Attachment A: Bid Breakdown & Schedule

Bidder: _____
DASNYContact: Susan Valente, Purchasing Coordinator - svalente@dasny.org

Services/Product Required By: January 24, 2022

Description: Furnish, Deliver & Install Audio/Video Equipment - Bid No. 710

Bid Open Location: DASNY, Corporate Headquarters, 515 Broadway, Albany, NY 12207
Bid Open Date and Time: December 9, 2021 at 2:30 p.m.

Item No.	Manufacturer	Make/Model	Description	QTY	UOM	Unit Price	Extended Price
1	See Detailed Specifications*.		Equipment (include itemized breakdown)		LS	**$**	**$**
2			Cost of Payment Bond		LS	**$**	**$**
3			Integration		LS	**$**	**$**
4			Installation		LS	**$**	**$**
5						**$**	**$**
6						**$**	**$**
7						$	$
8						$	$
9						$	$
10						$	$
11						$	$

*Attach an itemized and detailed price sheet with unit cost for all product (manufacturer/model/quantity/unit cost/ extended total). If providing substitutions for any of the specified product, provide information on proposed manufacturer's product. The burden of proof equality is on the bidder, and only complete submittals, as requested, will be considered and evaluated by DASNY. Failure to comply with any or all above shall result in immediate disqualification.

INSTALLATION LABOR (if required)
***LABOR TO INSTALL* _____**

Estimated No. of Hours _____
Hourly Rate (*Prevailing Wage rates are required for this work)*_____

TOTAL BID_____

NOTICE AND INFORMATION FOR BIDDERS

(The below questions 1) and 2) need only be answered if the above total bid is for one million dollars or more)

1. Does your firm anticipate the use of subcontractors and outside suppliers specific to this procurement?
   Yes ☐ No ☐
2. Does your firm anticipate the creation of employment opportunities arising from this procurement?
   Yes ☐ No ☐

(The below information must be completed for all bids.)

Identify all subcontractors, if any: _____

STATE, PROVINCE FOR FOREIGN COUNTRY THAT YOUR FIRM'S PRINCIPAL PLACE OF BUSINESS IS LOCATED:

_____

ADDRESS OF FACTORY OR PLANT WHERE ITEMS ARE MANUFACTURED AND/OR ASSEMBLED. *(Attach additional sheet(s) if more than one manufacturer)*

_____

_____

_____

_____

_____
BIDDER (FIRM NAME)

_____
SIGNATURE

_____
NAME (TYPE/PRINTED)

_____
TITLE

_____
Date

Attachment B

Detailed Specifications and Drawings

	Video & Control Equipment	
1	Panasonic PT-MZ16KLBU	16,000LM, WUXGA RESOLUTION (4K SIGNAL) LCD LASER PROJECTOR, NO LENS, BLACK
1	Panasonic ET-EMT800	4.14 7.40:1 ZOOM LENS FOR PT-MZ16K/MZ13K/MZ10K LCD LASER PROJECTORS
1	CHIEF WMA2S	WMA2S WALL MOUNT ACCY 1 1/2 NPT LAT SHI
1	CHIEF RPMA302	RPA ELITE KEY A INCL SLM302 BLK
1	CHIEF CMA348	VIBRATION ISOLATOR COUPLER
1	CHIEF CMS012	FIXED PIPE 12"
1	CHIEF CMS006	FIXED PIPE 6"
1	Crestron DMPS3-4K-350-C	3-Series® 4K DigitalMedia™ Presentation System 350
1	Crestron PW-5430DUS	High-Efficiency Power Pack
1	Crestron DM-RMC-4KZ-SCALER-C	DigitalMedia 8G+® 4K60 4:4:4 HDR Receiver and Room Controller with Scaler
1	Crestron DM-TX-4KZ-302-C	DigitalMedia 8G+® 4K60 4:4:4 HDR Transmitter 302
1	Crestron DM-TX-4KZ-100-C-1G-W-T	DigitalMedia 8G+® 4K60 4:4:4 HDR Wall Plate Transmitter, White
1	Crestron HD-TX-101-C-E	DM Lite – HDMI® over CATx Transmitter, Surface Mount
1	Crestron HD-RX-101-C-E	DM Lite – HDMI® over CATx Receiver, Surface Mount
1	Crestron TSW-1070-B-S	10.1 in. Wall Mount Touch Screen, Black Smooth
1	Luxul AMS-1816P	AV SERIES 18-Pt/16 PoE+ GbE Mngd Sw
1	Kramer VIA Connect PLUS	Kramer Via Wired and Wireless
1	Lumens VC-TR1	Full HD Auto Tracking Camera
1	Lumens VC-WM11	Wall Mount for VC-TR1
1	Epson ELPDC21	Education Document Camera
1	Extron 60-1833-01	SW2 USB Pro ; Two Input SuperSpeed USB 10G Switcher
1	Magewell 32060	USB Capture HDMI Gen 2
1	Extron 60-1163-02	EWB 103 ; External Wall Box - Three-gang, black
1	Lectern Disconnect Plate (Wall)	Custom 3 Gang Plate with (5) Color Coded RJ45 Connections and 1 Female XLR
1	Lectern Disconnect Plate (Lectern)	Custom 3 Gang Plate with (5) Color Coded RJ45 Connections and 1 Male XLR
	Audio Equipment	
1	Biamp Systems Tesira EX-UBT	PoE AVB/USB expander with Bluetooth® wireless technology
1	Biamp Systems TesiraFORTE AVB VT	Fixed I/O DSP with 12 analog inputs, 8 analog outputs, 8 channels configurable USB audio, 128 x 128 channels of AVB, AEC technology, 2 channel VoIP, and standard FXO telephone interface
1	Biamp Systems TesiraFORTÉ AVB CI	Fixed I/O DSP with 12 analog inputs, 8 analog outputs, 8 channels configurable USB audio, 128 x 128 channels of AVB, and AEC technology
1	Luxul AGS-1016	AV Series 16-Port Gigabit Rack Mount Sw
1	Biamp Systems TesiraCONNECT TC-5	5-port expansion device
1	Extron 60-1760-02	XPA U 1004-70V ; Four Channel Amp, 100 watts at 70 volts
1	Shure SCM820	Eight Channel Digital Automatic Mixer, Block Connectors
5	Shure QLXD24/B58-G50	Beta 58® Vocal System
5	Shure QLXD14/85-G50	WL185 Lavalier Microphone System
5	Shure QLXD14-G50	QLX-D Bodypack System
15	Shure MX153B/O-TQG	Omnidirectional Earset Headworn Microphone, Black
10	Shure WL185	Microflex® Cardioid Lavalier Microphone
4	Shure UA844+SWB/LC	Five-way active antenna splitter and power distribution system for QLX-D®, ULX®, ULX-D®, SLX®, and BLX® (BLX4R only) receivers. Excludes antenna cables and locking power cables (470-952 MHz)
2	Shure UA834WB	In-line antenna amplifier for remote mounting. (470-902 MHz)
2	Shure UA8100	100' UHF Remote Antenna Extension Cable, BNC-BNC, RG213/U Type
1	Beyerdynamic Classis RM 31 RC	Vertical Array Microphone
1	Custom XLR Input Plate	Custom 3 Gang Plate with 8 Female XLR Connectors
1	Aux Input Rack Panel	Custom 1 RU Rack Panel with Female XLR
	Lectern & Equipment Racks	
1	Spectrum Freedom XRS Elite Lectern	Height Adjustable Lectern
1	Middle Atlantic DWR-24-22	24SP/22D WALLRACK BLACK
1	Middle Atlantic VFD-24	24SP VENT.FR.DOORUNIV.BL
1	Middle Atlantic ERK-1825	18SP/25D RACK W/RD AND TO
1	Middle Atlantic CBS-ERK-25R	FLR-FNDLY CBS25"DPERK
1	Middle Atlantic VFD-18	18SP VENT.FR.DOORUNIV.BL
7	Misc. Rack Hardware & Accessories	Rack Power, Cable Management, Shelves, Drawers, etc. as required
	Cabling	
1	Cabling and Connectors	Bulk Cabling and Connectors, Patch Cables, and Accessories

AUDIO & VIDEO DRAWINGS
DEVELOPED FOR:

CUNY CITY COLLEGE
ARONOW THEATER
NORTH ACADEMIC CENTER

160 CONVENT AVE.
NEW YORK, NY 10031

DRAWING SHEET INDEX

SHEET NUMBER	SHEET TITLE	NOTES
TA-001	SHEET INDEX, NOTES, & SYMBOLS	
TA-101	AV PLAN	
TA-501	AV DETAILS - EQUIPMENT RACKS	
TA-502	AV DETAILS	
TA-601	SYSTEM DIAGRAM - VIDEO	
TA-602	SYSTEM DIAGRAM - AUDIO	

EQUIPMENT SYMBOLS

AUDIO/VIDEO SYMBOLS

ANT	WALL MOUNTED WIRELESS ANTENNA
CPL	WALL MOUNTED CONTROL PANEL
LCP	WALL MOUNTED LECTERN CONNECTION PLATE
MIP	WALL MOUNTED MICROPHONE INPUT PLATE

ELECTRICAL & DATA SYMBOLS

	WALL MOUNTED DUPLEX RECEPTACLE
	WALL MOUNTED QUAD RECEPTACLE
	CEILING MOUNTED DUPLEX RECEPTACLE
	CEILING MOUNTED QUAD RECEPTACLE
▽	WALL MOUNTED DATA OUTLET
▼	WALL MOUNTED TELEPHONE OUTLET

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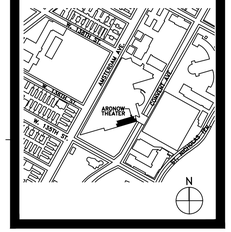
WWW. DASNY.ORG

Consultants:

HERITAGE ARCHITECTURE LLC
12W 37TH ST. SUITE 401,
NEW YORK, NY 10018,
T(201)262-3800

ADWAR VIDEO
125 GAZZA BLVD.
FARMINGDALE, NY 11735
(631)777-7070

Project Key



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Client

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THE CITY COLLEGE OF NEW YORK
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CCNY-ARONOW THEATER RENOVATION
ARONOW THEATER IT/ AV
IN NORTH ACADEMIC CENTER
AMSTERDAM AVE & 134TH ST
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Drawing Title

SHEET INDEX,
NOTES, & SYMBOLS

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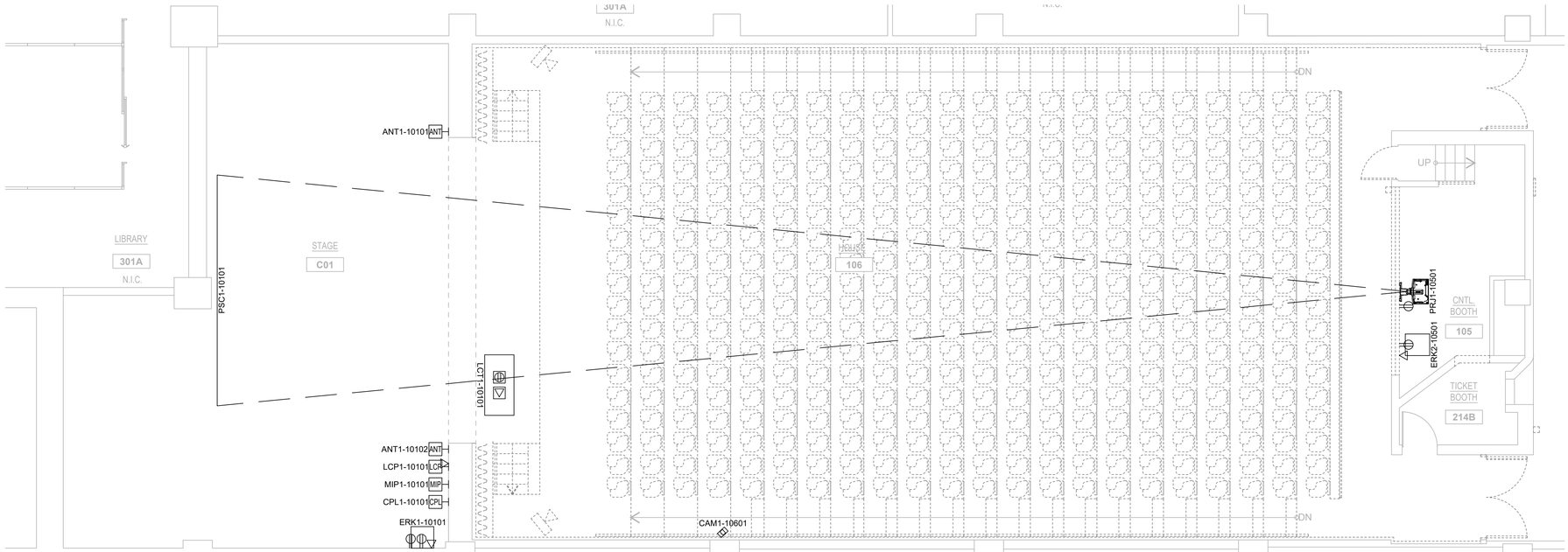
Drawing Number
TA-001

Drawing of



1 THEATER AV PLAN

Scale: 3/16" = 1'-0"

AV EQUIPMENT					ELECTRICAL REQUIREMENTS				DATA REQUIREMENTS	ADDITIONAL NOTES
DEVICE ID	DESRIPTION	MANUFACTURER	MODEL NUMBER	MOUNTING	J-BOX	J-BOX HEIGHT	POWER REQUIRED	POWER LOCATION	DATA	
ANT1	WIRELESS MICROPHONE ANTENNA	SHURE	UA874US	WALL MOUNTED	1 GANG BOX	108" A.F.F.				
CPL1	CONTROL PANEL	CRESTRON	TS-1070-B-S	WALL MOUNTED	2 GANG BOX	48" A.F.F.				
LCP1	LECTERN CONNECTION PLATE	CUSTOM	CUSTOM	WALL MOUNTED	3 GANG BOX	T.B.D.			2 DATA CONNECTIONS	
MIP1	MICROPHONE INPUT PLATE	CUSTOM	CUSTOM	WALL MOUNTED	3 GANG BOX	T.B.D.				
PRJ1	VIDEO PROJECTOR	PANASONIC	PT-MZ16KL	WALL MOUNTED			1 DUPLEX RECEPTACLE	T.B.D.		
PSC1	VIDEO PROJECTION SCREEN	EXISTING	EXISTING	CEILING MOUNTED						
CAM1	PTZ CAMERA	LUMENS	VC-TR1	WALL MOUNTED	1 GANG	108" A.F.F.	P.O.E.			
LCT1	LECTERN	SPECTRUM	FREEDOM XRS ELITE	PORTABLE			(1) DUPLEX RECEPTACLE	T.B.D.		
ERK1	EQUIPMENT RACK	MIDDLE ATLANTIC	DWR-24-22	WALL MOUNTED			(2) DUPLEX OUTLETS FED BY (2) DEDICATED 20 AMP CIRCUITS	DIRECTLY BEHIND EQUIPMENT RACK	DUPLEX DATA OUTLET BEHIND RACK	
ERK2	EQUIPMENT RACK	MIDDLE ATLANTIC	ERK-18-25	FLOOR STANDING			(1) DUPLEX OUTLET FED BY (1) DEDICATED 20 AMP CIRCUIT	DIRECTLY BEHIND EQUIPMENT RACK	DUPLEX DATA OUTLET BEHIND RACK	

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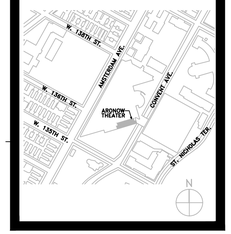
Project Key



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Drawing Title

SYSTEM DIAGRAM
VIDEO

Phase

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Drawing Number TA-101

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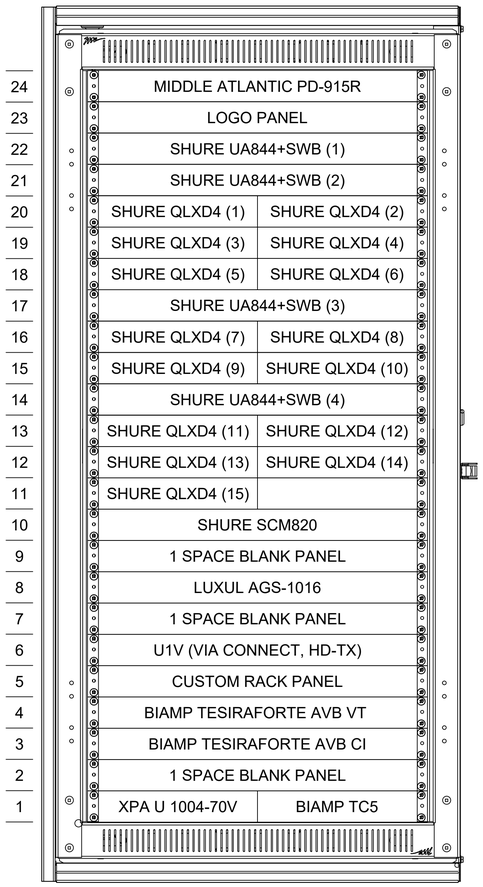
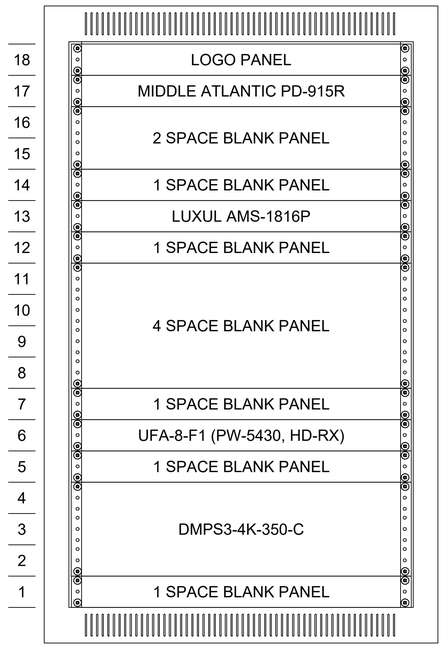


MIDDLE ATLANTIC DWR-24-22 WALL MOUNTED
EQUIPMENT RACK WITH VFD-24 LOCKING FRONT DOOR
(49.06" HEIGHT X 23.40" WIDTH X 22.00" DEPTH)

1 AUDIO EQUIPMENT RACK (BACKSTAGE)

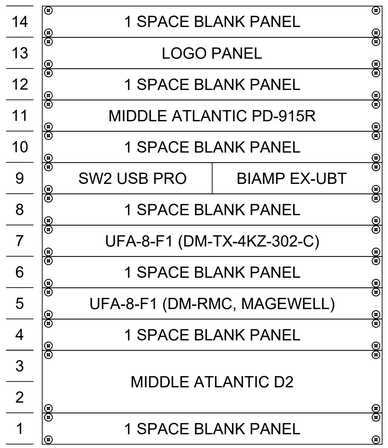
Scale: 3" = 1'-0"



MIDDLE ATLANTIC ERK-1825 EQUIPMENT RACK
WITH VFD-18 LOCKING FRONT DOOR
(35.63" HEIGHT X 22.00" WIDTH X 25.00" DEPTH)

2 VIDEO EQUIPMENT RACK (IN BOOTH)

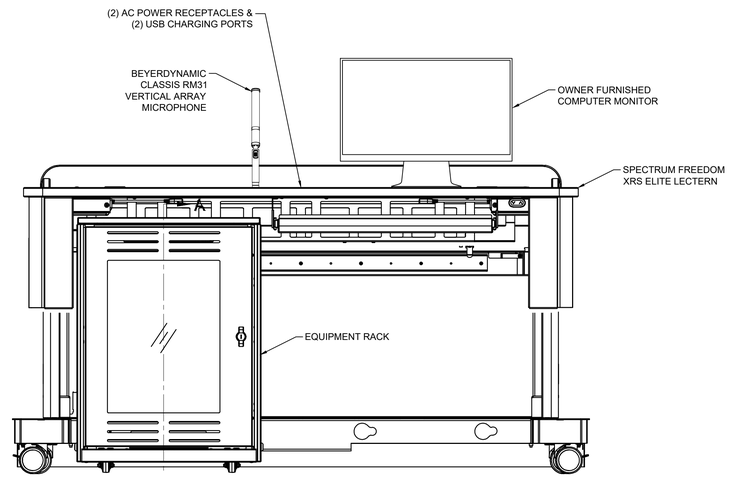
Scale: 3" = 1'-0"



LECTERN EQUIPMENT RACK

3 LECTERN EQUIPMENT RACK (PORTABLE)

Scale: 3" = 1'-0"



4 LECTERN DETAIL

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

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ARONOW THEATER IT/ AV
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AV DETAILS - EQUIPMENT RACKS & LECTERN

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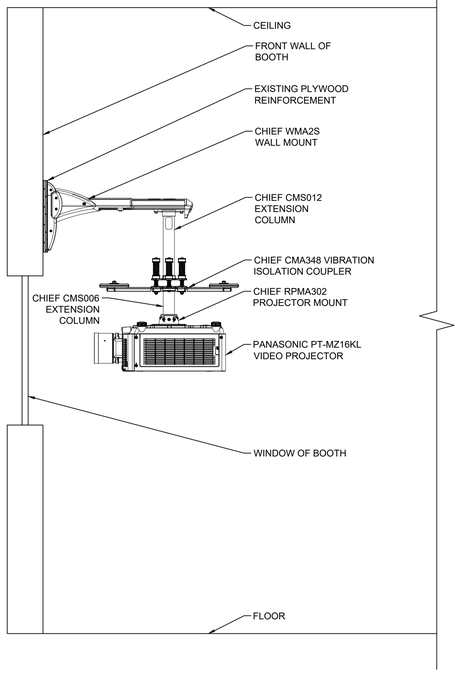
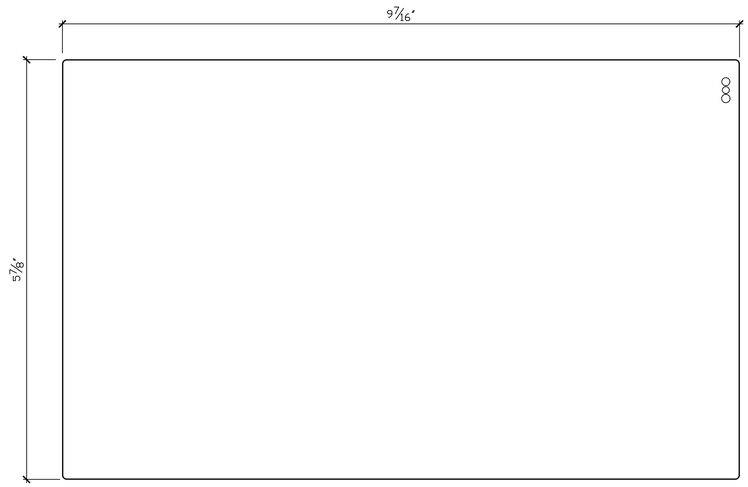


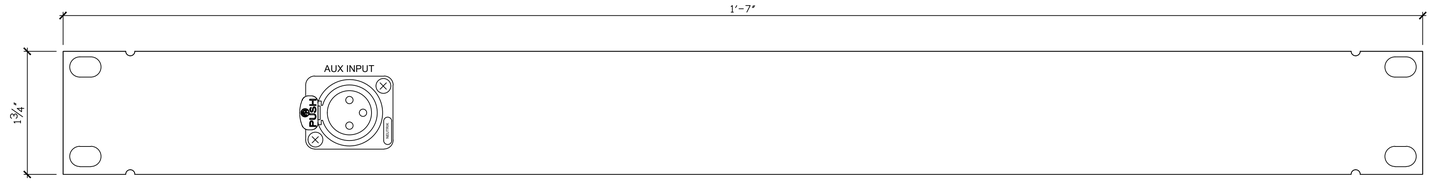
1 VIDEO PROJECTOR MOUNTING DETAIL

Scale: 1" = 1'-0"



2 CRESTRON TSW-1070 CONTROL PANEL (CPL1)

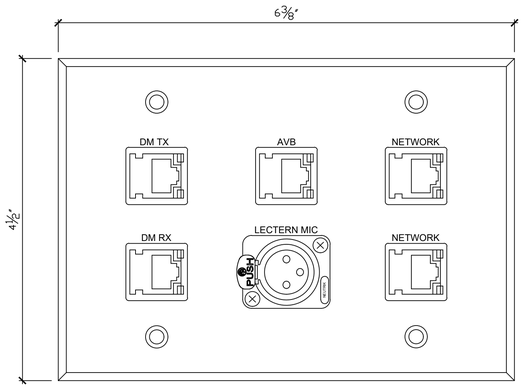
Scale: 1'-0" = 1'-0"



AUX INPUT: FEMALE XLR (BLACK)

3 AUX INPUT RACK PANEL

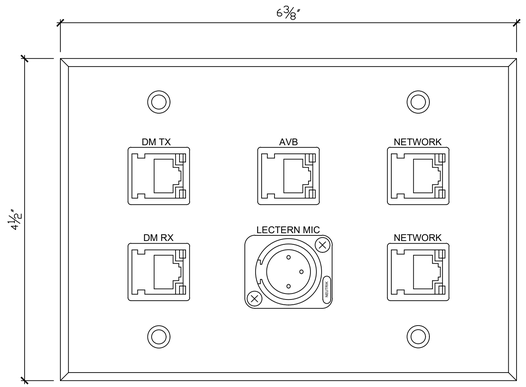
Scale: 1'-0" = 1'-0"



DM-TX: RJ45 (BLUE)
DM-RX: RJ45 (GREEN)
AVB: RJ45 (RED)
LECTERN MIC: FEMALE XLR (BLACK)
NETWORK: RJ45 (YELLOW)
NETWORK: RJ45 (WHITE)

4 LECTERN CONNECTION PLATE (LCP1)

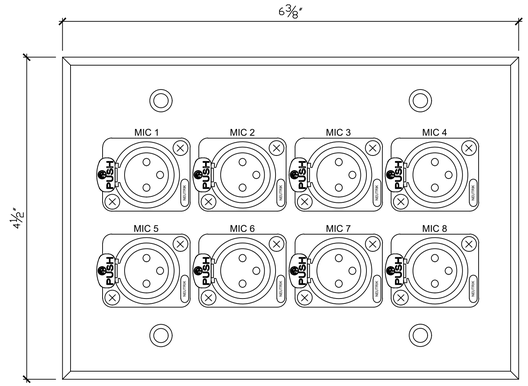
Scale: 1'-0" = 1'-0"



DM-TX: RJ45 (BLUE)
DM-RX: RJ45 (GREEN)
AVB: RJ45 (RED)
LECTERN MIC: MALE XLR (BLACK)
NETWORK: RJ45 (YELLOW)
NETWORK: RJ45 (WHITE)

5 LECTERN CONNECTION PLATE (MOUNTED TO LECTERN)

Scale: 1'-0" = 1'-0"



MIC 1-8: FEMALE XLR (BLACK)

6 MICROPHONE INPUT PLATE (MIP1)

Scale: 1'-0" = 1'-0"

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AV DETAILS

Phase
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EH		09/07/2021

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DASNY Project No:
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Drawing Number
TA-502

Drawing of

TOP OF LECTERN

CABLE PASS THROUGH

EQUIPMENT RACK WITHIN LECTERN

OWNER FURNISHED LAPTOP
- USB — 9' USB
- HDMI OUT — 9' HDMI
- LAN — CAT5E

EPSON ELPDC21 DOCUMENT CAMERA
- HDMI OUT — 9' HDMI
- USB

O.F.E. USB DRIVE — 9' USB

EXTRON SW2 USB PRO USB SWITCHER
- HOSTS: USB-C 1, USB-C 2
- DEVICES: USB-C 1, USB-A 2, USB-A 3, USB-A 4
- RS-232
- LAN — CAT5E
- PWR

BIAMP EX-UBT USB EXPANDER
- USB — 6' USB
- AVB/CNTRL — CAT5E

OWNER FURNISHED ROOM PC
- USB — USB-C — USB-C/DPORT
- USB — USB
- LAN — USB

MAGEWELL USB CAPTURE HDMI GEN 2 HDMI TO USB CONVERTER
- USB — 6' USB
- HDMI IN — CAT5E

CRESTRON DM-TX-4KZ-302-C DM TRANSMITTER
- DP IN
- HDMI IN 1
- HDMI IN 2
- AUDIO IN
- COM
- IR
- LAN — CAT5E
- USB HID
- HDMI OUT
- DM OUT — CAT5E

CRESTRON DM-RMC-4KZ-SCALER-C VIDEO RECEIVER
- DM IN — 6' HDMI
- HDMI IN
- AUDIO OUT
- COM
- LAN
- RELAY 1
- RELAY 2
- PWR

LECTERN DISCONNECT PLATE (LECTERN MOUNTED)

CAT5E

LECTERN DISCONNECT PLATE (WALL MOUNTED)

RJ45

CLIENT LAN

FROM TESIRACONNECT TC-5

BACKSTAGE AUDIO EQUIPMENT RACK

KRAMER VIA CONNECT PLUS WIRELESS PRESENTATION
- HDMI IN — HDMI OUT — 6' HDMI
- USB — DISPLAYPORT OUT
- LAN — 3.5MM OUT
- CLIENT LAN

CRESTRON HD-TX-101-C-E DM LITE TRANSMITTER
- HDMI IN — TO RX — CAT5E

CRESTRON HD-RX-101-C-E DM LITE RECEIVER
- FROM TX — HDMI OUT — 6' HDMI
- PWR

POWER SUPPLY

EQUIPMENT RACK

CRESTRON DMPS3-4K-350-C PRESENTATION SWITCHER

HDMI 1	HDMI OUT 1
HDMI 2	HDMI OUT 2
HDMI 3	DM 3 — CAT5E
HDMI 4	DM 4 — CAT5E
HDMI 5	
HDMI 6	
DM 7	
DM 8	CAT5E
AUDIO IN 1	PROG OUT L — 22/2 — TO TESIRAFORTE AVB CI, MIC/LINE 9
AUDIO IN 2	PROG OUT R — 22/2 — TO TESIRAFORTE AVB CI, MIC/LINE 10
AUDIO IN 3	AUX OUT 1 L
AUDIO IN 4	AUX OUT 1 R
AUDIO IN 5	AUX OUT 2 L
MIC/LINE 1	AUX OUT 2 R
MIC/LINE 2	SPKR OUT L
MIC/LINE 3	SPKR OUT R
MIC/LINE 4	70V SPKR OUT
MIC/LINE 5	
MIC/LINE 6	
	COM A
IR IN	COM B
INPUT 1	IR 1
INPUT 2	IR 2
INPUT 3	IR 3
INPUT 4	IR 4
CRESNET 1	RELAY 1
CRESNET 2	RELAY 2
CRESNET 3	RELAY 3
CRESNET 4	RELAY 4
PODM	
CONTENT LAN	
AV NET — CONTROL SUBNET	
LAN	

CRESTRON PW-5430DUS PODM POWER SUPPLY

LUXUL AMS-1816P MANAGED SWITCH (AV NET)

PORT 1	CAT5E — TO DMPS3-4K-350-C
PORT 2	CAT5E — TO TSW-1070-B-S
PORT 3	CAT5E — TO VC-TR1
PORT 4	CAT5E — TO TESIRAFORTE AVB VT
PORT 5	CAT5E — TO SCM820
PORT 6	CAT5E — TO AGS-1016
PORT 7	
PORT 8	
PORT 9	
PORT 10	
PORT 11	
PORT 12	
PORT 13	
PORT 14	
PORT 15	
PORT 16	
PORT 17	
PORT 18	
SFP 1	
SFP 2	

REAR WALL

CRESTRON DM-RMC-4KZ-SCALER-C VIDEO RECEIVER
- DM IN — 9' HDMI
- HDMI IN
- AUDIO OUT
- COM — 22/2
- LAN — CAT5E
- RELAY 1
- RELAY 2
- PWR

PANASONIC PT-MZ16KL VIDEO PROJECTOR
- HDMI IN
- RS-232
- LAN

SIDE WALL

LUMENS VC-TR1 AUTO TRACKING CAMERA
- HDMI OUT — 1.5' HDMI
- SDI OUT
- RS-232 — 22/2
- LAN (POE) — CAT5E — AV NET
- PWR

CRESTRON DM-TX-4KZ-100-C-1G-W-T DM LITE TRANSMITTER
- HDMI IN — DM OUT — CAT5E
- COM
- IR

BACKSTAGE ON WALL

CRESTRON TSW-1070-B-S 10" TOUCH SCREEN — CAT5E — AV NET

NEW YORK STATE OF OPPORTUNITY | DASNY

515 Broadway, Albany, New York 12207-2964
One Penn Plaza, 52 Floor, NY, NY 10119-0098
539 Franklin Street, Buffalo, NY 14202-1109
WWW. DASNY.ORG

Consultants:

HERITAGE ARCHITECTURE LLC
12W 37TH ST. SUITE 401,
NEW YORK, NY 10018.
T(201)262-3800

ADWAR VIDEO
125 GAZZA BLVD.
FARMINGDALE, NY 11735
(631)777-7070

Project Key

REVISIONS

Rev No	Description	Date:
–	-	-

Client

THE CITY UNIVERSITY OF NEW YORK
THE CITY COLLEGE OF NEW YORK
555 W 57TH STREET, 10TH FL
NEW YORK, NY 10019

CCNY-ARONOW THEATER RENOVATION
ARONOW THEATER IT/ AV
IN NORTH ACADEMIC CENTER
AMSTERDAM AVE & 134TH ST
NEW YORK, NY 10031

Drawing Title

SYSTEM DIAGRAM - VIDEO

Phase
50% CD FOR REVIEW

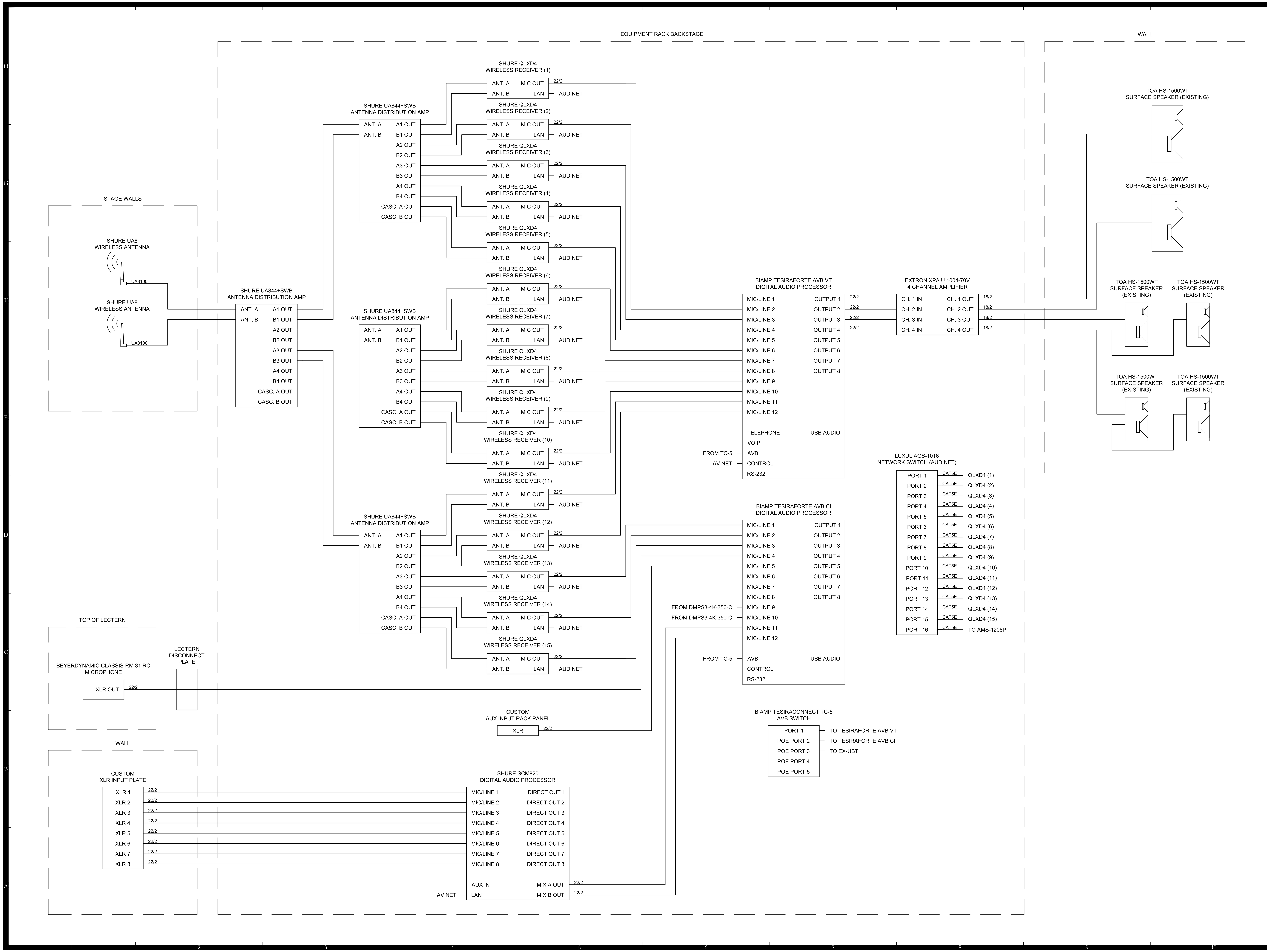
Drawn By:	Checked By:	Date:
EH		09/07/2021

Seal & Signature

DASNY Project No: 000

Drawing Number TA-601

Drawing of



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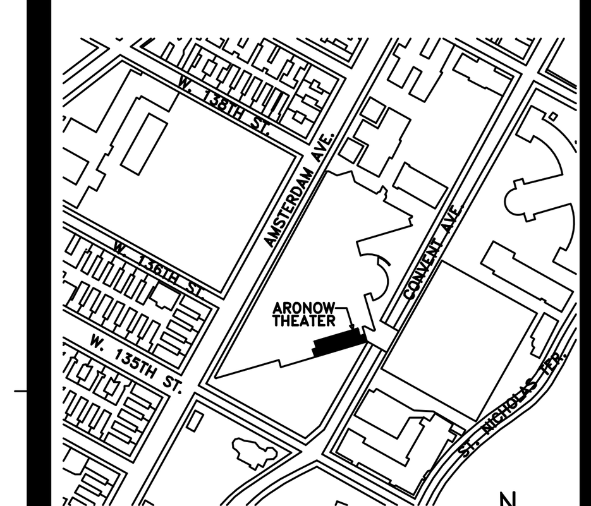
Project Key



REVISIONS

Rev No	Description	Date:
-	-	-

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555 W 57TH STREET, 10TH FL
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CCNY-ARONOW THEATER RENOVATION
ARONOW THEATER IT/ AV
IN NORTH ACADEMIC CENTER
AMSTERDAM AVE & 134TH ST
NEW YORK, NY 10031

Drawing Title

SYSTEM DIAGRAM - AUDIO

Phase
50% CD FOR REVIEW

Drawn By: EH | *Checked By:* | *Date:* 09/07/2021

Seal & Signature

DASNY Project No: 000

Drawing Number
TA-602

Drawing *of*

Attachment C: Scope of Work

and Site Logistics

See attached.

SECTION 274116

INTEGRATED AUDIO-VIDEO SYSTEMS AND EQUIPMENT

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

A. Work of this Section, as shown or specified shall be in accordance with the requirements of the Contract Documents for the Audio-Visual systems specified herein.

1. 2 WORK INCLUDED

A. Audio-Visual Systems include systems located where indicated on the drawings:

1. Video projection/display
2. Control system
3. Audio and video switching and distribution system
4. Custom plates
5. Providing and installing cable
6. Installation and warranty of systems
7. Owner Training

B. Provide installation of all Audio-Visual Systems, equipment and assemblies specifiedherein including termination of all cable, provided by this Contractor or supplied as specified herein and on the AV System contract drawings, for a complete and fully functioning system. Minor items not specifically mentioned in the specification, but necessary for fully functioning systems, shall be included without claim for additionalpayment.

C. Verify dimensions and conditions at the job site. All items are to be located per the locations confirmed by the architect prior to installation.

D. Submit shop drawings and samples for review prior to fabrication.

E. Fabricate and assemble audio-visual systems in accordance with these specifications, equipment manufacturer's recommendations and all applicable coderequirements.

F. Coordinate work with other trades of adjoining and related work. Review shop drawings of projection screen, millwork, etc. for coordination of equipment installation,clearances, ventilation, etc.

G. Inspect, align and final adjust completed installation. Demonstrate the operation of the completed, audio-visual installation for acceptance by Consultant and Owner. Submitfinal documentation as described herein.

H. Provide training to system operators.

1.3 QUALITY ASSURANCE

A. The system shall be comprised of components that are of professional quality.

Approved manufacturers shall be as specified herein.

B. This Contractor shall be an authorized representative of the manufacturer of the specified audio-visual equipment unless specifically exempted from this requirementby the Owner or Consultant.

C. This Contractor shall have successfully provided installation and engineering servicesover completed installations for a period of five years or more and shall have completed at least five major system installations of this type. The Owner and the Consultant shall be the final judge of suitability of experience.

1.4 DEFINITION OF TERMS

A. The term “Contractor” as used herein refers to theparty responsible for providing all services and system integration covered herein and on related drawings.

B. The term Consultant shall refer to the party responsible for the design of the system.

C. The term “General Contractor” shall refer to party responsible for managing and installing the general construction of the project.

D. The term “Electrical Contractor” shall refer to the party responsible for the installationof conduit and 120V devices.

E. The term “provide” shall mean supply and install.

F. The term “Owner Furnished Equipment Contractor Installed” shall refer to equipment supplied by the Owner to this contractor for installation.

G. Technical terms particular to special systems and related work shall be construed inthe following manner, in accordance with:

1. Captions on related drawings.
2. Generally recognized audio-visual technology usage.
3. Relevant usage and definitions of handbooks, guidebooks or trade group recommendations by manufacturers' associations or professional and engineering societies.

1.5 INDUSTRY STANDARDS

A. Regulatory Agencies: Work shall be carried out in conformance with the requirementsof the Owner, applicable Building and Electrical Codes, OSHA, Underwriter's Laboratories, National Association of Sound Contractors, Electronic Industries Association and the National Fire Protection Association.

1.6 SUBMITTALS

A. Shop Drawings:

1. Provide three copies of the shop drawings for review by the Owner, Architectand Consultant. The following scaled drawings shall be provided for reviewprior to fabrication:
   a. Wiring and interconnection diagrams of system components including notation of type and manufacturer of all items of equipment.Include cable types and quantities (using the contract drawings as a basis), connector types, cable numbering scheme, etc. (scale as required). Any discrepancies between the contract drawings and thesystem requirements shall be brought immediately to the attention ofthe Consultant.
   b. Point to point riser diagram for all devices indicating cable type and quantity.
   c. Manufacturer's cut sheets of major dimensions, specifications and finishes of all equipment and accessories shall be provided in a binder. The binder shall include a detailed list of part numbers andquantities of each item to be provided.
   d. Suspension and attachment arrangement for all equipment includingbut not limited to video projectors, video monitors, loudspeakers, etc.
   e. Receptacle plate details.
   f. Remote control panel pictorial layouts and functional description.
   g. Rack elevations.
   h. Sample of proposed instruction page for non-technical description of functional capabilities of the system for each room type. Final copy will be laminated and provided in each classroom.

2. All shop drawings shall be CAD generated. DWG and PDF format drawingsshall be included in the final system documentation material turned over to the Owner including source code of remote control system programming.
3. Drawings used in the fabrication and installation of the systems specifiedherein shall bear the Consultant's stamp.
4. Review of shop drawings shall not be considered as a guarantee of measurements of site conditions. Where drawings are indicated as having been reviewed, said review does not mean that drawings have been checkedin detail, and said review does not in any way relieve this Contractor from hisresponsibility or necessity of furnishing material or performing work as required by the Contract Specifications

B. Final Submittals

1. Within thirty days of the Acceptance Tests, this Contractor shall furnish the following:
   a. Two copies of the as-built shop drawings shall be turned over the Owner. One copy shall be sent to the Consultant. Functional diagrams of the audio, video and control systems for each spaceshall be reduced and laminated for turn-over to Owner.
   b. Three copies of a complete instruction, operation and maintenance book, including all block and schematic diagrams, wiring diagrams and technical manuals of system components are required. Booksshall be turned over to the Owner. The instruction book shall also include a written description of system operation procedures to supplement training activities. The system description shall includepictorial views of operator adjustable settings with normal settings indicated for future restorations of system setting.
   c. Four copies of as-built shop drawing files (in AutoCAD V2014 or higher and PDF format) and control system source code file.Three copies

to be turned over to the Owner, one disk shall be sent to the Consultant.

d. Provide at each room a laminated 8.5” x 11” instruction page for non-technical staff describing basic functionality of AV system. Mount as directed in field.

1.7 DELIVERY, STORAGE AND HANDLING

A. The equipment to be furnished hereunder shall be delivered to the building upon receipt of written notice from the Construction Manager and/or Owner that secure storage facilities are available.

B. Liaison shall be made between this Contractor and the authorized personnel at the project site for safe storage of components being shipped. The requirements for safehandling and storage of these components shall be coordinated between these two parties.

C. Fabricated and assembled equipment shall be wrapped and sealed in polyethyleneand substantially boxed for shipment. Standard components shall be shipped in manufacturer's original packing. Boxes shall clearly indicate equipment contained, "front", "top", "fragile", nature of components and site location.

1.8 SUBSTITUTE EQUIPMENT

A. Bids must be based upon specified or approved alternate equipment.

B. Substitute equipment is that which may or may not have been reviewed for inclusionin the system design, or which may have become available following issuance of theContract Documents.

C. This Contractor shall have the burden of proving at his own cost and expense to the satisfaction of the Owner and Consultant that the proposed product is equal to the named product.

D. The Contractor shall ship, prepaid by UPS (or other carrier as agreeable by the Consultant) the substitution with all shipping costs paid by the Contractor.

1. Where optional materials or methods are specified and/or approved, this Contractor shall make all adjustments to contingent work necessary to accommodate the option he selects.

E. New Products:

1. Minimum performance requirements for individual components specified herein shall be as detailed in the latest published Manufacturers data sheets.
2. In the event that one or more of the products specified herein is unavailable,this Contractor shall make recommendations to the Consultant as to what substitutions are available to meet the intent of the Specification. The Consultant shall then determine what product, either from the Contractors' recommendations,

or from the Consultant's own research, may be substituted.

3. The Consultant reserves the right to substitute a new product that may have become available following the issuance of the Contract Documents. Such substitutions shall be made prior to final review of the equipment list.

1.9 GUARANTEE AND SERVICE

A. Contractor shall warrant systems and equipment to be free of defective components,faulty workmanship or improper adjustment for a period of one year from the date ofFinal Acceptance by the Owner and Consultant. Paint, exterior finishes, lamps and fuses are excluded.

B. Warranties on manufactured equipment shall be designated to the Owner on the date of Final System Acceptance. See Part 3 for more information regarding Final System Acceptance

C. This Contractor shall provide at his expense maintenance service for a period of oneyear after final acceptance of the installation. The service shall consist of at least sixvisits to the site at regular intervals over the course of the maintenance period for checking and adjusting of equipment. Contractor shall submit signed copies of his service visits, including the date, tasks accomplished and names of Owner’s personnel in attendance.

D. This Contractor shall be required to answer all service calls within twenty-four hoursof a request being made.

1.10 PUBLICATION

A. Written approval from the Owner shall be obtained prior to the release of any information concerning this Project.

PART 2 – PRODUCTS

2.1 GENERAL PERFORMANCE REQUIREMENTS

A. Audio System:

1. Certain overall performance requirements of the audio system shall be checked by measurement. Each system as designed meets the following requirements based upon available data and the manufacturer's published specifications. The Contractor shall be responsible for use of the equipmentspecified in the manner specified, and each component's conformance withits manufacturer's specifications.
2. Overall system noise shall be at least 60 dB below +40 dBm (10 watts) outputin a frequency range of 63 to 12000 Hz measured from the microphone matched input to the speaker terminals.
3. Residual noise and hum shall be below the masking noise levels produced bythe air

conditioning system, for an overall signal-to-noise ratio of 60 dB for theentire system.

B. Video System:

1. Performance of the video system shall be free of distortion due to grounding,signal loss from cable attenuation or any other cause.
2. Video monitors and projectors shall be calibrated for optimal color renditionand performance.

2.2 SYSTEM EQUIPMENT

A. Video Projectors:

1. Coordinate with Consultant and Owner on projector mounting positions with site conditions, image sizes, aspect ratios, and projector throw ratios.
2. Provide the appropriate lens for all projectors.
3. Provide vibration isolation and additional support as required to stabilize the projected image.
4. Projector mounting height shall be placed for optical alignment with projection screen so that keystone shall not be engaged.

B. Digital Video System:

1. Adjust Video Media transmitters and receivers for proper EDID tables and resolutions.
2. Video Media Receivers shall be set to maintain aspect ratio as determined by display orientation.
3. Provide Owner with complete list of all IP addresses.
4. Coordinate V-LAN'S and IP schemes with owner.

C. Speakers and Amplifiers:

1. Label each amplifier with which speaker zones each amp channel is driving.
2. Set gain levels for appropriate gain structure and maximum range of system volume.

D. Rack-Mounted Equipment

1. AV equipment racks and accessories shall be manufactured by Middle Atlantic or approved equal.
2. Provide all mounting hardware, power distribution, cable management, and rack screws as required.
3. Provide blank panels for all unused rack spaces.
4. Provide appropriate ventilation for equipment to operate at or below 80 degrees Fahrenheit.

E. Custom Plates

1. Plates shall be fabricated from 0.125" aluminum and engraved with text above specified connectors.
2. Plate color shall be anodized black unless noted otherwise.
3. Submit plate engraving for approval.
4. Plates shall be manufactured by PanelCrafters or approved equal.

F. Audio Visual Cable

1. This Contractor shall provide all cable between equipment as indicated on the functional and wiring diagrams.

2. All portable cable, connectors and required adapters that connect fixed receptacle panels to loose or fixed equipment will be furnished by this Contractor.
3. Provide permanent cable identification tags for all cable.

G. Control Systems

1. The Contractor will provide all required programming of the controlsystem to achieve the functional and aesthetic requirements described herein.
2. The Contractor will provide any changes to the touch screen controlpanel layouts requested during the check-out and testing period.
3. Source code file shall be turned over to the Owner as part of the final Submittals.

2.3 GENERAL FUNCTIONAL REQUIREMENTS

A. Video Systems

1. High brightness laser video projector shall be provided and installed via a wall mount with necessary vibration isolation within the projection booth. This projector shall be used with the existing video projection screen for the time being until the projection screen is upgraded at a later date.
2. Video sources for the projector include an owner furnished PC to be mounted within the lectern, a lectern mounted HDMI connection for a laptop, a lectern mounted document camera, and a wireless presentation system. (2) Wall plates and (1) floor box will allow connection of input devices via HDMI and/or microphone connections.
3. All video sources shall be routed through a Crestron presentation switcher A rack mounted aux panel may also be utilized as a potential connection forowner furnished equipment.

B. Audio Systems

1. All existing speakers shall be reused including the (2) main left and right speakers and the (4) supplemental fill speakers. A new 4 channel amplifier shall be installed to power the existing speakers, while a new digital audio processor will provide all necessary routing and tuning as needed to optimize the audio system for the intended use of the room. (2) Wall plates and (1) floor box will allow connection of customer suppliedvideo sources (HDMI) within the room to be viewed by the system.
2. Desktop microphone to be installed on the lectern
3. (5) Wireless handheld microphones, (5) Wireless lavalier microphones, and (5) wireless headset microphones shall be installed, along with remote antennas, and all corresponding antenna distribution.
4. Microphone input plate with 8 XLR inputs to be installed on the wall to the side of the stage. These 8 inputs shall feed a rack mounted microphone mixer for simple tactile control of the levels of each input. The levels shall also be able to be controlled via the control system as well when used with the rest of the audio system.

C. Conferencing

1. Wall mounted auto-tracking PTZ camera to be installed along the side wall for capturing the stage area. Camera shall be routed through the video presentation

switcher to an HDMI to USB converter in order to use the camera with conferencing applications on the PC.

2. Audio DSP with AEC and a USB interface to connect to conferencing applications on the Room PC

D. Control

1. 10" touch panel to be securely installed on the wall beside the stage. From this touch panel, a user shall be able to control basic room functionality such as display on/off, video source selection, volume, camera control, microphone mute/unmute, microphone level control, and more.

E. Lectern and Equipment Racks

1. A moveable instructor lectern shall be provided with an integrated equipment rack for housing local equipment. Additionally, on this lectern will also be a document camera, a boundary microphone, laptop connectivity, AC and USB power, and an owner furnished PC.
2. A wall mounted rack shall be provided and installed on the wall beside the stage for all audio equipment
3. A small floor standing rack shall be provided in the booth for all video and control equipment

2.4 MAJOR EQUIPMENT

See Attachment B - Detailed Specifications

PART 3 – EXECUTION

3.1 INSPECTION

A. Examine all work prepared by others to receive work of this Section and report any defects affecting installation to the Consultant or Owner for correction. Commencement of work will be construed as complete acceptance of preparatorywork by others.

B. The Contractor shall visit the project site to become familiar with the work as it relatesto the audio-visual system. The Contractor shall attend project meetings with Owner,related trades, Consultant and Architect to anticipate conflicts with equipment installation.

3.2 AUDIO SYSTEM PERFORMANCE CRITERIA

A. With all furnishings and finishes in place, the audio system gain shall be adjusted to provide levels of at least 70dB, or 10dB above room ambient noise levels, whicheveris higher, at the measuring location for testing (see Testing and Calibration below).

B. The uniformity of level throughout the specified coverage area for each system shallnot vary more than +/- 4dB utilizing “pink” noise at 4,000 Hz.

C. All equalizers are to be adjusted to realize maximum gain and optimal tonal balancefrom sound system throughout coverage area.

D. The output level of all program sources arriving at routing or switching equipment shall be within +/- 0.25dB of all other program sources. Provide line amplifiers or othergain control devices as required to achieve said levels.

E. The Audio system shall meet or exceed the following specification levels, measuredat any output point within said system:

1. Frequency Response: +/- 3.0dB between 20Hz to 20KHz.

2. Signal to Noise Ratio: No less than 60dB peak noise to RMS signal.

3. Total Harmonic Distortion: 1% between 20Hz to 20KHz

F. To meet audio system performance criteria, the settings for the initial adjustments of equalizers, gain controls, other signal processing equipment and loudspeakers is the responsibility of the AVC under the direction of the Owner’s authorized representatives during demonstration and acceptance testing, making the final adjustments at this time.

G. The specified coverage area’s acoustical frequency response is to be measured within +/- 3dB of a flat, low-frequency spectrum limit band below 2500Hz and slopesdownward thereafter at the rate of 3dB per octave to 12,500Hz.

3.3 VIDEO SYSTEM PERFORMANCE CRITERIA

A. Digital Video Signal Cabling, Extension and Distribution

1. The video cabling and distribution system, measured at any point within said system shall meet or exceed the electrical specifications shown below. To accomplish this compliance, a standard video reference signal shall be introduced to the system at any or all source locations of origin (e.g. media players, computer input locations, Blu-Ray players, cameras, etc.), and signalcharacteristics are to be measured at standard destination locations (e.g. projectors, monitors, video walls, digital signage displays, etc.). These direct signal performance requirements are to be accomplished in all systems whether any matrix switching, wideband equalizing, workstation interfaces orvideo distribution are present or not.

   a. Frequency response: +/-1.5dB, DC to 100 MHz for computer andvideo signals and +/- 3.0dB for digitally encoded HD-SDI signals.

   b. Jitter Amplitude: Less than 0.2 unit intervals at HD-SDI rate.

   c. All other video parameters are the same as analog video shown above.

2. Digital signals to provide the following

   a. EDID Management

   b. HDCP 2.2 compliance

   c. HDMI 1.4, DVI 1.0, Display port 1.1 or 3G-SDI signal transport

   d. Troubleshooting tools

   e. Support for video formats up to but not limited to 1920 x 1200 (where4K is requested 3840 x 2160 or 4096 x 2160)

   f. Cabling must meet or exceed manufacturer’s specifications.

3. Digital Video Extension

   a. Transmitters and receivers must be able to extend resolutions up to4096 x 2160 at 30Hz with a 4:4:4 color sampling or 4096 x 2160 at 60Hz with a 4:2:0 color sampling for cable length based on manufacturer’s specifications.

   b. Cabling must meet or exceed transmitter/receiver manufacturer’s specifications.

B. Displays (Projectors, Monitors and Video Walls)

1. Projectors shall be installed based on mount specifications and secured to structural elements of the field verification. Vibration isolators to be used if necessary.

2. Projectors are to be adjusted so that the resultant images are free from barrel

distortion, vignetting and keystoning, and to be adjusted to best fill the screenarea as per resolution requirements. They shall be adjusted to exhibit the correct color balance, both at black and peak white as well as proper grey- scale tracking.

3. All video displays are to meet or exceed manufacturer's specifications for brightness, contrast, focus, convergence, distortion, purity and linearity across the entire range of horizontal and vertical scan frequencies that the display is to be specified capable of. In the absence of available specifications for the previously mentioned, no distortion, convergence, purityor linearity errors shall be visible from a viewing distance equal to the image width and brightness, contrast and focus shall meet standard performance guidelines.

4. All displays shall meet or exceed manufacturer's published specifications for horizontal and vertical scan frequency ranges. Where appropriate, adjustments shall be made to allow for automatic scan locking across specified frequency ranges. Image quality specifications shall be met throughout the horizontal and vertical scan frequency ranges.

3.4 INSTALLATION

A. The Contractor shall supply all equipment, pre-wired equipment racks, receptacle plates, consoles, mounting hardware and accessories etc., required for complete andfunctioning systems for installation.

B. All rack mounted equipment, switches, jacks, outlets, etc., shall be permanently identified with labels approved by Consultant. Submit samples of proposed labels forapproval.

C. All cables shall be clearly and permanently identified with standard alphanumeric markers at each end. These marker codes shall be noted on the Shop Drawings prepared by the Contractor.

D. Care shall be exercised in wiring, so as to avoid damage to the cables and to the equipment. Between racks, cabinets, consoles or modules, all cables shall be well-supported and shall be neatly laced and dressed. All joints and connections shall bemade with rosin-core solder or with mechanical connectors approved by the Consultant.

E. Drawings are diagrammatic and indicate general arrangement of systems and work included. Follow drawings in laying out work and check drawings of other trades relating to work to verify spaces in which work will be installed. Maintain headroomand space conditions to all points.

F. Final location of all equipment shall be located as shown on reviewed shop drawings,or as located in the field by the Consultant.

G. All signal cables shall be insulated from the conduit and from each other from termination to termination. Microphone, loudspeaker and other signal conduits shallbe mechanically and electrically connected to receptacle plates and shall be electrically isolated from system equipment racks.

H. Microphone or line level shields shall be grounded only at the end that terminates atthe equipment rack(s) and shall be grounded only to the common ground of the equipment

rack.

I. All grounds in the equipment rack(s) shall be connected to a common point on therack.

J. At receptacle plates, all joints and connections shall be made with rosin-core solder orwith mechanical connectors approved by the Consultant.

K. All power and high level circuits shall be run on the right side of the rack or cabinet asviewed from the rear. All other circuits shall be run on the left side as viewed from therear.

3.5 SYSTEM TESTING AND CALIBRATION

A. Initial tests and adjustments shall be performed by the Contractor who shall include the cost of these tests in his bid proposal. The Contractor shall furnish all equipmentnecessary and perform all work required to determine or modify the performance of the system in accordance with the specifications. The Contractor shall carry out the following inspections of the system and submit to the Consultant the written results ateach inspection for inclusion on the permanent records of the sound system.

1. Verify signal flow through the entire system.
2. Precisely align, adjust, and calibrate video projectors.
3. Measure and record the impedance of each loudspeaker line before connecting it to the output of its respective amplifier and confirm that it isequal to or above the rated impedance.
4. Measure and record the phasing of all loudspeakers. A phase checker shallbe used to verify proper phasing.
5. The remote control shall be checked out for specified operation function requirements. "Remote" shall include all functions between the rack mounted control electronics, required system equipment to be controlled, remote control touch panels and wireless devices for the functions described in Part2.
6. Balance the levels of the loudspeakers driven by different channels of amplifiers in the system to assure uniform coverage and level of sound fromloudspeakers.
7. All level controls on rack-mounted equipment shall be adjusted for optimum signal to noise ratio and signal balance, noted for system documentation andthen capped, where possible, to prevent tampering.

C. Video System:

1. Operate video projectors with NTSC video and data sources from all input locations to demonstrate to Consultant and Owner proper operation and adjustment. Color balance for projectors shall be established with the use ofa meter. Align projected image to eliminate any keystoning. Focus shall be consistent from edge to edge of image.
2. Demonstrate remote video projector control functions from control panels.
3. Establish the normal settings for all video and audio matrix switchers. Presetsfor typical system operation shall be established in conjunction with Owner and Consultant and included in documentation.
4. Demonstrate proper operation of video cameras.

3.6 CLEANING

A. Following Installation, all soiled, abraded or discolored surfaces of work installed herein shall be cleaned and left free from blemishes or defects. Work that is damaged or improperly installed shall be removed and replaced and the entire installation left in complete satisfactory condition. Clean the areas affected by theWork to a level of operational cleanliness. Dispose of protective covering materialand debris accordingly.

3.7 FINAL ACCEPTANCE TESTING

A. Contractor shall demonstrate operation of each component of the systems to the Consultant and Owner's representative until acceptance is granted.

B. When Final Acceptance testing has concluded to the Owner and Consultant's satisfaction, Contractor shall submit a written request for Final Acceptance. Guarantees, warranties and service contracts will commence upon written notificationof Final Acceptance by the Architect.

3.8 INSTRUCTION

A. Within two working weeks of system acceptance, the Contractor shall commence aseries of training sessions for persons designated by the Owner. A total of (8) eight hours of training, at mutually acceptable times, shall be provided during a four-week period. Contractor shall submit names and period of attendance of thoseinstructed.

END OF SECTION 274116

Site Logistics:

1) Work area is directly accessible from the street. A loading dock available, if needed.

2) Hours preferred for delivery are M-F between 8:00 AM and 5:00 PM.

3) Ground floor delivery, no elevators required.

4) Parking is available on Convent Avenue for commercial vehicles, only.

5) All visitors must present proof of vaccination or a copy of the negative COVID-19 test to gain access to the building. Visitors must access the Cleared4 application and self-register.