ARCHITECTS CLIENT FOCUSED. PASSION DRIVEN.

May 26, 2017

TO	:	All Bidders
FROM	:	George M. Wiens
PROJECT	:	CTE Classroom Addition 1615400.41
SUBJECT	:	Addendum 1
DSA	:	04-115755 / 33-H18

The following changes, omissions, and/or additions to the Project Manual and/or Drawings shall apply to proposals made for and to the execution of the various parts of the work affected thereby, and all other conditions shall remain the same.

Careful note of the Addendum shall be taken by all parties of interest so that the proper allowances may be made in strict accordance with the Addendum, and that all trades shall be fully advised in the performance of the work which will be required of them.

Bidder shall acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject Bidder to disqualification.

In case of conflict between Drawings, Project Manual, and this Addendum, this Addendum shall govern.

1. GENERAL NOTE

1.1 Refer to the attached Addendum 1 dated May 24, 2017 as prepared by Ledcor Construction, Inc.

PROJECT MANUAL

1.2 SECTION 04 20 00 - UNIT MASONRY

A. Paragraph 2.2, Item C, revise the following lines:

"1. Split Faced Units: Orco Brown.

2. Smooth Units: Orco Sourdough.

3. Cap Blocks: Match adjacent.

4. Window Sills: Match adjacent.

5. Lintels: Match adjacent.

6. Concealed Block: Gray."

1.3 SECTION 09 90 00 - PAINTING

A. Paragraph 2.1, add the following item:

"10. Rosco Laboratories, www.rosco.com"

B. Paragraph 3.13, add the following item:

"G. Gypsum Board (Green-Screen)

1st coat: Rosco Tough Prime

2nd coat: Rosco Chroma Green

3rd coat: Rosco Chroma Green"

1.4 SECTION 11 90 00 - MISCELLANEOUS EQUIPMENT

A. Add this attached section it its entirety.

1.5 SECTION 27 13 43 - COMMUNICATIONS SERVICES CABLING

A. Replace this section in its entirety with the attached revised section.

1.6 SECTION 27 41 16.51 - INTEGRATED AUDIO-VIDEO SYSTEMS AND EQUIPMENT FOR CLASSROOMS

A. Replace this section in its entirety with the attached revised section.

DRAWINGS

Architectural

1.7 DRAWING AW2.1

A. Revise as indicated in the clouded area labeled Delta 1 on the attached AW2.1.

1.8 DRAWING AW2.2

A. Revise Wall Legend to indicate "metal stud" in lieu of "wood stud."

1.9 DRAWING AW3.1

A. Revise as indicated in the clouded area labeled Delta 1 on the attached AW3.1.

1.10 DRAWING AW3.2

A. Revise as indicated in the clouded area labeled Delta 1 on the attached AW3.2.

1.11 DRAWING AW7.2

A. Detail 8; revise as indicated in the clouded area labeled Delta 1 on the attached AW7.2.

1.12 DRAWING AW7.3

A. Revise Reference Note 1661 to indicate "OFCI" in lieu of "NIC."

1.13 DRAWING AX2.1

A. Revise Wall Legend to indicate "metal stud" in lieu of "wood stud."

1.14 DRAWING 2.1

A. Details 2, 3, and 4; revise reference for concrete slab reinforcement to indicate "#4 rebar @ 24" oc" in lieu of "#4 rebar @ 18" oc."

1.15 DRAWING 9.3

A. Revise as indicated in the clouded area labeled Delta 1 on the attached 9.3.

Structural

1.16 DRAWING SW2.1

A. Revise as indicated in the clouded area labeled Delta 1 on the attached SW2.1.

Mechanical

1.17 DRAWING M4.1

A. Revise as indicated in the clouded area labeled Delta 1 on the attached M4.1.

1.18 DRAWING M4.2

A. Revise as indicated in the clouded area labeled Delta 1 on the attached M4.2.

Electrical

1.19 DRAWING E2.1

A. Revise as indicated in the clouded area labeled Delta 1 on the attached E2.1.

1.20 DRAWING E3.1

A. Revise as indicated in the clouded area labeled Delta 1 on the attached E3.1.

1.21 DRAWING E4.1

A. Revise as indicated in the clouded area labeled Delta 1 on the attached E4.1.

END OF ADDENDUM 1

Submitted by,

GEORGE M. WIENS
Architect, AIA
LEED™ AP
Principal

GMW:LC:hb/P41615400x1-add

Attachments: Addendum 1 dated May 24, 2017 as prepared by Ledcor Construction, Inc.
Section 11 90 00 - Miscellaneous Equipment
Section 27 13 43 - Communications Services Cabling
Section 27 41 16.51 - Integrated Audio-Video Systems and Equipment for Classrooms
Drawings AW2.1, AW3.1, AW3.2, AW7.2, 9.3, SW2.1, M4.1, M4.2, E2.1, E3.1, E4.1

Ledcor Construction Inc.
38975 Sky Canyon Drive, Suite 109
Murrieta, California
USA 92563

CTE Classroom Addition

Addenda No. 1 – Scope Questions

Question No. 1: License Requirement

Question:

Notice Inviting Bids

Please clarify and confirm license requirements for the PTC packages.

Answer:

In the Notice Inviting Bid Document, please insert the following table of license requirements, just prior to the "Prequalification of Bidders" paragraph on page 1 of the Notice Inviting Bids:

Bid Package No. and Description	Contractor's License Class, Required
Bid Package #01 – Building and Site Concrete	B / C8
Bid Package #02 – Structural Steel, Miscellaneous Metals, Metal Deck	C51
Bid Package #03 – Masonry	C29
Bid Package #04 – Casework, Finish Carpentry, Laboratory Casework	C6
Bid Package #05 – Roofing and Sheet metal	C39
Bid Package #06 – Gypsum and Plaster Systems, Insulation	C9 / C35
Bid Package #07 – Doors, Frames & Hardware	C28 / D28
Bid Package #08 – Painting	C33
Bid Package #09 – Carpet and Tile	C15 / C54
Bid Package #10 – Acoustical Ceiling and Wall Panels	D50
Bid Package #11 – Building Specialties	B
Bid Package #12 – Glass and Glazing	C17
Bid Package #13 – Fire Sprinklers	C16
Bid Package #14 – Plumbing and Site Utilities	C36 / C34
Bid Package #15 – HVAC Systems	C20
Bid Package #16 – Electrical Systems	C10
Bid Package #17 – Low Voltage Systems	C7

*Where more than one license is listed, prime contractor must hold at least one license. Scope of work that includes other sub specialties, must be subcontracted to a specialty contractor holding required license, as required by CSLB.

Question No. 2: Facility Natural Gas clarification

Question:

Bid Package #14 – Plumbing / Site Utilities

Bid Package #15 – HVAC

Scope of work for PTC #15 has specification section 23 11 23 Facility Natural Gas Piping as a required element, but Bid Package#14 has included interior and exterior gas piping in scope of work. Please confirm, that all gas piping will be provide by PTC #14.

Answer:

Confirmed. In the Division of Work Among Bid Packages, in Bid Package #14, please add the specification section 23 11 23 Facility Natural Gas Piping as a requirement. In the Division of Work Among Bid Packages, in Bid Package #15, please remove specification section 23 11 23 Facility Natural Gas Piping as a requirement.

Bid Scope Clarification:

Specification Section 11 90 00 has been added in its entirety. The following denotes bid package responsibility for the specified items:

Bid Package #17 – Low Voltage – BP 17 is to provide the projection screen and mounting, all as integral to their Audio Visual scope of work complete.

Bid Package #11 – Specialties – BP 11 is to provide the Sound Isolation Enclosures (whisperrooms) complete, the Green Screen Flooring, and the Rifle Storage Cabinet.

Bid Package #4 – Casework / Laboratory Equipment – BP 4 is to provide the Refrigerator, Dishwasher, Ice Machine, Chemical Storage Cabinet, and Fume Hoods, all as integral to their casework and laboratory equipment scope of work complete.

Ledcor Construction Inc.
38975 Sky Canyon Drive, Suite 109
Murrieta, California
USA 92563

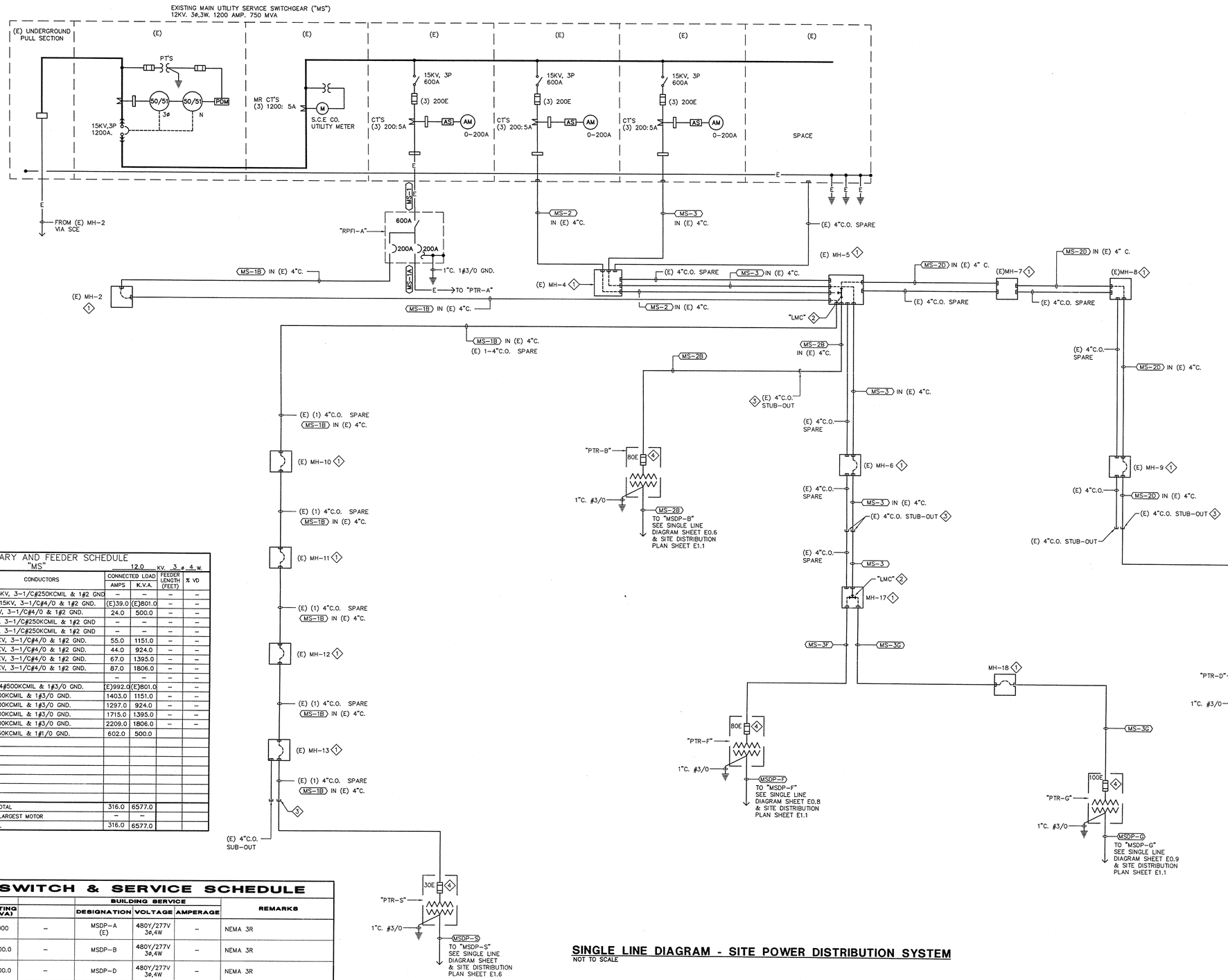
MVUSD CTE Classroom Addition

Addenda No. 1 – Site Electrical Scope Clarification

See attached sheets E 0.5, E0.6, E0.7 and E1.1 for existing campus electrical distribution. Please note these sheets are to be used for coordination of work shown on sheets E1.0 and E1.1 of the VMHS – CTE DSA Approved plans dated April 25, 2017.

Please note high voltage cabling at MH No. 5 as it relates to the relocation of MH No.7. Please plan for work to be performed over summer break 2017 (campus is occupied) with minimal campus disruption.

Attachments : E0.5 Site Single Line Diagram
E0.6 Single Line Diagram
E0.7 Single Line Diagram
E1.1 Site Power Plan



SINGLE LINE DIAGRAM NOTES

1. INSTALL 1-1/4 INCH CONDUIT WITH #4/0 GROUNDING ELECTRODE CONDUCTOR TO UFER GROUND SYSTEM CABLE. UFER GROUND SYSTEM SHALL BE 40 FEET OF #4/0 BARE COPPER GROUND WITH 3/4 INCH ROUND BY 10 FEET SOLID COPPER GROUND ROD AT EACH END OF 4/0 BARE COPPER CABLE. CADWELD ALL CONNECTIONS.
2. INSTALL 1 1/4 INCH CONDUIT – ONE #4/0 TO ACCESSIBLE COLD WATER LINES. CONNECT TO WATER MAIN AT BACKFLOW PREVENTER AT SERVICE ENTRY. REFER TO PLUMBING DRAWINGS FOR LOCATIONS. CONNECT USING APPROVED GROUNDING CLAMPS.
3. FURNISH GROUND BUS IN EACH TRANSFORMER. CONNECT PRIMARY FEEDER EQUIPMENT GROUNDING CONDUCTOR, SECONDARY NEUTRAL, SECONDARY FEEDER EQUIPMENT GROUNDING CONDUCTOR, GROUNDING ELECTRODE CONDUCTOR, AND TRANSFORMER FRAME TO GROUND BUS. CONNECT GROUND BUS TO BUILDING STEEL OR CENTRAL GROUND POINT AS APPLICABLE. CONNECTIONS TO BUILDING STEEL SHALL BE WITH EXOTHERMIC WELDS. TYPICAL ALL TRANSFORMERS.

DRAWING NOTES:

1. MANHOLE PRECAST WITH TRAFFIC TYPE COVER. REFER TO SHEET 3/E5.8 FOR MANHOLE DETAIL. SIZES ARE THE FOLLOWING: REFER TO SITE PLAN FOR EXACT LOCATION.
   (E) MH-1 – 4'-0" x 4'-0" x 7'-0" DEPTH.
   (E) MH-2 – 4'-0" x 4'-0" x 7'-0" DEPTH.
   (E) MH-3 – 4'-0" x 4'-0" x 7'-0" DEPTH.
   (E) MH-4 – 5'-0" x 5'-0" x 7'-0" DEPTH.
   (E) MH-5 – 5'-0" x 5'-0" x 7'-0" DEPTH.
   (E) MH-6 – 4'-0" x 4'-0" x 7'-0" DEPTH.
   (E) MH-7 – 4'-0" x 4'-0" x 7'-0" DEPTH.
   (E) MH-8 – 4'-0" x 4'-0" x 7'-0" DEPTH.
   (E) MH-9 – 4'-0" x 4'-0" x 7'-0" DEPTH.
   (E) MH-10 – 4'-0" x 4'-0" x 7'-0" DEPTH.
   (E) MH-11 – 4'-0" x 4'-0" x 7'-0" DEPTH.
   (E) MH-12 – 4'-0" x 4'-0" x 7'-0" DEPTH.
   (E) MH-13 – 4'-0" x 4'-0" x 7'-0" DEPTH.
   MH-17 – 4'-0" x 4'-0" x 7'-0" DEPTH.
   MH-18 – 4'-0" x 4'-0" x 7'-0" DEPTH.
2. LOADBREAK MULTIPLE CONNECTOR "LMC", 200A. RATED, 3ø, 15KV. TAP CONFIGURATION AS SHOWN. RFI 675 – Submittal required
3. INTERCEPT (E) 4"C.O. STUBOUT & EXTEND CONDUIT AS SHOWN. REFER TO ELECTRICAL SITE POWER PLAN FOR EXACT LOCATION.
4. FUSE RATING ARE SUBJECT TO CHANGE DEPENDING ON THE SIZE OF TRANSFORMER & AS PER MANUFACTURER'S RECOMMENDATION. REFER TO SPECIFICATIONS.

LOAD SUMMARY AND FEEDER SCHEDULE

LOCATION MAIN ELECT'L. SERVICE YARD 1 "MS" 12.0 KV. 3 ø 4 W.

	FEEDER FROM	FEEDER TO	NO. OF SETS	CONDUIT (INCHES)	CONDUCTORS	CONNECTED LOAD AMPS	CONNECTED LOAD K.V.A.	FEEDER LENGTH (FEET)	% VD
MS-1	MS	(E)RPF1-A	1	(E)4"	(E)15KV, 3-1/C#250KCMIL & 1#2 GND	–	–	–	–
MS-1A	RPF1-A	(E) PTR-A	1	(E)4"	(E) 15KV, 3-1/C#4/0 & 1#2 GND.	(E)39.0	(E)801.0	–	–
MS-1B	RPF1-A	PTR-S	1	4"	15KV, 3-1/C#4/0 & 1#2 GND.	24.0	500.0	–	–
MS-2	MS	"LMC"	1	(E)4"	15KV, 3-1/C#250KCMIL & 1#2 GND	–	–	–	–
MS-3	MS	"LMC"	1	(E)4"	15KV, 3-1/C#250KCMIL & 1#2 GND	–	–	–	–
MS-2B	"LMC"	PTR-B	1	4"	15KV, 3-1/C#4/0 & 1#2 GND.	55.0	1151.0	–	–
MS-2D	"LMC"	PTR-D	1	4"	15KV, 3-1/C#4/0 & 1#2 GND.	44.0	924.0	–	–
MS-3F	"LMC"	PTR-F	1	4"	15KV, 3-1/C#4/0 & 1#2 GND.	67.0	1395.0	–	–
MS-3G	"LMC"	PTR-G	1	4"	15KV, 3-1/C#4/0 & 1#2 GND.	87.0	1806.0	–	–
–	–	–	–	–	–	–	–	–	–
(E)MSDP-A	(E)PTR-A	(E)MSDP-A	(E)4	(E)4"	(E) 4#500KCMIL & 1#3/0 GND.	(E)992.0	(E)801.0	–	–
MSDP-B	PTR-B	MSDP-B	6	4"	4#500KCMIL & 1#3/0 GND.	1403.0	1151.0	–	–
MSDP-D	PTR-D	MSDP-D	6	4"	4#500KCMIL & 1#3/0 GND.	1297.0	924.0	–	–
MSDP-F	PTR-F	MSDP-F	6	4"	4#500KCMIL & 1#3/0 GND.	1715.0	1395.0	–	–
MSDP-G	PTR-G	MSDP-G	8	4"	4#500KCMIL & 1#3/0 GND.	2209.0	1806.0	–	–
MSDP-S	PTR-S	MSDP-S	3	3"	4#350KCMIL & 1#1/0 GND.	602.0	500.0		
					SUBTOTAL	316.0	6577.0		
					25% LARGEST MOTOR	–	–		
					TOTAL	316.0	6577.0		

TRANSFORMER SWITCH & SERVICE SCHEDULE

BLDG	LOAD (KVA)	TRANSFORMER DESIG	PRIMARY VOLTAGE	SECONDARY VOLTAGE	RATING (KVA)		BUILDING SERVICE DESIGNATION	VOLTAGE	AMPERAGE	REMARKS
A (E)		PTR-A (E)	12KV Δ	480/3/4	1000	–	MSDP-A (E)	480Y/277V 3ø,4W	–	NEMA 3R
B		PTR-B	12KV Δ	480/3/4	1500.0	–	MSDP-B	480Y/277V 3ø,4W	–	NEMA 3R
D		PTR-D	12KV Δ	480/3/4	1500.0	–	MSDP-D	480Y/277V 3ø,4W	–	NEMA 3R
F		PTR-F	12KV Δ	480/3/4	1500.0	–	MSDP-F	480Y/277V 3ø,4W	–	NEMA 3R
G		PTR-G	12KV Δ	480/3/4	2000.0	–	MSDP-G	480Y/277V 3ø,4W	–	NEMA 3R

SINGLE LINE DIAGRAM - SITE POWER DISTRIBUTION SYSTEM

NOT TO SCALE

D.S.A. STAMP

ARCHITECT'S STAMP
LICENSED ARCHITECT
GEORGE M. WENS
C14546
Exp. 06-30-03
STATE OF CALIFORNIA

ENGINEER'S STAMP
REGISTERED PROFESSIONAL ENGINEER
MICHAEL J. AGUILAR
No. 13618
Exp. 6/30/03
ELECTRICAL
STATE OF CALIFORNIA

CONSULTANT
TMAD Engineers, Inc.
Mechanical, Electrical and Structural Consulting Engineers
500 East "E" Street
Ontario, CA 91764
(909) 986-4560
Job No. 2000.178.02

NO	DATE	BY	REMARKS

VISTA MURRIETA HIGH SCHOOL - PHASE 3
MURRIETA VALLEY UNIFIED SCHOOL DISTRICT

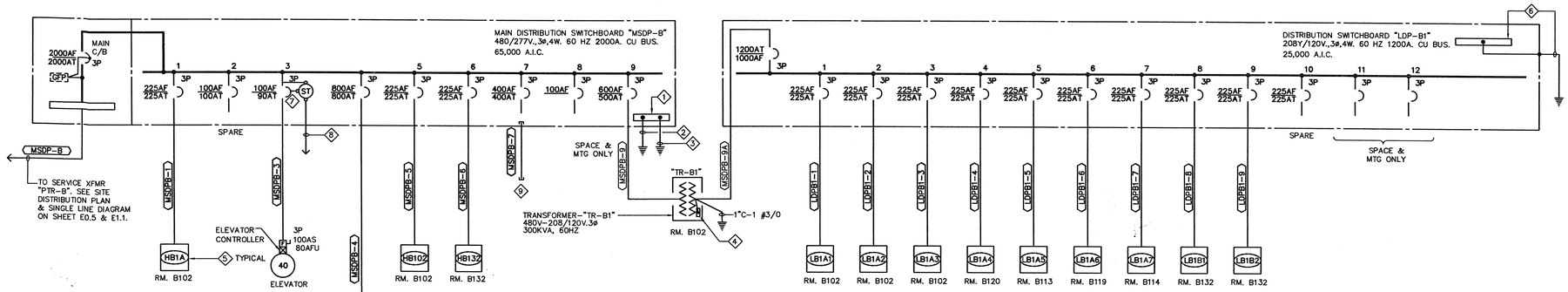
WLC Architects
Virginia Dare Tower
10470 Foothill Blvd.
Rancho Cucamonga
California 91730-3754
tel: 909 987 0909
fax: 909 980 9980

1110 Iron Point Road
Suite 200 - Folsom
California 95630-8301
tel: 916 355 9922
fax: 916 355 9950

SINGLE LINE DIAGRAM

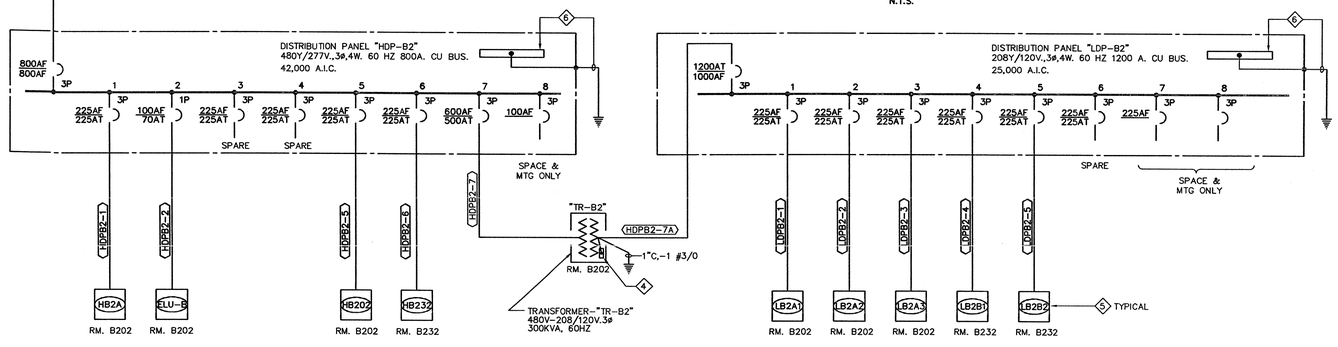
DRAWN	NW
CHECKED	VZD
DATE	05/10/02
SCALE	NONE
JOB NO.	98265

E0.5



BLDG. B AREA A & B FIRST FLOOR

N.T.S.



BLDG. B AREA A & B SECOND FLOOR

N.T.S.

LOAD SUMMARY AND FEEDER SCHEDULE

"MSDP-B" — 480Y/277 V. 3 ø 4 W.

LOCATION ELECT. RM. B102

	FEEDER FROM	FEEDER TO	NO. OF SETS	CONDUIT (INCHES)	CONDUCTORS	CONNECTED LOAD AMPS	CONNECTED LOAD K.V.A.	FEEDER LENGTH (FEET)	% VD
MSDPB-1	MSDPB	HB1A	1	2 1/2"	4#4/0 & 1#4 GND	112.0	94.0		
MSDPB-2	MSDPB	SPARE	–	–	–	–	–		
MSDPB-3	MSDPB	ELEVATOR	1	1 1/2"	3#2 & 1#8 GND.	52.0	43.2		
MSDPB-4	MSDPB	HDPB2	3	3"	4#350 KCMIL, 1#1/0 GND.	625.0	504.0		
MSDPB-5	MSDPB	HB102	1	2 1/2"	4#4/0 & 1#4 GND.	207.0	172.0		
MSDPB-6	MSDPB	HB132	1	2 1/2"	4#4/0 & 1#4 GND.	66.0	55.0		
MSDPB-7	MSDPB	SPARE	1	4"	CONDUIT ONLY	–	–		
MSDPB-8	MSDPB	SPACE	–	–	–	–	–		
MSDPB-9	MSDPB	TR-B1	2	3"	3#350 KCMIL, 1#1/0 GND.	361.0	300.0		
MSDPB-9A	TR-B1	LDPB1	3	4"	4#600 KCMIL, 1#3/0 GND.	327.0	272.0		
					SUBTOTAL	1389.0	1140.0		
					25% LARGEST MOTOR	14	11		
					TOTAL	1403.0	1151.0		

LOAD SUMMARY AND FEEDER SCHEDULE

"HDP-B2" — 480Y/277 V. 3 ø 4 W.

LOCATION ELECT. RM. B202

	FEEDER FROM	FEEDER TO	NO. OF SETS	CONDUIT (INCHES)	CONDUCTORS	CONNECTED LOAD AMPS	CONNECTED LOAD K.V.A.	FEEDER LENGTH (FEET)	% VD
HDPB2-1	HDPB2	HB2A	1	2 1/2"	4#4/0 & 1#4 GND.	93.0	78.0		
HDPB2-2	HDPB2	ELU-B	1	1 1/4"	2#4 & 1#8 GND.	33.0	12.5		
HDPB2-3	HDPB2	SPARE	–	–	–	–	–		
HDPB2-4	HDPB2	SPARE	–	–	–	–	–		
HDPB2-5	HDPB2	HB202	1	2 1/2"	4#4/0 & 1#4 GND.	196.0	163.0		
HDPB2-6	HDPB2	HB232	1	2 1/2"	4#4/0 & 1#4 GND.	86.0	71.0		
HDPB2-7	HDPB2	TR-B2	2	3"	3#350 KCMIL, 1#1/0 GND.	361.0	300.0		
HDPB2-7A	TR-B2	LDPB2	3	4"	4#600 KCMIL, 1#3/0 GND.	217.0	180.0		
HDPB2-8	HDPB2	SPACE	–	–	–	–	–		
HDPB2-9	HDPB2	SPACE	–	–		–	–		
HDPB2-10	HDPB2	SPACE	–	–		–	–		
					SUBTOTAL	625.0	504.0		
					25% LARGEST MOTOR	–	–		
					TOTAL	625.0	504.0		

LOAD SUMMARY AND FEEDER SCHEDULE

"LDP-B1" — 208Y/120 V. 3 ø 4 W.

LOCATION ELECT. RM. B102

	FEEDER FROM	FEEDER TO	NO. OF SETS	CONDUIT (INCHES)	CONDUCTORS	CONNECTED LOAD AMPS	CONNECTED LOAD K.V.A.	FEEDER LENGTH (FEET)	% VD
LDPB1-1	LDPB1	LB1A1	1	2 1/2"	4#4/0 & 1#4 GND.	79.0	29.0		
LDPB1-2	LDPB1	LB1A2	1	2 1/2"	4#4/0 & 1#4 GND.	79.0	29.0		
LDPB1-3	LDPB1	LB1A3	1	2 1/2"	4#4/0 & 1#4 GND.	144.0	52.0		
LDPB1-4	LDPB1	LB1A4	1	2 1/2"	4#4/0 & 1#4 GND.	51.0	18.0		
LDPB1-5	LDPB1	LB1A5	1	2 1/2"	4#4/0 & 1#4 GND.	51.0	18.0		
LDPB1-6	LDPB1	LB1A6	1	2 1/2"	4#4/0 & 1#4 GND.	48.0	17.0		
LDPB1-7	LDPB1	LB1A7	1	2 1/2"	4#4/0 & 1#4 GND.	48.0	17.0		
LDPB1-8	LDPB1	LB1B1	1	2 1/2"	4#4/0 & 1#4 GND.	113.0	41.0		
LDPB1-9	LDPB1	LB1B2	1	2 1/2"	4#4/0 & 1#4 GND.	140.0	51.0		
LDPB1-10	LDPB1	SPARE	–	–	–	–	–		
LDPB1-11	LDPB1	SPACE	–	–	–	–	–		
LDPB1-12	LDPB1	SPACE	–	–	–	–	–		
					SUBTOTAL	753.0	272.0		
					25% LARGEST MOTOR	–	–		
					TOTAL	753.0	272.0		

LOAD SUMMARY AND FEEDER SCHEDULE

"LDP-B2" — 208Y/120 V. 3 ø 4 W.

LOCATION ELECT. RM. B202

	FEEDER FROM	FEEDER TO	NO. OF SETS	CONDUIT (INCHES)	CONDUCTORS	CONNECTED LOAD AMPS	CONNECTED LOAD K.V.A.	FEEDER LENGTH (FEET)	% VD
LDPB2-1	LDP-B2	LB2A1	1	2 1/2"	4#4/0 & 1#4 GND.	57.0	21.0		
LDPB2-2	LDP-B2	LB2A2	1	2 1/2"	4#4/0 & 1#4 GND.	40.0	15.0		
LDPB2-3	LDP-B2	LB2A3	1	2 1/2"	4 #4/0 & 1#4 GND.	176.0	63.0		
LDPB2-4	LDP-B2	LB2B1	1	2 1/2"	4 #4/0 & 1#4 GND.	76.0	27.0		
LDPB2-5	LDP-B2	LB2B2	1	2 1/2"	4 #4/0 & 1#4 GND.	150.0	54.0		
LDPB2-6	LDP-B2	SPACE	–	–		–	–		
LDPB2-7	LDP-B2	SPACE	–	–	–	–	–		
					SUBTOTAL	499.0	180		
					25% LARGEST MOTOR	–	–		
					TOTAL	499.0	180		

SINGLE LINE DIAGRAM-BLDG. "B"

NOT TO SCALE | 1

KEYNOTES

1. INSTALL 1/4 INCH X 1 INCH X 4 FEET COPPER GROUND BUS AS A CENTRAL GROUND POINT FOR BUILDING. ALL GROUND CONDUCTORS SHALL ORIGINATE AT THIS BUS. NO OTHER GROUND POINTS SHALL BE USED.
2. INSTALL 1-1/4 INCH CONDUIT WITH #4/0 GROUNDING ELECTRODE CONDUCTOR TO UFER GROUND SYSTEM CABLE. UFER GROUND SYSTEM SHALL BE 40 FEET OF #4/0 BARE COPPER GROUND WITH 3/4 INCH ROUND BY 10 FEET SOLID COPPER GROUND ROD AT EACH END OF 4/0 BARE COPPER CABLE.
3. INSTALL 1-1/4 INCH CONDUIT – ONE #4/0 TO ACCESSIBLE COLD WATER AND GAS MAIN LINES. CONNECT TO BLACK STEEL GAS LINE ON SECONDARY SIDE OF METER AT SERVICE ENTRY. CONNECT TO WATER MAIN AT BACKFLOW PREVENTER AT SERVICE ENTRY. REFER TO PLUMBING DRAWINGS FOR LOCATIONS. CONNECT USING APPROVED GROUNDING CLAMPS.
4. FURNISH GROUND BUS IN EACH TRANSFORMER. CONNECT PRIMARY FEEDER EQUIPMENT GROUNDING CONDUCTOR, SECONDARY NEUTRAL, SECONDARY FEEDER EQUIPMENT GROUNDING CONDUCTOR, GROUNDING ELECTRODE CONDUCTOR, AND TRANSFORMER FRAME TO GROUND BUS. CONNECT GROUND BUS TO BUILDING STEEL OR CENTRAL GROUND POINT AS APPLICABLE. CONNECTIONS TO BUILDING STEEL SHALL BE WITH EXOTHERMIC WELDS. TYPICAL ALL TRANSFORMERS.
5. FURNISH GROUND BUS IN EACH BRANCH CIRCUIT PANEL. ALL PANELS 480/277 VOLT AND 208/120 VOLT, SHALL HAVE THE FEEDER EQUIPMENT GROUNDING CONDUCTOR AND BRANCH CIRCUIT EQUIPMENT GROUNDING CONDUCTOR CONNECTED TO GROUND BUS. FURNISH EQUIPMENT GROUNDING CONDUCTOR IN EVERY FEEDER AND BRANCH CIRCUIT, RUN TO LAST OUTLET AND CONNECT TO BUS. CONDUIT GROUND IS NOT ACCEPTABLE AS A SUBSTITUTE. TYPICAL ALL PANELS, SWITCHBOARDS, DISTRIBUTION PANELBOARDS, AND SWITCHGEAR.
6. INSTALL FEEDER CONDUIT EQUIPMENT GROUNDING CONDUCTOR, BRANCH FEEDER EQUIPMENT GROUNDING CONDUCTORS, AND PANEL FRAME GROUND STRAP TO FULL LENGTH COPPER GROUND BUS. DO NOT JUMPER NEUTRAL AND GROUND BUSES IN PANELS. TYPICAL FOR ALL DISTRIBUTION PANELS AND MOTOR CONTROL CENTERS.
7. CIRCUIT BREAKER WITH 24V. SHUNT TRIP.
8. 3/4"C. & WIRING TO NEAREST FIRE ALARM CONTROL PANEL.
9. STUB-OUT & CAPPED, SEE SITE DISTRIBUTION PLAN FOR CONTINUATION.

D.S.A. STAMP

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NO	DATE	BY	REMARKS

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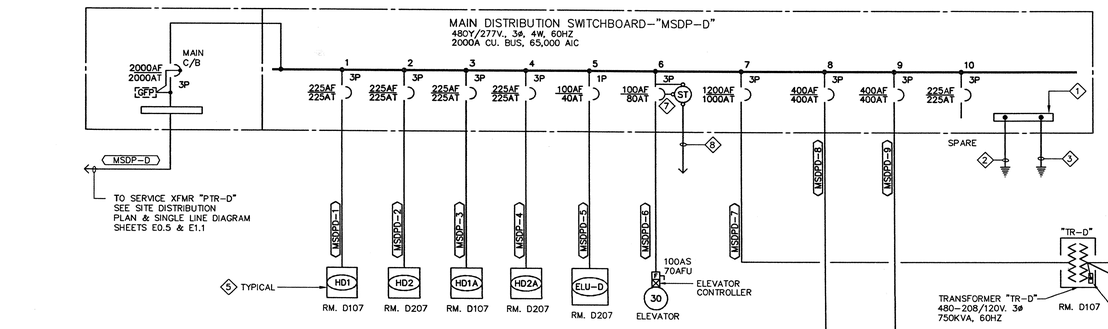
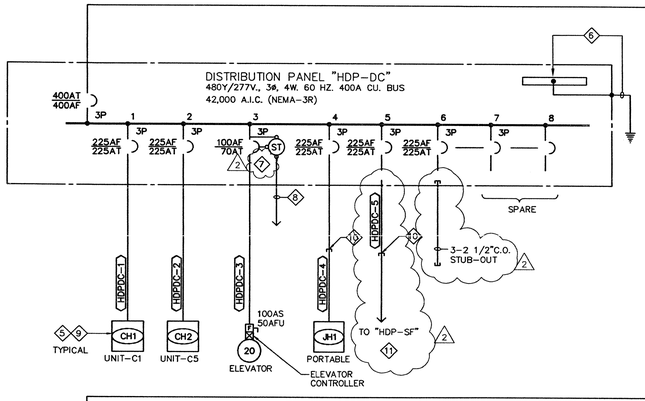
tel: 916 355 9922
fax: 916 355 9950

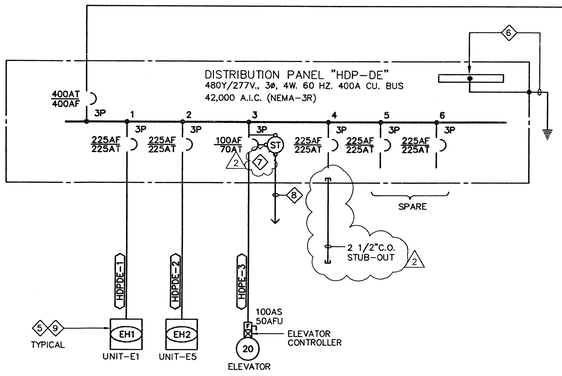
SINGLE LINE DIAGRAM

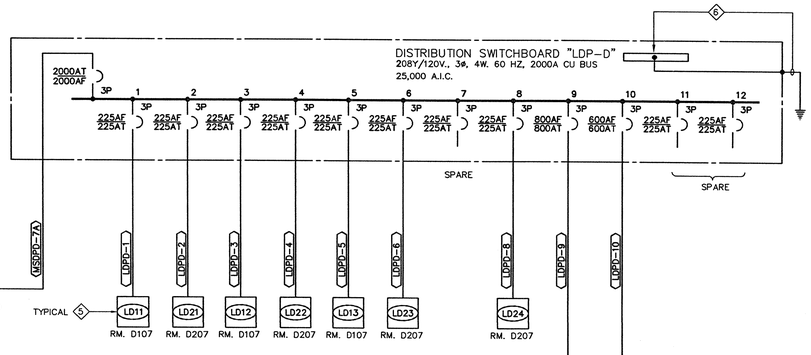
DRAWN	JHC II
CHECKED	VZD
DATE	05/10/02
SCALE	NONE
JOB NO.	98265

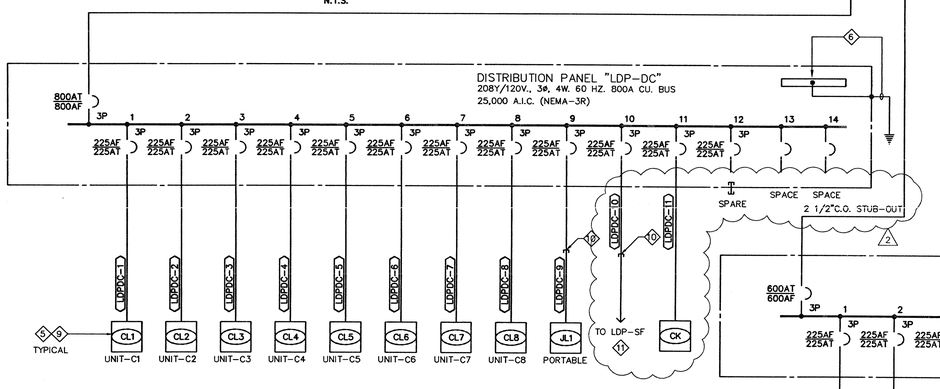
E0.6

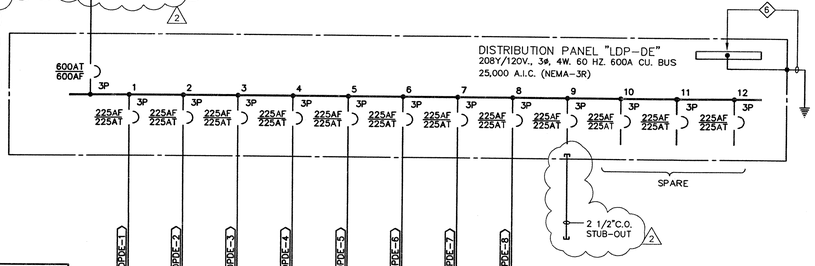












KEYNOTES:

1. INSTALL 1/4 INCH X 1 INCH X 4 FEET COPPER GROUND BUS AS A CENTRAL GROUND POINT FOR BUILDING. ALL GROUND CONDUCTORS SHALL ORIGINATE AT THIS BUS. NO OTHER GROUND POINTS SHALL BE USED.
2. INSTALL 1–1/4 INCH CONDUIT WITH #4/0 GROUNDING ELECTRODE CONDUCTOR TO UFER GROUND SYSTEM CABLE. UFER GROUND SYSTEM SHALL BE 40 FEET OF #4/0 BARE COPPER GROUND WITH 3/4 INCH ROUND BY 10 FEET SOLID COPPER GROUND ROD AT EACH END OF 4/0 BARE COPPER CABLE.
3. INSTALL 1–1/4 INCH CONDUIT – ONE #4/0 TO ACCESSIBLE COLD WATER AND GAS MAIN LINES. CONNECT TO BLACK STEEL GAS LINE ON SECONDARY SIDE OF METER AT SERVICE ENTRY. CONNECT TO WATER MAIN AT BACKFLOW PREVENTER AT SERVICE ENTRY. REFER TO PLUMBING DRAWINGS FOR LOCATIONS. CONNECT USING APPROVED GROUNDING CLAMPS.
4. FURNISH GROUND BUS IN EACH TRANSFORMER. CONNECT PRIMARY FEEDER EQUIPMENT GROUNDING CONDUCTOR, SECONDARY NEUTRAL, SECONDARY FEEDER EQUIPMENT GROUNDING CONDUCTOR, GROUNDING ELECTRODE CONDUCTOR, AND TRANSFORMER FRAME TO GROUND BUS. CONNECT GROUND BUS TO BUILDING STEEL OR CENTRAL GROUND POINT AS APPLICABLE. CONNECTIONS TO BUILDING STEEL SHALL BE WITH EXOTHERMIC WELDS. TYPICAL ALL TRANSFORMERS.
5. FURNISH GROUND BUS IN EACH BRANCH CIRCUIT PANEL. ALL PANELS 480/277 VOLT AND 208Y/120 VOLT, SHALL HAVE THE FEEDER EQUIPMENT GROUNDING CONDUCTOR AND BRANCH CIRCUIT EQUIPMENT GROUNDING CONDUCTOR CONNECTED TO GROUND BUS. FURNISH EQUIPMENT GROUNDING CONDUCTOR IN EVERY FEEDER AND BRANCH CIRCUIT RUN TO LAST OUTLET AND CONNECT TO BUS. CONDUIT GROUND IS NOT ACCEPTABLE AS A SUBSTITUTE. TYPICAL ALL PANELS, SWITCHBOARDS, DISTRIBUTION PANELBOARDS, AND SWITCHGEAR.
6. INSTALL FEEDER CONDUIT EQUIPMENT GROUNDING CONDUCTOR, BRANCH FEEDER EQUIPMENT GROUNDING CONDUCTORS, AND PANEL FRAME GROUND STRAP TO FULL LENGTH COPPER GROUND BUS. DO NOT JUMPER NEUTRAL AND GROUND BUSES IN PANELS. TYPICAL FOR ALL DISTRIBUTION PANELS AND MOTOR CONTROL CENTERS.
7. CIRCUIT BREAKER WITH 120V. SHUNT TRIP.
9. 3/4"C. & WIRING TO FIRE ALARM CONTROL PANEL–D (FACP–D)
9. PANELBOARD TO SERVE FIRST AND SECOND FLOOR LOAD. REFER TO PANELBOARD SCHEDULE FOR RELOCATABLES, TYPICAL.
10. INTERCEPT (E) STUB–OUT CONDUIT AND EXTEND CONDUIT AS SHOWN. REFER TO ELECTRICAL SITE POWER PLAN WHERE OCCURS.
11. REFER TO SHEET E0.10 FOR CONTINUATION AND SCHEDULE.

SINGLE LINE DIAGRAM - BLDG. "D"

N.T.S.

SINGLE LINE DIAGRAM - RELOCATABLES

N.T.S.

LOCATION :RELOCATABLES (OUTDOOR) "LDP–DC" 208Y/120 V. 3 ø 4 W.

	FEEDER FROM	FEEDER TO	NO. OF SETS	CONDUIT (INCHES)	CONDUCTORS	CONNECTED LOAD AMPS	CONNECTED LOAD K.V.A.	FEEDER LENGTH (FEET)	% VD
LDPDC–1	LDP–DC	CL1	1	2 1/2"	4 #4/0 & 1 #4 GND	61.0	22.0	–	–
LDPDC–2	LDP–DC	CL2	1	2 1/2"	4 #4/0 & 1 #4 GND	61.0	22.0	–	–
LDPDC–3	LDP–DC	CL3	1	2 1/2"	4 #4/0 & 1 #4 GND	61.0	22.0	–	–
LDPDC–4	LDP–DC	CL4	1	2 1/2"	4 #4/0 & 1 #4 GND	61.0	22.0	–	–
LDPDC–5	LDP–DC	CL5	1	2 1/2"	4 #4/0 & 1 #4 GND	61.0	22.0	–	–
LDPDC–6	LDP–DC	CL6	1	2 1/2"	4 #4/0 & 1 #4 GND	61.0	22.0	–	–
LDPDC–7	LDP–DC	CL7	1	2 1/2"	4 #4/0 & 1 #4 GND	61.0	22.0	–	–
LDPDC–8	LDP–DC	CL8	1	2 1/2"	4 #4/0 & 1 #4 GND	61.0	22.0	–	–
LDPDC–9	LDP–DC	JL1	1	2 1/2"	4 #4/0 & 1 #4 GND	61.0	22.0	–	–
LDPDC–10	LDP–DC	LDP–SF	1	2 1/2"	4 #4/0 & 1 #4 GND	150.0	54.0	–	–
LDPDC–11	LDP–DC	SPARE	1	2 1/2"	CONDUIT ONLY				
LDPDC–12	LDP–DC	SPARE	–	–	–				
					SUBTOTAL	699.0	252.0	–	–
					25% LARGEST MOTOR	–	–	–	–
					TOTAL	699.0	252.0	–	–

LOCATION :RELOCATABLES (OUTDOOR) "LDP–DE" 208Y/120 V. 3 ø 4 W.

	FEEDER FROM	FEEDER TO	NO. OF SETS	CONDUIT (INCHES)	CONDUCTORS	CONNECTED LOAD AMPS	CONNECTED LOAD K.V.A.	FEEDER LENGTH (FEET)	% VD
LDPDE–1	LDP–DE	EL1	1	2 1/2"	4#4/0 & 1#4 GND	61.0	22.0	–	–
LDPDE–2	LDP–DE	EL2	1	2 1/2"	4#4/0 & 1#4 GND	61.0	22.0	–	–
LDPDE–3	LDP–DE	EL3	1	2 1/2"	4#4/0 & 1#4 GND	61.0	22.0	–	–
LDPDE–4	LDP–DE	EL4	1	2 1/2"	4#4/0 & 1#4 GND	61.0	22.0	–	–
LDPDE–5	LDP–DE	EL5	1	2 1/2"	4#4/0 & 1#4 GND	61.0	22.0	–	–
LDPDE–6	LDP–DE	EL6	1	2 1/2"	4#4/0 & 1#4 GND	61.0	22.0	–	–
LDPDE–7	LDP–DE	EL7	1	2 1/2"	4#4/0 & 1#4 GND	61.0	22.0	–	–
LDPDE–8	LDP–DE	EL8	1	2 1/2"	4#4/0 & 1#4 GND	61.0	22.0	–	–
LDPDE–9	LDP–DE	SPARE	–	–	–	–	–	–	–
LDPDE–10	LDP–DE	SPARE	–	–	–	–	–	–	–
LDPDE–11	LDP–DE	SPARE	–	–	–				
LDPDE–12	LDP–DE	SPARE	–	–	–				
					SUBTOTAL	488.0	176.0	–	–
					25% LARGEST MOTOR	–	–	–	–
					TOTAL	488.0	176.0	–	–

LOCATION :RELOCATABLES (OUTDOOR) "HDP–DE" 480Y/277 V. 3 ø 4 W.

	FEEDER FROM	FEEDER TO	NO. OF SETS	CONDUIT (INCHES)	CONDUCTORS	CONNECTED LOAD AMPS	CONNECTED LOAD K.V.A.	FEEDER LENGTH (FEET)	% VD
HDPDE–1	HDP–DE	EH1	1	2 1/2"	4 #4/0 & 1#4 GND	30.0	25.0	–	–
HDPDE–2	HDP–DE	EH2	1	2 1/2"	4 #4/0 & 1#4 GND	30.0	25.0	–	–
HDPDE–3	HDP–DE	ELEVATOR	1	1 1/4"	3#4 & 1#8 GND	27.0	23.0	–	–
HDPDE–4	HDP–DE	SPARE	–	–	–	–	–	–	–
HDPDE–5	HDP–DE	SPARE	–	–	–	–	–	–	–
HDPDE–6	HDP–DE	SPARE	–	–	–	–	–	–	–
					SUBTOTAL	87.0	73.0	–	–
					25% LARGEST MOTOR	–	–	–	–
					TOTAL	87.0	73.0	–	–

LOCATION :RELOCATABLES (OUTDOOR) "HDP–DC" 480Y/277 V. 3 ø 4 W.

	FEEDER FROM	FEEDER TO	NO. OF SETS	CONDUIT (INCHES)	CONDUCTORS	CONNECTED LOAD AMPS	CONNECTED LOAD K.V.A.	FEEDER LENGTH (FEET)	% VD
HDPDC–1	HDP–DC	CH1	1	2 1/2"	4 #4/0 & 1#4 GND	30.0	25.0	–	–
HDPDC–2	HDP–DC	CH2	1	2 1/2"	4 #4/0 & 1#4 GND	30.0	25.0	–	–
HDPDC–3	HDP–DC	ELEVATOR	1	1 1/4"	3 #4/0 & 1#8 GND	27.0	23.0	–	–
HDPDC–4	HDP–DC	JH1	1	2 1/2"	4 #4/0 & 1#4 GND	30.0	25.0	–	–
HDPDC–5	HDP–DC	HDP–SF	1	2 1/2"	4 #4/0 & 1#4 GND	150.0	54.0	–	–
HDPDC–6	HDP–DC	SPARE	–	–	–	–	–	–	–
					SUBTOTAL	117.0	98.0	–	–
					25% LARGEST MOTOR	–	–	–	–
					TOTAL	117.0	98.0	–	–

LOCATION :ELECT. RM. D107 "MSDP–D" 480Y/277 V. 3 ø 4 W.

	FEEDER FROM	FEEDER TO	NO. OF SETS	CONDUIT (INCHES)	CONDUCTORS	CONNECTED LOAD AMPS	CONNECTED LOAD K.V.A.	FEEDER LENGTH (FEET)	% VD
MSDPD–1	MSDP–D	HD1	1	2 1/2"	4 #4/0 &1#4 GND	40.0	34.0	–	–
MSDPD–2	MSDP–D	HD2	1	2 1/2"	4 #4/0 &1#4 GND	16.0	14.0	–	–
MSDPD–3	MSDP–D	HD1A	1	2 1/2"	4 #4/0 &1#4 GND	151.0	126.0	–	–
MSDPD–4	MSDP–D	HD2A	1	2 1/2"	4#4/0 & 1#4 GND	139.0	115.0	–	–
MSDPD–5	MSDP–D	ELU–D	1	1"	2#8 & 1#10 GND	22.0	8.0	–	–
MSDPD–6	MSDP–D	ELEVATOR	1	1 1/2	3#4 & 1#8 GND	40.0	33.0	–	–
MSDPD–7	MSDP–D	TR–D	3	4"	3 #500 KCMIL & 1#3/0 GND	903.0	750.0	–	–
MSDPD–7A	TR–D1	LDP–D	6	4"	4 #500 KCMIL & 1#250KCMIL GND.	732.0	608.0	–	–
MSDPD–8	MSDP–D	HDP–DC	1	4"	4#600 KCMIL & 1#2 GND.	117.0	98.0	–	–
MSDPD–9	MSDP–D	HDP–DE	1	4"	4#600 KCMIL & 1#2 GND.	87.0	73.0	–	–
MSDPD–10	MSDP–D	SPACE	–	–	–				
MSDPD–11	MSDP–D	SPACE	–	–	–				
MSDPD–12	MSDP–D	SPACE	–	–	–				
					SUBTOTAL	1344.0	938.0	–	–
					25% LARGEST MOTOR	10	8.0	–	–
					TOTAL	1354.0	946.0	–	–

LOCATION :ELECT. RM. D107 "LDP–D" 208Y/120 V. 3 ø 4 W.

	FEEDER FROM	FEEDER TO	NO. OF SETS	CONDUIT (INCHES)	CONDUCTORS	CONNECTED LOAD AMPS	CONNECTED LOAD K.V.A.	FEEDER LENGTH (FEET)	% VD
LDPD–1	LDP–D	LD11	1	2 1/2"	4 #4/0 &1#4 GND	116.0	42.0	–	–
LDPD–2	LDP–D	LD21	1	2 1/2"	4 #4/0 &1#4 GND	83.0	30.0	–	–
LDPD–3	LDP–D	LD12	1	2 1/2"	4 #4/0 &1#4 GND	112.0	40.0	–	–
LDPD–4	LDP–D	LD22	1	2 1/2"	4 #4/0 &1#4 GND	68.0	25.0	–	–
LDPD–5	LDP–D	LD13	1	2 1/2"	4 #4/0 &1#4 GND	99.0	36.0	–	–
LDPD–6	LDP–D	LD23	1	2 1/2"	4 #4/0 &1#4 GND	94.0	34.0	–	–
LDPD–7	LDP–D	SPACE	–	–	–	–	–	–	–
LDPD–8	LDP–D	LD24	1	2 1/2"	4 #4/0 &1#4 GND	76.0	27.0	–	–
LDPD–9	LDP–D	LDP–DC	3	3"	4 #350 KCMIL & 1#2/0 GND.	549.0	198.0	–	–
LDPD–10	LDP–D	LDP–DE	3	3"	4 #250 KCMIL & 1#1/0 GND.	488.0	176.0	–	–
LDPD–11	LDP–D	SPARE							
LDPD–12	LDP–D	SPARE							
					SUBTOTAL	1685.0	608.0	–	–
					25% LARGEST MOTOR	–	–	–	–
					TOTAL	1685.0	608.0	–	–

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Re Date 3-31-03
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(909) 986–4560
Job No. 2000.178.02

NO	DATE	BY	REMARKS
2	06/07/02		ADDEDUM #2

VISTA MURRIETA HIGH SCHOOL - PHASE 3

MURRIETA VALLEY UNIFIED SCHOOL DISTRICT

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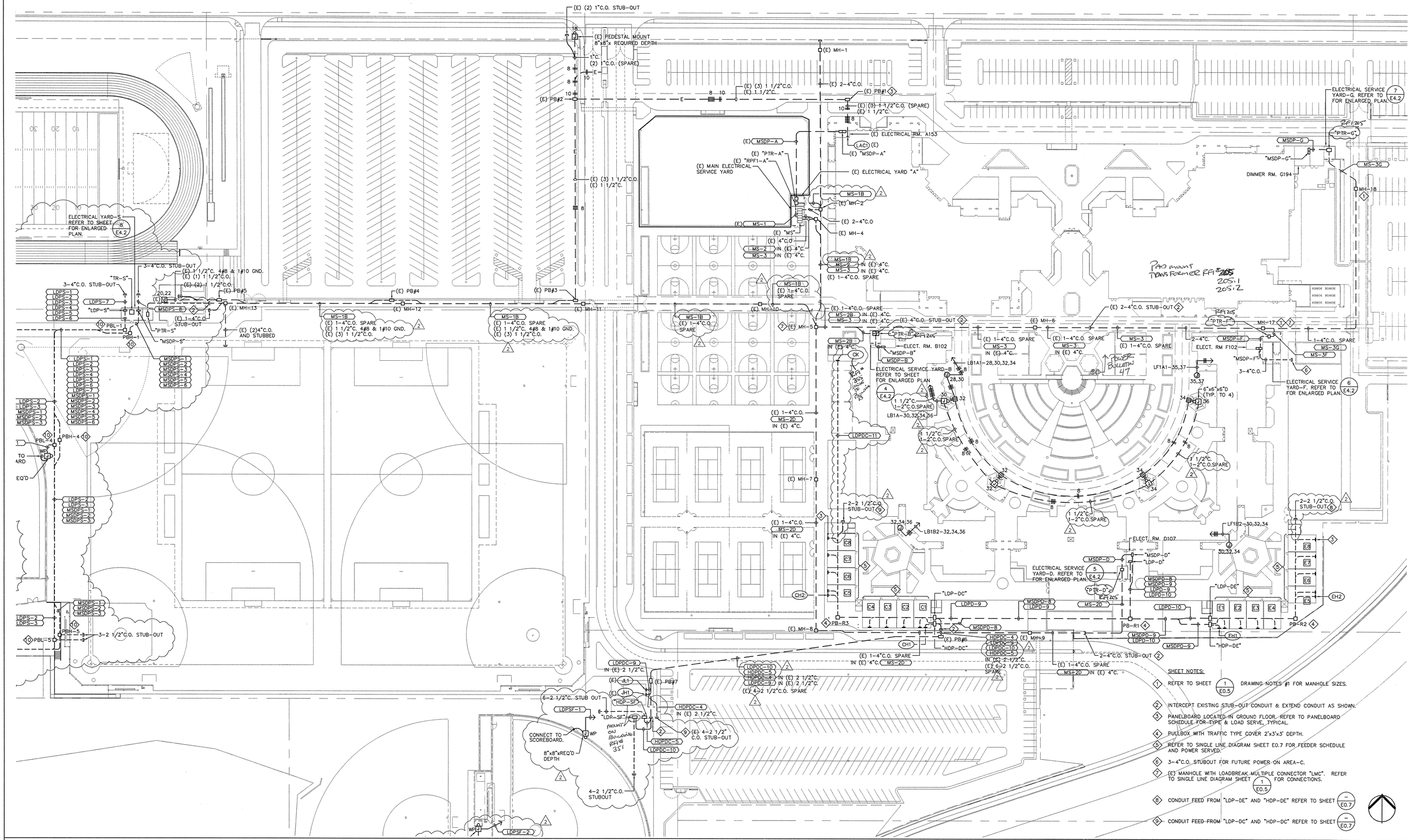
SINGLE LINE DIAGRAM

DRAWN	LY
CHECKED	VZD
DATE	05/10/02
SCALE	NONE
JOB NO.	98265

E0.7



SHEET NOTES:

1. REFER TO SHEET 1 E0.5 DRAWING NOTES #1 FOR MANHOLE SIZES.
2. INTERCEPT EXISTING STUB-OUT CONDUIT & EXTEND CONDUIT AS SHOWN.
3. PANELBOARD LOCATED IN GROUND FLOOR. REFER TO PANELBOARD SCHEDULE FOR TYPE & LOAD SERVE, TYPICAL.
4. PULLBOX WITH TRAFFIC TYPE COVER 2'x3'x3' DEPTH.
5. REFER TO SINGLE LINE DIAGRAM SHEET E0.7 FOR FEEDER SCHEDULE AND POWER SERVED.
6. 3-4"C.O. STUBOUT FOR FUTURE POWER ON AREA-C.
7. (E) MANHOLE WITH LOADBREAK MULTIPLE CONNECTOR "LMC". REFER TO SINGLE LINE DIAGRAM SHEET 1 E0.5 FOR CONNECTIONS.
8. CONDUIT FEED FROM "LDP-DE" AND "HDP-DE" REFER TO SHEET – E0.7
9. CONDUIT FEED FROM "LDP-DC" AND "HDP-DC" REFER TO SHEET – E0.7

ELECTRICAL SITE POWER DISTRIBUTION PLAN

1"=50'-0" 1

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NO	DATE	BY	REMARKS
2	06/07/02		ADDEDUM #2

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ELECTRICAL SITE POWER PLAN

DRAWN	NW
CHECKED	VZD
DATE	05/10/02
SCALE	1"=50'-0"
JOB NO.	98265

E1.1

SECTION 11 90 00

MISCELLANEOUS EQUIPMENT

1. PART 1 GENERAL

1.1 SECTION INCLUDES

A. Projection Screen.

B. Refrigerator.

C. Dishwasher.

D. Ice Machine.

E. Chemical Storage Cabinet.

F. Fume Hood.

G. Sound Isolation Enclosure.

H. Green Screen Flooring.

I. Rifle Storage Cabinet.

1.2 REFERENCES

A. 2010 Americans with Disabilities Act (ADA) Standards for Accessible Design.

B. CBC - California Building Code, (CCR) California Code of Regulations, Title 24, Part 2.

1.3 SUBMITTALS

A. Submit product data and manufacturer's installation instructions for each item under provisions of Section 01 33 00.

1.4 REGULATORY REQUIREMENTS

A. Conform to CBC, California Building Code, (CCR), Title 24, Part 2 and the 2010 ADA Standards for Accessible Design for accessibility.

1.5 OPERATION AND MAINTENANCE DATA

A. Submit operation and maintenance data under provisions of Section 01 77 00.

2. PART 2 PRODUCTS

2.1 PRODUCTS

A. Projection Screen: Draper, Inc., www.draperinc.com; Model Luma 2 with AR; manual operation, auto return spring roller, Image Format: 16:10, Diagonal Image: 109" (57.5" x 92"), Surface Material: Matt White XT1000E.

B. Refrigerator: GE Appliances, www.geappliances.com; Model GE Café Series 42" Built-In Side-By-Side Refrigerator; 42" H x 84" H x 28.25" D, stainless steel finish.

C. Dishwasher: Labconco, www.labconco.com; Undercounter SteamScrubber 33 Glassware Washer; up to 180 degrees Fahrenheit, 24.1" W x 27.4" D x 32.9" H.

D. Ice Machine: Hoshizaki America, Inc., www.hoshizakiamerica.com; Model F-330BAJ-C, air-cooled, self-contained, built-in storage bin, 24" W x 26" D x 39" H.

E. Chemical Storage Cabinets: Labconco, www.labconco.com; Protector Solvent Storage Cabinet, self-closing doors, 36" W x 22" D.

F. Fume Hood: Labconco, www.labconco.com; Model 4' Protector Classmate HOPEC IV Laboratory Hood; 48" W x 32.25" D x 59" H, provide coordinating base cabinet, remote blower, and ductwork; solid back panel.

G. Sound Isolation Enclosure: Whisper Room, Inc., www.whisperroom.com; Model MDL 96120 E, RM, ADA; 8' x 10', 32" door, studio foam color: blue; install in recessed slab with flush transition at door.

H. Green Screen Flooring: Rosco Laboratories, www.rosco.com; Chroma Floor; color: green.

I. Rifle Storage Cabinet: SEK Solutions, www.seksolutions.com; Model NSN # 1095-01-646-1206, 10 rifle cabinet, 42" W x 48" H x 15" D, retractable door, 7-point lock mechanism; secure cabinets to each other and rear wall.

J. Substitutions: Under provisions of Section 01 25 13.

3. PART 3 EXECUTION

3.1 INSTALLATION

A. Install equipment in accordance with manufacturer's printed instructions and as indicated on the drawings.

B. Furnish all necessary hardware, anchors, inserts, connections, and embedded items necessary for proper installation. Coordinate with work of other sections.

END OF SECTION

SECTION 27 13 43

COMMUNICATIONS SERVICES CABLING

1. PART 1 GENERAL

A. Provide all labor, equipment, supplies, transportation, and materials and the performing of all operations necessary for the installation of complete and operating systems, for extension of data Local Area Network, LAN, to new buildings.

B. The work described by this specification includes the furnishing of all materials, equipment, supplies, labor, all conduits, outlet boxes, back boxes, junction boxes, terminal cabinets, backboards, wiring, cables, equipment, devices, etc., shall be furnished and installed complete under this section. The Installing Data Systems Contractor shall determine conduit and junction box sizes for the particular wire and cable fills required for the systems installed (conduit sizes shall comply with the 2013 California Electrical Code and National Electrical Code). The entire responsibility of the system, including the installation, operation, function, testing and maintenance for one (1) year after final acceptance under this section shall be the responsibility of the Data Systems Contractor.

C. The Data Systems Contractor shall furnish and install all equipment, cables, devices, and other materials even if not specifically mentioned herein, which are necessary for the proper integration of the system so that the system shall perform the functions listed herein in compliance with all specified requirements.

D. The Installing Data Systems Contractor shall hold a valid State of California License, shall have completed at least 20 projects of equal scope, shall have been in business of furnishing and installing data systems of this type for at least five years and capable of being bonded to assure the Owner of performance and satisfactory service during the guarantee period.

E. The Data System Contractor shall be a factory trained and certified for the brand of equipment offered, qualified to extend full ten year warranty offered by manufacturer of the cabling and outlets and shall maintain a fully equipped service organization capable of furnishing adequate repair service to the equipment. Bids received without this certification are subject to rejection.

1.2 APPLICABLE DOCUMENTS

A. The system design described in this document and depicted in the attached drawing package is derived in part from the recommendations made in industry standard documents. The list of Documents below are incorporated by reference:

1. This Technical Specification and Associated Drawings.

2. ANSI/EIA/TIA-568 Commercial Building Wiring Standard – July 2016.

3. EIA/TIA-TSB-36 Technical Systems Bulletin, Additional Cable Specifications for Unshielded Twisted-Pair Cables – November 1991

4. TIA/EIA-TSB-40 Telecommunications Systems Bulletin, Additional Transmission Specifications for Unshielded Twisted-Pair Connecting Hardware – January 1994

5. TIA-569 Commercial Building Standard for Telecommunications Pathways and Spaces – April 2015

6. TIA-606 Administration Standard for the Telecommunications Infrastructure of Commercial Buildings – June 2012

7. EIA-607 Commercial Building Grounding and Bonding Requirements for Telecommunications – November 2015

8. Building Industries Consulting Services, International (BICSI) Telecommunications Distribution Methods Manual (TDMM) –1994

9. California Electrical Code (CED), 2013

B. If a conflict exists between applicable documents then the order in the list above shall dictate the order of precedence in resolving conflicts. This order of precedence shall be maintained unless a lesser order document has been adopted as code by a local, state or federal entity, and is therefore enforceable as law by a local, state, or federal inspection agency.

C. If this document and any of the documents listed above are in convict, then the more stringent requirement shall apply. All documents listed are believed to be the most current releases of the documents, the vendor is responsible to determine and adhere to the most recent release when developing the proposal for installation.

D. The Installing Data Systems Contractor shall hold a valid State of California License, shall have completed at least 20 projects of equal scope, shall have been in business of furnishing and installing data systems of this type for at least five years, and capable of being bonded to assure the Owner of performance and satisfactory service during the guarantee period.

E. The Data Systems Contractor shall be a factory trained and certified for the brand of equipment offered, qualified to extend full ten year warranty offered by manufacturer of the cabling and outlets and shall maintain a fully equipped service organization capable of furnishing adequate repair service to the equipment. With submittal of bid, contractor shall include a copy of certification form Amp or equal by Lucent Technologies, Bids received without this certification shall be rejected.

1.3 ASSOCIATED REFERENCES

A. This document describes a system to be installed in accordance with recognized telecommunications industry cabling standards. Although the intent of the standards is to provide an application independent cable system, one or more of the following documents, describing specific network types and topologies, may be pertinent to the overall operation of the system and should be considered associated reference materials.

1. ISO/IEC 8802-3 (IEEE 802.3)

2. ISO/IEC 8802-5 (IEEE 802.5)

3. ANSI X3T9.5 Fiber Distributed Data Interface (FDDI) Physical Medium Dependent (PMD)

4. ANSI X3T9.5 Twisted Pair Physical Medium Dependent (TP-PMD)

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit catalog data for each termination device, cable, and outlet device.

C. Test Reports: Indicate procedures and results for specified field testing and inspection.

1.5 JACKS

A. Eight-wire, eight-position modular jacks shall be used for all telecommunications outlets. Each jack shall be fed by a separate four pair cable sheath. All four pairs shall be wired to the jack using TIA/EIA-568-A (T568A) wiring scheme. The jacks shall employ PC board mounted (110 or IDC) contacts for termination of the wire. To meet district standards the part number shall be a 406372-(color as requested), faceplates shall be two port 557505-X, four port 558088-X, six port

557691-X or duplex mounting straps 558321-X, 558302-Y as required in any floor box or surface raceway application.

B. The jacks shall be matched to the Category rating of the attached horizontal distribution cable which will all be category 6 compliant.

C. Category 6 patch panels shall be Amp, enhanced part number 406330-1.

1.6 FIBER OPTIC CONNECTORS

A. Fiber optic connectors shall meet the following minimum criteria:

1. Fiber optic connectors shall be SC-style connectors, to match existing.

2. Connectors shall incorporate zirconia ceramic ferrules. The same type shall be used throughout the installation. Amp, or equal by Lucent Technologies, #503693-1

3. All connectors provided by the Contractor shall be of the same manufacturer and part number throughout this contract.

4. Fiber optic connectors shall be rated for a mean loss not greater than 0.3 dB per mated pair.

1.7 OUTLET PLATE

A. The outlet shall be configured so that the interconnect couplings are at an acute angle to, or parallel with, the wall surface.

B. The outlet plate shall be affixed to an in-wall or surface mount box with two screws, which match the color of the outlet plate.

2. PART 2 TELECOMMUNICATIONS OUTLET INSTALLATION

2.1 ALL OUTLET SHALL BE INSTALLED IN THE FOLLOWING MANNER:

A. Wall mount boxes shall be attached to (box eliminators, 4”x 4” boxes, old work boxes) provided by the Contractor providing outlets and boxes.

B. Wall mount boxes shall be installed with the center of the plate at (15” IAW ADA requirements or match existing) above finished floor (AFF). The faceplates shall be installed in a (horizontal or vertical) orientation.

C. Any unused faceplate positions shall be covered/filled with a blank insert made of the same or compatible material as the faceplate and shall be molded in the same color. Blank spaces shall be incorporated between populated positions on the faceplate. Amp, or equal by Lucent Technologies, #557626-Y

D. Cables shall be coiled in the in-wall or surface-mount boxes. In hollow wall installations where box-eliminators are used, excess wire can be stored in the wall. No more than 12” of slack shall be stored in an in-wall box, modular furniture raceway, or insulated walls. Excess slack for these situations shall be neatly coiled in the ceiling above the drop location.

2.2 IN ADDITION, EACH CABLE TYPE SHALL BE TERMINATED AS INDICATED BELOW:

A. 100 Ω UNSHIELDED TWISTED PAIR JACKS

1. Cables shall be dressed and terminated in accordance with the recommendations made in the TIA-568-A document, manufacturers’ recommendations and/or best industry practices.

2. Pairs that are untwisted at the termination shall not exceed one-half an inch.

3. Bend radius of the cable in the termination area shall not exceed 4 times the outside diameter of the cable.

4. The cable jacket shall be maintained as close as possible to the termination point.

5. All modular jacks shall be oriented with the locking tab slot towards the floor.

6. Voice jacks shall be located in the top or top left position of each faceplate. In instances where there is more than one voice jack per faceplate, then the second shall occupy the top right or second position, continuing top to bottom, or left to right. Voice jacks in horizontally oriented faceplates shall occupy the left-most position. Modem jacks shall be considered the last voice jack in the sequence.

7. Data jacks shall occupy the bottom or bottom right position on the faceplate. Where multiple data jacks on a faceplate, data jacks shall occupy the first position available after the phone jack and continue to the last position on the faceplate.

8. Data jacks that are in surface metal raceway (Wiremold 3000 or similar) shall be mounted in the proper termination plate by the manufacturer of the raceway to ensure that the customer gets a professional end product. These termination plates and trim are to be provided by the electrical Contractor installing the raceway and power outlets to ensure that all outlets and trim will match. Mounting straps shall be provided by the data contractor. Amp, or equal by Lucent Technologies, #558321-x or 558302-Y.

2.3 OPTICAL FIBER COUPLERS

A. Multimode optical fibers shall be terminated with duplex SC style connectors and attached to (SC-style to duplex SC, duplex SC to duplex SC, style, or SC-style to MIC) feed through couplers. Amp, or equal to Lucent Technologies, 503200-2

B. Single-mode optical fibers shall be terminated with (duplex SC, SC-style, or FC) connectors and attached to duplex SC to duplex SC feed through couplers.

C. All fiber optic terminations shall be installed in boxes with bend limiting provisions for fiber slack storage.

D. Wall mounted optical fiber faceplates/boxes shall provide an angled or parallel connector exit in reference to the wall surface.

2.4 HORIZONTAL DISTRIBUTION CABLE

A. Horizontal distribution cables shall be installed from the MDF and IDF to the designated locations in the Work Area Information Outlet (IO). Horizontal distribution cables shall be manufactured in compliance with the mechanical and electrical specifications detailed in the TIA/EIA-SP 2840A (568-A) document, as applicable. Cables not supported under the current revision of the standard shall be of recent design and manufacture and be capable of supporting the application (e.g., broadband coaxial, base band coaxial).

B. All cables shall be furnished by the Contractor in full, factory-packaged reels. The reels shall be marked with the respective cable part number and lot number by the manufacturer. Upon request by the Owner, the Contractor shall provide Manufacturer's proof of compliance with the required manufacturing guidelines presented in the aforementioned standards. Each reel shall be visually inspected upon receipt and prior to installation to ensure that no damage was incurred during shipment. Any damaged cable shall be returned to the vendor/manufacturer for replacement of the entire reel. The cost for replacement cable shall be borne by the Contractor. Any residual cable, in lengths greater than 500 feet, shall be delivered to the Owner and the Owner shall decide to the disposition of the cable.

2.5 PRODUCT SPECIFICATIONS

A. The planned cable system shall utilize the following cable types for horizontal distribution. Each cable shall meet or exceed the mechanical and electrical performance characteristics listed below:

1. Horizontal Unshielded Twisted Pair Cable

2. UTP Enhanced Category 6 Data and Telephone. Amp, or equal by Lucent Technologies

B. Mechanical

1. Optical fiber cables used outside shall be housed in an OSP loose tube, gel-filled, construction jacket configuration. Amp, part numbers 769509-1(6MM), 769510-1(12MM), 503028-1(24MM), 769511-1(48MM). 769512-1(72MM), 599013-1(6MM/6SM), 599012-1(8MM/4SM). Inside fiber shall be riser or plenum tight buffered as manufactured by Amp, or equal by Lucent Technologies. A UTP enhanced category 6 for data and telephone. Amp number 57825-6.

2. Mechanical:

a. Optical fiber shall be housed in an OSP loose tube, gel-filled, construction jacket configuration.

b. Optical fiber shall be rated a minimum of 100 Kpsi

c. Each optical fiber component shall be surrounded by an individual aramid yarn strength member

d. The optical fiber cable construction shall meet or exceed the requirements of the TIA-568-A Standard specification

1) When not installed in conduit, (per the plans and electrical specifications requirements), all horizontal cables shall be supported at a maximum of four-foot intervals. At no point shall cable(s) rest on acoustic ceiling grids or panels, nor shall they be attached to ceiling grid wires. Horizontal distribution cables shall be bundled in groups not greater than 40 cables. Bundles shall be supported by cable tray, conduit, trapezes, or multiple support strap made by Erico, Caddy part # CAT21 and CAT32.

e. Optical fiber cable shall withstand a minimum short term tensile load of 105 pounds without damage to the optical fiber

f. Optical fiber cable shall be able to withstand a minimum bend radius of 45 millimeters (mm) during installation without damage to the optical fiber elements

g. Optical fiber cable shall have a minimum crush resistance of 200 N/cm

C. Optical Transmission Performance

1. All optical fiber cable shall exhibit the following minimum transmission characteristics:

a. Maximum attenuation of 3.5 dB/km @ 850 nm and 1.5 dB/Km @ 1300 nm

b. Minimum bandwidth of 160 MHz/km @ 850 nm and 500 MHz/km @ 1300nm

2.6 HORIZONTAL DISTRIBUTION CABLE INSTALLATION

A. Cable shall be installed in accordance with Manufacturer's recommendations and best industry practices.

B. All cables shall be installed in the following manner:

1. Cable raceways shall not be filled greater than the CEC maximum fill for the particular raceway type.

a. Cable raceways shall not be filled greater than the NEC maximum fill for the particular raceway type. Conduit sizing shall be minimum of ¾ inch conduit for each outlet with no more than two outlets fed by one 1' homerun. If two outlets are fed by one homerun the conduit shall be 1" to the IDF or MDF and ¾ inch to the end box. For conduits feeding a multiple outlet surface raceway the sizing shall be as follows: 1" for raceways 6' long and under, 1 ¼ inch for raceways 6' to 18' long and multiple conduits to meet this pattern for lengths greater than 18'. These specifications shall take precedence over conduit routing shown on the plans that deviate from this method. The Data Contractor shall bring any discrepancies to the attention of the Architect/Engineer/Owner before bid time.

2. Cables shall be installed in continuous lengths from origin to destination (no splices) unless specifically addressed in this document.

3. Where cable splices are allowed, they shall be in accessible locations and housed in an enclosure intended and suitable for the purpose.

4. The cable's minimum bend radius and maximum pulling tension shall not be exceeded.

a. When not installed in conduit, (per the plans and electrical specifications requirements), all horizontal cables shall be supported at a maximum of four-foot intervals. At no point shall cables(s) rest on acoustic ceiling grids or panels, nor shall they be attached to ceiling grid wires. Horizontal distribution cables shall be bundled in groups not greater than 40 cables. Bundles shall be supported by cable tray, conduit, trapezes, or multiple support strap made by Erico, Caddy part # CAT21 and CAT32.

5. All horizontal cables shall be supported at a maximum of four-foot intervals. At no point shall cable(s) rest on acoustic ceiling grids or panels.

6. Horizontal distribution cables shall be bundled in groups not greater than 40 cables. Where larger bundles are required, the cables shall be supported by cable tray, conduit, trapezes, or multiple support strap made by Erico, Caddy part #CAT21 and CAT32.

7. Cable shall be installed above fire-sprinkler and systems and shall not be attached to the system or any ancillary equipment or hardware. The cable system and support hardware shall be installed so that it does not obscure any valves, fire alarm conduit, boxes, or other control devices.

8. Cables shall not be attached to ceiling grid or lighting support wires. Where light supports for drop cable legs are required, the Contractor shall install clips to support the cabling.

9. Any cable damaged or exceeding recommended installation parameters during installation shall be replaced by the Contractor prior to final acceptance at no cost to the Owner.

10. Cables shall be identified by a self-adhesive label in accordance with the Cable System Labeling Section 9.1 of this specification. The cable label shall be applied to the cable behind the faceplate on a section of cable that can be accessed by removing the cover plate.

2.7 ADDITIONAL REQUIREMENTS

A. In addition, different cable types shall be installed under the following provisions:

1. Unshielded Twisted Pair

a. Unshielded twisted pair cable shall be installed so that there are no bends less than four times the cables outside diameter (4X cable 0.D) at any point in the run and at the termination field.

b. Pulling tension on 4-pair UTP cables shall not exceed 25-pounds for a single cable or cable bundle.

c. A minimum amount of slack shall be left in the outlet box, but sufficient slack for at least one re-termination shall be allowed.

2.8 OPTICAL FIBER CABLE

A. 900-micron tight-buffered strands shall be directly terminated only when completely housed in a box or panel. Tight-buffered cable shall never be used outside between buildings.

B. When distribution style fiber cable is installed, strength members shall be mechanically secured to the outlet box and distribution enclosure.

C. A minimum of 12” of slack shall be stored at the drop end and 3” shall be stored at the TC termination enclosure.

D. Where 250-micron coated cable is field terminated, breakout kits that build up the fiber to a minimum of 900 microns shall be used.

E. Any splices shall be housed in fiber trays and an enclosure with splice tray organizers.

2.9 BACKBONE CABLING SUBSYSTEM GENERAL REQUIREMENTS

A. Backbone cables will be installed between the locations described in the scope of work and on the plans. An inner duct shall be pulled in all backbone conduits along with the fiber optic cable. This inner duct shall be left with only a pull rope for future use and shall be of the size and quantity called out in other areas of this specification. All conduits shall be plugged with snug plugs and duct seal after inner duct installation is completed. The backbone cable subsystem is comprised of all cable, connecting hardware, pathways and cable management hardware required to form a continuous path from the Telecommunications Entrance Facility (EF) to the Equipment Room (ER), from the ER to each Terminal Cabinet (TC), and between TCs on the same floor.

B. All cables shall be furnished by the Contractor in full, factory-packaged reels. The reels shall be marked with the respective cable part number and lot number by the manufacturer. Upon request by the Owner, the Contractor shall provide manufacturers’ proof of compliance with the required manufacturing guidelines presented in the aforementioned standards. Each reel shall be visually inspected upon receipt and prior to installation to ensure that no damage was incurred during shipment. Any damage cable shall be returned to the vendor/manufacturer for replacement. The cost for replacement cable shall be borne by the Contractor. Any residual cable, in lengths greater than 500 feet, shall be delivered to the Owner and the Owner shall decide the disposition of the cable.

2.10 FIBER BACKBONE CABLE

A. The fiber backbone cable shall meet the following minimum mechanical and transmission requirements:

1. Mechanical:

a. Optical fiber shall be housed in an OSP loose tube, gel-filled, construction if used in outside, underground, or overhead.

b. Inside/outside gel-filled construction shall be used if entering a building more than 50 feet outside of threaded rigid conduit.

c. Use OFNR construction if used as a riser cable.

d. Use Plenum construction if used in an air plenum of any kind.

e. Optical fiber shall be rated a minimum of 100 Kpsi.

f. Optical fiber elements shall have a ~900 micron tight buffer.

g. The optical fiber cable construction shall meet or exceed the requirements of the EIA/TIA-268-A Standard specification.

h. Optical fiber cable shall withstand a minimum short-term tensile load of 448 pounds without damage to the optical fiber.

i. Optical fiber cable shall be able to withstand a minimum bend radius of 5.01” (128 mm) during installation without damage to the optical fiber elements.

j. Optical fiber cable shall have a minimum crush resistance of 200 N/cm.

B. Optical Transmission Performance:

1. All optical fiber cable shall exhibit the following minimum transmission characteristics:

a. Maximum attenuation of 3.5 dB/km @ 850 nm and 1.5 dB/Km @ 1300 nm.

b. Minimum bandwidth of 160 MHz/km @ 850 nm and 500 MHz/km @ 1300 nm

2.11 BACKBONE CABLE INSALLATION

A. All backbone cables shall be installed in the following manner:

1. Backbone cables shall be installed separately from horizontal distribution cables.

2. Where cables are housed in conduits, the backbone and horizontal cables shall be installed in separate conduits or in separate inner ducts within conduits.

3. Where cables are installed in an air return plenum, the cable shall be installed in conduit, or plenum cable shall be installed in a plenum inner duct to provide protection to the cable.

4. Where backbone cables and distribution cables are installed in a cable tray or wire way, backbone cables shall be installed first and bundled separately from the horizontal distribution cables.

5. Backbone cable shall consist of strand count as required- strand multimode, loose tube OSP cable emanating from the MDF to each IDF. These cables shall be of the same manufacturer of all the other fiber and copper cabling system and terminations. These cables shall be FDDI+ grade per EIA/TIA standards.

6. All backbone conduits shall have (1) ¾ inch inner duct with pull ropes if in a 2" conduit (2) 1" inner duct with pull ropes if in a 3" conduit, and (4) 1" inner duct with proper "Jack-moon" plugs if installed in a 4" conduit. This inner duct will be for future use in the 2" and 3" conduits and one or as many as necessary will be utilized in the 4" conduit leaving the remainder for future use. All unused inner duct shall have a rubber snug plug with rope tie off installed and all inner duct occupied with cable shall have the appropriate cable seal.

2.12 HORIZONTAL CROSS-CONNECT TERMINATION HARDWARE

A. The backbone side of the horizontal cross-connect, and the main cross-connect shall be terminated in the same termination panels as the horizontal cables. The backbone fibers shall be maintained in separate termination panels from the horizontal distribution fiber cables. The backbone termination panels shall be installed in the double swing enclosed rack. Termination details and rack elevations for fiber panel placement shall be provided in the Contractor submittals.

B. The Contractor shall be required to install, secure and ground the racks. The Contractor shall only be required to install those fiber termination panels provided by the Contractor into the enclosures. Placement of the enclosures is detailed in the attached drawings.

C. Each fiber optic cable shall be terminated in the telecommunications closet in an Amp, or equal by Lucent Technologies. ATDU enclosure providing protection to the terminated fibers. The enclosures shall provide a strain relief bracket for attaching the optical fiber cable and support slack storage of a minimum of 36" per fiber cable. The enclosure shall provide a minimum of 12 ports for fiber terminations and fully enclose both the hardwired cable and the patch cord terminations when the shelf is closed.

2.13 PRODUCT SPECIFICAITONS

A. Products for this installation shall be furnished in new and factory packaged condition. Each product shall be inspected by the Contractor to ensure completeness and that no damage was incurred during shipping. The Contractor shall return to the manufacturer, any product found to be deficient. The cost of the return and replacement product shall be borne by the Contractor. All products provided for this installation shall meet the following minimum criteria.

2.14 FIBER OPTIC CONNECTORS

A. Fiber optic connectors shall meet the following minimum criteria:

1. Fiber optic connectors shall be SC-style connectors, to match existing on site.

2. Connectors shall incorporate ceramic connectors and the same type shall be used throughout the installation.

3. All connectors provided by the Contractors shall be of the same manufacturer and part number.

4. Fiber optic connectors shall be rated for a mean loss not greater than 0.3 dB per mated pair.

2.15 FIBER TERMINATION PANELS

A. Fiber optic connectors shall meet the following minimum criteria:

1. Fiber termination panels shall be capable of handling a minimum of 48 fiber optic connectors, Amp, or equal by Lucent Technologies. Part numbers 503325-1 and 503326-1 with the appropriate number of connector panels and couplers as manufactured by Amp. All unused locations shall be filled with blank panels.

2. Fiber termination panels shall be 19” rack mountable.

3. Fiber termination panels shall be hinged to provide complete access to connectors and slack storage from the front.

4. Fiber termination panels shall be complete with 12 SC-style interconnect couplers.

5. Fiber termination panels shall be equipped with cable strain relief brackets.

6. Fiber termination panels shall provide Amp, or equal by Lucent Technologies. Le storage and handling for up to 36” of slack per fiber strand.

7. Fiber termination panels shall protect both the installed cable and patch cord cable interface when the panel is in the closed position.

8. Fiber termination panels must be of the same manufacturer as the fiber cable and ST connectors, as well as the horizontal cabling system to ensure the Owner will not have any coordination problems in the future.

2.16 CABLE PREPARATION

A. All fiber optic cable shall be installed per industry standards. This includes using a proper breakaway swivel and sealing the end of all cables before pulling through any conduit system. 10 feet of slack cable shall be left at each end of the cable run for future maintenance purposes.

B. OSP, loose-tube cables shall be properly prepared and protected per industry standards. All cables shall be properly cleaned; the cable ends shall be terminated in a furcation unit and a 900 micron buffer tube for each fiber strand. Each cable OSP buffer tube shall be labeled for strand counts contained therein.

2.17 RACKS/CABINETS PRODUCTS

A. The products supplied shall meet the following specifications:

1. All wall mounted MDF and IDF racks shall be Everest 24” wide x 35” high x 24” deep, double-swing wall racks with two-lock option. Part number 3-351924-2 lock.

2. Floor mounted Server Racks (if shown on plans or in scope of work) shall be floor-mounted racks with all the following list of options. Middle Atlantic Products #HCM-X.

3. Inter-bay and end-cap cable managers shall be a single piece full height unit supporting front and rear cable routing and attachment.

4. The inter-bay manager shall have integral routing and slack storage loops supporting an l.5” minimum bend radius.

5. Inter-bay and end-cap management panels shall be supplied with adjustable routing guides.

6. Both inter-bay and end-cap units shall have removable covers secured with ¼ turn fasteners.

7. Inter-bay and end cap cable managers shall securely attach to the rear rail of the rack with #12-24 screws.

8. A cable trough shall be supplied at the bottom of each rack to support patch cord routing between racks.

2.18 CABLE MANAGEMENT

A. Horizontal cable management shall be provided in each rack. A minimum of two front wire management panels shall be provided in each rack. One combination front and rear horizontal wire management shall be provided for each fiber termination box, for each 24 ports of RJ45 panels, and each 24 ports of switches. All racks shall be furnished with a minimum of 25 Velcro cable ties to ensure a neat and manageable system. All cables and their termination on each end shall be labeled per EIA/TIA administration standards. All labeling schemes and label designations shall be reflected on the CAD drawings at the end of the project and in the submittals.

2.19 RACK MOUNTING HARDWARE

A. TMGB ground bus shall be provided at the MDF and a TGB ground bus shall be provided at each IDF. B-LINE #SB-476 & SB-477.

B. Racks shall be installed in the following manner:

1. Vertical wire management shall be supplied for all open racks. Vertical wire management shall be Amp, or equal by Lucent Technologies, Number 559371-1 (six required per rack).

2. A TMGB ground bus shall be provided at the MDF and a TGB ground bus shall be provided at each IDF. B-line part numbers SB-476 & SB-477.

3. Floor mount racks shall be securely attached to the concrete floor using 3/8 inch hardware.

4. Open racks shall be secured to the overhead cable ladder using appropriate attachment hardware.

5. All racks shall be grounded to the telecommunications ground bus bar in accordance with Section 8.01of this document.

6. Rack mount screws (#12-24) not used for installing fiber panels and other hardware shall be bagged and left with the rack upon completion of the installation.

7. Inter-bay and end-cap managers shall be installed to the rear-mounting rail of the rack using all available mounting holes.

8. Inner ducts and cables shall be securely fastened to the cable managers.

9. Cable feeds shall alternate left and right to minimize congestion at the top of the rack.

10. Wall mounted racks shall be installed with a minimum of six 5/16 inch lag bolts into wood framing or masonry anchors into structural building members.

11. All racks shall have an APC PRO-7 or equal surge suppression power strip installed with a cord long enough to reach the rack power supply.

2.20 CABLE SYSTEM TESTING HARDWARE

A. All cables and termination hardware shall be 100% tested for defects in installation and to verify cable performance under installed conditions. All conductors of each installed cable shall be verified useable by the Contractor prior to system acceptance. Any defect in the cable system installation including but not limited to cable, connectors, feed-through couplers, patch panels, and connector blocks shall be repaired or replaced in order to ensure 100% useable conductors in all cables installed.

2.21 COPPER

A. Each cable shall be tested for continuity on all pairs and/or conductors. Coaxial cables shall be tested for continuity, opens shorts and resistance using a volt/ohm meter (VOM) and installed length using a Time Domain Reflectometer (TDR). Twisted-pair voice cables shall be tested for continuity, pair reversals, shorts, and opens using a “green light” type test set. Twisted-pair data cables shall be tested for the all of the above requirements, plus tests that indicate installed cable performance. All category 6 cables shall be tested to ensure the category 6 standard performance to 100Mhz is complied with. All tests shall be printed out in hard copy in the quantity called out in the general specifications for O&M turn over documents as well as one disc copy for the Owners use. These data cables shall be tested using a (Class II) cable analyzer.

2.22 CONTINUITY

A. Each pair of each installed cable shall be tested using a “green light” test set that shows opens, shorts, polarity and pair-reversals. Shielded/screened cables shall be tested with a device that verifies shield continuity in addition to the above stated tests. The test shall be recorded as pass/fail as indicated by the test set in accordance with the manufacturers recommended procedures, and referenced to the appropriate cable identification number and circuit or pair number. Any faults in the wiring shall be corrected and the cable re-tested prior to final acceptance.

2.23 LENGTH

A. Each installed cable shall be tested for installed length using a TDR type device. The cables shall be tested from patch panel to patch panel, block to block, patch panel to outlet or block to outlet as appropriate. The cable length shall conform to the maximum distances set forth in the TIA-568-A Standard. Cable lengths shall be recorded, referencing the cable identification number and circuit or pair number. For multi-pair cables, the longest pair shall be recorded as the length for the cable.

2.24 PERFORMANCE VERIFICATION

A. High speed unshielded twisted pair (UTP) data cable shall be performance verified using an automated test set. This test set shall be capable of testing for the continuity and length parameters defined above, and provide results for the following tests:

1. Near End Cross-Talk (NEXT)

2. Attenuation

3. Ambient Noise

4. Attenuation to Cross-Talk Ratio (ACR)

B. Test results shall be automatically evaluated by the equipment, using the most up-to-date criteria from the TIA/EIA Standard, and the result shown as Pass/fail. Test results shall be printed directly form the test unit or from a download file using an application from the test equipment manufacturer. The printed test results shall include all test performed, the expected test result and the actual test result achieved.

2.25 FIBER

A. All fiber terminations shall be visually inspected with a minimum 200 X microscopes to ensure that no surface imperfections exist after final polishing. In addition, each fiber strand shall be tested for attenuation with an optical power meter and light source. Cable length and splice attenuation shall be verified using an OTDR.

2.26 ATTENUATION

A. Horizontal distribution multimode optical fiber attenuation shall be measured at either 850 nanometers (nm) or 1300 nm using an LED light source and power meter. Backbone multimode fiber shall be tested at both 850 nm and 1300 nm in one direction. Test set-up and performance shall be conducted in accordance with TIA-526-14 Standard, Method B. One 2-meter patch cord shall be used for the test reference and two 2-meter patch cords shall be used for the actual test. This test method uses a one-jumper reference, two-jumper test to estimate the actual link loss of the installed cables plus the loss of two connectors. This measurement is consistent with the loss which network equipment will see under normal installation and use. Test evaluation for the panel to panel (backbone) or panel to outlet (horizontal) shall be based on the values set forth in the EIA/TIA-568-A Annex H, Optical Fiber Link Performance Testing.

B. Where concatenated links are installed to complete a circuit between devices, the Contractor shall test each link from end to end to ensure the performance of the system. After the link performance test has been successfully completed, each link shall be concatenated and tested. The test method shall be the same used for the test described above. The evaluation criteria shall be established between the Owner and the Contractor prior to the start of the test.

C. Single mode optical fiber attenuation shall be measured at 1310 nm and 1500 nm using a laser light source and power meter. Tests shall be performed at both wavelengths in one direction on each strand of fiber. The set-up and test shall be performed in accordance with TIA-526-7 Standard, Method IA. Two-meter patch cords shall be used as test references and for the actual test. This test method utilizes a one-jumper reference, two-jumper test to estimate the actual link loss of the install cable plus two patch cords.

D. Test evaluation for the panel to panel (backbone) shall be based on the values set forth in the EIA/TIA-568-A Annex H, Optical Fiber Link Performance Testing.

1. For this application, the length based on cable length measurements marked on the jacket, will be suitable. If OTDR testing is performed in accordance with 8.2.2, then the actual measured length shall be used. Conversion from metric to US Standard measurement shall use 3.2808 as a constant with the result rounded to the next highest whole number.

2. The testing for this project is measuring the loss over the installed cable plus two jumpers, which accounts for three mated pairs of connectors. Subtract one mated pair for the equipment interface to arrive at a total of two mated pairs under test.

E. Each cable shall be tested with an Optical Time Domain Reflectometer (OTDR) to verify installed cable length and splice losses. The OTDR measurements for length shall be performed in accordance with TIA-455-60. The measurements to determine splice loss shall be performed in accordance with manufacturers recommendations and best industry practices. These tests shall be employed where one or more of the following conditions exist.

1. OTDR and power meter testing is specifically requested by the Owner.

2. Each strand shall be tested on all outside plant and tight-buffered cables and/or where splices exist.

3. A representative strand of each fiber cable shall be tested to verify length if the estimated cable length is within 10% of the maximum length specified, respective to cable function in the TIA/EIA-568-A Standard.

2.27 FIRESTOP SYSTEMS GENERAL REQUIREMENTS

A. A firestop system is comprised of: the item or items penetrating the fire rated structure; the opening in the structure and the materials and assembly of the materials used to seal the penetrated structure. Firestop systems comprise an effective block for fire, heat, vapor and pressurized water stream.

B. All penetrations through fire rated building structures (walls and floors) shall be sealed with an appropriate firestop system. This requirement applies to through penetrations (complete penetration) and membrane penetrations (through one side of a hollow fire rated structure). Any penetrating items i.e., riser slots and sleeves, cables, conduit, cable tray, and raceways, etc. shall be properly firestopped.

2.28 PRODUCT SPECIFICATONS

A. Firestop systems shall be UL Classified to ASTM E814 (UL 1479) and shall be approved by a qualified Professional Engineer (PE), licensed (actual or reciprocal) in the state where the work is to be performed. A drawing showing the proposed firestopped system; stamped/embossed by the cognizant PE shall be provided to the Owner's Technical Representative prior to installing the firestop system.

B. All firestop systems shall be installed in accordance with the Manufacturer's recommendations and shall be completely installed and available for inspection by the local inspection authorities prior to cable system acceptance.

2.29 GROUNDING AND BONDING GENERAL REQUIREMENTS

A. The facility shall be equipped with a Telecommunications Bonding Backbone (TBB). This backbone shall be used to ground all telecommunications cable shields equipment, racks, cabinets, raceways, and other associated hardware that has the potential for acting as a current carrying conductor. The TBB shall be installed independent of the buildings electrical and building ground and shall be designed in accordance with the recommendations contained in the TIA-607 Telecommunications Bonding and Grounding Standard.

B. The main entrance facility/equipment room in each building shall be equipped with a telecommunications main grounding bus bar (TMGB). Each telecommunications closet shall be provided with a telecommunications ground bus bar (TGB). The TMGB shall be connected to the building electrical entrance grounding facility. The intent of this system is to provide a grounding system that is equal in potential to the building electrical ground system. Therefore, ground loop current potential is minimized between telecommunications equipment and the electrical system to which it is attached.

2.30 PRODUCT SPECIFICATIONS

A. All racks, metallic backboards, cable sheaths, metallic strength members, splice cases, cable trays, etc. entering or residing in the TC or ER shall be grounded to the respective TGB or connectors. Where metallic panels attached to the rack to not have sufficient metal to metal contact to provide an adequate path to ground, they shall be bonded to the rack using a minimum #14 AWG copper conductor. The copper conductor size shall be upgraded based on the largest power conductor feeding any rack mount equipment. The conductor shall be continuous; attaching all isolated components in a daisy chain fashion from top to bottom and bonded to the rack using an appropriate compression connector.

B. All wires used for telecommunications grounding purposes shall be identified with a green insulation. Non-insulated wires shall be identified at each termination point with a wrap of green tape. All cables and bus bars shall be identified and labeled in accordance with the System Documentation Section of this Specification.

2.31 SYSTEM DOCUMENTION

A. The following section describes the installation, administration, testing, and as-built documentation required to be produced and/or maintained by the Contractor during the course of the installation. The documentation required will allow the Owner to create a TIA 606 compliant administration system.

2.32 CABLE SYSTEM LABELING

A. The Contractor shall develop and submit for approval a labeling system for this cable installation. At a minimum, the labeling system shall clearly identify all components of the system: racks, cables, panels and outlets. The labeling system shall designate the cables origin and destination and a unique identifier for the cable within the system. Racks and patch panels shall be labeled to identify the location within the cable system infrastructure. All labeling information shall be recorded on the as-build drawings and all test documents shall reflect the appropriate labeling scheme.

B. All label printing will be machine generated using indelible ink ribbons or cartridges. Self laminating labels will be used on cable jackets, appropriately sized to the OD of the cable, and placed within view at the termination point on each end. Outlet labels will be the manufacturers label provided with the outlet assembly.

2.33 AS-BUILT DRAWINGS

A. The installation Contractor will be provided with (two) set(s) of (D-) size drawings at the start of the project. One set will be designated for as the central location to document all as-built information as it occurs throughout the project. The central set will be maintained by the Contractor's Foreman on a daily basis, and will be available to the Technical representative upon request during the course of the project. Anticipated variations from the build-to drawings may be for such things as cable routing and actual outlet placement. No variations will be allowed to the planned termination positions of horizontal and backbone cables, and grounding conductors unless approved in writing by the Owner. Contractor shall also redraw the site and floor plans showing all fiber, copper, racks, and information outlets as well as the labeling scheme for all items. These CAD drawings shall be on 8 ½" x 11" sheets of paper and be turned over to the Owner with the O&M manuals.

B. The Contractor shall provide the central drawing set to the Owner at the conclusion of the project. The marked up drawing set will accurately depict the as-built status of the system including termination locations, cable routing, and all administration labeling for the cable system. In addition, a narrative will be provided that describes any areas of difficulty encountered during the installation that could potentially cause problems to the telecommunications system.

2.34 TEST DOCUMENTATION

A. Test documentation shall be provided in a three ring binder(s) within three weeks after the completion of the project. The binder(s) shall be clearly marked on the outside front cover and spine with the words "Test Results", the project name, and the date of completion (month and year). The binder shall be divided by major heading tabs, Horizontal ad Backbone. Each major heading shall be further sectioned by test type. Within the horizontal and backbone sections, scanner test results (Category 3, 4 or 5), fiber optic attenuation test results, OTDR traces, and green light test results shall be segregated by tab. Test data within each section shall be presented in the sequence listed in the administration records. The test equipment by name, manufacturer, model number and last calibration date will also be provided at the end of the document. Unless a more frequent calibration cycle is specified by the manufacturer, an annual calibration cycle is anticipated on all test equipment used for this installation. The test document shall detail the test method used and the specific settings of the equipment during the test.

B. Scanner tests shall be printed on 8 ½" x 11". Hand written test results (attenuation results and green light results) shall be documented on the attached test form (Appendix C). OTDR test results shall be printed or attached and copied on paper for inclusion in the test documentation binder.

C. When repairs and re-tests are performed, the problem found and corrective action taken shall be noted, and both the failed and passed test data shall collocate in the binder.

2.35 WARRANTY AND SERVICES

A. The Contractor shall provide a system warranty covering the installed cable system against defects in workmanship, components, and performance, and follow-on support after project completion.

2.36 INSTALLATION WARRANTY

A. The Contractor shall warrant the cabling system against defects in workmanship for a period of one year from the date of system acceptance. The warranty shall cover all labor and materials necessary to correct a failed portion of the system and to demonstrate performance within the original installation specifications after repairs are accomplished. This warranty shall be provided at no additional cost to the Owner.

2.37 CABLE SYSTEM WARRANTY

A. The Contractor shall facilitate a warranty between the Manufacturer and the Owner that provides coverage of the installed cabling system in excess of ten years. An extended component warranty shall be provided which warrants functionality of all components used in the system for a minimum of fifteen years from the date of acceptance. All fiber cable, copper cable, fiber termination hardware and housings, copper termination hardware and trim shall be of one Manufacturer to ensure the Owner can establish one relationship for the warranty. Any Manufacturer's warranties offered by one manufacturer for another Manufacturer's product will not be acceptable. A performance warranty in excess to ten years shall also be provided which warrants the installed 100 MHz horizontal copper (HC to WA and for both the horizontal and the backbone optical fiber (HC to WA, or cross-connect to cross-connect) portions of the cabling system. Copper links shall be warranted against the link performance minimum expected results defined in the TIA/EIA SP-2840A, Annex H. All fiber and copper cabling, termination components, and ancillary devices shall be of one manufacturer to insure no disputes can arise between different manufacturers if performance problems arise. Installers shall be factory-trained technicians with a factory-trained supervisor overseeing the project.

2.38 CABLE SYSTEM ACCEPTANCE

A. The Owner's Technical Representative will make periodic inspection of the project in progress. One inspection will be performed at the conclusion of cable pulling, prior to closing of the false ceiling, to inspect the method of cable routing and support, and the firestopping of penetrations. A second inspection will be performed at completion of cable termination to validate that cables were dressed and terminated in accordance with TIA/EIA specifications for jacket removal and pair untwist, compliance with Manufacturer's minimum bend radius, and that cable ends are dressed neatly and orderly.

2.39 FINAL INSPECTION

A. Upon completion of the project, the Owner's Technical Representative will perform a final inspection of the installed cable system with the Contractor's Project Foreman. The final inspection will be performed to validate that all horizontal and backbone cables were installed as defined in the drawing package, and that the installation meets the expectations of the Owner. The Owner must be provided with proof that the Contractor is a ND & I certified installer in good standing with Amp, or equal by Lucent Technologies. Incorporated before the project will be signed off as complete.

2.40 TEST VERIFICATION

A. Upon receipt of the test documentation, the Owner reserves the right to perform spot testing of a representative of the cabling system to validate test results provided in the test document. Owner testing will use the same method employed by the Contractor, and minor variations will be allowed

to account for differences in test equipment. If significant discrepancies are found the Contractor will be notified for resolution.

2.41 SYSTEM PERFORMANCE

A. During the three-week period between final inspection and delivery of the test and as-built documentation, the Owner will activate the cabling system. The Owner will validate operation of the cabling system during this period.

2.42 FINAL ACCEPTANCE

A. Completion of the installation and in-progress and final inspections, receipt of the test and as-built documentation, and successful performance of the system for a two-week period will constitute acceptance of the system.

3. PART 3 NETWORK CABLING NOTES

3.1 ADDITIONAL REQUIREMENTS:

A. The electrical Contractor shall provide a #6 building ground wire to each data rack from the corresponding building grounding electrode system. This ground will be connected to the MDF or IDF grounding bus for the grounding of all the telecommunications equipment.

B. Data cabling shall not occupy the same conduits as other low voltage systems to ensure the data network can be up-graded and expanded in the future without disturbing the other critical communications systems.

C. Each RJ45 workstation outlet shall be provide with one (1) 3' patch cord for the rack location and one (1) 12' workstation cord for the future computer. These patch cords shall be of the same manufacturer as the cabling system.

3.2 ACTIVE COMPONENTS

A. Provide the following active components in quantities and capacities to serve all outlets as shown on the drawings.

3.3 MDF, IDF AND SERVER RACK EQUIPMENT

A. Elementary school and Middle Schools:

1. The MDF shall be provided with CISCO Catalyst WS-C4507R with the following modules: Supervisor engine WS-X4515, WS-X4548-GB-RJ45, two WS-X4306-GB, fourteen WS-G5484 GBIC.

B. High Schools:

1. The MDF shall be provided with Cisco Catalyst WS-C6509, supervisor engine WS-SUP720-3B, two WS-X6548-GE-TX, WS-X6724-SFP, and twenty four GLC-SXMM GBIC.

C. All IDF's shall be provided with CICSO Catalyst 3560-48TS switches and GLC-SXMM GBIC in quantities as required. All necessary fiber and Cat 6 patch cables shall be included.

D. All switches shall be provided with the appropriate RJ45 outlets and not the ACO style outlets and inserts.

END OF SECTION

SECTION 27 41 16.51

INTEGRATED AUDIO-VIDEO SYSTEMS AND EQUIPMENT FOR CLASSROOMS

1. PART 1- GENERAL

1.1 PROJECT SCOPE

A. This section covers the requirements for an Integrator to design, provide equipment for, and install instructional classroom technology. This is intended to supply a complete instructional technology classroom that can be arranged in multiple configurations. There will be a multimedia display as primary projection. Flexibility, integration of multiple technologies and sources, and multiple user groupings are essential to this concept. As an example, all audio and image sources should be capable of being shown on the screen and heard in the classroom. The work covered in this document consists of furnishing all labor, material and services necessary to install a complete audiovisual system as indicated on the project drawings and in these specifications.

B. Deliverables: Prior to ordering materials or commencing any construction activities, the Integrator shall provide the owner with a complete bill of materials, including all quantities of components, devices, equipment, and wiring required to complete this work. Submit product data, including manufacturer's data sheets for all proposed system components. Submit three copies with all specific items that will be provided clearly indicated and any options highlighted.

2. PART 2 - PRODUCTS

2.1 SYSTEMS DESCRIPTION

A. Provide a complete Audiovisual System for small to medium sized classrooms. The system switching and audio amplification equipment shall be securely mounted and concealed in an enclosure mounted in close proximity to the display device. Audio and image source equipment can be connected to the system and displayed via active (powered) interface panels located throughout the room. The audio and image signals from source devices shall be transmitted from the active interface panels over shielded UTP cabling architecture.

B. Classroom Definition: A classroom that has fixed instructional media video projection capabilities, Internet connectivity at the teacher's station, student networking (usually wireless), a document camera, Blu-ray and/or other multimedia input devices, standard laptop interface, multimedia control system that is connected to the network and capabilities for additional add-on modular features.

Technology Enhanced Classrooms (TECs) use standardized control/interface systems and employ a standardized operational protocol. The principles of this recommendation are to establish desirable goals with respect to classroom design and installed technology. The TEC classroom standard includes control systems that have ADA, Section 508 compliant buttons that are discernible without activating the controls or buttons on the control panel, easily reached control panel locations, closed captioning, hearing assistance capability, and user friendly operator protocols among the features that are consistent with universal design principles.

All new construction general purpose classrooms will meet this minimum standard. The standard will be met in major renovations wherever possible. The standard will be retrofitted in existing general purpose classrooms according to an established upgrade plan.

2.2 GENERAL EQUIPMENT REQUIREMENTS

A. The room will be equipped with a standard easy to operate audio video system. The system shall be controlled by a control system with a control panel mounted near the instructor area. For ease of use during instruction, the system shall also be able to be controlled through a Graphical User Interface (GUI) on the teacher's computer. The audio system may be monaural or stereo for voice and program sound. System parameters shall be able to be monitored, administered and controlled over the data network.

Acceptable functionality requirements are listed below categorized by type of equipment. Quantities are listed for movable, portable or loose equipment, and other selected entries. Where quantities are not listed, refer to the system drawings.

B. The System components shall all be correctly listed and labeled by Underwriters Laboratories Incorporated (UL) for their intended use.

C. All products shall be new and under warranty at the time of installation. B-stock, previously installed, refurbished or used equipment shall not be provided on this project.

D. Where the specification lists several manufacturers for a major item, or group of items, the AV Integrator shall provide that entire item from one manufacturer only.

E. The Integrator shall provide all options, accessories and hardware necessary to meet the function of the design even if they are not specifically listed (i.e. mounting kits, separate or additional power supplies, input modules, transformers, etc.).

2.3 FIXED EQUIPMENT

A. ROOM

Provide the following Audio Video System as an all-inclusive system as described below, one system for each room:

1. Mounting - The audio, video, data connectivity components and projector, if applicable, shall be mounted using the following components.

Equipment:

Optoma
#EH415ST
1080p Short-throw Data Projector

Camcor, Inc.
#BMS LOC II/DCP824
Universal Security Mount with Ceiling Panel Kit

Chief
#CMS391
24” Dual Joist Ceiling Mount

a. Short-throw projector mounting

1) Universal Short-throw Projector mount/Projector Drop Ceiling Mount Adjustable Pole

The universal short throw projector mount must be capable of mounting to a wall via lag bolts into studs.

Check the structural wall to ensure that it can support a load four times the weight of the final setup. If not, the wall structure must be reinforced. Refer to local building standards and codes to verify that the installation meets all the relevant regulatory standards.

The mount must also include openings for access to power connections or for use as cable pass-through.

2) Universal Projector Bracket

The bracket shall be able to support projectors up to 15 pounds.

The projector bracket must have independent adjustments of horizontal tilt or roll (± 5 degrees of horizontal tilt), vertical angle or pitch (± 20 degrees of vertical angle), and rotation or yaw (360 degrees of rotation).

The projector bracket shall also use a 1.5" NPT threaded pipe adapter for mounting a projector pole.

The projector bracket should also maintain positioning adjustments even if the projector is removed for service.

b. Multi-Product Mounting Kit

1) The multi-product enclosure that makes up the base of the projector mount houses the key electronic components of the AV system including the switcher, audio amplifier and power supply, protecting them from tampering and theft.

2. Media Source Switching:

a. System source selection and switching shall be provided by a PVS 400D Switcher.

1) The switcher shall have two inputs that each support connection to a dual input switching wallplate via one female RJ-45 connector.

2) Audio for switched video sources shall be carried on the same RJ-45 connections.

3) The switcher shall provide two local HDMI inputs for sources that can be located in close proximity to the switcher.

4) The switcher shall have a switched auxiliary audio input to support audio from video sources that are directly connected to the projector or sources that only offer audio content.

5) The switcher shall have one HDMI video output

6) Connection from the switcher to the display device shall be provided with one HDMI to HDMI video cable.

7) An onboard audio amplifier shall provide gain / volume adjustment from -10db to +10db, adjustable in 1 db steps. The speaker amplifier shall have two channels, one stereo (default) or dual mono channels via one 5.0 mm 4 pole captive screw connector. The output of the amplifier shall be 25 watts (rms) per channel at 4/8 ohms.

8) In addition to the stereo / mono speaker output, an additional audio output that will produce line level output shall also be available. This line level audio output must be capable for being set for either fixed or variable level and balanced or unbalanced signal settings.

3. Media Source Interfacing:

The media source equipment shall be connected to the audiovisual system via up to two active dual input, switching wall plates or the two local inputs of the switcher. These inputs shall enable the system to display video, graphic data and audio from laptop computers, tablets, Blu-ray players, document cameras, streaming devices, tuners, etc.

The active transmitters shall be placed in convenient locations throughout the classroom to facilitate easy connection of sources.

a. **One or two** PVT HDMI, shall be used to connect two HDMI devices to the system and transmit the video and audio data from either source to the PVS AV switcher.

1) Twisted Pair Transmitter shall transmit high resolution digital video and audio over shielded UTP cable to the PVS AV Switcher

2) Wallplate shall offer two female HDMI connectors for interfacing with video source devices

3) Wall plate shall fit in a standard, 2-gang electrical box and feature Decora® type faceplates.

4) One stereo audio input on 3.5mm mini stereo jack shall be available for each video input

5) The output of the interface shall be via one female RJ-45 connector

6) Connection to the PVS AV Switcher shall be via one UL plenum rated shielded UTP cable.

b. **One to two** PVT HDMI RGB, shall be used to connect HDMI and VGA devices to the system and transmit the video and audio data from either source to the PVS AV switcher.

1) Twisted Pair Transmitter shall transmit high resolution digital video and audio over shielded UTP cable to the PVS AV Switcher

2) Wallplate shall offer one female HDMI and one female 15-pin HD connector for interfacing with video source devices

3) Wall plate shall fit in a standard, 2-gang electrical box and feature Decora® type faceplates.

4) One stereo audio input on 3.5mm mini stereo jack shall be available for each video input

5) Built-in VGA distribution amplifier output for local monitor shall be provide on one female 15-pin HD connector

6) The output of the interface shall be via one female RJ-45 connector

7) Connection to the PVS AV Switcher shall be via one UL plenum rated shielded UTP cable.

4. Media Source Control:

a. Classroom media sources shall be controlled with a MediaLink Controller.

1) The MediaLink Controller shall contain six tri-color, multi-status LEDs push-buttons for device selection, projector on / off control, and special functions. A rotary volume control knob with five LED volume indicators shall permit system volume level control.

2) The controller shall provide a LAN (IP) connector. This Ethernet connection shall be used for configuration of the controller and installation of device drivers for the equipment to be controlled.

3) The MLC Controller shall feature Extron IP Link Ethernet for monitoring, scheduling and control. This IP technology shall enable the device to be controlled, scheduled and monitored over a LAN, WAN or the Internet using Extron GlobalViewer software.

4) The Controller shall also feature two bi-directional serial ports to provide device control. These two ports shall control the display device and PVS AV Switcher respectively.

5) The MLC Controller shall also have two configurable (via software) digital input / outputs for devices such as sensors, switches, LEDs and relays.

6) Connection from the MLC Controller to the display shall be provided by one 50' Projector control cable.

7) Connection from the MLC Controller to the PVS AV Switcher shall be provided by one 50' Switcher Control cable.

5. Audio & Speech Reinforcement:

a. Speakers - In suspended ceiling applications, one pair of Extron FF120 speakers shall be used.

1) These speakers feature a low profile, 3.25" deep, aluminized composite enclosure, rectangular shape with a metal grille.

2) The coverage angle of the speaker offers an extraordinarily wide dispersion area of 170 degrees, providing a very wide room coverage pattern.

3) Meets the regulatory compliance safety specifications of NFPA90A, NFPA70; UL Listed for use in plenum airspaces: meets UL 2043 for heat and smoke release, meets UL 1480 for commercial and professional audio

4) The speakers feature a frequency response of 68 Hz to 18 kHz – 10 db, half space.

5) The power capacity is 16 watts of continuous pink noise or 32 watts of continuous program media.

6) The nominal impedance is 8 ohms.

7) The input connector uses (1) 5mm captive screw for 1 input

8) Connection from the PVS AV switcher to the FF120 speaker is provided by Plenum rated 18 Gauge Speaker Cable Extron SPK-18.

b. **(a ALTERNATE)** Speakers – In surface mount applications, one (1) pair of Extron SM 3 speakers are used

1) The speakers feature a 3" full-range driver and a high impact enclosure

2) The speakers include an exclusive mounting system allows the speaker to slide onto the mount, lock into place, and auto automatically mate with the pre-wired contacts.

3) The speakers feature a frequency response of 75 Hz to 18 kHz

4) The power capacity is 15 watts of continuous pink noise or 30 watts of continuous program media.

5) The nominal impedance is 8 ohms

6) Connection from the PVS AV switcher to the SM 3 speaker is provided by 18 Gauge Speaker Cable Extron SPK 18.

c. VoiceLift Pendant IR Microphone, Audio Enhancement MTD-09:

1) The wireless pendant microphone is lightweight and designed to be worn around the neck with a lanyard or clipped on the belt or lapel. The instructor's voice is picked up by the microphone and transmitted wirelessly to the receiver mounted on the ceiling near the center of the room or on an unobstructed wall. The signal is then passed as line level audio to the amplifier. This is used to amplify the sound level in the classroom up to approximately 15 dB above ambient room noise.

2) Speech is mixed with the program audio and distributed to the speakers for even room coverage. Each microphone shall have volume control, a power switch and an auxiliary input to use for a MP3 player or other audio source. The IR microphone system can operate on two IR frequencies.

3) The microphone will have an instant alert feature that may be configured to allow the instructor to request assistance in the classroom.

d. VoiceLift Wireless IR Receiver, Audio Enhancement TLD100

1) The receiver has a round base with dome shaped translucent cover. This allows for surface mounting on the ceiling with concealed wiring above the ceiling using plenum rated cables run to the dedicated VoiceLift Receiver input of the PVS AV Switcher.

2) This device acts as the receiver of up to two room microphones and transmits their audio signal to the PVS AV Switcher for mix into the program content of presented material.

e. VoiceLift Wireless IR Microphone Charging Station, Audio Enhancement Microphone Charger

1) This device is constructed of high impact ABS plastic and acts as a holding and charging station of up to two of the Extron VoiceLift wireless IR microphones.

f. Priority Page

1) The system shall incorporate a method to automatically mute classroom audio during an announcement from the public address system.

6. Data Connectivity

The audio video system shall incorporate features that expand access and connectivity to an existing data network

a. The PVS Switcher shall incorporate a four port network switch, allowing the switcher to be configured over the over the network as well as data access for three additional devices over a single network drop

b. The audio video system shall include a IP Link enabled MediaLink controller, also connected to the network switch in the PVS Switcher, allowing remote monitoring, scheduling and control of the system over a network.

7. Energy Efficiency

The audio video system shall incorporate energy conservation features to reduce consumption and lower operating costs.

a. The system shall incorporate an Auto Power Save Mode with fast power-up that automatically deactivates the audio amplifier after 25 minutes of inactivity. It quickly returns to full power status in less than one second upon signal detection

b. The system shall incorporate a Network Standby Power Save Mode that allows the amplifier, wallplates, VoiceLift receiver, and network switch to be deactivated when not in use.

c. The system shall incorporate monitoring and scheduling of system peripherals, such as sources and displays, in order to deactivate them when not in use or alert to unauthorized use.

3. PART 3 - EXECUTION

3.1 GENERAL

A. All equipment and enclosures described in this specification shall be installed plumb and square per manufacturer's instructions.

B. All equipment, except that designated as movable, portable or loose equipment, shall be secured and permanently attached to the permanent structure in a manner which will require the use of a tool (e.g.: screw driver, nut driver, etc.) for removal.

C. All supports shall meet or exceed the load requirements of the intended application with a minimum safety factor of five.

D. Provide support structure and hardware with a SAE Grade 8 load rating (min.).

3.2 ACCEPTABLE MANUFACTURERS - SYSTEMS

A. Manufacturer

Extron Electronics
1025 E. Ball Road
Anaheim, CA 92805
714.491.1500 or 800.633.9876

B. System

WallVault Digital Classroom AV System, part number 42-310-000123

VoiceLift Microphone System, part number VLM 1000

C. Substitutions: Exceptions to the specifications are not acceptable. No substitutions are permitted.

D. All equipment part numbers shall be listed in the bill of materials and the system drawings specifications.

3.3 EXAMINATION

A. Site Verification of Conditions: Verify that related conditions, including equipment that has been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.

B. All devices connected to equipment specified in this section shall bear the UL label and comply with the applicable National Electrical Code (NEC) standards.

3.4 INSTALLATION

A. Integrator shall furnish all equipment, labor, system setup, and other services necessary for the proper installation of the products/system as indicated on the drawings and specified herein. System setup information shall include each components proper mounting and alignment and properly verified signal pathways and operation. Proper operational and network support control functions shall be verified.

B. Install in accordance with manufacturer's handling and installation instructions.

C. Install in accordance with all local and pertaining codes and regulations

D. Utilize an Integrator with demonstrated experience in projects of similar size and complexity.

E. Equipment shall be configured and in ready to use condition at the end of installation.

F. Energize and commission equipment in accordance with manufacturer's instructions. Commissioning the system shall at minimum, consist of the following:

Install Global Configurator software on PC

Download from www.extron.com, or install from Extron Software Products CD

Install Product Configuration Software - PCS

Download from www.extron.com

Verify the following MLC and PVS switcher connections

Power

Local Area Network (LAN)

Switcher and display control

PVT wallplates

Speakers

Classroom Source Devices

Configure MLC 104 IP Plus Series using Global Configurator

Download the latest device drivers for all source and projection devices

Create a new Global Configurator project file

Add a device and set its IP address

Define the location of the new Media Link Controller device

Save the new Global Configurator file

Configure e-mail server

Configure contacts

Configure e-mail messages

Assign serial device drivers

Assign IR drivers

Configure the front panel (All buttons are required to have a function assigned: source or control)

Configure associated control modules

Create a shutdown schedule

Create a lamp hour notification

Create a disconnect notice

Build the Global Configurator file

Upload the Global Configurator file

Launch GlobalViewer

Test the MLC's setup for proper control and support of the classroom

Configure PVS 407D using PCS – Product Configuration Software

From the Device Discovery tab scroll to the applicable PVS 407D and click Connect. Or, specify the IP address of the switcher using the TCP/IP Tab, then click Connect.

Update PVS 407D to latest firmware, verify input plates have correct firmware versions.

Configure input video formats, EDID, and audio to suit the connections and room environment.

Installation of the Extron system is covered in full detail at http://www.extron.com/training.

Document the MAC and IP address of every MLC controller and PVS switcher.

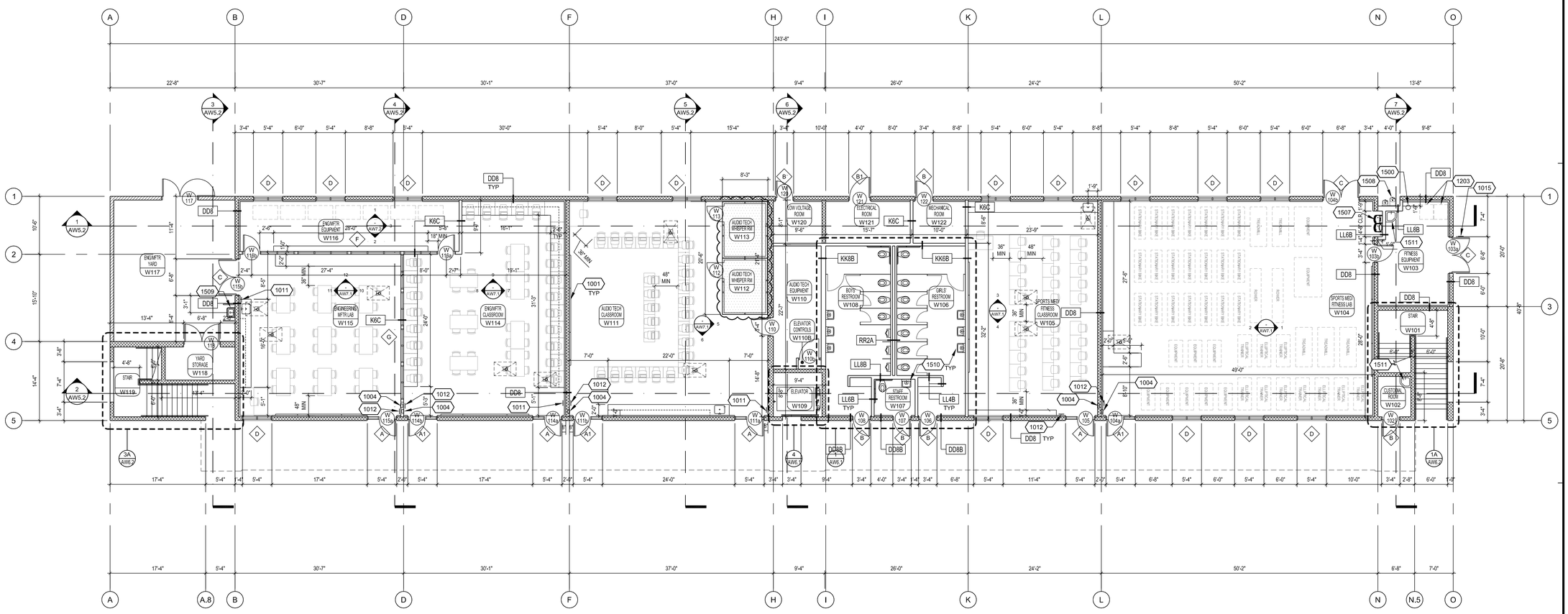
3.5 PROTECTION AND CLEANING

A. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.

B. Repair or replace damaged components before Substantial Completion of the project.

C. Remove temporary tags, coverings, and construction debris from interior and exterior surfaces of the equipment. Remove construction debris from equipment area and dispose of properly.

END OF SECTION



FLOOR PLAN - FIRST FLOOR

1/8" = 1'-0" | 1

WALL LEGEND

FULL HEIGHT CONCRETE MASONRY UNIT WALL CONSTRUCTION PER CBC 2013 TABLE 721.1(2), ITEM 3-1.1

8'-0" HEIGHT EXTERIOR CONCRETE MASONRY UNIT WALL CONSTRUCTION PER CBC 2013 TABLE 721.1(2), ITEM 3-1.1

INTERIOR METAL STUD WALL CONSTRUCTION WITH 5/8" TYPE 'X' GYP BD BOTH SIDES OR ONE SIDE AT WALL FURRING CONSTRUCTION UNLESS NOTED OTHERWISE PER CBC 2013 TABLE 721.1(2), ITEM 13-1.1

INTERIOR FULL HEIGHT 1-HR FIRE BARRIER METAL STUD WALL CONSTRUCTION WITH TYPE 5/8" 'X' GYP BOARD BOTH SIDES UNLESS NOTED OTHERWISE PER CBC 2013 TABLE 721.1(2), ITEM 15-1.4

PLAN LEGEND

ALL INTERIOR DOORS ARE TO HAVE A MIN 12" CLEAR ON THE PUSH SIDE, AND A 18" CLEAR ON THE PULL SIDE, SEE ADJACENT DIAGRAM.

ALL EXTERIOR DOORS ARE TO HAVE A MIN 12" CLEAR ON THE PUSH SIDE, AND A 24" CLEAR ON THE PULL SIDE, SEE ADJACENT DIAGRAM.

REFER TO SHEET 9.3 FOR WALL TAG EXPLANATION

FIRE EXTINGUISHER TYPE 2A-10BC WITH VALID CERTIFICATE, IN SEMI RECESSED CABINET PER DET 22/ AND 23/9.3.

ROOF/OVERFLOW DRAIN PIPE LOCATION, REF PLUMBING DRAWINGS

PROPOSED FURNITURE/EQUIPMENT LAYOUT, N.I.C.

30" X 48" CLEAR FLOOR SPACE

3.75" SLAB DEPRESSION REFER TO 1C/S1.1

NOTE:
REFER TO THE FOLLOWING DETAILS FOR LOCATION OF ALL INTERIOR IDENTIFYING DEVICES (SIGNAGE):
SIGNAGE SCHEDULE ON 10.1
SIGNAGE MOUNTING DETAILS 15 AND 16/10.1
ASSISTIVE LISTENING SYSTEM SIGN DETAIL 13/10.1
ROOM CONTROL SIGNAGE DETAIL 10/10.1
TACTILE EXIT SIGNAGE DETAIL 21/10.1
ACCESSIBLE SYMBOL SIGNAGE DETAIL 9/10.1
RESTROOM SIGNAGE AS INDICATED ON SIGNAGE SCHEDULE PER DETAILS 3, 4, 7, 8, 11 OR 12/10.1

ROOM SIDE — (N) TACTILE EXIT SIGN SEE SIGNAGE SCHED 21/10.1 — ROOM SIDE
CORRIDOR/ LOBBY SIDE — (N) ROOM CONTROL SIGN SEE SIGNAGE SCHED 10/10.1 — ROOM SIDE

GENERAL NOTES

1. REFER TO ROOM FINISH SCHEDULE ON 9.1 FOR INTERIOR WALL FINISHES
2. DIMENSIONS FOR CMU ARE FROM FACE OF MASONRY
3. DIMENSIONS FOR MTL. STUDS ARE FROM CENTERLINE OF INTERIOR STUDS OR FACE OF EXTERIOR STUDS
4. REF TO STRUCTURAL DWG FOR MTL STUD SIZES
5. ALL INTERIOR STUD WALLS SHALL HAVE BATT SOUND INSULATION, FULL HEIGHT
6. ALL INTERIOR FURRING WALLS SHALL HAVE RIGID SOUND INSULATION, FULL HEIGHT
7. REFER TO EXTERIOR ELEVATIONS & SECTIONS AW5.1, AW5.2 & AX5.1 FOR EXTERIOR WALL FINISHES & SECTIONAL ELEVATIONS
8. REFER TO DRAWING 8.1 FOR DOOR SCHEDULE
9. REFER TO DRAWING 8.2 FOR WINDOWS SHEDULE

REFERENCE NOTES

1001	MARKER BOARD, REF DET 3/9.4
1004	RECESSED FIRE EXTINGUISHER, REF DET 22 AND 23/9.3
1011	ROOM CAPACITY SIGN, REF DET 20/10.1
1012	ASSISTIVE LISTENING SIGN, REF DET 13/10.1
1015	FIRE SPRINKLER RISER INSIDE SIGN, REF DET 19/10.1
1203	WASHER AND DRYER NIC SHALL COMPLY WITH 11B-214
1500	FIRE RISER MAIN, REF FIRE PROTECTION DWGS
1507	INTERIOR DRINKING FOUNTAIN WITH BOTTLE FILLER, REF SPEC, PLUMBING DWGS AND DET 21/9.3
1508	EXTERIOR DRINKING FOUNTAIN, REF SPEC, PLUMBING DWGS AND DET 22/9.4
1509	EXTERIOR WALL MOUNTED UTILITY SINK WITH BARRIER RAILS, REF SPEC, PLUMBING DWGS AND DET 12/9.3
1510	LAVATORY, REF PLUMBING DWGS AND SHEET AW6.1
1511	MOP SINK, REF PLUMBING DWGS FOR FIXTURE AND DET 21/9.4 FOR WALL FINISH

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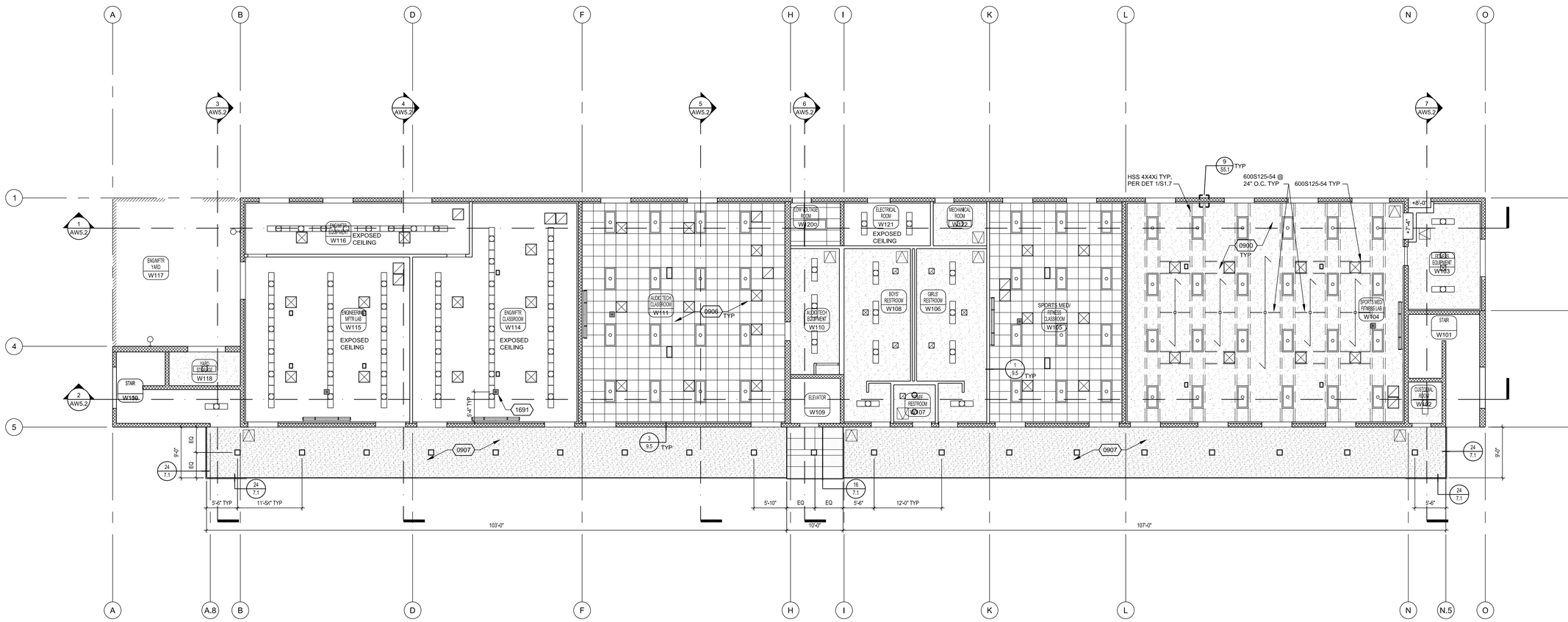
NO	DATE	BY	DESCRIPTION
1			REVISIONS

DRAWN: LC	CHECKED: LC
DATE: 04/25/2017	SCALE: 1/8" = 1'-0"
PROJECT NUMBER: 1615400	

BUILDING W
FLOOR PLAN
FIRST FLOOR

DRAWING NUMBER: AW2.1



N

REFELECTED CEILING PLAN - FIRST FLOOR

1/8" = 1'-0" | 1

LEGEND

- EXTERIOR PLASTER
- EXTERIOR METAL PANEL - REF DET 16/7.1
- GYPSUM BOARD
- 2 x 4 SUSPENDED ACOUSTICAL CEILING TILE
- 2 x 2 SUSPENDED ACOUSTICAL CEILING TILE
- AIR DIFFUSERS, REF MECHANICAL DRAWINGS
- LIGHT FIXTURES, REF ELECTRICAL DRAWINGS
- AV SYSTEM SPEAKERS - REF ELECTRICAL DRAWINGS & SPECS
- 24" x 24" CEILING ACCESS DOOR, REF DTL 24/9.3

NOTE: REF ROOM FINISH SCHEDULE ON 9.1 FOR CEILING HEIGHTS

REFERENCE NOTES

0900	GYPSUM BOARD, PAINTED
0906	SUSPENDED ACOUSTIC CEILING SYSTEM, REF SHTS 9.2A, 9.2B, 9.2C
0907	EXTERIOR PLASTER SOFFIT, STUD ATTACHMENT PER 4/9.5
1691	CEILING MOUNTED SHORT THROW PROJECTOR, TYP
1692	WALL MOUNTED PROJECTOR SCREEN, TYP

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			REVISIONS

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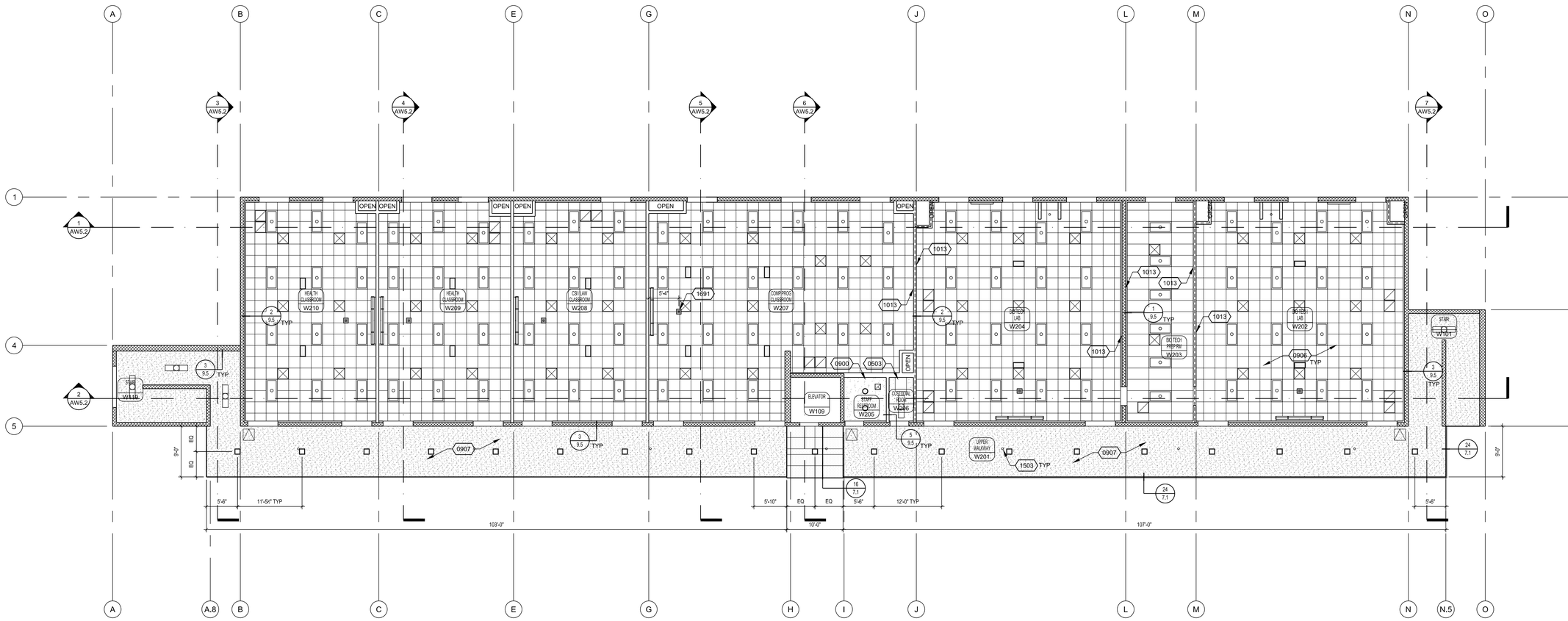
DATE: 04/25/2017	SCALE: 1/8" = 1'-0"
PROJECT NUMBER: 1615400	

BUILDING W
CEILING PLAN
FIRST FLOOR

DRAWING NUMBER: AW3.1



REFLECTED CEILING PLAN - SECOND FLOOR

1/8" = 1'-0" | 1

LEGEND

- EXTERIOR PLASTER
- EXTERIOR METAL PANEL - REF DET 16/7.1
- GYPSUM BOARD
- 2 x 4 SUSPENDED ACOUSTICAL CEILING TILE
- 2 x 2 SUSPENDED ACOUSTICAL CEILING TILE
- AIR DIFFUSERS, REF MECHANICAL DRAWINGS
- LIGHT FIXTURES, REF ELECTRICAL DRAWINGS
- AV SYSTEM SPEAKERS - REF ELECTRICAL DRAWINGS & SPECS
- 24" x 24" CEILING ACCESS DOOR, REF DTL 24/9.3

NOTE: REF ROOM FINISH SCHEDULE ON 9.1 FOR CEILING HEIGHTS

REFERENCE NOTES

- 0503 ROOF ACCESS LADDER, REF DET 11/7.1
- 0900 GYPSUM BOARD, PAINTED
- 0906 SUSPENDED ACOUSTIC CEILING SYSTEM, REF SHTS 9.2A, 9.2B, 9.2C
- 0907 EXTERIOR PLASTER SOFFIT, STUD ATTACHMENT PER 4/9.5
- 1013 FIRE BARRIER WALL SIGN ABOVE CEILING, REF DET 22/10.1
- 1503 FIRE SPRINKLER HEAD, REF FIRE PROTECTION DRAWINGS
- 1691 CEILING MOUNTED SHORT THROW PROJECTOR, TYP

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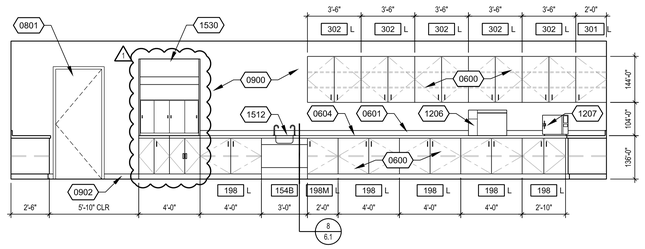
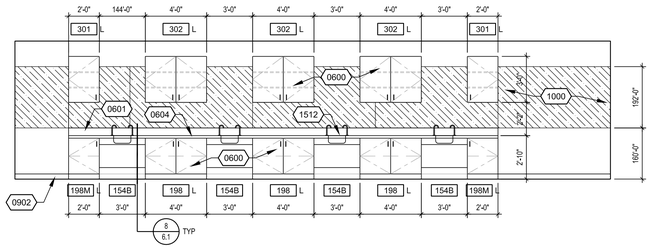
PROJECT NUMBER: 1615400	

BUILDING W
CEILING PLAN
SECOND FLOOR

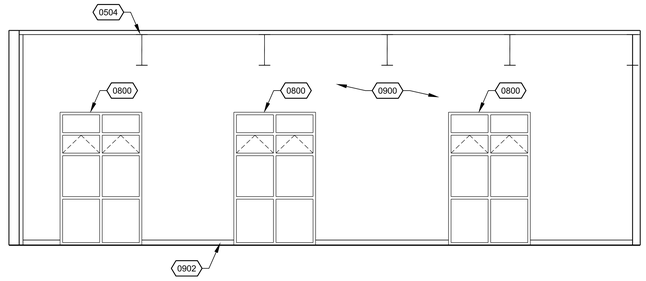
DRAWING NUMBER: AW3.2



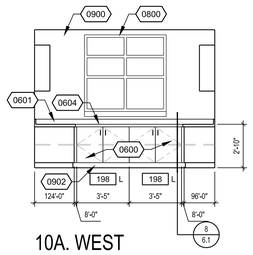
W203 BIO TECH PREP ROOM - SOUTH | 1/4" = 1'-0" | 9



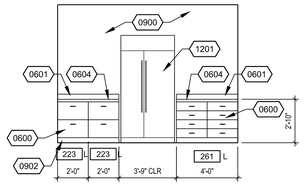
W202 BIO TECH LAB - NORTH | 1/4" = 1'-0" | 5



W116 ENGINEERING MFG EQUIPMENT - WEST | 1/4" = 1'-0" | 1

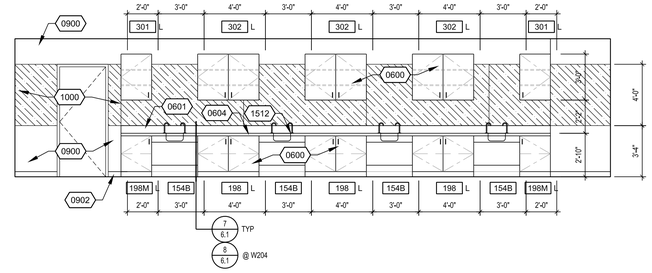


10A. WEST

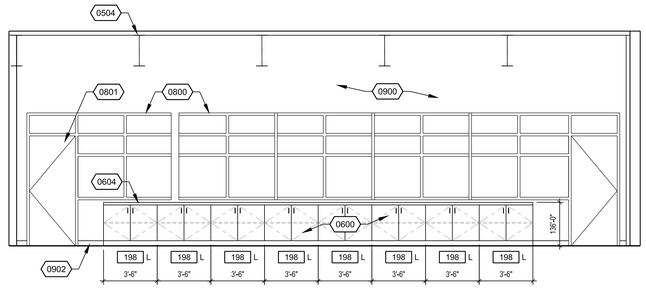


10B. EAST

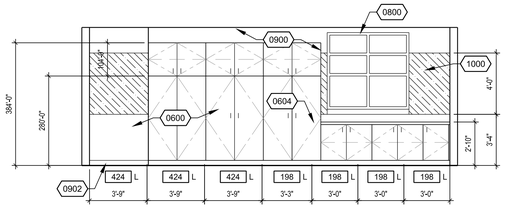
W203 BIO TECH PREP ROOM - WEST & EAST | 1/4" = 1'-0" | 10



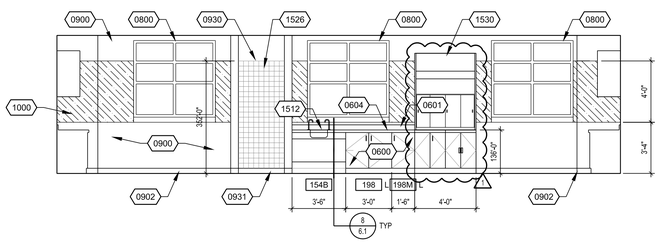
W202 BIO TECH LAB - SOUTH | 1/4" = 1'-0" | 6



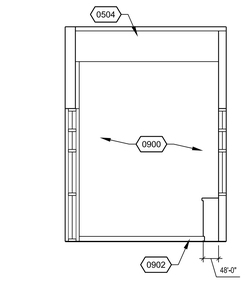
W116 ENGINEERING MFG EQUIPMENT - EAST | 1/4" = 1'-0" | 2



W208 CSI / LAW ENFORCEMENT CLASSROOM - WEST | 1/4" = 1'-0" | 11



W202 BIO TECH LAB - WEST | 1/4" = 1'-0" | 7

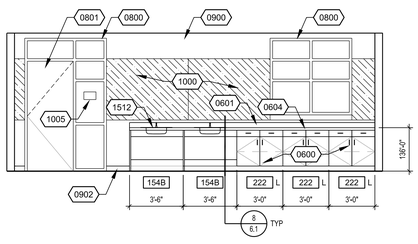


W116 ENG MFG EQUIP - NORTH | 1/4" = 1'-0" | 3

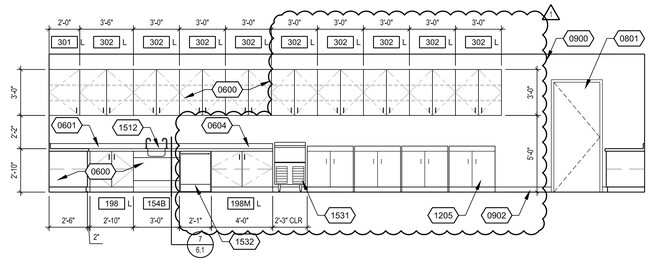
WI NUMBER
222M L — LOCK
MODIFIED

CASEWORK LEGEND

1. REFER TO SHEET 6.1 FOR CASEWORK AND COUNTER TOP MOUNTING REQ.
2. REFER TO PLUMBING DWGS FOR SINK AND POC.
3. REFER TO ELEC DWGS FOR WALL OUTLETS AND MOUNTING HEIGHT REQ.



W208 CSI / LAW ENFORCEMENT CLASSROOM - EAST | 1/4" = 1'-0" | 12



W203 BIO TECH PREP ROOM - NORTH | 1/4" = 1'-0" | 8

GENERAL NOTES

0504	STEEL BEAM, REF STRUCTURAL DWGS
0600	PLAM CASEWORK TYP, REF DETAILS ON SHT 6.1
0601	PLAM BACKSPLASH, TYP
0604	PLAM COUNTERTOP, TYP
0800	SPECIFIED WINDOW TYP, REF WINDOW SCHEDULE
0801	SPECIFIED DOOR TYP, REF DOOR SCHEDULE
0900	GYPSUM BOARD, PAINTED
0902	RESILIENT TOPSET BASE, TYP
0930	WALL TILE, TYP
0931	TILE BASE
1000	TACKABLE WALL PANELS TYP, REF DET 2/9.4
1005	ROOM ID SIGN, REF DET 10/10.1
1201	ACCESSIBLE REFRIGERATOR AND FREEZER, NIC SHALL COMPLY WITH 11B-804.6.6
1205	CHEMICAL STORAGE CABINETS, NIC
1206	LAB FREEZER, NIC
1207	AUTOCLAVE, NIC
1512	COUNTER SINK, REF PLUMBING DWGS
1526	EMERGENCY SHOWER & EYE WASH, REF 14/6.1 & PLUMBING DWGS
1530	FUME HOOD, REF MECHANICAL DWGS
1531	ICE MAKER, REF PLUMBING DWGS & SPECS
1532	DISH WASHER, REF PLUMBING DWGS & SPECS SHALL COMPLY WITH 11B-804.6.3

REFERENCE NOTES

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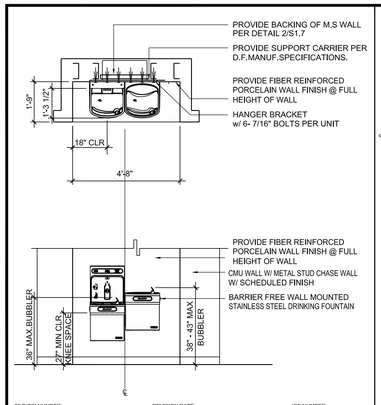
#	REVISIONS		

DRAWN: LC | CHECKED: LC
DATE: 04/25/2017 | SCALE: 1/4" = 1'-0"
PROJECT NUMBER: 1615400

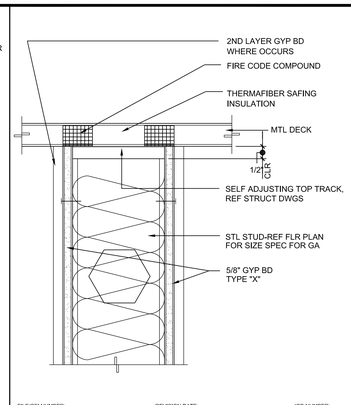
BUILDING W
INTERIOR
ELEVATIONS

DRAWING NUMBER: AW7.2



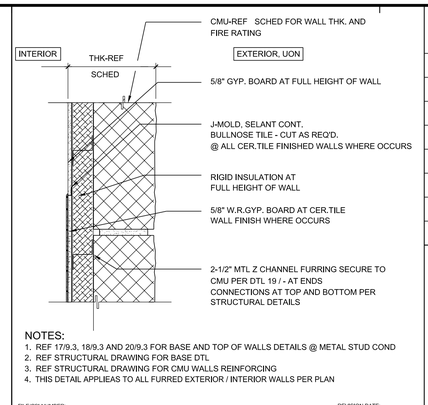
FILE/CSI NUMBER: REVISION DATE: JOB NUMBER:

HIGH/LOW BOTTLE FILLER & DF — 3/8" = 1'-0" — 21



FILE/CSI NUMBER: REVISION DATE: JOB NUMBER:

WALL HEAD — 3"=1'-0" — 17



NOTES:
1. REF 17/9.3, 18/9.3 AND 20/9.3 FOR BASE AND TOP OF WALLS DETAILS @ METAL STUD COND
2. REF STRUCTURAL DRAWING FOR BASE DTL
3. REF STRUCTURAL DRAWING FOR CMU WALLS REINFORCING
4. THIS DETAIL APPLIEAS TO ALL FURRED EXTERIOR / INTERIOR WALLS PER PLAN

CMU SIZE	WALL THK	FIRE RATING (CBC/UL/GA LISTING) O HR	1 HR	2 HR	REMARKS
8	11 1/4	DD8**	DD81* (UL U914)		DD8**

PLAN INDICATION
- NON RATED
- 1 HR RATED CMU WALL

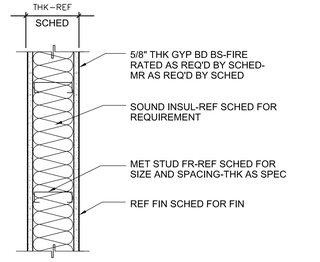
NOTES:
1. REF FIN SCHED FOR FIN
2. GROUT CMU SOLID

REMARKS SCHEDULE
A. MR GYP BD
B. INTERIOR SIDE CERAMIC TILE PER WALL TYPE KK

* OPTIONAL CHARACTER

FILE/CSI NUMBER: REVISION DATE: JOB NUMBER:

WALL TYPE DD — 12"=1'-0" — 9



NOTE:
1. REF 20/9.3 AND STRUCTURAL DRAWING FOR HEAD CONNECTION DTL
2. REF 20/9.3 AND STRUCTURAL DRAWING FOR BASE CONNECTION DTL
3. REF 7/ AND 8/9.5 AND STRUCTURAL DRAWING FOR FIRE RATED PENETRATIONS

FILE/CSI NUMBER: 00905/-00010 REVISION DATE: JOB NUMBER:

STUD SIZE	WALL THK	FIRE RATING (CBC/UL/GA LISTING) O HR	1 HR	2 HR	REMARKS
1 5/8	2 7/8	K1**	K11* (CBC 13-1.1)	——	——
2 1/2	3 3/4	K2**	K21* (CBC 13-1.1)	——	K2*A
3 5/8	4 7/8	K3**	K31* (CBC 13-1.1)	——	K3*B
4	5 1/4	K4**	K41* (CBC 13-1.1)	——	K4*B
6	7 1/4	K6**	K61* (CBC 13-1.1)	——	K6*C
8	9 1/4	K8**	K81* (CBC 13-1.1)	——	K8*C

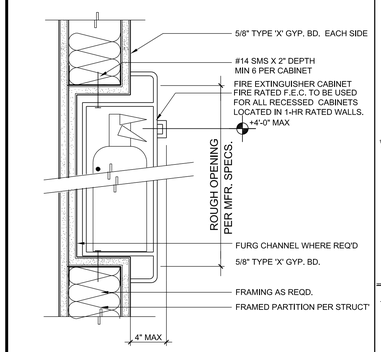
PLAN INDICATION
- NON RATED
- 1 HR RATED

NOTES:
1. REF FIN SCHED FOR FIN
2. STUDS SPACED 16" OC
3. ALL WALLS FULL HGT

REMARKS SCHEDULE
A. 2-1/2" THK SOUND INSUL
B. 3-1/2" THK SOUND INSUL
C. 5-1/2" THK SOUND INSUL
D. MR GYP BD

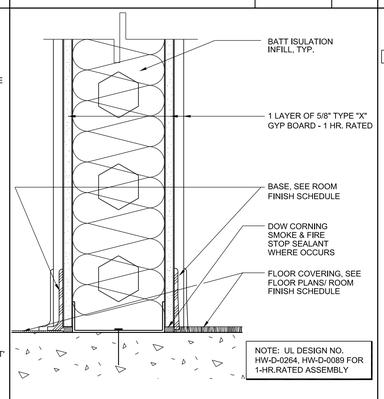
* OPTIONAL CHARACTER

WALL TYPE K — 1"=1'-0" — 1



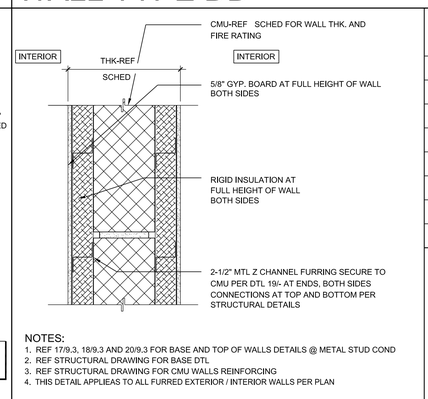
FILE/CSI NUMBER: REVISION DATE: JOB NUMBER: 001400

FIRE EXTINGUISHER CABINET @ MTL STUD — 3"=1'-0" — 22



FILE/CSI NUMBER: REVISION DATE:

BASE OF WALL DETAIL — 3"=1'-0" — 18



NOTES:
1. REF 17/9.3, 18/9.3 AND 20/9.3 FOR BASE AND TOP OF WALLS DETAILS @ METAL STUD COND
2. REF STRUCTURAL DRAWING FOR BASE DTL
3. REF STRUCTURAL DRAWING FOR CMU WALLS REINFORCING
4. THIS DETAIL APPLIEAS TO ALL FURRED EXTERIOR / INTERIOR WALLS PER PLAN

CMU SIZE	WALL THK	FIRE RATING (CBC/UL/GA LISTING) O HR	1 HR	2 HR	REMARKS
8	13 7/8	DDD8**	DDD81* (UL U914)		DDD8**

PLAN INDICATION
- NON RATED
- 1 HR RATED CMU WALL

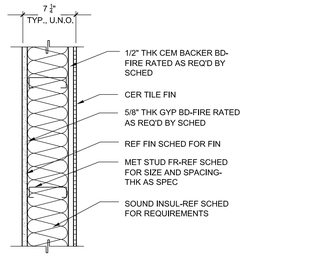
NOTES:
1. REF FIN SCHED FOR FIN
2. GROUT CMU SOLID

REMARKS SCHEDULE
A. MR GYP BD

* OPTIONAL CHARACTER

FILE/CSI NUMBER: REVISION DATE: JOB NUMBER:

WALL TYPE DDD — 12"=1'-0" — 10



NOTES:
1. REF 20/9.3 AND STRUCTURAL DRAWING FOR HEAD CONNECTION DTL
2. REF 20/9.3 AND STRUCTURAL DRAWING FOR BASE CONNECTION DTL
3. REF 17/9.3 FOR T.O.W. FIRE RATED COND
4. REF 18/9.3 FOR BOTTOM OF WALL FIRE RATED CONDITION

FILE/CSI NUMBER: REVISION DATE: JOB NUMBER:

STUD SIZE	WALL THK	FIRE RATING (CBC/UL/GA LISTING) O HR	1 HR	2 HR	REMARKS
4	5 3/8	KK4**	KK41* (UL U442)	——	KK4*A
6	7 3/8	KK6**	KK61* (UL U442)	——	KK6*B
8	9 3/8	KK8**	KK81* (UL U442)	——	KK8*B

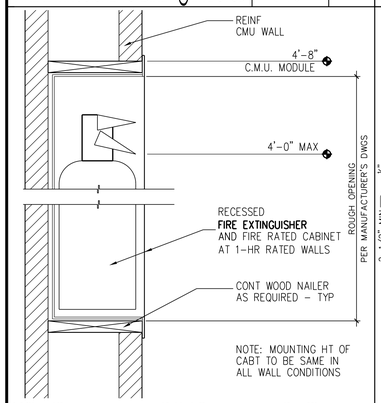
PLAN INDICATION
- NON RATED
- 1 HR RATED

NOTES:
1. STUDS SPACED 16" OC
2. ALL WALLS FULL HGT

REMARKS SCHEDULE
A. 3-1/2" THK SOUND INSUL
B. 6-1/2" THK SOUND INSUL

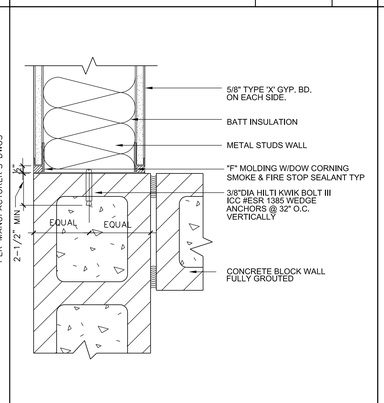
* OPTIONAL CHARACTER

WALL TYPE KK — 1"=1'-0" — 2



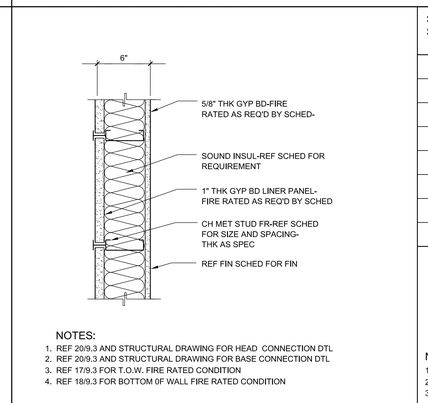
FILE/CSI NUMBER: REVISION DATE: JOB NUMBER:

FIRE EXTINGUISHER CABINET @ CMU — 3"=1'-0" — 23



FILE/CSI NUMBER: REVISION DATE: JOB NUMBER:

METAL STUD AT CMU — 3" = 1'-0" — 19



NOTES:
1. REF 20/9.3 AND STRUCTURAL DRAWING FOR HEAD CONNECTION DTL
2. REF 20/9.3 AND STRUCTURAL DRAWING FOR BASE CONNECTION DTL
3. REF 17/9.3 FOR T.O.W. FIRE RATED CONDITION
4. REF 18/9.3 FOR BOTTOM OF WALL FIRE RATED CONDITION

STUD SIZE	WALL THK	FIRE RATING (CBC/UL/GA LISTING) O HR	1 HR	2 HR	REMARKS
4	4 5/8	Q4**	Q41* UL U469	——	Q4*B
6	6 5/8	Q6**	Q61* UL U469	——	Q6*B

PLAN INDICATION
- NON RATED
- 1 HR RATED

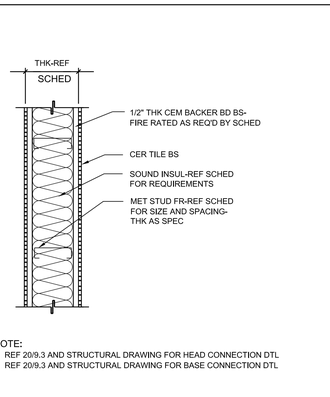
NOTES:
1. REF FIN SCHED FOR FIN
2. STUDS SPACED 16" OC
3. ALL WALLS FULL HGT

REMARKS SCHEDULE
A. 2-1/2" THK SOUND INSUL-MIN.
B. 3-1/2" THK SOUND INSUL-MIN.

* OPTIONAL CHARACTER

FILE/CSI NUMBER: REVISION DATE: JOB NUMBER:

WALL TYPE Q — 1"=1'-0" — 11



NOTE:
1. REF 20/9.3 AND STRUCTURAL DRAWING FOR HEAD CONNECTION DTL
2. REF 20/9.3 AND STRUCTURAL DRAWING FOR BASE CONNECTION DTL

FILE/CSI NUMBER: 00905/-00035 REVISION DATE: JOB NUMBER:

STUD SIZE	WALL THK	FIRE RATING (CBC/UL/GA LISTING) O HR	1 HR	2 HR	REMARKS
3 5/8	4 5/8	LL3**	LL31* (UL U442)	——	LL3*A
4	5	LL4**	LL41* (UL U442)	——	LL4*A
6	7	LL6**	LL61* (UL U442)	——	LL6*B
8	9	LL8**	LL81* (UL U442)	——	LL8*B

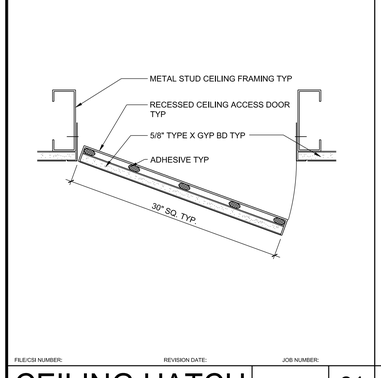
PLAN INDICATION
- NON RATED
- 1 HR RATED

NOTES:
1. STUDS SPACED 16" OC
2. ALL WALLS FULL HGT

REMARKS SCHEDULE
A. 3-1/2" THK SOUND INSUL
B. 6-1/2" THK SOUND INSUL

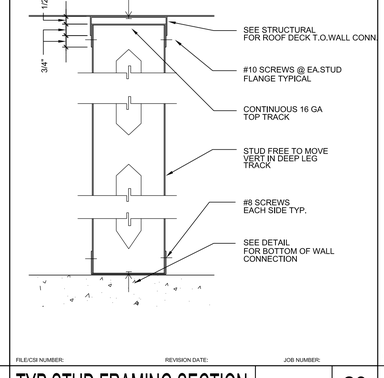
* OPTIONAL CHARACTER

WALL TYPE LL — 1"=1'-0" — 3



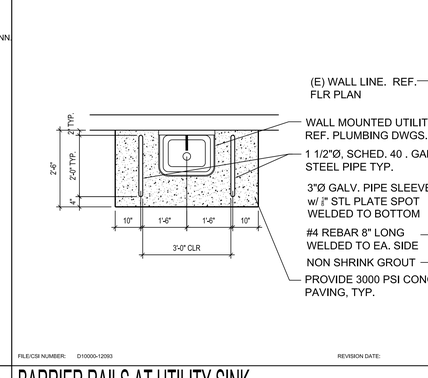
FILE/CSI NUMBER: REVISION DATE: JOB NUMBER:

CEILING HATCH — 3"=1'-0" — 24



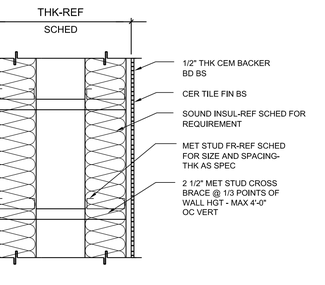
FILE/CSI NUMBER: REVISION DATE: JOB NUMBER:

TYP STUD FRAMING SECTION — 3"-1'-0" — 20



FILE/CSI NUMBER: D10000-12093 REVISION DATE: JOB NUMBER: 1615400

BARRIER RAILS AT UTILITY SINK — 1/2"=1'-0" — 12



NOTE:
1. REF 20/9.3 AND STRUCTURAL DRAWING FOR HEAD CONNECTION DTL
2. REF 20/9.3 AND STRUCTURAL DRAWING FOR BASE CONNECTION DTL

FILE/CSI NUMBER: 00905/-00040 REVISION DATE: JOB NUMBER:

STUD SIZE	WALL THK	FIRE RATING (CBC/UL/GA LISTING) O HR	1 HR	2 HR	REMARKS
2 1/2	1'-0"	RR2**	——	——	RR2*A
3 5/8	2'-0"	RR3**	——	——	RR3*B

PLAN INDICATION
- NON RATED

NOTES:
1. STUDS SPACED 16" OC
2. ALL WALLS FULL HGT

REMARKS SCHEDULE
A. 2 LAYERS 2 1/2" THK SOUND INSUL
B. 2 LAYERS 3 1/2" THK SOUND INSUL

* OPTIONAL CHARACTER

WALL TYPE RR — 1"=1'-0" — 4

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28251 CLINTON KEITH ROAD
MURRIETA, CA 92563
MURRIETA VALLEY UNIFIED SCHOOL DISTRICT
PTN 75200-83

LICENSED ARCHITECT — GEORGE M. WIENS C-14546 — 08/31/17 — STATE OF CALIFORNIA

CONSULTANT

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NO	DATE	BY	DESCRIPTION
1	05/25/2017	CS	ADDENDUM 1
#			REVISIONS

DRAWN: CHECKED:
DATE: 04/25/2017 SCALE:
PROJECT NUMBER: 1615400

WALL TYPES AND DETAILS

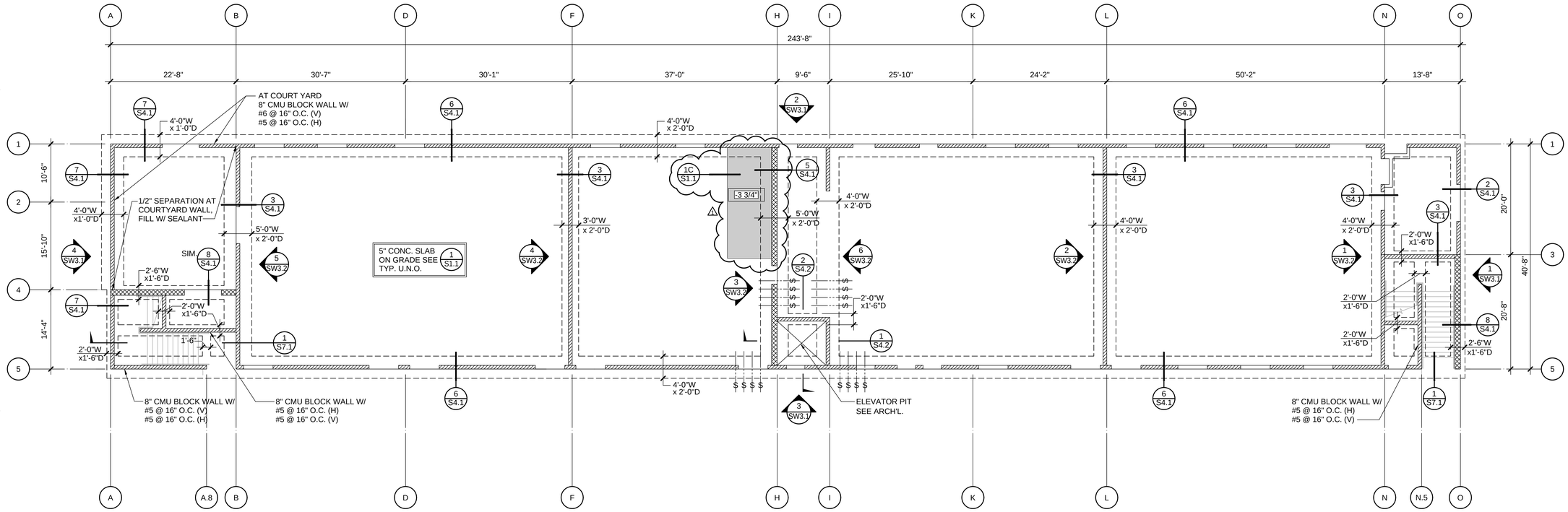
DRAWING NUMBER: 9.3

FOUNDATION NOTES:

1. REFER TO SHEETS S0.1 & S0.2 FOR GENERAL NOTES.
2. REFER TO SHEETS S1.1 THRU S1.7 FOR TYPICAL DETAILS.
3. ALL DIMENSIONAL INFORMATION SHOWN IS BASED ON THE ARCHITECTURAL DRAWINGS. FOR ANY DIMENSIONAL INFORMATION NOT SHOWN REFER TO THE ARCHITECTURAL DRAWINGS.
4. ALL SLAB OPENINGS, EDGES, PADS, CURBS, FLOOR SLOPES, DRAINS, TRENCHS, STEPS, EXTERIOR PAVING AND DEPRESSIONS SHALL BE LOCATED AND COORDINATED PER THE ARCHITECTURAL AND CIVIL DRAWINGS.
5. EQUIPMENT NOT SHOWN ENTIRELY FOR CLARITY, COORD., WITH ARCH'L., & MEP, DWG.
6. PROVIDE CORNER BARS AT ALL FOOTING OR GRADE BEAM INTERSECTIONS FOR ALL PERPENDICULARS LONGITUDINAL FOOTING REINFORCING, PER 1/S1.2.
7. CONTINUOUS FOOTING OR GRADE BEAM REINFORCING TO BE CONTINUED THROUGH ISOLATED PAD FTGS.
8. FOR TYPICAL FOOTING FORMING DETAIL, SEE 3/S1.1
9. FOR TYPICAL PIPE TRENCH DETAIL, SEE 10/S1.1
10. FOR TYPICAL STRUCTURAL SLAB AND GRADE BEAM CONSTRUCTION JOINT DETAILS, SEE 2/S1.2
11. FOR TYPICAL REINFORCING AT FOOTING INTERSECTION SEE DETAIL 1/S1.2
12. SITE PREPARATION FOR FOOTING AND SLAB ON GRADE SEE 1/S4.1
13. VERIFY AND COORDINATE WITH, CIVIL & ARCH'L. FOR FINISH GRADE, SLOPE, DRAIN, EXTERIOR SLAB ON GRADE, CURB, JOINT LOCATION, ETC.
14. BLOCK OUT WHERE REQ'D. FOR DRAIN, PIT, ETC... SEE 4A/S1.2

LEGEND:

1. - INDICATES 8" CMU WALL (f'm = 1500 psi) PER PLAN W/ #5 VERT. @ 16" O.C. AND #5 HORIZ. @ 16" O.C. (ONE LAYER)(U.N.O.) ON ELEV./DETAIL
2. - INDICATES 12" CMU WALL (f'm = 1500 psi) PER PLAN W/ #5 VERT. @ 16" O.C., EA. FACE AND #6 HORIZ. @ 16" O.C. EA. FACE (U.N.O.) ON ELEV./DETAIL
3. -3" - INDICATES DEPRESSION IN SLAB. SEE ARCH'L.
4. - INDICATES STEP FOOTING SEE 6/S1.1
5. - INDICATES CONC. PAD SEE ARCH'L.
6. E.J. - INDICATES EXPANSION JOINT SEE DETAIL 9/S1.2
7. C.J. - CONTROL JOINT PER 5/S1.2



FOUNDATION PLAN 1/8" 1

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LICENSED ARCHITECT GEORGE M. WIENS C-14546 R/W 08/31/17 STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER TERRY C. TSAO No.S2992 Re. 06/30/2018 STRUCTURAL STATE OF CALIFORNIA

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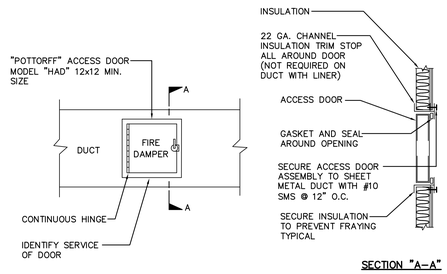
NO	DATE	BY	DESCRIPTION
1	5/25/17		ADDENDUM 1
			REVISIONS

DRAWN: AV	CHECKED: GW
DATE: 04/25/2017	SCALE: AS NOTED
PROJECT NUMBER: 1615400	

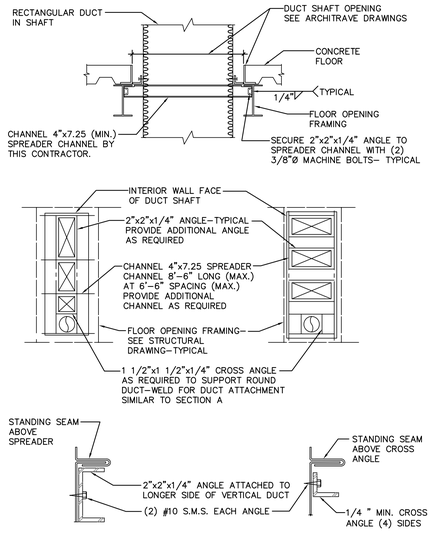
FOUNDATION PLAN

DRAWING NUMBER: SW2.1

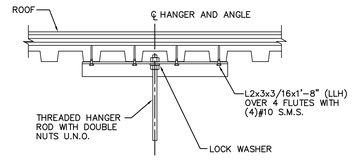


SECTION "A–A"

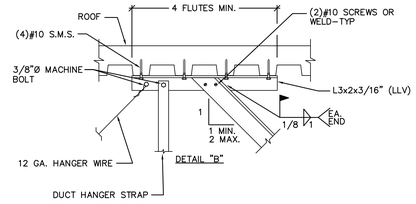
ACCESS DOOR DETAIL | NTS | 10



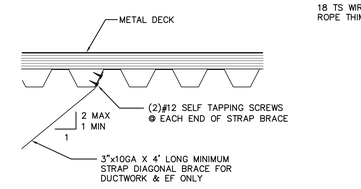
DUCT THRU FLOOR SUPPORT | NTS | 7



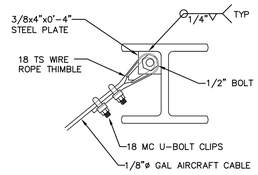
HANGER ROD ATTACHMENT

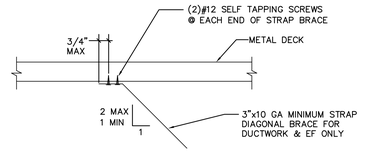


ATTACHMENT PERPENDICULAR TO DECK



BRACE TO DECK FLUTE

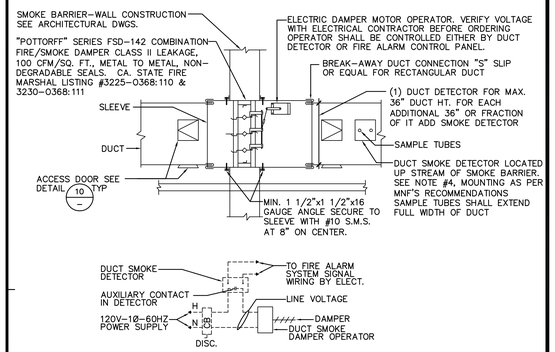




BRACE PARALLEL TO DECK FLUTE

NOTE:
SEE STRUCTURAL DRAWINGS FOR FURTHER DETAIL

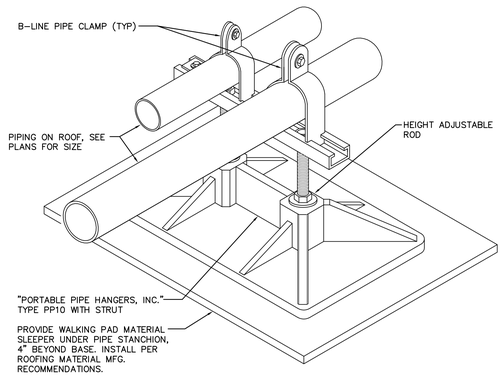
CONNECTION TO METAL DECK STRUCTURE DETAIL | NTS | 1



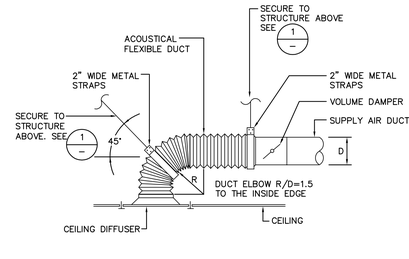
NOTE:

1. FIRE DAMPER DETAIL IS FOR REFERENCE ONLY. FIRE DAMPERS SHALL BE STATE FIRE MARSHALL APPROVED AND INSTALLED STRICTLY PER MANUFACTURER'S PRINTED INSTRUCTION. MANUFACTURER'S INSTALLATION INSTRUCTION SHALL BE MADE AVAILABLE TO THE INSPECTING AUTHORITIES. (CBC 4306(K)
2. DAMPER SHALL BE NORMALLY CLOSED WITHOUT POWER
3. INTERLOCK SMOKE DAMPER TO RELATED AIR HANDLING UNIT AND SHUT DOWN UNIT UPON SMOKE DETECTION
4. DUCT SMOKE DETECTORS SUPPLIED BY ELECT. CONTRACTOR, SEE ELECT. DWGS. FOR ADDITIONAL INFORMATION
5. PROVIDE SQUARE DAMPERS WITH ROUND COLLAR FOR ALL ROUND DUCTS. SIZE OF DUCT AS INDICATED ON DRAWING.
6. IF DUCT SMOKE DETECTOR IS USED IN LIEU OF AREA SMOKE DETECTOR THE DUCT SMOKE DETECTOR SHOULD BE SELECTED TO WORK WITH MINIMUM VELOCITY (VAV SYSTEM).

FIRE/SMOKE DAMPER DETAIL | NTS | 11

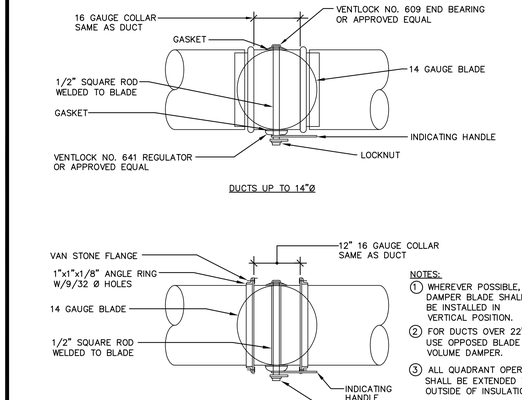


REFRIGERANT PIPE SUPPORT ON ROOF | NTS | 8



NOTE:
IN LIEU OF ABOVE DETAIL, METAL PLENUM MAY BE USED TO CONNECT THE BRANCH DUCT TO THE DIFFUSERS.

DIFFUSER CONNECTION DETAIL | NTS | 5

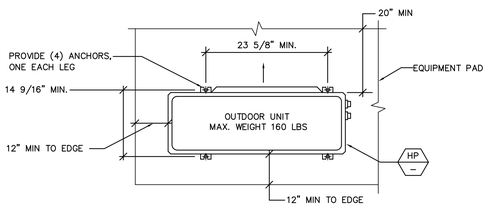


DUCTS UP TO 14"Ø

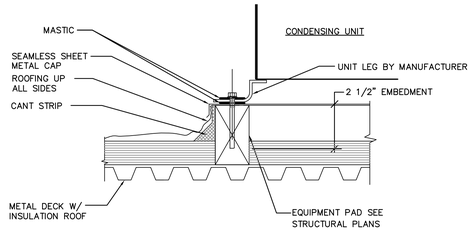
NOTES:
1. WHEREVER POSSIBLE, DAMPER BLADE SHALL BE INSTALLED IN VERTICAL POSITION.
2. FOR DUCTS OVER 22"Ø, USE OPPOSED BLADE VOLUME DAMPER.
3. ALL QUADRANT OPERATORS SHALL BE EXTENDED TO OUTSIDE OF INSULATION.

DUCTS 16"Ø TO 22"Ø

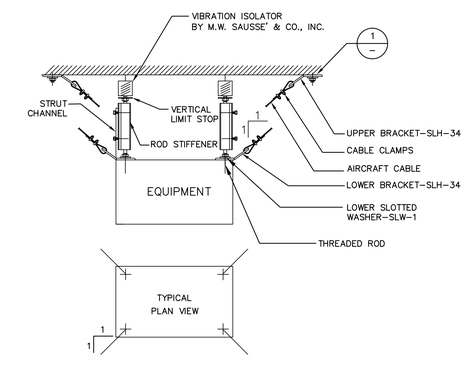
VOLUME DAMPER DETAIL | NTS | 2



PLAN VIEW



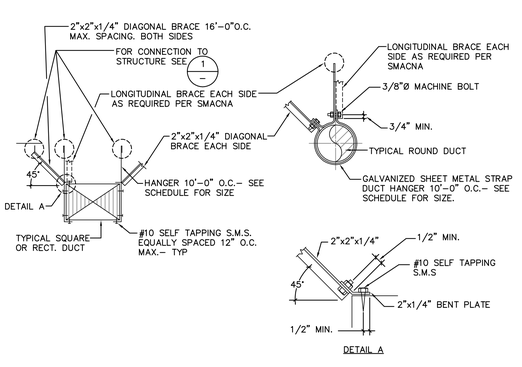
SPLIT SYSTEM OUTDOOR UNIT MOUNTING | NTS | 12



NOTE: 1) CABLE IS 7 X 19 GALVANIZED AIRCRAFT CABLE.
2) CABLES TO BE INSTALLED HAND TAUT W/O SLACK.

EQUIPMENT BRACING KIT: 18C4–12SLH–34
(04) UPPER BRACKET – SLH–34
(04) UPPER SLOTTED WASHER –SLW–1
(04) LOWER BRACKET – SLH–34
(04) LOWER SLOTTED WASHER –SLW–1
(08) ROD STIFFENER CLAMPS – RS–1
(04) CABLE – 1/8" – 10 FT.
(16) CABLE CLAMPS – 1/8"

INLINE EXHAUST FAN DETAIL | NTS | 9

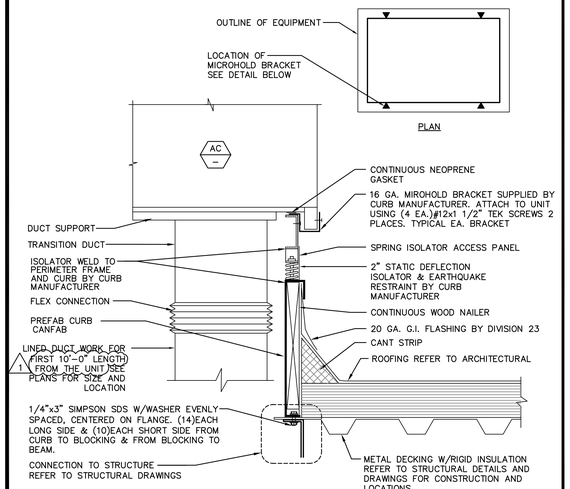


DETAIL A

RECTANGULAR DUCT			ROUND DUCT		
MAX. OF DUCT PERIMETER/IN.	STRAP	MAX. LOAD EACH HANGER/LBS.	DIAMETER /INCHES	STRAP	MAX. LOAD EACH HANGER/LBS.
P/2 =72	1"X 20 GA.	20	UP TO 20"	1"X 20 GA.	20
P/2 =96	1"X 18 GA.	30	21" TO 36"	1"X 18 GA.	30

NOTE:
1. NO BRACING REQUIRED IF DUCT IS SUSPENDED 12 INCHES OR LESS IN LENGTH.
2. FOR TRANSVERSE AND LONGITUDINAL BRACING FOLLOW "SMACNA" GUIDELINES

DUCT SUPPORT DETAIL | NTS | 6



NOTES:
1. FILL ENTIRE VOID SPACE IN ROOF CURB WITH R30 BATT. INSULATION.
2. SEE STRUCTURAL DETAILS FOR FRAMING AROUND ROOF OPENINGS.

ROOFTOP AC UNIT MOUNTING | NTS | 3

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REGISTERED PROFESSIONAL ENGINEER CHRIS E. RADTKE No. M24519 Exp. 9/30/18 MECHANICAL STATE OF CALIFORNIA

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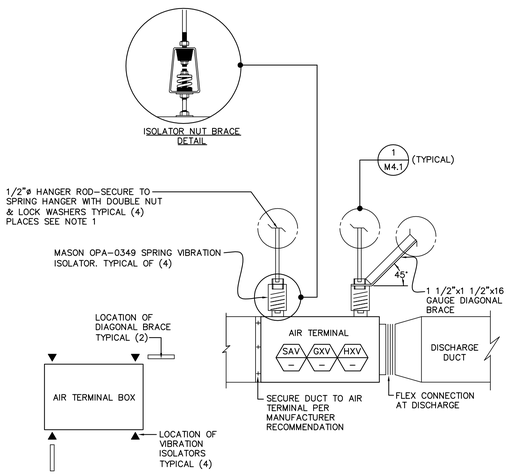
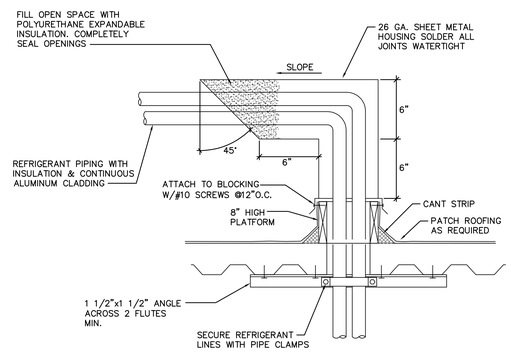
DETAILS

DRAWING NUMBER: M4-1



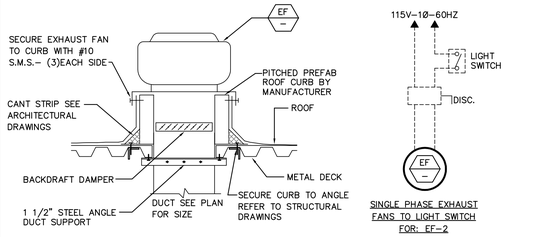
CONTROL VALVES MOUNTING DETAIL

NTS | 10



REFRIGERANT PIPE THRU ROOF

NTS | 7



INSTALLATION NOTES:

1. ROOF OPENING SHALL CONFORM TO MANUFACTURER'S CURB SIZE.
2. ROOF OPENING SHALL PROVIDE 1" CLEAR ON ALL SIDES OF DUCT.
3. RELIEF/INTAKE HOOD INSTALLATION ARE SIMILAR

SINGLE PHASE EXHAUST FANS TO LIGHT SWITCH FOR: EF–2

WIRING NOTES:

1. ALL WIRING AND EQUIPMENT SHOWN DASHED SHALL BE FURNISHED AND INSTALLED BY DIVISION 26 ELECTRICAL. REFER TO ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR COMPLETE DETAILS.
2. SEE CONTROL WIRING LEGEND DETAIL 1 THIS SHEET.

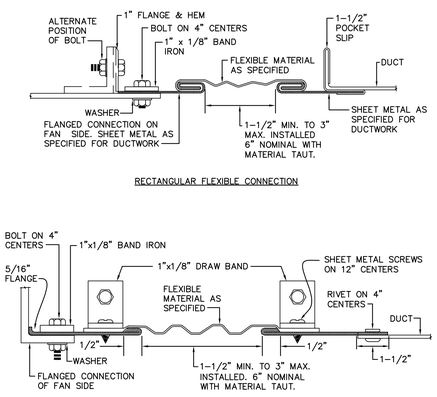
EXHAUST FAN MOUNTING & WIRING DETAILS

NTS | 4

- EQUIPMENT FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR (DIVISION 26).
- EQUIPMENT FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR (DIVISION 23).
- LINE VOLTAGE WIRING AND CONDUIT FURNISHED BY ELECTRICAL CONTRACTOR.
- LOW VOLTAGE CONTROL WIRING AND CONDUIT FURNISHED AND INSTALLED UNDER DIVISION 23. SEE SPECIFICATION SECTIONS 260519 AND 260533 FOR CONDUIT & WIRING REQUIREMENTS. (ALL LOW VOLTAGE WIRING TO BE IN CONDUIT)
- DISC. DISCONNECT SWITCH
- C.B. CIRCUIT BREAKER
- DD DUCT SMOKE DETECTOR FURNISHED UNDER DIVISION 26 AND INSTALLED UNDER DIVISION 23.
- S SPACE SENSOR BY CONTROLS CONTRACTOR

CONTROL WIRING LEGEND

NTS | 1

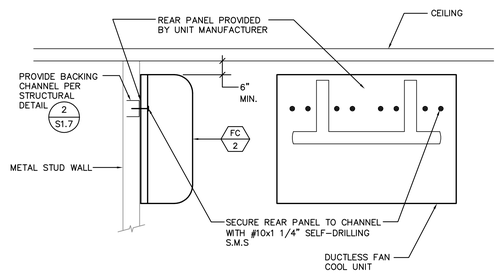


RECTANGULAR FLEXIBLE CONNECTION

ROUND FLEXIBLE CONNECTION

FLEXIBLE DUCT CONNECTION DETAIL

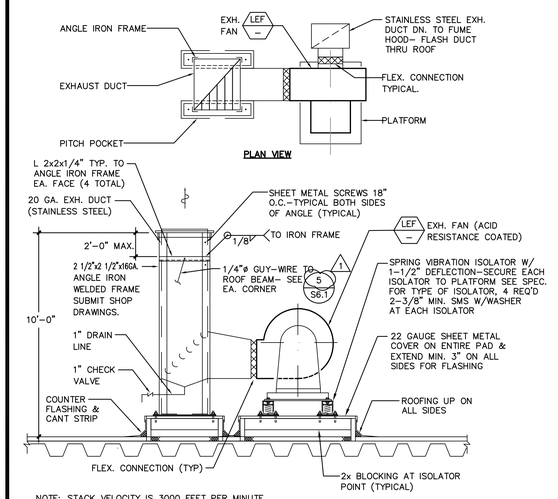
NTS | 11



SIDE VIEW REAR VIEW

FAN COIL MOUNTING DETAIL

NTS | 8

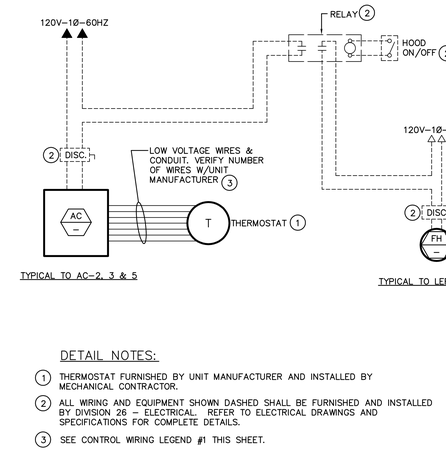


NOTE: STACK VELOCITY IS 3000 FEET PER MINUTE

ELEVATION

LAB/FUMEHOOD EXHAUST FAN MOUNTING DETAIL

NTS | 5

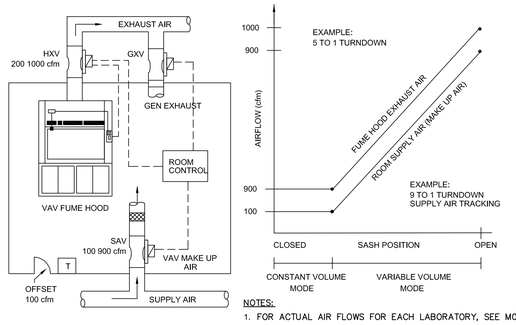


DETAIL NOTES:

1. THERMOSTAT FURNISHED BY UNIT MANUFACTURER AND INSTALLED BY MECHANICAL CONTRACTOR.
2. ALL WIRING AND EQUIPMENT SHOWN DASHED SHALL BE FURNISHED AND INSTALLED BY DIVISION 26 – ELECTRICAL. REFER TO ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR COMPLETE DETAILS.
3. SEE CONTROL WIRING LEGEND #1 THIS SHEET.

FUME HOOD CONTROL WIRING DIAGRAM

NTS | 2



NOTES:

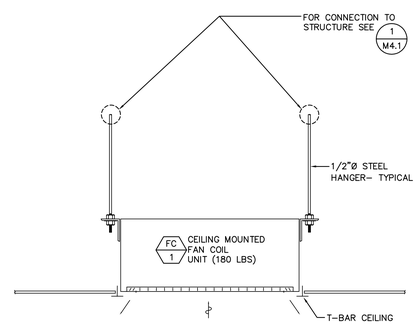
1. FOR ACTUAL AIR FLOWS FOR EACH LABORATORY, SEE M0.3.

SEQUENCE OF OPERATIONS – VAV LABORATORY TEMPERATURE AND PRESSURE

1. ZONE CONTROLLER SHALL BE ACTIVATED BASED ON A TIME OF DAY SCHEDULE.
2. THE SPACE THERMOSTAT SHALL SEND SIGNAL TO THE DDC CONTROLLER IN ORDER TO MAINTAIN SPACE TEMPERATURE SET–POINT (73 DEGREE F, ADJUSTABLE). THE DDC CONTROLLER SHALL MODULATE THE PRIMARY AIR DAMPER ON SAV) AS REQUIRED TO MAINTAIN SPACE TEMPERATURE SET–POINT. ON A CALL FOR COOLING, THE PRIMARY AIR DAMPER SHALL OPEN TO THE MAXIMUM SETTING AND PROVIDE FULL VOLUME OF COOLING AIR FLOW (CFM), AS SPACE TEMPERATURE FALLS TO SPACE TEMPERATURE SET–POINT, THE PRIMARY AIR DAMPER SHALL CLOSE TO PROVIDE THE VOLUME OF COOLING AIR FLOW REQUIRED TO MAINTAIN SPACE TEMPERATURE. ON A FURTHER DROP IN SPACE TEMPERATURE, THE HOT WATER REHEAT VALVE (ON REHEAT COIL, RH) SHALL OPEN TO MAINTAIN SPACE TEMPERATURE SET–POINT. CONTROLS SHALL COORDINATE TEMPERATURE TO PRECLUDE SIMULTANEOUS HEATING AND COOLING AS MUCH AS POSSIBLE.
3. THE SUPPLY AIR FLOW SHALL BE THE HIGHER OF THE FOLLOWING:
   a. AIR FLOW REQUIRED TO MAINTAIN SPACE TEMPERATURE
   b. AIR FLOW REQUIRED TO MAINTAIN SPACE PRESSURE.
4. THE LABORATORY EXHAUST CONTROLS SYSTEM SHALL MAINTAIN A NEGATIVE PRESSURE IN THE LABORATORY AT ALL TIMES BASED ON MEASUREMENT OF THE SUPPLY AIR AND EXHAUST AIR. THE TOTAL EXHAUST AIR FLOW SHALL BE THE SUM OF THE FLOW THROUGH THE FUME HOODS (HXV) AND FLOW THROUGH THE GENERAL EXHAUST (GXV).

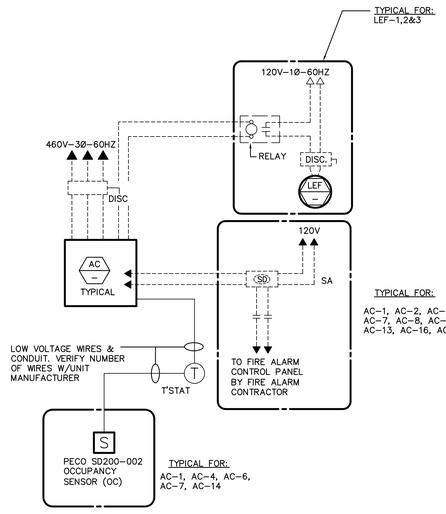
LAB VALVE SEQUENCE OF OPERATION

NTS | 9



FAN COIL UNIT MOUNTING DETAIL

NTS | 6



AC UNIT CONTROL WIRING DIAGRAM

NTS | 3

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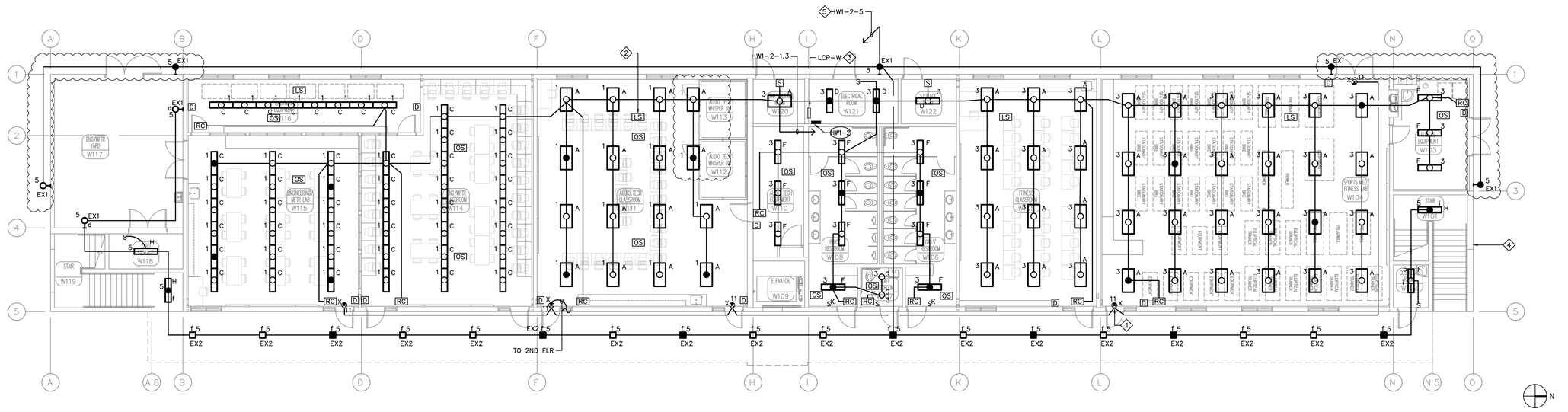
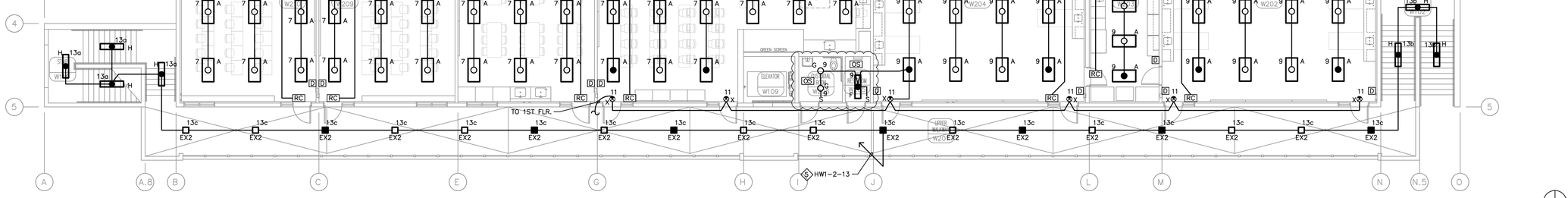
DETAILS

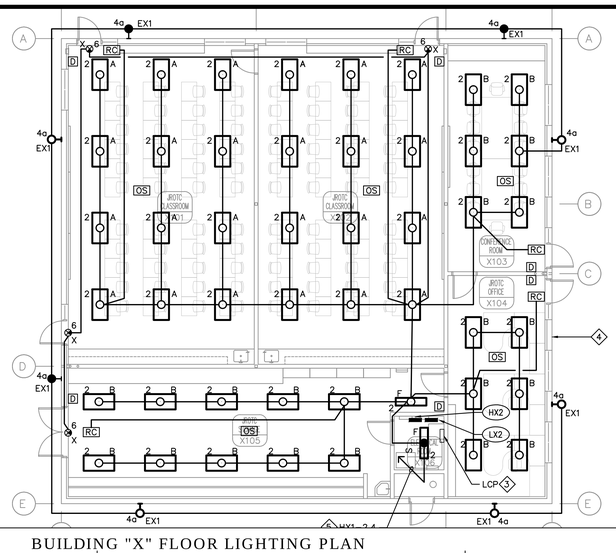
DRAWING NUMBER: M4-2



BUILDING "W" FIRST FLOOR LIGHTING PLAN | NTS | 1



BUILDING "W" SECOND FLOOR LIGHTING PLAN | NTS | 2



BUILDING "X" FLOOR LIGHTING PLAN | NTS | 3

KEY NOTES

1. DO NOT USE EXIT SIGN AS PASS-THROUGH DEVICE.
2. DAY LIGHTING SENSORS SHALL BE MOUNTED 2/3RD DISTANCE OF WINDOW HEIGHT INTO ROOM.
3. PROVIDE 7-DAY ASTRONOMICAL TIME CLOCK.
4. REFER TO DETAIL #6, SHEET E6.1 FOR TYPICAL LIGHTING CONTROL WIRING DIAGRAMS. CONTRACTOR SHALL COORDINATE ALL ASPECTS OF THE LIGHTING CONTROL SYSTEM WITH THE APPROVED MANUFACTURER AND OBTAIN SHOP DRAWINGS AS REQUIRED TO PROVIDE A COMPLETE AND OPERABLE SYSTEM.
5. VIA LCP, LOWER CASE LETTER DESIGNATED CONTROLLED BY SEPARATE RELAY.

ENERGY ACCEPTANCE TESTING

MANDATORY ACCEPTANCE TESTING PER CEC 2013 ENERGY CODE APPENDIX A SHALL BE PROVIDED AS LISTED BELOW:

NOTE: DIVISION 26 CONTRACTOR WILL RETAIN AN AABC CERTIFIED AGENCY TO PERFORM AND DOCUMENT THE REQUIRED ACCEPTANCE TESTING AS DESCRIBED IN CHAPTER 13 OF THE 2013 NON-RESIDENTIAL COMPLIANCE MANUAL. THIS WORK INCLUDES COMPLETING THE FORMS, SIGNING THE FORMS, AND SUBMITTING THE FORMS TO THE AUTHORITY HAVING JURISDICTION. THE FORMS AND REQUIREMENTS CAN BE OBTAINED FROM THE CEC WEBISTE:

INCLUDE FORMS WHICH APPLY TO THE SCOPE OF WORK IN THIS SET OF DRAWINGS AND SPECIFICATIONS. THE LIST OF FORMS IS REFERENCED BELOW:

1. NRCA-ILT-02-A LIGHTING CONTROL ACCEPTANCE DOCUMENT
2. NRCA-ILT-03-A AUTOMATIC DAYLIGHTING CONTROL ACCEPTANCE DOCUMENT
3. NRCA-ILT-04-A DEMAND RESPONSIVE LIGHTING CONTROL ACCEPTANCE DOCUMENT
4. NRCA-OLT-02-A NA7.7 OUTDOOR LIGHTING ACCEPTANCE TESTS

THE CONTRACTOR SHALL COORDINATE WITH THE ACCEPTANCE TECH TECHNICIAN PRIOR TO PURCHASING OR INSTALLING ANY PORTION OF THE LIGHTING SYSTEMS.

THE ACCEPTANCE TECH TECHNICIAN SHALL BE PRESENT DURING COMMISSIONING

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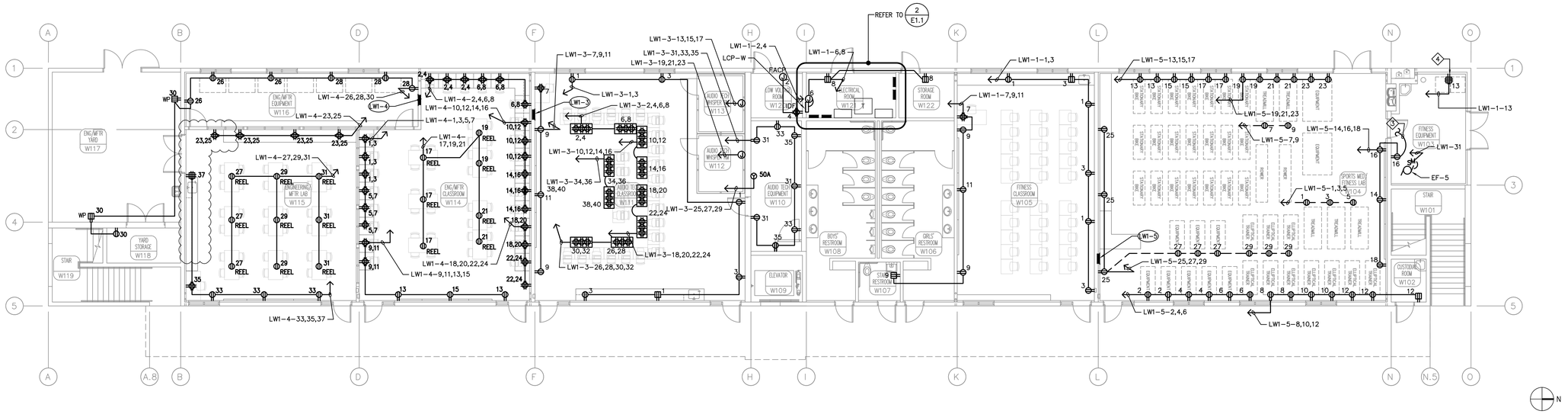
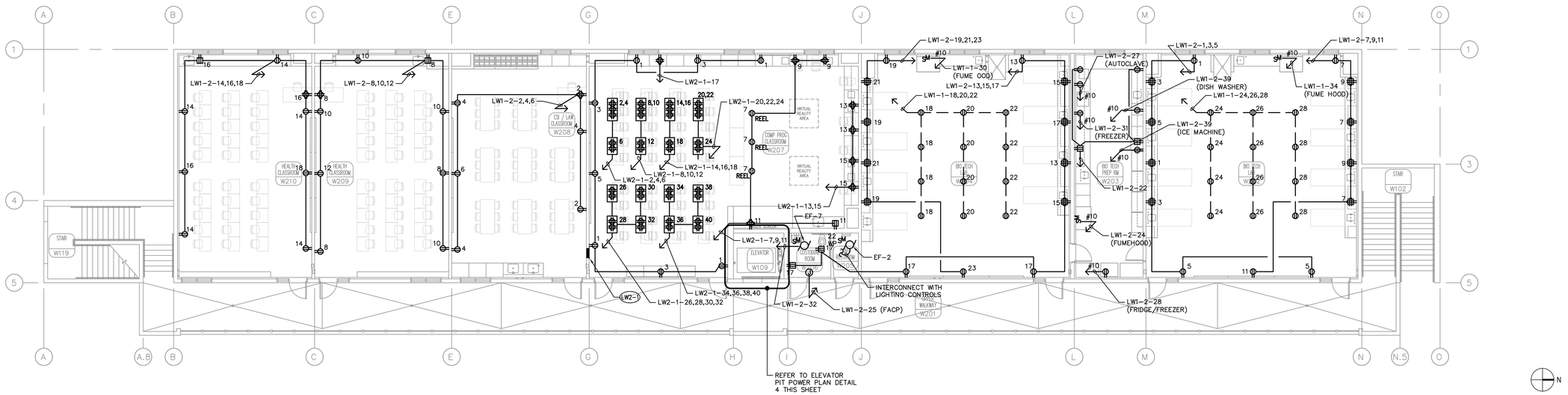
LIGHTING PLANS

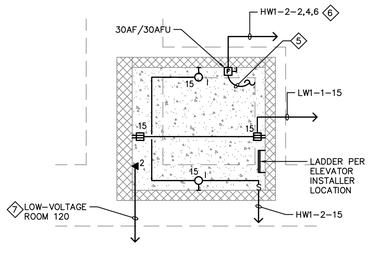
DRAWING NUMBER: E2.1



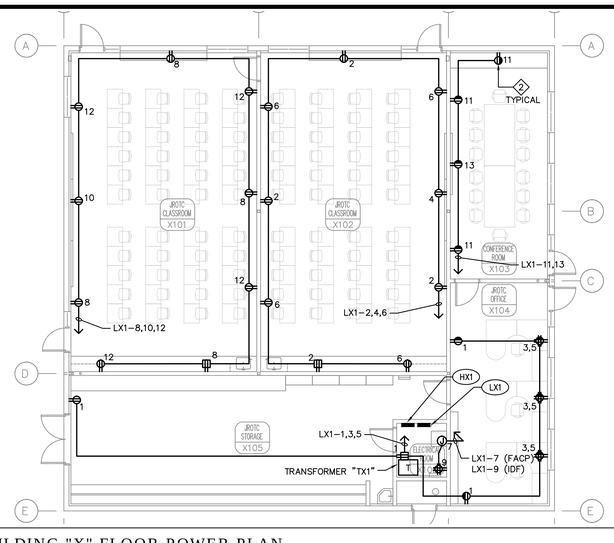
BUILDING "W" FIRST FLOOR POWER PLAN | 1/8"=1'-0" | 1



BUILDING "W" SECOND FLOOR POWER PLAN | 1/8"=1'-0" | 2



ELEVATOR PIT POWER/SIGNAL DETAIL | 1/4"=1'0" | 4



BUILDING "X" FLOOR POWER PLAN | 1/8"=1'0" | 3

KEY NOTES

1. PROVIDE 2"C.O. TO ROOF FOR FUTURE PV SYSTEM. STUB UP AND CAP 6 INCHES ABOVE FINISHED ROOF.
2. PARTIAL SHADED RECEPTACLE TO BE SPLIT WIRED SO ROOM OCCUPANCY SENSOR SHUTS HALF RECEPTACLE OFF WITH LIGHTING.
3. EXTEND CIRCUIT TO DRINKING FOUNTAIN DF-2 & ELECTRONIC TRAP PRIMER ETP-1. REFER TO PLUMBING DRAWINGS FOR EXACT LOCATION.
4. POWER FOR WASHER & DRYER. RECEPTACLE SHALL BE IN ELEVATION WHERE IT IS ACCESSIBLE WITHOUT MOVING THE EQUIPMENT.
5. 1"C FLEXIBLE CONDUIT W/ 3#1 AWG & 1#1 GROUND TO ELEVATOR FOR POWER COMPARTMENT.
6. PROVIDE 1"C W/ 3#10AWG & 1#10 GROUND.
7. PROVIDE (2) EACH TELEPHONE CABLE. CONSULT ELEVATOR INSTALLER FOR ADDITIONAL PHONE LINE REQUIREMENT.

GENERAL NOTES

1. ELEVATOR POWER/SIGNAL PLAN SHOWN DEVICES/EQUIPMENT DIAGRAMMATICALLY. CONTRACTOR SHALL CONSULT W/ ELECTRICAL INSTALLER FOR EXACT LOCATION.

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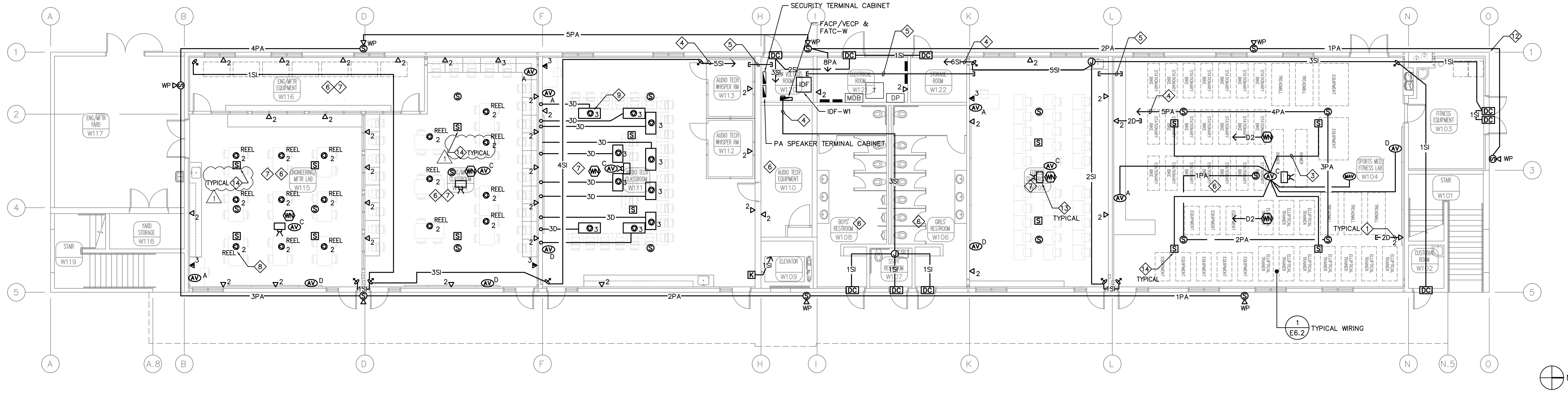
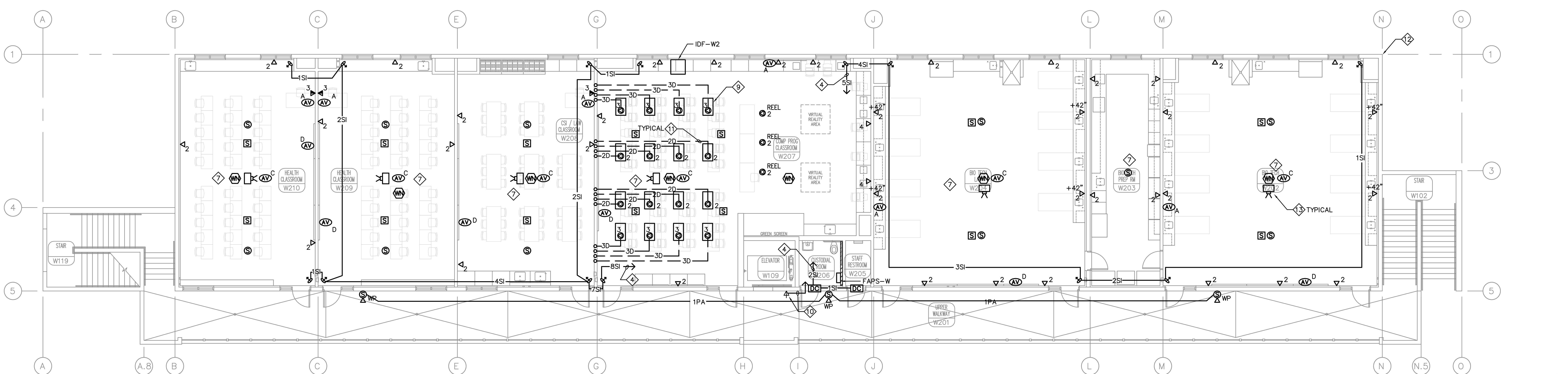
POWER PLANS

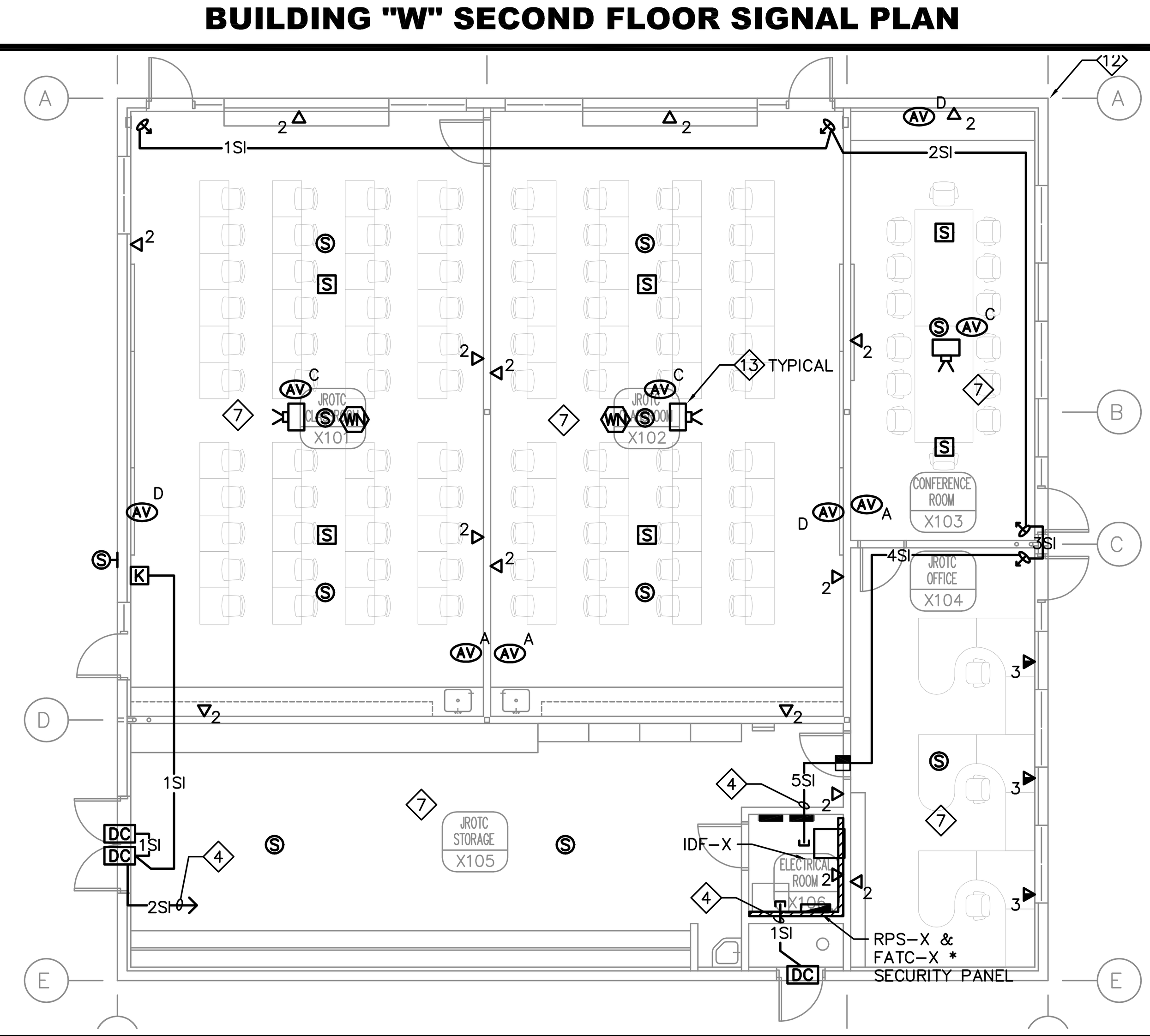
DRAWING NUMBER: E3.1



BUILDING "W" FIRST FLOOR SIGNAL PLAN — NTS — 1



BUILDING "W" SECOND FLOOR SIGNAL PLAN — NTS — 2



BUILDING "X" FLOOR SIGNAL PLAN — NTS — 3

KEY NOTES

1. PROVIDE CABLE TYPE & QUANTITY AS INDICATED WITH CONDUIT TO ACCESSIBLE CEILING SPACE. CONTINUE CABLE RUN VIA J-HOOKS TO IDF INDICATED ON PLAN.
2. MOUNT 6" ABOVE COUTNER TO TOP OF DEVICE BOX.
3. REFER TO DETAIL#1, SHEET E6.2 FOR CABLE REQUIRMENTS TYPICAL FOR AV SYSTEM.
4. TO LOW VOLTAGE ROOM TERMINAL CABINET FOR ASSOCIATED SYSTEMS WIRING.
5. PROVIDE (2) 1"CONDUIT FOR PA, SECURITY & (1) 3" CONDUIT FOR DATA CABLES TO LOW VOLTAGE ROOM.
6. ALL LOW VOLTAGE WIRING & CABLES IN THIS ROOM SHALL BE IN CONDUIT.
7. FOR TYPICAL CABLE & CONDUIT LAYOUT, REFER TO FITNESS LAB ROOM, DETAIL #1, THIS SHEET.
8. 20' RETRACTABLE DATA CORD REEL WITH CAT6 PLUG BY GRAINGER OR EQUAL, MOUNT PER MANUFACTURES REQUIREMENTS. REFER TO SPECIFICATIONS FOR MORE INFORMATION. (DEVICE IS LESS THAN 4 LBS)
9. MOUNT IN FLOORBOX WITH RECEPTACLES PER POWER PLAN. FLOOR BOX SHALL CAPABLE OF HOLDING 8 SINGLE GANG DEVICES. FSR #FL500P OR EQUAL. PROVIDE POKETHRU DEVICE FOR LOCATIONS ON SECOND FLOOR.
10. PROVIDE EMERGENCY CALL STATION WITH CONDUIT & CABLE TO LOW VOLTAGE ROOM.. REFER TO SPECIFICATIONS.
11. CONDUIT RUN UNDERGROUND AND VERTICALLY TO ACCESSIBLE CEILING SPACE. FIELD DETERMINE MOST SUITABLE PATH.
12. PROVIDE ASSISTIVE LISTENING SYSTEM IN EACH CLASSROOM. REFER TO SPECIFICATIONS FOR MORE INFORMATION.
13. CEILING MOUNTED PROJECTOR PER DETAIL #1, SHEET E6.2. COORDINATE WITH OPTOMA FOR EXACT LOCATION AND MOUNTING REQUIREMENTS. (1)
14. PROVIDE SURFACE MOUNTED SPEAKER SUITABLE FOR ROOM WITH NO CEILING VISIBLE TO ROOF STRUCTURE. REFER TO SPECIFICATIONS FOR MORE INFORMATION.

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#	REVISIONS		

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DATE: 04/25/2017	SCALE:
PROJECT NUMBER: 1615400	

SIGNAL PLANS

DRAWING NUMBER: E4.1