NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION GROUP
THE GOVERNOR NELSON A. ROCKEFELLER
EMPIRE STATE PLAZA
ALBANY, NY 12242

ADDENDUM NO. 5 TO PROJECT NO. 45649

CONSTRUCTION WORK, HVAC WORK, PLUMBING WORK, AND ELECTRICAL WORK
PROVIDE FORENSIC IDENTIFICATION UNIT BUILDING &
HEADQUARTERS BUILDING ADDITION/RENOVATIONS
NEW YORK STATE POLICE
2541 ROUTE 44
SALT POINT, NEW YORK 12578

January 26, 2021

NOTE: This Addendum forms a part of the Contract Documents. Insert it in the Project Manual. Acknowledge receipt of this Addendum in the space provided on the Bid Form.

CONSTRUCTION WORK SPECIFICATIONS

1. SECTION 081116 ALUMINUM DOORS AND FRAMES: Discard Section 081116 in its entirety.

2. Page 093013-3: Article 2.02: Change article to read:

"**2.02 SETTING MATERIALS**

A. Dry-Set Portland Cement Mortar (Thinset): ANSI A118.1, and meeting the requirements for setting the particular type of tile to be set with the mortar.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Bonsal American, an Oldcastle company.
      b. Bostik, Inc.
      c. Laticrete International, Inc.
      d. MAPEI Coporation.
      e. Summitville Tiles, Inc.
   2. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.1.

B. Latex-Portland Cement Mortar (Thinset): ANSI A118.4.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Bonsal American, an Oldcastle company.
      b. Bostik, Inc.
      c. Laticrete International, Inc.
      d. MAPEI Corporation.
   2. Provide prepackaged, dry-mortar mix combined with acrylic resin or styrene-butadiene-rubber liquid-latex additive at Project site.

3. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.4."

3. SECTION 321216 ASPHALT CONCRETE PAVING, Discard the Section bound in the Project Manual and substitute the accompanying SECTION 321216 ASPHALT PAVING (pages 321216 – 1 through 321216 – 4) noted "Printed 01/21/2021".

4. SECTION 323113 CHAIN LINK FENCE, Discard the Section bound in the Project Manual and substitute the accompanying section (pages 323113 – 1 through 323113 – 6) noted "Printed 01/20/2021".

5. Page 460700 - 1, 1.02, A, 2: Add sub-paragraph:
"a. Design is based on H2O Innovations."

6. Page 460700 - 1, 1.02, A, 3, b, i: Revise to read:
"i. Integrated equalization tank to hold a minimum volume equal to one day (6000 gallons) of raw wastewater, with aeration diffusers, blower and 2000 gallon sludge tank."

ELECTRICAL WORK SPECIFICATIONS

7. SECTION 274116 INTEGRATED AUDIO-VIDEO SYSTEMS AND EQUIPMENT pages (274116 – 1 through 274116 – 45) noted "Printed 1/21/2021" accompany this Addendum and supersede the same numbered originally issued section.

CONSTRUCTION WORK DRAWINGS

8. Drawing C-502:
    a. Detail 107 PROPANE TANK INSTALLATION DETAIL, PROPANE TANK SCHEDULE Add Note "3. PROVIDE INITIAL TANK FILL."
    b. Detail 4: Add Drawing CSK-1 dated 1/21/21 accompanying this Addendum.

9. Revised Drawings:
    a. Drawing Nos. C-504, noted "01/21/2021 ADDENDUM 5" accompany this Addendum and supersede the same numbered originally issued drawings.
    b. Drawing Nos. S-107-H and S-107-F noted "01/21/2021 ADDENDUM #5" accompany this Addendum and supersede the same numbered originally issued drawings.

10. Drawing A-604-H, ROOM FINISH SCHEDULE:
    a. H67E FLOOR change "PFT-1" to "terrazzo shower base provided by P-Contract"
    b. H67F FLOOR change "PFT-1" to "terrazzo shower base provided by P-Contract"
    c. H67G FLOOR change "PFT-1" to "terrazzo shower base provided by P-Contract"

11. Drawing A-601-F – DOOR SCHEDULE:
    a. Door NO. 151A change HARDWARE SET to read "3".
    b. Door NO. 150 change HARDWARE SET to read "2"
    c. Door NO. 151B change HARDWARE SET to read "4".

HVAC WORK DRAWINGS

12. Revised Drawings:
    a. Drawing Nos. M-601-F, M-604-F and M-703-F, noted "01/21/2021 ADDENDUM 5" accompany this Addendum and supersede the same numbered originally issued drawings.

ELECTRICAL WORK DRAWINGS

13. Revised Drawing:
    a. Drawing No. TA-002-F noted "01/21/2021 ADDENDUM #5" accompany this Addendum and supersede the same numbered originally issued drawing.

END OF ADDENDUM

Erik T. Deyoe, P.E.
Director, Division of Design
Design & Construction

SECTION 321216

ASPHALT PAVING

PART 1 GENERAL

1.01 REFERENCES

A. New York State Department of Transportation (DOT) Specification section 400 dated January 1, 2020.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Earthwork: Section 310000.

B. Pavement Marking: Section 321723.

1.03 SUBMITTALS

A. Product Data:
   1. Asphaltic Pavement: Include mix design from NYSDOT approved Batch Plant, Mix Design Test results that are less than 6 months old

B. Batch plant name, NYSDOT Plant Number, and location of asphalt plant.

C. Pavement Quality Control Submittals: Material Delivery Tickets
   1. At the time of delivery, a copy of the delivery ticket must be presented to the Director's Representative with the following minimum information:
      a. Ticket Number.
      b. Plant Identification.
      c. Project Name.
      d. Mix Type.
      e. Quantity of material in vehicle.
      f. Date and Time.

1.04 PROJECT CONDITIONS

A. Environmental Requirements:
   1. Discontinue paving when surface temperatures fall below requirements listed in DOT Table 402-1 unless otherwise specified in the General Conditions of this Contract or as directed by the Director's Representative.
   2. Do not place asphalt concrete on wet surfaces, or when weather conditions otherwise prevent the proper handling or finishing of bituminous mixtures as determined by the Director's Representative.
   3. Pavement is restricted by dates listed in the General Conditions or by temperatures.

1.04 ASPHALT PRICE ADJUSTMENT

A. The State can require, or the Contractor may request evaluation and possible adjustment of the price of asphalt providing the actual price differs by more than 20 percent from the contract baseline price of asphalt. For the purposes of determining if contract price adjustments are warranted the following baseline prices have been set for this contract:
   1. 12.5 Top Course: $150 per ton.
   2. 25.0 Binder Course: $100 per ton.
   3. 37.5 Base Course: $100 per ton.

B. If the actual price paid by the Contractor is more than 120% of the baseline price, the adjustment will be calculated as follows, with this adjusted value being credited to the contractor: Price adjustment = actual tonnage X {actual price paid - (1.2 X baseline price)}.

C. If the actual price paid by the Contractor is less than 80% of the baseline price, the adjustment will be calculated as follows, with this adjusted value being credited to the State: Price adjustment = actual tonnage X {(0.8 X baseline price) - actual price paid}.

PART 2 PRODUCTS

2.01 MATERIALS

A. All aggregate used in design mixes shall be as specified in DOT Specification Section 401-2.02 B.; Coarse Aggregate Type F2 Conditions.

B. Hot Mix Asphalt (HMA): Use aggregate and PG binder from suppliers listed in the NYS DOT's Approved List for Fine and Coarse Aggregates and Performance Graded (PG) Binders for Hot Mix Asphalt (HMA) Paving respectively. Use of mineral filler or any other materials for the production of HMA will be accepted in accordance with the State's written instructions.

C. Supply approved HMA mixtures that meet the requirements of NYS DOT MM 5.16 *Superpave Hot Mix Asphalt Mixture Design and Mixture Verification Procedures*. Each mixture must be obtained from a single plant for the duration of the project. The following NYS DOT items only shall be utilized for this project:
   1. 12.5 Top Course HMA
   2. 25.0 Binder Course HMA.
   3. 37.5 Base Course HMA.

D. Reclaimed Asphalt Pavement (RAP) shall meet the requirements of NYS DOT MM 5.16 *Superpave Hot Mix Asphalt Mixture Design and Mixture Verification Procedures*.

B. Asphalt Cement Tack Coat.

PART 3 EXECUTION

3.01 PRE-CONSTRUCTION MEETING

A. The Director's Representative will conduct a Pre-Paving meeting prior to any Hot Mix Asphalt (HMA) placement. The attendance at this meeting will include Contractor's Paving Superintendent, Chief Inspector or Paving Inspector(s), HMA plant representative, density gauge operator, depending on the compaction method used, and work zone traffic control (WZTC) competent person (if applicable). The contractor's Paving Superintendent must be prepared to discuss the operation necessary to complete the work successfully. Participants will review all aspects of the project requirements including, but not limited to, the following:

1. HMA delivery temperature.
2. Equipment and setup.
3. Mix codes to ensure the correct mix is delivered.
4. Frequency of testing.
5. Density Gauge operator certification.
6. Proper construction practice to provide quality product.
7. Work zone traffic control activities necessary.

3.03 ASPHALT PAVING PLACEMENT & COMPACTION

A. Prepare existing surfaces in accordance with DOT Section 402-3.05, *Conditioning of Existing Surface*.

B. Apply Tack Coat in accordance with DOT Section 407-3.02, *Application of Tack Coat*, specifically Table 407-1 – Tack Coat Application Rates. The rates listed are recommended application rates for tack coat on various surfaces and may be modified by the Director's Representative.

C. Spread and Finish HMA in accordance with DOT Section 402-3.05, *Spreading and Finishing*.

D. Provide compaction of HMA in accordance with DOT Section 402-3.07, *Compaction*.

1. Paragraph D. 80 Series Compaction Methods, specifically meeting the minimum requirements as shown in Table 402-6 Number of Passes. The Director's Representative may increase or decrease the number of passes to obtain adequate density of the compacted HMA.
2. The Director's Representative may also approve alternate compaction procedures where the specified procedures are not applicable.
3. Testing to be performed at the direction of and in locations chosen by the Director's Representative. Target compaction is 95% (92% - 97% range is acceptable).

E. HMA joints shall be in accordance with DOT Section 402-3.09, *Joints*.

F. Construct each pavement course to a ¼" surface tolerance. The Director's Representative may test the surface with a 16-foot straight edge or string line placed parallel to the centerline of the pavement and with a 10-foot straight edge or string line placed transversely to the centerline of the pavement on any portion of the pavement. Variations exceeding ¼ inch will be appropriately corrected or the pavement be removed and replaced at no additional cost to the State.

G. The allowable thickness tolerance of all HMA mixtures shall be:

1. 1/4 inch or less when the total nominal thickness indicated on the plans is 4 inches or less.
2. 1/2 inch or less when the total nominal thickness is over 4 inches but not more than 8 inches.
3. When the HMA mixture is placed on newly constructed subbase material, an additional tolerance of 1/4 inch will be allowed both in the nominal thickness of the course placed directly on the subbase and the total pavement thickness.

H. Remove and restore paved areas that are defective or contaminated as delineated by the Director's Representative at no additional cost to the State.

I. Do not clean tools and equipment used for HMA placement on the pavement surface, or near streams, ponds, drainage structures or other areas that are tributaries to waterways. Use an area approved by the Director's Representative for cleaning all paving equipment and tools.

J. Once pavement cures for a minimum of 24 hours, apply pavement markings with mechanical equipment to a minimum wet film thickness of 15 mils (0.4 mm), or as specified by the Manufacturer if greater.

END OF SECTION

SECTION 323113

CHAIN LINK FENCE

PART 1 GENERAL

1.01 REFERENCES

A. Comply with ASTM A 53 for requirements of Schedule 40 piping.

1.02 DEFINITIONS

A. Height of Fence: Distance measured from the top of concrete footing to the top of fabric.

1.03 SUBMITTALS

A. Shop Drawings: Complete detailed drawings for each height and style of fence and gate required. Include separate schedule for each listing all materials required and technical data such as size, weight, and finish, to ensure conformance to specifications.

B. Product Data: Manufacturer's catalog cuts, specifications, and installation instructions for each item specified.

C. Samples:
   1. Fence Fabric: Minimum one square foot.
   2. Fence and Gate Posts: Two each, one foot long, if requested.
   3. Miscellaneous Materials and Accessories: One each, if requested.

1.04 QUALITY ASSURANCE

A. Comply with standards of the Chain Link Fence Manufacturer's Institute.

B. Provide steel fence and related gates as a complete compatible system including necessary erection accessories, fittings, and fastenings.

C. Posts and rails shall be continuous without splices.

PART 2 PRODUCTS

2.01 MATERIALS

A. Class B Steel Tubing (Option):
   1. SS-40 Fence Pipe by Allied Tube & Conduit Corp., 16100 S. Lathrop Ave., Harvey, IL, 60426, (800) 882-5543.
   2. Tuf-40 Fence Framework by American Tube and Pipe Co., Inc., 2525 N. 27th Ave., Phoenix, AZ 85009, (800) 669-8823.

2.02 STEEL FRAMEWORK (FOR FENCES UP TO 6'-0" HIGH)

A. End Posts, Corner Posts and Pull Posts:
   1. Pipe: 2.375 inches OD, 3.65 pounds per linear foot (Schedule 40).
   2. Square Tubing: 2 inches OD, 3.60 pounds per linear foot.
   3. Class B Steel Tubing: 2.375 inches OD, 3.11 pounds per linear foot.
   4. Roll Formed C-Section: ASTM A 570 Grade 45, 3.5 inches by 3.5 inch by 0.128 inch thick, with minimum bending strength of 486 pounds under a 6 foot cantilever load.

B. Line Posts:
   1. Pipe: 1.90 inches OD, 2.72 pounds per linear foot (Schedule 40).
   2. Class B Steel Tubing: 1.90 inches OD, 2.28 pounds per linear foot.
   3. H-Section: 1.875 inches x 1.625 inches x 0.113 inch, 2.70 pounds per linear foot.
   4. Roll Formed C-Section: ASTM A 570 Grade 45, 1.875 inches by 1.625 inches by 0.121 inch thick with minimum bending strength of 247 pounds under a 6 foot cantilever load.

2.03 STEEL FABRIC

A. One-piece widths for fence heights up to 12'-0".

B. Chain link, 2 inch mesh, No. 9 gauge; 3/8 inch mesh, No. 11 gauge.

C. Selvages: Top edge and bottom edge twisted and barbed.

2.04 SWING GATE POSTS

A. Single width of gate up to 6'-0" wide and less than 10'-0" high:
   1. Pipe: 2.875 inches OD, 5.79 pounds per linear foot (Schedule 40).
   2. Square Tubing: 2.50 inches OD, 5.70 pounds per linear foot.
   3. Class B Steel Tubing: 2.875 inches OD, 4.64 pounds per linear foot.
   4. Roll Formed C-Section: ASTM A 570 Grade 45, 3.5 inches 3.5 inches by 0.128 inch thick, with minimum bending strength of 486 pounds under a 6 foot cantilever load.

B. Single width of gate 6'-0" to 12'-0" wide or over 10'-0" high:
   1. Pipe: 4 inches OD, 9.11 pounds per linear foot (Schedule 40).
   2. Class B Steel Tubing: 4 inches OD, 6.56 pounds per linear foot.
   3. Square Tubing: 3 inches OD, 9.10 pounds per linear foot.
   4. Roll Formed C-Section: ASTM A 570 Grade 45, 3.5 inches by 3.5 inches by 0.128 inch thick, with minimum bending strength of 486 pounds under a 6 foot cantilever load.

2.05 SWING GATE FRAMES

A. Up to 6'-0" high, and leaf width 8'-0" or less.
   1. Pipe: 1.660 inches OD, 2.27 pounds per linear foot (Schedule 40).
   2. Square Tubing: 1.50 inches OD, 1.90 pounds per linear foot.
   3. Class B Steel Tubing: 1.660 inches OD, 1.84 pounds per linear foot.

B. Height: 6’-0” - 12’-0”, or leaf width exceeding 8’-0”:
   1. Pipe: 1.90 inches OD, 2.72 pounds per linear foot (Schedule 40).
   2. Square Tubing: 2 inches OD, 2.60 pounds per linear foot.
   3. Class B Steel Tubing: 1.90 inches OD, 2.28 pounds per linear foot.

C. Assemble gate frames by welding or with special steel fittings and rivets for rigid connections. Install mid-height horizontal rails on gates over 10 feet high. When width of gate leaf exceeds 10 feet, install mid-distance vertical bracing of the same size and weight as frame members. When either horizontal or vertical bracing is not required, provide truss rods as cross bracing to prevent sag or twist.

2.06 SLIDING GATE FRAMEWORK

A. Posts
   1. Pipe: 4 inches OD, 9.11 pounds per linear foot (Schedule 40).
   2. Class B Steel Tubing: 4 inches OD, 6.56 pounds per linear foot.

B. Frames:
   1. Pipe 1.90 inches OD, 2.72 pounds per linear foot (Schedule 40).
   2. Class B Steel Tubing: 1.90 inches OD, 2.28 pounds per linear foot.

2.07 SWING GATE HARDWARE

A. Hinges: Non-lift-off type, offset to permit 180 degree swing, and of suitable size and weight to support gate. Provide 1-1/2 pair of hinges for each leaf over 6 feet high.

B. Latch: Forked type for single gates 10 feet wide or less. Drop bar type with keeper for double gates and single gates over 10 feet wide complete with flush plate set in concrete. Drop bar length shall be 2/3 the height of the gate. Padlock eye shall be an integral part of latch construction.

C. Holdbacks for Vehicle Gates: Type which automatically engages the gate leaf and holds it in open position until manually released.

2.08 SLIDING GATE HARDWARE

A. Cantilever type:
   1. Ty-Metal Corp., 1626 Route 9, Clifton Park, NY 12065, (800) 328-4283.
   2. Anchor Fence, 6500 Eastern Ave., Baltimore, MD, (410) 633-6500.
   3. Approved Equal.

2.09 MISCELLANEOUS MATERIALS AND ACCESSORIES

A. Rails and Post Braces:
   1. Pipe: 1.660 inches OD, 2.27 pounds per linear foot (Schedule 40).
   2. Class B Steel Tubing: 1.660 inches OD, 1.84 pounds per linear foot.
   3. Roll formed C-Section: 1.625 inches by 1.25 inches by 0.0747 inch thick with minimum bending strength of 192 pounds on a 10 foot span.

B. Fittings and Post Tops: Steel, wrought iron, or malleable iron.
   1. Fasteners: Tamper-resistant cadmium plated steel screws.

C. Stretcher Bars: One piece equal to full height of fabric, minimum cross-section 3/16 inch by 3/4 inch.

D. Metal Bands (for securing stretcher bars): Steel, wrought iron, or malleable iron.

E. Wire Ties: Conform to American Steel Wire gauges.
   1. For tying fabric to line posts, rails and braces: 9 gauge (.1483 inch) steel wire.
   2. For tying tension wire to fabric: 11 gauge (.1205 inch) steel hog rings.

F. Truss Rods: 3/8 inch diameter.

G. Concrete: Portland Cement concrete having a minimum compressive strength of 4000 psi at 28 days.

H. Spiral Paper Tubes:
   1. Sonotube by Sonoco Products Co., North Second St., Hartsville, SC 29550, (800) 377-2692.
   2. Sleek/tubes by Jefferson Smurfit Corp., P.O. Box 66820, St. Louis, Mo 63166, (314) 746-1100.

I. Cold Galvanizing Compound: Single component compound giving 93 percent pure zinc in the dried film, and meeting the requirements of DOD-P-21035A (NAVY).

J. Tension Wire: 7 gauge coiled spring steel wire.

K. Angle Beams, I Beams, and Steel Shapes: ASTM A 36.

L. Bolts and Nuts: ASTM A 307, Grade A.

M. Expansion Anchors: ¾ inch diameter with a minimum 4-3/4" embedment depth, Stainless Steel KWIK Bolt 3 (KB3) by Hilti, Inc. www.us.hilti.com ; 1-800-879-8000.

N. Shrink-Resistant Grout (Ferrous): Factory-packaged, non-catalyzed, ferrous aggregate mortar grouting compound selected from the following:
   1. Embeco 636 by Master Builders, 23700 Chagrin Blvd., Cleveland, OH 44122, (800) 227-3350.
   2. Ferrolith G-NC by Sonneborn, Chemrex, Inc., 57-46 Flushing Ave., Maspeth, NY 11378, (800) 433-9517.
   3. Ferro-Grout by L&M Construction Chemicals, 14851 Calhoun Rd., Omaha, NB 68152, (800) 362-3331.
   4. Vibra-Foil by A.C. Horn, Inc., Tamm Industries, 7405 Production Dr., Mentor, OH 44060, (800) 862-2667.

2.10 FINISHES

A. Steel Framework:
   1. Pipe: Galvanized in accordance with ASTM A 53, 1.8 ounces zinc per square foot.
   2. Square Tubing: Galvanized in accordance with ASTM A 123, 2.0 ounces zinc per square foot.
   3. Class B Steel Tubing: Exterior; 1.0 ounces zinc per square foot plus chromate conversion coating and clear polyurethane. Interior; zinc rich organic coating.
   4. H-Section: Galvanized in accordance with ASTM A 123, 2.0 ounces zinc per square foot.
   5. Roll Formed C-Section: Galvanized in accordance with ASTM A 123, 2.0 ounces zinc per square foot.

B. Fabric; one of the following:
   1. Galvanized Finish: ASTM A 392 class II zinc coated after weaving, with 2.0 ounces per square foot.
   2. Aluminized Finish: ASTM A 491 aluminum coated with 0.40 ounces per square foot.

C. Fence and Gate Hardware, Miscellaneous Materials, Accessories:
   1. Wire Ties: Galvanized Finish, ASTM A 90 1.6 ounces zinc per square foot, or aluminized finish, ASTM A 809 0.40 ounces per square foot.
   2. Hardware and Miscellaneous Items: Galvanized Finish, ASTM A 153 (Table 1).
   3. Extension Arms: Hot-dip galvanized after fabrication, ASTM 123, 2.0 ounces zinc per square foot.
   4. Angle Beams, I Beams, and Steel Shapes: Galvanized in accordance with ASTM A 123, 2.0 ounces zinc per square foot.

D. Barbed Wire and Tension Wire; one of the following:
   1. Galvanized Finish: ASTM A 121 class 3, 0.80 ounces per square foot.
   2. Aluminized Finish: ASTM A 585 class 2, 0.30 ounces per square foot.

PART 3 EXECUTION

3.01 PREPARATION

A. Clear and grub along fence line as required to eliminate growth interfering with alignment. Remove debris from State property.

B. Do not begin installation of fence in areas to be cut until finished grading has been completed.

3.02 INSTALLATION

A. Space posts equidistant in the fence line with a maximum of 10 feet on center. For fences 16 feet and higher space posts a maximum of 8 feet on center.

B. Setting Posts in Earth: Drill holes for post footings. If existing grade at the time of installation is below finished grade, provide spiral paper tubes to contain concrete to finish grade elevation. Set posts in center of hole and fill hole with concrete. Plumb and align posts. Vibrate or tamp concrete for consolidation. Finish concrete in a dome shape above finish grade elevation to shed water. Do not attach fabric to posts until concrete has cured a minimum of 7 days.

C. Locate corner posts at corners and at changes in direction. Use pull posts at all abrupt changes in grade and at intervals no greater than 500 feet. On runs over 500 feet, space pull posts evenly between corner or end posts. On long curves, space pull posts so that the strain of the fence will not bend the line posts.

D. Install top rail continuously through post tops or extension arms, bending to radius for curved runs. Install expansion couplings as recommended by fencing manufacturers.

E. Install bottom and intermediate rails in one piece between posts and flush with post on fabric side using special offset fittings where necessary.

G. Brace corner posts, pull posts, end posts, and gate posts to adjacent line posts with horizontal rails.

H. Diagonally brace corner posts, pull posts, end posts, and gate posts to adjacent line posts with truss rods and turnbuckles.

I. Attach fabric to security side of fence. Maintain a 2 inch clearance above finished grade except when indicated otherwise. Thread stretcher bars through fabric using one bar for each gate and end post and 2 for each corner and pull post. Pull fabric tight so that the maximum deflection of fabric is 2 inches when a 30 pound pull is exerted perpendicular to the center of a panel. Maintain tension by securing stretcher bars to posts with metal bands spaced 15 inches oc. Fasten fabric to steel framework with wire ties spaced 12 inches oc for line posts and 24 inches oc for rails and braces. Bend back wire ends to prevent injury. Tighten stretcher bar bands, wire ties, and other fasteners securely.

J. Position bolts for securing metal bands and hardware so nuts are located opposite the fabric side of fence. Tighten nuts and cut off excess threads so no more than 1/8 inch is exposed. Peen ends to prevent loosening or removal of nuts.
1. Secure post tops and extension arms with tamper-resistant screws.

K. Install gates plumb and level and adjust for full opening without interference. Install ground-set items in concrete for anchorage, as recommended by fence manufacturer. Adjust hardware for smooth operation and lubricate where necessary.

L. Tension Wire: Support bottom edge of fabric with tension wire. Weave tension wire through fabric or fasten with hog rings spaced 24 inches oc. Tie tension wire to posts with 9 gauge wire ties.

END OF SECTION

SECTION 274116

INTEGRATED AUDIO-VIDEO SYSTEMS AND EQUIPMENT

PART 1 - GENERAL

1.01 SYSTEM DESCRIPTION

A. It is the intent of these specifications to provide a complete working audio visual system ready for use. System acceptance shall be judged on the successful adherence to the installation instructions of this Specification.

B. Any item not specifically shown on the drawings or called for in the specifications, but normally required to conform to the intent, are to be considered as part of the Work.

C. Any given item type of equipment or material shall be the product of one manufacturer throughout the facility. Multiple manufacturers of any one item will not be permitted, unless specifically noted otherwise.

D. Provide audio visual devices and equipment with performance levels and capacities as noted herein.

1.02 SCOPE OF WORK

A. General: Provide audio visual systems design, engineering, and installation within all spaces of the Project. Systems are to include all devices, equipment, installation, programming and commissioning in accordance with requirements of the documents.

1. The Work detailed within the documents has been specified to meet certain requirements for performance and appearance. It shall be the responsibility of the contractor to implement the guidelines and requirements contained in the documents and translate them into a complete package containing all elements necessary for a complete, operational, and functionally integrated Audio Visual Systems.

2. Provide all work as detailed in the documents as a turnkey installation including all material, labor, engineering, warranties, taxes, freight, and permits. Only items and requirements specifically stated to be provided by others shall not be a requirement for this Section of the Work.

B. Work Included:

1. Base AV Work

a. Refer to Sections listed in 1.3.C for scope requirement and system descriptions for each System Type.

C. Coordinated Work

1. Coordinate with related trades to schedule the Work and ensure a complete.

2. Installation of support structure.

D. Design Intent

1. The design intent of the system may require equipment not listed , but are indicated elsewhere in the contract documents, in either the drawings or the written specification or is required for intended operation of the system. It is the sole responsibility of the E Contractor to reconcile the contract documents with the equipment and labor required for this project.

2. The E Contractor is to provide a complete working and turnkey solution. That solution is to be provided associated cut sheets as well as a systems diagram.

a. In this situation, the E Contractor is required to submit 3 references of similar size and complexity within the last 3 years in support of the components identified to include Contact Name, Address, Phone Number and detailed description of the system and application.

1.03 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

B. Refer to the following Sections for specifications related to the Work:

1. Section 27 05 26 – Grounding and Bonding for Communications Systems

C. Refer to the following standards for performance verification related to the Work:

1. INFOCOMM 10-201X, AV Systems Performance Verification

1.04 RELATED WORK

D. E Contractor shall provide raceway/junction box locations for audio visual equipment and routing of audio, video, control, and power cables/raceway from equipment, terminal and pull boxes to system equipment racks

E. Related Work:

1. Section 26 05 26 – Grounding and Bonding for Electrical Systems

2. Section 26 05 29 – Hangers and Supports for Electrical Systems

3. Section 26 09 23 – Lighting Control Devices

1.05 DEFINITIONS

4.

F. Regardless of their usage in codes or other industry standards, certain words or phrases as used in the Drawings or Specifications for the Work, shall be understood to have the specific meanings as ascribed to them in the following list:

1. "Circuit" – Any specific run of circuitry

2. "Circuitry" – Any Work which consists of wires, cables, raceways, and/or specialty wiring method assemblies complete with associated junction boxes, pull boxes, outlet boxes, joints, couplings, splices, and connections except where limited to a lesser meaning by specific description.

3. "Concealed" (as applied to circuitry) – Covered completely by building materials, except for penetrations (by boxes and fittings) to a level flush with the surface as necessitated by functional or specified accessibility requirements.

4. "Exposed" (as applied to circuitry) – Not covered in any way by building materials.

5. "Normal Work Conditions" – Locations within building confines that are not damp, wet, or hazardous and that are not used for air handling.

6. "Patch Panel" – A System of terminal blocks, patch cords, and backboards that facilitate administration of cross-connecting cables.

7. "Raceway" – Any pipe, duct, extended enclosure, or conduit (as specified for a particular System) which is used to contain wires and which is of such nature as to require that the wires be installed by a "pulling in" procedure.

8. "Riser" – Shall refer to the portion of the installation that transmits between building floors (or between Audio Visual Systems rooms), also referred to as "Backbone Cabling".

9. "Audio Visual Closet" – The enclosed area or room specifically designated for the routing, termination, and/or cross connecting of Audio Visual Systems cable (i.e. riser cable) to other Audio Visual Systems cable and/or equipment.

10. "AV Systems Control Room" and/or "AV Systems Headend" – The enclosed area or room specifically designated for the routing, termination, and/or cross connecting of Audio Visual System cable (i.e. riser cable) to other Audio Visual System cable, and/or equipment and racks.

11. "AV System(s)" – Audio Visual System(s), includes all components contained herein that work in conjunction to create and completely integrated and fully functioning system as described within the Drawings and Specifications

12. "Audio Visual Systems Wiring" – see "Circuitry"

13. "Audio Visual Systems Work" – See "Scope of Work"

14. "Standard" (as applied to wiring devices) – Not of a separately designated individual type.

15. "Subject to Mechanical Damage" – Exposed within 2,200 mm of the floor in mechanical rooms, manufacturing spaces, vehicular spaces, or other spaces where heavy items are moved around or rigged as a common practice or as required for replacement purposes.

16. "System" – See "AV Systems"

17. "Wiring" – see "Circuitry"

G. Where the word "conduit" is used without specific reference to type, it shall be understood to mean "raceway".

H. Reference to "U.L. (Materials Construction) Standards" shall mean the "Standards for Safety" published by Underwriters Laboratories, Inc.

1.06 REFERENCES

A. The Audio Visual Systems shall be installed in accordance with the latest applicable revisions pertaining to all applicable national, state, and local codes and standards including, but not limited to the following:

1. Any portion of the audiovisual work not subject to the requirements of an electrical code published by a specific authority having jurisdiction over such work shall be governed by the National Electrical Code and any and all applicable sections of the National Fire code, as published by the National Fire Protection Association.

2. Installation procedures, methods and conditions shall be in compliance with the latest requirements of the Federal Occupational Safety and Health Administration (OSHA), the Americans with Disabilities Act (ADA) and the Architectural Barriers Act (ABA).

3. The E Contractor is responsible for all costs incurred to meet these codes and conditions.

4. Additional codes and requirements pertaining to the work:

   a. NFPA-72 National Fire Alarm and Signaling Code

   b. International and National Electric Codes (IEC/ NEC)

   c. IEC 60268-16 Third Edition 2003-05 Objective rating of speech intelligibility

   d. ANSI/Infocomm

      1) 10:2013 Audiovisual Systems Performance Verification

      2) 1M:2009 Audio Coverage Uniformity Standard in Enclosed Listener Areas

      3) 2M:2010 Standard Guide for Audiovisual Systems Design and Coordination

      4) 3M:2011 Projected Image System Contrast Ratio

      5) X3T9.5 FDDI

      6) X3T9.5 CDDI

   e. Sustainable Technology Environments Program

   f. Underwriters Laboratories, Inc. (UL)

   g. Society of Motion Picture and Television Engineers (SMPTE)

h. Building Industry Consulting Service International (BICSI) Telecommunications Distribution Methods Manual - latest edition.

i. ANSI/TIA/EIA-568-B - Commercial Building Telecommunications Cabling Standard

j. ANSI/TIA/EIA-569 - Commercial Building Standards for Telecommunications Pathways and Spaces

k. ANSI/TIA/EIA-606-A. Administration Standard for Commercial Telecommunications Infrastructure

l. TIA-607-A, Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications

m. EIA RS-232 Serial Communications Electrical Interface

n. EIA RS-310-C Racks, Panels and Associated Equipment

o. FCC Part 15

p. FCC Part 68

q. IEEE 802.3

r. IEEE 802.5

s. Article 770 Optical Fiber Cables

t. Article 800 Communications Circuits

u. NFPA 70 National Electrical Code

v. NFPA 75 Protection of Electronic Computer / Data Processing Equipment

w. United States Green Building Council (USGBC): Leadership in Energy & Environmental Design (LEED®): Green Building Rating System for New Construction & Major Renovations (NC) Version 3.0 (2009) www.usgbc.org.

1.07 GENERAL CONDITIONS

A. The E Contractor represents that they are familiar with and have expertise in the Work of this nature and scope. The E Contractor further agrees that they shall provide all Work as may be required to make a complete job of that which may not be fully defined in the Contract Documents.

B. Comply with all of the regulations, including safety regulations of national, city, local and other government agencies having jurisdiction concerning the work of the E Contractor. The E Contractor shall give all notices and comply with all laws, ordinances, codes, rules, and regulations bearing on the conduct of the Work. If the E Contractor performs any work, which is contrary to such laws, ordinances, codes, rules and regulations, they shall make all changes for compliance and bear all associated costs.

C. Provide all protection necessary to safeguard their work from damage by their operations and the operations of others. Promptly repair, adjust, and clean all defective installations and bear all associated costs.

D. All work shall be tested and inspected in accordance with all Specifications. .

E. The project documentation is, in general, diagrammatic and/or developed to communicate design intent. Coordinate the installation of all devices and/or equipment with the Director's Representative prior to installation based on the existing field conditions.

F. Examine the site and the Contract Documents and review with the Director's Representative the designated areas of access, delivery, and storage.

G. Upon receiving notice from the Director's Representative that the furnished inferior, improper or unsound work or materials (including equipment), or work or materials at variance with that which is specified, will proceed to remove such work or materials and make good on all work. .

H. The Drawings for the Work utilize symbols and schematic diagrams that have no dimensional significance. The Work shall be installed to fulfill the diagrammatic intent expressed on the Drawings, field layouts, and shop drawings of all trades.

I. Certain details appear on the Drawings for the Work that are specified with regard to the dimensioning and positioning of the Work. These are intended only for general information purposes. They do not obviate field coordination for individual items of the indicated Work.

J. Ratings of devices, materials, and equipment specified without reference to specific performance criteria shall be understood to be nominal or nameplate ratings established by means of industry standard procedures.

K. Include in the Work all necessary supervision and issuing of all coordination information to any other trades who are supplying work to accommodate the Audio Visual Systems installation.

1.08 WARRANTY AND MAINTENANCE

A. Provide a one (1) year warranty for the Work. The warranty shall cover all Work, Systems, and subsystems against defects in materials and workmanship. The Work as specified herein, including all materials and labor, but excepting any existing devices and equipment which are incorporated in the completed Work, shall be warranted to be free from defects in design, workmanship, and materials. Warrant that the completed Systems, including all components (except those, which are existing or provided by others), are of sufficient size and capacity to fulfill the requirements of the Specifications.

B. In order to maintain certain manufacturer's warranties, system equipment must be installed, aligned and serviced by those installers recognized and authorized by said manufacturers to be capable of performing such duties. If a certain installer is not so authorized by a particular manufacturer, it is solely their responsibility to make such arrangements to come into such compliance and they shall bear all costs and consequences thereof.

C. The warranty shall be valid and initiated following the date of System acceptance by the Director's Representative. System acceptance shall commence when all parts, components, sub-Systems, and Systems have been tested, shown to be working in accordance with the Specification, and approved by the Director's Representative

D. Warranty Service:

1. In the event that defects in the materials and/or workmanship are identified during the warranty period, provide all labor and materials as may be required for prompt correction of the defect.

2. All manufacturers' equipment warranties shall be activated in the owner's name and shall commence on the date of system acceptance. In the case of contractor modified equipment, the manufacturer's warranty is normally voided. In such cases, the contractor shall provide the User with a warranty equivalent to that of the original manufacturer.

3. All repairs required following Substantial Completion of the rooms shall be scheduled at the User's convenience. In no case will the User allow such repairs to interrupt or delay a regularly scheduled event. Notwithstanding the above, all repairs within the regular period of usage must be completed within 24 hours of notification of a failure; 2nd and /or 3rd shift warranty repair activity should be anticipated.

4. Provide written notice to the Director's Representative documenting any Work performed during the warranty period, including any preventative maintenance Work performed.

5. Provide loaner equipment that is fully compatible with the Audio Visual Systems for any equipment not field repairable.

6. Loaner equipment for components that must be shipped to/from the manufacturer or distributor shall be on site and operational within 48 hours of the component failure. Furnish lists of equipment that will require shipment from the manufacturer or distributor and lead times associated with that equipment.

1.09 SUBMITTALS

A. Furnish submittals in accordance with general requirements specified in Division 1, and Construction Managers submittal procedures

1. All submissions are to be processed and then forwarded to the A/E team for tracking and response purposes

B. Prefabrication Submittals

1. Submit pre-fabrication submittals in accordance with the Director's Representative's construction schedule.

2. Pre-fabrication submittals shall consist of product data, shop drawings, samples, and a detailed completion schedule. Partial submittals will not be accepted without prior written approval.

3. Pre-fabrication submittals shall be furnished in electronic formats.

4. No portion of the Work shall commence nor shall any equipment be procured until the Work and equipment has approved pre-fabrication submittals in writing.

5. A letter of transmittal identifying all details, shall accompany pre-fabrication submittals and a list of items transmitted.

C. Product data required as part of the pre-fabrication submittal shall include the following:

1. Submit manufacturer's product data sheets for all materials and equipment proposed for use on the project sorted by room and indexed.

2. Submit manufacturer's product data sheets for all fire stopping materials proposed for use on the project.

3. Equipment schedules listing all System components, manufacturer, model number and the quantity of each

4. General functional descriptions for each System

5. Manufacturer's data specification sheets for all System components, including any warranty information.

a. Mark each product data sheet to show applicable choices and options (sheets containing more than one device or component model number shall be clearly marked to delineate items included in the Work)

b. Manufacturer's Data: For each manufactured device submit manufacturers' specifications and print photograph of the proposed device. Include engineering descriptions, principle of operation, application, and proposed model, style or size clearly indicated.

6. A complete list of cable and wiring types, sizes, manufacturer, and model number

7. A complete list of finishes and sample graphics, including custom art work and custom graphics (if applicable)

8. List of parts inventory to provide manufacturer recommended service and maintenance of the Work

D. Shop Drawings shall include the following:

1. Detailed plan views and elevations of AV Control and/or Head-end rooms (in addition to relevant telecommunications rooms) showing raceway, sleeves, cable tray, cable paths, equipment racks, equipment cabinets, termination blocks, power receptacles and grounding bus bars.

2. Drawings to show evidence of coordination with other trades.

3. Cable run sheets denoting cable type, signal type, termination type, cable number designation, start point and end point.

4. Cable termination schedules showing cable transmission and device location. Provide schedules in printed and electronic format.

5. Floor plan drawings indicating device locations with device legends

6. System riser diagram with all devices, wire runs, and wire designations

7. Schematic block diagrams for each System showing all equipment, interconnects, data flow, etc.

8. Wiring diagrams for each subsystem defining the interconnection of all inputs and outputs for all equipment.

9. Fabrication shop drawings for all custom equipment (if applicable)

10. Plans and elevations of the Audiovisual equipment racks and/or custom furniture (including consoles, desks, and lecterns) quantifying all equipment to be mounted therein for review and approval by Director's Representative.

11. Submit samples of any equipment components upon request of the Director's Representative.

12. Samples submitted shall be the latest version of equipment.

13. Confirm all dimensions, quantities, and the coordination of materials and products supplied. Approval of shop drawings containing errors does not relieve the contractor from making corrections at their expense.

E. Record Documentation shall include all information required in the Pre-fabrication Submittals but revised to reflect "as installed" conditions.

1. General Description and Requirements

a. Submit Record Documentation in accordance with the construction schedule.

b. Record Documentation shall consist of Record Drawings and Operation and Maintenance Manuals.

c. Provide a letter of transmittal with Record Documentation identifying the name of the Project, contractor's name, date submitted for review, and a list of items transmitted.

d. Prior to the final acceptance of the Work, submit two draft sets of the Record Drawings portion of Record Documentation. The draft copy shall be used during the final acceptance testing.

e. Update all record documentation to reflect changes or modifications made during final acceptance testing as required and submit three blue/black lines and one reproducible set.

f. Provide cable test results for all cables installed under this Work, tested and documented as described herein.

g. Provide Director's Representative with Operation and Maintenance Manuals including wiring diagrams, parts lists, shop drawings and manufacturers' information on all equipment and cables. Manuals shall be provided in a high quality, 3-ring binder and completely indexed.

h. Provide Director's Representative with all systems programming on electronic media. All programming and source code is to be considered as a work for hire and will be the property of the Director's Representative upon completion of the project.

2. Record Drawings

a. Produce all Record "as-built" Drawings using the latest version of AutoCAD. Record drawings shall, at a minimum, include the following:

1) Floor plan drawings indicating device locations, with device legends indicating manufacturers and model numbers for each device

2) Floor plan drawings indicating wire routing, wire routing shall be delineated in straight line runs and be tagged with cable identification and terminal strip numbers to coincide with the installation

3) Mounting details for all equipment and hardware

4) Functional block diagrams for each subsystem

5) Wiring details showing rack elevations, equipment wiring and terminations, and inter-rack wiring

6) Wiring diagrams for all custom circuitry including interfaces to various control output controlled devices, lighting control interfaces, projection screens, operable window treatments, motorized doors/partitions, etc.

7) Wiring diagrams for each System, wiring diagrams shall be identical to those laminated and located within the door of the equipment room where the subject equipment racks are located.

8) Typical point-to-point wiring diagrams for each piece of equipment and groups of equipment within the System

9) Layout details for each riser location, including Audiovisual panels, power supplies, junction boxes, conduit, and any other Audiovisual related equipment

3. Operation and Maintenance Manuals

a. Operation and Maintenance Manuals shall apply to all Audio Visual related devices, equipment and software modules.

b. Operation and Maintenance Manuals shall be formatted as follows:

1) Bind each manual in a hard-back loose-leaf binder.

2) Identify each manual's contents on the cover.

3) Provide a table of contents and tabulated sheets for each manual. Place tab sheets at the beginning of each chapter or section and at the beginning of each appendix if applicable.

4) Any hardware manual demonstrating more than one model number of device on any one page shall be clearly marked as to delineate which model has been implemented in the Work.

c. Operation and Maintenance Manuals shall include, at a minimum, the following:

1) Operational description of each subsystem

2) Detailed programming descriptions for each subsystem

3) Explanations of subsystem interrelationships

4) Electrical schematics for each piece of equipment specified

5) Power-up and power-down procedures for each subsystem

6) Description of all diagnostic procedures

7) A menu tree for each subsystem

8) Setup procedures for each component of the subsystems

9) A list of manufacturers, their local representatives, and subcontractors that have performed Work on the Project

10) Installation and service manuals for each piece of equipment

11) Maintenance schedules for all installed components

d. Operation and Maintenance Manuals shall include a separate section for each software program incorporated into the Project. The software section shall include, at a minimum, the following information:

1) Definitions of all software related terms and functions

2) Description of required sequences

3) Directory of all disk files

4) Description of all communications protocols, including data formats, command characters, and a sample of each type of data transfer

5) Instructions for manufacturer supplied report generation

6) Instructions for custom report generation

7) Database format and data entry requirements

F. Procedure for Resubmitting

1. Make corrections or changes in O & M and/or Record Drawings as required and resubmit when the stamp requires re-submittal.

2. Clearly identify changes made other than those specifically requested when resubmitting Record Drawings. Changes shall be clouded or similarly highlighted as coordinated. Only changes that have been specifically requested or have been clouded will be reviewed on resubmittals.

3. Any drawing sheets added to the resubmittal shall be clearly identified and clouded, and shall not change the sheet numbering scheme for previously issued Record Drawings.

4. Contractor is responsible for any delays caused by the re-submittal process.

1.10 QUALITY ASSURANCE

A. Installer Training Process: – All labor force shall have certified installers who attended training programs of the proposed system preparing them to perform the work.

B. The Installer for this Project is to be certified by all manufacturers of the installed equipment.

C. Registered and Certified supervisors- All supervisory personnel certified for the type of work they are overseeing (installation and design) from Infocomm International (CTS-I/D)

D. All personnel on staff and available to work on this project with the following Certifications:

1. Cisco CCNA – Routing & Switching

2. Microsoft MCSE - Productivity

E. In addition, for any projects employing wireless data, the contractor shall also have personnel with the following certifications:

1. Cisco CCNA – Wireless

2. Microsoft MCSE - Mobility

F. Quality assurances for audio visual systems includes a multi-step program consisting of pre-qualification procedure for manufacturers and installation specialists; products phase; installation; operating instruction and training; and the submission of maintenance and operating manuals.

G. The contractor shall have local in-house engineering and project management capabilities consistent with the requirements of the Work.

H. Certify that it is qualified in all areas pertaining to, directly or indirectly, the Work.

I. Provide factory-certified technicians to install, commission, and maintain the Work. All installing personnel shall be licensed as required by local and/or state jurisdictions.

J. Ensure compliance with, and have a thorough understanding of, all local codes and contract conditions pertaining to this Project.

K. Maintain an inventory of spare parts and other items critical to System operation and as necessary to meet the emergency service requirements of this Project.

L. Product Standards

1. All equipment and materials for contained herein shall be the products of recognized manufacturers and shall be new.

2. New equipment and materials shall:

a. Be Underwriters Laboratories, Inc. (U.L.) listed and approved where specifically called for; or where normally subject to such U.L. labeling and/or listing services.

b. Be without blemish or defect.

c. Be products that meet with the acceptance of the agency inspecting the Audio Visual Systems work.

3. It is the intent of these specifications that wherever a manufacturer of a product is specified, and the terms "other approved" or "approved equal" are used, the substituted item must conform in all respects to the specified item. Consideration will not be given to claims that the substituted item meets the performance requirements with lesser construction. Performance as delineated in schedules and in the specifications shall be interpreted as minimum performance.

1.11 USER TRAINING

A. The Contractor shall provide on-the-job training by a suitably qualified instructor, to personnel designated by the Director's Representative, to instruct them in the operation and maintenance of the systems. In the event the Contractor does not have qualified instructors on staff for certain sophisticated equipment, the contractor will provide a manufacturer's representative for such instruction to the Director's Representative at no additional cost. All training shall take place after the systems are operational and accepted. There shall be a minimum of 40 hours, of end-user training included in these specification durations to be specified by Director's Representative. Director's Representative is to retain 10% of contract fee until completion of acceptance.

1.12 PUBLICATION

A. No information relative to the project or work, whether covered in this specification or otherwise may be released for publication without prior written consent and approval from the Director's Representative.

PART 2 - PRODUCTS

2.01 DETAILED SPECIFICATIONS – COMPUTER CRIMES LAB (FIU)

A. This section of the specification describes the functional details of the audiovisual systems to be furnished and installed in the Computer Crimes Lab (107) within the FIU building.

1. A wall mounted flat panel display will be used to view content from gaming, PC, or laptop OFE devices.

2. An active HDMI wall plate input will provide connection to the flat panel display.

3. Speakers built into the flat panel display will support all playback of audio.

4. Equipment will be located behind the flat panel display within a structured cabling enclosure.

B. System Interconnection & Functional Description

1. The functional interconnections of the audio, video and control systems shall be as detailed on drawings #TA- 501-F

2. The Contractor shall provide all interconnection cable, connectors, terminal strips, wireways, flexible conduit, etc., to facilitate the audiovisual systems as detailed within these specifications and drawings.

3. The conduit and power systems are detailed in the Electrical Engineer's drawings.

C. Display and Video

1. Provide and integrate displays, switching, video distribution equipment, interfaces and cabling as detailed on the drawings and as described in this specification.

a. Provide one wall mounted 55" flat panel display for viewing of HD up to UHD content.

b. Provide AV transmitter wall plate to accept HDMI and VGA connections. AV Transmitter wall plate shall use HDBaseT protocol for audio/video signal transport over CAT type twisted pair cable.

c. Provide AV receiver with scaling to scale images to be viewed properly on the display. AV Receiver must be compatible with HDBaseT AV Transmitter wall plate.

2. Video source devices

a. Images/Video from an OFE PC, laptop, gaming, or other video source with an HDMI or VGA output.

D. Audio

1. Provide playback of all audio via the speakers built into the flat panel display.

2. Provide playback of program audio from the video source devices.

3. Provide playback of program audio content.

E. Control

1. Establish control system functionality for the following devices:

   a. Flat Panel Display (using manufacturer provided remote)

   b. Program Volume Control (using manufacturer provided remote)

2. Provide, and configure as necessary the manufacturer remote. This will be the primary means of user control for the audiovisual systems within the Computer Crimes Lab.

3. Provide control of all equipment as indicated within this specification and as indicated on drawings.

4. Provide all loose cables, connectors, etc. required to complete a full working system.

5. Coordinate with the Director's Representative and provide system interface to the local IP network (LAN). Provide interfacing of multiple control systems components over IP, for the application of future interface to any Director's Representative-furnished AV-system monitoring systems.

6. When a choice of control protocols is available for a piece of equipment, the most secure and flexible one shall be used; i.e. RS-232 control, where available, shall be used in place of either infrared or relay control.

F. Miscellaneous

1. Provide and install all hardware, cabling, connectors, faceplates, terminators, adapters, audio combiners, balanced-unbalanced audio converters, wall boxes, etc. required to ensure installation of a fully functional audiovisual system as depicted in the attached AV Systems drawings.

G. Equipment Layout

1. The equipment in this area shall be as detailed on drawings.

2. Provide audiovisual equipment racks with blank and vent panels as indicated on the drawings. There are not to be any open areas on the front of the racks.

3. All equipment shall be installed with rack ears/mounts or custom rack-mounts/face-plates, using security screws. There shall not be any shelf-mounted components in the audiovisual racks.

H. Furnished Equipment

1. All room furniture will be furnished by others (Unless otherwise noted in this specification).

2. All video source devices will be furnished by others (Unless otherwise noted in this specification).

I. Related Work Specified Elsewhere

J. The following systems and equipment are not provided under this contract. The Contractor is to coordinate with the base bid contractors as necessary to insure compatibility.

1. Installation of all furniture stub-ups, floor boxes and/or poke thru devices (excluding any plates and connectors to be provided by the contractor.

2. Telephone and telecommunications jacks and special telecom outlets not related directly to AV, (LAN/WAN, ISDN, POTS, etc.).

2.02 DETAILED SPECIFICATIONS – CONFERENCE ROOM (FIU)

A. This section of the specification describes the functional details of the audiovisual systems to be furnished and installed in the Conference Room (104) within the FIU building.

1. A wall mounted flat panel display will be used to present content (wired & wireless) and support video & audio conference calls.

2. A tabletop conferencing unit will support video & audio conferencing, Bluetooth audio, and, wireless & wired content sharing.

3. The tabletop conferencing unit will support BYOD meetings where a user uses their device to run a meeting using any platform they choose.

4. An active HDMI tabletop input will provide a wired connection to the flat panel display.

5. Speakers and microphones integrated into the tabletop conferencing unit will support audio playback and capture for all video & audio conference calls.

6. A USB conferencing camera located below the flat panel display will support video capture for video conferencing calls.

7. Speakers built into the flat panel display will support all playback of program audio.

8. Equipment will be located at the table and behind the flat panel display within a structured cabling enclosure.

B. System Interconnection & Functional Description

1. The functional interconnections of the audio, video and control systems shall be as detailed on drawings #TA- 501-F

2. The Contractor shall provide all interconnection cable, connectors, terminal strips, wireways, flexible conduit, etc., to facilitate the audiovisual systems as detailed within these specifications and drawings.

3. The conduit and power systems are detailed in the Electrical Engineer’s drawings.

C. Display and Video

1. Provide and integrate displays, switching, video distribution equipment, interfaces and cabling as detailed on the drawings and as described in this specification.

    a. Provide one wall mounted 75” flat panel display for viewing of HD up to UHD content.

    b. Provide tabletop conferencing unit to support video/audio conferencing, wired/wireless sharing, and Bluetooth audio.

    c. Provide AV transmit/receive pair to support extension of HDMI and USB from the table to the flat panel location.

2. Video source devices

    a. Images/Video from an OFE PC, laptop, gaming, or other video source with an HDMI or VGA output.

D. Audio

1. Provide playback of program audio via the speakers built into the flat panel display.

2. Provide playback of program audio from the video source devices.

3. Provide playback of program audio content.

4. Provide playback of audio/video conferencing audio via the speakers integrated in the tabletop conferencing unit.

5. Provide coverage of the entire seating area via the microphones integrated in the tabletop conferencing unit.

E. Control

1. Establish control system functionality for the following devices:

    a. Flat Panel Display (using CEC via tabletop conferencing unit)

    b. Program Volume Control (using manufacturer provided remote)

    c. Tabletop Conferencing Unit (all functions included on device)

2. Provide, and configure as necessary the tabletop conference unit. This will be the primary means of user control for the audiovisual systems within the Conference Room.

3. Provide control of all equipment as indicated within this specification and as indicated on drawings.

4. Provide all loose cables, connectors, etc. required to complete a full working system.

5. Coordinate with the Director’s Representative and provide system interface to the local IP network (LAN). Provide interfacing of multiple control systems components over IP, for

the application of future interface to any Director's Representative-furnished AV-system monitoring systems.

6. When a choice of control protocols is available for a piece of equipment, the most secure and flexible one shall be used; i.e. RS-232 control, where available, shall be used in place of either infrared or relay control.

F. Miscellaneous

1. Provide and install all hardware, cabling, connectors, faceplates, terminators, adapters, audio combiners, balanced-unbalanced audio converters, wall boxes, etc. required to ensure installation of a fully functional audiovisual system as depicted in the attached AV Systems drawings.

G. Equipment Layout

1. The equipment in this area shall be as detailed on drawings.

2. Provide audiovisual equipment racks with blank and vent panels as indicated on the drawings. There are not to be any open areas on the front of the racks.

3. All equipment shall be installed with rack ears/mounts or custom rack-mounts/face-plates, using security screws. There shall not be any shelf-mounted components in the audiovisual racks.

H. Director's Representative Furnished Equipment

1. All room furniture will be furnished by others (Unless otherwise noted in this specification).

2. All video source devices will be furnished by others (Unless otherwise noted in this specification).

3. Coordinate Conference Room Table Box AV connections with furniture systems.

I. Related Work Specified Elsewhere

J. The following systems and equipment are not provided under this contract. The Contractor is to coordinate with the base bid contractors as necessary to insure compatibility.

1. Installation of all furniture stub-ups, floor boxes and/or poke thru devices (excluding any plates and connectors to be provided by the contractor.

2. Telephone and telecommunications jacks and special telecom outlets not related directly to AV, (LAN/WAN, ISDN, POTS, etc.).

2.03 DETAILED SPECIFICATIONS – TRAINING ROOM (HQ)

A. This section of the specification describes the functional details of the audiovisual systems to be furnished and installed in the Training Room (HA101) within the HQ building.

1. A ceiling mounted projector and motorized screen will be used to present content (wired & wireless) and support video & audio conference calls.

2. In-Ceiling microphones support audio capture during audio and video conference calls.

3. Wireless microphones will support audio capture for local speech reinforcement and conferencing.

4. In-Ceiling cameras will support video conferencing, recording, and other TBD use cases.

5. In-Ceiling speakers will support local speech reinforcement playback

6. Wall mounted speakers will support program audio playback.

7. An active HDMI floor plate input at the podium location will provide a secondary wired connection to the flat panel display.

8. A media presentation switcher will support video switching, control, and wireless sharing.

9. A wireless touch control panel will support control of all AV systems and any lighting or shading systems in the space.

    a. Wireless 8.7" Touch Panel: Crestron TST-902 or equivalent

10. Equipment will be located in closet location HA101-1 within a dedicated AV equipment rack.

B. System Interconnection & Functional Description

1. The functional interconnections of the audio, video and control systems shall be as detailed on drawings #TA-501-H

2. The Contractor shall provide all interconnection cable, connectors, terminal strips, wireways, flexible conduit, etc., to facilitate the audiovisual systems as detailed within these specifications and drawings.

3. The conduit and power systems are detailed in the Electrical Engineer’s drawings.

C. Display and Video

1. Provide and integrate displays, switching, video distribution equipment, interfaces and cabling as detailed on the drawings and as described in this specification

2. Provide one ceiling mounted projector for viewing of HD up to UHD content. Projector shall be laser light source, 3840x2160 resolution, minimum 2000 lumens.

    a. Ceiling Mounted Projector – UHD: Sony VPL-GTZ240 or equivalent
    b. Ceiling Projector Mount: Chief RPAU or equivalent.

3. Provide one 137” diagonal ceiling mounted motorized projection screen. See Section 115213 for projection screen specification.

4. Provide an Audiovisual Bridge device to integrate software CODECs (Skype, Jabber, Microsoft Teams, Zoom, etc.) to the Training Room audiovisual system

    a. Audiovisual soft CODEC Bridge: Vaddio AV Bridge or equivalent

5. Provide one all in one 4K media presentation switcher with integrated wireless sharing gateway, control system, 8x4 matrix switcher, video scaler, HDMI input/output, HDBaseT input/output for video switching and control of the AV systems.

    a. Multimedia Presentation Switcher & Control Processor with wireless presentation: Crestron DMPS3-4K-350-C-AIRMEDIA or equivalent

D. Video source devices

1. Images/Video from wall mounted cameras.

    a. HDBaseT PTZ Camera: Vaddio RoboSHOT 12E HDBT OneLINK Bridge System or equivalent

2. Images/Video from document camera.

    a. Document Camera: Elmo PX-30E or equivalent

3. Images/Video from an OFE PC or laptop via wall or floor input plate (HDMI/VGA)

4. Images/Video from OFE conferencing PC

5. Images/Video from wireless sharing device

E. Audio

1. Provide playback of program audio via the wall mounted speakers. Speakers shall be surface mount, 2-way with 8” woofer and 1” tweeter, 200W power handling at 8 Ohms.

    a. Wall Mount Speakers, 8" two way, pair: Crestron SAROS SR8T-W-T-EACH or equivalent

2. Provide playback of program audio from the video source devices.

3. Provide playback of dedicated program audio content.

    a. Audio Amplifier: Crestron AMP-3210-T or equivalent

4. Provide an Audio DSP for audio matrix routing and signal processing. Audio DSP shall have 12 mic/line level inputs with AEC, 8 mic/line level outputs, SIP VoIP interface, Dante audio over Ethernet.

    a. Audio DSP: Biamp Tesira Forte DAN VT or equivalent

5. Provide playback of audio/video conferencing audio via the in-ceiling speakers. Ceiling Speakers shall be a low-profile enclosure, 2-way with 6.5” woofer and 1” tweeter, 70V multi-tap transformer, 90 degree nominal coverage pattern.

    a. In-Ceiling Speakers: Crestron SAROS IC6LPT-W-T-EACH or equivalent

6. Provide coverage of the entire seating area via the in-ceiling microphones. Microphone shall be an PoE array type microphone with digitally steerable lobes, designed to fit within a 24" ceiling grid, Dante audio over Ethernet.

    a. In-Ceiling Microphone Array: Shure MXA-910 or equivalent

7. Provide wireless microphone system to be used throughout the Training Room. Wireless microphone system shall be RF based, have AES 256-bit encryption for secure transmission, consist of one handheld transmitter with cardioid pickup, one earset headworn condenser omnidirectional microphone with bodypack transmitter, charging base station, PoE ceiling mounted transceiver, Dante audio over Ethernet.

    a. Wireless Microphone Transceiver: Shure MXWAPT2 or equivalent
    b. Microphone Charging Station: Shure MXWNCS2 or equivalent
    c. Hybrid Bodypack Microphone: Shure MXW1 or equivalent
    d. Headset Microphone: Shure MX153 or equivalent
    e. Handheld Microphone: Shure MXW2/SM58 or equivalent

F. Furniture

1. Provide a Presenter-style Lectern with the following:

    a. Flat work surface
    b. Sloped backsplash
    c. Hinged locking doors
    d. Wheeled caster base, with locking casters on the Presenter's side
    e. 10RU rack rails for mounting AV rack equipment
    f. sliding shelf for PC keyboard
    g. slots at the bottom panel for ventilation and cable pass through
    h. cut out on the work surface for an AV connection box
    i. cut out on the sloped backsplash for an AV touch panel
    j. locking slide out drawer at the side of the lectern for document camera
    k. locking access back panel
    l. coordinate color of finish and laminate of lectern with architect (provide sample for approval)

2. Presenter style Lectern: Miller's Presentation Furniture Quote # AVC-4357 or equivalent

G. Control

1. Establish control system functionality for the following devices:

    a. Projector (on/off with timing delay for heatup/cooldown)

    b. Screen (up/down)

    c. Program Volume Control

    d. ATC Volume Control

    e. VTC Volume Control

    f. Mic Level/Mute

g. Power

1) Remote power cycle of all AV equipment in system.

2) Allow for access to this feature on a tech page within the touch panel.

2. Provide remote control of systems with an integrated network-based master controller that provides ports for IR/serial, RS-232/422/485, Ethernet, relay closures and input and output control card frames and rack mounted, as indicated on the drawings and in this specification.

3. Provide control of all equipment as indicated within this specification and as indicated on drawings.

4. Provide all loose cables, connectors, etc. required to complete a full working system.

5. Coordinate with the Director's Representative and provide system interface to the local IP network (LAN). Provide interfacing of multiple control systems components over IP, for the application of future interface to any Director's Representative-furnished AV-system monitoring systems.

6. When a choice of control protocols is available for a piece of equipment, the most secure and flexible one shall be used; i.e. RS-232 control, where available, shall be used in place of either infrared or relay control.

7. Where the power state of a piece of equipment is indeterminate, power sensors shall be provided to indicate the devices power state to prevent misalignment of system and equipment power cycles.

8. Provide remote connectivity and monitoring of all AC powered devices via IP power management device.

H. User Interface

1. Provide programming of control interfaces as directed by the Client. Programming shall provide simple user interface to select audio sources, adjust volume, and turn flat panel displays on or off.

2. Provide control panel operations that are consistent from page to page.

3. Provide control panel operations that are consistent from room to room and/or station to station.

4. Provide feedback that indicates the current equipment and/or system status where possible.

5. Provide feedback between multiple touch panel locations

I. Software

1. Provide control capability for every function available on every piece of equipment being controlled by the system. Define and provide "macro" commands for the most used functions.

2. Provide password protection for any operations that can adversely affect certain room set-up functions. Provide for the ability for remote monitoring of system functions and adjustments via TCP/IP. Capability for configuration will require password protection for use of facility management. Provide for the delivery of email fault alerts to facility management.

3. Provide control of all equipment as indicated within this specification and as indicated on drawings.

4. Provide all loose cables, connectors, etc. required to complete a full working system.

5. Coordinate with the Director's Representative and provide system interface to the local IP network (LAN). Provide interfacing of multiple control systems components over IP, for the application of future interface to any Director's Representative-furnished AV-system monitoring systems.

6. When a choice of control protocols is available for a piece of equipment, the most secure and flexible one shall be used; i.e. RS-232 control, where available, shall be used in place of either infrared or relay control.

J. Miscellaneous

1. Provide and install all hardware, cabling, connectors, faceplates, terminators, adapters, audio combiners, balanced-unbalanced audio converters, wall boxes, etc. required to ensure installation of a fully functional audiovisual system as depicted in the attached AV Systems drawings.

2. Provide a wireless keyboard/mouse to work with the OFE desktop PC,

   a. Wireless Keyboard/Mouse: Gyration U77796

K. Equipment Layout

1. The equipment in this area shall be as detailed on drawings.

2. Provide audiovisual equipment racks with blank and vent panels as indicated on the drawings. There are not to be any open areas on the front of the racks.

   a. Equipment Rack: Middle Atlantic ERK-4420LRD or equivalent

3. All equipment shall be installed with rack ears/mounts or custom rack-mounts/face-plates, using security screws. There shall not be any shelf-mounted components in the audiovisual racks.

L. Director's Representative Furnished Equipment

1. All room furniture will be furnished by others (Unless otherwise noted in this specification)..

2. All video source devices will be furnished by others (Unless otherwise noted in this specification).

M. Related Work Specified Elsewhere

1. The following systems and equipment are not provided under this contract. The Contractor is to coordinate with the base bid contractors as necessary to insure compatibility.

    a. Installation of all furniture stub-ups, floor boxes and/or poke thru devices (excluding any plates and connectors to be provided by the contractor.

    b. Telephone and telecommunications jacks and special telecom outlets not related directly to AV, (LAN/WAN, ISDN, POTS, etc.).

2.04 DETAILED SPECIFICATIONS – CONFERENCE ROOM (HQ)

A. This section of the specification describes the functional details of the audiovisual systems to be furnished and installed in the Conference Room (HA100) within the HQ building.

1. A ceiling mounted projector and motorized screen will be used to present content (wired & wireless) and support video & audio conference calls.

2. In-Ceiling microphones support audio capture during audio and video conference calls.

3. A wall mounted camera will support video conferencing.

4. In-Ceiling speakers will support local speech reinforcement playback.

5. Wall mounted speakers will support program audio playback.

6. An active HDMI floor plate input the podium location will provide a secondary wired connection to the video projector.

7. A media presentation switcher will support video switching, control, and wireless sharing.

8. A wireless touch control panel will support control of all AV systems and any lighting or shading systems in the space.

    a. Wireless 8.7" Touch Panel: Crestron TST-902 or equivalent

9. Equipment will be located in closet location HA100-1 within a dedicated AV equipment rack.

B. System Interconnection & Functional Description

1. The functional interconnections of the audio, video and control systems shall be as detailed on drawings #TA-502-H

2. The Contractor shall provide all interconnection cable, connectors, terminal strips, wireways, flexible conduit, etc., to facilitate the audiovisual systems as detailed within these specifications and drawings.

3. The conduit and power systems are detailed in the Electrical Engineer’s drawings.

C. Display and Video

1. Provide and integrate displays, switching, video distribution equipment, interfaces and cabling as detailed on the drawings and as described in this specification.

2. Provide one ceiling mounted projector for viewing of HD up to UHD content. Projector shall be laser light source, 3840x2160 resolution, minimum 2000 lumens.

    a. Ceiling Mounted Projector – UHD: Sony VPL-GTZ240 or equivalent
    b. Ceiling Projector Mount: Chief RPAU or equivalent.

3. Provide one 137” diagonal ceiling mounted motorized projection screen. See Specification Section 115213 for projection screen information.

4. Provide an Audiovisual Bridge device to integrate software CODECs (Skype, Jabber, Microsoft Teams, Zoom, etc.) to the Conference Room audiovisual system

    a. Audiovisual soft CODEC Bridge: Vaddio AV Bridge or equivalent

5. Provide one all in one 4K media presentation switcher with integrated wireless sharing gateway, control system, 8x4 matrix switcher, video scaler, HDMI input/output, HDBaseT input/output for video switching and control of the AV systems.

    a. Multimedia Presentation Switcher & Control Processor with wireless presentation: Crestron DMPS3-4K-350-C-AIRMEDIA or equivalent

D. Video source devices

1. Images/Video from wall mounted cameras.

    a. HDBaseT PTZ Camera: Vaddio RoboSHOT 12E HDBT OneLINK Bridge System or equivalent

2. Images/Video from an OFE PC or laptop via wall or floor input plate (HDMI/VGA)

3. Images/Video from OFE conferencing PC

4. Images/Video from wireless sharing device

E. Audio

1. Provide playback of program audio via the wall mounted speakers. Speakers shall be surface mount, 2-way with 8” woofer and 1” tweeter, 200W power handling at 8 Ohms.

    a. Wall Mount Speakers, 8" two way, pair: Crestron SAROS SR8T-W-T-EACH or equivalent

2. Provide playback of program audio from the video source devices.

3. Provide playback of dedicated program audio content.

    a. Audio Amplifier: Crestron AMP-3210-T or equivalent

4. Provide an Audio DSP for audio matrix routing and signal processing. Audio DSP shall have 12 mic/line level inputs with AEC, 8 mic/line level outputs, SIP VoIP interface, Dante audio over Ethernet

    a. Audio DSP: Biamp Tesira Forte DAN VT or equivalent

5. Provide playback of audio/video conferencing audio via the in-ceiling speakers. Ceiling Speakers shall be a low-profile enclosure, 2-way with 6.5" woofer and 1" tweeter, 70V multi-tap transformer, 90 degree nominal coverage pattern.

    a. In-Ceiling Speakers: Crestron SAROS IC6LPT-W-T-EACH or equivalent

6. Provide coverage of the entire seating area via the in-ceiling microphones

    a. In-Ceiling Microphone Array: Shure MXA-910 or equivalent

F. Control

1. Establish control system functionality for the following devices:

    a. Projector (on/off with timing delay for heat up/cool down)

    b. Screen (up/down)

    c. Program Volume Control

    d. ATC Volume Control

    e. VTC Volume Control

    f. Mic Level/Mute

    g. Power

        1) Remote power cycle of all AV equipment in system.

        2) Allow for access to this feature on a tech page within the touch panel.

2. Provide remote control of systems with an integrated network-based master controller that provides ports for IR/serial, RS-232/422/485, Ethernet, relay closures and input and output control card frames and rack mounted, as indicated on the drawings and in this specification.

3. Provide control of all equipment as indicated within this specification and as indicated on drawings.

4. Provide all loose cables, connectors, etc. required to complete a full working system.

5. Coordinate with the Director's Representative and provide system interface to the local IP network (LAN). Provide interfacing of multiple control systems components over IP, for the application of future interface to any Director's Representative-furnished AV-system monitoring systems.

6. When a choice of control protocols is available for a piece of equipment, the most secure and flexible one shall be used; i.e. RS-232 control, where available, shall be used in place of either infrared or relay control.

7. Where the power state of a piece of equipment is indeterminate, power sensors shall be provided to indicate the devices power state to prevent misalignment of system and equipment power cycles.

8. Provide remote connectivity and monitoring of all AC powered devices via IP power management device.

G. User Interface

1. Provide programming of control interfaces as directed by the Client. Programming shall provide simple user interface to select audio sources, adjust volume, and turn flat panel displays on or off.

2. Provide control panel operations that are consistent from page to page.

3. Provide control panel operations that are consistent from room to room and/or station to station.

4. Provide feedback that indicates the current equipment and/or system status where possible.

5. Provide feedback between multiple touch panel locations

H. Software

1. Provide control capability for every function available on every piece of equipment being controlled by the system. Define and provide “macro” commands for the most used functions.

2. Provide password protection for any operations that can adversely affect certain room set-up functions. Provide for the ability for remote monitoring of system functions and adjustments via TCP/IP. Capability for configuration will require password protection for use of facility management. Provide for the delivery of email fault alerts to facility management.

3. Provide control of all equipment as indicated within this specification and as indicated on drawings.

4. Provide all loose cables, connectors, etc. required to complete a full working system.

5. Coordinate with the Director’s Representative and provide system interface to the local IP network (LAN). Provide interfacing of multiple control systems components over IP, for the application of future interface to any Director’s Representative-furnished AV-system monitoring systems.

6. When a choice of control protocols is available for a piece of equipment, the most secure and flexible one shall be used; i.e. RS-232 control, where available, shall be used in place of either infrared or relay control.

I. Miscellaneous

1. Provide and install all hardware, cabling, connectors, faceplates, terminators, adapters, audio combiners, balanced-unbalanced audio converters, wall boxes, etc. required to ensure installation of a fully functional audiovisual system as depicted in the attached AV Systems drawings.

2. Provide a wireless keyboard/mouse to work with the OFE desktop PC,

   a. Wireless Keyboard/Mouse: Gyration U77796

J. Equipment Layout

1. The equipment in this area shall be as detailed on drawings.

2. Provide audiovisual equipment racks with blank and vent panels as indicated on the drawings. There are not to be any open areas on the front of the racks.

   a. Equipment Rack: Middle Atlantic ERK-4420LRD or equivalent

3. All equipment shall be installed with rack ears/mounts or custom rack-mounts/face-plates, using security screws. There shall not be any shelf-mounted components in the audiovisual racks.

K. Furnished Equipment

1. All room furniture will be furnished by others (Unless otherwise noted in this specification).

2. All video source devices will be furnished by others (Unless otherwise noted in this specification).

L. Related Work Specified Elsewhere

1. The following systems and equipment are not provided under this contract. The Contractor is to coordinate with the base bid contractors as necessary to insure compatibility.

   a. Installation of all furniture stub-ups, floor boxes and/or poke thru devices (excluding any plates and connectors to be provided by the contractor.

   b. Telephone and telecommunications jacks and special telecom outlets not related directly to AV, (LAN/WAN, ISDN, POTS, etc.).

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Examine the areas to receive the work and the conditions under which the Work would be performed. Remedy conditions detrimental to the proper and timely completion of the Work. Do not proceed until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. General

1. Installation shall include the delivery to the installation site, unloading, setting in place, fastening to walls, floors, ceilings, counters, or other structures where required, interconnecting wiring of the system components, equipment alignment and adjustment, programming and configuration and all other work whether or not expressly required herein which is necessary to result in complete and fully operational systems.

2. Prior to ordering equipment, the contractor shall coordinate the frequencies of all wireless devices to prevent unwanted interaction between devices and rooms. This includes, but is not limited to, wireless microphones, assisted listening system devices, wireless control panels, etc.

3. All accessories, including rack mounting hardware, power supplies, etc., shall be obtained from the original equipment manufacturer. Unless otherwise noted or specified, third party accessories shall not be used.

4. If, in the opinion of the Contractor, an installation practice is desired or required, which is contrary to these specifications or drawings, a written request for modification shall be made to the Design Team. Modifications shall not commence without written approval from the Design Team

5. During the installation, and up to the date of final acceptance, the Contractor shall be under obligation to protect his finished and unfinished work against damage and loss. In the event of such damage or loss, the damage shall be replaced or repaired at no cost to the Director's Representative.

B. Physical Installation

1. All equipment shall be firmly secured in place unless requirements of portability dictate otherwise.

2. All equipment shall have an engraved plaque permanently affixed, denoting its function.

3. Fastenings and supports shall be adequate to support their loads with a safety factor of at least three. All boxes, equipment, etc., shall be secured plumb and square.

4. In the installation of equipment and cable, consideration shall be given not only to operational efficiency, but also to overall aesthetic factors.

5. Trim and Escutcheon Components

   a. To insure a proper finished appearance, furnish and install trim/escutcheon components at all conditions where A/V components pass through the finished ceilings. This would include but not be limited to video projector supports, television monitor/receiver supports and any other component which is not specifically supplied with integral flanges/trim components; i.e. speaker mounts, assistance listening devices, etc.

b. The visible component of any trim should be minimal in size, preferably no wider than 1/2". All trim components at the ceiling plane shall be finished to match the approved ceiling finish. The audiovisual contractor should obtain a sample from the General Contractor, including any custom color information, or standard color numbers.

c. All visible components and finish options shall be submitted to the Design Team for review and approval prior to fabrication.

C. Cable Installation

1. All wire bundles are to be neat and combed free of cable crossovers.

2. All cables, regardless of length, shall be marked with a permanent, self-laminating wrap-around number or letter cable marker at both ends, similar to the Panduit "Pan-Code" system. Labels must be computer-generated for legibility. Wire labels done by hand in the field must be replaced with computer generated labels. There shall be no unmarked cables at any place in the system. Marking codes used on cables shall correspond to codes shown on drawings and or run sheets. All labeling must be reviewed and approved by Director's Representative prior to installation as part of the shop drawing process.

3. All cables shall be grouped according to the signals being carried. In order to reduce signal contamination, separate groups shall be formed for the following cable families:

   a. Power cables

   b. Control cables

   c. Video cables

   d. Audio cables carrying signals less than – 20 dBm

   e. Audio cables carrying signals between – 20 dBm and +20 dBm

   f. Audio cables carrying signals above +20 dBm

4. As a general practice, all power cables, control cables, and high level cables shall be run on the left side of an equipment rack as viewed from the rear. All other cables shall be run on the right side of an equipment rack, as viewed from the rear.

5. Cables ties shall be placed at appropriate intervals of no greater than six inches for vertical bundles, two inches for horizontal bundles.

6. All vertical cable bundles shall be attached to the rack frame.

7. All cables shall be continuous lengths without splices. All system wire, after being cut and stripped, shall have the wire strands twisted back to their original lay and be terminated by approved soldered or mechanical means. Except where noted otherwise in the specifications, NO BARE WIRE TERMINATIONS WILL BE ACCEPTED. Heat-shrink tubing shall be used to insulate the ground or drain wire. Unused wires at the end of a cable shall remain unstripped and shall be laid back and held in place with wire ties.

8. All solder connections shall be made with rosin-core solder using temperature-controlled solder stations. Care shall be taken to avoid cold or cracked solder joints. Any connections that do not appear to be clean and shiny, or which show signs of cracking, shall be resoldered by the contractor before final acceptance of the system.

9. Mechanical connections using insulated, crimp-type connectors shall be bonded to the connector by soldering the wire to the metal part of the connector.

10. Connections made with screw actuated pressure type terminal strips shall be made by stripping approximately 1/4 inch of insulation from the stranded conductor. Then the un-tinned wire shall be inserted into the terminal and the screw tightened using a secure fitting precision screwdriver.

11. Terminal blocks, boards, strips or connectors shall be furnished for all cables which interface with racks, cabinets, consoles, or equipment modules. No audio cables shall run directly to the audio patch panel jacks. Each audio patch panel shall be furnished with an audio terminal block, and all audio cables to and from the audio patch panel shall terminate on this block.

12. All wire markers shall face a common direction.

13. All cables shall have proper connector housing.

14. Cables shall not protrude from the back of racks.

15. All cable entry shall be through the tops of racks or through entrance holes in the base of the rack. No cable shall enter racks through front, rear or side panel openings.

16. Unless otherwise called for in these specifications and drawings, the following cables, or their approved equals, shall be used in these systems:

Type	Manufacturer	Non-Plenum	Plenum
RF-CATV (Horizontal-RG6)	Belden	1189A	1189P
RF-DBS/DSS (Horizontal-RG6)	Belden	1829A	1829P
RF-CATV (Vertical-RG11)	Belden	1617A/7731	1153A
RF-50 Ohm (Horizontal RG-8)	Times Microwave	Microwave	LMR400
Video (Baseband & SDI)	Belden	1505A	1506A
S-Video	Belden	1807A	7700A
Control (4 conductor shielded)	Belden	1502R	1502P
Control (12 conductor shielded)	Belden	9556	6309FE
Audio	Belden	9451/1266A	9451P
Audio (8 Ohm program speakers)	Belden	8473	1861A

Audio (70 Volt Speaker)	Belden	8461	1863A
Video, RGB (RG6)	Belden	7721A	None
Video, RGB (RG59)	Belden	7796A	1826A
Multi-Channel Audio	Belden	8774	88778
Digital Audio (110 Ohm)	Belden	1800B	1801B
Tight-Buffered 50 µm multimode (OM3)	Corning Cable Systems		006T88-31190-29
Tight-Buffered 50 µm multimode (OM4) Armored	Corning Cable Systems		006T88-31190-D3
Tight-Buffered singlemode (OS2)	Corning Cable Systems		006E88-31131-29
Tight-Buffered singlemode (OS2) Armored	Corning Cable Systems		006E88-31131-D3
Category 6e	Berk-Tek		LANmark-1000 Enhanced Category 6 UTP
Category 6	Berk-Tek		LANmark-6 CAT 6 UTP Plenum
Category 5e	Berk-Tek		LANmark-350 Prem. Cat 5e

D. Note: These cable types are cited to illustrate the type and quality of cable required. Unless otherwise noted, cables from other manufacturers, i.e. Canare, CommScope, Extron, Gepco, Liberty, etc. will be considered if data sheets indicating equivalency are submitted for approval prior to installation.

1. It is the responsibility of the Audiovisual Contractor to verify, furnish and install the correct CATV cable type and connectors, as per the local CATV provider.

2. Unless otherwise noted, all video and computer video cables are to be terminated using seventy-five ohm (75 Ohm) connectors, with a captive center pin.

3. Cables running in plenum areas without conduit shall be plenum rated cable, and match the specified cable above. It is the responsibility of the contractor to inspect the electrical drawings, and verify in what spaces plenum cable shall be used. No claims for additional monies, based on the use of plenum cable, will be allowed.

4. All cables that can be terminated in the field (except video and pulse cables, which must be cut to an electrical length) shall be cut to the length dictated by the run. No splices shall be permitted in any pull boxes without prior permission. For equipment mounted on

casters, in drawers or on slides, the interconnecting cables shall be provided with a service loop of appropriate length.

5. No cable shall be installed with a bend radius less than that recommended by the cable manufacturer.

6. Where cables are installed in architectural niches, ensure that the cables are black, unless otherwise directed, to reduce visibility from the audience.

7. Where cables are visible, the cables will be sheathed in a color wrap that has been submitted for approval by the Design Team.

E. CABLE SEPARATION

1. Cable separation of cables for runs greater than 24'.

   a. Microphone Level – 12" from all other circuits.

   b. Line Level and Control – 12" from any circuit with signal of 20dB or greater than Line Level and Control cables.

   c. Speaker level circuits – 12" from other circuits.

   d. Video and Data – 12" from any circuit with signal of 20dB or greater than Video and Data.

   e. AC Power Circuits – 12" from all other circuits.

   f. Required conduit separation are given for all audiovisual pathways on plans

F. CABLE SUPPORT

1. Supporting method in accordance with Section 26 05 00

2. Individual runs throughout building – Support cable at 600mm on center and 100mm at any change in direction. Support from building structure. Cables on top of ceiling tiles will be rejected. Cable supported by ceiling grid support wires will be rejected.

3. Cable Bundles – Where multiple cable combine support at 300mm on center and 100mm at any change in direction. Support from building structure. Cables on top of ceiling tiles will be rejected. Cable supported by ceiling grid support wires will be rejected.

G. RACK CABLING

1. Neatly train and lace cables.

2. Route Cables from components to lacing bars installed on rear rack rail.

3. Provide services loops for each cable.

4. Cable separation of cables for runs within Equipment rack.

   a. Microphone Level – 50mm from all other circuits.

b. Line Level and Control – 50 mm from any circuit with signal of 20dB or greater than Line Level and Control cables.

c. Speaker level circuits – 50mm from other circuits.

d. Video and Data – 50 mm from any circuit with signal of 20dB or greater than Video and Data.

e. AC Power Circuits – 50mm from all other circuits.

H. APPROVED WIRE TERMINATION MEANS

1. Solder Connections – For connectors utilizing Solder Cups

2. Terminal strip Connectors – For termination of blunt cut cables, cable to be tinned prior to termination

3. Multi Pin connectors – Utilize connector manufacturers crimper

4. Crimp Cap Terminations – For Loudspeaker circuits at individual devices. Distribution cable termination to utilize terminal strip connectors.

I. CONNECTION PLATE RECEPTACLES (unless otherwise specified)

1. All connection plate receptacles must be labeled properly according to Director's Representative approved labeling scheme.

2. Audio (microphone or line level) – XLR type.

3. Audio (loudspeaker level) – Neutrik Speakon®.

4. Intercom – XLR or ¼ inch diameter tip/ring/sleeve type, or as required by the intercom system. Jack shall be insulated from panel type.

5. Video – BNC type.

6. VGA – DB-15HD jack, isolated from panel type, with hex nuts

7. DVI (Inclusive of DVI-A, DVI-I and DVI-D signal types) – DVI-I type connector unless otherwise specified.

8. HDMI – HDMI with locking nut.

9. USB – USB Type A

10. Category 5/6 – RJ45 Type

11. RF – "F" type. Receptacles shall be insulated from panel type.

12. Note: All connectors on wall plates, or in other exposed locations, are to be recessed.

J. PATCH PANELS

1. Patch Panel Assignments

a. All patch panels shall be wired so that signal “sources” (outputs from) appear on the upper row of a row pair; and all “loads” (inputs to) appear on the lower row of a row pair.

2. Patch Panel Designation Strips

a. All audio and video patch panel designation strips shall utilize alphanumeric identifications and descriptive information. The jack position in each horizontal row shall be numbered sequentially from left to right. The horizontal jack rows shall be lettered sequentially from top to bottom. The alphanumeric identification of each jack shall be included on the functional block drawings, as well as on reproductions of these drawings, which shall be mounted in an appropriate location near the patch bays.

K. MOUNTING HEIGHTS

1. Coordinate locations of the following with mounting heights as indicated on Architectural, Electrical and Audiovisual drawings.

a. Technical wall plates

1) AV input/output connections

2) Flat panel display panel connections

3) Video projector connections

4) Annotation panel connections

5) Networked Digital Clocks

6) PTZ cameras

7) Wall mounted speaker boxes

b. Control panels

c. Pull boxes

d. Other devices as required

L. Grounding Procedures

1. In order to minimize problems resulting from improper grounding, and to achieve maximum signal-to-noise ratios, the following grounding practices shall be adhered to in order to maintain the integrity of the grounding system:

a. General

b. Because of the great number of possible variations in grounding systems, it shall be the responsibility of the Contractor to follow good engineering practice, as outlined

below, and to deviate from these practices only when necessary to minimize crosstalk, ground loops, ground-induced noise, and to maximize signal-to-noise ratios in the audio, video, and control systems.

c. System Power Ground: A single primary "system ground" shall be established for the system in each particular area. All grounding conductors in that area shall connect to this primary system ground.

1) The system ground shall be provided at the audio equipment rack for the area and shall consist of a copper bar of sufficient size to accommodate all secondary ground conductors. A copper conductor having a maximum of 0.1 Ohms total resistance shall connect the primary system ground bar to the nearest approved ground. The Contractor shall be responsible for determining if the metallic conduit is properly electrically bonded to the building ground system.

2) Secondary system grounding conductors shall be provided between all racks, audio consoles, and audiovisual system equipment local to the area. Each of these grounding conductors shall have a maximum of 0.1 Ohms total resistance.

3) Under no conditions shall the AC neutral conductor, either in the power panel or in a receptacle outlet, be used as a system ground, except as specifically defined by NFPA 70 for bonding.

4) Ungrounded equipment with either an inline transformer or a 2-prong plug, shall be bonded to the rack bus bar using #12awg cable.

d. Audio Cable Shields

1) All audio cable shields shall be grounded at one point only. There are no exceptions. For inter and intra-rack wiring, this requires that the shield be connected at one end only. For ungrounded portable equipment, such as microphones, the shield shall be connected at both ends but grounded at only one end.

e. Video Receptacles

1) All video receptacles that are provided and installed by the Contractor shall be insulated from the mounting panel, outlet box, or wireway. Unless otherwise detailed herein, this shall be accomplished by using insulated-from-panel type receptacles.

f. Audio Receptacles

1) All audio receptacles that are provided and installed by the Contractor shall be insulated from the mounting panel, outlet box, or wireway. Unless otherwise detailed herein, this shall be accomplished by using insulated-from-panel type receptacles.

g. General

1) Because of the great number of possible variations in grounding systems, it shall be the responsibility of the contractor to follow good engineering practice, as outlined above, and to deviate from these practices only when necessary to minimize crosstalk and to maximize signal-to-noise ratios in the audio, video, and control systems.

3.03 PERFORMANCE STANDARDS

A. Unless restricted by the published specifications of a particular piece of equipment, or unless otherwise required under the Detailed Specifications, the following performance standards shall be met by each system. The signal paths for the above Performance Standards shall be as follows: From all source inputs to all signal destinations. See Contractor System Checkout Section III-T for testing procedures.

1. Analog Audio

   a. Frequency Response Within plus or minus 0.5dB, 20 Hz to 20,000 Hz

2. Signal to Noise Ratio greater than 90dB (including crosstalk and hum at all input/output levels)

3. Total Harmonic Distortion 0.05% maximum from 20 Hz to 20,000 Hz.

   a. Input Levels

      1) Microphone (Nominal) -50dbu

      2) Overload (Minimum gain) -5dbu

      3) Maximum Gain -26dbu

      4) Line (Nominal) +4dbu

      5) Overload (Minimum gain) +24dbu

      6) Maximum Gain +9dbu

      7) Input Common Mode Rejection >100db

   b. Output Levels

      1) Line (Nominal) +4dbu

      2) Maximum +24dbu

      3) Output Impedance < 0.5 Ohms

      4) Load Impedance >150 Ohms

4. Analog Video (signal)

      1) Frequency Response Within plus or minus 0.5dB, DC to 4.2 MHz

2) Signal to Noise Ratio 55 dB minimum (peak to RMS) unweighted, DC to 4.2 MHz

3) Crosstalk 45 dB minimum unweighted DC to 4.2 MHz

4) Line and Field Tilt: 2% maximum

5) Differential Gain: 3% maximum

6) Differential Gain: 2 degrees maximum

5. SDI - Per SMPTE 259M

6. HD SDI - Per SMPTE 292M

7. HD SDI - (Dual Link) – Per SMPTE 424M

8. 3G SDI – Per SMPTE 424M

9. HDMI - Per HDMI Ver. 1.3b

10. DVI - Per DVI Ver. 1.0

11. Analog NTSC Video

    a. COMPOSITE VIDEO SIGNAL

        1) Signal 1V P-P 75 Ω(3.58, 4.43MHz) NTSC, PAL, or SECAM as appropriate

    b. S-VIDEO SIGNAL

        1) Signal Y: 1.0V p-p, 75 ΩC: 0.286V p-p, 75Ω(3.58, 4.43MHz) NTSC, PAL, or SECAM as appropriate

    c. COMPONENT VIDEO (Beta Component)

        1) Signal Y: 1.0V p-p, 75 ΩPB/CB: 07V p-p, 75ΩPR/CR: 0.7V p-p, 75 Ω

12. RF Broadband

    a. The RF Broadband system shall meet or exceed the published standards of the following organizations:

        1) FCC Part 15 Rules and Regulations: Radio Frequency Devices

        2) FCC Part 76 Rules and Regulations: Cable Television Service

        3) NCTA-02 Recommended Practices for Measurements on Cable Television Systems.

    b. Visual Carrier Level +7 +/- 3dBMv for each tap at channel WW(433.25 MHz)

    c. Visual Carrier Level +5 +/- 3dBMv for each tap at channel 2(55.25 MHz)

    d. Visual Carrier to Noise Ratio 42 dB minimum on any channel (4MHz bandwidth)

e. Maximum Loss from common point to any tap at channel WW(433.25 MHz) — 45 dB or less

f. Maximum Loss from common point to any tap at channel 2(55.25 MHz) — 37 dB or less

13. Audio Video Bridging (AVB)

    a. IEEE 802.1AS: Timing and Synchronization for Time-Sensitive Applications

    b. IEEE 802.1Qat: Stream Reservation Protocol (SRP)

    c. IEEE 802.1Qav: Forwarding and Queuing for Time-Sensitive Streams

    d. IEEE 802.1BA: Audio Video Bridging Systems

14. Dante Audio

    a. Protocol not subject to performance-based substitution.

15. Audiovisual System, Control System and User Interface Programming

16. Control system user interfaces pages and programming shall be designed for this project exclusively. While there are a great number of design approaches to designing the user interface, the following guidelines shall be adhered to:

    a. The use of custom system programming from prior projects and/or 'modules' provided by a given manufacturer or programmer may or may not meet the functional intent of the systems and work described herein. It is the responsibility of the contractor to meet the functional intent of the systems in this specification, including any and all necessary modification of program code or creation of custom modules as required.

    b. The operation(s) of all system(s) are to match the functional intent already implemented at the Director's Representative's facilities as applicable.

    c. All panels are to have the time and date as icons, in the same position on every page.

    d. All panels are to have a title, indicating the piece of equipment and/or functionality being controlled.

    e. Final programming shall include capability to remotely control all functions of the audiovisual system. Only functions required for normal use shall appear on top level pages while underlying "Tech Pages" shall provide access to full manufacturer's remote control functionality.

    f. Devices similar in nature shall be programmed to operate with a common format.

    g. No individual component shall be programmed to function atypically.

    h. Whenever the same button appears on more than one page, it will be in the same position on each page.

i. Where feasible, multi-level access to controls should be implemented. See paragraph “e”, above.

j. During performance testing, all equipment shall be operated under standard conditions as recommended by the manufacturer.

k. Please see Detailed Specifications for further information on specific control system programming requirements.

B. Performance Test Signal Paths

1. The signal paths for the above Performance Standards shall be as follows:

a. Audio:

b. From all source inputs (for microphones, audio tape units, video tape units, etc.) through all mixers, switchers, etc., to all signal destinations.

c. Video:

d. From all sources of the above signal paths. This shall not exempt the contractor from the responsibility of checking all paths and outlets for appropriate compliance with the Performance Standards, see section below for detailed requirements.

C. Optical

1. All optical projection systems shall meet the following performance standards:

2. The total averaged light output from a projector, in lumens, shall be within plus-or-minus 15% of that specified by the projector manufacturer.

3. The “corner” location shall be defined as the four points determined by intersecting lines drawn 5% of the distance in from the focused edges of the image.

4. The light meter used for the above measurements shall be a properly calibrated foot-candle (or lux) meter and shall be cosine-corrected.

5. Projectors, lenses, and mirrors shall be solidly mounted and braced, so that there will be no observable movement in the image induced by motor vibration or other mechanical operations.

3.04 CONTRACTOR SYSTEM CHECKOUT

A. Before Commissioning Tests are scheduled, the Contractor shall perform his own system checkout based upon an approved testing procedure for the systems. The Contractor shall furnish all required test equipment and shall perform all work necessary to determine and/or modify performance of the system to meet the requirements of this specification. The Contractor shall submit a testing plan which shall be in accordance with ANSI-INFOCOMM standard 10-2013-Audiovisual Systems Performance verification for approval by the individual or firm representing the Director’s Representative during the Audiovisual Installation. At a minimum, the following sub-components of the Audiovisual System shall be tested and verified:

1. Cable and Connectors

    a. All cables and connectors shall be tested and verified to comply with the manufacturer's specifications and design intent

    b. Cable test results shall be submitted in advance of the Commissioning for review by the Director's Representative's Representative

2. Devices

    a. All devices shall meet the functionality as specified by manufacturer.

    b. If any device is found to deviate from the manufacturer's functionality it shall be replaced by the contractor at no cost.

3. Signal Types

    a. The Audiovisual System shall be tested to comply with all video and audio standards as specified in the Performance Standards section and described by the design intent.

4. System Function

    a. The cables and connectors, devices, and signal types shall meet the functional requirements as specified by the design intent.

    b. Acceptable testing procedures may include but is not limited to that which is described in the detailed specifications such as (streaming, push-to-talk, annotation, etc.)

5. Document that all matrix switching crosspoints have been tested and verified.

6. Provide documentation that all Cobranet bundles and audio signal lines have been tested and verified.

7. Test all audio and video systems for compliance with the Performance Standards:

    a. Test Equipment: The following test equipment (or submit equivalent for approval) shall be used to test the systems on site.

        1) Audio check:

            a) Time based measurement system, Goldline TEF20 or SIA Smaart live with laptop PC, calibrated omnidirectional mic, and appropriate interface

            b) Audio test set, Audio Precision ATS-1DD

            c) Media representative of all types found in the subject system

            d) Audio cables as required to connect test equipment to the system

            e) Set of terminations, adapters etc.

        2) Video checks:

a) Video, Component, RGBS, RGBHV and Digital video signal generator, Extron VTG 400 DVI

b) Digital Video test generator with EDID and HDCP components, PureLink HDG-8000 PRO

c) Media and portable hardware (i.e laptop) representative of all types found in the subject system including but not limited to Blu-ray ™ players and discs (provide discs with and without HDCP encrypted content), mobile PC/Tablets.

d) RGB cable, Extron BNC-5-6'HR

e) Video cable

f) Set of terminations, 'T' pieces etc.

3) Gain Setting

a) Adjust all systems (end to end within a system) for maximum signal-to-noise ratio. No hiss should be audible through any loudspeaker at the completion of gain structure setting, and all audio gain stages should clip simultaneously.

8. Signal Paths

a. Video/Audio

1) Connect the output of the video signal generator to a floor box/table/rack connector and select the "Full Field Color Bar" signal. Connect the combined waveform monitor/vectorscope to a final output point, e.g. an input to a picture monitor or video projector. Ensure that the test signal is routed to the selected output.

2) Measure and record the signal amplitudes.

3) Repeat item '1' after selecting the "Multiburst, 50 IRE" test signal.

4) Measure and record the signal amplitudes.

5) Repeat item '1' after selecting the "Modulated 5-step" test signal.

6) Measure and record the signal differential phase and gain.

7) Repeat item #'s '1' through '6' for other video signal paths.

8) Repeat item '1' after selecting the Window test signal.

9) Measure and record the signal line and field tilt.

10) Repeat item '1' after connecting the Black Burst signal from a rear mounted connector.

11) Measure and record the signal/noise ratio.

12) Connect the output of the audio test set to a floor box/table/rack program audio connector and connect the input of the audio test set to a final output point, e.g. an input to a program speaker power amplifier. Ensure that the test signal is routed to the selected output, that the volume control is set to 100% and that the equalizers are bypassed.

13) Measure and record the signal/noise ratio, total harmonic distortion and frequency response.

14) Repeat items '12' and '13' for other audio signal paths.

15) Connect the output of the audio test set to a floor box/table/rack speech audio connector and connect the input of the audio test set to a final output point, e.g. an input to a speech speaker power amplifier. Ensure that the test signal is routed to the selected output, that the volume control is set to 100% and that the equalizer is bypassed.

16) Measure and record the signal/noise ratio, total harmonic distortion and frequency response.

17) Repeat items '15' and '16' for other audio signal paths.

18) DVI: Connect the DVI output of the signal generator to a floorbox/table/rack connector and select the SMPTE & PLUGE signal at the various computer scan rates as follows:

    a) 640 x 480 31.5 kHz H, 60 Hz V

    b) 640 x 480 37.5 kHz H, 75 Hz V

    c) 800 x 600 38 kHz H, 60 Hz V

    d) 832 x 624 49.7 kHz H, 75 Hz V

    e) 1024 x 768 48 kHz H, 60 Hz V

    f) 1280 x 768 48 kHz H, 60 Hz V

    g) 1366 x 768 47.8 kHz H, 60 Hz V

    h) 1280 x 1024 64 kHz H, 60 Hz V

    i) 1400 x 1050 63.9 kHz H, 60 Hz V

    j) HD 720p 45 kHz H, 60 Hz V

    k) HD 1080i 33.75 kHz H, 30/60 Hz V

    l) HD 1080p 33.75 kHz H, 30/60 Hz V

19) Check that the image is correctly displayed on the picture monitor(s) and/or by the video projector.

20) Repeat item ‘2’ using Crosshatch signal, checkerboard signal and H Pattern signal.

21) Repeat item ‘2’ for other DVI connection locations.

22) Connect the output of the audio signal generator to a floorbox/table/rack ‘Left’ and ‘Right’ connectors and select the 1 kHz tone. Check that the signal is emitted from the left and right program speakers.

23) Repeat item ‘v’ for other audio connection location.

24) Note: Whenever possible, include computer sources provided by the Director’s Representative, at the desired resolution, in your testing.

25) Note: The term “RGB” is used generically. The system will be tested with the sync format dictated by functional requirements, including, but not limited to, sync-on-green, composite sync and separate horizontal and vertical sync. Whenever possible, include computer sources provided by the Director’s Representative, at the desired resolution, in your testing.

b. At the conclusion of the tests, return all equipment settings to previously calibrated positions.

c. Provide written records of all test results in spreadsheet form.

d. Check all control functions, from all controlling devices to all controlled devices, for proper operations.

e. Adjust, balance, and align all equipment for optimum quality and to meet the manufacturer’s published specifications. Establish and mark normal settings for all level controls and record these settings in the “System Operation and Maintenance Manual”.

f. Check all optical projection images for average light level, light fall-off, and image alignment and size to comply with the Performance Standards and specifications drawings. Check to determine that all projectors, projector bases, carts, tables, and mirrors are rigid and vibration-less in operation.

g. Maintain documentation of all performance tests for reference by the Consultant during the System Acceptance Tests.

3.05 SYSTEM ACCEPTANCE TESTING

A. System Acceptance Tests will be performed upon completion of the Contractor’s System Checkout and the test results have been provided to the Director’s Representative for review. The System Acceptance Tests will be supervised by the Director’s Representative’s Representative and shall consist of the following at a minimum:

1. A physical inventory of all equipment on site and will be compared to equipment lists in the contract documents.

2. The operation of all system equipment shall be demonstrated by the Contractor.

3. Review of final As-Build documentation as described in the "Contractors Documentation" section of this specification.

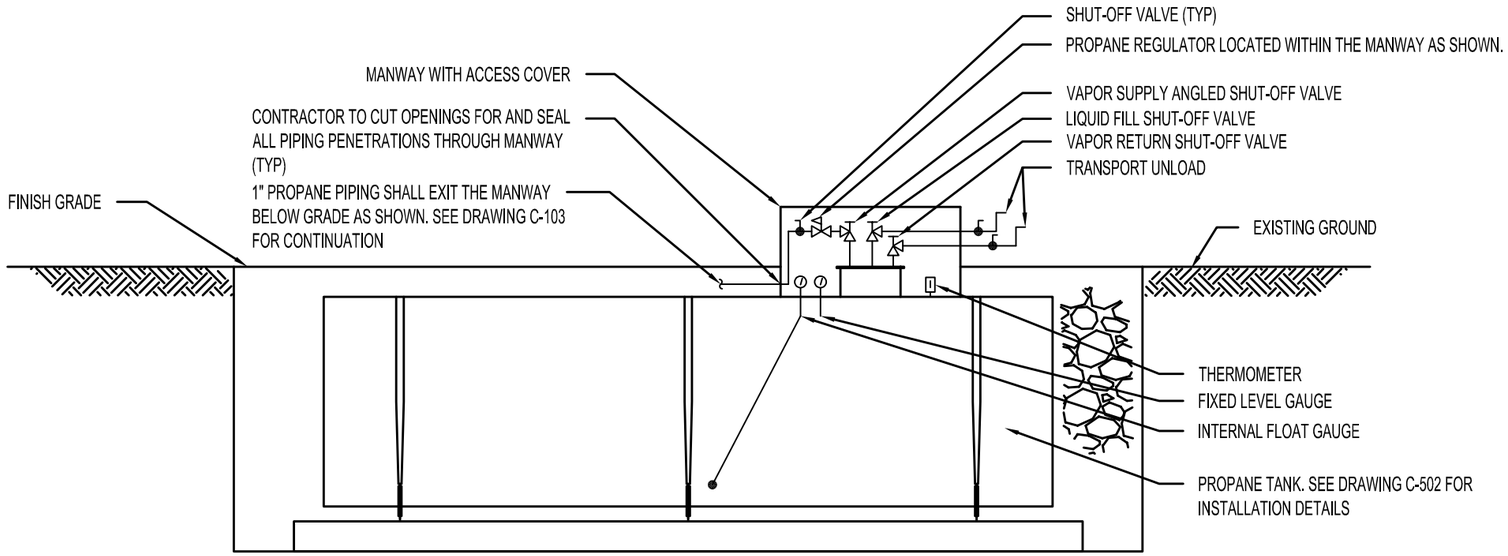
4. Both subjective and objective tests will be required by the Director's Representative's Representative to determine compliance with the specifications. The Contractor shall be responsible for providing test equipment for these tests.

5. All final, "as-built" drawings, run sheets, manuals, and other required documents, as detailed in Part I, shall be on hand. Two complete sets of these documents shall be delivered to the Director's Representative at this time.

B. In the event further adjustment is required, or defective equipment must be repaired or replaced, tests may be suspended or continued at the option of the Director's Representative's Representative.

C. Any charge for additional time incurred by the Director's Representative's Representative required to over-see the system tests, due to improper system installation or previous failed systems, shall be the responsibility of, and charged directly to the contractor

END OF SECTION



4 PROPANE TANK INSTALLATION DETAIL

NOT TO SCALE

NOTES:
1. TANK, INCLUDING PIPING AND ACCESSORIES.

STATE OF NEW YORK
MATTHEW M. RODAK
No. 089732
LICENSED PROFESSIONAL ENGINEER

POPLI DESIGN GROUP
450 West Kirkpatrick Street • Syracuse, NY 13204
main: 315.463.4540 • fax: 315.463.4573

PROPANE TANK DETAIL

TROOP K HEADQUARTERS
RT. 82 AND 44
POUGHKEEPSIE, NY 12603

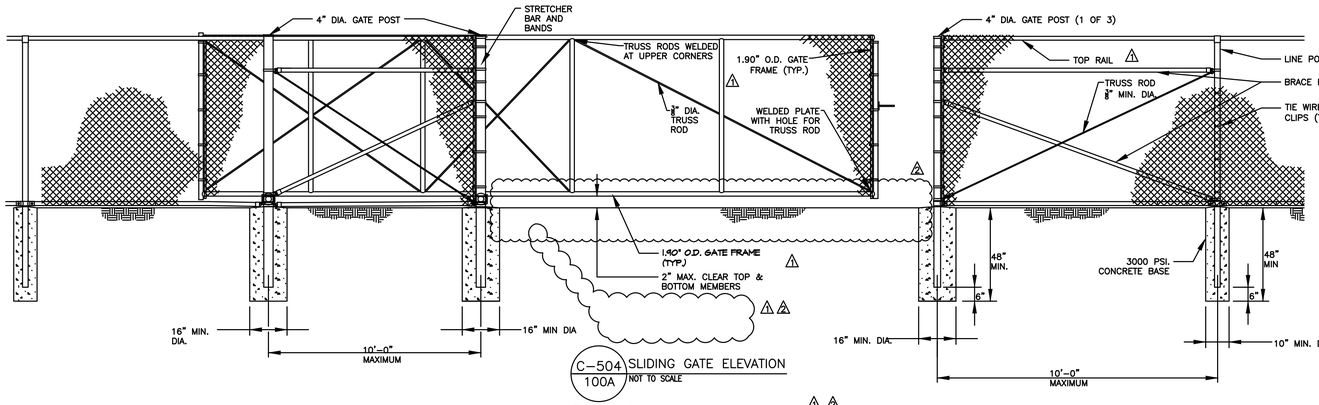
drawn by: CMD

record date: 1/21/21

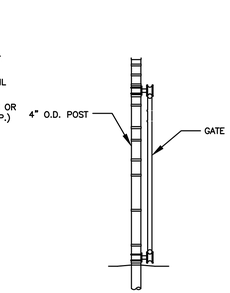
sheet number:

CSK-1

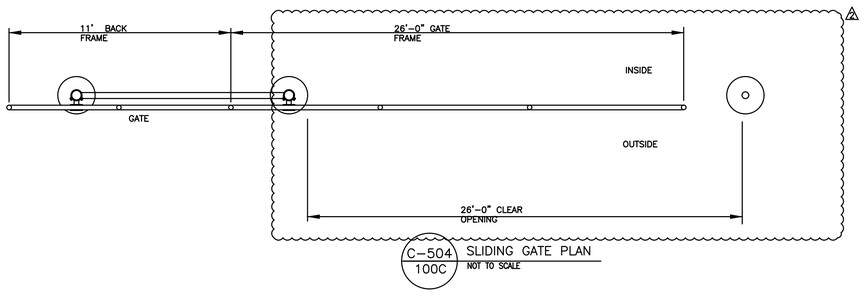
job number:



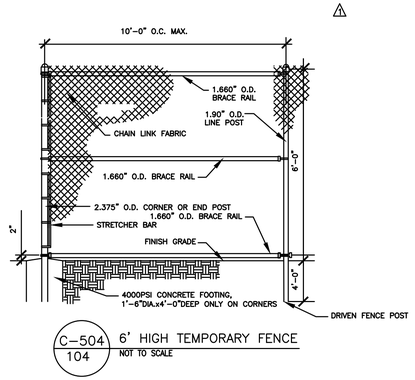
C-504 / 100A SLIDING GATE ELEVATION
NOT TO SCALE



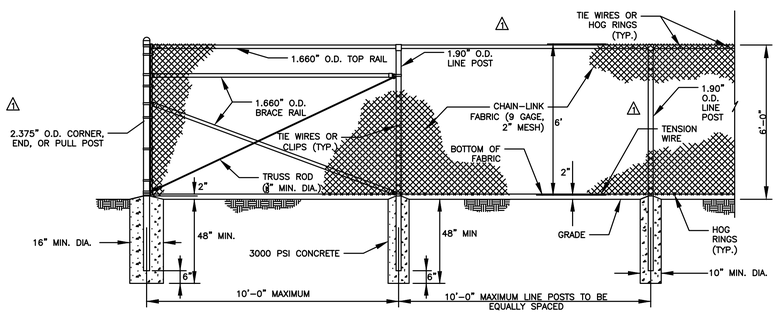
C-504 / 100B SLIDING GATE SECTION
NOT TO SCALE



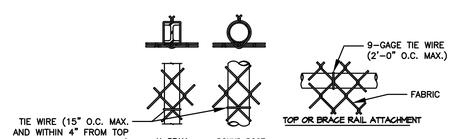
C-504 / 100C SLIDING GATE PLAN
NOT TO SCALE



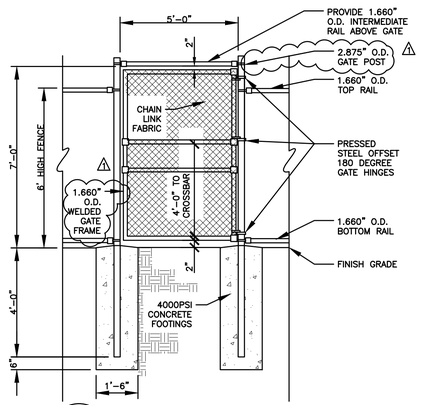
C-504 / 104 6' HIGH TEMPORARY FENCE
NOT TO SCALE



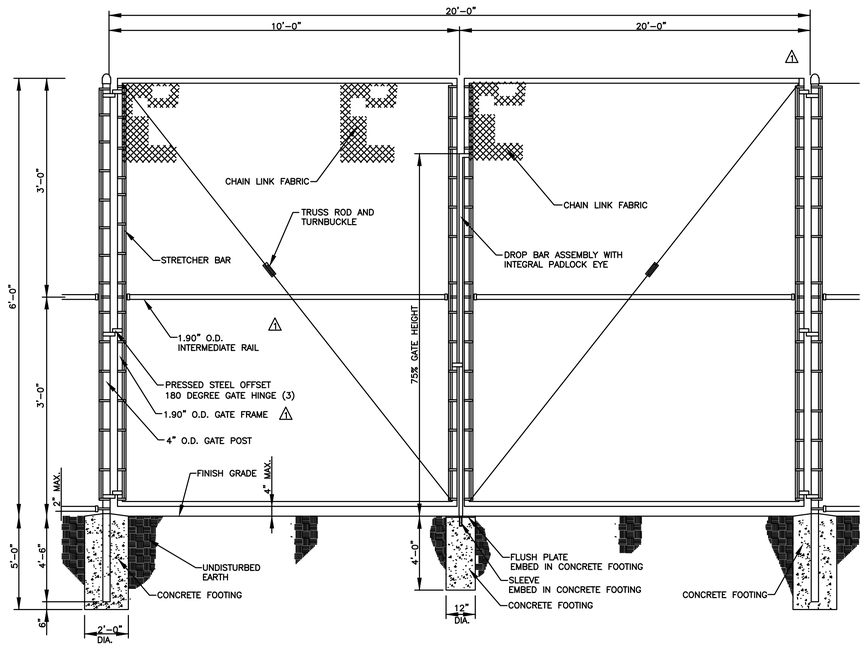
C-504 / 101 CHAIN LINK FENCE DETAIL
NOT TO SCALE



C-504 / 101A LINE POST ATTACHMENTS
NOT TO SCALE



C-504 / 102 7' HIGH 5' WIDE PERSONNEL GATE
NOT TO SCALE



C-504 / 103 20'-0" WIDE DOUBLE SWING GATE
NOT TO SCALE

NEW YORK STATE OF OPPORTUNITY. Office of General Services
DESIGN & CONSTRUCTION

CONSULTANT
SHUMAKER
Consulting Engineering & Land Surveying, D.P.C.
143 Court Street, Binghamton, New York 13901
Telephone (607) 798-8081/ Fax (607) 798-8186

STATE OF NEW YORK · JAMES M. CUMMINGS · 080958 · LICENSED PROFESSIONAL ENGINEER

CONTRACT:
CONSTRUCTION

TITLE:
PROVIDE FORENSIC IDENTIFICATION UNIT BUILDING & HEADQUARTERS BUILDING ADDITION/RENOVATION

LOCATION:
TROOP K HEADQUARTERS
RT. 82 AND 44
POUGHKEEPSIE, NY 12603

CLIENT:
NEW YORK STATE POLICE

MARK	DATE	DESCRIPTION
2	01/21/2021	ADDENDUM 5
1	01/08/2021	ADDENDUM 4

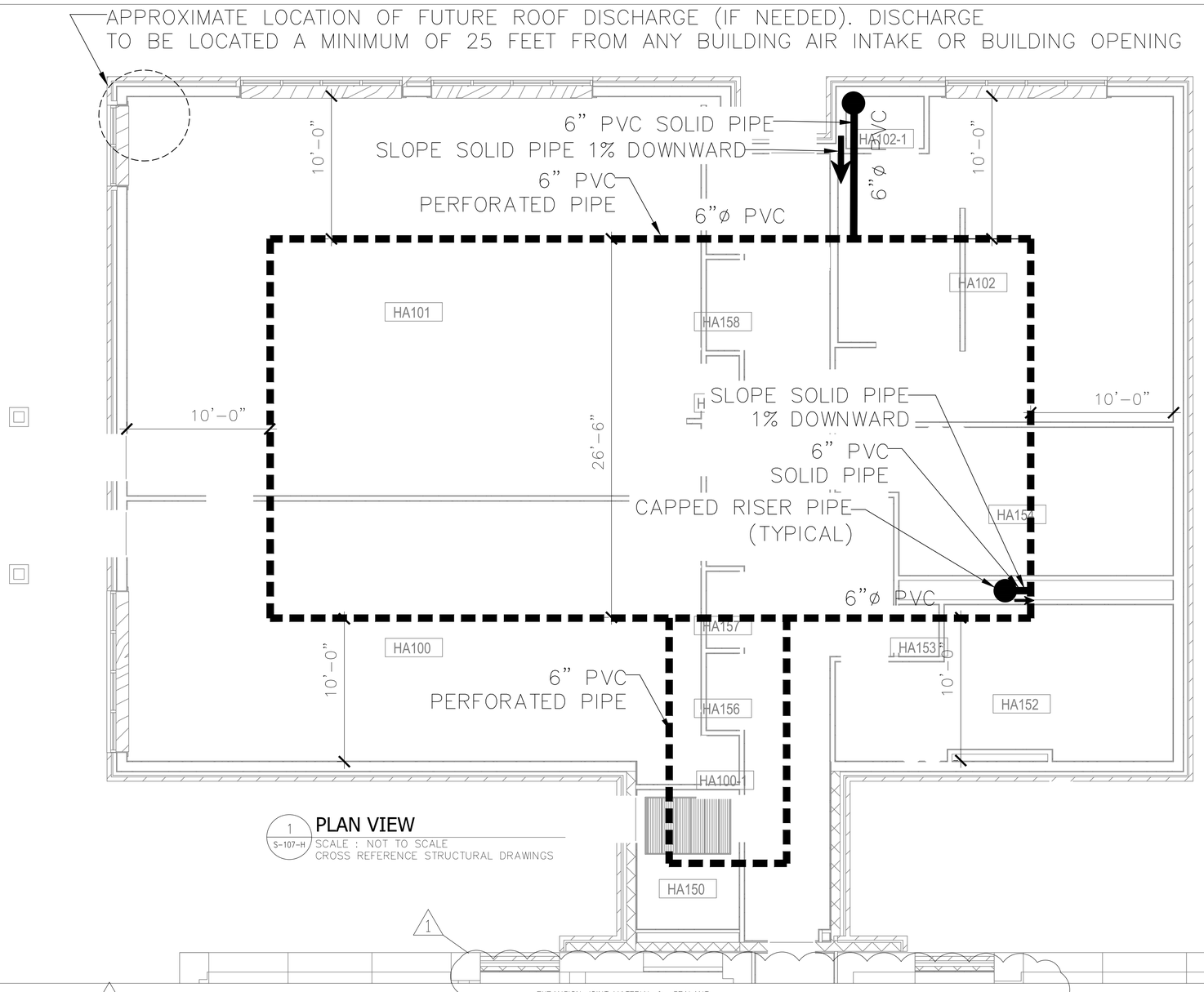
PROJECT NUMBER:	45649-C
DESIGNED BY:	AWR
DRAWN BY:	JTM
FIELD CHECK:	
APPROVED:	JMC

SHEET TITLE:
FENCING AND GATE DETAILS

DRAWING NUMBER:
C-504

SHEET 22 OF 24

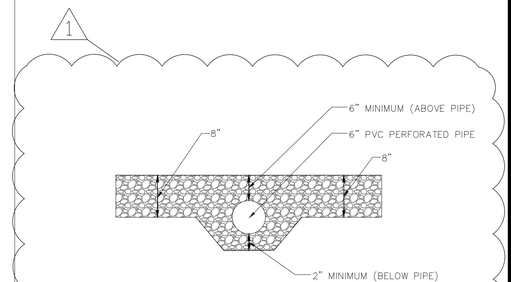
Jan 13,2021 - 11:11am
E:\2017\17282 NYSP Troop K Headquarters\Design\addendum sheets\17282 - C500-C5XX - Detail Sheets_A0.dwg
36x24 PLOT SHEET



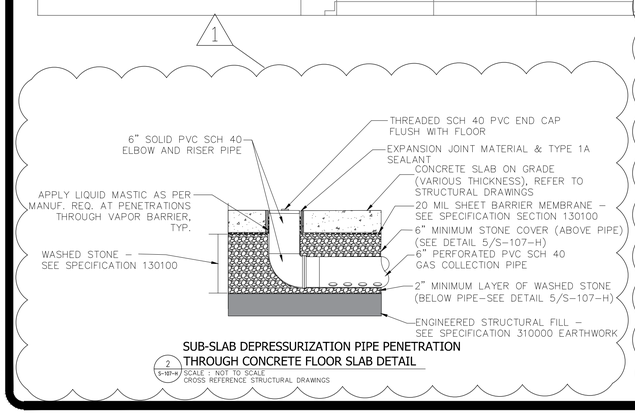
1 S-107-H **PLAN VIEW**
SCALE : NOT TO SCALE
CROSS REFERENCE STRUCTURAL DRAWINGS

NOTE:

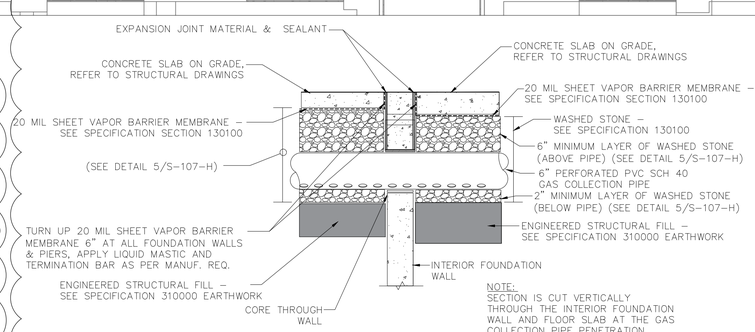
ALL SOLID PIPE SHALL HAVE A 1% SLOPE DOWNWARD FROM THE RISER.
ALL PERFORATED PIPE SHALL REMAIN LEVEL.



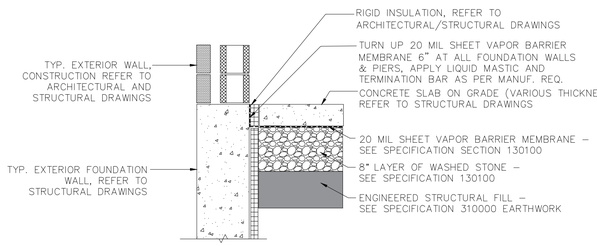
5 S-107-H **STONE DEPTH AT PIPE**
SCALE : NOT TO SCALE
CROSS REFERENCE STRUCTURAL DRAWINGS



2 S-107-H **SUB-SLAB DEPRESSURIZATION PIPE PENETRATION THROUGH CONCRETE FLOOR SLAB DETAIL**
SCALE : NOT TO SCALE
CROSS REFERENCE STRUCTURAL DRAWINGS



3 S-107-H **SUB-SLAB DEPRESSURIZATION PIPE PENETRATION THROUGH INTERIOR FOUNDATION WALL SECTION**
SCALE : NOT TO SCALE
CROSS REFERENCE STRUCTURAL DRAWINGS



4 S-107-H **SUB-SLAB DEPRESSURIZATION EXTERIOR FOUNDATION TO FLOOR DETAIL**
SCALE : NOT TO SCALE
CROSS REFERENCE STRUCTURAL DRAWINGS

36x24 PLOT SHEET

NEW YORK STATE OF OPPORTUNITY. | Office of General Services
DESIGN & CONSTRUCTION

CONSULTANT

Stantec
3 Columbia Circle Suite 6
Albany, NY 12203-5158
www.stantec.com

WARNING:
THE ALTERATION OF THIS MATERIAL IN ANY WAY, UNLESS DONE UNDER THE DIRECTION OF A COMPARABLE PROFESSIONAL, I.E. ARCHITECT FOR AN ARCHITECT, ENGINEER FOR AN ENGINEER OR LANDSCAPE ARCHITECT, FOR A LANDSCAPE ARCHITECT, IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW AND/OR REGULATIONS AND IS A CLASS "A" MISDEANOR.

STATE OF NEW YORK — ANTHONY KENNEDY HARRIS — 061283 — LICENSED PROFESSIONAL ENGINEER

CONTRACT:
CONSTRUCTION

TITLE:
PROVIDE FORENSIC IDENTIFICATION UNIT BUILDING & HEADQUARTERS BUILDING ADDITION / RENOVATION

LOCATION:
TROOP K HEADQUARTERS
RT. 82 AND 44
POUGHKEEPSIE, NY 12603

CLIENT:
NEW YORK STATE POLICE

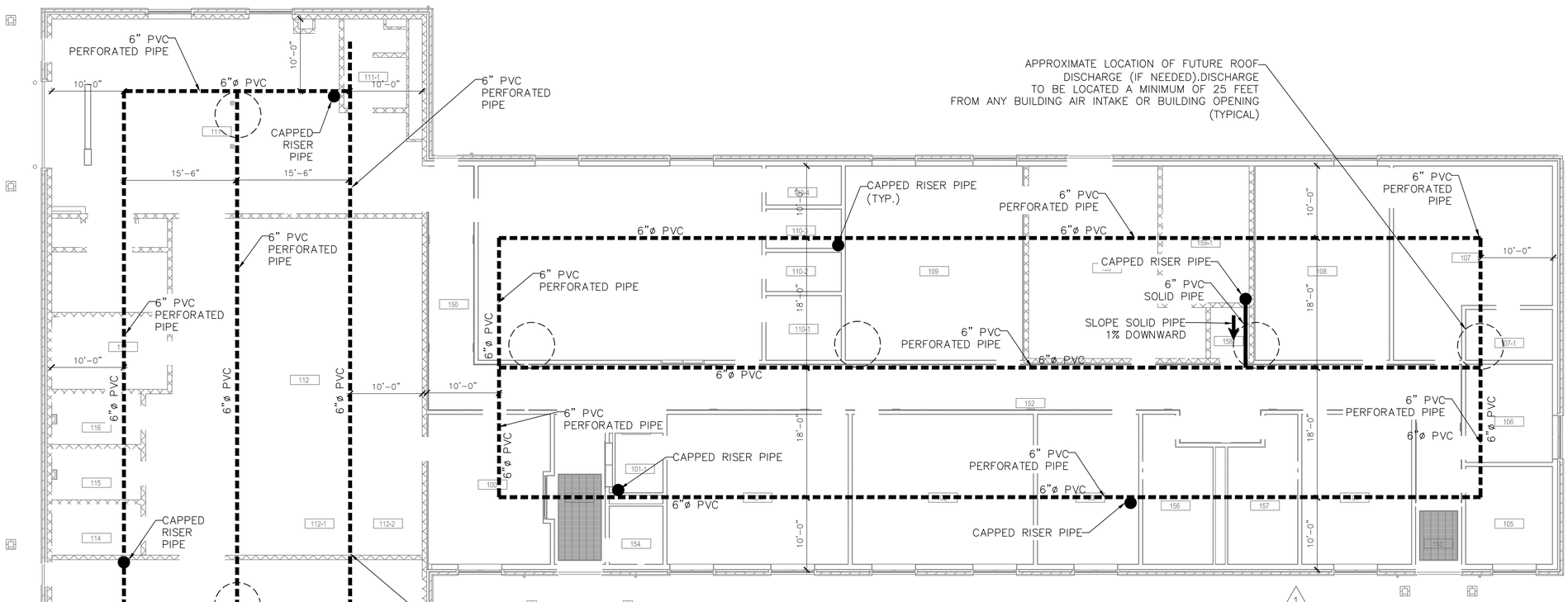
MARK	DATE	DESCRIPTION
1	01/21/2021	ADDENDUM #5
0	06/10/2020	BID/CONSTRUCTION DOCUMENTS

PROJECT NUMBER:	45649-C
DESIGNED BY:	AK/DH
DRAWN BY:	APL
FIELD CHECK:	AK
APPROVED:	DH

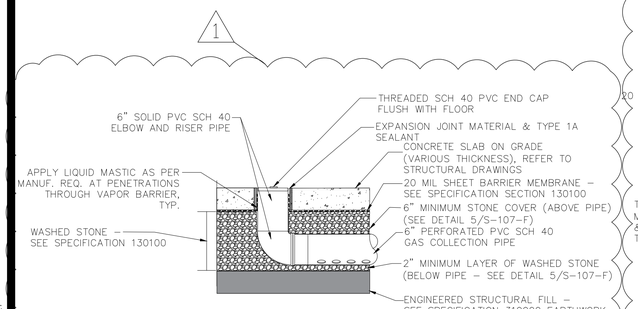
SHEET TITLE:
HEADQUARTERS
SUB-SLAB PIPING FLOOR PLAN & DETAILS

DRAWING NUMBER:
S-107-H

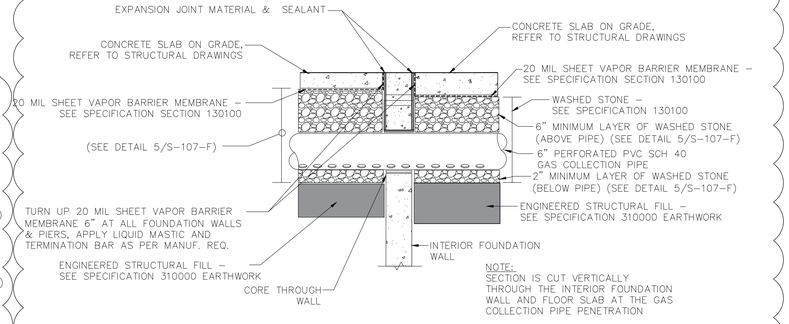
SHEET 18 OF 115



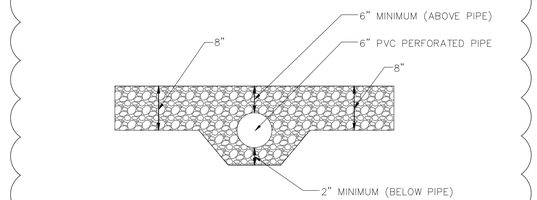
1 PLAN VIEW
S-107-F
SCALE : NOT TO SCALE
CROSS REFERENCE STRUCTURAL DRAWINGS



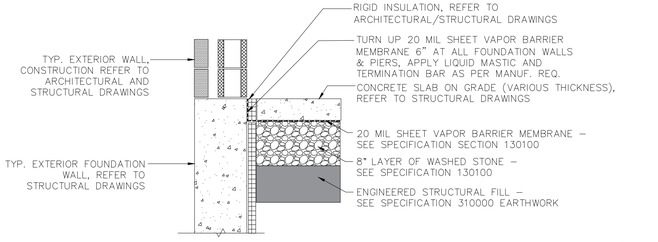
SUB-SLAB DEPRESSURIZATION PIPE PENETRATION THROUGH CONCRETE FLOOR SLAB DETAIL
3 / S-107-F
SCALE : NOT TO SCALE
CROSS REFERENCE STRUCTURAL DRAWINGS



SUB-SLAB DEPRESSURIZATION PIPE PENETRATION THROUGH INTERIOR FOUNDATION WALL SECTION
3 / S-107-F
SCALE : NOT TO SCALE
CROSS REFERENCE STRUCTURAL DRAWINGS



STONE DEPTH AT PIPE
5 / S-107-F
SCALE : NOT TO SCALE
CROSS REFERENCE STRUCTURAL DRAWINGS



SUB-SLAB DEPRESSURIZATION EXTERIOR FOUNDATION TO FLOOR DETAIL
4 / S-107-F
SCALE : NOT TO SCALE
CROSS REFERENCE STRUCTURAL DRAWINGS

TRUE NORTH / PROJECT NORTH

36x24 PLOT SHEET

NEW YORK STATE OF OPPORTUNITY. Office of General Services
DESIGN & CONSTRUCTION

CONSULTANT

Stantec
3 Columbia Circle Suite 6
Albany, NY 12203-5158
www.stantec.com

STATE OF NEW YORK · DIANE ALAN HAMMERLY · 061283 · LICENSED PROFESSIONAL ENGINEER

CONTRACT:
CONSTRUCTION

TITLE:
PROVIDE FORENSIC IDENTIFICATION UNIT BUILDING & HEADQUARTERS BUILDING ADDITION / RENOVATION

LOCATION:
TROOP K HEADQUARTERS
RT. 82 AND 44
POUGHKEEPSIE, NY 12603

CLIENT:
NEW YORK STATE POLICE

MARK	DATE	DESCRIPTION
1	01/21/2021	ADDENDUM #5
0	06/10/2020	BID/CONSTRUCTION DOCUMENTS

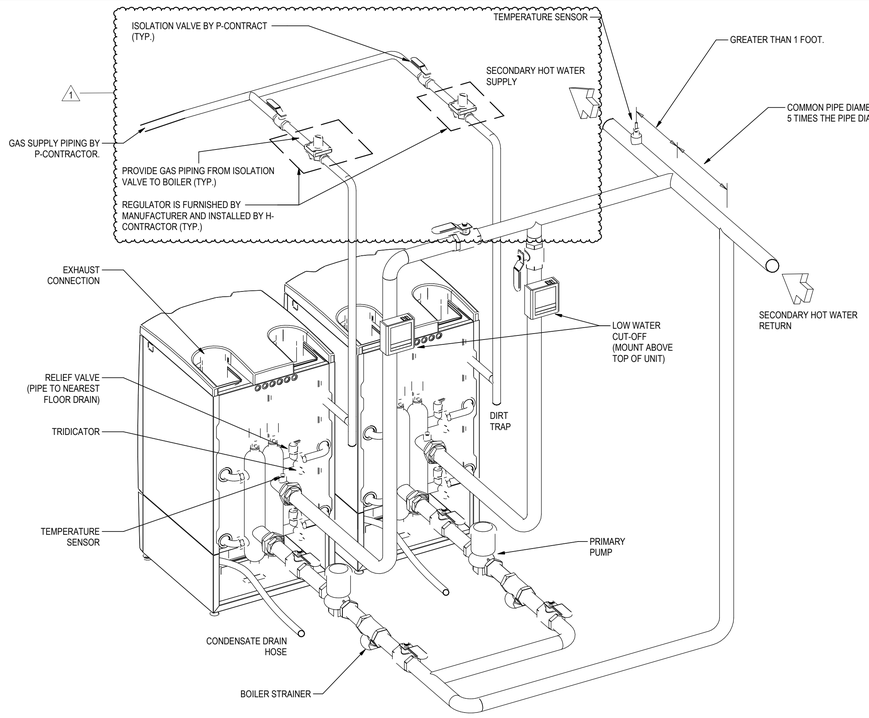
PROJECT NUMBER:	45649-C
DESIGNED BY:	AK/DH
DRAWN BY:	APL
FIELD CHECK:	AK
APPROVED:	DH

SHEET TITLE:
FORENSIC IDENTIFICATION UNIT

SUB-SLAB PIPING FLOOR PLAN & DETAILS

DRAWING NUMBER:
S-107-F

SHEET 13 OF 117

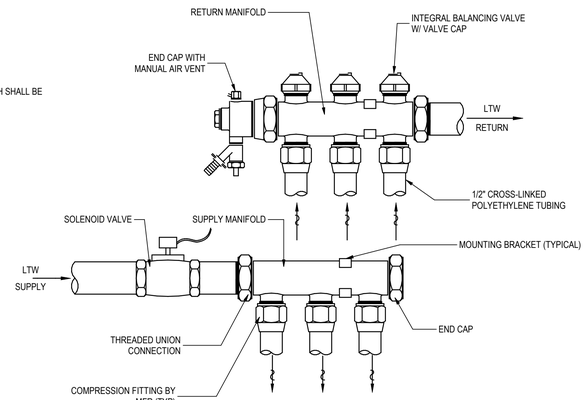


NOTES:

1. COORDINATE GAS PIPING WITH P-CONTRACTOR

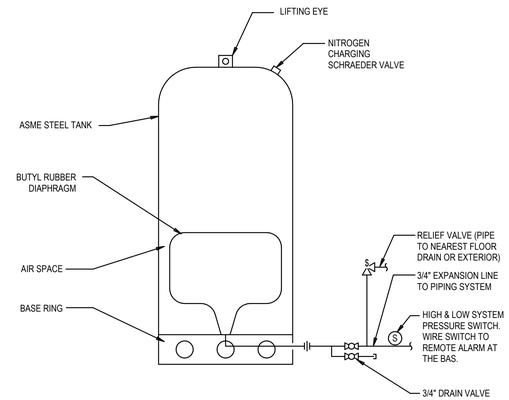
1 BOILER WITH PRIMARY PUMPS - PIPING CONNECTIONS

M-601-F N.T.S.



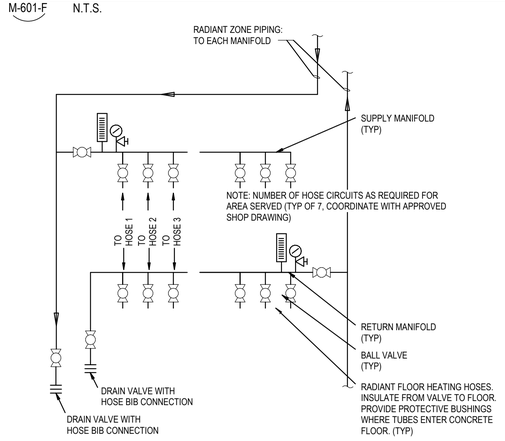
2 RADIANT FLOOR MANIFOLD PIPING DETAIL A

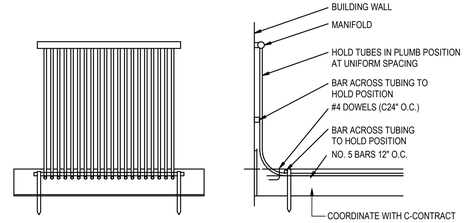
M-601-F N.T.S.



4 DIAPHRAM EXPANSION TANK

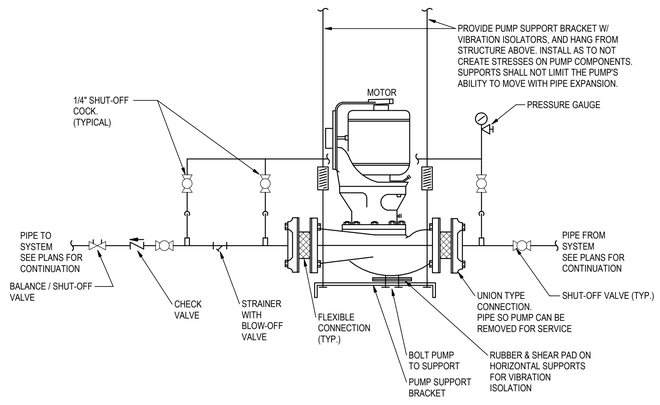
M-601-F N.T.S.





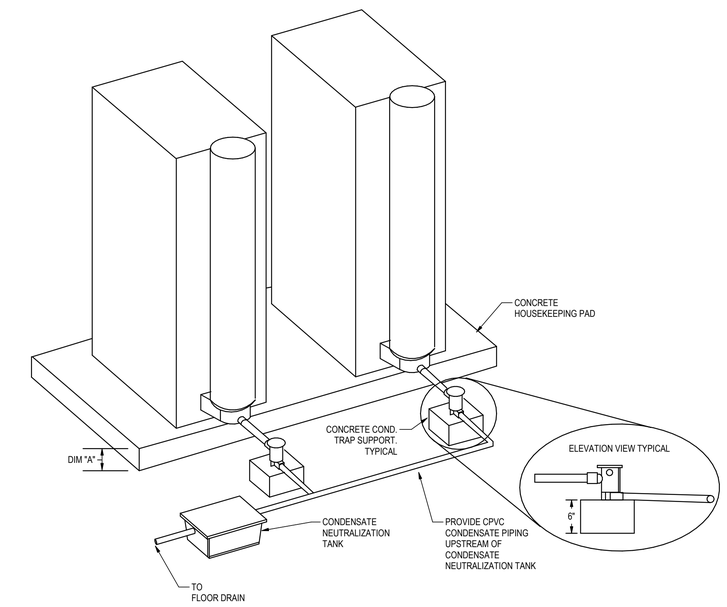
5 RADIANT FLOOR MANIFOLD PIPING DETAIL B

M-601-F N.T.S.



INSTALLATION NOTES

1. SHUT OFF VALVES AND ACCESSORIES SHALL BE THE SAME SIZE AS SYSTEM PIPING.
2. THE BALANCE VALVE SHALL BE SIZED AT A PRESSURE DROP OF 3 PSI MAX AT FULL FLOW.
3. PROVIDE OPTIONAL SPACER COUPLING FOR FLUID TEMPERATURES OVER 100 DEG. F.



NOTES:

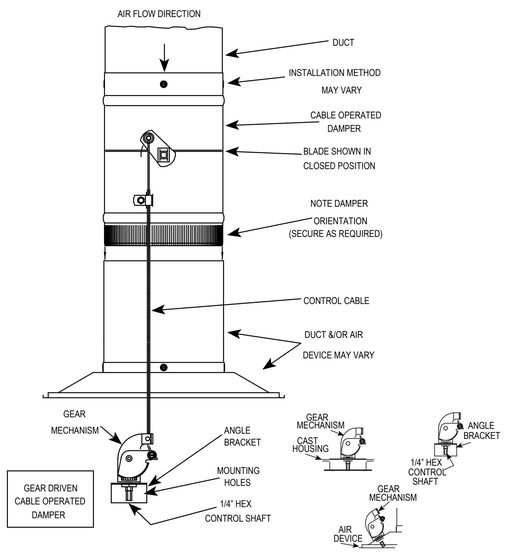
1. DIM "A" TO BE A MINIMUM OF 8", OR AS RECOMMENDED BY THE MANUFACTURER.

6 CONDENSING BOILER DRAIN AND ACID NEUTRALIZER DETAIL

M-601-F N.T.S.

3 INLINE PUMP INSTALLATION (OVER 1 H.P.)

M-601-F N.T.S.



7 CABLE OPERATED DAMPER

M-601-F 12" = 1'-0"

NEW YORK STATE OF OPPORTUNITY. Office of General Services
DESIGN & CONSTRUCTION

CONSULTANT

Stantec
3 Columbia Circle Suite 6
Albany, NY 12203-5158
www.stantec.com

CONTRACT: HVAC

TITLE: PROVIDE FORENSIC IDENTIFICATION UNIT BUILDING & HEADQUARTERS BUILDING ADDITION / RENOVATION

LOCATION: TROOP K HEADQUARTERS RT. 82 AND 44 POUGHKEEPSIE, NY 12603

CLIENT: NEW YORK STATE POLICE

MARK	DATE	DESCRIPTION
1	01/21/2021	ADDENDUM #5
0	06/10/2020	BID/CONSTRUCTION DOCUMENTS

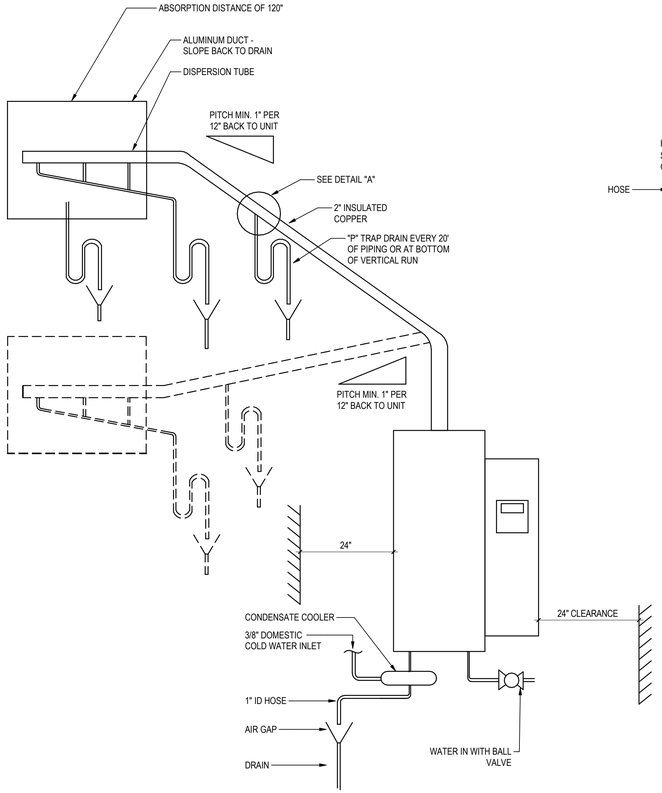
PROJECT NUMBER:	45649-H
DESIGNED BY:	FM
DRAWN BY:	JLB
FIELD CHECK:	
APPROVED:	JDR

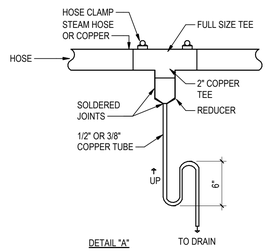
SHEET TITLE: FORENSIC IDENTIFICATION UNIT EQUIPMENT DETAILS – SHEET #1

DRAWING NUMBER: M-601-F

SHEET 68 OF 117

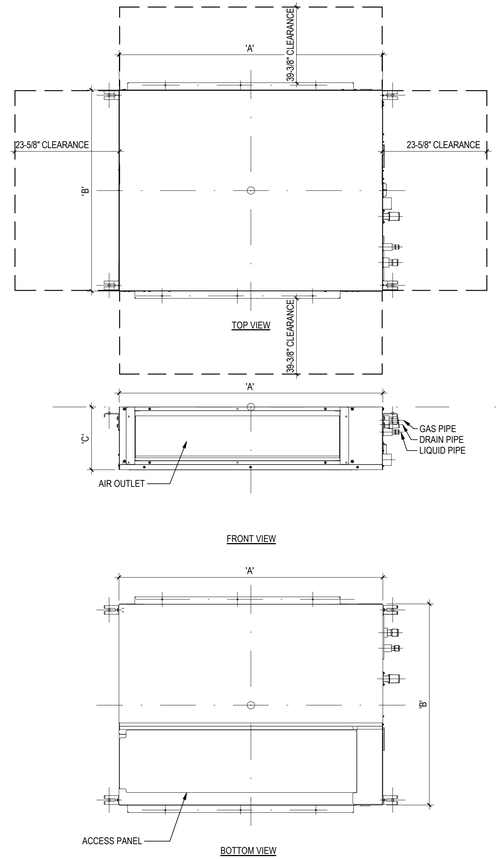
1/21/2021 4:40:40 PM 36x24 PLOT SHEET

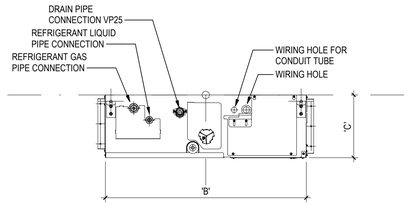




1 HUMIDIFIER PIPING DETAIL

M-604-F N.T.S.



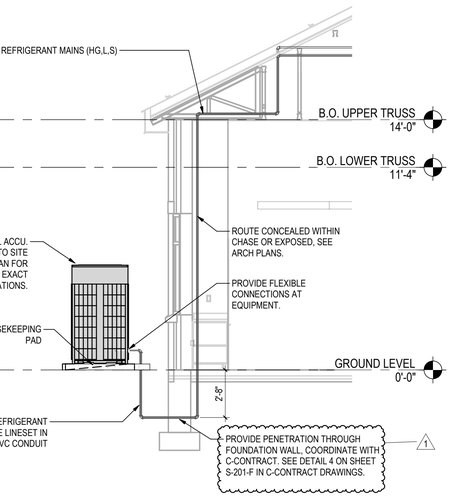


FAN COIL UNIT DIMENSIONS			
BASIS OF DESIGN MODEL #	A	B	C
YID M006, 008, 012, 015B22S	27-9/16"	31-1/2"	9-7/8"
YID M018, 024, 027B22S	41-1/2"	31-1/2"	9-7/8"

NOTE: PROVIDE FLEXIBLE DUCTWORK CONNECTIONS FOR EACH FAN COIL UNIT.

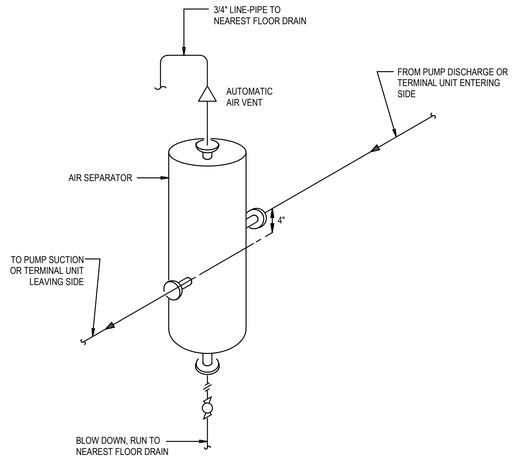
2 FAN COIL UNIT DETAIL

M-604-F N.T.S.



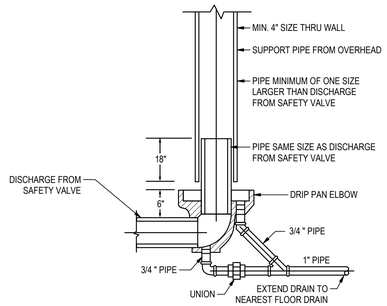
3 REFRIGERANT FOUNDATION PENETRATION DETAIL

M-604-F 1/4" = 1'-0"



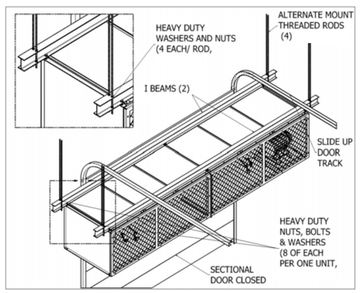
4 CENTRIFUGAL AIR SEPARATOR DETAIL

M-604-F N.T.S.



5 HHW PIPING CONNECTIONS FROM DISCHARGE OF SAFETY VALVE

M-604-F N.T.S.



NOTES:

1. COORDINATE CLEARANCES OF GARAGE DOOR WITH GARAGE DOOR MANUFACTURER.
2. REFER TO DETAIL 13 ON S-307-F FOR INSTALLATION.
3. USE TOP MOUNTING BRACKETS FOR OVERHEAD INSTALLATION OF UNIT.

6 AIR CURTAIN HANGING DETAIL

M-604-F 12" = 1'-0"

NEW YORK STATE OF OPPORTUNITY. Office of General Services

DESIGN & CONSTRUCTION

CONSULTANT

Stantec
3 Columbia Circle Suite 6
Albany, NY 12203-5158
www.stantec.com

CONTRACT:
HVAC

TITLE:
PROVIDE FORENSIC IDENTIFICATION UNIT BUILDING & HEADQUARTERS BUILDING ADDITION / RENOVATION

LOCATION:
TROOP K HEADQUARTERS
RT. 82 AND 44
POUGHKEEPSIE, NY 12603

CLIENT:
NEW YORK STATE POLICE

MARK	DATE	DESCRIPTION
1	01/21/2021	ADDENDUM #5
0	06/10/2020	BID/CONSTRUCTION DOCUMENTS

PROJECT NUMBER:	45649-H
DESIGNED BY:	FM
DRAWN BY:	JLB
FIELD CHECK:	
APPROVED:	JDR

SHEET TITLE:
FORENSIC IDENTIFICATION UNIT EQUIPMENT DETAILS – SHEET #4

DRAWING NUMBER:
M–604–F

SHEET 71 OF 117

1/21/2021 3:42:47 PM
36x24 PLOT SHEET

SPECIFICATION 238316 — RADIANT FLOOR

UNIT IDENTIFICATION MARK	LOCATION	ZONES	HEATED AREA (SQFT)	FLUID TYPE	CONSTRUCTION	ATTACHMENT METHOD	TUBE TYPE	TUBE SPACING (INCH)	LEADER LENGTH (FEET)	LOOP LENGTH (FEET)	# OF LOOPS	ROOM BTUH LOAD PER SQFT	SURFACE TEMP (F)	DESIGN TEMP DROP (F)	FLOW RATE (TOTAL GPM)	HEAD LOSS (FT H20)	FLUID TEMP. REQUIRED (F)	FLUID TEMP SUPPLIED (F)	BASIS OF DESIGN MANUFACTURER	NOTES
FIU-RFLR-1	GARAGE FLOOR	1	1350	30% PG	SLAB OG/CONCRETE	EMBEDDED	HEPEX 1/2"	12	10	SEE M-203-F	7	19.2	79.6	20	3.2	2.6	114	114	UPONOR	

NOTES:
1. PROVIDE IN-SLAB SENSOR COMPATIBLE WITH RADIANT FLOOR.
2. COORDINATE RADIANT FLOOR LAYOUT WITH P-CONTRACT AND C-CONTRACT.

SPECIFICATION 238216 — DUCT MOUNTED HOT WATER HEATING COIL SCHEDULE

UNIT IDENTIFICATION		COIL						AIR					FLUID					OPERATING WEIGHT (LBS.)	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL NUMBER	NOTES
MARK	FCU SERVED	TOTAL CAPACITY (MBH)	HEIGHT (IN)	LENGTH (IN)	NUMBER OF ROWS	FIN DENSITY (FINS/IN)	FIN TYPE	TOTAL AIRFLOW (CFM)	EDB (F)	LDB (F)	FACE VELOCITY (FPM)	APD (IN-WG)	FLUID TYPE	FLUID FLOW (GPM)	EWT (F)	LWT (F)	WPD (FT)				
FIU-RHC-1	FIU-FCU-9	20.3	12	24	2	8	ALUMINUM	1,210	72.0	87.0	605	0.21	PROPYLENE GLYCOL 30%	1.00	140.0	100.0	0.6	17.1	USACOILS	F58-208	
FIU-RHC-2	FIU-FCU-10	7.1	9	15	2	10	ALUMINUM	425	72.0	87.0	455	0.15	PROPYLENE GLYCOL 30%	0.35	140.0	100.0	0.1	10.4	USACOILS	F58-210	
FIU-RHC-3	FIU-FCU-11	4.4	9	15	2	8	ALUMINUM	260	72.0	87.0	280	0.06	PROPYLENE GLYCOL 30%	0.22	140.0	100.0	0.0	10.0	USACOILS	F58-208	
FIU-RHC-4	FIU-FCU-12	10.9	9	18	2	10	ALUMINUM	660	72.0	87.0	590	0.23	PROPYLENE GLYCOL 30%	0.55	140.0	100.0	0.2	11.9	USACOILS	F58-210	
FIU-RHC-5	FIU-FCU-13	13.3	12	18	2	8	ALUMINUM	800	72.0	87.0	535	0.17	PROPYLENE GLYCOL 30%	0.66	140.0	100.0	0.3	13.7	USACOILS	F58-208	
FIU-RHC-6	FIU-FCU-14	12.7	12	15	2	10	ALUMINUM	740	72.0	87.0	600	0.24	PROPYLENE GLYCOL 30%	0.63	140.0	100.0	0.2	12.5	USACOILS	F58-210	
FIU-RHC-7	FIU-FCU-15	7.1	9	15	2	10	ALUMINUM	425	72.0	87.0	455	0.15	PROPYLENE GLYCOL 30%	0.35	140.0	100.0	0.1	10.4	USACOILS	F58-210	
FIU-RHC-8	FIU-FCU-16	4.6	9	15	2	8	ALUMINUM	250	72.0	87.0	280	0.06	PROPYLENE GLYCOL 30%	0.22	140.0	100.0	0.0	10.4	USACOILS	F58-208	
FIU-RHC-9	FIU-FCU-17	9.6	12	15	2	8	ALUMINUM	575	72.0	87.0	460	0.13	PROPYLENE GLYCOL 30%	0.48	140.0	100.0	0.1	12.0	USACOILS	F58-208	
FIU-RHC-10	FIU-FCU-18	12.8	12	15	2	10	ALUMINUM	750	72.0	87.0	600	0.24	PROPYLENE GLYCOL 30%	0.63	140.0	100.0	0.2	12.5	USACOILS	F58-210	
FIU-RHC-11	FIU-FCU-19	7.2	9	15	2	10	ALUMINUM	430	72.0	87.0	460	0.16	PROPYLENE GLYCOL 30%	0.36	140.0	100.0	0.1	10.4	USACOILS	F58-210	
FIU-RHC-12	FIU-FCU-20	4.1	9	15	2	8	ALUMINUM	235	72.0	87.0	250	0.05	PROPYLENE GLYCOL 30%	0.20	140.0	100.0	0.0	10.0	USACOILS	F58-208	
FIU-RHC-13	FIU-FCU-21	4.5	9	15	2	8	ALUMINUM	265	72.0	87.0	285	0.06	PROPYLENE GLYCOL 30%	0.22	140.0	100.0	0.0	10.0	USACOILS	F58-208	

NOTES:

SPECIFICATION 233300 — GRILLE, REGISTER, DIFFUSER SCHEDULE

UNIT... MARK	SYSTEM CLASSIFICATION	DIFFUSER FACE SIZE (IN)	FLOW RANGE (CFM)	STATIC PRESSURE (IN. WG.)	DIFFUSER NECK SIZE (IN)	NC LEVEL	FLOW PATTERN	MOUNTING TYPE	MATERIAL	ACCESSORY	MANUFACTURER	MODEL NUMBER	NOTES
FIU-SD-1	SUPPLY	24 X 24	380-435	0.07	AS NOTED ON PLANS	<20	4-WAY	ACOUSTICAL CEILING TILE	ALUMINUM	OBD	TITUS	OMNI-AA	1,2,3,4,8
FIU-SD-2	SUPPLY	24 X 24	120-630	0.08	AS NOTED ON PLANS	<30	4-WAY	ACOUSTICAL CEILING TILE AND GYPUSM CEILING	ALUMINUM	OBD	TITUS	TMSA-AA	1,2,3,4,5,6,7,8
FIU-SD-3	SUPPLY	24 X 24	220-275	0.07	AS NOTED ON PLANS	<20	4-WAY	ACOUSTICAL CEILING TILE	ALUMINUM	OBD	TITUS	PCS-AA	1,2,3,4,8
FIU-SD-4	SUPPLY	16 X 16	80-170	0.01	AS NOTED ON PLANS	<20	4-WAY	GYPSUM CEILING	ALUMINUM	OBD	TITUS	PAS-AA	1,2,3,4,6,7,8
FIU-SD-5	SUPPLY	24 X 24	385	0.07	AS NOTED ON PLANS	<25	-	ACOUSTICAL CEILING TILE	ALUMINUM	-	TITUS	PAR-AA	1,2,3,4,8
FIU-SG-1	SUPPLY	10"X10"	40	0.02	10"X6"	<25	-	GYPSUM WALL	ALUMINUM	-	TITUS	45F	1,3,8
FIU-SG-2	SUPPLY	20"X20"	140	0.02	14"X14"	<25	-	GYPSUM WALL	ALUMINUM	-	TITUS	45F	1,3,8
FIU-TG-1	TRANSFER	20"X12"	450	-0.10	20"X12"	<25	-	GYPSUM WALL	ALUMINUM	-	TITUS	45F	1,3,8
FIU-RG-1	RETURN	24 X 24	175-470	-0.13	AS NOTED ON PLANS	<25	-	ACOUSTICAL CEILING TILE	ALUMINUM	-	TITUS	PAR-AA	1,2,3,4,8
FIU-RG-2	RETURN	12 X 12	25-200	-0.13	AS NOTED ON PLANS	<25	-	ACOUSTICAL CEILING TILE	ALUMINUM	-	TITUS	PAR-AA	1,2,3,4,8
FIU-EG-1	EXHAUST	24 X 24	1000 MAX	-0.07	AS NOTED ON PLANS	<25	-	GYPUSM CEILING	ALUMINUM	-	TITUS	45F	1,2,3,4,5,6,8
FIU-EG-2	EXHAUST	12 X 12	350 MAX	-0.07	AS NOTED ON PLANS	<25	-	GYPUSM CEILING	ALUMINUM	-	TITUS	45F	1,2,3,4,6,8
FIU-EG-3	EXHAUST	8 X 4	100 MAX	-0.07	AS NOTED ON PLANS	<25	-	GYPSUM CEILING	ALUMINUM	-	TITUS	45F	1,2,3,4,6,8

NOTES:
1. REFER TO REFLECTED CEILING PLANS FOR EXACT LOCATION.
2. FLEXIBLE DUCTWORK SHALL BE THE SAME SIZE AS THE DIFFUSER NECK OR AN EQUIVALENT ROUND DUCT. FLEXIBLE DUCTWORK SHALL BE SUPPORTED TO PREVENT KINKS OR BENDS. MAXIUM LENGTH OF FLEXIBLE DUCTWORK NOT TO EXCEED 5 FT.
3. COLOR TO BE SELECTED BY ARCHITECT FROM STANDARD COLORS.
4. BALANCE AIR TERMINALS TO VALUES LISTED ON PLAN.
5. PROVIDE GYPSUM CEILING MOUNTING IN ROOM 111, ROOM 112, ROOM 113, ROOM 156, AND ROOM 157. ALL OTHER ROOMS USE ACOUSTICAL CEILING TYPE MOUNTING.
6. PROVIDE CABLE OPERATED DAMPER WHERE CEILING IS INACCESSIBLE.
7. PROVIDE WITH OPTIONAL DIRECTIONAL BLOW CLIPS. BALANCER SHALL ADJUST AIRFLOW PATTERNS FOR COMFORTABLE / DRAFT FREE PERFORMANCE. REFER TO SHEET M-301-F FOR SUGGESTED DIFFUSER BLOW PATTERNS.
8. PROVIDE ALL FRAMES AND ACCESSORIES AS REQUIRED FOR PROPER INSTALLATION.

SPECIFICATION 238413 — HUMIDIFIER SCHEDULE

UNIT IDENTIFICATION MARK	LOCATION	MAKEUP WATER (GPM)	SUPPLY AIR (CFM)	EAT (F)	LAT (F)	GR/LB AIR IN	GR/LB AIR OUT	ABSORPTION DISTANCE (IN)	PHYSICAL CHARACTERISTICS HEIGHT (IN)	WIDTH (IN)	OPERATING WEIGHT (LBS.)	ELECTRICAL V/PH/HZ	FLA	KW	OCP	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL NUMBER	NOTES
FIU-HUM-1	111	1.2	1,210	72.0	72.0	0	70	120	56	26	330	200/3/60	37	15	50	ARMSTRONG	HUMIDICLEAN HC6100	1
FIU-HUM-2	159	1.2	750	72.0	72.0	0	70	120	56	26	330	200/3/60	23	9	30	ARMSTRONG	HUMIDICLEAN HC6100	1

NOTES:
1. PROVIDE CONDENSATE COOLER ON HUMIDIIFER DRAINS. USE ARMSTRONG TEMP-R-DRAIN OR APPROVED EQUAL.

SPECIFICATION 233600 — AIR TERMINAL UNIT APPLICATION SCHEDULE

UNIT IDENTIFICATION MARK	SYSTEM SERVED	ROOM(S) SERVED	BOX CHARACTERISTICS BOX INLET (IN)	BOX OUTLET (IN)	MAX STATIC PRESSURE DROP (IN WC)	AIRFLOW MAX AIRFLOW (CFM)	MINIMUM AIRFLOW (CFM)	DIMENSIONS HEIGHT (IN)	LENGTH (IN)	ELECTRICAL V/P/HZ	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL	NOTES
FIU-VAV-1	FIU-DOAS-1	111	12" Ø	14"X12.5"	0.50	2,000	145	15	18	115/1/60	TITUS	DESV	1,2,3

NOTES:
1. BOXES TO BE PROVIDED WITH INTEGRAL ACCESS PANEL.
2. E CONTRACT TO PROVIDE DISCONNECT.
3. PROVIDE WITH 24V/120V TRANSFORMER.

CHARCOAL FILTER SCHEDULE

UNIT IDENTIFICATION MARK	UNIT SERVED	FUNCTION	FILTER FILTER TYPE	TOTAL AIRFLOW (CFM)	AIR PRESSURE DROP INITIAL (IN-WG)	AIR PRESSURE DROP FINAL (IN-WG)	EFFICIENCY (MERV)	FILTER MEDIA QTY.	WIDTH (IN)	HEIGHT (IN)	DEPTH (IN)	MANUFACTURER	MODEL NUMBER	NOTES
FIU-CF-1	FIU-EF-7	ODOR NEUTRALIZER	PLEATED	450	0.41	1.00	8	1	12	12	4	TRIDIM MANN+HUMMEL	TRISORB-XL HIGH EFFICIENCY CARBON SERIES	1, 2, 3

NOTES:
1. PROVIDE FILTER RACKS FOR FILTER INSTALLATION.
2. FINAL AIR PRESSURE DROPS ARE BASED ON DIRTY FILTERS.
3. PROVIDE HEAVY DUTY SELECTION.

SPECIFICATION 232123 — PUMP SCHEDULE

UNIT IDENTIFICATION MARK	LOCATION	SYSTEM SERVED	PUMP TYPE	FLOW (GPM)	HEAD (FT)	MOTOR HP	SPEED (RPM)	ELECTRICAL VOLTS	HERTZ	PHASE	STARTER TYPE	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL NUMBER	NOTES
FIU-PHWP-1	159	BOILER	IN-LINE	20	15	1/4	1800	115	60	1	ATL	B&G	E-90	2
FIU-PHWP-2	159	BOILER	IN-LINE	20	15	1/4	1800	115	60	1	ATL	B&G	E-90	2
FIU-SHWP-1	159	HHW	IN-LINE	40	45	1-1/2	3414	200	60	3	VFD	B&G	E-90 1.5AAB	
FIU-SHWP-2	159	HHW	IN-LINE	40	45	1-1/2	3414	200	60	3	VFD	B&G	E-90 1.5AAB	
FIU-THWP-1	111	RADIANT FLOOR	IN-LINE	4	3	0.0115	1492	115	60	1	ECM	B&G	ECO-CIRC 19-16	
FIU-THWP-2	111	RADIANT FLOOR	IN-LINE	4	3	0.0115	1492	115	60	1	ECM	B&G	ECO-CIRC 19-16	

NOTES:
1. PROVIDE ALL LEAD FREE, BRONZE CONSTRUCTION.
2. PERFORMANCE REQUIREMENTS FOR APPROVED EQUAL TO AERCO PUMP KIT SCHEDULED HERE. REFER TO BOILER SCHEDULE, NOTE #1.

SPECIFICATION 232006 — AIR SEPARATOR SCHEDULE

UNIT IDENTIFICATION MARK	NUMBER	SYSTEM SERVED	TYPE	CONNECTION SIZE (IN)	DIAMETER (IN)	HEIGHT (IN)	WEIGHT (LBS)	FLOW (GPM)	MAX WPD (FT)	MANUFACTURER	MODEL NUMBER	NOTES
FIU-AS	1	HHW	CENTRIFUGAL	3	11	27	173	40.0	0.1	BELL AND GOSSETT	RL-3FB	

NOTES:

SPECIFICATION 232006 — EXPANSION TANK SCHEDULE

UNIT IDENTIFICATION MARK	NUMBER	SYSTEM SERVED	TYPE	FILL PRESSURE (PSI)	REQUIRED TANK VOLUME (GAL.)	REQUIRED ACCEPTANCE VOLUME (GAL.)	ACTUAL TANK VOLUME (GAL.)	ACTUAL ACCEPTANCE VOLUME (GAL.)	MANUFACTURER	MODEL NUMBER	NOTES
FIU-ET	1	HHW	CENTRIFUGAL	9	17.36	8.15	26	11.0	BELL & GOSSETT	B-100LA	

NOTES:

SPECIFICATION 089100 — LOUVER SCHEDULE

UNIT IDENTIFICATION MARK	LOCATION	QTY	WIDTH (IN.)	HEIGHT (IN.)	CFM INTAKE	FREE AREA (SQ.FT.)	FREE AREA %	FREE AREA VEL. (FPM)	PRESSURE DROP (W.G.)	BEGINNING WATER PEN. (FPM)	MANUFACTURER	MODEL NUMBER	NOTES
FIU-LV-1	MECHANICAL ROOM MEZZANINE	1	34	47	3000	6.1	55%	500	0.04	989	GREENHECK	ESD435	1,2
FIU-LV-2	MECHANICAL ROOM MEZZANINE	1	32	35	2000	4.02	52%	500	0.04	989	GREENHECK	ESD435	1,2
FIU-LV-3	MECHANICAL ROOM MEZZANINE	1	36	39	2550	5.19	53.2	500	0.04	989	GREENHECK	ESD435	1,2

NOTES:
1. LOUVER LOCATION TO BE COORDINATED WITH C CONTRACT.
2. SUBMIT COLOR OPTIONS FOR SELECTION BY DIRECTOR'S REPRESENTATIVE.

1/21/2021 3:42:47 PM
36x24 PLOT SHEET

NEW YORK STATE OF OPPORTUNITY. Office of General Services
DESIGN & CONSTRUCTION

CONSULTANT
Stantec
3 Columbia Circle Suite 6
Albany, NY 12203-5158
www.stantec.com

CONTRACT:
HVAC

TITLE:
PROVIDE FORENSIC IDENTIFICATION UNIT BUILDING & HEADQUARTERS BUILDING ADDITION / RENOVATION

LOCATION:
TROOP K HEADQUARTERS
RT. 82 AND 44
POUGHKEEPSIE, NY 12603

CLIENT:
NEW YORK STATE POLICE

MARK	DATE	DESCRIPTION
2	01/21/2021	ADDENDUM #5
1	01/08/2021	ADDENDUM #4
0	06/10/2020	BID/CONSTRUCTION DOCUMENTS

PROJECT NUMBER: 45649-H

DESIGNED BY:	FM
DRAWN BY:	JLB
FIELD CHECK:	
APPROVED:	JDR

SHEET TITLE:
FORENSIC IDENTIFICATION UNIT SCHEDULES – SHEET #3

DRAWING NUMBER:
M-703-F

SHEET 76 OF 117

NOTES:

1. POWER AND DATA REQUIREMENTS SHOWN FOR REFERENCE ONLY AND ARE NOT FOR CONSTRUCTION.
2. WHERE POWER CIRCUITS ARE SHOWN TERMINATING IN JUNCTION BOXES WITHOUT RECEPTACLES, THE WIRES SHALL BE TAPED AND THE BOXES COVERED. THESE CIRCUITS WILL BE CONNECTED BY OTHERS DURING INSTALLATION OF THE AV SYSTEMS EQUIPMENT.
3. EMPTY CONDUIT RUNS ON THESE DRAWINGS SHOW ONLY INTERCONNECTION BETWEEN TERMINATION POINTS.
4. HIGH LEVEL/HIGH CURRENT FEEDS (SUCH AS FOR POWER DISTRIBUTION PANELS, LIGHTING, AND BRANCH CIRCUITS,) ARE NOT TO BE RUN PARALLEL WITH AUDIO/VIDEO CONDUITS OR CABLING. IF HIGH LEVEL/HIGH CURRENT FEEDS MUST RUN PARALLEL TO AUDIO/VIDEO CONDUITS OR CABLING, MINIMUM SEPARATION MUST BE MAINTAINED ACCORDING TO THE FOLLOWING TABLE. "NA" INDICATES THAT THE USE SHOULD BE AVOIDED. SPACINGS ASSUME THAT POWER CONDUCTORS WILL NOT BE TWISTED PAIRS. CLOSER SPACINGS CAN BE USED IF POWER CONDUCTORS ARE TWISTED PAIRS.

MINIMUM ACCEPTABLE DISTANCE BETWEEN PARALLEL AV AND POWER CONDUITS

AV CONDUIT	POWER CONDUIT	COMBINED AMPACITY OF ALL PHASE CONDUCTORS IN POWER CONDUIT				
		UNDER 60A	60A	120A	240A	400A
EMT	EMT	2 FT.	3 FT.	4 FT.	NA	NA
EMT	RIGID STEEL	4 IN.	8 IN.	1 FT.	2 FT.	4 FT.
RIGID STEEL	RIGID STEEL	1 IN.	2 IN.	4 IN.	8 IN.	16 IN.

4.1. NO LARGE POWER TRANSFORMERS OR MOTORS SHOULD BE LOCATED WITHIN 50 FEET OF AV EQUIPMENT SPACES.

5. ALL AV CABLING THAT IS RUN OPEN-WIRE SHALL BE SUPPORTED FROM J-HOOKS NO GREATER THAN 3 FEET APART. NO CABLE IS TO BE UNSUPPORTED OR LAID OVER CEILING TILES, BLACK IRON, OR OTHER CEILING MEMBERS.
6. THE METHOD OF INSTALLATION OF BOXES IN WALLS, AND THE METHOD OF PASSAGE OF CONDUITS AND WIREWAYS THROUGH ACOUSTICALLY SENSITIVE WALLS SHALL BE COORDINATED WITH THE ACOUSTICAL CONSULTANT.
7. INSTALL FIRESTOP TO ALL SLAB AND WALL PENETRATIONS PROVIDED FOR THE INSTALLATION OF CABLE AND CONDUIT AS REQUIRED TO MAINTAIN FIRE RATING OF SLAB OR WALL. REVIEW C-CONTRACT PLANS FOR ADDITONAL PARTITION TYPES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE FIRE RATING OF ALL WALLS AND FLOORS HAVING CABLING PENETRATIONS, COORDINATE SEALANT INSTALLATION WITH WORK OF OTHER TRADES. REFER TO ELECTRICAL SPECIFICATIONS FOR MATERIAL AND INSTALLATION PARAMETERS.
8. ALL POWER, WIREWAYS, AND JUNCTION BOXES ARE TO BE REVIEWED FOR CODE AND SAFETY COMPLIANCE.
9. REFER TO ELECTRICAL DRAWINGS FOR DISTRIBUTION PANEL ARE SIZING AND SPECIFICATION.
10. ALL CABLE TRAY THAT IS SURFACE-MOUNTED ON SLAB BELOW RAISED FLOOR OR ABOVE EQUIPMENT RACKS SHALL BE SECURELY FASTENED AND LEFT OPEN FOR CABLE ACCESS.
11. POWER FOR AV AND RELATED SYSTEMS SHALL USE AN EIA/TIA 607 COMPLIANT GROUNDING SYSTEM, REFER TO ELECTRICAL DRAWINGS. REFER TO AV DETAIL SHEETS FOR ADDITIONAL GROUNDING REQUIREMENTS IF APPLICABLE.
12. ALL AV-RELATED EMPTY CONDUIT SHALL BE REAMED, CLEANED, CAPPED (WHERE APPROPRIATE), TAGGED, AND FURNISHED WITH PULL WIRES.
13. WHERE EXACT DIMENSIONS ARE NOT INDICATED, THE SCALE OF THIS DRAWING IS SUFFICIENTLY ACCURATE FOR DETERMINING THE LOCATION OF EQUIPMENT, JUNCTION BOXES, OUTLET BOXES, WIREWAYS, PANELS, ETC. WHERE EXACT DIMENSIONS ARE INDICATED, THE REFERENCE SURFACE SHALL BE THE FINAL FINISHED SURFACE INCLUDING ANY ACOUSTICAL TREATMENT. ALL DIMENSIONS MUST BE VERIFIED AND ANY DEVIATIONS CAUSING CHANGES MUST BE COORDINATED WITH SHEN MILSOM & WILKE, LLC.
14. NOTIFY DIRECTOR'S REPRESENTATIVES OF ANY DISCREPANCIES BETWEEN THE EXISTING CONDITIONS AND THE AV DRAWINGS. OBTAIN CLARIFICATION BEFORE PROCEEDING WITH WORK.
15. ALL AV DEVICES SHALL BE SECURELY MOUNTED PLUMB AND STRAIGHT TO WALLS, FLOORS, OR RACKS PER THE MANUFACTURER'S RECOMMENDED MOUNTING PRACTICE.
16. THERE SHALL BE A MINIMUM OF ONE PULL BOX FOR EVERY 100' OF STRAIGHT EMPTY AV-RELATED CONDUIT AND ONE PULL BOX WHERE THERE ARE MORE THAN TWO 90° BENDS OR LESSER BENDS TOTALING 180° IN A CONDUIT RUN.
17. MAINTAIN MINIMUM BEND RADIUS OF 10X OD FOR ALL AV-RELATED CONDUITS.
18. CONTRACTOR SHALL RESTORE CEILINGS, WALLS AND ANY OTHER SURFACES AFFECTED BY THEIR WORK PRIOR TO COMPLETION OF WORK WITH LIKE MATERIALS TO MATCH EXISTING CONSTRUCTION.

NOTES:

19. REFER TO AV ELECTRICAL PLANS AND/OR RISER DIAGRAMS FOR EMPTY CONDUIT SIZING.
20. ALL POWER CIRCUITS INDICATED IN THIS DRAWING SET TO BE PROVIDED BY DEDICATED BREAKER PANEL(S). NO NON-AV CIRCUITS TO BE FED FROM DEDICATED AV BREAKER PANEL(S).
21. POWER FOR ALL AV SERVICES IN EACH DESIGNATED SPACE SHALL BE ON THE SAME ELECTRICAL PHASE, AND THIS PHASE SHALL NOT INCLUDE MOTORS, APPLIANCES, OR ANY OTHER SOURCE THAT CAN CAUSE SIGNAL INTERFERENCE.
22. GROUNDING: GROUND COMMUNICATIONS SYSTEMS AND EQUIPMENT IN ACCORDANCE WITH ANSI/TIA/EIA-807 GROUNDING STANDARDS AND APPLICABLE NEC REQUIREMENTS EXCEPT WHERE DRAWINGS OR SPECIFICATIONS EXCEED NEC REQUIREMENTS. ALL RACKS, METALLIC BACKBOARDS, CABLE SHEATHS, CABLE TRAYS, ETC. ENTERING OR RESIDING IN TECHNICAL EQUIPMENT SPACES SHALL BE GROUNDED TO THEIR RESPECTIVE GROUND SYSTEM USING A MINIMUM OF #6 AWG STRANDED COPPER BONDING CONDUCTOR AND COMPRESSOR CONNECTORS. ALL WIRES USED FOR TECHNICAL POWER SYSTEMS GROUNDING PURPOSES SHALL BE IDENTIFIED WITH GREEN INSULATION OR IDENTIFIED AT EACH TERMINATION POINT WITH A WRAP OF GREEN TAPE. ALL CABLES AND BUS BARS SHALL BE IDENTIFIED AND LABELED "TECHNICAL POWER SYSTEM GROUND".
23. CONDUIT STUBS: PROVIDE NYLON BUSHING ON ALL CONDUIT STUBS AND NON-TERMINATING CONDUIT ENDS TO PROTECT WIRE PULLS.
24. JUNCTION BOX COVERS: UNLESS OTHERWISE NOTED, ALL JUNCTION BOXES MUST BE PROVIDED WITH A COVER. WHERE RAISED DEVICE COVERS ARE SPECIFIED, MATCH COVER DEPTH TO WALL THICKNESS. WHERE JUNCTION BOXES ARE MOUNTED AT OR ABOVE FINISHED CEILING HEIGHT, INSTALL JUNCTION BOXES WITH OPEN SIDE FACING DOWN.
25. POWER RECEPTICALS: TECHNICAL POWER RECEPTICALS, INCLUDING THOSE WITHIN FLOOR BOXES, WALL BOXES, OR CEILING BOXES, SHALL BE PROVIDED BY THE BUILDING CONTRACTOR AND APPEAR ON THE ELECTRICAL DRAWINGS. TECHNICAL POWER RECEPTACLES IN RELATION TO TECHNOLOGY INFRASTRUCTURE IS CRITICAL. REFER TO THE ELECTRICAL DRAWINGS FOR COMPLETE POWER LAYOUTS AND CIRCUITING DETAILS
26. NETWORK OUTLETS FOR AUDIOVISUAL SYSTEMS: ALL NETWORK OUTLETS SHALL APPEAR ON THE NETWORK DRAWINGS. REFER TO THE STRUCTURED CABLING SYSTEM SPECIFICATIONS (SECTIONS 27 21 00, 27 21 12, 27 21 26, AND 27 21 29) AND DRAWINGS FOR ADDITIONAL INFORMATION.

SCOPE OF WORK BETWEEN TRADES - RESPONSIBILTY MATRIX:

SCOPE OF WORK	PROVIDE	FURNISH	INSTALL
IN-WALL BLOCKING SUPPORT FOR AV MOUNTS		GC	GC
WALL AND CEILING SPEAKER CUTOUTS			GC
FURNITURE CUTOUTS FOR AV EQUIPMENT (UNLESS PROVIDED BY FURNITURE PROVIDER)		GC	
KINDORF AND/OR BLACK IRON AS REQUIRED FOR CEILING MOUNTED AV DEVICES		GC	GC
CABLE CONTAINMENT INCLUDING:		EC	EC
CONDUIT WITH MEASURED PULLSTRINGS		EC	EC
CABLETRAY, LADDERTRAY, AND WIREWAYS		EC	EC
FLOORBOXES		EC	EC
JUNCTION BOXES, PULL BOXES, AND BACKBOXES		EC	EC
POWER OUTLETS		EC	EC
DEDICATED DISTRIBUTION PANELS, LOAD CENTERS, AND POWER ISOLATION TRANSFORMERS		EC	EC
AV CABLING (LOW VOLTAGE)		AV	AV
AV TERMINATIONS		AV	AV
CUSTOM ENGRAVED AV COVER PLATES		AV	AV
J-HOOKS AND OTHER SUPPORTS REQUIRED FOR OPEN-RUN AV CABLING		AV	AV
AV DEVICE WALL MOUNTS		AV	AV
AV DEVICES (AS DESCRIBED IN THE AV BID DOCUMENTS)		AV	AV
VOICE/DATA NETWORK CABLING (FIBER AND TWISTED PAIR)		ST	ST
VOICE/DATA COVER PLATES		ST	ST
CATV CABLING		ST	ST
LIGHTING & SHADE CONTROL INTERFACE		EC	EC

REFER TO AV DETAIL SHEETS FOR ADDITIONAL SCOPE DELINEATION AND INFORMATION

DEFINITION OF TERMS

FURNISH - TO PURCHASE AND DELIVER TO THE PROJECT SITE COMPLETE WITH EVERY NECESSARY APPURTENANCE AND SUPPORT. PURCHASING SHALL INCLUDE PAYMENT OF ALL SALES TAXES AND OTHER SURCHARGES AS MAY BE REQUIRED TO ASSURE THAT PURCHASED ITEMS ARE FREE OF ALL LIENS, CLAIMS, OR ENCUMBRANCES.

INSTALL - TO UNLOAD AT THE DELIVERY POINT AT THE SITE AND PERFORM EVERY OPERATION NECESSARY TO ESTABLISH SECURE MOUNTING AND CORRECT OPERATION AT THE PROPER LOCATION IN THE PROJECT, ALL AS PART OF THE WORK.

PROVIDE - TO FURNISH AND INSTALL.

LEGEND FOR SCOPE OF WORK BETWEEN TRADES:
GC = GENERAL CONTRACTOR
EC = ELECTRICAL CONTRACTOR
AV = AUDIOVISUAL CONTRACTOR
O = OWNER
ST = STRUCTURED CABLING, OR TELECOMMUNICATIONS CONTRACTOR

NEW YORK STATE OF OPPORTUNITY. Office of General Services
DESIGN & CONSTRUCTION

CONSULTANT
SM&W
3 Columbia Circle Suite 6
Albany, NY 12203-5158
Tel.(518) 452-4358
Fax.(518) 452-9234
www.smwllc.com

STATE OF NEW YORK CHESTER T. VOGEL LICENSED PROFESSIONAL ENGINEER

CONTRACT: ELECTRICAL
TITLE: HEADQUARTERS BUILDING ADDITION / RENOVATION
LOCATION: TROOP K HEADQUARTERS RT. 82 AND 44 POUGHKEEPSIE, NY 12603
CLIENT: NEW YORK STATE POLICE

MARK	DATE	DESCRIPTION
2	01/21/2021	ADDENDUM #5
1	01/08/2021	ADDENDUM #4
0	06/10/2020	BID/CONSTRUCTION DOCUMENTS

PROJECT NUMBER: 45649-E
DESIGNED BY: MT
DRAWN BY: MT
FIELD CHECK:
APPROVED: DG
SHEET TITLE: FORENSIC IDENTIFICATION UNIT AUDIOVISUAL NOTES
DRAWING NUMBER: TA-002-F
SHEET 106 OF 117