ADDENDUM NO. 01

PROJECT:	WAYNE COUNTY JAIL CAPITAL IMPROVEMENTS PROJECT
	DLZ Project Number 1863-1002-90
TO:	All Bidders and others to whom Plans and Specifications for the above referenced Project have been issued.
OWNER:	Wayne County Board of Commissioners 401 East Main Street County Administrative Building Richmond, Indiana 47374
ARCHITECT:	DLZ INDIANA, LLC 157 East Maryland Street. Indianapolis, Indiana 46204
DATE:	January 8, 2019

The items included in this Addendum are to become a part of the original Drawings and Project Manual dated December 6, 2018 as if included herein. Only these items are to be altered. The remainder of the original Drawings and Project Manual remain valid in their entirety.

PROJECT MANUAL

ITEM NO. 1. SECTION 096725 – SEAMLESS SHOWER COATINGS

a. Section 2.1.A: Add "3. DecoFloor, Seamless Shower System DFL-950

ITEM NO. 2. SECTION 111900 – DETENTION EQUIPMET CONTRACTOR

a. Add this section to the Project Manual

ITEM NO. 3. SECTION 125500 – DETENTION FURNITURE

a. Add this section to the Project Manual

ITEM NO. 4. SECTION 235216 – CONDENSING BOILERS

a. Section 2.2.A: Add "6. Fulton."

ITEM NO. 5. SECTION 238127 – VARIABLE REFRIGERANT FLOW SYSTEM

a. Add specification in its entirety.

ITEM NO. 6. SECTION 262923 – VARIABLE FREQUENCY MOTOR CONTROLLERS

a. Part 2.1.A. Add the following:
"2. Eaton.

3. ABB.

4. Danfoss Inc.; Danfoss Drive Div.

5. Eaton Electrical Inc.; Cutler-Hammer Business Unit

6. Johnson Controls.

7. Siemens Energy & Automation, Inc.

8. Square D; a brand of Schneider Electric.

9. Trane.

10. Toshiba International Corporation."

DRAWINGS

ITEM NO. 7. DRAWING A100B – ARCHITECTURAL FIRST FLOOR AREA B

a. Note 13: Delete "1/2"H x 2" W STAINLESS STEEL THRESHOLDS" and replace with "ALUMINUM THRESHOLD SIMILAR TO HAGER MODEL 432S".

b. Note 14: Add ", FLOOR" after the word "WALLS".

ITEM NO. 8. DRAWING A100C – ARCHITECTURAL FIRST FLOOR AREA C

a. Note 6: Delete "1/2"H x 2" W STAINLESS STEEL THRESHOLDS" and replace with "ALUMINUM THRESHOLD SIMILAR TO HAGER MODEL 432S".

b. Note 7: Delete note and replace with "PREPARE AND INSTALL SEAMLESS SHOWER COATING ON SHOWER WALLS, FLOOR AND CEILING.

ITEM NO. 9. DRAWINGS E400 – ELECTRICAL LIGHT FIXTURE SCHEDULE

a. Fixture Type 'L1'. Add Bruck Lighting #137-420-XTM19-11LM-40K-83-SSA40-120-ELV-BK-X / 900305BK as an equal manufacturer.

ATTACHMENTS:

01 Specification 111900 – Detention Equipment Contractor

02 Specification 125500 – Detention Furniture

03 Specification 238127 - Variable Refrigerant Flow System

END OF ADDENDUM NO. 01

SECTION 111900 - DETENTION EQUIPMENT CONTRACTOR

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the contract including General Conditions and Division 1 Specifications, apply to this Section.

1.2 SUMMARY

A. The Detention Equipment Contractor (DEC) shall be responsible for the coordination, furnishing and installation of the work of all sections listed below, according to the standards listed in the respective sections.

B. Coordinate procurement schedules for accurate and timely delivery of all materials necessary for this bid category.

C. The DEC shall have 75% of the labor performed by direct employees of the DEC company.

D. Detention work required by, but not specified in this Section includes the following:

1. Section 055963 Detention Enclosures
2. Section 079200 Joint Sealants, Security Sealant.
3. Section 083463 Detention Doors and Frames
4. Section 111901 Detention Furnishings and Equipment
5. Section 111903 Security Screens and Woven Rod

E. Related Sections include the following:
1. Section 042200, Concrete Unit Masonry - embedding accessories and installation of products.

F. REFERENCES: The following organizations have standards which are referenced in this section:

1. ANSI - American National Standards Institute
2. ASTM - American Standard Testing Materials
3. AWS - American Welding Society
4. BHMA - Builders Hardware Manufacturers Association
5. DHI - Door and Hardware Institute.
6. NFPA-70 - National Electrical Code.
7. NFPA-80 - Fire Doors, Windows.
8. NFPA-101 - Life Safety Code
9. UL - Underwriters Laboratories.

1.3 SUBMITTALS

A. Shop drawings: Submit in accordance with Division 1 requirements.

1. Provide templates and detailed drawings of equipment showing construction methods, type and gauge of metal, hardware and fittings; with plan elevation, and cross sections as required.
2. Show service roughing-in connections, characteristics, and wiring diagrams for control systems.
3. For concrete or masonry embedded items, provide to the appropriate trade the setting drawings and templates showing anchorage.

B. Embedded Item: Detention equipment to be set in concrete, or CMU by other Contractors shall be furnished and delivered by the Detention Equipment Contractor (DEC) to the building site. DEC shall furnish other Contractors with reviewed shop drawings and setting diagrams for these embedded items, such as including but not limited to, secure steel doors, frames, windows, brackets, inserts, etc., to which detention equipment attaches.

C. Embedded items shall be set in strict accordance with reviewed shop drawings. Embedded items that do not comply with reviewed shop drawings because of improper embedment procedure or incorrect building construction or location, shall be replaced and repaired by General Contractor at no cost to the Owner or DEC.

D. Substitutions and Equivalents: Any product submitted as a substitution or equivalent shall fulfill the requirements of the specifications and have passed the same testing agency (ANSI, UL, ASTM, etc.) as referenced with the product, and include with the package an itemized list showing manufacturer, model number, sizes, finishes, noting any differences from the specified products. Also include a sample with a written list showing the names, location, and Architects of a minimum of ten (10) institutions for which similar products have been installed. No substitution will be allowed after the bid date.

E. Maintenance Manuals: Furnish two (2) copies of maintenance manuals covering all of the detention equipment for this project. Include the current name, address, and phone number of the detention equipment contractor, maintenance instructions and parts list for each type of hardware.

1.4 QUALITY ASSURANCE

A. Upon successful Award of this bid the submittal package shall be completed within three (3) weeks from written Notice-To-Proceed. This shall be completed for the following as applicable and including but not limited to:
1. Detention Enclosures
2. Detention Furnishings – Including anchorage and embed requirements

B. After receipt of approved shop drawings shall be
1. Shipment of all embedded items within four (4) weeks from receipt of notice to proceed.
2. Shipment of Security Doors within ten (10) weeks

3. Shipment of all other materials in a manner as not to negatively affect the construction schedule.

C. The following DEC's are pre-approved to perform the work of this section:

1. Noah Detention Construction (NDC)
2. Pauly Jail Building Company
3. Crowder Detention

D. Approval of a firm as a DEC does not relieve that DEC from furnishing all materials from the manufacturers as herein specified.

E. Project DEC shall furnish payroll record of executing project installation labor with a minimum of 75% of labor performed by direct employees of the DEC Company.

F. All materials and labor specified in this Section of the Specifications shall be furnished by a single qualified DEC who shall assume responsibility for the detailing, coordinating, erecting, performance, and warranty of this work, in accordance with this specification section.

G. Non-pre-approved Detention Equipment Subcontractors intending to submit a bid on the work specified in this section shall provide to the Architect the following information 14 days prior to bid date and shall be approved by addendum.

1. Provide a narrative and historical description of the firm from inception; including history of ownership, partnership, incorporation and/or other organizational information. Include information on the growth of the firm over time to include the number of employees, relocation(s) of the firm, major production equipment purchases and replacements. Use only the current corporate or business entity, intending on bidding and performing the work, should it be awarded the work.
2. Provide a statement that the firm has been in business under its current name for a minimum of ten (10) continuous years.
3. Provide a list of all employees in supervision capacity stating their area of responsibility and their years of experience in that capacity.

    a. Number of years as a full-time employee of the DEC
    b. Minimum years of jail experience
    c. Completed training program for iron workers (if involved with equipment installation)

4. Submit a complete list of all projects completed under the DEC's current name.

    a. Project Name, Owner, Contract Name, Address, and Phone Number
    b. User Agency or Government Entity Name, Address and Phone Number
    c. Architect and/or Engineer or Record Name, Address and Phone Number
    d. General Contractor and/or Construction Manager Name, Address and Phone Number
    e. Total Amount of the DEC's Contract
    f. Completion Date

5. Submit a list of 5 jobs that this corporation, under its current name has built in the last (5) years comparable in size and construction built within the last (5) five years. Include in this list:

    a. Project Name, Owner, Contract Name, Address, and Phone Number
    b. User Agency or Government Entity Name, Address and Phone Number
    c. Architect and/or Engineer or Record Name, Address and Phone Number
    d. General Contractor and/or Construction Manager Name, Address and Phone Number
    e. Total Amount of the DEC's Contract
    f. Completion Date

6. Submit a list of 5 jobs that this corporation, under its current name has built in the last ten (10) years comparable in size and construction that have been in continuous operation for a minimum of five 5 years. Include in this list:

    a. Project Name, Owner, Contract Name, Address, and Phone Number
    b. User Agency or Government Entity Name, Address and Phone Number
    c. Architect and/or Engineer or Record Name, Address and Phone Number
    d. General Contractor and/or Construction Manager Name, Address and Phone Number
    e. Total Amount of the DEC's Contract
    f. Completion Date

7. Provide an audited financial statement from a recognized Certified Public Accounting Firm for the three (3) past fiscal years.
8. Provide a financial statement for the current fiscal year.
9. List the firm's business volume (dollar amount) for the last five (5) fiscal years.
10. Provide a letter from an 'A' rated Surety company that your firm will be able to provide a 100% Performance/Payment Bond for this project if awarded the project, but not less than $500,000 dollars and that bonding will be allocated to this project if the bidder is successful.
11. Submit a listing of all jobs in which Detention Contractor is presently and has been involved in litigation and the status thereof.
12. Provide a factual list of any/all jobs that your firm has been involved in liquidated damages on delay damages were filed against your firm
13. Submit for approval the name of the detention equipment manufacturers you intend to purchase from. Submit a current letter from the detention hardware manufacturer stating that the Erector is a factory trained, fully authorized distributor and installer of their complete line of products.
14. Submit a letter of intent to test each detention door as described under subparagraph heading Detention Door Testing.
15. **FOR A YES ANSWER TO ANY QUESTION (a thru k)**
    Attach a separate sheet with prequalification which provides a brief explanation of the facts, the names of the parties involved, dollar amount being claimed from your firm and the present status of the case. Attach explanations of any lawsuits alleging negligent or defective work or breach of contract of the firm. Do not include lien matters, automobile accidents cases or Workmen's Compensation cases.

a. Has a court issued a judgment of $100,000 or more against the firm or its predecessors in the past five years?

_____YES _____NO

b. Has the firm or its predecessors been party to the settlement of a lawsuit with a potential value of $100,000 or more?

_____YES _____NO

c. Is the firm or its predecessors currently a party to a pending lawsuit with a potential value of $100,000 or more?

_____YES _____NO

d. In the past five years, has any key person, the firm or its predecessors defaulted on a loan?

_____YES _____NO

e. Has the firm or its predecessors, any key person of the firm or its predecessors or any with which a key person was affiliated ever filed for bankruptcy?

_____YES _____NO

f. Has the firm or its predecessors or any person of the firm or its predecessor ever been suspended or debarred by a state, federal or municipal agency?

_____YES _____NO

g. In the past five years, has the firm or its predecessor been terminated on or failed to complete any contract?

_____YES _____NO

h. In the past five years, has the firm or its predecessor been responsible for significant delays in completion of a project or incurred liquidated damages for delays

_____YES _____NO

i. How many years has the firm been in business under its current name?

j. How many years has the firm been in business under the current owner?

k. Prequalification is contingent upon the applicant having surety (performance) bond capacity authorized by a surety company acceptable to the architect, and owner/owner representative. Firms are encouraged to contact their local

broker/agent to alert them that this page may be telefaxed to their office for confirmation of surety information.

Name of your firm_____

Specific Surety Company Name_____

Street Address_____

Telephone Number_____

Telefax Number_____

Local Broker/Agent_____

Contact Person_____

Street Address_____

City, State, Zip_____

Telephone Number_____

Telefax Number_____

Provide the current level of performance bonding (in dollar amount) authorized by the surety. These limits do not preclude a firm from bidding on a large project, if the firm is able to secure the necessary bonding prior to submitting a bid.

Single Limit: _____ Aggregate Limit:_____

By signing below, the local broker/agent confirms the information provided in items a through k above. This page may be returned via fax to _____.

l. Bank name_____

Street address_____

City, state, zip_____

Telephone number_____

Contact person_____

16. Any bidder who fails to submit the above or submits misrepresented or incomplete information shall be disqualified.

H. Approved manufacturer list.

1. Manufacturers will not be added to this list unless qualification evidence is provided to and approved by the Architect.
2. Approved manufacturers will be added by addendum.

I. Code Compliance: The work of this section shall comply with the latest requirements of the Federal, State, and local codes or ordinances, and other agencies having jurisdiction. In the event of conflict, the more stringent requirements shall apply.

1. The work shall conform to applicable sections of the Life Safety Code NFPA-101, and the National Electric code NFPA-70.
2. Fire-rated openings shall comply with NFPA Standard Number 80. Provide only hardware which has been tested and listed by Underwriters Laboratories for these openings.

J. Field Welding

1. Welder Qualifications: Employ only welders and tackers who are qualified by American Welding Society's testing procedure.
2. Quality: Repairing of defective welds by adding new material over the defects will not be permitted.
3. Welds: Shall be of neat and clean appearance, and deep penetration in accordance with AWS. Joints shall be tight and true with members ground where necessary to assure a correct fit.

K. Detention Door Testing: Upon completion of installation and before project is turned over to the Owner, the detention equipment manufacturer shall provide a factory representative to test each door. Each door shall be tested for correct installation, fit, finish and electric control if required. Upon completion of testing the manufacturers representative shall turn over to the Architect a written account of each door with deficiencies noted. Notify the Architect at least three (3) days prior to inspection so arrangements can be made for Architects representative to be present.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Packaging and Delivery

1. Wrap and crate finished components and assemblies to prevent damage to finished items.
2. Deliver pertinent items requiring to be built-in to the General Contractor or trades in accordance with construction progress to prevent any delay.
3. Determine and coordinate the openings for delivery and installation of equipment.

B. Storage and Protection

1. Hardware received, but not installed shall be placed in secured storage. Control handling to prevent losses and delays before and after installation.

2. Lay panels and flat sections flat and blocked clear of floor in a manner to prevent warping, twisting or sagging.
3. Immediately upon delivery, inspect components and assemblies for damage. Advise manufacturer no later than two days after receipt of damaged items, the quantity and description of the items. Remove all damaged items from the site.

C. Off-site Storage: In the event that off-site storage is required, the following requirements apply:

1. Protect stored items from diversion, destruction, theft, and damage.
2. Stored items shall be marked for use on the project.
3. Stored items shall be available for inspection by Architect and Owner.
4. Copies of bill of sale for stored items shall be submitted to Architect and Owner.
5. Certificates of property insurance for stored items, protecting against damage and theft while in storage, certifying said coverage, and indicating the nature, quantity, and exact location of stored items shall be submitted to Architect and the Owner.
6. A waiver of lien shall be provided in Accordance with the Contract Documents.

1.6 JOB CONDITIONS

A. Coordination:

1. Coordinate the work of this section with other work, and the progress schedule.
2. Provide items of proper design for use on this project as indicated and in accordance with the approved door schedule regardless of omissions or conflicts specified or indicated.
3. Coordinate the delivery and location of items to meet the progress schedule.
4. To the manufacturers of related equipment and trades affected by the work of this section, provide copies of the approved drawings of other work to confirm adequate provisions have been made for the proper location and installation of detention equipment.

B. Scheduling:

1. Refer to Division 1 Section for specific scheduling requirements.
2. The work of this section shall be scheduled and coordinated with the Architect and Owner to ensure that all detention restrictions, rules, regulations, and security measures will be maintained throughout the course of the work.

1.7 WARRANTY AND SERVICE

A. Detention Equipment Contractor shall warrant the material and workmanship on this project for a period of one (1) year after substantial completion as specified in Division 1 - General Requirements. Detention Equipment Contractor agrees to repair or replace any defective detention materials or work when given written notice during Warranty period.

B. Detention Equipment Contractor shall provide emergency service during the 12-month warranty period, should a major breakdown occur. Response time shall be within a 24-hour period from written notification.

1.8 MAINTENANCE

A. Spare Parts:

1. Furnish the Owner with the following maintenance/spare parts:

Spare Parts	Quantity
a. Torx tamper-resistant screws	100 each
d. Torx Tool Sets	6 each

2. Parts shall be packed in suitable containers clearly labeled. Deliver and store maintenance/spare parts material where directed by Owner.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install in strict accordance with the manufacturers written installation instruction, reviewed shop drawings, and as shown on the drawings.

1. All anchors and fasteners shall be tamper-proof.

3.2 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance requirements for installation tolerances and other conditions affecting performance of detention work.

1. Examine roughing-in for embedded, built-in and cast-in anchors to verify actual locations of detention work connections before detention work installation
2. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of detention work.

B. Verify locations of detention work with those indicated on Coordination Drawings.

3.3 FIELD QUALITY CONTROL

A. Ensure quality of field welding of detention work and anchorages

B. Verify that detention work is installed and connected according to the Contract Documents.

C. Observe startup service of detention work.

D. Observe installation and startup checks of detention work according to manufacturer's written instructions.

E. Inspect installed detention work to verify compliance with requirements. Prepare inspection reports and indicate compliance with and deviations from the Contract Documents.

1. Perform additional inspections to determine compliance of replaced or additional work.
2. Prepare field quality control certification that states installed detention work and its installation complies with requirements in the Contract Documents

F. Testing: After installing electrified detention work and after electrical circuitry has been installed and energized, test detention work for compliance with requirements.

1. When testing reveals detention work not in compliance with requirements, perform additional random testing to determine extent of noncompliance.
2. Where test results indicate that detention work does not comply with specified requirements, retest after repairs or replacements are made.
3. Perform additional testing and inspecting, at this Contractor's expense, to determine compliance of replaced or additional work.

3.4 DEMONTRATION/TRAINING

A. Demonstrate to the Owner operations and maintenance of all Detention Work. Coordinate dates for training sessions with the Owner prior to scheduling dates.

B. On-site and Detention Hardware Factory Training: Provide qualified personnel for instruction and a training period involving the Owner's designated personnel. Representatives must be capable of training Owner's personnel in the adjustment, operation and repair of detention work, including pertinent safety requirements. Instruction shall be given during the first week after detention work has been accepted and turned over to the Owner for regular operation, except if adjustment and/or repairs have been satisfactorily completed.

C. During the warranty period, if significant changes or modifications take place in the equipment or system, additional instruction shall be provided at no cost to the Owner.

END OF SECTION 111900

SECTION 125500 - DETENTION FURNITURE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Detention tables.

B. Related Sections:
   1. Section 055000 “Metal Fabrications” for recessed wall-mounted steel steps to access upper bunks.

1.3 COORDINATION

A. Coordinate installation of anchorages for detention furniture. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors that are to be embedded in adjacent construction. Deliver such items to Project site in time for installation.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for detention furniture.

B. Shop Drawings: For detention furniture.
   1. Include plans, elevations, sections, details, and attachments to other work.
   2. Indicate locations, dimensions, and profiles of wall and floor reinforcements.
   3. Indicate locations and installation details of built-in anchors.
   4. Show elevations of detention furniture and indicate dimensions of furniture, preparations for receiving anchors, and locations of anchorage.
   5. Show details of attachment of detention furniture to built-in anchors.

1.5 INFORMATIONAL SUBMITTALS

A. Welding certificates.

B. Product Certificates: For each type of detention furniture, from manufacturer.

C. Other Informational Submittals:
   1. Examination reports documenting inspections of substrates, areas, and conditions.
   2. Field quality-control reports documenting inspections of installed products.
   3. Field quality-control certification signed by Contractor and Detention Specialist.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Security Fasteners: Furnish not less than one box for every 50 boxes or fraction thereof, of each type and size of security fastener installed.
   2. Tools: Provide two sets of tools for installing and removing security fasteners.

1.7 QUALITY ASSURANCE

A. Source Limitations for Detention Furniture: Obtain each type of detention furniture from single source from single manufacturer.

B. Welding Qualifications: Qualify procedures and personnel according to the following:
   1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
   2. AWS D1.3, "Structural Welding Code - Sheet Steel."
   3. AWS D1.6, "Structural Welding Code - Stainless Steel."

1.8 PROJECT CONDITIONS

A. Field Measurements: Verify openings for recessed detention furniture by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

B. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, CS (Commercial Steel), Type B; suitable for exposed applications.

C. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, CS (Commercial Steel), Type B; free of scale, pitting, or surface defects; pickled and oiled.

D. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A 666 or ASTM A 240/A 240M, austenitic stainless steel, Type 304.

E. Steel Tubing: ASTM A 513, Type B unless otherwise indicated; thickness indicated or required by structural loads.

F. Steel Pipe: ASTM A 53/A 53M, Standard Weight (Schedule 40) unless another weight is indicated or required by structural loads.

G. Concealed Bolts: ASTM A 307, Grade A unless otherwise indicated.

H. Welding Rods and Bare Electrodes: Select according to AWS specifications.

2.2 DETENTION TABLES

A. 8-Man Floor-Mounted Dayroom Table and Seats:
   1. Location: Dayroom Tables
   2. Basis-of-Design Product: Subject to compliance with requirements, provide Norix Group, Inc.; MaxMaster Table, Model No. MX9630-8PT/ MX9630-8PT-ADA or a comparable product by one of the following:
      a. PSI LLC.
      b. Willo Products Company, Inc.
   3. Tabletop (Stainless Steel Inlay): Durable 304 stainless steel surface sealed with a specially formulated, highly durable Slammer Stone edge. Edges are radiused for safety and pressure fused to the top rendering it firmly attached and highly sanitary. 1 1/4" thick edge profile
      a. Size: Minimum 96 inches long x 30 inches wide x 32 inches high
   4. Seats (Super Slammer Stone Seats): 13-inch diameter, formed from high density color impreganated compression molded composite.
   5. Table/Seat Support Framing: Formed from 3-inch diameter by 0.079-inch (14 gage) thick steel tubing welded to top and base plate. Provide one leg base for each seat with curved member to support the table.
      a. Concealed tamper-resistant bolt-down application through bottom of leg.
      b. Legs at ADA Dayroom Tables to allow 30-inch wide wheelchair access to the table between adjacent seats.
   6. Capacity: Eight persons
   7. Steel Finish: Baked enamel or powder coat.
   8. Stainless-Steel Finish: No. 4.
   9. Tables may be shipped knock-down and field assembled. Tack weld nuts to bolts after fully assembled.

2.3 SECURITY SEALANTS

A. Refer to section 079200 “Joint Sealants”.

2.4 SECURITY FASTENERS

A. Fasteners operable only by tools produced by fastener manufacturer or other licensed fabricator for use on specific type of fastener.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Holo-Krome; a Danaher corporation.
   b. Safety Socket LLC.
   c. Tamper-Pruf Screws.
   d. Textron Fastening Systems; Textron Inc.

B. Provide drive-system type, head style, material, and protective coating as required for assembly, installation, and strength, and as follows:
1. Drive-System Type: Pinned Torx-Plus.
2. Fastener Strength: 120,000 psi.
3. Socket Button Head Fasteners:
   a. Stainless steel, ASTM F 879, Group 1 CW.
4. Socket Flat Countersunk Head Fasteners:
   a. Stainless steel, ASTM F 879, Group 1 CW.
5. Socket Head Cap Fasteners:
   a. Stainless steel, ASTM F 837, Group 1 CW.

2.5 FABRICATION

A. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Coordinate dimensions and attachment methods of detention furniture with those of adjoining construction to produce integrated assemblies with closely fitting joints and with edges and surfaces aligned unless otherwise indicated.

C. Shear and punch metals cleanly and accurately. Remove burrs.

D. Form and grind edges and corners to be free of sharp edges or rough areas.
1. Fabricate detention furniture with no more than 1/32-inch gap between component materials and fill with auto body filler or security sealant. Weld edges that cannot be crimped to meet tolerance so as to provide a seamless joint with no place for concealment of contraband.

E. Form metal in maximum lengths to minimize joints. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing the Work.

F. Weld corners and seams continuously to comply with referenced AWS standard and the following:
1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. Finish exposed welds and surfaces smooth and blended at exposed connections so that no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

5. Weld before finishing components to greatest extent possible. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

G. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to secure detention furniture rigidly in place and to support expected loads. Build in straps, plates, and brackets as needed to support and anchor fabricated items to adjoining construction. Reinforce formed-metal units as needed to attach and support other construction.

H. Cut, reinforce, drill, and tap detention furniture as indicated to receive hardware, security fasteners, and similar items.

I. Form exposed work true to line and level with accurate angles, surfaces, and straight sharp edges.

J. Form exposed connections with hairline joints, flush and smooth using concealed fasteners where possible. Use exposed security fasteners of type indicated or, if not indicated, flat-head (countersunk) security fasteners. Locate joints where least conspicuous.

2.6 STEEL FINISHES

A. Surface Preparation: Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning" or SSPC-SP 8, "Pickling" After cleaning, apply a conversion coating suited to the organic coating to be applied over it.

B. Baked-Enamel or Powder-Coat Finish: Immediately after cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2 mils.
1. Color and Gloss: As selected by Architect from manufacturer's full range.

2.7 STAINLESS-STEEL FINISHES

A. General: Remove tool and die marks and stretch lines or blend into finish. Grind and polish surfaces to produce uniform, directionally textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.

B. Intermediate Polish Finish: No. 4 unless otherwise indicated.

C. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer and Detention Specialist present, for compliance with requirements for installation tolerances and other conditions affecting performance of detention furniture.

B. Examine roughing-in for embedded and built-in anchors to verify actual locations of detention furniture before detention furniture installation.

C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of detention furniture.

D. Verify locations of detention furniture with those indicated on Shop Drawings and with Owner's Representative in the field.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing detention furniture to in-place construction. Include threaded fasteners for concrete and masonry inserts, security fasteners, and other connectors.

B. Cutting, Fitting, and Placement: Obtain manufacturer's written approval for cutting, drilling, and fitting required for installing detention furniture. Set detention furniture accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

C. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations.

D. Field Welding: Comply with the following requirements:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.
   4. Finish exposed welds and surfaces smooth and blended at exposed connections so that no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
   5. Fillet Welds: Minimum size of 1/8 inch by 1-1/2 inches long, spaced not greater than 12 inches o.c. Fill spaces between welds with security sealant or auto body filler where weld is exposed.
   6. Fillet Welds: Continuous.

E. Assemble detention furniture requiring field assembly with security fasteners and without exposed fasteners on exposed faces and frames.

F. Anchor as indicated on Drawings to floors and walls with security fasteners at intervals required by expected loads, but not more than 12 inches o.c.
   1. Install anchors through backup reinforcing plates where necessary to avoid metal distortion.
   2. Use security fasteners with head styles appropriate for installation requirements, strength, and finish of adjacent materials, except that a maximum of two different sets of tools shall be required to operate security fasteners for Project. Provide stainless-steel security fasteners in painted materials.
   3. Tack weld nuts onto cast-in-place anchors after installation so as to be nonremovable.

G. Apply security sealant or auto body filler at all exposed gaps between detention furniture between tack welds and between detention furniture and adjacent construction greater than 1/16 inch.

3.3 FIELD QUALITY CONTROL

A. Detention Specialist shall inspect installed products to verify compliance with requirements. Prepare inspection reports and indicate compliance with and deviations from the Contract Documents.

B. Prepare field quality-control certification endorsed by Detention Specialist that states installed products and their installation comply with requirements in the Contract Documents.

3.4 CLEANING AND PROTECTION

A. Touchup Painting: Immediately after erection, clean bolted connections and abraded areas of shop paint, and paint exposed areas with same material used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

END OF SECTION 125500

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SECTION 238127 – VARIABLE REFRIGERANT FOW SYSTEM

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Base Bid:

1. Contractor provide:

a. Variable Refrigerant Flow (VRF) air conditioning system including indoor units, outdoor units, DDC controls, refrigerant piping and other accessories where shown on the Drawings and specified herein for a complete and proper installation.

b. The HVAC equipment basis of design is Mitsubishi Electric City Multi VRF (Variable Refrigerant Flow) zoning system.

1.2 QUALITY ASSURANCE

A. The units shall be listed by Electrical Laboratories (ETL) and bear the cETL label.

B. All wiring shall be in accordance with the National Electric Code (NEC).

C. The system will be produced in an ISO 9001 and ISO 14001 facility, which are standards set by the International Standard Organization (ISO). The system shall be factory tested for safety and function.

D. The outdoor unit will be factory charged with R-410A.

E. All units must meet or exceed the 2010 Federal minimum efficiency requirements and the ASHRAE 90.1 efficiency requirements for VRF systems. Efficiency shall be published in accordance with the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) Standard 1230.

F. System start-up supervision shall be a required service to be completed by the manufacturer or a duly authorized, competent representative that has been factory trained in system configuration and operation. The representative shall provide proof of manufacturer certification indicating successful completion within no more than two (2) years prior to system installation. This certification shall be included as part of the equipment and/or controls submittals.

1.3 SUBMITTALS

A. Shop Drawings: Indicate assembly, unit dimensions, weight loading, required clearances, construction details, field connection details, and electrical characteristics and connection requirements.

B. Product Data.

1. Provide literature that indicates dimensions, weights, capacities, ratings, fan performance, gauges and finishes of materials, and electrical characteristics and connection requirements.
2. Manufacturer's Installation Instructions.

1.4 OPERATION AND MAINTENANCE DATA

A. Maintenance Data: Include instructions for filter, motor, and drive replacement.

1.5 WARRANTY

A. The units shall be covered by the manufacturer's limited warranty for a period of one (1) year parts and seven (7) year compressor to the original owner from date of installation.
B. Installing contractor shall meet manufacturer requirements to obtain extended manufacturer's limited parts and compressor warranty for a period of ten (10) years to the original owner from date of installation. This warranty shall not include labor.

PART 2 - PRODUCTS

2.1 DESIGN BASIS

A. The HVAC equipment basis of design is the Mitsubishi Electric City Multi VRF (Variable Refrigerant Flow) zoning system.

2.2 ALTERNATE MANUFACTURERS

A. Daikin.
B. Samsung.
C. Sanyo.
D. York/Hitachi.
E. Contractor bidding an alternate manufacturer listed above does so with full knowledge that the manufacturers product may not be acceptable or approved and that the contractor is responsible for all specified items and intents of this document without further compensation.

2.3 Y-SERIES HEATING/COOLING (HEAT PUMP), AIR-COOLED OUTDOOR UNITS

A. General:

1. The outdoor unit modules shall be air-cooled, direct expansion (DX), multi-zone units used specifically with VRF components described in this section and Part 5 (Controls). The outdoor unit modules shall be equipped with a single compressor which is inverter-driven and multiple circuit boards—all of which must be manufactured by the branded VRF manufacturer. Each outdoor unit module shall be completely factory assembled, piped and wired and run tested at the factory.

2. Outdoor unit systems may be comprised of multiple modules with differing capacity if a brand other than basis of design is proposed. All units requiring a factory

supplied twinning kits shall be piped together in the field, without the need for equalizing line(s). If an alternate manufacturer is selected, any additional material, cost, and labor to install additional lines shall be incurred by the contractor. Contractor responsible for ensuring alternative brand compatibility in terms of availability, physical dimensions, weight, electrical requirements, etc.

3. Outdoor unit shall have a sound rating no higher than 62 dB(A) individually or 62 dB(A) twinned. Units shall have a sound rating no higher than 51 dB(A) individually or 54 dB(A) twinned while in night mode operation. If an alternate manufacturer is selected, any additional material, cost, and labor to meet published sound levels shall be incurred by the contractor.

4. Refrigerant lines from the outdoor unit to the indoor units shall be insulated in accordance with the installation manual.

5. The outdoor unit shall have the capability of installing the main refrigerant piping through the bottom of the unit.

6. The outdoor unit shall have an accumulator with refrigerant level sensors and controls.

7. The outdoor unit shall have a high pressure safety switch, over-current protection, crankcase heater and DC bus protection.

8. VRF system shall meet performance requirements per schedule and be within piping limitations & acceptable ambient temperature ranges as described in respective manufacturers' published product catalogs. Non-published product capabilities or performance data are not acceptable.

9. The outdoor unit shall be capable of guaranteed operation in heating mode down to -13°F ambient temperatures and cooling mode up to 109°F without additional restrictions on line length & vertical separation beyond those published in respective product catalogs. Models with capacity data for required temperature range published as "for reference only" are not considered capable of guaranteed operation and are not acceptable. If an alternate manufacturer is selected, any additional material, cost, and labor to meet ambient operating range and performance shall be incurred by the contractor.

10. The outdoor unit shall have a high efficiency oil separator plus additional logic controls to ensure adequate oil volume in the compressor is maintained. Oil return sequences must be enabled only during extended periods of reduced refrigerant flow to ensure no disruption to correct refrigerant flow to individual zones during peak loads. Systems which might engage oil return sequence based on hours of operation risk oil return during inopportune periods are not allowed. Systems which rely on sensors (which may fail) to engage oil return sequence are not allowed.

11. Unit must defrost all circuits simultaneously in order to resume full heating more quickly during extreme low ambient temperatures (below 23F). Partial defrost, also known as hot gas defrost which allows reduced heating output during defrost, is permissible only when ambient temperature is above 23F.

B. Unit Cabinet:

1. The casing(s) shall be fabricated of galvanized steel, bonderized and finished.

2. The outdoor unit shall be tested in compliance with ISO9277 such that no unusual rust shall develop after 960 hours of salt spray testing.

3. Panels on the outdoor unit shall be scratch free at system startup. If a scratch occurs the salt spray protection is compromised and the panel should be replaced immediately.

C. Fan:

1. Each outdoor unit module shall be furnished with direct drive, variable speed propeller type fan(s) only. Fans shall be factory set for operation at 0 in. WG external static pressure, but capable of normal operation with a maximum of 0.24 in. WG external static pressure via dipswitch.

2. All fan motors shall have inherent protection, have permanently lubricated bearings, and be completely variable speed.

3. All fans shall be provided with a raised guard to prevent contact with moving parts.

D. Refrigerant and Refrigerant Piping

1. R410A refrigerant shall be required for systems.

2. Polyolester (POE) oil—widely available and used in conventional domestic systems—shall be required. Prior to bidding, manufacturers using alternate oil types shall submit material safety data sheets (MSDS) and comparison of hygroscopic properties for alternate oil with list of local suppliers stocking alternate oil for approval at least two weeks prior to bidding.

3. Refrigerant piping shall be phosphorus deoxidized copper (copper and copper alloy seamless pipes) of sufficient radial thickness as defined by the VRF equipment manufacturer and installed in accordance with manufacturer recommendations.

4. All refrigerant piping must be insulated with ½" closed cell, CFC-free foam insulation with flame-Spread Index of less than 25 and a smoke-development Index of less than 50 as tested by ASTM E 84 and CAN / ULC S-102. R value of insulation must be at least 3.

5. Refrigerant line sizing shall be in accordance with manufacturer specifications.

E. Coil:

1. The outdoor heat exchanger shall be of zinc coated aluminum construction with turbulating flat tube construction. The coil fins shall have a factory applied corrosion resistant finish. Uncoated aluminum coils/fins are not allowed.

2. The coil shall be protected with an integral metal guard.

3. Refrigerant flow from the outdoor unit shall be controlled by means of an inverter driven compressor.

F. Compressor:

1. Each outdoor unit module shall be equipped with only inverter driven scroll hermetic compressors. Non inverter-driven compressors, which may cause inrush current (demand charges) and require larger generators for temporary power shall not be allowed.

2. Crankcase heat shall be provided via induction-type heater utilizing eddy currents from motor windings. Energy-wasting “belly-band” type crankcase heaters are not allowed.

3. Compressor shall have an inverter to modulate capacity. The capacity for each compressor shall be variable with a minimum turndown not greater than 20%.

4. The compressor shall be equipped with an internal thermal overload.

5. Field-installed oil equalization lines between modules are not allowed. Prior to bidding, manufacturers requiring equalization must submit oil line sizing calculations specific to each system and module placement for this project.

G. Controls:

1. The unit shall be an integral part of the system & control network described in Part 5 (Controls) and react to heating/cooling demand as communicated from connected indoor e control circuit. Required field-installed control voltage transformers and/or signal boosters shall be provided by the manufacturer.

2. The outdoor unit shall have the capability of 4 levels of demand control for each refrigerant system based on external input.

H. Electrical:

1. The outdoor unit shall be controlled by integral microprocessors.

2. The control circuit between the indoor units and the outdoor unit shall be 24VDC completed using a 2-conductor, twisted pair shielded cable to provide total integration of the system.

2.4 4-WAY CEILING-RECESSED CASSETTE WITH GRILLE FOR 2X2 GRID INDOOR UNIT

A. General:
   1. The indoor unit shall be a four-way cassette style indoor unit that recesses into the ceiling with a ceiling grille.
   2. The indoor unit shall be factory assembled, wired and run tested.
   3. Contained within the unit shall be all factory wiring, piping, electronic modulating linear expansion device, control circuit board and fan motor.
   4. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, an auto restart function, an emergency operation function and a test run switch.
   5. Indoor unit and refrigerant pipes shall be charged with dehydrated air before shipment from the factory.
   6. The unit shall be suitable for use in plenums in accordance with UL1995 ed 4.

B. Unit Cabinet:
   1. The cabinet shall be a compact 22-7/16” wide x 22-7/16” deep so it will fit within a standard 24” square suspended ceiling grid.
   2. The cabinet panel shall have provisions for a field installed filtered outside air intake.
   3. Four-way grille shall be fixed to bottom of cabinet allowing two, three or four-way blow.

C. Fan:
   1. The indoor fan shall be an assembly with a turbo fan direct driven by a single motor.
   2. The indoor fan shall be statically and dynamically balanced to run on a motor with permanently lubricated bearings.
   3. The indoor unit shall include an AUTO fan setting capable of maximizing energy efficiency by adjusting the fan speed based on the difference between controller set-point and space temperature.
   4. The indoor fan shall be capable of five (4) speed settings, Low, Mid, High and Auto.
   5. The indoor unit shall have an adjustable air outlet system offering 4-way airflow, 3-way airflow, or 2-way airflow.
   6. The auto air swing vanes shall be capable of automatically swinging up and down for uniform air distribution.
   7. Grille shall include a factory-installed “i-see” sensor, or equal, to work in conjunction with indoor unit control sequence to prevent unnecessary cooling or heating in unoccupied areas of the zone without decreasing comfort levels.
   8. Sensor must detect occupancy (not simply motion) and location of occupants by measuring size & temperature of objects within a 39’ detecting diameter (based on 8.8ft mounting height) with 1,856 or more measuring points.

D. Filter:
   1. Return air shall be filtered by means of a long-life washable filter.

E. Coil:
   1. The indoor coil shall be of nonferrous construction with smooth plate fins on copper tubing. The tubing shall have inner grooves for high efficiency heat exchange. All tube joints shall be brazed with phos-copper or silver alloy.
   2. The coils shall be pressure tested at the factory.

3. The unit shall be provided with an integral condensate lift mechanism that will be able to raise drain water 19-3/4" inches above the condensate pan

F. Controls:
1. Indoor unit shall compensate for the higher temperature sensed by the return air sensor compared to the temperature at level of the occupant when in HEAT mode.
2. Disabling of compensation shall be possible for individual units to accommodate instances when compensation is not required.
3. Control board shall include contacts for control of external heat source. External heat may be energized as second stage with 1.8°F – 9.0°F adjustable deadband from set point.
4. Indoor unit shall include no less than four (4) digital inputs capable of being used for customizable control strategies.
5. Indoor unit shall include no less than three (3) digital outputs capable of being used for customizable control strategies.
6. A factory-installed drain pan sensor shall provide protection against drain pan overflow by sensing a high condensate level in the drain pan. Should this occur the control shuts down the indoor unit before an overflow can occur. A thermistor error code will be produced should the sensor activate indicating a fault which must be resolved before the unit re-starts.

2.5 CONTROLS

A. OVERVIEW

1. The control system shall consist of a low voltage communication network and a web-based interface. The controls system shall gather data and generate web pages accessible through a conventional web browser on each PC connected to the network.
2. Operators shall be able to perform all normal operator functions through the web browser interface.
3. Furnish energy conservation features such as optimal start, request-based logic, and demand level adjustment of overall system capacity as specified in the sequence.
4. System shall be capable of email generation for remote alarm annunciation.

B. ELECTRICAL CHARACTERISTICS
1. General:
   a. Controller power and communications shall be via a common non-polar communications bus and shall operate at 30VDC.
2. Wiring:
   a. Control wiring shall be installed in a daisy chain configuration from indoor unit to indoor unit, to the BC controller (main and subs, if applicable) and to the outdoor unit. Control wiring to remote controllers shall be run from the indoor unit terminal block to the controller associated with that unit.
   b. Control wiring for centralized controllers shall be installed in a daisy chain configuration from outdoor unit to outdoor unit, to the system controllers

(centralized controllers and/or integrated web based interface), to the power supply.

3. Wiring type:
   a. Wiring shall be 2-conductor (16 AWG), twisted, stranded, shielded wire as defined by the Diamond System Builder output.

   b. Network wiring shall be CAT-5 with RJ-45 connection.

C. CITY MULTI CONTROLS NETWORK

1. The CITY MULTI Controls Network (CMCN) consists of remote controllers, centralized controllers, and/or integrated web based interface communicating over a high-speed communication bus.
2. The CITY MULTI Controls Network shall support operation monitoring, scheduling, occupancy, error email distribution, personal web browsers, tenant billing, online maintenance support, and integration with Building Management Systems (BMS) using BACnet® interface.

PART 3 - EXECUTION

3.1 INSTALLATION

A. The VRF system shall be installed per Manufacturer's Installation Instructions.

3.2 START-UP

A. Start-up. Test, and adjust system in accordance with manufacturer's start-up instructions.

B. Check and calibrate controls.

3.3 SEQUENCE OF OPERATIONS

A Variable Refrigerant Flow System: Variable refrigerant flow system shall consist of indoor fan coil units, heat / cool branch selector boxes and outdoor heat recovery units with a minimum of two compressors per module.

1 Occupied Mode

a Heat recovery unit shall run a start up of the unit using PI control to equalize the system pressure and reducing start load. Inverter ON to charge capacitor.
b Compressor shall start and ramp to maintain load based on PI control
c Multiple compressors shall start based on load and PI step control.
d Heat recovery units and compressors on multiple units will rotate starting to equalize run time.

e Unit shall be equipped with multiple outdoor fans that step modulate on PI control to maintain head pressure.
f Heat recovery unit shall use PI control to maintain heating availability during the cooling mode to allow for heat recovery operation.
g Heat recovery unit shall use two condenser coils per unit to allow for heat rejection between the indoor and outdoor units during heat recovery using PI control.
h Fan coils shall operate in heating or cooling mode to maintain space setpoint.

2 Defrost Mode when Occupied

a Heat recovery unit shall perform defrost during the heating operation without disruption of the heating cycle
b Indoor fans shall remain on and never shut off during defrost mode.
c Heating operation shall stay operational during oil recovery.
d Condenser coils shall defrost independently and the heating operation shall stay operational.
e Heat recovery unit shall have multiple outdoor fan motors PI step controlled to maintain head pressure during defrost

3 Oil Recovery Mode when Occupied

a If anytime during operation, the heat recovery unit reaches eight hours of operation in heating or cooling, the unit will perform an oil recovery cycle without disruption of heating cycle.
b Indoor fans shall remain on and never shut off during oil recovery.
c Heating operation shall stay operational during oil recovery.
d Oil recovery cycle shall last between three and five minutes.

4 Unocuppied Mode

a During the unoccupied cycle the heat recovery unit shall cycle to maintain setpoint in heating or cooling based on demand from onboard DDC controls as required by indoor fan coil setback temperatures.
b Heat recovery unit function shall be the same as occupied, defrost and oil recovery
c Pump down operation will be available to remove refrigerant from evaporator coils prior to shutdown.

5 Safety Devices:

Heat recovery unit shall be equipped with the following safety devices.
a High pressure safety operation.
b Low pressure safety operation
c Discharge pipe protection control.
d Inverter protection control
e Standard compressor overload protection.

f Heat recovery unit shall be capable of back up operation in event of a compressor failure (multiple condenser application with multiple compressors).

END OF SECTION 238127