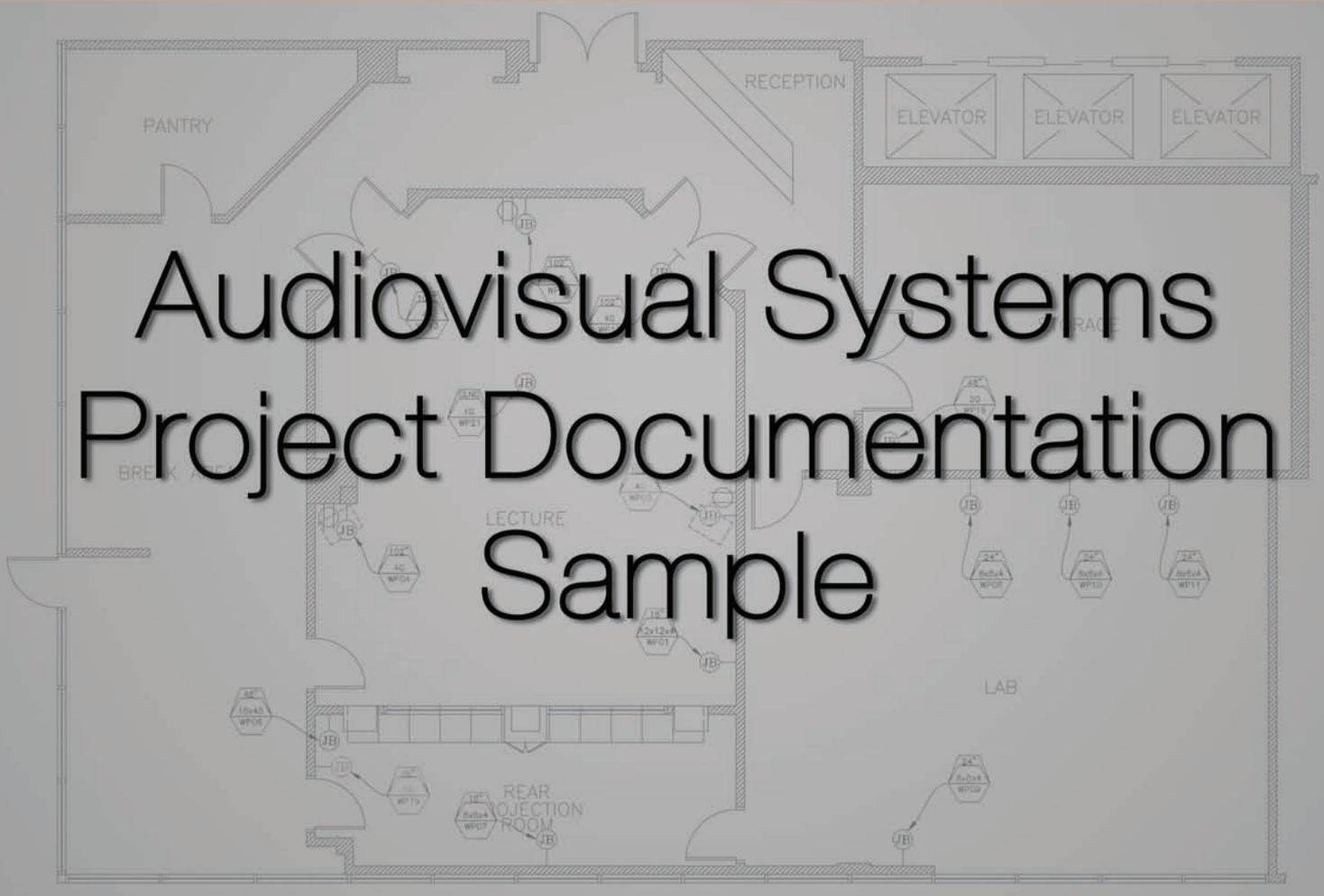
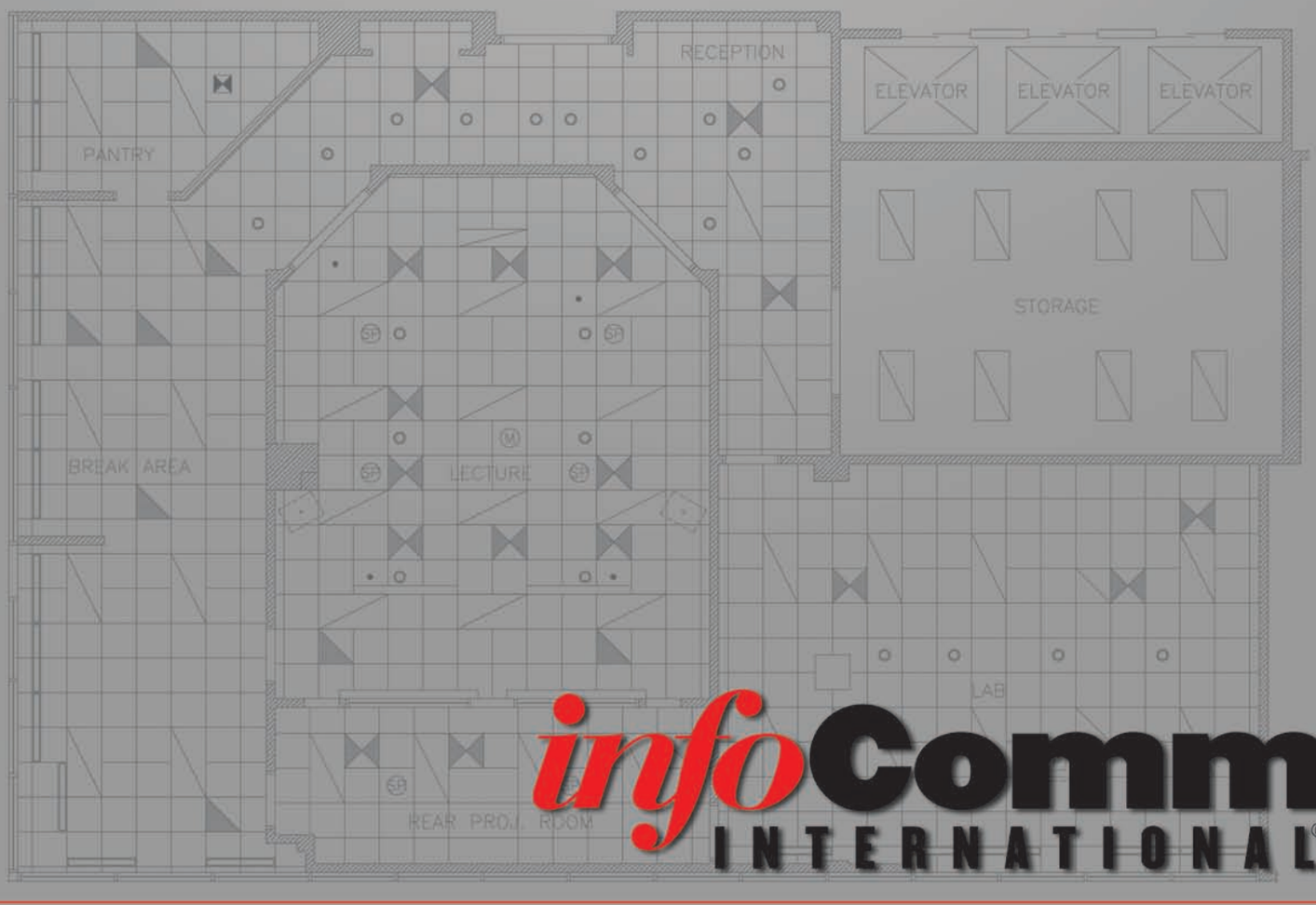



# Audiovisual Systems Project Documentation Sample




infoComm INTERNATIONAL®

# Audiovisual Systems Project Documentation Sample

ISBN: 978-0-939718-23-8



InfoComm International® is the leading trade association serving the professional audiovisual communications industry worldwide, advancing the AV industry by developing work-class education, certification, performance standards, expositions, publications and outreach programs. Founded in 1939, InfoComm is an ANSI accredited standards developer and administrator of the Certified Technology Specialist (CTS®) program which is accredited by ANSI to the ISO/IEC 17024 personnel standard. Its training and education programs set a standard of excellence for AV professionals. InfoComm International is the founder of InfoComm, the largest annual conference and exhibition for AV buyers and sellers worldwide, and is a co-sponsor of Integrated Systems shows in Europe, Asia and China. For more information, visit www.infocomm.org.

InfoComm International®
11242 Waples Mill Rd.
Suite 200
Fairfax, VA 22030

Tel.: +1.703.273.7200 or
Tel.: 1.800.659.7469 (USA/Canada toll-free)
Fax: +1.703.278.8082
Email: customerservice@infocomm.org
Web: www.infocomm.org
www.infocommshow.org
www.ctsforav.com
www.powerofav.com

## Preface

InfoComm International® is pleased to offer this collection of audiovisual systems drawings and documents. This is a coordinated example of the unique documentation required for AV systems showing how the audiovisual systems documents relate to documentation from allied professions. In addition, the collection illustrates elements of the *Audiovisual Systems Design and Coordination Components Performance Standard*.

The collection fulfills two objectives:

- Business development: consultants and sales professionals can convey documentation concepts to other design and construction professionals using concrete examples.
- Educational: InfoComm Academy students can associate design criteria and goals with appropriate representation and documentation.

Illustrating the intention of the performance standard, this sample collection accommodates a variety of contractual and project management models, allowing the user to decide which documents specifically pertain to his or her project.

The documents are divided into sections based upon either 1) the project phase, or 2) the professional entity that prepares the documents. Documents from architects, engineers, consultants, integrators and field engineers are organized according to the project timeline. Both “Design” and “Drawing of Record” versions of most audiovisual-specific drawings are included so the user can study differences in intention and level of detail. Further detail may be found in the normative references listed in the *Audiovisual Systems Design and Coordination Components Performance Standard* and by attending related InfoComm Academy courses, webinars and seminars.

Users of this collection are cautioned that this sample represents one of many ways to document a project, and may not conform to the conventions used by the user’s organization. None of these documents is an absolute, perfect, industry-standardized example. The examples are drawn from:

- A combination of actual documents used to construct the InfoComm Academy Classroom in Fairfax, VA.
- Examples from other audiovisual consultants and audiovisual systems integrators.
- New documents developed specifically for this collection.

InfoComm has a long history of leading open discussion on industry knowledge documentation. InfoComm welcomes your input via the Reviewer’s Comments Form included in this collection, or by sending an email to support@infocommacademy.org.

## Acknowledgments

The InfoComm International Board of Directors gratefully acknowledges the work of the following contributors:

Members of the Performance Standards Planning Committee
- Richard Derbyshire (Chair), Shen Milsom & Wilke, Inc.
- Scott Walker, CTS-D, LEED® AP (Past Chair), Waveguide Consulting, Inc.
- Frederick J. Ampel, Technology Visions
- Michael Carter, CTS, AMX Corporation
- Joy Caspar, CTS, Real Time Services, Inc.
- Barry Goldin, CTS, Audio Video Systems, Inc.
- Gary Hall, CTS-D, CTS-I, National Geospatial Intelligence Agency
- Brian E. Huff, CTS-D, LEED® AP, ISF-C, Acentech Incorporated
- Matthew Kosel, CTS-D, CTS-I, Spinitar
- Greg Jeffreys, Paradigm Audio Visual Ltd.
- Brian R. Pipe, Arup Communications
- Peter Swanson, CTS, WSP Lincolne Scott

Members of the Audiovisual Systems Design and Coordination Components Performance Standard Task Group
- Brian E. Huff, CTS-D, LEED® AP, ISF-C (Moderator), Acentech Incorporated
- Joy Caspar, CTS, Real Time Services, Inc.
- Matthew Jackson, CTS-D, AMX Corporation
- Ratnesh Javeri, CTS-D, Innovative Systems & Solutions Ltd.
- John O'Brien, Montclair State University
- Howard Quinton, CTS-D, Walker Communication, Inc.

Additional key contributors
- Eur Ing Geoffrey Plevin, CEng, MITE (UK), MRTS (UK), independent consultant
- Nathan Powell, Production Technology Consultants, Inc.
- Lee Fleishman, Production Technology Consultants, Inc.

Members of the InfoComm International staff:
- Randal A. Lemke, Ph.D., Executive Director
- Melissa Taggart, Senior Vice President of Education, Certification and Standards
- Joseph Bocchiaro III, Ph.D., AStd, CTS-D, CTS-I, ISF-C, Director of the InfoComm Performance Standards Program
- Scott Wills, CTS-D, CTS-I, Director of International Education
- Amanda Beckner, CTS, Director of Training
- Tom Kehr, CTS-D, CTS-I, ISF, Sr. Staff Instructor
- Ann Brigida, CTS, Director of Education, Certification and Standards Marketing
- Bill Thomas, CTS-I, Director of Education Programs
- Rachel Bradshaw, Education Programs Coordinator

# Reviewer's Comments
# Audiovisual Systems Project Documentation Sample

Your Name:

Company Name:

Daytime Phone:

Email:

Today's Date:

1. How do you use this documentation sample?

2. What is the most useful aspect of this documentation sample?

3. How clear is the information in the documentation sample?

4. What changes do you think might improve this documentation sample?

**Please use the reverse side for additional comments,** and include specific chapter and page references for specific suggestions and/or corrections.
Thank you for your comments.

Send to: Education Department
InfoComm International
11242 Waples Mill Road
Suite 200
Fairfax, VA 22030

Fax: +1 703.278.8082
support@infocommacademy.org

## Table of Contents

Project Goals Memorandum ..... Tab 1
Onsite Survey Checklist..... Tab 2
AV Program Report..... Tab 3
Project Specifications..... Tab 4
Contract Documents ..... Tab 5
Architectural & Engineering Drawings ..... Tab 6
Audiovisual Drawings..... Tab 7
AV/IT Device Inventory ..... Tab 8
Audio Coverage Uniformity Test Report..... Tab 9
Audiovisual Systems Commissioning Tests Checklist..... Tab 10
Touch Panel User Manual ..... Tab 11

**Memorandum**

To: Architectural Design Team and Construction Manager
From: InfoComm Academy Staff
Date: December 23, 2008

Re: AV Classroom for the InfoComm Academy in Fairfax VA Headquarters

1) The design team is requested to provide for audiovisual capabilities in the new facility. The intension is to establish a permanent classroom and meeting room, with "state-of-the-art" teaching, training, and conference facilities, on the first floor of the building. Employees and members of InfoComm, as well as visitors, will be using the room.

2) Please incorporate the following criteria into the overall project plan:

   a. Classroom to seat 24 students at moveable desks
   b. Presentation area with room for large instructor workstation
   c. The AV equipment must be completely exposed for audiovisual system education
   d. Rear projection room with dual screens
   e. A surround sound system and a speech reinforcement system in class/meeting room
   f. Audio and video conferencing systems
   g. Individual branch circuits from a single panelboard with auxiliary, insulated grounding conductor
   h. Dimmable and programmable lighting system
   i. Partitioned network with wireless capability
   j. A reception/lobby area
   k. A cafeteria with a pantry/food preparation area
   l. A storage area
   m. Furniture, custom if required
   n. Dedicated entrance with separate physical security

3) The finish of this facility should be formal but not elegant. It is anticipated that there will be significant usage of the facility, so durable surfaces should be used. The class/meeting room should have the appropriate acoustic treatment for sound reinforcement and audio conferences. Also, neutral color room finishes should be selected for a videoconferencing system. The InfoComm committee must approve all finishes.

## Onsite Survey Checklist

- ☑ Site contact name InfoComm Academy Classroom
- ☑ Site contact phone number (703) 273-7200
- ☑ Site contact mobile number none
- ☑ Exact address of job site 11242 Waples Mill Road Suite 200 Fairfax VA
- ☑ Best route to job site Route 66 exit to Route 50 East, make a left onto Waples Mill Road - Courtyard Marriott on corner
- ☑ Travel time from warehouse to venue, taking into account normal traffic conditions for your scheduled trip about 25 minutes
- ☑ Type of loading/unloading/parking access (hour or time restrictions) no loading dock - a ramp up curb in front - call ahead
- ☑ Location of loading/unloading access Just to the left of the front door
- ☑ Access route from delivery dock to storage area Through the "lab" across hall
- ☑ Elevator dimensions Classroom is on 1st floor - ground floor
- ☑ Security concerns – Is the area able to be locked? Who has a key? Yes - the Education Events Coordinator
- ☑ The primary function of the job site room(s) Training, meetings, videoconference
- ☑ Your room's proximity to other functions in the same building and area Lobby has some AV; Education Dept. and lab across the hall
- ☑ Name and contact number of facility owner's representative, site's maintenance chief, or AV technician (Who will know where power and ducts are?) Call Education Coordinator - he will arrange meeting or find out
- ☑ Potential for electrical interference with other equipment Considerable antennae on roof - a military contractor in same building
- ☑ Potential for any other problems regarding room location. (For example - ambient noise from outside the room) Significant noise from AV Cafe just outside the classroom with doors open
- ☑ Potential for any problems regarding traffic patterns during installation Do not schedule during May or early June - warehousing for InfoComm show
- ☑ Dimensions of the room – ceiling height, room length, and width CH = 10ft 30ft long 25ft wide
- ☑ Ceiling type (drywall, drop ceiling, location of joists) Acoustical tile / T-Bar
- ☑ Wall material (drywall, block, etc.) Drywall - Acoustic absorbing fabric to be applied
- ☑ Acoustical properties of the room (echoes, loud mechanical noise, outside noise, voices or sounds from adjacent room) Serious low-frequency vibration from HVAC around 200-500 Hz

- [x] Existing sound system (if there is one and, if so, what kind is it?) None - demolition is in progress for space
- [x] Natural light from windows (can it be masked if necessary?) With doors closed there is no natural light
- [x] Exiting lighting 3 doors each have EXIT lights; 2 doors are double
- [x] Existing security lights that might make lighting difficult None - light zones to be programmed
- [x] Electrical capacity of the room 200 A 3 phase
- [x] Existing AV features or equipment none - demolition - client will have some donated equipment
- [x] Possible obstructions to audience view (such as chandeliers or sliding walls which are not completely retractable, or pillars) none
- [x] Is the room suitable to audience size and the type of equipment being considered? Yes - good size rear projection room to be built
- [x] Seating capacity of room according to requested setup about 24 - 32 depending on seats & tables
- [x] Room shape and orientation of the requested setup Rectangular with "clusters" of tables or "flying V" classroom style tables

NOTES - 1) There can be no floor penetrations due to downstairs tenants

2) There are some special requirements for "teaching" - empty conduits with wallboxes for cable-pull instruction

3) Client has internal IT Department that will assign IP addresses, and wishes to mount some IT equipment in equipment racks in classroom

4) Client mentioned some other spaces they are considering! Possibly a learning lab, a boardroom, some conference rooms, a lobby, etc. Make sure sales department follows up on this!

# Audiovisual Program Report

**For**

# INFOCOMM ACADEMY

## 11242 Waples Mill Road
## Suite 200
## Fairfax, VA 22030

## New Classroom

*Prepared By:*

**The ABC AV Company**

January 14, 2009

# Audiovisual Systems Project Documentation Sample

# CONTENTS

**Executive Summary** ..... 2
**Systems Descriptions** ..... 3
**Infrastructure Considerations** ..... 6
**Audiovisual Budgets** ..... 9
**Additional Costs** ..... 11

# Audiovisual Systems Project Documentation Sample

## Executive Summary

InfoComm Academy, the educational program of InfoComm International, is planning for a new classroom/meeting facility to be located on the 1st floor of the Waples Mill Road headquarters building in Fairfax, VA. Audiovisual capabilities will be included in a state-of-the-art teaching/training/meeting facility with an associated rear projection room.

The facility area will include a classroom/meeting room, a reception/lobby area, a cafeteria with pantry and a storage area. Voice/Data network interfacing is also considered as it relates to the classroom/meeting area.

ABC AV Company has been retained by InfoComm International to provide this Report, which after consultation with representatives of InfoComm International, addresses the architectural and system requirements for the facility. Also our recommendations are based on our experience with similar facilities.

An audiovisual facility drawing of the classroom/meeting area and budgetary pricing estimates are included.

Documentation and drawings with be provided for coordination into the construction set of drawings once the Program has been modified and/or approved. Also a "Request For Proposal" (RFI) will be developed which will include all pertinent details for the installation of a fully operational audiovisual facility.

## Systems Descriptions

The InfoComm Academy classroom will feature a "media wall" at the front. The wall will be constructed of standard sheetrock-on-stud materials, but with an attractive covering and millwork. Dual rear projection LCD or DLP projectors will be mounted within the rear projection room located behind this wall. A videoconference camera, a center channel loudspeaker, and a subwoofer will be mounted between the displays. Dual program audio loudspeakers will be mounted beside the dual display assembly. The audiovisual and videoconferencing equipment will be located within a bank of equipment racks built into the front wall below the projection screens. These racks will house the switchers, amplifiers, controllers, etc. The racks will also house the user-accessible equipment such as a VCR, a DVD player, an audiocassette recorder, etc., such that the fronts of the racks are completely open. As this room is to be used primarily for audiovisual systems education, it is appropriate and desirable to have the equipment completely exposed.

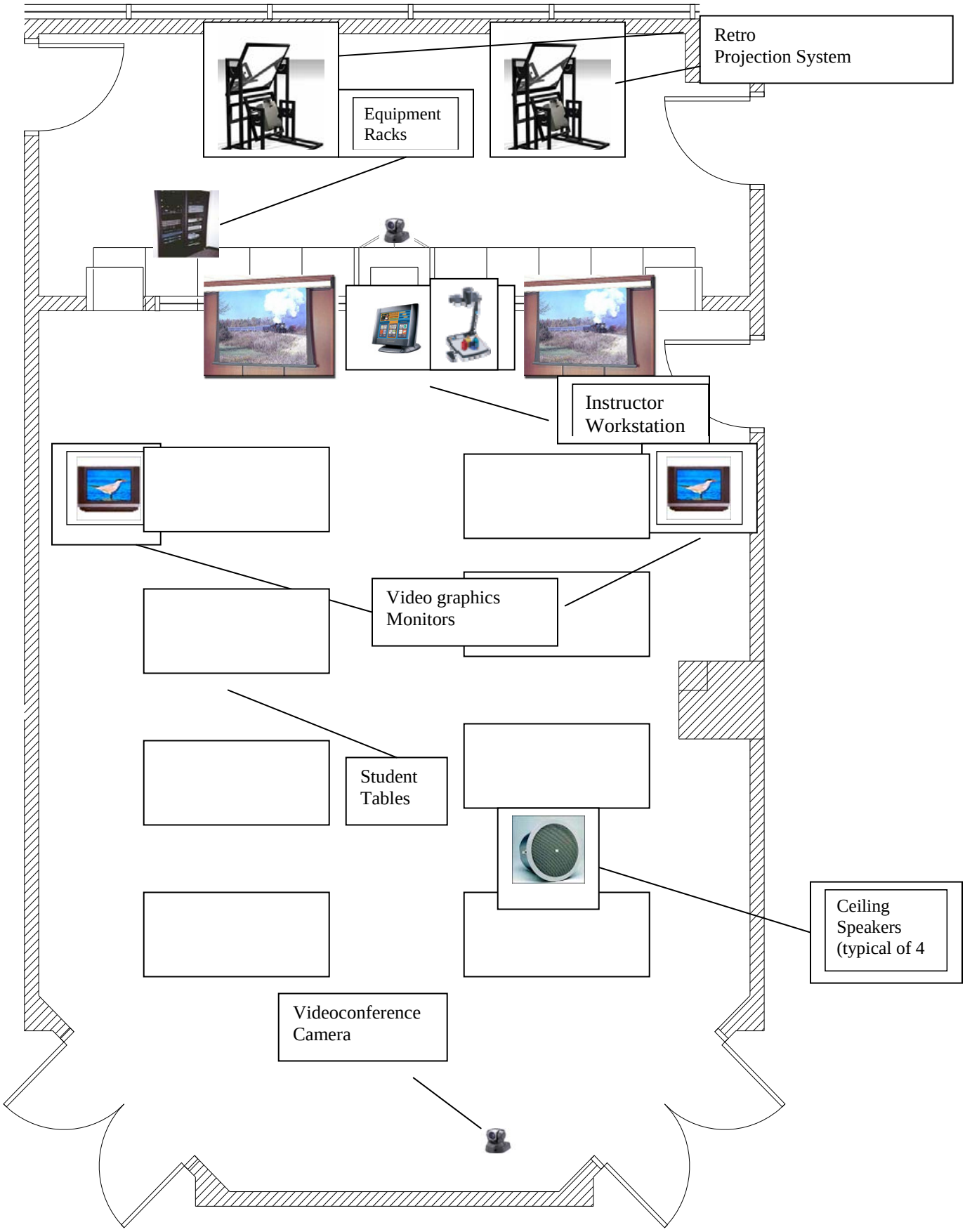
The center of the room will feature sectional, rectilinear tables. The tables may be arranged in a variety of configurations to suit the meetings, training sessions, and videoconferences. Large wall boxes located at the sides and rear of the room will contain connections for portable computers to be connected to the LAN and power. A microphone will be located in the ceiling to pick up voices from within the room for the purposes of audio conferencing and videoconferencing. A wireless microphone and a wired touch controller will allow flexibility during presentations. Built-in videoconference and distance learning capabilities will also utilize this equipment. Presenters may utilize a teaching workstation that will feature a video document camera, and notebook computer connectivity.

Ceiling loudspeakers will provide reinforcement of speech from presenters from within the room, and from incoming audio conference voices. A second video camera will be located on the rear wall to provide coverage of the workstation locations for videoconferences. Dual ceiling-mounted presentation monitors will provide confidence monitoring for presenters. Dual rear-channel loudspeakers will be mounted on the rear wall to provide surround sound capabilities. A remote control system will provide the means to easily control the equipment from the instructor workstation. This control system will also be tied into the classroom light dimming system, and two electric roll-down projection screens.

**Classroom features:**

- Front Media Wall with:
    - Large, dual LCD / DLP projection video graphics displays
    - Videoconference camera
    - Program loudspeakers
    - Center and subwoofer loudspeakers

    - Accessible equipment areas for source equipment (DVD, VCR, cassette, housed within equipment racks.)
- High-fidelity ceiling speakers for speech and program reinforcement, audio conferences, and video conferences
- Ceiling mounted microphone
- Ceiling-mounted videographics presentation monitors
- Audio teleconference and video teleconference system utilizing automatic microphone mixers and ceiling speakers. This will feature a distributed echo cancellation mixer coupled with a telephone interface and the videoconference CODEC
- ISDN (minimum of three) connections at the CODEC (videoconferencing interface) unit location
- Dual-interface ISDN or IP over LAN/WAN videoconference CODEC
- Network/IP connections at the CODEC / control system unit location.
- Remote control system with wired touch screen controller
- Portable instructor workstation with high resolution document camera
- Wall boxes around room perimeter for audiovisual connectivity
- UHF lavaliere wireless microphone
- Videoconference camera with pan/tilt/zoom/focus capability on rear wall to image presenters
- Dual electric roll-down front projection screens for document cameras or projection demonstration purposes


Retro
Projection System
Equipment
Racks
Instructor
Workstation
Video graphics
Monitors
Student
Tables
Ceiling
Speakers
(typical of 4
Videoconference
Camera

## Infrastructure Considerations

Lighting shall be installed in a manner that will illuminate the faces of people at the table to enhance the video presentation. Additional lighting shall be installed to illuminate the wall behind the people in the room. Both sets of lights should have dimming capabilities to allow for adjustments of the lighting intensity. Task lighting and general-purpose fluorescent lighting will be available for customizing to different room purposes and be dimmable. The dimming system should be under the control of the audiovisual control system via a low voltage interface, and coupled to the audiovisual control system. Also the ceiling lights in the projection screen area should be dimmable in order to realize the full projected image quality.

Videoconferencing applications require special lighting which should include even illumination on the meeting participants. The lighting level should be 70 ft. candles, vertical, with a color temperature of 3,500 degrees Kelvin. Also the lighting levels on the front wall should be less than 40 ft. candles and the rear and sidewalls should be 45 – 60 ft. candles. There should be minimum contrast between wall and furniture colors. Matte colors are recommended. Busy patterns, weaves and wood-grains should not be used. Reflective hardware should not be used and tabletops should be non-reflective. Pictures with glass covers should be avoided.

The following list is the estimated power consumption for the audiovisual equipment:

- Rear Projection Room equipment ≤ 4400 Watts
- Classroom equipment: ≤ 1200 Watts
- Personal computer ≤ 1000 Watts
- Document camera ≤ 150 Watts

The estimated heat load due to the audiovisual equipment within the seating area, the audiovisual equipment racks, and video graphics presentation equipment shall require ventilation as follows:

- Rear projection room equipment: 15,000 BTU
- Classroom equipment: 4,000 BTU

Acoustic Criteria must be considered for the classroom space, and a Noise Criteria rating between NC-25 and NC-30 is recommended.

The audiovisual recommendations do not include provisions for LAN or voice networks or other similar systems. Architectural considerations such as wall and floor treatments, seating, lighting, acoustics, etc. are to be coordinated with the interior design team. Architectural presentation components such as flip charts, whiteboards, etc. are to be specified in an interior design package by the architects unless they are requested to be included in the audiovisual package.

## Space Allocation

| **Room** | **Area** (square feet) |
|---|---|
| Classroom | 750 |
| Laboratory | 750 |
| Rear Projection and Storage Room | 225 |
| Break Area | 600 |
| Pantry / Food Preparation Area | 150 |
| Reception | 350 |
| Storage | 400 |

## Rear Projection Room

A rear projection room will be located behind the media wall at the front of the classroom. It will have a separate task lighting system. This room is to be painted matte black.

## Break Area

A break area will be located directly outside the classroom, with dual means of egress. This room will have egress to the exterior of the building. It will feature a window wall, high-traffic carpeting, and access to reception and the pantry.

## Pantry

A pantry is to be located outside the Break Area, and will include:

- Cabinetry
- Sink
- Counter space
- Adequate power for a microwave oven, a refrigerator, coffee makers, etc.

## Reception Area

The reception area is to be accessible from the main building hallway. It is to feature a prominent display wall. Permanent reception millwork is to flank one side of the space.

## Laboratory

A general-purpose lab space will have functional lighting and finishes only. Additional power is required in this room for equipment used in instruction.

## Storage Area

A large general-purpose storage area is to be located adjacent to the reception area. This space requires functional lighting and finishes only. Electrical and other mechanical equipment may be located within this area.

## Audiovisual Budgets

The costs itemized in the following table include the audiovisual components deemed appropriate for the facility. This budget pertains only to the audiovisual equipment and the AV labor to install these components. These budget figures are those that can be expected from a bidding audiovisual contractor. The budget does not include conduit, power, junction boxes, floor boxes, voice/data provisions, general construction, or the labor related to these items. Also, it does not include writing boards, (with the exception of the electronic copy boards), tack able surfaces, telephones, furniture, millwork, or similar items.

Owner-furnished equipment is not listed except as noted “OFE”.

## Estimated Budget:

| Item | Estimated Unit Cost | Estimated Quantity | Estimated Total Cost |
|---|---|---|---|
| Ceiling microphone | $250 | 1 | $250 |
| Videographics Projector | $12,000 | 2 | $24,000 |
| Projector Mirror Assemblies | $3,500 | 2 | $7,000 |
| Audio/video switching system | $3,500 | 1 | $3,500 |
| Surround Sound Audio System | $3,500 | 1 | $3,500 |
| RGBS/audio switching system | $3,500 | 1 | $3,500 |
| Ceiling loudspeaker | $150 | 6 | $1,200 |
| Videocassette recorder | $500 | 1 | $500 |
| DVD Player | $500 | 1 | $500 |
| Videoconference CODEC, (384 kbps upgradeable), and integral I-MUX. IP Connectivity | $8,000 | 1 | $8,000 |
| Videoconference Camera | $4,000 | 2 | $8,000 |
| Cable television receiver | $500 | 1 | $500 |
| Document camera | $3,500 | 1 | $3,500 |
| Wireless mouse | $350 | 1 | $350 |
| Presentation Monitor | $3500 | 2 | $7,000 |
| Computer video interface | $500 | 2 | $1,000 |
| Half-size equipment rack | $500 | 8 | $4000 |
| Audiocassette recorder | $400 | 1 | $400 |
| UHF wireless microphone | $700 | 1 | $700 |
| Audio reinforcement system | $11,000 | 1 | $11,000 |
| Audio conference interface | $2,000 | 1 | $2,000 |
| Audiovisual control system | $16,000 | 1 | $16,000 |
| Auxiliary audiovisual connections | $250 | 5 | $1,250 |
| Instructor Workstation | $3,000 | 1 | $3,000 |
| Wall box | $500 | 4 | $2,000 |
| Miscellaneous hardware, cable, and connectors | $3,000 | 1 | $3,000 |
| Audiovisual contractor labor | $ 12,000 | 1 | $12,000 |
| **Total Estimated AV Cost** | | | **$127,650.00** |

## Additional Costs

The following costs have not been included in the Audiovisual Budgets but consideration should be given to their inclusion.

### Taxes

Additional costs will have to be added to the budget if InfoComm International is not exempt from sales tax on all or part of equipment and labor purchases.

### Markups

These costs, which could be between 5% and 10%, may have to be added if InfoComm International intends contracting the project out to a General Contractor.

## END OF AUDIOVISUAL PROGRAM REPORT

# SECTION 27 41 16.51

# INTEGRATED AUDIO-VIDEO SYSTEMS FOR CLASSROOMS

## PART 1 GENERAL

### 1.01 SUMMARY

A. This document specifies the furnishing, installing, and testing of a complete audiovisual presentation, training, audio and video conferencing system and associated equipment to be installed in InfoComm Academy, InfoComm International's headquarters in Fairfax, Virginia (here-in-after referred to as "the facility"). The systems shall include, but not be limited to: Dual rear projection as well as dual front projection, various computer sources, satellite television, loadable media including, but not limited to: S-VHS, DVD, CD-R, audio cassette tape with program sound reproduction including 5.1 surround sound loudspeakers and processing, speech reinforcement system, audio and video conferencing including microphones, ISDN and IP capable codec with multiple cameras, and a dedicated control system with touch panel and content preview capabilities, un-interruptible power supplies (UPS), conduit, cable duct, and/or cable tray; and necessary passive devices such as cable, wire, and connectors; and specialized telecommunications outlets.

B. The intent of this project is to provide a new audiovisual training facility for InfoComm International.

C. The project is for the InfoComm Academy, located in InfoComm International's headquarters, at 11242 Waples Mill Road, Suite 200, Fairfax, VA22030. In accordance with the contract documents (plans with specifications) for the project, the proposal for the work is to include furnishing complete construction services.

D. Work is to include all runs and wiring as well as the final connections to new equipment as indicated in the contract documents. The Contractor will be required to return for final instructions as indicated in the contract documents.

E. The systems shall be delivered free of engineering, manufacturing, installation, and operating defects. They shall be engineered and installed for ease of operation, maintenance, and testing.

F. The term “provide”, as used herein, shall be defined as: designed, engineered, furnished, installed, certified and tested, by the Contractor.

G. Installation and operation shall adhere to all appropriate National, Government, and/or Local Life Safety and/or Support Codes, whichever are the more stringent for this Facility. At a minimum, the systems shall be installed according to NFPA, Section 70, National Electrical Code (NEC), NFPA, Section 101, Life Safety Code; this specification; and the audiovisual systems original equipment manufacturer’s suggested installation design, recommendations, and instructions. The original equipment manufacturer and Contractor shall ensure that all management, sales, engineering, and installation personnel have read and understood the requirements of this specification before the systems are designed, engineered, delivered, and provided.

H. InfoComm’s Project Manager (PM) and/or if delegated, Resident Engineer (RE) are the approving authorities for all contractual and mechanical changes to the systems. The Contractor is cautioned to obtain in writing, approvals for system changes relating to the published contract specifications and drawings, from the PM and/or the RE BEFORE proceeding with the change.

## 1.02 REFERENCES

### A. Standards:

1. Division 16 “Electrical” Sections for conduits, wire ways, connections boxes, pull boxes, junction boxes and outlet boxes permanently installed in walls, floors and ceilings.
2. Division 16 “Electrical” Sections for room lighting fixtures, power receptacle outlets, interconnecting wiring for these circuits and electrical panel boards for powering the audiovisual equipment.
3. InfoComm International, “Basics of Audio and Visual Systems Design”, Revised Edition.
4. Building Industry Consulting Service International (BiCSi), “Telecommunications Distributions Methods Manual” (TDMM), 11th Edition.

5. Telecommunications Industry Association/Electronic Industries Alliance (TIA/EIA), "TIA/EIA Wiring Standards" (Includes TIA/EIA-568-1, TIA/EIA-568-2, TIA/EIA-568-3, TIA-569, TIA-570, TIA-598, TIA/EIA-606, J-STD-607, TIA-758, 526-7 & TIA-526-14).
6. National Fire Protection Agency (NFPA) 70, "National Electric Code 2005".
7. McGraw Hill, "Architectural Acoustics", M. David Egan.
8. McGraw Hill, "Master handbook of Acoustics", 4th Ed., F. Alton Everest.
9. Focal Press, "Audio Systems Design and Installation", Philip Giddings.
10. Focal Press, "Sound System Engineering", 3rd Ed., Don Davis & Eugene Patronis, Jr.

**B. Definitions:**

1. The term "OFE" shall refer to "Owner Furnished Equipment" which will be provided by the Owner to the Installer. This equipment will be integrated as required.
2. The term "shall" is mandatory; the term "will" is informative; the term "should" is advisory; and the term "provide" means furnish and install.
3. The term "Consultant" refers to Acme Consulting.
4. The term "Installer" or "Contractor" refers to the successful audiovisual vendor and installer.
5. The term Owner refers to InfoComm International.

## 1.03 ADMINISTRATIVE REQUIREMENTS

**A. Schedule:**

1. To facilitate completion of the project, a brief weekly progress meeting will be held in InfoComm International's Conference Room on the Second Floor. The Owner or Owner's Representative will schedule and conduct the meetings.

**B. Job Site Supervision:**

1. The Contractor shall provide a working project superintendent to oversee the work of their employees and subcontractors.
2. InfoComm International's Project Manager (PM) will be the point of contact for the work. All communications shall be directed though the Project Manager.

3. Access to the building will be limited to between 7:00am – 5:00pm weekdays. Weekend or Holiday work will be via special prior arrangements only.

**C. Specific Conditions:**

1. The construction work shall be performed during normal work hours. The Contractor shall be required to coordinate all construction activity to eliminate impact on traffic and normal operations of existing tenants.
2. Outages shall be requested two days in advance in writing through the Project Manager and Resident Engineer (RE). The timing of outages shall be agreed upon between InfoComm International, the Building Engineer and Contractors.
3. The Contractor shall meet all City of Fairfax, County of Fairfax and Commonwealth of Virginia Building and Fire codes.

**D. Project Closeout:**

1. Prior to completion, the Contractor shall notify the Project Manager four (4) days prior to substantial completion of the work. An inspection will be performed to determine the completeness of the work and a punch list will be provided to the Contractor.

## 1.04 SUBMITTALS

**A. Shop Drawings:**

1. Prior to fabrications, submit custom engineering pertaining to the audiovisual system. This engineering includes, but is not limited to, the following:
   a. All panels, plates and designation strips, including details relating to terminology, engraving, finish and color.
   b. Remote control panel design (to include “live” interactive electronics format).
   c. All equipment racks, cabinets, consoles, tables, carts, support bases and shelves.
   d. Schematic drawings (AV & Control Signal flows).
   e. All non-factory equipment modifications.
   f. Equipment medication drawings.
   g. Front mechanical drawings of each equipment rack.
   h. Equipment location drawings.

i. Systems functional block drawings, including those for audio and video subsystems.
j. Cable labeling plan.

2. The RE shall retain one-copy and forward three copies of the submittal to the PM. The PM shall retain one-copy and forward two copies of the submittal to Consultant, ACME Consulting, 15 Main Street, Fairfax, VA 22030, for technical evaluation and approval.
3. If the submittal is technically approved, the Consultant will retain one copy for official records and return one technically approved submittal to the PM.
4. If the submittal is technically disapproved, the Consultant will return both copies to the PM with written explanation attached indicating the areas the submittal deviated from the system specifications.

**B. Samples:**

1. A sample of each of the following items shall be furnished to the RE for approval prior to installation. The samples may be returned to each Contractor at the discretion of the RE:
   a. Two foot section of each cable and/or wire to be used with connectors installed and original equipment manufacturer's cable sweep compliance and/or certification tags as specified herein.
   b. Back Boxes and junction boxes.
   c. Cover plates used for wall and floor boxes.
   d. Telecommunication outlets with back box, cover plate, and outlets installed.
   e. UPS equipment (if required by system design).

**C. Documents:**

1. Documentation shall include any item or quantity of items, computer discs, Drawings of Record, equipment, maintenance, and operation manuals, and each original equipment manufacturer materials needed to completely and correctly provide the systems documentation as required by this document and explained herein.
2. Each submittal shall be separated into sections for each subsystem and shall contain the following:
   a. Title page to include:

1. Facility name.
2. Contractor's name, address, and telephone (including fax) numbers.
3. Date of submittal.
4. InfoComm International Project Number.

3. A list containing a minimum of three locations of installations of similar size and complexity as identified herein. These locations shall contain the following:
   a. A list containing a minimum of three locations of installations of similar size and complexity as identified herein. These locations shall contain the following:
      1. Facility location and name.
      2. Owner's or User's name, address, and telephone (including fax) numbers.
      3. Date of Project Start and Date of Final Acceptance by Owner.
      4. System Project Number.
      5. Brief (three paragraphs minimum) description of each system's function, operation, and installation.
4. Narrative description of the system as it is expected to be installed in the Contractor's own words. The use of technical literature statements and/or extracts will not be accepted or approved.
5. A list of the equipment to be furnished. The quantity, make and model number of each item is required. Use the list format identified herein.
6. Cabinet layout drawings, as they are expected to be installed.
7. Equipment technical literature detailing the electrical and technical characteristics of each item of equipment to be furnished.
8. Engineering drawings of each system, with information to determine compliance with contract drawings and specifications.
9. List of test equipment.

## 1.05 CLOSEOUT SUBMITTALS

### A. Certification:

1. After the system has been provided, pretested, and found to meet the requirements of this specification, the Contractor shall submit a letter to the Project Manager certifying that the system is ready for the formal proof of performance test to be accomplished in the presence of the Consultant or Consultants' representative.

2. In the interim, the systems shall be left operating to “cook in”.
3. A copy of each recorded system pretest measurements shall be submitted to the Project manager with the certification. The RE shall submit one copy of the measurements to the Consultant for review 15 working days prior to the test.

**B. Equipment Manuals:**

1. Fifteen working days prior to the scheduled proof of performance test, the Contractor shall deliver to the RE; four complete sets of commercial operation and maintenance manuals for each item of equipment furnished as part of the systems. The manuals shall detail the theory of operation and shall include narrative descriptions, pictorial illustrations, block and schematic diagrams, and parts list. The RE shall submit one copy of each manual to the Consultant for review ten working days prior to the test.

**C. Drawings of Record:**

1. Fifteen working days prior to the proof of performance test, the Contractor shall deliver to the Project Manager, four complete sets of as-installed wiring diagrams of the system. The diagrams shall show all inputs and outputs of electronic and passive equipment correctly identified according to the markers installed on the interconnecting cables, equipment and room/area locations.
2. The as-installed wiring diagrams shall be in hard copy on standard 36” x 24” pages and two CD copies in AutoCAD 2006 (.dwg) and Adobe Acrobat Portable Document Format (.PDF). The RE shall submit one hard copy of each as-installed drawing to the Consultant for review 15 working days prior to the acceptance test.

**D. System Operation Manual:**

1. Produce this manual specifically for the system detailed herein. The manual shall describe all procedures necessary to activate the system to provide for the functional requirements, except as specifically excluded by the Owner. This section shall provide a non-technical graphic and narrative “how-to” users guide for the procedures needed to operate the system. The document shall contain a section on operating the system’s equipment in the event of control system failure. Control system touch panel

layouts shall be accompanied by narrative text describing step-by-step function engagement.

**E. Record Documentation:**

1. Accuracy of Records:
   a. Delegate the responsibility of maintenance of Record Documents to one person of the Contractor's staff.
   b. Thoroughly coordinate changes within the Record Documents, making adequate and proper entries on each page of Specifications and each sheet of Drawings and other Documents where such entry is required to show the change properly.
2. Maintenance of Job Set:
   a. Immediately upon receipt of the job set, identify each of the Documents with the title, "Documents of Record".
3. Preservation:
   a. Considering the contract completion time, the probable number of occasions upon which the job set must be taken out for new entries and for examination, and the conditions under which these activities will be performed, devise a suitable method for protecting the job set to the approval of the Project Manager.
   b. Do not use the job set for any purpose except entry of new data and for review by the Project Manager until start of transfer of data to the final Project Record Documents.
   c. Maintain the job set at the site of work.
4. Final Project Record Documents:
   a. The purpose of the Final Documents of Record is to provide factual information regarding all aspects of the work, both concealed and visible, to enable future modification of the work to proceed without lengthy and expensive site measurement, investigation, examination and verification.
   b. InfoComm International's Finance & Administration Office is charged with maintenance of all project record documents. It is imperative that final documents be submitted in both hard copy and electronic medium. Therefore, final submitted project documents shall consist of the following:
      1. Electronic – Provide to the Owner, two CD copies containing all system diagrams, Drawings of Record

in AutoCAD 2006 (.dwg) and Adobe Acrobat Portable Document Format (.PDF), equipment manuals, editable versions of all configuration files for any digital signal processing as well as the associated software required for editing those files, editable and uncompiled versions of all master source code for the control system with final contract documents attached. Documents shall indicate all revisions, clarifications and "Drawings of Record" conditions as recorded by the Contractor and as reviewed and approved by the Consultant and the Architect. Changes shall be clearly marked by "clouds" and in the appropriate spaces within the title block.

## 1.06 QUALITY ASSURANCE

### A. Contractor's Qualifications:

1. The Contractor shall meet the minimum requirements identified herein. Additionally, the Contractor shall have had at least three (3) years experience in the programming, fabrication, assembly and installation of audiovisual presentation, conferencing and remote control systems of comparable size, magnitude and quality in regards to coordinating, engineering, testing, certifying, supervising, training and documentation as specified for the subject job and shall submit documentation to this effect with the bid return. Each of these systems shall have been in successful operation for at least three (3) years after final acceptance by the Owner. Also, a qualified firm shall be an authorized sales and service center for all listed components, or approved comparable product offerings in the specification.

### B. References:

1. Furnish no less than three (3) references for installations of similar size and scope, performed throughout the Washington, D.C., Northern Virginia and Baltimore areas within the past eighteen (18) months. At a minimum, reference information will include the reference company or institute name, contact person's name and title with telephone and fax numbers, address and detailed project description, and contact information of the organization that is

responsible for the day-to-day operation of the audiovisual installation.

**C. Consultant:**

1. The Consultant reserves the right to inspect any of these installations and question the user and owner concerning the installations without the presence of the Contractor and at the direction of the PM.

**D. Contractor:**

1. The Contractor shall show written proof of contractual relationship or technical certification by the respective equipment manufacturers and shall be authorized by that equipment manufacturer to pass through the manufacturer's certification and equipment warranty to InfoComm International. Additionally, the equipment manufacturer and Contractor shall accept complete responsibility for the design, installation, certification, operation, and physical support for the system. The Contractor, including all subcontractors (if any) shall have a minimum proven three-year track record for audiovisual projects and cabling systems of this complexity. This record, along with the Contractor and equipment manufacturer's certifications must be provided in writing as a part of each Contractor's technical submittal.
2. The Contractor's Audiovisual Technicians assigned to the systems shall be fully trained, qualified, and certified by the respective original equipment manufacturers on the engineering, installation, operation, and testing of the systems. Each Contractor shall provide formal written evidence of current original equipment manufacturer's certification(s) for the installer(s) as a part of their submittal or to the RE before being allowed to commence work on the system.
3. The Contractor's Audiovisual Technicians assigned to the systems shall be fully trained, qualified, and carry valid and current industry certifications regarding the engineering, installation, operation, and testing of audiovisual technologies. At least one (1) each CTS-D and CTS-I shall be assigned to oversee the complete design and installation of the system. The Contractor shall provide formal written evidence of current industry certifications for the designer(s) and installer(s) dedicated

to this project as a part of their submittal or to the RE before being allowed to commence work on the system.

## 1.07 DELIVERY, STORAGE AND HANDLING

### A. Supply:

1. Supply, transport, deliver, unload and move to the installation location, unpack, place, assemble, secure, connect and install all equipment needed to complete the installation. Transportation, parking, delivery and on-site storage of the system's equipment shall be the responsibility of the Contractor. The Contractor is also responsible for all transportation of personnel to and from the site.

### B. Delivery:

1. Reconfirm before delivery that hallways, stairways, passageways, doorways, rooms, entries, elevators and foyers are of sufficient size to accommodate the passage and installation of the equipment and systems. Off-site pre-staging of goods by the Contractor is encouraged.
2. The actual dates of delivery shall be under the absolute control of the Owner. The dates and times for delivery and installation are critical to the successful completion of the project. Deliveries shall normally be accepted only Monday through Friday 8:00 am to 4:00 pm. It may become necessary for goods to be installed outside these hours and comply with the instructions of the Owner. Deliveries attempted outside these hours without prior consent of the Owner may be turned away. Comply with all instructions of the Owner and the PM concerning time of arrival at the site; which entrance shall be utilized for delivery; routes to be taken to reach the installation locations; and other matters relating to the orderly and timely installation of the system.

## 1.08 SITE CONDITIONS

### A. General:

1. Because the proposed work is top be accomplished in an existing occupied building, the Contractor shall make every effort to keep noise levels to a minimum. In the cases where extreme or disruptive noise levels are expected, coordinate with the engineer

for convenient times with the owner for that work. The Contractor should thoroughly examine the scope of work to anticipate excessive noise level periods and should prepare his proposals accordingly if after hours work is required.

2. The proposed work is located on the ground floor of the building. Access to the project site is good. There is a side entrance door facing the parking lot for use for both materials and employees but there are restrictions on size and accessibility. The Contractor should give this consideration when preparing his costs. The Contractor shall at all times protect the building surfaces that are used as an access route. Carpeted areas must be covered with heavy rosin paper and/or other acceptable protecting materials. Do not use plastic sheeting or drop cloths as a means of protection. The Contractor, to the complete satisfaction of the Owner, will correct damage to the existing building as a result of this project. All costs to be borne by the Contractor.

## 1.09 WARRANTY

### A. Contractor's Responsibility:

1. The Contractor shall guarantee that all provided material and equipment will be free from defects, workmanship, and will remain so for a period of one year from date of final acceptance of the system by InfoComm International. The Contractor shall provide original equipment manufacturer's equipment warranty documents, to the RE (or Facility Contracting Officer if the Facility has taken procession of the building) that certifies each item of equipment installed conforms to each original equipment manufacturer's published specifications.
2. The Contractor's maintenance personnel shall have the ability to contact the Contractor and original equipment manufacturers for emergency maintenance and logistic assistance, remote diagnostic testing, and assistance in resolving technical problems at any time. The Contractor and each original equipment manufacturer at no additional cost shall provide this contact capability to InfoComm International.
3. All Contractor maintenance and supervisor personnel shall be fully qualified by the original equipment manufacturers and must provide copies of current and qualified original equipment

manufacturer training certificates and original equipment manufacturer certification upon request.

4. Additionally, the Contractor shall accomplish the following minimum requirements during the one-year guaranty period.

**B. Response Time During The One-Year Guarantee Period:**

1. The RE or Facility Contracting Officer is the Contractor's reporting and contact official for system trouble calls, during the guaranty period.
2. A standard workweek is considered 8:00 A.M. to 5:00 P.M., Monday through Friday exclusive of Federal Holidays.
3. The Contractor shall respond and correct on-site trouble calls, during the standard workweek to:
   a. A routine trouble call within one working day of its report. A routine trouble is considered a trouble, which causes a single interface, projector or loudspeaker component to be inoperable.
   b. An emergency trouble call within four hours of its report. An emergency trouble is considered a trouble that causes the entire display or audio system to be inoperable at anytime.
4. If a system component failure cannot be corrected within four hours (exclusive of the standard work time limits), the Contractor shall be responsible for providing alternate items of equipment. The alternate equipment and/or systems shall be operational within a maximum of four hours after the four-hour trouble shooting time and restore the effected location operation to meet the system performance standards. If any sub-system or major system trouble cannot be corrected within one working day, the Contractor shall furnish and install compatible substitute equipment returning the system or subsystem to full operational capability, as described herein, until repairs are complete.

**C. Required On-Site Visits During The One Year Guarantee Period:**

1. If a system component failure cannot be corrected within four hours (exclusive of the standard work time limits), the Contractor shall be responsible for providing alternate items of equipment. The alternate equipment and/or systems shall be operational within a maximum of four hours after the four-hour trouble shooting time and restore the effected location operation to meet

the system performance standards. If any sub-system or major system trouble cannot be corrected within one working day, the Contractor shall furnish and install compatible substitute equipment returning the system or subsystem to full operational capability, as described herein, until repairs are complete.

2. The Contractor shall arrange all Facility visits with the RE or Facility Contracting Officer prior to performing the required maintenance visits.
3. Preventive maintenance shall be performed by the Contractor in accordance with each original equipment manufacturer's recommended practice and service intervals during non-busy time agreed to by the RE or Facility Contracting Officer and Contractor.
4. The preventive maintenance schedule, functions and reports shall be provided to and approved by the RE or Facility Contracting Officer.
5. The Contractor shall provide the RE or Facility Contracting Officer a typewritten report itemizing each deficiency found and the corrective action performed during each required visit or official reported trouble call. The Contractor shall provide the RE and Consultant with sample copies of these reports for review and approval at the beginning of the Acceptance Test.
6. The Contractor shall provide a monthly summary all equipment and sub-systems serviced during this guarantee period to RE or Facility Contracting Officer by the fifth working day after the end of each month. The report shall clearly and concisely describe the services rendered, parts replaced and repairs performed. The report shall prescribe anticipated future needs of the equipment and systems for preventive and predictive maintenance.
7. The Contractor shall maintain a separate log entry for each item of equipment and each sub-system of the system. The log shall list dates and times of all scheduled routine and emergency calls. Each emergency call shall be described with details of the nature and causes of emergency steps taken to rectify the situation and specific recommendations to avoid such conditions in the future.
8. The RE or Facility Contracting Officer shall convey to the Facility Engineering Officer, copies of actual reports for evaluation.
9. The RE or Facility Contracting Officer shall ensure copies of these reports are entered into the system's official acquisition documents.

10. The Facility Chief Engineer shall ensure copies of these reports are entered into the system's official technical as-installed documents.

# PART 2 PRODUCTS

## 2.01 OWNER FURNISHED PRODUCTS

**A. Computer Equipment:**

1. PC computer
   - Processor
   - Keyboard and mouse

## 2.02 EQUIPMENT

**A. Display Equipment**:

1. Two input computer interface:
   - 300 MHz (-3dB) RGB bandwidth
   - 800 Ohm to 600 Ohm balanced audio line output converter

   Extron RGB202xi
   Or Approved Equivalent

2. Computer VGA interface:
   - 300 MHz (-3dB) bandwidth
   - VGA, SVGA, SXVGA, PowerPC compatible

   Extron RGB109xi
   Or Approved Equivalent

3. 12x8 RGBHV matrix switcher:
   - 300 MHz (-3dB) RGB bandwidth
   - +/- 0.05 dB, 20 Hz to 20 kHz, audio frequency response

   Extron Crosspoint 128HVA
   Or Approved Equivalent

4. Six-output RGBHV distribution amplifier:
   - 300 MHz (-3dB) RGB bandwidth
   - -44 dB @ 5 MHz RGB return loss

   Extron ADA 6 300 MX HV
   Or Approved Equivalent

5. Scan converter:
   - 15.6 kHz to 70 kHz input horizontal frequency range
   - Transcodes to/from Y/C, RGB and Y/R-Y. Y/B-Y

Sony DSC1024
Or Approved Equivalent

6. XGA LCD video projector:
   - 4500 ANSI lumens brightness level
   - Short throw lens

   Christie LX45
   Or Approved Equivalent

7. 100” diagonal rear projection screen with mounting frame:
   - 1.0 gain
   - 180º viewing cone

   Draper IRUS
   Draper Cineframe
   Or Approved Equivalents

8. Rear projection mirror assembly:
   - First surface mirror
   - Projector/mirror adjustable mount

   Large Screen Displays RMS Custom
   Or Approved Equivalent

9. Electric front projection ceiling mounted retractable screen:
   - 70” x 70” projection area
   - M1300 viewing surface

   Draper Premier
   Or Approved Equivalent

10. 22” TFT LCD flat panel monitor:
    - 1680 x 1050 @ 60 Hz optimal resolution
    - 800:1 contrast ratio

    Dell E228WFPc
    Or Approved Equivalent

11. Video monitor ceiling mount:
    - Pole with ceiling mount
    - Monitor tilt platform

    Premier Mounts Custom

Or Approved Equivalent

12. VHS videocassette recorder with rack mount:
    - Two line inputs
    - VHF, UHF, CATV tuner
    - Custom rack mount

    Sony SLV-685HF
    Or Approved Equivalent

13. S-VHS videocassette recorder with rack mount
    - 400 lines horizontal resolution
    - VHF, UHF, CATV tuner
    - Custom rack mount

    Sony SVO-2000
    Or Approved Equivalent

14. CD/DVD player with rack mount
    - Line, S-Video, component video outputs
    - 4 Hz to 20 kHz, +/- 0.5 dB, CD audio frequency response
    - Custom rack mount

    Sony DVP-S7000
    Or Approved Equivalent

15. Laser disk player
    - 430 lines resolution
    - Laser vision video disc and digital audio system
    - Custom rack mount

    Panasonic AG-LD20
    Or Approved Equivalent

16. DSS receiver
    - LNB input
    - Video and line level audio outputs

    Custom

17. 12x8 S-video matrix switcher
    - 150 MHz (-3dB) video frequency bandwidth
    - 20 Hz to 20 kHz (+/- 0.05 dB) audio frequency response

    Extron Matrix 50

Or Approved Equivalent

18. Video scan doubler
    - S-Video and composite video input
    - RGBHV output
    - Rack mount

    Extron Lancia xi
    Or Approved Equivalent

19. Video distribution amplifier
    - 90 MHz (-3 dB) video bandwidth
    - Two composite video inputs and 2 x 6 composite video outputs
    - Rack mount

    Extron CVDA 6 MX Dual
    Or Approved Equivalent

20. Video/Audio distribution amplifier
    - 30 MHz (< +/-0.5 dB) video bandwidth
    - 20 Hz to 20 kHz audio frequency response
    - Rack mount

    Extron AVDA 6 MX Dual
    Or Approved Equivalent

**B. Videoconferencing Equipment:**

1. 3 – CCD video camera with power supply
    - ½" IT CCD's, 380,000 pixels
    - 2000 lx at F9.5 sensitivity
    - Custom mount

    Sony DXC-930
    Sony CMA-D2
    Or Approved Equivalent

2. Videoconferencing codec
    - H.261, H.263, H.263+, H.263++, H.264 video standards
    - Six video inputs and outputs
    - Four audio inputs and 3 audio outputs

    Tandberg Codec 6000
    Or Approved Equivalent

**C. Audio Equipment:**

1. Boundary microphone
   - Cardioid polar pattern
   - 50 Hz to 17 kHz frequency response

   Shure MX393/C
   Or Approved Equivalent

2. Boundary ceiling microphone
   - Omni directional polar pattern
   - 40Hz to 18 kHz frequency response

   Audio-Technica ES945W
   Or Approved Equivalent

3. Wireless microphone system
   - 470MHz to 680 MHz transmitter frequency range
   - 100 mW (nominal) RF transmitter power output
   - >0.3 µV for 20 dB SINAD, 1.5 µV for 50 dB S/N ratio receiver sensitivity

   Lectrosonics UM190/UCR190
   Or Approved Equivalent

4. Automatic microphone/matrix mixer
   - Echo and noise cancellation
   - 20 Hz to 20 kHz bandwidth

   Polycom EF2280
   Or Approved Equivalent

5. Telephone interface
   - 60 Hz to 38 kHz, +/- 1 dB, phone frequency response
   - 50 Hz to 20 kHz, +/- 1 dB, mixer frequency response

   Polycom EF200
   Or Approved Equivalent

6. Matrix mixer
   - 12 balanced line inputs
   - 15Hz to 55kHz, +0/-3db frequency response

   Lectrosonics MM8
   Or Approved Equivalent

7. CD/Audio cassette recorder
   - 5 Hz to 20 kHz, +/- 0.3 dB, CD frequency response
   - 30 Hz to 15 kHz audio cassette frequency response

   Marantz PMD350
   Or Approved Equivalent

8. Digital controller
   - 20-bit Delta-Sigma D/A conversion
   - 10 Hz to 20 kHz, +/- 0.5 dB, ref. 1 kHz, audio frequency response
   - NTSC, PAL and SECAM video compatibility

   Lexicon DC-1
   Or Approved Equivalent

9. Two channel programmable audio equalizer
   - 28 – 1/3 octave ISO spacing equalizer bands
   - 10 Hz to 30 kHz, +0/-1 dB, frequency response

   Rane RPE 228
   Or Approved Equivalent

10. Two channel power amplifier
    - 210 watt, 20 Hz to 20 kHz, power output/channel @ 8 Ohm load
    - +/- 0.1 dB frequency response, 20 Hz to 20 kHz at 1 watt

    Crown CT-410
    Or Approved Equivalent

11. Two channel power amplifier
    - 105 watt, 20 Hz to 20 kHz, power output/channel @ 8 Ohm load
    - +/- 0.1 dB frequency response, 20 Hz to 20 kHz at 1 watt

    Crown-210
    Or Approved Equivalent

12. Loudspeaker
    - +/- 3 dB frequency response, 84 Hz to 18 kHz
    - 200 watts, AES standard, power handling

    EAW JF60
    Or Approved Equivalent

13. Subwoofer loudspeaker
    - 250 watt RMS power handling
    - 40 Hz to 150 Hz frequency response

    Community CSX40-S2
    Or Approved Equivalent

14. Loudspeaker
    - 100 watt RMS power handling
    - 70 Hz to 18 kHz frequency response

    Community CSX25-S2
    Or Approved Equivalent

15. Ceiling loudspeaker
    - 35 Watt, 70.7 volt transformer
    - 40 Hz to 19 kHz, +/- 4 dB, frequency response

    Sound Advance CT73DT32
    Or Approved Equivalent

16. Attenuator
    - 75 watt, 70.7 volt transformer
    - 10, 3 dB/step attenuation

    Atlas Sound AT75
    Or Approved Equivalent

**C. Control Equipment**

1. Control system, including:
    - Controller, CNMSX-PRO
    - Distribution block, CNHBLOCK
    - Power supply, CNPWS-75
    - Transceiver, CNRFGWA
    - Touch control panel, TPS6000
    - Keyboard and mouse controller, CNMK
    - RS-232/422 module, ST-COM
    - Volume controller, ST-VC
    - Rack mount, ST-RMK
    - Pan/Tilt control head, CPC-CAMI
    - Adapter, CN-RJ11
    - Power supply, CNPWS-75

- Power switching module, CLCI-8
- Power control interface, CNPCI-8

Crestron
Or Approved Equivalent

2. Lighting programming interface
   - Status monitoring
   - RS232 control

   Lutron GRX-PRG
   Or Approved Equivalent

**D. Miscellaneous Equipment:**

1. 20RU equipment rack
   - Power distribution strip
   - Door
   - Blank panels

   Winstead Pro Series II
   Or Approved Equivalent

2. Equipment rack drawer
   - 4 RU high x 14½" deep
   - Black anodized finish

   Middle Atlantic D4
   Or Approved Equivalent

3. Classroom wall plate
   - Architect approval

   Custom

4. Projector wall plate
   - Architect approval

   Custom

5. Presentation monitor wall plate
   - Architect approval

   Custom

6. Classroom wall plate
   - Architect approval

   Custom

7. Equipment rack panel
   - 1RU high
   - Black anodized finish

   Middle Atlantic HBL1
   Or Approved Equivalent

8. TV camera wall plate
   - Architect approval

   Custom

9. Microphone equipment rack panel
   - 1Ru high
   - Black anodized finish

   Middle Atlantic HBL1
   Or Approved Equivalent

10. Audio/video input equipment rack panel
    - 2Ru high
    - Black anodized finish

    Middle Atlantic HBL2
    Or Approved Equivalent

11. Equipment rack panel
    - 2Ru high
    - Black anodized finish

    Middle Atlantic HBL2
    Or Approved Equivalent

12. Installation items, including (but not limited to):
    - Wire and cables
    - Terminal blocks
    - Connectors

    Custom

## 2.03 PERFORMANCE

### A. General:

1. Unless restricted by the published specification of a particular piece of equipment, or unless otherwise required, the following

minimum performance standards shall be met by the audiovisual system.

**B. Audio:**

1. Signal/Noise ratio (including crosstalk and hum): 75dB minimum.
2. Total Harmonic Distortion: 0.5% maximum from 30 Hz to 15,000 Hz.
3. Frequency Response: Flat within +1.0 dB, 30 Hz to 15,000 Hz.

**C. Display:**

1. Minimum 15:1 contrast ratio.

**D. Video:**

1. Signal/Noise ratio (peak to RMS), unweighted DC to 4.2 MHz: 45 dB minimum.
2. Crosstalk, unweighted DC to 4.2 MHz: 45 dB minimum.
3. Frequency Response (RGBHV): Within +0.5 dB to 300 MHz.
4. Frequency Response (composite): Within +0.5 dB to 10 MHz.
5. Frequency Response (component): Within +0.5 dB to 100 MHz.
6. Line and Field Tilt: 2% maximum.
7. Differential Gain: 3% maximum.
8. Differential Phase: 2 degrees maximum.

**E. Test Signal Paths:**

1. Audio: From any and all source inputs (microphones, audiotape units, videotape units, etc.) through all audio mixers, switchers, distribution amplifiers, codecs, etc., to all signal destinations.
2. Audio: From any and all source inputs (microphones, audiotape units, videotape units, etc.) through all audio mixers, switchers, distribution amplifiers, codecs, etc., to all signal destinations.

## 2.04 OPERATION

**A. Design Standards:**

1. Baseline audiovisual requirements within this system specification will be maximized to the greatest extent possible in order to support future growth in an effective manner. Therefore part of the Installer's development efforts for successfully implementing the audiovisual system should include:

a. Installing the system in a manner that allows for future audiovisual equipment to integrate easily into the overall desired system design, properly routing all audio, video, control and structured cabling elements of the final design in an industry acceptable manner that preserves the architectural and visual integrity of the building.
b. Except when plenum rated cabling is used above finished ceilings or below raised, accessible floors, it is required that cabling for microphone and line inputs, wideband RGBHV, video, control and other audiovisual related cabling be routed inside the comprehensive system of conduit indicated on the drawings and installed by others. Floor and wall boxes shall serve as the primary interface points to the audiovisual system.
c. Provide and install cover plates, connectors and associated cabling to link all floor and wall boxes to all affiliated local and remote audiovisual components. The Owner will provide no additional conduit, power or workboxes. If additional infrastructure is required, include provisions for what is additionally required in the proposal. No wiremold or surface mounted raceway will be permitted.

**B. Remote Control and Digital Signal Processing Standards:**

1. At a minimum, the remote control system for the audiovisual system shall be programmed to include the following:
   a. Full function control of all source components, display units, processing devices and switching electronics.
   b. Per function status feedback indicating active/passive modes of operation.
   c. Separate program and microphone audio level control with mute function.
   d. 50% audio level default.
   e. Panel layout to include user screens as well as password protected technician pages.
   f. Raise and lower projection screens.
   g. At least four (4) lighting presets with independent control for the separate lighting zones.
   h. Full audio and video teleconferencing functions with dialing.
   i. A minimum of three (3) presets for each installed remote controllable video camera.

j. Assignment of dedicated OFE room computer as default.
k. Owner logo on first page.
l. Automatic system shutdown.
m. AM/PM Clock settings.
n. Intellectual property release for installing editable, uncompiled source code for the entire remote control system and associated panel layouts on OFE computer(s). Editable, uncompiled source code is intended for the Owner to make additions, modifications and changes to the remote control system after the warranty period has expired.
o. Provide and load onto Owner's dedicated computer, editable versions of all configuration files for any digital signal processing as well as the associated software required for editing those files. Provide editable and uncompiled versions of all master source code for the control system on CD-ROM.

## 2.05 MATERIALS

### A. Coaxial Cables:

1. Coaxial cables shall include all coaxial connectors, cable tying straps, heat shrink tabbing, hangers, clamps, etc., required to accomplish a neat and secure installation.

### B. Wires and Cables:

1. Wire and cables shall include all connectors and terminals, spade lugs, barrier straps, punch blocks, wire wrap strips, heat shrink tubing, tie wraps, solder, hangers, clamps, labels etc., required to accomplish a neat and orderly installation.

### C. Conduits, Cable Ducts and Cable Trays:

1. Shall include all conduit, duct, trays, junction boxes, back boxes, cover plates, feed through nipples, hangers, clamps, firestop and other hardware required to accomplish a neat and secure conduit, cable duct, and/or cable tray installation in accordance with the NEC and this document.

### D. Labels:

1. Labeling shall include any item or quantity of labels, tools, stencils, and materials needed to completely and correctly label

each system and subsystem according to each original equipment manufacturer requirements, Drawings of Record, and this document.

## 2.06 ASSEMBLY

### A. Equipment Interface:

1. Equipment shall include any item or quantity of equipment, cable, mounting hardware and materials needed to interface each systems and subsystems according to each original equipment manufacturer requirements and this document.

### B. Equipment Assembly:

1. Cabinets and Consoles:
   a. Each cabinet and console (here-in-after referred to as “enclosure”) shall be: floor or wall mounted with standard knockout holes for conduit connection or cable entrance; provide for ventilation of the equipment; have front and rear locking doors (except wall mounted cabinets that require only a front locking door); power outlet strip(s) and bulkhead connector panel(s).
   b. Each cabinet shall be equipped with a quiet fan and non-disposable air filter.
   c. Enclosures shall be installed plumb and square. Each shall be permanently attached to the building structure and held firmly in place as approved by the RE.
   d. Signal equipment, patch or bulkhead connector panels (i.e.: audio, data, control, etc.) shall be connected so that output for from each source, device or system component shall enter the panel at the top row of jacks, beginning left to right as viewed from the front, which will be called “input”. Each connection to a load, device or system component shall exit the panel at the bottom row of jacks, beginning left to right as viewed from the front, which will be called “output”.
   e. Cables shall enter the equipment racks/cabinets in such a manner that all doors shall open and close without disturbing or damaging the cables.
   f. All distribution hardware shall be securely mounted in a manner that shall provide access to the connections for

testing and allow sufficient cable room for the doors to open and close without disturbing the cables.

2. Labeling:
   a. Abbreviations may be used as long as they are the symbol(s) designated for the system or equipment by accepted industry standards and each abbreviation and symbol are used on the appropriate system and subsystem "as-installed" drawing(s).
   b. Cable and Wires (Hereinafter referred to as "Cable"):
      1. The Contractor shall install labels on all cables at each side of all connections. The labeling shall be permanent, with contrasting identification alpha or numeric, identifying each cable according to the system "Drawings of Record". Labels shall be installed adjacent to each mechanical connector, pull box or break in the cable run.
   c. Equipment:
      1. Amplifying, control, switching, and routing equipment inputs and outputs shall be permanently labeled with contrasting plastic laminate or Bakelite material. System equipment shall be permanently labeled on the face of the unit corresponding to its source. Remote control equipment shall be labeled according to the unit or system being controlled. Equipment labels shall be permanently affixed to the equipment with metal screws, permanent mounting devices or cement.

## 2.07 SOURCE QUALITY CONTROL

**A. Pre-testing:**

1. Upon completing installation of each system, the Contractor shall align, balance, and completely pretest each entire system under full operating conditions.
2. Procedure:
   a. During the system pretest the Contractor shall verify (utilizing an approved oscilloscope, spectrum analyzer and test equipment) that the systems are fully operational and that they meet each system performance requirements of this standard.

b. The Contractor shall pretest and verify that each system's equipment functions and specification requirements are met and operational allowing no undesirable visual effects such as key stoning, banding and shimmering as well as no undesirable aural effects such as signal distortion, noise pulses, glitches, audio hum, poling noise, etc. are present.

3. The Contractor shall provide four copies of the recorded system pretest measurements and the written certification that the system is ready for the formal acceptance test shall be submitted to the RE. The RE will forward three copies of these measurements to the PM. The PM will forward two copies of these measurements to the Consultant for evaluation no later than 10 working days prior to the scheduled acceptance test.

# PART 3 EXECUTION

## 3.01 PREPARATION

### A. Demolition:

1. Carefully remove all existing wire mold, wires and equipment, etc. that are scheduled for replacement. Do not damage adjacent areas that are not affected by this work or are not scheduled for change. Investigate each work area prior to demolition to ensure that the work does not interfere with adjacent office suites.
2. Coordinate with the Owner or Owner's representative for salvage of all existing materials. All materials removed for demolition and not slated for salvage shall be removed from the site and deposited legally at a local fill accepting those type materials.
3. Demolished materials may only be removed by hand or cart. Free falling materials are not an acceptable method of removable.
4. Noise levels during demolition must be kept to a minimum.

## 3.02 INSTALLATION

### A. System Installation:

1. After award of the contract, and within the time period specified in the contract, the Contractor shall deliver the system in a manner that fully complies with the requirements of this specification. The Contractor shall make no substitutions or changes in the system without written approval from the RE. The Contractor shall insure that the installation personnel understand all the requirements of this specification.
2. The Contractor shall install all systems to comply with NFPA 70, National Electric Code 2005 recommendations, guidelines, and directives, in a manner which complies with accepted industry standards of good practice, the requirements of this specification and in a manner which does not constitute a life or physical safety hazard.
3. The Contractor shall provide suitable filters, traps, and pads for minimizing interference and for balancing the amplifiers and distribution system(s). Items used for balancing and minimizing interference shall be able to pass video, audio, data, and control signals in the speeds and frequency bands selected, in the directions specified, with low loss and high isolation. The

Contractor shall install all equipment necessary to meet the requirements each system's performance standards.

4. All passive equipment shall be connected according to the original equipment manufacturer's specifications to insure correct termination, isolation, impedance match, and signal level balance.
5. Install all equipment for each location identified herein and as specified on the drawings.

**B. Equipment and Materials:**

1. Each item of equipment to be supplied under this specification shall be new and the current model of a standard product of an original equipment manufacturer of record. An original equipment manufacturer of record shall be defined as a company whose main occupation is the manufacture for sale of the items of equipment supplied and which:
   a. Maintains a factory production line for the item submitted.
   b. Maintains a stock of replacement parts for the item submitted.
   c. Maintains engineering drawings, specifications, and operating manuals for the items submitted.
   d. Has published and distributed descriptive literature and equipment specifications on the items of equipment submitted at least 30 days prior to the Invitation for Bid.
2. Specifications of equipment as set forth in this document are salient and minimum requirements, unless otherwise stated, and shall not be construed as limiting the overall quality, quantity, or performance characteristics of items furnished in the system. When the Contractor furnishes an item of equipment for which there is a specification contained herein, that item of equipment shall meet or exceed the specification for that item of equipment.
3. The systems shall be provided so that the installation, integration, and combination of equipment actually employed does not produce any undesirable visual effects such as key stoning, banding and shimmering as well as any undesirable aural effects such as signal distortion, noise pulses, glitches, audio hum, poling noise, voltage or spike transients, etc.
4. While individual items of equipment may meet the equipment specifications, and in fact, meet the system specifications; when electrically associated with other equipment, the total system shall be designed and installed so that the installation, interfacing,

integration, combining, and/or consolidation of equipment actually employed does not produce any undesirable visual or aural effects such as signal distortions, noise pulses, glitches, audio or video hum bars, transients, ghosting, etc.

5. The Contractor shall produce verification, in writing to the RE at time of installation, that the type of wire/cable actually being provided is recommended and approved by the original equipment manufacturers and will provide a total system free of undesirable effects. The Contractor is responsible for the providing the correct protection cable duct and/or conduit and wiring even though the actual item installation may be by another subcontractor.
6. The Contractor is responsible for interfacing the systems with each required sub-system. The Contractor shall continually employ interfacing methods that are approved by the original equipment manufacturer and industry best practices. At a minimum, the acceptable interfacing method requires not only a physical and mechanical connection; but also a matching of signal, voltage, and processing levels, with regard to signal quality and impedance.
7. Active electronic component equipment shall consist of solid-state components and be rated for continuous duty service in the areas where provided.
8. All passive equipment and cables shall meet or exceed -80 dB radiation shielding specifications.
9. All signaling and communication circuits shall be solid state except for projection screen relays.
10. Each system shall utilize microprocessor components for all signaling and programming circuits and functions. Program memory shall be non-volatile or protected from erasure from power outages for a minimum of five minutes.
11. All voltages, except for the primary power to the power supply circuits, shall not exceed 70.7 VAC Root Mean Squared (RMS) or 100 V direct current (DC).
12. Color code all distribution wiring to conform to the respective system industry standard, TIA/EIA, and this document; which ever is the more stringent. At a minimum, all equipment, cable duct and/or conduit, enclosures, wiring, terminals, and cables shall be clearly and permanently labeled according to and using the provided Drawings of Record, to facilitate installation and

maintenance. Reference Specification Sections 16127, CABLES LOW VOLTAGE 600 VOLTS AND BELOW.

13. All equipment faceplates utilized in the system shall be stainless steel, anodized aluminum, or ABS plastic for the areas where provided.
14. Noise filters and surge protectors shall be provided for the audiovisual system including equipment racks and display devices to ensure protection from input primary AC power surges and noise glitches are not induced into low voltage data circuits.
15. Passive and electronic components and cabling shall be provided under the original equipment manufacturer's recommendations and guidance, to prevent damage to any system equipment from electrostatic discharges. The RE shall contact the Consultant for technical review and approval for this requirement in case of system redesign or change of technical approved system equipment that may require substitution.

**C. Equipment Lists:**

1. The Contractor shall include the list as a part of the technical submittal as identified herein.
2. Refer to the attachments following this section for materials and equipment required to complete the work of this section.

**D. System Grounding:**

1. A single primary "System Ground" shall be established for the system. All grounding conductors shall connect to this primary system ground. The "System Ground" shall be provided within the audio-visual equipment racks. It shall be comprised of a copper bar of sufficient size to accommodate all secondary ground conductors.
2. A copper conductor, having a maximum of 0.1 Ohms total resistance, shall connect the primary system ground bar to the nearest metallic electrical conduit or direct to building steel. The Contractor shall be responsible for determining if the metallic conduit is electrically bonded to the building ground system.
3. Secondary system grounding conductors shall be provided from all racks, audio consoles and ungrounded audio equipment, to the primary system grounding point. Each of these grounding conductors shall have a maximum of 0.1 Ohm, total resistance.

4. Under no circumstances shall the AC neutral conductor, either in the power panel or in the receptacle be used for a system ground.
5. All balanced audio cable shields shall be grounded at one point only. For inter and intra-rack wiring this requires that, the shield is connected at one end only. For ungrounded portable equipment, such as microphones, the shield shall be connected at both ends but grounded only at one end.

**E. Conduit and Signal Ducts:**

1. Conduit:
   a. The Contractor shall employ the latest installation practices and materials. Conduit size shall be provided at a minimum Trade Size 3/4.
   b. All cables shall be installed in separate conduit and/or signal ducts. Conduit shall be provided at a minimum in accordance with Specification Section 16111, CONDUIT SYSTEMS.
2. Conduit fill shall not exceed 40 percent.
3. Cable runs shall be splice free between conduit junction and interface boxes and equipment locations. Use of tape of any kind or wire nuts will not be accepted.
4. Signal Duct, Cable Duct, or Cable Tray:
   a. Existing signal duct, cable duct, and/or cable tray shall be used by the Contractor, when identified and approved by the RE.
   b. Approved signal and/or cable duct shall be a minimum size of 4” X 4” inside diameter with removable tops or sides, as appropriate. Protective sleeves, guides, or barriers are required on all sharp corners, openings, anchors, bolts, or screw ends, junction, interface and connection points.
   c. Approved cable tray shall be fully covered, mechanically and physically partitioned for multiple electronic circuit use, and UL certified and labeled for audiovisual circuits and/or systems. Technical approval for cable tray use must be obtained in writing from Consultant. The RE shall approve width and height detentions.
   d. The Contractor shall label all conduit, duct, and tray, including utilized OFE, with permanent marking devices or spray painted stenciling a minimum every 10 feet

identifying it as the system. Also, each enclosure shall be labeled according to this standard.

5. Do not pull wire or cable through any box, fitting, or enclosure where change of approved conduit, cable tray, signal, or cable duct alignment or direction occurs. Ensure the proper bend radius is maintained for each wire or cable as specified by its original equipment manufacturer.
6. Employ temporary guides, sheaves, rollers, and other necessary items to protect the wire or cable from excess tension or damaging bending during installation. Abrasion to wire or cable jackets is not acceptable and will not be allowed. Replace all cables whose jackets has been abraded (THE DISCOVERY OF ANY ABRADED AND/OR DAMAGED CABLES DURING THE PROOF OF PERFORMANCE TEST SHALL BE GROUNDS FOR DECLARING THE ENTIRE SYSTEM UNACCEPTABLE AND THE TERMINATION OF ITS PROOF OF PERFORMANCE TEST). Completely cover edges of wire or cable pass through holes in chassis, cabinets or racks, enclosures, pull or junction boxes, conduit, etc., with plastic or nylon grommeting.
7. All cable junctions and taps shall be accessible. Do not install junction blocks, multi distribution connections or other audiovisual equipment (active or passive) items inside signal ducts. Use a 6" X 6" X 4" minimum covered junction box attached to the signal duct fixed side for distribution system passive equipment installation (see detail drawing). Ensure all equipment and connection assembly junctions are accessible.

**F. System Signal Wires and Cables:**

1. Wires and cables shall be provided in the same manner and use like construction practices that are identified and outlined in NFPA 70, National Electrical Code 2005. The wires and cables shall be able to withstand any adverse environmental conditions in their respective location without deterioration. Wires and cables shall enter each equipment enclosure, console, cabinet or rack in such a manner that all doors or access panels shall open and close without removing or disturbing the cables.
2. Routing and Interconnection:
   a. Wires or cables between consoles, cabinets, racks, and other equipment shall be in approved conduit, signal duct,

cable duct, or cable tray that are secured to solid building structures.

3. Wires and cables shall be insulated to prevent contact with signal or current carrying conductors and 100% shielded. Wires or cables used in assembling consoles, panels, equipment cabinets and racks shall be formed into harnesses that are bundled and tied. Harnessed wires or cables shall be combed straight, formed, and dressed in either a vertical or horizontal relationship to equipment, controls, components or terminations.
4. Harnesses with intertwined members are not acceptable. Each wire or cable that breaks out from a harness for connection or termination shall have be tied off at that harness or bundle point, and be provided with an ample neatly formed service loop.
5. Wires and cables shall be grouped according to service and industry best practice (i.e.: AC, grounds, signal, DC, control, etc.). Wires and cables shall be neatly formed and shall not change position in the group throughout the conduit run. Wires and cables in approved signal duct, conduit, cable ducts, or cable trays (open wire-ways or open cable ladders are not authorized and will not be approved), shall be neatly formed, bundled, and tied off in 24 to 36 inch lengths and shall not change position in the group throughout the run. Concealed splices are not allowed.
6. Separate, organize, bundle, and route wires or cables to restrict channel cross-talk or feedback oscillation inside any enclosure. Looking at any enclosure from the rear (wall mounted enclosures, junction, pull or interface boxes from the front), locate AC power, DC power, loudspeaker, RF, relay and switching control wires or cables on the left; microphone level, line level audio, video, digital control and time code wires or cables on the right. This installation shall be accomplished with ties and/or hook and loop fasteners that will not damage or distort the wires or cables. Limit spacing between tied off points to a maximum of six inches.
7. Audiovisual cables shall be installed and fastened without causing sharp bends or rubbing of the cables against sharp edges. Cables shall be fastened with hardware that will not damage or distort them.
8. Cables shall be labeled with permanent markers at the terminals of the electronic and passive equipment and at each junction point in the system. The lettering on the cables shall correspond with the lettering on the as installed diagrams.

9. Completely test all of the cables after installation and replace any defective cables (REFER TO CAUTION DESCRIBED HEREIN).
10. Provide system input and output polarity as recommended by the original equipment manufacturer. Ensure each color-coded wire or cable is connected and terminated to maintain system polarity to be at least the same quality of professional audio systems. Reflect all color codes, wire and cable terminations on the system's Drawings of Record as required herein.

**G. Outlet Boxes, Back Boxes and Faceplates:**

1. Outlet Boxes:
   a. Signal, power, interface, connection, distribution, and junction boxes shall be provided as required by the system design, on-site inspection and review of the contract drawings.
2. Back Boxes:
   a. Back boxes shall be provided as directed by the original equipment manufacturer as required by the approved system design, on-site inspection and review of the contract drawings.
3. Face-plates (or Cover Plates):
   a. Face-plates shall be of a standard type, stainless steel, anodized aluminum or ABS plastic construction and provided by the Contractor for each identified system location. Connectors and jacks appearing on the faceplate shall be clearly and permanently marked.

**H. Connectors:**

1. Circuits, transmission lines and signal extensions shall have continuity, correct connection, and polarity. Polarity shall be maintained between all points in the system.
2. Wires:
   a. Wire ends shall be neatly formed and where insulation has been cut, heat shrink tubing shall be employed to secure the insulation on each wire. Tape of any type is not acceptable and will not be approved.
   b. Audio spade lugs shall be installed on each wire (including spare or unused) end and connect to screw terminals of

appropriate size barrier strips. AC barrier strips shall be provided with a protective cover to prevent accidental contact with wires carrying live AC current. Punch blocks are approved for signal, NOT AC wires. Wire nut or "Scotch Lock" connectors are not acceptable for signal wire installation.

3. Cables:
   a. Each connector shall be designed for the specific size cable being used and installed with the original equipment manufacturer's approved installation tool.

## I. AC Power:

1. The Contractor shall connect all of the branch AC circuits that supply power to the system to the Facility's designated AC panelboard and shall clearly indicate on the directory in the panelboard that the circuits supply power to the system.
2. The Contractor shall furnish and install an individual 120 VAC branch circuit, wired to a separate breaker, from the designated panelboard to a minimum quad receptacle mounted inside each equipment rack or cabinet in conduit and according to the NEC 2005.
3. An AC power outlet shall be provided convenient to each item of equipment inside the equipment rack or cabinet. Extension or "pig tail" non-protected cords from the system cabinet or rack to a system wall outlet is not authorized and shall not be allowed and IF DISCOVERED SHALL BE GROUNDS TO DECLARE THE ENTIRE SYSTEM UNACCEPTABLE AND TERMINATE ALL ACCEPTANCE TESTING (SEE CAUTION IDENTIFIED HEREIN).
4. AC power wiring shall be run separately from signal cable.
5. Labeling:
   a. Each circuit breaker shall be labeled at the AC panelboard to identify which equipment console, cabinet or enclosure that it serves. Each equipment console, cabinet or enclosure shall be labeled to identify which AC panelboard provides power to it. These labels shall be permanently affixed to the equipment with metal screws, permanent mounting devices or cement.

## 3.03 SITE QUALITY CONTROL

### A. Testing Plan:

1. Prior to system testing, furnish a typewritten document (including illustrations), which, utilizing the test equipment specified in paragraph 1.7 C.2, provides a detailed system testing plan for the system to meet this specification's performance standards indicated in paragraph 1.5 A. The test plan will be evaluated and approved by the Consultant, before system testing.

### B. Test Equipment:

1. Each Contractor is responsible for furnishing all test equipment required to test the system in accordance with the parameters specified. Unless otherwise stated, the test equipment shall not be considered part of the system. Each Contractor shall furnish test equipment of accuracy better than the parameters to be tested.
2. The test equipment furnished by each Contractor shall have a calibration tag of an acceptable calibration service dated not more than 12 months prior to the test. As part of the submittal, a test equipment list shall be furnished that includes the make and model number of the following type of equipment as a minimum:
   a. Oscilloscope.
   b. Spectrum Analyzer.
   c. Signal Level Meter.
   d. Volt-Ohm Meter.
   e. SPL Meter.
   f. SPL Calibrator.
   g. Sine wave and random Noise Generator.
   h. Audio Amplifier with external speaker.

## 3.04 CLOSOUT ACTIVITIES

### A. Acceptance and Commissioning:

1. After each system has been pre-tested and the Contractor has submitted the pretest results and certification to the RE, then the Contractor, along with the RE and Consultant, shall schedule an acceptance test date. The Contractor shall provide the RE 30 days advance written notice of the date the acceptance test is expected to begin.

2. The systems shall be tested, in the presence of the Consultant and an original equipment manufacturer's certified representative. The systems shall be tested utilizing the approved test equipment to certify each system's proof-of-performance. Each system test shall verify that total system meets all the requirements of this specification under full operating conditions.
3. The acceptance tests shall be performed on a "go-no-go" basis. Only those operator adjustments required to show proof-of-performance shall be allowed. The tests shall demonstrate and verify that the provided systems comply with all requirements of this specification under operating conditions. The systems shall be rated as either acceptable or unacceptable at the conclusion of the test. Failure of any part of the systems that precludes completion of that system's testing, which cannot be repaired in one hour, shall be cause for terminating the acceptance test of that system. Repeated failures that result in a cumulative time of four hours to effect repairs shall cause the entire system to be declared unacceptable. Retesting of that entire system shall be rescheduled at the convenience of the Consultant at the direction of the RE.

**B. Acceptance Test Procedure:**

1. Physical and Mechanical Inspection:
   a. The Consultant will physically tour all areas where each system is installed to insure that all sub-systems are completely and properly installed in place, and are mechanically ready for proof-of-performance testing. A system inventory including required spare parts will be taken at this time. Each item of installed equipment shall be checked to ensure appropriate UL certification labels are affixed.
   b. Each system's diagrams, Drawings of Record, equipment manuals, AutoCAD disks, editable versions of all configuration files for any digital signal processing as well as the associated software required for editing those files, editable and uncompiled versions of all master source code for the control system on CD-ROM and pretest results shall be formally inventoried and reviewed.

c. Failure of any system to meet the installation requirements of this specification shall be grounds for terminating all testing.

2. Operational Test:
   a. After the Physical and Mechanical Inspection, each head end, terminating, distribution, and remote control equipment shall be checked to verify that it meets all performance requirements outlined herein. An oscilloscope, spectrum analyzer and sound level meter may be additionally utilized to accomplish this requirement.
   b. Following the head end, terminating, distribution, and remote control equipment test, test equipment shall be connected to each equipment's output tap to ensure there are no signal distortions such as visual, inter-modulation, data noise, popping sounds, erratic system functions, on any function.
   c. Each system shall be checked at each interface, junction, and distribution point, first, middle, and last intersectional, room and outlet, in each leg to verify that the system meets all system performance standards.
   d. Once these tests have been completed, each installed sub-system function shall be tested as a unified, functioning and fully operating system. Also, minimum of ten minutes of UPS operation and memory saving.
3. Individual Item Test:
   a. The Consultant will select individual items of equipment for detailed proof-of-performance testing until 100% of each system has been tested and found to meet the contents of this specification. Each item shall meet or exceed the minimum requirements of this document.
4. Test Conclusion:
   a. At the conclusion of the Acceptance Test, using the generated punch list (or discrepancy list) the Consultant and the Contractor shall jointly agree to the results of the test, and reschedule testing on deficiencies and shortages, if any, with the RE. Any retests that are needed to reach agreement on the results of these tests or to later establish compliance with these specifications will be done at the Contractor's expense.

5. If the systems are declared unacceptable without conditions, all rescheduled retest expenses will be born by the Contractor.

**C. Training:**

1. Furnish the services of a factory-trained engineer or technician for two four-hour periods to instruct the Facility's personnel. Instruction shall include corrective and preventive maintenance of each system's equipment. Training shall be accomplished before InfoComm International can accept the system. Additionally, training will be scheduled at the convenience of InfoComm International.
2. Furnish the services of a representative of the systems; familiar with the functions and operation of the equipment, for two four-hour periods to train selected Facility personnel. Instructions shall be provided for staff personnel in each area where new equipment is provided under this contract. When multiple locations are involved, classes will be grouped. Periods of training shall be coordinated with InfoComm International to ensure all shifts receive the required training. A video tape presentation shall be provided where such tape exist that is sufficient in detail to stand alone as a training aid for initial utilization and familiarization of the system. Additionally, the Contractor shall provide two copies of the video presentation to the InfoComm International.

## 3.05 MAINTENANCE

**A. Work Not Included:**

1. Maintenance and repair service shall not include the performance of any work due to improper use; accidents; other vendor, contractor, or owner tampering or negligence, for which the Contractor is not directly responsible and does not control. The Contractor shall immediately notify the RE or Facility Contracting Officer upon the discovery of these incidents, in writing. The RE or Facility Contracting Officer will investigate all reported incidents and render findings concerning any Contractors responsibility.

## 3.06 ATTACHMENTS

**A. List of System Drawings**

1. AV100 List of Drawings

| | | |
|---|---|---|
| 2. | AV101 | Audiovisual Electrical Symbols |
| 3. | AV201 | Facility Plan |
| 4. | AV202 | Audiovisual Good Viewing Area Plan and Sightline Study |
| 5. | AV203 | Uniformity of Coverage |
| 6. | AV301 | Audiovisual Electrical Floor/Ceiling Plan |
| 7. | AV302 | Audiovisual Electrical Reflected Ceiling Plan |
| 8. | AV303 | IT/AV Plan |
| 9. | AV304 | Audiovisual Conduit Riser |
| 10. | AV305 | Lighting Zone Plan |
| 11. | AV401 | RGBHV System |
| 12. | AV402 | Video System |
| 13. | AV403 | Audio/Program/Voice System |
| 14. | AV404 | Program Audio System |
| 15. | AV405 | Control System |
| 16. | AV406 | DSP Routing Tables |
| 17. | AV501 | Rack Elevation |
| 18. | AV502 | Audiovisual Elevations |
| 19. | AV503 | Audiovisual Sections |
| 20. | AV504 | Equipment Racks and Wallplate Details |
| 21. | AV505 | Control System Touchpanel Page Layouts 1 |
| 22. | AV506 | Control System Touchpanel Page Layouts 2 |

**END OF SECTION**

infoComm INTERNATIONAL

11242 Waples Mill Road, Suite 200
Fairfax, VA 22030
www.infocomm.org

703.273.7200
800.659.7469
703.278.8082 FAX

**PROJECT TITLE:** InfoComm Academy

**DESCRIPTION:** Provide and install a new audiovisual system in InfoComm International's Academy training facility. All work must be completed by December 31, 2000.

**PRE-BID/PROPOSAL MEETING:** August 1, 2000 at 2:00 pm.

**DEADLINE FOR QUESTIONS:** August 6, 2000 at 2:00 pm.

**DEADLINE FOR BID SUBMISSION:** August 10, 2000 at 4:30 pm.

**TENTATIVE DATE OF AWARD:** August 31, 2000

**PROCUREMENT OFFICE AND CONTACT INFORMATION:**
Finance & Administration
InfoComm International
11242 Waples Mill Road
Fairfax, VA 22030

**INQUIRIES REGARDING THIS BID MAY BE MADE TO:** Finance & Administration

**PROCUREMENT METHOD:** The solicitation will be conducted in accordance with InfoComm International's procurement policies and procedures.

**BASIS FOR AWARD:** Award will be made to the responsive and responsible bidder whose bid is determined to be the most advantageous to InfoComm International considering the bid price, the submittal requirements detailed in the solicitation and sound business practices.

**INCLUDED IN BID PACKAGE:**
Section 00100, General Conditions
Section 00400, Scope of Work
Section 01720, Project Record Documents
Section 16800, Audiovisual Equipment and System
Equipment List
Drawings AV1-AV2
Exhibits A and B

**BID SUBMITTALS:** The following items should be submitted with the Bid: Bid/Price Proposal Form and Exhibits A and B.
Prices quoted are valid for 90 days unless noted otherwise.

**BID RESPONSE SHOULD BE MADE VIA:**
Fax – Attention: Finance & Administration 703.278.8082
Hand delivery or mail – Attention: Finance & Adminstration, 11242 Waples Mill Road, Fairfax, VA 22030

**MINORITY BUSINESSES ARE ENCOURAGED TO RESPOND.**

infoComm INTERNATIONAL
11242 Waples Mill Road, Suite 200
Fairfax, VA 22030
www.infocomm.org
703.273.7200
800.659.7469
703.278.8082 FAX

## BID/PRICE PROPOSAL FORM

BIDDER'S NAME: _____

PROJECT TITLE: _____

**Failure to properly and completely fill in all blanks may be cause for rejection of this bid/proposal.**

Having carefully examined all of the solicitation documents for the above referenced project and ADDENDA NUMBER(S) _____ being collectively referred to as the Contract Documents, and having received clarification on all items of conflict or upon which any doubt arose, the undersigned proposes to furnish all labor, materials and equipment required by the said documents for the entire work, all in strict accordance with the Contract Documents, for the sum of :

BASE BID (TOTAL COST OF PROJECT)_____ ($_____)
(Words) (Numbers)

All offerors should specify any additional costs that may be incurred, or savings or benefits that may be realized by InfoComm International, although this information has not been specifically requested elsewhere in the RFP.

If the undersigned is notified by the Procurement Officer/Representative of the acceptance of the bid within 90 days after bid date, Contractor agrees to guarantee the completion of this work as specified in the Contract Documents.

| _____ | _____ | _____ |
|---|---|---|
| Firm License Number (if applicable) | Date Issued | Place of Issuance |

Minority Business Enterprises:

The undersigned certifies that the Bidder:

____ IS NOT a Certified Minority Business Enterprise.

____ IS a Certified Minority Business Enterprise (MBE), certified by _____
(Certifying Agency)

The Certification Council has assigned the following certification number: _____

infoComm INTERNATIONAL
11242 Waples Mill Road, Suite 200
Fairfax, VA 22030
www.infocomm.org
703.273.7200
800.659.7469
703.278.8082 FAX

**INDIVIDUAL PRINCIPAL**

Firm Name: _____

Address: _____

_____

Telephone/Fax No. _____

_____
Federal Tax Number or Social Security Number

Witness: _____ Signed: _____

**CO-PARTNERSHIP PRINCIPAL**

Address: _____

_____

Telephone/Fax No. _____

_____
Federal Tax Number or Social Security Number

In the Presence of:

Witness: _____ By: _____

Witness: _____ By: _____

Witness: _____ By: _____
Partner

**CORPORATE PRINCIPAL**

_____
Name of Corporation

Address: _____

_____

Telephone/Fax No. _____

_____
Federal Tax Number

The undersigned affirms, and it is a condition precedent to acceptance of this bid, that the bidder has not been a party to any agreement to bid a fixed or uniform price.

By: _____
Signature of Officer or Authorized Agent
(Affix Corporate Seal)

_____
Printed Name

_____
Title

Witness: _____

infoComm INTERNATIONAL
11242 Waples Mill Road, Suite 200
Fairfax, VA 22030
www.infocomm.org
703.273.7200
800.659.7469
703.278.8082 FAX

## COMPANY PROFILE

Company Name: _____

Date of Incorporation: _____ State of Incorporation: _____

Type of Work Performed: _____

_____

_____

Number of Years in Business: _____

Other or Former Names Under Which Your Organization has Operated: _____

_____

Type of Organization (i.e. Corporation, Partnership, Individual, Joint Venture, Other): _____

_____

Name of Principal(s) and Titles: _____

_____

_____

Brief History of Company: _____

_____

_____

Total Number of Employees: _____

Number of Field Employees (Excluding Supervisors): _____

Number of Field Supervisory Personnel: _____

Number of Office Personnel (Excluding Supervisors): _____

Number of Office Supervisory Personnel: _____

Bonding Company: _____ Bonding Capacity: _____

infoComm INTERNATIONAL
11242 Waples Mill Road, Suite 200
Fairfax, VA 22030
www.infocomm.org
703.273.7200
800.659.7469
703.278.8082 FAX

## FIRM EXPERIENCE

Proposer: _____

Project Name: _____

Project Dollar Size: _____

Start Date:_____

Completion Date: _____

Client/Customer: _____

Address: _____

Contact Person: _____

Telephone Number: _____

Fax Number: _____

Email: _____

Project Manager: _____

Brief, but detailed description of the project:

Similarities between this project and Infocomm Academy:

## GENERAL NOTES

NOTE: It is the responsibility of the Contractor to provide all work and materials to accomplish the design intent on the drawings. Drawings indicate the extent, general character, and location of Work. Minor details not shown shall be furnished complete to perform the functions intended.

1. Contractor shall verify all dimensions and conditions shown on drawing at the job site and shall notify the Architect and the Owner of any discrepancies, omissions, and/or conflicts before proceeding with the job. The Contractor shall verify all conditions and dimensions in the field before ordering materials and commencing the Work. All Work shall be performed in a first class workmanlike manner.
2. Do not scale drawings; dimensions govern. Large scale details govern small scale plans.
3. All work shall conform to state and local building codes, Fire, Health, WSSC, etc.
4. All partitions are dimensioned to outside surface, unless otherwise noted.
5. Contractor shall be responsible for the bracing and blocking of walls receiving millwork, shelving, etc.
6. Where a vinyl base is specified, use a top set base.
7. All floors shall be leveled and free of irregularities to assure one constant floor height so that door backs when set are at consistent dimensions from the ceiling, with no gaps between the bottom of the door back at the slab after carpeting and other floor finishes are installed. Any unavoidable changes in the floor height shall be gradually raised and troweled to create a easy-like effect. All depressions, cracks, screeds, and expansion joints are to be filled with a good grade noncrumbling latex base flashing compound, water putty or crack filler.
8. All wall duplex, telephone and switch boxes are to be caulked as per building standard.
9. Contractor shall be responsible for arranging with building manager for elevators or other hoisting facilities for handling materials, if available.
10. For information on columns, exterior walls, core area, etc.: see base building architectural drawings, shell and core drawings.
11. All work is to conform with Owner's drawings and specifications.
12. All Contractors are responsible for laying out equipment runs to avoid interferences.
13. If the ceiling diffusers, light fixtures or other elements on or above the ceiling cannot be located as shown on plan due to obstructions, this should be noted before bidding so revisions may be made and included in bids.
14. Doors and frames which require a fire resistant rating shall be a type approved by the National Board of Fire Underwriters.
15. After the job is in progress, "attendnce" must be approved in writing by the Owner and/or Architect.
16. Exit and directional signs and lights shall comply with state and local building codes.
17. Interior rooms shall be mechanically ventilated in accordance with the state and local building codes.
18. Contractor shall be responsible for bracing and partition walls as required and at all door openings.
19. Drywall control joints shall be provided in accordance with recommended practices of United States Gypsum Association.
20. All miscellaneous wood blocking shall be fire treated.
21. Contractor shall review all documents to assure proper alignment of all mechanical and electrical systems and to avoid conflicts with furniture and cabinetry placement.
22. Partitions terminating at mullions shall be centered on mullion unless otherwise noted.
23. All angles shown are 45 degrees, unless otherwise noted.
24. Contractor shall apply for and obtain all necessary permits.
25. Contractor may substitute materials and/or construction upon submission to and approval by the Architect.
26. Dimensions noted "hold" are not adjustable without approval by the Architect.
27. Isolate dissimilar metals in contact with each other.
28. All doors, door frames, and shelving shall be finished with semi-gloss enamel. All other surfaces are to be flat paint, eggshell finish (U.N.O.).
29. Contractor shall furnish and install fire extinguishers, fire dampers, and smoke detectors as required by the fire marshall and local codes.
30. Contractor shall coordinate installation of fire pull boxes, fire bells, and exit signs, etc. as required by local codes.
31. Contractor shall schedule and perform all work so as not to reasonably disturb any tenant in the building and shall be responsible for any overtime costs incurred thereby.
32. Contractor shall be responsible for removal and disposal of all construction debris and refuse and cleaning of all interior glass surfaces.
33. Upon completion of the work, Contractor shall notify the Architect to compile a punch-list of corrections.
34. All new and existing mechanical, plumbing and sprinklers, and electrical works shall be coordinated with new ceiling layout. Any discrepancies shall be brought to the attention of the Architect prior to proceeding with any other work.
35. Contractor shall replace all existing exit and emergency lights in locations as shown after new ceiling and new wall finishes are installed.
36. Contractor shall replace and restore existing finishes and surfaces as affected by new construction.
37. Electrical Contractor shall circuit receptacles to available spares in existing panel box.
38. Electrical Contractor shall cap off all unused existing wiring.
39. Mechanical Contractor shall relocate diffusers to new locations as shown, clean, relocate and/or replace as required.
40. All supply and return air grills to tie into existing mechanical system with identical/compatible type of ductwork.
41. The Contractor shall verify any conflicts with existing utilities.
42. Hazardous materials shall not be stored within the premise nor the building structure.

## PROJECT DATA

| | |
|---|---|
| PROJECT DESCRIPTION: | New Tenant Improvement |
| PROJECT LOCATION: | 11242 Waples Mill Road<br>Fairfax, VA 22030<br>First and Second Floor |
| USE GROUP: | B-Business |
| CONSTRUCTION TYPE: | Base Building 2c |
| NUMBER OF STORIES IN BUILDING: | 4 Story office building |
| NUMBER OF STORIES IN PROJECT: | Partial Tenant on First Floor |
| PROPOSED SQUARE FOOTAGE: | 3,384 sf on First Floor |
| CEILING HEIGHT: | 9'-0" / 10'-0" VIF |
| SPRINKLER SYSTEM IN BUILDING: | Yes (All levels) |

## INDEX OF DRAWINGS


| | |
|---|---|
| CS | Cover Sheet |
| D-1 | First Floor Demolition Plan |
| AT-1 | First Floor Plan |
| AT-2 | Reflected Ceiling Plan, Outlet Plan, Furniture plan, Finish Plan |
| AT-3 | Details |
| AT-4 | Details / Schedules |

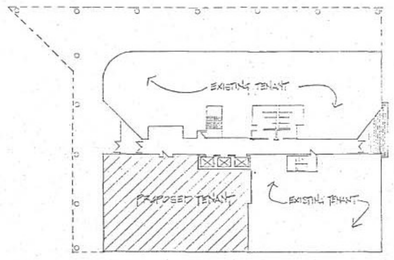

## SYMBOLS

- 10 / A15 — SECTIONAL DETAIL NO. SHEET NO.
- 12 / A10 — DETAIL TARGET, ENLARGEMENT SHEET NO.
- A / D / 2 / A12 / B / C — INTERIOR ELEVATION SYMBOL DRAWING NO. SHEET NO.
- 100 — AREA DESIGNATION/ROOM NUMBER
- 4 — DOOR NO.
- W1 — WINDOW TYPE
- BREAK LINE
- P1 — PARTITION TYPES-SEE SCHEDULE

## PROJECT DIRECTORY

| | |
|---|---|
| OWNER: | Quadrangle Development Corporation<br>1001 G Street, NW Suite #700<br>Washington, DC 20001<br>(202) 393-1999 |
| TENANT: | ICIA<br>3150 Spring Street<br>Fairfax, VA 22031 |
| ARCHITECT: | Soe Lin & Associates<br>8108 Fenway Road<br>Bethesda, MD 20817<br>(301) 469-8784 |
| CONTRACTOR: | Mark Winkler Co.<br>4900 Seminary Road<br>9 th Floor<br>Alexandria, VA 22311<br>(703) 998-0400 |
| MECHANICAL: | E. K. Fox & Associates<br>10306 Eaton Pl.<br>Suite 510<br>Fairfax, VA 22030<br>(703) 273-1112 |

## VICINITY MAP




FIRST FLOOR


Soe Lin & Associates

SL&A

Architecture,Interiors
Planning
8108 Fenway Rd
Bethesda, Maryland
20817
USA
301.469-8784
Fax.469-7830


Notes Consultants

Project

International Communications Industries Association ICIA

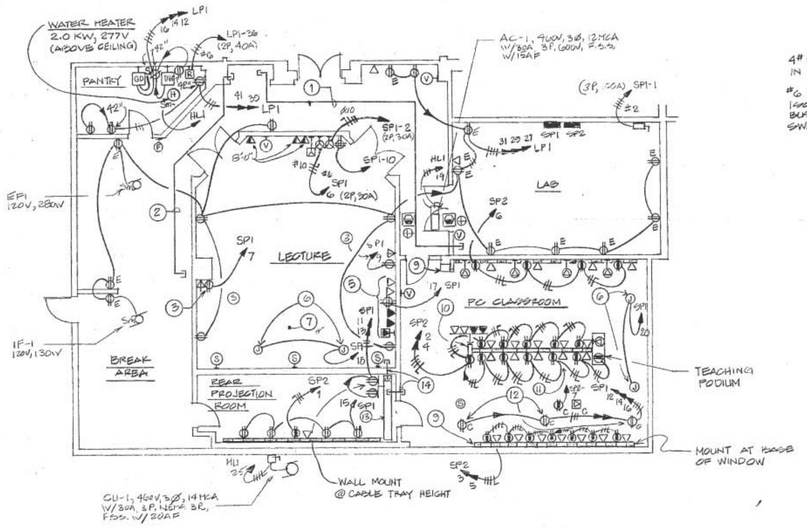
**FAIRFAX RIDGE PLAZA**
**11242 WAPLES MILL ROAD**
**FAIRFAX, VA**

Drawing Title
COVER SHEET

| Date | Issue |
|---|---|
| APRIL 9, 1996 | PERMIT |

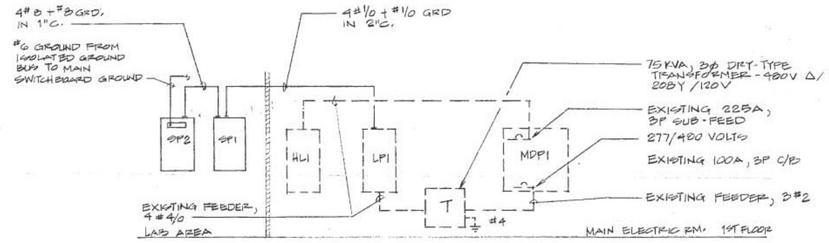
Dwn By
Chkd By
Job No.
Scale

Sheet No.
CS




## FIRST FLOOR PLAN - POWER

SCALE: 1/8"=1'-0"




## POWER RISER DIAGRAM

NOT TO SCALE

## DRAWING NOTES:

1. (2) 1" CONDUITS STUBBED IN TO CEILING SPACE. (1) CONDUIT TO HAVE DIRECT ROUTING; THE SECOND CONDUIT TO HAVE AS MANY TURNS AND PULLBOXES AS INDUSTRY STANDARDS FOR DATA CABLING WILL ALLOW. ALL PULLBOXES TO BE ACCESSIBLE.
2. (1) 1" CONDUIT STUBBED INTO CEILING SPACE.
3. 29" GRAPHICS AND VIDEO MONITOR WITH CEILING MOUNTED MONITOR BRACKET, 8' - 0" ABOVE FLOOR (MINIMUM).
4. AUXILIARY VIDEO/RGBHV INPUT AND OUTPUT.
5. PODIUM WALL FEEDS. PROVIDE WIRING TO PODIUM THROUGH PODIUM PLATFORM AND MAKE ALL FINAL CONNECTIONS TO PODIUM STAND AS DIRECTED BY TENANT.
6. CEILING MOUNTED JUNCTION BOX FOR RECESSED PROJECTION SCREEN, 120 VOLT. PROVIDE AN ABOVE CEILING 4-GANG BOX WITH 3/4" CONDUIT TO REAR PROJECTION ROOM CABLE TRAY.L
7. PROVIDE A 1" CONDUIT FROM VIDEO CONFERENCING CAMERA LOCATED IN CENTER OR PROJECTION SCREENS TO REAR PROJECTION ROOM CABLE TRAY.
8. 100A, 240V, 3P, N.F.S.S. FOR TEMPORARY CONNECTIONS TO RENTAL SCHOOL POWER PANEL.
9. BUILT-OUT CONDUIT CHASE, VERTICAL RUN.
10. INPUTS TO AND FROM PODIUM. PROVIDE (2) 1-1/2", (1) 1-1/4, AND (2) 1" CONDUITS TO REAR PROJECTION ROOM CABLE TRAY FROM FALSE COLUMN. PROVIDE (1) 1-1/2" CONDUIT TO PODIUM.
11. WIREMOLD G-6000 RACEWAY MOUNTED AT BASE OF DESKS.
12. BLACKOUT SHADE - PROVIDE A 5" X 5" X 2-1/2" JUNCTION BOX FOR LOW VOLTAGE INTERFACE UNIT. A SINGLE GANG BOX WITH A 3-PRONG RECEPTACLE IS REQUIRED FOR LINE VOLTAGE FROM MOTOR. BOTH MUST BE LOCATED WITHIN 2' - 0" OF MOTOR (MUST BE ACCESSIBLE FROM ROOM) (TYPICAL FOR 3). COORDINATE EXACT LOCATION WITH BLACKOUT SHADE SHOP DRAWING.
13. CABLE TRAY LOCATED ABOVE EQUIPMENT RACKS. STEEL TRAY LADDER TYPE WITH 6" RUNG SPACING, 18" WIDTH AND 4" SIDERAIL HEIGHT.
14. (3) 4" CONDUITS THROUGH WALL ABOVE CEILING FOR PLENUM CABLES. REAR PROJECTION ROOM STUB-OUT TO HAVE A RADIUS BEND FOR DROP TO CABLE TRAY.
15. ALL EMPTY CONDUIT TO HAVE PULLSTRING. ALL STUB-OUTS TO HAVE PLASTIC BUSHING.
16. CONTRACTOR TO PRICE AS ALTERNATE: PLENUM RATED CABLE IN LIEU OF CONDUIT FOR ALL LOW VOLTAGE RUNS EXCLUDING MICROPHONE RUNS.

(EXISTING) PANELBOARD SCHEDULE

PANEL: HL1 225A.– 480Y/277V.–3 PH–4W–SN MAINS: ☐ MLO, ■ MCB MTG: ■ S, ☐ F

| LOAD DESCRIPTION | LOAD (KVA) AØ | LOAD (KVA) BØ | LOAD (KVA) CØ | CKT. BKR. | POLE | CKT. NO. | PHASES A | PHASES B | PHASES C | CKT. NO. | POLE | CKT. BKR. | LOAD (KVA) AØ | LOAD (KVA) BØ | LOAD (KVA) CØ | LOAD DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EX CKT | — | | | 20 | 1 | 1 | | | | 2 | 1 | 20 | — | | | EX. CKT. |
| | | — | | | | 3 | | | | 4 | | | | — | | |
| | | | — | | | 5 | | | | 6 | | | | | — | |
| | — | | | | | 7 | | | | 8 | | | — | | | |
| | | — | | | | 9 | | | | 10 | | | | — | | |
| | | | — | | | 11 | | | | 12 | | | | | — | |
| | — | | | | | 13 | | | | 14 | | | — | | | |
| | | — | | | | 15 | | | | 16 | | | | — | | |
| | | | — | | | 17 | | | | 18 | | | | | — | |
| AC-1 ** | 3.3 | | | 15 | 3 | 19 | | | | 20 | | | — | | | SPACE |
| | | 3.3 | | — | — | 21 | | | | 22 | | | | — | | |
| | | | 3.3 | — | — | 23 | | | | 24 | | | | | — | |
| CU-1 ** | 3.0 | | | 20 | 3 | 25 | | | | 26 | | | — | | | |
| | 3.0 | | | — | — | 27 | | | | 28 | | | | — | | |
| | | | 3.0 | — | — | 29 | | | | 30 | | | | | — | |
| SPACE | | | | — | 1 | 31 | | | | 32 | | | — | | | |
| | | | | | | 33 | | | | 34 | | | | — | | |
| | | | | | | 35 | | | | 36 | | | | | — | |
| | | | | | | 37 | | | | 38 | | | — | | | |
| | | | | | | 39 | | | | 40 | | | | — | | |
| | | | | ↓ | ↓ | 41 | | | | 42 | ↓ | ↓ | — | | | ↓ |
| NEW LOAD → | 7.2 | 7.2 | 7.2 | | | | | | | | | | — | — | — | |
| EX. LOAD → | 18.0 | 18.0 | 18.0 | | | | | | | | | | | | | |
| TOTAL → | 25.2 | 25.2 | 25.2 | | | | | | | | | | | | | |

75.6 KVA / 360/831 = 91.0 AMPS

* NEW CIRCUIT; REUSE EXISTING BREAKER.
** NEW CIRCUIT; PROVIDE NEW CIRCUIT BREAKER.

PANELBOARD SCHEDULE

PANEL: SP1 225A.– 208Y/120V.–3 PH–4W–SN MAINS: ■ MLO, ☐ MCB MTG: ■ S, ☐ F

| LOAD DESCRIPTION | LOAD (KVA) AØ | LOAD (KVA) BØ | LOAD (KVA) CØ | CKT. BKR. | POLE | CKT. NO. | PHASES A | PHASES B | PHASES C | CKT. NO. | POLE | CKT. BKR. | LOAD (KVA) AØ | LOAD (KVA) BØ | LOAD (KVA) CØ | LOAD DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RENTAL SCHOOL | 1.0 | | | 100 | 3 | 1 | | | | 2 | 2 | 30 | 1.5 | | | PROJECTOR |
| — | | 1.0 | | — | — | 3 | | | | 4 | — | — | | 1.5 | | — |
| — | | | 1.0 | — | — | 5 | | | | 6 | 2 | 30 | | | 1.5 | PROJECTOR |
| GRAPHIC MONITOR | .3 | | | 20 | 1 | 7 | | | | 8 | — | — | 1.5 | | | — |
| GRAPHIC MONITOR | | .3 | | | | 9 | | | | 10 | 1 | 20 | | 1.0 | | PROJECTOR |
| CABLE TRAY RECEPT | | | .8 | | | 11 | | | | 12 | | | | | .8 | MECHO SHADE |
| CABLE TRAY RECEPT. | .8 | | | | | 13 | | | | 14 | | | .8 | | | — |
| PROJ. TEM. WIREMOLD | | 1.0 | | | | 15 | | | | 16 | | | | .8 | | — |
| PODIUM RECEPT. | | | .5 | ↓ | ↓ | 17 | | | | 18 | | | | | .6 | PROJ. SCREEN |
| SP2 | 1.5 | | | 50 | 3 | 19 | | | | 20 | | ↓ | 1.0 | | | — |
| — | | 1.0 | | — | — | 21 | | | | 22 | | — | — | | | SPACE |
| — | | | 1.0 | — | — | 23 | | | | 24 | | | | — | | |
| SPACE | — | | | — | 1 | 25 | | | | 26 | | — | | | | |
| | | — | | | | 27 | | | | 28 | | | — | | | |
| | | | — | | | 29 | | | | 30 | | | | — | | |
| | — | | | | | 31 | | | | 32 | | — | | | | |
| | | — | | | | 33 | | | | 34 | | | — | | | |
| | | | — | | | 35 | | | | 36 | | | | — | | |
| | — | | | | | 37 | | | | 38 | | — | | | | |
| | | — | | | | 39 | | | | 40 | | | | | | |
| | | | — | ↓ | ↓ | 41 | | | | 42 | ↓ | ↓ | 4.3 | 3.3 | 2.9 | |
| | 9.6 | 3.3 | 3.3 | | | | | | | | | | | | | |
| | 8.0 | 6.6 | 6.2 | | | | | | | | | | | | | |

20.8 KVA / 360/831 = 57.8 AMPS

(EXISTING) PANELBOARD SCHEDULE

PANEL: LP1 225A.– 208Y/120V.–3 PH–4W–SN MAINS: ☐ MLO, ■ MCB MTG: ■ S, ☐ F

| LOAD DESCRIPTION | LOAD (KVA) AØ | LOAD (KVA) BØ | LOAD (KVA) CØ | CKT. BKR. | POLE | CKT. NO. | PHASES A | PHASES B | PHASES C | CKT. NO. | POLE | CKT. BKR. | LOAD (KVA) AØ | LOAD (KVA) BØ | LOAD (KVA) CØ | LOAD DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EX. CKT. | — | | | 20 | 1 | 1 | | | | 2 | 1 | 20 | — | | | EX. CKT. |
| | | — | | | | 3 | | | | 4 | | | | — | | |
| | | | — | | | 5 | | | | 6 | | | | | — | |
| | — | | | | | 7 | | | | 8 | | | — | | | SPARE |
| | | — | | | | 9 | | | | 10 | | | | — | | |
| | | | — | | | 11 | | | | 12 | | | | | .6 | RECEPTACLE |
| | — | | | | | 13 | | | | 14 | | | .6 | | | RECEPTACLE |
| | | — | | | | 15 | | | | 16 | | | | .4 | | RECEPTACLE |
| | | | — | | | 17 | | | | 18 | | | | | 1.0 | LIGHTING * |
| | — | | | | | 19 | | | | 20 | | | | | | EX. CKT. |
| | | — | | | | 21 | | | | 22 | | | | | | |
| | | | — | | | 23 | | | | 24 | | | | | | |
| | — | | | | | 25 | | | | 26 | | | | | | |
| * RECEPTACLE | | .4 | | | | 27 | | | | 28 | ↓ | ↓ | | | | |
| * RECEPTACLE | | | .4 | | | 29 | | | | 30 | 3 | 150 | | | 8.0 | SP1 ** |
| * RECEPTACLE | .4 | | | | | 31 | | | | 32 | — | — | 16.6 | | | — |
| SPARE | | — | | | | 33 | | | | 34 | — | — | | 16.2 | | — |
| | | | — | | | 35 | | | | 36 | 2 | 40 | | | 2.0 | RANGE ** |
| | — | | | | | 37 | | | | 38 | — | — | 2.0 | | | — |
| * RECEPTACLE | | .4 | | | | 39 | | | | 40 | 2 | 20 | | — | | EX. CKT. |
| * RECEPTACLE | | | .4 | ↓ | ↓ | 41 | | | | 42 | — | — | | | — | |
| NEW LOAD | 9.6 | 7.4 | 12.4 | | | | | | | | | | | | | |
| EX. LOAD | 10.0 | 10.0 | 10.0 | | | | | | | | | | | | | |
| TOTAL | 19.6 | 17.4 | 22.4 | | | | | | | | | | | | | |

50.4 KVA / 360/831 = 165 AMPS

PANELBOARD (PROVIDE ISOLATED/INSULATED COPPER GROUND BUS) SCHEDULE

PANEL: SP2 100A.– 208Y/120V.–3 PH–4W–SN MAINS: ■ MLO, ☐ MCB MTG: ■ S, ☐ F

| LOAD DESCRIPTION | LOAD (KVA) AØ | LOAD (KVA) BØ | LOAD (KVA) CØ | CKT. BKR. | POLE | CKT. NO. | PHASES A | PHASES B | PHASES C | CKT. NO. | POLE | CKT. BKR. | LOAD (KVA) AØ | LOAD (KVA) BØ | LOAD (KVA) CØ | LOAD DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RECEPTACLES | .5 | | | 20 | 1 | 1 | | | | 2 | 1 | 20 | .5 | | | RECEPTACLE |
| RECEPTACLES | | .5 | | | | 3 | | | | 4 | | | | .5 | | ↓ |
| RECEPTACLES | | | .5 | ↓ | | 5 | | | | 6 | | ↓ | | | .5 | |
| EQUIPMENT | .5 | | | ↓ | ↓ | 7 | | | | 8 | — | — | | | | SPACE |
| SPACE | | | | — | | 9 | | | | 10 | | | — | | | |
| | | | | | | 11 | | | | 12 | | | | — | | |
| | | | | | | 13 | | | | 14 | | | — | | | |
| | | | | | | 15 | | | | 16 | | | | — | | |
| | | | | | | 17 | | | | 18 | | | | | — | |
| | | | | | | 19 | | | | 20 | | | — | | | |
| | | | | | | 21 | | | | 22 | | | | — | | |
| | | | | ↓ | ↓ | 23 | | | | 24 | ↓ | ↓ | | | — | |
| | | | | | | 25 | | | | 26 | | | | | | |
| | | | | | | 27 | | | | 28 | | | | | | |
| | | | | | | 29 | | | | 30 | | | | | | |
| | | | | | | 31 | | | | 32 | | | | | | |
| | | | | | | 33 | | | | 34 | | | | | | |
| | | | | | | 35 | | | | 36 | | | | | | |
| | | | | | | 37 | | | | 38 | | | | | | |
| | | | | | | 39 | | | | 40 | | | | | | |
| | | | | | | 41 | | | | 42 | | | | | | |
| | 1.0 | .5 | .5 | | | | | | | | | | | | | |
| | 1.5 | 1.0 | 1.0 | | | | | | | | | | | | | |

3.5 KVA / 360/831 = 9.7 AMPS


Soe Lin & Associates

SL&A

Architecture, Interiors
Planning
8108 Fenway Rd
Bethesda, Maryland
20817
USA
301.469-8784
Fax: 469-7830

Notes Consultants

E. K. FOX & ASSOCIATES, LTD.
CONSULTING ENGINEERS
10306 Eaton Place, Suite 510
Fairfax, Virginia 22030
703 273-1112


Project

International Communications Industries Association

FAIRFAX RIDGE PLAZA
11242 WAPLES MILL ROAD
FAIRFAX, VA

Drawing Title

FIRST FLOOR - POWER, RISER DIAGRAM, SCHEDULES AND NOTES

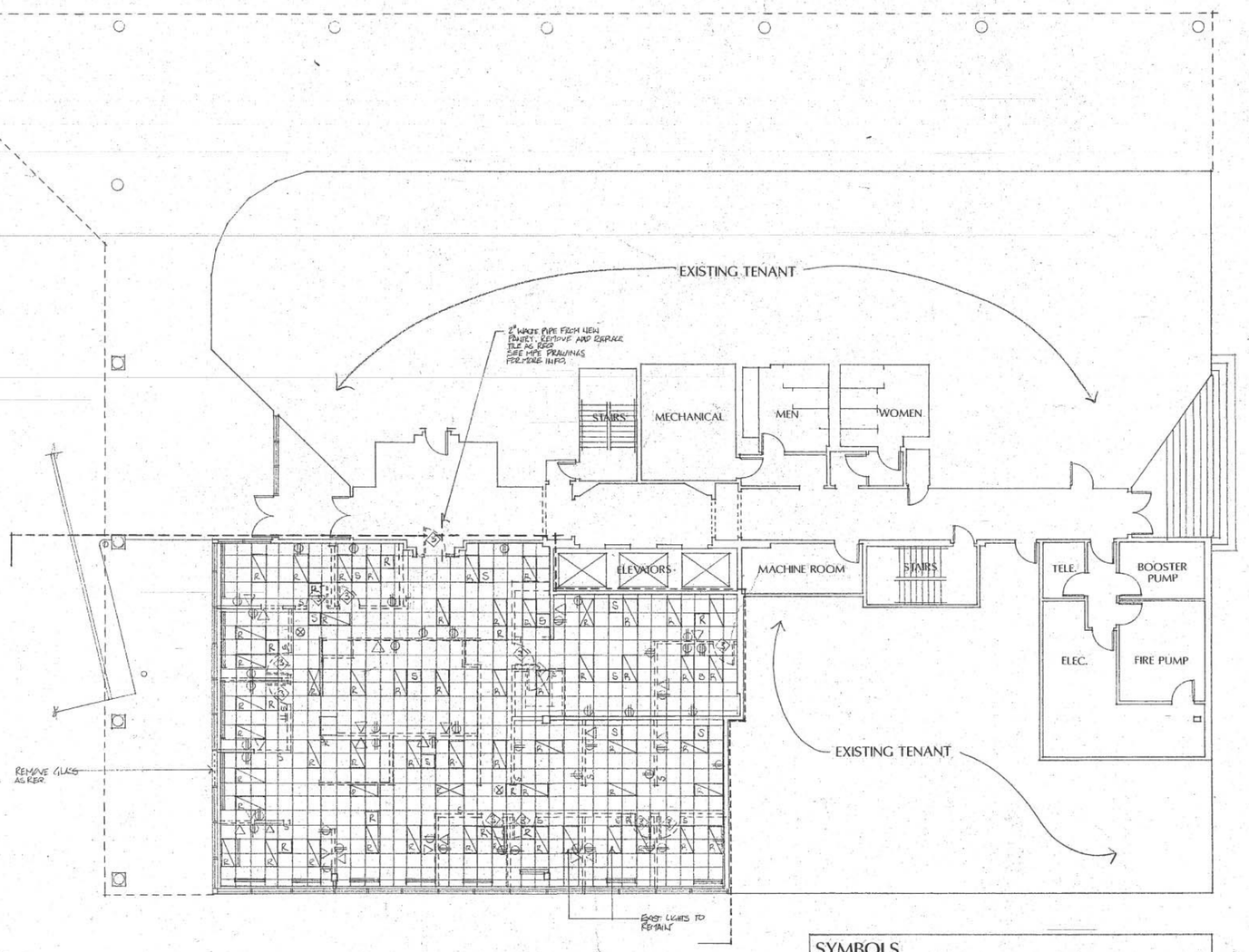
| Date | Issue |
|---|---|
| 5/9/96 | PERMIT |

Dwn By
Chkd By JHD
Job No. 960908
Scale 1/8"= 1'-0"

Sheet No.
TE1- 2

## DEMOLITION NOTES

1. Unless noted otherwise, existing ceiling grid & tile to remain. Repair & replace grid and tiles as req'd.
2. Relocate light fixtures and diffusers as shown on reflected ceiling plan. Clean as required. See also Mech. and Elec. dwgs for additional information.
3. All existing doors & frames as shown to remain. All doors and frames shown as to be removed shall be reused or stored as req'd.
4. Patch and repair any damaged area as reqd. to receive new finishes.
5. Remove existing partitions as shown. Patch and repair existing partitions as reqd.
6. Plenum ceiling shall be cleaned of all debris and construction material.
7. Relocate wall switches as required.
8. Existing Mechanical, Plumbing, & Electrical systems shall remain as noted. See Mechanical/Plumbing/Electrical drawings for more information. Balancing shall be provided by Mechanical Contractor.
9. Electrical Contractor shall circuit receptacles to available spares in existing panel boxes. See Electrical Drawings for additional information.
10. Electrical Contractor shall cap off all unused existing wiring.
11. Sprinkler Contractor shall coordinate relocation of sprinkler heads with Architectural and MPE drawings.
12. Sprinkler Contractor shall revised sprinkler layout to comply with all applicable codes.




DEMOLITION PLAN
SCALE: 1/8"=1'-0"

## SYMBOLS

- PARTITION TO REMAIN
- PARTITION TO BE REMOVED
- EXISTING 2 X 4 FLUORESCENT LIGHT
- EXISTING EMERGENCY 2 X 4 FLUORESCENT LIGHT
- S / R — EXISTING SUPPLY / EXISTING RETURN
- EXISTING SUPPLY
- EXISTING EMERGECY LIGHT
- EXISTING DUPLEX OUTLET
- EXISTING TELEPHONE / DATA JACK
- S,T — EXISTING SWITCH / THERMOSTAT

NOTE: SEE MPE DRAWINGS FOR RELOCATION OF MECH.

NOTE
ELECTRICAL FIXTURES LOCATED WITHIN PARTITIONS TO BE REMOVED WILL BE REMOVED. ALL OTHER FIXTURES TO REMAIN UNLESS OTHERWISE NOTED. REUSE FIXTURES AS REQ.


Soe Lin & Associates

SL&A

Architecture,Interiors
Planning
8108 Fenway Rd
Bethesda, Maryland
20817
USA
301.469-8784
Fax.469-7830


Notes

Consultants

Project

International Communications Industries Association ICIA

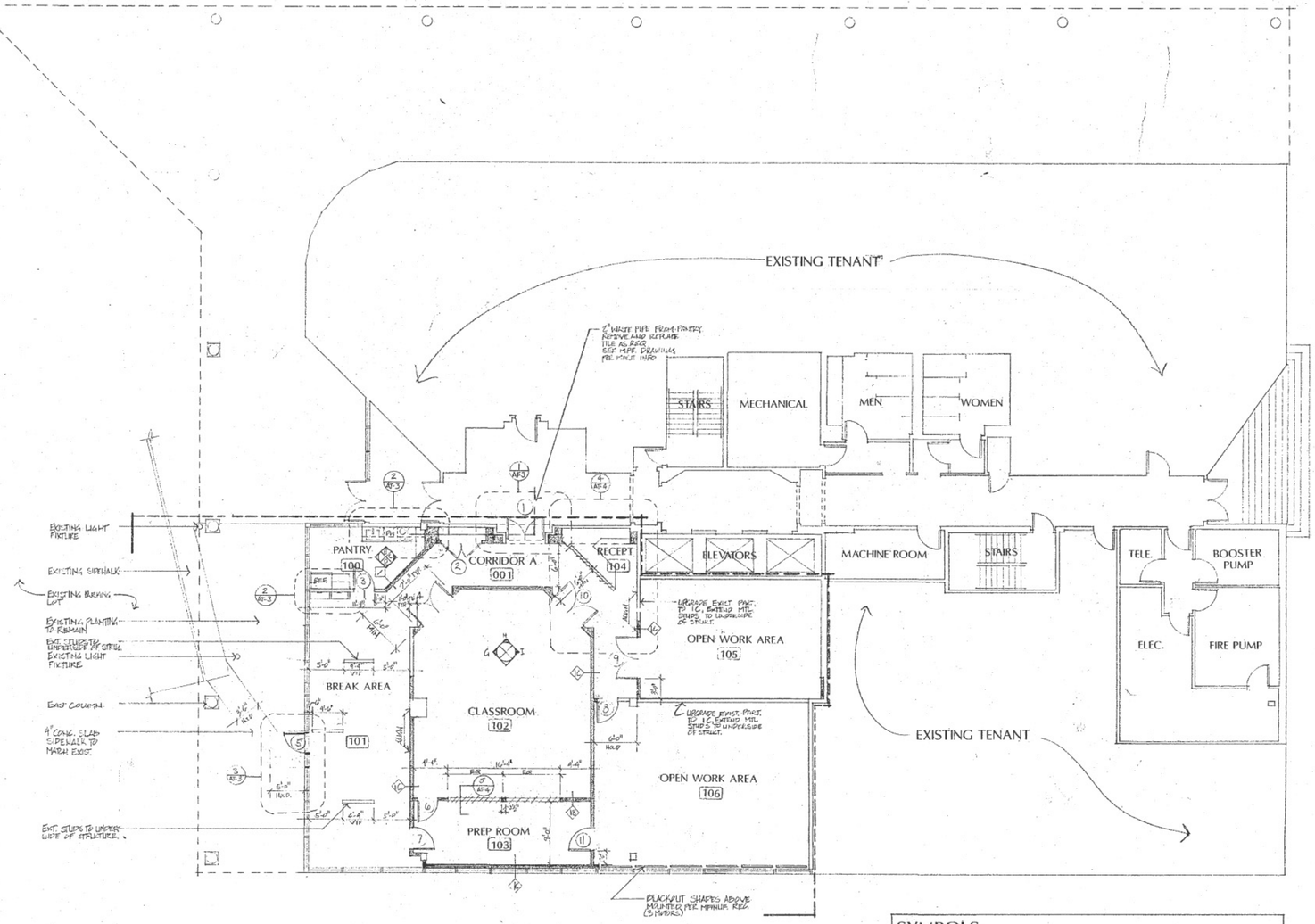
**FAIRFAX RIDGE PLAZA**
**11242 WAPLES MILL ROAD**
**FAIRFAX, VA**

Drawing Title
DEMOLITION PLAN

| Date | Issue |
|---|---|
| APRIL 9 1996 | PERMIT |

Dwn By
Chkd By
Job No.
Scale

Sheet No.
D-1




## FIRST FLOOR PLAN

SCALE: 1/8"=1'-0"

### SYMBOLS

- EXISTING PARTITIONS
- NEW PARTITIONS
- LOW WALL SEE DETAILS


Soe Lin & Associates

SL&A

Architecture Interiors
Planning
8108 Fenway Rd
Bethesda, Maryland
20817
USA
301.469-8784
Fax.469-7830


Notes

Consultants

Project

International Communications Industries Association

**FAIRFAX RIDGE PLAZA**
**11242 WAPLES MILL ROAD**
**FAIRFAX, VA**

Drawing Title
FIRST FLOOR PLAN

| Date | Issue |
|---|---|
| APRIL 9, 1996 | PERMIT |

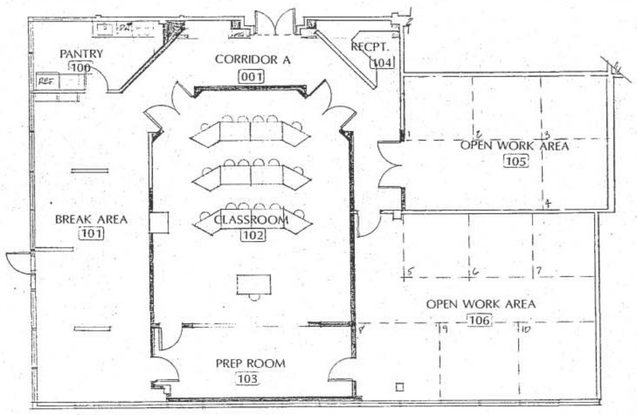
Dwn By

Chkd By

Job No.

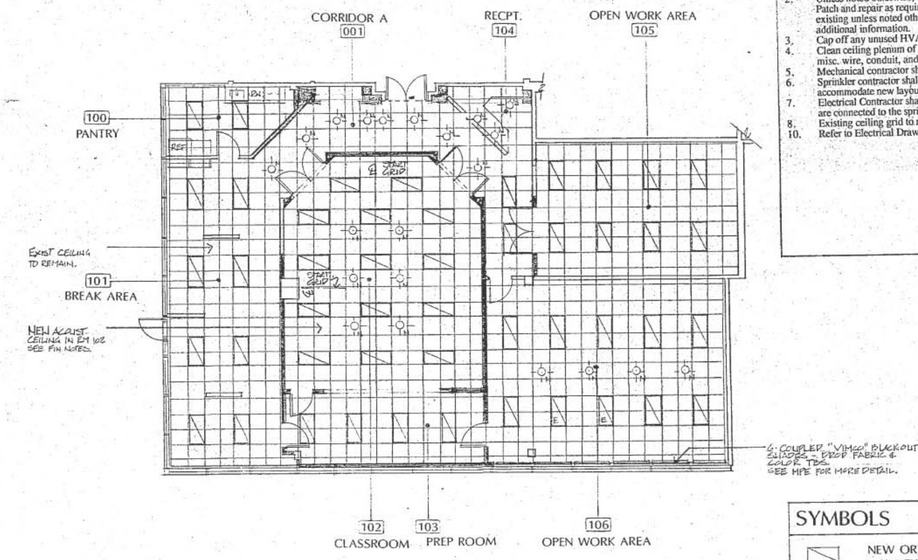
Scale

Sheet No.
AT-1




FURNITURE PLAN

SCALE: 1/8"=1'-0"




REFLECTED CEILING PLAN

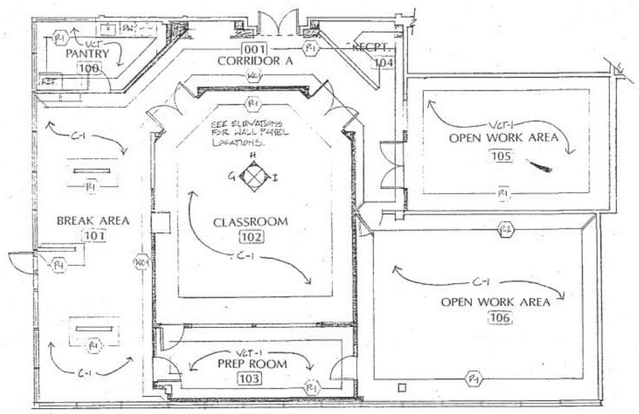
SCALE: 1/8"=1'-0"

## REFLECT. CEIL. PLAN NOTES

1. Remove and relocate existing exhaust units, grills, lights, and ductwork as required to accommodate new layout. All unused fixtures shall be removed and stored or hauled away as directed.
2. Unless noted otherwise, existing ceiling grid and tile to remain. Patch and repair as required. Any new tile or fixture to match existing unless noted otherwise. See Electrical Drawings for additional information.
3. Cap off any unused HVAC duct as required.
4. Clean ceiling plenum of all telephone, data, speakers, and other misc. wire, conduit, and debris.
5. Mechanical contractor shall verify balancing of new layout.
6. Sprinkler contractor shall remove / relocate / add to accommodate new layout per NFPA 13.
7. Electrical Contractor shall confirm that all existing bells / horns are connected to the sprinkler system hydrant.
8. Existing ceiling grid to remain @ 9'-9" AFF VIF
10. Refer to Electrical Drawings for additional details.

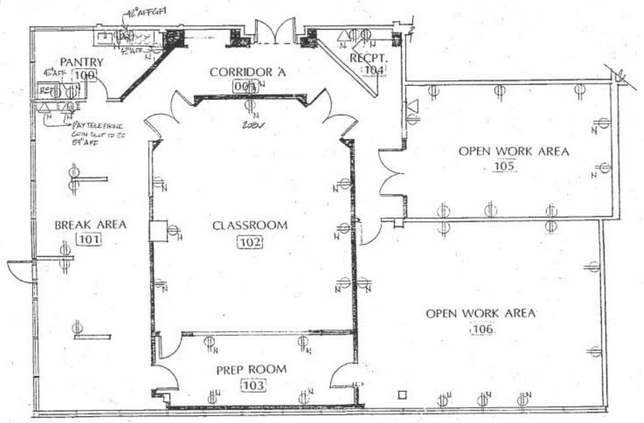
## SYMBOLS

- NEW OR RELOCATED 2 X 4 FLUORESCENT LIGHT
- E — EXISTING 2 X 4 FLUORESCENT LIGHT
- N — NEW OR RELOCATED DOWNLIGHT




FINISH PLAN

SCALE: 1/8"=1'-0"




OUTLET PLAN

SCALE: 1/8"=1'-0"

## SYMBOLS

- EXISTING DUPLEX OUTLET
- N — NEW DUPLEX OUTLET
- EXISTING TELE. / DATA JACK
- N — NEW TELE. / DATA JACK

NOTE:
REUSE EXISTING FIXTURES AS REQ.


Soe Lin & Associates

SL&A

Architecture, Interiors
Planning
8108 Fenway Rd
Bethesda, Maryland
20817
USA
301.469-8784
Fax.469-7830


Notes Consultants

Project

International Communications Industries Association

**FAIRFAX RIDGE PLAZA**
**11242 WAPLES MILL ROAD**
**FAIRFAX, VA**

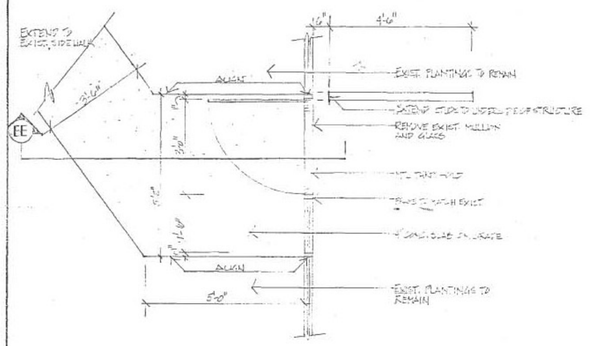
Drawing Title
REFLECTED CEILING PLAN, OUTLET PLAN, FURNITURE PLAN, AND FINISH PLAN

| Date | Issue |
|---|---|
| APRIL 9, 1996 | PERMIT |

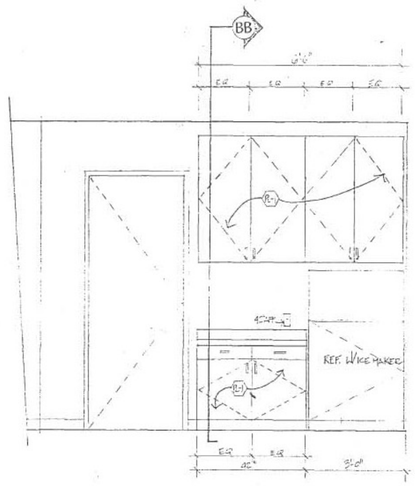
Dwn By
Chkd By
Job No.
Scale

Sheet No.
AT-2

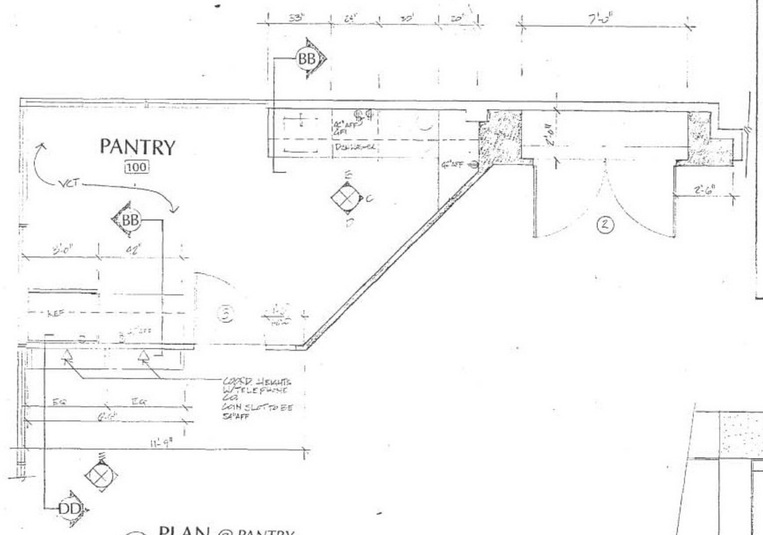
# DETAILS




3 PLAN SIDE ENTRANCE
SCALE: 1/2"=1'-0"



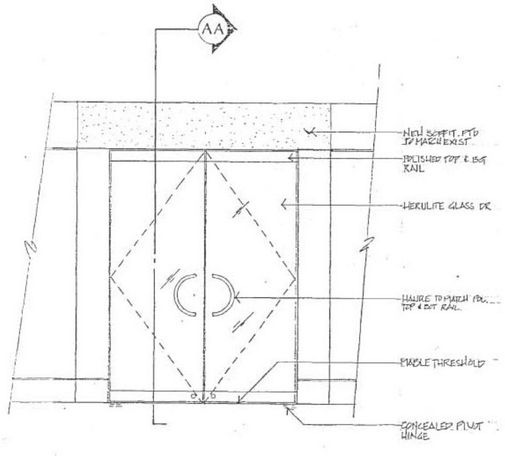

D ELEVATION PANTRY
SCALE: 1/2"=1'-0"



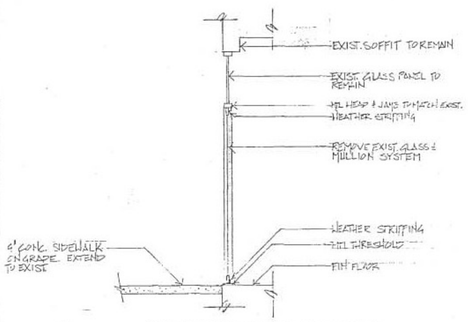

2 PLAN @ PANTRY
SCALE: 3/8"=1'-0"

## MILLWORK / CABINETRY NOTES

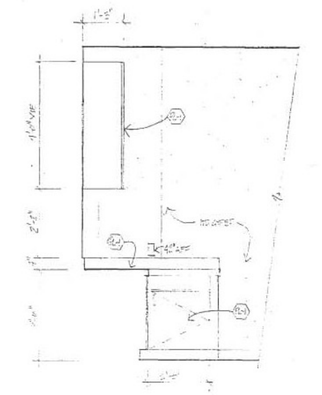
1. All woodwork, blocking grounds, crush backs and miscellaneous blocking shall be fireproofed according to the state and local code and installed by the cabinet contractor unless otherwise indicated.
2. The cabinet contractor shall install, as indicated for cabinet work, all electrical fixtures and make cutouts for switches, outlets, etc. This work shall be coordinated with the Electrical Contractor.
3. All wood surfaces and edges to be painted shall be properly sealed, sanded, and shop primed to receive shop finish coats by the Cabinet Contractor.
4. All exposed surfaces of cabinet work shall be finished unless otherwise noted.
5. All surfaces that are to have plastic laminate applied shall also have plastic laminate applied to the back and edges where applicable unless otherwise noted.
6. All built-in plumbing fixtures are to be supplied by Cabinet Contractor and installed by Plumbing Contractor.
7. Cabinet Contractor shall verify all dimensions in the field for built-in work prior to fabrication.
8. Shop drawing required for all millwork. Architect is to approve prior to construction.



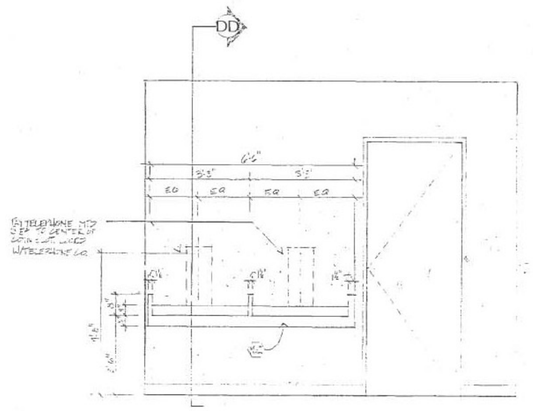

A ELEVATION FRONT ENTRANCE LOBBY SIDE
SCALE: 1/2"=1'-0"



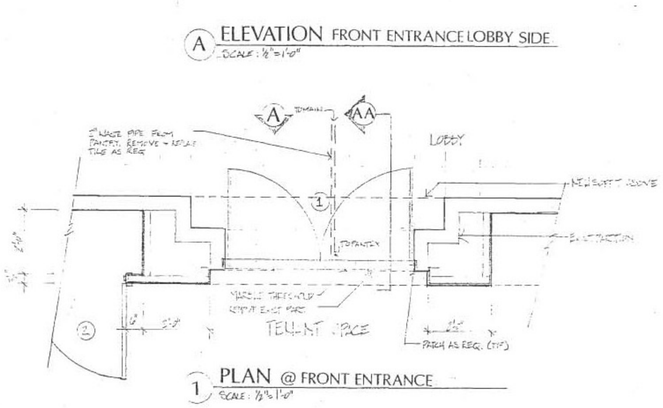

EE SECTION @ SIDE ENTRANCE
SCALE: 3/8"=1'-0"



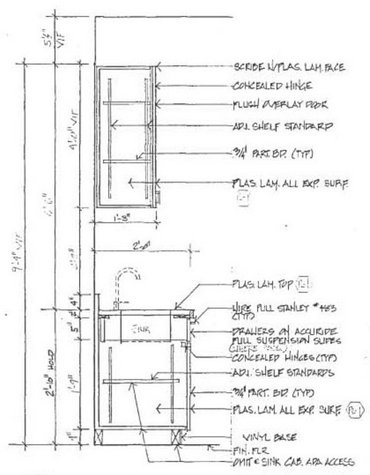

C ELEVATION PANTRY
SCALE: 1/2"=1'-0"



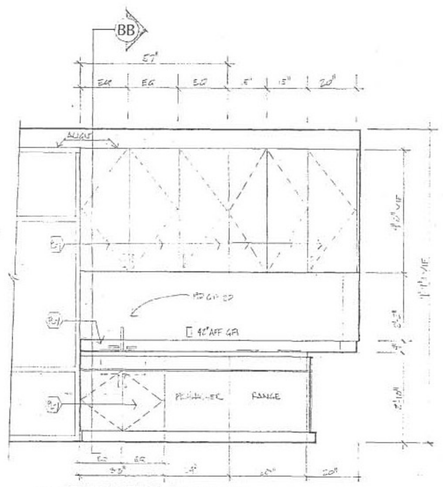

E ELEVATION TELEPHONE AREA
SCALE: 1/2"=1'-0"



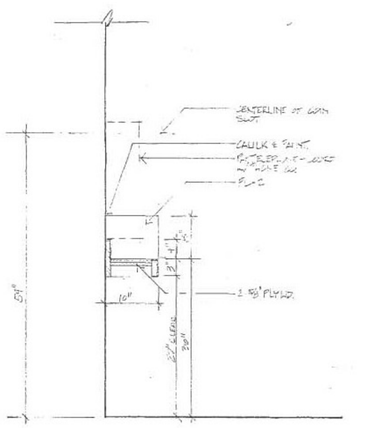

1 PLAN @ FRONT ENTRANCE
SCALE: 1/2"=1'-0"



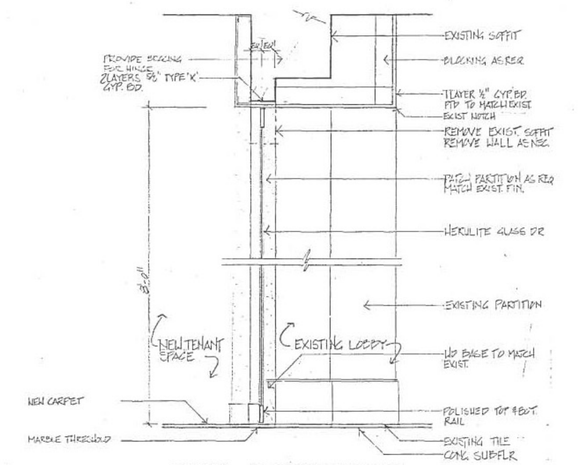

BB SECTION: TYPICAL CABINET W/DRAWER
SCALE: 1"=1'-0"




B ELEVATION PANTRY
SCALE: 1/2"=1'-0"




DD SECTION @ TELEPHONE AREA
SCALE: 1"=1'-0"




AA DETAIL @ FRONT ENTRANCE
SCALE: 1"=1'-0"


Soe Lin & Associates

SL&A

Architecture, Interiors
Planning
8108 Fenway Rd
Bethesda, Maryland
20817
USA
301.469-8784
Fax.469-7830


Notes Consultants

Project

International Communications Industries Association ICIA

FAIRFAX RIDGE PLAZA
11242 WAPLES MILL ROAD
FAIRFAX, VA

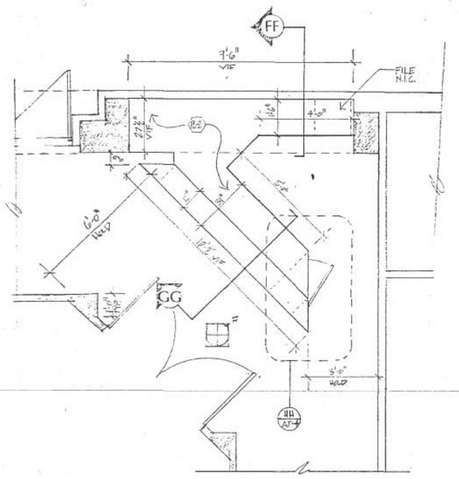
Drawing Title
DETAILS

| Date | Issue |
|---|---|
| APRIL 2, 1993 | PERMIT |

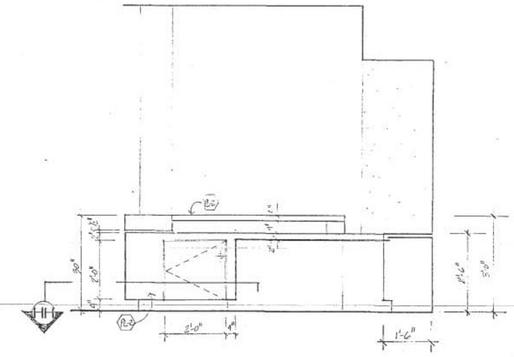
Dwn By
Chkd By
Job No.
Scale

Sheet No.
AT-3

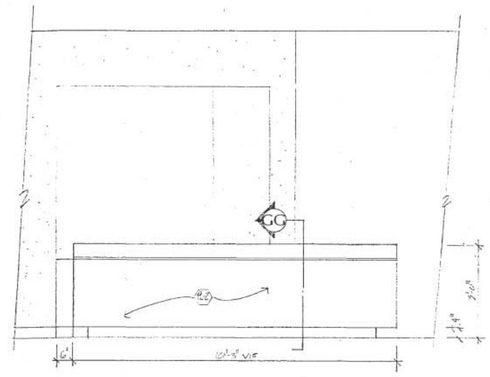
# DETAILS



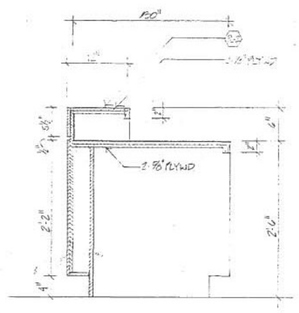

4 DETAIL RECEPT. DESK PLAN
SCALE: 3/8"=1'-0"



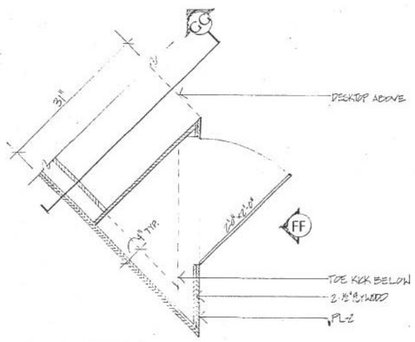

FF DETAIL RECEPT. DESK ELEVATION / SECTION
SCALE ½"=1'-0"



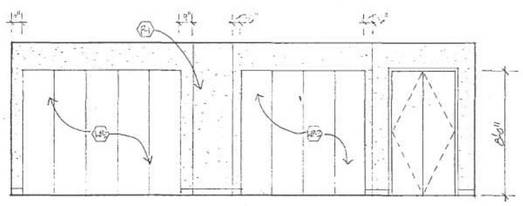

F DETAIL RECEPT. DESK ELEVATION
SCALE ½"=1'-0"



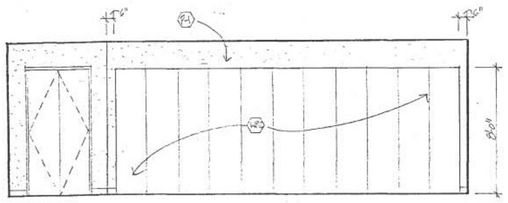

GG DETAIL RECEPT. DESK SECTION
SCALE: 1"=1'-0"



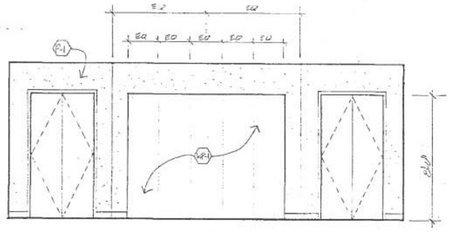

HH DETAIL RECEPT. DESK CABINET
SCALE: 1"=1'-0"



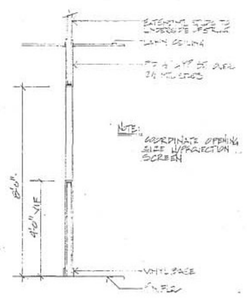

G ELEVATION CLASSROOM #102
SCALE: ¼"=1'-0"



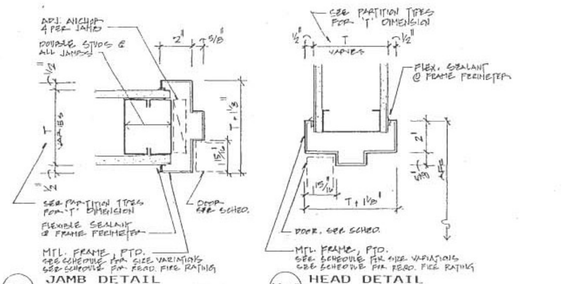

I ELEVATION CLASSROOM #102
SCALE: ¼"=1'-0"




H ELEVATION CLASSROOM #102
SCALE: ¼"=1'-0"



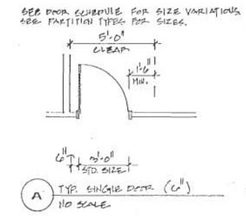

5 DETAIL PROJ. SCREEN SECTION
SCALE: 3/8"=1'-0"



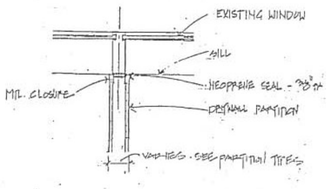

J-J JAMB DETAIL
No SCALE




H-J HEAD DETAIL
No SCALE




A TYP. SINGLE DOOR (6")
No SCALE




4 DETAIL PARTITION @ WINDOW
SCALE 1 1/2"=1'-0"

# FINISH SCHEDULE

**FIRST FLOOR**

| RM. No. | Description | Floor | Base | Walls | Clg. | Remarks |
|---|---|---|---|---|---|---|
| 001 | Corridor A | C-1 | B-1 | P-1 | ACT-1 | |
| 100 | Pantry | VCT-1 | B-1 | P-1/WC-1 | ACT-1 | |
| 101 | Break Area | C-1 | B-1 | P-1 | ACT-1 | |
| 102 | Classroom | C-1 | B-1 | P-1/ WP-1/WP-2 | ACT-2 | |
| 103 | Prep. Room | VCT-1 | B-1 | P-1 | ACT-1 | |
| 104 | Recept. Area | C-1 | B-1 | P-1 | ACT-1 | |
| 105 | Open Work Area | VCT-1 | B-1 | P-1 | ACT-1 | |
| 106 | Open Work Area | C-1 | B-1 | P-1/P-2 | ACT-1 | |

# DOOR SCHEDULE

| DOOR NO. | LOCATION | TYPE | SIZE | DOOR DESCRIPTION MATERIAL | FINISH | GLASS | FRAME MATERIAL | FINISH | LABEL | HARDWARE SET | DETAILS HEAD | JAMB | THRESH | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | CORRIDOR A | - | (2)3'-0"X8'-0"X1-3/4" | - | - | YES | - | - | - | 2A | - | - | Marble | |
| 2 | CLOSET | BB | (2)3'-0"X8'-0"X1-3/4" | SC.WD. | PTD | - | H.M. | P.T.D. | - | 2 | H-1 | J-1 | | |
| 3 | PANTRY 100 | AA | 3'-0"X8'-0"X1-3/4" | SC.WD. | PTD | - | H.M. | P.T.D. | - | 1 | H-1 | J-1 | | |
| 4 | CLASSRM 102 | BB | 3'-0"X8'-0"X1-3/4" | SC.WD. | PTD | - | H.M. | P.T.D. | - | 2 | H-1 | J-1 | | |
| 5 | BREAKRM 101 | CC | 3'-0"X8'-0"X1-3/4" | - | - | YES | H.M. | - | - | 3 | - | - | MTL | Exterior Door |
| 6 | CLASSRM 102 | AA | 3'-0"X8'-0"X1-3/4" | SC.WD. | PTD | - | H.M. | P.T.D. | - | 1A | H-1 | J-1 | | Push Button Lock, No Key |
| 7 | PREP ROOM 103 | AA | 3'-0"X8'-0"X1-3/4" | SC.WD. | PTD | - | H.M. | P.T.D. | - | 1A | H-1 | J-1 | | Push Button Lock, No Key |
| 8 | OPEN WORK 106 | AA | 3'-0"X8'-0"X1-3/4" | SC.WD. | PTD | - | H.M. | P.T.D. | - | 1 | H-1 | J-1 | | |
| 9 | OPEN WORK 105 | BB | (2)3'-0"X8'-0"X1-3/4" | SC.WD. | PTD | - | H.M. | P.T.D. | - | 2 | H-1 | J-1 | | |
| 10 | CLASSRM 102 | BB | (2)3'-0"X8'-0"X1-3/4" | SC.WD. | PTD | - | H.M. | P.T.D. | - | 2 | H-1 | J-1 | | |
| 11 | PREP ROOM 103 | AA | 3'-0"X8'-0"X1-3/4" | SC.WD. | PTD | - | H.M. | P.T.D. | - | 1A | H-1 | J-1 | | Push Button Lock, No Key |

# MATERIAL SCHEDULE

| MARK | DESCRIPTION | MANUFACTURER | REF.NO. | COLOR | REMARKS |
|---|---|---|---|---|---|
| C-1 | CARPET | Shaw: Half Moon Bay | 38519 | Windstorm | Typ. Rooms |
| VCT-1 | VINYL FLOOR TILE | Armstrong Premium Excelon | 52126 Stonetex | Gravel Blue | Pantry |
| ACT-1 | ACOUSTICAL TILE | Existing Repair as required | | | |
| ACT-2 | ACOUSTICAL TILE | Armstrong | #3200 | White | Tegular Painted Nubby |
| B-1 | VINYL BASE | Armstrong | 14118 | Gray | 4" Typ. Rooms |
| WC-1 | WALL COVERING | Wolf Gordon | ASAP#9664 | Feathers | Break Area / Corridor A |
| P-1 | PAINT | Duron | #5890W | Citylights | Typ. Rooms* Eggshell |
| P-2 | PAINT | Duron | #5820W | Whitewhite | Room #106 Eggshell |

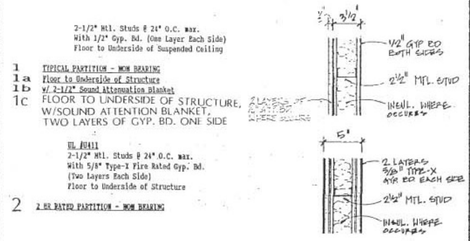
*DOORS AND FRAMES TO BE PAINTED SEMI-GLOSS P-1 AS REQUIRED

| | | | | | |
|---|---|---|---|---|---|
| PL-1 | P-LAM | Nevamar | S-7-4T | Sld White Text. | Pantry/Tele Area |
| PL-2 | P-LAM | Nevamar | S-6-12T | Neutral | ~~all Counter tops~~ Shower ~~walls~~ |
| WP-1 | ACOUSTICAL WALL PANEL | Armstrong | Soundsoak | TBS | 2'-0"x 8'-0"x 2" Flrglss substrate |
| WP-1 | ACOUSTICAL WALL PANEL | Armstrong | Soundsoak | TBS | 2'-0"x 8'-0"x 1" Flrglss substrate |

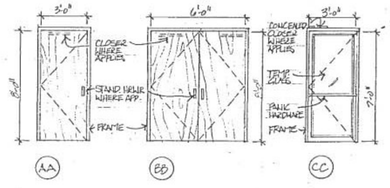
## GENERAL FINISH NOTES

1. All material samples are subject to "approved equals."
2. All materials shall be applied in accordance with specifications and manufacturer's recommendations.
3. Contractor shall submit samples of all finishes prior to application.
4. Paint selection shall be subject to adjustment or change on site.
5. All paint grade doors and metal frames shall be painted a semi-gloss finish to match the wall in which they occur, unless noted otherwise.

# PARTITION TYPES




# DOOR TYPES




# HARDWARE SCHEDULE

NOTE: ALL NEW DOOR HANDLES SHALL BE "LEVER TYPE." ALL FINISHES TO BE BRUSHED BUILDING STANDARD EXCEPT SUITE ENTRY WHICH WILL BE POLISHED

HARDWARE SET #1: SINGLE INTERIOR W/O CLOSER

HARDWARE SET #1A: SINGLE INTERIOR LOCKED W/O CLOSER
- LATCHSET /LOCK SET
- HINGES
- SILENCERS
- WALL STOP

HARDWARE SET #2: DOUBLE INTERIOR W/O CLOSER

HARDWARE SET #2A: DOUBLE INTERIOR LOCKED W/CLOSER
- LATCH / LOCKSET
- HINGES
- SILENCERS
- WALL STOP
- FLUSH MOUNT SIDE LOCKS

HARDWARE SET #3: SINGLE EXTERIOR W/CLOSER
- LOCKSET
- HINGES
- SILENCERS
- PANIC HARDWARE


Soe Lin & Associates

SL&A

Architecture,Interiors Planning
8108 Fenway Rd
Bethesda, Maryland
20817
USA
301.469-8784
Fax.469-7830


Notes Consultants

Project

International Communications Industries Assciation

FAIRFAX RIDGE PLAZA
11242 WAPLES MILL ROAD
FAIRFAX, VA

Drawing Title
DETAILS AND SCHEDULES

| Date | Issue |
|---|---|
| April 9, 1996 | PERMIT |

Dwn By
Chkd By
Job No.
Scale

Sheet No.
AT-4

## EQUIPMENT LIST:

AC-1/CU-1 SYSTEM DX

SYSTEM TO BE COMPRISED OF AN OUTDOOR CONDENSING/COMPRESSOR SPLIT SECTION (CU-1) AND AN INDOOR EVAPORATOR FAN COIL SECTION (AC-1). COMBINED UNIT CAPACITY SHALL BE 75.7 BTUH TOTAL AND 59.6 BTUH SENSIBLE WITH 2,400 CFM OF AIR ENTERING THE EVAPORATOR SECTION AT 83° DB/68°WB AND 95°F OUTDOOR AMBIENT (CN CONDENSING UNIT). INDOOR FAN SECTION SHALL BE CAPABLE OF SUPPLYING 2,400 CFM AT .6" E.S.P. (W/LATEST MIXED AIR TEMP. : 56.8°) ⚠

OUTDOOR UNIT: (AC-1)
460 VOLT, 3 PHASE, 60 HERTZ

INDOOR UNIT: (CU-1)
460 VOLT, 3 PHASE, 60 HERTZ

BASIS OF DESIGN:

CU-1: TRANE TTA072C400A
AC-1: TRANE TWE200A

PROVIDE:

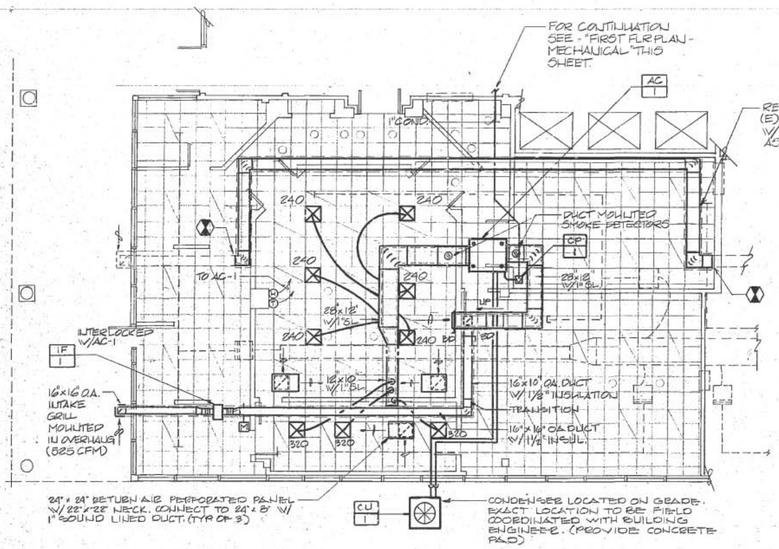
- 5 KW HEATER
- LOW AMBIENT KIT
- CRANK CASE HEATER
- FILTER
- DUCT MOUNTED SMOKE DETECTOR
- COOLING/HEATING THERMOSTAT AND HUMIDISTAT
- ALL REQUIRED CONTROL (REFER TO CONTROL SEQUENCE)
- DISCONNECT

NOTE:

PROVIDE AIR FLOW INTERLOCK SWITCH TO ENSURE AIRFLOW DURING TIMES OF HEATER OPERATION.

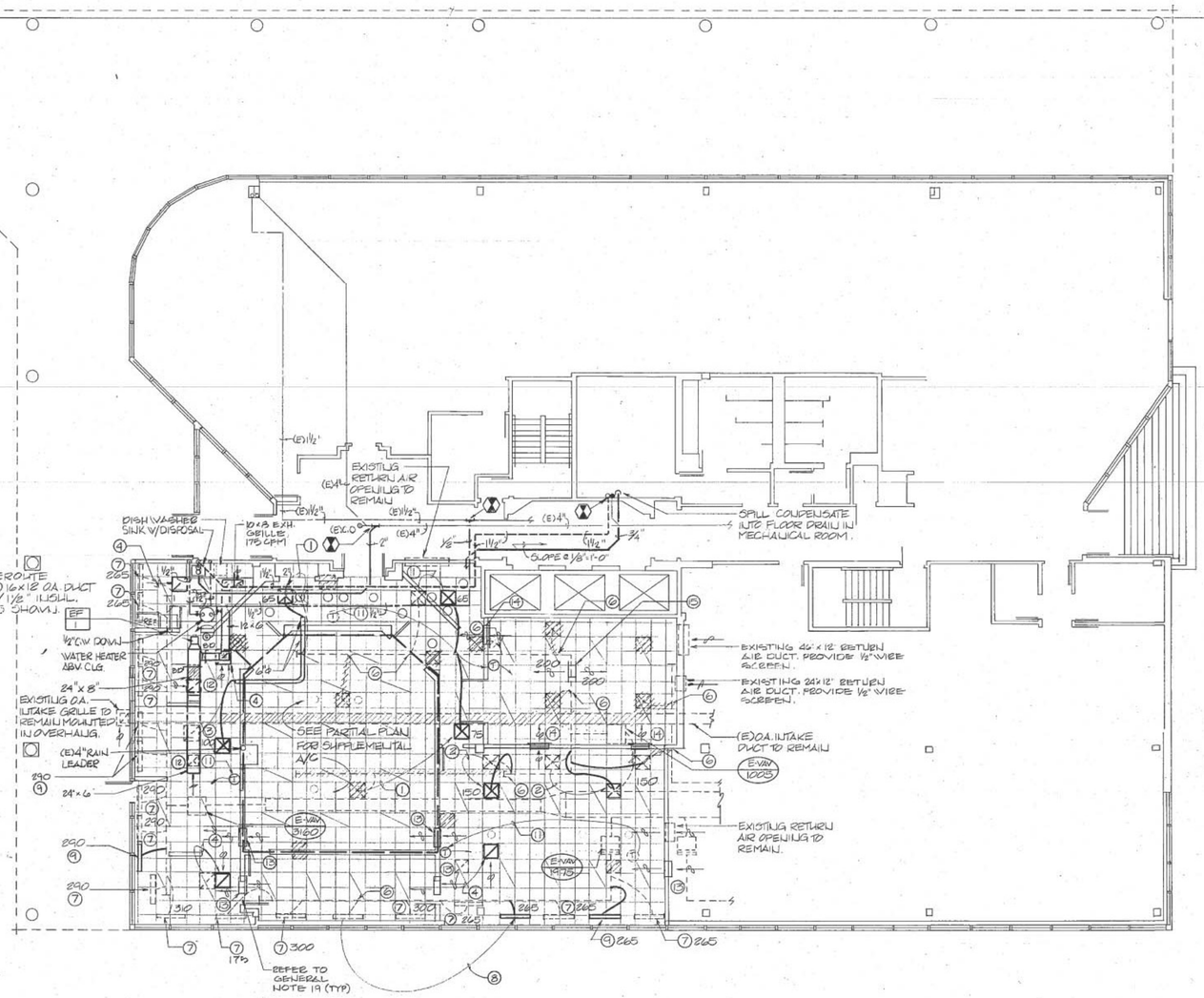
## DESIGN NOTES (1ST FLOOR):

1. REBALANCE EXISTING SQUARE DIFFUSER AS INDICATED. CONFIRM ADEQUATE NECK SIZE AS PER DIFFUSER SCHEDULE, REPLACE DIFFUSER IF REQUIRED.
2. RELOCATE EXISTING SQUARE DIFFUSER AS INDICATED. CONFIRM ADEQUATE NECK SIZE AS PER DIFFUSER SCHEDULE, REPLACE IF REQUIRED. BALANCE TO CFM INDICATED.
3. NEW SQUARE DIFFUSER, BALANCE TO CFM INDICATED. REFER TO SQUARE DIFFUSER SCHEDULE FOR SIZE.
4. RELOCATE EXISTING RETURN AIR PANEL AS INDICATED.
5. EXISTING RETURN AIR PANEL TO REMAIN.
6. SEAL DUCT AIR TIGHT WITH SHEET METAL BLANK.
7. REBALANCE EXISTING SLOT DIFFUSER AS INDICATED.
8. RELOCATE EXISTING SLOT DIFFUSER AS INDICATED, BALANCE TO CFM INDICATED.
9. NEW SLOT DIFFUSER, BALANCE TO CFM INDICATED. REFER TO SLOT DIFFUSER SCHEDULE FOR SIZE.
10. EXISTING HVAC CONTROL TO REMAIN. CALIBRATE FOR PROPER OPERATION.
11. RELOCATE EXISTING HVAC CONTROL AS SHOWN. CALIBRATE FOR PROPER OPERATION.
12. 24" X 24" EXHAUST PERFORATED PANEL WITH 22" X 22" NECK. CONNECT TO DUCT WITH 1" SOUND LINING.
13. NEW 30"X 14"RETURN AIR OPENING ABOVE CEILING.
14. NEW 30" X 12" RETURN AIR DUCT OPENING ABOVE CEILING WITH RETURN AIR GRILLE MOUNTED ON "LAB" SIDE (KRUEGER MODEL S580HZ WITH PLASTER FRAME)
15. NEW 12" X 6" SUPPLY AIR GRILLE MOUNTED TO EXISTING DUCT (TYPICAL OF 2) (KRUEGER MODEL S800H).




### PARTIAL FIRST FLOOR SUPPLEMENTAL A/C

SCALE: 1/8"=1'-0"




### FIRST FLOOR PLAN - MECHANICAL

SCALE: 1/8"-1'-0"


Soe Lin & Associates

SL&A

Architecture, Interiors
Planning
8108 Fenway Rd
Bethesda, Maryland
20817
USA
301.469-8784
Fax:469-7830

Notes Consultants

E. K. FOX & ASSOCIATES, LTD.
CONSULTING ENGINEERS
10306 Eaton Place, Suite 510
Fairfax, Virginia 22030
703 273-1112


Project

International Communications Industries Association

**FAIRFAX RIDGE PLAZA**
**11242 WAPLES MILL ROAD**
**FAIRFAX, VA**

Drawing Title

**FIRST FLOOR PLAN - MECHANICAL**

| Date | Issue |
|---|---|
| 3-9-96 | PERMIT |
| 3-10-96 | COUNTY COMMENT ⚠ |

Dwn By KAC
Chkd By JWP
Job No. 960903
Scale 1/8"=1'-0"

Sheet No.
**TMP1-1**

## GENERAL NOTES

1. THE FOLLOWING WORK IS BASED ON PREVIOUSLY PREPARED BASE BUILDING DRAWINGS. WHERE CONDITIONS DIFFER FROM WHAT IS SHOWN, THE CONTRACTOR SHALL ADVISE THE ARCHITECT OF DISCREPANCIES WHICH WILL EFFECT THE PROPOSED WORK.
2. THE CONTRACTOR SHALL TAKE FIELD MEASUREMENTS AND VERIFY FIELD CONDITIONS AND SHALL CAREFULLY COMPARE SUCH FIELD MEASUREMENTS AND CONDITIONS AND OTHER INFORMATION KNOWN TO THE CONTRACTOR WITH THE CONTRACT DOCUMENTS BEFORE SUBMITTING BID. ERRORS, INCONSISTENCIES OR OMISSIONS DISCOVERED SHALL BE REPORTED TO THE ARCHITECT AT ONCE.
3. PRIOR TO BID THE MECHANICAL CONTRACTOR SHALL EXAMINE THE PROJECT SITE AND ALL PROJECT DRAWINGS TO DEVELOP A COMPLETE UNDERSTANDING OF THE PROJECT SCOPE. FAILURE TO REVIEW ALL CONTRACT DRAWINGS WILL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY TO PERFORM ALL WORK REQUIRED AT NO ADDITIONAL COST TO THE OWNER.
4. CONTRACTOR SHALL INSPECT ENTIRE EXISTING HVAC SYSTEM TO INSURE BUILDING COMPLIES WITH SPECIFICATIONS SET FORTH BY BASE BUILDING DOCUMENTS AND IS IN GOOD OPERATING ORDER. A LIST SHALL BE GENERATED OF DEFECTIVE DEVICES AND AREAS OF CONCERN FOR RESOLUTION BY OWNER. SEE NOTE 10 FOR ADDITIONAL WORK.
5. THE CONTRACTOR SHALL OBTAIN AND PAY FOR PERMITS AND ARRANGE FOR INSPECTIONS BY LOCAL AUTHORITIES HAVING JURISDICTION.
6. ALL WORK AND MATERIAL SHALL BE IN ACCORDANCE WITH LOCAL CODES.
7. CONTRACTOR SHALL PUT ALL EQUIPMENT INTO OPERATION, BALANCE SYSTEM TO AIR QUANTITIES INDICATED ON PLANS AND ADJUST ALL EQUIPMENT FOR PROPER OPERATION. EXPLAIN SYSTEM TO OWNER.
8. AIR BALANCE: CERTIFIED TEST REPORTS SHALL BE SIGNED BY TEST AND BALANCE SUPERVISOR WHO PERFORMED THE TESTING AND BALANCING WORK. IN ADDITION, THE REPORTS SHALL BE CERTIFIED BY A TECHNICIAN CERTIFIED TO AABC OR NEBB. THREE COPIES OF THE AIR BALANCE REPORT SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.
9. VAV BOX INSPECTION/BALANCE (FOR EACH BOX WITHIN TENANT SPACE)
   - A. VERIFY THAT EP'S ARE MAKING CONTACT IN HEAT MODE AND THAT ALL STAGES OF HEAT ARE ACTIVATED. VERIFY SAFETIES TO ENSURE THAT AIR FLOW SWITCH OR THERMAL CUT-OUTS ARE NOT ACCIDENTALLY DISABLING UNIT.
   - B. SET MINIMUM AIRFLOW FOR REHEAT BOXES TO 35%-50% OF MAXIMUM BUT NOT LESS THAN 65 CFM PER KW.
   - C. FOR COOLING ONLY BOXES SET MINIMUM TO 10% OF MAXIMUM FLOW RATE SHOWN.
   - D. SET MAXIMUM AIR FLOW RATE TO MAXIMUM SHOWN ON DRAWINGS.
   - E. VERIFY INLET PRESSURE ON FARTHEST BOX ON DUCT BRANCH, PROPER INLET PRESSURE SHOULD BE NO LESS THAN .80" W.G. MINIMUM.
   - F. VERIFY THERMOSTAT OPERATIONS AND BOX CONTROLLER. RE-CALIBRATE SO THAT THEY ARE SET FOR OPTIMUM OPERATION. OBTAIN REPLACEMENT PARTS FROM BUILDING OWNER FOR DEFECTIVE DEVICES DISCOVERED.
10. ALL DUCTWORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH SMACNA STANDARDS.
11. ALL DUCTWORK SHOWN ARE INSIDE CLEAR SIZES.
12. COORDINATE WORK TO AVOID INTERFERENCES.
13. ALL DUCTWORK AND PIPING SHALL BE RUN AS HIGH AS POSSIBLE AND ABOVE CEILINGS UNLESS NOTED OTHERWISE. CONTRACTOR SHALL OFFSET DUCTWORK AS REQUIRED TO MAINTAIN CLEARANCES.
14. PROVIDE TURNING VANES IN ALL MITERED ELBOWS THAT CHANGE THE AIRFLOW DIRECTION MORE THAN 30 DEGREES.
15. ALL DUCTWORK SHALL CONNECT TO MOTOR OPERATED EQUIPMENT WITH FLEXIBLE CONNECTIONS.
16. FLEXIBLE DUCT CONNECTIONS TO TRUNK DUCT SHALL BE MADE WITH SPIN-IN TYPE FITTINGS WITH VOLUME DAMPERS.
17. ALL NEW FLEXIBLE DUCT SHALL MATCH DIFFUSER INLET DIAMETER SIZE. THE MINIMUM LENGTH OF NEW FLEX DUCT SHALL BE 4'-0" AND THE MAXIMUM LENGTH SHALL BE 8'-0". (REFER TO DIFFUSER SCHEDULE FOR CORRECT INLET SIZE).
18. EXISTING FLEXIBLE DUCT OF ADEQUATE LENGTH AND IN GOOD CONDITION IS TO BE RE-USED WHEREVER POSSIBLE. ANY UNUSED FLEX DUCT CONNECTIONS TO EXISTING DUCT SHALL BE SEALED AIR TIGHT WITH SHEETMETAL BLANK.
19. ANY FLEXIBLE DUCT PASSING THROUGH FULL HEIGHT WALLS SHALL DO SO THROUGH METAL SLEEVE OR WITH ROUND SHEETMETAL DUCT.
20. MOUNT ALL THERMOSTATS 5'-0" ABOVE FINISHED FLOOR. ADJUST AND CALIBRATE FOR PROPER OPERATION.
21. ALL TRANSFER DUCTS AND EXHAUST DUCTS SHALL HAVE 1/2" THICK SOUND LINING UNLESS NOTED OTHERWISE.
22. ALL GRILLES, REGISTERS AND DIFFUSERS SHALL BE FINISHED IN ACCORDANCE WITH THE BASE BUILDING STANDARDS AND ARCHITECT'S REQUIREMENTS.
23. CONTRACTOR SHALL COORDINATE EXACT LOCATION OF DIFFUSERS, REGISTERS AND GRILLES WITH ARCHITECTURAL DOCUMENTS.
24. PROVIDE FIRE DAMPERS AT ALL PENETRATIONS INTO FIRE RATED STRUCTURE, SUCH AS DUCT SHAFTS, ETC. ALL FIRE DAMPERS SHALL BEAR THE U.L. LABEL.
25. RETURN AIR GRILLES SHALL BE 24 X 24 PERFORATED FACE.
26. CONSULT BASE BUILDING DOCUMENTS FOR ANY FURTHER INFORMATION.

## EQUIPMENT LIST:

CP 1 — CONDENSATE REMOVAL PUMP-ABS THERMOPLASTIC CONSTRUCTION. INTERGRAL SUMP PAN, CONTROL FLOAT. PUMP TO HAVE 1/35 HP, 120 VOLT, 60 HERTZ MOTOR WITH 8 GPM CAPACITY AT 15 FT. BASIS OF DESIGN: TEEL OR EQUAL.

EDH 1 — ELECTRICAL SUP-IN DUCT HEATER SHALL HAVE OVERTEMPERATURE PROTECTION, AIR FLOW INTERLOCK SWITCH TO ENSURE AIRFLOW DURING TIME OF HEATER OPERATION, DOOR INTERLOCK/DISCONNECT SWITCH, CONTROL TRANSFORMER (HEATING AND COOLING THERMOSTAT PROVIDED WITH A/C UNITS TO CONTROL DUCT HEATERS AND A/C UNIT.) (REFER TO CONTROL SEQUENCE FOR ALL REQUIRED CONTROLS)

DUCT HEATERS SHALL HAVE A CAPACITY AND ELECTRICAL CHARACTERISTICS AS LISTED BELOW: * 6 KW, 480 VOLT, 60 HZ, 3Ø (SINGLE STAGE)

**NOT USED**

BASIS OF DESIGN: INDEECO, QUA WITH CONTROL OPTION G.

IF 1 — CABINET EXHAUST FAN IF-1 SHALL HAVE THE CAPACITY OF 525 CFM, .05" S. P., 1050 RPM, 130 WATTS @ 115/1/60. FAN SHALL BE PENN ZEPHYR MODEL Z-10TDA APPROVED EQUAL. PROVIDE ACCESSORIES, GRAVITY DAMPER, OUTLET WIRE GUARD, DISCONNECT SWITCH (INTERLOCKED WITH AC-1, REFER TO A/C CONTROL SEQUENCE)

EF 1 — CABINET EXHAUST FAN EF-1 SHALL HAVE THE CAPACITY OF 930 CFM, .05" S. P., 1050 RPM, 280 WATTS @ 115/1/60. FAN SHALL BE PENN ZEPHYR MODEL Z-12TDA OR APPROVED EQUAL. PROVIDE ACCESSORIES GRAVITY DAMPER, OUTLET WIRE GUARD, DISCONNECT SWITCH AND VARIABLE SPEED CONTROL WITH CONTROLLER MOUNTED IN SPACE SERVED BY FAN.

## A/C CONTROL SEQUENCE

A SPACE THERMOSTAT AND HUMIDISTAT (LOCATED IN SPACE) SHALL CONTROL THE UNIT FOR ON/OFF AND AS FOLLOWS:

A. WHEN COOLING IS REQUIRED (SPACE ABOVE 72 F., HUMIDISTAT SATISFIED) THE SPACE THERMOSTAT SHALL OPERATE THE COMPRESSOR CIRCUITS TO MAINTAIN SET POINT.

B. WHEN DE-HUMIDIFICATION IS REQUIRED (SPACE ABOVE 55% R. H., THERMOSTAT COOLING SATISFIED) THE HUMIDISTAT SHALL OPERATE THE UNIT'S COMPRESSOR CIRCUITS (OVERRIDE SPACE THERMOSTAT COOL SETTING) TO MAINTAIN R. H. SETPOINT AND THE SPACE THERMOSTAT SHALL SIMULTANEOUSLY ENERGIZE THE REHEAT COIL IN TWO STAGES TO MAINTAIN SPACE SET POINT OF 72° (ADJ.)

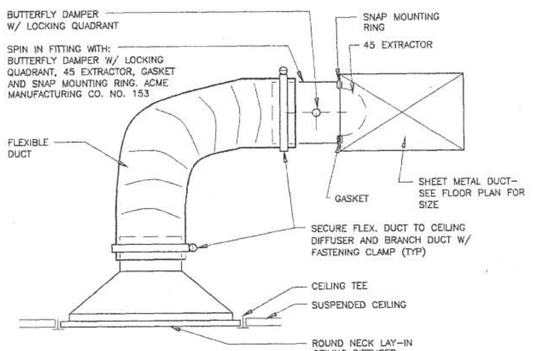
C. WHEN HEATING IS REQUIRED (SPACE BELOW 68 F. (ADJ.) SPACE THERMOSTAT SHALL ENERGIZE REHEAT COIL IN STAGES TO MAINTAIN HEATING SET POINT, IN HEATING MODE WITH NO DE-HUMIDIFICATION REQUIRED COOLING SHALL BE LOCKED OUT.

UNDER ALL CONDITIONS WHEN SPACE CONTROL IS INDEXED TO THE "ON" POSITION THE SUPPLY FAN SHALL START, THE OUTSIDE AIR FAN SHALL START, AND THE MOTORIZED OUTSIDE AIR DAMPER SHALL GO TO THE FULLY OPEN POSITION. PROVIDE NECESSARY INTERLOCKS FOR THE ABOVE TO OCCUR.

DUCT MOUNTED SMOKE DETECTOR SHALL SHUT-DOWN SUPPLY AIR FAN DURING UNSAFE CONDITIONS.

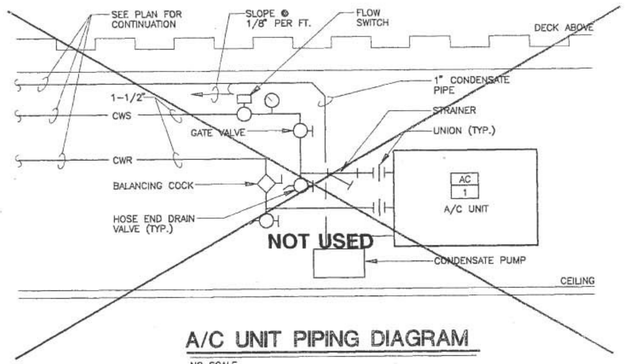
## SYMBOLS & ABBREVIATIONS

- NEW OR RELOCATED WORK/EQUIPMENT
- EXISTING WORK/EQUIPMENT TO REMAIN AND BE RE-USED
- EXISTING WORK/EQUIPMENT TO BE REMOVED
- NEW OR RELOCATED CEILING DIFFUSER, WITH FLEX DUCT
- NEW 24"x24" PERFORATED PANEL RETURN GRILLE
- 240 — LINEAR SLOT DIFFUSER WITH FLEX DUCT
- POINT OF CONNECTION NEW TO EXISTING
- (1) — DESIGNATES APPLICABLE DESIGN NOTE NUMBER
- EXISTING VAV BOX
- EVAV / CFM — EXISTING VAV BOX DESIGNATION
- NEW EQUIPMENT DESIGNATION
- ϕ — DIAMETER
- TYP. — TYPICAL
- S.L. — SOUND LINING
- E.G. — EXHAUST GRILLE
- (U) — DOOR UNDERCUT
- BALANCE DAMPER
- (M) — MOTORIZED DAMPER
- EXISTING PIPING
- SANITARY PIPING
- VENT PIPING
- COLD WATER PIPING
- HOT WATER PIPING
- GATE VALVE
- UNION
- (E) — EXISTING




### TYPICAL CEILING DIFFUSER DETAIL

NO SCALE (SLOT DIFFUSER TYPICAL)




### A/C UNIT PIPING DIAGRAM

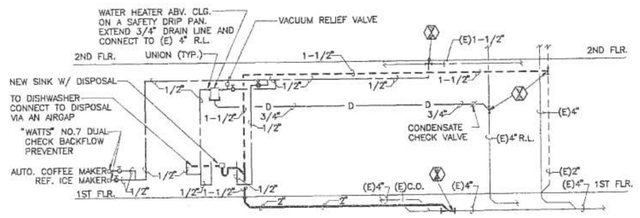
NO SCALE

## SPRINKLER NOTES

1. SPRINKLER CONTRACTOR SHALL SURVEY EXISTING CONDITIONS AND DEVELOP A FULL UNDERSTANDING OF THE PROJECT PRIOR TO THE BID.
2. SPRINKLER CONTRACTOR SHALL FIELD VERIFY EXACT LOCATION OF EXISTING SPRINKLER HEADS AND PIPING, THE CONTRACTOR SHALL REVISE THE EXISTING LAYOUT TO ACCOMODATE THE NEW WORK. CONTRACTOR SHALLRELOCATE EXISTING HEADS AND PROVIDE NEW HEADS IN ACCORDANCE WITH N.F.P.A. 13 AND LOCAL AUTHORITIES HAVING JURISDICTION.
3. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH NFPA 13, LOCAL AUTHORITIES HAVING JURISDICTION AND PROJECT SPECIFICATIONS.
4. SPRINKLER CONTRACTOR SHALL SUBMIT NEW SPRINKLER SYSTEM SHOP DRAWINGS SHOWING NEW LAYOUT TO PROJECT ARCHITECT FOR REVIEW PRIOR TO INSTALLATION.
5. SPRINKLER CONTRACTOR SHALL COORDINATE NEW SPRINKLER LAYOUT WITH ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING, STRUCTURAL AND EXISTING CONDITIONS PRIOR TO INSTALLATION TO AVOID INTERFERENCES.
6. NEW SPRINKLER HEADS SHALL MATCH EXISTING. TEMPERATURE RATING SHALL BE IN ACCORDANCE WITH NFPA STANDARDS AND LOCAL REQUIREMENTS.

## GENERAL NOTES - PLUMBING

1. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH LOCAL CODES BASE BUILDING SPECIFICATIONS AND AUTHORITIES HAVING JURISDICTION.
2. PLUMBING CONTRACTOR SHALL COORDINATE WITH EXISTING CONDITIONS, ARCHITECTURAL, MECHANICAL AND ELECTRICAL TRADES TO AVOID INTERFERENCE.
3. WASTE AND VENT PIPING SHALL BE NO-HUB SERVICE WEIGHT CAST IRON PIPING OR DWV TYPE COPPER. NO PVC PIPING PERMITTED IN AREAS USED AS PLENUMS.
4. WATER PIPING SHALL BE TYPE "L" COPPER TUBING WITH 95/5 SOLDER. PROVIDE WITH 1" FIBERGLASS INSULATION WITH VAPOR BARRIER AND SELF-SEALING LAP.
5. SINK SHALL BE "ELKAY" DAYTON MODEL D-11721 STAINLESS STEEL BOWL, 3 HOLE INSTALLATION. FAUCET SHALL BE "DELTA" MODEL 3573-WFLGHDF FAUCET WITH LEVER HANDLES. CONTRACTOR SHALL PROVIDE P-TRAP, ANGLE SUPPLY PIPES WITH STOPS, CRUMB CUP STRAINER, DISPOSAL "G.E." MODEL GFC195A, 1/3 H.P., 120 VOLT, SINGLE PHASE AND ALL OTHER ITEMS NECESSARY FOR A COMPLETE INSTALLATION.
6. THE CONTRACTOR SHALL CONNECT ALL ITEMS OF EQUIPMENT FURNISHED BY OTHERS AND UNDER OTHER SECTIONS OF THE SPECIFICATIONS, I.E. COFFEE MAKERS, REFRIGERATOR ICE MAKERS, DISHWASHERS ETC. CONTRACTOR SHALL PROVIDE ALL ITEMS NECESSARY TO COMPLETE THE PLUMBING INSTALLATION. PROVIDE BACKFLOW PROTECTION FOR ICE MAKERS, COFFEE MAKERS ETC. IN ACCORDANCE WITH LOCAL AUTHORITIES.
7. WATER HEATER SHALL BE "A.O.SMITH" MODEL DEL-10, 10 GALLON CAPACITY, 2K.W. 277 VOLT, SINGLE PHASE. MOUNT ABOVE CEILING AS HIGH AS POSSIBLE. PROVIDE WITH A SAFETY DRIP PAN, EXTEND A 3/4" DRAIN LINE FROM DRIP PAN AND CONNECT TO (E)4" RAINLEADER INDICATED ON THE FLOOR PLAN, PROVIDE DRAIN LINE WITH A CONDENSATE TYPE CHECK VALVE AT POINT OF CONNECTION.




### PLUMBING RISER DIAGRAM

SCALE: NONE

## GLYCOL AIR CONDITIONING UNIT SCHEDULE

| UNIT DESIG. | CFM | ESP IN W.G. | GPM | COOLING ENT DB | COOLING ENT WB | COOLING EWT | COOLING LWT | COOLING TOT. MBTU | COOLING SENS. MBTU | HEATING ENT WB | HEATING EWT | HEATING LWT | HEATING NOTE | ELECTRICAL FAN HP | ELECTRICAL UNIT VOLT | ELECTRICAL PH | BASIS OF DESIGN: | ROOM NO. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC-1 | 2400 | 0.5" | 18.2 | 80 | 66 | 86 | 95 | 67.8 | 49 | — | — | — | 1,2 | 1½ | 480 | 3 | CCH070 | CLASS 100 & PREP. RM 103 |

PROVIDE:
- COOLING/HEATING THERMOSTAT AND HUMIDISTAT (7-DAY, PROGRAMABLE)
- STRAIGHT DISCHARGE
- COOLING ONLY
- COP SHALL NOT BE LESS THAN DICTATED BY CODE
- VIBRATION ISOLATION HANGERS
- SELECTED FOR 30% GLYCOL
- 2" FILTER W/ RACK
- DUCT MOUNTED SMOKE DETECTOR
- "EXTRA-QUIET" CONSTRUCTION OPTION

**NOT USED**

NOTE:
1. REFER TO CONTROL SEQUENCE FOR ALL REQUIRED CONTROLS.
2. HEAT PROVIDED BY ELECTRIC DUCT HEATER, SEE PLANS FOR SIZE.

## SQUARE DIFFUSER SCHD.

| CFM | FACE SIZE | NECK SIZE | NC > | BASIS OF DESIGN |
|---|---|---|---|---|
| 0-125 | 24X24 | 6"ϕ | 30 | KRUEGER MODEL 6604 |
| 126-220 | 24X24 | 8"ϕ | 30 | KRUEGER MODEL 6604 |
| 221-350 | 24X24 | 10"ϕ | 25 | KRUEGER MODEL 6604 |

NOTE:
- ALL DIFFUSERS SHALL BE 4-WAY BLOW EXCEPT WHERE NOTED.
- OPPOSED BLADE DAMPER
- ROUND NECK INLET
- PERFORATED FACE

(INFORMATION TAKEN FROM BASE BLDG. DOCUMENTS)

## SLOT DIFFUSER SCHD.

| CFM | LENGTH | NECK SIZE | NC < | BASIS OF DESIGN |
|---|---|---|---|---|
| 0-320 | 48" | 8"ϕ | 30 | TEMPMASTER MODEL TLD-2 |

NOTE: * INFORMATION TAKEN FROM BASE BUILDING DOCUMENTS.


Soe Lin & Associates

SL&A

Architecture,Interiors Planning
8108 Fenway Rd
Bethesda, Maryland
20817
USA
301.469-8784
Fax:469-7830

Notes Consultants

ecs E. C. FOX & ASSOCIATES, LTD.
CONSULTING ENGINEERS
1030 Eaton Place, Suite 510
Fairfax, Virginia 22030
703 273-1112


Project

International Communication Industries Association

FAIRFAX RIDGE PLAZA
11242 WAPLES MILL ROAD
FAIRFAX, VA

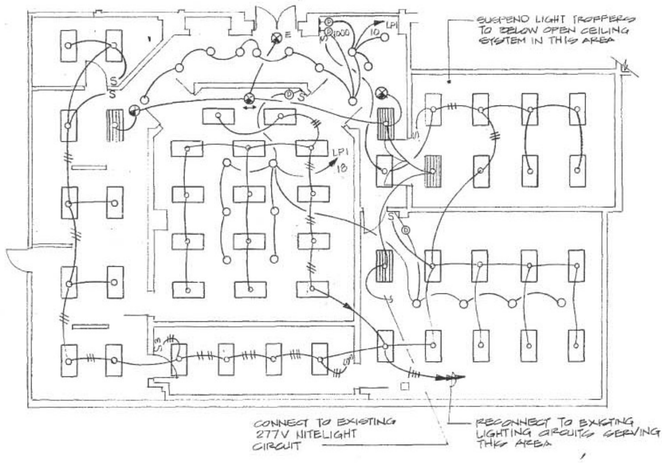
Drawing Title

MECHANICAL NOTES, SYM & ABB., DETAILS AND SCHEDULES

| Date | Issue |
|---|---|
| 5-9-96 | PERMIT |

Dwn By KWM
Chkd By JWP
Job No. 960903
Scale NONE

Sheet No.
TMP1-2




## FIRST FLOOR PLAN - LIGHTING

SCALE: 1/8"=1'-0"

## SYMBOLS LIST

- CEILING OUTLET FOR NEW/RELOCATED FLUORESCENT LIGHTING FIXTURE.
- CEILING OUTLET FOR FLUORESCENT LIGHTING FIXTURE WITH BODINE BATTERY PACK ON NIGHTLIGHT CIRCUIT.
- CEILING OUTLET FOR NEW/RELOCATED INCANDESCENT DOWNLIGHT WITH CLEAR ALZAK REFLECTOR AND 100 WATT, A-19 LAMP.
- EXIT SIGN WITH BATTERY PACK ON NIGHTLIGHT CIRCUIT. "E" DENOTES EXISTING TO REMAIN. "RL" DENOTES RELOCATED.
- S — SINGLE POLE FLUSH TUMBLER SWITCH, 4' - 0" ABOVE FLOOR OR AS NOTED.
- $S_3$ — THREE-WAY FLUSH TUMBLER SWITCH, 4' - 0" ABOVE FLOOR OR AS NOTED.
- $S_E$ — EXISTING SWITCH TO REMAIN.
- $D_{LH}$ — FLUSH INCANDESCENT DIMMER SWITCH, 4' - 0" ABOVE FLOOR OR AS NOTED. DIMMER TO BE LUTRON NOVA SERIES OR EQUAL; DIMMER RATING TO BE 600 WATT OR AS NOTED.
- Sm — MANUAL MOTOR CONTROLLER.
- DUPLEX RECEPTACLE 2P, 3W, 20A, 125V, 18" ABOVE FLOOR OR AS NOTED. "E" DENOTES EXISTING TO REMAIN.
- DOUBLE DUPLEX RECEPTACLE 2-2P, 3W, 20A, 125V, 18" ABOVE FLOOR OR AS NOTED. "E" DENOTES EXISTING TO REMAIN.
- DUPLEX RECEPTACLE, ON GROUND FAULT INTERRUPTER CIRCUIT, 2P, 3W, 20A, 125V, 44" ABOVE FLOOR OR AS NOTED.
- DW — WALL OUTLET FOR DISHWASHER. LOCATE TO SUIT TYPE OF UNIT PROVIDED.
- GD — GARBAGE DISPOSAL.
- R — WALL OUTLET FOR RANGE. VERIFY POWER REQUIREMENTS WITH TENANT BEFORE INSTALLATION.
- S — VARIABLE SPEED FAN CONTROLLER, 4' - 0" ABOVE FLOOR FURNISHED BY MECHANICAL, INSTALLED BY ELECTRICAL.
- MOTOR OUTLET.
- DUCT MOUNTED SMOKE DETECTOR.
- $P_E$ — EXISTING AUDIO/VISUAL FIRE ALARM SIGNALLING DEVICE TO REMAIN.
- P — A.D.A. COMPLIANT AUDIO/VISUAL FIRE ALARM SIGNALLING DEVICE, 80" TO CENTERLINE OF DEVICE.
- V — A.D.A. COMPLIANT VISUAL ONLY FIRE ALARM SIGNALLING DEVICE, 80" TO CENTERLINE OF DEVICE.
- $F_E$ — EXISTING FIRE ALARM STRIKE STATION TO REMAIN.
- DUCT MOUNTED SMOKE DETECTOR REMOTE INDICATOR LIGHT.
- H — 277/480 VOLT BRANCH CIRCUIT PANELBOARD. LETTER/NUMERAL IN CIRCULE INDICATES PANEL DESIGNATION.
- L — 120/208 VOLT BRANCH CIRCUIT PANELBOARD. LETTER/NUMERAL IN CIRCLE INDICATES PANEL DESIGNATION.
- BRANCH CIRCUIT HOMERUN TO PANELBOARD. NUMBER OF ARROWHEADS INDICATE NUMBER OF CIRCUITS IN RUN. UNLESS OTHERWISE NOTED, CONNECT CIRCUIT TO SINGLE POLE, 20 AMP BRANCH CIRCUIT BREAKER IN PANELBOARD INDICATED.
- BRANCH CIRCUIT WIRING CONCEALED IN CEILING OR WALLS - CROSSMARKS AND NUMERALS INDICATE NUMBER AND SIZE OF CONDUCTORS RESPECTIVELY. 2 NO. 12 A.W.G. IN 1/2" OR 3/4" CONDUIT NOT NOTED. CROSSMARK WITH HOOK INDICATES A SEPARATE PARITY SIZE GREEN INSULATED GROUND WIRE.
- EXISTING BRANCH CIRCUIT WIRING TO REMAIN.
- 4-GANG OUTLET BOX, 4" DEEP WITH (1) 1-1/4" AND (1) 1" CONDUITS TO REAR PROJECTION ROOM CABLE TRAY.
- 4-GANG OUTLET BOX WITH (1) 1-1/4" AND (2) 1" CONDUITS TO REAR PROJECTION ROOM CABLE TRAY.
- 6" D X 8" X 8" PULLBOX RECESSED 36" A.F.F. WITH (1) 1-1/2" CONDUIT TO REAR PROJECTION ROOM CABLE TRAY.
- 6"D X 8" X 8" PULLBOX MOUNTED ABOVE CEILING TILE. PROVIDE (1) 1-1/4" AND (2) 1" CONDUITS TO REAR PROJECTION ROOM CABLE TRAY.
- 30A, 250V, 1 PHASE OUTLET, 36" ABOVE FLOOR. VERIFY RECEPTACLE TYPE WITH TENANT.
- S — CEILING MOUNTED FLUSH SPEAKER WITH 1" CONDUIT TO REAR PROJECTION ROOM CABLE TRAY.
- S — WALL MOUNTED FLUSH SPEAKER WITH 1" CONDUIT TO REAR PROJECTION ROOM CABLE TRAY.
- 4" D X 12" X 12" RECESSED PULLBOX WITH (2) 1-1/2", (1) 1-1/4" AND (2) 1" CONDUITS TO REAR PROJECTION ROOM CABLE TRAY.
- 4" D X 8" X 8" PULLBOX RECESSED. VERIFY MOUNTING HEIGHT WITH TENANT. PROVIDE (1) 1-1/2" CONDUIT TO REAR PROJECTION ROOM CABLE TRAY.
- SURFACE MOUNTED RACEWAY (WIREMOLD G-6000) WITH NUMBER OR OUTLETS SHOWN.
- ISOLATED GROUND (ORANGE) DUPLEX RECEPTACLE, 2P, 3W, 20A, 125V, 18" ABOVE FLOOR OR AS NOTED.
- CEILING MOUNTED DUPLEX RECEPTACLE, 2P, 3W, 20A, 125V.

## GENERAL NOTES

1. THE ELECTRICAL PLANS ARE DIAGRAMMATIC ONLY. REFER TO ARCHITECTURAL PLANS FOR EXACT DIMENSIONS OF THE BUILDING.
2. CONTRACTOR SHALL VERIFY ALL DOOR SWINGS BEFORE INSTALLING LIGHT-SWITCHES. SWITCHES SHALL BE ON LOCK SIDE OF DOOR UNLESS OTHERWISE SHOWN.
3. ALL LIGHT AND RECEPTACLE CIRCUITS OVER 100 FEET FROM PANEL TO LAST OUTLET FOR 120 VOLT CIRCUITS AND 200 FEET FROM PANEL TO LAST OUTLET FOR 277 VOLT CIRCUITS SHALL HAVE CONDUCTORS ONE SIZE LARGER THAN NORMALLY REQUIRED.
4. CEILING GRID LAYOUTS INDICATED ON THE PLANS ARE FOR CONVENIENCE ONLY. THE ELECTRICAL CONTRACTOR SHALL COORDINATE THE LIGHTING FIXTURE LAYOUT WITH ARCHITECT AND THE GENERAL CONTRACTOR, THE CEILING SYSTEM CONTRACTOR, AND THE MECHANICAL CONTRACTOR BEFORE THE CEILING GRID, AIR OUTLETS, OR LIGHTS ARE INSTALLED.
5. SEE ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATION OF ALL LIGHTING FIXTURES.
6. EXISTING CIRCUITING WHERE SHOWN IS FOR CONVENIENCE PURPOSED ONLY. VERIFICATION OF EXISTING WIRING DESTINATION, TERMINATION AND ADDITION OF NEW LIGHTS OR OTHER EQUIPMENT TO SUCH "EXISTING" CIRCUITS SHOULD BE FIELD VERIFIED.
7. EXISTING EXIT LIGHTS AND NIGHT LIGHT CIRCUITS MAY NOT BE SHOWN. VERIFICATION OF EXISTING WIRING, DESTINATION, TERMINATION AND ESPECIALLY ADDITION OF NEW LIGHTS TO SUCH "EXISTING" CIRCUITS SHALL BE FIELD VERIFIED.
8. ALL DATA CABLE AND TELEPHONE CABLE RUN IN CEILING IS TO BE SUPPORTED INDEPENDENT OF CEILING GRID SYSTEM.
9. CONTRACTOR IS CAUTIONED TO DETERMINE WHICH CIRCUITS IN PANELS ARE IN USE IN BUILDING CORE AREA (CORRIDOR, TOILETS, EQUIPMENT ROOMS, ETC.) AND IS NOT TO INTERRUPT SERVICE TO THESE AREAS.
10. ALL OPENINGS CUT THROUGH WALLS FOR CONDUIT AND ARMORED CABLE ARE TO BE SEALED AFTER COMPLETION OF WORK.
11. CONTRACTOR IS TO UPDATE PANELBOARD SCHEDULE INDEX CARDS WITH NEW BRANCH CIRCUIT INFORMATION.
12. ALL EXISTING LIGHTING FIXTURES THAT ARE BEING RE-USED ARE TO BE CLEANED AND RELAMPED. ANY DAMAGE TO FIXTURES IS TO BE REPAIRED OR FIXTURE REPLACED. ANY BROKEN LENSES ARE TO BE REPLACED.
13. PROVIDE ALL ELECTRICAL DEMOLITION WORK NECESSARY TO INSTALL NEW WORK. ELECTRICAL CONTRACTOR SHALL RE-ROUTE AND RECONNECT ANY CIRCUITS THAT REMAIN IN USE BUT INTERFERE WITH NEW CONSTRUCTION.
14. ALL EXISTING CONDUITS THAT WILL NOT BE RE-USED SHALL BE REMOVED WHERE THEY WILL BE EXPOSED AFTER COMPLETION OF CONSTRUCTION. ALL OTHERS MAY BE ABANDONED IN CEILING, WALLS OR BELOW FLOORS. CONTRACTOR SHALL REMOVE WIRING FROM ABANDONED CONDUITS, DISCONNECT FROM ALL POWER SOURCES, AND PROVIDE BLANK PLATES ON ALL ABANDONED OUTLETS. CUT OFF ABANDONED CONDUITS 2" BELOW FINISHED FLOOR AND GROUT FLUSH.
15. MAINTAIN CONTINUITY OF ALL EXISTING CIRCUITS TO REMAIN OR PORTIONS THEREOF AFFECTED BY NEW WORK.
16. CONTRACTOR SHALL EXERCISE CARE IN REMOVING DEMOLITION ITEMS AND SHALL REPAIR OR REPLACE AT HIS COST ANY DAMAGE CAUSED TO EXISTING CONSTRUCTION AND EQUIPMENT TO REMAIN.
17. DRAWINGS ARE BASED ON EXISTING PLANS AND FIELD INVESTIGATION WITHOUT DEMOLITION. CONTRACTOR SHALL VISIT THE EXISTING BUILDING AND FAMILIARIZE HIMSELF WITH EXISTING CONDITIONS AND SHALL EXAMINE ALL RELATED DRAWINGS TO AVOID CONFLICTS.
18. OWNER FURNISHED EQUIPMENT: THE CONTRACTOR SHALL ROUGH-IN THIS EQUIPMENT AND SHALL MAKE CONNECTIONS TO THIS EQUIPMENT TO MAKE IT OPERATE AS INTENDED, INCLUDING PROVIDING MISCELLANEOUS ITEMS SUCH AS LUGS, RECEPTACLES, WIRE, CABLE, CONDUIT, FLEXIBLE CONDUIT, AND OUTLET BOXES OR FITTINGS.
19. SCHEDULE WORK IN EXISTING BUILDING AT TIMES CONVENIENT TO OWNER.
20. DESIGN AND ADDITION OF NEW CIRCUITING IS BASED ON THE ENGINEER'S BEST INFORMATION REGARDING EXISTING CONDITIONS AND CURRENT AVAILABLE BASE BUILDING INFORMATION OR TENANT DRAWINGS. AVAILABILITY OF ADEQUATE CIRCUIT BREAKER SPACE FOR NEW TENANT WORK IN EXISTING PANELBOARDS SHALL BE VERIFIED BY CONTRACTOR AFTER DEMOLITION OF EXISTING SPACE. IF ADEQUATE SPACE IS NOT AVAILABLE FOR NEW CIRCUIT BREAKERS THE CONTRACTOR SHALL NOTIFY THE BUILDING OWNER'S REPRESENTATIVE.
21. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS OF WIRING DEVICES BEING REMOVED AND FOR EXISTING LIGHTING FIXTURES BEING REMOVED AND RELOCATED.

## ELECTRICAL SPECIFICATIONS

1. ALL WORK AND MATERIALS SHALL CONFORM TO, AND BE IN STRICT ACCORDANCE WITH THE LATEST EDITIONS OF THE NATIONAL AND LOCAL ELECTRICAL CODES, OSHA, AND THE LIFE SAFETY CODES.
2. BIDDERS SHALL VERIFY LOCAL CODE REQUIREMENTS PRIOR TO BID SUBMITTAL AND SHALL INCLUDE ALL COSTS FOR COMPLETE COMPLIANCE WITH SAME.
3. PRIOR TO BID THE ELECTRICAL CONTRACTOR SHALL EXAMINE THE PROJECT SITE AND ALL PROJECT DRAWINGS TO DEVELOP A COMPLETE UNDERSTANDING OF THE PROJECT SCOPE. FAILURE TO REVIEW ALL CONTRACT DOCUMENTS WILL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY TO PERFORM ALL WORK REQUIRED AT NO ADDITIONAL COST TO THE OWNER.
4. ANY NEW ELECTRICAL EQUIPMENT SHALL BEAR THE U.L. LABEL OR OTHER ACCREDITED AUTHORIZATION AGENCIES AND TESTING ORGANIZATIONS.
5. CONTRACTOR SHALL OBTAIN ALL PERMITS AND UPON COMPLETION OF WORK SHALL PRESENT THE OWNER WITH A CERTIFICATION OF FINAL INSPECTION FROM THE LOCAL AUTHORITY; CONTRACTOR SHALL INCLUDE ALL COSTS IN HIS BID.
6. CONTRACTOR SHALL GUARANTEE HIS WORK AND MATERIALS FOR A PERIOD OF ONE YEAR AFTER ACCEPTANCE BY THE OWNER.
7. THE OWNER RESERVES THE RIGHT TO REJECT ANY MATERIAL OR WORK IF IN HIS OPINION, IT IS NOT IN STRICT ACCORDANCE WITH THE CONTRACT DOCUMENTS.
8. WHERE PERMITTED BY CODE, BRANCH CIRCUIT WIRING RUNS ABOVE ACCESSIBLE SUSPENDED CEILINGS, IN STUD PARTITIONS, OR IN FURRED SPACES MAY BE (BX) INTERLOCKED ARMORED CABLE, WITH MINIMUM THW INSULATION.
9. ALL WIRE AND CABLE SHALL BE COPPER, WITH MINIMUM THW INSULATION.
10. THE CONTRACTOR SHALL TAKE FIELD MEASUREMENTS AND VERIFY FIELD CONDITIONS AND SHALL CAREFULLY COMPARE SUCH FIELD MEASUREMENTS AND CONDITIONS AND OTHER INFORMATION KNOWN TO THE CONTRACTOR WITH THE CONTRACT DOCUMENTS BEFORE SUBMITTING BID. ERRORS, INCONSISTENCIES OR OMISSIONS DISCOVERED SHALL BE REPORTED TO THE ARCHITECT AT ONCE.

Soe Lin & Associates

SL&A

Architecture, Interiors
Planning
8108 Fenway Rd
Bethesda, Maryland
20817
USA
301.469-8784
Fax.469-7830

Notes Consultants

E. K. FOX & ASSOCIATES, LTD.
CONSULTING ENGINEERS
10306 Eaton Place, Suite 510
Fairfax, Virginia 22030
703 273-1112

Project

FAIRFAX RIDGE PLAZA
11242 WAPLES MILL ROAD
FAIRFAX, VA

Drawing Title

FIRST FLOOR - LIGHTING; SYMBOLS AND NOTES

| Date | Issue |
|---|---|
| 5-9-96 | PERMIT |

Dwn By
Chkd By JHD
Job No. 960903
Scale 1/8"= 1'-0"

Sheet No.
TE1-1

infoComm Academy

| DRAWING LIST | |
|---|---|
| Drawing # | Title |
| AV100 | List of Drawings |
| AV101 | Audiovisual Electrical Symbols |
| AV201 | Facility Plan |
| AV202 | Audiovisual Good Viewing Area Plan and Sightline Study |
| AV203 | Uniformity of Coverage |
| AV301 | Audiovisual Electrical Floor/Ceiling Plan |
| AV302 | Audiovisual Electrical Reflected Ceiling Plan |
| AV303 | IT/AV Plan |
| AV304 | Audiovisual Conduit Riser |
| AV305 | Lighting Zone Plan |
| AV401 | RGBHV System |
| AV402 | Video System |
| AV403 | Audio/Program/Voice System |
| AV404 | Program Audio System |
| AV405 | Control System |
| AV406 | DSP Routing Tables |
| AV501 | Rack Elevation |
| AV502 | Audiovisual Elevations |
| AV503 | Audiovisual Sections |
| AV504 | Equipment Racks' and Wallplates' Details |
| AV505 | Control System Touchpanel Page Layouts 1 |
| AV506 | Control System Touchpanel Page Layouts 2 |
| RECORD DRAWINGS | |
| AVRD202 | RGBHV System Record Drawing |
| AVRD203 | Video System Record Drawing |
| AVRD204 | Voice Audio System Record Drawing |
| AVRD205 | Program Audio System Record Drawing |
| AVRD206 | Control System Record Drawing |
| AVRD207 | Audio DSP Details |

PTCGROUP
512 Northridge Road
Collegeville, PA 19426
B: (610) 409-5657
F: (610) 409-5658

CAD Designer

infoComm Academy
11242 Waples Mill Road
Suite 200
Fairfax, VA 22030
Toll Free: (800) 659-7469
Fax: (703) 278-8082
Website: www.infocomm.org



# InfoComm Academy Classroom Design Sample

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

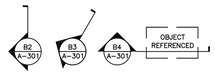
| | | |
|---|---|---|
| PROJECT NO: | Appendix A | DATE |
| DRAWN BY: | AVDesigner, CTS-D | 24Mar09 |
| CHECKED BY: | AVDesigner, CTS-D | 24Mar09 |
| FILE NAME: | AV100.dwg | |
| SCALE: | NTS | |

## List of Drawings

AV100

# Architectural Symbols

Section Indicators




Elevation Indicator, Exterior


Elevation Indicator, Interior


Elevation Indicator, Interior, Multiple


Detail Indicator


Drawing Block Title


Device Note


Junction Box


Ceiling Loudspeaker


Ceiling Microphone


Keynote


Room Identifier


# Electrical Symbols

Duplex Receptacle, Wall Mounted

Duplex Receptacle, Floor Mounted

Duplex Receptacle, Ceiling Mounted

Quad Receptacle, Wall Mounted

Quad Receptacle, Floor Mounted

Quad Receptacle, Ceiling Mounted

Telco Outlet, Wall Mounted

Telco Outlet, Floor Mounted

Data Outlet, Wall Mounted

Data Outlet, Ceiling Mounted

Infomation Outlet, Wall Mounted

Infomation Outlet, Ceiling Mounted

Ceiling Lights

Track Lights



Down Lights



PTCGROUP
512 Northridge Road
Collegeville, PA 19426
B: (610) 409-5657
F: (610) 409-5658

CAD Designer

infoComm Academy
11242 Waples Mill Road
Suite 200
Fairfax, VA 22030
Toll Free: (800) 659-7469
Fax: (703) 278-8082
Website: www.infocomm.org



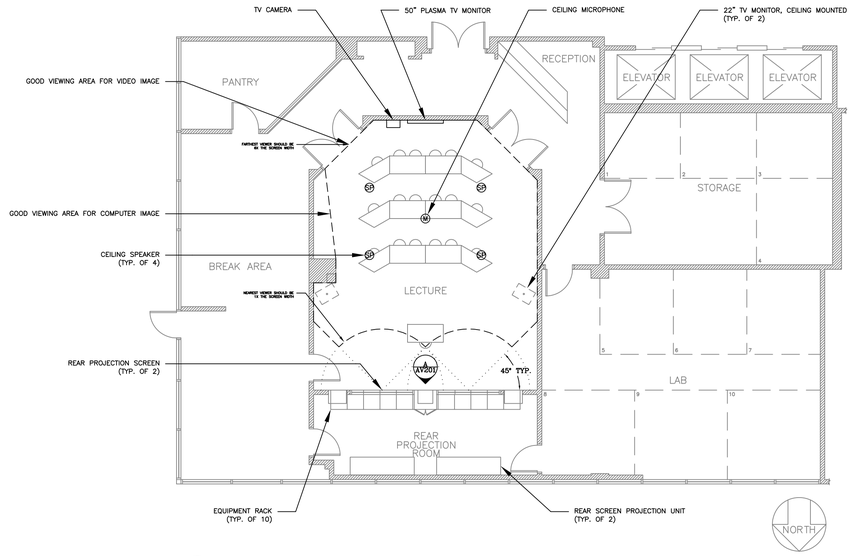
InfoComm Academy Classroom Design Sample

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

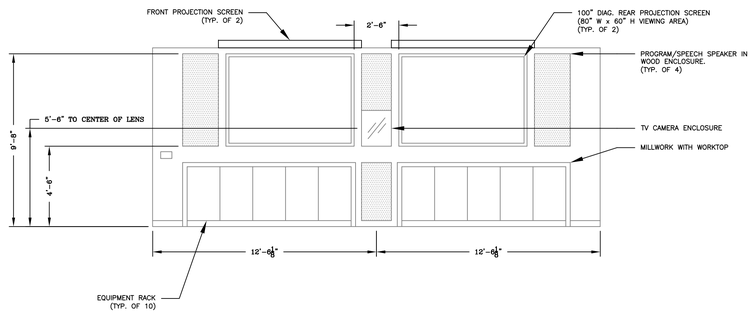
| | | |
|---|---|---|
| PROJECT NO: | Appendix A | DATE |
| DRAWN BY: | AVDesigner, CTS-D | 24Mar09 |
| CHECKED BY: | AVDesigner, CTS-D | 24Mar09 |
| FILE NAME: | AV101.dwg | |
| SCALE: | | NTS |

AudioVisual Electrical Symbols

AV101




1 FACILITY PLAN
SCALE: 1/8" = 1'




2 ELEVATION 'A'
SCALE: 1/4" = 1'

PTCGROUP
512 Northridge Road
Collegeville, PA 19426
B: (610) 409-5657
F: (610) 409-5658

CAD Designer

infoComm Academy
11242 Waples Mill Road
Suite 200
Fairfax, VA 22030
Toll Free: (800) 659-7469
Fax: (703) 278-8082
Website: www.infocomm.org



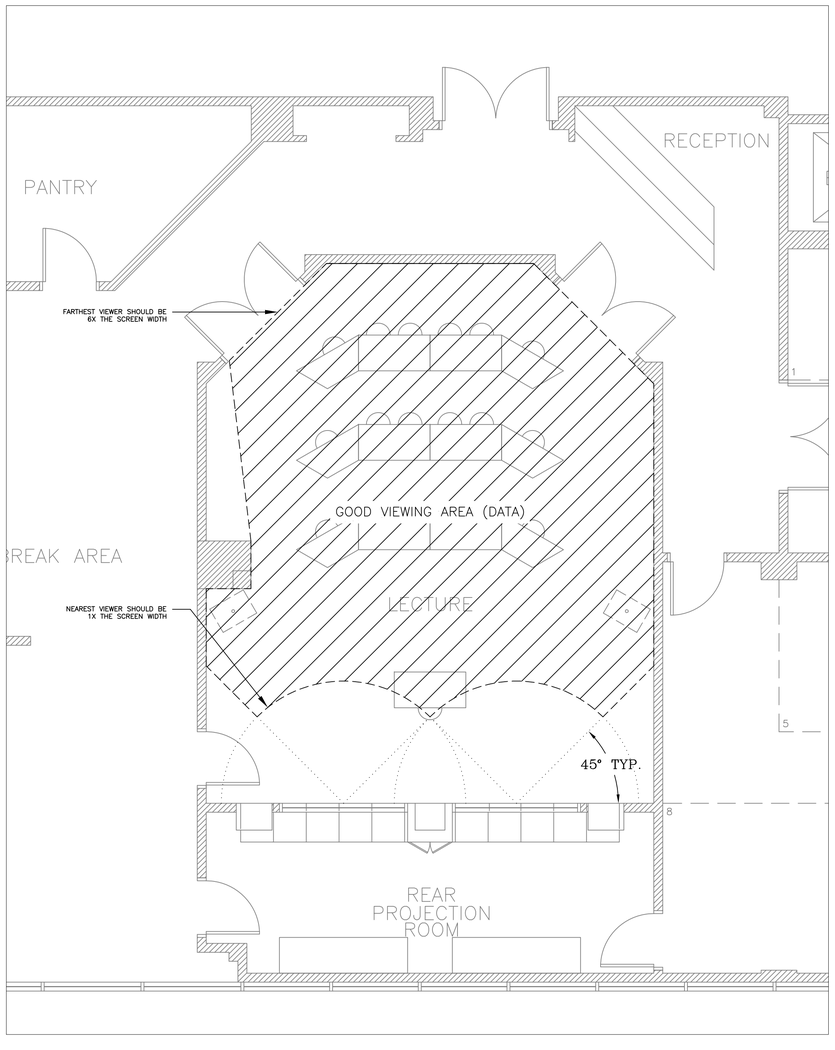
# InfoComm Academy Classroom Design Sample

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

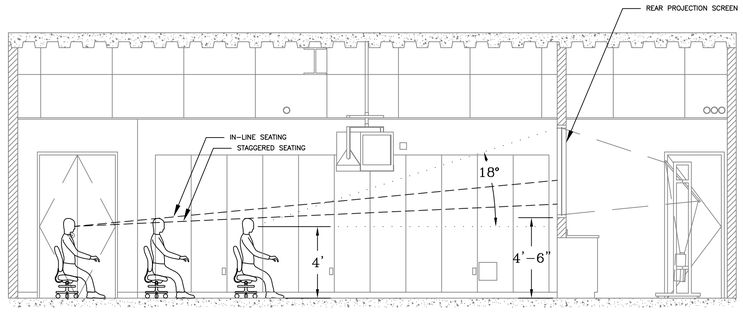
| | | |
|---|---|---|
| PROJECT NO: | Appendix A | DATE |
| DRAWN BY: | AVDesigner, CTS-D | 24Mar09 |
| CHECKED BY: | AVDesigner, CTS-D | 24Mar09 |
| FILE NAME: | AV201.dwg | |
| SCALE: | As Noted | |

## Facility Plan

AV201




1 AUDIOVISUAL GOOD VIEWING AREA PLAN
SCALE: 1/4" = 1'




2 SIGHTLINE STUDY SECTION VIEW
SCALE: 1/4" = 1'

PTCGROUP
512 Northridge Road
Collegeville, PA 19426
B: (610) 409-5657
F: (610) 409-5658

CAD Designer

infoComm Academy
11242 Waples Mill Road
Suite 200
Fairfax, VA 22030
Toll Free: (800) 659-7469
Fax: (703) 278-8082
Website: www.infocomm.org



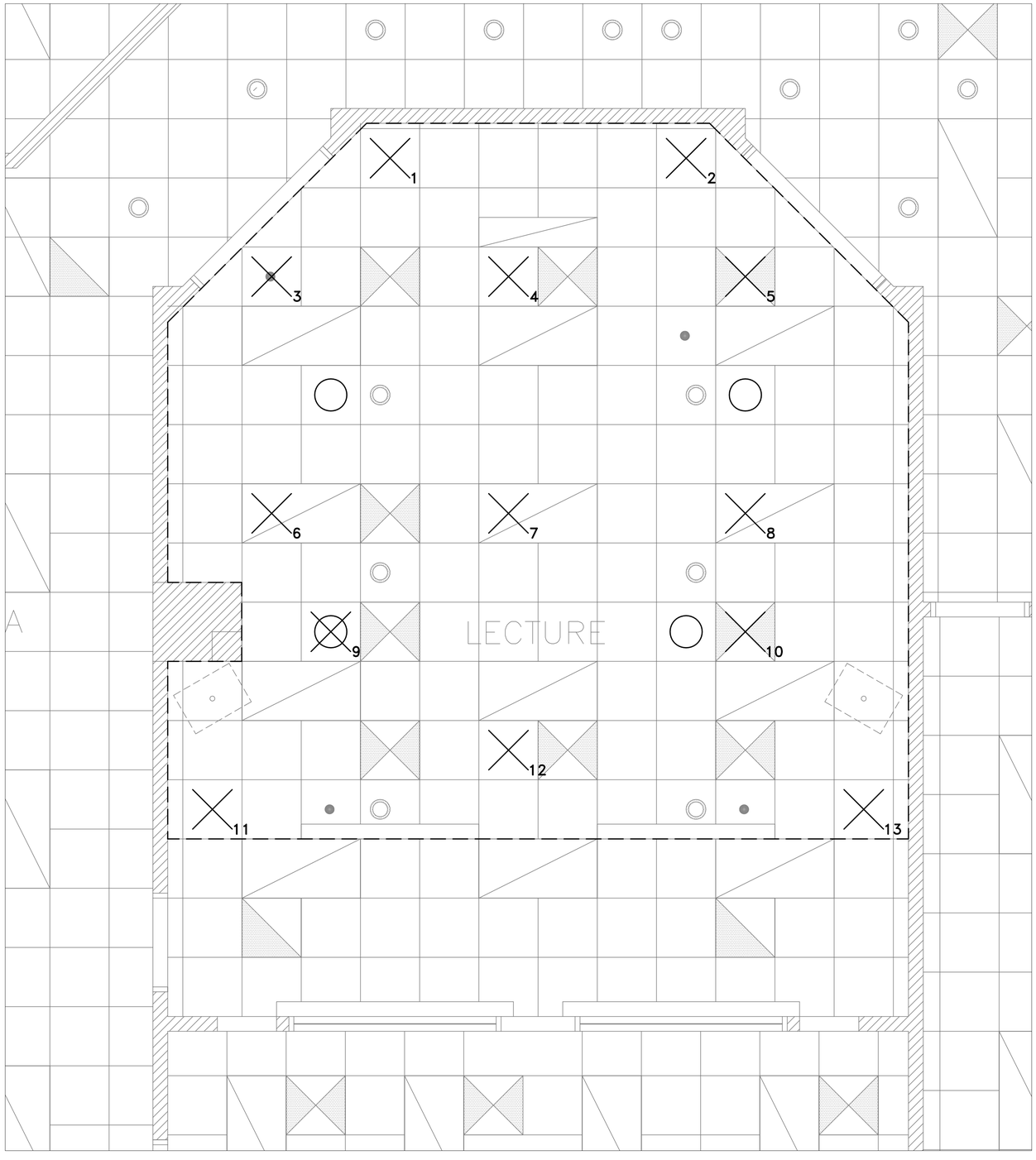
# InfoComm Academy Classroom Design Sample

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| PROJECT NO: | Appendix A | DATE |
| DRAWN BY: | AVDesigner, CTS-D | 24Mar09 |
| CHECKED BY: | AVDesigner, CTS-D | 24Mar09 |
| FILE NAME: | AV202.dwg | |
| SCALE: | As Noted | |

## Audiovisual Good Viewing Area Plan and Sightline Study

AV202




Criteria:
Classroom

| | | | |
|---|---|---|---|
| 1. | Total coverage area | – | 49m² |
| 2. | Minimum number of permissable measurements | – | 10 |
| 3. | Ceiling height | – | 10' |
| 4. | Loudspeaker type | – | Distributed on varying centers |
| 5. | Listener ear height | – | 1.2m |
| 6. | DLL | – | 2.4m |

Commentary:
Includes clause 3.d. and clause 3.a. requirements which add three (3) measurement locations to the mandatory quantity of ten (10).

MEASUREMENT LOCATIONS

RECESSED LOUDSPEAKER

PERIMETER OF COVERAGE AREA

PTCGROUP
512 Northridge Road
Collegeville, PA 19426
B: (610) 409-5657
F: (610) 409-5658

CAD Designer

infoComm Academy
11242 Waples Mill Road
Suite 200
Fairfax, VA 22030
Toll Free: (800) 659-7469
Fax: (703) 278-8082
Website: www.infocomm.org



# InfoComm Academy Classroom Design Sample

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| PROJECT NO: | Appendix A | DATE |
| DRAWN BY: | AVDesigner, CTS-D | 27Apr09 |
| CHECKED BY: | AVDesigner, CTS-D | 27Apr09 |
| FILE NAME: | AV203.dwg | |
| SCALE: | 1/2" = 1' | |

## Uniformity of Coverage

AV203


PTCGROUP
512 Northridge Road
Collegeville, PA 19426
B: (610) 409-5657
F: (610) 409-5658

CAD Designer

infoComm Academy
11242 Waples Mill Road
Suite 200
Fairfax, VA 22030
Toll Free: (800) 659-7469
Fax: (703) 278-8082
Website: www.infocomm.org



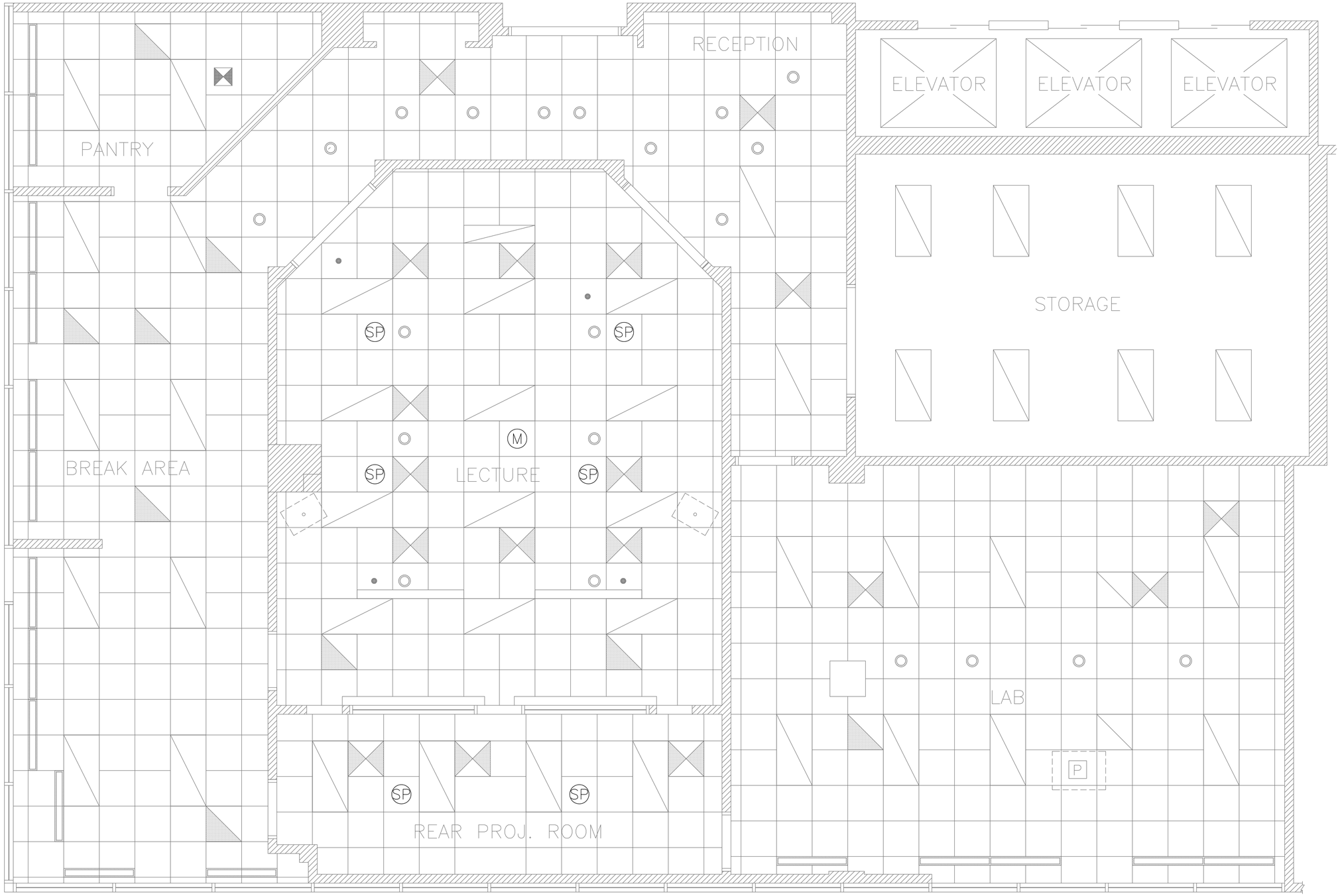
# InfoComm Academy Classroom Design Sample

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| PROJECT NO: | Appendix A | DATE |
| DRAWN BY: | AVDesigner, CTS-D | 27Apr09 |
| CHECKED BY: | AVDesigner, CTS-D | 27Apr09 |
| FILE NAME: | AV301.dwg | |
| SCALE: | 3/8" = 1' | |

## Audiovisual Electrical Floor/Ceiling Plan

AV301




PTCGROUP
512 Northridge Road
Collegeville, PA 19426
B: (610) 409-5657
F: (610) 409-5658

CAD Designer

infoComm Academy
11242 Waples Mill Road
Suite 200
Fairfax, VA 22030
Toll Free: (800) 659-7469
Fax: (703) 278-8082
Website: www.infocomm.org



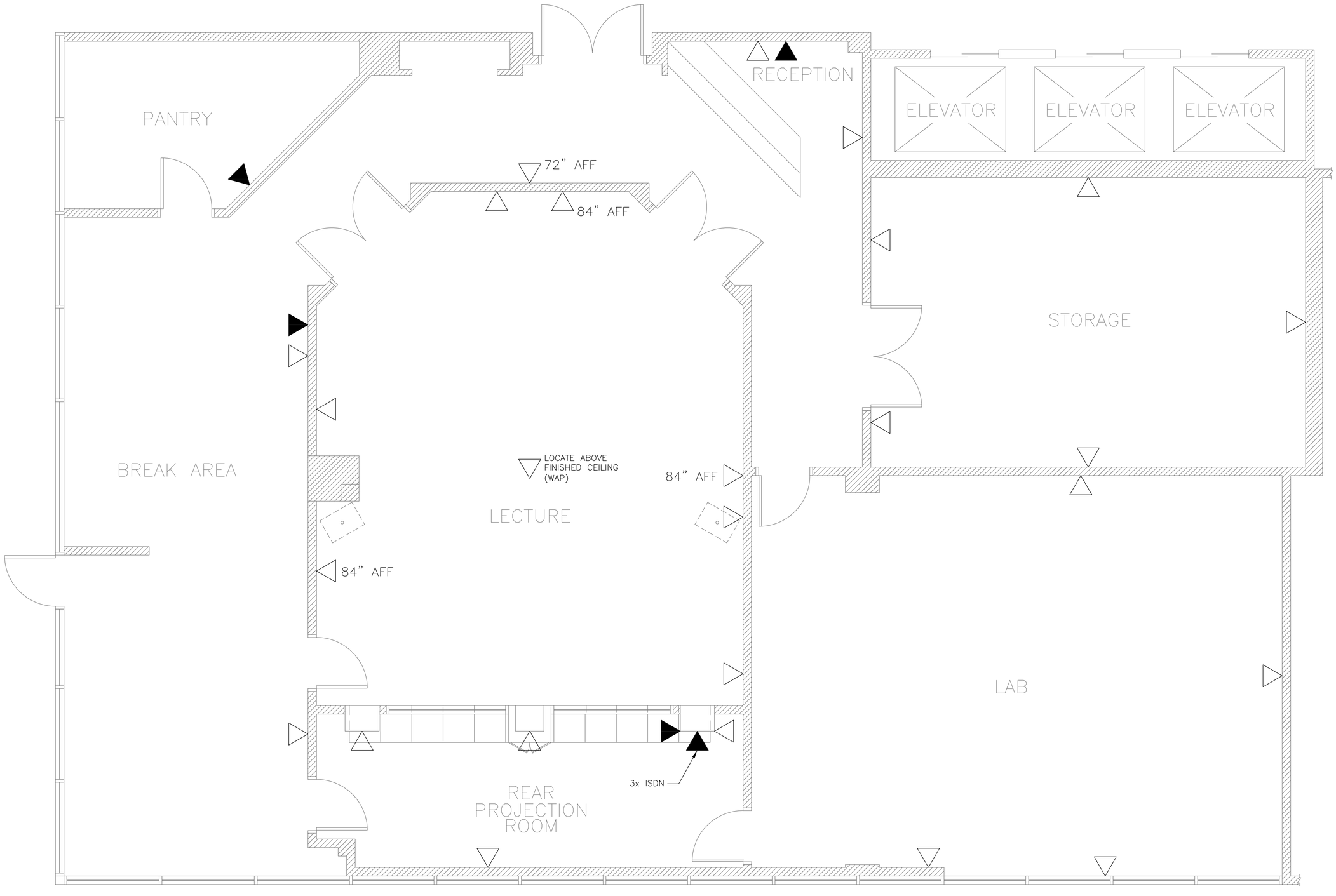
# InfoComm Academy Classroom Design Sample

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| PROJECT NO: | Appendix A | DATE |
| DRAWN BY: | AVDesigner, CTS-D | 27Apr09 |
| CHECKED BY: | AVDesigner, CTS-D | 27Apr09 |
| FILE NAME: | AV302.dwg | |
| SCALE: | 3/8" = 1' | |

## Audiovisual Electrical Reflected Ceiling Plan

AV302




PTCGROUP
512 Northridge Road
Collegeville, PA 19426
B: (610) 409-5657
F: (610) 409-5658

CAD Designer

infoComm Academy
11242 Waples Mill Road
Suite 200
Fairfax, VA 22030
Toll Free: (800) 659-7469
Fax: (703) 278-8082
Website: www.infocomm.org



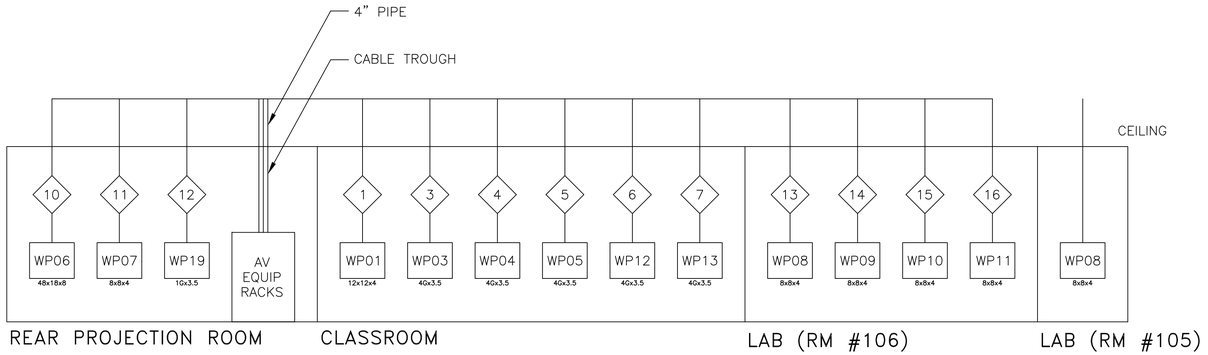
# InfoComm Academy Classroom Design Sample

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| PROJECT NO: | Appendix A | DATE |
| DRAWN BY: | AVDesigner, CTS-D | 27Apr09 |
| CHECKED BY: | AVDesigner, CTS-D | 27Apr09 |
| FILE NAME: | AV303.dwg | |
| SCALE: | 3/8" = 1' | |

## IT/AV Plan

AV303




| RUN # | PLATE | WIRE BY SVC CONTRACTOR | | E.M.C. CONDUIT |
|---|---|---|---|---|
| | | QTY. | TYPE | |
| 1 | WP01 | | | (1) ¾"<br>(2) 1"<br>(1) 1¼" |
| 3 | WP03 | | | (3) ¾" |
| 4 | WP04 | | | (3) ¾" |
| 5 | WP05 | | | (3) ¾" |
| 6 | WP12 | | | (1) ¾" |
| 7 | WP13 | | | (1) ¾" |
| 10 | WP06 | | | |
| 11 | WP07 | | | (1) 2" |
| 12 | WP19 | | | (1) ¾" |
| 13 | WP08 | | | (1) ¾"<br>(1) 1" |
| 14 | WP09 | | | (1) ¾"<br>(1) 1" |
| 15 | WP10 | | | (1) ¾"<br>(1) 1" |
| 16 | WP11 | | | (1) ¾"<br>(1) 1" |

NOTES:

All gangable electrical boxes to be 3½" deep.

All gangable electrical boxes to be equipped with ¾" knockouts.

PTCGROUP
512 Northridge Road
Collegeville, PA 19426
B: (610) 409-5657
F: (610) 409-5658

CAD Designer

infoComm Academy
11242 Waples Mill Road
Suite 200
Fairfax, VA 22030
Toll Free: (800) 659-7469
Fax: (703) 278-8082
Website: www.infocomm.org



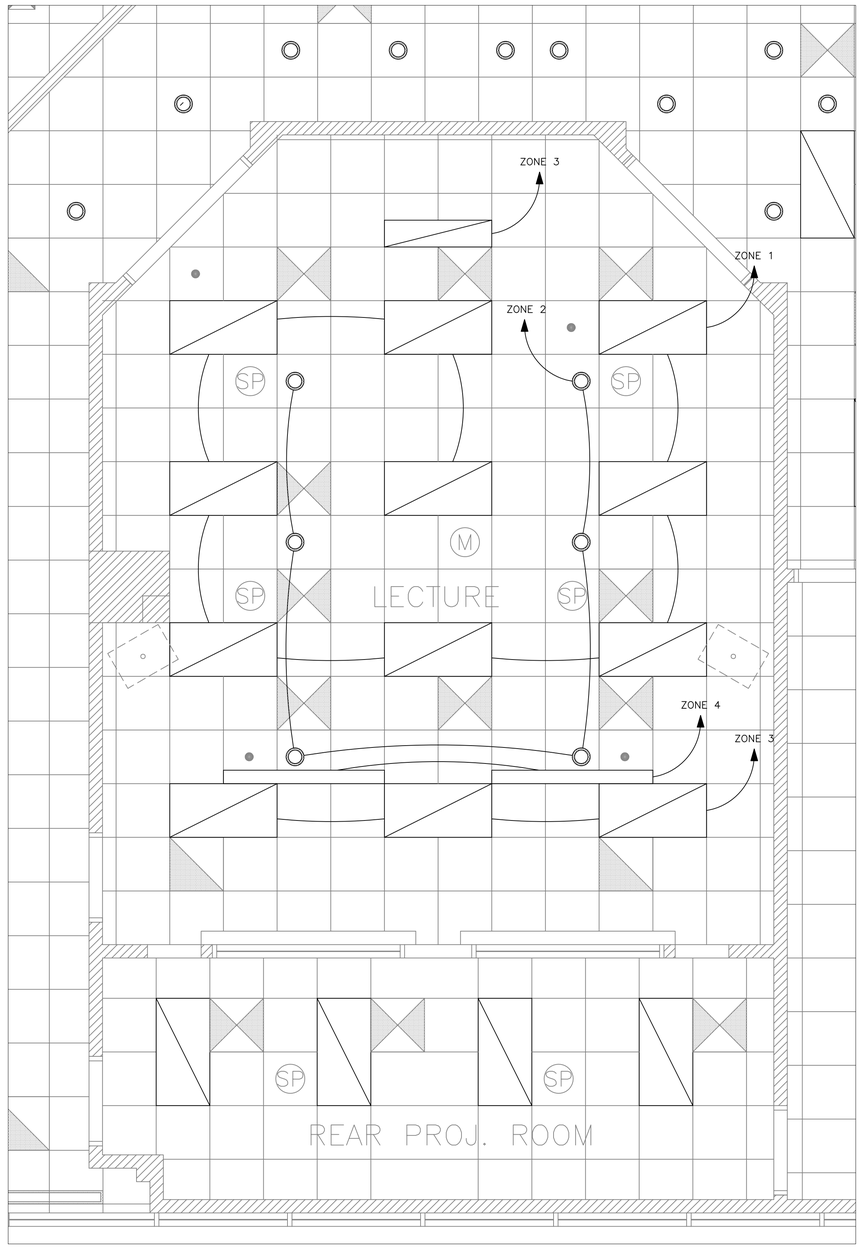
# InfoComm Academy Classroom Design Sample

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| PROJECT NO: | Appendix A | DATE |
| DRAWN BY: | AVDesigner, CTS-D | 27Apr09 |
| CHECKED BY: | AVDesigner, CTS-D | 27Apr09 |
| FILE NAME: | AV304.dwg | |
| SCALE: | As Noted | |

## Audiovisual Conduit Riser

AV304




| SCENE | ZONE | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| MEETING | 100% | 0% | 0% | 0% |
| PRESENT | 75% | 75% | 100% | 0% |
| AV PRESENT | 75% | 100% | 25% | 0% |
| VIDEO CONFERENCE | 100% | 100% | 100% | 100% |
| OFF | 0% | 0% | 0% | 0% |

PTCGROUP
512 Northridge Road
Collegeville, PA 19426
B: (610) 409-5657
F: (610) 409-5658

CAD Designer

infoComm Academy
11242 Waples Mill Road
Suite 200
Fairfax, VA 22030
Toll Free: (800) 659-7469
Fax: (703) 278-8082
Website: www.infocomm.org



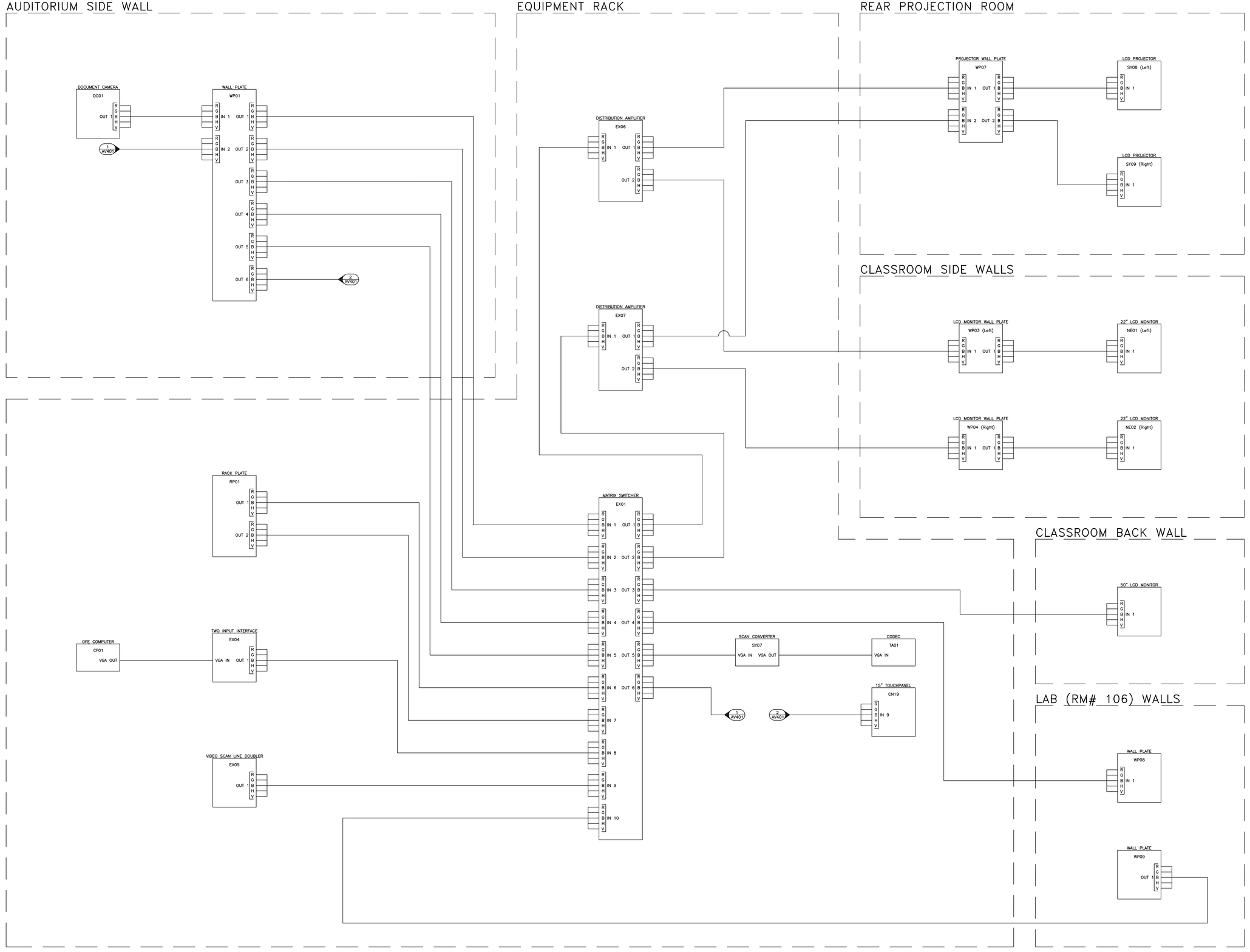
# InfoComm Academy Classroom Design Sample

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| PROJECT NO: | Appendix A | DATE |
| DRAWN BY: | AVDesigner, CTS-D | 27Apr09 |
| CHECKED BY: | AVDesigner, CTS-D | 27Apr09 |
| FILE NAME: | AV305.dwg | |
| SCALE: | 3/8" = 1' | |

## Lighting Zone Plan

AV305




PTCGROUP
512 Northridge Road
Collegeville, PA 19426
B: (610) 409-5657
F: (610) 409-5658

CAD Designer

infoComm Academy
11242 Waples Mill Road
Suite 200
Fairfax, VA 22030
Toll Free: (800) 659-7469
Fax: (703) 278-8082
Website: www.infocomm.org



# InfoComm Academy Classroom Design Sample

| REV | DESCRIPTION | DATE |
|---|---|---|
| A | SNAFU | 31Jan06 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| PROJECT NO: | Appendix A | DATE |
| DRAWN BY: | AVDesigner, CTS-D | 30Jan06 |
| CHECKED BY: | AVDesigner, CTS-D | 30Jan06 |
| FILE NAME: | AV401.dwg | |
| SCALE: | As Noted | |

## RGBHV System

AV401

EQUIPMENT RACK

CLASSROOM SIDE WALL

REAR PROJECTION ROOM

AUDITORIUM SIDE WALLS

CLASSROOM BACK WALL

LAB (RM #106) WALLS

CLASSROOM REAR WALL

CLASSROOM CAMERA BOX

RACK PLATE
RP01
VIDEO OUT

VCR
CF03
VIDEO OUT

DVD PLAYER
SY06
VIDEO OUT

LASER DISC PLAYER
PA01
VIDEO OUT

PROCESSER
LX01
LASER DISC IN
MONITOR OUT

VCR
SY05
VIDEO 1 IN
LINE 3 IN

DSS RECEIVER
CF01
ANTENNA
VIDEO OUT

SCAN CONVERTER
SY07
VIDEO OUT

AUDITORIUM WALL PLATE
WP01
VIDEO OUT 1
VIDEO OUT 2

MATRIX SWITCHER
EX02
IN 1 – OUT 1
IN 2 – OUT 2
IN 3 – OUT 3
IN 4 – OUT 4
IN 5 – OUT 5
IN 6 – OUT 6
IN 7 – OUT 7
IN 8 – OUT 8
IN 9
IN 10
IN 11
IN 12

CODEC
TA01
VIDEO IN
VIDEO OUT 1
VIDEO OUT 3

DISTRIBUTION AMPLIFIER
EX10
IN A – OUT A1
OUT A2
IN B – OUT B1
OUT B2

PROJECTOR WALL PLATE
WP07
VID IN A – VID OUT 1
VID IN B – VID OUT 2

LCD PROJECTOR
SY08 (Left)
VIDEO IN

LCD PROJECTOR
SY09 (Right)
VIDEO IN

MONITOR WALL PLATE
WP03 (Left)
VIDEO IN
VIDEO OUT

LCD MONITOR
NE01 (Left)
VIDEO IN

MONITOR WALL PLATE
WP04 (Right)
VID IN A
VID OUT 1

LCD MONITOR
NE02 (Right)
VIDEO IN

DISTRIBUTION AMPLIFIER
EX12
IN A – OUT A1
IN B – OUT B1
OUT B2

WALL PLATE
WP02
VIDEO 8
VIDEO 9

TOUCHPANEL INTERFACE
CN15
Y/C IN
NET VID OUT

15" TOUCHPANEL
CN19
NET VID IN

WALL PLATE
WP08 (Tie Line #1)
VIDEO IN

VIDEO SCAN LINE DOUBLER
EX05
IN 1

WALL PLATE
WP09 (Tie Line #2)
VIDEO OUT

CAMERA POWER SUPPLY
SY04
DC OUT

CAMERA
SY01
DC IN
VIDEO OUT

CAMERA WALL PLATE
WP05
VIDEO IN
VIDEO OUT

CAMERA POWER SUPPLY
SY04
DC OUT

CAMERA
SY01
DC IN
VIDEO OUT

PTCGROUP
512 Northridge Road
Collegeville, PA 19426
B: (610) 409-5657
F: (610) 409-5658

CAD Designer

infoComm Academy
11242 Waples Mill Road
Suite 200
Fairfax, VA 22030
Toll Free: (800) 659-7469
Fax: (703) 278-8082
Website: www.infocomm.org



# InfoComm Academy Classroom Design Sample

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| PROJECT NO: | Appendix A | DATE |
| DRAWN BY: | AVDesigner, CTS-D | 14Apr09 |
| CHECKED BY: | AVDesigner, CTS-D | 14Apr09 |
| FILE NAME: | AV402.dwg | |
| SCALE: | As Noted | |

## Video System

AV402

CLASSROOM SIDE WALL

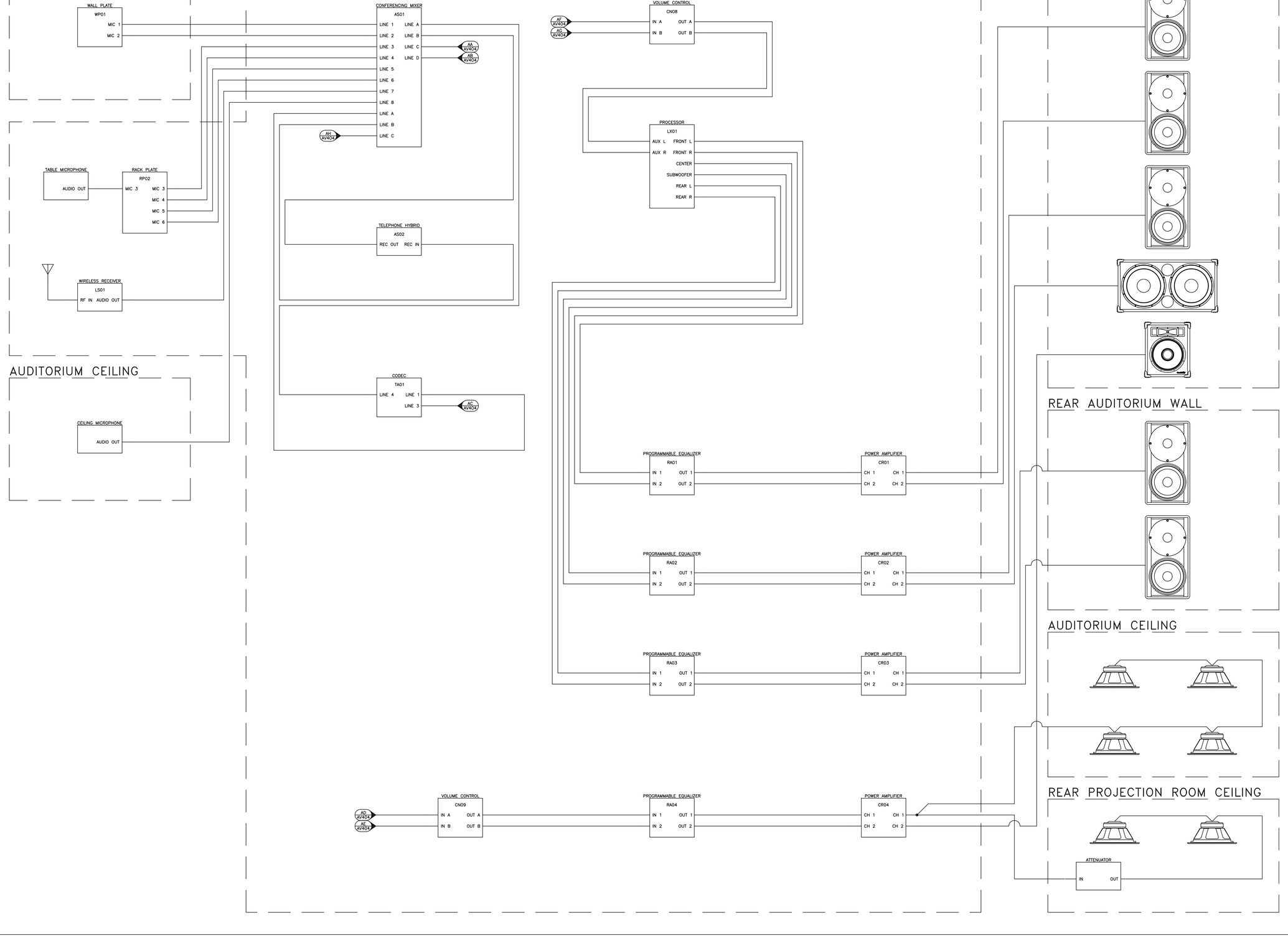
EQUIPMENT RACK

FRONT AUDITORIUM WALL

REAR AUDITORIUM WALL

AUDITORIUM CEILING

REAR PROJECTION ROOM CEILING





PTCGROUP
512 Northridge Road
Collegeville, PA 19426
B: (610) 409-5657
F: (610) 409-5658


CAD Designer


infoComm Academy
11242 Waples Mill Road
Suite 200
Fairfax, VA 22030
Toll Free: (800) 659-7469
Fax: (703) 278-8082
Website: www.infocomm.org



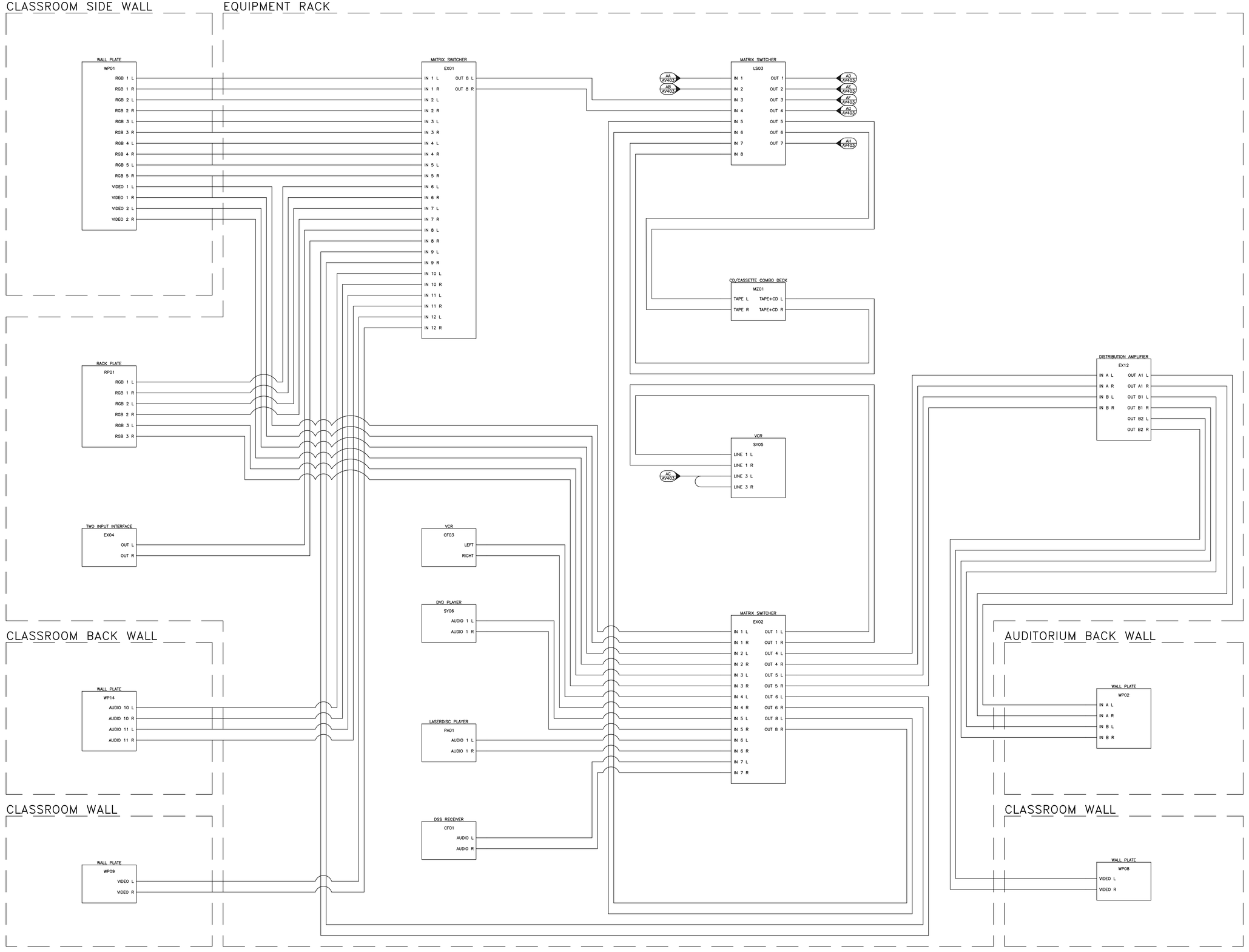

# InfoComm Academy Classroom Design Sample

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| PROJECT NO: | Appendix A | DATE |
| DRAWN BY: | AVDesigner, CTS-D | 27Apr09 |
| CHECKED BY: | AVDesigner, CTS-D | 27Apr09 |
| FILE NAME: | AV403.dwg | |
| SCALE: | As Noted | |

## Audio/Program/Voice System

AV403




PTCGROUP
512 Northridge Road
Collegeville, PA 19426
B: (610) 409-5657
F: (610) 409-5658

CAD Designer

infoComm Academy
11242 Waples Mill Road
Suite 200
Fairfax, VA 22030
Toll Free: (800) 659-7469
Fax: (703) 278-8082
Website: www.infocomm.org



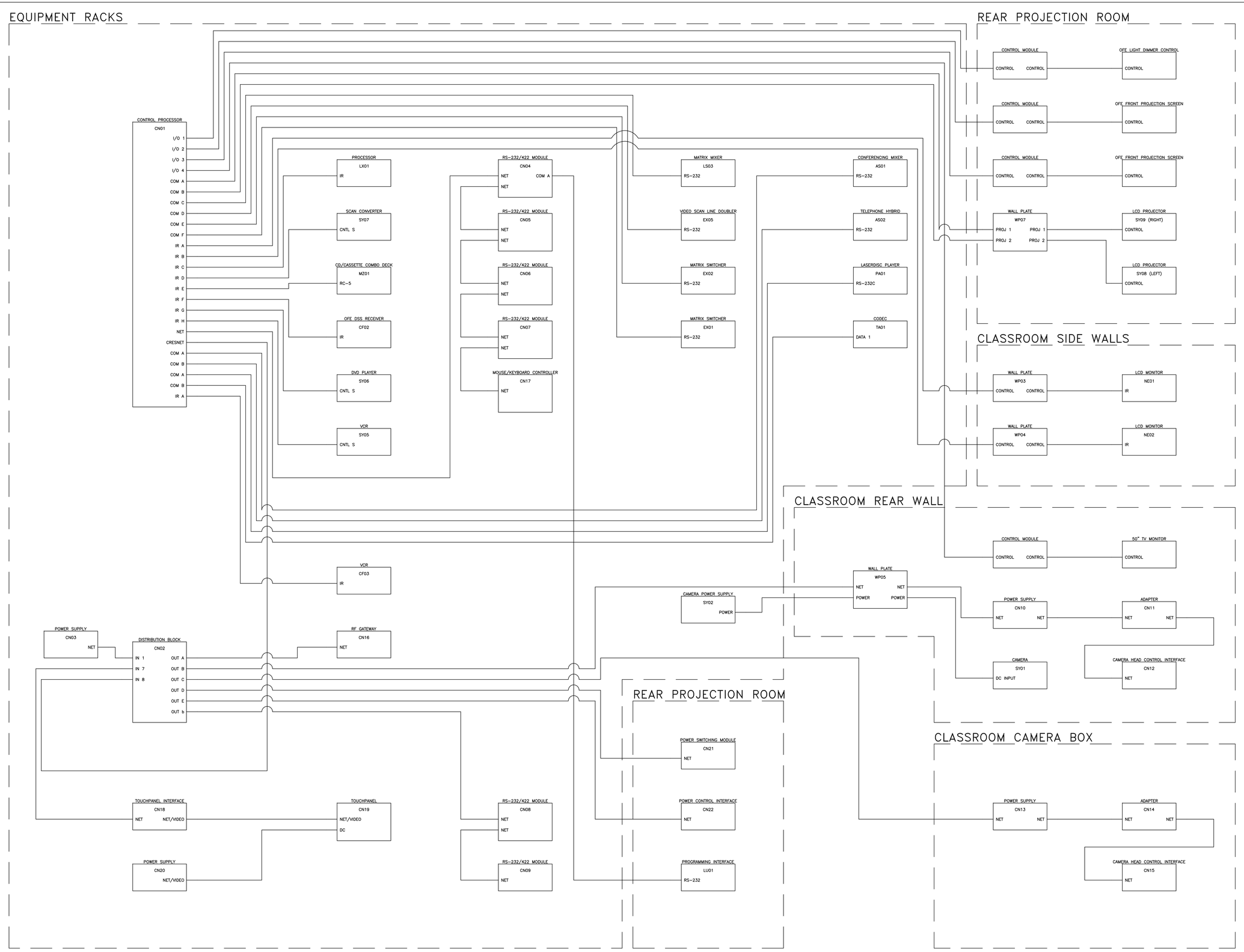
# InfoComm Academy Classroom Design Sample

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| PROJECT NO: | Appendix A | DATE |
| DRAWN BY: | AVDesigner, CTS-D | 27Apr09 |
| CHECKED BY: | AVDesigner, CTS-D | 27Apr09 |
| FILE NAME: | AV404.dwg | |
| SCALE: | As Noted | |

## Program Audio System

AV404




PTCGROUP
512 Northridge Road
Collegeville, PA 19426
B: (610) 409-5657
F: (610) 409-5658

CAD Designer

infoComm Academy
11242 Waples Mill Road
Suite 200
Fairfax, VA 22030
Toll Free: (800) 659-7469
Fax: (703) 278-8082
Website: www.infocomm.org



# InfoComm Academy Classroom Design Sample

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| PROJECT NO: | Appendix A | DATE |
| DRAWN BY: | AVDesigner, CTS-D | 27Apr09 |
| CHECKED BY: | AVDesigner, CTS-D | 27Apr09 |
| FILE NAME: | AV405.dwg | |
| SCALE: | As Noted | |

## Control System

AV405

| INPUTS | NAME | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | A | B | C | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NAME | | | | | | | | VTC CODEC | ATC HYBRID | PROGRAM MATRIX MIXER IN 1 (LS03) | PROGRAM MATRIX MIXER IN 2 (LS03) |
| 1 | MIC 1 (WALL PLATE) | | | | | | | | | 2 | 1 | | |
| 2 | MIC 2 (WALL PLATE) | | | | | | | | | 2 | 1 | | |
| 3 | MIC 3 (RACK PLATE) | | | | | | | | | 2 | 1 | | |
| 4 | MIC 4 (RACK PLATE) | | | | | | | | | 2 | 1 | | |
| 5 | MIC 5 (RACK PLATE) | | | | | | | | | 2 | 1 | | |
| 6 | MIC 6 (RACK PLATE) | | | | | | | | | 2 | 1 | | |
| 7 | WIRELESS MIC | | | | | | | | | 2 | 1 | 1, 2 | 1, 2 |
| 8 | CEILING MIC | | | | | | | | | 2 | 1 | | |
| A | VTC CODEC (TA01) | | | | | | | | | | | 2 | 2 |
| B | ATC HYBRID (AS02) | | | | | | | | | | | 1 | 1 |
| C | PROGRAM AUDIO (MM8) | | | | | | | | | 2 | 1 | | |
| D | | | | | | | | | | | | | |

DEVICE: CONFERENCING MIXER (AS01)
MODE: 1–AUDIO CONFERENCING
2–VIDEO CONFERENCING

## 1 DSP ROUTING TABLE
SCALE: NTS

| INPUTS | NAME | 1 | 2 | 3 | 4 | 5 | 1 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| | | OUTPUTS | CEILING SPEAKERS A | CEILING SPEAKERS B | PROGRAM SPEAKERS A | PROGRAM SPEAKERS B | CD/CASS IN LEFT (MZ01) | CD/CASS IN RIGHT (MZ01) | CONFERENCE MIXER IN LINE (AS01) | PROGRAM SPEAKERS B |
| 1 | CONFERENCE MIXER (AS01) | 1 | 1 | | | 1 | 1 | | | |
| 2 | CONFERENCE MIXER (AS01) | 1 | 1 | | | 1 | 1 | | | |
| 3 | SWITCHER LEFT (EX01) | 1 | 1 | 2 | 2 | 1 | 1 | | | |
| 4 | SWITCHER RIGHT (EX01) | 1 | 1 | 2 | 2 | 1 | 1 | 1 | | |
| 5 | SWITCHER LEFT (EX02) | | | 2 | 2 | 1 | 1 | 1 | | |
| 6 | SWITCHER RIGHT (EX02) | | | 2 | 2 | 1 | 1 | 1 | | |
| 7 | CD/CASS LEFT (MZ01) | | | 2 | 2 | | | 1 | | |
| 8 | CD/CASS RIGHT (MZ01) | | | 2 | 2 | | | 1 | | |
| 9 | | | | | | | | | | |
| 10 | | | | | | | | | | |
| 11 | | | | | | | | | | |
| 12 | | | | | | | | | | |

DEVICE: MATRIX MIXER (LS03)
MODE: 1–AUDIO CONFERENCING
2–PROGRAM AUDIO

## 2 AUDIO DSP ROUTING TABLE
SCALE: NTS

PTCGROUP
512 Northridge Road
Collegeville, PA 19426
B: (610) 409-5657
F: (610) 409-5658

CAD Designer

infoComm Academy
11242 Waples Mill Road
Suite 200
Fairfax, VA 22030
Toll Free: (800) 659-7469
Fax: (703) 278-8082
Website: www.infocomm.org



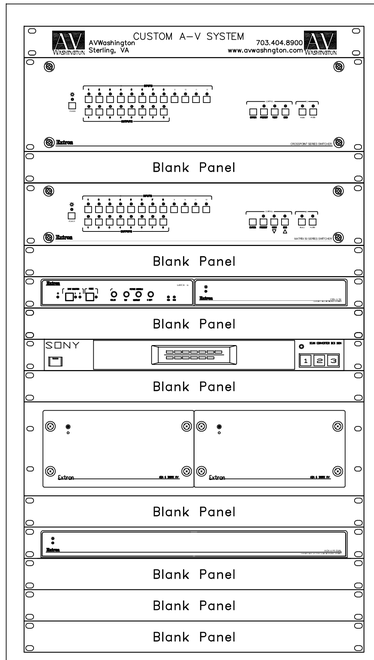
# InfoComm Academy Classroom Design Sample

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

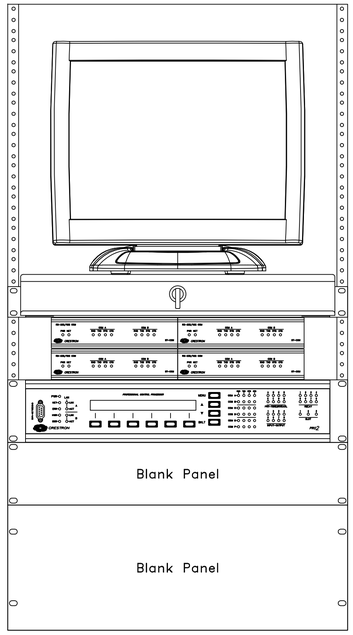
| | | |
|---|---|---|
| PROJECT NO: | Appendix A | DATE |
| DRAWN BY: | AVDesigner, CTS-D | 27Apr09 |
| CHECKED BY: | AVDesigner, CTS-D | 27Apr09 |
| FILE NAME: | AV406.dwg | |
| SCALE: | As Noted | |

# DSP Routing Tables

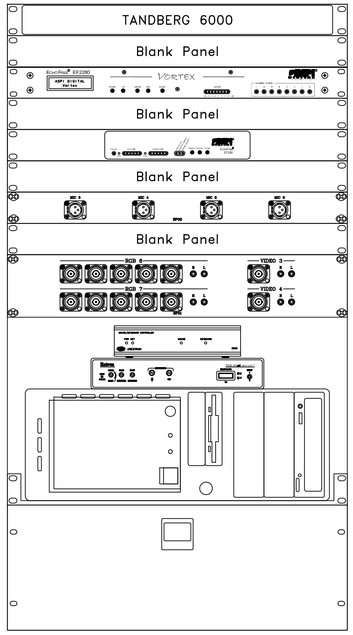
AV406



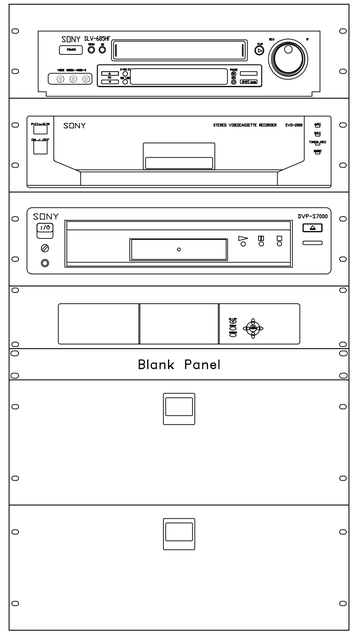

1



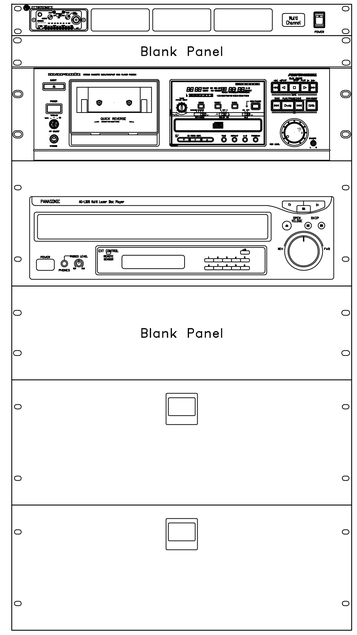

2



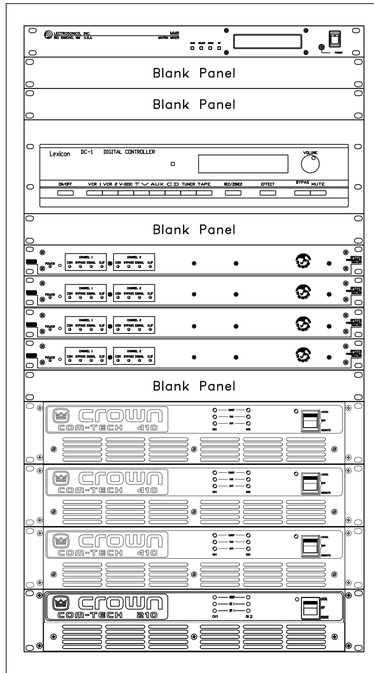

3



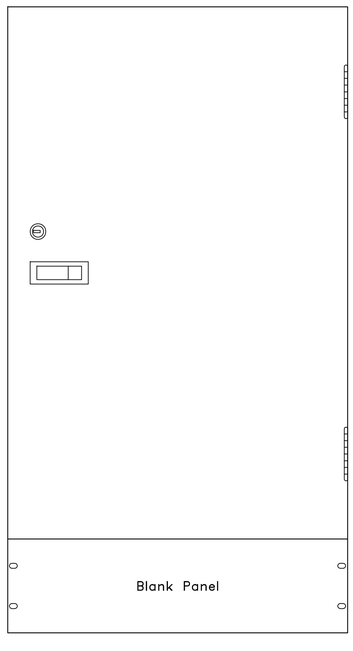

4



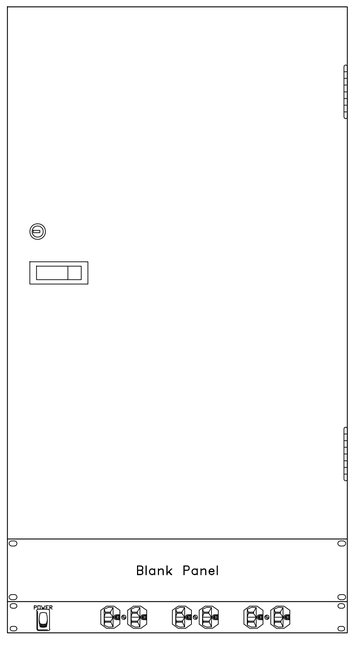

5



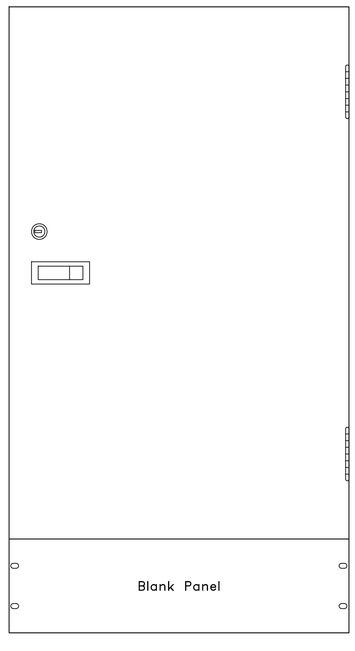

6



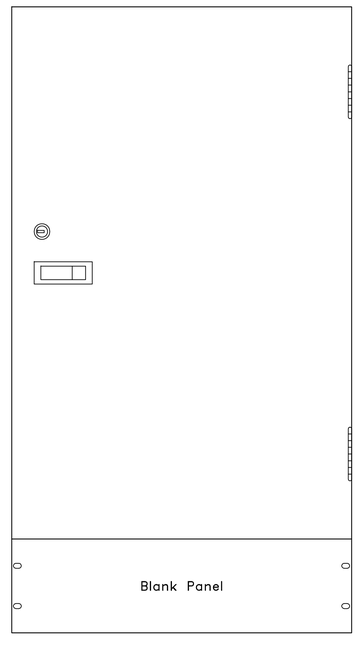

7




8




9




10

PTCGROUP
512 Northridge Road
Collegeville, PA 19426
B: (610) 409–5657
F: (610) 409–5658

CAD Designer

infoComm Academy
11242 Waples Mill Road
Suite 200
Fairfax, VA 22030
Toll Free: (800) 659-7469
Fax: (703) 278-8082
Website: www.infocomm.org



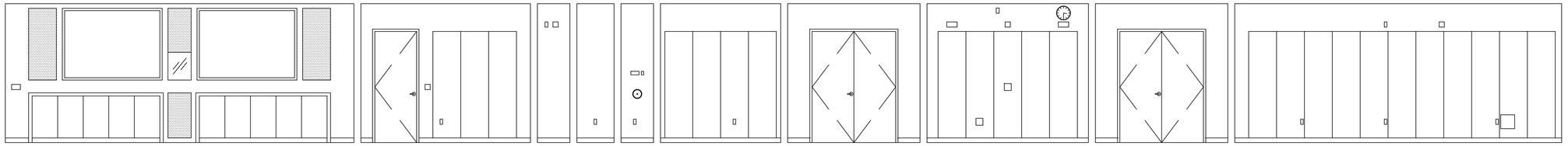
# InfoComm Academy Classroom Design Sample

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

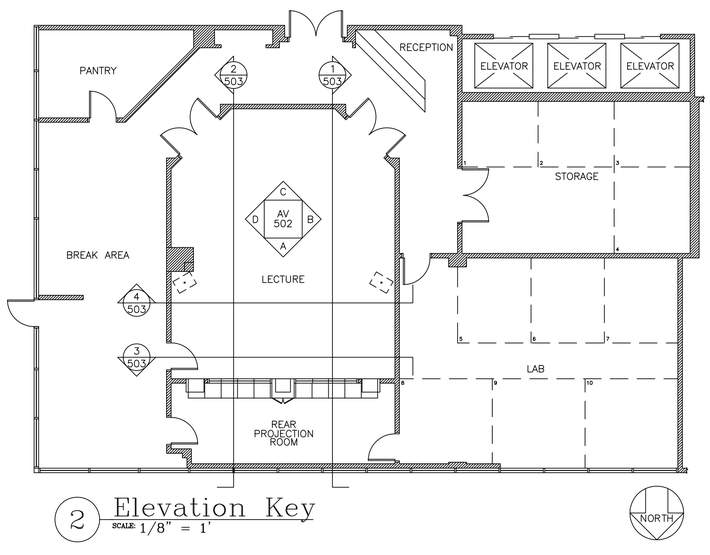
| | | |
|---|---|---|
| PROJECT NO: | Appendix A | DATE |
| DRAWN BY: | AVDesigner, CTS-D | 27Apr09 |
| CHECKED BY: | AVDesigner, CTS-D | 27Apr09 |
| FILE NAME: | AV501.dwg | |
| SCALE: | 3" = 1' | |

## Rack Elevation

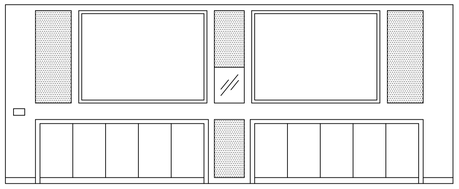
AV501



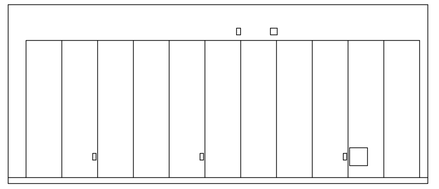
1 CLASSROOM FOLD OUT ELEVATION
SCALE: 1/4" = 1'



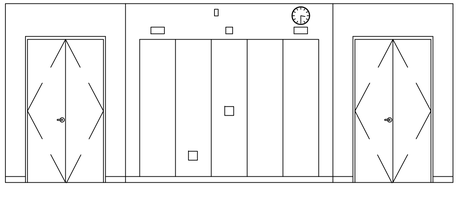

2 Elevation Key
SCALE: 1/8" = 1'



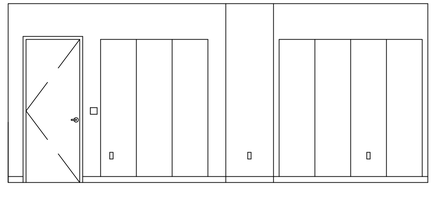
A CLASSROOM ELEVATION
SCALE: 1/4" = 1'



B CLASSROOM ELEVATION
SCALE: 1/4" = 1'



C CLASSROOM ELEVATION
SCALE: 1/4" = 1'



D CLASSROOM ELEVATION
SCALE: 1/4" = 1'

PTCGROUP
512 Northridge Road
Collegeville, PA 19426
B: (610) 409-5657
F: (610) 409-5658

CAD Designer

infoComm Academy
11242 Waples Mill Road
Suite 200
Fairfax, VA 22030
Toll Free: (800) 659-7469
Fax: (703) 278-8082
Website: www.infocomm.org



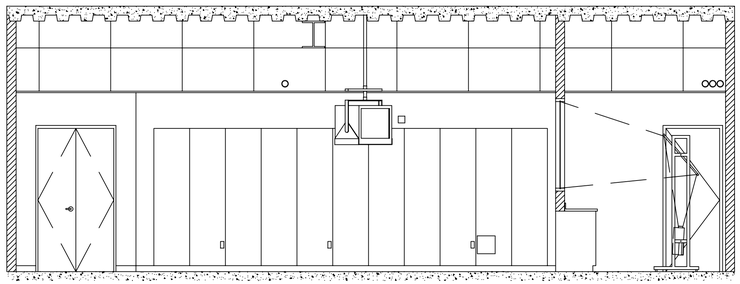
# InfoComm Academy Classroom Design Sample

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

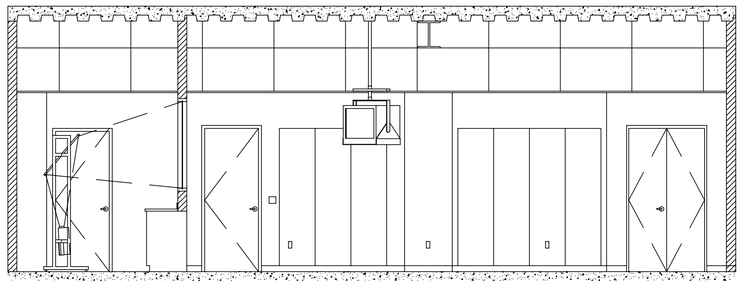
| | | |
|---|---|---|
| PROJECT NO: | Appendix A | DATE |
| DRAWN BY: | AVDesigner, CTS-D | 27Apr09 |
| CHECKED BY: | AVDesigner, CTS-D | 27Apr09 |
| FILE NAME: | AV502.dwg | |
| SCALE: | As Noted | |

## Audiovisual Elevations

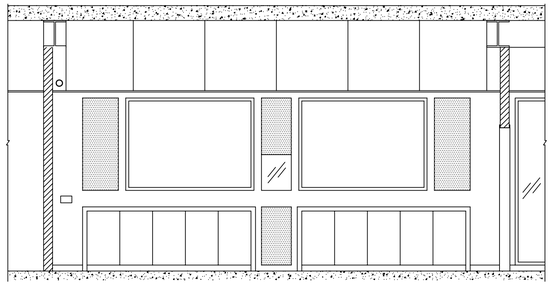
AV502



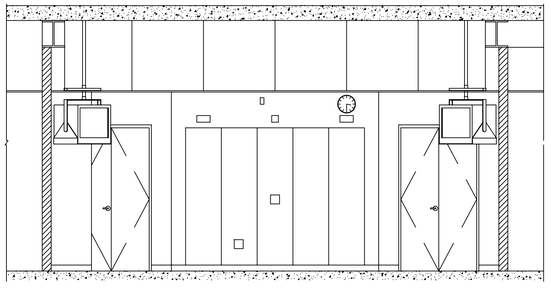
1 SECTION
SCALE: 1/4" = 1'



2 SECTION
SCALE: 1/4" = 1'



3 SECTION
SCALE: 1/4" = 1'



4 SECTION
SCALE: 1/4" = 1'

PTCGROUP
512 Northridge Road
Collegeville, PA 19426
B: (610) 409-5657
F: (610) 409-5658

CAD Designer

infoComm Academy
11242 Waples Mill Road
Suite 200
Fairfax, VA 22030
Toll Free: (800) 659-7469
Fax: (703) 278-8082
Website: www.infocomm.org



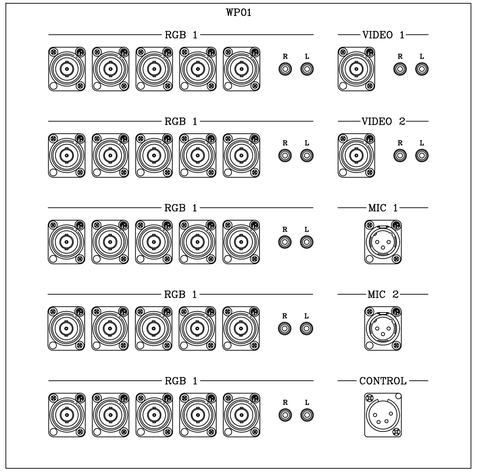
# InfoComm Academy Classroom Design Sample

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| PROJECT NO: | Appendix A | DATE |
| DRAWN BY: | AVDesigner, CTS-D | 27Apr09 |
| CHECKED BY: | AVDesigner, CTS-D | 27Apr09 |
| FILE NAME: | AV503.dwg | |
| SCALE: | As Noted | |

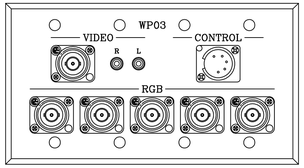
## Audiovisual Sections

AV503



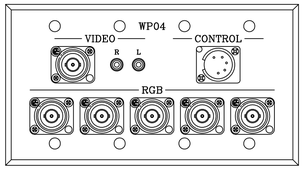

1 WP01
SCALE: 1:2

Size: 13" x 13" Plate to fit 12" x 12" flush mount box



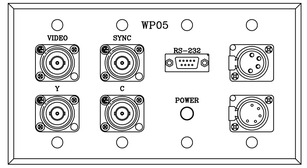

2 WP03
SCALE: 1:2

Size: 4 Gang Box



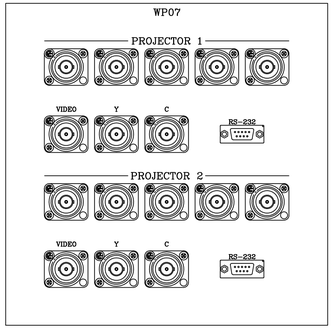

3 WP04
SCALE: 1:2

Size: 4 Gang Box



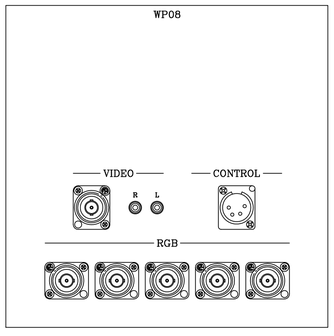

4 WP05
SCALE: 1:2

Size: 4 Gang Box



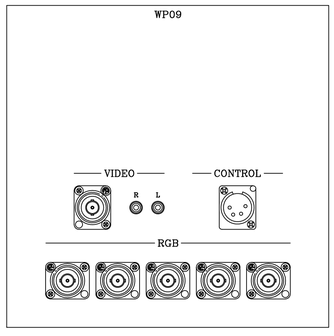

5 WP07
SCALE: 1:2

Size: 9" x 9" Plate to fit 8" x 8" flush mount box



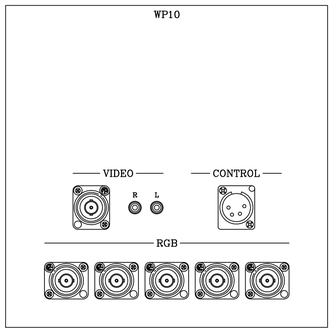

6 WP08
SCALE: 1:2

Size: 9" x 9" Plate to fit 8" x 8" flush mount box



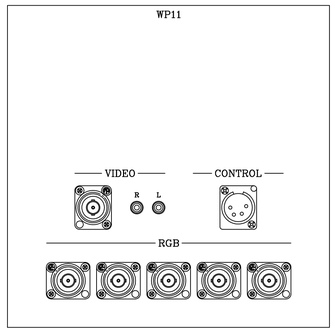

7 WP09
SCALE: 1:2

Size: 9" x 9" Plate to fit 8" x 8" flush mount box



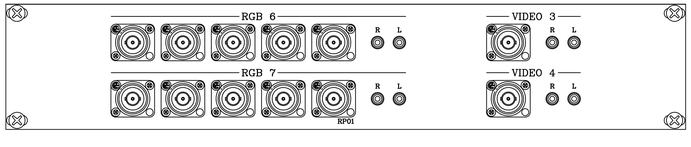

8 WP10
SCALE: 1:2

Size: 9" x 9" Plate to fit 8" x 8" flush mount box



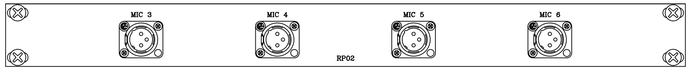

9 WP11
SCALE: 1:2

Size: 9" x 9" Plate to fit 8" x 8" flush mount box




10 RP01
SCALE: 1:2

Size: Custom two space rack panel




11 RP02
SCALE: 1:2

Size: Custom one space rack panel

PTCGROUP
512 Northridge Road
Collegeville, PA 19426
B: (610) 409-5657
F: (610) 409-5658

CAD Designer

infoComm Academy
11242 Waples Mill Road
Suite 200
Fairfax, VA 22030
Toll Free: (800) 659-7469
Fax: (703) 278-8082
Website: www.infocomm.org



# InfoComm Academy Classroom Design Sample

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| PROJECT NO: | Appendix A | DATE |
| DRAWN BY: | AVDesigner, CTS-D | 27Apr09 |
| CHECKED BY: | AVDesigner, CTS-D | 27Apr09 |
| FILE NAME: | AV504.dwg | |
| SCALE: | As Noted | |

## Equipment Racks' and Wallplates' Details

AV504










PTCGROUP
512 Northridge Road
Collegeville, PA 19426
B: (610) 409-5657
F: (610) 409-5658

CAD Designer

infoComm Academy
11242 Waples Mill Road
Suite 200
Fairfax, VA 22030
Toll Free: (800) 659-7469
Fax: (703) 278-8082
Website: www.infocomm.org



# InfoComm Academy Classroom Design Sample

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| PROJECT NO: | Appendix A | DATE |
| DRAWN BY: | AVDesigner, CTS-D | 27Apr09 |
| CHECKED BY: | AVDesigner, CTS-D | 27Apr09 |
| FILE NAME: | AV505.dwg | |
| SCALE: | As Noted | |

## Control System Touchpanel Layouts 1

AV505









PTCGROUP
512 Northridge Road
Collegeville, PA 19426
B: (610) 409-5657
F: (610) 409-5658

CAD Designer

infoComm Academy
11242 Waples Mill Road
Suite 200
Fairfax, VA 22030
Toll Free: (800) 659-7469
Fax: (703) 278-8082
Website: www.infocomm.org



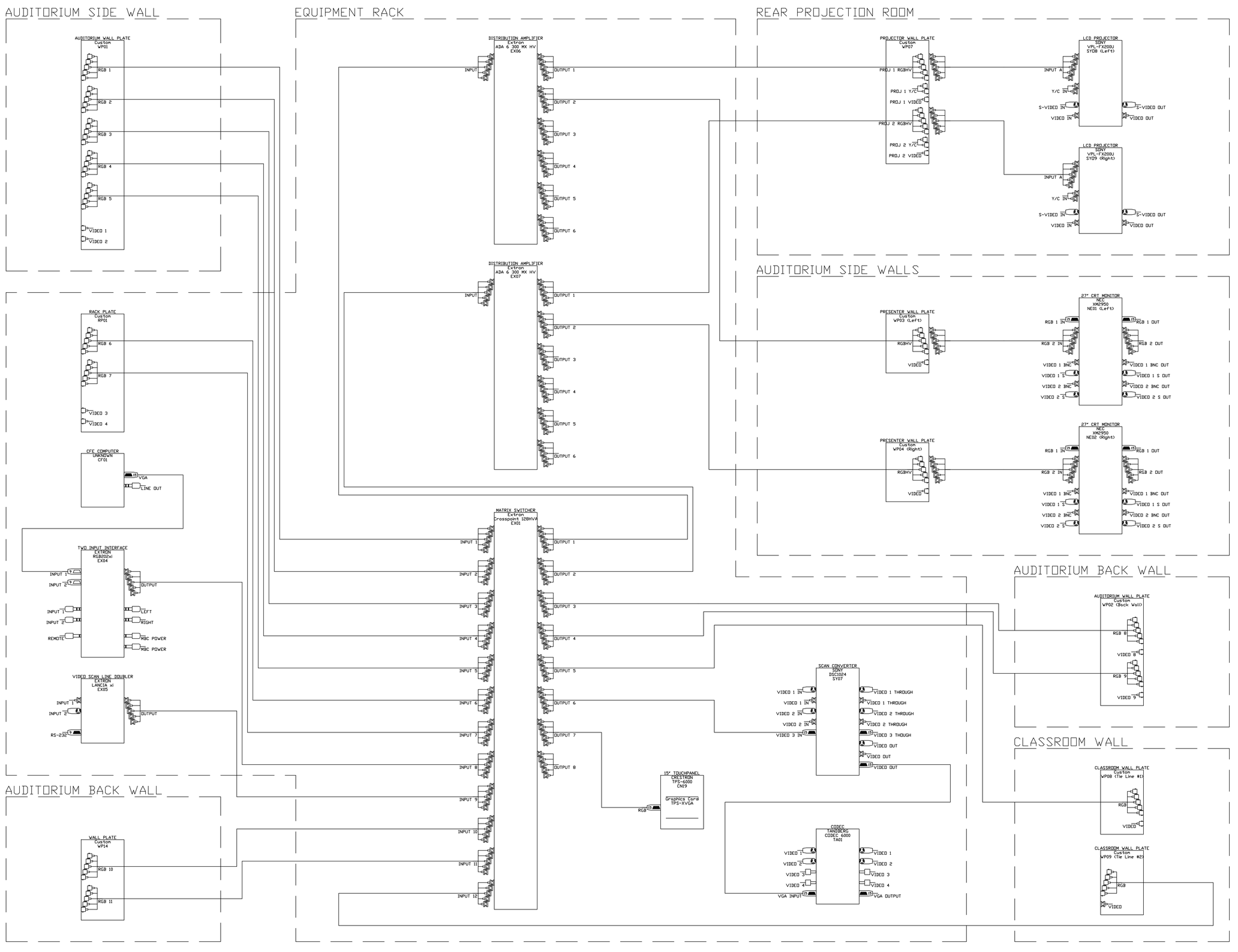
# InfoComm Academy Classroom Design Sample

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| PROJECT NO: | Appendix A | DATE |
| DRAWN BY: | AVDesigner, CTS-D | 27Apr09 |
| CHECKED BY: | AVDesigner, CTS-D | 27Apr09 |
| FILE NAME: | AV506.dwg | |
| SCALE: | As Noted | |

## Control System Touchpanel Layouts 2

AV506




PTCGROUP
512 Northridge Road
Collegeville, PA 19426
B: (610) 409-5657
F: (610) 409-5658

CAD Designer

infoComm Academy
11242 Waples Mill Road
Suite 200
Fairfax, VA 22030
Toll Free: (800) 659-7469
Fax: (703) 278-8082
Website: www.infocomm.org



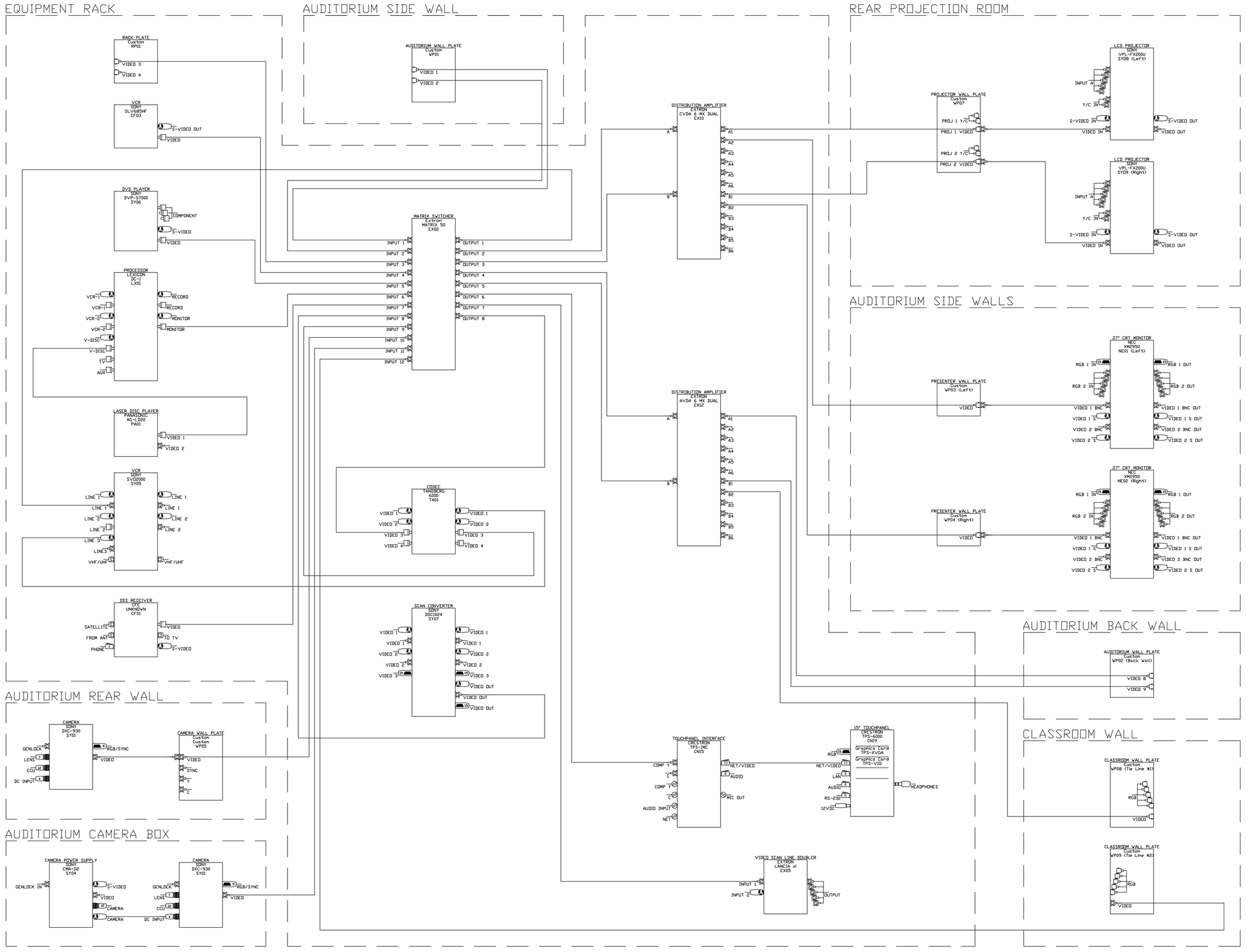
# InfoComm Academy Classroom Design Sample

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| PROJECT NO: | Appendix A | DATE |
| DRAWN BY: | AV CAD Technician | 1Jun06 |
| CHECKED BY: | AV Project Manager, CTS-I | 1Jun06 |
| FILE NAME: | AVRD202.dwg | |
| SCALE: | As Noted | |

## RGBHV System Record Drawing

AVRD202




PTCGROUP
512 Northridge Road
Collegeville, PA 19426
B: (610) 409-5657
F: (610) 409-5658

CAD Designer

infoComm Academy
11242 Waples Mill Road
Suite 200
Fairfax, VA 22030
Toll Free: (800) 659-7469
Fax: (703) 278-8082
Website: www.infocomm.org



# InfoComm Academy Classroom Design Sample

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| PROJECT NO: | Appendix A | DATE |
| DRAWN BY: | AV CAD Technician | 1Jun06 |
| CHECKED BY: | AV Project Manager, CTS-I | 1Jun06 |
| FILE NAME: | AVRD203.dwg | |
| SCALE: | As Noted | |

## Video System Record Drawing

AVRD203

AUDITORIUM SIDE WALL

EQUIPMENT RACK

FRONT AUDITORIUM WALL

AUDITORIUM CEILING

REAR AUDITORIUM WALL

AUDITORIUM CEILING

REAR PROJECTION ROOM CEILING

AUDITORIUM WALL PLATE
Custom
WP01
MIC 1
MIC 2

CONFERENCING MIXER
ASPI DIGITAL
EF2280
AS01
MIC/LINE 1
MIC/LINE 2
MIC/LINE 3
MIC/LINE 4
MIC/LINE 5
MIC/LINE 6
MIC/LINE 7
MIC/LINE 8
LINE 9
LINE A
LINE B
LINE C
LINE D
EF BUS
LINE 1
LINE 2
LINE 3
LINE 4
LINE 5
LINE 6
LINE 7
LINE 8
LINE A
LINE B
LINE C
LINE D
EF BUS
AH AV205
AV205 AA
AV205 AB

VOLUME CONTROL
CRESTRON
ST-VC
CN08
AF AV205
AG AV205
A
B
C
NET
A
B
C
NET

MIC 1
MIC 2
MIC 3
RACK PLATE
CUSTOM
RP02
MIC 3
MIC 4
MIC 5
MIC 6

WIRELESS RECEIVER
LECTROSONICS
UCR190
LS01
ANT
AUDIO

TELEPHONE HYBRID
ASPI DIGITAL
EF200
AS02
FROM AEC
FROM REMOTE
LINE
TO AEC
TO REMOTE
PHONE

PROCESSOR
LEXICON
DC-1
LX01
VCR-1 L
VCR-1 R
VCR-2 L
VCR-2 R
V-DISC L
V-DISC R
TV L
TV R
AUX L
AUX R
CD L
CD R
TUNER L
TUNER R
TAPE L
TAPE R
COAX 1
COAX 2
OPTICAL 1
OPTICAL 2
FRONT L
FRONT R
CENTER
SUBWOOFER
SIDE L
SIDE R
REAR L
REAR R
RECORD L
RECORD R
ZONE 2 L
ZONE 2 R

CODEC
TANDBERG
6000
TA01
MIC 1
MIC 2
MIC 3
AUDIO 4
AUDIO 5
AUDIO 6
AUDIO 1
AUDIO 2
AUDIO 3
AV205 AC

CEILING MIC

PROGRAMMABLE EQUALIZER
RANE
RPE 228
RA01
PROGRAMMABLE EQUALIZER
RANE
RPE 228
RA02
PROGRAMMABLE EQUALIZER
RANE
RPE 228
RA03
PROGRAMMABLE EQUALIZER
RANE
RPE 228
RA04
RV232

POWER AMPLIFIER
CROWN
CT-410
CR01
POWER AMPLIFIER
CROWN
CT-410
CR02
POWER AMPLIFIER
CROWN
CT-410
CR03
POWER AMPLIFIER
CROWN
CT-210
CR04
CH-1
CH-2

VOLUME CONTROL
CRESTRON
ST-VC
CN09
AD AV205
AE AV205
A
B
C
NET

ATTENUATOR
ATLAS
AT75

PTCGROUP
512 Northridge Road
Collegeville, PA 19426
B: (610) 409-5657
F: (610) 409-5658

CAD Designer

infoComm Academy
11242 Waples Mill Road
Suite 200
Fairfax, VA 22030
Toll Free: (800) 659-7469
Fax: (703) 278-8082
Website: www.infocomm.org



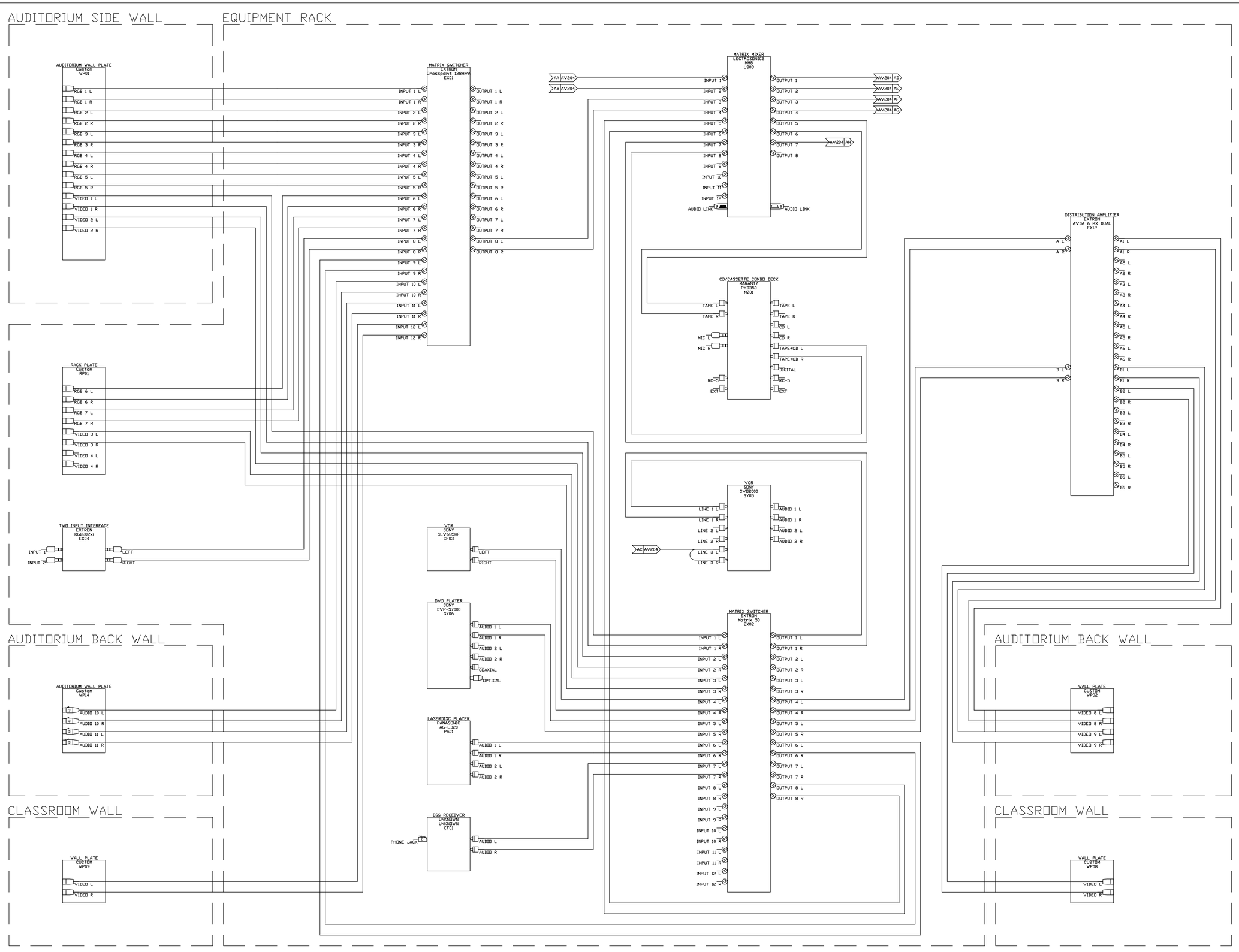
# InfoComm Academy Classroom Design Sample

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| PROJECT NO: | Appendix A | DATE |
| DRAWN BY: | AV CAD Technician | 1Jun06 |
| CHECKED BY: | AV Project Manager, CTS-I | 1Jun06 |
| FILE NAME: | AVRD204.dwg | |
| SCALE: | As Noted | |

## Voice Audio System Record Drawing

AVRD204




PTCGROUP
512 Northridge Road
Collegeville, PA 19426
B: (610) 409-5657
F: (610) 409-5658

CAD Designer

infoComm Academy
11242 Waples Mill Road
Suite 200
Fairfax, VA 22030
Toll Free: (800) 659-7469
Fax: (703) 278-8082
Website: www.infocomm.org



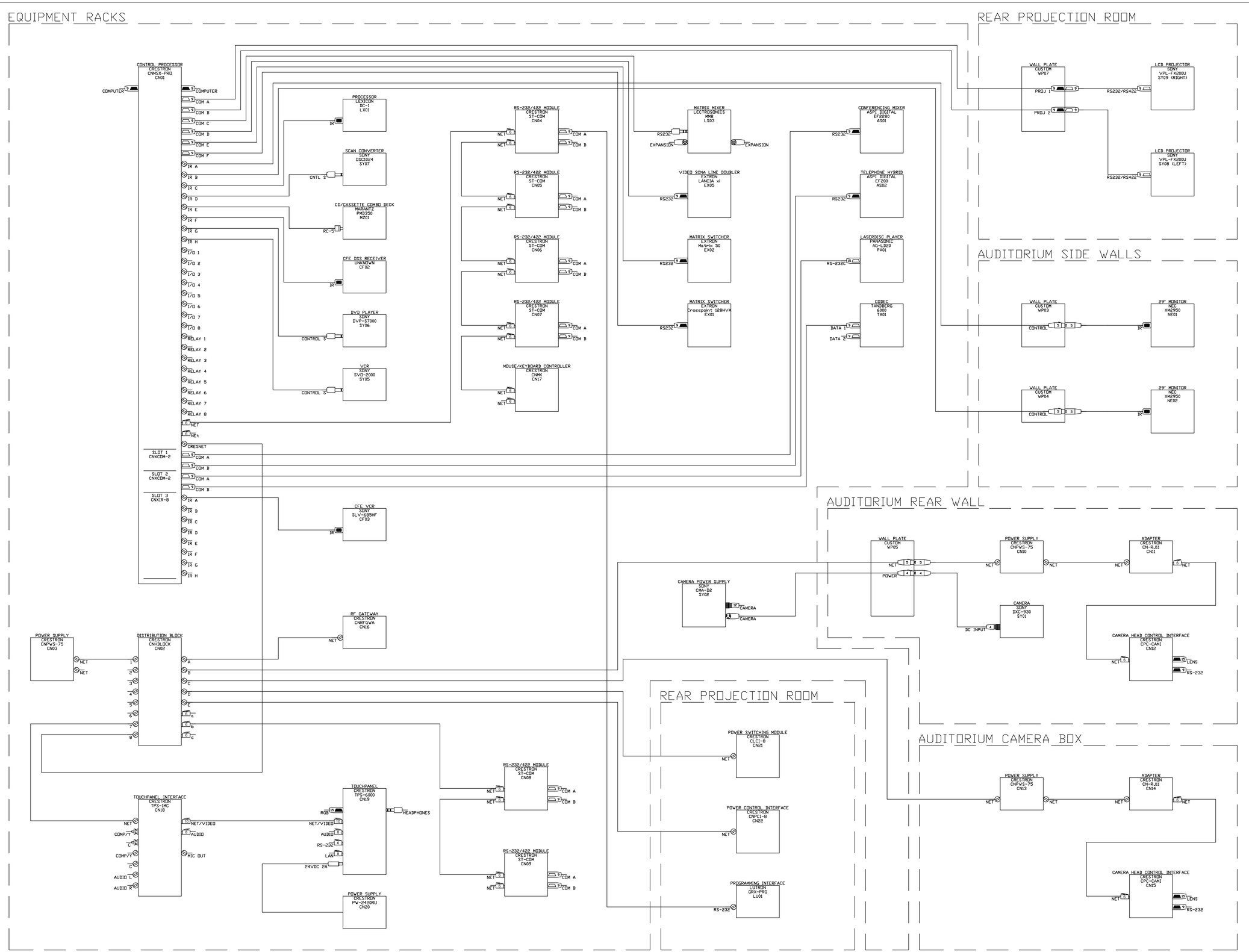
# InfoComm Academy Classroom Design Sample

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| PROJECT NO: | Appendix A | DATE |
| DRAWN BY: | AV CAD Technician | 1Jun06 |
| CHECKED BY: | AV Project Manager, CTS-I | 1Jun06 |
| FILE NAME: | AVRD205.dwg | |
| SCALE: | As Noted | |

## Program Audio System Record Drawing

AVRD205





PTCGROUP
512 Northridge Road
Collegeville, PA 19426
B: (610) 409-5657
F: (610) 409-5658

CAD Designer

infoComm Academy
11242 Waples Mill Road
Suite 200
Fairfax, VA 22030
Toll Free: (800) 659-7469
Fax: (703) 278-8082
Website: www.infocomm.org



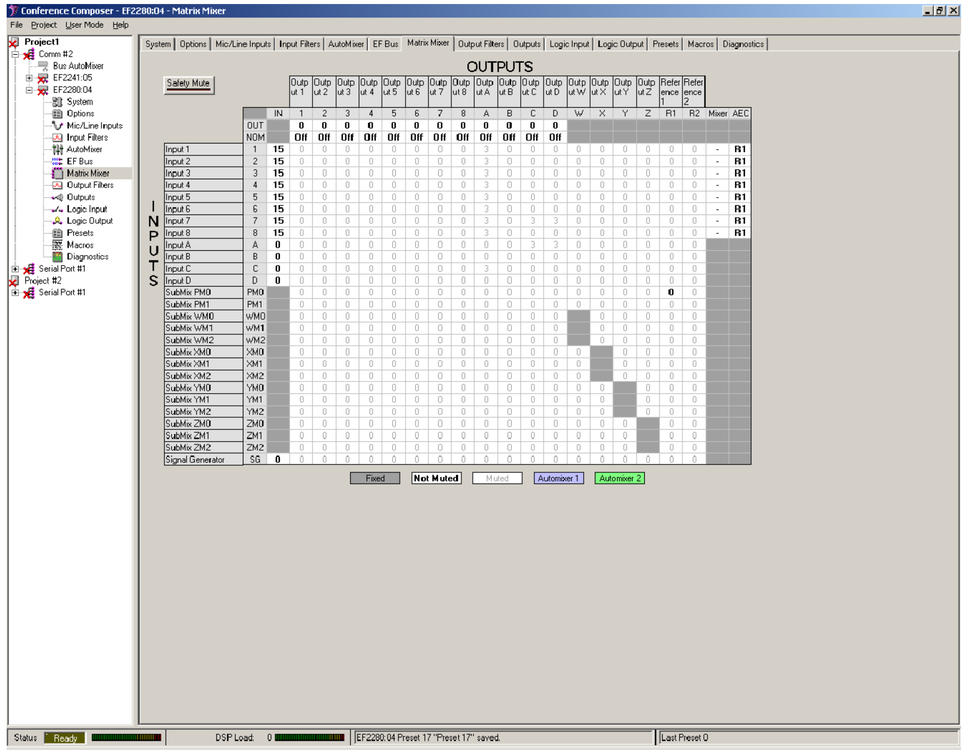

# InfoComm Academy Classroom Design Sample

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

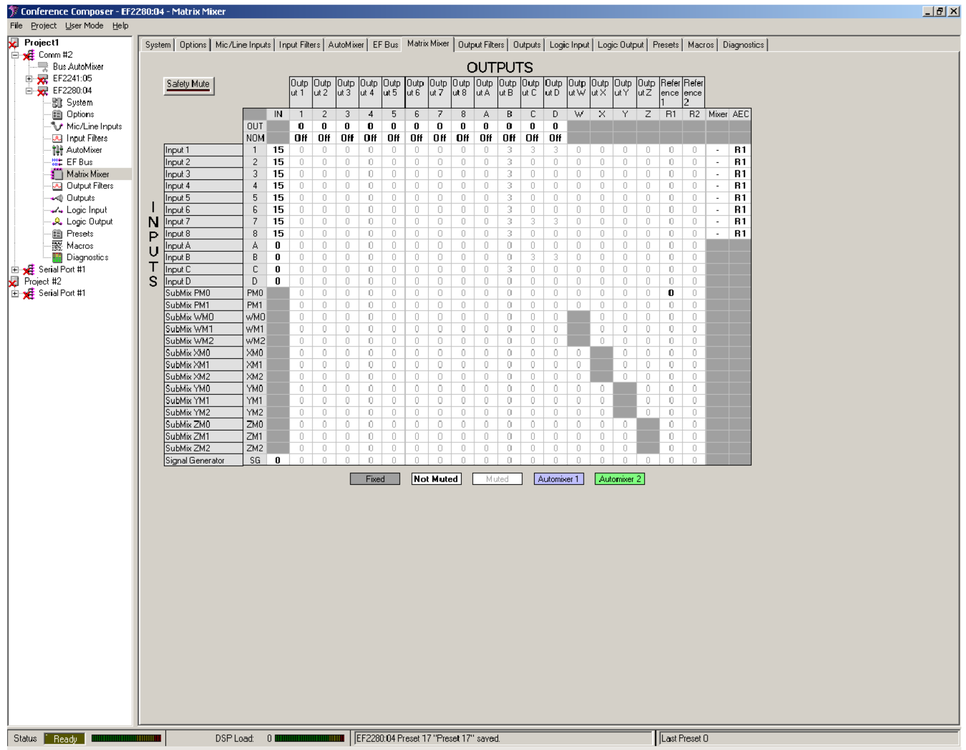
| | | |
|---|---|---|
| PROJECT NO: | Appendix A | DATE |
| DRAWN BY: | AV CAD Technician | 1Jun06 |
| CHECKED BY: | AV Project Manager, CTS-I | 1Jun06 |
| FILE NAME: | AVRD206.dwg | |
| SCALE: | As Noted | |

## Control System Record Drawing

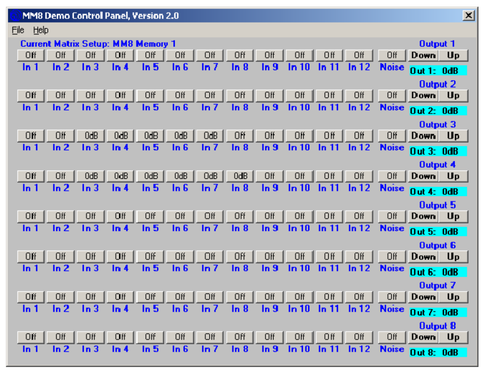
AVRD206



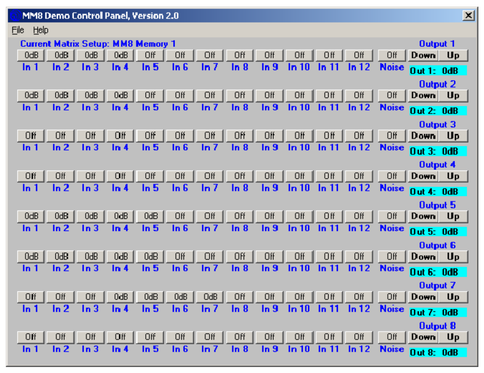

1 EF2280 VIDEO CONFERENCING MACRO
SCALE: NTS




2 EF2280 AUDIO CONFERENCING & PRESENTATION MACRO
SCALE: NTS




3 MM8 PROGRAM AUDIO MACRO
SCALE: NTS




4 MM8 AUDIO AND VIDEO CONF. MACRO
SCALE: NTS

PTCGROUP
512 Northridge Road
Collegeville, PA 19426
B: (610) 409-5657
F: (610) 409-5658

CAD Designer

infoComm Academy
11242 Waples Mill Road
Suite 200
Fairfax, VA 22030
Toll Free: (800) 659-7469
Fax: (703) 278-8082
Website: www.infocomm.org



# InfoComm Academy Classroom Design Sample

| REV | DESCRIPTION | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| PROJECT NO: | Appendix A | DATE |
| DRAWN BY: | AV CAD Technician | 27Apr09 |
| CHECKED BY: | AV Project Manager, CTS-I | 1Jun09 |
| FILE NAME: | AVRD207.dwg | |
| SCALE: | As Noted | |

## Audio DSP Details

AVRD207

## AV/IT Device Inventory

| | Device Type | Manufacturer | Model | MAC Address | IP Address | Ports Used | Notes |
|---|---|---|---|---|---|---|---|
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |
| 8 | | | | | | | |
| 9 | | | | | | | |
| 10 | | | | | | | |
| 11 | | | | | | | |
| 12 | | | | | | | |
| 13 | | | | | | | |
| 14 | | | | | | | |
| 15 | | | | | | | |
| 16 | | | | | | | |
| 17 | | | | | | | |
| 18 | | | | | | | |
| 19 | | | | | | | |
| 20 | | | | | | | |
| 21 | | | | | | | |
| 22 | | | | | | | |
| 23 | | | | | | | |
| 24 | | | | | | | |
| 25 | | | | | | | |

# AUDIO COVERAGE UNIFORMITY TEST REPORT

## INFOCOMM ACADEMY CLASSROOM

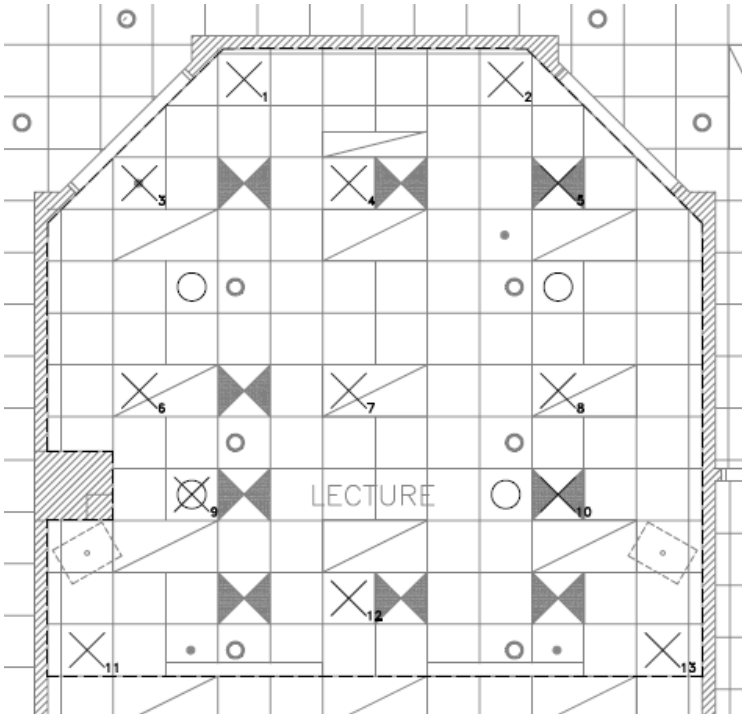
TECHNICIAN'S NAME(S): Tom Kehr

DATE OF TEST: May 17, 2009

Venue:
Training room, approximately 25 ft wide, 30 ft deep and 10 ft high. Side and rear walls well covered with acoustical treatment. Front wall includes two rear projection screens with multiple short equipment racks underneath. All testing performed with doors closed. Since furniture can be and is used in multiple arrangements, all tables and chairs were removed except presenter's station in front left corner of the room.

Venue Equipment:
System equalization and gain settings unknown.

Test Equipment:
Dell Latitude D810 with Firewire PCMCIA Interface
PreSonus FireBox Audio A/D Interface
Audix TR-40 Omnidirectional Microphone
Amprobe CAL-SM Class 2 Calibrator with 1/4 in. Adapter
NTI Minirator MR-PRO Signal Generator
SmaartLive 6, One Octave RTA, Slow Response, Flat dB




## Audio Coverage Uniformity Plan (ACUP)

| | Frequency Band | | | | | |
|---|---|---|---|---|---|---|
| Position | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz |
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | | | | | | |
| 8 | | | | | | |
| 9 | | | | | | |
| 10 | | | | | | |
| 11 | | | | | | |
| 12 | | | | | | |
| 13 | | | | | | |
| Range | | | | | | |
| Ambient Level - dB SPL Flat | 43 | 40 | 35 | 33 | 31 | 30 |
| Note: | | | | | | |

**RESULT: System incapable of obtaining 15 dB above ambient noise level due to excessive HVAC noise; 2 loudspeakers not in design locations. ACUML's not measaureable. FAILURE TO CONFORM TO ACU**

# Audiovisual Systems Commissioning Tests Checklist

**Issued November 20, 2008**

This checklist is intended to provide owners, consultants and integrators with a comprehensive and singular source of tests to determine if the audiovisual system achieves the client's goals or objectives and that the system performs in accordance with the best practices of the industry. By providing this list to the audiovisual industry, InfoComm is establishing a set of commissioning guidelines to help industry professionals and their clients communicate effectively about their expectations for system performance.

In many projects, not all tests are required for each system or circumstance. Owners and designers can elect to include or exclude certain tests, as they may not be meaningful for a particular system. In some instances, certain performance capabilities are less critical and therefore stringent review of those capabilities is unnecessary. In other circumstances, certain elements of the system may require more critical review, and the performance of that aspect of the system may need to exceed the general guidelines outlined here. The commissioning process for each system should be an agreed upon set of tests between the client and the designer.

**Acknowledgements**

This checklist was developed by many dedicated volunteer industry experts. Special thanks go to the Project Commissioning Working Group (PCWG) Steering Committee:

Richard Derbyshire, Shen Milsom & Wilke (Chair)
John Bailey, CTS-D, CTS-I, Whitlock Group
Greg Bronson, CTS-D, Cornell University
Blake Brubaker, CTS, Da-Lite Screen Company
Tim Cape, CTS-D, Technitect
Paul Chavez, Harman International
Dave Corcoran, CTS-D, Corcoran Audio Visual Engineering
Travis Lisk, CTS-I, Advanced AV Systems Integration
Jim Smith, CTS, HB Communications
Jim Smith, CTS, Polycom, Inc.

InfoComm would also like to acknowledge Mario Maltese, CTS-D, CTS-I, of Audio Visual Resources, Inc., for sharing the commissioning checklist he developed as a starting point for this group.

Download a copy of this Commissioning Tests Checklist from www.infocomm.org.

# Audiovisual Systems Commissioning Tests Checklist

| | | | | | |
|---|---|---|---|---|---|
| **I** | **AV-PH** | **Physical Installation** | **VI** | **AV-V** | **Video Performance** |
| II | AV-CM | Cable Management, Termination and Labeling | VII | AV-N/AV-C | Control, Software and Networking |
| III | AV-E | Electrical | VIII | AV-AC | Acoustical Environment |
| IV | AV-S | Serviceability | IX | AV-DR | Verification and Documentation |
| V | AV-A | Audio Performance | | | |

## I AV-PH: Physical Installation

| Item Number | Item Title | Description | Criteria | Responsible Party | Pass Fail | Notes |
|---|---|---|---|---|---|---|
| AV-PH-01 | Site Inventory of AV Equipment | Is all equipment in shop or on site? List all equipment in system NOT present, and why. | | | | |
| AV-PH-02 | Installation Status of AV Equipment | Is all rackable equipment installed? | | | | |
| AV-PH-03 | AV Rack Cleanliness | Racks are "clean" - grease markings removed, etc. | | | | |
| AV-PH-04 | AV Rack Blanks and Vents Installation | All blanks and vents installed in unused rack spaces. | | | | |
| AV-PH-05 | AV Patch Bay Labeling | All patchbays labeled | | | | |

| Item Number | Item Title | Description | Criteria | Responsible Party | Pass Fail | Notes |
|---|---|---|---|---|---|---|
| AV-PH-06 | AV Patch Bay Configuration | Patchbays configured with all outputs on top rows, inputs on bottom rows | | | | |
| AV-PH-07 | AV Rack Thermal Gradient Performance | Thermal gradient inspected; all equipment operating within manufacturers' guidelines | | | | |
| AV-PH-08 | AV Rack Protective Treatments | Small racks have carpet tiles on bottom to avoid scratching credenzas | | | | |
| AV-PH-09 | AV Equipment Labeling | All engraved labels permanently fastened. | | | | |
| AV-PH-10 | AV System Cabling Verification | All peripheral equipment hooked up as per flow diagram: microphones, loudspeakers, video monitors, projectors, PC's, USB switchers, etc. | | | | |

## II AV-CM: Cable Management, Termination and Labeling

| Item Number | Item Title | Description | Criteria | Responsible Party | Pass Fail | Notes |
|---|---|---|---|---|---|---|
| AV-CM-01 | AV Equipment Power Cable Management | Equipment without IEC removable power cords are not tie-wrapped to the cabinet, and there are no obstructions to the item being pulled from the front of the rack. | | | | |
| AV-CM-02 | Verification of AV Rack Cable Installation | Tie wraps are not too tight as to deform the cable. UTP cables are laced and bound with Velcro ties. | | | | |
| AV-CM-03 | Verification of AV Rack Cable Installation | Terminations are free from stress due to gravity acting on the cabling or cable dressing technique. | | | | |
| AV-CM-04 | Verification of AV Rack Cable Installation | Terminations have sufficient service loop, allowing a re-termination or two without having to open a cable bundle or pathway to lay in a new cable. | | | | |
| AV-CM-05 | Verification of AV Rack Cable Installation | Cables appropriately dressed and bundled according to cable type. | | | | |
| AV-CM-06 | Verification of AV Rack Cable Installation | Verify cable supports are used depending on size and stiffness of cable. | | | | |
| AV-CM-07 | Verification of AV Rack Cable Installation | Cables have appropriate separation according to signal type and level. | | | | |

| Item Number | Item Title | Description | Criteria | Responsible Party | Pass Fail | Notes |
|---|---|---|---|---|---|---|
| AV-CM-08 | Verification of AV Rack Cable Installation | Verify all cables are installed with an adequate bend radius as recommended by the manufacturer and general system requirements. | | | | |
| AV-CM-09 | AV System Cable Labeling | All cables have clearly legible, unambiguous identifying labels, and labels are oriented and positioned consistently. Labels are visible without system disassembly and are not hidden in cable bundles. | | | | |
| AV-CM-10 | AV System Cable Labeling | All cable labels are permanent, non-slipping and according to specification. | | | | |
| AV-CM-11 | AV Connector Verification | All terminations are in agreement with the equipment and system requirements. | | | | |
| AV-CM-12 | AV Connector Verification | All connectors are correctly seated to its mating connector. | | | | |
| AV-CM-13 | AV Connector Plate Labeling | All connectors on input and output plates are labeled. | | | | |
| AV-CM-14 | AV Connector Plate Labeling | Confirm all labeling nomenclature for consistency between drawings, touch screen labels, wall plates and other labeling of connectors, connection points and devices. | | | | |

## III AV-E: Electrical

| Item Number | Item Title | Description | Criteria | Responsible Party | Pass Fail | Notes |
|---|---|---|---|---|---|---|
| AV-E-01 | AV System Power and Grounding Verification | Stray AC voltages on any equipment accessible to a user relative to ground? | | | | |
| AV-E-02 | AV System Power and Grounding Verification | Neutral and isolated ground current test. | | | | |
| AV-E-03 | AV System Power and Grounding Verification | Verify equipment is powered by correct circuits. | | | | |

## IV AV-S: Serviceability

| Item Number | Item Title | Description | Criteria | Responsible Party | Pass Fail | Notes |
|---|---|---|---|---|---|---|
| AV-S-01 | AV System Serviceability | Input/output panels are easily accessible. | | | | |
| AV-S-02 | AV System Serviceability | If there are obstructions prohibiting the disconnection of terminations on the back of AV equipment, there must be sufficient cabling to permit the equipment to be pulled from the front, and disconnected there. | | | | |
| AV-S-03 | AV System Serviceability | It is relatively easy to find proper cable termination points when removed or replaced equipment is re-installed. | | | | |

| Item Number | Item Title | Description | Criteria | Responsible Party | Pass Fail | Notes |
|---|---|---|---|---|---|---|
| AV-S-04 | AV System Serviceability | Equipment can be pulled for repair or replacement without hindrance. | | | | |
| AV-S-05 | AV System Serviceability | Equipment must be able to be serviced indefinitely; designed with the maintenance technician in mind (he or she will "own it" longer than the person who fabricated the system initially). | | | | |

## V AV-A: Audio Performance

All audio performance tests are made from all electronic system inputs (first physical output of source media, all I/O plates, mic inputs) to all electronic system outputs (all outputs connected to amplifier inputs, all connections to external facilities (to other rooms, buildings or external services such as broadcast connections).

| Item Number | Item Title | Description | Criteria | Responsible Party | Pass Fail | Notes |
|---|---|---|---|---|---|---|
| AV-A-01 | Audio System Total Harmonic Distortion | Measure total harmonic distortion of the audio system. Distortion level should not exceed best practices. | | | | |
| AV-A-02 | Audio System Signal-to-Noise Ratio | Measure system signal to noise ratio. Noise level should not exceed best practices. | | | | |
| AV-A-03 | Speech Reinforcement System Electronic Frequency Response | Measure frequency response of the audio system for speech sound reinforcement. System frequency response should be determined for the system during design process. | | | | |

| Item Number | Item Title | Description | Criteria | Responsible Party | Pass Fail | Notes |
|---|---|---|---|---|---|---|
| AV-A-04 | Audio Playback System Electronic Frequency Response | Measure frequency response of the audio system for program sound amplification. System frequency response should be determined for the system during design process. | | | | |
| AV-A-05 | Audio System Latency | Measure latency of the audio system. Latency should not exceed design requirements of the system. | | | | |
| AV-A-06 | Audio Coverage in Listener Areas | Measure audio coverage uniformity in the listener area, see InfoComm Performance Standard for test procedure and acceptable performance criteria. | | | | |
| AV-A -07 | Audio Level versus Background Noise Level | Measure background noise level during normal room operation. Measure audio system level during normal room operation. Audio level should exceed background noise level to provide for clear, intelligible amplified sound. | | | | |
| AV-A-08 | Speech Reinforcement System Headroom | Measure audio system headroom. Audio system should be capable of performing above nominal operating levels without distortion. | | | | |
| AV-A-09 | Program Loudspeaker Polarity | Program loudspeakers in the same system shall produce consistent polarity for a mono input signal in all channels. | | | | |

| Item Number | Item Title | Description | Criteria | Responsible Party | Pass Fail | Notes |
|---|---|---|---|---|---|---|
| AV-A-10 | Speech Reinforcement Speaker Polarity | Speech reinforcement systems shall be polarized such that a positive acoustic pressure on a microphone results in a positive acoustic pressure at all loudspeakers. | | | | |
| AV-A-11 | Alignment of Multiple Audio Sources | Calibrate audio system inputs so there is zero or minimal difference between any input signal level. | | | | |
| AV-A-12 | Audio Buzz and Rattles | There shall be no audible vibration caused by improper mechanical installation. Perform buzzes and rattles test, using continuous sweep signal (from generator or test CD) pass/ fail result or which device at what frequencies. | | | | |
| AV-A-13 | Audio System Gain Before Feedback | The speech reinforcement system shall be stable and operate without feedback. | | | | |
| AV-A-14 | Conferencing System Microphone Sensitivity and Gain Structure Alignment | For conference systems, adjust microphone input gain to demonstrate that "standard talker," positioned at each talker position in the room, produces a 0 dBu level at the output of the output bus of the audio conference DSP device. Verify signal levels for both transmit and receive using normal speech. | | | | |

| Item Number | Item Title | Description | Criteria | Responsible Party | Pass Fail | Notes |
|---|---|---|---|---|---|---|
| AV-A-15 | Audio System Equalization for Speech Intelligibility | Equalizers shall be adjusted for best intelligibility, and in accordance with the preferred acoustic level response curves. For systems with equalizers, document the “house curve” before equalization, as well as after the equalizers have been tuned, with and without microphone input filters. If requested by the Consultant, produce this documentation for systems without equalizers, as this test may apply to the preamp filter settings in cases where intelligibility can be improved. | | | | |
| AV-A-16 | Audio System Speech Intelligibility at Listener Positions | Audio system should provide intelligible sound above background noise levels. System design should anticipate background noise levels in the listener space. | | | | |
| AV-A-17 | Audio System Amplifier Loading | No power amplifier shall have its rated load exceeded. Record the impedance (and at what frequency) of each loudspeaker line of each power amplifier. 63, 250, and 1,000 Hz are recommended if available | | | | |

| Item Number | Item Title | Description | Criteria | Responsible Party | Pass Fail | Notes |
|---|---|---|---|---|---|---|
| AV-A-18 | Conferencing Echo Suppression Performance | For a system with conference capability, system shall perform at nominal operating levels in a full duplex mode without echo or latency. | | | | |
| AV-A 19 | DSP Signal Path Verification | All DSP programming installed and properly passing intended signal pathways and mixes. | | | | |

## VI AV-V: Video Performance

All video performance tests are made from all electronic system inputs (first physical output of source media, all I/O plates) to all electronic system outputs (all outputs connected to display inputs, all connections to external facilities (to other rooms, buildings or external services such as broadcast connections).

| Item Number | Item Title | Description | Criteria | Responsible Party | Pass Fail | Notes |
|---|---|---|---|---|---|---|
| AV-V-01 | Video System NTSC Signal Gain | For NTSC sources, demonstrate a consistent 1 volt peak-to-peak test signal at each source shall produce 1 volt peak-to-peak to each destination. Verify at each destination using NTSC bars, peak white, and 5-step multiburst (0.5, 1.0, 2.0, 3.0, 3.58, and 4.2 MHz) | | | | |
| AV-V-02 | Video System RGBHV Signal Gain | For RGB sources, demonstrate consistent 700 mV from each source to each destination. Observe results using a flat-field pattern signal at 1024 by 768 resolution (VESA 8). Measure peak-to-peak voltage using a 200 MHz oscilloscope at each destination when a test generator with either multi-burst or H pattern is at each source location. Adjust ‘peaking’ and ‘level’ control settings on any interface at the positions whereby the 700 mV voltages were attained. | | | | |
| AV-V-03 | Video System Pixel Failure Tolerance | "White Purity" Test. Note number and location of stuck or lost pixels, if any. | | | | |
| AV-V-04 | Video Camera Image | Verify camera performance and operation. | | | | |

| Item Number | Item Title | Description | Criteria | Responsible Party | Pass Fail | Notes |
|---|---|---|---|---|---|---|
| AV-V-05 | NTSC Image Alignment | For NTSC sources, confirm optimum brightness, contrast, and color in displays using SMPTE source with PLUGE (Picture Line Up Generation Equipment) display. | | | | |
| AV-V-06 | Consistency of Multiple NTSC Displays | When several NTSC displays are visible, demonstrate consistencies in displays using NTSC bars with PLUGE signal to all. | | | | |
| AV-V-07 | Projected Display Physical Alignment | Verify that projected displays are focused, centered, and evenly-illuminated. | | | | |
| AV-V-08 | Projected Display Physical Alignment | For projected displays, take actual measurements of image geometry to verify image is rectangular and proportional across the entire image. | | | | |
| AV-V-09 | Projected Image Contrast Ratio | Measure the contrast ratio of the projected image with ambient lighting in normal operating mode. | | | | |
| AV-V-10 | Projected Display Brightness Uniformity | For projected displays, using a calibrated light meter, determine the image has uniform brightness across the entire image. | | | | |

| Item Number | Item Title | Description | Criteria | Responsible Party | Pass Fail | Notes |
|---|---|---|---|---|---|---|
| AV-V-11 | Multiple Resolution Performance of Video Displays | Display stable, properly scaled images, with no scaling-related visual artifacts when switching between, at a minimum, 1024 x 768, 1280 x 1024, 1280 x 720 sources, and/or all those specified in the performance criteria for this system. | | | | |
| AV-V-12 | Image Size Relative to Furthest Viewer | Image size relative to furthest viewer: Record each, compare to recommended multiplier. | | | | |
| AV-V-13 | Cable Television RF Tap Levels | Confirm TV RF levels, using the highest frequency channel of the system, with field strength meter at all system taps. | | | | |
| AV-V-14 | On Screen Display Settings for Video Displays | Displays have OSDs (on screen displays) "OFF", or as specified by the user. | | | | |
| AV-V-15 | Video Standby Screen Setting | Video projector, if any, must have 'blue screen' off, or as directed by the user. | | | | |

## VII AV-N / AV-C: Control, Software and Networking

| Item Number | Item Title | Description | Criteria | Responsible Party | Pass Fail | Notes |
|---|---|---|---|---|---|---|
| AV-N-01 | Control System IP Address Assignment | All IP-controlled equipment properly configured with IP addresses, host names, time servers, Gatekeeper addresses, network configurations, and subnets as applicable. All system connections are operational and devices communication correctly. | | | | |
| AV-C-02 | Control System Communications | All control system programming installed and properly communicating with the equipment intended. | | | | |
| AV-C-03 | Control System User Interface Performance | Control system user interface conforms to user or specified requirements and all pages and buttons operate as intended. | | | | |
| AV-C-04 | Interfacing and Control of External Devices and Systems | Confirm control system functions not obvious from the control flow diagrams (i.e., lighting presets that are activated when the control system enters a videoconferencing mode) | | | | |

| Item Number | Item Title | Description | Criteria | Responsible Party | Pass Fail | Notes |
|---|---|---|---|---|---|---|
| AV-C-05 | Interfacing and Control of External Devices and Systems | Confirm control system interfaces exist and are functional for devices that may be outside AV scope such as drapes, shades, screens, lights, security, life safety and HVAC. | | | | |
| AV-C-06 | Control System Power Cycling and Recovery | The control system will restart and resume full operation following an unanticipated cycling of AC power to the control system. | | | | |

## VIII AV-AC: Acoustical Environment

| Item Number | Item Title | Description | Criteria | Responsible Party | Pass Fail | Notes |
|---|---|---|---|---|---|---|
| AV-AC-01 | Acoustical Ambient Noise | Record ambient noise level with room is normal operating mode, see AV-A-07. | | | | |
| AV-AC-02 | Acoustical Ambient Noise | Document octave band ambient noise and calculate NC or RC per ASHRAE if NC was part of design criteria | | | | |
| AV-AC-03 | AV Room Reverberation Time | Document octave band reverberation times if speech intelligibility criterion is not met. | | | | |

## IX AV-DR: Verification and Documentation

| Item Number | Item Title | Description | Criteria | Responsible Party | Pass Fail | Notes |
|---|---|---|---|---|---|---|
| AV-DR-01 | AV System Documentation | There is perfect agreement between the "paper model" documentation (drawings), the control system user interface (i.e., touch panel screens, push button labels, panel engravings, etc.), and the physical wiring and labeling. This includes designation strips, equipment labeling, etc. | | | | |
| AV-DR-02 | Video System Test Reporting | Video system tested (all pathways tested, all interconnections marked as tested on drawing). | | | | |
| AV-DR-03 | Audio System Test Reporting | Audio Tested (all pathways tested, all interconnections marked as tested on drawing). | | | | |
| AV-DR-04 | Control System Test Reporting | Control tested (all pathways tested, all interconnections marked as tested on drawing). Emulate closures for screens, motors, etc. | | | | |
| AV-DR-05 | AV System Commissioning Sanity Check | Sanity Check: Is there any reason why this system should NOT be turned over to the owner for use. | | | | |
| AV-DR-06 | Final Commissioning Report and System Turnover | Prepare document report, certifying the product, performance, and practices are in compliance, and note any exceptions. Distribute accordingly. | | | | |

# Touch Panel User Manual

## *InfoComm Academy Training Room*

**1 May 2009**

# Introduction Page


**Figure 1. Introduction Page**

The Introduction Page is the default first page and acts as a gateway to the rest of the touch panel's functional pages. Users should push any part of the screen to start system operations.

# 1. Automated Set Up Page


**Figure 2. Automated Set Up Page**

## *a. Main Navigation Area*

The Main Navigation Area contains four primary buttons listed below:

- ***Presentation***
- ***Video Conference***
- ***Audio Conference***
- ***System Shutdown***

The first three buttons allow users to automatically set up the room for a certain activity they would like to conduct. For example, if the user wishes to give a presentation or teach a class, he would push the ***Presentation*** button in order to power on the A/V system and allow him to select the computer connection associated with the presentation content. Similarly, pressing the ***Video Conference*** or ***Audio Conference*** buttons automatically set up the room for conditions that are conducive to that respective activity.

The final primary button, ***System Shut Down***, allows the user to quickly shut down the system once he has finished using the room. Pushing this button leads to a popup page

verifying that the user actually wants to shut down the system and did not push the ***System Shut Down*** button by mistake.

## *b. Lower Navigation Bar*

The Lower Navigation Bar allows the user to have direct access to the various devices within the system. These buttons lead to additional touch panel pages that provide the user with the most important functionalities of the device chosen. The list below gives a brief description of the system activities associated with each button on the Lower Navigation Bar:

- ***Router*** – brings up the **Router Page** allowing the user to select the specific sources and destinations for the video he would like to display.
- ***Room*** – brings up the **Room Page** allowing the user to adjust the lighting, main volume and power status of the various room displays.
- ***VTC*** – brings up the **VTC Page** allowing the user to conduct a video teleconference.
- ***CD/Cass*** – brings up the **CD Cassette Control Page** allowing the user to operate the system's CD/Cassette player.
- ***DVD/VCR***– brings up the **DVD/VCR Control Page** allowing the user to operate the system's DVD Combo unit.
- ***TV*** – brings up the **TV Control Page** allowing the user to watch TV and operate the cable box.
- ***Camera*** – brings up the **Camera Control Page** allowing the user to select and operate the system's front and rear cameras.
- ***Phone*** – brings up the **Phone Page** allowing the user to operate the system's teleconference unit
- ***UPX –*** brings up the **UPX Page** allowing the user to operate the Universal Presentation Processor

## *c. Right Navigation Bar*

The only button on the Right Navigation Bar is the Exit button, which closes the **Main Page** and brings up the **Introduction Page**.

## *d. System Status Indicators*

The Main Navigation Area includes a status bar indicating the system's current start-up progress.

### *e. Popup Pages*

Pushing the ***System Shutdown*** button brings up the **Are You Sure** popup page. The intent of this popup page is to confirm that the user wants to shut down the system, as opposed to accidentally pressing this button. Once the system begins the shut down process, it may take several minutes to bring the system back up due to the projectors' cool-down/warm-up cycles.

## 2. Router Page


**Figure 3. Router Page**

### *a. Main Navigation Area*

The Main Navigation Area is broken down into two zones and allows users to manually send an A/V source to a specific destination. The Sources zone represents all possible A/V sources within the room. The Destinations zone represents all possible A/V destinations within the room. In order to make a manual route, users must sequentially select a source followed by a destination.

### *b. Lower Navigation Bar*

Refer to Section 2.b for a breakdown of each button in the Lower Navigation Bar.

## *c. Right Navigation Bar*

The first button in the Right Navigation Bar is the ***Exit*** button. Pushing this button brings the user back to the **Main Page**. The Right Navigation Bar also provides room volume control capabilities. Users can raise, lower and mute the room's program audio. Finally, the bar provides privacy functionality in order to mute the room microphones, preventing any far-side VTC or teleconference parties from hearing any audio occurring in the room.

## *d. System Status Indicators*

The Main Navigation Area provides the user feedback as to which source is currently selected and which source is currently routed to each destination. When the user pushes a source button, that button will be highlighted and remain highlighted until a different source button is pushed. Only one source button can be highlighted at a time. Additionally, underneath each of the destination buttons, there is text indicating the current source connection for that specific destination. Finally, for the Left and Right front screens, the user has the ability to turn the audio for that source on or off. The button reflects the current status of the source audio as either ***AUDIO OFF*** or ***AUDIO ON***.

The Right Navigation Bar provides a number indicating the current volume level from 0-100%. Also, when the program audio is muted, the ***Mute*** button is highlighted.

## *e. Popup Pages*

There are no Popup Pages associated with the Router Page.

# 3. Room Page


**Figure 4. Room Page**

## *a. Main Navigation Area*

The Main Navigation Area is broken down into three zones, including Lighting, Displays and Sound System. The Lighting zone allows users to adjust the room lighting to one of four presets, depending on how the room is being used. The Displays zone allows users to turn on/off the three room displays. The Sound System zone allows users to adjust the room volume.

## *b. Lower Navigation Bar*

Refer to Section 2.b for a description of each button in the Lower Navigation Bar.

## *c. Right Navigation Bar*

Refer to Section 3.d for a description of each button in the Right Navigation Bar.

## *d. System Status Indicators*

In the Lighting zone, the button corresponding to the lighting preset in use will be highlighted.

The Displays zone provides the current power status for each of the displays and the number of lamp hours used for each projector.

The Sound System zone provides the current over-head volume from 0-100% and also highlights the ***Mute*** button whenever the volume is a muted state.

### *e. Popup Pages*

There are no Popup Pages associated with the **Room Page**.

## 4. VTC Page


**Figure 5. VTC Page**

### *a. Main Navigation Area*

The Main Navigation Area provides users with the various codec controls. Users can dial distant parties or select speed-dial options based on the address book. Additionally, the area provides camera adjustment and selection options. Finally, the camera video preview window allows users to see the selected camera's video output. A breakdown of the primary buttons is below:

- SEE THE VTC… - Brings up a popup page that allows the user to route the VTC signal to a specific destination.
- HANG UP - Hangs up the VTC call and cancels any VTC menus overlaid on the screen.
- CALL – Brings up a VTC menu and also prompts the user to enter the VTC number.
- GREEN Menu Tab – Brings up the menu options associated with the green menu tab in the Tandberg overlay menu.
- YELLOW Menu Tab – Brings up the menu options associated with the yellow menu tab in the Tandberg overlay menu.
- BLUE Menu Tab – Brings up the menu options associated with the blue menu tab in the Tandberg overlay menu.
- Tandberg Camera – Displays the front camera that is oriented towards the rear of the room.

## *b. Lower Navigation Bar*

Refer to Section 2.b for a description of each button in the Lower Navigation Bar.

## *c. Right Navigation Bar*

Refer to Section 3.d for a description of each button in the Right Navigation Bar.

## *d. System Status Indicators*

There are no system status indicators on this page

## *e. Popup Pages*

The **SEE THE VTC** popup page provides the user with options for where he would like the VTC signal to be displayed. The popup presents the following options:

- Left (the front left screen)
- Right (the front right screen)
- VTC (the codec)
- Heads Up (a preview monitor for the presenter)
- Rear (the rear flat panel)

The popup page will eventually time out or the user can manually turn off the popup by pushing the ***SEE THE VTC*** button again.

# 5. CD/Cassette Page


**Figure 6. CD/Cassette Page**

## *a. Main Navigation Area*

The Main Navigation Area provides users with the ability to switch between the CD and Cassette modes within the unit. Additionally, once a mode is chosen, users can enact the various transport commands, such as Play, Stop, Pause, etc.

## *b. Lower Navigation Bar*

Refer to Section 2.b for a description of each button in the Lower Navigation Bar.

## *c. Right Navigation Bar*

Refer to Section 3.d for a description of each button in the Right Navigation Bar.

## *d. System Status Indicators*

The ***CD*** or ***CASS*** buttons highlight which mode the unit is currently in.

### *e. Popup Pages*

There are no Popup Pages associated with the **CD/Cassette Page**.

## 6. DVD/VCR Page


**Figure 7. DVD/VCR Page**

### *a. Main Navigation Area*

The Main Navigation Area provides users with the ability to switch between the DVD and VCR modes within the DVD Combo device. Additionally, once a mode is chosen, users can enact the various transport commands, such as Play, Stop, Pause, etc. Finally, a video preview window is available showing the output video of the DVD/VCR combo.

### *b. Lower Navigation Bar*

Refer to Section 2.b for a description of each button in the Lower Navigation Bar.

### *c. Right Navigation Bar*

Refer to Section 3.d for a description of each button in the Right Navigation Bar.

### *d. System Status Indicators*

The ***DVD*** or ***VCR*** buttons highlight which mode the unit is currently in.

### *e. Popup Pages*

When the user pushes the ***SEE AND HEAR DVD/VCR*** button, a popup page presents options for the various displays where the user may want to route the DVD combo signal. The popup lists the following options:

- Left (the front left screen)
- Right (the front right screen)
- VTC (the codec)
- Heads Up (a preview monitor for the presenter)
- Rear (the rear flat panel)

## 7. TV Controls Page


**Figure 8. TV Controls Page**

### *a. Main Navigation Area*

The Main Navigation Area provides users with access to the controls associated with the cable set top box, such as changing the channel. The ***SEE AND HEAR TV*** button brings

up a popup page that allows users to select a specific destination for the TV display. Other buttons allow users to navigate and select options within the cable program guide or menus. Finally, there is a TV Presets zone that allows users to automatically select the most commonly watched channels, such as ABC and CBS.

## *b. Lower Navigation Bar*

Refer to Section 2.b for a description of each button in the Lower Navigation Bar.

## *c. Right Navigation Bar*

Refer to Section 3.d for a description of each button in the Right Navigation Bar.

## *d. System Status Indicators*

There are no system status indicators on this page.

## *e. Popup Pages*

When the user pushes the ***SEE AND HEAR TV*** button, a popup page presents options for the various displays where the user may want to route the TV signal. The popup lists the following options:

- Left (the front left screen)
- Right (the front right screen)
- VTC (the codec)
- Heads Up (a preview monitor for the presenter)
- Rear (the rear flat panel)

# 8. Camera Control Page


**Figure 9. Camera Control Page**

## *a. Main Navigation Area*

The Main Navigation Area provides users with camera selection and camera control functionality. In the camera selection zone, users can select either the front or rear cameras. When a user selects a specific camera, that video will be displayed in the video preview window. Also, users will then be able to adjust the various camera settings, such as the zoom, focus and direction.

The ***SAVE*** button establishes a preset scene or overwrites an existing preset scene. If a specific scene number is highlighted and the ***SAVE*** button is pushed, that scene number will then be overwritten and associated with the current orientation of the camera.

## *b. Lower Navigation Bar*

Refer to Section 2.b for a description of each button in the Lower Navigation Bar.

## *c. Right Navigation Bar*

Refer to Section 3.d for a description of each button in the Right Navigation Bar.

### *d. System Status Indicators*

The ***FRONT*** or ***REAR*** buttons highlight which camera is currently selected. Additionally, the currently selected preset scene is also highlighted.

### *e. Popup Pages*

When the user pushes the ***SEND CAMERA TO…*** button, a popup page presents options for the various displays where the user may want to route the camera signal. The popup lists the following options:

- Left (the front left screen)
- Right (the front right screen)
- VTC (the codec)
- Heads Up (a preview monitor for the presenter)
- Rear (the rear flat panel)

## 9. Phone Page


**Figure 10. Phone Page**

### *a. Main Navigation Area*

The Main Navigation Area provides users with a dialing pad and calling options, such as Dial, Pick up, etc. When users are dialing a third-party, the number they are entering is shown above in the keypad, but is not actually dialed until the user pushes the ***DIAL*** button. The ***PICK UP*** button allows users to bring the phone off-hook and the ***HANG UP*** button allows users to bring the phone on-hook.

### *b. Lower Navigation Bar*

Refer to Section 2.b for a description of each button in the Lower Navigation Bar.

### *c. Right Navigation Bar*

Refer to Section 3.d for a description of each button in the Right Navigation Bar.

### *d. System Status Indicators*

The current on-hook or off-hook status is displayed through the ***PICK UP*** and ***HANG UP*** buttons.

### *e. Popup Pages*

There are no Popup Pages associated with the **Phone Page**.

# 10. UPX Page


**Figure 11. UPX Page**

## *a. Main Navigation Area*

The Main Navigation Area provides users with the ability to utilize the Crestron UPX annotation device. The ***SEND UPX TO…*** button brings up a popup page that allows users to select a specific destination for the UPX display. To begin annotation, users must first select the ***ROUTER*** button in the Lower Navigation Bar and select a source. That source will show up in the ***PREVIEW*** window in the Main Navigation Area. If the user wants to annotate on top of that video, he must push the ***TAKE*** button to send that video to the UPX for annotation. (Note: If the Annotation source is the same as the Preview source, no video will be displayed in the ***ANNOTATE SOURCE*** window. Video will only be displayed in the ***ANNOTATE SOURCE*** window if the annotation source is different than the preview source.)

Once the user is ready to annotate, he must push the ***ANNOTATE*** button. That will bring up the annotation screen on the touch panel where the user can select from various drawing tools in order to effectively annotate the video source. Additionally, users can push the ***WHITE BOARD*** or ***BLACK BOARD*** buttons to annotate a message on a blank black or white canvas.

## *b. Lower Navigation Bar*

Refer to Section 2.b for a description of each button in the Lower Navigation Bar.

## *c. Right Navigation Bar*

Refer to Section 3.d for a description of each button in the Right Navigation Bar.

## *d. System Status Indicators*

There are no system status indicators on this page.

## *e. Popup Pages*

When the user pushes the ***SEND UPX TO…*** button, a popup page presents options for the various displays where the user may want to route the camera signal. The popup lists the following options:

- Left (the front left screen)
- Right (the front right screen)
- VTC (the codec)
- Heads Up (a preview monitor for the presenter)
- Rear (the rear flat panel)