Section 074213.19 – INSULATED METAL WALL PANELS
   a. REVISE Paragraph 2.2-B. as follows:

      B. Concealed-Fastener, Foamed-Insulation-Core Metal Wall Panels MP-3: Formed with tongue-and-groove panel edges; designed for sequential installation by interlocking panel edges and mechanically attaching panels to supports using concealed clips or fasteners.

   b. REVISE Paragraph 2.2-B.1. as follows:

      1. Basis-of-Design Product: Subject to compliance with requirements, provide Centria Versawall. NO SUBSTITUTIONS are permitted.

6. Section 075419 - POLYVINYL-CHLORINE (PVC) ROOFING
   a. ADD Paragraph 2.2-A.1.e. as follows:
e. Sika/Sarnafil

b. DELETE Paragraph 2.4 SUBSTRATE BOARDS in its entirety.

c. REVISE Paragraph 2.5-B.4. as follows:

4. Thickness: Provide thickness as required to achieve R-30.

d. ADD Paragraph 2.8 COVER BOARD as follows:

2.8 ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 1/2 inch (13 mm) thick. Or High Density closed cell polyisocyanurate foamcore with coated glass fiber, 1/2 inch thick.

e. DELETE Paragraph 3.4 SUBSTRATE BOARD INSTALLATION in its entirety.

f. DELETE Paragraph 3.5 VAPOR RETARDER INSTALLATION in its entirety.

g. ADD Paragraph 3.6-D. as follows:

D. Insulation shall be mechanically fastened only in areas needed to meet FM Global requirements. All other areas shall be fully adhered.

7. Section 083313 – COILING COUNTER DOORS

a. REVISE Paragraph 2.2-D.1. as follows:

1. Slat Interior Facing: Metal

8. Section 083323 – OVERHEAD COILING DOORS

a. DELETE: Paragraph 2.2-B. Windborne Debris Impact Resistance in its entirety.

b. ADD Paragraph 2.3-O. as follows:

O. Door shall be self-supported from jambs.

9. Section 084113 – ALUMINUM FRAMED ENTRANCES AND STOREFRONTS


10. Section 084413 – GLAZED ALUMINUM CURTAIN WALLS


11. Section 084523 – FIBERGLASS SANDWICH PANEL ASSEMBLIES

a. REVISE Paragraph 1.8-C.2. as follows:

2. Warranty Period: 10 years from date of Substantial Completion

b. REVISE Paragraph 2.1-C.1. as follows:
1. Overhead Panel Assemblies: Limited to L/60 of clear span for each assembly component.

c. DELETE Paragraph 2.1-E. Windborne-Debris Impact Resistance in its entirety.

d. REVISE Paragraph 2.3-A.1. as follows:

   1. Core Insulation: Fill panel cores with standard insulation.

e. REVISE Paragraph 2.3-E.1. as follows:

   1. Thickness: 0.045 inch.

f. ADD Paragraph 2.3-E.3. as follows:

   3. Face sheets shall not vary more than +/-10% in thickness and be uniform in color.

g. ADD Paragraph 2.3-H. 9-12 as follows:

   9. Light Transmission: 26%
   10. Solar Heat Gain Coefficient: 0.28
   11. Panel U-factor by NFRC certified laboratory: 2-3/4” thermally broken grid 0.23U
   12. Complete insulated panel system shall have NFRC certified U-factor of 0.28U

h. REVISE Paragraph 2.6-A. as follows:

   A. Manufacturer’s standard finish, which meets performance requirements AAMA 2604. Color to be selected from manufacturers full line.

12. Section 088000 – GLAZING

   a. DELETE Paragraph 2.2-D. Windborne Debris Impact Resistance in its entirety.

   b. ADD Paragraph 2.5-B. as follows:

      B. Laminated glass consists of two nominal 1/8” glass panes bonded together with a minimum of a 0.030in interlayer of a material designed for blast resistance. The same requirements apply to the spandrel units.

   c. ADD Paragraph 2.6-B. as follows:

      B. Use the polycarbonate or laminated glass for the innermost pane as a minimum. Provide a glazing frame bite in accordance with ASTM F2248. The same requirements apply to the spandrel units.

13. Section 096723 – RESINOUS FLOORING

   a. ADD Paragraph 2.2-B.1. as follows:

      1. Existing color is Cobblestone, RES-2 – Cobalt. Color shall match existing or provide custom color to match.

14. Section 105113 – METAL LOCKERS

   a. ADD Paragraph 2.1-B.4. as follows:
4. Elite Storage Products
b. ADD Paragraph 2.1-C.4. as follows:

4. Elite Storage Products

15. Section 114000 – FOOD SERVICE EQUIPMENT

a. ADD Specification Section 114000 Food Service Equipment. See attached Section 114000.

16. Section 221124 – DOMESTIC WATER PUMPS

a. ADD Paragraph 2.1-A.2-6. as follows:

2. Bell & Gossett
3. Patterson
4. Wilo
5. Taco
6. Armstrong

17. Section 220719 – PLUMBING PIPING INSULATION

a. ADD Paragraph 2.2-C. as follows:

C. Approved Manufacturers:

1. Proto

18. Section 230719 – HVAC PIPING INSULATION

a. ADD Paragraph 2.3-C. as follows:

C. Approved Manufacturers:

1. Proto

19. Section 233713 – HVAC DIFFUSERS, REGISTERS, AND GRILLES

a. REVISE Section 233713; See attached revised Section 233713

20. Section 238220 – FAN-COIL UNITS AND UNIT VENTILATORS

a. ADD Paragraph 2.2-E. as follows:

E. Manufacturers:

1. Berko
2. Marley
3. Raywall
4. Markel

b. ADD Paragraph 2.3-C.6. as follows:
6. Markel

21. Section 260913 – ELECTRICAL POWER MONITORING AND CONTROL
   a. DELETE Paragraph 2.1-E. in its entirety.
   b. ADD Paragraph 2.3-A.5. as follows:

5. Shark

DRAWING CHANGES:

22. Sheet A001 – PARTITION TYPES
   a. Partition Type P14 WIRE MESH PANEL:
      1. ADD the following note:
         
         PARTITIONS SHALL WRAP TIGHT AROUND STRUCTURE.

23. Sheet A111 – FIRST FLOOR PLAN
   a. ADD Keynote #8 as follows:
      
      8. PROVIDE EXPANSION JOINT FOR FULL LENGTH OF WALL FOR BOTH FIRST
         AND SECOND FLOORS. BASIS OF DESIGN: ARCHITECTURAL ART
         MANUFACTURING. APPROVED MANUFACTURERS: CONSTRUCTION
         *Locate keynote at southwest corner of exterior of building near column grids S1
         and AD.

   b. ADD General Note as follows:
      
      CONTRACTOR SHALL PROVIDE WOOD BLOCKING IN WALL FOR (4'X6') VISUAL
      DISPLAY UNITS (12 LOCATIONS).

24. Sheet A120 – SECOND FLOOR PLAN
   a. ADD note at CORRIDOR 201 as follows:
      
      PROVIDE RAILING AROUND PERIMETER OF OPENING IN FLOOR INDICATED AS
      “OPEN TO BELOW” (TWO LOCATIONS). SEE DETAIL 1/A303 AND SECTION
      057300. OPENING IN FLOOR IS 2'-0"+/- WIDE X 16'-0" LONG. PROVIDE RAILING
      ON THREE SIDES.

   b. CLARIFICATION at LOBBY 200 as follows:
      
      GRAPHIC SHOWN ON EAST WALL IS A GUARD RAIL, REFER TO DETAIL 6/A303.

   c. ADD note at LOBBY 200 as follows:
      
      PROVIDE PARTITION TYPE P6 ALONG NORTH WALL, PROVIDE 1 1/2" SPACE
BETWEEN NEW PARTITION AND EXISTING WALL. REMOVE FINISHES FROM EXISTING WALL AS REQUIRED.

d. ADD General Note as follows:

AT THE TRANSITION BETWEEN EXISTING BUILDING AND NEW CONSTRUCTION. (NORTH OF COLUMN GRID S11), PROVIDE EXPANSION JOINT ALONG ALL INTERIOR WALLS, FLOORS, AND CEILINGS.

a. BASIS OF DESIGN: ARCHITECTURAL ART MANUFACTURING

1. APPROVED MANUFACTURERS: CONSTRUCTION SPECIALTIES & INPRO CORP.

b. WALL TO WALL: G15-58-14

c. CEILING TO CEILING: G15-71-14

d. FLOOR TO FLOOR: D10-18-21

25. Sheet A130 – ROOF PLAN

a. REVISE Keynote #1 as follows:

1. PVC ROOF SYSTEM OVER TAPERED INSUL. SLOPE TO ROOF DRAINS.

b. ADD General Note as follows:

PROVIDE WALK PADS FROM DOOR MARK 201 AND CREATE A LOOP THAT GOES BY THE MECHANICAL EQUIPMENT ON THE ROOF AND THE ROOF DRAINS.

26. Sheet A151 – ENLARGED KITCHEN PLAN

a. See attached Revised Sheet A151. Kitchen equipment to be included with the bid has been added as indicated in the revision cloud on the Revised Sheet A151.

27. Sheet A200 – ELEVATIONS

a. REVISE Keynote #6 as follows:

6. MP3 INSULATED VERTICAL METAL WALL PANELED. REFER TO SPECIFICATIONS FOR PANEL WIDTH.

b. REVISE Keynote #9 as follows:

9. NON-INSULATED VERTICAL METAL WALL PANEL MECHANICAL SCREENWALL. MP-1 CORRUGATED METAL PANEL.

c. ADD Note at EAST ELEVATION 1-AREA A as follows:

THE THREE DORMERS ON THE ROOF SHALL HAVE BATTEN SEAM METAL ROOF ON THE VERTICAL WALLS, ALL THREE SIDES.
28. Sheet A300 – WALL SECTIONS
   a. ADD note to Detail 1-WALL SECTION as follows:
      
      REFER TO DETAIL 6/A300 FOR ADDITIONAL INFORMATION AT SECOND FLOOR SLAB AT EXISTING BUILDING.
   b. REVISE Detail 6 insulation note as follows:
      
      CLOSED CELL SPRAY FOAM CONTINUOUS.

29. Sheet A301 – WALL SECTIONS
   a. REVISE all detail notes referring to “TPO” and REPLACE with “PVC”.
   b. REVISE Detail 5 WALL PANEL note as follows:
      
      MP-2 HORIZONTAL WALL PANEL OVER SUB-FRAMING AS REQUIRED BY MANUFACTURER/INSTALLER.

30. Sheet A302 – WALL SECTIONS
   a. REVISE all detail notes referring to “TPO” and REPLACE with “PVC”.
   b. REVISE Detail 4 note as follows:
      
      MP-3 PREFIN VERT MTL WALL PANEL

31. Sheet A303 – WALL SECTIONS
   a. REVISE SECTION 6 Post and Rail note as follows:
      
      2" DIA S.S. POSTS AND TOP RAIL WITH HORIZONTAL PICKETS SPACED AT 4" OC. HORIZONTAL PICKETS SHALL BE 1/2" DIAMETER STAINLESS STEEL TUBING TO MATCH COMPOSITION OF EXISTING GUARDRAIL AT EXISTING 2ND FLOOR WALKWAY AT LOBBY.

32. Sheet A306 – WALL SECTIONS
   a. REVISE Detail 5 WALL PANEL note as follows:
      
      MP-3 PREFIN VERT MTL WALL PANEL OVER WRB (WATER RESISTANT BARRIER, SIMILAR TO OWENS CORNING ICE AND WATER SHIELD) OVER ½" CDX PLYWOOD SHEATHING OVER 6" METAL STUDS AT 16" OC.

33. Sheet A400 – DOOR SCHEDULE
   a. ADD DOOR NO. 102d to SCHEDULE as follows:
      
      102d: Locate in curtain wall CW2 on south wall of Lobby 101
      
      i. Door: Config: Single, Width 3’-0”, Height: 7’-0”, Thick: 1 3/4”, Type: AL1,
Material: AL/Glass,
II. Frame Type: CW2 (Locate on north section of curtain wall.), Material: AL.
III. Hardware Set #1

34. Sheet A403 – HEAD, JAMB, SILL DETAILS
   a. REVISE HEAD DETAIL 4 note as follows:
      Structural Steel Beam and related note shall be removed from the detail. Overhead door shall be self-supported from jambs.

35. Sheet A810 – FIRST FLOOR FINISH PLANS
   a. ADD General Note #15 as follows:

36. Sheet A811 – FIRST AND FLOOR FINISH PLANS
   a. ADD General Note #15 as follows:

37. Sheet A820 – SECOND FLOOR FINISH PLANS
   a. ADD LACT 225 room finish note as follows:
      LACT 225 Finishes: Flooring: CPT-2, Paint: PT-1, Wall Base: RB-1
   b. ADD General Note #15 as follows:
      15. Rooms with roller window shades type (WT-1): 203, 204, 205, 206, 217, 218, 219, 220, and 221.

38. Sheet A910 – FIRST FLOOR SIGNAGE AND FURNITURE PLAN AREA A
   a. REVISE room title TLT 107J as follows:
      TR-Toilet Room Identity
   b. ADD note to Lobby 101 as follows:
      PROVIDE TE-TACTILE EXIT SIGN AT CURTAIN WALL CW2 ON SOUTH WALL.

39. Sheet M211 – FIRST FLOOR MECHANICAL PIPING PLAN – AREA B
   a. REVISE Keynote #1 as follows:
      1. CONNECT HEATING HOT WATER AND CHILLED WATER TO SYSTEMS FROM ADJACENT BUILDING. METERS INDICATED SHALL BE ONICON OR EQUAL MAG-METERS WITH BAS INTEGRATION TO GRAPHICS.
b. A snip from the adjacent building mechanical piping plan is shown below for where piping valves are located high within walkway for connection to readiness center hydronic piping. Reference revised keynote #1 above.

40. Sheet M700 – MECHANICAL SCHEDULES
   a. REVISE DUCT PRESSURE CLASS schedule. See attached M700 Sketch SK-1.

41. Sheet E110 – FIRST FLOOR LIGHTING PLAN – AREA A
   a. ADD General Note G. as follows:

   G. For new door added in Lobby 101 curtainwall as part of this addendum per architectural drawing change, install a type EX exit light fixture wired to corridor circuit.

42. Sheet E500 – DIAGRAMS
   a. REVISE Keynote #3 as follows:

   A. ROUTE FEEDER TO ABOVE CEILING IN THE ADMINISTRATION BUILDING TO A NEW MOLDED CASE 800A/3PH CIRCUIT BREAKER IN EXISTING SWITCHBOARD IN BUILDING 29 ON MEZZANINE. SEE PHOTO OF SWITCHBOARD AND OPEN BREAKER MOUNTING SPACE. FIELD VERIFY EXISTING ROUTING, DISTANCE IS 250-350 FEET DEPENDING ON ROUTING.
b. ADD note as follows:

THE SPLIT-CORE CTS AND METERING PACKAGE FOR EACH BREAKER WITHIN MDP ARE SHOWN FOR COMPLIANCE WITH LEED POINTS. REFERENCE KEYNOTE #7 AND SECTION 260913.

c. REVISE Keynote #7 as follows:

7. SQUARE D, SHARK, OR EQUAL, METERING (PM800) FOR EACH BREAKER WITHIN MAIN DISTRIBUTION BOARD. MAIN BREAKER SHALL BE POWER STYLE BREAKER WITH BUILT IN METERING. MULTIFUNCTION DIGITAL POWER METERS SHALL INCLUDE DATA LOGGING, COMMUNICATION AND I/O FOR INCLUSION INTO SOFTWARE PACKAGE AND BAS GRAPHICS. COMMUNICATION SLOTS SHALL BE MODBUS/IP FOR SOFTWARE GRAPHICS INTO AUTOMATED LOGIC SYSTEM. ACCEPTABLE MODELS ARE SHARK 200, SQUARE D PM800 SERIES, SIEMENS SENTRON PAC3200 SERIES, EATON POWER XPERT 2000 SERIES, AND GE EPM 6000 SERIES.

43. Sheet E702 – ELECTRICAL PANEL SCHEDULES

a. ADD L2-3 Panel Schedule as indicated in the snip below:
GENERAL COMMENTS:

1. Changes to, or clarification of, the bid documents are only made as issued in the addenda.
2. All correspondence with respect to this project must include the State of Missouri project number as indicated above.
3. Current Planholders list available online at: https://www.adsplanroom.net/jobs/444/details/t1809-01-tasmg-readiness-center-avcrad-facility
4. Prospective Bidders contact American Document Solutions, 1400 Forum Blvd Suite 1C, Columbia MO 65201, 573-446-7768 to order official plans and specifications.

ATTACHMENTS:

1. Specification Section 114000 – FOOD SERVICE EQUIPMENT
2. Specification Section 233713 – HVAC DIFFUSERS, REGISTERS, AND GRILLES
3. Drawing Sheets A151 – ENLARGED KITCHEN PLAN
4. Drawing Sketch M700 SKETCH SK-1

May 19, 2020

END OF ADDENDUM NO. 4
PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the furnishing of material and labor required to completely assemble and erect all food service equipment as specified herein and indicated on drawings. This work is to be performed in such a manner as to complete the installation of each individual piece of equipment to perform the function for which it is designed.

B. The work referred to in these documents consists of furnishing all labor and materials required to deliver and install all food service equipment as specified into the building. The Kitchen Equipment Contractor (K.E.C.) shall uncrate, assemble, hang, set-in-place, level and completely install exclusive of all plumbing, electrical, and ventilation rough-in and final connections.

C. For required drain traps, steam traps, atmospheric vents, valves, pipes and pipe fittings, ductwork, and other materials necessary to complete mechanical hookup of food service equipment, refer to the specifications governing other trades.

D. For wiring, disconnects, and other materials necessary to complete electrical hookup of food service equipment, refer to the Architect's specifications governing other trades. Rough-in and connections are included under other Contractor's work.

E. Related Responsibilities to be Completed by Other Trades:
   1. Hanging of exhaust hoods, ductwork, fans placement, installation of curbs, etc., and air balancing.
   2. Furnishings and installation of plumbing fixtures as indicated (i.e., mop sink, hand sink, etc.).
   3. Installation of food service equipment accessories included, but not limited to:
      a. Booster Heater:
         1. Two (2) temperature/pressure gauges.
         2. One (1) pressure reducing valve.
      3. Connection of incoming hot water to booster and tee to dish machine fill.
      4. Extending of copper drain line from pressure relief to floor sink.
      b. Dish Machine:
         1. Connection of incoming water from booster heater.
         2. Install final rise temperature gauge.
         3. Connection of main drain and also rinse tank overflow to appropriate drain.
         5. Final duct connection above ceiling for pant leg duct or straight vents
      c. Disposal or Waste Scrapping System:
         1. Connection from supply to hot and cold temperature mixing valve.
         2. Combining disposal and tank reservoir drains prior to connection to waste system.
         3. Mounting and inter-piping of trough diffuser, gusher head(s), swirl valves, and vacuum breaker.
         4. Electrical connection from control to solenoid valve.
         5. Plumbing and electrical connection to solenoid valve.
         6. Mounting pre-rinse faucet and connecting supply lines.
         7. Extending drain line from scrapping system to floor sink or direct waste connection
      d. Preparation/Scullery Sinks:
         1. Mounting of faucets and connection of supply lines to the faucet(s).
         2. Mounting of 2" lever waste drains and extension of drain and trap to indirect waste.
      e. Hot and Cold Food Tables:
         1. Furnish and install copper drain line from hot and cold tables to nearest floor drain.
         2. Cord and plug connection as required.
      f. Steamers/Combi Ovens/Steam Kettles:
         1. Extending water supply through water filtration system to unit(s).
2. Extend air gap drain(s) from pop off valve, boiler, or kettle drain(s) to floor sink.

g. Walk-In Refrigeration:
   1. Extend copper drain line from evaporator to nearest floor drain. Refer to mechanical specs.
   2. Connect incoming water to water cooled condensing units (if applicable) and extend drain line to nearest floor drain.
   3. Installation and wiring of Modularm system to building security system (if applicable)
   4. Electrical contractor to seal all penetrations for conduit and j-boxes required final electrical connections
   5. Fire sprinkler contractor to seal all penetrations for sprinkler drops within the cooler/freezer compartments

h. Ceiling grid within the dishroom area shall be installed as to accommodate two (2) 4" x 16" condensate ducts allowing penetrations through ceiling tiles and not through grid.
   a. Cutting of ceiling tiles to accommodate two (2) 4" x 16" condensate ducts shall be by others

i. Review of food service equipment shop drawings and equipment submittals necessary for items for a complete utility connection/hook-up.

j. Installation of Owner furnished items.

1.2 SUBMITTALS
   A. All submittals shall be uploaded electronically within thirty (30) days of Contract Award. K.E.C. to verify with Architect/Construction Manager/General Contractor as to which submittal review platform shall be used for the project. Documents must be in a PDF format.
      1. Floorplan and rough-in utility drawings shall be ¼” scaled dimensioned drawings. Electrical and Plumbing rough-in drawings shall be dimensioned with plumbing, electrical, and mechanical schedules for all equipment as shown within the food service drawings.
   B. Rough-In Verification: Before the concrete floor slab is poured, the K.E.C. shall inspect the site to verify all under slab utilities are placed per plans and specifications.
   C. Project Closeout Submittals: Upload maintenance and service manuals electronically, covering each item of food service equipment. This submittal shall include product data sheets, wiring diagrams, parts list and service agency. Furnish Owner with (1) hard copy of O&M manuals in a 3-ring binder along with a digital copy of the manuals saved to a CD.

1.3 QUALITY ASSURANCE
   A. Manufacturers' Qualifications: Firms regularly engaged in the manufacture of food service equipment of types, capacities, and sizes required, whose products have been in satisfactory use in similar service for not less than 5 projects.
   B. Contractors' Qualifications: Shall be firms regularly engaged in contracting for food service installations. They shall have successfully completed at least ten projects of similar size and magnitude as this project. They shall have the technical personnel to handle all phases of the work. They shall be able to demonstrate their financial ability to handle this project to the Owner's satisfaction.
   C. Fabricators' Qualifications: Shall be firms regularly engaged in the manufacture of custom-built food service equipment, and who have a complete factory with suitable equipment, personnel and engineering facilities to properly draw, detail and manufacture the highest quality of food service equipment. All items of custom-built equipment shall be fabricated by one fabricator. The workmanship shall be of the highest quality throughout and in accordance with the best accepted practices for this type of equipment.
   D. Installers' Qualifications: Shall be a firm regularly engaged in food service equipment installations who has successfully completed installations of the same size and magnitude. Firm shall have expertise in field-welding and finishing, as well as being able to field-adjust equipment to fit the project field conditions.
   E. Codes and Standards:
1. Building Codes: The work shall comply with the local building codes.

2. NSF Standards: The work as included under this Contract as being special-fabricated equipment shall conform to the National Sanitation Foundation Standards No. 1 and No. 2, and revisions thereafter as established by the National Sanitation Foundation, Ann Arbor, Michigan. The pieces of fabricated equipment shall be properly marked with the seal as supplied by NSF, and applied to the equipment before delivery to the project site.

3. Underwriters Laboratories: Where available, provide UL labels on prime electrical components of food service equipment. Provide UL "recognized marking" on other items of electrical components, signifying listing by UL, where available.

4. NEMA Standards: All electric-operated and/or heated equipment fabricated or otherwise shall conform to the latest standards of the National Electrical Manufacturer's Association.

5. ANSI Standards: Comply with applicable ANSI standards for electric-powered and gas-burning appliances, for piping to compressed-gas cylinders, and for plumbing fittings including vacuum breakers and air gaps to prevent siphonage in water piping.

6. NFPA Codes: Install food service equipment in accordance with the following National Fire Protection Codes (NFPA):
   b. NFPA 70 - National Electrical Code.
   c. NFPA 96 - Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment.

7. ASME Boiler Code: Construct steam-generating and closed steam-heating equipment to comply with American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code; Section IV for units not exceeding 15 psi or 250 deg F (121 deg C), or Section 1 for higher pressure/temperature units.

8. American Gas Association Standards: All items of gas burning equipment shall be designed for operation with the gas available and shall be listed as approved by the American Gas Association.

F. It is the purpose of these plans and specifications to purchase for the Owner, food service equipment, both specially-fabricated items and items of general manufacture, that conform to the best existing policies of the industry. These items have been selected as preferred items as a result of past experiences in functional design, construction, material and in maintenance and repair. If a Contractor elects to quote upon a substitute not specified, he will be permitted to do so provided that he lists these substitutions on a separate sheet of paper, outlining them as an addition or deduction to the specified brand shown on the specifications. Contractor will be required to submit his base proposal on the equipment specified in the specifications. Any Contractor offering such an alternate bid shall accompany his alternate sheet with complete construction details, brochures and comparison sheets to the equipment specified. The Owner and Architect, reserve the right to accept or reject such substitute bids.

G. The specifications and drawings are complementary, and what is called for by one shall be as binding as if called for by both. Contractor shall examine the plans and specifications to be fully satisfied as to the conditions of the project. No allowance shall be subsequently made to the Contractor by reason of error on his part or obvious oversight not called to the attention of the Food Service Consultant.

1.4 DELIVERY, STORAGE, AND HANDLING
A. Deliver food service equipment in containers designed to protect equipment and finish until final installation. Make arrangements to receive equipment at project site or to hold in warehouse until delivery can be made to jobsite.

B. Store food service equipment in original containers and in location to provide adequate protection to equipment while not interfering with other construction operations.

C. Handle food service equipment carefully to avoid damage to components, enclosures, and finish. Do not install damaged food service equipment; replace and return damaged components to equipment manufacturer.

1.5 PROJECT CONDITIONS
A. General: Take field measurements to assure accurate fit of fabricated equipment. Fabricated equipment is to be built to fit out-of-square corners and to fit out-of-plumb walls.

B. Check and verify all rough-ins. Should the rough-ins not agree with the previously submitted and approved dimensioned rough-in plans, then this Contractor shall have the rough-in moved or notify the Architect and Food Service Consultant of the error.

C. Check electrical characteristics and water, steam, and gas pressure. Provide pressure-regulating valves where required for proper operation of equipment.
1.6 WARRANTY
A. Equipment Warranty: Provide a warranty of all equipment both special fabricated and regular manufactured items against defective material and failure to perform as required provided user has followed the manufacturer's instructions for use. This period of warranty shall be for one (1) year from date of substantial completion.
B. Special Project Warranty: Provide written warranty, by the manufacturer, agreeing to replace/repair, within warranty period, refrigeration compressors with inadequate and defective materials and workmanship, including leakage, breakage, improper assembly, or failure to perform as required, provided manufacturer's instructions for handling, installing, protecting, and maintaining units have been adhered to during warranty period. This warranty shall be in addition to the standard 1-year parts and labor warranty and shall extend for a period of 5-years upon substantial completion of the project.
C. Refrigeration Service Policy: K.E.C. shall include start-up, testing and temperature adjustment on all self contained and remote refrigeration systems included within this division.

PART 2 - PRODUCTS

2.1 GENERAL
A. The material to be used in the manufacturing of equipment shall be as hereinafter specified. Material that is not definitely specified shall be of the best quality used for its specified or intended purpose. All materials shall be new and free from all defects and imperfections.
B. All fabricated equipment in this specification shall be custom-built by a fabricator who has a complete factory with suitable equipment, personnel and engineering facilities to properly design, detail and manufacture the highest quality of food service equipment. The workmanship of all equipment shall be of the highest grade throughout and in accordance with the best practice recognized for this type of equipment.

2.2 STANDARDS
A. Where specified, items of gas burning equipment shall be designed for operation with the type and pressure of gas available. Each items shall be listed as approved by the American Gas Association (AGA) and shall comply with State and Local Codes.
B. Where specified, items of equipment that are electrically-operated and/or heated, either fabricated or otherwise, shall conform to current applicable standards of the National Electric Code, the National Electrical Manufacturers Association (NEMA), the Underwriters Laboratories, Inc. (UL), and the State and local codes where standards have been established by those agencies.
C. Where specified, steam-operated and/or heated equipment shall be of a type and design that has been approved by the American Society of Mechanical Engineers (ASME).
D. All special-fabricated equipment shall conform to the current standards of the National Sanitation Foundation (NSF). All fabricated equipment shall bear the NSF seal applied before delivery to the job site. Prior approval by the Food Service Consultant shall be obtained on any exceptions.
E. All metal used in the construction of this equipment shall be of the thickness as specified by gauge.
F. Each item of equipment shall be appropriately labeled with only the manufacturer's name, model number, and serial number. All labels shall be mounted in an inconspicuous but accessible location.
G. Each item of standard manufactured equipment shall be the current model at the time of deliver.

2.3 MATERIALS
A. Stainless Steel:
   8. All stainless steel used in the construction of this equipment shall be of Type #304, or standard analysis 18-8 containing a minimum of 18% chromium, 8% percent nickel and a maximum of 0.08% percent carbon.
   9. Fractures or mill reject sheets that are not uniform in color and finish shall not be used in this equipment. Sheet color and finish, whether mill or shop-finished, shall be uniform throughout and shall have uniform finish and appearance.
B. Galvanized Metal:
   1. All galvanized metal used in the construction of this equipment shall be copper-bearing galvanized steel sheets of an approved grade, rerolled for smoothness.
C. Finishing:
1. All exposed stainless steel shall be polished to a #4 finish.
2. All metals used in the special-fabricated equipment, other than those specified to be stainless steel, are to be finished in a spray-on-epoxy, completely primed with proper primer, formulated for epoxy finish on metal. The epoxy is to be in color to be selected, with sample submitted for approval before application to the equipment.
3. Wherever metal is depressed as a result of welding, the depression shall be hammered out flush with adjacent surfaces, ground and polished smooth to match adjacent surfaces.
4. Wherever discoloration of stainless steel occurs as result of welding, etc., the discoloration shall be polished out completely and the grain restored.
5. Sheared edges shall not be sharp and shall be without burrs and projections.
6. Wherever brake marks occur, they shall be polished out. Where cracks in stainless steel occur as a result of brakes, the cracks shall be completely welded closed, ground smooth and polished to the original finish.

D. Welding:
1. All welding of stainless steel whether specifically specified or implied shall be accomplished by the arc-welding (heli-arc) method using stainless steel rods of the same composition as the parts being welded. Welds shall be free of pits or flaws and peened to remove flux and other impurities. Welds shall be ground smooth and polished to the original finish of the metal, with the grain uniform to the grain of the original sheet. Where grinding and polishing has destroyed the grain, restore and blend to obliterate all traces of welding. All welds, whether exposed or concealed on unpolished surfaces, shall be ground back to the surface of the original metal.
2. All welding of galvanized steel whether specifically specified or implied shall be accomplished by the arc-welding (heli-arc) method using bronze rods. Welds shall be free of pits or flaws and peened to remove flux and other impurities. Welds shall be ground to the surface of the original metal and regalvanized.
3. Acetylene welding will not be accepted.
4. Solder will not be accepted unless specifically specified and approved.
5. Field joints and joints in counter and table tops are to be arc-welded (heli-arc), ground and polished smooth. Where field joints are necessary for moving equipment into proper location, the field joints are to be welded, ground and polished smooth at the project site and shall be a part of installation.

E. Bolts, Screws, and Rivets:
1. Bolts, screws and rivets in exposed surfaces will be unacceptable.
2. Whenever bolts, or screws are used to fasten paneling or trim or permanent components of counters or cabinets together, they shall be of an approved type.
3. Where stud bolts are used to fasten table tops, etc., to base frames or bodies, the stud bolts shall not extend past the nut more than 1/4”.
4. All bolts, screws or rivets shall be of the same composition as metal to which they are fastened.

F. Pitch and Drainage:
1. Whenever a fixture has a waste or drain outlet, the surfaces shall have a distinct pitch toward such outlet.

G. Sealing:
1. Wherever required, the sealing of backsplashes to walls, to cabinet bodies, to concrete or tile bases, roll-in refrigerators to floors or other types of application, the adhesive sealant shall be Dow Corning Corp. silicone, in either clear or approved color to match the surrounding surfaces.

2.4 FABRICATED PRODUCTS

A. Pipe Stands and Frames: Fabricate pipe stands and frames from stainless steel tubing. Legs shall be constructed from 1-5/8” diameter stainless steel tubing and cross rails from 1-1/4” diameter stainless steel tubing. Locate cross rails with centerlines 10” above floor. Anchor legs to closed gussets at the tops only. Provide cross rails at all pipe stands, except omit rear cross rails at sinks and other locations as specified for plumbing access. Finish off pipe leg bottoms smoothly and overlap stems of feet resulting in a sanitary fitting preventing the accumulation of grease or foreign matter.

B. Feet at Pipe Stands: Shall be sanitary die stamped stainless steel, bullet shaped feet, fully enclosed, with slightly rounded bottoms. Fit the tops of these feet with male threaded stems to fit into the pipe legs and provide 1” of adjustment. Stems shall be extra long so threads are not exposed.

C. Table Tops: Shall be stainless steel with horizontal and vertical interior corners coved on 5/8” radius. Turn
Design and Construct TASMG Readiness Center - Army Aviation Site - Springfield, MO
Project Number T1809-01

2.5 REFRIGERATION EQUIPMENT

A. General: Remote refrigeration systems shall conform to the following specifications. Condensing units shall be factory assembled, piped, wired, tested and run. Condensing units shall be mounted on a metal frame and shall include semi-hermetic motor compressors (or as specified by the refrigeration manufacturer) with built-in thermal overload, suction and discharge stop valves, oil sight glass, and suction and discharge line vibration isolators as required, factory installed and braced. Units shall have an air cooled condenser with copper tubes and aluminum fins arranged for horizontal airflow with direct driven propeller fans and motors with built-in overload protection. Units shall also be equipped with a refrigerant receiver with purge, charge and relief valves with seal caps.

B. Evaporator units shall be as specified and shall be ceiling suspended with nylon bolts and mounted as shown on drawings. The evaporator housing shall protect the refrigerant piping against damage. The evaporator shall be mounted to assure complete drainage from defrost or the refrigerant piping. Fan guards shall be supplied and shall be OSHA approved.

C. Control of each refrigeration system shall be by automatic recycling pump down cycle by means of a solenoid valve in the liquid line of each system operating by a thermostat with remote bulb in the return air to an
evaporator unit. The thermostat shall be suitable for use within the refrigerated space.

D. Piping of refrigerant and condensate piping shall be copper tubing, hard drawn, Type "L", ACR nitrogen filled and sealed. Fittings for refrigerant lines shall be forged or wrought copper, assembled using silver solder. The suction lines shall be sized to give a maximum pressure drop from the condensing unit to the evaporator unit of two pounds for medium temperature systems and shall allow gas velocities of not less than 750 ft per minute in horizontal runs and 1,500 ft per minute in vertical risers. Liquid lines shall be sized to give a maximum pressure drop of 3 lbs from receiver to the evaporator units.

E. Furnish and install adjustable hangers, anchors, or straps for all refrigerant piping. Hangers shall be spaced not to exceed 10 ft on centers and closer where required for the expansion and contraction of pipe lines. Hangers shall permit screw adjustment after erection of the piping. Insulated refrigerant lines shall be provided with approved protective sleeves at hanger points.

F. All refrigerant suction lines shall be insulated back to the condensing units with Armstrong Armadex foamed plastic insulation with flame spread rating of 25 or less and smoke developed rating of 50 or less as tested by ANSI/ ASTM E 84 (NFPA 255) method. Insulation shall be applied in accordance with the manufacturer's directions. The minimum thickness of the insulation on refrigerant piping shall be 1/2" for medium temperature units and 3/4" for low temperature units. All insulation that is outdoors and exposed shall be covered completely with plastic sleeving secured and sealed in place.

G. After refrigerant piping has been run, but before it is insulated, each system shall be run and tested for leaks. If there are no leaks, then the Contractor shall connect a rotary vacuum pump to the gauge port of the compressor discharge service valve with copper tubing or vacuum hose if not less than 3/8” diameter. With the compressor suction and discharge valves open, the vacuum pump shall be operated until a vacuum of 1,500 microns absolute is obtained. The vacuum shall then be broken with dry nitrogen and the system evacuated again to 1,500 microns. The vacuum shall again be broken with dry nitrogen and a third evacuation to 500 microns or deeper shall be made. The motor compressor shall not be operated while the system is under a vacuum and shall not be used as a vacuum pump to evacuate the system. The Contractor shall then charge each system. The Contractor shall charge each system with the correct type and amount of refrigerant as shown in the manufacturer's instructions. The motor compressor must be operating while the charging is being done.

H. The start-up, testing, and placing into operation of this equipment shall be supervised by a qualified Refrigeration Installer.

I. All equipment shall be warranted against defects in workmanship and material and all repairs and replacement which may become apparent and necessary by reason of such defects during the first year after final completion and acceptance of the equipment installation will be made by the Contractor at his own cost and expense and without charge to Owner. All repairs and replacements shall be made at a time and during hours satisfactory to the Owner.
PART 3 – EXECUTION

3.1 EXAMINATION
A. Field Measurements: Verify dimensions before fabrication as required at all equipment locations. When checking measurements at jobsite, carefully examine existing conditions and report to the Construction Manager of any work performed and planned which would prevent execution of this work. Notify the Architect and Construction Manager of such conditions in writing before proceeding.

B. Mechanical and Electrical Rough-In’s: Examine roughed-in mechanical and electrical services, and installation of floors, walls, columns and other conditions under which the work is to be installed. Notify the Construction Manager of unsatisfactory conditions for proper installation of food service equipment.
   1. Visit the job site to check mechanical and electrical rough-ins, prior to the installation of concrete floor.
   2. Cost to relocate or add utility lines due to the failure of the K.E.C. to indicate their proper location on the rough-in shop drawings, will be assumed by K.E.C.

C. Thoroughly Review Architectural, Mechanical, and Electrical Drawings, and visit the project site as necessary to coordinate construction of all partitions prior to delivery of food service equipment.

3.2 INSTALLATION
A. General: Set each item of non-mobile and non-portable equipment securely in place, level, and adjust to correct height. Anchor to supporting substrate where indicated and where required for sustained operation and use without shifting or dislocation. Conceal anchorages where possible. Adjust countertops and other work surfaces to level tolerance of 1/16" maximum offset, and maximum variation from level or indicated slope of 1/16" per foot.
   1. Where indicated or required for safety of equipment operator, anchor equipment to floor or wall. Where equipment is indicated to be anchored to floor, provide legs with adjustable flanged foot. Install two anchors on each foot.

B. Field Joints: Complete field-assembly joints in the work (joints that cannot be completed in shop) by welding. Grind welds smooth and restore finish.

C. Enclosed Spaces: Treat spaces that are inaccessible after equipment installation by covering horizontal surfaces with powdered Borax at rate of 4 oz per sq ft.

D. Closure Plates and Strips: Install where required with joints coordinated with units of equipment.

E. Cutouts: Provide finished smooth cutouts in food service equipment where required to run plumbing, electric, gas, or steam lines through equipment items for final connections.

F. Sealants and Gaskets: Install all around each unit to make joints airtight, watertight, vermin-proof, and sanitary for cleaning purposes. In general, make sealed joints not less than 1/8" wide, and stuff backer rod to shape sealant bead properly at 1/4" depth. Shape exposed surfaces of sealant slightly concave, with edges flush with faces of materials at joint. At internal-corner joints, apply sealant or gaskets to form a sanitary cove of not less than 3/8" radius. Provide sealant-filled or gasketed joints up to 3/8" joint width; metal closure strips for wider joints, with sealant application each side of strips. Anchor gaskets mechanically or with adhesives to prevent displacement.

3.3 FIELD QUALITY CONTROL
A. Testing: Coordinate start-up of food service equipment when service lines have been tested, balanced, and adjusted for pressure, voltage, and similar considerations. Do not operate steam lines until they have been cleaned and treated for sanitation. Before testing, lubricate each equipment items in accordance with manufacturer’s recommendations.
   1. Test each item of operational equipment to demonstrate that it is operating properly and that controls and safety devices are functioning. Repair or replace equipment found to be defective in its operation, including units that are below capacity or operating with excessive noise or vibration.
3.4 CLEANING
A. After completion of installation and other major work in food service areas, remove protective coverings, if any, and clean food service equipment, internally and externally. Restore exposed and semi-exposed finishes to remove abrasions and other damages; polish exposed-metal surfaces and touch-up painted surfaces.
B. Final Cleaning: After testing and start-up, and before time of partial occupancy, clean all food service equipment and leave in condition for Owner's sanitizing procedures prior to use in food service.

3.5 CLOSEOUT PROCEDURES
A. Provide services of Installer's technical representative, and manufacturer's technical representative, to instruct Owner's personnel in operation and maintenance of food service equipment.
   1. Schedule training with Owner's representative; provide at least 7-day notice of training date to Owner's representative.

3.6 FOOD SERVICE EQUIPMENT SCHEDULE - ITEM SPECIFICATIONS

Item #20 Griddle with Stand: One (1) Req'd
A. Basis of Design Product: Subject to compliance with requirements, provide Garland #E24-36G, 36" electric grill, 208v/3Ø.
   1. Furnish #SS-CS24-36 griddle stand with casters.
B. Or comparable product by one of the following: Vulcan, Southben

Item #25 Soiled Dishtable: One (1) Req'd
A. Custom fabricated per general specifications, NSF, full st. stl.
   1. 14 ga. st. stl. tops per size and shape on floor plan drawing with 8" integral splash having 2" return to walls on 45° angle. Free edges terminated in a 3”h x 1 ½” rolled rim.
      a. Furnish integral pass window sill with ¾” marine “V” edge and turned down 4”. Cut and notch splash for rolling shutter furnished and installed by others.
   1. Weld integral to top, a 22”x22”x6”d silver soak sink at operator’s left end. Fit sink with lever handle drain.
      a. Furnish a T&S faucet, #B-0201, to rear of soak sink.
   2. Weld integral to top, a 22”x22”x6”d prerinse sink where shown. Furnish with lift off rack slide.
      a. Sink to accommodate weld in collar for Item #26 Disposal, provide for vacuum breaker.
      b. Furnish st. stl. Disposal control bracket for Item #26 to right of sink.
      c. Punch top for pre-rinse faucet Item #27.
   4. Mount top on open st. stl. base with 16 ga. undershelf where indicated, welded to 1 5/8” O.D. legs. Fit legs with adjustable st. stl. bullet feet. Omit at soak sink and disposal leg of table.
B. Basis of Design Product: Subject to compliance with requirements, provide one of the following: Advance Tabco, Kemlee Manufacturing, Stainless Innovations
Item #26  Disposal: One (1) Req’d  
A. Basis of Design Product: Subject to compliance with requirements, provide Salvajor #500-SA-MRSS, 5hp disposal, 480v/3Ø.  
1. Furnish with 6” weld in Collar, MRSS control and standard accessories.  
B. Or comparable product by one of the following: Insinkerator, Hobart  

Item #27  Pre-Rinse Faucet: One (1) Req’d  
A. Basis of Design Product: Subject to compliance with requirements, provide T&S Brass  
B. #B-0113-B, deck mounted faucet with wall bracket.  
C. Or comparable product by one of the following: Fisher, Krowne  

Item #30  Dish Machine: One (1) Req’d  
A. Basis of Design Product: Subject to compliance with requirements, provide Hobart #AM15T-4, single tank, tall chamber, dish machine, 480v/3Ø.  
1. Furnish standard unit and accessories.  
2. Furnish #DWT-AM15 Drain Water Tempering kit, installed.  
B. Or comparable product by one of the following: Champion, CMA  

Item #32  Clean Dishtable: One (1) Req’d  
A. Custom fabricated per general specifications, NSF, full st. stl.  
1. 14 ga. st. stl. tops per size and shape on floor plan drawing with 8” integral splash having 2” return to walls on 45° angle. Free edges terminated in a 3”h x 1 ½” rolled rim.  
2. Provide and weld booster slide brackets where shown.  
3. Mount top on open st. stl. base with 16 ga. undershelf where indicated, welded to 1 5/8” O.D. legs. Fit legs with adjustable st. stl. bullet feet.  
B. Basis of Design Product: Subject to compliance with requirements, provide one of the following: Advance Tabco, Kemlee Manufacturing, Stainless Innovations  

Item #33  Corner Pot & Pan Sink: One (1) Req’d  
A. Custom fabricated per general specifications, NSF, full st. stl.  
1. 14 ga. st. stl. with integral 8” splash having 2” return to wall on 45° angle. Terminate free edges in a 3” h x 1 ½” rolled rim  
2. Weld integral with top, three 26 ½”x 26 ½”x 14”d fully coved sink bowls. Fit each with a 2” lever drain. Furnish one 26 ½”x6”x4”d overflow sink where shown. Furnish overflow sink with 3 ½” cup drain. Furnish two 4” wide areas for leg location(s).  
   a. Furnish (2) T&S Brass #B-0231 faucets.  
3. Furnish integral left and right drainboards with matching splash and rim.  
   a. Weld 15” cone into right drainboard. Make accommodations for vacuum breaker and prerinse faucet.  
   b. Provide st. stl disposal control bracket where indicated.  
4. Splash mounted above shall be a 54” 4-bar pot drying rack. Mount via 1 5/8” O.D. tubular supports through splash to anchor brackets below top.
a. Weld between support brackets a 2”x 3/16” utensil bar fitted with a full complement of st. stl. dual pot hooks.

b. Furnish 6”h full length wall rub plate and secure at top of drying rack.

5. Mount sink on open st. stl. base with left, right, and front crossrails welded to legs at 10”AFF. Fit legs with adjustable st. stl. bullet feet.

B. Basis of Design Product: Subject to compliance with requirements, provide one of the following: Advance Tabco, Kemlee Manufacturing, Stainless Innovations

**Item #34 Disposal: One (1) Req’d**

A. Basis of Design Product: Subject to compliance with requirements, provide Salvajor #500-CA-15-MRSS, 5hp disposal, 480v/3Ø.

1. Furnish with 15” cone assembly, MRSS control and standard accessories.

B. Or comparable product by one of the following: Hobart, Insinkerator

**Item #35 Pre-Rinse Faucet: One (1) Req’d**

A. Basis of Design Product: Subject to compliance with requirements, provide T&S Brass

1. #B-0133-B, splash mounted faucet with wall bracket.

B. Or comparable product by one of the following: Fisher, Krowne

**Item #36 Sink Heater/Sanitizer: One (1) Req’d**

A. Basis of Design Product: Subject to compliance with requirements, provide Hatco #3CS2-9B, electric sink heater, 208v/3Ø.

1. Furnish #SSBB stainless body, and standard accessories.

B. Or comparable product by one of the following: Hubbell, Champion

**Item #41 Booster Heater: One (1) Req’d**

A. Basis of Design Product: Subject to compliance with requirements, provide Hatco #C-15, electric booster heater, 480v/3Ø.

1. Furnish #SSBB stainless body, counter mount slide brackets and all standard accessories.

B. Or comparable product by one of the following: Hubbell, Champion

**Item #45 20 Gal. Steam Kettle: One (1) Req’d**

A. Basis of Design Product: Subject to compliance with requirements, provide Blodgett Steam #KLT-20E, 20 gal kettle, 480v/3Ø.

1. Furnish 480 volt unit with 18” double pantry faucet.

2. Furnish lift off cover, 2” tangent draw off, lip strainer and pan carrier.

B. Or comparable product by one of the following: Cleveland, Vulcan

**Item #46 30 Gal. Tilting Skillet: One (1) Req’d**

A. Basis of Design Product: Subject to compliance with requirements, provide Blodgett Steam #BLP-30E, 30 gal skillet, 480v/3Ø

1. Furnish 480 volt unit with 18” double pantry faucet.

2. Furnish 2” tangent draw off and pan carrier.

B. Or comparable product by one of the following: Cleveland, Vulcan
Item #48  Four Burner Range:  One (1) Req’d
A. Basis of Design Product: Subject to compliance with requirements, provide
   Garland/U.S. Range model #MST44R-E, natural gas, four burner range.
   1. Furnish with ¾” rear gas connection, capped ends and regulator
   2. Furnish with #M34SD single high shelf.
   3. Furnish with electronic spark ignition, 115v/1Ø.
   4. Furnish swivel caster set.
   5. Furnish standard oven base with one extra oven rack
   6. Furnish one Dormont #1675KITS-48, ¾” gas connection kit.
B. Or comparable product by one of the following: Southbend, Vulcan

Item #49  Double Stack Convection Oven: Two (2) Req’d
A. Basis of Design Product: Subject to compliance with requirements, provide G. S.
   Blodgett model DFG-100DBL, natural gas, 115v/1Ø.
   1. Furnish each set with #SSI-M control and timers
   2. Furnish each set with 4” low profile caster set
   3. Furnish each with gas interconnection kit
   4. Furnish each with a Dormont #1675KITS48 gas connection kit
B. Or comparable product by one of the following: Garland, Southbend

Item #69  Walk-in Cooler/Freezer: One (1) Req’d
A. Basis of Design Product: Subject to compliance with requirements, provide
   Kolpak Industries Combination Cooler/Freezer
   1. Furnish unit measuring 17’-4” x 9’-8” x 8’-6”h, divided equally.
   2. Furnish 4” polyurethane insulated walls, floor, and ceiling, embossed white
      aluminum interior and exterior
   3. Furnish for 4” recess and treadplate overlay on floor.
   4. Furnish matching closure trim to ceiling, and trim to wall opening.
   5. Furnish exposed face with 36”h aluminum treadplate protection.
   6. Furnish each compartment with 34” x 78” entrance doors with ¼ height
      treadplate on both sides of doors, LED light centered above door, and
      extended thresholds. Furnish each door with a strip curtain.
   7. Furnish each compartment with one (1) 48” LED light fixture
   8. Furnish cooler unit with PC68MZOP, ¾ hp, 208/3Ø system, R448A
      refrigerant with outdoor housing and controls.
   9. Furnish freezer unit with PC248LZOP, 2 ½ hp, 208/3Ø system, R448A
      refrigerant with outdoor housing and controls. Freezer to have on demand
      defrost with no time clock.
   10. K.E.C. to pipe, charge, and fire refrigeration systems. Condensing units are
       to be remoted to roof top above walk-in. Roof penetration shall be by others
   11. Plumbing Contractor to extend condensate drain line from evaporators to
       floor drain as shown on plans, this shall include insulation and heat tape.
   12. K.E.C. shall be responsible for the refrigeration permit.
B. Or comparable product by one of the following: American Panel, Masterbilt

End of Section 114000
SECTION 233713 – HVAC DIFFUSERS, REGISTERS, AND GRILLES

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Diffusers

B. Grilles and Registers

C. Outside Louvers

D. Roof Hoods

1.2 RELATED DOCUMENTS

A. Air Diffusion Council, ADC

B. American Society of Heating, Refrigerating and Air Conditioning Engineers, ASHRAE:
   1. Make air flow test and sound level measurements in accordance with ADC Equipment Test Codes and ASHRAE Standards.

C. National Fire Protection Association, NFPA:
   1. NFPA 90A: Air Conditioning and Ventilating Systems
   2. NFPA 90B: Standard for Installation of Warm Air Heating and Air Conditioning Systems

1.3 QUALITY ASSURANCE

A. The manufacturer shall provide the Owner with a one-year warranty. The manufacturer shall replace any equipment, assembly or part that fails due to defective material or workmanship during the warranty period.

B. Upon written notice from the Owner or Engineer the Contractor shall promptly repair any defects occurring within a one-year period from the date of final acceptance. All warranty work shall be performed by the Contractor without any cost to the Owner.

1.4 SUBMITTALS

A. Submit shop drawings for all materials in accordance with Division 1, Section 013300.

B. Shop Drawings:
   1. Submit shop drawings covering each item together with schedule of outlets and inlets.

C. Product Data:
1. Submit manufacturer's data for air distribution equipment, including specifications, capacity and noise criteria. Furnish catalog cut sheets, product specifications and dimensioned drawings for each type of diffuser, grille, register, louver and hood.

2. Include performance tables marked to clearly indicate CFM, pressure drop, neck velocity, throw and noise criteria value for each item submitted.

3. Throw values shall be given in feet to terminal velocities of 150 FPM, 100 FPM and 50 FPM. All pressures shall be given in inches of water.

4. Catalog cut sheets shall be clearly marked in red ink to indicate the performance data for each item submitted.

5. Submit certified copies of tests showing water penetration for louvers in accordance with AMCA Standard 500 and complying with the requirements of the AMCA Certified Ratings Program.

6. Submit anodize finish color charts for louvers with shop drawings.

PART 2 - EQUIPMENT

2.1 SUBMITTALS

A. Manufacturers for Grilles, Registers, Diffusers:
   1. Titus
   2. Price
   3. Nailor
   4. Tuttle & Bailey
   5. Krueger

B. Types Listed herein and on-drawing schedules
   1. Refer to on-drawing schedule for governing of types/models. This specification shall be used for specifications of those types and models.

2.2 GENERAL REQUIREMENTS

A. Rate units in accordance with ADC standards. Base air outlet application on space noise level of NC 35 maximum. Provide baffles to direct air away from walls, columns, or other obstructions within the radius of diffuser operation.

B. Provide boots of same manufacturer as grille or register fitted with equalizer deflector or diffuser plate as noted or scheduled on drawings. All units shall be furnished with sponge rubber gasket seal around edge with mounting surface secured in place. Foam plastic gaskets are not acceptable. All units shall have finish as specified.

C. Where supply registers are installed on exposed ductwork provide an inverted collar on the duct. The outside dimensions of the inverted collar shall be the same as the outside dimensions of the register so that the edges are even with one another. The depth of the collar shall be sufficient to contain the register and volume control damper within the collar. The register and damper shall not extend back into the duct. The collar shall not be in excess of the depth of the register and damper.
D. Refer to Architectural reflected ceiling drawings for the type of ceiling construction to determine the exact mounting frame required for each ceiling mounted grille, register and diffuser.

E. Provide quantity and sizes of grilles, registers and diffusers as indicated on drawings. Coordinate with other work, including ceiling layout, ductwork and ductwork accessories, to interface installation of units properly with other work and existing conditions.

F. Provide reinforcing bars on the back side of blades for grilles and registers when blades are 12" long or greater. Install grilles and registers for minimum sight through unit when viewed from floor.

2.3 REGISTERS

A. Supply Register SR-1 shall be steel, rectangular, double deflection type, with individually adjustable horizontal and vertical blades. Furnish units with heavy formed 1-1/4" steel borders and countersunk screw holes suitable for surface mounting.

1. Blades shall be spaced 3/4" on centers with friction pivots which allow individual blade adjustments without loosening or rattling. Front blade shall be parallel to the long dimension. Registers shall be furnished with gang-operated, opposed blade type, volume control dampers. Dampers shall be adjustable from the face of the register with screwdriver.

2. Secure overlapping frame of register to inverted duct collar, or to wall construction with oval head, countersunk screws. Screw heads shall be enameled to match the border. Finish for registers shall be off-white baked enamel.

B. Exhaust Registers EG-2 shall be steel construction and rectangular configuration. Provide one set of fixed blades parallel to the long dimension. Registers for lay-in ceiling installation shall be furnished with Titus type 3 borders. Registers for installation in walls or hard ceilings shall be furnished with Titus type 1 border for surface mounting.

1. Blades shall be spaced 1/2" on centers with 30° deflection. Registers shall be furnished with gang-operated, opposed blade type, volume control dampers. Dampers shall be adjustable from the face of the register with screwdriver.

2. Secure overlapping frame of register to inverted duct collar, wall or ceiling construction with oval head, countersunk screws. Screw heads shall be enameled to match the border. Finish for registers shall be off-white baked enamel.

3. Manufacturers:

2.4 SUPPLY DIFFUSERS

A. Supply Diffuser SD-1 shall be 12" x 12" or 24" x 24" square plaque face type as shown on the drawings, with round neck ductwork connection. Diffusers for lay-in ceiling installation shall be furnished with Titus type 3 borders. Diffusers for installation in hard ceilings shall be furnished with Titus type 1 border for surface mounting.

1. Diffusers shall deliver airflow in a 360° pattern unless blank-off plates (sectorizing baffles) are indicated on the drawings. Blank-off plates shall be installed in the neck of the diffuser when shown to alter the discharge pattern for walls, columns or other obstructions.
2. Provide a Titus model D-75 opposed blade damper for final trim balancing (to within 5%). Each branch takeoff shall also be provided with manual volume damper for balancing purposes, per to Specification Section 233300. Integral damper shall be suitable for installation with flexible ductwork and shall be accessible by removal of plaque face. Finish for diffusers shall be off-white baked enamel.

3. Manufacturers:

B. Supply Diffuser SD-2 shall be 24” x 24” square, architectural, panel faced type as shown on the drawings, with round neck ductwork connection. Diffuser shall be available in ¾- or 1-inch slot widths; one, two, three or four slots shall be available as standard. Diffuser shall be compatible with 24 x 24-inch modules for lay-in T-bar ceilings.

1. Diffusers must be field adjustable for vertical, one-, two-way opposite, two-way corner, three-way and four-way discharge patterns. Fixed vane diffusers are not acceptable. Each supply slot of the diffuser shall be provided with a two-element, aerodynamically curved, “ice-tong” shaped steel deflector capable of 180° pattern adjustment from the face of the diffuser and shall allow volume dampering of supply air for final balancing. All adjustments shall be accessible from the face of the diffuser.

2. The diffuser shall have an extruded aluminum face and factory fabricated 22-gauge steel backpan. The diffuser shall have the capacity to insert a ceiling tile into the center of the diffuser to match the ceiling system. Coordinate ceiling tile installation with general contractor. The backpan shall be removable and shall include side handles. Diffuser shall have ¾-inch thick fiberglass internal insulation. The diffuser inlet shall be located on the top of the backpan and shall have a minimum of 1 1/8-inch depth available for duct connection, with damper constructed of heavy gauge steel.

3. The diffuser finish shall be #26 white and the pattern controllers shall be black. The finish shall be an anodic acrylic paint, baked at 315°F for 30 minutes. The pencil hardness must be HB to H. The paint must pass a 100-hour ASTM B117 Corrosive Environments Salt Spray Test without creepage, blistering or deterioration of film. The paint must pass a 250-hour ASTM D870 Water Immersion Test. The paint must also pass the ASTM D2794 Reverse Impact Cracking Test with a 50-inch pound force applied.

4. The manufacturer shall provide published performance data for the architectural diffuser. The test data shall include static pressure drop, horizontal air throw pattern and NC. The diffusers shall be tested in accordance with ANSI/ASHRAE Standard 70-1991.

C. Supply Diffuser SD-3 shall be a modulinear diffuser with 1-inch slot spacing of the sizes and mounting types shown on the plans and outlet schedule. Linear slot diffusers shall be available in standard one piece lengths up to 6 feet and 1 to 8 discharge slots. Diffuser lengths greater than 6 feet shall be furnished in multiple sections and will be joined together end-to-end with alignment pins to form a continuous slot appearance. All alignment components to be provided by the manufacturer.

1. The frame and support bars shall be constructed of heavy gauge extruded aluminum. The pattern controller shall be an aerodynamically curved “ice-tong” shaped steel deflector capable of 180° pattern adjustment from the face of the diffuser and shall allow dampering if required. Maximum pattern controller length shall be 3 feet, for diffusers longer than 3 feet pattern controllers shall be furnished in multiple sections.
2. The finish shall be #26 white on the face and #84 black on the pattern controllers. The finish shall be an anodic acrylic paint, baked at 315°F for 30 minutes. The pencil hardness must be HB to H. The paint must pass a 100-hour ASTM B117 Corrosive Environments Salt Spray Test without creepage, blistering or deterioration of film. The paint must pass a 250-hour ASTM D870 Water Immersion Test. The paint must also pass the ASTM D2794 Reverse Impact Cracking Test with a 50-inch pound force applied.

3. Heavy gauge extruded aluminum end borders, end caps and mitered corners shall be available to close off the ends of the diffusers. Plenums shall be manufactured by the same manufacturer of the linear slot diffusers. Optional diffuser curving to a 6-foot minimum radius with fixed deflection shall be available as required.


D. Supply Drum Louvers DL-1 shall be a high capacity, long throw type. Outer borders shall be 1-1/4" wide and shall be constructed of heavy gauge extruded aluminum. Corners shall be assembled with full penetration resistance welds with a reinforcing steel patch for extra strength. Provide with heavy gauge steel opposed blade damper, operable from face of grille.

1. Screw holes shall be countersunk for a neat appearance. Drum shall be constructed of heavy gauge extruded aluminum and shall rotate a minimum of 25 degrees up and down from center line of diffuser. Heavy extruded aluminum blades shall be individually adjustable.

2. Drum Louvers shall be extruded aluminum with #26 finish. Louver shall be provided with curved frame, with foam gasket seals, for spiral duct mounting.

2.5 GRILLES

A. Return Grilles RG-1 shall be 24” x 24” or 24” x 12” perforated steel construction with a flush face and one-piece stamped heavy gauge backpan. Grilles for lay-in ceiling installation shall be furnished with Titus type 3 borders. Grilles for installation in walls or hard ceilings shall be furnished with Titus type 1 border for surface mounting.

1. Perforations shall be minimum 3/16” diameter on 1/4” staggered centers and no less than 51% free area. Neck of grilles shall have 1-1/8” depth for easy duct connection.

2. Return grilles shall be steel construction with #26 finish. Finish shall be anodic acrylic paint, baked at 315° for 30 minutes. The paint must pass a 100-hour ASTM B117 Corrosive Environments Salt Spray Test without creepage, blistering, or deterioration of film. The paint must pass a 250-hour ASTM D870 Water Immersion Test. The paint must also pass the ASTM D2794 Reverse Impact Cracking Test with a 50-inch pound force applied.

B. Exhaust Grilles EG-1 shall be 24” x 24” or 24” x 12” perforated steel construction with a flush face and one-piece stamped heavy gauge backpan. Grilles for lay-in ceiling installation shall be furnished with Titus type 3 borders. Grilles for installation in walls or hard ceilings shall be furnished with Titus type 1 border for surface mounting.
1. Perforations shall be minimum 3/16” diameter on 1/4” staggered centers and no less than 51% free area. Neck of grilles shall have 1-1/8” depth for easy duct connection.

2. Return grilles shall be steel construction with #26 finish. Finish shall be anodic acrylic paint, baked at 315° for 30 minutes. The paint must pass a 100-hour ASTM B117 Corrosive Environments Salt Spray Test without creepage, blistering, or deterioration of film. The paint must pass a 250-hour ASTM D870 Water Immersion Test. The paint must also pass the ASTM D2794 Reverse Impact Cracking Test with a 50-inch pound force applied.

2.6 STATIONARY BLADE LOUVER

A. Manufacturers:

1. Ruskin Mfg Co.: ELF6375DXD Series
2. Pottorff.
3. Carnes
4. Greenheck
5. Engineer Approved Equal.

B. Fabrication:

1. Design: Extruded aluminum, stationary louvers with horizontally mounted drainable blades.
   a. Miami-Dade Notice of Acceptance Number: 12-0601.22.

2. Application: Miami-Dade Approved Product for use in open structures or installations where the enclosed space is designed to accommodate water infiltration (wet rooms). Open structure building envelope protection for single unit sizes up to 88 inches wide by 120-inches high. Factory assembly. Unlimited width by 120-inches high field assembly. Unlimited height by 88” wide in vertical configuration.

3. Frame:
   a. Frame Depth: 6 inches, nominal.
   b. Wall Thickness: 0.081 inch, nominal.

4. Blades:
   a. Style: Drainable, horizontally mounted.
   b. Wall Thickness: 0.081 inch, nominal.

5. Minimum Assembly Size: 12 inches wide by 12 inches high.
6. Maximum factory assembly size 88” x 120”.
7. Maximum field assembly size.
   a. Unlimited width by 120” high.
   b. Unlimited height by 88: width in vertical configuration.
C. Performance Data:

1. Based on testing 48 inches’ x 48 inches size unit in accordance with AMCA 500.
2. Free Area: 57 percent, nominal.
3. Free Area Size: 9.08 square feet.
4. Maximum Recommended Air Flow through Free Area: 1,023 fpm.
6. Maximum Pressure Drop at 1,023 fpm: 0.20 inches w.g.

D. Accessories:

1. Insulated Aluminum Blank-Off Panels: 0.040” aluminum sheet, 2-inch aluminum skin insulated core, factory installed with removable fasteners and neoprene gaskets.
2. Bird Screen: Aluminum, 5/8 inch by 0.040 inch, expanded and flattened. Provide with removable and rewirable frame.
3. Insect Screen: Aluminum, 18-16 mesh, mill finish, 0.011-inch wire. Provide with aluminum frame.
4. Extended Sill: Formed Aluminum 3003 Alloy. Minimum nominal thickness 0.081 inch.

E. Finish: Class 1 Color Anodized.

1. Comply with Aluminum Association AA-C21A44.
2. Apply finish following chemical etching and pretreatment.
3. Minimum thickness: 0.7 mils, 60-minute anodizing process.
4. Class 1 Color Anodized: As directed by Architect.

PART 3 - EXECUTION

3.1 INSPECTION

A. Visit job-site prior to installation to verify all conditions, connections, and instruction to all parties with regard to shop drawings. Starting work means acceptance of other in-place work.

B. Before installation, inspect building dimensions and rough-in, including means of access, for conditions affecting delivery and installation.

C. Before work is installed, Architect/Engineer reserves right to make modifications to location of items to provide satisfactory coordination between Contractors.

D. Provide inserts and anchors built into other work for support of this work.

1. Ensure these items are installed in their proper location.
2. Include fastening devices to attach work.
3. Use proper anchoring devices for materials encountered and usage expected.
3.2 METHOD OF INSTALLATION

A. Install grilles, registers, diffusers, louvers, hoods and accessories in accordance with manufacturer’s instructions using workers skilled and familiar with items and installation specifications and procedures.

B. Sequence installation and erection to ensure work is effected in orderly and expeditious manner. Do cutting, fitting and patching, coordinating work fully with other crafts involved. Locate all ceiling mounted grilles, registers and diffusers according to Architectural reflected ceiling drawings.

3.3 START-UP, TESTING AND TRAINING

A. Clean, test, balance and adjust equipment prior to start-up to ensure systems are operational and complete in all respects, including all accessories. Testing and balancing specified in Section 230593.

END OF SECTION 233713
ITEM     QUANTITY              CATEGORY
69         1                  WALK
48         1            RANGE, HEAVY DUTY, GAS
46         1            TILT SKILLET, ELECTRIC
36         1          SINK HEATER & SANITIZER
34         1             DISPOSER, GARBAGE
33         1          CORNER POT SINK
26         1             DISPOSER, GARBAGE
25         1            SOILED TABLE
22-24       -                  SPARE NUMBERS
21         1   EXHAUST HOOD - BY HVAC - OMITTED
20         1            GRIDDLE, ELECTRIC
19         1            CABINET, HEATED, REACH-IN
18         1            TRAY SLIDE
17         1            RINSE FAUCET, DECK MOUNT
74         1            EXISTING ICE MACHINE - VERIFY
73         1          LOT SHELVING UNITS (QTY. CHANGES)
42-44       -                  SPARE NUMBERS
71         2            CART, UTILITY
70         2            STRIP CURTAIN
69A        1          LOT COOLER/FREEZER SHELVING
68         1                  SPARE NUMBER
67         1            REFRIGERATOR, REACH-IN
65         1            CAN OPENER - ELECTRIC
64         1            STAND, MIXER
61         1            PREP TABLE
60         1    POT RACK, TABLE MOUNT. PART OF #62
59         1            PREP TABLE
58         2    HAND SINK, WALL MOUNT - BY PLUMB.
53         1            PREP TABLE
50         1            EXHAUST HOOD - BY HVAC
48         1            RANGE, HEAVY DUTY, GAS
45         1            KETTLE, STEAM JACKETED, FLOOR
41         1        WATER HEATER, BOOSTER, ELECTRIC
37-40       -                  SPARE NUMBERS
36         1          SINK HEATER & SANITIZER
34         1             DISPOSER, GARBAGE
33         1            CORNER POT SINK
32         1            CLEAN DISH TABLE
30         1    WAREWASHER, DOOR TYPE, HIGH TEMP
29         1            DISHTABLE, SORTING SHELF
28         1                  SPARE NUMBER
27         1            PRE-RINSE FAUCET, DECK MOUNT
25         1            SOILED TABLE
22-24       -                  SPARE NUMBERS
21         1   EXHAUST HOOD - BY HVAC - OMITTED
20         1            GRIDDLE, ELECTRIC
19         1            CABINET, HEATED, REACH-IN
18         1            TRAY SLIDE
9-14        -                  SPARE NUMBERS
6         1            COFFEE URN, AUTOMATIC
5         1            DISPENSER, BEVERAGE/NON-CARBONATED
4         1                  SPARE NUMBER
3         1            BEVERAGE COUNTER
2         2            DISPENSER, SELF-LEVELING CUP/GLASS
1         1            DISPENSER, SELF-LEVELING TRAY

NO QTY EQUIPMENT CATEGORY
OF CONTRACT - SEE MEP SHEETS.
**Duct Pressure Class**

<table>
<thead>
<tr>
<th>System Fan</th>
<th>Location/duct involved</th>
<th>Positive or negative pressure</th>
<th>Pressure class (in w.g.)</th>
<th>Ductwork type</th>
<th>Insulation type/thickness (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHU 1 &amp; 2</td>
<td>Primary ductwork (up to vav box)</td>
<td>POS</td>
<td>4&quot; TDC Flanged spiral exposed spiral (note 2)</td>
<td>1&quot; thick 1.5 lbs/ft³ 1&quot; thick int 1&quot; thick int</td>
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</tr>
<tr>
<td>AHU 3 &amp; Blower coils</td>
<td>Rectangular supply return air</td>
<td>POS/NEG</td>
<td>2&quot; S &amp; Drive Spiral Exposed spiral (note 2)</td>
<td>1&quot; thick 1.5 lbs/ft³ 1&quot; thick int</td>
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<tr>
<td>Grease Exhaust</td>
<td>Grease exhaust, fire rated, prefabricated grease duct</td>
<td>NEG</td>
<td>3&quot; TDC Flanged Spiral</td>
<td>1.5&quot; thick 1.5 lbs/ft³ Wrap</td>
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<tr>
<td>Dishwasher exhaust</td>
<td>Type 2 heat removal exhaust ductwork</td>
<td>NEG</td>
<td>2&quot; TDC Flanged</td>
<td>1&quot; thick 1.5 lbs/ft³ Wrap</td>
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</tr>
</tbody>
</table>

Notes:
1. Where noted as ductwork wrap, refer to specifications for make, density, r-value.
2. This schedule refers to new duct only.
3. Any exposed spiral ductwork, this ductwork type shall be double-wall insulated, per specs. Section 2301.13, paragraph 2.3. This application applies to storage, locker rooms, and floor clean-air, etc. See reflected ceiling plans A600, A611, and A62 for ceiling types. Refer to HVAC plans M10, M11, and M120 for ceiling types.
4. System for kitchen grease exhaust ductwork is pre-manufactured UL grease rated ductwork with fire wrap. It also comes with prefabricated fittings and components. Refer to specification section 2301.13.2.8 for all requirements. See sample parts list below for all requirements. See sample parts list to the right for all requirements.

**Duct Pressure Class**

<table>
<thead>
<tr>
<th>1&quot; or 2&quot; Pressure Class</th>
<th>Seal class</th>
<th>Traverse Joints Only Applicable Sealing</th>
<th>Rect - 24</th>
<th>Round - 12</th>
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</thead>
<tbody>
<tr>
<td>3&quot; Pressure Class</td>
<td>Seal class</td>
<td>Traverse Joints and Seams Applicable Sealing</td>
<td>Rect - 12</td>
<td>Round - 6</td>
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<tr>
<td>4&quot;, 6&quot; or 10&quot; Pressure Class</td>
<td>Seal class</td>
<td>Traverse Joints, Seams, and All Wall Penetrations</td>
<td>Rect - 6</td>
<td>Round - 3</td>
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**Application / Insulation**

<table>
<thead>
<tr>
<th>System</th>
<th>Description</th>
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<tbody>
<tr>
<td>Supply: rectangular/round primary/secondary</td>
<td>External Wrap</td>
</tr>
<tr>
<td>Outside air: rectangular/round</td>
<td>External Wrap</td>
</tr>
<tr>
<td>Kitchen heat exhaust</td>
<td>External Wrap</td>
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<tr>
<td>Relieve exhaust</td>
<td>Uninsulated</td>
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<tr>
<td>Air transfer/return air boots (see plans and mdos)</td>
<td>1/2&quot; FiberMold Free Liner</td>
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<tr>
<td>Return typ branch and main ducts</td>
<td>1/2&quot; Armacell Duct Liner</td>
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<tr>
<td>Return: last 2' prior to AHU connection</td>
<td>Armacell Duct Liner</td>
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<tr>
<td>Grease exhaust</td>
<td>3M or Great Lakes Zero Barrier Fire Wrap</td>
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**Grease Sample Parts**

<table>
<thead>
<tr>
<th>Part</th>
<th>Description</th>
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<tbody>
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**Addendum #4**

Ref. - M700 schedules