

ADDENDUM NO. 1

**GYMNASIUM FLOOR REPLACEMENT
BID# AVC2015/2016-19
Project #16-251**

Antelope Valley Community College District
Lancaster, CA

March 8, 2016

Ledesma & Meyer Construction Co., Inc.
9441 Haven Avenue
Rancho Cucamonga, CA 91730

NOTICE TO BIDDERS

This Addendum forms a part of the Contract and modifies the original documents dated March 8, 2016. It is intended that all work affected by the following modifications shall conform to the related provisions and general conditions of the contract of the original drawings and specifications. Modify the following items wherever appearing in any drawing or sections of the specifications. Acknowledge receipt of Addendum No. 1 in the space provided on the Bid Form. Failure to do so may subject bidder to disqualification.

1. CHANGES TO THE PROJECT MANUAL

- 1.1 Reference Specification 00020 Notice To Contractors Calling for Bids**
Revise Required Classification of California Contractor's License to read B or C-15.
- 1.2 Reference Specification 01011- Work Scope Special Conditions**
Work Scope Special Conditions is hereby added to this project and made a part of this addendum per the attached.
- 1.3 Reference Section 01210 – Allowances**
Specification Section 01210 Allowances is hereby added to this project and made a part of this addendum per the attached.

- 1.4 Reference Section 01310 – Project Construction Schedule:**
Project construction schedule is hereby added to this project and made a part of this addendum per the attached.
- 1.5 Reference Section 01500 – Temporary Construction Facilities:**
Replace specification section 01500 in its entirety with the attached 01500 Temporary Construction Facilities.
- 1.6 Reference Section 160110 – Campus Technology Standards with Appendix**
Specification Section 160110 Campus Technology Standards with Appendix is hereby added to this project and made a part of this addendum per the attached.

End of Addendum 1

Attachments:

01011 – Work Scope Special Conditions
01210 - Allowances
01310 – Project Construction Schedule
01500 – Temporary Construction Facilities
Sheet A1.2 - Enlarged Floor Plan
Sheet E1.2 – Electrical Plan

ANTELOPE VALLEY COMMUNITY COLLEGE - GYMNASIUM FLOOR REPLACEMENT

WORK SCOPE SPECIAL CONDITIONS

CONTRACTOR CATEGORY NUMBER		
ITEM:	DESCRIPTION:	4
1	Contractor shall not interfere with the normal, regular, or existing business operations or activities of the College at the project site.	yes
2	Properly protect existing improvements scheduled to remain when performing work within this category.	yes
3	Properly & completely coordinate all work through the Construction Manager to ensure that all work is properly and efficiently installed per the project manual.	yes
4	All daily reports shall be turned into the Construction Manager on a daily basis.	yes
5	All deliveries and material or equipment moving between construction areas shall be coordinated and approved by the Construction Manager prior to commencement.	yes
6	This Contractor shall include all site visits as requested by the Construction Manager with the purpose of coordinating with the applicable Category Contractors. This Contractor shall also provide, all layouts for the integration of work between this Category and the applicable Categories.	yes
7	Utilize suitable equipment for traversing the site, hauling or relocating of materials, and/or erection of items within this trade regardless of soils conditions or grades at no additional cost or delay to the schedule.	yes
8	Contractors within this category shall pay and maintain cell phone numbers for their project foreman throughout the duration of this project.	yes
9	Provide all job verification and field measuring as may be needed and/or required to ensure that the work is coordinated and fits properly.	yes
10	Repair any and all finishes damaged as a result of the execution of the work in this category.	yes
11	Provide cleanup on a daily basis to insure a clean and safe & accessible work environment.	yes
12	Contractor to provide trash containers and/or properly dispose of waste, trash, lunch trash and debris. This includes procurement of all hauling permits and/or dump fees which may be required. This applies equally to any/all subcontractors employed by the Prime Contractor.	yes
13	Be advised - the project site is located in an area of potential high winds. The protection against and prevention of wind damage to incomplete work or on-site stored materials is the responsibility of the contractor.	yes
14	Be advised - the project site is located in an area of potential high heat. The protection against and prevention of heat damage to incomplete work or on-site stored materials is the responsibility of the contractor.	yes
18	The Construction Manager will set the construction working hours on site.	yes
20	Completely furnish all cutting and patching as required in all existing construction including finishes due to the installation of work of this category contractor.	yes
21	All deliveries and material or equipment moving between construction areas shall be coordinated and approved by the Construction Manager prior to commencement. They will need to take place 1st thing in the morning before students and staff are on site.	yes
22	Parking areas shall be designated by the Construction Manager.	yes
23	The Construction Manager will review and approve the placement of all temporary storage containers, trailers and stored materials. Refer to CMSK-1	yes

ANTELOPE VALLEY COMMUNITY COLLEGE - GYMNASIUM FLOOR REPLACEMENT

WORK SCOPE SPECIAL CONDITIONS

CONTRACTOR CATEGORY NUMBER		
ITEM:	DESCRIPTION:	4
24	Provide all barricades, warning lights and signs & safety measures etc. required for the execution of the work within this category.	yes
25	ALL references to "Architect" throughout the Project Manual shall be replaced with "Construction Manager".	yes
26	Provide all demo of the existing assemblies indicated to be demolished as per the documents.	yes
27	Provide and properly install all flooring as indicated per the documents along with any flooring accessories required for a complete installation.	yes
28	Prior to installation the new flooring and after the existing flooring has been demolished, properly prep/patch and/or skim coat the existing concrete floor and stairs so as to provide a sound and suitable substrate for the installation of the new flooring.	yes
29	Provide moisture & PH testing prior to commencement of prep/patch for the flooring installation for verification that the existing substrate does not exceed the manufactures recommendations for moisture vapor emission and PH levels.	yes
30	Provide and maintain all temporary chemical toilets and temporary had wash stations for the duration of the project. A minimum of 2 toilets and 1 hand wash station shall be provided and may be adjusted based upon the quantity of manpower present on the jobsite. Provide twice a week cleaning. Coordinate locations of temp toilets and hand wash stations with the Construction Manager.	yes
31	Provide any and all temporary fencing which may be required as a result of work of this contract.	yes
32	This Category Contractor shall provide all work shown on the project documents to provide a complete and operable system. Including all electrical, low voltage and painting.	yes
33	Contractor made need to modify the specified wall base to adhere to existing walls. Review prior to bidding project to include all necessary adjustments at no additional cost to the owner.	yes
34	Provide all new thresholds at all doors entering gymnasium.	yes
35	This Category Contractor shall include removing and reinstalling of the existing bleacher system.	yes
36	Contractor shall verify and keep all existing systems fully operational as they execute the scope of work within this contract.	yes
37	Provide all floor prep to concrete sub floor to accept new wood floor system.	yes
38	Include all work to provide an operable system per E1.2.	yes
39	Provide any touch up paint as needed to finishes damaged during this work.	yes
40	THIS CATEGORY CONTRACTOR SHALL SUBMIT ALL SUBMITTALS AND SHOP DRAWINGS WITHIN FIVE (5) BUSINESS DAYS AFTER RECEIPT OF NOTICE OF INTENT TO AWARD. AFTER RECEIVING APPROVAL, CONTRACTOR WILL IMMEDIATELY ORDER ALL ITEMS THAT HAVE LONG LEAD TIMES SO AS THE MATERIAL IS AVAILABLE BY THE SCHEDULED CONSTRUCTION START. CONTRACT WILL BE ABLE TO TO BILL FOR STORED MATERIAL AFTER SUBMITTING INVOICES AND PROOF OF DELIVERY.	YES
41	Include delivery of material to get acclimated in gymnasium. Will need to provide all necessary equipment to relocate throughout the duration of the project.	yes

ALLOWANCES

PART 1 - GENERAL

.1 SUMMARY:

.1 Section Includes: Allowances which the Contractor shall provide for designated construction activities in the Work and in his bid.

.2 Related Documents: The Conditions of the Contract and other sections of Division apply to this section as fully as if repeated herein.

.2 DESCRIPTION OF REQUIREMENTS:

.1 Definitions and Explanations: Certain requirements of the construction related to each allowance are indicated and specified. The allowance has been established instead of additional requirements for that construction, and further requirements thereof will be issued by Change Order.

.2 Type of allowance scheduled herein for the Work include the following:

.1 Lump sum allowances

.3 Selection and Purchase: At earliest feasible date after award of Contract, advise the Architect of scheduled date when final selection and purchase of each product or system described by each allowance must be accomplished in order to avoid delays in performance of the Work.

.1 As requested by the Architect, obtain and submit proposals for construction activities involved in each allowance for use in making final selections; include recommendations for selections which are relevant to the proper performance of the work.

.2 Purchase products and systems as specifically selected by the Architect

.3 Submit proposals and recommendations, for purchase of products or systems of allowances, in form specified for Change Orders.

.4 Change Order Data: Where applicable, include in each change order proposal both the quantities of products being purchased and unit cost, along with total amount of purchases to be made. When requested, furnish data to substantiate quantities. Indicate applicable taxes and delivery charges.

.5 Unit Cost Allowances: Each change order amount for unit cost type allowance shall be based solely on the difference between the actual unit purchase amount and the unit allowance, multiplied by the final measure or count of construction in place with reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections and similar margins.

.1 Include installation costs in the purchase amount as part of the allowance.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 CASH ALLOWANCES

3.1.1 The following Category Contractors shall include the following noted cash allowances in their base bid to be used solely by the Construction Manager;

3.1.1.1 Category #04 - \$15,000.00

3.1.2 Cash allowances shall be "NET" cost amounts. The contractors shall include all cost associated with the processing of items that may be charged against the designated allowance amount including estimating, project management, supervision, withholding of retention, overhead, profit and bond costs in their base bid. The only allowable markup shall be a 10% overhead and profit fee by any subcontractor that may perform work (labor) submitted under the prime contractor. The prime contractor shall receive no additional markups. If any allowance amount (in whole or part) is deleted by change order at any given point of the project, the Contractor shall credit back the full or unused portion of the allowance amount stipulated. The Category contractor shall not be entitled to withhold any monies for overhead or profit or be obligated to return any overhead or profit included within their base bid. The use of any allowances is at the sole discretion of the Construction Manager/District.

END OF SECTION

Activity ID	Activity Name	Start	Finish	2016																											
				F		March		April		May		June		July		August		S		October		N									
				0	1	2	0	1	2	0	1	2	0	1	2	0	1	2	0	1	2	3	0	1	2	0	1	2	0	1	2

AVC 2016 SUMMER PROJECTS

GENERAL PROJECT INFORMATION

PRE BID INFORMATION

PB-00-00	documents ready for distribution	18-Feb-16*	18-Feb-16
PB-00-01	complete set of docs issued	22-Feb-16*	22-Feb-16
PB-00-02	pre-bid meeting	04-Mar-16*	04-Mar-16
PB-00-03	last RFI accepted	11-Mar-16*	11-Mar-16
PB-00-04	last addendum issued	14-Mar-16*	14-Mar-16
PB-00-05	bids opened	18-Mar-16*	18-Mar-16

- documents ready for distribution
- complete set of docs issued
- pre-bid meeting
- last RFI accepted
- last addendum issued
- bids opened

GENERAL INFORMATION

GI-00-06	district purchased items ordered (if applicable)	21-Mar-16*	27-May-16
GI-00-11	notice of intent to award	08-Apr-16	08-Apr-16
GI-00-00	avc board meeting	11-Apr-16*	11-Apr-16
GI-00-01	notice of award/ contracts issued for signature	12-Apr-16*	12-Apr-16
GI-00-03	contractual start/ notice to proceed issued	19-Apr-16*	19-Apr-16
GI-00-02	signed contracts & docs due back to Imcci	19-Apr-16*	19-Apr-16
GI-00-04	schedule of values approved	20-Apr-16	20-Apr-16
GI-00-05	long lead time orders made	27-Apr-16	27-Apr-16
GI-00-07	pre-construction meeting	29-Apr-16*	29-Apr-16
GI-00-08	Imcci mobilization	02-May-16*	02-May-16
GI-00-09	last day of spring session	03-Jun-16*	03-Jun-16
GI-00-10	DSA APPROVED DRAWINGS RECEIVED (if applicable)	20-Jun-16*	20-Jun-16

- ▬ district purchased items ordered (if applicable)
- notice of intent to award
- avc board meeting
- notice of award/ contracts issued for signature
- contractual start/ notice to proceed issued
- signed contracts & docs due back to Imcci
- schedule of values approved
- long lead time orders made
- pre-construction meeting
- Imcci mobilization
- last day of spring session
- DSA APPROVED DRAWINGS RECEIVED (if applicable)

GYMNASIUM FLOOR REPLACEMENT

GYMNASIUM

GM-04-00	prepare & submit shop drawings/ submittals	13-Apr-16	19-Apr-16
GM-00-01	review & approve shop drawings/ submittals	20-Apr-16	21-Apr-16
GM-00-02	contractor mobilization/ construction start	06-Jun-16	06-Jun-16
GM-04-20	electrical safe off (center)	06-Jun-16	06-Jun-16
GM-04-01	selective demolition (center)	06-Jun-16	10-Jun-16
GM-04-18	install temp fencing and toilets	06-Jun-16	06-Jun-16
GM-04-21	electrical demolition (center)	09-Jun-16	09-Jun-16
GM-04-02	laser level, sleeper system install (center)	13-Jun-16	17-Jun-16
GM-04-22	electrical rough in (center)	20-Jun-16	22-Jun-16
GM-04-08	install robbins flooring over sleeper system (center)	23-Jun-16	29-Jun-16
GM-04-09	remove bleachers from walls	30-Jun-16	30-Jun-16

- ▬ prepare & submit shop drawings/ submittals
- review & approve shop drawings/ submittals
- contractor mobilization/ construction start
- electrical safe off (center)
- ▬ selective demolition (center)
- install temp fencing and toilets
- electrical demolition (center)
- ▬ laser level, sleeper system install (center)
- electrical rough in (center)
- ▬ install robbins flooring over sleeper system (center)
- remove bleachers from walls



- ▬ Remaining Work
- ▬ Actual Work
- ▬ Critical Remaining Work
- ▬ % Complete

AVC 2016 SUMMER PROJECTS
Ledesma & Meyer Construction Co. Inc.

ADD NO. 1 BID SCHEDULE

Date	Revision	Checked	Approved
18-Mar...	Addendum No. 1	MTO	MTO

Activity ID	Activity Name	Start	Finish	2016																																						
				F	March	April	May	June	July	August	S	October	N																													
GM-04-03	electrical safe off (sides)	01-Jul-16	01-Jul-16	0	1	2	2	0	1	2	2	0	1	1	2	0	0	1	2	2	0	1	1	2	0	1	1	2	3	0	1	1	2	0	0	1	1	2	3	0	1	2
GM-04-23	selective demolition (sides)	01-Jul-16	06-Jul-16																																							
GM-04-04	electrical demolition (sides)	07-Jul-16	07-Jul-16																																							
GM-04-16	laser lever, sleeper system install (sides)	07-Jul-16	11-Jul-16																																							
GM-04-05	electrical rough in (sides)	08-Jul-16	11-Jul-16																																							
GM-04-13	install robbins flooring over sleeper system (sides)	12-Jul-16	14-Jul-16																																							
GM-04-06	wood sealer and finish (sides)	15-Jul-16	21-Jul-16																																							
GM-04-07	install bleachers on wall	22-Jul-16	22-Jul-16																																							
GM-04-12	wood sealer (center)	25-Jul-16	29-Jul-16																																							
GM-04-24	game line stripping & graphics (center)	01-Aug-16	03-Aug-16																																							
GM-04-11	wood finish (center)	04-Aug-16	08-Aug-16																																							
GM-04-10	closure angle and thresholds	09-Aug-16	10-Aug-16																																							
GM-04-14	electrical trim out	09-Aug-16	11-Aug-16																																							
GM-04-25	final clean up	12-Aug-16	12-Aug-16																																							
GM-04-26	remove temp fencing/ temp toilets	15-Aug-16	15-Aug-16																																							
GM-00-03	compose incomplete work list	15-Aug-16	15-Aug-16																																							
GM-00-04	complete incomplete work list	16-Aug-16	17-Aug-16																																							
GM-00-05	construction completion	18-Aug-16	18-Aug-16																																							
CLOSEOUT INFORMATION																																										
GCI-04-04	project closeout	18-Aug-16	16-Sep-16																																							
GCI-04-05	contractural completion	16-Sep-16	16-Sep-16																																							



- Remaining Work
- Actual Work
- Critical Remaining Work
- % Complete

AVC 2016 SUMMER PROJECTS
Ledesma & Meyer Construction Co. Inc.

ADD NO. 1 BID SCHEDULE

Date	Revision	Checked	Approved
18-Mar...	Addendum No. 1	MTO	MTO

SECTION 01500
TEMPORARY CONSTRUCTION FACILITIES

PART 1- GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General Conditions and other Division-1 Specification sections, apply to work of this section.

SUMMARY:

Definitions: Specific administrative and procedural minimum actions are specified in this section, as extensions of provisions in General Conditions and other Contract Documents. These requirements have been included for special purposes as indicated. Nothing in this section is intended to limit types and amounts of temporary work required, and no omission from this section will be recognized by Architect, Engineer, Engineer or Project Manager that such temporary activity is not required for successful completion of the work and compliance with requirements of Contract Documents. Provisions of this section are applicable to, but not by way of limitation as follows:

- Utility services
- Construction facilities
- Support facilities
- Security / protection provisions

Multiple Prime Contracts: Provisions of this Section apply to construction activities of each Prime Contractor.

QUALITY ASSURANCE:

General: In addition to compliance with governing regulations and rules/recommendations of franchised utility companies, comply with specific requirements indicated and with applicable local industry standards for construction work (published recommendations by local "building councils").

ANSI Standards: Comply with applicable provisions of ANSI A10-Series standards on construction safety, including A10.3, A10.4, A10.S, A10.6, A10.7, A10.8, A10.9, A10.10, A10.11, A10.12, A10.13, A10.14, A10.1S, A10.17, A10.18, A10.20, and A10.22.

Conservation: In compliance with Owner's policy on energy/materials conservation, install and operate temporary facilities and perform construction activities in manner which reasonably will be conservative and avoid waste of energy and materials including water.

JOB CONDITIONS:

General: Establish and initiate use of each temporary facility at time first reasonably required for proper performance of the work. Terminate use and remove facilities at earliest reasonable time, when no longer needed or when permanent facilities have, with authorized use, replaced the need.

Conditions of Use: Install, operate, maintain and protect temporary facilities in a manner and at locations which will be safe, non-hazardous, sanitary, and protective of persons and property, and free of deleterious effects.

PARTS 2 AND 3 - PRODUCTS AND EXECUTION

TEMPORARY UTILITY SERVICES:

Water Service:

General: Prime Contractors will be responsible for providing appurtenances for directing water to desired locations.

Electrical Power Service:

General: Each Prime Contractor will be responsible for providing extension cords for operation of equipment used for his work.

Telephone Service: NOT USED

TEMPORARY CONSTRUCTION FACILITIES:

The types of temporary construction facilities required include, but not by way of limitation as follows:

- Water distribution
- Drainage and watering equipment
- Enclosure of work
- Heat
- Ventilation
- Electrical power distribution
- Lighting
- Hoisting facilities
- Stairs
- Ladders
- Roads

Provide facilities reasonably required to perform construction operations properly and adequately. Each Prime Contractor shall be responsible for providing all temporary facilities for the work of their contract (excluding those facilities specifically indicated above as being furnished by others.)

Heating: Supply power for electric welding by engine-driven power-generator sets.

Lighting: The Prime Contractor will provide temporary lighting and power once the project permanent power is established.

TEMPORARY SUPPORT FACILITIES:

The Prime Contractor will provide for the use of all Prime Contractors, the following support facilities:

- Sanitary facilities

Each Prime Contractor will provide the first aid facilities, materials, and equipment required by governing authorities, laws, ordinances, regulations, standards, orders and underwriters for the

work of his contract.

SECURITY/PROTECTION PROVISIONS:

The types of temporary security and protection provisions that the Project Manager will provide are described below. The Project Manager will provide security/protection services and systems in coordination with activities and in a manner to achieve reasonable security for the work.

Temporary Fire Protection:

Construction Sheds, Etc: Shall be placed outside of the building structure, limited to no more than 300 square feet area and located at least ten feet away from the buildings or from combustible materials storage piles. Stoves shall be set on properly protected floor with ample lateral clearance and particular attention shall be given to stack clearance and arrangement.

Gasoline, Oils, Paint and Other Volatile Liquids: Shall be kept outside, to be brought into the building in quantities only as needed. Such storage shall be in a well ventilated location, well removed from all open heating or lighting devices. Particular care shall be given to the housekeeping in the storage room to eliminate spillage and accumulation of oil wastes: provide approved waste and safety cans.

Fire Extinguishers: Each Prime Contractor shall provide types, sizes, numbers and locations as would be reasonably effective in extinguishing fires during early stages, by personnel at Project Site. Prime Contractor will instruct all his personnel at Project Site, at time of their first arrival, on proper use of extinguishers.

Barricades, Guardrails, Warning Signs and Lights:

Each Prime Contractor shall comply with recognized standards and code requirements for erection of substantial and structurally adequate barricades where needed to prevent accidents and losses. Paint with appropriate colors, graphics and warning signs to inform personnel at site, and the general public where exposure exists, of hazard being protected. Provide lighting where appropriate and needed for recognition of facility, including flashing red lights where appropriate.

Each Prime Contractor shall construct and maintain fences, guardrails, barricades, lights, flashers, shoring and warning signs as required by local authorities and State safety ordinances and as required to protect the Owner's property from injury or loss and as necessary for the protection of the public place for carrying on the work covered in this contract. Leave all protection in place and maintain until removal is authorized.

All temporary work shall conform to all the requirements of State and local authorities and underwriters which pertain to operation, safety, and fire hazard. The Prime Contractor shall furnish and install all items necessary for conformity with such requirements, whether or not called for under the separate divisions of these specifications. All fencing and barricades shall be removed upon completion of the project.

Each Prime Contractor shall protect all streets and sidewalks and shall repair all damage caused by his work at his own expense.

Noise Control: Noise from job equipment and construction operations shall be kept to a minimum by adequate mufflers and other means as approved by the Project Manager.

Dust Control: Throughout the entire contract period, the Prime Contractor shall palliate dust conditions in the working area, involved portions of the site and all roads used in the operations. 1ms shall consist of intermittent watering and sprinkling of such frequency as will satisfactorily allay the dust during the hours that work is to be performed, as required.

Drainage Control: (Water) Prime Contractor shall at all times protect related or adjacent to his work, excavations, banks, trenches and/ or the building from rain water, spring water, ground water, backing up on drains or sewers, and all other water admitted to any work by his operation. He shall provide all pumps and other equipment and enclosures to provide this protection.

Prime Contractor shall construct and maintain all necessary temporary drainage and do all pumping necessary to keep aforementioned excavations, etc., free of water.

Each Prime Contractor shall furnish and maintain pumping apparatus as needed to prevent any water damage to the work in progress.

Pollution Control: All fires are strictly forbidden. Refer to Fire Regulations.

Weather Protection: Prime Contractor shall at all times provide protection to the work against weather, rain, wind storms, frost or heat so as to maintain all work, materials, apparatus and fixtures free from injury or damage.

LOCATION AND USE OF TEMPORARY FACILITIES:

Project Manager will direct location of construction trailers, sheds, and other facilities which individual Prime Contractors bring to the Project Site.

Prime Contractors will be responsible for damage to existing improvements caused by the installation, presence, use, and removal of temporary facilities. Temporary Facilities shall be removed as soon as their use is not needed and immediately repair all damage to previously existing or new work.

END OF SECTION

ANTELOPE VALLEY COLLEGE

Information Technology Infrastructure, Audiovisual
and Cabling Standard

January 10, 2016

Prepared for:
Antelope Valley College



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I. OVERVIEW

This document contains the standards for Information Technology Infrastructure and Cabling for new construction and renovation projects at Antelope Valley College (AVC). It describes the requirements for outside plant and cabling, inside cabling, technology rooms and spaces, infrastructure, wireless networking, project submittals, testing and labeling.

As technology continues to advance, this standard will be regularly updated by AVC. Users of this standard should confirm that they are in possession of the latest version of the document prior to referring to its contents.

A. Revisions

The following major revisions have been made to the Information Technology Infrastructure and Cabling standard since its original issue:

<i>Revision Number</i>	<i>Revision Date</i>	<i>Revision Item</i>	<i>Rationale</i>
1	6/13/08	Distribution of north end of campus via North MDF	Location of North MDF was relocated from the Health and Sciences building to the North Central Plant
2	6/13/08	Addition of fiber cables and counts	EMS and Fire Alarm will be utilizing Campus fiber for distribution
3	6/13/08	Addition of Singlemode in the riser	Allow Fire Alarm and future campus data applications
4	6/13/08	Addition of distribution list	Track who has been given document
5	6/28/12	Update of Wireless Data Network Requirements	Wireless technology has advanced; the College is deploying 802.11 wireless networking in the new Health & Science Building and is planning to deploy the technology across campus in a phased deployment.
6	6/28/12	Distribution List updated.	Key staff have changed since the last revision.
7	1/10/2016	Manufacturer changes and data drop count	District requirements have changed
8	2/25/2016	Distribution List updated	Key staff have changed since the last revision.

B. Distribution List

<i>Contact Person</i>	<i>Company</i>	<i>E-mail Address</i>
Doug Jensen	Antelope Valley College	djensen@avc.edu
Rick Shaw	Antelope Valley College	rshaw@avc.edu
Javier Carcano	Antelope Valley College	jcarcano@avc.edu
Michael Dioquino	Antelope Valley College	mdioquino@avc.edu
Phil Crompton	Vantage	Phil.crompton@vantagetcg.com

II. OUTSIDE PLANT

A. Support Structures

1. Ductbanks and Trenching

Communication Ductbank shall provide a permanent and durable pathway system which is available for the delivery of entrance cable from carrier service providers, or as part of AVC's campus backbone system.

Once it is in place, modification to the Communication Ductbank is often impractical. It is critical, therefore, to plan for adequate expansion and growth of the communication system at the time the ductbank is constructed, rather than after the fact. No less than four, 4-inch, ducts shall be installed at the time of construction. This rule applies even if only a small number of cable pairs or strands of fiber that partially fill just a single duct are projected to be required over time. Ductbanks shall be configured in arrays, typically with several rows stacked together. 1 x 4, 2 x 2, 3 x 4 are examples of duct arrays, which also correspond to the arrangement of duct openings in pre-cast concrete vaults and manholes where transitions occur.

Wherever applicable, the communication ductbank should share underground pathways with other underground infrastructure components such as electrical feeders, water lines, gas lines and sanitary systems. This reduces the cost of the installation and helps to create a series of utility routes that aid in future campus development and planning. Sufficient spacing between electrical feeders and communication ductbanks shall be maintained at all times to prevent electromagnetic interference between the services.

It is critical that the communications infrastructure be provided the highest level of durability to prevent inadvertent damage by backhoes and other heavy equipment. Only concrete-encased ductbanks shall provided, using 2,500 psi concrete. The duct material itself should be Trade Size 4 (4-inch inside diameter), PVC Schedule 40 or equal, and suitable for contact with concrete.

Duct routing should be planned with consideration for distance between Transition Structures and difficulty of cable pulls, particularly when high-count multi-pair copper cables are necessary. The minimum radius for curves is 15 feet. Trenches should be dug with the following depth and width considerations for concrete pours:

<i>Ductbank Dimension Guidelines</i>	
Ground Cover	Minimum of 24 inches
Top Level of Concrete	Minimum 2 Inches above top duct
Concrete on Outer Sides of Ductbank	Minimum 1.5 inches
Concrete Between Ducts	1 inch (above, below and to each side)
Bottom Level of Concrete	Minimum 1.5 inches

The top layer of concrete in the ductbank should be dyed red to alert workmen who encounter the concrete while hand digging during utility location. A metallic warning tape, detectable with magnetic location equipment, should be buried directly over the path of the Ductbank approximately eighteen inches below the surface.

Communication ductbanks should be terminated with bell-end connectors, flush with the inner surface of the manhole or vault. Ductbanks entering the building shall protrude 4" beyond the floor or wall and shall be plugged with mechanical seals to prevent entry of foreign matter.

Pullropes shall be provided in all conduits.

2. Manholes and Handholes

Transition Structures, including manholes and handholes, allow access to cable installed within underground ductbanks. They shall provide a location for the storage of splice cases and slack loops of cable. Transition Structures shall also facilitate the distribution of cable to multiple locations by providing a junction point for ductbanks radiating in several directions.

The type of structure chosen for installation shall be dependent on the number of ducts in the span. These can range from vaults measuring 20 feet long, and 12 feet deep, to small, shallow, handholes only a few feet square. Wherever possible, preformed concrete structures (using 3,500 psi concrete) shall be utilized with weight-bearing cover/lid capacities based on the anticipated exposure of the structure to traffic (ranging from light pedestrian traffic to deliberate heavy vehicular traffic).

Structures shall be placed after 180 degrees of directional change has occurred in the ductbank route. In straight or relatively straight runs, there shall be no more than 400 feet between structures. Structures shall not be used as the apex of 90 degree changes in duct direction. Sweeps and structures should be planned such that the sweep occurs outside of the structure, allowing straight cable pulls through the structure itself.

Transition Structures require the following equipment:

- a) A sump, or gravel drainage in the case of small hand holes.
- b) Corrosion-resistant pulling eyes.
- c) Cable racking.
- d) Grounding cables installed per applicable codes or practices.
- e) Ladders and steps.
- f) Watertight duct plugs.

B. External Cabling

1. Copper

External use gel-filled core ASP telephone cable shall be used for direct-burial or in-duct applications. The cable shall have solid annealed copper conductors, with a core filled with a Flex-Gel filling compound and wrapped in a non-hygroscopic core tape. The ASP sheath shall consist of a 0.008" corrugated aluminum shield, with a 0.006" corrugated steel shield and a black polyethylene jacket. The jacket shall be sequentially printed with a footage marker at regular intervals. A flooding compound shall be applied over the core and to all surfaces of the aluminum and steel shields to resist moisture entry and to inhibit corrosion. Printed length markings shall be provided on the cable jacket every two feet.

The external voice cabling shall be home run to either the South MDF in the Student Services building for the South end of the campus or the North MDF located adjacent to the new North Central Plan building for the North end of the Campus.

2. Optical Fiber

External optical fiber cables shall be recommended by the manufacturer for use as an external cable suitable for installation in an underground duct. Optical fibers shall be contained within loose buffer tubes utilizing water blocking tapes or compounds surrounding these tubes. The cable will be an all-dielectric construction, with a central strength member. Standard provision for external cables shall be twenty-four singlemode and twenty-four multimode elements provided for each building via a 4-cell tube. Campus will have a standard of Sumitomo Air Blown Fiber for inter-building and Corning conventional fiber for intra-building infrastructure.

The external optical fiber cables shall be in a ring configuration. . Each building on campus is served from this ring with twelve singlemode and twelve multimode elements from each side of the ring. Twelve singlemode and twelve multimode elements shall be terminated in the South MDF in the Student Services building and the other twelve singlemode and twelve multimode elements shall be terminated in the North MDF located adjacent the new North Central Plant building.

C. Splicing and Interconnection Methods

1. External Splice Point

A splice closure designed for buried and underground encapsulated splices shall be used for all external splice points. The closure shall utilize a controlled forced-injection encapsulation process, which shall force the encapsulant around the splice and down the cable core to prevent moisture from entering the splice bundle. The case shall allow all elements/cables to be dressed in without violating any manufacturer's specifications. The splice closure shall be recommended by the manufacturer for installation in manholes, vaults and building entrance applications. The closure shall provide mechanical support for the splice.

2. Internal Splice Point

A splice closure recommended by the manufacturer for internal use shall be used for all internal splice points. The splice case shall be sealed to be moisture and vermin resistant. The case shall allow all elements/cables to be dressed in without violating any manufacturer's specifications. The splice closure shall be suitable for installation in building entrance applications. The closure shall provide mechanical support for the splice.

3. Sumitomo Splice Cases / Tube Distribution Unit (TDU)

A **Sumitomo splice case** or tube distribution unit shall be installed in manholes or BDFs where the tube cell will need to be branched out to supply a pathway into each building.

D. Entrance Protectors

Building Entrance Protection Blocks (solid state) shall be provided on all incoming copper telephone cable pairs, with one protector module provided per entrance cable pair.

E. Termination Methods

1. Termination Frames

External voice cable pairs shall be terminated on building entrance protection blocks (solid state) in the BDF / MDF Room. All pairs of each cable shall be terminated. A riser cable of the same count as the external voice cable shall be terminated on 110-type blocks mounted in termination frames in the BDF / MDF Room and be routed to a rack-mounted patch panel. Each pair of the voice riser cable shall be terminated on a single port on the patch panel. The 25th pair shall be coiled and left as spare.

2. Patch Panels

Optical Fiber cables shall be terminated on EP (Epoxy and Polish) LC-style connectors fitted in patch panels mounted in equipment racks in the BDF / MDF Room.

III. HORIZONTAL AND INTRABUILDING CABLING

A. Support Structures

1. Cable Tray

Ladder-style cable tray - manufactured of aluminum alloy and complying with NEMA Class 12A - shall be provided in the ceiling void for the major cable pathways throughout the building. Cable tray should be placed about 8 inches above the suspended ceiling to ensure access once the ceiling is in place with 12 inches of clearance on all sides. Cable tray should be routed over common use areas such as corridors.

Cable tray shall be 12" wide, with a depth of 6" along major cable pathways.

Cable Trays that penetrate fire-rated walls shall be equipped with wall penetration sleeves at each location, and have appropriate firestopping materials installed after the placement of cable has been completed.

2. Ladder Rack

Ladder Rack – 12" in size - shall be provided in MDF, BDF and IDF Rooms to route cable from sleeves, risers, ducts and cable trays to termination fields within equipment racks or mounted on walls.

Ladder Rack shall be mounted vertically on walls to support riser cables from floor to ceiling as they pass between floors.

3. Conduit

a) Conduits between MDF, BDF and IDF Rooms

Provide multiple 4" conduits running vertically between MDF, BDF and IDF Rooms in sufficient quantities to provide at least 100% spare capacity for future cabling.

Provide multiple 4" conduits running horizontally between MDF, BDF and IDF Rooms in situations where cable tray cannot be used in sufficient quantities to provide at least 100% spare capacity for future cabling.

b) Conduits to Individual Outlets

Conduits serving individual outlets shall be 1" in diameter and shall be connected to double-gang, deep device boxes (2-1/2 in. deep), fitted with a single-gang drywall ring at the outlet location. Individual workstation conduits shall be dedicated to a single outlet and shall not be "daisy-chained" together.

c) Conduit Fill Ratios

Communication Conduits have fill limitations based on the number and size of cables installed within them. Planning the number and diameter of conduits required for specific routes should be based on the anticipated cable load, and guidance for fill ratio calculations provided in ANSI/ TIA/EIA/569A and the NEC.

d) General Conduit Requirements

Conduits shall be less than 100 feet and not have more than 180 degrees of bends or turns in a segment without the installation of a pullbox.

Conduits that pass through fire-rated walls or through floors shall be firestopped in accordance with code.

In order to protect cable from damage conduits should be cut square, with the cut ends reamed and deburred. Plastic bushings shall be installed over the each end of every conduit. To facilitate cable installation, nylon or polyethylene pull strings shall be placed in each conduit from end to end.

4. J-hooks

J-Hooks shall be used in locations where communication cables cannot be supported by continuous systems such as cable trays or conduit. Since support is not continuous, cable weight is concentrated at the intervals of the support hardware. Therefore, J-Hooks shall be placed no more than 5 feet apart in linear runs.

Provide J-Hooks with large surface areas (to prevent kinking or crimping of high-performance UTP cables) that are specifically designed to support Category 6 cables, in sizes and quantities appropriate for the number of cables to be supported.

B. Equipment Racks

Equipment Racks shall be provided in each IDF, BDF and MDF Room to support horizontal and riser cable terminations, active data network equipment and other miscellaneous equipment. A sufficient quantity of racks should be provided to ensure that no more than 50% of available rack space is taken up by cable terminations and patch panels.

Each rack shall consist of a modular EIA 19" mounting frame, with a minimum of 84" (45U) space for equipment in the vertical plane. Each rack shall have a load-carrying capacity of 1000 lbs (450 kg), be painted black and be manufactured from aluminum.

Each rack shall be securely fixed to the floor and supporting walls using appropriate seismic transverse and longitudinal bracing. Overhead ladder rack shall be fixed to the top of each rack and run from the top of the rack to the wall to support riser and horizontal cables. Cable bend management fixtures shall be provided to maintain the proper bend radius as the cables drop into the rack.

Patch management rings shall be provided in each rack, with (1) 2U high horizontal patch management in the top and bottom of each rack and the top and bottom of each patch panel. Two-sided vertical cable management shall be provided on both sides of each rack.

Strain relief and cable management shall be provided at the rear of each rack to ensure tidy routing of all feeder and horizontal cables.

Each rack to have a minimum of eight power sockets mounted on a strip at the rear of the rack. The power receptacles on the connector strip shall be NEMA 5-20R compatible. The plug shall be NEMA L 5-20P compatible.

In major construction projects, it is expected that all network hardware located inside the Data Centers and Server Rooms will be plugged into a central UPS system, backed up by generator within the campus. For network hardware located inside the BDF or IDF, it is expected that an appropriately sized, rack-mounted UPS be provided to support the equipment mounted in the rack plugged into the generator power outlets provided.

C. Cabling

1. Copper (UTP)

a) Horizontal Cabling

Horizontal cabling runs from each outlet to its associated IDF, BDF or MDF Room. Cabling shall be provided with four Category 6 cables per outlet as a standard. Cables shall be plenum-rated.

The following configuration shall be used at every outlet:

	<i>Application</i>	<i>Cable Jacket Color</i>
Cable 1,2,3	Data	Blue
Cable 4	Voice	White

The following horizontal cable jacket color codes are in place at AVC:

<i>Cable Jacket Color</i>	<i>Application</i>	<i>Comment</i>
White	Voice	Cat 3 (prior to this standard)
Blue	Data	Cat6

b) Copper Riser Cabling – Analog Voice

Copper Riser Cabling for voice applications runs between the MDF or BDF Room and each IDF Room. ARMM-type Category 3 multi-pair cables shall be provided with an allowance of 2 pairs per horizontal voice cable provided per riser connection as a standard.

2. Optical Fiber

Singlemode optical fiber cabling shall be provided for data and fire alarm applications running between the BDF Room and each IDF. Six strands of singlemode shall be provided per riser connection.

Multimode OM4 (50 micron, 2000 MHz.km) optical fiber cabling shall be provided for data applications running between the BDF Room and each IDF. Six strands of multimode shall be provided per riser connection.

Optical Fiber Riser cables shall be provided as follows:

- In multiple-floor buildings, each IDF Room shall be connected to the IDF Room directly above and below it (where one exists).
- In buildings with more than one IDF per floor, each IDF Room on a floor shall be connected to its adjacent IDF Room (where one exists).
- The two IDF Rooms closest to the MDF or BDF Room shall be connected to the MDF or BDF Room.

Tube cells and cables shall be plenum-rated.

D. Connection and Termination Methods

1. Copper

AVC has standardized on Black Box and Commscope Uniprise products to ensure continuity and a long term warranty of the systems and components installed throughout the district. All Technology Cabling Projects for AVC shall utilize these products to maintain a single standard across all of AVC's facilities, to allow AVC to stock a single set of spares and to support AVC staff training in the maintenance of this system.

a) Analog Voice

Horizontal voice cables shall be terminated on one eight-way 'RJ45' connectors at each faceplate - the EIA/TIA 568B termination configuration shall be used. These connectors shall be flush-mounted in the faceplate and shall be color coded as detailed in this document.

Horizontal voice cables shall be terminated on eight-way 'RJ45' connectors (with color-coded icons) fitted in patch panels mounted in equipment racks in each IDF, BDF or MDF Room – the EIA/TIA 568B termination configuration shall be used.

Riser voice cables shall be terminated on patch panels in each IDF, BDF or MDF Room. Each pair of the voice riser cable shall be terminated on a single port on the patch panel. The 25th pair shall be coiled and left as spare.

b) Data

Horizontal data cables shall be terminated on eight-way 'RJ45' connectors at each faceplate – the EIA/TIA 568B termination configuration shall be used. These connectors shall be flush-mounted in the faceplate and shall be color coded as detailed in this document.

Horizontal data cables shall be terminated on eight-way 'RJ45' connectors (with color-coded icons) fitted in patch panels mounted in equipment racks in each IDF, BDF or MDF Room – the EIA/TIA 568B termination configuration shall be used. Connectors shall be grouped on the patch panel in multiples of four – not six – to aid connector management.

c) Color Coding

The following connector color-coding shall be used at each faceplate and at each patch panel:

	<i>Application</i>	<i>Connector Color</i>
Connector 1	Data	Blue
Connector 2	Data	Blue
Connector 3	Voice	White

2. Optical Fiber

Optical Fiber cables shall be terminated on LC-style connectors fitted in patch panels mounted in equipment racks in each IDF, BDF or MDF Room.

E. Faceplates and Workstation Outlets

Four-port faceplates, white in color, shall be provided at each outlet location. Each faceplate shall be labeled as described in this document. All faceplates shall be installed in a 'portrait' orientation.

IV. TELECOMMUNICATIONS ROOMS

A. MDF and BDF Rooms

MDF (Main Distribution Frame) Rooms and BDF (Building Distribution Frame) Rooms are special-purpose rooms that provide space and maintain a suitable operating environment for the termination of backbone and campus cabling and house centralized communications and/ or computer equipment (such as Core Switches and Servers). The MDF or BDF Room is considered the demarcation point within the building itself, the location where the interbuilding and intrabuilding communication distribution systems interface. MDF/BDF Rooms differ from IDF Rooms in that MDF/BDF Rooms are generally considered to serve a building, whereas IDF Rooms serve a floor area of a building.

There shall be one MDF/BDF Room per building. The MDF/BDF Room shall be 200 to 250 sq ft in size, depending on the systems it will contain. The room shall be roughly square, with a minimum clear dimension of 8 ft. in one direction.

B. IDF (Intermediate Distribution Frame) Rooms

IDF Rooms are floor-serving (as opposed to building or campus-serving) spaces that provide a connection point between backbone and horizontal distribution pathways. IDF Rooms provide an environmentally suitable and secure area for installing cables, cross-connects, rack- and wall- mounted hardware and technology equipment.

There shall be at least one IDF Room per floor. Multiple rooms are required if the cable length between the IDF Room and the telecommunications outlet, including slack, exceeds 295 ft.

The recommended size for the IDF Rooms should be 100 to 120 sq.ft., depending on the systems they will contain. The rooms shall be roughly square, with a minimum clear dimension of 8 ft. in one direction.

C. Telecommunications Room Requirements

The following clearances shall be maintained for equipment and cross-connect fields in each Telecommunications Room:

- A minimum of 36 in. of clear working space in front of and behind equipment and patch panels.
- A minimum of 6 in. depth off wall for wall-mounted equipment.
- Aisles shall be a minimum of 42 in. wide.

1. Architectural Requirements

a) Ceiling Clearance

The minimum ceiling clearance shall be 8.5 ft. above the finished floor. To permit maximum flexibility and accessibility of cabling pathways, suspended ceilings are not recommended in Telecommunications Rooms.

b) Doors

Telecommunications Rooms shall have doors with key-controlled access that are at least 3.0 ft. wide and 7 ft. tall. Doors should be equipped with sweeps, however, door sills shall not be provided because they impede the movement of equipment.

c) Floor

Anti-static floor tiles should be provided in each Telecommunications Room. Imbed 2in. copper tape between the anti-static tile and the conductive adhesive 1.5 feet from the wall. Leave 12 in. of copper tape exposed above the anti-static tile for grounding to telecommunications grounding busbar in each Telecommunications Room.

d) Flood Prevention

If possible, locate Telecommunications Rooms above any threat of flooding. Avoid locations that are below or adjacent to areas of potential water hazard (e. g., restrooms and kitchens).

e) Floor Loading

Provide a minimum floor loading of 2.4 kPa – 4.8 kPa(50 –100lb/sq.ft.).

f) Other Uses

Telecommunications Rooms shall be dedicated to the technology function and related support facilities. Equipment not related to the support of the Telecommunications Rooms such as piping, duct work, and distribution of building power must not be located in, or pass through, the Telecommunications Room. Telecommunications Rooms must not be used as passageways for unauthorized persons to other facilities within the building. Telecommunications Rooms shall not have roof access for maintenance (such as hatches) that could pose security or environmental (i.e., rain leakage) threats.

g) Wall Requirements

Telecommunications Room walls shall extend from the finished floor to the structural ceiling (e.g., the slab), be covered with two coats of white latex or fire-retardant white paint and be one hour fire-rated as required by the applicable codes and regulations. Telecommunications Room walls should not have windows.

h) Backboard

Provide AC- grade or better plywood, 8 ft. high with a minimum thickness of 0.75 in. around the perimeter of the Telecommunications Room. Plywood shall be either fire-rated or treated on all sides with at least two coats of fire- resistant paint. The bottom of the plywood shall be mounted 6" above finished floor.

2. Mechanical System (HVAC) Requirements

Provide HVAC that will maintain continuous and dedicated environmental control (24 hours per day, 365 days per year). Thermostatic controls should be located within the room itself to prevent setting changes by unauthorized personnel. Maintain positive pressure with a minimum of one air change per hour in the Telecommunications Room. Provide:

- Temperature 70 degrees F +/- 5 degrees
- Relative humidity 30% -- 55%
- Estimated Heat Loads: 5,000 to 7,500 BTU per equipment cabinet or rack.

3. Electrical System Requirements

a) Lighting

Provide 500 lux (50 footcandles) measured at floor level, evenly distributed. Locate light fixtures a minimum of 2.6 m (8.5 ft) above the finished floor. Emergency lighting systems which operate on trickle-charge storage batteries are required as a safety precaution in the event of an inadvertent power outage.

b) Power

Telecommunications Rooms shall be equipped to provide adequate electrical power. Provide one dedicated, non-switched 30A, 208 Volt (V) alternating current (AC) with locking electrical outlets (NEMA L6-20R) per room and one dedicated, non-switched 20A 120 Volt (V) alternating current (AC) with locking electrical outlets (NEMA L5-20R) per equipment rack mounted at the top of the rack. Each outlet shall be on emergency backup power (preferably a central UPS system) and wired to separate branch circuits.

Provide separate duplex 120 V AC convenience outlets (NEMA 5-15R or 5-20R) for tools, test sets, etc., located at least 18 in. above the finished floor, placed at approximately 6 ft. intervals around perimeter walls and identified and marked as such. All outlets must be on non-switched circuits.

c) Bonding and Grounding

Provide a telecommunications grounding busbar in each Telecommunications Room. The ground lead shall be a copper cable sized appropriately to provide not greater than 2 Ohms of resistance, cad-welded to the Ufer Ground or building steel. Provide labeling which states: "DO NOT DISCONNECT".

4. Fire Suppression System Requirements

Provide wet-pipe system with sprinkler heads in wire cages to prevent accidental operation. Hardwired smoke detectors are required.

V. WIRELESS NETWORKING REQUIREMENTS

A. General Requirements

AVC has implemented a wireless data network in the campus facility. All new and renovated facilities should be provided with wireless data network connectivity. Planning for Wireless Access Points should include the following:

1. Provide wireless access point outlets placed on approximate 30' centers in buildings where a dense deployment of access points is required to provide high density coverage. This includes classrooms, labs, office and administration areas, computer labs, libraries and other locations where a relatively high density of wireless connections are anticipated.
2. Provide wireless access point outlets placed on approximate 50' centers in buildings where a less dense deployment of access points is more suitable. This includes workshops, art classrooms and other locations where a relatively lower density of wireless connections are anticipated.
3. Provide external wireless access points (or internal access points with external antennas) to support external spaces surrounding the building. Provide directional antennas to focus the wireless coverage in these external areas.

Note that these deployment densities are subject to change based on physical wireless survey performed by the approved installation vendor.

B. Wireless Access Point Infrastructure

4. Wireless Network Equipment Vendor

AVC has standardized on Enterasys Networks for all networking equipment including the Wireless Local Area Network (WLAN). All equipment for the WLAN shall be procured from Enterasys or a value added reseller that supports Enterasys Networking equipment.

5. Wireless Coverage Area

The Wireless Local Area Network coverage will cover both internal and external spaces. Indoor spaces shall have complete wireless coverage while the AVC campus will have select locations for outdoor wireless hotspots. Design flexibility shall be provided so that the campus can achieve its goal of complete wireless coverage. Please refer to the wireless coverage area map in the appendix section for external wireless coverage areas.

6. Wireless Site Survey

An RF Site Survey shall be conducted in all AVC construction projects mapping the ideal placement of wireless access points in order to achieve complete coverage to support all potential users throughout the facility. The RF shall be conducted in both the 802.11a/n (5GHz) and 802.11b/g/n (2.4GHz) frequency ranges. All RF challenges found during the RF Site Survey shall be well documented in order to install the WLAN infrastructure and proper WLAN configuration.

7. Wireless Local Area Network Design

The AVC WLAN shall be designed and implemented using all of the wireless management features the Enterasys Networks wireless products can provide. Standard components will include 802.3at POE+ (Power over Ethernet) switches, wireless controllers, thin access points, appropriate 802.11a/b/g/n antennas, RF site survey software/hardware, and a wireless network management system making the WLAN easy to administer and upgrade. Antenna types and placements shall be determined from the wireless network assessment any integrator will do before installation. Each of these items is necessary to build a complete wireless network will be easily managed from a centralized location on campus.

Wireless access point outlets shall be planned to be installed in accessible locations inside each building. Access point outlets shall be installed above accessible ceilings (using purpose-designed ceiling mounts or fixing them to metal rods fastened on the underside of the slab). In areas where the ceiling is constructed on in-accessible materials (dry-wall or specialty ceilings), access points shall either be mounted below the ceiling or access panels included in the ceiling to allow for maintenance and future upgrade.) Ceiling materials that include significant amounts of metal may attenuate the wireless signal and require relocation of the access point or an increase in access point quantities.

If wireless equipment is mounted in an external location, that equipment shall be designed to outdoor environment standards. If any equipment used is not rated for external use, it shall be protected from the elements so that the equipment operates within its rated specifications.

8. Cabling

Two horizontal data cables shall be provided between each Wireless Access Point location and the nearest appropriate IDF. Each cable shall be terminated on a data connector mounted in an outlet fixed in place at the proposed access point location. The outlet shall consist of an electrical backbox, faceplate and all associated components.

9. In-line Power

Separate power connections will not be provided at each Wireless Access Point location. Instead, in-line power, POE (power over Ethernet) will be provided by AVC running over the data cable. If current switches in the desired deployment area are not POE capable, new POE switches per AVCCD ITS spec shall be procured as part of the WLAN installation project in order to power all thin access points.

VI. GENERAL REQUIREMENTS

A. Project Submittals

1. Bid Submittals

a) Project References

Contractors bidding on Technology Cabling Projects for AVC shall provide references as a part of their bids. The references shall include a minimum of three similar Educational projects that they have successfully undertaken and completed within the last three years. These projects should be of similar scale, complexity and have similar time scales as this project. As stated, references shall be located in California and be available for AVC to visit and inspect the installation.

The references shall include the project name and address, client contact name and telephone number and construction manager name and telephone number. The Contractor shall also provide a brief description of each project indicating types of systems installed, quantities and configurations of outlets and project time scales.

b) Personnel Training

Contractors bidding on Technology Cabling Projects for AVC shall provide the names of all employees who are expected to be engaged in work on Antelope Valley College's premises, and if applicable, their Training Records as a part of their bids. The records shall include resumes, training certificates, previous work experience details (especially on reference projects) and other relevant information for the Contractor's management, installation and testing personnel.

c) Health and Safety Requirements

Contractors will adopt and enforce, and cause all subcontractors to comply with, sound and accepted safety practices relative to health, safety, security of persons and property, and the protection of all workers engaged in the work.

d) Warranties

Contractor warrants the goods and/or services furnished to be exactly as specified in this Purchase Order, free from defects in Seller's design, labor, materials and manufacture, and to be in compliance with any drawings or specifications incorporated herein and with any samples furnished by Seller. All applicable warranties express and implied are incorporated herein.

2. Pre-Installation Submittals

a) Cabling Diagram

On award of the contract, the Contractor shall submit a complete cabling diagram showing quantities and part numbers for all components including patch panels, cable, conduit, cabinets and equipment racks, splices, splice cases and all other associated components.

b) Test Equipment

On award of the contract, the Contractor shall submit details of each item of test equipment to be used to test the optical fiber and copper components

c) Product Literature/Data Sheets

On award of the contract, the Contractor shall submit manufacturer's product data sheets for each component of the telephone and data cabling systems. The Contractor shall certify that the data sheets depict the components to be provided by the Installer to make up the complete system as described in this specification.

d) Component Samples and Mock-ups

On award of the contract, the Contractor shall submit one full size installation sample mock-up of each of the following components for approval. All samples are to be fully labeled as per the AVC standards.

All sample mock-ups are intended to represent the components that are to be installed as part of this project; therefore, they are to be provided with all associated components and labeling necessary to make up a complete mock-up. Provide bushings and strain relief for the horizontal cable jacket, demonstrating how the cable shall be secured. Label the outlet and each connector as detailed in this specification.

Installation shall not proceed until AVC has approved the samples. Once samples and other documents have been submitted, inspected by AVC and approved, they shall be retained.

The samples will be used as the standards by which the quality of work on the project by the Contractor shall be judged.

Samples of the following outlet configurations shall be provided when they are present in the project:

- (1) Wall-mounted outlet (Four-port) - provide the communications outlet and all terminations, the electrical backbox, a 12" length of 1" EMT conduit and a 36" length of the relevant cables.

3. Post-Installation Submittals, including As-Built documentation.

All documentation and drawings shall be provided in hardcopy reproducible format and electronic format (AutoCAD 2000 at a minimum for drawings, MS Excel for schedules, etc) and supplied on CD-ROM, DVD-ROM, or accessible via an FTP site.

a) As-Built Drawings/Field "Red-line" Drawings

On completion of the work, the Contractor shall provide as-built drawings showing locations of Telecommunications Rooms, telephone and data outlets, backbone, link and external cable routes, data rack locations, telephone termination board locations and station identification. The Contractor is then expected to turn over the marked-up "Red-line" field documents with notes to AVC.

b) Final Test Results

On completion of the work, the Contractor shall provide test results for each cable indicating tests performed, results obtained and values measured.

B. Testing

1. General

Testing shall show beyond reasonable doubt that there are no errors, damaged or incorrectly installed components, that the installation is correctly labeled and that all the installed components meet or exceed the criteria detailed in these specifications.

All outlets, cables, patch panels and associated components shall be fully assembled and labeled prior to testing.

2. Copper Cabling and Components

a) Telephone System External and Riser Cabling

Each Telephone System Riser and External Cable and its associated patch frame connectors shall be tested using the following tests on every pair of every telephone system feeder and external cable:

- Conductor Continuity
- Conductor Separation
- Conductor Polarity

b) Category 6 Cabling

Each Category 6 Cable and its associated connectors shall be tested using the following tests on every pair of every cable:

- Conductor Continuity
- Conductor Separation
- Conductor Polarity
- Pair Mapping
- NEXT, ELFEXT, ACR and Attenuation
- Power Sum NEXT, Power Sum ACR and Power Sum ELFEXT
- Structural Return Loss and Delay Skew
- Cable length

c) Patch Panels, Termination Frames, Work Area Faceplates and Blanking Plates

A visual inspection of the patch panels, termination frames, faceplates and blanking plates shall be made, with any damaged components replaced and all labels installed correctly.

3. Optical Fiber Cable & Connectors

Testing shall confirm that the attenuation of each optical fiber cable is within its performance parameters and each connector has a loss of no greater than 0.5 dB. Each optical fiber cable element and its associated connectors shall be tested using the following tests on every element of every optical fiber cable:

- Optical connectors shall be visually checked using a microscope (minimal magnification x200) to ensure that no physical damage has occurred during the installation process. There are to be no scratches on the core of the fiber or pits on the core or cladding. If any defect cannot be rectified with polishing, the connector is to be replaced.
- Power meter tests shall be done on all optical fiber strands with a record of the length and link loss of each strand and its connectors made on the test results schedule for each strand.
- The labeling of the cable and connectors shall be verified.

C. Labeling

Labels shall be provided on connectors, cables, outlets, termination frames and patch panels. The lettering on each label shall be as large as is practicable. All labels shall be machine-produced. Hand-written labels will not be acceptable. A standard relative orientation shall be adopted for all labels unless otherwise specified.

Labels shall be robust, durable, shall resist abrasion and shall be UV inhibiting, permanent and indelible. Labels shall be proof to 140 degrees Fahrenheit. All labels shall be readily visible and shall be fixed so that they remain in a visible position wherever practical. Labels shall carry the full complement of characters to designate the unique identification for the item that they identify.

Cables and outlets should be labeled with the IDF room number (i.e. 270) followed by the patch panel number and a sequential number indicating the jack number(s) in the face plate. For example, the first outlet fed from IDF 270 Patch Panel 1 would have its six jacks labeled 270 1/01 -06.

1. Cable Labels

Provide heat-shrink tubing labels for cables with less than 1/2" diameter. The labels shall permanently fixed to each cable once they have been installed. Any labels that split, partially split or otherwise damaged shall be replaced.

Provide laminated, cable-tied labels for cables of 1/2" or greater diameter. The labels shall be water-proof and shall be of sufficient size to include all identification letters or numbers. The label shall be punched with holes to allow two cable ties (one at each end) to be used to secure the label to the cable.

Horizontal Cabling: Label each cable so that the label is within 8" of the end of the cable at the patch frame end and within 6" of the end of the cable at the outlet end.

Backbone / External Cabling: Label each cable so that the label is within 40" of each end of the cable and is visible for inspection.

2. Outlet and Patch Panel Labels

Provide labels for each outlet and patch panel. The patch panel and faceplate labels shall have black letters on a white background.

Outlet Label: Provide P-Touch or similar style labels to identify the faceplate. The labels shall be neatly fixed in place behind the faceplate's clear plastic cover.

Patch Panel: Provide P-Touch or similar style labels to identify each Patch Panel. Panels should be labeled in ascending order starting at the top panel furthest to the right in the room.

3. Telephone System Termination Frames

Termination Frame Labels. Provide a full complement of pre-printed cardboard patch frame labels, allowing each pair of each telephone system horizontal and feeder cable to be clearly identified. Provide a jumpering schedule at each Telephone Backboard that identifies which feeder telephone pairs are jumpered to which horizontal cable pairs served by that backboard.

VII. AUDIOVISUAL

A. Classroom Definitions:

1. Typical Classroom – the standard Classroom on campus is equipped with a “state of the industry” level of technology that supports basic content display.
2. Smart Classroom – the Smart Classroom is a more technologically intensive space that provides an additional layer of technology to assist the instructor.
3. Distance Education Classroom – the Distance Education Classroom has the same level of technology as the Smart Classroom, but is capable of originating Distance Education.

	Typical Classroom	Smart Classroom	Distance Education Classroom
Projector & Screen for Main Image Display	•	•	•
Internet Access	•	•	•
AVC Data Network Access	•	•	•
Access to Distance Learning Content	•	•	•
Dedicated Classroom Computer	•	•	•
Speakers for Program Audio Reproduction	•	•	•
Telephone for Helpdesk and Campus Police	•	•	•
Microphone and Speakers for Voice Reinforcement		•	•
Assistive Listening System (ALS)**		•	•
Integrated System Control		•	•
Voting / Student Response System		•	•
Document Camera		•	•
DVD/VCR		•	•
Distance Learning Dedicated Display			•
Video Cameras			•
Distance-Learning Capable			•
Proctoring Systems			•*
Desk-mounted tablet			•*

*- as needed by specific teaching model.

** - required in every room with a permanently installed voice reinforcement system.

B. Power/Data/Lighting

1. Wall mounted or recessed floor box for power, data and AV multi-media input panel at instructor station.
2. Power receptacles and one standard data outlet dedicated to AV next to the AV multi-media input panel at instructor station.
3. Telephone to be located by Classroom door.
4. Power and one standard data outlet on each wall in the classroom. (Wireless data network access will be the primary method of accessing network resources -including the Internet - by students.)
5. Power and two standard data outlets mounted at the ceiling projector location for ceiling mounted projector and wireless access point.
6. Floor boxes, power receptacles, and data outlets installed behind or offset from the projector.
7. Lighting - Parabolic non-glare and/or suspended indirect light fixtures with multiple switching for maximized light control to support electronic presentations. Coordinate lighting fixtures with projector location.

C. Audio Visual

1. Main Image Display
 - a) Maximum Viewing Distance: 25' – 35'
 - b) Image Height: 65" –84"
 - c) Image Width: 116" – 150" (16:9 “widescreen” image aspect ratio).
 - d) Display Technology: Ceiling mounted video projector (minimum 1280 x 768 pixels; 5,000 ANSI lumens) projecting onto ceiling recessed matte white tensioned front projection screen.
2. Distance Learning Dedicated Displays
 - a) Provisions will be made for the installation of two wall mounted flat panel monitors at the rear wall. These monitors will be used to view the far end classroom(s) participating in the distance learning session and the instructors “Self View”. Students will view the far end classroom on the monitor above the instructor position while the instructor views the monitor at the rear wall. Multiple remote sites are possible based on division of the image on the screen (i.e., multiple windows).
3. Video Cameras
 - a) Video cameras will be located at front and rear wall positions for video image capture during distance learning sessions.
4. Audio Reproduction
 - a) Media Audio Reproduction: Stereo loudspeakers ceiling mounted. Audio volume will be controlled via the AV Control Panel at the instructor station.

- b) **Voice Reinforcement:** Provisions for use of wireless and wired microphones will be included in distance learning classroom. Equipment will be located in the secured instructor station. Amplified speech reproduced through 6” ceiling recessed loudspeakers distributed at approximately 12’ centers.
 - c) **Assistive Listening System:** Provision of an ALS system is required in each room with a permanently installed voice reinforcement system.
 - d) In rooms with permanent ALS system installations there shall be a quantity of receivers that equals at least 4% of the number of seats in the room (rounding up to the nearest integer), or a minimum of 2. (i.e., a classroom of 30 seats would receive 2 receivers. A classroom of 80 would receive 4 receivers.)
5. **Audio/Video Source Equipment**
- a) **Audiovisual Source and Control systems** will be installed in secured AV equipment cabinet. This will be integrated into the secured instructor station.
 - b) **Permanent Video Sources:** Document Camera, VHS/DVD player and room dedicated computer.
 - c) A desk-mounted tablet (such as the Star Tablet) will be provided in the Distance Education Classroom to allow on-screen annotation of presentations and other displayed content (similar to a Telestrator system as used on televised sports broadcasts).
 - d) **Mobile AV Sources:** Mobile AV sources such as Laptop PCs, portable Video Conferencing carts and other systems may be connected to the audiovisual input panel for connection to the room AV presentation system.
6. **AV System Control**
- a) In Distance Education Classrooms an advanced level of AV control will be required to provide camera, microphone and videoconferencing codec controls. These advanced controls will operate from the dedicated computer via a web browser display.
 - b) **Device Selection:** The AV source device to be displayed will be selectable via push-buttons on the AV Control Panel.
 - c) **Device Control:** Control of AV source device functions, such as “Play” and “Fast Forward”, will be controlled directly at the device front panel or using the AV Control Panel.
 - d) **Volume Control:** Program audio volume will be controlled via a volume dial on the AV Control Panel. (Note: Voice reinforcement volume level, if a microphone is connected to the room dedicated AV system, will be controlled by the microphone system and not the AV Control Panel.)
7. **Other Systems**
- a) A wireless student voting system will be capable of being provided in the Smart Classroom and Distance Education Classroom. Students will be able to vote anonymously on questions presented by the Instructor, with options for multiple choice selections. Real-time statistics and graphing of the voting will be able to be displayed on the screen in the room.

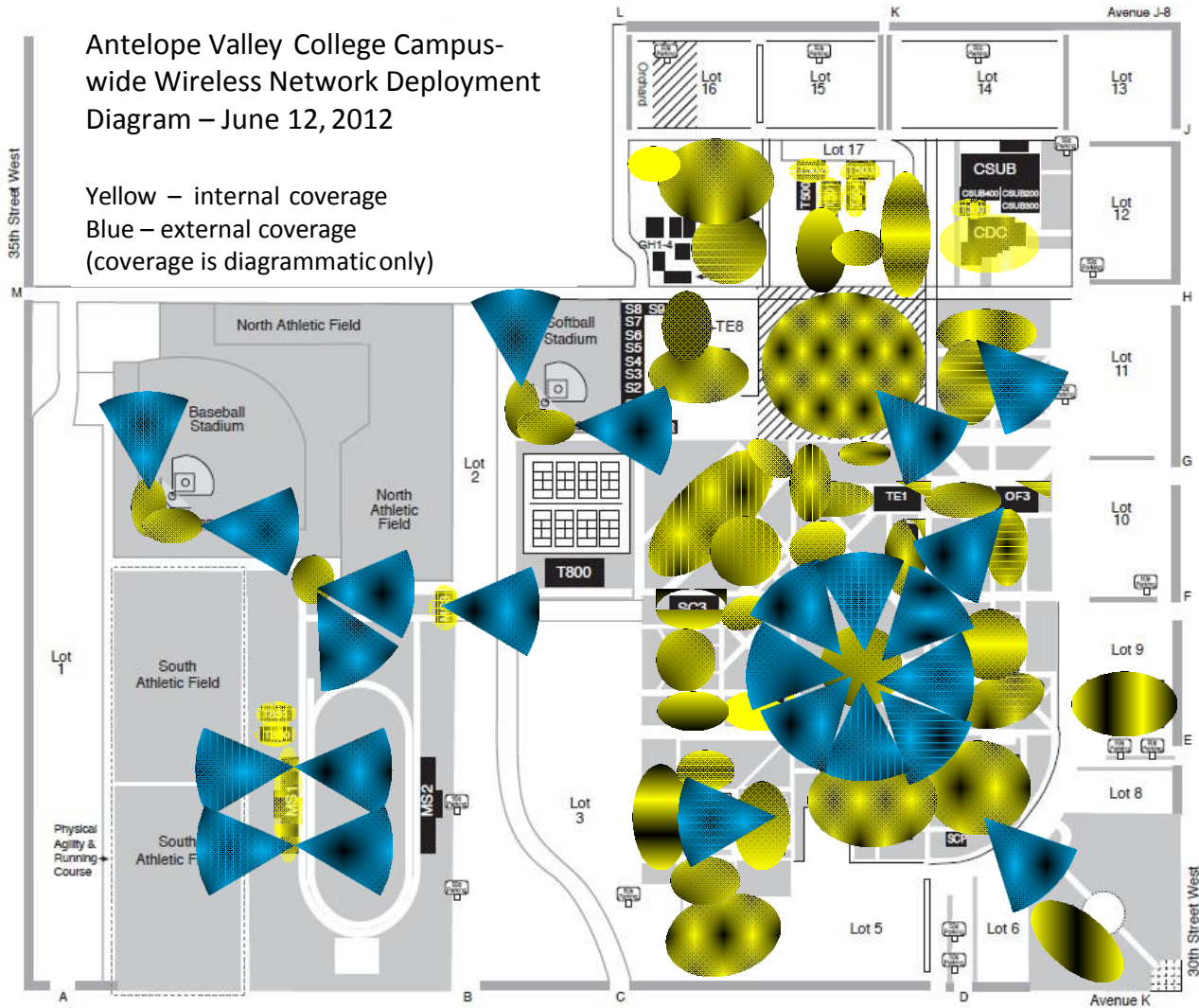
b) A software-based Proctoring system will be capable of being provided in the Distance Education Classroom. Since this is a software-based system, no cable or conduit infrastructure will be required.

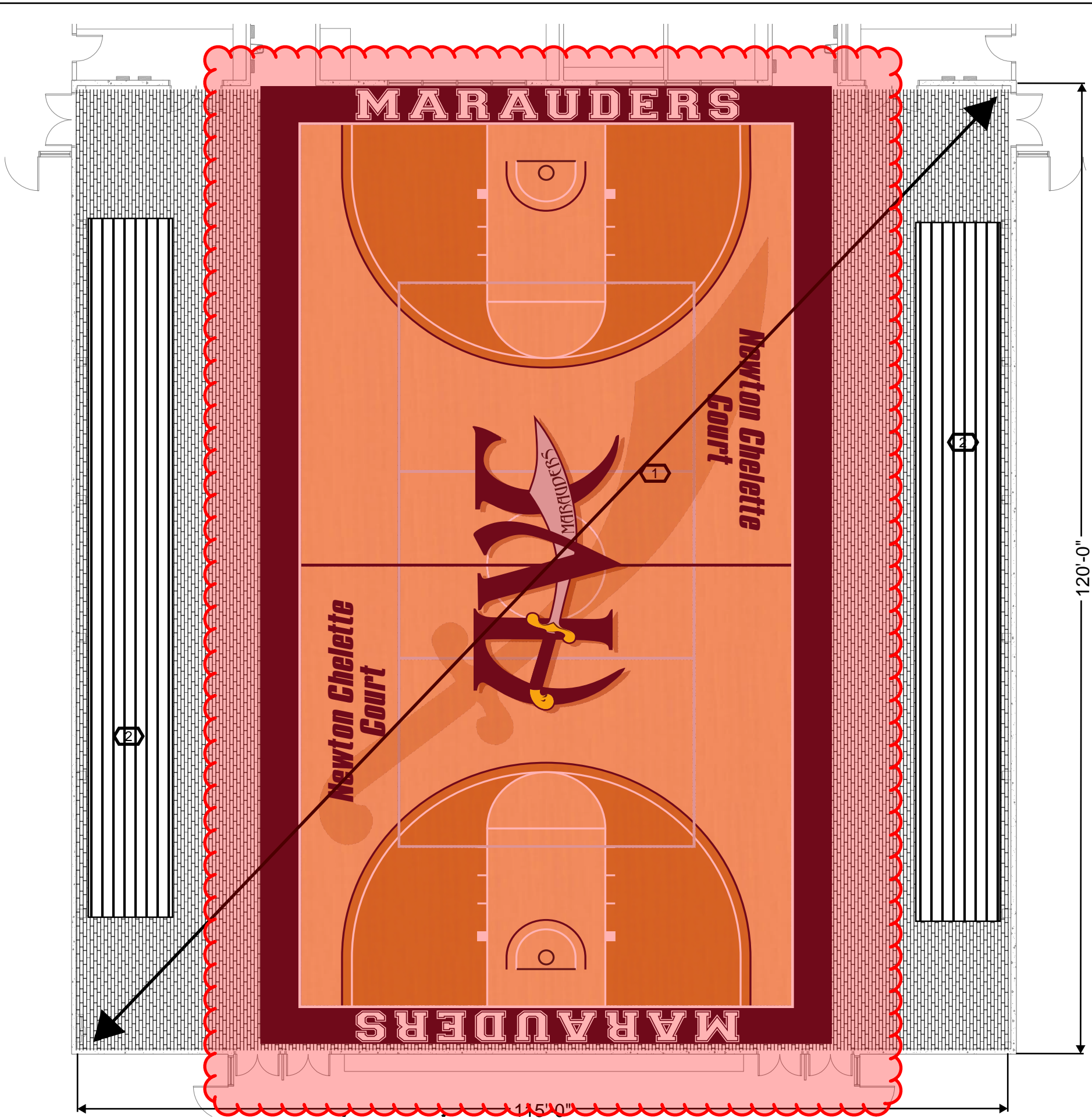
D. Conference Rooms

1. Built-in Flat Screen Plasma/LCD Monitor or Ceiling-Mounted Data Projector
2. Connectivity on desktop for laptop computers and speakerphone, preferably in pop-up table-mounted box containing power, data and telephone connections.
3. Capability for Video Conferencing based on a roll-about cart. Provide one Video Conferencing cart per new building consisting of:
 - a) Video Conferencing H.323 codec and equipment.
 - b) 42" Widescreen Flat Panel Display
 - c) High-Definition Camera
 - d) Speakers
 - e) Microphones, including satellite microphones to place on table top in front of participants

Antelope Valley College Campus-wide Wireless Network Deployment Diagram – June 12, 2012

Yellow – internal coverage
 Blue – external coverage
 (coverage is diagrammatic only)





120'-0"

115'-0"

1

PROVIDE (2) COATS OF BONA KEMI "DTS SEAL" AND (3) COATS OF BONA KEMI "SUPER-SPORT HD" FINISH. PROVIDE FINAL GRAPHIC LAYOUT FOR DISTRICT APPROVAL. APPLY APPROVED GAME LINE STRIPING AFTER SEAL COATS AND BEFORE FINISH COATS. REUSE ALL EXISTING SLEEVES FOR OTHER GAME COURT STRIPING. REINSTALL EXISTING THRESHOLDS THAT HAVE BEEN THOROUGHLY CLEANED. PROVIDE NEW ROBBINS VENT COVE BASE - USE PRE-MOLDED OUTSIDE CORNERS AND NEATLY MITERED INSIDE CORNERS. AT ALL DOORS ALL THRESHOLDS WILL BE REPLACED WITH NEW. TYPE TO MATCH EXISTING.

2

PERMINENT LOCATION OF BLEACHERS AFTER ALL COATS HAVE BEEN APPLIED AND CURED TO WOOD FLOOR SYSTEM.



CLIENT: ANTELOPE VALLEY COLLEGE

PROJECT: GYMNASIUM FLOOR REPLACEMENT

ADDRESS: 3041 WEST AVENUE K
LANCASTER, CA 93436

DATE:

PROJECT:

BID NO:

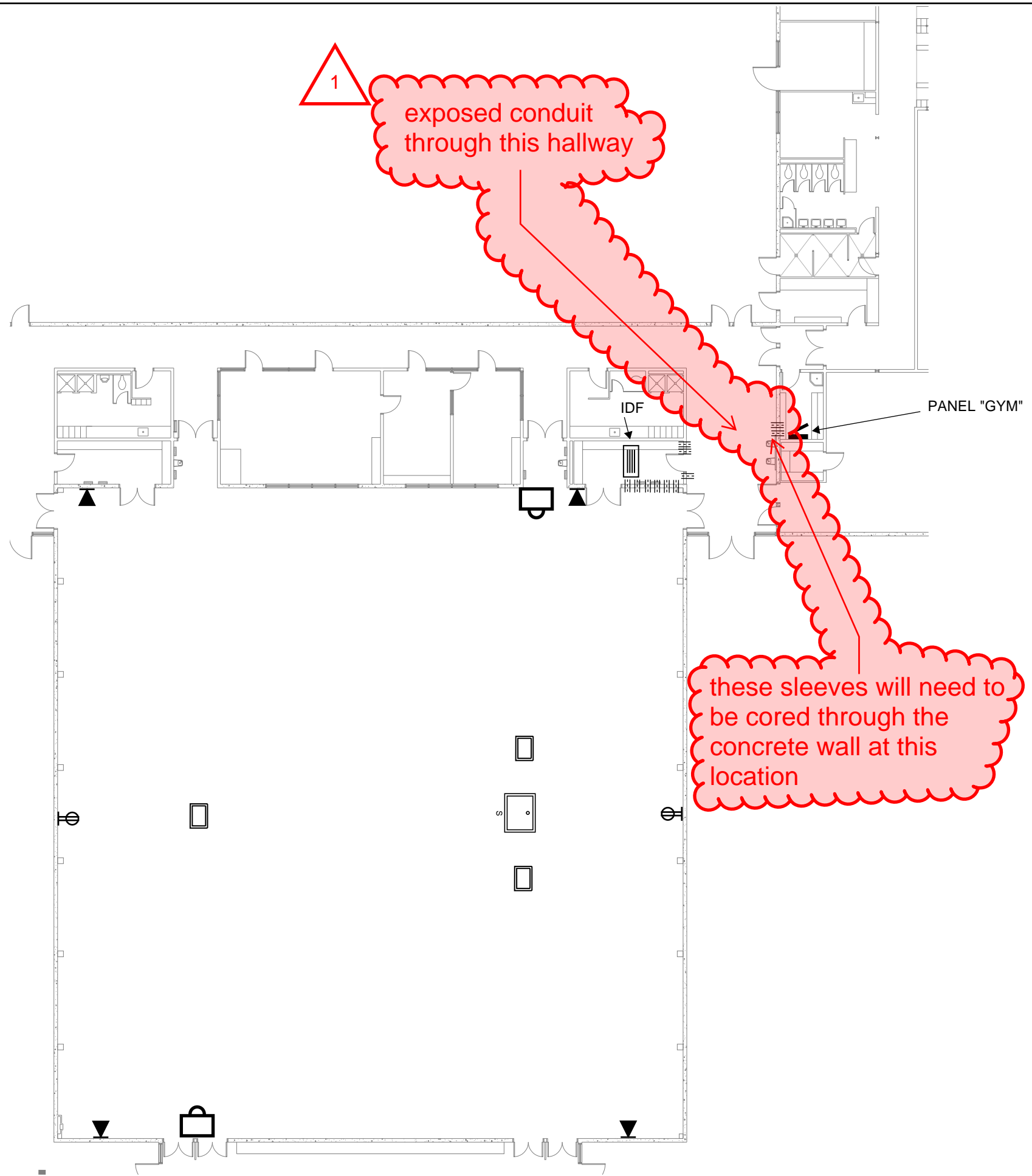
ADDENDUM: 1

ADDENDUM:

ENLARGED FLOOR PLAN

SHEET:

A1.2



SYMBOL LEGEND & NOTES

CIRCUITRY FOR NEW OUTLETS IN NEW FLOOR BOXES TO BE FED FROM THIS PANEL.

EXISTING NEVCO SCOREBOARDS

HOME SIDE CENTER COURT FLOOR BOX (1 TOTAL) LEGRAND/ EFB10S EVOLUTION SERIES W/ EFB610BTS BRASS LIDS. EXISTING PATHWAYS MAY BE USED TO PROVIDE THE FOLLOWING (IF NOT PROVIDE NEW 1" CONDUIT AND CONDUCTORS FOR EA ITEM);

- 4 DUPLEX POWER RECEPTACLES TO PNL GYM (FOUR GANG BOX),
- 4 CAT6 DROPS (SINGLE GANG BOX),
- 2 NEVCO SCOREBOARD COAX CABLE CONNECTIONS (TWO GANG BOX) TO SCOREBOARDS
- 3 REMAINING LOCATIONS SHALL HAVE SINGLE GANG BOXES WITH COVER PLATES AND 1" CONDUIT RAN TO THE EXISTING IDF ROOM FOR FUTURE USE. PROVIDE ALL NECESSARY HARDWARE, EXTENSTIONS, FLEX, BENDS ETC. TO PROVIDE A OPERABLE AND FINISHESD PRODUCT. ALL NEW CONDUIT TO BE RAN FROM FLOOR BOX UNDER NEW WOOD FLOOR WITHIN THE SLEEPER SYSTEM (REFER TO DETAIL 1 ON SHEET A1.3) RUN UP GYM SIDE WALL OF IDF ROOM. PENETRATE APPROPRIATE SLEEVES OVERHEAD TO RUN INTO THE ROOM WHERE FINAL TERMINATION POINT IS. ALL SERVICE MOUNTED CONDUIT TO BE IN A NEAT AND UNIFORM FASSION AND WILL NEED TO BE APPROVED BY THE CONSTRUCTION MANAGER.

SMALL FLOOR BOXES (3 TOTAL) 10' ON EITHER SIDE ON CENTER COURT FLOOR BOX. LEGRAND/ EFB82 EVOLUTION SERIES W/ EFB610BTS BRASS LIDS. PROVIDE CONDUIT AND CONDUCTORS FOR THE FOLLOWING FROM EACH FLOOR BOX;

- 2 DUPLEX POWER RECEPTACLES (TWO GANG BOX) TO PNL GYM.
- 4 CAT6 DATA DROPS (SINGLE GANG BOX)
- 5 BLANK PLATES (ALL SINGLE GANG BOX)

PROVIDE ALL NECESSARY HARDWARE, EXTENSTIONS, FLEX, BENDS ETC. TO PROVIDE AN OPERABLE AND FINISHESD PRODUCT. ALL NEW CONDUIT TO BE RAN FROM FLOOR BOX UNDER NEW WOOD FLOOR WITHIN THE SLEEPER SYSTEM (REFER TO DETAIL 1 ON SHEET A1.3.) RUN UP GYM SIDE WALL OF IDF ROOM. PENETRATE APPROPRIATE SLEEVES OVERHEAD TO RUN INTO THE ROOM WHERE FINAL TERMINATION POINT IS. ALL SERVICE MOUNTED CONDUIT TO BE IN A NEAT AND UNIFORM FASSION AND WILL NEED TO BE APPROVED BY THE CONSTRUCTION MANAGER.

PATHWAY/ RACEWAY CONDUIT AND JUNCTION/ PULL BOXES FOR FUTURE CAT6 DATA DROPS (4 TOTAL). J-BOX TO BE MOUNTED 18" ABOVE FINISH FLOOR. 2" CONDUIT TO BE RAN DOWN INTO WOOD FLOOR SLEEP SYSTEM (REFER TO DETAIL 1 ON SHEET A1.3). RUN UP GYM SIDE WALL OF IDF ROOM FROM WOOD FLOOR AND PENETRATE ROOM OVERHEAD.

EXISTING IDF CABINET LOCATION. ALL NEW CAT6 AND PATHWAYS FOR FUTURE CABLING TO BE RAN TO THIS LOCATION.

EXISTING POWER FOR BLEACHERS - CONTRACTOR TO REMOVE TERMINATION FOR TEMPORARY MOVE AND RETERMINATE AFTER PUTTING BACK BLEACHERS IN PERMANENT LOCATION.

LOCATION WHERE ALL NEW CONDUIT TO BE RAN OVERHEAD AND NOT UNDER THE WOOD FLOOR.

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CLIENT:	ANTELOPE VALLEY COLLEGE
PROJECT:	GYMNASIUM FLOOR REPLACEMENT
BID NO:	3041 WEST AVENUE K LANCASTER, CA 93436

DATE:
ADDENDUM:
ADDENDUM:
(N) ELECTRICAL PLAN
SHEET:
E1.2