MCA Project No. 12032

MARSHALL CRAFT ASSOCIATES, INC.
6112 York Road
Baltimore, Maryland 21212

Chesapeake College
Center for Allied Health and Athletics
Wye Mills, Maryland

May 16, 2014

ADDENDUM NO. 02

Acknowledge receipt of this addendum by inserting its number in the proposal form. Failure to do so may subject bidder to disqualification. The addendum forms part of the contract documents.

This addendum consists of pages ADD-02-1 to ADD-02-82 inclusive of attachments.

FF&E PACKAGE

Deletions to the FF&E Specification Sections are shown with a ~~strikethrough~~ and additions are shown in **bold font**.

SECTION 11 06 00 – VENDOR PACKAGE SCHEDULES

Item 1: Add the following Vendor Supplier packages (see section 11 70 00 Healthcare Equipment for requirements):

A. Surgical Instrument Trays – Supplier VH85
B. Operating Room Miscellaneous Equipment – Supplier VH86
C. Laparoscopic and Video Integration – Supplier VH87

Item 2: Move catalogue items H55A through H55K from supplier VH71 to Supplier VH85

Item 3: Change catalogue number H55G to Laparoscopic Instrument Tray

Item 4: Change catalogue number H55J to Arthroscopic Instrument Tray

Item 5: Change catalogue number H55K to Bookwalter Tray

SECTION 11 70 00 - HEALTHCARE EQUIPMENT

Item 1: Revise paragraph 2.06 as follows:

2.06 Surgical Equipment – Supplier VH30

The surgical equipment package requires three mounts: one for anesthesia. One for a light and equipment boom, and one for a light and flat screen display.

A. Item H12D – Surgical Light
   1. Berchtold Chromophare Surgical lights or equal
   2. One light on dual mount with equipment boom.
   3. Second light on dual mount with flat screen display specified under supplier VH87. This light to have integrated HD camera by Stryker or equal

B. Item H12F – Anesthesia Ceiling Boom
   1. Berchtold Teletom or Equal
   2. (9) Duplex Outlets
   3. (2) Quad Data Outlets
   4. (2) Vacuum Outlets
   5. (2) Oxygen Outlets
   6. (1) Medical Air Outlet
   7. (1) Amico Venturi Switch for simulating vacuum
   8. Friction Brakes

C. Item H12H – Equipment Mounted Boom
   1. Berchtold Teletom 6 series or equal

2. (9) Duplex Receptacles
3. (2) Vacuum Outlets
4. (1) Amico Venturi switch to simulate vacuum
5. (2) Quad Data Outlets
6. (3) Conform Platforms
7. Electromagnetic Brakes

Item 2: Revise paragraph 2.10 as follows:

2.10 Imaging Equipment – Supplier VH40

A. Item 31B – X-ray Generator
~~1. Delmed CM 40KW with Ionization Type automatic exposure control~~
1. Delmed IT series high frequency 55KW generator.

B. Item 31C – X-ray control panel
1. Delmed – compatible with x-ray generator – 3 phase.

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C. Item H31N – Upright Bucky
1. Delmed VT100 or equal – to be compatible with xray table and generator package.
2. WS 04 wall stand with tiltable bucky
3. The grid needs to be compatible with Computed Radiography and Direct Radiography System.

D. Item H31P – X-Ray table
~~1. Elevating table Delmed EV650 or equal. Provide complete package including overhead mounted x-ray tube, generator, and control panel. Also must be compatible with wall mounted bucky Item H31N~~
1. Delmed Rad TC-A elevating table with 617 lb patient load capacity and automatic size sensing cassette tray.
2.The grid needs to be compatible with Computed Radiography and Direct Radiography System.

E. Item H31R– WiFi Dr image receptor battery charger and 2 batteries
1. Compatible with image receptor Item H31S

F. Item H31S – DR Image Receptor
1. Fugi D-EVO wireless Direct Radiography (DR) 35x43 cm flat panel detector
2. FDX console workstation DICOM compliant

G. Item H31W – Overhead tube crane
1. Delmed OTC 12S-A
2. X-ray Tube3
   a. 300,000 Heat Units Capacity
   b. 150 kV capable
   c. General purpose (Anode angle 14^{o} to 16^{o})
   d. 6 mm Small and 1.2 mm Large Focal Spot

3. Collimator – Manual
   a. 360^{o} rotation of collimator possible and 90^{o} locks or detents
   b. Integrated SID measurement
   c. Manual Tape Measure

Item 3: Revise paragraph 2.14 as follows:

2.14 Dental Supply and Storage – Supplier VH51

A. Item H14F – Ultrasonic Cleaner
   1. Biosonic UC125 unit with LCD, tank cover and enzymatic cleaner
   2. Pearson Dental #W50-2451 or equal

B. Item H56B – Model Vibrator
   1. Vibrator #1A by Buffalo Dental or equal

C. Item H56C – Model Trimmer
   1. Buffalo 12” Model trimmer #61820 or equal

D. Item H56D – Vacuum Former
   1. Buffalo Econo Vac #B75-0472 or equal

E. Item H57A – Crown / Bridge Instrument Cassette
   1. Hu-Friedy Signature Series Collection Crown and Bridge Standard Set-Up or equal
   2. Standard set ups include IMCROWN, IMCOMPOSIT and IMAMALGAM
   3. Resin cassette is acceptable

F. Item H57B – Exam Instrument Cassette
   1.Hu-Friedly #392-1615 IMS 16 instrument cassette or equal

G. Item H57C – Restorative Instrument Cassette
   1. Hu-Friedly IMS Restorative Standard Set-Up cassette with accessories and 20 instruments or equal

H. Item H57D – Rubber Dam Setup
   1. Pearson Dental Ivory Complete Rubber Dam Kit #50057966 or equal

I. Item H57E – Aspirating Syringe
   1. Hu-Friedly Aspirating Syringe #392-5928; **or Cook-Waite style 1.8ml #SYRCW**, or equal

J. Item H57F – Trofflemire Retainer
   1. Miltex Tofflemire Universal Retainer #327-0134

K. Item H57G – Typodont
   1. Full primary dentition #D75DP-920 by Kilgore International or equal

L. Item H57H – Cement Spatula
1. Hu-Friedly Cement Spatula #CS246 or equal

Item 4: Revise Paragraph 2.22 and its sub-paragraphs to read as follows:

2.22 Medical Supply Storage Equipment – Supplier VH71

A. Item H03A – Mobile Tall Supply Cabinet
1. Unicell Supply cart or equal
2. 4 casters – 2 swivel, 2 swivel/brake
3. Roll front closure
4. 3 shelves / 4 drawers

B. Item H03B – Clean linen cart
1. Marketlab ML5911 or equal (50”W x 20”D x 64”H)
2. 3 shelves and removable cover
3. 4 non-marking casters (2 locking)

C. Item H03C – Clean linen cart
1. Marketlab ML 5916 or equal (40”W x 20”D x 48”H)
2. 3 shelves and removable cover
3. 4 non-marking casters (2 locking)

D. Item H03H – Mini Supply Medication Cart
1. 5 drawer with push button lock
2. Swivel casters (2 locking)

E. Item H04A – Linen Hamper with Lid
1. Pedigo P-121 or equal
2. Accommodates 25” diameter bags

F. Item H04B – Soiled Linen Cart
1. Dandux Hopper Front Plastic truck or equal
2. Folding top and front drop panel
3. 38 cubic foot capacity

G. Item H16A – Triple Glove Box
1. MarketLab # ML3615 or equal

H. Item H52P – Narcotic cabinet
1. Lakeside Double Door, Double lock Narcotic cabinet with 2 Shelves or equal

~~I. Item H55A – Surgical Instrument Tray~~
~~1. Minor Tray with Container~~

~~J. Item H55B – Surgical Instrument Tray~~

~~1. Minor Orthopedic Tray with Container~~

~~K. Item H55C – Surgical Instrument Tray~~
~~1. Major Tray with Container~~

~~L. Item H55D – Surgical Instrument Tray~~
~~1. OB/GYN Tray with Container~~

~~M. Item H55E – Surgical Instrument Tray~~
~~1. Plastic Instrument Tray with Container~~

~~N. Item H55F – Surgical Instrument Tray~~
~~1. Orthopedic Drill Set with Container~~

~~O. Item H55G – Surgical Instrument Tray~~
~~1. Genitourinary Tray with Container~~

~~P. Item H55H – Surgical Instrument Tray~~
~~1. Vascular Tray with Container~~

~~Q. Item H55J – Surgical Instrument Tray~~
~~1. ENT Tray with Container~~

~~R. Item H55K – Surgical Instrument Tray~~
~~1. Retractor Tray with Container~~

S. Item H58F – Demonstration Table
1. Unicell mobile table 30”D x 52”L x 38”H or equal
2. (4) casters – 2 swivel/brake
3. (2) deep shells with (4) drawers per shell

Item 5: Add new paragraph 2.25 as follows:

2.25 Surgical Instrument Trays – Supplier VH85

For all surgical instruments listed below, floor grade / economy grade instruments will not be acceptable.

A. Item H55A – Surgical Instrument Tray – Minor tray with container
1. Scissors
a. Metz – quantity 1
b. Mayo curved – quantity 1
c. Mayo straight – quantity 1
d. Tenotomy – quantity 1

2. Pick-ups
- **a. Adson – quantity 2**
- **b. Rat tooth – quantity 2**
- **c. Dressing – quantity 2**
- **d. DeBakey – quantity 2**

3. Clamps
- **a. Hemostats – quantity 4**
- **b. Kellys – quantity 4**
- **c. Kochers – quantity 2**
- **d. Babcocks – quantity 2**
- **e. Allis – quantity 2**
- **f. Right angle – quantity 2**
- **g. Tonsils – quantity 2**

4. Retractors
- **a. Army-Navy – quantity 2**
- **b. Goulet – quantity 2**
- **c. Senns – quantity 2**
- **d. Sweetheart Harringtons – quantity 2**

5. Other
- **a. Sponge stick short – quantity 2**
- **b. Crile – wood needle holder – quantity 2**
- **c. Webster needle – quantity 2**

B. Item H55B – Surgical Instrument Tray – Orthopedic Instrument Tray

1. Instruments
- **a. #3 Knife Handle – quantity 1**
- **b. #4 Knife Handle – quantity 1**
- **c. Crile – quantity 2**
- **d. Long Kelly – quantity 1**
- **e. Long Kocher – quantity 4**
- **f. Allis – quantity 2**
- **g. Right angle (short) – quantity 2**
- **h. Right angle (long) – quantity 1**

2. Scissors and Needle Holders
- **a. Straight Mayo – quantity 1**
- **b. Curved Mayo – quantity 1**
- **c. Metzenbaum scissors – quantity 1**
- **d. Wire Cutter scissors – quantity 1**
- **e. Mayo-Heger Needle Holder – quantity 1**

3. Pick-ups

- **a. Adson w/teeth – quantity 2**
- **b. Rat tooth pick-ups – quantity 2**
- **c. Ferris Smith pick-ups – quantity 1**
- **d. Long Russian pick-ups – quantity 1**
- **e. Short Russian pick-ups – quantity 1**

4. Retractors (handheld)

- **a. Wide Richardson Retractor – quantity 1**
- **b. Narrow Richardson Retractor – quantity 2**
- **c. Volkman RAKE Retractor – quantity 2**
- **d. Senn Retractor – quantity 2**
- **e. Ragnell Retractor – quantity 2**
- **f. Cushing Vein Retractor – quantity 2**
- **g. Joseph Skin Hook Retractor, Single Prong – quantity 2**
- **h. Narrow Malleable Retractor – quantity 2**
- **i. Cobra Retractor – quantity 2**
- **j. Bennett Retractor – quantity 4**
- **k. Mini Hohmann Retractor – quantity 2**

5. Retractors (self retaining)

- **a. Sharp Gelpi Retractor – quantity 2**
- **b. Jarit Cross-Action Retractor – quantity 2**

6. Orthopedic Instruments

- **a. Straight Bone Curettes – quantity 2**
- **b. Angled Bone Curettes – quantity 2**
- **c. Key Periosteal Elevator – quantity 2**
- **d. Freer Elevator – quantity 1**
- **e. Cobb Elevator – quantity 2**
- **f. Bone File w/ bone rasp on sides – quantity 1**
- **g. Bone Hook – quantity 1**
- **h. Adson Periosteal Elevator Joker – quantity 2**
- **i. Straight and Angled Ruskin Rongeur (Double action Rongeur, Leksell Rongeur) – qty 2**
- **j. Liston-Stille Bone Cutter (Angled double action) – quantity 1**
- **k. Ruskin-Stille Bone Cutter (Straight double action) – quantity 1**
- **l. Mini Ruskin-Stille Bone Cutter (Mini double action) – quantity 1**
- **m. Liston Bone Cutter (single action) – quantity 1**
- **n. Lowman Bone Holding Clamp – quantity 1**
- **o. Verbrugge Bone Holding Clamp – quantity 1**

7. Neuro/Spine

a. Spurling Kerrison Rongeur (Straight Kerrison) – quantity 1
b. Bayonet Kerrison Rongeur – quantity 1
c. Pituitary Rongeur (Straight Biter) – quantity 1
d. Cushings Bayonet Pick-ups (Smooth Bayonet Pick-ups) – quantity 1
e. Gerald bayonet Pick-ups (Bayonet pick-ups with teeth) – quantity 1
f. Cushings Bipolar Cautery Bayonet Pick-ups w/ insulated shaft – quantity 1
g. Bipolar Pick-ups – quantity 1
h. Nerve Root Retractor – quantity 1
i. Nerve Hook – quantity 2

C. Item H55C – Surgical Instrument Tray – Major Tray with Container

1. Scissors

a. Mayo 5 ½" long straight – quantity 2
b. Mayo 9" curved – quantity 2
c. Metzenbaum 7" straight – quantity 2

2. Needle Holder

a. Mayo-Hegar 7" – quantity 2
b. Mayo-Hegar 5 1/2" – quantity 2
c. Crile wood 6" – quantity 2
d. Sarot 7" – quantity 1

3. Clamps

a. Mosquitos curved 3 1/2" – quantity 6
b. Criles curved 5 1/2" – quantity 6
c. Kellys straight 6 1/4" – quantity 4
d. Kellys curved 6 1/4" – quantity 4
e. Kochers straight 6 1/4" – quantity 4
f. Kochers curved 6 1/4" – quantity 4
g. Sawtels 6" – quantity 2
h. Right angle 6" – quantity 2
i. Babcock – quantity 4 (2 long / 2 short)
j. Backhaus towel clips – quantity 6
k. Lorna towel clips – quantity 2

4. Retractors

a. Army-navy – quantity 2
b. Goulet – quantity 2
c. Richardson – quantity 2
d. Balfour – quantity 1

5. Knife Handle
    a. #3 short – quantity 2
    b. #3 long – quantity 1
    c. #4 short – quantity 1

6. Pick-ups
    a. DeBakey 6” – quantity 2
    b. Adson w/teeth – quantity 2
    c. Bonnies – quantity 2
    d. Russians – quantity 1
    e. Poole suction – quantity 1

D. Item H55D – Surgical Instrument Tray – OB/GYN Tray w/ container
1. Scissors
    a. Mayo long curved – quantity 1
    b. Mayo long straight – quantity 1
    c. Metzenbaum long curved – quantity 1
    d. Metzenbaum short curved – quantity 1
    e. Jorgensen – quantity 1
    f. Lister bandage – quantity 1

2. Zepplins
    a. “S” shaped – quantity 1
    b. Straight – quantity 1
    c. Slight curved – quantity 1

3. Tenaculums
    a. Barrett – quantity 1
    b. Lahey – quantity 1
    c. Hulka – quantity 1

4. Needle holders
    a. Haney long – quantity 2
    b. Haney short – quantity 2
    c. Heaney – quantity 2

5. Hemostats
    a. Straight – quantity 6
    b. Curved – quantity 6

6. Speculums
    a. Auvard short – quantity 1
    b. Auvard long – quantity 1
    c. Sims retractor – quantity 2
    d. Haney retractor – quantity 2
    e. Graves – quantity 1

f. Sims delivery forceps – quantity 1
g. Side-opening vaginal speculum – quantity 1
h. Hank dilators – quantity 1 set
i. Baby Deavers – quantity 2

7. Miscellaneous
a.Edna towel forceps – quantity 4
b. Knife handles (long and short) – quantity 2
c. Allis Clamps – quantity 4
d. Heaney Ballantine curved – quantity 4
e. Heaney Ballantine straight – quantity 4
f. Heaney hysterectomy single tooth curved – quantity 4
g. Heaney hysterectomy double tooth curved – quantity 4
h.Lahey traction forceps – quantity 2
i. Simms uterine sound – quantity 2
j. Barrett tenaculum – quantity 2
k. Rubin catheter – quantity 1
l. Bonney forceps – quantity 2
m. Russian forceps – quantity 2
n. Sims curette set 1-6 – quantity 6

D. Item H55E – Surgical Instrument Tray – Plastic Instrument tray with container
1. Scissors
a. Stevens tenotomy – quantity 2
b. face-lift scissors – quantity 1
c. Iris – quantity 2
d. Littler plastic scissors – quantity 2
e. Wire scissors – quantity 1
f. Metzenbaum – quantity 1

2. Forceps
a. Bishop Harmon – quantity 4
b. Adson brown – quantity 2
c. Adson smooth – quantity 2
d. Adson w/teeth – quantity 2
e. DeBakey – quantity 2
f. Dressing forceps – quantity 2

3. Needle Holders
a. Ryder Slim – quantity 2
b. Crile wood – quantity 2
c. Castroviejo – quantity 2
d. Webster – quantity 2
e. Olsen-Hegar – quantity 2

4. Retractors
- **a. Ragnell – quantity 2**
- **b. Senn – quantity 2**
- **c. Army Navy – quantity 2**
- **d. Skin hooks single – quantity 2**
- **e. Skin hooks double – quantity 2**
- **f. Joseph skin hooks – quantity 2**
- **g. Small rake – quantity 2**
- **h. Small Weitlaner – quantity 2**
- **i. Freeman face lift – quantity 1**
- **j. Lighted breast retractor – quantity 1**

5. Clamps
- **a. Hartman mosquito – quantity 6**
- **b. Jacobson micro straight – quantity 4**
- **c. Jacobson micro curved – quantity 4**
- **d. Kelly – quantity 6**
- **e. Pean curved – quantity 6**
- **f. Baby mixter – quantity 4**
- **g. Short allis – quantity 6**

6. Knife handles
- **a. #3 – quantity 2**
- **b. #7 – quantity 2**
- **c. Beaver knife handle – quantity 2**

7. Towel Clips
- **a. Large – quantity 4**
- **b. Small – quantity 2**
- **c. Edna – quantity 4**

8. Suction, Fraizer Brain
- **a. #7 – quantity 1**
- **b. #10 – quantity 1**

9. Miscellaneous
- **a. Ruler – quantity 1**
- **b. Freer elevator – quantity 1**
- **c. Freeman nipple marking template – quantity 1**
- **d. Liposuction cannulas set – quantity 1**
- **e. Dermatome – quantity 1**
- **f. Dermamesher – quantity 1**

E. Item H55F – Surgical Instrument Tray –Orthopedic Drill set with Container

1. Power instruments

a. Stryker big bone and powered saw and drill system – quantity 1 set

b. Small bone cordless drill – quantity 1

F. Item H55G – Surgical Instrument Tray – Laparoscopic Instruments

1. Laparoscopic Instruments

a. Bowel clamp – quantity 2

b. Biopsy Forceps – quantity 1

c. Curved grasper – quantity 2

d. Maryland dissector – quantity 2

e. Allis Forceps – quantity 2

f. Babcock Forceps – quantity 2

g. Suture Hook – quantity 1

h. 10mm spoon – quantity 1

i. Alligator Forceps – quantity 2

j. Mixter – quantity 2

k. Tooth grasper 10mm – quantity 2

l. Paddle Grasper – quantity 2

m. Needle Holder – quantity 1

n. Hook Scissors – quantity 1

o. Micro scissors – quantity 1

p. Metzenbaum scissors – quantity1

q. Kleppinger Bipolar – quantity 1

r. L Hook Cautery – quantity 1

s. Cautery Cord – quantity 2

t. Suture Passer – quantity 1

u. Aspirating needle – quantity 1

v. Endoscopic Claw – quantity 1

w. Suction Cannula 10mm-5mm – quantity 2

x. Endoscopic Applier – quantity 1

2. Miscellaneous Instruments

a. Towel Clamp – quantity 4

b. Crile – quantity 6

c. Short Kellys – quantity 6

d. Straight Kocher – quantity 2

e. Straight Mayo – quantity 1

f. Curved Mayo – quantity 1

g. Metzenbaum – quantity 1

h. Crile wood needle holder – quantity 2

i. Short mayo-Heger Needle holder – quantity 2

j. Long Mayo-Heger – quantity 2

k. DeBakey pick-ups – quantity 2

l. Gerald Vascular – quantity 2

m. Adson w/teeth – quantity 2
n. S Retractor – quantity 2
o. Cushing Vein Retractor – quantity 2

G. Item H55H – Surgical Instrument Tray – Vascular Tray with Container

1. Scissors
   a. 9” Metz – quantity 1
   b. Potts 45 degree – quantity 1
   c. delicate potts 25 degree-45 degree – quantity 2
   d. 4.5” Stevens tenotomy – quantity 1
   e. Microscissors – quantity 1
   f. Jameson – quantity 1
   g. 9” Heavy curved Mayo – quantity 2
   h. Reynold dissecting – quantity 1

2. Needle Holder
   a. Long Castroviejo – quantity 2
   b. Short Castroviejo – quantity 2
   c. Ryder 6.0” and 7.0” – quantity 2
   d. Long Sarot – quantity 2
   e. Short Sarot – quantity 2
   f. Stratte 9.0” double curved – quantity 2

3. Clamps
   a. DeBakey bulldog – quantity 2
   b. Diethrich bulldog – quantity 2
   c. Glover bulldog – quantity 2
   d. Javid carotid – quantity 2
   e. Debakey Aorta – quantity 2
   f. Cooley – quantity 2
   g. Debakey peripheral vascular – quantity 2
   h. Fogarty aortic cross clamp – quantity 2
   i. DeBakey peripheral vascular clamp – quantity 2
   j. Satinsky clamp – quantity 2
   k. Duval lung – quantity 2
   l. Sarot bronchurs clamp – quantity 2

4. Retractors
   a. Beckmann – quantity 2
   b. Allison lung – quantity 2
   c. Cushing Vein – quantity 2
   d. Burford-Finochietto – quantity 1
   e. Cooley atrial – quantity 2
   f. Dandy nerve hook – quantity 2

5. Knife handle
- **a. #3 – quantity 2**
- **b. #4 – quantity 1**
- **c. #7 – quantity 1**
- **d. Long #3 – quantity 1**

6. Pick-ups
- **a. Gerald tissue forceps – quantity 2**
- **b. Debakey tissue foreceps – quantity 2**
- **c. Adson 1x2 – quantity 2**
- **d. Rat tooth – quantity 2**

7. Miscellaneous
- **a. Doyen rib raspatory – quantity 1**
- **b. Bailey-Gibbon rib contractor – quantity 1**
- **c. Rib spreader – quantity 1**
- **d. Sternal saw – quantity 1**
- **e. Towel clamps – quantity 6**

H. Item H55J – Surgical Instrument Tray

1. Arthroscopic Instrument Tray
- **a. Shaver hand piece – quantity 1**
- **b. Sheath and Obturator – quantity 1**
- **c. Arthroscopic probe – quantity 1**
- **d. Duckbill Biters – quantity 1 set**
- **e. Arthroscopic Graspers – quantity 1**
- **f. Arthroscopic scissors – quantity 1**

I. Item H55K – Surgical Instrument Tray

1. Bookwalter Tray
- **a. Oval Ring (Medium) – quantity 1**
- **b. Segment oval ring (Medium) – quantity 8**
- **c. Advanced tilting blade clamp – quantity 6**
- **d. Vertical Post with table Clamp – quantity 1**
- **e. Horizontal Flex Bar – quantity 1**
- **f. Retractor Post Clamp (will separate into 3 pieces) – quantity 3**
- **g. Kelly Retractor Blade (2”x3”) – quantity 2**
- **h. Kelly Retractor Blade (2”x4”) – quantity 1**
- **i. Kelly Retractor Blade (2”x5”) – quantity 1**
- **j. Kelly Retractor Blade (2”x6”) – quantity 1**
- **k. Malleable Ribbon Blade (1.5”x6”) – quantity 1**
- **l. Malleable Ribbon Blade – quantity 2**
- **m. Malleable Ribbon Blade (3”x2.5”) – quantity 1**
- **n. Harrington Sweetheart Blade (2.5”x5”) – quantity 1**
- **o. Gelpi Retractor Blade – quantity 1**

p. Pull Through Blade – quantity 1

J. Item H55L – Containers

a. Rigid containers with mesh basket inserts and dividers and stringers to organize instruments – quantity 3

b. Rigid containers with mesh basket inserts and dividers and posts to organize instruments – quantity 3

Item 5: Add new paragraph 2.26 as follows:

2.26 Operating Room Miscellaneous Equipment – Supplier VH86

1. Equipment

a. Candy cane stirrups – quantity one pair
b. Footboard – quantity 1
c. Knee-Crutch stirrups – quantity one pair
d. Wilson frame – quantity 1
e. Boot Stirrups (Alan or yellowfins) with holder – quantity one pair
f. Bean Bag – quantity 1
g. Chest Rolls – quantity 1set
h. Gel pads – quantity 1 set
i. Touriquet machine (Zimmer ATS 3000 or equal) – quantity 1
j. Stirrup Holders – quantity 5 sets
k. Donut Headrest – quantity 2
l. Axillary Roll – quantity 2
m. Bair Hugger – quantity 1
n. Large Splash Basin suitable for autoclave – quantity 6
o. Sponge bowls suitable for autoclave – quantity 3
p. Emesis basins suitable for autoclave – quantity 6
q. Metal cups suitable for autoclave – quantity 6
r. medicine cups suitable for autoclave – quantity 3

Item 6: Add new paragraph 2.27 as follows:

2.27 Laparoscopic and Video Integration - Supplier VH87

Upon execution of contract supplier will be required to create a site specific drawing indicating required conduits and power for interconnection of devices.

1. Video Integration

a. Switchpoint Infinity 3 Lite media router by Stryker or equal – set up for four inputs and outputs
b. Switchpoint Infinity 3 control system by Stryker or equal
c. 22” touchscreen – Stryker 2200L or equal
d. 46” Commercial grade LCD display – NEC V series or equal – quantity 2
e. Vision Pro SYNK 26” wireless LED Display by Stryker or equal – mounted on light boom
f. SYNK wireless transmitter by Stryker or equal

g. HD camera system – Stryker 1488HD or equal – quantity 4

h. Light Source – Stryker L9000 or equal

i. SDC Recorder – Stryker SDC3 or equal

2. Scopes

a. Light cord – quantity 4

b. 5MM 0 degree scope – quantity 2

c. 10MM 0 degree scope – quantity 2

d. 5MM 30 degree scope – quantity 1

e. 10MM 30 degree scope – quantity 1

SECTION 12 48 13 – MAINTENANCE EQUIPMENT AND SUPPLIES

Item 1: Add the following to paragraph 1.02 SUMMARY

7. Clocks

8. White noise machines

Item 2: Add the following subparagraphs to paragraph 2.01 Equipment Listing

25. Item G06A- White Noise Machine

a. Speech Privacy Systems, model MC10-NS or equal

b. Self contained table top sound/speech masking device.

c. Power; 120volt AC, UL listed

26. Item G06B—Clock, Wall

a. Wall, surface mounted, battery powered, analog clock with second hand.

b. American Time model R54BHDD989BP-Dial Style #89, 12 hour format

c. Black numerals on white face, 12" diameter, black steel case

d. Include extended battery life 'battery booster' accessory to be concealed within the clock housing.

27. Item G06C –Clock, Elapsed Time

a. Wall mounted, recessed for flush installation

b. Digital, red LED illuminated, elapsed time indicator with 'Code Blue' activation.

c. American Time model DSY261RFAE, 12 hour format

d. Display character height; minute 2" minimum, seconds 1" minimum

e. Power; 120 volt AC with battery backup

f. Timer control station, clock control separate from clock/timer, 1 control per clock display, to be flush mounted on a partition adjacent to the clock.

g. Code Blue feature to override normal clock functions and provide an elapsed time mode. Normal timekeeping shall continue to run in the background during Code Blue timing.

SECTION 27 41 00 – AUDIOVISUAL SYSTEMS

Item 1: Revise Paragraphs 2.01.A.55 through 2.01.A.62 to read as follows and see revised specification attached:

55) Blu-Ray Disc Player with RS-232 Control

- DVD+/-RW Playback
- CD, CD-R/-RW Playback
- Provide rack mount
- 3D playback supported
- 1080p 24Hz Playback
- HDMI and Digital Optical Audio outputs
  Product: ~~Sharp BD-HP75U~~ **Sony BDP-S3100** or approved comparable product.

56) ~~40"~~ **42"**Flat Panel Display

- ~~40"~~ **42"** screen size
- 1920 x 1080 native display resolution
- 4000:1 contrast ratio
- Integrated Stereo Audio
- 16:9 aspect ratio
  Product: Sharp ~~LC-40LE550U~~ **LC-42LB150U** or approved comparable product.

57) ~~46"~~ **48"** Flat Panel Display

- ~~46"~~ **48"** screen size
- 1920 x 1080 native display resolution
- Integrated Stereo Audio
- 16:9 aspect ratio
  Product: Sharp ~~LC-46LE540U~~ **LC-48LE551U** or approved comparable product.

58) 50" Flat Panel Display

- 50" screen size
- 1920 x 1080 native display resolution
- 4000:1 contrast ratio
- Provide Sharp HT-SB60 loudspeakers as needed
- 16:9 aspect ratio
  Product: Sharp ~~LC-50LE650U~~ **LC-50LB150U** or approved comparable product.

59) 60" Flat Panel Display

- 60" screen size
- 1920 x 1080 native display resolution
- 4000:1 contrast ratio
- Provide Sharp HT-SB60 loudspeakers as needed

- 16:9 aspect ratio
  Product: Sharp ~~LC-60LE857U~~ **LC-60LE650U** or approved comparable product.

60) 70" Flat Panel Display

- 70" screen size
- 1920 x 1080 native display resolution
- Provide Sharp HT-SB60 loudspeakers as needed
- 16:9 aspect ratio
  Product: Sharp ~~LC-70LE755U~~ **LC-70LE650U** or approved comparable product.

61) 80" Flat Panel Display

- 80" screen size
- 1920 x 1080 native display resolution
- Provide Sharp HT-SB60 loudspeakers as needed
- 16:9 aspect ratio
  Product: Sharp ~~LC-80LE857U~~ **LC-80LE650U** or approved comparable product.

62) 90" Flat Panel Display

- 90" screen size
- 1920 x 1080 native display resolution
- Provide Sharp HT-SB60 loudspeakers as needed
- 16:9 aspect ratio
  Product: Sharp ~~LC-90LE745U~~ **LC-90LE657U** or approved comparable product.

Item 2: Delete Paragraph 2.01.A.63.

Item 3: Revise Paragraphs 2.01.A.16 to read as follows:

16) Hard Disk Video Recorder

- SD/HD-SDI hard disk recorder
- 250 GB HDD (removable)
- HD-SDI compatible video input
- HD-SDI and HDMI video outputs
- 4:2:0 color sampling
- M2T recording format
- RS-422 control interface
  Product: Datavideo ~~HDR-40~~ **HDR-60** or approved comparable product.

Item 4: Add Paragraph 2.01.A.77 as follows:

77) 70 Volt Audio Amplifier

- **600 Watts at 70 Volts, 1 kHz**

- **Less than 1% THD**
- **20 Hz to 20 kHz frequency response**
  Product: QSC CX602V or approved comparable product.

PROJECT DRAWINGS

LOW VOLTAGE

Note: see revised drawings attached

Drawing AV-500, AV-702:

Item 1: Revised Flat Panel Display model from Sharp LC-70LE755U to Sharp LC-70LE650U.

Drawings AV-510:

Item 1: Revised Blu-Ray Disk Player model from Sharp BDHP75U to Sony BDP-S3100.
Item 2: Revised Flat Panel Display model from Sharp LC-60LE755U to Sharp LC-60LE650U.

Drawings AV-520:

Item 1: Revised Blu-Ray Disk Player model from Sharp BDHP75U to Sony BDP-S3100.
Item 2: Revised Flat Panel Display model from Sharp LC-80C6500U to Sharp LC-80LE650U.

Drawings AV-530:

Item 1: Revised Blu-Ray Disk Player model from Sharp BDHP75U to Sony BDP-S3100.
Item 2: Revised Flat Panel Display model from Sharp LC-90LE745U to Sharp LC-90LE657U.

Drawings AV-540, AV-600:

Item 1: Revised Blu-Ray Disk Player model from Sharp BDHP75U to Sony BDP-S3100.

Drawings AV-550:

Item 1: Revised Blu-Ray Disk Player model from Sharp BDHP75U to Sony BDP-S3100.
Item 2: Revised Flat Panel Display model from Sharp LC-90LE745U to Sharp LC-90LE657U.
Item 3: Revised Flat Panel Display model from Sharp LC-60LE755U to Sharp LC-60LE650U.

Drawings AV-560:

Item 1: Revised Blu-Ray Disk Player model from Sharp BDHP75U to Sony BDP-S3100.
Item 2: Revised Flat Panel Display model from Sharp LC-70LE755U to Sharp LC-70LE650U.

Drawings AV-570:

Item 1: Revised Blu-Ray Disk Player model from Sharp BDHP75U to Sony BDP-S3100.
Item 2: Revised Flat Panel Display model from Sharp LC-80LE857U to Sharp LC-80LE650U.
Item 3: Revised Audio Amplifier model from QSC CX-702 to QSC CX-602V.

Drawings AV-580:

Item 1: Revised Flat Panel Display model from Sharp LC-60LE857U to Sharp LC-60LE650U.

Drawings AV-590:

Item 1: Revised HD Video Recorder model from Datavideo HDR-40 to Datavideo HDR-60.

Drawings AV-610:

Item 1: Revised Flat Panel Display model from Sharp LC-60LE857U to Sharp LC-60LE650U.
Item 2: Revised Flat Panel Display model from Sharp LC-40LE550U to Sharp LC-42LB150U.
Item 3: Revised Flat Panel Display model from Sharp LC-46LE540U to Sharp LC-48LE551U.
Item 4: Revise Room References.

Drawings AV-701:

Item 1: Revised Flat Panel Display model from Sharp LC-80LE857U to Sharp LC-80LE650U.
Item 2: Revised Flat Panel Display model from Sharp LC-40LE550U to Sharp LC-42LB150U.
Item 3: Remove Reference to Room 229B.

SECTION 27 41 00
AUDIOVISUAL SYSTEMS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Division 1 - Applicable sections of Division 1 shall govern all work under this section.

B. 11 52 13 – Projection Screens

C. 27 05 28.48 – Multimedia Connection Wall Box

D. 27 05 28.50 Multimedia Flush Poke-Thru Device

E. 27 41 13 – Multimedia Floorbox

F. Audiovisual (AV) System Drawings

G. Other Drawings

1. Related Architectural Drawings; for reference only.
2. Related Electrical Drawings; for reference only.

1.02 REFERENCES

A. Building Industry Consulting Services International (BiCSi),"Telecommunications Distributions Methods Manual," Twelfth Edition.

B. Electronic Industries Association/Telecommunications Industry Association (EIA/TIA) -568-C, "Commercial Building Telecommunications Wiring Standard"

C. EIA/TIA-569-B, "Commercial Building Standard for Telecommunications Pathways and Spaces"

D. EIA/TIA-606A, “Administration Standard for the Telecommunications Infrastructure of Commercial Buildings”

E. EIA/TIA-607-A, “Commercial Building Grounding/Bonding Requirements”

F. National Electrical Code (NEC), 2008 - National Fire Protection Agency (NFPA) 70

G. Institute of Electrical and Electronic Engineers (IEEE) 802.3 Carrier Sense Multiple Access with Collision Detection (Ethernet 100BASE-T)

H. Federal Communications Commission (FCC), Title 47, Code of Federal Regulations, Part 68.

I. National Institution for Certification in Engineering Technologies (NICET)

J. International Communications Industry Association (ICIA).

1.03 DEFINITIONS

A. ADA: Americans with Disabilities Act

B. AV: Audiovisual

C. Bid: Herein, used interchangeably with “proposal”

D. CATV: Central or Master Antenna Television (broadband)

E. DSP: Digital Signal Processor

F. IR: Infrared

G. NIC: material and work which is Not In Contract and for which the Installer is not responsible except as otherwise detailed herein.

H. OFE: “Owner Furnished Equipment” which will be provided by The Owner. Be responsible for installing and integrating this equipment as detailed herein.

I. OFCI: “Owner Furnished Contractor Installed” Equipment which will be provided by The Owner. Be responsible for installing and integrating this equipment as detailed herein.

J. The term “shall” is mandatory.

K. The term “will” is informative.

L. The term “should” is advisory.

M. Term “provide” means furnish and install.

N. AV Consultant: Convergent Technologies Design Group, Inc.

O. Bidder: Qualified firm intending to tender a bid on the systems described herein.

P. Owner:Chesapeake College

Q. Construction Manager (CM) or General Contractor(GC):The representative responsible for general building construction and onsite coordination between sub-contractors

1.04 BID PROPOSALS

A. Itemized Bid Response

1. Each piece of equipment shall be individually priced and submitted with Bid Proposals. Provide itemized bid response to include equipment description, manufacturer, model number, unit price, and quantity on a per room basis. All equipment prices shall reflect required modifications and accessories as needed for a complete and functioning system.
2. Non-equipment charges shall be outlined separately as a single line item on a per room basis. A sum of the audiovisual system total cost shall be provided with the bid proposal.

B. Contractor Qualification

1. Demonstrate at least three (3) years experience in the fabrication, programming, assembly, and installation of audiovisual presentation and remote control systems of similar magnitude and quality as specified for the subject job. Submit documentation to this effect with the bid response. Be an authorized sales and service center for all listed components and offerings in this specification.

2. References: Furnish no less than three (3) references for installations of similar size (dollar amount & quantity of spaces receiving integrated technology) and scope, performed throughout the Eastern Shore, MD area within the past three (3) years. At a minimum, reference information will include the reference company or institute name, contact person's name and title, telephone number, address, and detailed project description, project manager's name, and contact information of the organization that is responsible for day-to-day operation of the audiovisual installation.

C. Alternate Proposals

1. Any proposed alternate equipment choices should be requested in writing by the contractor prior to the proposal submission for approval. Each item on the alternate equipment list must be accompanied by catalog cut sheets and technical specifications.

D. Non-Equipment Charges,Including but not be limited to:

1. Engineering: Including all required design drawings, run sheets, instruction manuals, console layout, step-by-step user guide, etc.
2. Pre-Installation: Work performed on the Installer's premises including all fabrication, modification, assembly, rack wiring, etc.
3. Installation: Including all on-site installation and wiring, shop drawing, coordination and supervision, testing, checkout, Owner training, etc., performed on the Owner's premises.
4. General and Administrative: Including all shipping, insurance, and guarantees.

E. Owner Furnished Equipment (OFE, OFCI)

1. Identify any Owner Furnished Equipment assumed in the Bid Proposal to be installed and integrated under this contract. Identify all assumed Owner Furnished equipment within each room/space type that will be required to complete the AV systems installation.

F. State of the Art Development

1. Supply only the manufacturer's latest developed product. In cases where product development surpasses the criteria of the specification, inform the Architect and make the newer product available to the project at no additional cost. In no case shall discontinued or obsolete equipment be acceptable. The same requirement applies to software programs developed/updated during the warranty period.
2. Should a manufacturer discontinue a specified product, provide the manufacturer's recommended replacement at no additional cost to the owner. Should the manufacturer have no direct replacement product, Propose a product of equal or greater specification from an alternate manufacturer at no additional cost to the owner.
3. Should a product recall bya specified manufacturer require temporary or permanent replacement of a product specified under this section, notify the Architect at the earliest possible time and arrange to replace the product in question as quickly as possible.
    a. Equipment found defective or subject to recall prior to scheduled installation shall not be delivered to the jobsite.
    b. Equipment defect or intended recall shall not relieve the AV Contractor from any contractual obligations with regard to delivery schedule of product.
    c. Under no circumstances shall arrangement for alternate product require the Owner to accept superseded equipment except on a temporary basis.

G. Service Contract

1. Submit the costs for a one-year service contract, renewable for up to three years, which shall commence with the completion of the two-year warranty period. These contracts shall be fixed-cost, and can be accepted at the option of the Owner.
2. The service contract shall include all of the services provided during the warranty period, including complete replacement or repair of defective equipment.

1.05 QUALITY ASSURANCE

A. Coordination

1. Coordinate this Section with work of other Project Manual sections and associated trades.
2. Specific references, herein, requiring coordination of certain work shall not obviate responsibility for other required coordination.

B. Standards and Codes

1. Comply with
   a. Local, state and federal codes
   b. Applicable National Electrical Code
   c. American National Standards Institute
   d. Underwriters' Laboratories, Inc. standards.
2. All equipment, material, accessories, and loose items provided by Contractor shall be new and shall conform to applicable requirements of the above-mentioned agencies.
3. If required by local authorities, provide certificates and labels indicating compliance with above-mentioned codes and standards where applicable.

C. Point of Contact

1. Designate to the Owner in writing, the responsible person who shall ensure timely and consistent communication with the Owner on progress of the contract. The designated representative shall have full knowledge of all engineering and production procedures and shall report status of the installation and upcoming work plans to the Owner's Project Manager and Consultant on a weekly basis.
2. Project manager shall have successfully managed not less than two (2) projects of similar size and scope (as defined in previous sections). Bid submission shall detail the percentage of time that the project manager and other key personnel will be involved with the project.

1.06 SCOPE OF WORK

A. Provide the following in accordance with Specifications and Drawings:

1. Submittals delivered in a timely manner as described hereinafter.
2. Verification of dimensions and other conditions at project site. Review conduit system as shown in electrical section of building construction documents and, where applicable, as built conditions.Notify Consultant, Architect, GC, and EC within four weeks after award of contract of any deficiencies or inadequacies in conduit system design.
3. Detailed design of Digital Signal Processor system "maps," including remote-control accommodations.
4. Complete programming of audiovisual remote control system inclusive of graphical layout and source code programming
5. Power distribution within equipment racks including power connection to electrical outlets as described in electrical section of building construction documents.

6. Incidentals necessary for a complete working system.
7. Initial testing and adjustments, demonstration of system for approval, participation in acceptance tests, final adjustments as required.
8. Record Documents, “As-Built” drawings and Owners Manual.
9. Training of operating personnel.
10. Notify appropriate parties of conflicts in a timely manner.
11. Work cooperatively with other trades to resolve conflicts.

B. Special Insurance

1. Provide insurance fully covering all equipment against loss and damage during shipment, storage, installation, testing, adjustment and demonstration.

1.07 SYSTEM DESCRIPTION

A. Design Intent

1. Provide a complete and functioning audiovisual (AV) system inclusive of all hardware, software and training to meet or exceed the performance features outlined in this document.

B. Design Standards

1. The Owner’s goal is to have available a cohesive and fully functional system. Therefore, part of the development efforts for successfully implementing the AV systems should include:
   a. Install the system in a manner that complies with BiCSi and ICIA cable routing standards. Route all audio, video, and control cabling elements in a subtle, unobtrusive manner to maintain the architectural and visual integrity of the building.
   b. Except where plenum cable is used above finished ceilings, it is required that all cabling be routed inside the comprehensive system of conduit. Floor and wall boxes shall serve as the primary interface points to the AV system.
   c. Provide and install cover plates, connectors, and associated cabling to link all floor and wall boxes to all affiliated local and remote AV components. No wiremold or surface-mounted raceway will be permitted. The AV contractor shall coordinate faceplate materials, colors, and finishes with the faceplates used by other trades on the project and the architect to match aesthetics.
   d. Provide and install security covers on any electronics with front panel controls that should not need to be adjusted after initial set-up. All components permanently mounted to rack rail systems shall be installed with industry accepted security screws.
   e. All ceiling mountedAV equipment shall be secured to building structure.
   f. No more than thirty lamp hours shall be expired for projection system set-up at the time of final systems acceptance. Should more hours than this be expired, the AV contractor shall replace the lamp at no cost to the Owner.
   g. Steel cable security systems and padlocks to secure structure shall be provided for all surface mount loudspeakers, document cameras, video cameras, flat panel displays, and projectors. All padlocks provided for security shall be keyed to a single master key.
   h. Provide intellectual property release and install an editable version of all master source code for all digital signal processing, remote control or microprocessor-based systems included on this project to an owner furnished personal computer. Also provide a hardcopy on portable media.
   i. Provide necessary audio, video, RGBHV, HDMI, DVI, USB, and control signal repeaters, extenders, and amplifiers for any run greater than 30 feet and as

needed to maintain required signal levels for receipt at destination device. All audio lines shall be balanced at the source, prior to any cable pull longer than 20 feet. There are no exceptions.

j. Video camera locations shall receive AC power from associated equipment rack low voltage transformers within 60 feet.

k. For each input/output point of interface to the system, provide a suitable length patch cord for owner use for every signal type present. Provide umbilical style cable management for any mobile solutions.

2. Performance Standards: Unless restricted by the published specifications of a particular piece of equipment, or unless otherwise required, the following minimum performance standards shall be met by each system:

a. Analog Audio:

1) S/N (including crosstalk and hum): 75 dB minimum

2) Total Harmonic Distortion: 0.5% maximum from 30 Hz to 15,00Hz.

3) Frequency Response: Flat within +1.0 dB, 30 Hz to 15,000Hz.

b. Analog Video:

1) S/N (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(composite): Within +0.5 dB to 10 MHz

4) Frequency Response(component): Within +0.5 dB to 100 MHz

5) Line and Field Tilt: 2% maximum

6) Differential Gain: 3% maximum

7) Differential Phase: 2 degrees maximum

c. Digital Visual Interface (DVI):

1) TMDS Channel Pixel Clock Support up to 165 MHz

2) EDID Support DDC

d. High Definition Multimedia Interface (HDMI):

1) TMDS Channel Pixel Clock Support up to 340 MHz

2) Bandwidth for 1080p signals Support Deep Color and 3D

3) EDID and CEC Supported

e. Performance Test Signal Paths: The signal paths for the above Performance Standards shall be as follows:

1) Audio: From any and all source inputs (for microphones, audiotape units, videotape units, etc.) through all audio processing, audio distribution amplifiers (ADA), mixers, switchers, codec, etc., to all electrical signal destinations.

2) Video: From all source inputs (for cameras, computers, videotape units, etc.) through all distribution amplifiers (VDA), processors, switchers, etc., to all signal destinations.

f. Remote Control Standards: As a minimum, the remote control system for each space shall be programmed to include the following:

1) Owner Logo on first page.

2) Automatic System Shutdown.

3) AM/ PM Clock Settings.

4) 50 % audio level default.

5) Separate Program and Microphone Audio Level Control with mute function.

6) Volume/ Mute control for program and speech audio reinforcement on every screen.

7) Panel layout to include user screens, as well as, password protected technician pages.

8) Raise and lower projection screen when projection is powered on/ off respectively.

9) Assign room computer as default system source upon power up.

10) Activate a minimum of three (3) presets for each installed remote controllable video camera.

11) Provide remote control room management software and full licensing for each system on the project.

12) Provide licensing and software for integration of iPad tablets into remote control systems as control interfaces, where possible.

13) Full function control of all source components, display units, processing devices and switching electronics.

14) Touchpanel page layouts shall be submitted for approval. Prior to designing touchpanel layouts, meet with the Owner and review existing control system standards on campus and determine a basis of design.

15) Follow-up programming and modifications as requested by the Owner shall be provided 6 months after system acceptance. Provide and install updated editable source code to the Owner following these updates.

16) In the event the remote control system programming becomes compromised during the warranty period, provide the necessary effort to make the system fully functional once again.

1.08 SUBMITTALS

A. Related Sections

1. Comply with requirements of Section 01 33 00 - Submittal Procedures.

B. Submittal Data

1. Submittal data is to be submitted in a three ring binder, a continuous spiral binder, or plastic binding that allows the booklet to lie flat while open. Each booklet shall contain the below in the following order:
   a. Cover Sheet.
      1) Include name of supplying contractor and project name.

   b. Detailed Bill of Materials.
      1) Include a listing of: component quantities, equipment manufacturers, model numbers, and description of each component being supplied, and the specification paragraph or drawing sheet that corresponds to the product. Failure to provide this information will result in the rejection of submittals.

   c. Product Data.
      1) Include a catalog sheet per product of equipment listed in the Detailed Bill of Materials, in the exact order as the Detailed Bill of Materials. Each catalog sheet shall describe mechanical, electrical and functional equipment specifications. The catalog sheet must also include an image of the product. Photocopy duplications of the manufacturer's original equipment catalog sheets will be allowed as long as they provide adequate clarity of both the printed word and graphics/pictures. If more than one product is shown on the catalog sheet the intended product must be denoted by either an arrow or highlight.

   d. Authorized Distributor Certificate.
      1) Recently dated (within one year from submittal date) support letter from manufacturer stating that the supplying contractor is an Authorized Distributor of the product being supplied.

C. Shop Drawings

1. Prior to fabrication submit contractor generated drawings for approval for all supplied systems. These drawings shall include, but are not limited to, the following:
   a. Title Sheet & Symbols Legend
   b. All panels, plates, and designation strips, including details relating to terminology, engraving, finish and color.
   c. All equipment racks, cabinets, consoles, tables, carts, support bases, and shelves.

d. Schematic drawings (AV & Control Signal Flow), system functional block drawings, including those for audio and video subsystems. Resubmission of contract drawings is unacceptable.
e. All unusual equipment modifications.
f. Front mechanical drawings of each equipment rack.
g. Equipment location drawings.
h. Cable labeling plan.
i. Floor Plans, RCPs and Elevations: Show planned location for all elements and cable routing. Drawings should be at project standard scale and clearly legible.

D. Form

1. Submit all materials for review as described above, specifically referenced to the Specification paragraph number (where applicable).
   a. Submit all drawings on sheets of one size, preferably the project standard size.
   b. Where materials are presented on sheets 11" x 17" or smaller, organize into three-ring binder which include:
      1) Dividers or tabs between logical sections
      2) Project name and binder title labels on face and edge of binders
   c. On submittal drawings, maintain 3/32" minimum lettering height. Submittals with text less than 1/16" in height may be rejected.
2. Partial Submittals may be rejected. If submitted individually and each in its entirety, the following Submittals shall not be considered partial:
   a. Personnel
   b. Milestones
   c. Conduit Verification Statement and Notifications
   d. Rigging and Mounting Drawings
   e. As-Built Documentation
3. Product Data and Shop drawings must be submitted together in order to be reviewed.

E. User Interface

1. In order to develop a user interface which is both functional and useable, provide working "Beta" copies of system software for review and comment by the owner, architect and the AV consultant as per the below listed schedule:
   a. This is anticipated to be an interactive process, requiring at least three submittals prior to first beneficial use. At a minimum, the software development process will have the following milestones:
      1) Initial concept Submittal for Review
      2) First Beta Review
      3) Second Beta Review
      4) Final Implementation and On-Site Training: Prior to Final Acceptance
      5) Follow-up programming review and updates; Timing (within sixty-days from final acceptance)

F. Weekly Reporting

1. Commencing with project award, provide weekly status reporting of milestone task status, anticipated completion date, and related memo notes for the following tasks:
   a. Submittals
   b. Infrastructure verification
   c. Pre-wire status
   d. Equipment Procurement
   e. Shop fabrication
   f. Remote control system design
   g. Installation and Terminations
   h. Field testing and pre-acceptance testing
   i. Final acceptance demonstrations
   j. Owner training
   k. First owner use
   l. Open Coordination Items and Questions
2. See below for a partial example of an acceptable weekly reporting list.

Project: *Project Name*							
Location: *Project Location*					Date: *Form Delivery Date*		
Project Manager: *Project Manager*					Delivered by: *Form Delivered By*		
			Projected Completion:		Status:		Notes:
Infrastructure Verification:			*6/1/2011*		*Complete*		
Submittals:							
	Product Data		*8/1/2011*		*Complete*		
	Drawings		*8/1/2011*		*Complete*		
	Personnel (etc.)		*8/1/2011*		*Complete*		
RFIs:							
	12		*8/25/2011*		*Received*		*Implementing*
	178		*9/6/2011*		*Pending*		*Projector Screen Clearances*
Installation Status by Space							
Room			Equipment				
Name	Number	Pre-Wire	Order	Receive	Install	Test	Notes:
Example 1	*105*	*100%*	*100%*	*100%*	*60%*	*0%*	*Re-programming*
Example 2	*135*	*100%*	*100%*	*100%*	*90%*	*0%*	*Other Notes Here*

G. Personnel

1. Provide, in writing, within two weeks after award of Contract, the names, mailing address, phone numbers with extensions, email addresses and paging service numbers (if available) of the following project personnel:
   a. Project Manager
   b. Lead Systems Engineer
   c. Field Foreman
   d. Remote Control System Programmer

H. Conduit Verification

1. Within four weeks after award of Contract, submit statement confirming that Contractor has reviewed the conduit system as designed in building construction documents and, where applicable, as built.
2. Notify Consultant, General Contractor, Architect or Electrical Contractor of deficiencies or inadequacies, if any, in conduit system design or installation. If none, so indicate.
3. Absent conduit verification by Contractor and after installation of conduit as designed, Contractor shall assume costs of equipment, materials, labor and engineering, including services of owner's representative(s) in designing and/or verifying revised wiring approach(es) as relate to providing a fully functional system using conduit as designed or as revised at the discretion of the owner.

I. Rigging and Mounting Drawings

1. Submit full size drawings outlining mounting and installation details of all AV equipment requiring integration with cabinetry or architectural elements.
2. Details, stamped and signed by an appropriately licensed engineer, of all equipment mounting methods and materials provided by the Scope of Work, wherein failure of method or materials used for mounting or hanging permanently installed equipment could result in serious personal injury.
   a. Details provided by or requiring approval by licensed engineer may include: method of attachment to building structure or attachment and/or suspension points; method of attachment to supported equipment; all suspension materials; a materials list including specifications of all suspension materials; calculations used to determine loads and strengths of suspension materials, other as deemed necessary by the engineer.
3. In the absence of submitted approved, stamped and signed mounting and hanging details, the Owner reserves the right to acquire such engineering approval at the expense of the Contractor. Owner will notify Contractor of such intent. Contractor shall remedy within two weeks or Owner may proceed without Contractor approval and without relieving Contractor from any other obligations set forth by Contract.

J. Color Selection

1. Color options for all items as applicable.
2. Wallplate finishes should be coordinated with the Architect.

K. Samples

1. Color and finish samples of any furniture or lecterns.

1.09 CLOSEOUT SUBMITTALS

A. At the completion of the installation, but before Final Acceptance, provide for review and approval the following, in compliance with Division 1 Section*Closeout Procedures*.

1. Operation and Maintenance Manuals:
   a. Equipment manufacturer's operation and service manuals for each make and model of equipment.
   b. System Operation Manual. Produce a manual specifically for the subsystems detailed herein. The manual shall describe all procedures necessary to activate each system to provide for the functional requirements, except as specifically excluded by the Owner. This section shall provide a simple "How-to" users guide for the procedures needed to operate the system. This document shall contain a section on operating the systems equipment in the event of control system

failure. Control system touchpanel layouts shall be accompanied by narrative text describing "step-by-step" function engagement.

2. Warranty
   a. Provide list and dates of activation of equipment warranties
   b. Provide original manufacturers' certificates.
3. As-built Drawings
   a. Include contractor generated (mark-up of contract documents is not acceptable) digital record diagrams for all systems including, but not limited to:
      1) Schematic wiring diagrams with cable markings.
      2) Internal wiring diagrams of the equipment rack cabinets.
      3) Custom equipment modifications.
      4) Final test results and nominal settings for all adjustable controls.
4. Software Passwords
   a. Software Passwords Schedule (i.e., a spreadsheet listing the manufacturer, model number and location in the Facility, of each piece of audio/video equipment, the software for which is password-protected).
   b. Provide to Owner's Representative as a secure document separate from Operating and Maintenance Manuals and As-Built Drawings.
5. Editable Control System Code
   a. Provide the final control system code in an editable format.
6. Laminated Instruction Cards
   a. Provide 8 ½ x 11 Instruction cards, approved by the Owner. Laminate step-by-step instructions outlining system operations for each room that has an AV system. Provide editable file of card to Owner.

1.10 DELIVERY, STORAGE, HANDLING, AND STAGING

A. Supply, transport, deliver, unload, move to the installation location, unpack, place, assemble, secure, connect, and install all equipment needed to complete the installation. Be responsible for transportation, parking, delivery, and on-site storage of the system's equipment. Be responsible for all transportation of personnel to and from the site.

B. Reconfirm before delivery that hallways, stairways, passages, 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 is encouraged.

C. The Owner's acknowledgment of delivery of goods and any payment made on account of such delivery shall not constitute acceptance (partial or otherwise) and shall not diminish obligations as specified.

D. The actual dates of delivery shall be under the absolute control of the Owner. The dates and times for delivery/installation are critical to the successful completion of the project. Deliveries shall normally be accepted only Monday through Friday 8:00 a.m. to 4:00 p.m. In the event it becomes necessary for goods to be installed outside these hours 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 Contractor concerning time of arrival at the site; which entrance shall be utilized for delivery; routes to be taken to reach the installation location; and other matters relating to the orderly and timely installation of the system.

E. Installation shall commence immediately upon delivery of materials to the jobsite, except as directed by Construction Manager. Time required from delivery date to completion of project shall be in accordance with the approved schedules.

1.11 SYSTEM TRAINING

A. Training: Provide training in the operation and maintenance of the system for personnel designated by the Owner. Record owner training sessions on DVD or other agreed upon media, and make training videos available to the owner at no charge. The training shall be organized as follows:

1. Two (2) two-hour training classes for system technical operation and maintenance. This class shall cover the following topics:
   a. Review of signal flow diagrams.
   b. Review of all equipment functions, relevant to the function in this system.
   c. Review of initial equipment settings.
   d. Demonstration of all functional connections from a user perspective.
   e. Review & demonstration of replacement procedures for consumables (e.g., lamps).
   f. Review of manufacturers' recommended routine maintenance procedures.
2. Two (2) two-hour training classes for system engineering concerns. This class shall cover the following topics:
   a. Review of signal flow diagrams.
   b. Review of all equipment functions, relevant to the installation.
   c. Review of initial equipment settings.
   d. Review of manufacturer's recommended routine maintenance procedures.
   e. Review & demonstration of replacement procedures for consumables (e.g., lamps).
   f. Review & demonstration of control system software replacement/upgrade procedures.
3. Two (2) four-hour training classes addressing AV system operations. The classes will demonstrate and describe the following:
   a. System set-up and operations.
   b. Control system operation.
   c. How to attach microphones, record AV signals, and control the sound system .
   d. Videoconferencing operation & capabilities (if applicable).
   e. Audio monitoring and ADA system operations.
   f. Cable antenna television system (CATV).
4. Training may take place at any time (chosen by the Owner) after the systems are operational, up to a year following system acceptance.
5. Close out submittals shall be provided prior to any training classes.
6. Coordinate detailed specifics of the training session(s) time, date & location with the Owner.

1.12 WARRANTY

A. The system warranty shall be for twenty-four (24) months from the date of final acceptance. Provide all equipment, material, and labor required to uphold a full system warranty at no charge to the Owner. All manufacturers' equipment warranties shall be activated in the Owner's name and shall commence on the date of final acceptance. In the case of modified equipment, the manufacturer's warranty is normally voided. In such cases, provide the Owner with a warranty equivalent to that of the original manufacturer.

B. There shall be no cost to the Owner for maintenance performed during the warranty period beyond the fixed cost of the contract.

C. Coordinate and provide updates to the control system code & touch panel layouts based on owner feedback of desired functionality during warranty period.

D. Provide a total of eight (8) one-day visits per year, or a total of sixty-four (64) engineering/ service labor hours to conduct preventive maintenance and the Owner directed system adjustments.

E. Each visit will include:

1. Cleaning optical lenses.
2. Checking and replacing projection lamps filters and indicators.
3. Checking and repairing microphones and microphone cables.
4. Conducting subjective and objective tests of the audio, video, and control systems of the installed audiovisual systems.

F. Repair and/or adjust any malfunctioning components located by the technician during this testing. Include control system programming updates and modifications as part of this service contract, providing an updated editable copy of the source code to the Owner.

G. Provide a service telephone number, staffed by a qualified technician familiar with the equipment installed. Staff this number during normal business hours.

H. Respond with an on-site technician within 24-hours of a service call (including Saturdays and Sundays) for all equipment and system failures.

I. Replace or repair, at no cost to the owner, any failed equipment hardware or software installations required to provide full system operations.

J. During the warranty period, advise the Owner in writing each time any routine software and firmware updates become available, giving the Owner the opportunity to upgrade the software/hardware should they so desire at no additional cost. Provide any necessary system modifications after installation of these updates to maintain a fully functioning system.

K. Provide updates to firmware during service period. Provide any necessary system modifications after installation of these updates to maintain a fully functioning system.

PART 2 - PRODUCTS

2.01 PRODUCTS AND MANUFACTURERS

A. Equipment Lists: Refer to the attachments following this Section for materials and equipment required to complete the work of this Section.

1) Wireless iPad Interface

- Small form factor wireless iPad interface
- Single HDMI video output
- Transmuits and receives through IEEE 802.11 wireless protocol
- Built-in IR Reciever. Provide IR cabling and control programming required for control from room AV system.
  Product: Apple TV or approved comparable product.

2) Digital Computer Monitor

- Widescreen 16:9 computer monitor
- 1920 x 1080 Resolution
- HDMI, Displayport, and DVI-D input connections
- HDCP compliant
  Product: Asus VE258Q or approved comparable product.

3) Digital Document Camera

- 30 fps
- 80x zoom
- XGA, HDMI, composite, VGA, and DVI outputs
- USB 2.0 compatible
  Product: Avermedia M70 or approved comparable product.

4) Parabolic Loudspeaker

- Directional parabolic loudspeaker
  Product: Brown Innovations Double Localizer II or approved comparable product.

5) Audio Patch Panel

- 96 Point Audio Patch Panel
  Product: Bittree B96DC-FNAIH/E3 M20U8B or approved comparable product.

6) CAE Healthcare LearningSpace Medical Simulation Recording System

- Medical Simulation Recording System
- Provide all components as outlined in CAE Healthcare Quote number 0005604
- Provide CAE VGA Connection Kits
- Provide LearningSpace Digital Audio Kits
- Provide three (3) 48-Port PoE Network Switches per Section 271000 requirements
- Provide LearningSpace Enterprise server, software, and associated hardware
- Provide LearningSpace Enterprise Simulator Data Capture Server and associated hardware and software
- Provide LearningSpace Enterprise Video Capture Server, and all associated hardware and software
- Provide all requires CAE software licenses
- Provide Axis P5534 PTZ Cameras as identified on AV-series drawings
- Provide Axis P5512 Cameras as identified on AV-series drawings
- Provide Axis M3006-PV Come Cameras as identified on AV-series drawings
- Coordinate provision of system training by CAE Healthcare representative
- Mannequin Simulators are specified under a separate contract.
- Provide pricing for 2 years of warranty and support, with an option for including an additional 4 years (for a total of 6 years warranty and support)
  Product: CAE Healthcare quote number 0005604 or approved comparable product.

7) Large Flat Panel Display Mount

- On-Wall Display Mount
  Product: Chief LSM or approved comparable product.

8) Extra-Large Flat Panel Display Mount

- On-Wall Display Mount
  Product: Chief XSM or approved comparable product.

9) HD Television Tuner

- Receives NTSC, ATSC and QAM cable
- RS-232 and IR controllable
- HDMI, RGBHV, component and composite video out
- Dual analog audio outputs
- Provide optional rack kit (2RU)
  Product: Contemporary Research 232-ATSC+1 or approved comparable product.

10) Wireless Presentation Gateway

- Supports up to thirty two (32) users
- Quad view mode allows four presentations sources simultaneously
- Controlled over IP network
- HDMI and RGB outputs up to 1080p
- HDMI and analog audio outputs
  Product: Crestron AM-100 or approved equal.

11) Lecture Capture Module

- RGBHV, HDMI, and Component/HD-SDI Video Inputs with audio
- Single 10/100/1000 Mb/s auto-switching full/half duplex DHCP Ethernet connection
- Capable of live streaming and MMC file storage
- RS-232 controllable
- HDCP Compliant
- 1 RU
  Product: Crestron CAPTURE-HD or approved comparable product.

12) 1-to-2 HDMI Distribution Amplifier

- One in, Two out HDMI signal splitter
- Supports HD 1080p w/ Deep Color, 3D, and 7.1 linear PCM audio
- EDID and HDCP compliant
- Compatible with DVI and DisplayPort Multimode
- Allows merging DVI and SPDIF audio sources into one HDMI signal
  Product: Crestron HD-DA-2 or approved comparable product.

13) Pressure Zone Ceiling Microphone

- Frequency response (typical) 40Hz-20kHz @ 30 degree incidence
- Inconspicuous, resembles a light switch
- Choice of mic level or line-level output
- Adjustable HF response
- 22 dB equivalent noise level
  Product: Crown PZM-10 or approved comparable product.

14) Medical Intercom System

- Intercom Headset, Clearcom model HS15
- Desktop Intercom Main Station, Clearcom model MS-704
- Wireless Intercom Base Station, Clearcom model PTX-3
- Wireless IFB Receiver, Clearcom Model PRC-2
- IFB Headphones, Clearcom model TS-1
- Intercom Wall Station, Clearcom model KB-702
- Provide all system components required for a complete and functional intercom system
- Provide device quantities as outlined on TA-series drawings
  Product: Clearcom or approved comparable product.

15) Custom Instructor's Station

- Provide Custom Instructor's Station for all Classroom locations
- 28" deep x 56" wide worksurface
- One (1) 16 Rack Unit (RU) Integral Equipment Rack
- One (1) Desktop CPU area adjacent to equipment rack
- Provide locking doors for equipment rack and CPU area
- Castered mobile lectern
- 37" High
- Submit detail drawing of lectern. Coordinate finishes with CC
  Product: Marshall Furniture or approved comparable product.

16) Hard Disk Video Recorder

- SD/HD-SDI hard disk recorder
- 250 GB HDD (removable)
- HD-SDI compatible video input
- HD-SDI and HDMI video outputs
- 4:2:0 color sampling
- M2T recording format
- RS-422 control interface
  Product: Datavideo ~~HDR-40~~ **HDR-60** or approved comparable product.

17) Compressor/Limiter/Gate

- ¼" and XLR inputs
- Balanced stereo output
- 20 Hz – 20 kHz frequency response
- -40 dBu to +20 dBu compressor threshold range

- Compression, limiting, and gate functions
  Product: DBX 166xs or approved comparable product.

18) Graphic Equalizer

- ¼" and XLR inputs
- Balanced stereo output
- 20 Hz – 20 kHz frequency response
- 1/3 octave constant-Q frequency bands
  Product: DBX 215sor approved comparable product.

19) All-In-One Touch Screen Computer

- Touch Screen Computer
- Mount at Simulation Bed locations, for use as vitals monitor computer
- Provide Ergotron LX Wall Mount LCD Arm, part number 45-243-026
- Provide Ergotron Keyboard Tray, part number 50-193-200
  Product: Dell Inspiron One 20 or approved comparable product.

20) Surface-Mountable Enclosure for Cables and AC Power Outlet

- Low profile with tilt-up lid
- Flush-mountable
- Include Architectural Adapter Plates (AAP) as needed
  Product: Extron Cable Cubby 600 or approved comparable product.

21) HDMI Twisted Pair Extender

- Inputs: 1 female HDMI type A (HDMI 201 Tx)
- Output: 1 female HDMI type A (HDMI 201 Rx)
- HDCP Compliant
- Extends video, audio, and control signals
- RS-232 remote control
- 1" high, quarter rack width
  Product: Extron DTP HDMI 230 Tx/Rx with rack shelf or approved comparable product.

22) HDMI Twisted Pair Decora Extender

- Inputs: 1 female HDMI type A (HDMI 201 Tx)
- Output: 1 female HDMI type A (HDMI 201 Rx)
- HDCP Compliant
- Extends video, audio, and control signals
- RS-232 remote control
- Integrated into wall plate
  Product: Extron DTP HDMI 230 D Tx/Rx with rack shelf or approved comparable product.

23) HDMI Audio De-Embedder

- Extracts stereo audio from HDMI signal
- Compliant with HDMI 1.3, HDCP 1.2 and EDID 1.3
- Supports up to 1920 x 1200
- Capable of 6.75 Gbps
  Product: Extron HAE 100 or approved comparable product.

24) Eight Input Scaling Presentation Switcher

- HDCP-Compliant
- Integrates HDMI, HDTV, RGB, video, and audio sources into presentation systems
- Inputs: two DTP 230 twisted pair, four HDMI, two universal analog video
- Three simultaneous video outputs
- Two mic/line inputs with ducking and 48V phantom power
- RS-232 serial and contact closure control port
  Product: Extron IN1608 with rack shelf/ears or approved comparable product.

25) Eight Input Scaling Presentation Switcher with amplifier

- HDCP-Compliant
- Integrates HDMI, HDTV, RGB, video, and audio sources into presentation systems
- Inputs: two DTP 230 twisted pair, four HDMI, two universal analog video
- Three simultaneous video outputs
- Two mic/line inputs with mixing, ducking and 48V phantom power
- RS-232 serial and contact closure control port
- Integrated amplifier for amplified output
  Product: Extron IN1608 MA with rack shelf/ears or approved comparable product.

26) 8x8 HDMI Matrix Switcher

- Eight (8) HDMI Inputs and Eight (8) HDMI outputs on female jacks, Independent switching
- HDCP Compliant
- RS-232 Controllable
- Rack Mountable, 1 RU
  Product: Extron DXP HDMI 88 or approved comparable product.

27) 2x1 HDMI Switcher

- Two (2) HDMI Inputs and One (1) HDMI outputs on female jacks, Independent switching
- HDCP Compliant
- Relay Controllable
- Rack Mountable, 1 RU
  Product: Extron SW2 HDMI or approved comparable product.

28) Audio Amplifier

- Mono 70/100V Amplifier

- 40 Watts RMS output power
- Energy Star qualified amplifier
- Provide all required mounting hardware
  Product: Extron MPA 401 or approved comparable product.

29) Control Processor

- Eight (8) bidirectional RS-232 ports
- Eight (8) unidirectional IR/RS-232 ports
- One (1) RJ-45 Lan connection
- Provide software and licensing for integration of wireless iPad tablets as remote control interface
  Product: Extron IPCP 505 or approved comparable product.

30) IP Link Ethernet Control Interface

- Three bidirectional RS 232 ports
- Four IR ports
- Four Relays
- Enables Web-based A/V asset management
- Integral high performance Web server
  Product: Extron IPL 250 or approved comparable product.

31) Touchlink 3.5” Wall Mount TouchPanel

- 3.5” widescreen high resolution color touchscreen
- Compatible with IP Link control processors
  Product: Extron TLP 350MV or approved comparable product.

32) Touchlink 7” Cable Cubby TouchPanel

- 7” widescreen high resolution color touchscreen
- Integral Cable Pass-through Enclosure
- Flip-up Screen design
- Compatible with IP Link control processors
  Product: Extron TLP 710CV or approved comparable product.

33) Touchlink 7” Wall Mount TouchPanel

- 7” widescreen high resolution color touchscreen
- Compatible with IP Link control processors
  Product: Extron TLP 710MV or approved comparable product.

34) Touchlink 10” Wall Mount TouchPanel

- 10” widescreen high resolution color touchscreen
- Compatible with IP Link control processors

Product: Extron TLP 1000MV or approved comparable product.

35) USB Extender Transmitter

- USB 2.0, USB 1.1, USB 1.0 compatible
- Low speed (1.5 Mbps), full speed (12 Mbps), high speed (480 Mbps)
- With CAT 5/5e/6/7 cable: 450' (135 m)
- 1 female RJ-45 per unit
  Product: Extron USB Extender D TX or approved comparable product.

36) USB Extender

- USB 2.0, USB 1.1, USB 1.0 compatible
- Low speed (1.5 Mbps), full speed (12 Mbps), high speed (480 Mbps)
- With CAT 5/5e/6/7 cable: 450' (135 m)
- 1 female RJ-45 per unit
- Integrated 4-port hub in receiver
  Product: Extron USB Extender Series Tx/Rx or approved comparable product.

37) High-Powered Loudspeaker

- High-power ceiling mounted loudspeaker
- 50 Hz – 15 kHz frequency range
- 99 dB Sensitivity
- 8 ohm impedance
- Submit all rigging and mounting details for approval
  Product: Frazier CAT 66 or approved comparable product.

38) In-Wall iPod Docking Station

- Compatible with iPod, iPod nano, and iPod Touch
- Provide audio wall plate and associated accessories
- Delivers unbalanced audio up to 30 feet
  Product: iPort IW-20 or approved comparable product.

39) Two Channel Audio Amplifier

- Maximum power per channel @ 8 ohms: 600W
- Frequency response: 2Hz to 40kHz
- Signal to noise ratio: >112dBa
- 1RU
  Product: LabGruppen E 12:2 or approved comparable product.

40) Audio Mixer

- 32-channel live production audio mixer
- 32 microphone/line level audio inputs

- Left, right, and summed mono audio outputs
- 4 auxiliary bus output
  Product: Mackie 3204-VLX4 or approved comparable product.

41) Rack Mounted LCD Quad-Monitor
- Four (4) 4.3” diagonal 16:10 aspect ratio displays
- 400:1 Contrast Ratio
- HD-SDI video inputs and throughputs
- Rack-mountable, 2RU
  Product: Marshall Electronics OR-434 or approved comparable product.

42) 82” Equipment Rack

- 78-3/4” useable rack space, 45 RU
- 83” overall height; 32” overall depth; 22” overall width
- Provide security screws
- Provide quiet exhaust fan top 4”
- Provide RSH series rack mount kits as needed
- Provide rack mount UPS to support a minimum of 30 min. backup time
- Provide Furman M-8DX power distribution
  Product: Middle Atlantic BGR-41SA-32 or approved comparable product.

43) 36” Half-Height Equipment Rack
- 34” useable rack space, 21 RU
- 50 ” overall height; 18” overall depth; 22” overall width
- Provide security screws
- Provide quiet exhaust fan top 4”
- ProvideRSH seriesrack mount kits as needed
- Provide Furman M-8DX power distribution
  Product: Middle Atlantic SLIM-5-21 or approved comparable product.

44) Half-Height Equipment Rack
- 14 RU
- 18” overall depth; 22” overall width
- Provide security screws
- Provide quiet exhaust fan top 4”
- ProvideRSH seriesrack mount kits as needed
- Provide Furman M-8DX power distribution
  Product: Middle Atlantic SLIM-5-14 or approved comparable product.

45) Live Production Video Switcher
- Eight (8) built in SDI inputs and one (1) built in DVI-D input
- Five (5) built in SDI outputs in BNC
- Supports HD-SDI video signals
- Integral chroma key processing
- Integral frame synchronizer

- Provide Panasonic AV-HS04M3 DVI input board
- Provide Panasonic AV-HS04M5 DVI output board
  Product: Panasonic AV-HS410N or approved comparable product.

46) 8,000 Lumen DLP Projector

- 8,000 ANSI Lumen output
- HDMI Input, HDCP Compliant
- 1024 x 768 Resolution
- 2000:1 Contrast Ratio
- Provide Draper SL-12 Scissor Lift
  Product: Panasonic PT-Dx800UK or approved comparable product.

47) 6,000 Lumen DLP Projector

- 6,000 ANSI Lumen output
- HDMI Input, HDCP Compliant
- 1280 x 800 Resolution
- 2000:1 Contrast Ratio
  Product: Panasonic PT-DW6300US or approved comparable product.

48) Wireless Simulated Nursecall System

- Wireless, battery-powered nurse call wall stations
- Microvision 200Z Console/Receiver
- Provide quantity as outlined on TA-series drawings
  Product: Pocket Nurse part number 04-50-9221 or approved comparable product.

49) Pan, Tilt, Zoom HD Video Camera w/ Wall Mount

- 1280 x 720 resolution at 60fps
- 12x zoom
- 180 degree panning radius
- Provide Vaddio IN-Wall Polycom EagleEye enclosure system wall mount
  Product: Polycom Eagle Eye or approved comparable product.

50) Video Conferencing Codec

- 1280 x 720 resolution
- Max bandwidth 6 mbps
- 4-way Multipoint
- HD H.264 Content
- Provide Polycom HDX hanging microphone array
  Product: Polycom HDX 9000 or approved comparable product.

51) 2-Channel Audio Amplifier

- 300 Watts per channel @ 8 Ohms
- Less than 0.01% THD
- 20 Hz to 20 kHz frequency response
  Product: QSC CX502 or approved comparable product.

52) 2-Channel Audio Amplifier

- 425 Watts per channel @ 8 Ohms
- Less than 0.01% THD
- 20 Hz to 20 kHz frequency response
  Product: QSC CX702 or approved comparable product.

53) QSYS 64 Channel Core DSP Processor

- Card Frame Audio DSP Processor
- RS-232 and IP controllable
- Rack Mountable, 2 RU
- Provide QSC CIML4 Input Cards
- Provide QSC COL4 Output Cards
- Provide QSC I/O Frames as needed
  Product: QSC Core 250i or approved comparable product.

54) Shotgun Microphone

- Long-range microphone
- Position for optimum coverage of gymnasium court areas
- Provide all required peripherals for a functional microphone system
  Product: Sennheiser ME66 or approved comparable product.

55) Blu-Ray Disc Player with RS-232 Control

- DVD+/-RW Playback
- CD, CD-R/-RW Playback
- Provide rack mount
- 3D playback supported
- 1080p 24Hz Playback
- HDMI and Digital Optical Audio outputs
  Product: ~~Sharp BD-HP75U~~ **Sony BDP-S3100** or approved comparable product.

56) ~~40"~~ **42"**Flat Panel Display

- ~~40"~~ **42"** screen size
- 1920 x 1080 native display resolution
- 4000:1 contrast ratio
- Integrated Stereo Audio
- 16:9 aspect ratio
  Product: Sharp ~~LC-40LE550U~~ **LC-42LB150U** or approved comparable product.

57) ~~46"~~ **48"** Flat Panel Display

- ~~46"~~ **48"** screen size
- 1920 x 1080 native display resolution
- Integrated Stereo Audio
- 16:9 aspect ratio
  Product: Sharp ~~LC-46LE540U~~ **LC-48LE551U** or approved comparable product.

58) 50" Flat Panel Display

- 50" screen size
- 1920 x 1080 native display resolution
- 4000:1 contrast ratio
- Provide Sharp HT-SB60 loudspeakers as needed
- 16:9 aspect ratio
  Product: Sharp ~~LC-50LE650U~~ **LC-50LB150U** or approved comparable product.

59) 60" Flat Panel Display

- 60" screen size
- 1920 x 1080 native display resolution
- 4000:1 contrast ratio
- Provide Sharp HT-SB60 loudspeakers as needed
- 16:9 aspect ratio
  Product: Sharp ~~LC-60LE857U~~ **LC-60LE650U** or approved comparable product.

60) 70" Flat Panel Display

- 70" screen size
- 1920 x 1080 native display resolution
- Provide Sharp HT-SB60 loudspeakers as needed
- 16:9 aspect ratio
  Product: Sharp ~~LC-70LE755U~~ **LC-70LE650U** or approved comparable product.

61) 80" Flat Panel Display

- 80" screen size
- 1920 x 1080 native display resolution
- Provide Sharp HT-SB60 loudspeakers as needed
- 16:9 aspect ratio
  Product: Sharp ~~LC-80LE857U~~ **LC-80LE650U** or approved comparable product.

62) 90" Flat Panel Display

- 90" screen size
- 1920 x 1080 native display resolution
- Provide Sharp HT-SB60 loudspeakers as needed

- 16:9 aspect ratio
  Product: Sharp ~~LC-90LE745U~~ **LC-90LE657U** or approved comparable product.

~~63) 108" Flat Panel Display~~

- ~~108" screen size~~
- ~~1920 x 1080 native display resolution~~
- ~~Provide Chief PSMH2108~~
- ~~16:9 aspect ratio~~
  ~~Product: Sharp LB-1085 or approved comparable product.~~

64) Gooseneck microphone

- 12" gooseneck electret condenser microphone
- Frequency Response: 50Hz to 17kHz
- Cardioid cartridge
- Shock mount, flange mount, windscreen
- Mute switch and LED
  Product: Shure MX418S/C w/shock mount or approved comparable product.

65) 1-Channel Wireless Microphone System

- 1RU Rack Mountable Wireless Receiver
- One discrete output channel, XLR connectors
- Switchable mic/line output levels
- Removable ½ wave antennas
- Provide remote antennas to enable coverage of vestibules 102a and 104a
- Provide Shure MX150 lapel microphones with Shure ULXD1 bodypack transmitters
- Provide Shure SM-58 handheld microphones with Shure ULXD2 transmitters
- Coordinate implementation of all wireless devices with CC IT department
  Product: Shure ULXD4 w/rack mount or approved comparable product.

66) 2-Channel Wireless Microphone System

- 1RU Rack Mountable Wireless Receiver
- Two discrete output channels, XLR connectors
- Switchable mic/line output levels
- Removable ½ wave antennas
- Provide remote antennas to enable coverage of vestibules 102a and 104a
- Provide Shure MX150 lapel microphones with Shure ULXD1 bodypack transmitters
- Provide Shure SM-58 handheld microphones with Shure ULXD2 transmitters
- Coordinate implementation of all wireless devices with CC IT department
  Product: Shure ULXD4D w/rack mount or approved comparable product.

67) 4-Channel Wireless Microphone System

- 1RU Rack Mountable Wireless Receiver
- Four discrete output channels, XLR connectors
- Switchable mic/line output levels

- Removable ½ wave antennas
- Provide remote antennas to enable coverage of vestibules 102a and 104a
- Provide Shure MX150 lapel microphones with Shure ULXD1 bodypack transmitters
- Provide Shure SM-58 handheld microphones with Shure ULXD2 transmitters
- Coordinate implementation of all wireless devices with CC IT department
  Product: Shure ULXD4Q w/rack mount or approved comparable product.

68) Digital Annotation Device

- 24" LCD display
- USB 2.0 communications interface
- 720p resolution
- DVI-I Input/Output interface
  Product: SMART SP524 or approved comparable product.

69) Studio Headphones

- Stereo Studio Headphones
  Product: Sony MDR-7506 or approved comparable product.

70) HD Pan/Tilt/Zoom Video Camera

- 10x optical, 40x with digital zoom
- 8 to 70 degrees horizontal angle of view
- RS-232 controllable
- HD-SDI, Analog Component HD video outputs, VBS, Y/C SD video outputs
  Product: Sony EVI-HD1 or approved comparable product.

71) Ceiling Mounted Subwoofer

- Tile Replacement Subwoofer
- 200 Watt output
  Product: Tannoy CMS 110TB or approved comparable product.

72) Ceiling Mounted Loudspeaker

- 10" cutout
- 6 ½" point source driver
- 75 Hz – 30 kHz ±3dB
- 160 watts program power handling
- 90 degree nominal conical dispersion
- Provide Tannoy ceiling back box for all loudspeaker locations
  Product: Tannoy CMS601 DC BM or approved comparable product.

73) In Wall Loudspeakers

- 1" high frequency driver and 6.5" low frequency driver

- Frequency response: 70Hz – 51kHz +/- 3dB
- 210 watts programme power handling
- 90 degree dispersion
- Provide Tannoy in-wall back box for all loudspeaker locations
  Product: Tannoy iw6 TDC or approved comparable product.

74) CD/MP3 Player

- Dock connector for Apple iPod charging and playback
- Shock/skip prevention memory buffer
- RCA unbalanced line outputs
- Coaxial and optical/PDIF digital out
- ¼" stereo headphone output
- 2 RU
  Product: Tascam CD-200i or approved comparable product.

75) AM/FM Tuner

- AM/FM Stereo Tuner
- 87.5 MHz-108.00 MHz FM tuning range
- 520kHz-1720kHz AM tuning range
- Left/right RCA out
- Provide AM and FM antennas
- 2 RU
  Product: Tascam TU-690 or approved comparable product.

76) Custom Multi-Gang AV plates

- Plate connections to match or exceed "TA" signal flow drawings
  Product: Whirlwind Custom or approved comparable product.

77) 70 Volt Audio Amplifier

- **600 Watts at 70 Volts, 1 kHz**
- **Less than 1% THD**
- **20 Hz to 20 kHz frequency response**
  Product: QSC CX602V or approved comparable product.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General:

1. All installation work shall be in accordance with, but not limited to, this specification and drawings. Work practices shall be performed in accordance with applicable standards, requirements, and recommendations of Federal and Local authorities having jurisdiction.

2. All discrepancies discovered and any discrepancies which are apparent at the date of submission of bids, shall be immediately corrected without additional charge to the Owner.
3. Any proposed network switches for inclusion in the Audiovisual System installation must be Cisco Managed switches.
4. Clearly label all user controls for intended use and nominal setting. These labels shall be engraved and filled, or equal. Note: “Dymo” labels are not acceptable.
5. All equipment to be rack mounted shall be supplied with the appropriate rack mount kits.
6. Each rack enclosure shall have a single button on/off power distribution panel to include pull out lights and LED voltage indicator (Furman M-8Dx or equal) located in the first available rack unit.
7. All equipment racks to include removable, locking front doors and a 4” diameter, low-noise fan.
8. All rack and instructor stations shall include “security type” screws to secure rack-mounted components.
9. In rooms containing wireless microphones or assisted listening system, provide an antenna distribution system inclusive of remote antennas as needed to support transparent coverage throughout the space(s).
10. Coordinate implementation of all wireless devices with CC IT department.
11. In rooms containing auto tracking camera systems, provide one (1) day of manufacturers set up and programming.
12. Provide a spare replacement lamp for each projector specified.

B. Physical Installation:

1. Provide system identification plate as shown below. Plate shall occupy the first available rack unit in all AV equipment racks. If more than two (2) racks are positioned together, one (1) plate for every two racks is acceptable. Product: Liberty Cable # C2121-28046-RHIM-Template2

2. All equipment shall be firmly secured in place unless requirements of portability dictate otherwise. Unless granted specific permission by the Owner, install and secure all boxes, equipment, etc., plumb and square.
3. Fastenings, mounting brackets and supports shall be adequate to support their loads with a safety factor of at least five (5). A safety chain or cable will be tied to all equipment suspended from above.
4. In the installation of equipment and cable, consideration shall be given not only to operational efficiency, but also to overall aesthetic factors.

3.02 AUDIOVISUAL CABLE INSTALLATION

A. All cables, regardless of length, shall be marked with wraparound cable markers at both ends. There shall be no unmarked cables at any place in the system. Marking codes used on cables shall correspond to codes shown on “as-built” drawings and/or run sheets. The labeling and numbering system will be coordinated with the Owner.

B. All wired microphones shall include a 30ft. patch cable with heavy-duty jacket and XLR connectors.

C. Loudspeakers operating at 8 ohms shall be installed with 12AWG cable as a minimum size/ diameter.

D. Wall plate and floor box input/output panels shall be installed with audio/ video line drivers on runs exceeding 35ft.

E. All cabling shall be neatly strapped, dressed, and adequately supported. Any exposed cabling shall be neatly enclosed in a protective covering.

F. Terminal blocks, boards, strips, or connectors shall be furnished for all cables, which interface, with racks, cabinets, consoles, or equipment modules.

G. All audio signal lines shall be balanced at AV I/O plates. Provide ninety (90) degree connector adapters for all AV cabling at custom AV I/O plates.

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

1. Power cables
2. RGBHV, Video cables and Control cables
3. Data cables (when applicable)
4. Audio cables carrying low level signals
5. Audio cables carrying line and high level signals

I. Supply cables as required to meet system performance standards. Any cabling installed in walls or ceilings shall be plenum rated. All cables shall be cut to the length dictated by the run plus the required service loop to permit future equipment movement and relocation. For equipment mounted in drawers or on slides, the interconnecting cables shall be provided with a service loop of appropriate length.

J. No cable shall be installed with a bend radius less than that recommended by the cable manufacturer. Notify the construction manager in the event that a field condition interferes with the proper installation of any cables or equipment.

K. Grounding Procedures: In order to minimize problems resulting from improper grounding and to achieve maximum signal-to-noise ratios, the following grounding procedures shall be adhered to:

1. General: Because of the great number of possible variations in grounding systems, follow good engineering practice, as specified herein, and to deviate from these practices only when necessary to minimize crosstalk and to maximize signal-to-noise ratios in the audio, video, and control systems. Inform the Consultant in the event that there is a deviation from the standard grounding practices prior to actually performing the work.
2. System Ground: A single “system ground” shall be established for the system. All grounding conductors shall connect to this system ground. The system ground shall be provided in the equipment rack, and shall consist of a copper bar of sufficient size to accommodate all secondary ground conductors.
3. A copper conductor, having a maximum of 0.1 Ohms total resistance, shall connect the system ground bar to the nearest grounded, metallic electrical conduit of at least 2 inches in diameter. Be responsible for determining if the metallic conduit is properly electrically bonded to the building ground system, and shall show the grounding path of a document that is provided with the system documentation.
4. Secondary system grounding conductors shall be provided from all ungrounded equipment in each area, to the primary system grounding point for the area. Each of these grounding conductors shall have a maximum of 0.1 Ohms total resistance.
5. Under no conditions shall the AC neutral conductor, either in the power panel or in a receptacle outlet, be used for a system ground.

L. Audio Cable Shields: All balanced audio cable shields shall be grounded at one point only. For ungrounded portable equipment, such as microphones, the shield shall be connected at both ends but grounded at only one end.

M. Video Receptacles: All video receptacles shall be insulated from the mounting panel, outlet box, or wireway.

N. Non-continuous cable supports

1. Audiovisual cables shall be supported AFC with adjustable non-continuous cable supports.
2. Non-continuous cable supports shall provide a bearing surface of sufficient width to comply with required bend radii of audiovisual cables.
3. Non-continuous cable supports shall have flared edges to prevent damage while installing cables.
4. Installation and configuration shall conform to the requirements of the current revision levels of ANSI/ EIA/TIA Standards 568 & 569, NFPA 70 (National Electrical Code), applicable local codes, and to the manufacturer's installation instructions.
5. Do not exceed load ratings specified by manufacturer.
6. Follow manufacturer's recommendations for allowable fill capacity for each size non-continuous cable support.
7. Non-continuous cable supports shall be ERICO CableCatTM J-hook series or approved equal.

3.03 REPAIR/RESTORATION

A. Any damage to any installed work or product caused by the unpacking, transporting, assembly, connecting, or configuring of the product shall be repaired at no charge to the Owner.

3.04 FIELD QUALITY CONTROL

A. Once installed and the System Checkout is complete, the system shall be demonstrated as operational to the Owner.

1. If the AV system fails to meet the requirements of this document or those stated by the technical documentation, then the Owner shall reject the installed system and the contractor shall be given notice (either oral or in writing) to correct the failure.
2. If unable to overcome repeated performance deficiencies within thirty (30) days, and if requested to do so by the Owner, remove the equipment and replace at no expense to the Owner.
3. No warranties shall begin until the Owner has authorized final acceptance in writing.
4. Right to Revoke Acceptance: If any equipment and/or goods which have been previously accepted, specifically or by the making of payment, are found to have defects, damage, deficiencies, or fail to conform to the specification, for any cause not attributable to the Owner, the Owner may revoke acceptance.

B. Conduct pre-acceptance tests

1. Perform all system performance checks on the installed systems prior to final acceptance testing. The Owner / AV Consultant, may witness the pre-acceptance tests. The Owner / Architect may inspect and operate system components in order to evaluate installation progress and technical compliance prior to acceptance testing.

C. Contractor System Checkout

1. Perform system checkout before acceptance tests are scheduled. Furnish all required test equipment.Perform all work necessary to determine and/or modify performance of the system to meet the requirements of this specification.
2. During performance testing, all equipment shall be operated under standard conditions as recommended by the manufacture.
3. Test all audio and video systems for compliance with the Performance Standards using test procedures that follow later in this specification.
4. Maintain documentation of all performance tests for reference by Consultant during the System Acceptance Tests.
5. At the conclusion of the tests, return all equipment settings to previously calibrated positions.
6. Provide written records of all test results in spreadsheet form.
7. Check all control functions, from all controlling devices to all controlled devices, for proper operation.
8. Adjust, balance, and align all equipment for optimum quality and to meet the manufacturer's published specifications. Establish and mark normal settings for all level controls, and record these settings in the "System Operation and Maintenance Manual."
9. Provide testing results and settings for all equipment and systems to the AV Consultant at least three (3) business days prior to System Acceptance Testing.
10. Provide the AV Consultant with all test results, manuals, software, as-built documentation, etc. prior to acceptance testing.
11. Inform the Owner and AV Consultant that the systems are ready for System Acceptance Testing by the AV Consultant. The system shall be considered ready for acceptance testing when the following conditions are met:
    a. AV Contractor has pre-tested all systems such that all sub-systems, functions, software, and equipment are de-bugged and operational
    b. AV Contractor has supplied the AV Consultant with the written test results and documentation as listed above for all rooms and systems
    c. AV Contractor has supplied the AV Consultant with close out (manuals, training materials, and other as-built) documentation revised to reflect comments and/or revisions arising from the review cycles listed elsewhere within this document
12. Should the systems not be ready for testing by the AV Consultant at the date(s) and time(s) indicated by the AV Contractor, system acceptance testing may be rescheduled at the sole discretion of the AV Consultant. Pay for the labor and expenses of the AV Consultant and other project team members assembled at the project site for the purpose of system acceptance testing for the date(s) of the original scheduled testing plus the labor and expenses of the AV Consultant and other project team members for the rescheduled testing date(s). The labor rate for the AV Consultant shall be a flat rate of $200.00/hour including travel time. Other project team member labor costs shall be at their respective published rates. The PM and/or Owner shall be entitled to deduct any money owed to the Owner, PM, AV Consultant, or other project team members under this contract from any sum which may become due or is payable to the AV Contractor under this Contract for the purposes of satisfying the charges listed above.

D. Final Acceptance Test

1. Testing will be performed with the Owner (or its designees) present to determine that the AV system equipment satisfies the manufacturers' performance specifications and that the AV system installed satisfactorily performs the functions required by this specification. Conduct formal pre-acceptance tests prior to the Owner's acceptance testing to ensure that the performance and functional specifications are satisfied by the installed system and the system is ready for the Owner's acceptance. The AV contractor shall verify in the owner's presence that the installed audiovisual system satisfies the performance and functional requirements through formal acceptance

testing. Be responsible for staging each room to be tested, and shall have sufficient personnel on site to run multiple systems at once (not less than three (3) personnel).

E. Test Equipment

1. Assemble the following test equipment (or equivalent) on site.
   a. Video signal generator, Leader 410C
   b. Combined waveform monitor/vectorscope, Leader 5872A
   c. Prerecorded VHS tape (NTSC)
   d. RGB HV cable, Extron BNC-5-6'HR
   e. Audio and Video cable, terminations, adapters, etc
   f. Audio Test CD
   g. DVD
   h. Programmable Video & Audio Test Generator, Extron VTG-400D
   i. HDMI/DVI Test Signal Generator

F. Audio System Testing

1. Absolute Impedances
   a. Set any speaker level controls at zero attenuation. Measure absolute impedance value of each speaker line at 250, 500, 1000, 2000, 4000 Hz without the amplifier connected but with all speakers connected. Impedance must not be below the rated load impedance of respective amplifier and may be any value equal to or above that. Check resistance of lines to all speakers and microphone receptacles with receptacles open and short-circuited.
2. Hum and Noise Level
   a. Test overall hum and noise, it should be at least 60 dB below rated power output of each amplifier with amplifier controls set for optimum signal to noise and full output and with inputs terminated with proper shielded resistor. (150 and 600 ohms).
3. Parasitic Oscillation and RF Pickup
   a. Set up system for each specified mode of operation.
   b. Use 5 MHZ band with oscilloscope and speaker monitoring.
   c. Check to insure that the system is free of spurious oscillation and RF pickup in the absence of any input signal and also with the system driven momentarily to full output at 160 Hz.
4. Buzzes, Rattles, Distortions
   a. Apply high quality music signal to the system. Adjust the sound system for frequent peaks at its specified maximum sound pressure level.
   b. Apply sine-wave sweep from 50 to 5,000 Hz to 6 dB below full amplifier power.
   c. In both cases, listen carefully for buzzes, rattles and objectionable distortion.
   d. Correct all causes of such defects. If cause is not from system, promptly notify the architect indicating cause and suggested corrective procedures.
5. Equalize all audio systems for maximum gain before feedback in all room configurations.
6. Record all systems settings and include into Systems Operation manuals

G. Video System Testing

1. Signal Paths
   a. Utilizing a NTSC color bar generator and waveform analyzer with the video signal set at 100% saturation and 75% amplitude check that the video performance specifications are met at the display devices from all source inputs to all system outputs. Connect the combined waveform monitor/vectorscope to a final output point, e.g. an input to a picture monitor or video projector. Ensure that the test signal is routed to the selected output.

2. Level Balance
   a. Adjust all video projection equipment to produce the best image possible. Ensure that horizontal sweep circuitry is not over driven to the point of audible sweep frequencies being emitted.
   b. Adjust all video monitor and videocassette players, video sources to produce the best image possible.
   c. Record all systems settings for inclusion into systems manuals

H. RGBHV System Testing

1. For all RGBHV inputs, connect the RGBHV output of the signal generator to a floorbox/table/rack connector and select the SMPTE bar with “pluge pulse” signal at the following computer scan rates:
   a. 1024 x 768 XGA
   b. 1280 x 1024 SXGA
   c. 1366 x 768 WXGA
   d. 1400 x 1050 SXGA+
   e. 1440 x 900 WXGA+
   f. 1600 x 1200 UXGA
   g. 1900 x 1080
   h. 1080i
   i. 1080p
   j. 720i
   k. 720p
2. Check that the image is correctly displayed at all system outputs including the monitor(s) and/or by the video projector.
3. Repeat items 1 and 2 using Crosshatch, Checkerboard, and H Pattern Signals

I. Digital Video System Testing

1. For all digital video inputs, connect the output of the digital signal generator to each connection atthe following resolutions:
   a. 640 x 480p60 24 MHz Pixel Clock
   b. 1024 x 768p60 63.5 MHz Pixel Clock
   c. 1280 x 768p60 68 MHz Pixel Clock
   d. 1280 x 768p60 79.5 MHz Pixel Clock
   e. 1280 x 1024p60 109 MHz Pixel Clock
   f. 1920 x 1080p60 (SMPTE reduced) 148.5 MHz Pixel Clock
   g. 1920 x 1200p60 (blanking reduced) 154 MHz Pixel Clock
   h. 1600 x 1200p60 162 MHz Pixel Clock
   i. 1920 x 1080p60 (VESA) 173 MHz Pixel Clock
   j. 1920 x 1080p60 (SMPTE rd.) Deep Color 148.5 MHz Pixel Clock
   k. 1280 x 768p60 3D HDTV
   l. 1920 x 1080p24 3D HDTV
   m. 1920 x 1200p75 Deep Color
   n. 2560 x 1600p75
   o. 4096 x 2160p24
   p. 4096 x 2160p24 Deep Color
2. Check that the image is correctly displayed at all system outputs including the monitor(s) and/or by the video projector.Display resolution shall be limited only by the manufacturer specified capabilities of the display or source device.
3. Repeat items 1 and 2 with an HDCP compliant source to all outputs simultaneously to verify compliance.

J. Optical Projection Systems

1. All optical projection systems shall meet the following performance standards:
   a. The total averaged light output from a projector, in lumens, shall be within plus-or-minus 15% of that specified by the projector manufacturer.
   b. The light fall-off from the center of the projected image to all four corners, as measured at the projected image plane, shall not exceed 35% for slide projector images. The light intensity shall be measured at all five positions of the projected image after the projector has been adjusted to provide the light output as specified above.
   c. The "corner" locations shall be defined as the four points determined by intersecting lines drawn 5% of the distance in from the focused edges of the image.
   d. The light meter used for the above measurements shall be properly calibrated footcandle (or lux) meter and shall be cosine-corrected
   e. Projectors, lenses, and mirrors shall be solidly mounted and braced so that there will be no observable movement in the image induced by motor vibration or other mechanical operations.

K. Qualification Methods

1. Three methods will be used to qualify the AV system for acceptance.
   a. Inspection - A critical observation of qualifying factors, such as quality of workmanship, equipment placement, routing of cables, adequacy of technical documentation, etc., that do not lend themselves to demonstration or measurement.
   b. Demonstration - A process of showing by reason or evidence that a given condition clearly satisfies the requirement.
   c. Measurement - A process of determining the actual dimension, capacity, or amount of something, by measuring using calibrated standards.
2. Acceptance of the Work of this Section shall occur after completion of corrections and adjustments required by "Punch List" (as generated during Demonstration and Acceptance Testing of Completed Installation).
3. Owner reserves the right to use equipment, material and services provided as part of Work of this Section, prior to Acceptance, without incurring any obligation to Accept any equipment or completed systems until Punch List work is complete and systems comply with Contract Documents.

3.05 SCHEDULES

A. Shared Lecture Hall

1. The Shared Lecture Hall shall serve as the primary space for multidisciplinary instructional presentations in the Center for Athletics and Allied Health. This Lecture Hall shall feature a ceiling mounted video projection system, along with separate program and speech audio reinforcement systems. The audiovisual system shall also utilize in-room video cameras and microphones to provide Lecture Capture functionality, which will enable instructors and students to interact directly with instructors and students in remote locations, as well as to record and live-stream presentations.

2. The visual display system shall consist of one ceiling mounted video projector capable of producing images on a motorized screen located at the presentation wall. A ceiling mounted document camera shall be provided over the presentation area, to enable instructors to display high-resolution images of a demonstration work area for medical demonstrations. An in-room video cameras shall also be provided, capable of displaying images on the in-room displays. This video camera, along with ceiling-hung microphones, shall be used to record presentations. A dedicated AV recording/streaming appliance shall be located in an equipment rack in the room, along with a dedicated video

teleconferencing codec, which shall serve as the core of the lecture capture / distance learning systems. An instructor's station shall be provided at the front of the lecture hall, which will house several AV sources and devices including, but not limited to, a digital document camera, blu-ray disk player, wireless iPad interface, TV tuner, gooseneck microphone, along with wireless lapel-type microphones. Input connections shall also be available for user-furnished laptop computers or other AV source devices. A digital annotation tablet shall also be provided, to give instructors the ability to annotate over video content from a dedicated host PC computer, and to display the annotated content on the projector system. The Instructors Station shall also feature a color touch screen remote control interface on the work surface, which shall give users full intuitive control over all AV system functions, including signal routing, power on/off, source selection, and control over room lighting presets. A surround-sound program audio system shall be provided, to consist of wall-mounted loudspeakers in strategic locations throughout the Lecture Hall. A separate monaural speech reinforcement system shall consist of distributed ceiling-mounted loudspeakers.

3. System Interconnection: The functional interconnections of the RGBHV, video, audio, and control systems shall be as detailed on the "TA" series drawing sheets associated with this space.

4. Equipment Layout: The equipment in this area shall be located as detailed on the "TA" series drawing sheets associated with this space.

5. Owner Furnished Equipment (OFE): Personal/Laptop Computer

6. System Details
   a. Control System: The Control System will be controlled from a hardwired lectern mount color LCD touchscreen that shall terminate at the specified custom instructor's station. From this touchscreen, users shall have full function control of all room source and system functions (including a light dimming system) with one button operation. These sources and associated electronics are to be detailed in the control drawing associated with these rooms. Touchscreen layouts to be approved prior to installation. It is intended to have the control system programmed to turn power on/off for all system components with a single function button.
   b. Electrical Boxes and Conduit: Electrical Contractor to provide electrical boxes and conduit below the floor, in the walls, and above the ceiling. Be responsible for all custom AV plates and the necessary cabling connecting to the system's equipment. There shall be a custom floorbox location for input/output hook-ups during presentations. Confirm on site conditions prior to ordering.
   c. Program/Speech Reinforcement Loudspeakers: Ceiling-mounted loudspeakers will be installed for monaural speech and stereo program audio signals. Take care not to damage the ceiling during installation, and repair or replace any damage caused during the installation. Audio inputs include, but are not limited to: personal computers, along with both wired and wireless microphones.
   d. Data/Video Projector: The data/video projector shall be installed on the ceiling of the Multipurpose room**.** The video projector shall be installed and adjusted to produce an image that fills the projection screen. Install on fixed pole mount secured to building structure.
   e. Video Cameras: Wall mounted video cameras shall be provided at the front and back of the room as detailed on the AV drawings.
   f. Instructor's Station: This station is to be located at the front the room. At this position, the station will have AV patch points via an associated room floorbox for connection to the room' system.

1) The specified instructor's stations will house the following: remote control touchscreen, digital annotation device, digital document camera, keyboard/mouse, and gooseneck microphone.
2) The station will be equipped with a task light. Unit to include a single duplex AC power receptacle on the work surface. Laptop access shall be provided.

g. Equipment Rack/Hardware: Provide rack and all equipment rack hardware, including vent panels, slide-out shelves, rack mounts and miscellaneous hardware for a complete and finished system. The equipment rack for this room shall be located as detailed on the AV series drawings. Provide cable management from the rack to associated wall plate.

7. Equipment List: On the following pages is the equipment list for this space. Each of these items shall be priced using both the equipment make and model shown, or components with equivalent functionality and of newer make, which meet or exceed the performance characteristics that are outlined for each component in the list. If an item is listed as "Custom," this means that the Contractor may use any manufacturer's component appropriate for the function and quality required for that item. Submit a "build" quality shop drawing for approval, on any custom items.

B. Shared Classrooms

1. The Shared Classrooms shall be generally scheduled pedagogical environments which will utilize AV Systems technology to enhance instructional presentations. Each classroom shall feature a wall-mounted flat panel display, separate program and voice audio reinforcement systems, and an instructor's station at the front of the classroom.

2. The primary display system in the Shared Classrooms shall be a large-format, LCD flat panel display mounted to the presentation wall. From this display, instructors will be able to display content from any source in the room, and annotate directly on the image using a lectern-mounted digital annotation tablet. A stereo program audio system shall be provided, to consist of two wall-mounted loudspeakers at the front of each Classroom. A separate monaural speech reinforcement system shall consist of distributed ceiling-mounted loudspeakers. An instructor's station shall be provided at the front of the each Classroom, which will house several AV sources and devices including, but not limited to, a digital document camera, blu-ray disk player, wireless iPad interface, TV tuner, gooseneck microphone, along with wireless lapel-type microphones. Input connections shall also be available for user-furnished laptop computers or other AV source devices. An in-room video camera and ceiling-mounted microphone shall be provided to be used as part of a Lecture Capture recording/streaming system, which shall include a dedicated recording/streaming appliance located in the Instructor's Station. Instructors shall be able to present directly from personal iPad tablets through the wireless iPad interface. A color remote control touch panel interface shall be mounted to the work surface of the instructor's station, which will give the instructor full control over all AV system functions, as well as room lighting presets. Ceiling mounted document cameras, pan-tilt-zoom video cameras, and additional displays shall be provided at strategic locations to enable students to view large format, detailed images of the demonstration.

3. System Interconnection: The functional interconnections of the RGBHV, video, audio, and control systems shall be as detailed on the "TA" series drawing sheets associated with this space.

4. Equipment Layout: The equipment in this area shall be located as detailed on the "TA" series drawing sheets associated with this space.

5. Owner Furnished Equipment (OFE): Personal/Laptop Computer

6. System Details
   a. Control System: The Control System will be controlled from a hardwired lectern mount color LCD touchscreen that shall terminate at the specified custom instructor's station. From this touchscreen, users shall have full function control of all room source and system functions (including a light dimming system) with one button operation. These sources and associated electronics are to be detailed in the control drawing associated with these rooms. Touchscreen layouts to be approved prior to installation. It is intended to have the control system programmed to turn power on/off for all system components with a single function button.
   b. Electrical Boxes and Conduit: Electrical Contractor to provide electrical boxes and conduit below the floor, in the walls, and above the ceiling. Be responsible for all custom AV plates and the necessary cabling connecting to the system's equipment. There shall be a custom floorbox and rackplate location for input/output hook-ups during presentations. Confirm on site conditions prior to ordering.
   c. Program/Speech Reinforcement Loudspeakers: Ceiling-mounted loudspeakers will be installed for monaural speech and stereo program audio signals. Take care not to damage the ceiling during installation, and repair or replace any damage caused during the installation. Audio inputs include, but are not limited to: personal computers, DVD/VHS Player/Recorder, HD TV Tuner, along with both wired and wireless microphones.
   d. LCD Display: The LCD display shall be installed as detailed on the AV drawings.
   e. Video Cameras: Wall mounted video cameras shall be provided at the front and back of the room as detailed on the AV drawings.
   f. Instructor's Station: This station is to be located at the front the room. At this position, the station will have AV patch points via an associated room floorbox for connection to the room' system.
      1) The specified instructor's stations will house the following: remote control touchscreen, digital annotation device, digital document camera, keyboard/mouse, and gooseneck microphone.
      2) The station will be equipped with a task light. Unit to include a single duplex AC power receptacle on the work surface. Laptop access shall be provided.
   g. Equipment Rack/Hardware: Provide rack and all equipment rack hardware, including vent panels, slide-out shelves, rack mounts and miscellaneous hardware for a complete and finished system. The equipment rack for this room shall be located as detailed on the AV series drawings. Provide cable management from the rack to associated wall plate.

7. Equipment List: On the following pages is the equipment list for this space. Each of these items shall be priced using both the equipment make and model shown, or components with equivalent functionality and of newer make, which meet or exceed the performance characteristics that are outlined for each component in the list. If an item is listed as "Custom," this means that the Contractor may use any manufacturer's component appropriate for the function and quality required for that item. Submit a "build" quality shop drawing for approval, on any custom items.

C. Seminar Rooms

1. The Seminar Room shall feature AV technology to enable small classroom interactions and presentations for groups of up to 16 students. This room will also be used as a group study room, or conference room. Users shall be able to present from a dedicated in-room PC computer, or from user-furnished laptop computers using AV input connections at the conference table.

2. The Seminar Room presentation system shall feature a single wall-mounted large-format LCD flat panel display. Distributed ceiling-mounted loudspeakers shall be provided for

audio reinforcement. A small equipment rack shall be located in the Seminar room to house a dedicated host PC computer with wireless mouse and keyboard, along with all switching and amplification hardware. AV input connections shall be made available at the conference table, so that users may connect their laptops and present directly from the table. A tabletop integrated cable pathway and flip-up control panel will be located at the conference table, to give users intuitive control over AV system functions, including source selection, audio volume, and system on/off.

3. System Interconnection: The functional interconnections of the RGBHV, video, audio, and control systems shall be as detailed on the "TA" series drawing sheets associated with this space.

4. Equipment Layout: The equipment in this area shall be located as detailed on the "TA" series drawing sheets associated with this space.

5. Owner Furnished Equipment (OFE): Personal/Laptop Computer

6. System Details
   a. Control System: The Control System will be controlled from a hardwired flush tabletop mount color LCD touchscreen that shall terminate at the specified custom equipment rack. From this touchscreen, users shall have full function control of all room source and system functions (including a light dimming system) with one button operation. These sources and associated electronics are to be detailed in the control drawing associated with these rooms. Touchscreen layouts to be approved prior to installation. It is intended to have the control system programmed to turn power on/off for all system components with a single function button.
   b. Electrical Boxes and Conduit: Electrical Contractor to provide electrical boxes and conduit below the floor, in the walls, and above the ceiling. Be responsible for all custom AV plates and the necessary cabling connecting to the system's equipment. There shall be a custom floorbox and rackplate location for input/output hook-ups during presentations. Confirm on site conditions prior to ordering.
   c. Program/Speech Reinforcement Loudspeakers: Ceiling-mounted loudspeakers will be installed for monaural speech and stereo program audio signals. Take care not to damage the ceiling during installation, and repair or replace any damage caused during the installation. Audio inputs include, but are not limited to: personal computers, DVD/VHS Player/Recorder, HD TV Tuner, along with both wired and wireless microphones.
   d. LCD Display: The LCD display shall be installed as detailed on the AV drawings.
   e. Equipment Rack/Hardware: Provide rack and all equipment rack hardware, including vent panels, slide-out shelves, rack mounts and miscellaneous hardware for a complete and finished system. The equipment rack for this room shall be located as detailed on the AV series drawings. Provide cable management from the rack to associated wall plate.

7. Equipment List: On the following pages is the equipment list for this space. Each of these items shall be priced using both the equipment make and model shown, or components with equivalent functionality and of newer make, which meet or exceed the performance characteristics that are outlined for each component in the list. If an item is listed as "Custom," this means that the Contractor may use any manufacturer's component appropriate for the function and quality required for that item. Submit a "build" quality shop drawing for approval, on any custom items.

D. Gymnasium

1. The Gymnasium shall serve as a central space for athletic activities and events. The Gymnasium shall feature a high-quality audio system for program audio as well as

speech reinforcement applications. Inputs shall be available at a "stage" location for connection of microphones and other audio and video sources into the room AV system. A small AV recording system shall be provided to enable recording of athletic events held in the space, which shall also be capable of live streaming recorded content. In-room video cameras and microphones shall be provided for use in the AV recording system.

2. The Gymnasium shall feature several high-fidelity loudspeakers positioned in strategic locations throughout the space to provide program audio reproduction, as well as distributed voice reinforcement capability. Input connections shall be provided for wired microphones, instrument inputs, as well as for an audio mixer that can be used during non-athletic events. Additional audio sources shall include an iPod docking station, and a dedicated CD player. The Gymnasium shall also feature two in-room pan, tilt, zoom video cameras and ceiling microphones to be used while recording athletic events held in the space. A dedicated recording/streaming appliance shall be located in an AV equipment rack located in a secure area. A wall mounted remote control touch panel interface shall be provided to give users control over AV system functions, including source selection and volume control. Infrastructure and equipment has been provided to allow for the future expansion of the current Storage area into an operator-run recording control room, utilizing audio mixer and a live video production switcher.

3. System Interconnection: The functional interconnections of the RGBHV, video, audio, and control systems shall be as detailed on the "TA" series drawing sheets associated with this space.

4. Equipment Layout: The equipment in this area shall be located as detailed on the "TA" series drawing sheets associated with this space.

5. Owner Furnished Equipment (OFE): Personal/Laptop Computer

6. System Details
   a. Control System: The Control System will be controlled from a hardwired wall mount color LCD touchscreen that shall terminate at the specified custom rack. From this touchscreen, users shall have full function control of all room source and system functions (including a light dimming system) with one button operation. These sources and associated electronics are to be detailed in the control drawing associated with these rooms. Touchscreen layouts to be approved prior to installation. It is intended to have the control system programmed to turn power on/off for all system components with a single function button.
   b. Electrical Boxes and Conduit: Electrical Contractor to provide electrical boxes and conduit below the floor, in the walls, and above the ceiling. Be responsible for all custom AV plates and the necessary cabling connecting to the system's equipment. There shall be a custom floorbox and rackplate location for input/output hook-ups during presentations. Confirm on site conditions prior to ordering.
   c. Program/Speech Reinforcement Loudspeakers: Ceiling-mounted loudspeakers will be installed for monaural speech and stereo program audio signals. Take care not to damage the ceiling during installation, and repair or replace any damage caused during the installation. Audio inputs include, but are not limited to: personal computers, DVD/VHS Player/Recorder, HD TV Tuner, along with both wired and wireless microphones.
   d. Equipment Rack/Hardware: Provide rack and all equipment rack hardware, including vent panels, slide-out shelves, rack mounts and miscellaneous hardware for a complete and finished system. The equipment rack for this room shall be located as detailed on the AV series drawings. Provide cable management from the rack to associated wall plate.

7. Equipment List: On the following pages is the equipment list for this space. Each of these items shall be priced using both the equipment make and model shown, or components with equivalent functionality and of newer make, which meet or exceed the performance characteristics that are outlined for each component in the list. If an item is listed as "Custom," this means that the Contractor may use any manufacturer's component appropriate for the function and quality required for that item. Submit a "build" quality shop drawing for approval, on any custom items.

E. Multipurpose Room

1. The Multipurpose Room shall serve as a space for various athletic activities and group classes. A video display system shall be provided, consisting of a single ceiling-mounted video projector and motorized projection screen. A program audio reinforcement system shall be provided, to consist of several wall-mounted loudspeakers in strategic locations throughout the room. In-room video cameras and microphones shall also be provided as part of an AV recording/streaming system, to be able to record athletic events held in the space.

2. A single ceiling-mounted video projector shall be provided, capable of displaying an image on a ceiling-mounted motorized projection screen. The ceiling mounted projector will be mounted to a motorized scissor lift, and the screen will be mounted to a screen deployment lift. Sources for this display system shall include a dedicated host PC computer, a TV tuner, a Blu-Ray disk player, and input connections shall be provided for user-furnished laptop computers or other sources. A dedicated CD player, iPod docking station, wireless lapel microphones, along with audio input connections shall be provided for use with the audio reproduction system. Several high-fidelity loudspeakers shall be provided for a full-range audio reproduction system. In-room video cameras and microphones shall be provided, along with a dedicated recording/streaming appliance, for recording events in the Multipurpose Room. A centralized remote control processor shall be included, along with a wall-mounted touch screen interface, to provide users with full control over all AV system functions.

3. System Interconnection: The functional interconnections of the RGBHV, video, audio, and control systems shall be as detailed on the "TA" series drawing sheets associated with this space.

4. Equipment Layout: The equipment in this area shall be located as detailed on the "TA" series drawing sheets associated with this space.

5. Owner Furnished Equipment (OFE): Personal/Laptop Computer

6. System Details
   a. Control System: The Control System will be controlled from a hardwired rack mount color LCD touchscreen that shall terminate at the specified custom equipment rack. From this touchscreen, users shall have full function control of all room source and system functions (including a light dimming system) with one button operation. These sources and associated electronics are to be detailed in the control drawing associated with these rooms. Touchscreen layouts to be approved prior to installation. It is intended to have the control system programmed to turn power on/off for all system components with a single function button.
   b. Projection Screen: The projection screen will be provided and installed by the Construction Manager. Projection screen shall be electric operated "permanently tensioned" type controlled by the remote control system.
   c. Electrical Boxes and Conduit: Electrical Contractor to provide electrical boxes and conduit below the floor, in the walls, and above the ceiling. Be responsible for all custom AV plates and the necessary cabling connecting to the system's equipment.

There shall be a custom floorbox and rackplate location for input/output hook-ups during presentations. Confirm on site conditions prior to ordering.

d. Program/Speech Reinforcement Loudspeakers: Ceiling-mounted loudspeakers will be installed for monaural speech and stereo program audio signals. Take care not to damage the ceiling during installation, and repair or replace any damage caused during the installation. Audio inputs include, but are not limited to: personal computers, DVD/VHS Player/Recorder, HD TV Tuner, along with both wired and wireless microphones.
e. Data/Video Projector: The data/video projector shall be installed on the ceiling of the Multipurpose room**.** The video projector shall be installed and adjusted to produce an image that fills the projection screen. Install on fixed pole mount secured to building structure.
f. Video Cameras: Wall mounted video cameras shall be provided at the back of the room as detailed on the AV drawings.
g. Equipment Rack/Hardware: Provide rack and all equipment rack hardware, including vent panels, slide-out shelves, rack mounts and miscellaneous hardware for a complete and finished system. The equipment rack for this room shall be located as detailed on the AV series drawings. Provide cable management from the rack to associated wall plate.

7. Equipment List: On the following pages is the equipment list for this space. Each of these items shall be priced using both the equipment make and model shown, or components with equivalent functionality and of newer make, which meet or exceed the performance characteristics that are outlined for each component in the list. If an item is listed as “Custom,” this means that the Contractor may use any manufacturer’s component appropriate for the function and quality required for that item. Submit a “build” quality shop drawing for approval, on any custom items.

F. Fitness Center

1. The Fitness Center shall serve as an instructional space for athletic classes and group activities. Instructors shall be able to utilize AV presentation technology to display instructional content over an in-room video display and audio reproduction system. An AV equipment rack shall be provided to house all AV sources, hardware, and connections.

2. The display system shall consist of a 90” Flat Panel LCD Display, capable of displaying content from a variety of sources including a dedicated PC computer with wireless mouse and keyboard, a Blu-Ray disk player, a TV Tuner, and owner-furnished laptop computers. Digital and analog AV input connections shall be provided for connection of laptop computers. A high-quality audio reproduction system shall be provided to consist of wall-mounted loudspeakers for program audio, and ceiling mounted loudspeakers for voice reinforcement. A low-frequency subwoofer shall be provided for full-range audio reproduction. Inputs into the audio system shall include an iPod docking station, as well as input connections at the equipment rack. In-room video cameras and microphones shall be provided, along with a dedicated AV recording/streaming appliance, as part of an AV recording system capable of recording activities in the room. A color remote control touch panel shall be provided at the AV equipment rack, to give users full control over all AV system functions, including room lighting presets.

3. System Interconnection: The functional interconnections of the RGBHV, video, audio, and control systems shall be as detailed on the “TA” series drawing sheets associated with this space.

4. Equipment Layout: The equipment in this area shall be located as detailed on the “TA” series drawing sheets associated with this space.

5. Owner Furnished Equipment (OFE): Personal/Laptop Computer

6. System Details
   a. Control System: The Control System will be controlled from a hardwired rack mount color LCD touchscreen. From this touchscreen, users shall have full function control of all room source and system functions (including a light dimming system) with one button operation. These sources and associated electronics are to be detailed in the control drawing associated with these rooms. Touchscreen layouts to be approved prior to installation. It is intended to have the control system programmed to turn power on/off for all system components with a single function button.
   b. Electrical Boxes and Conduit: Electrical Contractor to provide electrical boxes and conduit below the floor, in the walls, and above the ceiling. Be responsible for all custom AV plates and the necessary cabling connecting to the system's equipment. There shall be a custom floorbox and rackplate location for input/output hook-ups during presentations. Confirm on site conditions prior to ordering.
   c. Program/Speech Reinforcement Loudspeakers: Ceiling-mounted loudspeakers will be installed for monaural speech and stereo program audio signals. Take care not to damage the ceiling during installation, and repair or replace any damage caused during the installation. Audio inputs include, but are not limited to: personal computers, DVD/VHS Player/Recorder, HD TV Tuner, along with both wired and wireless microphones.
   d. LCD Display: The LCD display shall be installed as detailed on the AV drawings.
   e. Video Cameras: Wall mounted video cameras shall be provided at the front and back of the room as detailed on the AV drawings.
   f. Equipment Rack/Hardware: Provide rack and all equipment rack hardware, including vent panels, slide-out shelves, rack mounts and miscellaneous hardware for a complete and finished system. The equipment rack for this room shall be located as detailed on the AV series drawings. Provide cable management from the rack to associated wall plate.

7. Equipment List: On the following pages is the equipment list for this space. Each of these items shall be priced using both the equipment make and model shown, or components with equivalent functionality and of newer make, which meet or exceed the performance characteristics that are outlined for each component in the list. If an item is listed as "Custom," this means that the Contractor may use any manufacturer's component appropriate for the function and quality required for that item. Submit a "build" quality shop drawing for approval, on any custom items.

G. Team Rooms

1. The Team Rooms, located adjacent to the various Team Locker Rooms, shall serve as central spaces for athletic teams to assemble and conduct team meetings. Meeting presentations in these rooms shall be enhanced by AV systems technology. Users shall be able to present from personal laptops, wireless iPad tablets, or from an in-room host PC computer.

2. The primary display in the Team Rooms shall be a wall-mounted 60" HD LCD Flat Panel Display with integral loudspeakers for audio reproduction. A wireless iPad interface shall be provided, to enable users to present directly from iPad tablets. A small equipment rack shall be provided in each Team Room to house a dedicated host PC computer with wireless mouse and keyboard, along with a blu-ray disk player and TV tuner, all able to display content on the wall mounted flat panel display. A centralized control processor shall be included in this equipment rack, which users will be able to utilize through a wall-mounted remote control touch panel located at the front of the Team Room. This remote control interface shall give users intuitive control over all AV system functions, including source selection and volume control.

3. System Interconnection: The functional interconnections of the RGBHV, video, audio, and control systems shall be as detailed on the "TA" series drawing sheets associated with this space.

4. Equipment Layout: The equipment in this area shall be located as detailed on the "TA" series drawing sheets associated with this space.

5. Owner Furnished Equipment (OFE): Personal/Laptop Computer

6. System Details
   a. Control System: The Control System will be controlled from a hardwired lectern mount color LCD touchscreen that shall terminate at the specified custom instructor's station. From this touchscreen, users shall have full function control of all room source and system functions (including a light dimming system) with one button operation. These sources and associated electronics are to be detailed in the control drawing associated with these rooms. Touchscreen layouts to be approved prior to installation. It is intended to have the control system programmed to turn power on/off for all system components with a single function button.
   b. Electrical Boxes and Conduit: Electrical Contractor to provide electrical boxes and conduit below the floor, in the walls, and above the ceiling. Be responsible for all custom AV plates and the necessary cabling connecting to the system's equipment. There shall be a custom floorbox and rackplate location for input/output hook-ups during presentations. Confirm on site conditions prior to ordering.
   c. Program/Speech Reinforcement Loudspeakers: Ceiling-mounted loudspeakers will be installed for monaural speech and stereo program audio signals. Take care not to damage the ceiling during installation, and repair or replace any damage caused during the installation. Audio inputs include, but are not limited to: personal computers, DVD/VHS Player/Recorder, HD TV Tuner, along with both wired and wireless microphones.
   d. LCD Display: The LCD display shall be installed as detailed on the AV drawings.
   e. Video Cameras: Wall mounted video cameras shall be provided at the front and back of the room as detailed on the AV drawings.
   f. Equipment Rack/Hardware: Provide rack and all equipment rack hardware, including vent panels, slide-out shelves, rack mounts and miscellaneous hardware for a complete and finished system. The equipment rack for this room shall be located as detailed on the AV series drawings. Provide cable management from the rack to associated wall plate.

7. Equipment List: On the following pages is the equipment list for this space. Each of these items shall be priced using both the equipment make and model shown, or components with equivalent functionality and of newer make, which meet or exceed the performance characteristics that are outlined for each component in the list. If an item is listed as "Custom," this means that the Contractor may use any manufacturer's component appropriate for the function and quality required for that item. Submit a "build" quality shop drawing for approval, on any custom items.

H. Small Conference Rooms

1. Two conference rooms shall be used for small group interaction and presentations utilizing AV presentation technology. A wall mounted flat panel display shall be provided, along with in-room loudspeakers, which presenters shall be able to connect to directly from the Conference Room table.

2. The Conference Room presentation system shall feature a single wall-mounted LCD Flat Panel Display with integral loudspeakers located at the front of the room. A small equipment rack shall be located in the Conference Room to house a dedicated host PC

computer with wireless mouse and keyboard, along with all a blu-ray disk player, TV tuner, and wireless iPad interface. AV input connections shall be made available at the conference table, so that users may connect their laptops and present directly from the table. Presenters shall also be able to present wirelessly from a personal iPad tablet. Additional input connections shall be available at a wall mounted custom input plate. A tabletop color touch screen remote control panel shall be provided at the conference room table, to give users intuitive control over AV system functions, including source selection, audio volume, and system on/off.

3. System Interconnection: The functional interconnections of the RGBHV, video, audio, and control systems shall be as detailed on the "TA" series drawing sheets associated with this space.

4. Equipment Layout: The equipment in this area shall be located as detailed on the "TA" series drawing sheets associated with this space.

5. Owner Furnished Equipment (OFE): Personal/Laptop Computer

6. System Details
   a. Control System: The Control System will be controlled from a hardwired lectern mount color LCD touchscreen that shall terminate at the specified custom instructor's station. From this touchscreen, users shall have full function control of all room source and system functions (including a light dimming system) with one button operation. These sources and associated electronics are to be detailed in the control drawing associated with these rooms. Touchscreen layouts to be approved prior to installation. It is intended to have the control system programmed to turn power on/off for all system components with a single function button.
   b. Electrical Boxes and Conduit: Electrical Contractor to provide electrical boxes and conduit below the floor, in the walls, and above the ceiling. Be responsible for all custom AV plates and the necessary cabling connecting to the system's equipment. There shall be a custom floorbox and rackplate location for input/output hook-ups during presentations. Confirm on site conditions prior to ordering.
   c. Program/Speech Reinforcement Loudspeakers: Ceiling-mounted loudspeakers will be installed for monaural speech and stereo program audio signals. Take care not to damage the ceiling during installation, and repair or replace any damage caused during the installation. Audio inputs include, but are not limited to: personal computers, DVD/VHS Player/Recorder, HD TV Tuner, along with both wired and wireless microphones.
   d. LCD Display: The LCD display shall be installed as detailed on the AV drawings.
   e. Equipment Rack/Hardware: Provide rack and all equipment rack hardware, including vent panels, slide-out shelves, rack mounts and miscellaneous hardware for a complete and finished system. The equipment rack for this room shall be located as detailed on the AV series drawings. Provide cable management from the rack to associated wall plate.

7. Equipment List: On the following pages is the equipment list for this space. Each of these items shall be priced using both the equipment make and model shown, or components with equivalent functionality and of newer make, which meet or exceed the performance characteristics that are outlined for each component in the list. If an item is listed as "Custom," this means that the Contractor may use any manufacturer's component appropriate for the function and quality required for that item. Submit a "build" quality shop drawing for approval, on any custom items.

I. Allied Health Laboratories

1. Several Simulation Laboratories shall be included in the Center for Allied Health and Athletics, which the Allied Health faculty and students shall use as combined instructional classroom spaces and medical simulation laboratories. Specific requirements for each Laboratory are identified below. In general, all laboratories shall include an area for classroom presentations featuring a 70" wall-mounted LCD flat panel display, along with distributed ceiling loudspeakers for voice and program audio reinforcement. This presentation area shall include a custom Instructor's Station, which shall house all AV presentation sources and hardware. Sources housed in the Instructor's Station shall include a Blu-Ray Disk Player, TV Tuner, Wireless iPad Interface, Digital Document Camera, a dedicated Host PC Computer, as well as digital and analog input connections for user-furnished laptop computers. Wireless lapel microphones shall be provided for voice reinforcement. Presenters shall be able to display content from any of these sources on the Flat Panel Display. A color remote control touch panel interface shall be provided at the Instructor's Station to give users full control over the AV presentation system functions.

2. Each laboratory shall also include one or more Medical Simulation areas. Each Simulation area shall feature three (3) ceiling-mounted PTZ video cameras to give several different visual perspectives on the simulation area, as well as one ceiling-mounted or wall-mounted microphone for capturing audio at the simulation area. Video and audio signals shall be routed to a centralized equipment closet located in room 146, where they shall be able to be recorded using network-based Medical Simulation Servers. Video and audio from each area will be recorded and stored digitally through these Servers, and will be able to be played back on PC computers throughout the facility through data network connections. Content will be able to be protected to ensure privacy for recorded simulation sessions. Additional inputs shall be available for video feeds from simulation mannequins, simulation ambulances, and other similar devices, which will also be able to be recorded on the Medical Simulation Servers. The basis of design for the Medical Simulation Encoders is CAE Healthcare Learning Space. Contact CAE Healthcare regarding installation and equipment requirements, in reference to quote number 00005604. Two-way audio intercommunication between the control area and the simulation areas shall be made possible through the LearningSpace system, and a separate dedicated wireless Intercom system, to include a master station in the Control Room capable of providing two-way communication with each simulation station. Parabolic loudspeakers shall be mounted from the ceiling above each simulation station to provide private audio reproduction at each simulation station, which will not be audible at adjacent simulation stations.

3. System Interconnection: The functional interconnections of the RGBHV, video, audio, and control systems shall be as detailed on the "TA" series drawing sheets associated with this space.

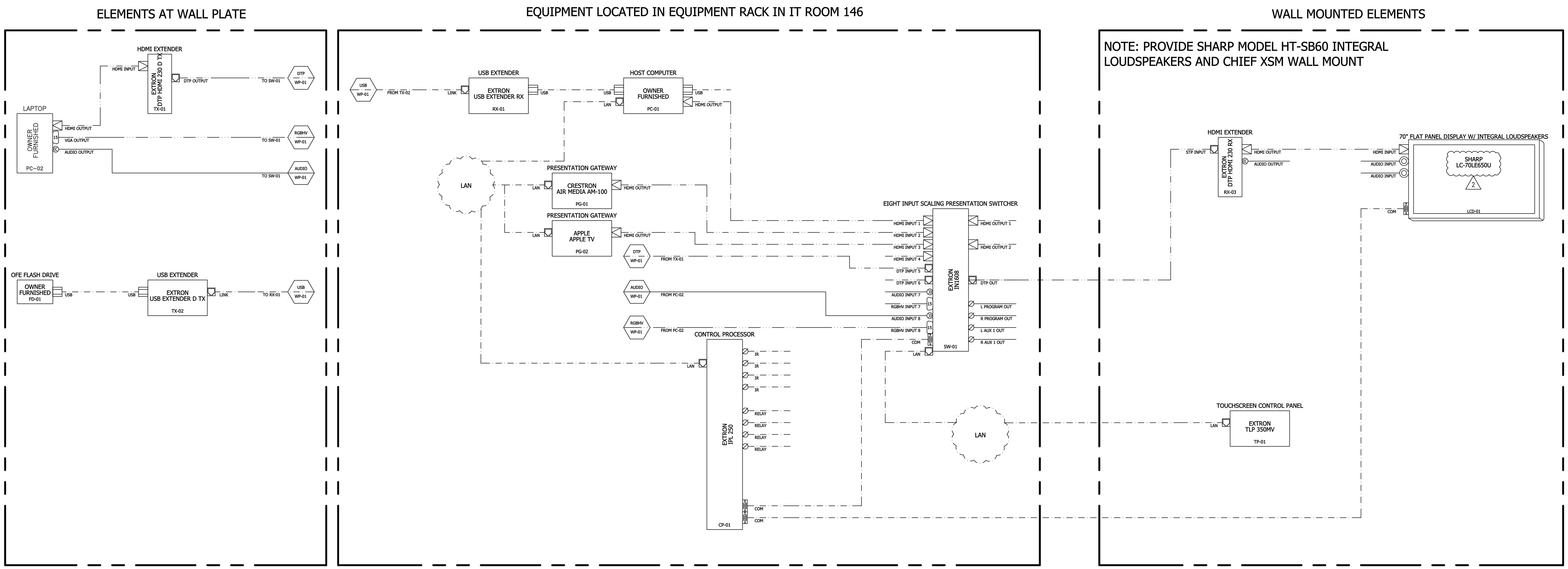
4. Equipment Layout: The equipment in this area shall be located as detailed on the "TA" series drawing sheets associated with this space.

5. Owner Furnished Equipment (OFE): Personal/Laptop Computer

6. System Details
   a. Control System: The Control System will be controlled from a hardwired lectern mount color LCD touchscreen that shall terminate at the specified custom instructor's station. From this touchscreen, users shall have full function control of all room source and system functions (including a light dimming system) with one button operation. These sources and associated electronics are to be detailed in the control drawing associated with these rooms. Touchscreen layouts to be approved prior to installation. It is intended to have the control system programmed to turn power on/off for all system components with a single function button.

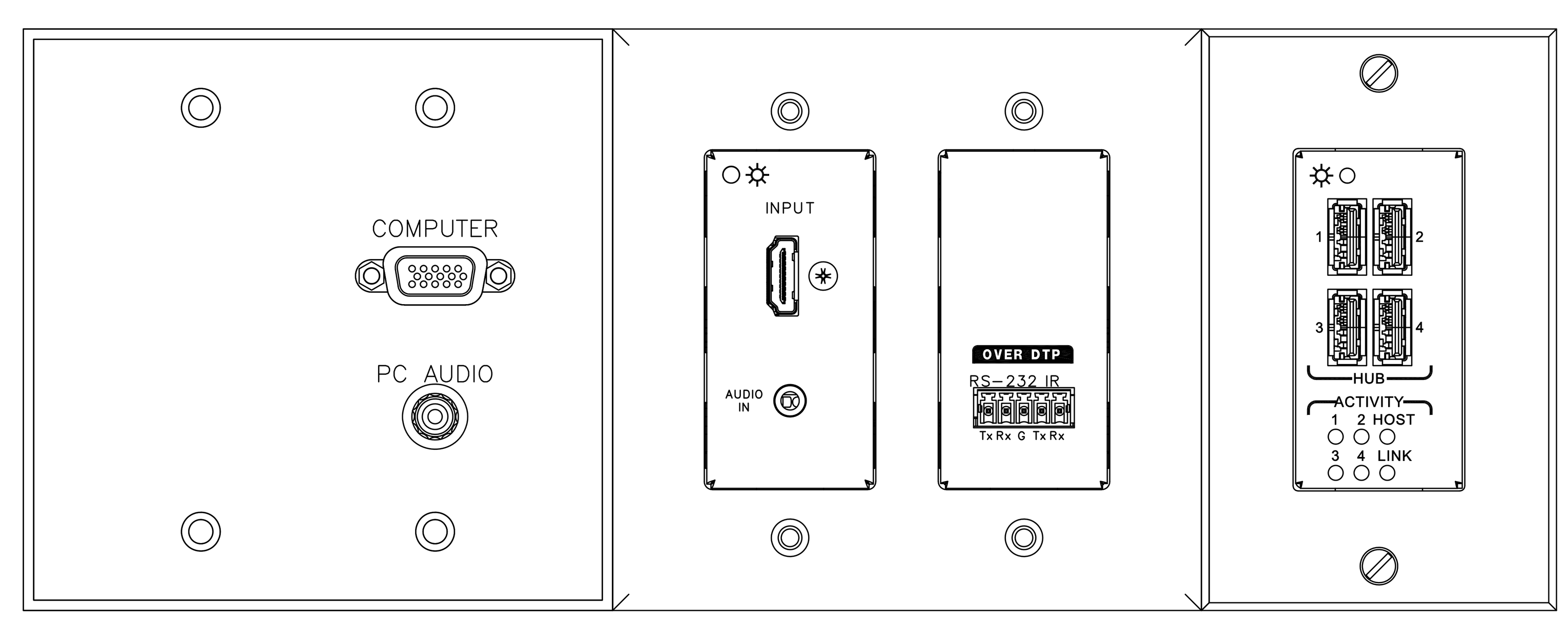
b. Electrical Boxes and Conduit: Electrical Contractor to provide electrical boxes and conduit below the floor, in the walls, and above the ceiling. Be responsible for all custom AV plates and the necessary cabling connecting to the system's equipment. There shall be a custom floorbox and rackplate location for input/output hook-ups during presentations. Confirm on site conditions prior to ordering.
c. Program/Speech Reinforcement Loudspeakers: Ceiling-mounted loudspeakers will be installed for monaural speech and stereo program audio signals. Take care not to damage the ceiling during installation, and repair or replace any damage caused during the installation. Audio inputs include, but are not limited to: personal computers, DVD/VHS Player/Recorder, HD TV Tuner, along with both wired and wireless microphones.
d. LCD Display: The LCD display shall be installed as detailed on the AV drawings.
e. Video Cameras: Wall mounted video cameras shall be provided at the front and back of the room as detailed on the AV drawings.
f. Instructor's Station: This station is to be located at the front the room. At this position, the station will have AV patch points via an associated room floorbox for connection to the room' system.
    1) The specified instructor's stations will house the following: remote control touchscreen, digital annotation device, digital document camera, keyboard/mouse, and gooseneck microphone.
    2) The station will be equipped with a task light. Unit to include a single duplex AC power receptacle on the work surface. Laptop access shall be provided.
g. Equipment Rack/Hardware: Provide rack and all equipment rack hardware, including vent panels, slide-out shelves, rack mounts and miscellaneous hardware for a complete and finished system. The equipment rack for this room shall be located as detailed on the AV series drawings. Provide cable management from the rack to associated wall plate.

7. Equipment List: On the following pages is the equipment list for this space. Each of these items shall be priced using both the equipment make and model shown, or components with equivalent functionality and of newer make, which meet or exceed the performance characteristics that are outlined for each component in the list. If an item is listed as "Custom," this means that the Contractor may use any manufacturer's component appropriate for the function and quality required for that item. Submit a "build" quality shop drawing for approval, on any custom items.



1 DEBRIEF ROOM SIGNAL FLOW

Scale: NTS



2 DEBRIEF ROOM WALL PLATE DETAIL

Scale: NTS

IF THIS DRAWING IS NOT 30"X42" IT IS A REDUCED PRINT

MARSHALL CRAFT ASSOCIATES

Architecture / Interior Design / Planning

Marshall Craft Associates, Inc.

6112 York Road, Baltimore, Maryland

410.532.3131 Fax: 410.532.9206

MCA JOB NO.	12032
PROJECT MANAGER:	R. BARTON
PROJECT DESIGNER:	

MECHANICAL/ELECTRICAL/PLUMBING ENGINEER
GIPE ASSOCIATES
410-822-8688

STRUCTURAL ENGINEER
HOPE FURRER ASSOCIATES
410-583-4874

CIVIL ENGINEER
DMS & ASSOCIATES
443-262-9130

GEOTECHNICAL ENGINEER
HILLIS-CARNES ENGINEERING
410-749-0940

AV/IT/SECURITY CONSULTANT
CONVERGENT TECHNOLOGIES
410-532-2395

SEAL:

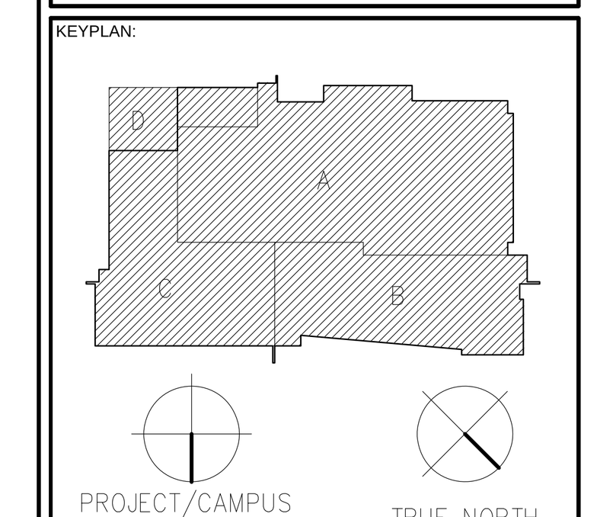
CHESAPEAKE COLLEGE CENTER FOR ALLIED HEALTH AND ATHLETICS - RENOVATION AND ADDITION

DGS PROJECT NO: CC-12-MC-420

Chesapeake College

GRAPHIC SCALES:

KEYPLAN:



REVISIONS:

NO.	DATE:	COMMENTS:
1	04/24/14	FF&E RE-BID
2	05/16/14	ADDENDUM 02

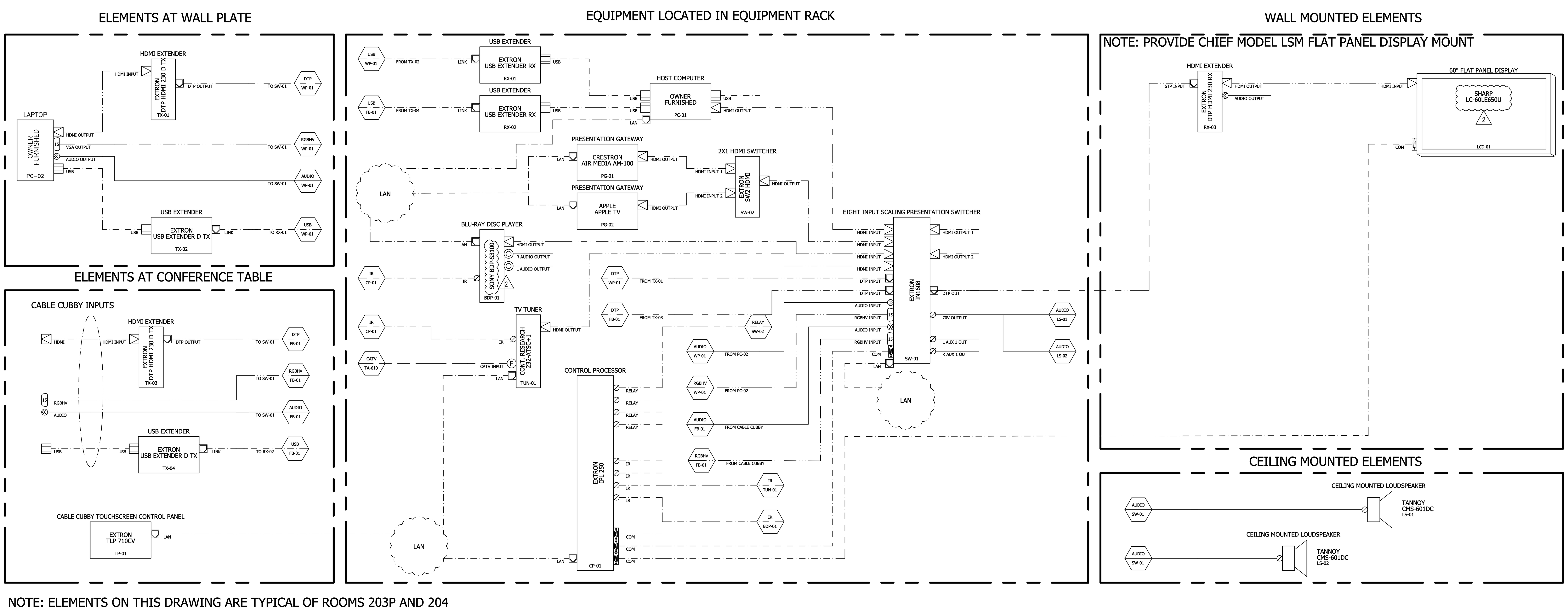
SHEET SET AND SHEET ISSUE DATE: FF&E 01/30/2014

SHEET NAME:

DEBRIEF ROOM 209 AUDIOVISUAL SIGNAL FLOW

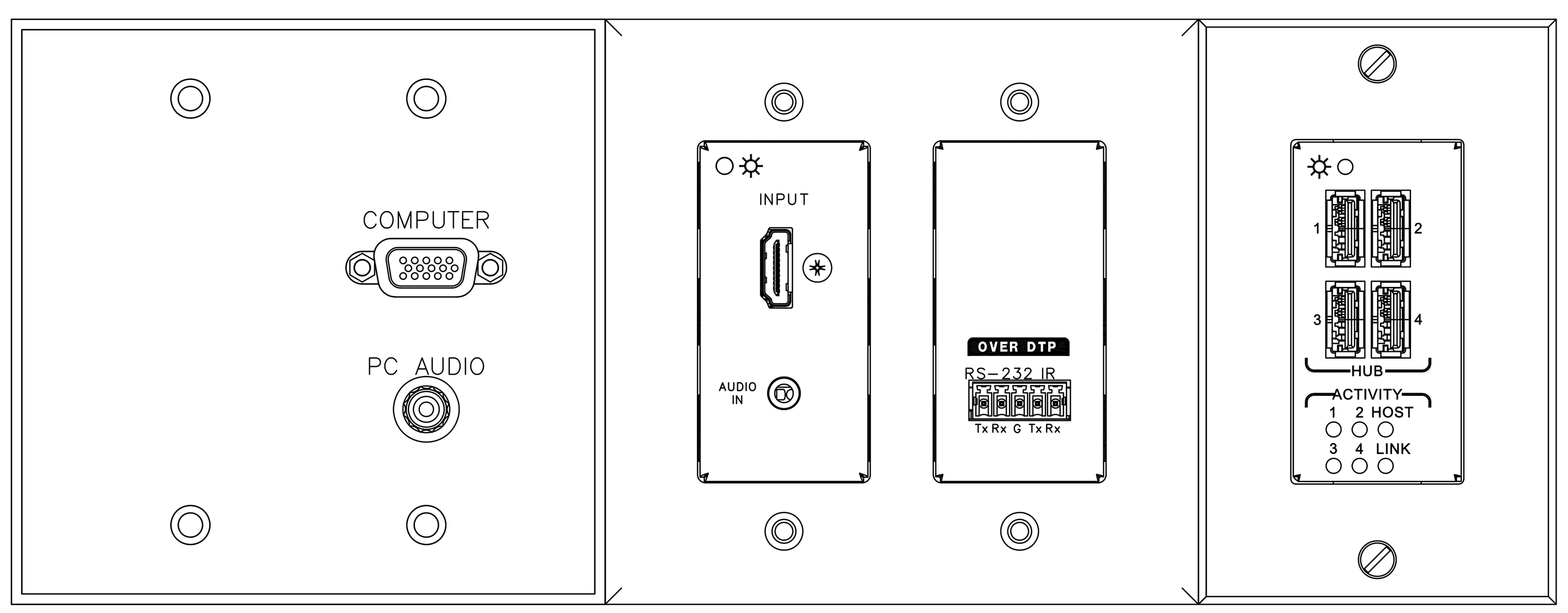
SHEET NO.

AV-500



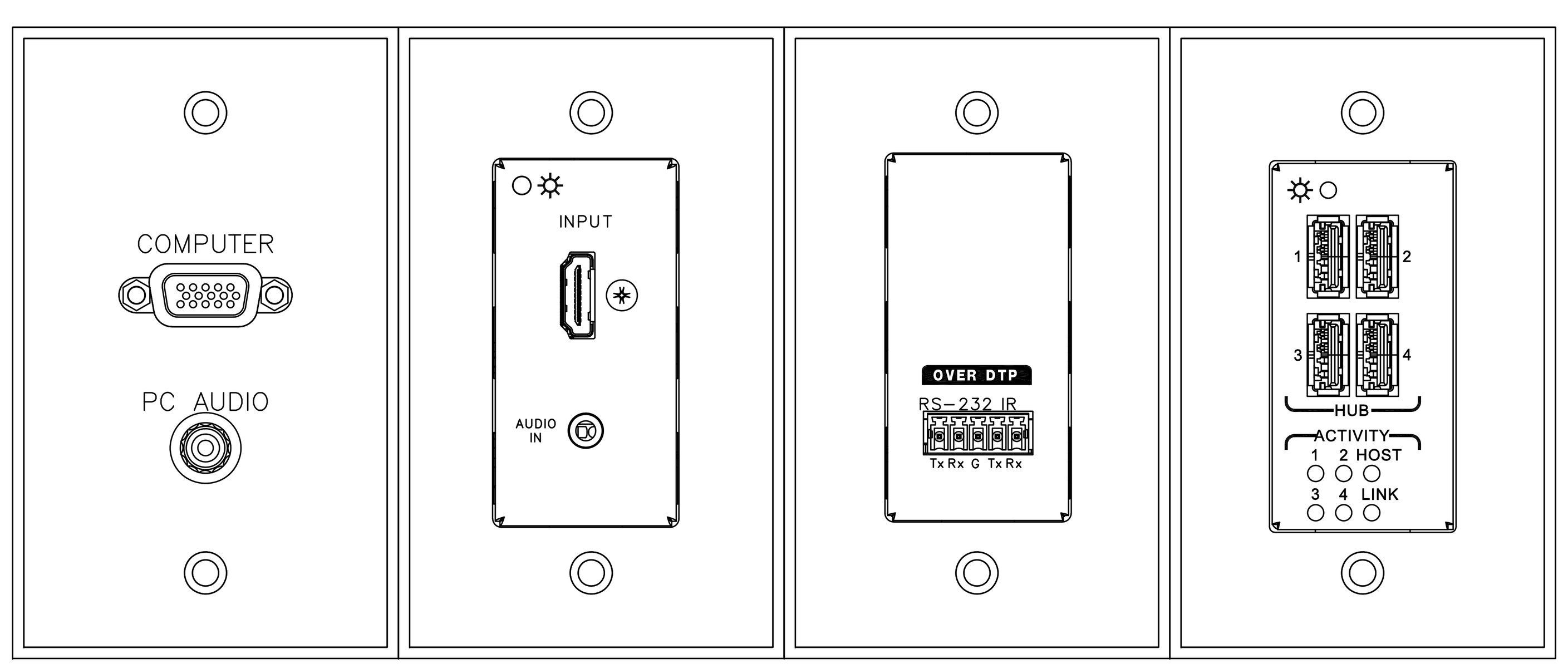
1 CONFERENCE ROOM SIGNAL FLOW

Scale: NTS



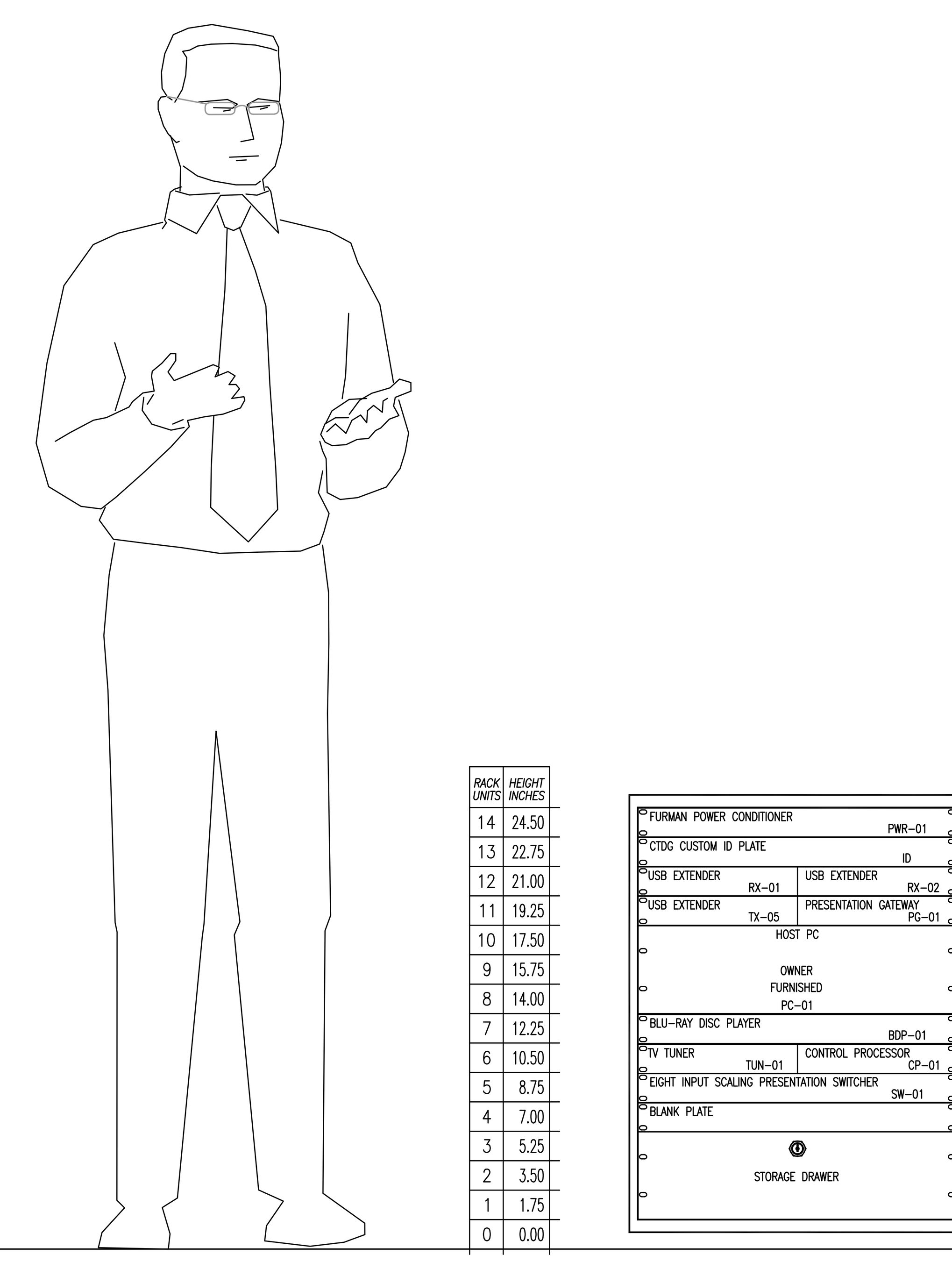
1 CONFERENCE ROOM WALL PLATE DETAIL

Scale: NTS



1 CONFERENCE ROOM FLOOR BOX PLATE DETAIL

Scale: NTS



1 CONFERENCE ROOM EQUIPMENT RACK ELEVATION

Scale: NTS

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MARSHALL CRAFT ASSOCIATES

Architecture / Interior Design / Planning

MCA JOB NO. 12032

PROJECT MANAGER: R. BARTON

PROJECT DESIGNER:

MECHANICAL/ELECTRICAL/PLUMBING ENGINEER
GIPE ASSOCIATES
410-822-8688

STRUCTURAL ENGINEER
HOPE FURRER ASSOCIATES
410-583-4874

CIVIL ENGINEER
DMS & ASSOCIATES
443-262-9130

GEOTECHNICAL ENGINEER
HILLIS-CARNES ENGINEERING
410-749-0940

AV/IT/SECURITY CONSULTANT
CONVERGENT TECHNOLOGIES
410-532-2395

SEAL:

CHESAPEAKE COLLEGE CENTER FOR ALLIED HEALTH AND ATHLETICS - RENOVATION AND ADDITION

DGS PROJECT NO: CC-12-MC-420

Chesapeake College

GRAPHIC SCALES:

KEYPLAN:

PROJECT/CAMPUS NORTH

TRUE NORTH

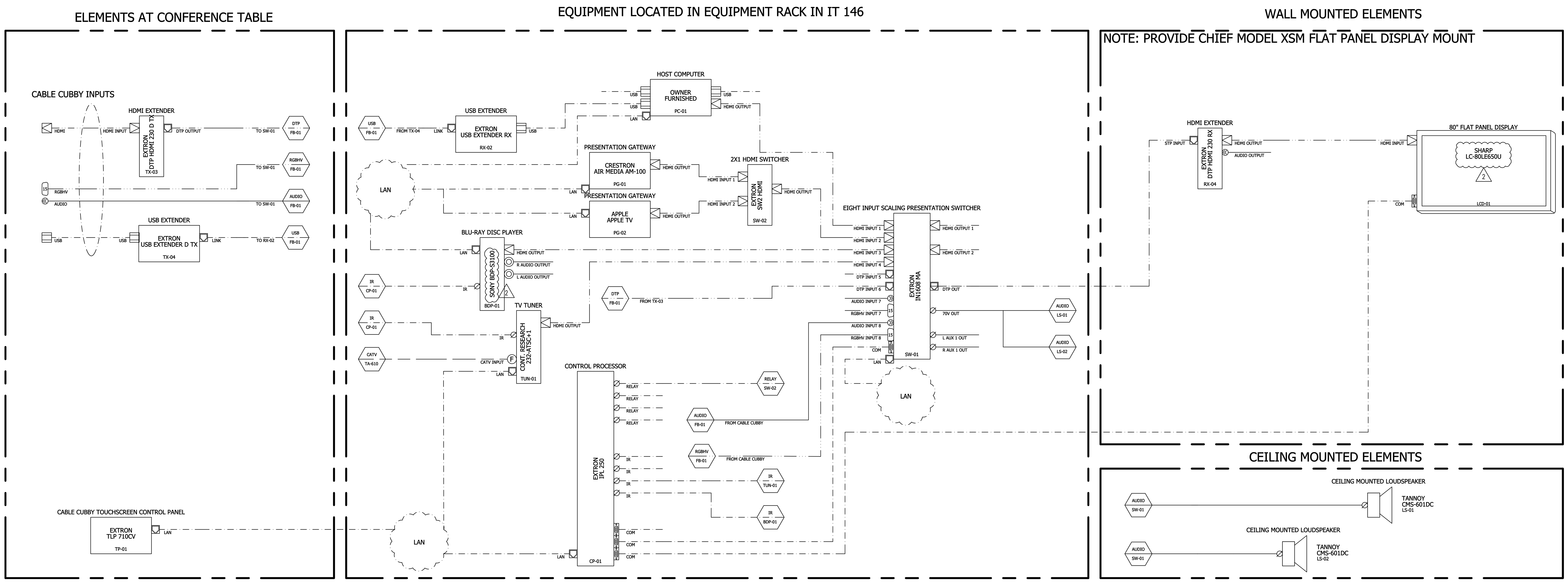
REVISIONS:

NO.	DATE:	COMMENTS:
1	04/24/14	FF&E RE-BID
2	05/16/14	ADDENDUM 02

SHEET SET AND SHEET ISSUE DATE: FF&E 01/30/2014

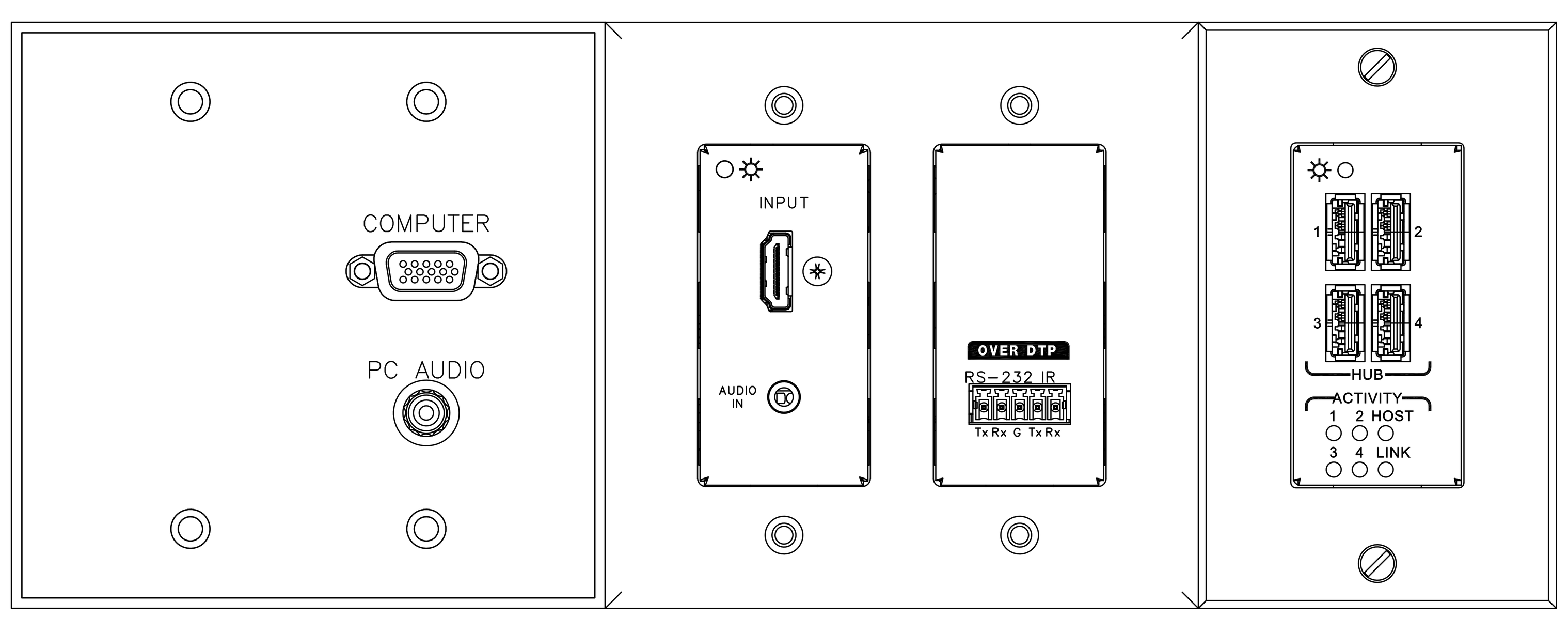
SHEET NAME: CONFERENCE ROOM AUDIOVISUAL SIGNAL FLOW

SHEET NO: AV-510



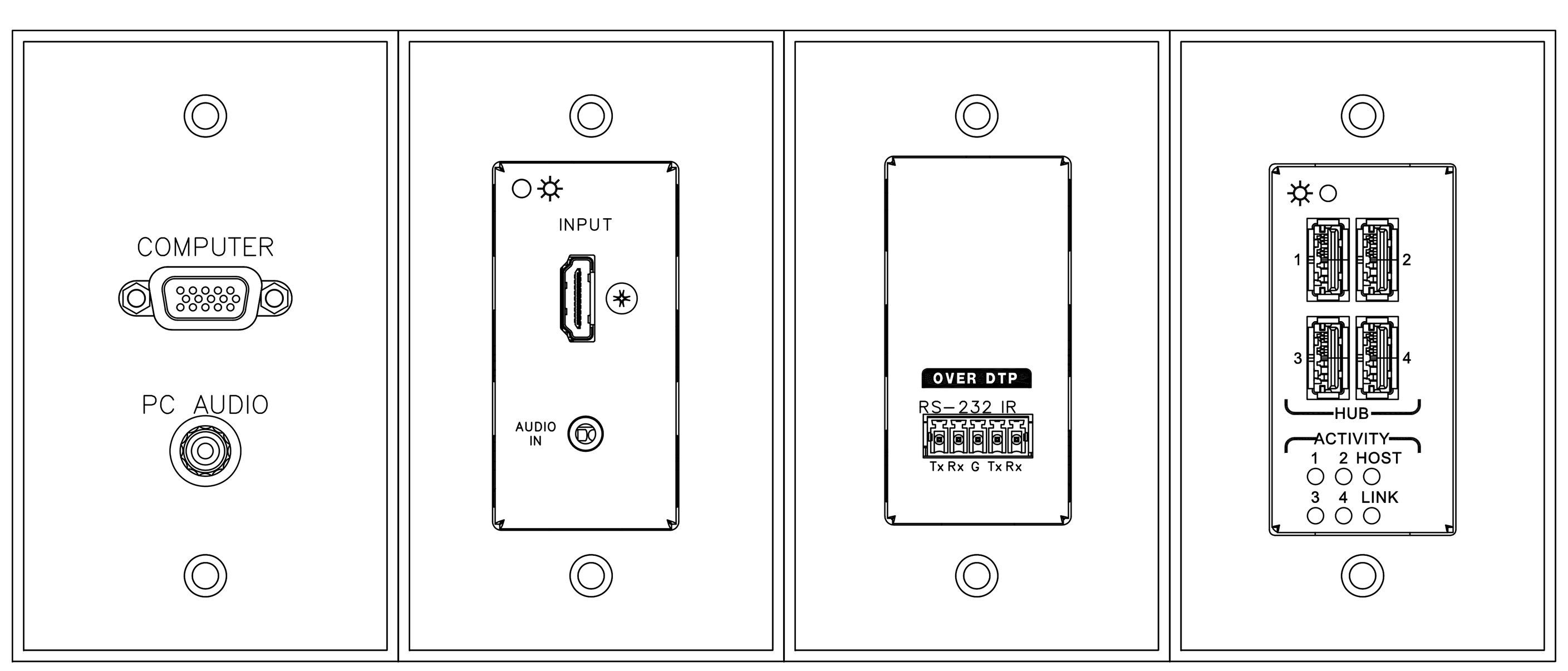
1 SEMINAR ROOM 137 SIGNAL FLOW

Scale: NTS



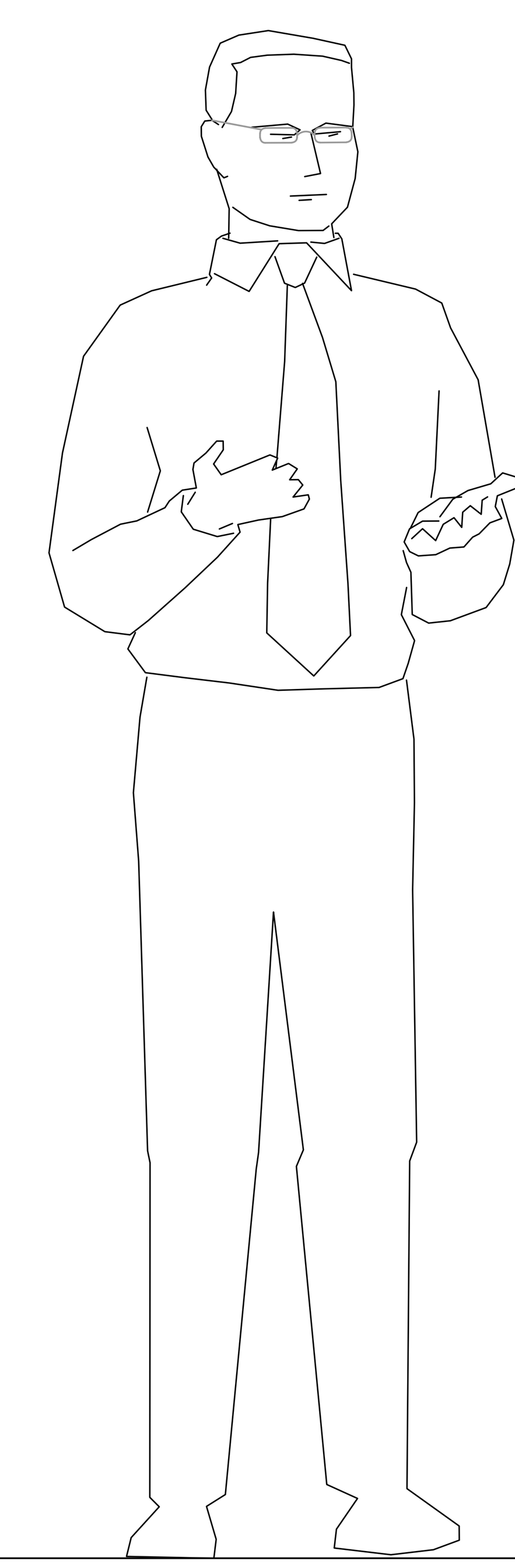
2 SEMINAR ROOM WALL PLATE DETAIL

Scale: NTS



3 SEMINAR ROOM FLOOR BOX PLATE DETAIL

Scale: NTS



RACK UNITS	HEIGHT INCHES
14	24.50
13	22.75
12	21.00
11	19.25
10	17.50
9	15.75
8	14.00
7	12.25
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2	3.50
1	1.75
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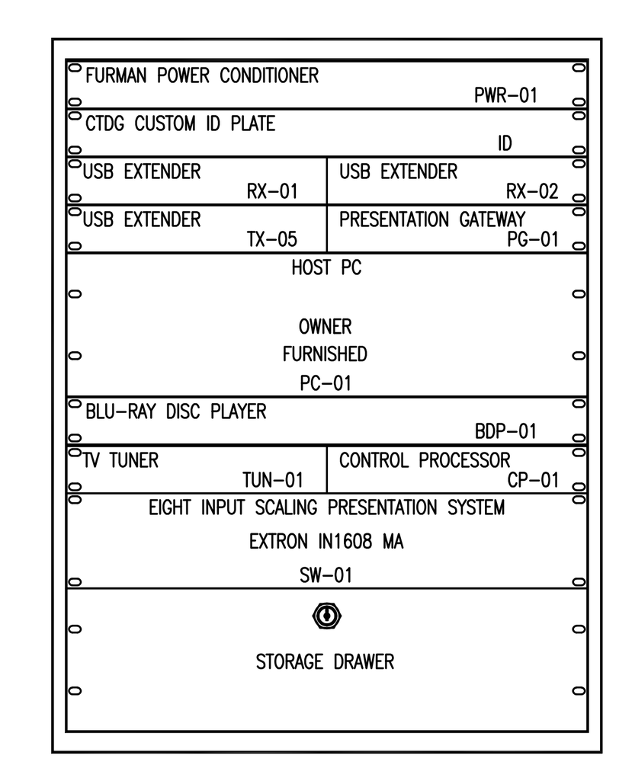

4 SEMINAR ROOM EQUIPMENT RACK ELEVATION

Scale: NTS

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Architecture / Interior Design / Planning

Marshall Craft Associates, Inc.

6112 York Road, Baltimore, Maryland 21212

410.532.3131 Fax: 410.532.9206

MCA JOB NO. 12032

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PROJECT DESIGNER:

MECHANICAL/ELECTRICAL/PLUMBING ENGINEER
GIPE ASSOCIATES
410-822-8688

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410-583-4874

CIVIL ENGINEER
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443-262-9130

GEOTECHNICAL ENGINEER
HILLIS-CARNES ENGINEERING
410-749-0940

AV/IT/SECURITY CONSULTANT
CONVERGENT TECHNOLOGIES
410-532-2395

SEAL:

CHESAPEAKE COLLEGE CENTER FOR ALLIED HEALTH AND ATHLETICS - RENOVATION AND ADDITION

DGS PROJECT NO: CC-12-MC-420

Chesapeake College

GRAPHIC SCALES:

SCALE: 1/16" = 1'-0"

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

SCALE: 1/4" = 1'-0"

SCALE: 3/4" = 1'-0"

SCALE: 1-1/2" = 1'-0"

SCALE: 3" = 1'-0"

KEYPLAN:

PROJECT/CAMPUS NORTH

TRUE NORTH

REVISIONS:

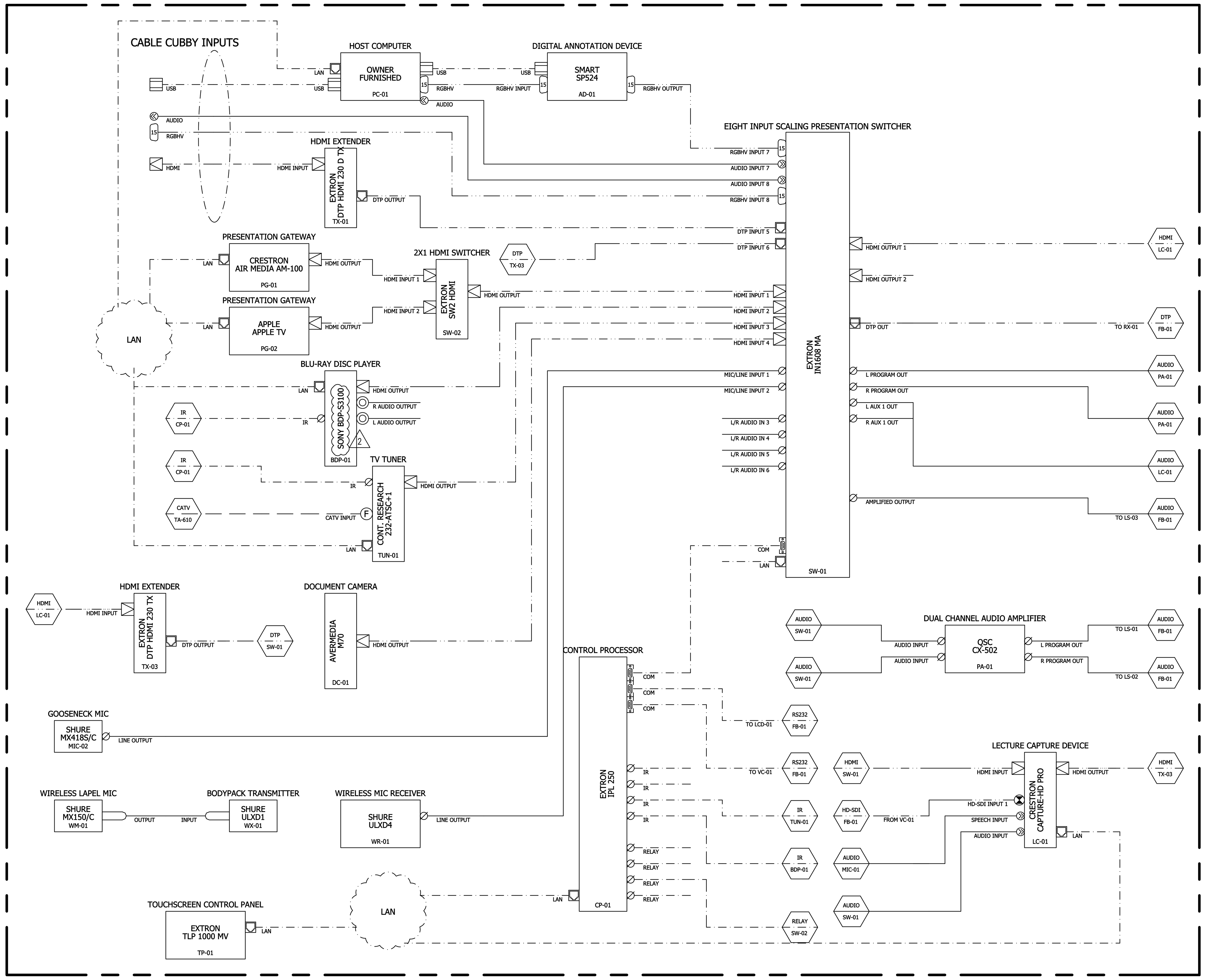
NO.	DATE:	COMMENTS:
1	04/24/14	FF&E RE-BID
2	05/16/14	ADDENDUM 02

SHEET SET AND SHEET ISSUE DATE: FF&E 01/30/2014

SHEET NAME: SEMINAR ROOM 137 AUDIOVISUAL SIGNAL FLOW

SHEET NO: AV-520

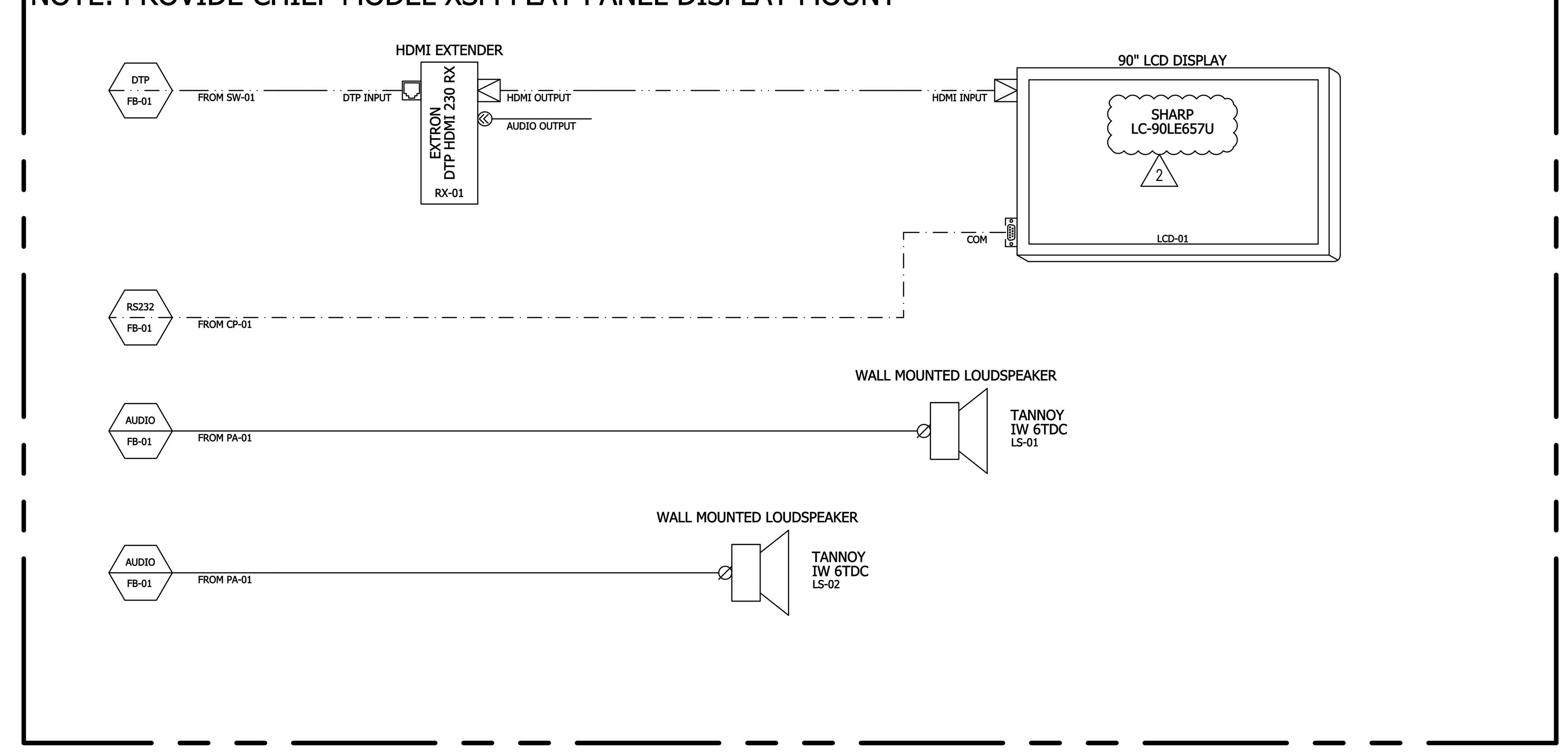
EQUIPMENT LOCATED IN LECTERN



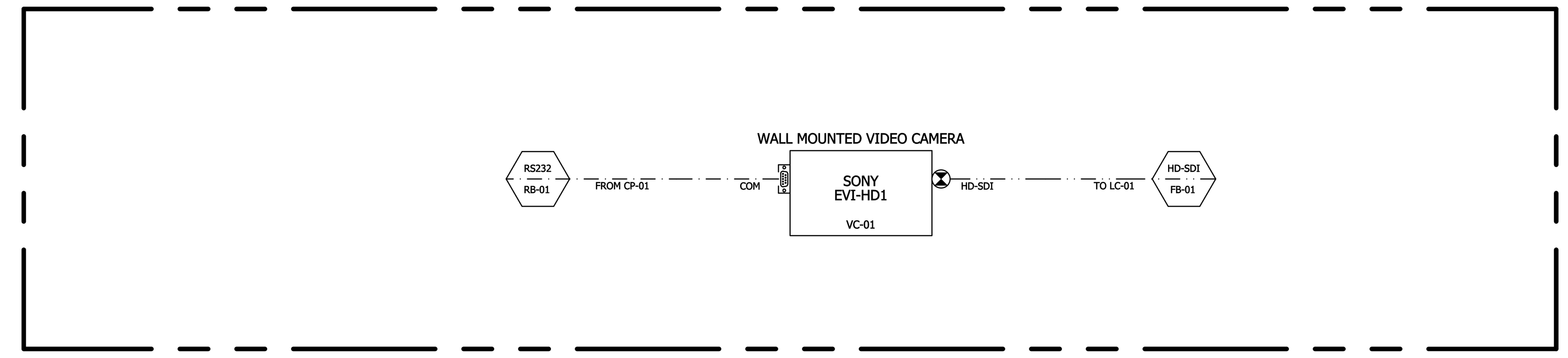
NOTE: ELEMENTS ON THIS DRAWING ARE TYPICAL OF ROOMS 131, 133, 139, 141, 143, AND 229B

FRONT WALL MOUNTED ELEMENTS

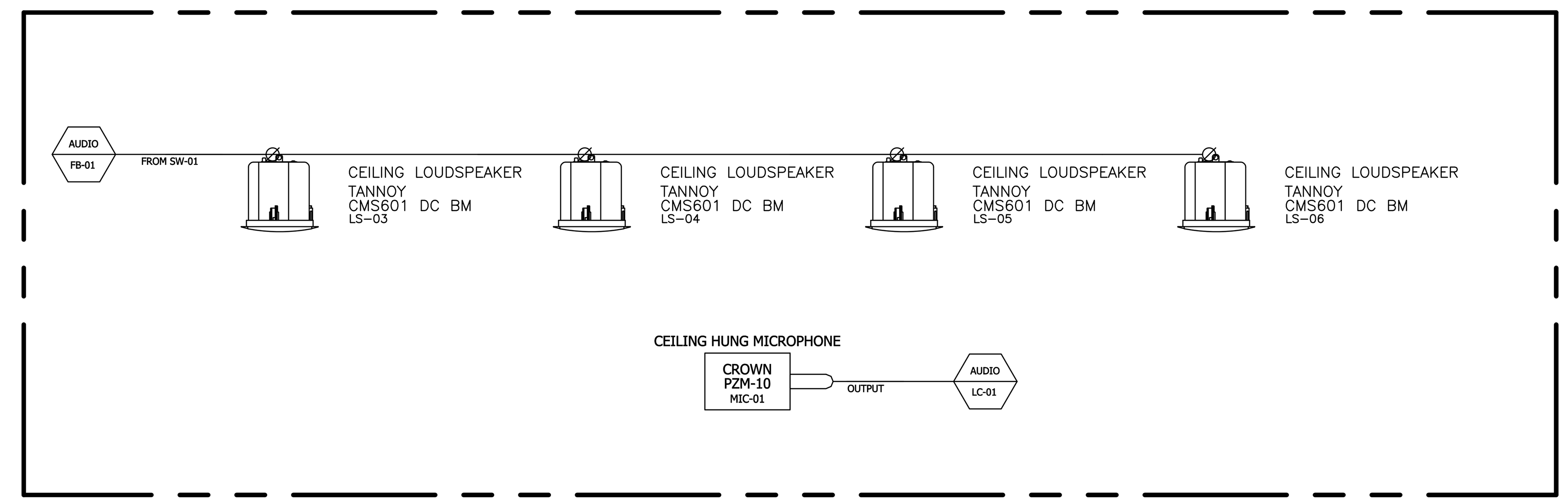
NOTE: PROVIDE CHIEF MODEL XSM FLAT PANEL DISPLAY MOUNT



REAR WALL MOUNTED ELEMENTS

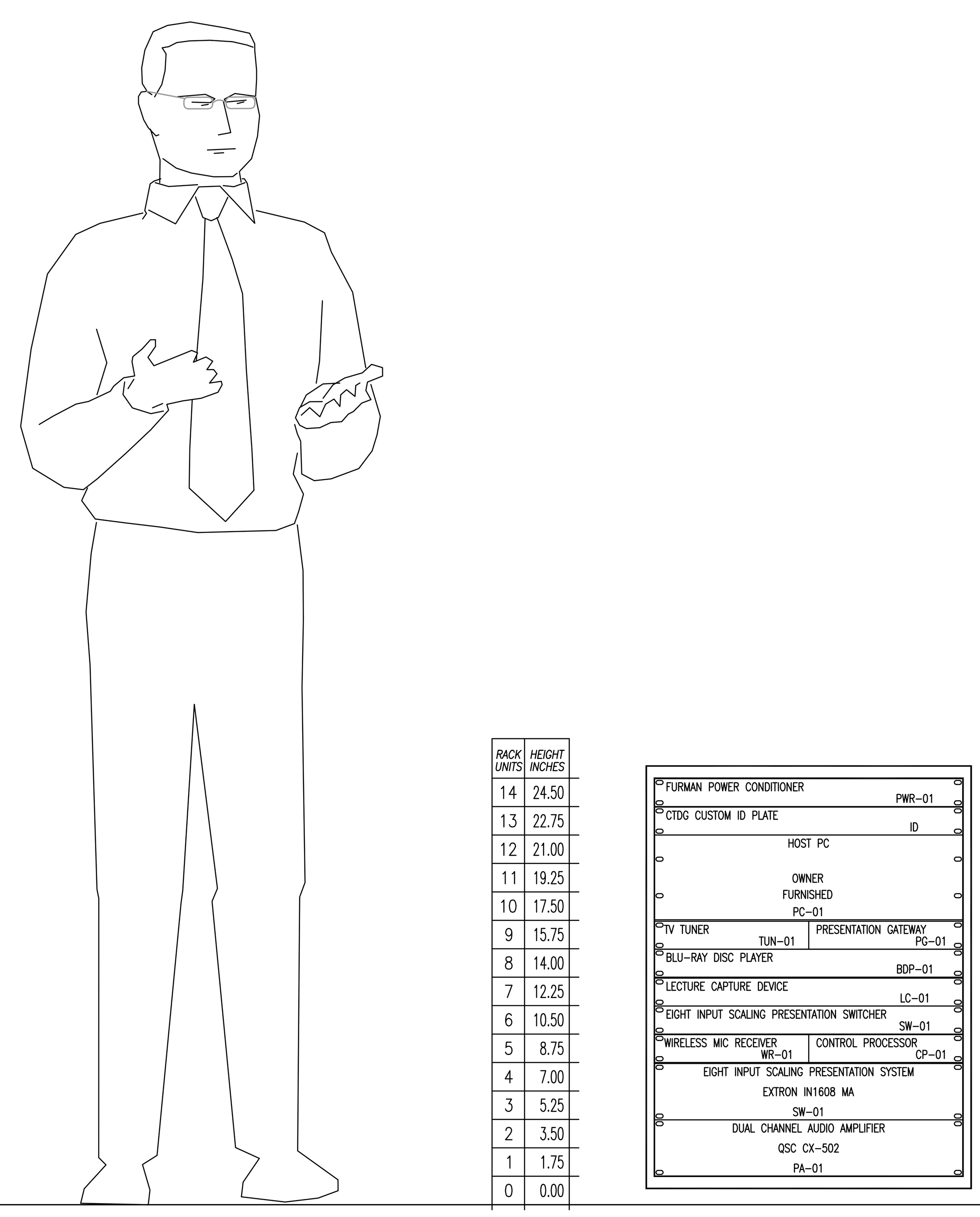


CEILING MOUNTED ELEMENTS



1 SHARED CLASSROOM SIGNAL FLOW

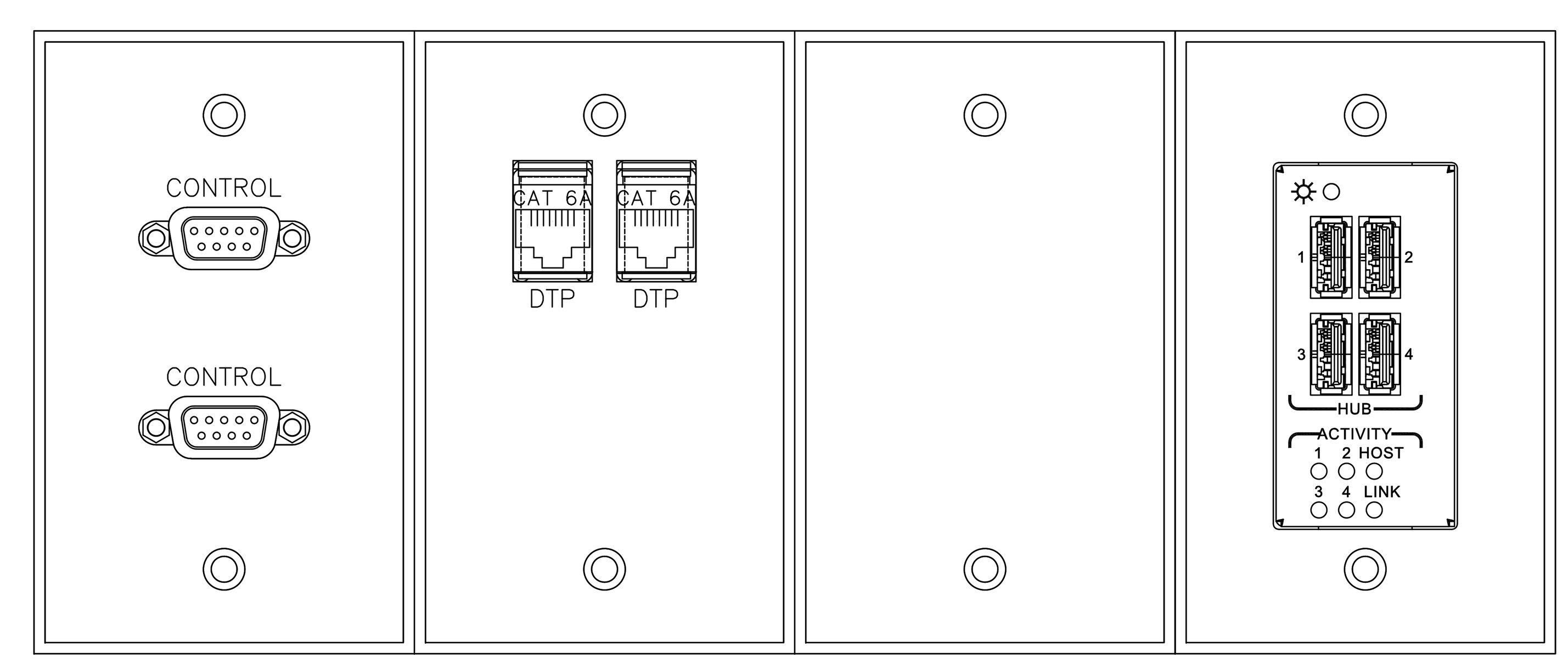
Scale: NTS



RACK UNITS	HEIGHT INCHES
14	24.50
13	22.75
12	21.00
11	19.25
10	17.50
9	15.75
8	14.00
7	12.25
6	10.50
5	8.75
4	7.00
3	5.25
2	3.50
1	1.75
0	0.00

2 SHARED CLASSROOM LECTERN RACK ELEVATION

Scale: NTS



1 SHARED CLASSROOM FLOOR BOX PLATE DETAIL

Scale: NTS

IF THIS DRAWING IS NOT 30"X42" IT IS A REDUCED PRINT

MARSHALL CRAFT ASSOCIATES
Architecture / Interior Design / Planning
6112 York Road, Baltimore, Maryland
410.532.3131 Phone
410.532.9206 Fax
MCA JOB NO.: 12032
PROJECT MANAGER: R. BARTON
PROJECT DESIGNER:
MECHANICAL/ELECTRICAL/PLUMBING ENGINEER
GIPE ASSOCIATES
410-822-8688
STRUCTURAL ENGINEER
HOPE FURRER ASSOCIATES
410-583-4874
CIVIL ENGINEER
DMS & ASSOCIATES
443-262-9130
GEOTECHNICAL ENGINEER
HILLIS-CARNES ENGINEERING
410-749-0940
AV/IT/SECURITY CONSULTANT
CONVERGENT TECHNOLOGIES
410-532-2395

SEAL:

CHESAPEAKE COLLEGE CENTER FOR ALLIED HEALTH AND ATHLETICS - RENOVATION AND ADDITION

DGS PROJECT NO: CC-12-MC-420

Chesapeake College

GRAPHIC SCALES:

SCALE: 1/16" = 1'-0"

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

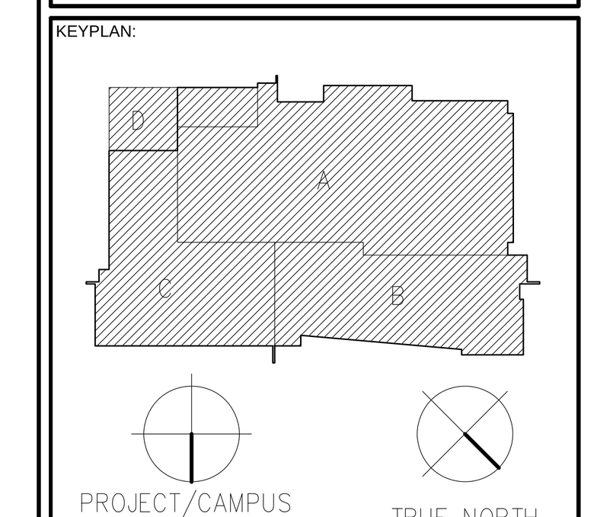
SCALE: 1/4" = 1'-0"

SCALE: 3/4" = 1'-0"

SCALE: 1-1/2" = 1'-0"

SCALE: 3" = 1'-0"

KEYPLAN:



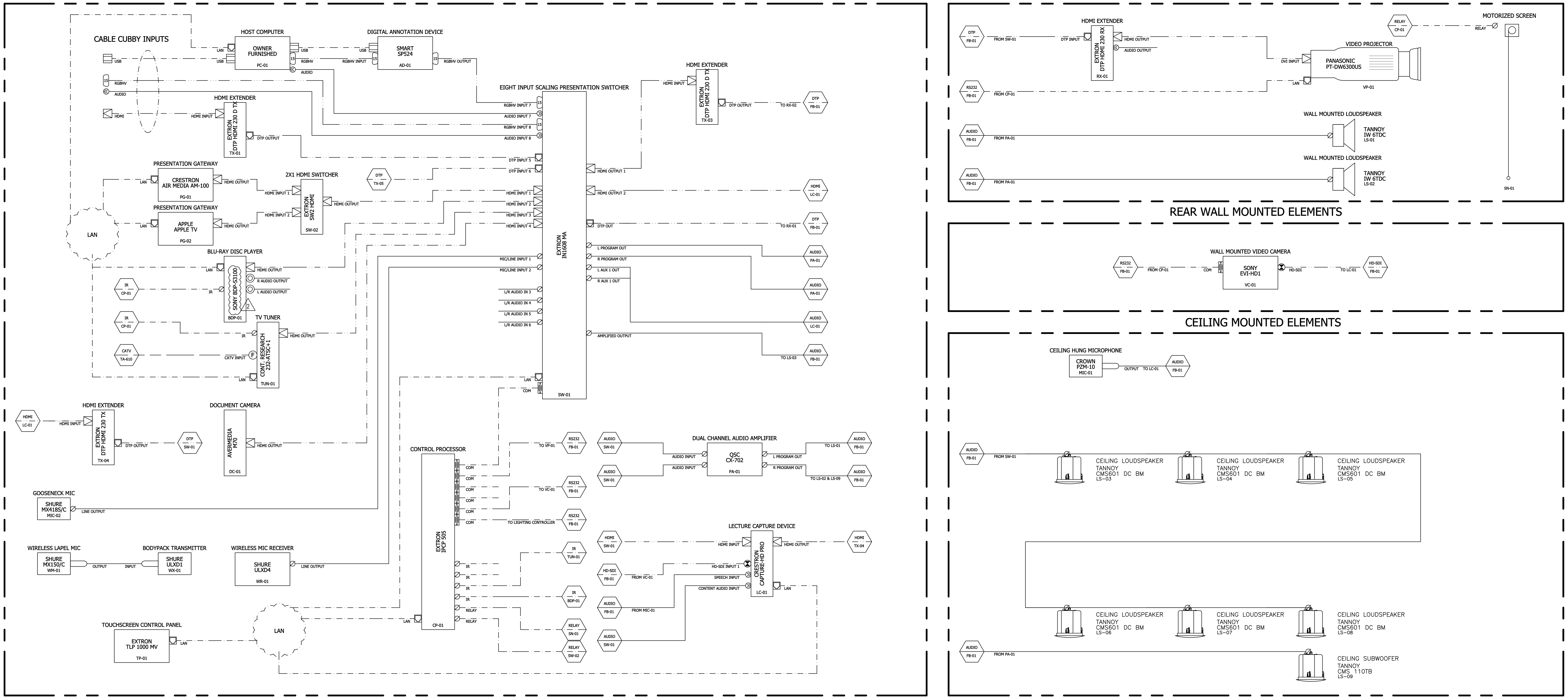
REVISIONS:

NO.	DATE:	COMMENTS:
1	04/24/14	FF&E RE-BID
2	05/16/14	ADDENDUM 02

SHEET SET AND SHEET ISSUE DATE: FF&E 01/30/2014

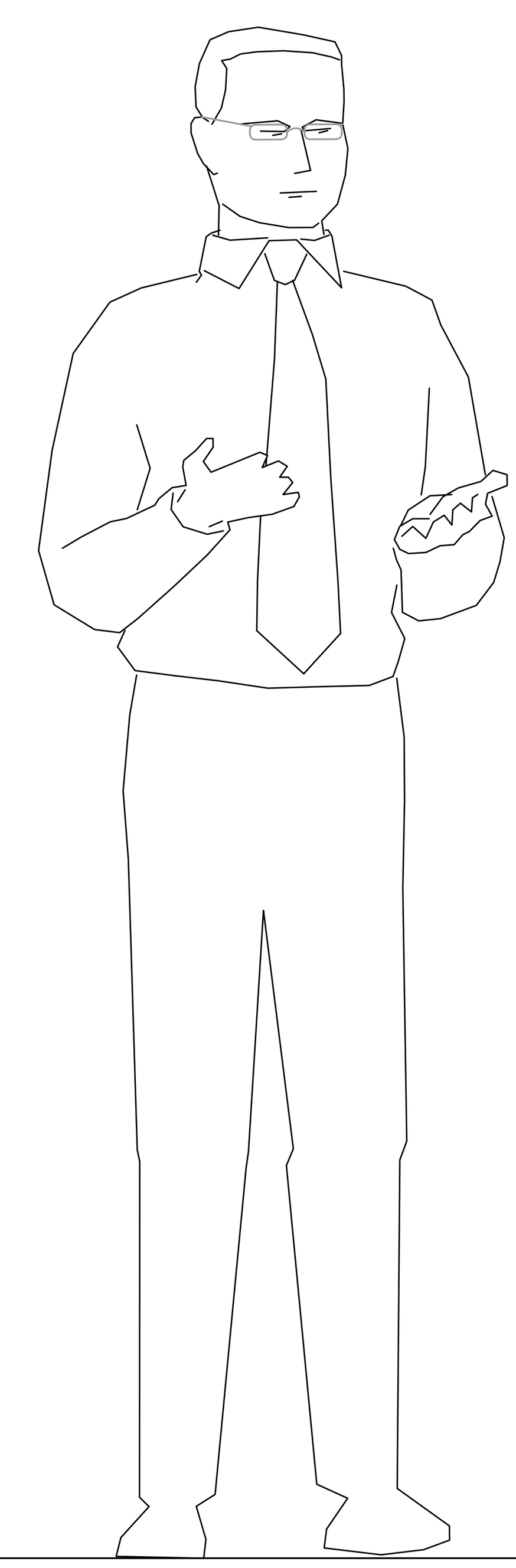
SHEET NAME: SHARED CLASSROOM AUDIOVISUAL SIGNAL FLOW

SHEET NO.: AV-530

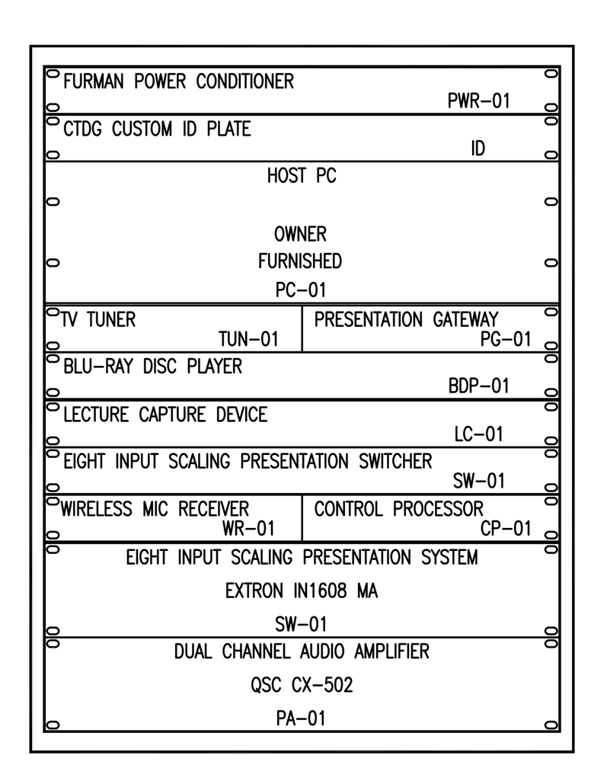


1 SHARED LECTURE HALL SIGNAL FLOW

Scale: NTS

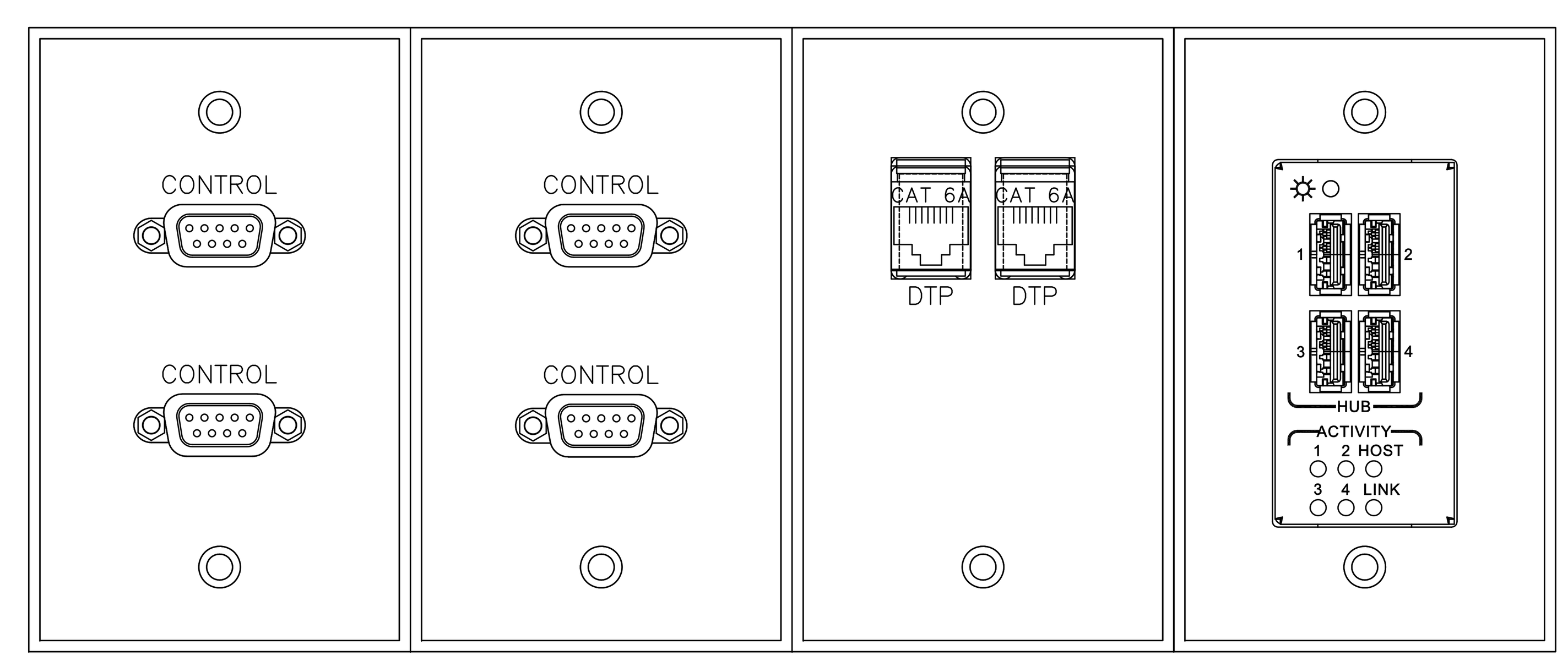


RACK UNITS	HEIGHT INCHES
14	24.50
13	22.75
12	21.00
11	19.25
10	17.50
9	15.75
8	14.00
7	12.25
6	10.50
5	8.75
4	7.00
3	5.25
2	3.50
1	1.75
0	0.00



2 SHARED LECTURE HALL LECTERN RACK ELEVATION

Scale: NTS



3 SHARED LECTURE HALL FLOORBOX PLATE DETAIL

Scale: NTS

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MARSHALL CRAFT ASSOCIATES
Architecture / Interior Design / Planning
Marshall Craft Associates, Inc.
6112 York Road, Baltimore, Maryland
410.532.3131 Fax: 410.532.9206

MCA JOB NO. 12032

PROJECT MANAGER: R. BARTON
PROJECT DESIGNER:

MECHANICAL/ELECTRICAL/PLUMBING ENGINEER
GIPE ASSOCIATES
410-822-8688

STRUCTURAL ENGINEER
HOPE FURRER ASSOCIATES
410-583-4874

CIVIL ENGINEER
DMS & ASSOCIATES
443-262-9130

GEOTECHNICAL ENGINEER
HILLIS-CARNES ENGINEERING
410-749-0940

AV/IT/SECURITY CONSULTANT
CONVERGENT TECHNOLOGIES
410-532-2395

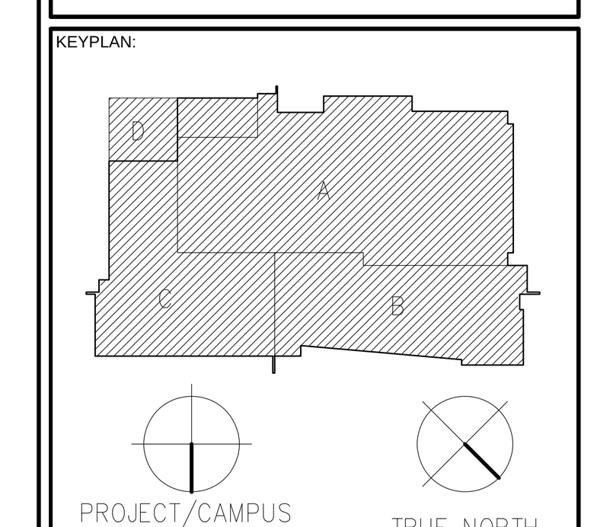
SEAL:

CHESAPEAKE COLLEGE CENTER FOR ALLIED HEALTH AND ATHLETICS - RENOVATION AND ADDITION

DGS PROJECT NO: CC-12-MC-420

Chesapeake College

GRAPHIC SCALES:



KEYPLAN:
PROJECT/CAMPUS NORTH
TRUE NORTH

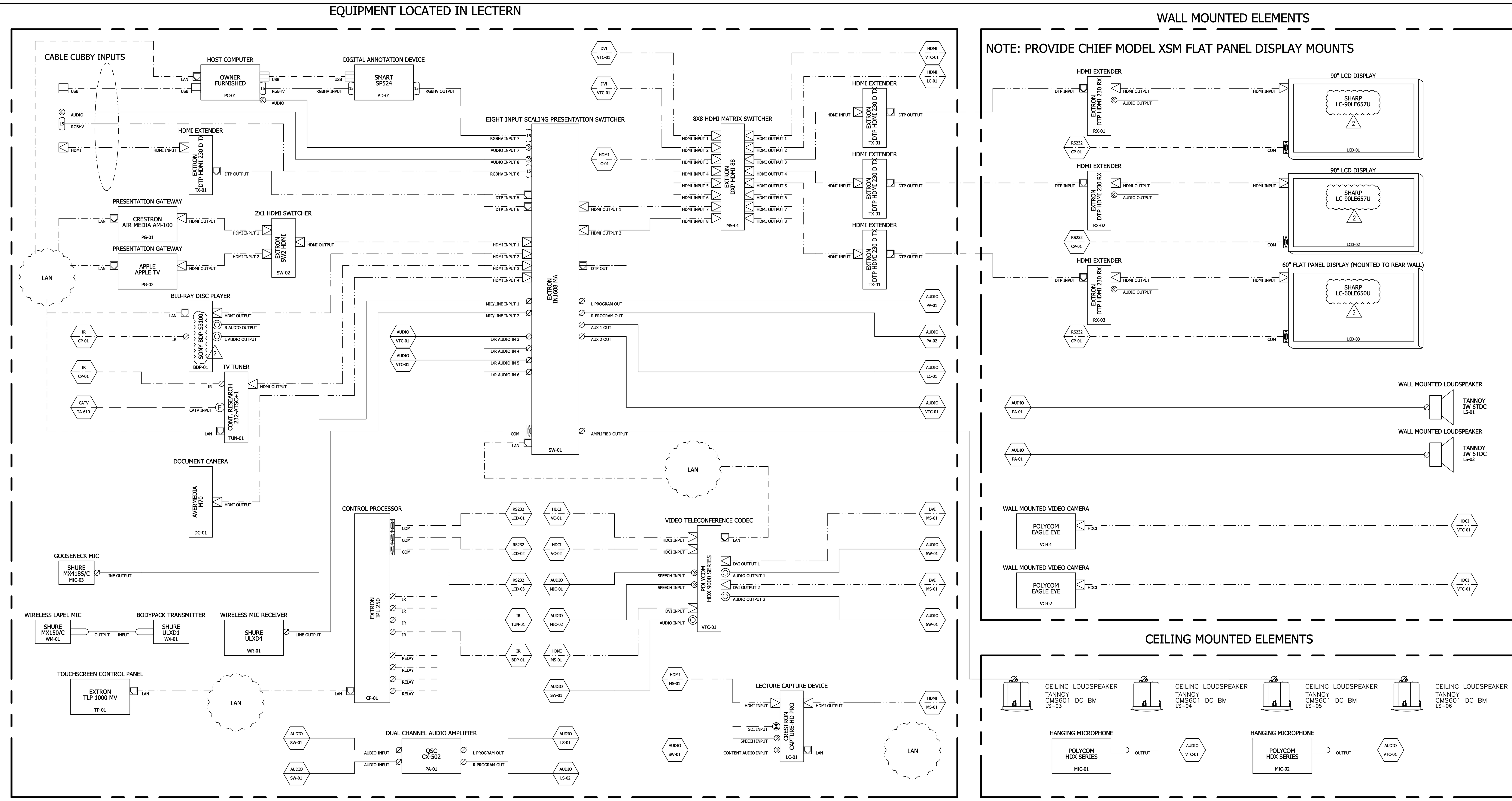
REVISIONS:

NO.	DATE:	COMMENTS:
1	04/24/14	FF&E RE-BID
2	05/16/14	ADDENDUM 02

SHEET SET AND SHEET ISSUE DATE: FF&E 01/30/2014

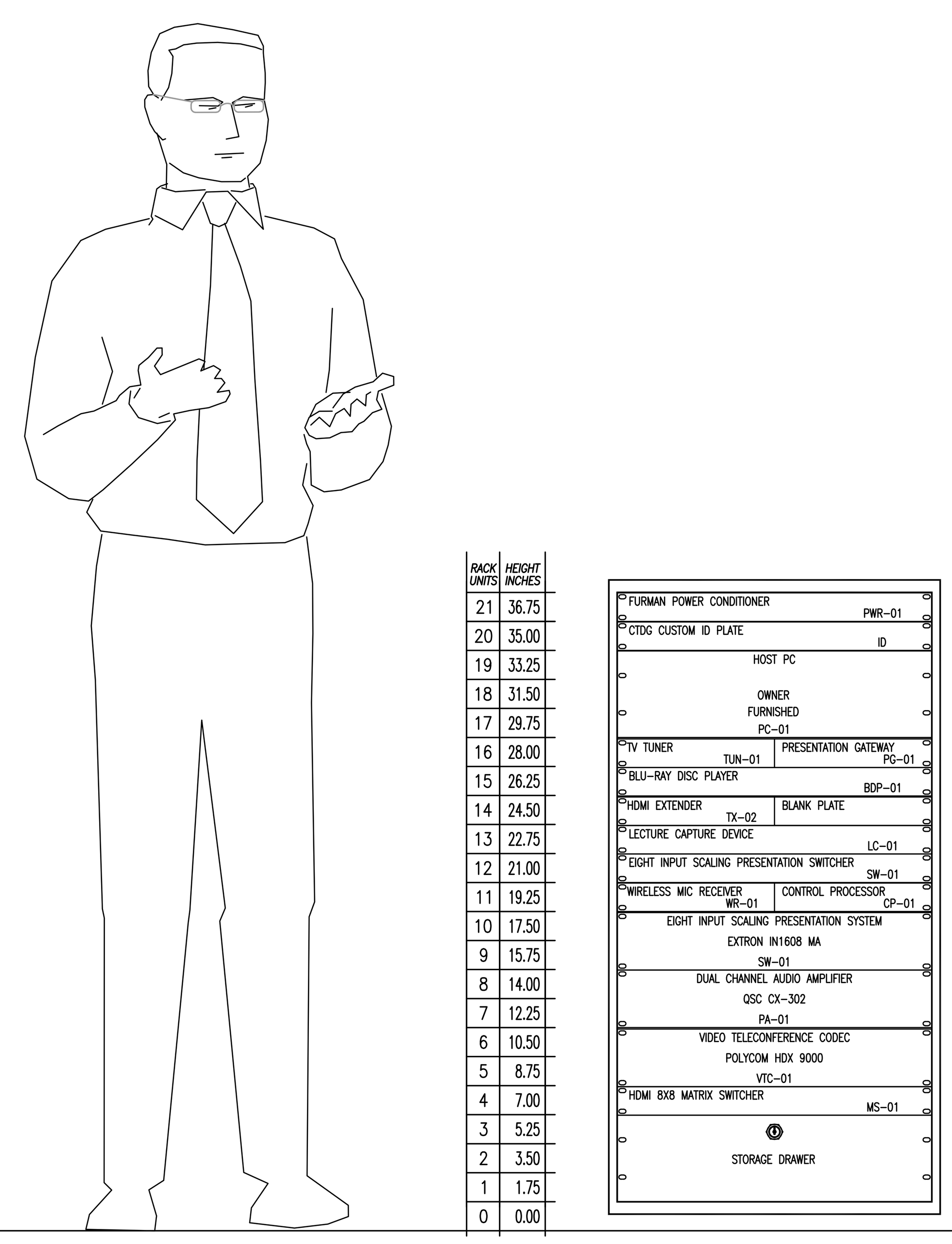
SHEET NAME: **SHARED LECTURE HALL AUDIOVISUAL SIGNAL FLOW**

SHEET NO. AV-540



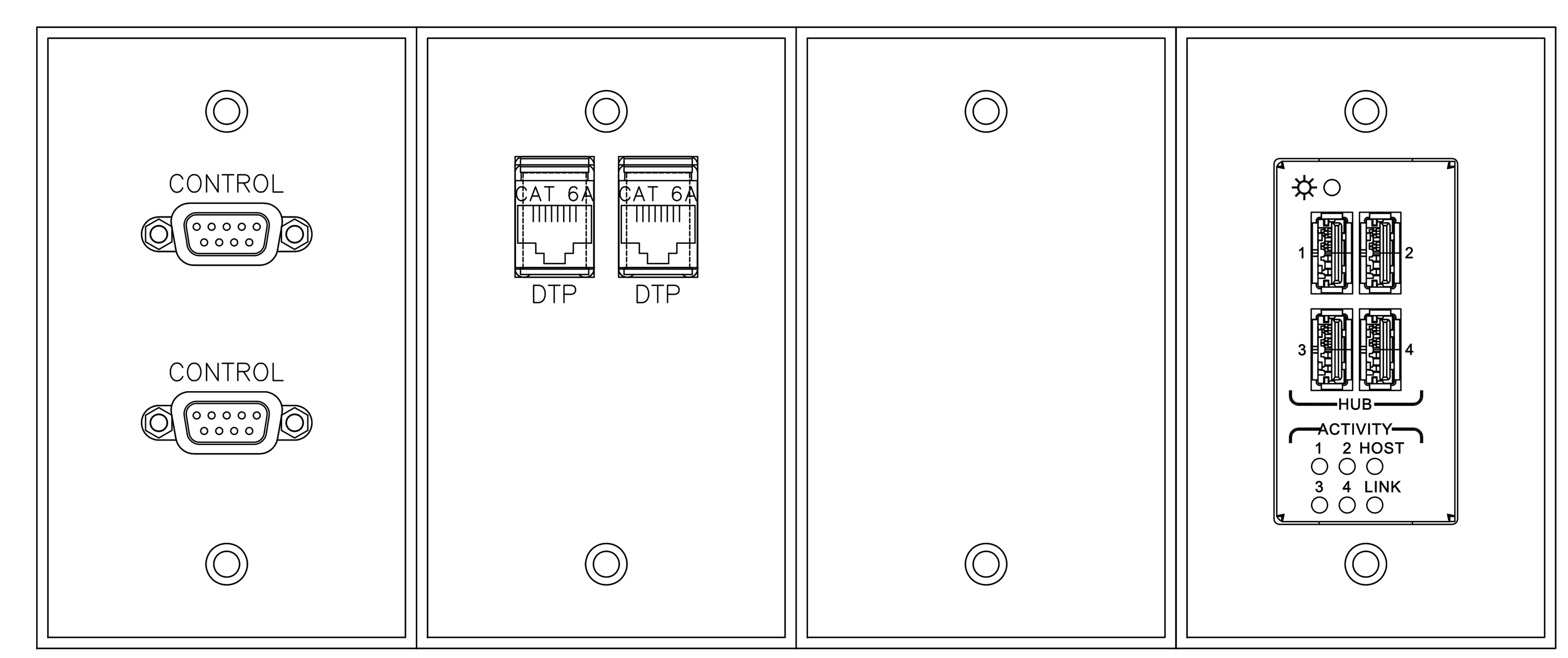
1 DISTANCE LEARNING CLASSROOM SIGNAL FLOW

Scale: NTS



2 DISTANCE LEARNING CLASSROOM LECTERN RACK ELEVATION

Scale: NTS



3 DISTANCE LEARNING CLASSROOM FLOORBOX PLATE DETAIL

Scale: NTS

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MARSHALL CRAFT ASSOCIATES
Architecture / Interior Design /
MCA JOB NO. 12032
PROJECT MANAGER: R. BARTON
PROJECT DESIGNER:

MECHANICAL/ELECTRICAL/PLUMBING ENGINEER
GIPE ASSOCIATES
410-822-8688

STRUCTURAL ENGINEER
HOPE FURRER ASSOCIATES
410-583-4874

CIVIL ENGINEER
DMS & ASSOCIATES
443-262-9130

GEOTECHNICAL ENGINEER
HILLIS-CARNES ENGINEERING
410-749-0940

AV/IT/SECURITY CONSULTANT
CONVERGENT TECHNOLOGIES
410-532-2395

SEAL:

CHESAPEAKE COLLEGE CENTER FOR ALLIED HEALTH AND ATHLETICS - RENOVATION AND ADDITION

DGS PROJECT NO: CC-12-MC-420

Chesapeake College

GRAPHIC SCALES:

KEYPLAN:

PROJECT/CAMPUS NORTH — TRUE NORTH

REVISIONS:

NO.	DATE:	COMMENTS:
1	04/24/14	FF&E RE-BID
2	05/16/14	ADDENDUM 02

SHEET SET AND SHEET ISSUE DATE: FF&E 01/30/2014

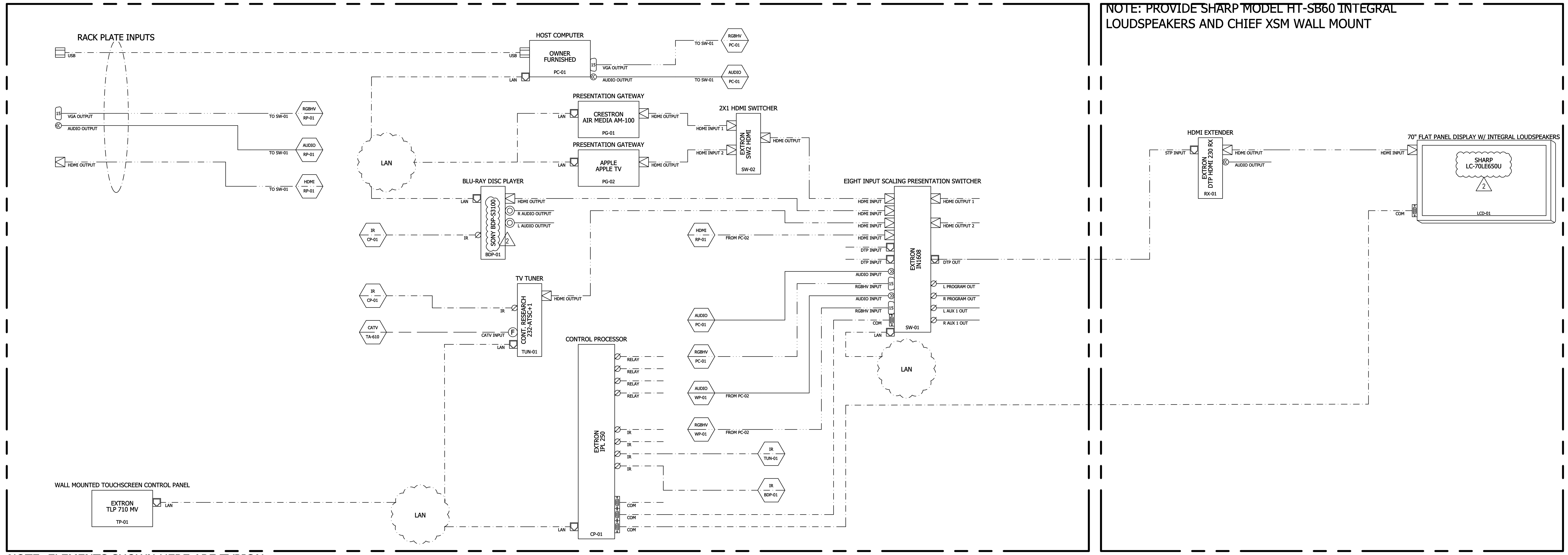
SHEET NAME: DISTANCE LEARNING CLASSROOM AUDIOVISUAL SIGNAL FLOW

SHEET NO.: AV-550

EQUIPMENT LOCATED IN EQUIPMENT RACK

WALL MOUNTED ELEMENTS

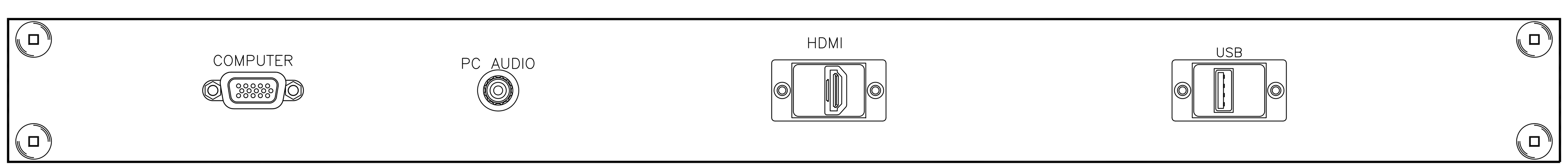
NOTE: PROVIDE SHARP MODEL HT-SB60 INTEGRAL LOUDSPEAKERS AND CHIEF XSM WALL MOUNT



NOTE: ELEMENTS SHOWN HERE ARE TYPICAL OF ROOMS 121 AND 124.

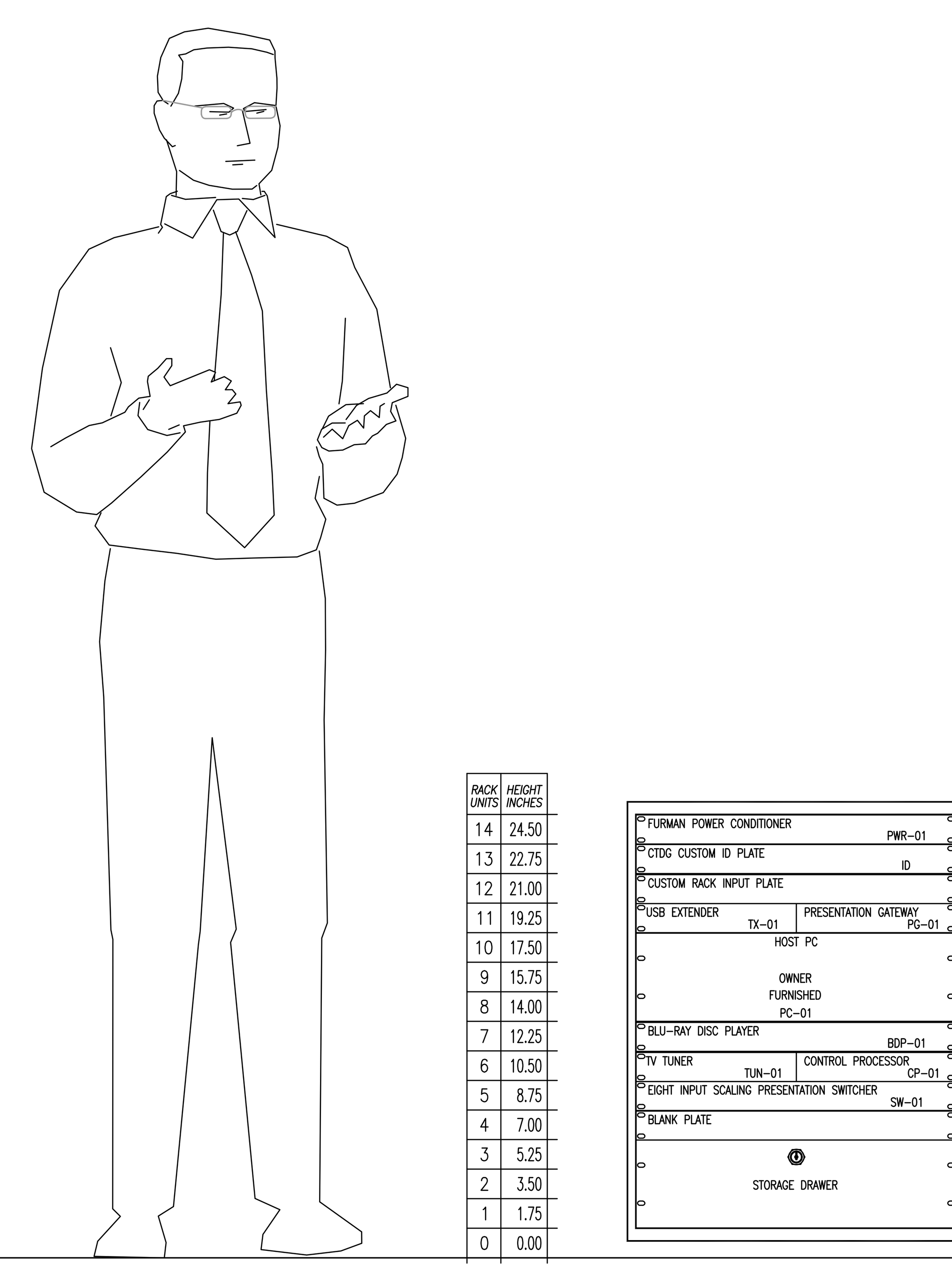
1 TEAM ROOM SIGNAL FLOW

Scale: NTS



2 TEAM ROOM RACK PLATE DETAIL

Scale: NTS



3 TEAM ROOM EQUIPMENT RACK ELEVATION

Scale: NTS

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MARSHALL CRAFT ASSOCIATES
Architecture / Interior Design / Planning
Marshall Craft Associates, Inc.
6112 York Road, Baltimore, Maryland
410.532.3131 Fax: 410.532.9206

MCA JOB NO. 12032

PROJECT MANAGER: R. BARTON

PROJECT DESIGNER:

MECHANICAL/ELECTRICAL/PLUMBING ENGINEER
GIPE ASSOCIATES
410-822-8688

STRUCTURAL ENGINEER
HOPE FURRER ASSOCIATES
410-583-4874

CIVIL ENGINEER
DMS & ASSOCIATES
443-262-9130

GEOTECHNICAL ENGINEER
HILLIS-CARNES ENGINEERING
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SEAL:

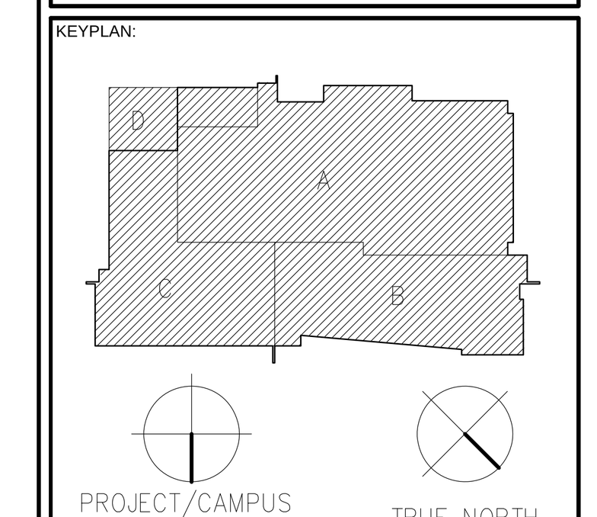
CHESAPEAKE COLLEGE CENTER FOR ALLIED HEALTH AND ATHLETICS - RENOVATION AND ADDITION

DGS PROJECT NO: CC-12-MC-420

Chesapeake College

GRAPHIC SCALES:

KEYPLAN:



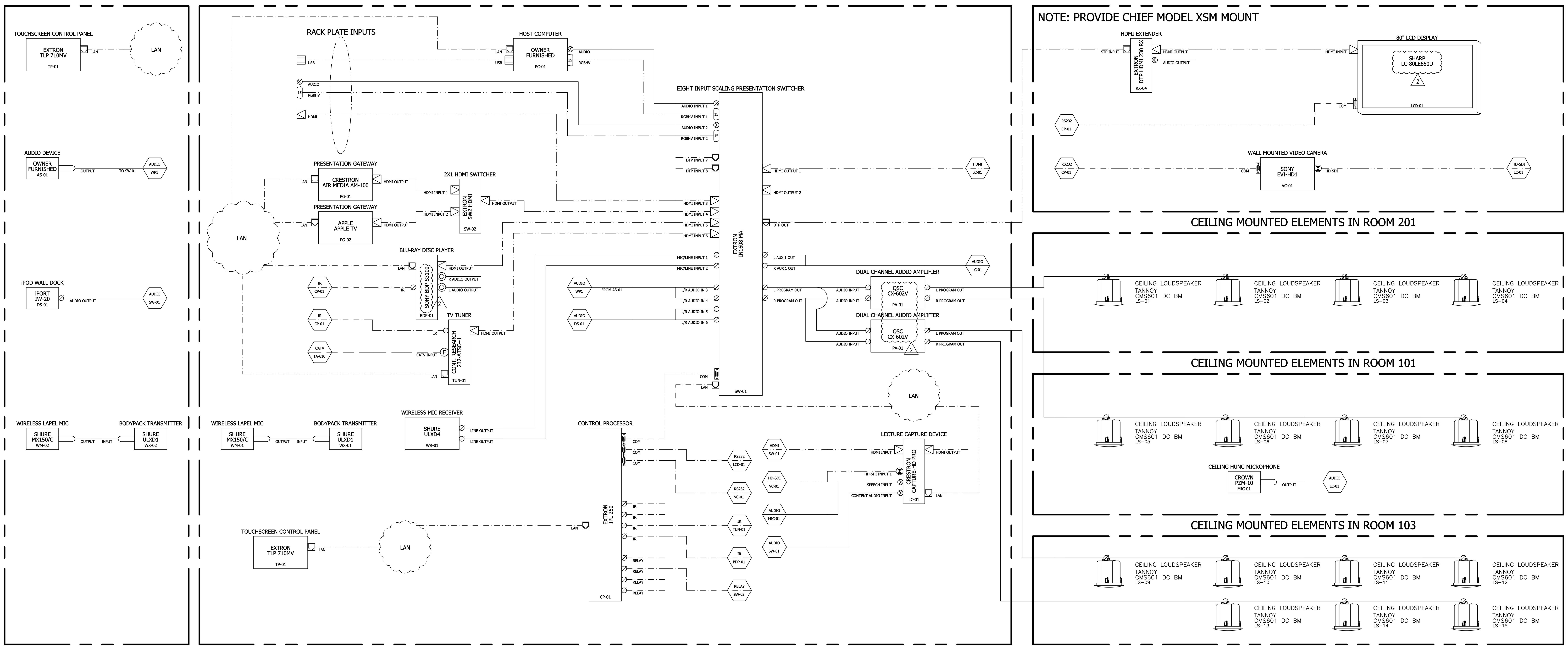
REVISIONS:

NO.	DATE:	COMMENTS:
1	04/24/14	FF&E RE-BID
2	05/16/14	ADDENDUM 02

SHEET SET AND SHEET ISSUE DATE: FF&E 01/30/2014

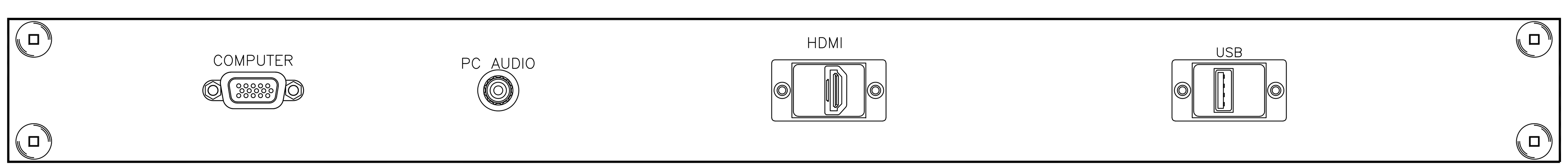
SHEET NAME: **TEAM ROOM AUDIOVISUAL SIGNAL FLOW**

SHEET NO. AV-560



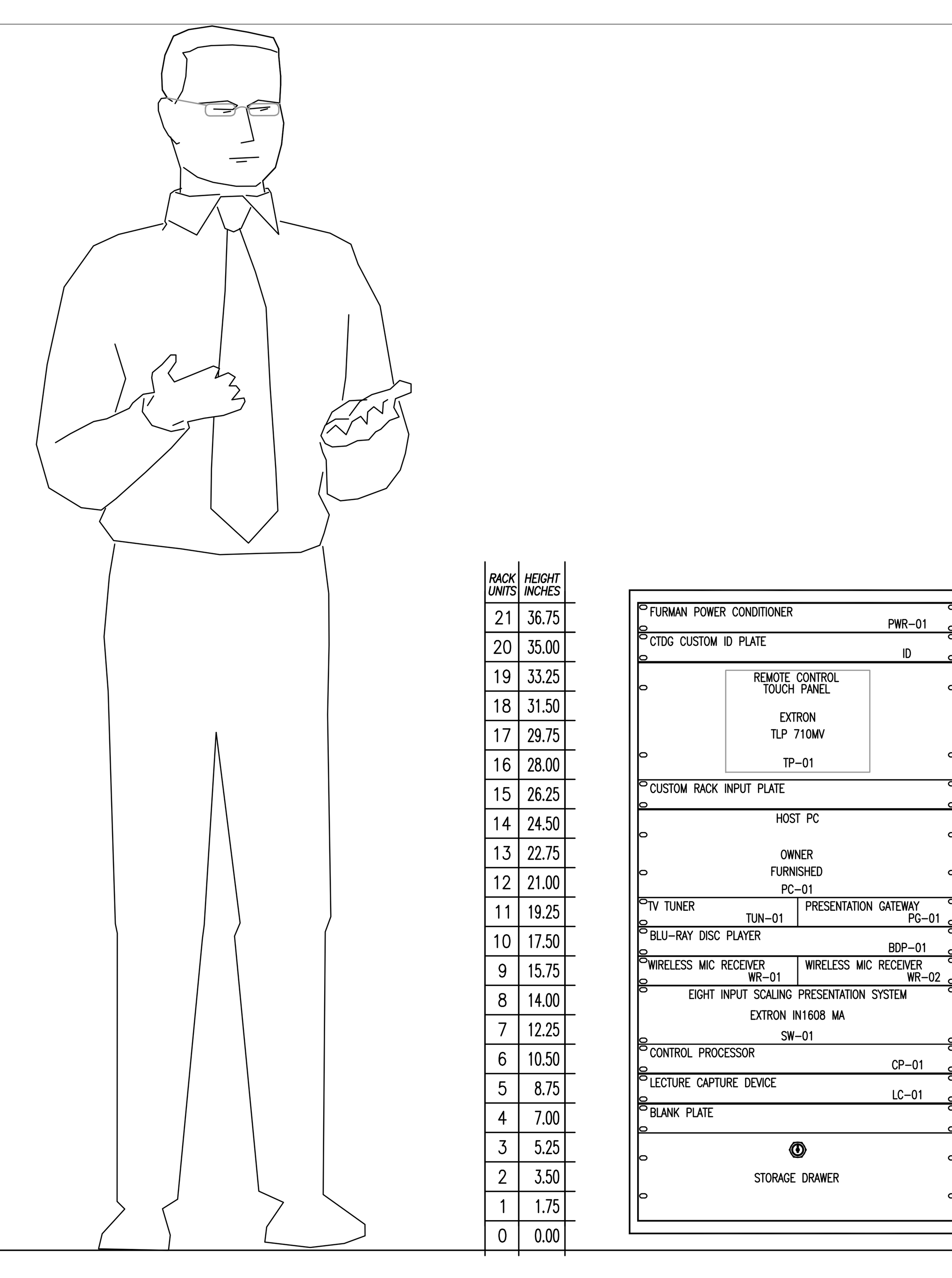
1 FITNESS CENTER SIGNAL FLOW

Scale: NTS



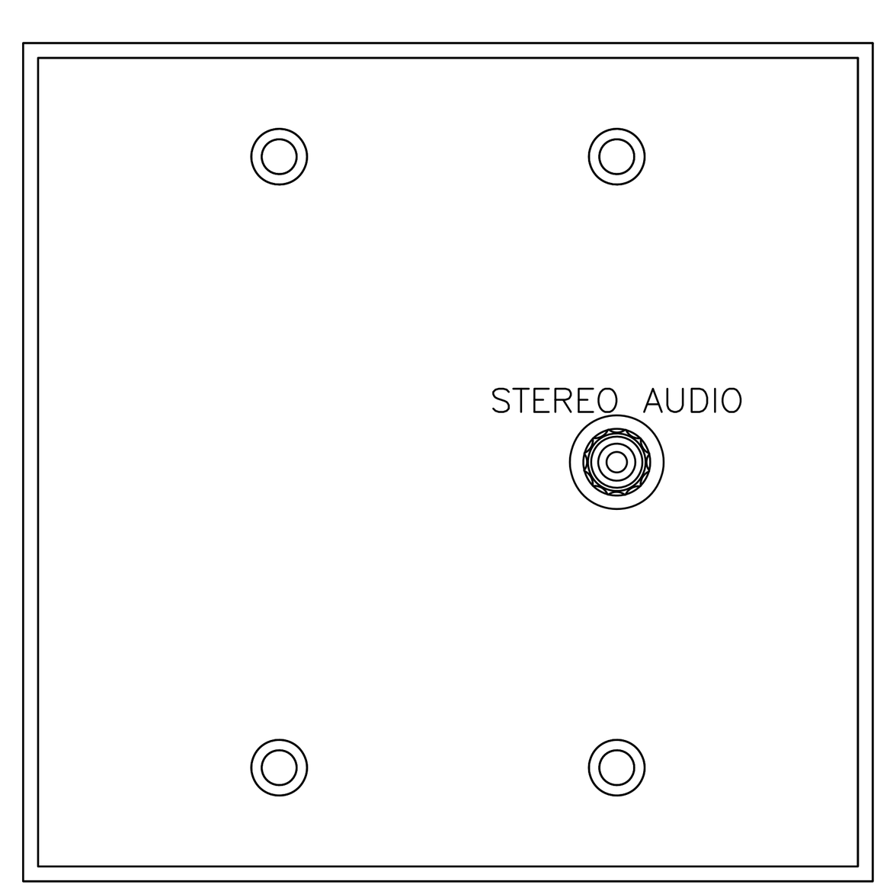
2 FITNESS CENTER RACK PLATE DETAIL

Scale: NTS



3 FITNESS CENTER EQUIPMENT RACK ELEVATION

Scale: NTS



4 YOGA STUDIO AUDIO INPUT PLATE DETAIL

Scale: NTS

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MARSHALL CRAFT ASSOCIATES
Architecture / Interior Design
6112 York Road, Baltimore, Maryland

PROJECT MANAGER: R. BARTON

MECHANICAL/ELECTRICAL/PLUMBING ENGINEER
GIPE ASSOCIATES
410-822-8688

STRUCTURAL ENGINEER
HOPE FURRER ASSOCIATES
410-583-4874

CIVIL ENGINEER
DMS & ASSOCIATES
443-262-9130

GEOTECHNICAL ENGINEER
HILLIS-CARNES ENGINEERING
410-749-0940

AV/IT/SECURITY CONSULTANT
CONVERGENT TECHNOLOGIES
410-532-2395

CHESAPEAKE COLLEGE CENTER FOR ALLIED HEALTH AND ATHLETICS - RENOVATION AND ADDITION

DGS PROJECT NO: CC-12-MC-420

Chesapeake College

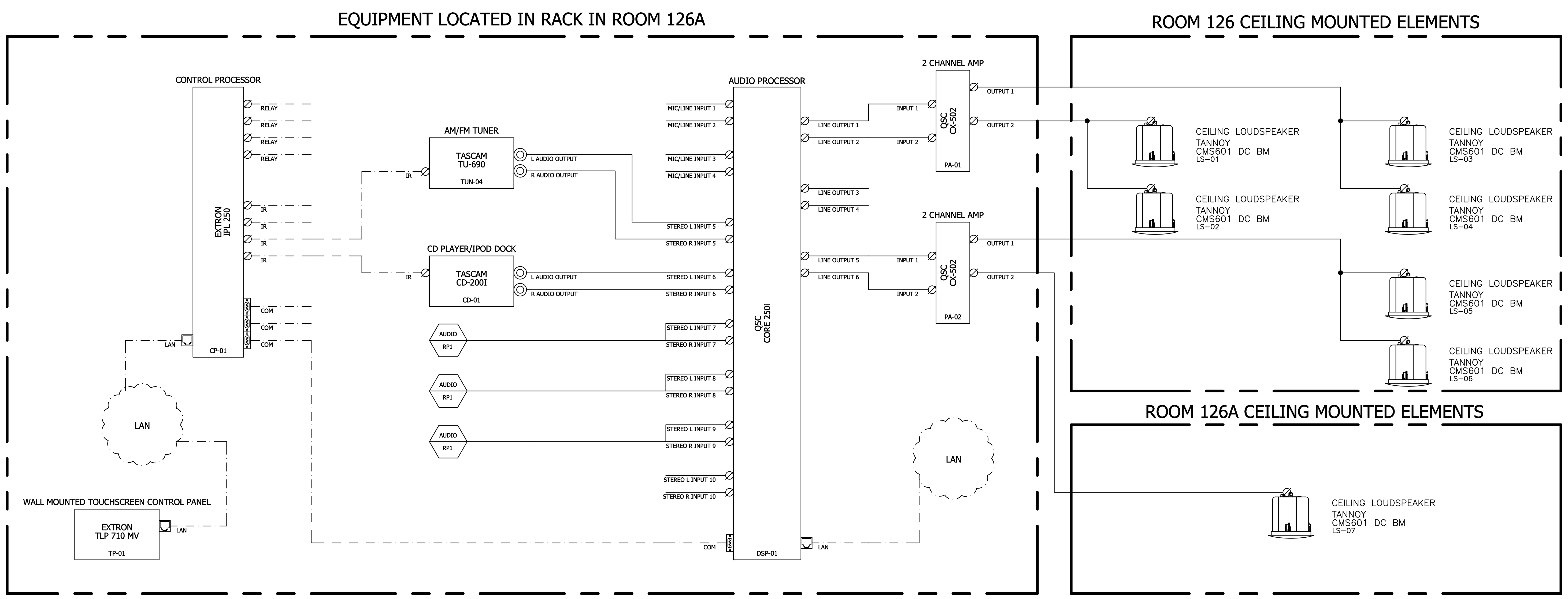
REVISIONS:

NO.	DATE:	COMMENTS:
1	04/24/14	FF&E RE-BID
2	05/16/14	ADDENDUM 02

SHEET SET AND SHEET ISSUE DATE: FF&E 01/30/2014

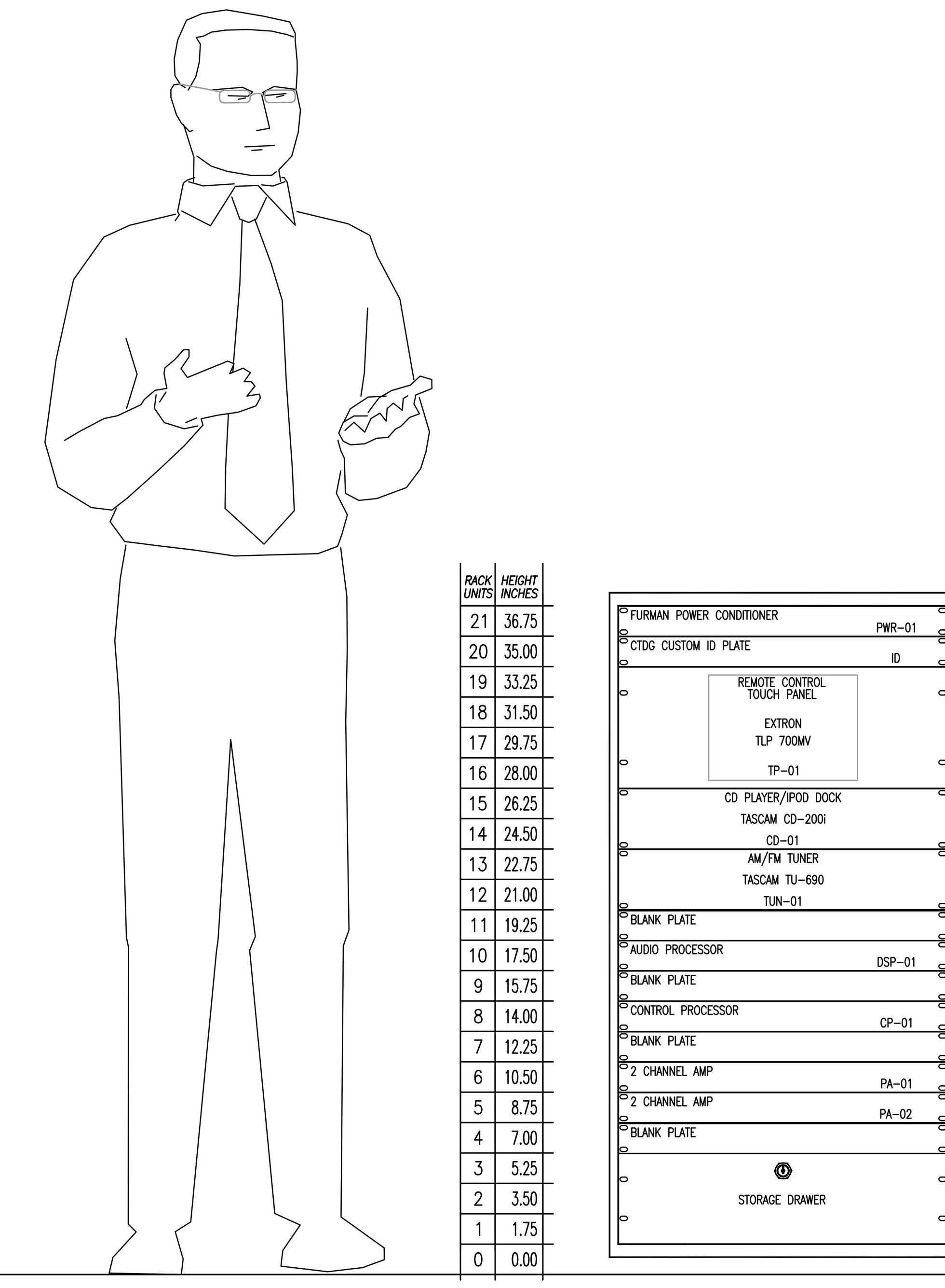
SHEET NAME: FITNESS CENTER AUDIOVISUAL SIGNAL FLOW

SHEET NO. AV-570



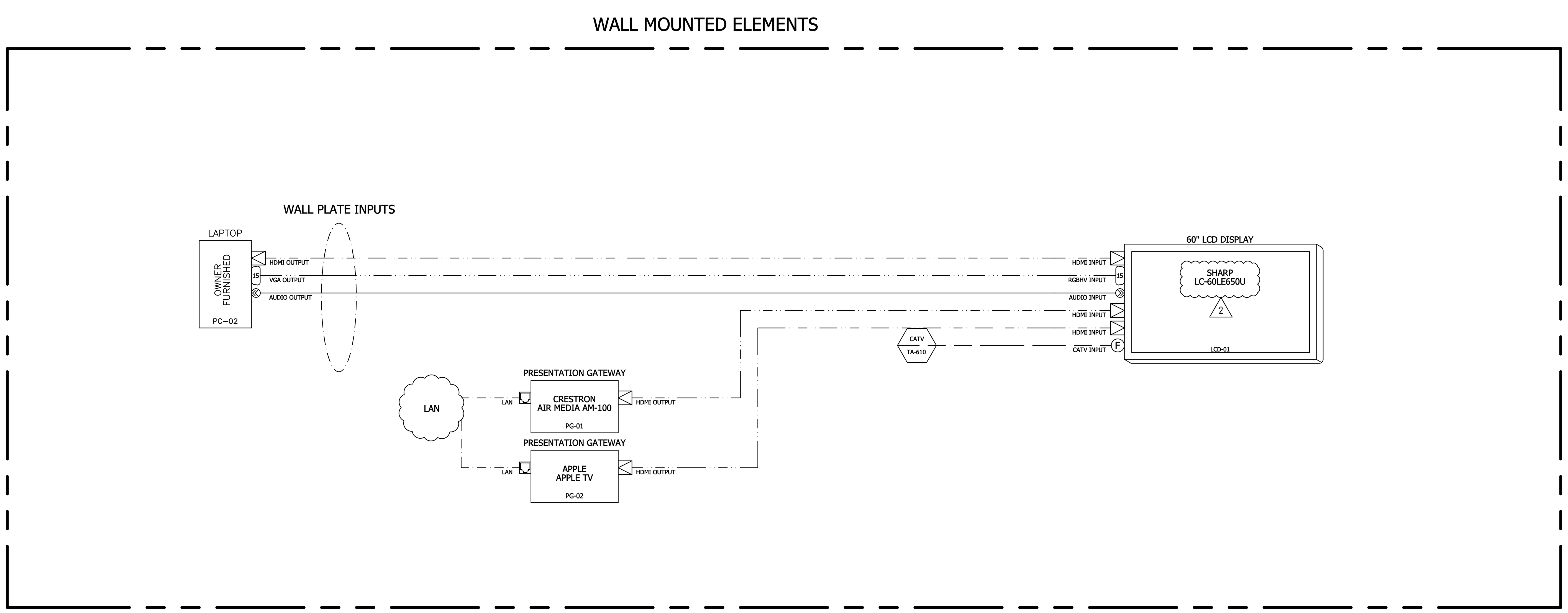
1 TRAINING ROOM SIGNAL FLOW

Scale: NTS



2 TRAINING ROOM EQUIPMENT RACK ELEVATION

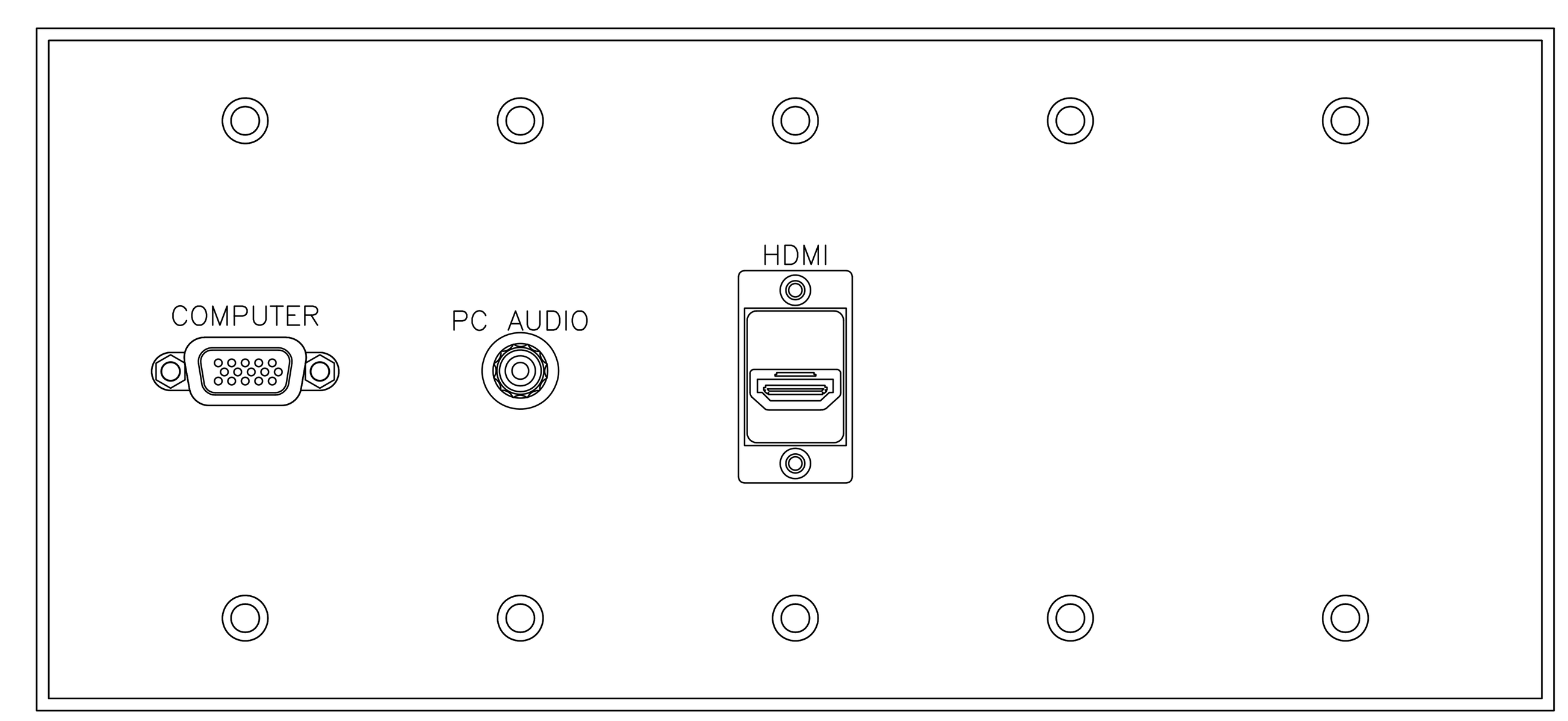
Scale: NTS



NOTE: ELEMENTS SHOWN IN THIS DRAWING ARE TYPICAL OF ROOMS 116, 117, 119A, 119B, 119C, 122A, 122B, AND 122C.

3 LOCKER ROOM SIGNAL FLOW

Scale: NTS



4 LOCKER ROOM WALL PLATE DETAIL

Scale: NTS

MARSHALL CRAFT ASSOCIATES
Architecture / Interior Design / Planning
6112 York Road, Baltimore, Maryland
410.532.3131
410.532.9206

MCA JOB NO. 12032

PROJECT MANAGER: R. BARTON

PROJECT DESIGNER:

MECHANICAL/ELECTRICAL/PLUMBING ENGINEER
GIPE ASSOCIATES
410-822-8688

STRUCTURAL ENGINEER
HOPE FURRER ASSOCIATES
410-583-4874

CIVIL ENGINEER
DMS & ASSOCIATES
443-262-9130

GEOTECHNICAL ENGINEER
HILLIS-CARNES ENGINEERING
410-749-0940

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Chesapeake College

GRAPHIC SCALES:

KEYPLAN:

PROJECT/CAMPUS NORTH

TRUE NORTH

REVISIONS:

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1	04/24/14	FF&E RE-BID
2	05/16/14	ADDENDUM 02

SHEET SET AND SHEET ISSUE DATE:
FF&E 01/30/2014

SHEET NAME:
TRAINING AND LOCKER ROOMS AUDIOVISUAL SIGNAL FLOWS

SHEET NO.
AV-580

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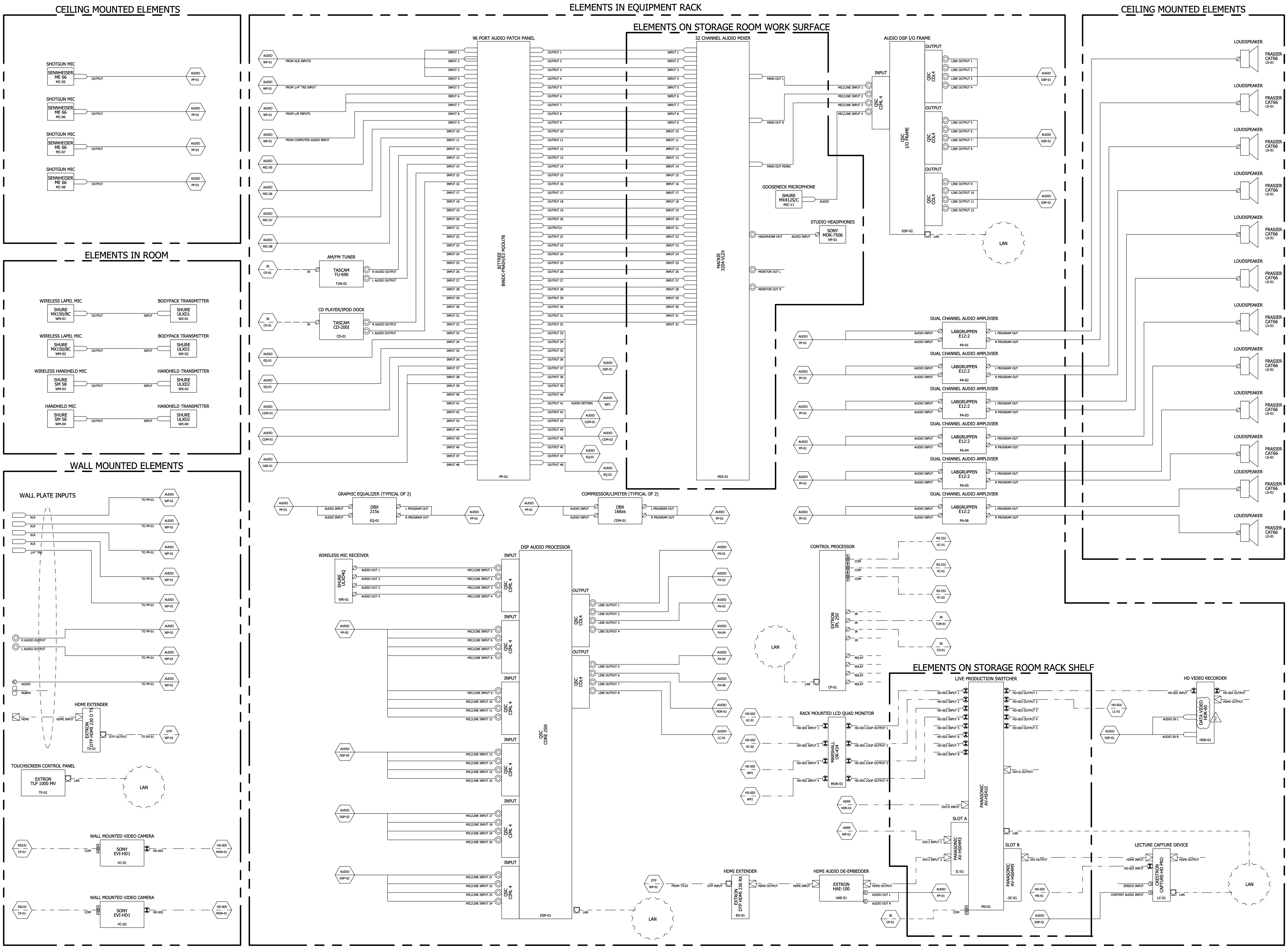

1 GYMNASIUM SIGNAL FLOW

Scale: NTS

IF THIS DRAWING IS NOT 30"X42" IT IS A REDUCED PRINT

MARSHALL CRAFT ASSOCIATES
Architecture / Interior Design / Planning
Marshall Craft Associates, Inc.
6112 York Road, Baltimore, Maryland
410.532.3131 Fax: 410.532.9206

MCA JOB NO.
12032

PROJECT MANAGER: R. BARTON
PROJECT DESIGNER:

MECHANICAL/ELECTRICAL/PLUMBING ENGINEER
GIPE ASSOCIATES
410-822-8688

STRUCTURAL ENGINEER
HOPE FURRER ASSOCIATES
410-583-4874

CIVIL ENGINEER
DMS & ASSOCIATES
443-262-9130

GEOTECHNICAL ENGINEER
HILLIS-CARNES ENGINEERING
410-749-0940

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Chesapeake College

GRAPHIC SCALES:

KEYPLAN:

PROJECT/CAMPUS NORTH
TRUE NORTH

REVISIONS:

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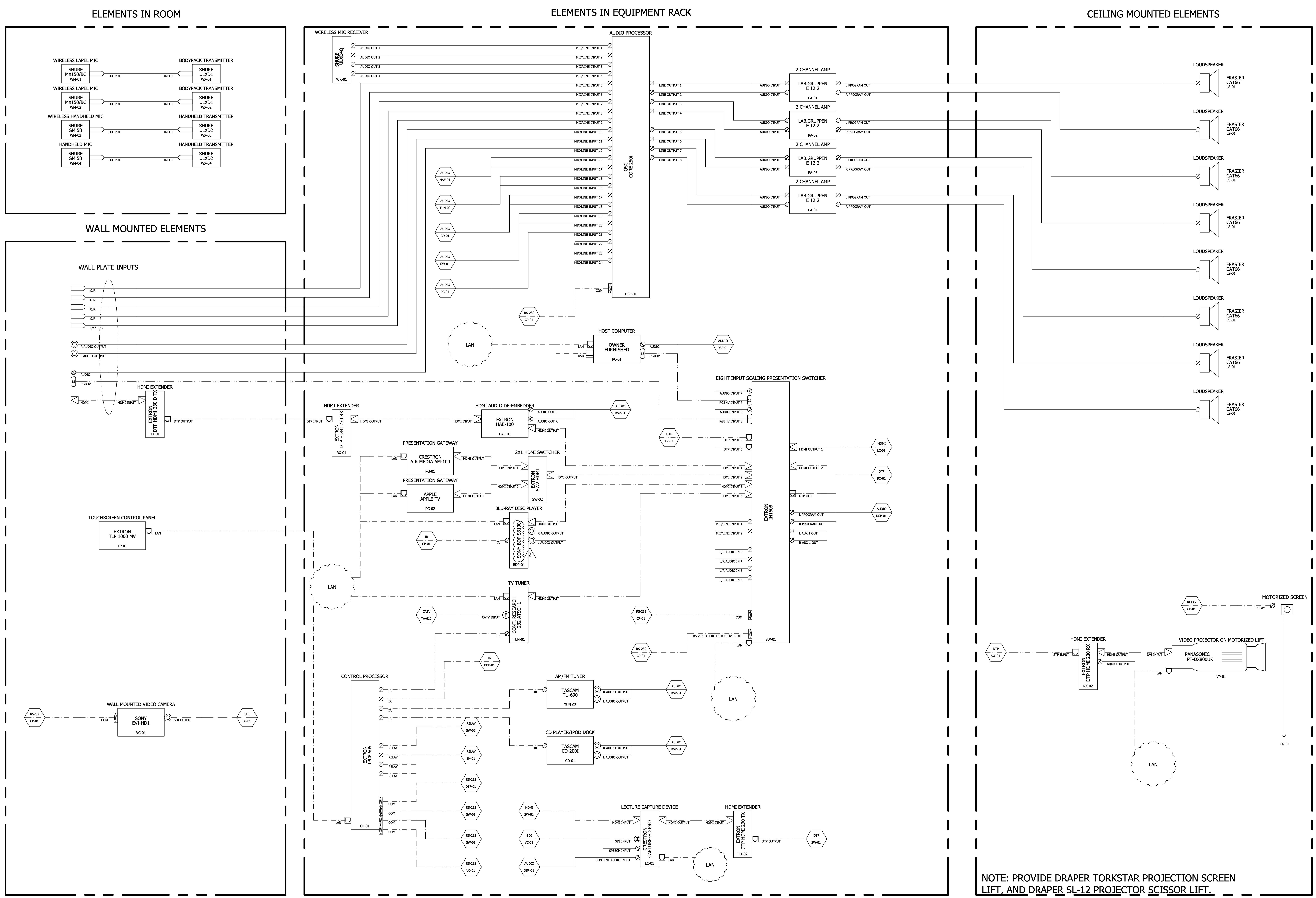
1	04/24/14	FF&E RE-BID
2	05/16/14	ADDENDUM 02

SHEET SET AND SHEET ISSUE DATE:
FF&E 01/30/2014

SHEET NAME:
GYMNASIUM AUDIOVISUAL SIGNAL FLOWS

SHEET NO.
AV-590



1 MULTIPURPOSE ROOM SIGNAL FLOW

Scale: NTS

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MARSHALL CRAFT ASSOCIATES
Architecture / Interior Design /
6112 York Road, Baltimore, Maryland
410.532.3131
410.532.9206 Fax

MCA JOB NO.
12032

PROJECT MANAGER: R. BARTON
PROJECT DESIGNER:

MECHANICAL/ELECTRICAL/PLUMBING ENGINEER
GIPE ASSOCIATES
410-822-8688

STRUCTURAL ENGINEER
HOPE FURRER ASSOCIATES
410-583-4874

CIVIL ENGINEER
DMS & ASSOCIATES
443-262-9130

GEOTECHNICAL ENGINEER
HILLIS-CARNES ENGINEERING
410-749-0940

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SEAL:

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DGS PROJECT NO: CC-12-MC-420

Chesapeake College

GRAPHIC SCALES:

KEYPLAN:

PROJECT/CAMPUS NORTH
TRUE NORTH

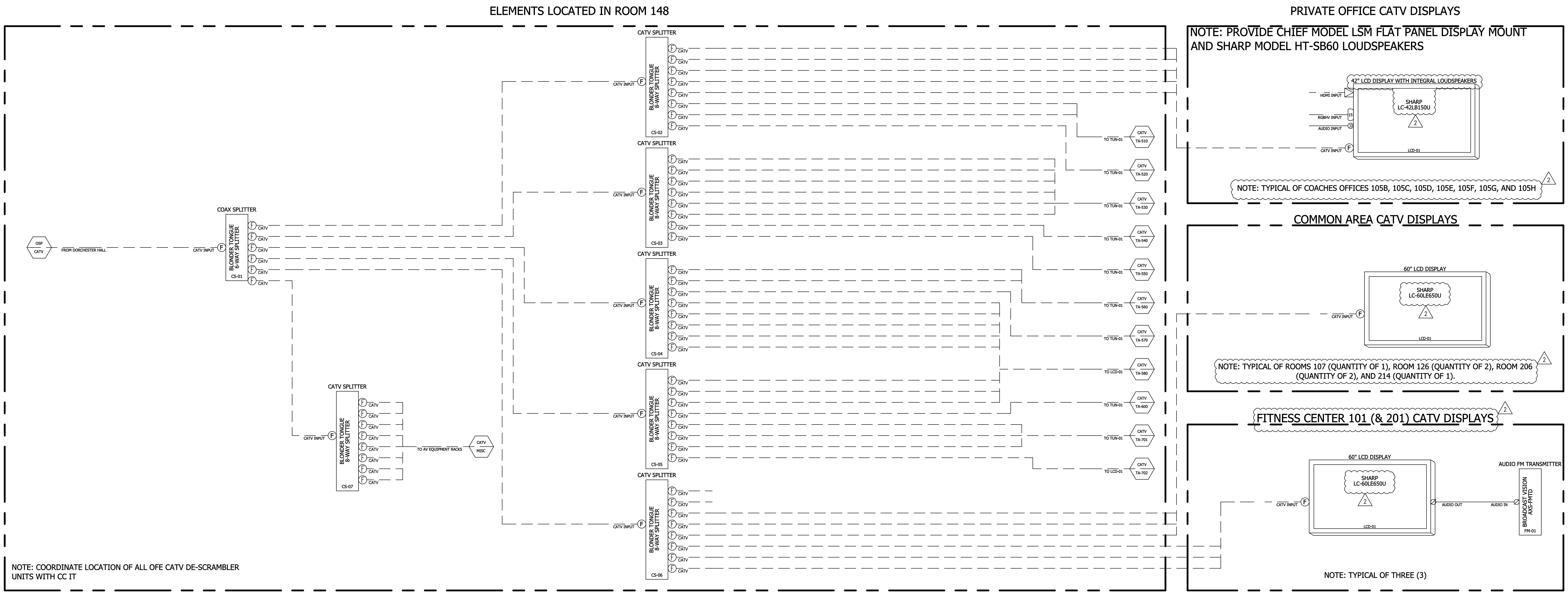
REVISIONS:

NO.	DATE:	COMMENTS:
1	04/24/14	FF&E RE-BID
2	05/16/14	ADDENDUM 02

SHEET SET AND SHEET ISSUE DATE:
FF&E 01/30/2014

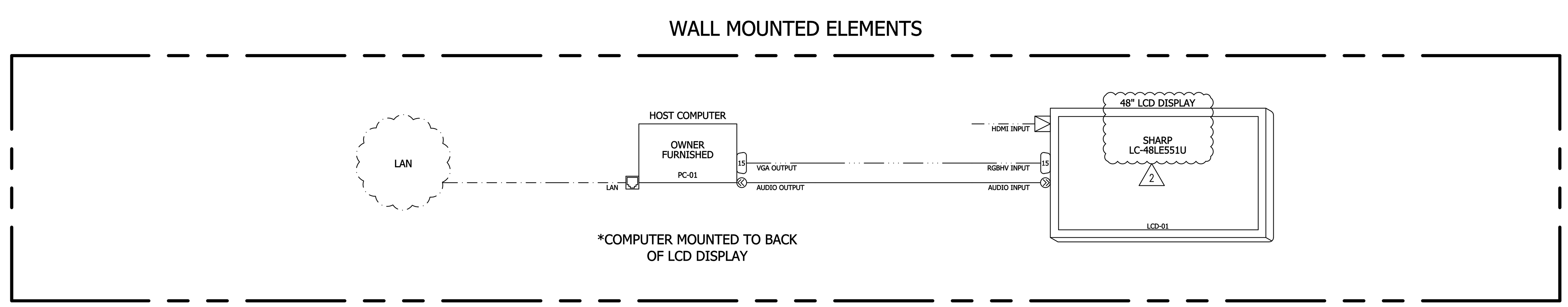
SHEET NAME:
MULTIPURPOSE ROOM AUDIOVISUAL SIGNAL FLOW

SHEET NO:
AV-600



1 CATV SIGNAL FLOW

Scale: NTS



2 DIGITAL SIGNAGE SIGNAL FLOW

Scale: NTS

NOTE: COAXIAL CABLING AND CATV DISTRIBUTION HARDWARE SHOWN IN THIS DRAWING ARE NOT IN CONTRACT.

IF THIS DRAWING IS NOT 30"X42" IT IS A REDUCED PRINT

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Marshall Craft Associates, Inc.
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410.532.3131 Fax: 410.532.9206

MCA JOB NO. 12032

PROJECT MANAGER: R. BARTON
PROJECT DESIGNER:

MECHANICAL/ELECTRICAL/PLUMBING ENGINEER
GIPE ASSOCIATES
410-822-8688

STRUCTURAL ENGINEER
HOPE FURRER ASSOCIATES
410-583-4874

CIVIL ENGINEER
DMS & ASSOCIATES
443-262-9130

GEOTECHNICAL ENGINEER
HILLIS-CARNES ENGINEERING
410-749-0940

AV/IT/SECURITY CONSULTANT
CONVERGENT TECHNOLOGIES
410-532-2395

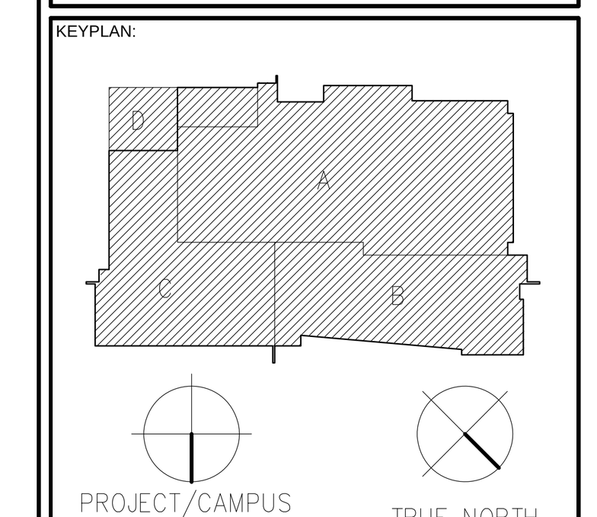
SEAL:

CHESAPEAKE COLLEGE CENTER FOR ALLIED HEALTH AND ATHLETICS - RENOVATION AND ADDITION

DGS PROJECT NO: CC-12-MC-420

Chesapeake College

KEYPLAN:



REVISIONS:

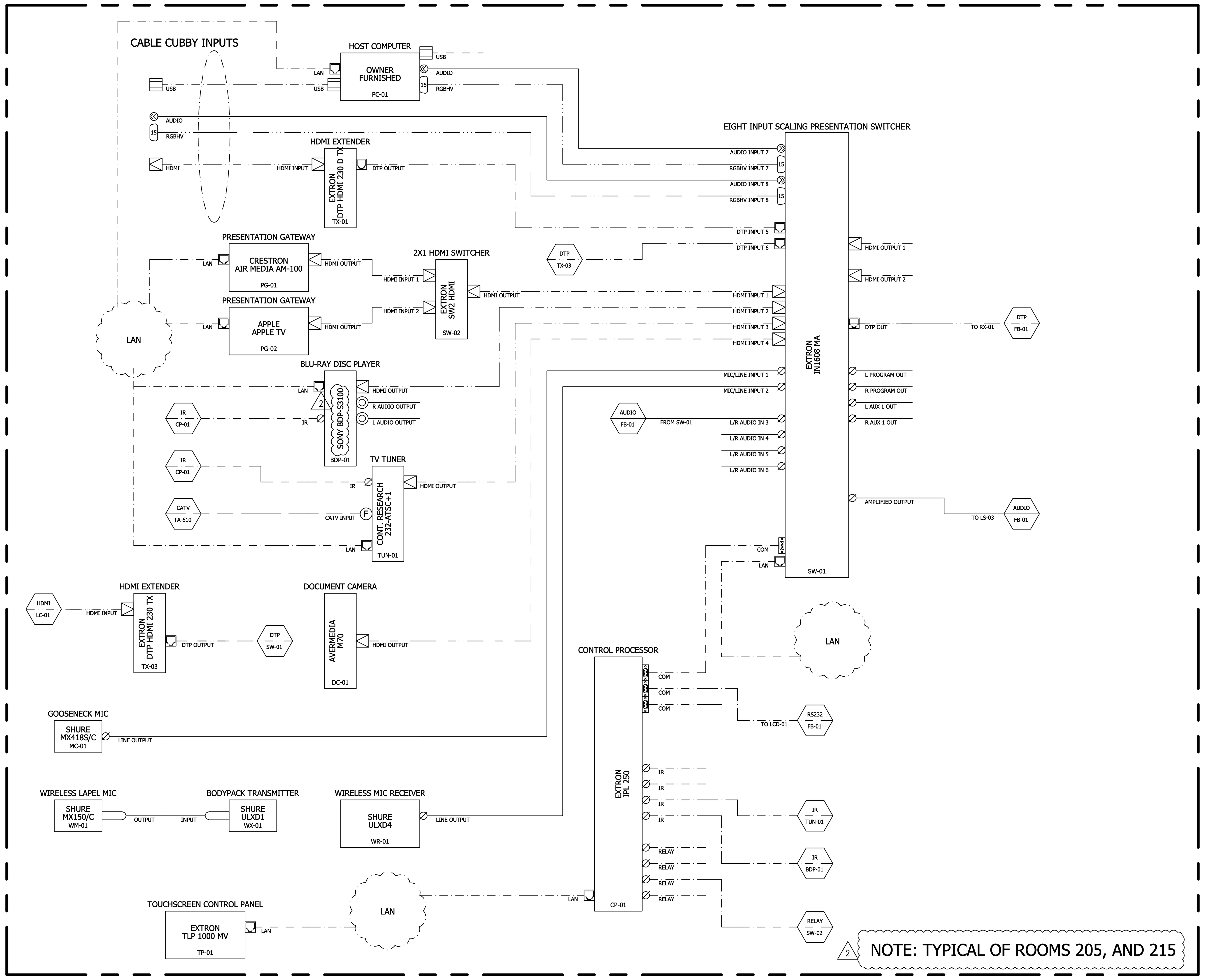
NO.	DATE:	COMMENTS:
1	04/24/14	FF&E RE-BID
2	05/16/14	ADDENDUM 02

SHEET SET AND SHEET ISSUE DATE: FF&E 01/30/2014

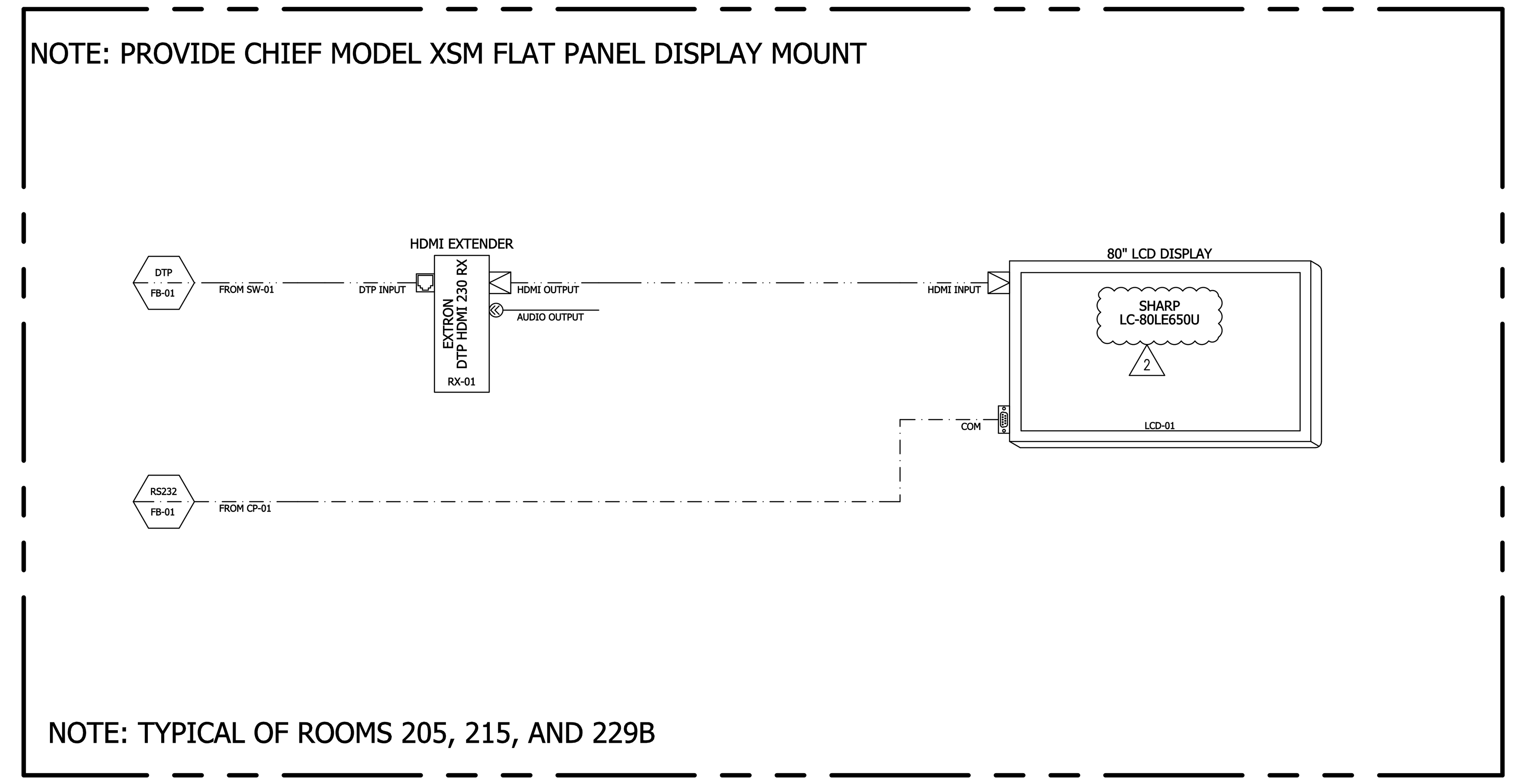
SHEET NAME: BUILDING-WIDE SYSTEMS SIGNAL FLOWS

SHEET NO. AV-610

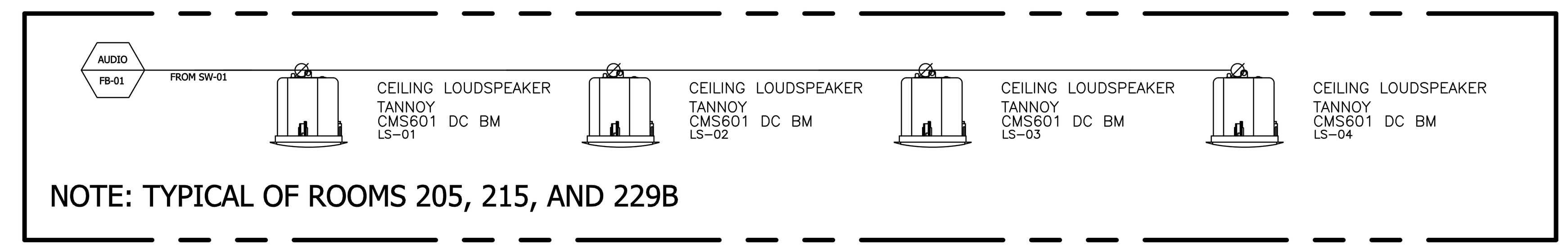
EQUIPMENT LOCATED IN LECTERN



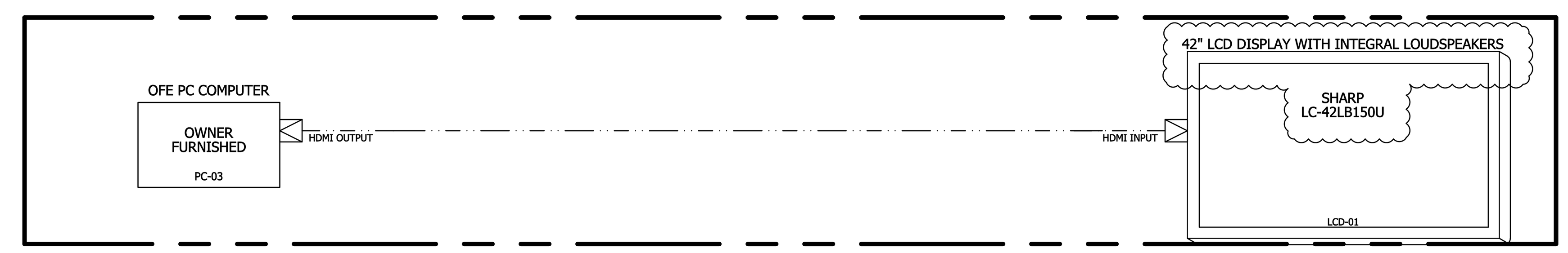
FRONT WALL MOUNTED ELEMENTS



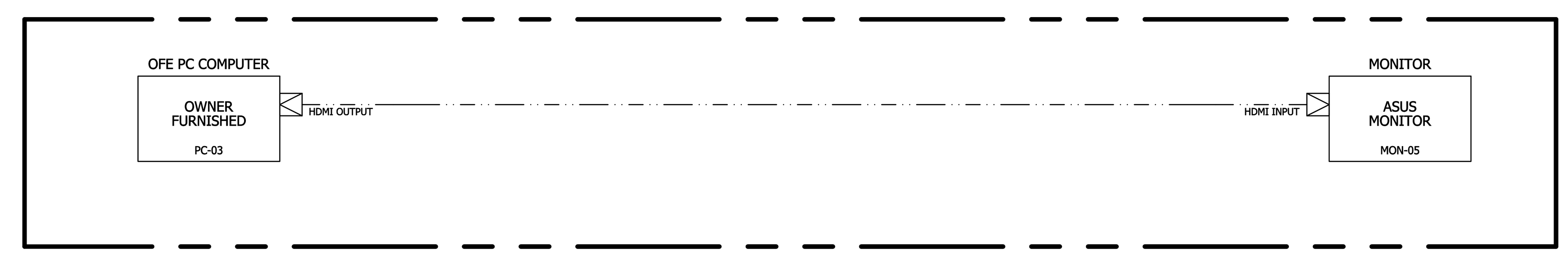
CEILING MOUNTED ELEMENTS



WALL MOUNTED ELEMENTS IN ROOM 229

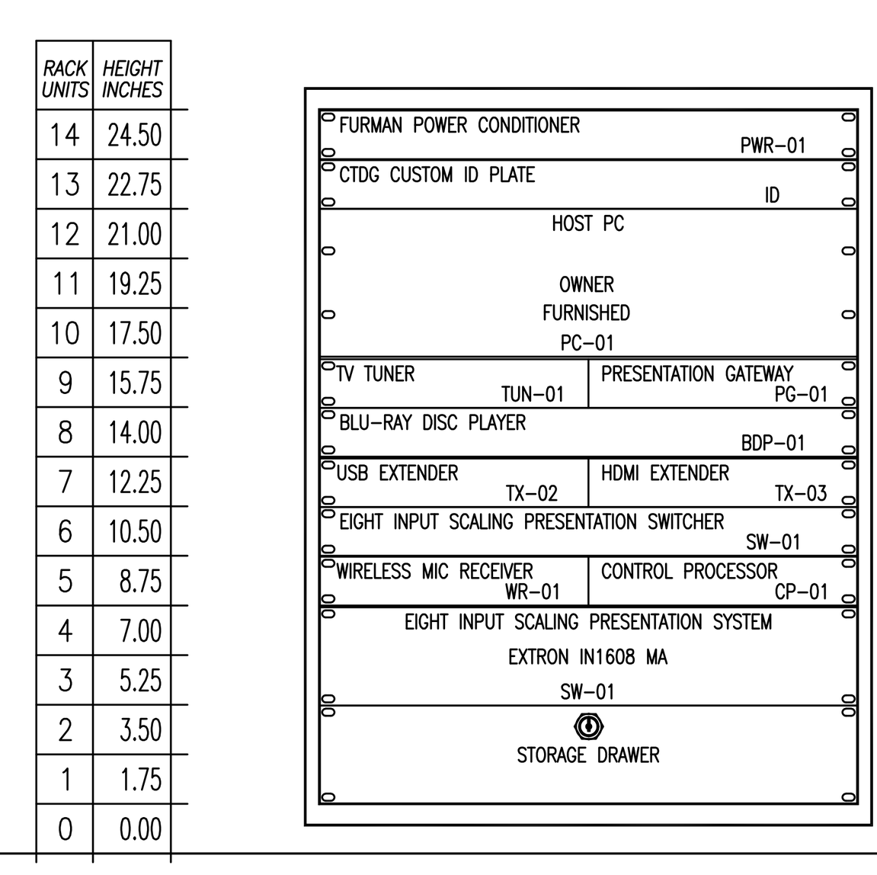


ELEMENTS MOUNTED TO DENTAL CHAIRS IN ROOM 225



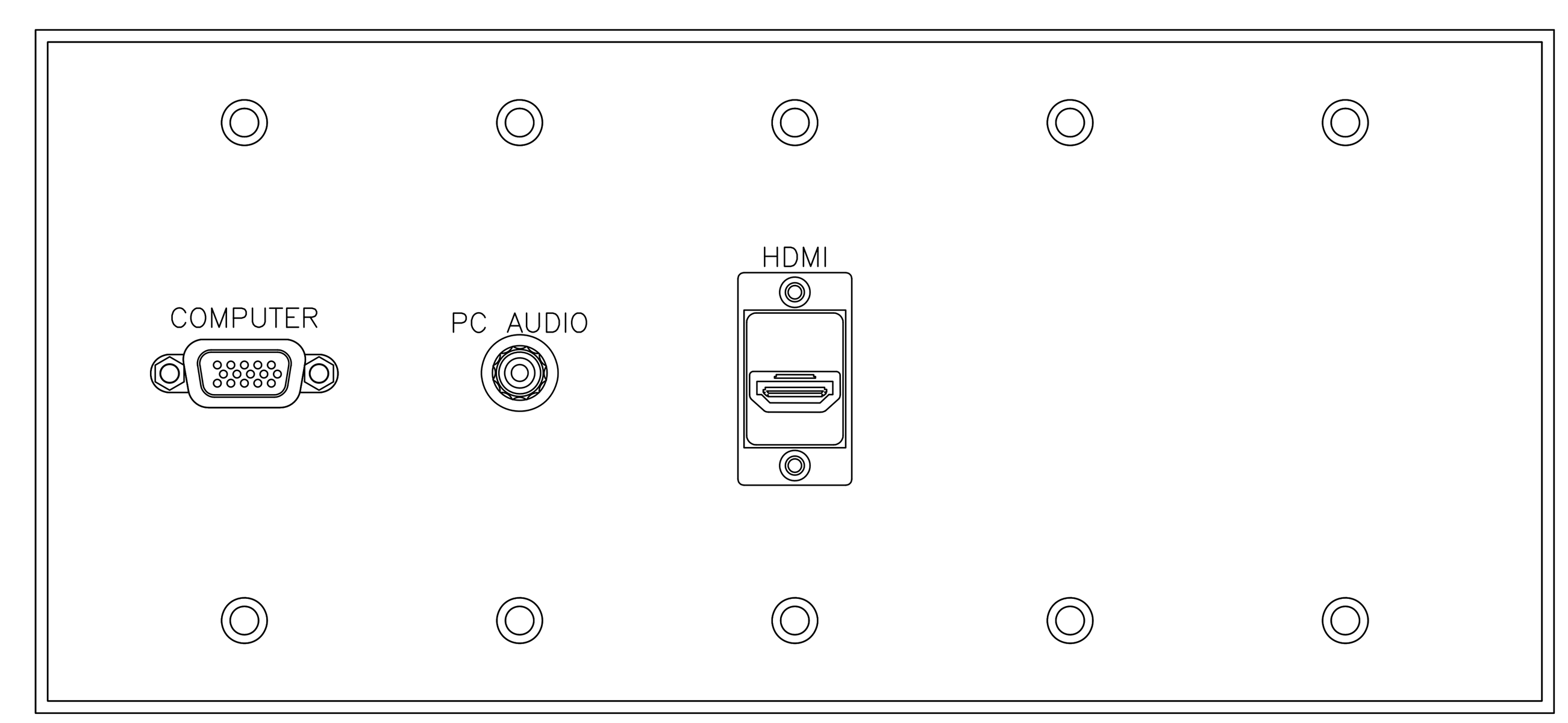
1 SIMULATION SPACE CLASSROOMS SIGNAL FLOW

Scale: NTS



2 SIMULATION SPACES CLASSROOMS RACK ELEVATION

Scale: NTS



4 SIMULATION SPACE CLASSROOMS FLOOR BOX PLATE DETAIL

Scale: NTS

IF THIS DRAWING IS NOT 30"X42" IT IS A REDUCED PRINT

MARSHALL CRAFT ASSOCIATES
Architecture / Interior Design / Planning
6112 York Road, Baltimore, Maryland
410.532.3131 tel
410.532.9206

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GIPE ASSOCIATES
410-822-8688

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HOPE FURRER ASSOCIATES
410-583-4874

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HILLIS-CARNES ENGINEERING
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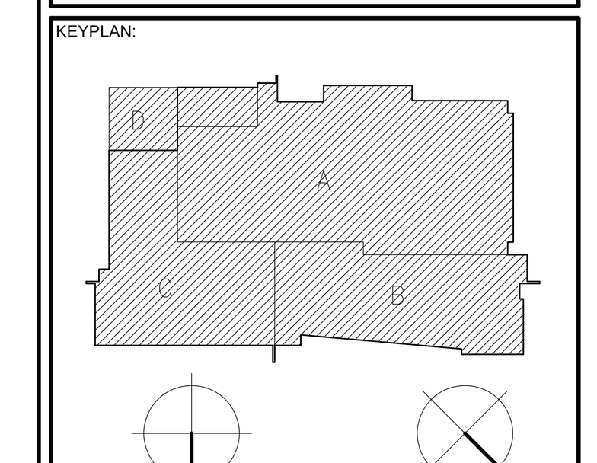
CHESAPEAKE COLLEGE CENTER FOR ALLIED HEALTH AND ATHLETICS - RENOVATION AND ADDITION

DGS PROJECT NO: CC-12-MC-420

Chesapeake College

GRAPHIC SCALES:
SCALE: 1/16" = 1'-0"
SCALE: 1/8" = 1'-0"
SCALE: 1/4" = 1'-0"
SCALE: 3/4" = 1'-0"
SCALE: 1-1/2" = 1'-0"
SCALE: 3" = 1'-0"

KEYPLAN:



PROJECT/CAMPUS NORTH
TRUE NORTH

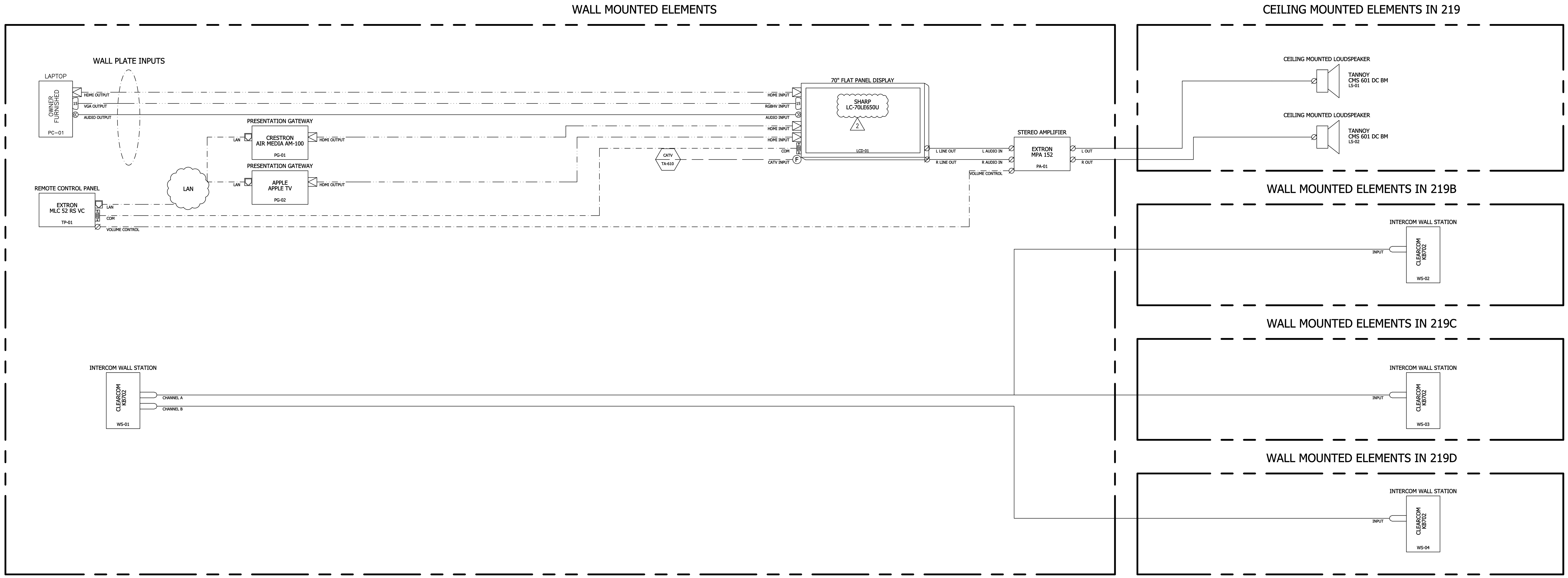
REVISIONS:

NO.	DATE:	COMMENTS:
1	04/24/14	FF&E RE-BID
2	05/16/14	ADDENDUM 02

SHEET SET AND SHEET ISSUE DATE: FF&E 01/30/2014

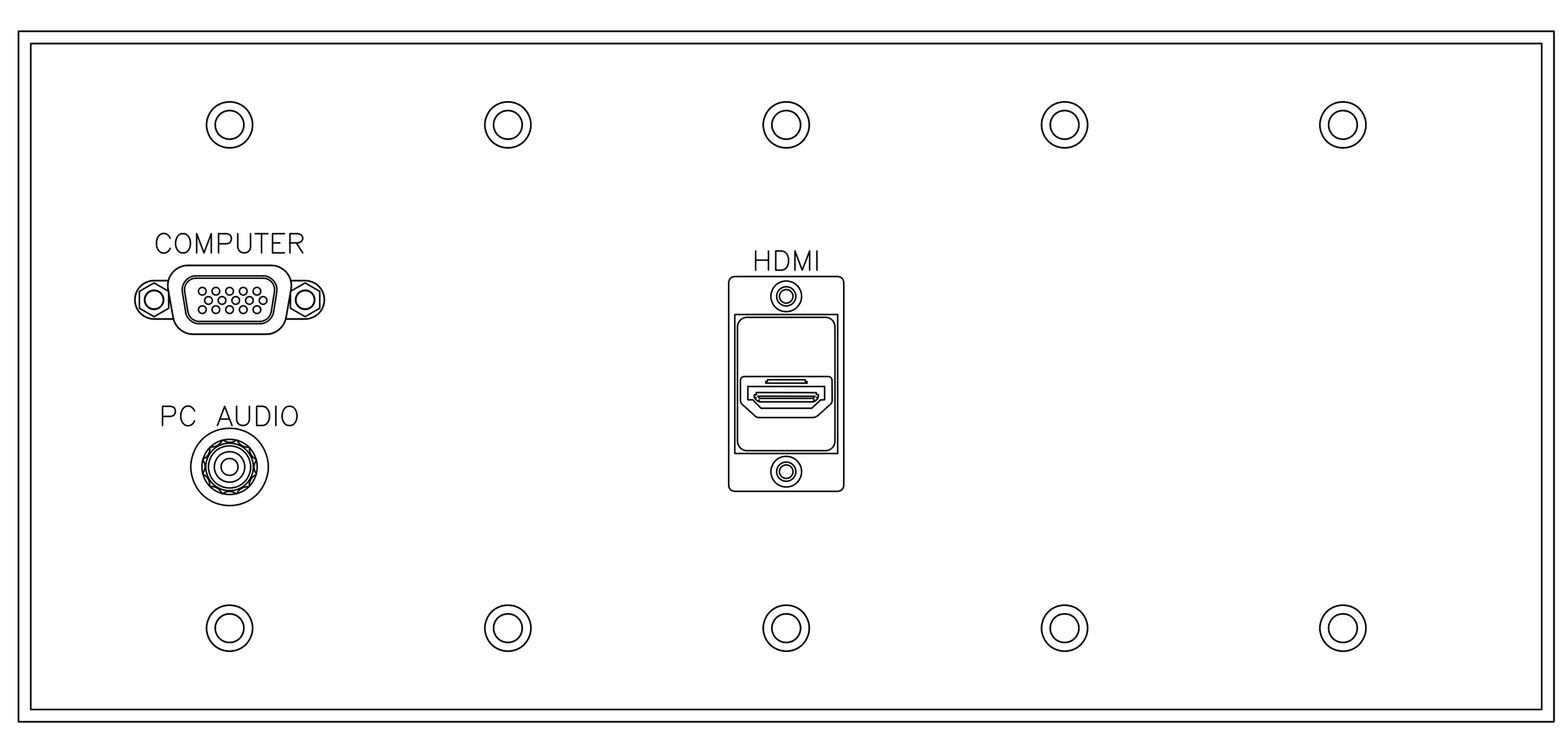
SHEET NAME: SIMULATION SPACES AUDIOVISUAL SIGNAL FLOW AND DETAILS

SHEET NO. AV-701



1 EMS ROOM SIGNAL FLOW

Scale: NTS



2 EMS ROOM WALL PLATE DETAIL

Scale: NTS

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MARSHALL CRAFT ASSOCIATES
Architecture / Interior Design /
6112 York Road, Baltimore, Maryland
410.532.9206

MCA JOB NO.: 12032
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MECHANICAL/ELECTRICAL/PLUMBING ENGINEER
GIPE ASSOCIATES
410-822-8688

STRUCTURAL ENGINEER
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HILLIS-CARNES ENGINEERING
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AV/IT/SECURITY CONSULTANT
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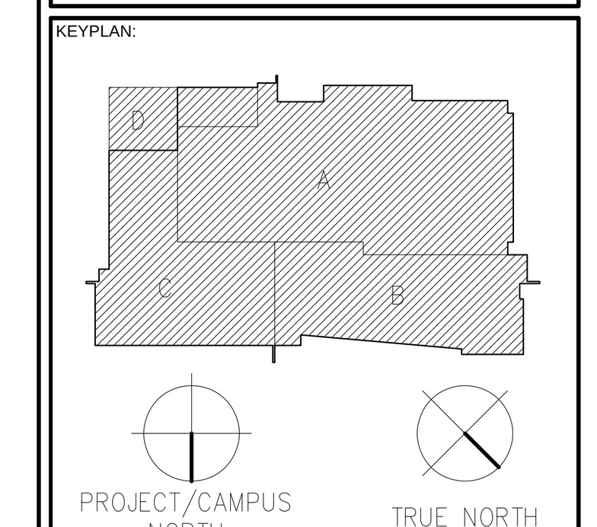
SCALE: 3/4" = 1'-0"
SCALE: 1-1/2" = 1'-0"
SCALE: 3" = 1'-0"

KEYPLAN:



REVISIONS:

NO.	DATE:	COMMENTS:
1	04/24/14	FF&E RE-BID
2	05/16/14	ADDENDUM 02

SHEET SET AND SHEET ISSUE DATE:
FF&E 01/30/2014

SHEET NAME:
EMS ROOM AUDIOVISUAL SIGNAL FLOW AND DETAIL

SHEET NO.:
AV-702