ADDENDUM NO. 1

TO THE PLANS AND PROJECT MANUAL FOR

INTERMOUNTAIN LAKE PARK LEVEL 1 REMODEL

4646 LAKE PARK BLVD.
WEST VALLEY, UTAH 84120

Prepared by:

233 South Pleasant Grove Blvd.
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(801) 769-3001 Fax

This addendum issued, October 16, 2020 is hereby made a part of the contract documents. It shall be the responsibility of each Contractor to notify his subcontractors of the contents of this addendum. In case of conflict between drawings, specifications and the Addendum, this Addendum shall govern. All changes, corrections, deletions and/or additions to the initial bidding documents shall be included in the bid.

ADDENDUM NO. 1

October 16, 2020

Purpose for the Addendum: These changes resulted from various contractor questions during the bidding process and additional clarifications from the design team as well as city review comments. Some contractor questions have been consolidated with other similar questions. Contractor questions are listed below with their response. The responses to some questions have triggered the modification of the plans and or specifications, which are indicated in the narrative below. For clarification, when an item is indicated as a "Deductive Alternate" it means that, if accepted, the cost would be deducted from the Base Bid.

Bidder's Instructions:

The initial bidding instructions provided clarifications for various contractor questions that have been asked since bidding has commenced and are being documented as part of this Addendum below:

1- Cameras will be provided and installed by Owner's vendor (Convergint). Contractor to coordinate with Owner's vendor as required.
2- Access control will be provided and installed by Owner's vendor (Accent Automatics). Contractor to provide junction boxes and conduit as required and coordinate with Owner's vendor.
3- Structured Cabling will be provided and installed by Owner's vendor (TBD). Contractor to provide junction boxes and conduit as shown in the drawings and as required and to coordinate with the Owner's vendor.
4- Audio Visual Equipment will be provided and installed by the Contractor. The Owner has pre-approved Marshall Industries and Cache Valley Electric as the only allowed sub-bidders on this equipment.
5- Please fill out the schedule of values provided in the specification book and submit with initial bid.
6- Contractor to submit number of calendar days to substantial completion.

Contractor Questions:

1. Some walls go to deck, what is the existing deck height? **Response: The deck height is roughly 14' from the finished floor. See the revised G003.**

2. Does the Area A and Area B indicate that there will be two phases? **Response: No these designations don't indicate any type of phasing. The contractor should have full access to the entire construction area the entire construction.**

3. Who is the existing fire alarm system vendor? **Response: Fire Protection Systems.**

4. Will fire alarm specifications be provided? **Response: Yes, see the revised 00 0010, and the new 28 3101 (specification sections).**

5. Who handles HVAC controls for the building and / or what type of controls are being used? **Response (From Mechanical Engineer): Carrier. We have updated our drawings to show the new vav box needing to be tied to the existing BMS and the new fan being tied to the BMS.**

6. What brand is the Access Control Brand? **Response: The brand is Continental. As a reminder, Access Controls will be provided by Owner.**

7. Will Audio Visual Specifications be provided? **Response: Yes, see the revised 00 0010, and the new 27 4113, 27 4114, 27 4115, 27 5119 (specification sections).**

8. Will Structured Cable Specifications be provided? **Response: Yes, see the revised 00 0010, and the new 27 0001, 27 0113, 27 0119, 27 0133, 27 0143, 27 0171, 27 0500, 27 0526, 27 0528, 27 0529, 27 0533, 27 0536, 27 0543/46, 27 0553, 27 1100, 27 1116, 27 1119, 27 1300, 27 1300, 27 1500, 27 1513, 27 1543, 27 1619, 27 619, 27 4100, 27 4101, 27 4102, 27 5319, 27 6001, 27 6002, 27 6003, 27 6005, 27 6006, 27 6007, 27 6008 (specification sections).**

9. Will the general contractor be required to provide the primary subcontractors as part of the bid? **Response: Yes, per Owner requirement, please fill out the Schedule of Values provided in the Spec book including the requested Subcontractors.**

10. Will the contactor be responsible for removal / moving of existing gym equipment and cubicles? **Response: No, the Owner will take responsibility for removal / moving of existing gym equipment and cubicles.**

11. Where tile is being removed from walls, will the drywall be removed as well? **Response: Yes, the drawings were noted that way (Sheet Note 23 on AD101). See the revised AD101 to clarify shower rooms have the same requirement.**

12. On sheets A101A and A101B note 23 it's asking us to add a layer of drywall and a layer of tile backer, I just want to confirm that they want both layers. **Response: No. The intent is to provide a single layer of 5/8" Type X code compliant tile backer (Georgia Pacific Denshield or Equal). The note has been updated to read more clearly. See the revised A101A and A101B.**

13. The existing fire line riser is missing the Backflow Preventer. Will this be required as part of this remodel? **Response: Yes. See the revised 21 1000 (Specification Section) and the revised PP101.**

14. Can we get the brand and AIC rating of the existing panels for the breakers we are providing? **Response: The brand is Seimens. See the attached existing panel images to help identify the existing AIC Rating.**

15. Can we get the panel schedule for the added panel UPS1? **Response: Yes, the USP2 panel listed in the panel schedule is actually USPS1. See the revised EP602.**

16. Can we get a floor box schedule? **Response: Yes, see the revised EP602.**

17. Fixture WB-10 is not on the fixture schedule, but it is on the plans, please clarify. **Response: The WB-10 designations in Restrooms 152, and 153 have been replaced with W-99 designations. See the revised EL151B.**

18. Looking for clarification on PP101 Note 7 it states "run condensate line to nearest condensate main or service sink" the plan does not show any condensate lines, however it shows the domestic water lines running to the water outlets. There is confusion on why we need a condensate line where there are domestic water line running to water outlets? Also, it shows no condensate mains or service sinks to run to if a condensate line was needed. Can you please clarify? **Response (From Mechanical Engineer): We've had these type of water coolers requiring a condensate lines for the condensing units. As noted the existing drawings did not indicate any condensate mains; however, the condensate can be taken to any floor sink possible locations could be Water Softener (141), Fire Riser (139), or Jan (110). Keyed note 8 has similar intent.**

19. EP101A Note 3 – The new alternate panel location is shown, but where is the location of the panel it is being fed from? **Response: The panel in the center of the room (across from note 5).**

20. Are the demountable walls to be salvaged? **Response: No, the contractor will be responsible to demolish.**

21. What is the preferred building access route and construction access location? **Response (From Owner): West dock for materials. Check in at the security desk each morning.**

22. Are there specific construction hours to adhere by? **Response (From Owner): There is 24 hour security. Usual work hours.**

23. Is the entire project area going to be vacated and existing equipment / furniture removed? **Response (From Owner): Yes, it will be vacated, and all furniture and equipment will be removed.**

24. Is it required for all walls noted as Type B to be 1 Hour Fire Rated. **Response: No, the wall type indicates that the fire rating is applicable where indicated in plan meaning, where indicated by the triangle rating symbol as shown on G101 and A101A, and A101B. Walls that are not fire rated should still be sound barriers and provide sound sealant as required. See the revised G003.**

25. How will substitutions for lighting and other items work? **Response: The Owner's general intent is to match existing fixtures on Level 2-4, but will consider value engineering alternate packages. Therefore, we have placed all of the matching and desired light fixtures in the Option #1 column of the light fixture schedule. All Option #1 fixtures are to be provided in the Base Bid. Alternate fixture packages will be considered, but must be provided as a deduct alternate to the Base Bid. Plumbing and mechanical fixtures will be considered the same way. The contractor shall provide the specified fixtures as part of the Base Bid. Alternate fixtures, if bid may be considered, but should be provided as a deduct alternate to the Base Bid. See the revised EL601.**

26. Will there be new window coverings, and if so, what fabric, mounting, location, size, etc. of the windows is required? **Response: Yes, Window Shades are to be provided (see General Note G on AI101). The intent is match the existing Level 2-4 Standard, which are Hunter Douglas manual chain shades. Shade sections are broken at each vertical mullion (typical O.C. spacing is 5'). The approximate heights and locations of the shades needed are now noted in AI101. The original submittals are being provided below as well as images of the existing blinds for reference to help clarify the existing system. See the revised AI101.**

Plan Review Comments:

We have received plan review comments from West Valley City. Here is a summary of the comments that will affect bidding:

1. Provide a backflow preventer on the existing fire sprinkler riser. **See the revised 21 1000 (Specification Section) and the revised PP101.**

2. Provide cable tray bonding per NEC 392.60(A). **See the revised ET101A, and ET101B.**

3. Move the ADA toilet in Restrooms 108 and 109 to the opposite side of the stall to provide ADA clearance. **See the revised G001, A101, A101A, A251, AI101, AP101, PP401, and EP101A.**

Electrical Sheet Narrative:

EEP101A, EP101B Updated background, updated floor box callouts to match new floor box schedule.
EL151B: Changed WB-10 lights to W-99 lights.
EP602: Updated panel schedule breakers (150 amp main breaker for panel and 125A subfeed) and added floor box schedule.
EL601: Updated fixture schedule with contractor allowances.

See referenced changes above and clouded changes for EJ101A, EJ101B, EJ601, ET101A, ET101B, TA002, TA601.

Summary of Attachments:

Drawing Sheets (8.5X11): Mechanical Engineer Narrative, Images of Electrical Panel, Existing Window Shade submittals (For Reference Only), Images of Existing Window Shades.

Specification Sections (8.5X11): 00 0010, 21 1000, 27 0001, 27 0113, 27 0119, 27 0133, 27 0143, 27 0171, 27 0500, 27 0526, 27 0528, 27 0529, 27 0533, 27 0536, 27 0543/46, 27 0553, 27 1100, 27 1116, 27 1119, 27 1300, 27 1300, 27 1500, 27 1513, 27 1543, 27 1619, 27 619, 27 4100, 27 4101, 27 4102, 27 4113, 27 4114, 27 4115, 27 5119, 27 5319, 27 6001, 27 6002, 27 6003, 27 6005, 27 6006, 27 6007, 27 6008, 28 3101

Drawing Sheets (24X36): G001, G003, AD101, A101, A101A, A101B, A251, AI101, AP101, MH101, MH102, PP101, PP401, EP101A, EP101B, EP602, EL151B, EL601, EJ101A, EJ101B, EJ601, ET101A, ET101B, TA002, TA601.

Issued by:
Jonathan Johnson
Project Manager (Curtis Miner Architecture)

Copy to: Owner, Contractor, Architect, Consultants

END OF ADDENDUM SUMMARY NO. 1 – INTERMOUNTAIN LAKE PARK LEVEL 1

VBFA

ADDENDUM

DATE: October 16, 2020

PROJECT NO: 20102

PROJECT: Intermountain Lake Park Level 1 Floor Remodel

The following revision, additions, deletions, and/or items of clarification shall hereby be included as an integral part of the Contract Documents for the above-listed project and shall be fully binding. All other requirements of the original plans and specification shall remain in effect in their respective order.

DIVISION – 21, 23

DRAWINGS

SHEET - MH101 – MECHANICAL PLAN LEVEL 1
1. Keyed note 1 added to drawing.

SHEET - MH102 – MECHANICAL PLAN UPPER FLOORS
1. Keyed note 7 added to view 4

SHEET - PP101 – PLUMBING PLAN LEVEL 1
1. Added picture of existing fire riser giving direction to upgrade to double check backflow preventer.
2. Keyed note 13 added.

SHEET - PP401 – PLUMBING ENLARGED RESTROOM PLAN
1. Keyed note 12 added.
2. DCW extended to new water closet locations.

SPECIFICATIONS

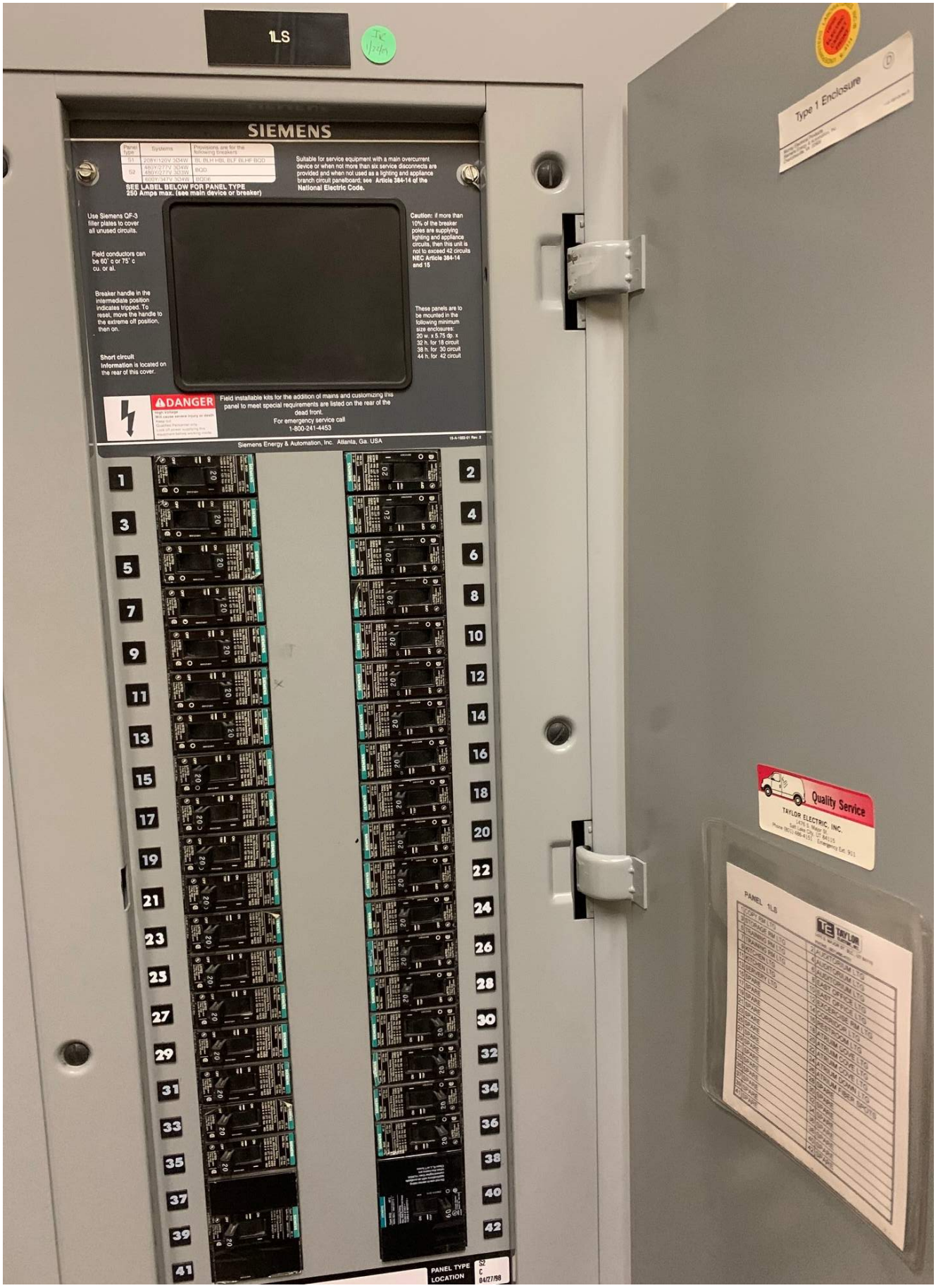
SECTION - 211000 WATER BASED FIRE SUPPRESSION SYSTEMS
1. Special items section added and Calculations portion edited for section 1.2.D.
2. Section 1.5.B edited.

PRIOR APPROVALS

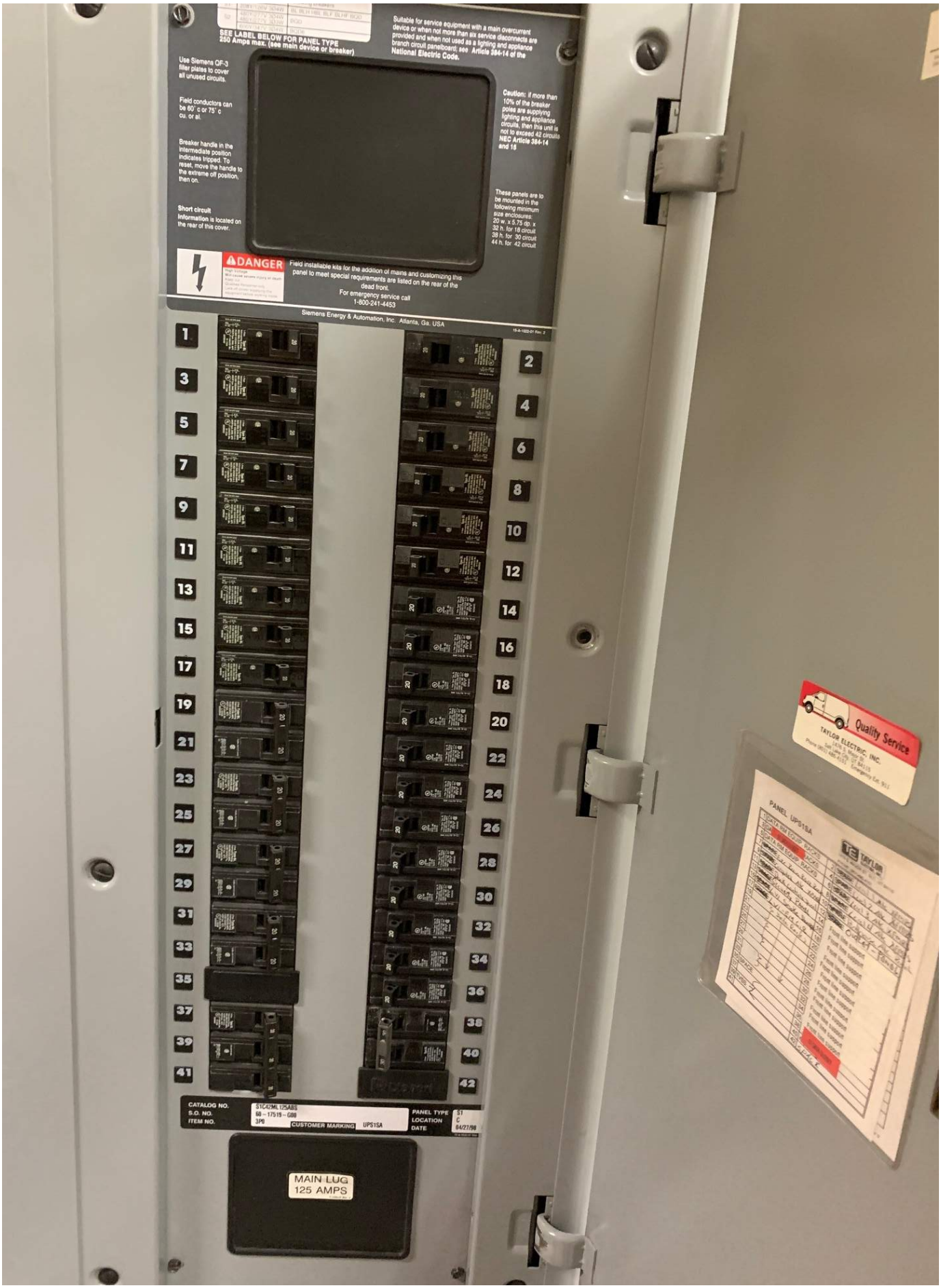
The following manufacturers, trade names and products are allowed to bid on a name brand only basis with the provision that they completely satisfy all and every requirement of the drawings, specifications and all addenda shall conform to the design, quality and standards specified, established and required for the complete and satisfactory installation and performance of the building and all its respective parts.

Item	Manufacturer	Comments
Split System Wall Air Conditioners	Daikin	APPROVED
Toilet Seats	American Standard	APPROVED
Flush Valves	American Standard	REJECTED
Faucets	American Standard	REJECTED

EXISTING ELECTRICAL PANEL #1



EXISTING ELECTRICAL PANEL #2



Saunders Construction Inc.

1601 N. 750 W. Harrisville, Utah 84404
(801)-782-7830 Fax (801)-782-7856
Website: www.saunders1.com
Email: saunderscoinc@yahoo.com

To: VCBO Architects

Letter of Transmittal

Date 5-19-15

Attention: JoanEllen

Re: IHC Lake Park

We are sending you _x__Attached _____Under separate cover via _____ the following items:
__Shop Drawings ___ Prints ____ Plans ____ Samples ____Specifications
__Copy of letter ___ Change Order _____

Copies	Spec. #	No.	Description
1			Roller Shade Submittal Section 12-2400

☐ REVIEWED ☒ REVISE & RESUBMIT

☐ REJECTED ☐ FURNISH AS CORRECTED

Corrections or comments made on the shop drawings during this review do not relieve contractor from compliance with requirements of the drawings and specifications. This check is only for review of general conformance with the design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for: confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating his work with that of all other trades; and performing his work in a safe and satisfactory manner.

VCBO ARCHITECTURE, L.L.C.

Date: 05/22/2015 By: K. BELL

SHOP DRAWINGS HAVE BEEN REVIEWED.

PLEASE SUBMIT PRODUCT CERTIFICATE SIGNED BY MANUFACTURER CONFIRMING THAT THE PRODUCT BEING INSTALLED IS OF AN ACCEPTABLE MANUFACTUER AS PER SPECIFICATION SECTION 12 2400 PARAGPRAH 1.3D

FABRIC SUBMITTED IS NOT ONE OF THE ACCEPTABLE MANUFACTURERS AS LISTED IN THE SPECIFICATIONS SECTION 12 2400 PARAGRAPH 2.1 A AND B

VERIFY WINDOW COVERINGS COMPLY WITH WCMA A 100.1 AS PER SPECIFICATION SECTION 12 2400 PARAGRAPH 1.4E

CONFIRM WARRANTY REQUIREMENTS CALLED OUT IN SPECIFICATION SECTION 12 2400 PARAGRAPH 1.5 ARE MET

GC TO FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION.

THESE ARE TRANSMITTED as checked below:

x	For Approval		Approved as Submitted		Resubmit __Copies for Approval
	For Your Use		Approved as Noted		Submit __Copies for Distribution
	As Requested		Returned for Corrections		Return___Corrected Prints
	For Review and Comment				
	FOR BIDS DUE		PRINTS RETURNED AFTER LOAN TO US		

REMARKS:

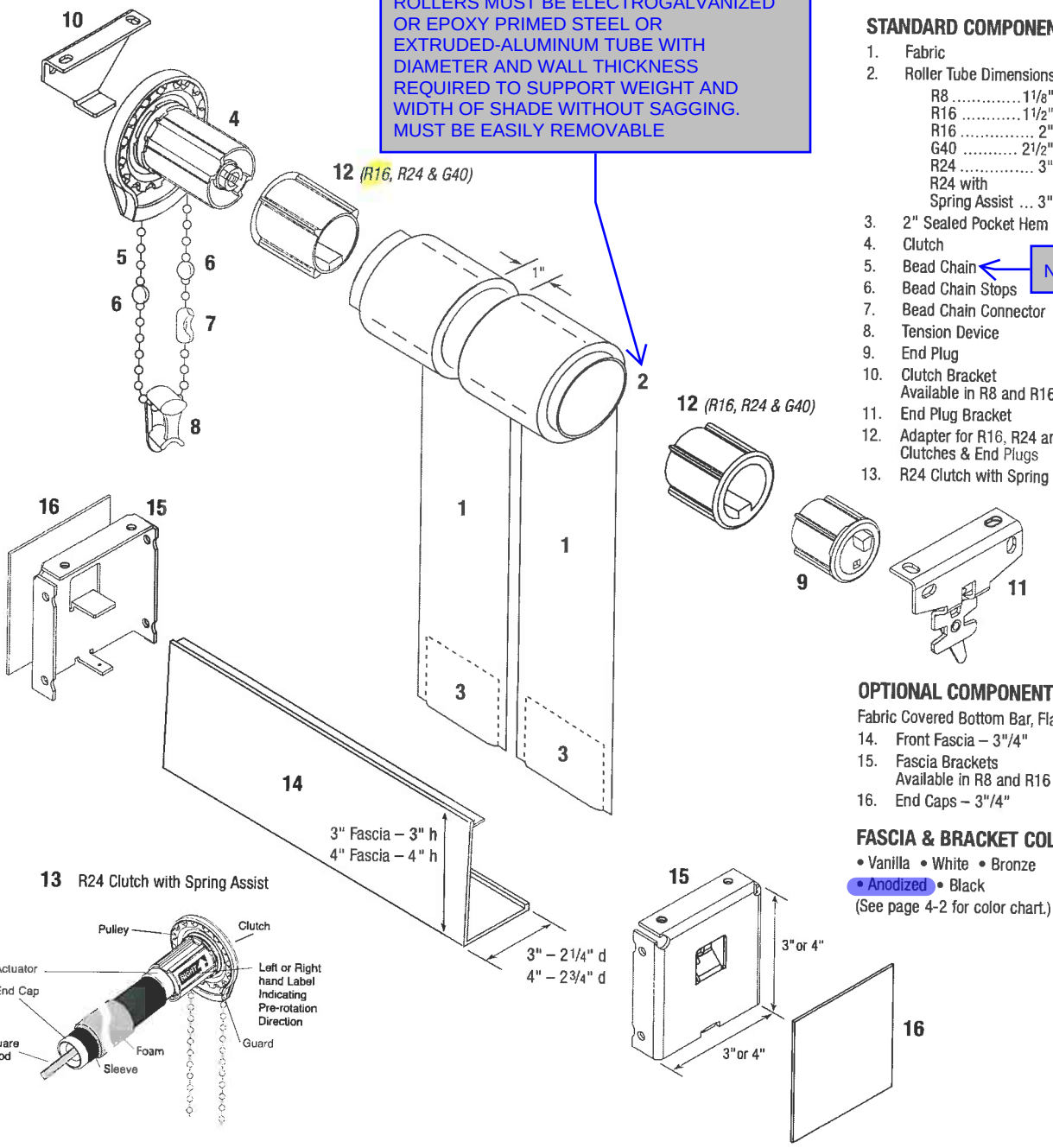
COPY TO: _____

SIGNED: _Ed Saunders_____

If enclosures are not as noted, kindly notify us at once.

— MANUAL BANDED ROLLER SHADE —

ROLLERS MUST BE ELECTROGALVANIZED OR EPOXY PRIMED STEEL OR EXTRUDED-ALUMINUM TUBE WITH DIAMETER AND WALL THICKNESS REQUIRED TO SUPPORT WEIGHT AND WIDTH OF SHADE WITHOUT SAGGING. MUST BE EASILY REMOVABLE



STANDARD COMPONENTS:

1. Fabric
2. Roller Tube Dimensions:
   - R8 ..... 1 1/8" Diameter
   - R16 ..... 1 1/2" Diameter
   - R16 ..... 2" Diameter
   - G40 ..... 2 1/2" Diameter
   - R24 ..... 3" Diameter
   - R24 with Spring Assist ... 3" Diameter
3. 2" Sealed Pocket Hem Bar
4. Clutch
5. Bead Chain — NICKEL-PLATED METAL
6. Bead Chain Stops
7. Bead Chain Connector
8. Tension Device
9. End Plug
10. Clutch Bracket
    Available in R8 and R16 sizes
11. End Plug Bracket
12. Adapter for R16, R24 and G40 Clutches & End Plugs
13. R24 Clutch with Spring Assist

OPTIONAL COMPONENTS:

Fabric Covered Bottom Bar, Flat or Oval

14. Front Fascia – 3"/4"
15. Fascia Brackets
    Available in R8 and R16 sizes
16. End Caps – 3"/4"

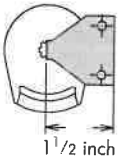
FASCIA & BRACKET COLORS:

• Vanilla • White • Bronze
• Anodized • Black
(See page 4-2 for color chart.)

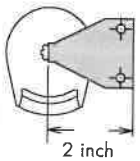
SHADE SIZES & WEIGHTS:

CLUTCH MODEL	SHADE WIDTH	SHADE DROP	MAXIMUM WEIGHT
R8	12" – 72"	12" – 144"	8 lbs.
R16	72 1/8" – 120"	12" – 144"	16 lbs.
G40	120 1/8" – 156"	12" – 144"	40 lbs.
R24/R24 with Spring Assist	156 1/8" – 192"	12" – 144"	40 lbs.

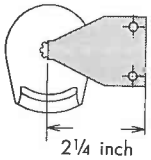
BRACKET PROJECTIONS:



CLUTCH MODEL:
R8
R16

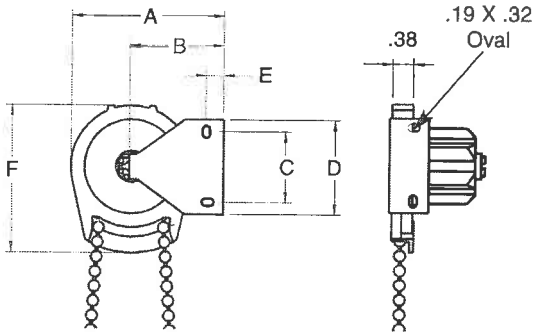


CLUTCH MODEL:
R8
R16

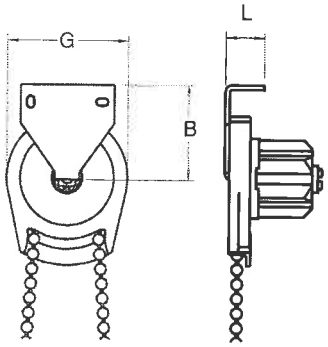


CLUTCH MODEL:
G40
R24/R24 Spring Assist

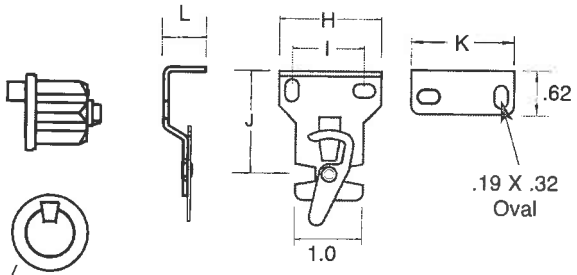
— COMPONENT DIMENSIONS —



Outside & Inside Mount



Ceiling Mount



End Plug and Bracket with Retainer

Flange diameter matches outside diameter of tube

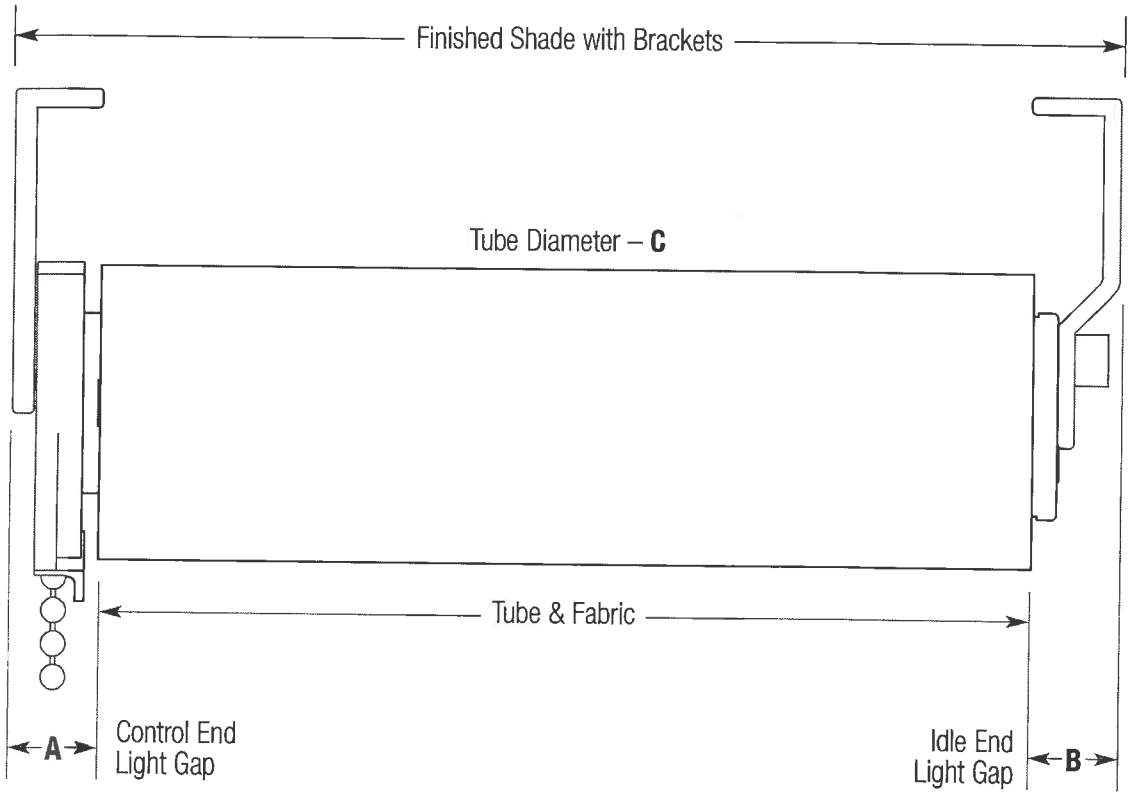
COMPONENT DIMENSIONS:

CLUTCH MODEL	BRACKET MODEL	A	B	C	D	E	F	G	H	I	J	K	L
R8	1½" Projection	2.48"	1.5"	1.06"	1.5"	0.28"	2.35"	1.95"	1.5"	1.125"	1.5"	1.5"	.62"
	2" Projection	2.98"	2.0"	1.06"	1.5"	0.28"	2.35"	1.95"	1.5"	1.125"	2.0"	1.5"	.62"
R16	1½" Projection	2.95"	1.62"	2.0"	2.5"	0.31"	3.21"	2.65"	2.5"	2.0"	1.5"	2.5"	.62"
	2" Projection	3.45"	2.12"	2.0"	2.5"	0.31"	3.21"	2.65"	2.5"	2.0"	2.0"	2.5"	.62"
G40*	2¼" Projection	4.0"	2.25"	1.75"	3.0"	0.375"	4.25"	3.50"	3.0"	1.75"	2.25"	3.0"	.62"
R24/R24 WITH SPRING ASSIST	2¼" Projection	4.0"	2.25"	1.75"	3.0"	0.375"	4.25"	3.50"	3.0"	1.75"	2.25"	3.0"	.62"

* Requires more chain length due to greater gear ratio

— SINGLE SHADE MOUNTING —

(Deductions will be taken by manufacturer. Please order desired width.)



SINGLE SHADE MOUNTING DIMENSIONS:

CLUTCH MODEL	CONTROL END LIGHT GAP A	IDLE END LIGHT GAP B	TUBE DIAMETER C
R8	.510"	.573"	1 1/8"
R16	.635"	.573"	1 1/2" / 2"
G40	7/8"	5/8"	2 1/2"
R24/R24 with Spring Assist	7/8"	5/8"	3"

SheerWeave® Style 2390/2360/2410/2500

Specifications

■ Manufactured with ease of fabrication in mind, Styles 2390, 2360, 2410 and 2500 are full basketweaves designed expressly for those applications which require a more opaque and nondirectional fabric. Style 2390/2360/2410/2500 can also be used in exterior roller shades.

Fire Classification: M1 (Style 2390), California U.S. Title 19 (small scale), NFPA 701-2004 TM#1 (small scale), NFPA 101 (Class A Rating), UBC (Class I), BS 5867 2008 Part 2 Type B Performance, NFPA 701 TM#2 (large scale), and CAN/ULC-S109-03 (large and small scale)
Bacteria and Fungal Resistance: ASTM E 2180, ASTM G22, AATCC30 Part 3, ASTM G21, ASTM D 3273, GREENGUARD Mold and Bacteria Standard ASTM 6329; includes Microban antimicrobial additives
Environmental Certification: GREENGUARD Certified and GREENGUARD for Children and Schools Certified
Lead Free: RoHS / Directive 2002/95/EC, US Consumer Product Safety Commission Section 101 and ANSI/WCMA A100.1-2007 for lead content, REACH (EC 1907/2006) compliant
Standard Uses: Roll-up shades, Roman shades, folding shades, pleated shades, vertical blinds, panel tracks, sheers and screens.
Warranty: 10-year interior; 5-year exterior
TrackLess™: TrackLess Technology minimizes the fiberglass yarns inherent tendencies to track when being rolled up in a shade. With TrackLess Technology these same fabrics now track less, roll up straighter and reduce shade fabrication time.

Children & Schools GREENGUARD Indoor Air Quality Certified

Microban® antimicrobial product protection
Microban® antimicrobial protection inhibits the growth of stain-causing bacteria, mold and mildew on the shade.

LEAD FREE · FLAME RETARDANT · ENERGY SAVING · PRINTABLE · INTERIOR 10 WARRANTY · EXTERIOR 5 WARRANTY

Style 2390

Standard Widths: 63" and 98" (160.0cm and 248.9cm); 126" (320cm) in P12, P13, P14, Q20, V22 and V24. Call for availability.
Standard Roll Length: 30 Linear Yards (27.4m)
Composition: 35% Fiberglass, 65% Vinyl on Fiberglass
Mesh Weight: 11.8 oz/yd² (403 g/m²)
Fabric Thickness: .017 in (0.43mm)
Openness Factor: Approximately 5%
UV Blockage: Approximately 95%

Style 2360

Standard Widths: 63" and 98" (160.0cm and 248.9cm)
Standard Roll Length: 30 Linear Yards (27.4m)
Composition: 35% Fiberglass, 65% Vinyl on Fiberglass
Mesh Weight: 10.5 oz/yd² (356 g/m²)
Fabric Thickness: .017 in (0.43mm)
Openness Factor: Approximately 10%
UV Blockage: Approximately 90%

Style 2410

Standard Widths: 63" and 98" (160.0cm and 248.9cm); 126" (320cm) in P12, P13, P14, Q20, V22 and V24. Call for availability.
Standard Roll Length: 30 Linear Yards (27.4m)
Composition: 35% Fiberglass, 65% Vinyl on Fiberglass
Mesh Weight: 14.1 oz/yd² (471 g/m²)
Fabric Thickness: .019 in (0.48mm)
Openness Factor: Approximately 3%
UV Blockage: Approximately 97%

Style 2500

Standard Widths: 63" and 98" (160.0cm and 248.9cm)
Standard Roll Length: 30 Linear Yards (27.4m)
Composition: 37% Fiberglass, 63% Vinyl on Fiberglass
Mesh Weight: 16.4 oz/yd² (546 g/m²)
Fabric Thickness: .024 in (0.61mm)
Openness Factor: Approximately 1%
UV Blockage: Approximately 99%

* Performance evaluations conducted by Matrix, Inc., Mesa, Arizona.

TS = Solar Transmittance
RS = Solar Reflectance
AS = Solar Absorptance
TV = Visual Transmittance
1/8 CL = 1/8" Clear Glass
1/4 CL = 1/4" Clear Glass
1/4HA = 1/4" Heat Absorbing Glass
1/2 CL = 1/2" Clear Glass
1 CL = 1" Clear Glass
1 HA = 1" Heat Absorbing Glass

The solar optical properties are used to calculate the shading coefficient. The shading coefficient represents the percentage of solar heat gain that is transmitted to the interior through the glass and shading system. Darker colors provide maximum glare reduction and visibility. For complete technical information, current test results, performance specifications and larger samples, contact our Sun Control Marketing Department.

Solar Heat Control Properties of Phifer SheerWeave Style 2390 Fabrics Installed Internally, Zero-Degree Profile Angle

Style No.	Color	*Solar Optical Properties TS	RS	AS	TV	Shading Coefficient w/ Single 1/8CL	1/4CL	1/4HA	Insulating 1/2CL	1CL	1HA
P12	Oyster	21	61	18	14	0.38	0.38	0.34	0.36	0.35	0.27
P13	Oyster/Beige	17	54	29	12	0.42	0.41	0.36	0.39	0.38	0.29
P14	Oyster/Pearl Gray	14	45	41	10	0.48	0.46	0.39	0.45	0.43	0.32
Q20	Beige	14	47	39	10	0.46	0.45	0.38	0.43	0.42	0.31
Q21	Beige/Pearl Gray	11	38	51	9	0.52	0.50	0.41	0.49	0.46	0.33
V20	Pearl Gray	10	31	59	9	0.57	0.54	0.43	0.53	0.50	0.35
V21	Charcoal	4	4	92	5	0.73	0.69	0.51	0.69	0.63	0.43
V22	Charcoal/Gray	5	9	86	6	0.70	0.67	0.49	0.66	0.60	0.41
V24	Charcoal/Chestnut	6	6	88	6	0.73	0.69	0.60	0.68	0.62	0.42
V32	Charcoal/Alpaca	7	18	75	9	0.65	0.62	0.47	0.61	0.56	0.39

Solar Heat Control Properties of Phifer SheerWeave Style 2360 Fabrics Installed Internally, Zero-Degree Profile Angle

Style No.	Color	*Solar Optical Properties TS	RS	AS	TV	Shading Coefficient w/ Single 1/8CL	1/4CL	1/4HA	Insulating 1/2CL	1CL	1HA
P12	Oyster	27	57	16	21	0.43	0.42	0.36	0.39	0.38	0.29
P13	Oyster/Beige	24	51	25	19	0.46	0.45	0.38	0.43	0.41	0.31
P14	Oyster/Pearl Gray	20	45	35	16	0.49	0.48	0.40	0.46	0.44	0.32
Q20	Beige	19	44	37	16	0.50	0.48	0.40	0.46	0.44	0.32
Q21	Beige/Pearl Gray	17	39	44	15	0.53	0.51	0.41	0.49	0.46	0.34
V20	Pearl Gray	16	30	54	14	0.59	0.56	0.44	0.55	0.51	0.36
V21	Charcoal	10	4	86	11	0.75	0.71	0.52	0.70	0.64	0.43
V22	Charcoal/Gray	12	8	80	14	0.73	0.69	0.51	0.68	0.62	0.42
V24	Charcoal/Chestnut	11	5	84	12	0.74	0.70	0.51	0.69	0.63	0.43
V32	Charcoal/Alpaca	12	15	73	16	0.68	0.65	0.48	0.64	0.58	0.40

Solar Heat Control Properties of Phifer SheerWeave Style 2410 Fabrics Installed Internally, Zero-Degree Profile Angle

Style No.	Color	*Solar Optical Properties TS	RS	AS	TV	Shading Coefficient w/ Single 1/8CL	1/4CL	1/4HA	Insulating 1/2CL	1CL	1HA
P12	Oyster	17	64	19	12	0.35	0.35	0.33	0.33	0.33	0.26
P13	Oyster/Beige	11	55	34	8	0.40	0.39	0.35	0.38	0.37	0.28
P14	Oyster/Pearl Gray	9	44	47	7	0.47	0.46	0.38	0.44	0.43	0.31
Q20	Beige	10	48	42	7	0.45	0.44	0.37	0.42	0.41	0.30
Q21	Beige/Pearl Gray	7	39	54	5	0.50	0.49	0.40	0.47	0.45	0.33
V20	Pearl Gray	6	31	63	5	0.56	0.53	0.42	0.52	0.49	0.35
V21	Charcoal	3	3	94	3	0.74	0.70	0.51	0.69	0.63	0.43
V22	Charcoal/Gray	3	9	88	3	0.70	0.66	0.49	0.65	0.60	0.41
V24	Charcoal/Chestnut	3	6	91	3	0.72	0.68	0.50	0.67	0.62	0.42
V32	Charcoal/Alpaca	4	20	76	5	0.63	0.60	0.46	0.59	0.55	0.38

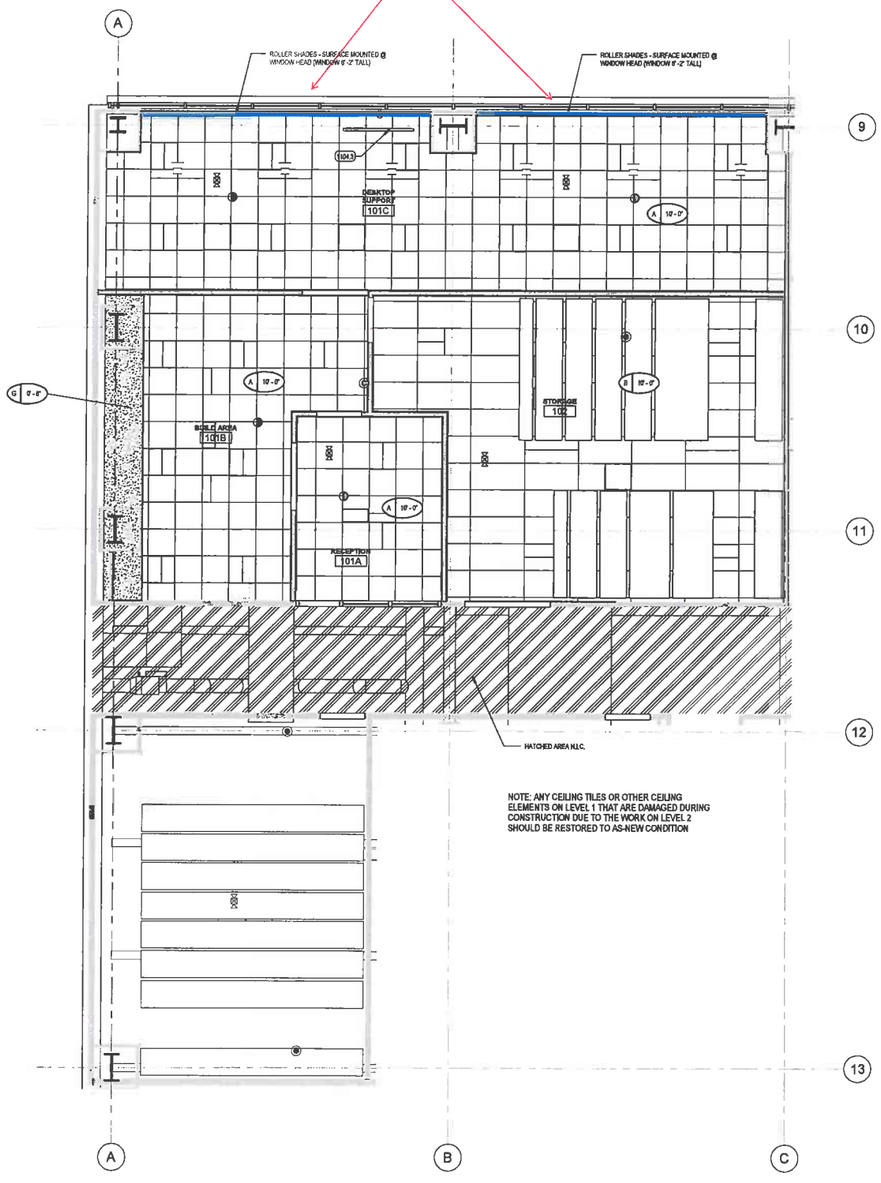
Solar Heat Control Properties of Phifer SheerWeave Style 2500 Fabrics Installed Internally, Zero-Degree Profile Angle

Style No.	Color	*Solar Optical Properties TS	RS	AS	TV	Shading Coefficient w/ Single 1/8CL	1/4CL	1/4HA	Insulating 1/2CL	1CL	1HA
P12	Oyster	15	68	17	13	0.31	0.32	0.31	0.30	0.30	0.25
P13	Oyster/Beige	10	60	30	9	0.36	0.36	0.33	0.34	0.34	0.27
P14	Oyster/Pearl Gray	7	50	43	6	0.43	0.42	0.36	0.40	0.39	0.29
Q20	Beige	7	50	43	6	0.43	0.42	0.36	0.40	0.39	0.29
Q21	Beige/Pearl Gray	5	42	53	5	0.48	0.46	0.39	0.45	0.43	0.32
V20	Pearl Gray	3	32	65	3	0.54	0.52	0.42	0.52	0.48	0.34
V21	Charcoal	1	4	95	1	0.73	0.69	0.50	0.69	0.62	0.42
V22	Charcoal/Gray	2	8	90	3	0.70	0.67	0.49	0.67	0.60	0.41
V24	Charcoal/Chestnut	1	6	93	1	0.71	0.68	0.50	0.68	0.61	0.42
V32	Charcoal/Alpaca	1	16	83	2	0.65	0.62	0.47	0.61	0.56	0.39

COLTON INCORPORATED
3455 South 3600 West
Salt Lake City UT 84119
801-969-3453 ph
801-969-7858 fax
800-437-6488 toll free

= Manual Roller Shades

Shades to break on vertical mullions



NOTE: ANY CEILING TILES OR OTHER CEILING ELEMENTS ON LEVEL 1 THAT ARE DAMAGED DURING CONSTRUCTION DUE TO THE WORK ON LEVEL 2 SHOULD BE RESTORED TO AS-NEW CONDITION

CEILING LEGEND

- A- SUSPENDED 2' X 2' ACOUSTICAL LAY-IN TILE CEILING
- B- SUSPENDED 2' X 4' ACOUSTICAL LAY-IN TILE CEILING - FABRIC SURFACE W/ MATCHING GRID
- C1- 3' X 5' SUSPENDED CEILING CLOUD SYSTEM
- C2- 59" Ø SUSPENDED CEILING CLOUD SYSTEM
- C3- 42" Ø SUSPENDED CEILING CLOUD SYSTEM
- C4- 24" Ø SUSPENDED CEILING CLOUD SYSTEM
- D- OPEN TO STRUCTURE ABOVE, PAINTED @ NEW CONSTRUCTION AND TOUCHED UP @ EXISTING
- E- EXISTING CEILING TO REMAIN UNDISTURBED FORM NEW CONSTRUCTION, ANY DAMAGE DURING CONSTRUCTION TO BE REPAIRED/REPLACED AT CONTRACTORS EXPENSE
- F- OPEN TO STRUCTURE ABOVE
- G- 5/8" GYP. BD. CEILING SYSTEM (1 LAYER) PAINTED, ON SUSPENDED METAL FRAME
- H- EXISTING 5/8" GYP BD. CEILING RETROFIT WITH NEW LIGHTING, RESTORED TO ORIGINAL CONDITION, PAINTED.
- J- SUSPENDED 2' X 4' ACOUSTICAL LAY - IN TILE

CEILING SYMBOLS

ARCHITECTURAL

- 2'X4' ACOUSTICAL TILE REMOVED, FOR MECHANICAL PLENUM

ELECTRICAL

- 2'X4' FLUORESCENT FIXTURE
- 2'X2' FLUORESCENT FIXTURE
- 1'X4' FLUORESCENT FIXTURE
- FLUORESCENT STRIP FIXTURE
- RECESSED DOWN LIGHT
- WALL WASH
- 1'X4' FLUORESCENT FIXTURE
- EXIT SIGN, SINGLE-SIDED
- EXIT SIGN, DOUBLE-SIDED
- F FIRE ALARM
- S SPEAKER
- (P) SMOKE DETECTOR
- (W) WIRELESS INTERNET

MECHANICAL

- SUPPLY GRILLE
- RETURN GRILLE
- EXHAUST GRILLE
- LINEAR DIFFUSER
- SPRINKLER HEAD - CEILING MOUNT
- SPRINKLER HEAD - WALL MOUNT

GENERAL CEILING NOTES

1. REFER TO DETAIL C5/A520-0 FOR TYPICAL CEILING SUSPENSION & SEISMIC BRACING
2. REFER TO DETAIL A5/A520-0 FOR TYPICAL SUSPENDED GYP. BOARD CEILINGS
3. UNIDENTIFIED CEILING TYPES ON THE PLANS SHALL BE TYPE " A" AT 9'-0" A.F.F.
4. GRID SUSPENSION SYSTEMS SHALL BE CENTERED WITHIN AREAS INDICATED, UNLESS NOTED OTHERWISE
5. PAINT ALL EXPOSED STRUCTURE, MECHANICAL, DUCTS, ELECTRICAL WORK, PIPING, ETC. ALL VISIBLE ELEMENTS TO BE PAINTED AT TYPE "D"
6. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATION OF MECHANICAL GRILLES, AND TO MECHANICAL DRAWINGS FOR QUANTITIES AND TYPES
7. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS OF LIGHT FIXTURES AND TO ELECTRICAL DRAWINGS FOR QUANTITY AND TYPES
8. MECHANICAL AND ELECTRICAL CONTRACTORS TO COORDINATE WORK WITH SPRINKLER CONTRACTOR TO AVOID CONFLICTS IN FIELD
9. ALL CEILING HEIGHTS ARE ELEVATION ABOVE TOP OF CONCRETE FLOOR SLAB
10. BRING FIREPROOFING AND STRUCTURAL ELEMENTS EXPOSED DURING CONSTRUCTION TO REQUIRED UL LISTING PRIOR TO BEING CONCEALED

A3 PLAN - RCP - LEVEL 01
SCALE 1/4" = 1'-0"

VCBO ARCHITECTURE
68 SOUTH 600 EAST, SALT LAKE CITY, UT 84102 801.575.8900 VCBO.COM

STATE OF UTAH
PETER BRUNJES
No. 12564-2201
LICENSED ARCHITECT
5.16.2015

REV	DATE	DESCRIPTION

VCBO NUMBER: 14350
CLIENT NUMBER: 00000
DATE: March 16, 2015

INTERMOUNTAIN LAKE PARK

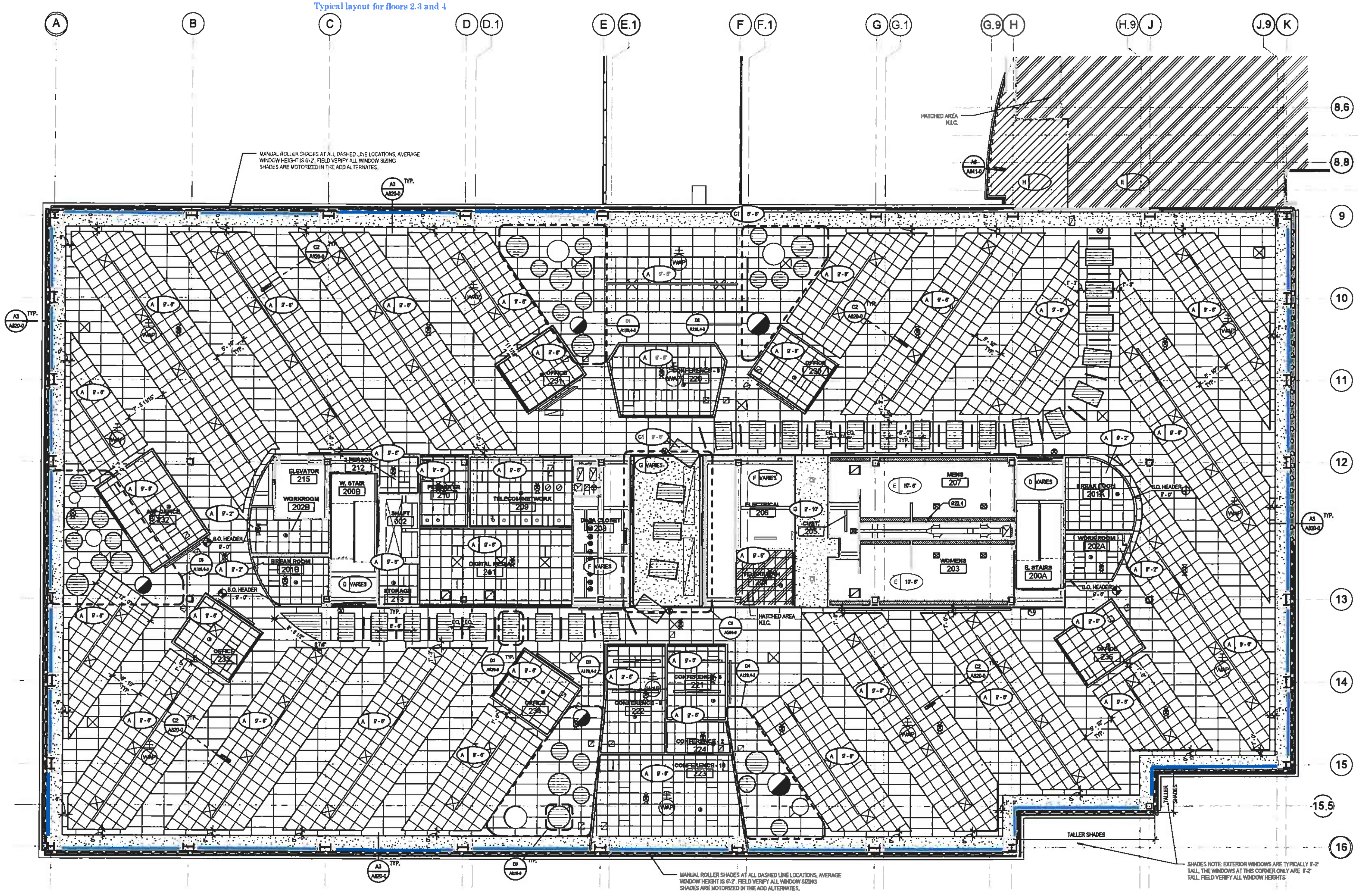
I.S. Department Remodel
4646 West Lake Park Blvd, Salt Lake City, UT 84130

CONSTRUCTION DOCUMENTS BID SET

PLAN - RCP - LEVEL 1

A110.3-1

=Manual Roller Shades
All roller shades to break on vertical mullions
Typical layout for floors 2,3 and 4



A3 PLAN - RCP - LEVEL 02B
SCALE 1/8" = 1'-0"
NORTH

KEYED NOTES

922.4	EXISTING LIGHTING COVE TO BE FRAMED IN AND REFINISHED TO MATCH THE ADJACENT CEILING

CEILING LEGEND

A-	SUSPENDED 2' X 2' ACOUSTICAL LAY-IN TILE CEILING
B-	SUSPENDED 2' X 4' ACOUSTICAL LAY-IN TILE CEILING - FABRIC SURFACE W/ MATCHING GRID
C1-	3' X 5' SUSPENDED CEILING CLOUD SYSTEM
C2-	59" Ø SUSPENDED CEILING CLOUD SYSTEM
C3-	42" Ø SUSPENDED CEILING CLOUD SYSTEM
C4-	24" Ø SUSPENDED CEILING CLOUD SYSTEM
D-	OPEN TO STRUCTURE ABOVE, PAINTED @ NEW CONSTRUCTION AND TOUCHED UP @ EXISTING
E-	EXISTING CEILING TO REMAIN UNDISTURBED FORM NEW CONSTRUCTION, ANY DAMAGE DURING CONSTRUCTION TO BE REPAIRED/REPLACED AT CONTRACTORS EXPENSE
F-	OPEN TO STRUCTURE ABOVE
G-	5/8" GYP. BD. CEILING SYSTEM (1 LAYER) PAINTED, ON SUSPENDED METAL FRAME
H-	EXISTING 5/8" GYP BD. CEILING RETROFIT WITH NEW LIGHTING, RESTORED TO ORIGINAL CONDITION, PAINTED.
J-	SUSPENDED 2' X 4' ACCOUSTICAL LAY - IN TILE

CEILING SYMBOLS

ARCHITECTURAL

- 2'X4' ACOUSTICAL TILE REMOVED. FOR MECHANICAL PLENUM

ELECTRICAL

- 2X4 FLUORESCENT FIXTURE
- 2X2 FLUORESCENT FIXTURE
- 1X4 FLUORESCENT FIXTURE
- FLUORESCENT STRIP FIXTURE
- RECESSED DOWN LIGHT
- WALL WASH
- 1X4 FLUORESCENT FIXTURE
- EXIT SIGN, SINGLE-SIDED
- EXIT SIGN, DOUBLE-SIDED
- FIRE ALARM
- SPEAKER
- SMOKE DETECTOR
- WIRELESS INTERNET

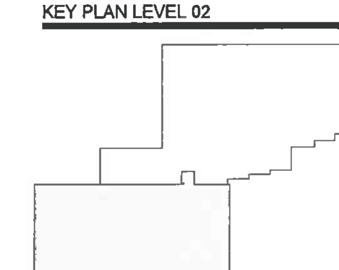
MECHANICAL

- SUPPLY GRILLE
- RETURN GRILLE
- EXHAUST GRILLE
- LINEAR DIFFUSER
- SPRINKLER HEAD - CEILING MOUNT
- SPRINKLER HEAD - WALL MOUNT

GENERAL CEILING NOTES

1. REFER TO DETAIL C6/A520-0 FOR TYPICAL CEILING SUSPENSION & SEISMIC BRACING
2. REFER TO DETAIL A6/A520-0 FOR TYPICAL SUSPENDED GYP. BOARD CEILINGS
3. UNIDENTIFIED CEILING TYPES ON THE PLANS SHALL BE TYPE " A" AT 9'-6" A.F.F.
4. GRID SUSPENSION SYSTEMS SHALL BE CENTERED WITHIN AREAS INDICATED, UNLESS NOTED OTHERWISE
5. PAINT ALL EXPOSED STRUCTURE, MECHANICAL, DUCTS, ELECTRICAL WORK, PIPING, ETC. ALL VISIBLE ELEMENTS TO BE PAINTED AT TYPE "D"
6. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATION OF MECHANICAL GRILLES, AND TO MECHANICAL DRAWINGS FOR QUANTITIES AND TYPES
7. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS OF LIGHT FIXTURES AND TO ELECTRICAL DRAWINGS FOR QUANTITY AND TYPES
8. MECHANICAL AND ELECTRICAL CONTRACTORS TO COORDINATE WORK WITH SPRINKLER CONTRACTOR TO AVOID CONFLICTS IN FIELD
9. ALL CEILING HEIGHTS ARE ELEVATION ABOVE TOP OF CONCRETE FLOOR SLAB
10. BRING FIREPROOFING AND STRUCTURAL ELEMENTS EXPOSED DURING CONSTRUCTION TO REQUIRED UL LISTING PRIOR TO BEING CONCEALED

KEY PLAN LEVEL 02



VCBO ARCHITECTURE

STATE OF UTAH
PETER BRUNJES
3-16-2015

REV	DATE	DESCRIPTION

VCBO NUMBER: 14380
CLIENT NUMBER: 00000
DATE: March 16, 2015

INTERMOUNTAIN LAKE PARK

I.S. Department Remodel
4646 West Lake Park Blvd, Salt Lake City, UT 84130
CONSTRUCTION DOCUMENTS BID SET

PLAN - RCP - LEVEL 2

A120.5-2

LETTER OF TRANSMITTAL

SAUNDERS CONSTRUCTION, INC.
1601 N. 750 W.
Ogden, Utah 84404
(801) 782-7830 • Fax (801) 782-7856

DATE 5-26-15	JOB NO.
ATTENTION Joan Ellon	
RE: IHC Lake Park	

To VCBO Architects

WE ARE SENDING YOU ☐ Attached ☐ Under separate cover via _____ the following items:

☐ Shop Drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of Letter ☐ Change Order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
1			Roller shade fabric samples Section 12-2400

RECEIVED
MAY 26 2015
VCBO
ARCHITECTURE

THESE ARE TRANSMITTED as checked below:

☑ For Approval ☐ Approved as Submitted ☐ Resubmit _____ Copies for Approval

☐ For Your Use ☐ Approved as Noted ☐ Submit _____ Copies for Distribution

☐ As Requested ☐ Returned for Corrections ☐ Return _____ Corrected Prints

☐ For Review and Comment ☐ _____

☐ FOR BIDS DUE _____ 20_____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS: _____

COPY TO: _____

SIGNED: LSR

If enclosures are not as noted, kindly notify us at once.

NEW! Now with TrackLess™ TECHNOLOGY

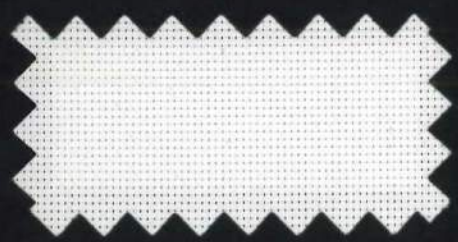
Interior Sun Control Fabrics

Phifer SheerWeave® BRAND FABRIC

STYLE 2390/2360/2410/2500

Style 2390 (5% open)	Style 2360 (10% open)	Style 2410 (3% open)	Style 2500 (1% open)
			
P13 Oyster/Beige	P13 Oyster/Beige	P13 Oyster/Beige	P13 Oyster/Beige

THE ABOVE STYLES ARE ALSO AVAILABLE IN THE COLORS SHOWN BELOW.



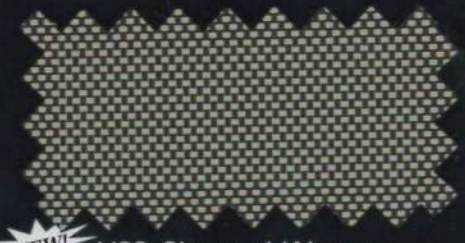
P12 Oyster

P14 Oyster/Pearl Gray

Q20 Beige

Q21 Beige/Pearl Gray

V20 Pearl Gray



NEW! V32 Charcoal/Alpaca

V21 Charcoal

V22 Charcoal/Gray

V24 Charcoal/Chestnut

SheerWeave® Style 2390/2360/2410/2500

Specifications

■ Manufactured with ease of fabrication in mind, Styles 2390, 2360, 2410 and 2500 are full basketweaves designed expressly for those applications which require a more opaque and nondirectional fabric. Style 2390/2360/2410/2500 can also be used in exterior roller shades.

Fire Classification: M1 (Style 2390), California U.S. Title 19 (small scale), NFPA 701-2004 TM#1 (small scale), NFPA 101 (Class A Rating), UBC (Class I), BS 5867 2008 Part 2 Type B Performance, NFPA 701 TM#2 (large scale), and CAN/ULC-S109-03 (large and small scale)

Bacteria and Fungal Resistance: ASTM E 2180, ASTM G22, AATCC30 Part 3, ASTM G21, ASTM D 3273, GREENGUARD Mold and Bacteria Standard ASTM 6329; includes Microban antimicrobial additives

Environmental Certification: GREENGUARD Certified and GREENGUARD for Children and Schools Certified

Lead Free: RoHS / Directive 2002/95/EC, US Consumer Product Safety Commission Section 101 and ANSI/WCMA A100.1-2007 for lead content, REACH (EC 1907/2006) compliant

Standard Uses: Roll-up shades, Roman shades, folding shades, pleated shades, vertical blinds, panel tracks, sheers and screens.

Warranty: 10-year interior; 5-year exterior

TrackLess™: Track*Less* Technology minimizes the fiberglass yarns inherent tendencies to track when being rolled up in a shade. With Track*Less* Technology these same fabrics now track less, roll up straighter and reduce shade fabrication time.

Children & Schools GREENGUARD Indoor Air Quality Certified

Microban® antimicrobial product protection

Microban® antimicrobial protection inhibits the growth of stain-causing bacteria, mold and mildew on the shade.

LEAD Pb FREE

FLAME RETARDANT

ENERGY SAVING

PRINTABLE

INTERIOR 10 WARRANTY

EXTERIOR 5 WARRANTY

Style 2390

Standard Widths: 63" and 98" (160.0cm and 248.9cm); 126" (320cm) in P12, P13, P14, Q20, V22 and V24. Call for availability.
Standard Roll Length: 30 Linear Yards (27.4m)
Composition: 35% Fiberglass, 65% Vinyl on Fiberglass
Mesh Weight: 11.8 oz/yd² (403 g/m²)
Fabric Thickness: .017 in (0.43mm)
Openness Factor: Approximately 5%
UV Blockage: Approximately 95%

Style 2360

Standard Widths: 63" and 98" (160.0cm and 248.9cm)
Standard Roll Length: 30 Linear Yards (27.4m)
Composition: 35% Fiberglass, 65% Vinyl on Fiberglass
Mesh Weight: 10.5 oz/yd² (356 g/m²)
Fabric Thickness: .017 in (0.43mm)
Openness Factor: Approximately 10%
UV Blockage: Approximately 90%

Style 2410

Standard Widths: 63" and 98" (160.0cm and 248.9cm); 126" (320cm) in P12, P13, P14, Q20, V22 and V24. Call for availability.
Standard Roll Length: 30 Linear Yards (27.4m)
Composition: 35% Fiberglass, 65% Vinyl on Fiberglass
Mesh Weight: 14.1 oz/yd² (471 g/m²)
Fabric Thickness: .019 in (0.48mm)
Openness Factor: Approximately 3%
UV Blockage: Approximately 97%

Style 2500

Standard Widths: 63" and 98" (160.0cm and 248.9cm)
Standard Roll Length: 30 Linear Yards (27.4m)
Composition: 37% Fiberglass, 63% Vinyl on Fiberglass
Mesh Weight: 16.4 oz/yd² (546 g/m²)
Fabric Thickness: .024 in (0.61mm)
Openness Factor: Approximately 1%
UV Blockage: Approximately 99%

* Performance evaluations conducted by Matrix, Inc., Mesa, Arizona.

TS = Solar Transmittance
RS = Solar Reflectance
AS = Solar Absorptance
TV = Visual Transmittance
1/8 CL = 1/8" Clear Glass
1/4 CL = 1/4" Clear Glass
1/4HA = 1/4" Heat Absorbing Glass
1/2 CL = 1/2" Clear Glass
1 CL = 1" Clear Glass
1 HA = 1" Heat Absorbing Glass

The solar optical properties are used to calculate the shading coefficient. The shading coefficient represents the percentage of solar heat gain that is transmitted to the interior through the glass and shading system. Darker colors provide maximum glare reduction and visibility. For complete technical information, current test results, performance specifications and larger samples, contact our Sun Control Marketing Department.

Solar Heat Control Properties of Phifer SheerWeave Style 2390 Fabrics Installed Internally, Zero-Degree Profile Angle

Style No.	Color	*Solar Optical Properties TS	RS	AS	TV	Shading Coefficient w/ Single 1/8CL	1/4CL	1/4HA	Insulating 1/2CL	1CL	1HA
P12	Oyster	21	61	18	14	0.38	0.38	0.34	0.36	0.35	0.27
P13	Oyster/Beige	17	54	29	12	0.42	0.41	0.36	0.39	0.38	0.29
P14	Oyster/Pearl Gray	14	45	41	10	0.48	0.46	0.39	0.45	0.43	0.32
Q20	Beige	14	47	39	10	0.46	0.45	0.38	0.43	0.42	0.31
Q21	Beige/Pearl Gray	11	38	51	9	0.52	0.50	0.41	0.49	0.46	0.33
V20	Pearl Gray	10	31	59	9	0.57	0.54	0.43	0.53	0.50	0.35
V21	Charcoal	4	4	92	5	0.73	0.69	0.51	0.69	0.63	0.43
V22	Charcoal/Gray	5	9	86	6	0.70	0.67	0.49	0.66	0.60	0.41
V24	Charcoal/Chestnut	6	6	88	6	0.73	0.69	0.50	0.68	0.62	0.42
V32	Charcoal/Alpaca	7	18	75	9	0.65	0.62	0.47	0.61	0.56	0.39

Solar Heat Control Properties of Phifer SheerWeave Style 2360 Fabrics Installed Internally, Zero-Degree Profile Angle

Style No.	Color	*Solar Optical Properties TS	RS	AS	TV	Shading Coefficient w/ Single 1/8CL	1/4CL	1/4HA	Insulating 1/2CL	1CL	1HA
P12	Oyster	27	57	16	21	0.43	0.42	0.36	0.39	0.38	0.29
P13	Oyster/Beige	24	51	25	19	0.46	0.45	0.38	0.43	0.41	0.31
P14	Oyster/Pearl Gray	20	45	35	16	0.49	0.48	0.40	0.46	0.44	0.32
Q20	Beige	19	44	37	16	0.50	0.48	0.40	0.46	0.44	0.32
Q21	Beige/Pearl Gray	17	39	44	15	0.53	0.51	0.41	0.49	0.46	0.34
V20	Pearl Gray	16	30	54	14	0.59	0.56	0.44	0.55	0.51	0.36
V21	Charcoal	10	4	86	11	0.75	0.71	0.52	0.70	0.64	0.43
V22	Charcoal/Gray	12	8	80	14	0.73	0.69	0.51	0.68	0.62	0.42
V24	Charcoal/Chestnut	11	5	84	12	0.74	0.70	0.51	0.69	0.63	0.43
V32	Charcoal/Alpaca	12	15	73	16	0.68	0.65	0.48	0.64	0.58	0.40

Solar Heat Control Properties of Phifer SheerWeave Style 2410 Fabrics Installed Internally, Zero-Degree Profile Angle

Style No.	Color	*Solar Optical Properties TS	RS	AS	TV	Shading Coefficient w/ Single 1/8CL	1/4CL	1/4HA	Insulating 1/2CL	1CL	1HA
P12	Oyster	17	64	19	12	0.35	0.35	0.33	0.33	0.33	0.26
P13	Oyster/Beige	11	55	34	8	0.40	0.39	0.35	0.38	0.37	0.28
P14	Oyster/Pearl Gray	9	44	47	7	0.47	0.46	0.38	0.44	0.43	0.31
Q20	Beige	10	48	42	7	0.45	0.44	0.37	0.42	0.41	0.30
Q21	Beige/Pearl Gray	7	39	54	5	0.50	0.49	0.40	0.47	0.45	0.33
V20	Pearl Gray	6	31	63	5	0.56	0.53	0.42	0.52	0.49	0.35
V21	Charcoal	3	3	94	3	0.74	0.70	0.51	0.69	0.63	0.43
V22	Charcoal/Gray	3	9	88	3	0.70	0.66	0.49	0.65	0.60	0.41
V24	Charcoal/Chestnut	3	6	91	3	0.72	0.68	0.50	0.67	0.62	0.42
V32	Charcoal/Alpaca	4	20	76	5	0.63	0.60	0.46	0.59	0.55	0.38

Solar Heat Control Properties of Phifer SheerWeave Style 2500 Fabrics Installed Internally, Zero-Degree Profile Angle

Style No.	Color	*Solar Optical Properties TS	RS	AS	TV	Shading Coefficient w/ Single 1/8CL	1/4CL	1/4HA	Insulating 1/2CL	1CL	1HA
P12	Oyster	15	68	17	13	0.31	0.32	0.31	0.30	0.30	0.25
P13	Oyster/Beige	10	60	30	9	0.36	0.36	0.33	0.34	0.34	0.27
P14	Oyster/Pearl Gray	7	50	43	6	0.43	0.42	0.36	0.40	0.39	0.29
Q20	Beige	7	50	43	6	0.43	0.42	0.36	0.40	0.39	0.29
Q21	Beige/Pearl Gray	5	42	53	5	0.48	0.46	0.39	0.45	0.43	0.32
V20	Pearl Gray	3	32	65	3	0.54	0.52	0.42	0.52	0.48	0.34
V21	Charcoal	1	4	95	1	0.73	0.69	0.50	0.69	0.62	0.42
V22	Charcoal/Gray	2	8	90	3	0.70	0.67	0.49	0.67	0.60	0.41
V24	Charcoal/Chestnut	1	6	93	1	0.71	0.68	0.50	0.68	0.61	0.42
V32	Charcoal/Alpaca	1	16	83	2	0.65	0.62	0.47	0.61	0.56	0.39

COLTON INCORPORATED

3455 South 3600 West
Salt Lake City, UT 84119
801-969-3453 ph
801-969-7858 fax
800-437-6488 toll free

Saunders Construction Inc.

1601 N. 750 W. Harrisville, Utah 84404
(801)-782-7830 Fax (801)-782-7856
Website: www.saunders1.com
Email: saunderscoinc@yahoo.com

To: VCBO Architects

Letter of Transmittal

Date 06-01-15

Attention: JoanEllen

Re: IHC Lake Park

We are sending you _x__Attached _____Under separate cover via _____ the following items:
__Shop Drawings ___ Prints ____ Plans ____ Samples ____Specifications
__Copy of letter ___ Change Order _____

Copies	Spec. #	No.	Description
1			Roller Shade Re-Submittal Section 12-2400
			The warranty requires an exception from Hunter Douglas to match the 25 year
			requirement. The subcontractor is working on it.

☐ REVIEWED ☒ REVISE & RESUBMIT

☐ REJECTED ☐ FURNISH AS CORRECTED

Corrections or comments made on the shop drawings during this review do not relieve contractor from compliance with requirements of the drawings and specifications. This check is only for review of general conformance with the design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for: confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating his work with that of all other trades; and performing his work in a safe and satisfactory manner.

VCBO ARCHITECTURE, L.L.C.

Date: 06/11/2015 By: K. BELL

PLEASE PROVIDE PHYSICAL SAMPLES OF FABRIC OPTIONS AS REQUESTED IN THE SPECIFICATIONS SECTION 12 2400 PARAGRAPH 1.3 C

AS LISTED IN THE SPECIFICATIONS SECTION 12 2400 PARAGRAPH 1.4E AND AS NOTED ON THE PREVIOUS SUBMITTAL, PLEASE VERIFY THAT WINDOW COVERINGS COMPLY WITH WCMA A 100.1

ARCHITECT/DESIGNER CANNOT APPROVE SUBMITTAL UNTIL WARRANTY INFORMATION HAS BEEN REVIEWED

THESE ARE TRANSMITTED as checked below:

x	For Approval		Approved as Submitted		Resubmit __Copies for Approval
	For Your Use		Approved as Noted		Submit __Copies for Distribution
	As Requested		Returned for Corrections		Return___Corrected Prints
	For Review and Comment				
	FOR BIDS DUE		PRINTS RETURNED AFTER LOAN TO US		

REMARKS:

COPY TO: _____

SIGNED: _Ed Saunders_____

If enclosures are not as noted, kindly notify us at once.

Project Location

ROLLER SHADE FR QUOTE

QUOTE NO	589587	6/1/2015 0:00	HD FAB CONTRACT
ACCOUNT NO.	60021500	SIDE MAI IHC Lake Park	
SOLD TO	COLTON INC	CONTAC Jared Colton	
ADDRESS		0	Ph-1-8774949174
CITY/STATE/ZIP		0	Fax- 1-8668490251
Phone / Fax / Em	801-969-7858		hdfabcontracts@hunterdouglas.com
TOTAL AMOUNT	[illegible]		

RSM DAVID COVER

NOTES
0
0
0

SQ.FT	TOTAL QTY.
6968.33	226

3
2.5 EXTERIOR
2
1.5

DETACH. Y
CRANK QTY

2.88
2.25
2

PLEASE CHECK THE QUOTE YOU MAY HAVE MIX BRACKET,TUBE , TOP TREATMENT OR OPERATION. OVER RIDE IS AVAILABLE IF YOU WANT TO CHANGE IT.

4 Y

NO.	FAB. NO	FABRIC	QTY	W	L	MOUNT	CONTROL	SPLINE	BOTTOM BAR	ROLL UP	TUBE	TUBE OVER	RIDE CO	CLUTCH	LIFT	ASSIST	CRANK	OPERATION	MOTOR TYPE	BRACKET OVERRIDE	BRACKET	EXT	LEVELING	FT BO	OVERRIDE	TOP	TREATMENT	SIDE	CHANNEL	BOTTOM	CHANNEL	CLOSURE	COUPLED	COSTER	FINE ADJ	45 DEG	90 DEG	BANDED	CABLE	GUIDE
1	51	SW2410	226	60	74	O	L	0	S	2.194	1.5			R16				CO			1.5	S	N																	
2																					0.0	S	N																	
3																					0.0	S	N																	
4																					0.0	S	N																	
5																					0.0	S	N																	
6																					0.0	S	N																	
7																					0.0	S	N																	
8																					0.0	S	N																	
9																					0.0	S	N																	
10																					0.0	S	N																	

Shows Authorized Vendor

Shows that Sheerweave 2410 is part of their product line.

Reviewed by Saunders Construction 06/01/2015

EXISTING WINDOW SHADES #1

EXISTING WINDOW SHADES #2

TABLE OF CONTENTS

DIVISION 11 - EQUIPMENT

Not Used

DIVISION 12 - FURNISHINGS

DIVISION 13 - SPECIAL CONSTRUCTION

Not Used

DIVISION 14 - CONVEYING EQUIPMENT

Not Used

DIVISION 21 - FIRE SUPPRESSION

DIVISION 22 - PLUMBING

DIVISION 23 - HEATING, VENTILATING, AND AIR CONDITIONING

DIVISION 25 - INTEGRATED AUTOMATION

Not Used

DIVISION 26 - ELECTRICAL

DIVISION 27 - COMMUNICATIONS

END OF TABLE OF CONTENTS

SECTION 21 1000

WATER BASED FIRE SUPPRESSION SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following fire-suppression piping inside the building:
   1. Remodel of an existing wet-pipe sprinkler system.

B. Related Sections include the following:

   1. Division 10 Section "Fire Extinguisher Cabinets" and "Fire Extinguishers" for cabinets and fire extinguishers.

   2. Division 22 Section "Facility Water Distribution Piping" for piping outside the building.

   3. Division 28 Section "Fire Detection and Alarm" for alarm devices not specified in this Section.

C. All black steel sprinkler pipe shall have a wall thickness less than or equal to schedule 40 and greater than schedule 10.

   1. Exception: Pipe with a nominal pipe size of 6 inches and greater may be schedule 10.

D. Summary Table:

Item	Summary
Underground service entrance piping	Existing to remain
Interior pipe type	Mains: Schedule 40 Branch lines: Threadable thin wall or Schedule 40
Sprinkler Finish	Flat Plate Concealed, except uprights and storage
Extended Coverage	Not Allowed
Center of Tile	Not required, follow a uniform pattern throughout
Flexible Sprinkler Drops	Not allowed
FM Global	No, AIG Insured
Calculations	Required, contractor is responsible for obtaining flow data for calculations. Use 10% reduced flow data.
Alarm Device	Existing to remain

FDC	Existing to remain
Special Items	Sprinkler Contractor shall upgrade existing fire riser with a double check backflow preventer per code official.

1.3 DEFINITIONS

A. CPVC: Chlorinated polyvinyl chloride plastic.

B. CR: Chlorosulfonated polyethylene synthetic rubber.

C. High-Pressure Piping System: Fire-suppression piping system designed to operate at working pressure higher than standard 175 psig.

D. PE: Polyethylene plastic.

E. Underground Service-Entrance Piping: Underground service piping below the building.

1.4 SYSTEM DESCRIPTIONS

A. Existing Wet-Pipe Sprinkler System: Add/relocate fire sprinkler head locations for new floor plan and ceiling plan including ceiling height adjustments. Modify sprinkler piping as required. Existing sprinkler piping may be used where it meets the current standards and is not defective. All sprinkler removed shall be replaced with new quick response sprinklers. All sprinklers throughout each remodeled space shall be quick response. Automatic sprinklers are attached to piping containing water and that is connected to water supply. Water discharges immediately from sprinklers when they are opened. Sprinklers open when heat melts fusible link or destroys frangible device. Hose connections are included if indicated.

1.5 PERFORMANCE REQUIREMENTS

A. Standard Piping System Component Working Pressure: Listed for at least 175 psig.

B. Sprinkler contractor responsible for obtaining flow data for hydraulic calculations. Design sprinkler piping according to 10% reduced flow data and obtain approval from engineer, prior to submitting to other authorities having jurisdiction.

1. Margin of Safety for Available Water Flow and Pressure: 10 percent, including losses through water-service piping, valves, and backflow preventers.
2. Sprinkler Occupancy Hazard Classifications:

    a. Building Service Areas: Ordinary Hazard, Group 1.
    b. Electrical Equipment Rooms: Ordinary Hazard, Group 1.
    c. General Storage Areas: Ordinary Hazard, Group 1.
    d. High Density Storage (moveable racks): Ordinary Hazard, Group 1.
    e. Libraries, Except Stack Areas: Light Hazard.
    f. Mechanical Equipment Rooms: Ordinary Hazard, Group 1.
    g. Office and Public Areas: Light Hazard.

3. Minimum Density for Automatic-Sprinkler Piping Design:

a. Light-Hazard Occupancy: 0.10 gpm over 1500-sq. ft. area.
b. Ordinary-Hazard, Group 1 Occupancy: 0.15 gpm over 1500-sq. ft. area.
c. Ordinary-Hazard, Group 2 Occupancy: 0.20 gpm over 1500-sq. ft. area.
d. Special Occupancy Hazard: As determined by authorities having jurisdiction.

4. Maximum Protection Area per Sprinkler:

a. Office Spaces: 225 sq. ft..
b. Storage Areas: 130 sq. ft..
c. Mechanical Equipment Rooms: 130 sq. ft..
d. Electrical Equipment Rooms: 130 sq. ft..
e. Other Areas: According to NFPA 13 recommendations, unless otherwise indicated.

5. Total Combined Hose-Stream Demand Requirement: According to NFPA 13, unless otherwise indicated:

a. Light-Hazard Occupancies: 100 gpm for 30 minutes.
b. Ordinary-Hazard Occupancies: 250 gpm for 60 to 90 minutes.
c. Extra-Hazard Occupancies: 500 gpm for 90 to 120 minutes.

C. Seismic Performance: Fire-suppression piping shall be capable of withstanding the effects of earthquake motions determined according to NFPA 13.

1.6 SUBMITTALS

A. Product Data: For the following:
1. Piping materials, including dielectric fittings, flexible connections, and sprinkler specialty fittings.
2. Pipe hangers and supports, including seismic restraints.
3. Valves, including listed fire-protection valves, unlisted general-duty valves, and specialty valves and trim.
4. Sprinklers, escutcheons, and guards. Include sprinkler flow characteristics, mounting, finish, and other pertinent data.
5. Alarm devices, including electrical data.

B. Shop Drawings: Diagram power, signal, and control wiring.

C. Fire-hydrant flow test report.

D. Seismic Calculations.

E. Approved Sprinkler Piping Drawings: Working plans, prepared according to NFPA 13, that have been approved by authorities having jurisdiction, including hydraulic calculations, if applicable. Drawings are to be approved by Engineer prior to submission to State Fire Marshal.

F. Field Test Reports and Certificates: Indicate and interpret test results for compliance with performance requirements and as described in NFPA 13. Include "Contractor's Material and Test Certificate for Aboveground Piping."

G. Field quality-control test reports.

H. Operation and Maintenance Data: For sprinkler specialties to include in emergency, operation, and maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications:

1. An experienced installer who has designed and installed fire-suppression piping similar to that indicated for this Project and obtained design approval and inspection approval from authorities having jurisdiction. The Engineer requires evidence to support the ability of the contractor to perform work in the scope and volume as specified. A contractor, who cannot show such experience, may be found not suitable to perform the work. The following are the approved contractors for this project:

a. PRE-APPROVED CONTRACTORS LIST
   1) Alta Fire
   2) Certified Fire
   3) Chaparral Fire
   4) Delta Fire
   5) Quality Fire Protection
   6) Fire Engineering
   7) Fire Services Inc.
   8) FireTrol
   9) Simplex-Grinnell
   10) The Safety Team
   11) Western Automatic
   12) Or prior approved equal

b. A contractor not listed in the “PRE-APPROVED CONTRACTORS LIST” must receive prior approval from the engineer to bid this project.

B. Installer's responsibilities include designing, fabricating, and installing fire-suppression systems and providing professional engineering services needed to assume engineering responsibility. Base calculations on results of fire-hydrant flow test.

1. Engineering Responsibility: Preparation of working plans, calculations, and field test reports by a qualified professional engineer or NICET Level III technician.

C. Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX.

D. NFPA Standards: Fire-suppression-system equipment, specialties, accessories, installation, and testing shall comply with the following:

1. NFPA 13-2013, "Installation of Sprinkler Systems."

E. International Conference of Building Code Officials codes and standards complying with the following:

1. IBC-2015, “International Building Code.”
2. IFC-2015, “International Fire Code.”

F. Utah Amendments

1. Title 15A

1.8 COORDINATION

A. Coordinate layout and installation of sprinklers with other construction that penetrates ceilings, including light fixtures, HVAC equipment, and partition assemblies.

1.9 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Sprinkler Cabinets: Finished, wall-mounting, steel cabinet with hinged cover, with space for minimum of six spare sprinklers plus sprinkler wrench. Include number of sprinklers required by NFPA 13 and sprinkler wrench. Include separate cabinet with sprinklers and wrench for each type of sprinkler on Project.

1.10 GENERAL ENGINEERING QUALITY

A. Unless noted otherwise the following applies:

1. In the event of multiple (3) submittal rejections (including revise and resubmit) a meeting shall be held at the engineer's office at the engineer time of choosing and the designer, fire sprinkler contractor, and general contractor shall be physically in attendance to discuss the required modifications to the design.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 STEEL PIPE AND FITTINGS

A. Threaded-End, Standard-Weight Steel Pipe: ASTM A 53/A 53M, ASTM A 135, or ASTM A 795, hot-dip galvanized where indicated and with factory- or field-formed threaded ends.

1. Cast-Iron Threaded Flanges: ASME B16.1.
2. Malleable-Iron Threaded Fittings: ASME B16.3.
3. Gray-Iron Threaded Fittings: ASME B16.4.
4. Steel Threaded Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M or ASTM A 106, Schedule 40, seamless steel pipe hot-dip galvanized where indicated.
5. Include ends matching joining method.Steel Threaded Couplings: ASTM A 865 hot-dip galvanized-steel pipe where indicated.

B. Plain-End, Standard-Weight Steel Pipe: ASTM A 53/A 53M, ASTM A 135, or ASTM A 795 hot-dip galvanized-steel pipe where indicated.

1. Locking-Lug Fittings: UL 213, ductile-iron body with retainer lugs that require one-quarter turn to secure pipe in fitting not allowed.

C. Plain-End, Standard-Weight Steel Pipe: ASTM A 53/A 53M, ASTM A 135, or ASTM A 795 hot-dip galvanized-steel pipe where indicated.

1. Steel Welding Fittings: ASTM A 234/A 234M, and ASME B16.9 or ASME B16.11.
2. Steel Flanges and Flanged Fittings: ASME B16.5.

D. Grooved-End, Standard-Weight Steel Pipe: ASTM A 53/A 53M, ASTM A 135, or ASTM A 795, hot-dip galvanized where indicated and with factory- or field-formed, roll-grooved ends.

1. Grooved-Joint Piping Systems:

a. Manufacturers:

1) Anvil International, Inc.
2) Central Sprinkler Corp.
3) Victaulic Co. of America.
4) Ward Manufacturing.

b. Grooved-End Fittings: UL-listed, ASTM A 536, ductile-iron casting with OD matching steel-pipe OD.

c. Grooved-End-Pipe Couplings: UL 213 and AWWA C606, rigid pattern, unless otherwise indicated; gasketed fitting matching steel-pipe OD. Include ductile-iron housing with keys matching steel-pipe and fitting grooves, prelubricated rubber gasket listed for use with housing, and steel bolts and nuts.

E. Threaded-End, Threadable, Thinwall Steel Pipe: ASTM A 135 or ASTM A 795, with wall thickness less than Schedule 40 and greater than Schedule 10, and with factory- or field-formed threaded ends.

1. Cast-Iron Threaded Flanges: ASME B16.1.
2. Malleable-Iron Threaded Fittings: ASME B16.3.
3. Gray-Iron Threaded Fittings: ASME B16.4.
4. Steel Threaded Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M or ASTM A 106, Schedule 40, seamless steel pipe.
5. Steel Threaded Couplings: ASTM A 865.

F. Plain-End, Threadable, Thinwall Steel Pipe: ASTM A 135 or ASTM A 795, with wall thickness less than Schedule 40 and greater than Schedule 10.

1. Locking-Lug Fittings: UL 213, ductile-iron body with retainer lugs that require one-quarter turn to secure pipe in fitting not allowed.

G. Plain-End, Threadable, Thinwall Steel Pipe: ASTM A 135 or ASTM A 795, with wall thickness less than Schedule 40 and greater than Schedule 10.

1. Steel Welding Fittings: ASTM A 234/A 234M, and ASME B16.9 or ASME B16.11.
2. Steel Flanges and Flanged Fittings: ASME B16.5.

H. Grooved-End, Threadable, Thinwall Steel Pipe: ASTM A 135 or ASTM A 795, with wall thickness less than Schedule 40 and greater than Schedule 10, and with factory- or field-formed, roll-grooved ends.

1. Grooved-Joint Piping Systems:

a. Manufacturers:

1) Anvil International, Inc.
2) Central Sprinkler Corp.
3) Victaulic Co. of America.
4) Ward Manufacturing.

b. Grooved-End Fittings: UL-listed, ASTM A 536, ductile-iron casting with OD matching steel-pipe OD.

c. Grooved-End-Pipe Couplings: UL 213 and AWWA C606, rigid pattern, unless otherwise indicated; gasketed fitting matching steel-pipe OD. Include ductile-iron housing with keys matching steel-pipe and fitting grooves, prelubricated rubber gasket listed for use with housing, and steel bolts and nuts.

I. Plain-End, Schedule 10 Steel Pipe: ASTM A 135 or ASTM A 795, Schedule 10 is not allowed.

J. Plain-End, Nonstandard OD, Thinwall Steel Pipe: ASTM A 135 or ASTM A 795, with wall thickness less than Schedule 10 is not allowed.

K. Plain-End, Hybrid Steel Pipe: ASTM A 135 or ASTM A 795, lightwall, with wall thickness less than Schedule 10 and greater than Schedule 5 is not allowed.

L. Grooved-End, Hybrid Steel Pipe: ASTM A 135 or ASTM A 795, lightwall, with wall thickness less than Schedule 10 and greater than Schedule 5; with factory- or field-formed, roll-grooved ends are not allowed.

M. Schedule 5 Steel Pipe: ASTM A 135 or ASTM A 795, lightwall, with plain ends is not allowed.

2.3 FLEXIBLE SPRINKLER DROPS

A. Flexible connectors shall not be used.

2.4 LISTED FIRE-PROTECTION VALVES

A. Valves shall be FMG approved, with 175-psig minimum pressure rating. Valves shall have 250-psig minimum pressure rating if valves are components of high-pressure piping system.

B. Ball Valves: Comply with UL 1091, except with ball instead of disc.

1. NPS 1-1/2 and Smaller: Bronze body with threaded ends.
2. NPS 2 and NPS 2-1/2: Bronze body with threaded ends or ductile-iron body with grooved ends.

3. NPS 3: Ductile-iron body with grooved ends.

4. Manufacturers:

   a. NIBCO.
   b. Victaulic Co. of America.

5. Butterfly Valves: UL 1091.

6. NPS 2 and Smaller: Bronze body with threaded ends.

   a. Manufacturers:

      1) Global Safety Products, Inc.
      2) Milwaukee Valve Company.

7. NPS 2-1/2 and Larger: Bronze, cast-iron, or ductile-iron body; wafer type or with flanged or grooved ends.

   a. Manufacturers:

      1) Central Sprinkler Corp.
      2) McWane, Inc.; Kennedy Valve Div.
      3) Mueller Company.
      4) NIBCO.
      5) Victaulic Co. of America.

C. Check Valves NPS 2 and Larger: UL 312, swing type, cast-iron body with flanged or grooved ends.

1. Manufacturers:

   a. American Cast Iron Pipe Co.; Waterous Co.
   b. Central Sprinkler Corp.
   c. Clow Valve Co.
   d. Crane Co.; Crane Valve Group; Crane Valves.
   e. Crane Co.; Crane Valve Group; Jenkins Valves.
   f. Globe Fire Sprinkler Corporation.
   g. Grinnell Fire Protection.
   h. Hammond Valve.
   i. McWane, Inc.; Kennedy Valve Div.
   j. Mueller Company.
   k. NIBCO.
   l. Potter-Roemer; Fire Protection Div.
   m. Reliable Automatic Sprinkler Co., Inc.
   n. Star Sprinkler Inc.
   o. Stockham.
   p. United Brass Works, Inc.
   q. Victaulic Co. of America.
   r. Watts Industries, Inc.; Water Products Div.

D. Indicating Valves: UL 1091, with integral indicating device and ends matching connecting piping.

1. Indicator: Electrical, 115-V ac, prewired, single-circuit, supervisory switch and Visual.
2. NPS 2 and Smaller: Ball or butterfly valve with bronze body and threaded ends.

a. Manufacturers:

1) Milwaukee Valve Company.
2) NIBCO.
3) Victaulic Co. of America.

3. NPS 2-1/2 and Larger: Butterfly valve with cast- or ductile-iron body; wafer type or with flanged or grooved ends.

a. Manufacturers:

1) Central Sprinkler Corp.
2) Grinnell Fire Protection.
3) McWane, Inc.; Kennedy Valve Div.
4) Milwaukee Valve Company.
5) NIBCO.
6) Victaulic Co. of America.

2.5 UNLISTED GENERAL-DUTY VALVES

A. Ball Valves NPS 2 and Smaller: MSS SP-110, 2-piece copper-alloy body with chrome-plated brass ball, 600-psig minimum CWP rating, blowout-proof stem, and threaded ends.

B. Check Valves NPS 2 and Smaller: MSS SP-80, Type 4, Class 125 minimum, swing type with bronze body, nonmetallic disc, and threaded ends.

C. Gate Valves NPS 2 and Smaller: MSS SP-80, Type 2, Class 125 minimum, with bronze body, solid wedge, and threaded ends.

D. Globe Valves NPS 2 and Smaller: MSS SP-80, Type 2, Class 125 minimum, with bronze body, nonmetallic disc, and threaded ends.

2.6 SPECIALTY VALVES

A. Sprinkler System Control Valves: FMG approved, cast- or ductile-iron body with flanged or grooved ends, and 175-psig minimum pressure rating. Control valves shall have 250-psig minimum pressure rating if valves are components of high-pressure piping system.

1. Manufacturers:

a. Central Sprinkler Corp.
b. Globe Fire Sprinkler Corporation.
c. Grinnell Fire Protection.
d. Reliable Automatic Sprinkler Co., Inc.
e. Star Sprinkler Inc.
f. Victaulic Co. of America.

g. Viking Corp.

B. Automatic Drain Valves: UL 1726, NPS 3/4, ball-check device with threaded ends.

1. Manufacturers:

a. Grinnell Fire Protection.

2.7 SPRINKLERS

A. Sprinklers shall be UL listed or FMG approved, with 175-psig minimum pressure rating. Sprinklers shall have 250-psig minimum 300-psig pressure rating if sprinklers are components of high-pressure piping system.

B. Manufacturers:

1. Central Sprinkler Corp.
2. Globe Fire Sprinkler Corporation.
3. Grinnell Fire Protection.
4. Reliable Automatic Sprinkler Co., Inc.
5. Star Sprinkler Inc.
6. Victaulic Co. of America.
7. Viking Corp.
8. Tyco Fire

C. Automatic Sprinklers: With heat-responsive element complying with the following:

1. UL 199, for nonresidential applications.

D. Sprinkler types, features, and options as follows:

1. Concealed ceiling sprinklers, including cover plate.
2. Extended-coverage sprinklers, not allowed unless approved in writing prior to bidding.
3. Pendent sprinklers.
4. Pendent, dry-type sprinklers.
5. Quick-response sprinklers.
6. Sidewall sprinklers.
7. Sidewall, dry-type sprinklers.
8. Upright sprinklers.

E. Sprinkler Finishes: Chrome plated, bronze, and painted. Finishes as approved by FM Global.

F. Special Coatings: Wax, lead, and corrosion-resistant paint.

G. Sprinkler Escutcheons: Materials, types, and finishes for the following sprinkler mounting applications. Escutcheons for concealed, flush, and recessed-type sprinklers are specified with sprinklers.

1. Ceiling Mounting: flat plate concealed, white.
2. Sidewall Mounting: Semi-recessed white with white escutcheon.

H. Sprinkler Guards: Wire-cage type, including fastening device for attaching to sprinkler.

2.8 ALARM DEVICES

A. Alarm-device types shall match piping and equipment connections.

B. Electrically Operated Alarm: Horn/Strobe, NEMA 3R minimum suitable for outdoor use.

1. Manufacturers:

a. Potter Electric Signal Company.
b. System Sensor.

C. Water-Flow Indicator: UL 346, electrical-supervision, paddle-operated-type, water-flow detector with 250-psig pressure rating and designed for horizontal or vertical installation. Include two single-pole, double-throw circuit switches for isolated alarm and auxiliary contacts, 7 A, 125-V ac and 0.25 A, 24-V dc; complete with factory-set, field-adjustable retard element to prevent false signals and tamperproof cover that sends signal if removed.

1. Manufacturers:

a. ADT Security Services, Inc.
b. Grinnell Fire Protection.
c. ITT McDonnell & Miller.
d. Potter Electric Signal Company.
e. System Sensor.
f. Viking Corp.
g. Watts Industries, Inc.; Water Products Div.

D. Valve Supervisory Switch: UL 753, electrical, single-pole, double-throw switch with normally closed contacts. Include design that signals controlled valve is in other than fully open position.

1. Manufacturers:

a. McWane, Inc.; Kennedy Valve Div.
b. Potter Electric Signal Company.
c. System Sensor.

2.9 PRESSURE GAGES

A. Manufacturers:

1. Brecco Corporation.
2. Dresser Equipment Group; Instrument Div.
3. Marsh Bellofram.
4. WIKA Instrument Corporation.

B. Description: UL 393, 3-1/2- to 4-1/2-inch- diameter, dial pressure gage with range of 0 to 250 psig minimum.

1. Water System Piping: Include caption "WATER" or "AIR/WATER" on dial face.

PART 3 - EXECUTION

3.1 PREPARATION

A. Obtain Engineer's Water Analysis or fire-hydrant flow test. Use results for system design calculations required in "Quality Assurance" Article in Part 1 of this Section.

3.2 EARTHWORK

A. Refer to Division 31 Section "Earth Moving" for excavating, trenching, and backfilling.

3.3 EXAMINATION

A. Examine roughing-in for hose connections and stations to verify actual locations of piping connections before installation.

B. Examine walls and partitions for suitable thicknesses, fire- and smoke-rated construction, framing for hose-station cabinets, and other conditions where hose connections and stations are to be installed.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.4 PIPING APPLICATIONS

A. Shop-weld pipe joints where welded piping is indicated.

B. Do not use welded joints for galvanized-steel pipe.

C. Flanges, flanged fittings, unions, nipples, and transition and special fittings with finish and pressure ratings same as or higher than system's pressure rating may be used in aboveground applications, unless otherwise indicated.

D. Sprinkler Main Piping: Use the following:

1. NPS 2-1/2 and Larger: Standard-weight steel pipe with threaded ends, or grooved ends. No plain ends allowed.
2. Outlets shall be welded.

    a. Victaulic Brand series 920 or 920N Mechanical tee fittings may be used in lieu of welded outlets.

E. Branch line piping: Use the following:

1. NPS 2 and Smaller: Standard-weight or threadable steel pipe with threaded ends; cast- or malleable-iron threaded fittings; and threaded joints.

    a. Victaulic Brand series 920 or 920N Mechanical tee fittings may be used

3.5 VALVE APPLICATIONS

A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:

1. Fire-Protection-Service Valves: UL listed and FM approved for applications where required by NFPA 13 and NFPA 14.
2. General-Duty Valves: For applications where UL-listed and FM-approved valves are not required by NFPA 13 and NFPA 14.

    a. Shutoff Duty: Use gate, ball, or butterfly valves.

    b. Throttling Duty: Use globe, ball, or butterfly valves.

3.6 JOINT CONSTRUCTION

A. Refer to Division 23 Section "Common Work Result for HVAC" for basic piping joint construction.

B. Steel-Piping, Grooved Joints: Use Schedule 40 steel pipe with cut or roll-grooved ends and Schedule 30 or thinner steel pipe with roll-grooved ends; steel, grooved-end fittings; and steel, keyed couplings. Assemble joints with couplings, gaskets, lubricant, and bolts according to coupling manufacturer's written instructions. Use gaskets listed for dry-pipe service for dry piping.

3.7 WATER-SUPPLY CONNECTION

A. Install shutoff Backflow preventions assemblies, valve, pressure gage’s, drain, and other accessories at connection to water service.

3.8 PIPING INSTALLATION

A. Refer to Division 23 Section "Common Work Result for HVAC" for basic piping installation.

B. Locations and Arrangements: Drawing plans, schematics, and diagrams indicate general location and arrangement of piping. Install piping as indicated, as far as practical.

    1. Deviations from approved working plans for piping require written approval from authorities having jurisdiction. File written approval with Architect before deviating from approved working plans.

C. Install mechanical sleeve seal at pipe penetrations in basement and foundation walls. Refer to Division 23 Section “Common Work Result for HVAC.”

D. Use approved fittings to make changes in direction, branch takeoffs from mains, and reductions in pipe sizes.

E. Install unions adjacent to each valve in pipes NPS 2 and smaller. Unions are not required on flanged devices or in piping installations using grooved joints.

F. Install flanges or flange adapters on valves, apparatus, and equipment having NPS 2-1/2 and larger connections.

G. Install "Inspector's Test Connections" in sprinkler piping, complete with shutoff valve, sized and located according to NFPA 13.

H. Install sprinkler piping with drains for complete system drainage.

I. Install alarm devices in piping systems.

J. Hangers and Supports: Comply with NFPA 13 for hanger materials. Install according to NFPA 13 for sprinkler piping.

1. No powder driven studs allowed.
2. Wrap-around braces are to be provided at end of branch lines.

K. Earthquake Protection: Install piping according to NFPA 13-9.3 requirements, to protect from earthquake damage. Seismic Bracing shall be designed to withstand vertical forces and movement.

L. Install piping with grooved joints according to manufacturer's written instructions. Construct rigid piping joints, unless otherwise indicated, or required by NFPA 13 for flexibility in seismic zones.

M. Install pressure gages on riser or feed main, at each sprinkler test connection, and at top of each standpipe. Include pressure gages with connection not less than NPS 1/4 and with soft metal seated globe valve, arranged for draining pipe between gage and valve. Install gages to permit removal, and install where they will not be subject to freezing.

3.9 SPECIALTY SPRINKLER FITTING INSTALLATION

A. Install specialty sprinkler fittings according to manufacturer's written instructions.

3.10 VALVE INSTALLATION

A. Refer to Division 23 Section "Valves" for installing general-duty valves. Install fire-protection specialty valves, trim, fittings, controls, and specialties according to NFPA 13 and NFPA 14, manufacturer's written instructions, and authorities having jurisdiction.

B. Valves: Install fire-protection-service valves supervised-open, located to control sources of water supply except from fire department connections. Provide permanent identification signs indicating portion of system controlled by each valve.

3.11 SPRINKLER APPLICATIONS

A. General: All sprinklers are to be quick response type. Sprinkler heads shall be of the latest design closed spray type for 155°F unless specified otherwise or required by code. Extended coverage heads shall not be used. Orifices larger than 1/2" may be used as required by density and spacing demands. Use sprinklers according to the following applications:

1. Rooms without Ceilings: Upright and/or pendent sprinklers. Provide mechanical guards on all heads at or below 7’-0” height above the floor or where damage from room occupant use may occur.
2. Rooms with Ceilings: Concealed sprinklers.
3. Wall Mounting: Sidewall sprinklers with recessed escutcheon.
4. Spaces Subject to Freezing: Upright; pendent, dry-type; and sidewall, dry-type sprinklers.
5. Provide freeze proof type automatic sprinkler heads serving unconditioned spaces, areas subject to freezing and in other areas requiring their use.

6. Heads located within the air streams of unit heaters or other heat-emitting equipment shall be selected for proper temperature rating.
7. Sprinkler Finishes: Use sprinklers with the following finishes:

    a. Upright, Pendent, and Sidewall Sprinklers: Chrome in finished spaces exposed to view; rough bronze in unfinished spaces not exposed to view.
    b. Concealed Sprinklers: Rough brass, with White cover plate to match ceiling color.
    c. Semi-Recessed Sprinklers: White, with FMG approved white escutcheon.

B. Sprinklers: Use the following:

1. All sprinklers shall be listed, quick response type.

3.12 SPRINKLER INSTALLATION

A. Every effort shall be required to insure that the heads form a symmetrical pattern in the ceiling with the ceiling grid, lights, diffusers and grilles. Offsets shall be made in piping to accommodate ductwork in the ceiling. Heads should be symmetrical and all piping run parallel or perpendicular to building lines.

1. In no case shall sprinkler heads be installed closer than approved distances from ceiling obstructions and HVAC ductwork.
2. Sprinkler heads shall not conflict with tile grids.
3. Sprinkler heads shall be located near center of corridors.

B. Where layout of sprinkler heads is shown on reflected ceiling plans the locations shall be followed unless approval is obtained from the Architect or such locations shown do not meet the requirements of NFPA-13. In either case, approval of the Architect shall be obtained in writing before sprinkler head locations are changed. If the installation of additional heads is needed to conform to NFPA 13 requirements in areas where heads are shown on reflected ceiling plans, they shall be included in the contract price.

C. Install sprinklers in uniform patterns.

D. Do not install pendent or sidewall, wet-type sprinklers in areas subject to freezing. Use dry-type sprinklers with water supply from heated space.

E. Concealed type sprinkler shall be installed throughout the project

3.13 CONNECTIONS

A. Connect water-supply piping and standpipes and sprinklers where indicated.

B. Install ball drip valves at each check valve for fire department connection. Drain to floor drain or outside building.

C. Connect piping to specialty valves, hose valves, specialties, fire department connections, and accessories.

D. Electrical Connections: Power wiring is specified in Division 28.

E. Connect alarm devices to fire alarm.

3.14 LABELING AND IDENTIFICATION

A. Install labeling and pipe markers on equipment and piping according to requirements in NFPA 13 and in Division 23 Section "Common Work Result for HVAC."

3.15 FIELD QUALITY CONTROL

A. Flush, test, and inspect sprinkler piping according to NFPA 13, "System Acceptance" Chapter.

B. Replace piping system components that do not pass test procedures and retest to demonstrate compliance. Repeat procedure until satisfactory results are obtained.

C. When making a mechanical tee connection the coupon shall be attached at the mechanical tee.

D. Report test results promptly and in writing to Architect and authorities having jurisdiction.

E. Whether the underground serving the sprinkler system is done by this contractor or another, this contractor will be responsible to assure and have in his possession a certificate that the underground has been flushed and tested by the contractor who installed it in accordance with NFPA-24 prior to connection of the underground piping to the overhead sprinkler system.

3.16 CLEANING

A. Clean dirt and debris from sprinklers.

B. Remove and replace sprinklers having paint other than factory finish.

3.17 PROTECTION

A. Protect sprinklers from damage until Substantial Completion.

3.18 COMMISSIONING

A. Verify that specialty valves, trim, fittings, controls, and accessories are installed and operate correctly.

B. Verify that specified tests of piping are complete and that “Material Test Certificates” are complete.

C. Verify that damaged sprinklers and sprinklers with paint or coating not specified are replaced with new, correct type.

D. Verify that sprinklers are correct types, have correct finishes and temperature ratings, and have guards as required for each application.

E. Fill wet-pipe sprinkler piping with water.

F. Coordinate with fire alarm tests. Operate as required.

3.19 DEMONSTRATION & TESTS

A. Demonstrate equipment, specialties, and accessories. Review operating and maintenance information.

B. All tests will be conducted as required by the local authority having jurisdiction, and in no case less than those required by NFPA standards. As a minimum, piping in the sprinkler system shall be tested at a water pressure at 200 psi for a period of not less two hours, or at 50 psi in excess of the normal pressure when the normal pressure is above 150 psi. Bracing shall be in place, and air shall be removed from the system through the hydrants and drain valves before the test pressure is applied. No apparent leaks will be permitted on interior or underground piping.

C. The local jurisdiction having authority and the Utah State Fire Marshal's office (where required) shall be notified at least three working days in advance of all tests and flushing. This includes any flushing of underground, hydrostatic testing, or flow testing that may be required.

D. This contractor shall make all the required tests to the sprinkler system as required by code. He shall be responsible to assure that the Contractor Test Certificates for the overhead, backflow and underground work are completed and delivered to the owner's insurance underwriter to assure proper insurance credit.

E. All tests requiring the witnessing by local authorities will be the responsibility of this contractor. If tests are not run or do not have the proper witness, then they will be run later and all damage caused by the system, or caused in uncovering the system for such test, will be borne by this contractor.

3.20 WARRANTY

A. This contractor shall warranty the sprinkler system and all its components for one year from the date of acceptance by the owner. Any costs incurred to extend any warranties of materials to assure this time frame shall be borne by this contractor.

B. Provide Operation and Maintenance Manuals with correct as-builts test certificates and warranties included. A minimum 6 sets to be provided in red 3-ring binders. Include a current adopted version of NFPA 25 softbound copy left with owner.

C. Electronic copy of AutoCAD as-built drawings shall also be provided on CD, with each O&M Manual.

3.21 FIELD QUALITY CONTROL

A. Flush, test and inspect sprinkler piping according to NFPA 13, "System Acceptance" Chapter.

B. Replace piping system components that do not pass test procedures and retest to demonstrate compliance. Repeat procedure until satisfactory results are obtained.

C. Report test results promptly and in writing to Architect and authorities having jurisdiction.

END OF SECTION 21 1000

SECTION 270000 - GENERAL COMMON CONDITIONS FOR ALL COMMUNICATION SECTIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, and other documents as designated, apply to this Document.
B. See Division 7 and section 27 01 00 Part 3 for additional requirements.

1.2 RELATED SECTIONS

A. Specifications throughout all Divisions of the Project Manual are directly applicable to this section, and this section is directly applicable to them.
   1. All Division 27 Sections
   2. Requirements of the following Division 26 sections apply to this section
      a. Basic electrical requirements
      b. Basic electrical materials and methods
      c. Grounding, earthing, and bonding
   3. Division 21 Fire Suppression
   4. Division 22 Plumbing
   5. Division 23 HVAC
   6. Division 28 Electronic Safety and Security

1.3 SUMMARY

A. The work on many processes in this section are not part of the Division 27 contract. The respective trades shall include their portions, and administration topics that are applicable to all Division 27 Sections in their proposals.
B. This document is based upon the 2018 Construction Specification Institute (CSI) Master Format numbers and titles for sections within Division 27: Communications.
C. Where IT or Owner representation is stipulated in this Division, it shall be provided by the Data Center Operations Infrastructure Cabling team.

1.4 SUBMITTALS

A. Product data shall be supplied for any parts/equipment that does not match the specified part number.
B. Shop drawings
   1. Labeling schedules and layouts in owner designated electronic format
   2. Cabling administrative drawings

1.5 CONDITIONS

A. Drawings and General provisions of the contract, including Uniform General Conditions, Supplementary General Conditions, architectural plans and specifications, requirements of Division 1, electrical, mechanical, plumbing, audio visual, security and telecommunications specifications and plans apply to the communications section, and shall be consider a part of this section. The contractor shall read all sections in their

entirety and apply them as appropriate for work in this section.
B. Prior to beginning installation, a kick-off meeting to properly coordinate the tray installation and expectations should be held. It should be arranged by the General Contractor, and at a minimum include representatives of the following trades: FP&D, Electrical (Div. 26), Structured cable, Nurse Call, paging, building automation and control, plumbing, HVAC, fire sprinkler, framing, and others as applicable. The Data Center Operations Infrastructure Cabling Team will lead the meeting.

C. Conflicts:
1. Drawings and specifications are to be used in conjunction with one another and to supplement one another. In general, the drawings determine the nature and quality of the installation, materials, and tests. The quantities are derived from the drawings, details, listings, and manufacturer's directions.
a. Final order counts and distances are the contractor's responsibility.
2. If there is an apparent conflict between the drawings and specifications, or between specification sections, the items with the greater quality or quantity shall be submitted, estimated, and installed.
3. Clarification with the Owner and/or Owner's Representative about these items shall be made prior to the ordering and installation.

D. Owner / Contractor
1. The Architect/Project Manager will submit appropriate scope of work information that will allow the contractor to appropriately plan and bid the project.

E. Contractor
1. Furnish all labor, materials, tools, equipment and services for the installation described herein. Provide add/deduct unit pricing for all components as part of the bid response. Base fixed price add/deduct units on an average cable length of 175 linear feet.
2. The Contractor shall procure and maintain for the duration of this agreement, insurance against claims.
3. Use of Subcontractors: Successful bidder shall inform the Owner's contact and/or General Contractor in writing about the intention to use Subcontractors and the scope of work for which they are being hired. The Owner or Owner's designated contact must approve the chosen Subcontractors in writing prior to the Subcontractor's hiring and start of any work. The low voltage Subcontractor must be approved and certified. Refer to the listing in appendix 7.
4. Use of Subcontractors: The Contractor's designated project manager will be recognized as the single point of contact. The Project manager shall oversee all work performed to ensure compliance with specifications as outlined in bid documents (which includes all specifications and drawings) to ensure a quality installation.

1.6 SCOPE OF WORK:

A. This establishes a communications infrastructure to be used as signal pathways for voice, high-speed data transmission, and other low voltage services. Contractor shall:
1. Comply with all Master Specifications documents and the following requirements for a complete project installation.
2. Provide a structured cabling system as described hereafter that includes, but is not limited to, supplying, installing, labeling and testing of fiber backbone, fiber and voice riser cable; data copper, fiber, and voice copper horizontal cabling, cable connectors, communications outlets and terminations, patch cables, and equipment racks/cabinets for networking hardware and patch panels.
3. All requirements and specifications will be enforced. Cable pathways and runs to individual outlets are not shown in their entirety but shall be provided as if shown in their entirety.
4. Coordinate with electrical tradespersons to verify conduit routing does not cause cabling to exceed allowable link length.
5. Follow industry standard installation procedures, including BICSI Installation Standard and guidelines as well as specified manufacturers standard recommended procedures and installation practices for communications cable to assure that the mechanical and electrical transmission characteristics of this cable plant and equipment are maintained.
6. The Division 27 work shall be performed by an approved, certified installer.
7. The low voltage communications Subcontractor shall complete non-concealed work.

1.7 REFERENCE STANDARDS:

A. The latest published edition of a reference shall be applicable to this Project unless identified by a specific edition date.
B. All reference amendments adopted prior to the effective date of the Contract shall be applicable to this Project.
C. The publications listed below form a part of this specification. The publications are referred to in the text by basic designation only.
D. Specific reference in specifications to codes, rules, regulations, standards, manufacturer's instructions, or requirements of regulatory agencies shall mean reference to the latest printed edition of each in effect at the date of contract.
E. Codes and Standards (Most recent editions with addenda/TSB, etc.) All materials, installation and workmanship shall meet or exceed the applicable requirements and standards addressed within the references listed in **Appendix 04**.

1.8 DEFINITIONS:

A. Definitions and Abbreviations are listed in **Appendix 05**:

PART 2 - PRODUCTS

2.1 PRODUCTS AND WORK NOT included BY DIVISION 27

A. Others shall separately purchase and/or provide certain equipment and miscellaneous items that will be installed during the installation process. Such items may not be indicated in the documents. Contractor shall coordinate with the Owner and his suppliers when considering:
1. Provision and installation of phone systems, computer hardware, and related networking software and equipment.
2. Provision and installation of multi-port routers, hubs in communications rooms.
a. TEC/TDR UPS's are owner provided.
3. Communications grounding bus bars and grounding wires connecting to the main building electrode system by Division 26.
4. Dedicated power panels, ground bus bars, circuits and utility outlets.
5. Installation and finishing of fire-rated plywood backboards.
6. Building mechanical ductwork, cooling/heating system, and environmental control sensors.
7. Communication pathway devices such as, conduits, conduit sleeves, back boxes, and penetrations in walls and floors. Including, but not limited to concealed work, office spaces and open areas.
8. Provision and installation of modular furniture and millwork.

PART 3 - PENETRATIONS

3.1 THE WORK IN THIS SECTION IS IN DIVISION 7 CONTRACT; AND VERIFIED COMPLETE AT PROJECT TURNOVER.

A. Wall Penetrations - Fire - Smoke – Sound
1. All fire, smoke, and sound wall penetrations must be correctly made to protect the safety of patients and employees. A facility is designed/architected and built with fire integrity that must not be lost as the building is modified over its lifetime.
2. The items listed often penetrate 1 – and 2 – hour fire-resistance-rated (FRR) assemblies. General requirements for filling the space between the item in question and the wall are found in NFPC 101® Section 8.2.3.2.4.2. There is the option to either fill the space with appropriately rated fire-stop material or protect the space with an approved device designed to maintain the fire resistance of the wall.

3. If a sleeve is used around the item that transverses the wall, the sleeve must be installed into the wall without any opening between the sleeve and the wall. The open space within the sleeve must then be filled with appropriately rated fire stop.

B. All items listed in 1 through 2 must have penetrations in fire-resistance-rated assemblies filled to maintain the integrity of the fire barrier.
   1. Conduits
      a. When conduit passes through a wall that is either rated or must be fire-stopped due to lack of sprinklers in the compartment, it is essential to fill any gap around the conduit as described above.
   2. Cables/Wires
      a. Sometimes cables or wires are passed through a penetration contained in a fire wall as a single installation. This often happens in a health care organization with communication cables. Even in these cases, the penetration must be patched appropriately.
   3. NOTE: Fire, smoke, and sound wall penetrations are also governed by local and state building codes.
   4. NOTE: This requirement applies to all departments, organizations, employees, and/or vendors who perform structured cable work in the facilities for:
      a. Telephony and Computer networks, fire, smoke, and sound wall penetrations, alarm systems, security systems, HVAC Control or sensors, patient entertainment systems, announcing systems, nurse call, telemetry, RFID, etc.
   5. NOTE: While this document is written specifically for low voltage wiring, the JCAHO standards apply for any fire or smoke wall penetration. As you perform work in the facility, if you note any existing penetrations that are not up to standard, please notify the construction Project Manager immediately.
   6. While Facility Engineering has the overall responsibility, each department, organization, employee, and/or vendor has the responsibility to follow the process in obtaining a permit from facility engineering before work is started and to follow the guidelines to maintain the fire/smoke wall integrity.

C. Process:
   1. NOTE: This process applies to any person, group, and/or vendor who perform low voltage cable installations at any Intermountain facility or clinic.
      a. Fire/Smoke Walls
         1) Any Vendor, department, and/or person needing to do any cable work that involves wall penetrations, adding to existing or new, are required to obtain a “Low Voltage Cable Work Permit” from Facility Engineer.
      b. Above Ceiling Work
         1) Any vendor, department, and/or person needing to do any cable work above ceiling tiles, adding to existing or new, are required to obtain all required permits.
      c. Above Ceiling Permit to be obtained from Facilities Management
         1) The permit requires detail information as to what work is being done, where the work will be done. The permit will also state the current approved sealing compound for the facility and specific requirements for conduits etc.
         2) There may also be specific rules regarding how work may be conducted in certain areas of the hospital. NOTE: Different manufacture’s sealing products can NOT be used in the same penetration. Therefore, if an additional cable is added to an existing penetration, and you don’t have the same brand of caulk, you must remove all of the caulk and re-do the seal completely.
      d. ICRA Permit to be obtain from Infectious Preventionist
      e. Hot Work Permit to be obtain from Facilities Engineer
   2. Quality of Work

a. Facility Engineering Orientation

3.2 MEASUREMENT PROCEDURES:

A. The Contractor shall
1. Coordinate supports, adjacent construction, and fixture locations to ensure actual dimensions correspond to established dimensions.
2. Verify dimensions in areas of installation by field measurements before fabrication and indicate measurements and scale on shop drawings.
3. Coordinate fabrication schedule with construction progress to avoid delaying the work.
4. Where field measurements cannot be made without delaying the work, establish dimensions and coordinate with the General Contractor.
5. When approved, proceed with fabricating units without field measurements.

3.3 CHANGES

A. ALTERNATES:
1. If an alternate material is proposed that is equal to or exceeds specified requirements, Contractor shall provide manufacturers' specifications in writing for Owner approval prior to purchase and installation.
2. Substitutions of material by the Contractor shall be in writing complete with written manufacturers' specifications. The material substituted shall not void, alter or change manufacturers' structured cabling system warranty.
3. Contractor shall:
   a. Provide a complete cabling infrastructure according to these written specifications and drawings. If the Owner changes the scope of work to be performed by the Contractor, it shall be in writing.
   b. Promptly respond to these changes with a complete material list, including pricing, and labor in writing presented to the Owner for approval. Also include unit pricing.
   c. Do not proceed with any additional scope of work without a signed approval by the Owner.
4. Owner will not pay for additional work performed by the Contractor without signed approval of these changes. Contractor will submit a copy of signed change order upon billing.
5. The Owner's Infrastructure Cable team will be the final judge of acceptability, with review by Owner's Representative and the distribution of the acceptance by the Architect. No substitute shall be ordered, installed or utilized without the

   Architect's prior written verification of acceptance from the Owner's Infrastructure Cable team.

B. SUBSTITUTION PROCEDURES
1. Substitution may be considered when a product becomes unavailable through no fault of the Contractor.
2. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Include in each request for substitution:
   a. Product identification, manufacturer's name and address.
   b. Product Data: Description, performance and test data, reference standards, finishes and colors.
   c. Samples: Finishes
   d. Complete and accurate drawings indicating construction revisions required (if any) to accommodate substitutions.
   e. Data relating to changes required in construction schedule.
   f. Cost comparison between specified and proposed substitution.
3. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

4. The Owner will be the final judge of acceptability, with review by Owner's Representative and the distribution of the acceptance by the Architect.
5. No substitute shall be ordered, installed or utilized without the Architect's prior written verification of acceptance from the Owner's Infrastructure Cable team.

PART 4 - EXECUTION

4.1 QUALITY ASSURANCE

A. Regulatory Requirements:
1. Contractor shall supply all city, county, and state telecommunication cabling permits required by appropriate governing agency.
2. Prior to commencing work, the Contractor and staff shall secure all required Intermountain Healthcare permits including, but not limited to; facility sign in, ceiling work permits, hot work permits, and confined space permits.
3. Contractor shall be city, county, and state-licensed and/or bonded as required for communications/low voltage cabling systems work.

B. Certifications:
1. Contractor shall submit an up-to-date and valid certification verifying qualifications of the Contractor and installers to perform the work specified herein at time of bid submission.
2. Contractor shall have a complete working knowledge of low voltage cabling applications such as, but not limited to data, voice and video network systems.
3. Contracting firm shall have installed similar-sized systems in at least ten (10) other projects in the last five years prior to this bid and be regularly engaged in the business of installation of the types of systems specified in this document. Certification shall include, but not be limited to, items such as name and location of project contacts and numbers, total square footage, total number of cables/drops, types of media, etc.
4. Contractor shall provide certificates for the appropriate insurance coverage as defined in contract documents.
5. All installer personnel that will be assigned to this project shall be listed in a qualification document. 50% of the personnel working on the job site shall have a minimum of 3 years' experience in the installation of the types of systems, equipment, and cables specified in this document. Any personnel substitutions shall be noted in writing to Owner's Data Center Operations Infrastructure

   Cabling representative prior to commencement of work.
6. BICSI ITS Cabling Installation Program Installer Level 1 or 2 or Technician certifications may be substituted in lieu of the 3-year requirement. All cabling installers shall be trained and certified by the cable manufacturer for communication cabling installations and maintenance of said materials.
7. Refer also to General Conditions.

C. Administrative Requirements and Coordination:
1. The Contractor shall:
   a. Ensure that all technicians performing work have obtain badge access 48 hours prior to scheduled start.
   b. Provide a specified contact person (name and contact number) for coordination to attend project meetings with the communication consultant, the Owner and others.
   c. Coordinate work of this section with Owner's system specifications, workstations, equipment suppliers, and installers.
   d. Coordinate installation work with other crafts (examples include ceiling grid contractors, HVAC and sheet metal contractors, etc.) under the direction of the General Contractor to resolve procedures and installation placement for cable trays and cable bundle pathways. The goal of this coordination will be to establish priority pathways for critical data/voice network cable infrastructure, materials, associated hardware, as well as mitigate delays to the project and to allow service access for

communications and HVAC components. Damage by Contractor to the craftwork of others will be remediated at the Contractor's expense in a timely manner.

e. Exchange information and agree on details of equipment arrangements and installation interfaces. Record agreements reached in meetings and distribute record to other participants, Owner and communication consultant.

f. Arrangement, layout, and locations of distribution frames, patch panels, and cross-connect blocks in equipment rooms and racks to accommodate and optimize arrangement and space requirements of any service provider equipment, telephone system, and LAN equipment as directed by Data Center Operations. Tasks shall be coordinated with the Owner's Data Center Operations team, and other trades' installation representatives.

g. Where installed, confirm exact locations and method of mounting outlets in modular furniture. Follow furniture manufacturers' written instructions for installing cable and devices in modular partitions. Obtain modular furniture and power pole locations from the General Contractor. Wiring locations noted in plans along walls for modular furniture are approximate and will have to be determined by Contractor at time of installation. Field condition adjustments for installation may have to be made and coordination efforts with the mechanical and electrical contractor for pathway must take place early in the project to comply with maximum 40% conduit fill factor requirements.

h. When requested by Owner or Owner's representative, furnish extra materials that match specified products and that are factory packaged with protective covering for storage and identified with labels describing contents. Unit pricing shall apply.

D. Contract Administration:

1. Change orders shall be submitted to the Owner/Project Manager complete with price breakdown and description for approval before any work is done.
2. Owner's Data Center Operations Representative will provide job field reports upon inspection of Contractor's installation, materials, supporting hardware,

   coordination with other trades and progress to schedule to the Owner's project manager.
3. Job Field Report outline:
   a. General installation progress in relation to scheduled work made by the Contractor up to that date.
   b. All deficiencies noted in the cable installation to be corrected by the Contractor.

E. Pre-Installation Meetings - Contractor shall:

1. Attend and/or arrange a scheduled pre-installation conference prior to beginning any work of this section.
   a. Agenda: This venue is to ask and clarify questions in writing related to work to be performed, scheduling, coordination, etc. with consultant and/or project manager/and Data Center Operations Infrastructure Cabling representative.
   b. Attendance: Communications project manager/supervisor shall attend meetings arranged by General Contractor, Owner's Data Center Operations Infrastructure Cabling representatives, and other parties affected by work of this document.
   c. All individuals who will be installers of communication cables and equipment in an on-site supervisory capacity shall be required to attend the pre-installation conference. Individuals who do not attend the conference will not be permitted to supervise the installation of, or install, terminate, or test communications cables on the project. This includes supervisors, project managers, and lead installers of this project.

F. Request for Change (RFC)

1. A Request for Change shall be opened and approved by the Change Approval Board prior to any modifications, attachments, or other activities that may affect production systems.
    a. Policy and details available through the Data Center Operations Infrastructure Cable Representative.

G. Post-Installation Meetings:
1. Schedule Div. 27 Final Inspection
2. At the time of substantial completion, or shortly thereafter, the low voltage Sub-Contractor shall call and arrange for a post-installation meeting to present and review all submittal documents to include, but not limited to as-built drawings, test reports, warranty documentation, etc. Attendees shall be Owner staff, Owner's Representative, General Contractor, and others that the General Contractor deems appropriate.
3. At this meeting the Contractor shall present and explain all documentation, including test results, and ask for feedback on its completeness. Any discrepancies or deviations noted by and agreed to by participants shall be remedied by Contractor and resubmitted within one week of meeting.

4.2 DELIVERY, STORAGE, AND HANDLING:

A. Coordination with delivery companies, drivers, site address, and contact person(s) will be the responsibility of the Contractor.
B. Contractor Shall:
1. Be responsible for prompt material deliveries to meet contracted completion date.
2. Coordinate deliveries and submittals with the General Contractor to ensure a timely installation.
3. No equipment materials shall be delivered to the job site more than three weeks prior to the commencement of its installation.
4. Equipment shall be delivered in original packages with labels intact and identification clearly marked.
5. Materials shall not be damaged in any way and shall comply with manufacturer's operating specifications.
6. Equipment and components shall be protected from the weather, humidity, temperature variations, dirt, dust, or other contaminants. Equipment damaged prior to system acceptance shall be replaced at no cost to the Owner.
7. Material Contractor shall be responsible for all handling and control of equipment.
8. Material Contractor is liable for any material loss due to delivery and storage problems.

C. Owner/General Contractor shall supply a list of security requirements for Contractor to follow.

4.3 PROJECT/SITE CONDITIONS

A. For all environmental recommendations, refer to master Architectural section.
B. For all security recommendations, refer to related Division 01.
C. After completing system installation, including outlet fittings and devices, inspect exposed finish. Contractor will remove burrs, dirt, and construction debris. If applicable, the Contractor will repair damaged finishes, including chips, scratches, and abrasions.
D. Contractor shall provide daily a clean work environment, free from trash/rubbish accumulated during and after cabling installation.
E. Food and drink are not permitted in work areas. They shall be stored, prepared, and consumed only in designated break or cafeteria areas.
F. Contractor shall keep all liquids (drinks, sodas, etc.) off finished floors, carpets, and tiles. If any liquid or other detriment (cuts, soils, stains, etc.) damages the above finishes, Contractor shall provide professional services to clean or repair scratched/soiled finishes, at Contractor's expense.

4.4 CLEANING

A. Work areas will be kept in a broom clean condition throughout the duration of the installation process.
B. Remove all unnecessary tools and equipment, unused materials, packing materials, and debris from each area where work has been performed daily, unless designated for storage.
C. The Contractor will damp clean all surfaces prior to final acceptance by Owner.

END OF SECTION

SECTION 270100 - OPERATION AND MAINTENANCE OF COMMUNICATIONS SYSTEMS

PART 1 - GENERAL

1.1 INTRODUCTION

A. To make the approval of such a large topic possible, the structured cable topic has been broken into its subcomponents and each subcomponent was completed, reviewed, and approved in turn. The result is this comprehensive guideline that should provide adequate guidance on this topic.

PART 2 - PRODUCT

2.1 KEY POINTS

A. Category 6A shielded foil over unshielded twisted pair (F/UTP) is the only approved standard for cabling.
   1. Specifically, Siemon category CAT6A F/UTP (foil over unshielded twisted pair) cable and associated patch panels, wall plates and jacks; for data centers, and all clinical and hospital campus'.
   2. Only Siemon certified contractors or certified Intermountain Healthcare cable technicians will install structured cable at Intermountain Healthcare facilities.

2.2 IMPLEMENTATION

A. This guide is to be used for New Construction and Remodels. These standards will be implemented over time in existing cabling environments as rework is performed.

B. If there is a current need to connect servers at 10GBaseT and the only option is copper, CAT6A F/UTP is required. New Server connections shall be a minimum OS1 Single Mode Fiber.

C. Installations already in place are not required to remove or replace existing cabling CAT5e or newer. All new cabling shall follow the recommendation to use CAT6A F/UTP cabling.

2.3 STANDARD PRODUCT

A. The Approved cable type for horizontal cabling is CAT 6A F/UTP.
   1. The Approved Standard Manufacturer for Intermountain Healthcare's horizontal cabling is:
      a. **Siemon Company USA**
         101 Siemon Company Drive
         Watertown, CT 06795
   2. Approved Suppliers of Siemon cable, patch panels, jacks, and parts are listed in Appendix 06:

PART 3 - EXECUTION

3.1 Horizontal Cabling

A. Horizontal Subsystem is the portion of the cabling system that extends from (and includes) the work area telecommunications outlet/connector to the Floor Distributor (FD)/Horizontal Cross-connect (HC) in the telecommunications room (TDR). It consists of the communications outlet/connector, the horizontal cable, optional consolidation point,

and that portion of the cross-connect in the telecommunications room serving the horizontal cable. Each floor of a building should be served by its own Floor Distributor/Horizontal (FD/HC) Subsystem located in the telecommunications Room (TDR).

1. NOTE: Cable installers have rigorous requirements to be certified for Siemon cables and products. Validation of certification is required prior to accepting a bid.
2. Current Siemon Approved/Certified Cable Installers for Siemon Network are listed in Appendix 07.

B. Reliability of the horizontal cabling system is critical to the operation of IS equipment throughout a facility. Installing the cable is extremely labor intensive and there are several learned skills used to correctly install the cable. Cable installers are certified, and installers must demonstrate the ability to install the cable correctly to be certified. If the cable is installed by a certified installer and is installed in accordance with the manufacture's guidelines, the manufacturer will warranty the cable installation.

C. The manufacturer also requires the cables to be individually labeled and 100% tested and certified. Cable testing and certification equipment is usually expensive and is not commonly available at the facility or by many telecom installers. Certified Installer companies are required by the manufacturer to be knowledgeable in the use of "Qualified" Field Testing equipment and provide test results for warranty registration.
1. Contractor is to verify with the manufacturer the current "Qualified" tester manufacturers and the current operating software.
2. Contractors will provide test results in the operating software format (not PDF, text or Word) to Intermountain Healthcare upon completion.

D. Much of the cable is installed in walls and in the ceiling and usually lasts the lifespan of the building. As with most technology, the lifespan of cable is its usability and applicability to its use on future computing technology.

END OF SECTION

SECTION 270113 - WARRANTY, PRODUCT AND SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
B. Specifications throughout all Divisions of the Project Manual are directly applicable to this Section, and this Section is directly applicable to them, including but not limited to the listing found in Section 27 00 00.

PART 2 - PRODUCTS

2.1 STANDARD WARRANTY

A. Contractor shall provide a minimum one (1) year warranty on installation and workmanship PLUS an Extended Product Warranty and System Assurance Warranty for this wiring system and shall commit to make available local support for the product and system during the Warranty period.
B. System Certification: Upon successful completion of the installation and subsequent inspection, the customer shall be provided with a Manufacture Warranty certificate.
C. Either a permanent link or channel model configuration may be applied to the horizontal and/or backbone sub-systems of the structured cabling system. Applications assurance is only applied to a channel model configuration. All channels are to be qualified for linear transmission performance up to 500 MHz to ensure that high-frequency voltage phase and magnitude contributions do not prove cumulative or adversely affect channel performance.

2.2 EXTENDED WARRANTY

A. The manufacturer of passive telecommunications equipment used in a manner not associated with the Systems Warranty must have a minimum five (5) year Component Warranty on all its product. The Products Warranty covers the components against defects in material or workmanship under normal and proper use.
    1. Special Project Warranty: A full end-to-end written warranty mutually executed by manufacturer and the principal Installer, agreeing to replace and install voice/data distribution system components that fail in materials or workmanship, or do not meet manufacturer’s official published specifications and performance criteria within the special Project warranty period specified below. This shall cover applications assurance, cable, and connecting hardware including both labor and materials. This warranty shall be in addition to, and not a limitation of, other rights and remedies the Owner may have against the Contractor under the Contract Documents.
B. A twenty (20) year warranty available for the Category 6A Z-MAX copper structured cabling system shall be provided for an end-to-end channel model installation which covers applications assurance, cable, connecting hardware and the labor cost for the repair or replacement thereof. The fiber warranty will be an XGLO twenty (20) year warranty, which is based on using laser optimized single mode fiber as minimum.
    1. Performance claims based on worst case testing and channel configurations.
    2. Special Project Warranty Period: 20 years minimum, beginning on the date of Substantial Completion.
    3. Siemon Certified Warranty Requirements:

a. Upon Completion of the project, Intermountain Healthcare must receive the Full Warranty Documentation from The Siemon Company before final retention funds are released to the general contractor, electrical contractor and structured cabling subcontractor if applicable.

2.3 MAINTENANCE

A. Support Availability: The Contractor shall commit to make available local support for the product and system during the Warranty or Extended Warranty period.

END OF SECTION

SECTION 270119 - FIELD TESTING AND REPORTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
B. Specifications throughout all Divisions of the Project Manual are directly applicable to this Section, and this Section is directly applicable to them, including but not limited to the listing found in Section 27 00 00.

1.2 SYSTEM DESCRIPTION

A. Owner reserves the right to be present during any or all testing.
B. The objective of this project is to provide a complete communications cabling infrastructure system installation including, but not limited to: fiber backbone, riser system, horizontal data and voice cabling with associated terminations, mounting equipment, cable pathway and management systems, testing and other items/materials, as specified in drawings, these specifications, and contract documents.
C. The Contractor's BICSI Registered Communications Distribution Designer (RCDD) supervisor shall review, approve and stamp all documents prior to submitting. The Contractor's RCDD shall warrant in writing that 100% of the installation meets the requirements specified herein upon completion of all work.
D. Product Certificates shall be signed by manufacturers of cables, connectors, and terminal equipment certifying that products furnished comply with requirements.
E. Contractor shall submit the required Field Test Reports in the format and media specified, upon completion of testing the installed system.
F. Contractor shall deliver manufacturer's signed long-term Warranty of installed cabling system to include all components that comprise the complete cabling system. Delivery to be affected within two weeks of the time of final punch list review. Failure of any component to pass system component tests shall be promptly corrected, repaired or replaced to meet standards compliance.

1.3 PREFERRED OWNER INSPECTION & TEST CHECKPOINTS

A. DCO & ICT Inspection Milestones & Responsibilities need to be coordinated into master project plan to allow the GC to make timely arrangements. All are per floor and/or phase.
    1. ICT & DCO = Framing, during and/or after boxes & conduits are in place; prior to sheetrock.
    2. ICT = When cable basket is starting to be installed.
    3. ICT = When cable basket is ready, but prior to starting to pull cable.
    4. ICT & DCO = When TDR's are ready for racks and ladders.
    5. DCO = When anchoring racks and laying out equipment.
    6. ICT & DCO = When TDR environmental requirements are ready, room is dust free, and securable.
        a. The TEC and TDRs must be high on the build timeline and be completed early in the construction to accommodate the building systems to be tested and commissioned, such as BAS, Security, and Wireless Network.
    7. ICT = When trim and testing are in progress.
    8. OTHERS
        a. Depending on project, the manufacturer will inspect 1 or 2 times.
        b. DCO or ICT = When problems or questions arise.

PART 2 - PRODUCTS

2.1 SITE TESTS & INSPECTIONS

A. Prior to pulling cable, the cabling contractor shall schedule an inspection of the pathways with a member of the Data Center Operations Infrastructure cabling team.

B. Upon completion of the communications infrastructure systems, including all pathways and grounding, the Contractor shall test the system.
   1. Cables and termination modules shall be affixed, mounted or installed to the designed/specified permanent location prior to testing.
   2. Any removal and reinstallation of any component in a circuit, including faceplates, shall require retesting of that circuit and any other disturbed or affected circuits.
   3. Approved instruments, apparatus, services, and qualified personnel shall be utilized.
   4. If tests fail, Contractor shall correct as required to produce a legitimate passing test.
   5. Manipulation of tester parameters on a failing test in order to achieve a passing test is unacceptable.

C. These specifications will be strictly enforced. The Contractor must verify that the requirements of the specifications are fully met through testing with an approved tester (rated for testing the cable type in use), and documentation as specified below. This includes confirmation of requirements by demonstration, testing and inspection. Demonstration shall be provided at final walk-through in soft copy.

D. Notification of the likelihood of a cable exceeding standardized lengths must be made prior to installation of the cable. Without contractor's prior written notice and written approval by the Owner, testing that shows some or all pairs of cable not meeting specifications, shall be replaced at Contractor's expense (including respective connectors).

E. Testing is still required for non-compliant cabling. The tests shall be for wire-mapping, opens, cable-pair shorts, and shorts-to-ground. The test results must be within acceptable tolerances and shall be submitted with the Owner's acceptance document.

2.2 CABLE TESTING PLAN

A. The Contractor shall:
   1. Provide a complete and detailed test plan for approval of the cabling system specified herein, including a complete list of test equipment for copper and fiber optic components and accessories prior to beginning cable testing. The following minimal items shall be submitted for review:
      a. All testing methods that clearly describes procedures and methods.
      b. Product data for test equipment
      c. Certifications and qualifications of all persons conducting the testing.
      d. Calibration certificates indicating that equipment calibration meets National Institute of Standards and Technology (NIST) standards and has been calibrated at least once in the previous year of the testing date.
   2. Include validation, and testing. Owner will require that the telecommunications cabling system installed by the Contractor be fully certified to meet all necessary requirements to be compliant with referenced IEEE and TIA specifications and vendor's warranty.
   3. Will determine the source/cause of test failure readings and correct malfunctioning component and/or workmanship within each channel or permanent link and retest to demonstrate compliance until corrected failure produces a passing result.

2.3 CABLE TESTING REPORTS

A. The Contractor shall submit cable test reports as follows:

   1. Submit certified test reports of Contractor-performed tests.
      a. The tests shall clearly demonstrate that the media and its components fully comply with the requirements specified herein.

b. (1) set of electronic test reports shall be submitted and clearly identified with cable identification.

PART 3 - EXECUTION

3.1 TEST EQUIPMENT

A. All transmission testing of balanced twisted-pair cables shall be performed with an approved Level III balance twisted pair tester found on the Siemon Ally Website. The latest version of software shall be installed prior to performing testing. Refer to the Siemon Warranty Documents for proper testing requirements of associated cable and components.

B. All balanced twisted-pair field testers shall be factory calibrated each calendar year by the field test equipment manufacturer as stipulated by the manuals provided with the field test unit. The calibration certificate shall be provided for review prior to the start of testing

C. Auto test settings provided in the field tester for testing the installed cabling shall be set to the default parameters

D. Test settings selected from options provided in the field testers shall be compatible with the installed cable under test.

3.2 TEST METHOD / CRITERIA

A. Copper Testing

1. Testing of all newly installed cable channels shall be performed prior to system cutover.
   a. Visually inspect F/UTP and optical fiber cable jacket materials for NRTL certification markings. Inspect cabling terminations in communications equipment rooms for compliance with color-coding for pin assignments and inspect cabling connections for compliance with TIA/EIA-568-C.1.
   b. Visually confirm Category 6A marking of outlets, cover plates, outlet/connectors, and patch panels.
   c. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
   d. Test F/UTP copper cabling for DC loop resistance, shorts, opens, intermittent faults, and polarity between conductors. Test operation of shorting bars in connection blocks. Test cables after termination but not cross-connection.
   e. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-C, and those required by manufacturer to validate and start warranty.
2. Copper Testing all 500 MHz category 6A field-testing shall be performed with an approved level 111e balanced twisted-pair field test device, that complies with performance requirements in "Test Instruments (Normative)" Annex, complying with measurement accuracy specified in "Measurement Accuracy (Informative)" Annex (Level IIe or IIIe balanced twisted pair field test device). Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.
3. All installed 500 MHz category 6A channels shall perform equal to or better than the minimum requirements as specified below:
   a. Category 3, balanced twisted-pair backbone cables, for the channel shall be 100 percent tested according to ANSI/TIA/EIA-568-C.1. Test parameters include wire map plus F/UTP (ScTP) shield continuity (when present), insertion loss, length and NEXT loss (pair-to-pair). NEXT testing shall be done in both directions.

   b. 500 MHZ Category 6A balanced twisted-pair horizontal and backbone cables, shall be 100 percent tested.
4. F/UTP Performance Tests
   a. Wire map.

b. Length (physical vs. electrical, and length requirements)
c. Insertion loss
d. Near-end crosstalk (NEXT) loss
e. Power sum near-end crosstalk (PSNEXT) loss
f. Equal-level far-end crosstalk (ELFEXT)
g. Power sum equal-level far-end crosstalk (PSELFEXT)
h. Return loss
i. Propagation delay
j. Delay skew
k. F/UTP Shield continuity

5. Final Verification Tests: Perform verification tests for F/UTP systems after the complete communications cabling and workstation outlet/connectors are installed.
6. Document data for each measurement. Data for submittals shall be printed in a summary report.
7. End-to-end cabling will be considered defective if it does not pass tests and inspections.
8. Prepare and submit test and inspection reports.

B. Horizontal Fiber Testing
1. Fiber horizontal cables shall be 100% tested for insertion loss and length.
2. Insertion loss shall be tested at 850 nm or 1300 nm for 50/125µm and 62.5/125µm multimode cabling in at least one direction using the Method B (1-jumper) test procedure as specified in ANSI/TIA/EIA-526-14A.
3. Length shall be tested using an OTDR, optical length test measurement device or sequential cable measurement markings.
4. The horizontal link performance guarantees are based on an optical fiber calculation for the appropriate fiber solution. Optical fiber calculations shall be determined using the Siemon Fiber Loss Calculator found on the Siemon Ally Website.

C. Backbone Fiber Testing
1. Fiber backbone cables shall be 100% tested for insertion loss.
2. Insertion loss shall be tested at both 850 nm and 1300 nm for 50/125µm and 62.5/125µm multimode cabling and both1310 nm and 1550 nm for 8.5/125µm single mode cabling and in at least one direction using the Method B (1-jumper) test procedure as specified in ANSI/TIA/EIA-526-14A.
3. Insertion loss shall be tested at 1310 and 1550 for single-mode cabling in at least one direction using the Method A.1 (1-jumper) test procedure as specified in ANSI/TIA/EIA-526-7.
4. Length shall be tested using an OTDR, optical length test measurement device or sequential cable measurement markings.
5. The backbone link performance guarantees are based on an optical fiber calculation for the appropriate fiber solution. Optical fiber calculations for any fiber cable greater than 90m (295 ft.) shall be determined using the Siemon Fiber Loss Calculator found on the Siemon Ally Website.

3.3 DEMONSTRATION

A. Include training for appropriate IT staff in numbering system and documentation system methods and record keeping. Proper fiber terminations and fiber jumper installations.

END OF SECTION

SECTION 270133 - SHOP DRAWINGS, PRODUCT DATA, SAMPLES DESIGN RECORDS & EXISTING CONDITIONS

PART 1 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

1.1 SUBMITTALS

A. The Contractor:
   1. Shall not perform any portion of the work requiring submittal and review of shop drawings, product data, or samples until Owner has approved the respective submittal. Such work shall be in accordance with approved submittals.
      a. Shop drawings as required by the owner or as a minimum to include a minimum of two sets of a plan view and elevations of all work to be installed. The Contractor shall make any corrections required by the owner or the owner's representative or consultant team, file with him two corrected copies and furnish such other copies as may be needed. The consultant's approval of such drawings or schedules shall not relieve the Contractor from responsibility for deviations from drawings or specifications, unless he has in writing and called to the Architect's attention such deviations at the time of submission, nor shall it relieve him from responsibility for errors of any sort in shop drawings or schedules.

B. The Contractor shall provide a copy of the Certified Test Data Sheet, available from the delivering distribution warehouse for either a full run or cut piece from the Master Reel of the fiber cable to be installed
   1. The Certified Test Data Sheet shall include the Master Reel number, cable description, a passing test result with details, test equipment description, date certified, and a certificate of compliance stamp, and shall be included in the O&M Manual as a component of the final deliverables submittal package.

1.2 DRAWINGS

A. Shop Drawings
   1. The Contractor shall:
      a. Submit catalogue cut sheets that include manufacturer, trade name, and complete model number for each product specified. Model number shall be handwritten, marked with an arrow or underlined to indicate exact selection.
      b. Identify applicable specification section reference for each product performance for each component specified for approval prior to purchase and installation.

B. Record Drawings
   1. Drawings for the cabling system infrastructure elements shall be maintained and kept on file by the Siemon Certified Installer (Company) for the entire term of the warranty. Drawings shall include:
      a. Horizontal cable routing and terminations
      b. Telecommunications outlets/connectors
      c. Backbone cable routing and terminations
      d. Telecommunication Spaces (TS)

C. Samples
   1. For workstation outlet connectors, jack assemblies, housing and faceplates for color selection and evaluation of technical specifications and requirements. Confirm with Architect, interior designer, and Owner representative for color before purchasing materials. Face plates shall match the electrical face plates in

      Color and material type.
   2. Upon request, provide samples for workstation outlets, jacks, jack assemblies, in specified finish, one for each size and outlet configuration

3. Sample mock-up rooms may be required in some areas to ensure proper equipment placement and fit.

D. Qualifications:
   1. The Contractor shall provide the appropriate documentation to comply with the requirements set forth in Section 01 43 23 Qualifications, included with, and at the time of, bid submittal.

PART 2 - SUSTAINABLE DESIGN RECORDS AND REPORTS

2.1 DRAWINGS

A. Closeout Submittals (As-built Drawings):
   1. Communications Design drawings are to be supplied to the Architect to prepare the master “As-Built” drawings.
   2. As-Built drawings shall be in a format that is compatible with the format used by the Architect and consultant. Dimensions and scale of the drawing sheets submitted shall match the size of the drawing used for the contract documents and shall include the cable numbers labeled in accordance with this document.
   3. Utilize normal recognized drafting procedures that match standards, Architect and consultant guidelines and methodology.
   4. The As-Built drawings shall incorporate all changes made to the building identified in, but not limited to, addendum, change notices, site instructions or deviations resulting from site conditions.

B. Contractor shall:
   1. Clearly identify any resubmitted drawing sheets, documents or cut sheets either by using a color to highlight or cloud around resubmitted information.
   2. Maintain drawing numbering or page/sheet scheme consistency as per previously issued drawings/documents.
   3. Provide dimensioned plan and elevation views of networking components, showing:
      a. All communications data/voice outlet locations complete with outlet/cable labeling.
      b. Cable routing paths of communications cables to identified infrastructure pathways.
      c. All rack and cabinet locations and labeling thereof.
      d. One-line diagram of equipment/device interconnecting data/voice cabling of the data and voice systems.
      e. Standard or typical installation details of installations unique to Owner’s requirements.
      f. Graphic symbols and component identification on detail drawing shall conform to the latest ANSI/TIA 568-C, ANSI/TIA 569-B, ANSI/TIA 606-A and ANSI/NECA/BICSI 607-A conventions.
   4. Submit one soft (compatible with Microsoft software) and hard copy with project deliverables within three weeks subsequent to substantial completion.
   5. Hard copy of floor plans for record shall be plotted to a standard, saleable, identified drawing scale.

2.2 RECORDS AND REPORTS

A. All records shall be created by the installation contractor and turned over at the completion of work.
   1. The format shall be computer based
      a. Soft copies and hard copies shall be part of the As-built package.
      b. The minimum requirements include:

         1) Cable records must contain the identifier, cable type, termination positions at both ends, splice information as well as any damaged pairs/conductors.
         2) Connecting hardware and connecting hardware position records must contain the identifier, type, damaged position numbers, and references to the cable identifier attached to it.

2. Test documentation on all cable types shall be included as part of the As-built package.

B. All Siemon Warranty Registration documents shall be included.

C. All reports shall be generated from the computer-based program used to create the records above. These reports should include but not limited to:
   1. Cable Reports
   2. Cross-connect Reports
   3. Connecting Hardware Reports

PART 3 - EXISTING CONDITIONS SITE SURVEY

3.1 SITE SURVEY

A. Prior to placing any cable pathways or cable, the contractor shall survey the site to determine job conditions will not impose any obstructions that would interfere with

B. the safe and satisfactory placement of the cables. The arrangements to remove any obstructions with the Project Manager need to be determined at that time.

END OF SECTION

SECTION 270143 - QUALIFICATIONS AND REQUIRED TRAINING FOR CONTRACTORS AND INSTALLERS

PART 1 - GENERAL INSTALLLER QUALIFICATIONS

1.1 ENTITIES

A. Communications contractors
   1. The Communications Contractor shall at a minimum possess the following qualifications:
      a. Contractor shall be a Siemon Certified Contractor with valid up to date contract certification and in good standing with the Siemon Company.
      b. Be in business a minimum of five (5) years.
      c. Contractor shall demonstrate satisfaction of sound financial condition and can be adequately bonded and insured if the project deems necessary.
      d. Possess those licenses/permits required to perform telecommunications installations in the specified jurisdiction.
      e. Use personnel knowledgeable in local, state, province and national codes and regulations. All work shall comply with the latest revision of the codes or regulations. When conflict exists between local or national codes or regulations, the most stringent codes or regulations shall be followed.
   2. Contractor must possess current liability and workers compensation insurance certificates.
   3. Contractor must be registered with BICSI and have at least one RCDD on staff or ITS Cabling Installer Program Technician certification and Installer Level 1 & 2 for a minimum of 75 percent of staff.

1.2 TRAINING

A. The Contractor shall be fully conversant and capable in the cabling of low voltage applications such as, but not limited to data, voice and imaging network systems. The Contractor shall at a minimum possess the following qualifications:
   1. Personnel trained and certified in the design of the Siemon Cabling System®.
   2. Personnel trained and certified to install the Siemon Cabling System®.
   3. The Designer and Installer shall show proof of current certification of the Siemon Cabling System® via an updated certificate given after attending the Certified Installer training course or an on-line re-certification class given every two years.
   4. Provide references of the type of installation provided in this specification.
   5. Personnel trained and certified in the installation of copper cable and in the use of Level IIIe Copper Transmission Performance testers, fiber optic cabling, splicing, termination and testing techniques. Personnel must have experience using an optical light source and power meter plus an OTDR.
   6. Personnel trained in the installation of pathways and supports for housing horizontal and backbone cabling.
B. Facilities Orientation

END OF SECTION

SECTION 270171 - RESPONSIBILITY AND WORKMANSHIP OF CONTRACTOR

PART 1 - GENERAL

1.1 CONTRACTOR RESPONSIBILITY

A. Contractor shall be obligated to exercise the highest standard of care in performing its obligations as defined in a request for proposal. All work shall be done in a workman like fashion of the highest standards in the telecommunications industry.
B. All equipment and materials are to be installed in a neat and secure manner, while cables are to be properly dressed in accordance with standards recommendation for a specific type of media (i.e. UTP vs. F/UTP @ 10 Gigabit)
C. Workers must clean any debris and trash at the close of each job and workday.
D. Contractor acknowledges that Intermountain Healthcare will rely on contractor's expertise, ability and knowledge of the system being proposed and shall be obligated to exercise the highest standard of care in performing contractual obligation as defined in the Scope of Work.
E. Contractor must submit The Siemon warranty, Cable Records, As Built Drawings and Test Results at the completion of work. Note: Intermountain Healthcare reserves the right to withhold final payments until all registration documents are approved by the Siemon Company and received by Intermountain Healthcare.

1.2 CONTRACTOR AND EMPLOYEE RESPONSIBILITY

A. Contractors, their employees, and installers will attend annually Intermountain Healthcare required Infection Control training.
B. Contractors, their employees, and installers will complete Reptrax registration.
C. Contractors, their employees, and installers will attend Intermountain Healthcare required site and job specific orientation.
D. Contractors, their employees, and installers will maintain Intermountain Healthcare required immunizations.
E. Contractors, their employees, and installers will keep their Intermountain Healthcare required confidentiality agreements current.
F. Contractors, their employees, and installers always agree to follow all Intermountain Healthcare Policies and procedures and wear the appropriate ID while on any of Intermountain properties.
G. Contractor will determine with Owner the appropriate level of Environmental Containment precautions to utilize for each work location. Infection Control Risk Assessments and permits will be performed as required.
H. Upon request, provide qualification data for all qualified layout technicians, installation supervisors, and field inspector
    1. Siemon issued qualification badges shall be readily available for this purpose.

1.3 EXAMINATION

A. Field Measurements: Verify dimensions in areas of installation by field measurements before fabrication and indicate measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the work.
B. Established Dimensions: Where field measurements cannot be made without delaying the work, establish dimensions and proceed with fabricating units without field

measurements. Coordinate supports, adjacent construction, and fixture locations to ensure actual dimensions correspond to established dimensions.

1.4 PREPARATION

A. Pre-installation inspection

1. The Contractor shall visually inspect all cables, cable reels, and shipping cartons to detect possible cable damage incurred during shipping and transport. Visibly damaged goods are not acceptable and shall be replaced by the contractor at no additional cost to the Owner.

1.5 MISCELLANEOUS CONTRACTOR RESPONSIBILITIES

A. Contractor will maintain unobstructed egress in work areas.
B. Contractor will keep an access for all Emergency Services.
C. Contractor will maintain training for Personnel in alternate exits if needed.
D. Contractor will maintain Temporary construction partitions, as required, that are smoke tight and built of non-combustible materials.
E. Additional Fire Extinguishers may be required and will be properly maintained and inspected.
F. Construction site will be maintained clean and orderly.
G. Contractor will observe Intermountain Healthcare's Tobacco Use Policy. (All forms of tobacco use are strictly prohibited)
H. All Electrical Extension cords will be grounded, and in good condition and, plugged into approved GFI Receptacles.
I. Construction site will be restricted. (Approved personnel Only)
J. Required Personal Protective Equipment (PPE) will be worn as required. (i.e. hard hats, safety glasses, safety shoes, fluorescent vest, in accordance with general contractor's safety policy)
K. Tools will be unplugged, and power secured at the end of each working day.
L. All employees and contractors will understand how to obtain MSDS sheets.
M. Contractor will notify proper personnel of any fire system shut down. A 48-hour notification is required.
N. Contractor will address all vibration concerns with Intermountain Healthcare and general contractor's staff.
O. Contractor will address all Noise Issues with Intermountain Healthcare and general contractor's staff.
P. Contractor will fill out a Hot Work permit and keep it on site daily as needed.
Q. Contractor will fill out an Above Ceiling Work Permit and keep it on site daily as needed.
R. Contractor will obtain a Confined Space Permit, when required, and keep it on site.
S. Contractor shall notify Information Systems 72 hours in advance of any shutdown or known interruption of required environmental services. Follow up by notifying the Service Desk.
T. Demolition of low voltage cabling shall be performed by the Low Voltage installation contractor.
    1. To prevent accidental removal of in-use circuits.
    2. To allow for re-use of circuits where practical.

END OF SECTION

SECTION 270500 - COMMON WORK RESULTS FOR COMMUNICATONS

PART 1 - PRODUCT

1.1 SUMMARY

A. This section covers general work results for all Communications Division detail subsections.
B. Work of the following sections cover a complete installation of both permanent and channel links for a data and voice communications network utilizing copper and fiber transmission media.

PART 2 - EXECUTION

2.1 SCOPE OF WORK

A. Includes, but is not limited to the following.
   1. The Contractor shall:
      a. Provide and install fabric and/or either plenum, PE or PVC Innerduct, rated appropriately for the installation environment; in accordance with all applicable codes and ordinances.
      b. Provide, install, terminate, test, label and document all fiber backbone, fiber and copper riser cable.
      c. Provide, install, terminate, test, and document all fiber, copper voice, and data horizontal cable.
         1) CAT6A UTP and CAT6A F/UTP shall not be mixed on the same campus.
      d. Provide and place all termination devices such as, but not limited to, modular patch panels, termination blocks, information outlets (jacks and plates), phone jacks, fiber distribution panels, bulkheads, connectors, and fiber fan out kits.
      e. Provide in quantities specified interconnect components such as, but not limited to, copper patch cords, fiber patch cables and data station cables.
      f. Provide and place horizontal and vertical cable support devices such as, but not limited to, rack and wall-mounted horizontal and vertical cable management, cable runway, communications cable runway, and all required mounting hardware, unless otherwise noted.
      g. Provide and install all equipment mounting racks, cabinets and/or brackets.
      h. Provide and install UL-approved fire stopping systems in all communication pass-thru, conduits, cable trays and ceiling, wall and floor penetrations in coordination with General Contractor.
      i. Provide all appropriate consumable items required to complete the installation.
      j. Grounding and bonding in TEC and TR rooms to grounding bus provided by Division 26.
      k. Provide complete documentation and demonstration of work.
      l. Completion of all punch list deficiencies within 10 working days.
      m. Provide indexed and organized complete Test Results of all copper and fiber cable and their components.
      n. Provide Submittals.
      o. Conduct a final document handover meeting with client, consultant, and PM to review, discuss and educate the Owner on the test results and As-Built Drawings.
      p. Provide a Manufacturer’s Extended Product Warranty and System Assurance Warranty for this wiring system.

END OF SECTION

SECTION 270526 - GROUNDING AND BONDING FOR COMMUNICATIONS SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. This work shall be provided by Division 26.
   1. Division 26 shall provide and install the communications system grounding bus bar.
   2. Systems other than the voice/data system shall be bonded by their respective installers or Division 26.
B. Exception: Division 27 shall bond racks, ladders, and other conductive IT equipment and enclosures as required.
C. Requirements of the following Division 26 Sections apply to this section:
   1. Basic Electrical Requirements
   2. Basic Electrical Materials and Methods
   3. Grounding and Bonding for Electrical Systems

1.2 SUMMARY

A. This Section includes methods and materials for grounding and bonding Communications systems.
B. All grounding / earthing and bonding shall be done to applicable codes and regulations. It is recommended that the requirements of IEC/TR 61000-5-2: 1.0, ANSI-J-STD-607-A, or both be observed throughout the entire cabling system.

PART 2 - PRODUCTS

2.1 CONDUCTORS

A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
   1. Stranded conductors No. 6 AWG.

2.2 CONNECTORS

A. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.
B. Compression fitting – 2-hole strap.

PART 3 - EXECUTION

3.1 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70 (NEC), Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
B. Comply with UL 467 for grounding and bonding materials and equipment.

3.2 APPLICATIONS

A. Conductors: Install stranded conductors for No. 6 AWG and larger, unless otherwise indicated.

3.3 INSTALLATION

A. Grounding Conductors
   1. Route along shortest and straightest paths possible, unless otherwise indicated or required by Code.
   2. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
      a. Jumper across all tray junctions use two-hole crimp lugs with a bolt, lock washer and nut to prevent loosening of ground connections over time.
      b. Contractor to remove small area of powder coat or paint to create a metal to metal bonding connection.
      c. Per current BICSI TDMM "Grounding, Bonding and Electrical Protection":
         1) Grounding and bonding connectors should be one of the following: Tin plated copper, copper or copper alloy
         2) Connections should be made using crimp connectors, or exothermic welding.
      d. Per TIA/EIA 607-A the TBB (Telecommunications Bonding Backbone) connections "shall be made using irreversible compression-type connectors, exothermic welding or equivalent."

END OF SECTION

SECTION 270528 - PATHWAYS FOR COMMUNICATONS SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Main pathways for communications systems shall be the responsibility of the Division 27 low voltage contract.
   1. Includes, but is not limited to, hangars, supports, J-hooks and cable tray.
   2. Sections 270536, 270539, and 270543_46, are supplemental clarifications that are additions to this section. The appropriate section(s) shall add for the material used.

B. Conduits, pathways, and boxes which are embedded within building finishes for communications systems shall be the responsibility of the Division 26 electrical contractor

C. Requirements of the following Division 26 sections apply to this section
   1. Basic electrical requirements
   2. Basic electrical materials and methods
   3. Grounding, earthing, and bonding for electrical systems

1.2 SUMMARY

A. Contractor shall install work following specifications, drawings, manufacturer's instructions and approved submittal data.

PART 2 - PRODUCTS

2.1 CABLE PATHWAYS

A. Comply with TIA/EIA-569-B.

B. Pathways shall be designed and installed to meet applicable local and national building and electrical codes or regulations.
   1. All materials shall be UL- and/or CSA and/or ETL-approved and labeled in accordance with NEC for all products where labeling service normally applies.
   2. NRTL labeled for support of Category 6A cabling, designed to prevent degradation of cable performance and pinch points that could damage cable
   3. Materials and equipment requiring UL 94, 149 or 1863 listing shall be so labeled. Modification of products that nullifies UL labels are not permitted.
   4. The installed systems shall not generate, nor be susceptible to any harmful electromagnetic emission, radiation, or induction that degrades, or obstructs any equipment.

C. Pathways consist of conduit, basket tray/ladder rack, J-hooks, surface mounted raceway and power poles.
   1. Basket tray shall be utilized for distribution pathways
      a. Provides proper support and load distribution along pathways.
      b. Flexibility, scalability, and accessibility
      c. Ladder rack shall be used in data rooms.
   2. Conduits may be utilized where cable tray is not viable, providing the cross-sectional area of the conduit is greater than the cross-sectional area of the cable tray.
   3. J-hooks are the minimum pathway device required for all low voltage contractors for use in ceiling distribution.
      a. Refer to section 270529.
   4. Note: Surface mounted raceway and power poles should be installed only when other pathway choices are not feasible.

2.2 EQUIPMENT

A. Compatibility
   1. All material and equipment as provided should be the standard Commercial-Off-The-Shelf (COTS) products of a manufacturer engaged in the manufacturing of such products. All shall be typical commercial designs that comply with the requirements specified. All material and equipment shall be readily available through manufacturers and/or distributors.
      a. All equipment shall be standard catalogued items of the manufacturer and shall be supplied complete with any optional items required for proper installation.
      b. Coordinate the features of materials and equipment so they form an integrated system. Match components and interconnections for optimum future performance and backward compatibility

B. Horizontal cables shall be installed in “clean, dry” locations that provide protection from moisture levels above the intended operating range of inside plant (ISP) cables
   1. Cable pathways shall be installed to provide protection from the elements (i.e. moisture) and other hazards.
   2. Cables and cable pathways shall be protected from detritus elements such as paints, adhesives, water and cleaners.
      a. In case of contamination, cables shall be replaced at the General Contractors expense. Cleaning is not acceptable.
   3. Pathways shall not have exposed sharp edges that may come into contact with telecommunications cables.

C. Pathways shall not be in elevator shafts.

D. Grounding / Earthing and bonding of pathways shall comply with applicable codes and regulations. It is recommended that the requirements of IEC/TR3 61000-5-2 - Ed. 1.0, ANSI-J-STD-607-B, or both be observed throughout the entire cabling system.

2.3 SURFACE MOUNTING

A. Surface Mount Cable Runs and Faceplate Boxes
   1. Surface mounting of cable pathway runs and/or boxes for outlets/faceplates are only authorized as a last resort and exception to running cables through the wall and above the ceiling.
   2. If surface mount cable runs are used:
      a. Burrs will be removed from the inside of the plastic or metal surface mount pathway to prevent damage to cables pulled through the run.
      b. Raceway manufacturer plastic bushings shall be installed at all outlet openings in raceway to prevent damage to cable.
      c. “T”, Splice, and corner pieces will be used to join runs. Runs will not be butted together without the appropriate joining pieces.

PART 3 - EXECUTION

3.1 HORIZONTAL PARAMETERS

A. Allowable Cable Bend Radius and Pull Tension:
   1. In general, communications cable cannot tolerate sharp bends or excessive pull tension during installation.
      a. Bend radius for 4 pair UTP and F/UTP under no load (no pulling tension) shall not exceed four (4) times the outside diameter of the cable and eight (8) times the outside diameter of the cable under load (110N/25lbf). Note: Cable bend radius and pulling tensions for cables other than 4 pair

cable increase with the diameter and type of cable refer to the manufacturer's recommendations for specific requirements.

2. After installation, exposed cable and other surfaces must be cleaned free of lubricant residue. Use only lubricants specifically designed for cable installation.

B. Pull Strings:

1. Horizontal and Vertical Pathways

a. The pathway installer shall:

1) Provide pull strings in all new conduits, including all conduits with cable installed as part of this contract.

2) Provide pull strings in all new cable trays.

3) Pull string shall have a rated average breaking strength of 200 pounds.

4) During pulling sessions, pull strings must move freely to prevent cable jacket/cable damage.

5) Free moving pull strings shall be provided in all locations where they are utilized as part of this contract.

C. Conduit Fill:

1. Reference manufacturer's Design Installation Guidelines manual.

2. Comply with requirements of NFPA 70 (NEC)

3. The number of cables placed in a pathway shall not exceed manufacture specifications, nor, will the geometric shape of a cable be affected.

a. Conduit pathways shall have a maximum fill ratio of 40% to allow for proper pulling tension and lay of the CAT6A F/UTP cable. A minimum of a 1" diameter conduit is required for new construction. Existing conduits will require the reduction of the number of cables placed in the conduit to meet the required fill ratio.

3.2 INTRA-BUILDING CABLE ROUTING

A. Pathways

1. The backbone subsystem shall include cable installed in a vertical manner between floor telecommunications rooms and the main or intermediate cross-connect in a multi-story building and cable installed horizontally between telecommunications rooms and the main or intermediate cross-connect in a long single-story building.

2. Adequate riser sleeve/slot space shall be available with the ability to ingress the area later in all telecommunications rooms, such that no drilling of additional sleeves/slots is necessary. Proper fire stopping is required for all sleeves/slots per national and local codes. Install fire stop material designed specifically for the building construction conditions and to meet the existing fire stop material as directed by the building engineer.

3. Backbone pathways shall be installed or selected such that the minimum bend radius of backbone cables is kept within manufacturer specifications both during and after installation.

4. Where redundant paths are required, they shall be separated by a minimum of 24".

a. Separate innerducts and/or armored fiber are required for each leg of the redundant path.

b. Separate physical routing for each path shall be utilized where possible.

5. Building backbone cables shall be installed in "dry" locations that provide protection from moisture levels above the intended operating range of inside plant (ISP) cables. "Slab-on-Grade" building designs wherein pathways are installed underground on/in the poured concrete slabs that are in direct contact with the soil are considered wet locations and hence are not permitted.

END OF SECTION

SECTION 270529 - HANGERS AND SUPPORTS FOR COMMUNICATION SYSTEMS

PART 1 - PRODUCTS

1.1 APPROVED PRODUCT

A. The J-hooks shall meet or exceed the below characteristics of construction and features
   1. Provide broad based support for cabling to aid in maintaining overall system performance.
   2. Be available in 50.8mm (2”) and 101.6mm (4”) options
   3. Come equipped with a cable retention clip
   4. Offers a full line of mounting accessories.

1.2 APPROVED MANUFACTURERS

A. Ericson / Caddy
B. B-Line
C. Stiffy

PART 2 - EXECUTION

2.1 J-HOOKS AND OTHER SUPPORTS SHALL BE INSTALLED SUCH THAT THEY:

A. Shall be supported with devices designed for this purpose and shall be installed independently of any other structural component. J-Hooks shall not use the suspended ceiling support wires or lighting fixture support wires.
B. The number of cables placed into the J-hooks shall be limited to a number that will not cause a change to the geometric shape of the cables.
   1. Limit to a 40% fill in new construction.
C. J-hooks shall not be spaced farther than 1.5 meters (5 ft.) apart, with a recommendation that they be space at 1 meter (3 ft.) apart. Note: Construction may require distances to exceed the maximum and are considered an exception requiring approval of project manager or building engineer.
D. J-hooks or better must be installed without exception.

2.2 UNACCEPTABLE INSTALLATIONS

A. Free flight of cables
B. Resting or attaching of cables on pipes, conduits, HVAC duct work, fire sprinkler systems, basket tray, basket tray supports or on the ceiling tiles/grid.

END OF SECTION

SECTION 270533 - CONDUITS AND BACK BOXES FOR COMMUNICATIONS SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
- A. Division 26 – Electrical work

PART 2 - PRODUCTS

2.1 APPROVED PRODUCT
- A. Conduits and Back boxes shall meet the construction requirements of the NEC for the type of structure and space in which they are installed and will be of the diameter and size to provide adequate fill, bend radius and connector space. Refer to section 270528.

PART 3 - EXECUTION

3.1 CONDUIT SIZING
- A. Conduit size shall be based on the type of cable installed and the required fill ratio and bend radius associated with the type of cable specified.
  1. Minimum conduit size to back box for CAT6A F/UTP shall be 1-inch EMT.
- B. Conduit and installation shall be provided by Division 26.
- C. All conduit stubs shall be installed with plastic bushings appropriate for the size of conduit used.
- D. Conduits that stub to accessible ceiling shall be installed in the direction to provide the shortest path to the TDR, complete with pull string.

3.2 BACK BOX SIZING
- A. New work back boxes for CAT6A F/UTP shall be a minimum of trade size 4-11/16” x 4-11/16” x 3” (depth) plus a 5/8” plaster ring to allow for proper bend radius and connector termination/installation. Side knockouts shall be avoided.
- B. Back boxes for rework shall meet the same specification as for new work.
  1. If existing back boxes or back boxes that are smaller due to construction restrictions, then devices such as extension rings, bezels or faceplates shall be used to modify the back box to insure proper bend radius and connector termination/installation.
     a. Verification and approval of the size change must have DCO Infrastructure Cabling and engineering approval.

3.3 BACK BOX COMPOSITION
- A. All back boxes for IT systems shall be UL/CSA listed and approved for the purpose.
  1. Non-metal back boxes shall not be used for any interior IT related device.

3.4 SPECIAL CONDITIONS – LEAD LINED WALLS FOR RADIATION CONTROL
- A. Refer to the complete IT Lead Lined Wall Procedure – Attachment Appendix 8

END OF SECTION

SECTION 270536 - CABLE TRAY FOR COMMUNICATIONS SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. This section shall be coordinated with Sections 270528, 270539, and 270543_46

1.2 COORDINATION

A. Prior to beginning installation, a kick-off meeting to properly coordinate the tray installation and expectations should be held. It should be arranged by the General Contractor, and at a minimum include representatives of the following trades: FP&D, Electrical (Div 26), Structured cable, Nurse Call, paging, building automation and control, plumbing, HVAC, fire sprinkler, framing, and others as applicable. The Data Center Operations Infrastructure Cabling Team will lead the meeting.
B. The wire basket tray routing shall be approved by the low voltage CI cable contractor (Div. 27 sub-contractor), and the Data Center Operations.
C. Where adequate space is available a Triple tier J-Hook pathway shall parallel the basket trays for other services
    1. The triple tier J-Hooks shall be installed by the cable tray installer.
D. Single J-Hooks as needed to extend beyond the triple tier, shall be installed by the trade that will be utilizing them.
E. Cable tray shall be a high priority installation to allow adequate time for proper and complete cable installation prior to ceiling grid.

PART 2 - PRODUCTS

2.1 APPROVED PRODUCT

A. The Cable Tray shall meet or exceed the below characteristics of construction and features:
    1. It shall be fully welded and available in a galvanized silver or powder coat black finish
    2. Have an optional construction using “elongated” shaped wires offering a more broad-based support for installed cables.
    3. Cable ladder shall be used in data rooms for horizontal management above the racks.
    4. Ladder shall match the manufacturer of the data racks or exact equal.
    5. Ladder shall be assembled with manufacturer approved parts and methods.
B. APPROVED MANUFACTURES
    1. WBT – Wire Basket Tray (preferred)
    2. Siemon RouteIT™ Wire Mesh Cable Tray, or equal basket type tray
    3. Cabolfil per owner’s approval

2.2 PART NUMBERS (SUBMITTAL REQUIRED)

A. Cable Tray
    1. Refer to plans for part numbers.

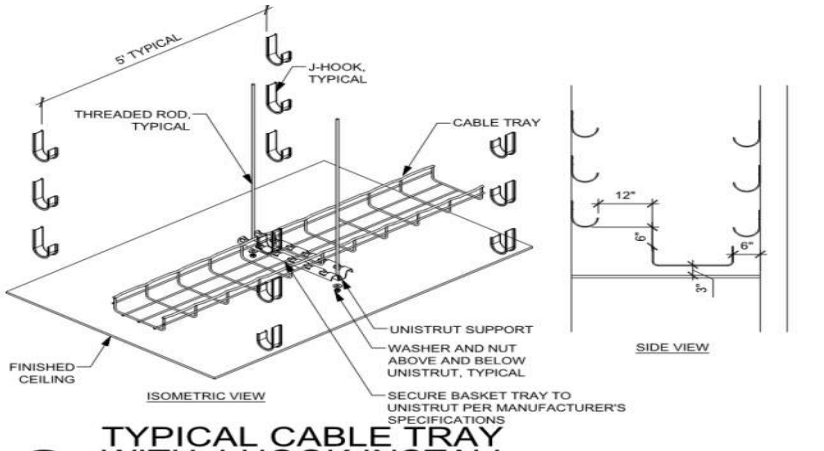
PART 3 - EXECUTION

3.1 PATHWAY INSTALLATION

A. Supports

1. Installed per Manufacturer's Specifications and utilize components specific to the maintenance of proper access in and out of the cable tray using bend delimiters.
2. Distance between supports shall not exceed 5 feet
   a. Less distance between supports required if per manufacturer's instructions.
   b. Minimum of one support required within 24" on each side of any junction point.
3. Supports shall be of the trapeze design to provide maximum stability.
   a. Each support shall attach to structure via its own hangers.
      1) All hanger supports shall be constructed of a rigid material such as all-thread.
      2) All hangers and supports shall be installed perpendicular and plumb to the tray. No angle supports shall be permitted unless augmented perpendicularly.
      3) Vibration and sway (seismic) damping required.
      4) Provide support across width of tray underneath, not via basket side wires.
      5) Building walls do not qualify as a support and shall not be used as a support.
4. Supports shall be of sufficient strength to support at least 200% of the expected load
5. Wall mounted angle brackets shall not be used as a load bearing support for cable tray.

B. Complete system access
1. Cable tray shall have a dedicated free clearance zone surrounding it.
   a. 12" clear space shall be provided on the side where natural feed will occur.
   b. 6" clear space shall be provided on the side opposite the feed access.
   c. 8" clear space above the top of tray minimum – recommended 12".
   d. 3" clear space below the tray.
2. Exception: other services may pass through the free clearance zone provided it is perpendicular to the tray direction and providing they do not exceed 6' in width or interfere with the access to pull wire in the tray.



3.2 ROUTING OF BASKET TRAY

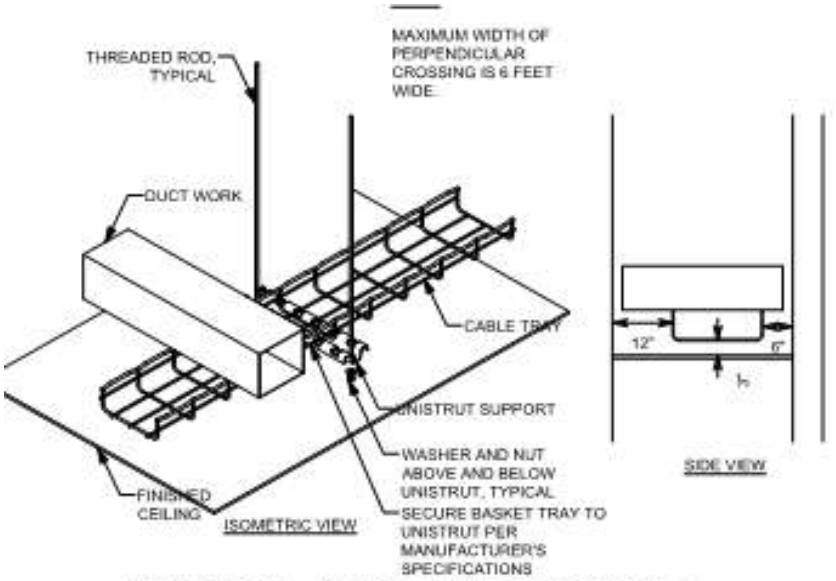
A. Exact cable tray location shall be coordinated with other trades to ensure proper clearances and access. Prior to installation, final cable tray routing must be approved by the Owner's Data Center Operations/Infrastructure cabling team.

B. Cable tray shall be installed in straight lines, either parallel or perpendicular to building lines

C. Cable tray shall follow corridor paths
   1. Routing above rooms and other partitions shall be avoided
D. Cable tray and flush penetrations shall be utilized over hard-lid areas as specified.
E. Access panels shall be provided where needed to provide access to the cable tray on both sides of the wall in hard lid areas within 3' or less of the basket tray.

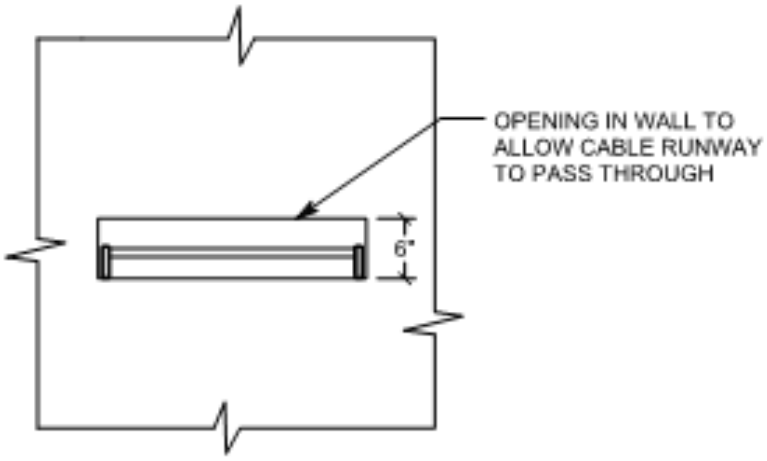
3.3 TRAY INTEGRITY

A. Tray shall be installed as a complete, continuous system with no open spaces, cut outs, or missing segments. Bonding between sections shall be accomplished by the manufacturer's approved clamp or designated method.
B. Tray shall be free from obstructions, other systems, trash or debris. Access to the tray shall be provided as outlined.
C. There shall not to be any other trades infrastructure or equipment attached to or supported by the basket tray or basket tray support system.
D. Tray must not be notched or cut-out to accommodate other trades. Repairs will not be accepted. Section replacement will be required at no cost to owner.
E. As much tray material as possible shall be left uncut at turns, junctions, elevation changes, width changes, etc. Overlap shall be clamped to maximize strength and prevent pinch points.



TYPICAL CABLE TRAY WITH PERPENDICULAR CROSSING

PART 4 -



CABLE RUNWAY
THROUGH WALL DETAIL

PART 5 - #

5.1 WALL OR OTHER PENETRATIONS (SUBMITTAL REQUIRED)

A. Fire and smoke rated assemblies
   1. Penetrations shall comply with all fire and smoke prevention methods per codes and as outlined elsewhere in this document, including Section 270528 and Division 7.

B. Approved penetration methods
   1. Preferred barrier penetration method shall be to run the tray continuous through the barrier, with closure provided by Firestop pillows.
      a. Framing shall be boxed around openings to permit proper pillow insertion. Coordinate with framing contractor.
   2. Sleeves or conduits
      a. EZ-Path or alternate penetrations must provide 150% of the designed cross-sectional area of the basket.
      b. Conduit permitted only with written pre-bid permission or engineering notation on the drawings.
      c. Each penetration sleeve or conduit shall be bonded on both sides of the penetrated barrier using UL and AHJ approved methods.
   3. All penetrations shall be positioned in-line with the cable tray to facilitate ease of pulling conductors and provide a straight-line path.
      a. The bottom of the penetration device shall be flush with the bottom of the cable tray
      b. Side-to-side penetrations must be completely within the cable tray space or directly above whenever possible.
   4. Approved penetration devices shall be a minimum size of 4”
      a. Total penetration space at each location shall be sized for 20% growth and be equal to or greater than the cross-sectional area of the basket tray.
      b. Approved devices where smaller penetrations are permitted shall be a minimum size of 1”.
   5. Approved devices shall be approved by the local facility manager:
      a. Fire rated STI EZ-Path

b. Hilti self-sealing device
c. Tray with enclosed wall and properly sized and installed pillows
d. Conduit sleeves
1) Conduit sleeves should only be used as a last resort upon approval from owner's Data Center Operations Infrastructure Cabling representative.

5.2 UTILIZATION

A. Capacity
1. Trays and penetration devices shall be properly sized
a. Provide a maximum calculated fill ratio of 40% to an inside depth not to exceed 3 inches (75 mm)
b. Provide capacity to allow for at least 20% future growth

B. Systems served
1. Cable trays, J-hooks, and penetrations shall be dedicated to a single system. Mixing of other systems with voice and data shall not be permitted in tray or J-hook paths.
2. Exception: Different systems may share cable tray providing the following conditions are met:
a. Less than 40% overall fill is maintained, plus 20% additional space for growth
b. There is a minimum 3" separation between systems
c. There is a grounded physical divider between systems

C. Restricted content in trays
1. The wire basket tray shall only contain cables for the voice and data communications systems.
a. If there is sufficient space in the tray, and with approval from both the data network sub-contractor and the Data Center Operations, certain other IP services may share tray space. (i.e. camera, telemetry, similar).
b. Service loops must not reduce tray capacity.
c. Nurse call cabling shall be run in the J-Hook path. All nurse call installations must provide their own path or utilize the triple J-Hook system.

D. Triple J-Hook path assignments
1. The Lower tier of the triple J-Hook path is designated for Card Access and building automation and controls
2. The Middle tier of the triple J-Hook path may alternately be utilized for Nurse Call, or other EMI producing systems.
3. The Top tier of the triple J-Hook path is designated for satellite, DAS, or similar systems.
4. When a triple J-hook pathway is not installed or available each system provider shall install their own j-hook pathway and wall penetrations.
5. Service loop and slack shall not interfere with other pathways.

END OF SECTION

SECTION 270543/46 - UNDERGROUND DUCTS, UTILITY POLES, AND RACEWAYS FOR INTERBUILDING/CAMPUS CABLE ROUTING

PART 1 - PRODUCTS

1.1 INTER-BUILDING/CAMPUS CABLE ROUTING

A. The backbone subsystem shall include cable installed between buildings via approved underground, tunnel, direct -buried, aerial or any combination of these from the Campus Distributor/Main Cross-connect (CD/MC/TEC) to Building Distributor/Intermediate Cross-connect (BD/IC/TDR) in a multi-building campus.
   1. 4” Conduit is required
   2. (3) 1 ¼” inner ducts shall be installed in all 4” conduits going building to building.
   3. Armored Fiber is required.
   4. Microduct/microfiber is optional.

B. Backbone pathways shall be installed or selected such that the minimum bend radius and pulling tension of backbone cables is kept within cable manufacturer specifications both during and after installation.

C. In an underground system, adequate underground conduit space shall be available and accessible at each building. The conduits shall not exceed a fill ratio of 40%.
   1. All underground systems shall be designed to prevent water runoff from entering the building. All underground systems must be cleared of any moisture prior to installation of any cable type. These systems must be sealed at both ends when not in use and after cable installation to prevent moisture and rodent infiltration.

PART 2 - EXECUTION

2.1 INSTALLATION

A. The backbone cables shall be installed in a hierarchical star topology, emanating from the Campus Distributor/Main Cross-connect to each satellite building, Building Distributor/Intermediate Cross-connect or Floor Distributor/Horizontal Cross-connect located in a telecommunication room. All Inter-building/Campus cables shall be installed to the applicable codes and regulations.

B. Where redundant paths are required, they shall be separated by a minimum of 24”.
   1. Separate innerducts are required for each leg of the redundant path.
   2. Separate physical routing for each path shall be utilized where possible.

C. Optical fiber shall be run for all Inter-building/Campus backbone segments, and as a recommendation, at least one balanced twisted-pair cable should be run for each Inter-building backbone segment.
   1. Fibers will be Fusion Spliced in the telecommunications rooms using LC Pigtails in wall mounted interconnect centers or rack mounted panels equipped with sufficient ports, slack storage space and splice trays if required to terminate and secure all fibers.

D. ST connectors are no longer recommended in the TIA 568-C.3 standard but may be used in legacy installations.

E. Over-voltage Circuit Protection shall be utilized for cabling which enters or exits a building shall comply with applicable codes and regulations.

F. OSP (outside plant) cables shall transition to an ISP (inside plant) within 50 feet of changing environment, per national and local codes and regulations.

END OF SECTION

SECTION 270553 - IDENTIFICATION FOR LOW-VOLTAGE CABLES AND LABELING

PART 1 - GENERAL

1.1 NOT USED

PART 2 - PRODUCTS

2.1 LABELING

A. Structured cabling shall be labeled in accordance with ANSI/TIA 606-B standards.
B. A unique identifier shall be marked on each faceplate to identify it as connecting hardware.
C. Each port in the faceplate shall be labeled with its identifier.
D. A unique identifier shall be marked on each piece of connecting hardware to identify it as connecting hardware.
E. Each port on the connecting hardware shall be labeled with its identifier.
F. Cable Labeling
    1. Label System
        a. Labels Identification (Labeling) System:
            1) Brady
            2) Dymo
            3) Hellerman-Tyton
            4) Panduit
            5) Acceptable alternate
                a) Approval from Data Center Operations Infrastructure Cabling team member required prior to bid
    2. Cable Labels
        a. Self-adhesive vinyl or vinyl-cloth wraparound tape markers, machine printed with alphanumeric cable designations. Plastic, self-adhesive labels are not acceptable.
        b. Each end of the Horizontal cables shall be labeled with a mechanically generated label within 300mm (12 in) of the end of the cable jacket with the link identifier which shall be a unique configuration determined by owner. This also applies to the Backbone Cables.
    3. Flat-surface labels
        a. Self-adhesive vinyl or vinyl-cloth labels, machine printed with alphanumeric cable designations
    4. Contractor shall:
        a. Provide transparent plastic label holders, and 4 pair marked colored labels.
        b. Install colored labels according to the type of field as per ANSI/TIA 606-B.1 color code designations.
G. PALLETTE
    1. Use the owners color-code guidelines for voice, data, cross-connect, riser, and backbone fields. Otherwise, use the ANSI/TIA 606-B designation strip color-code guidelines for voice, data, cross-connect, riser, and backbone fields. Color designations for F/UTP cable:
        a. Intermountain Healthcare Standard Wiring Palettes for Horizontal Cabling

        b.

Use		Color
1)	Data & IP Phones	Blue
2)	Analog Phone	Blue
3)	Security Card Readers	Grey/Yellow
4)	IP Security Cameras	Blue

5)	Fire Systems	Red
6)	TV Coax	Black
7)	Public Address/Telecom Patching in TEC only	White
8)	Clinical Engineering –	Orange
	a) Monitoring, Bed Systems	Orange
	b) Nurse Call (5e)	Orange
	c) Real time patient data	Orange
9)	Wireless	Yellow
10)	Foreseer (Belden 1422)	Red

H. Outlet/Jack/Faceplate Icons/labeling will match the color of the cable attached to the back side of the outlet/jack.

PART 3 - EXECUTION

3.1 GENERAL IDENTIFICATION

A. Installer shall label all cable, regardless of length.
B. Identify system components, wiring, and cabling complying with TIA/EIA-606-B.1. Comply with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."
C. Color-code cross-connect fields. Apply colors to voice and data service backboards, connections, covers, and labels.
D. Using cable management system software specified in Part 2, develop Cabling Administration Drawings for system identification, testing, and management. Use unique, alphanumeric designation for each cable and label cable, jacks, connectors, and terminals to which it connects with same designation. At completion, cable and asset management software shall reflect as-built conditions.
E. Cable Schedule: Post in prominent location in each equipment room and wiring closet. List incoming and outgoing cables and their designations, origins, and destinations. Protect with rigid frame and clear plastic cover. Furnish an electronic copy of final comprehensive schedules for Project.
F. Cabling Administration Drawings: Show building floor plans with cabling administration-point labeling. Identify labeling convention and show labels for telecommunications rooms, backbone pathways and cables, entrance pathways and cables, terminal hardware and positions, horizontal cables, work areas and workstation terminal positions, grounding buses and pathways, and equipment grounding conductors. Follow convention of TIA/EIA-606-B.1. Furnish electronic record of all drawings, in software and format selected by Owner

3.2 CONCEALED ENDS

A. Jacks, connectors, terminations, and similar that are in concealed locations such as above grid ceilings, shall have additional labeling. The additional label shall be on the face of the grid in a visible location, immediately adjacent to the termination location.

3.3 CABLE AND WIRE IDENTIFICATION

A. Label each cable visibly within 4 inches of each termination and tap, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.

B. Each wire connected to building-mounted devices is not required to be numbered at device if color of wire is consistent with associated wire connected and numbered within panel or cabinet.
C. Label each terminal strip and screw terminal in each cabinet, rack, or panel.
1. Individually number wiring conductors connected to terminal strips and identify each cable or wiring group being extended from a panel or cabinet to a building

mounted device shall be identified with name and number of particular devices as shown.

2. Label each unit and field within distribution racks and frames.

D. Labels shall be preprinted or computer-printed type with printing area and font color that contrasts with cable jacket color but still complies with requirements in TIA/EIA-606-B.1.

END OF SECTION

SECTION 271100 - EQUIPMENT ROOM FITTINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Requirements of the following Division 26 sections apply to this section
   1. Basic electrical requirements
   2. Basic electrical materials and methods
   3. Grounding, earthing, and bonding

B. Standards
   1. Minimum equipment room specifications shall comply with the 2010 AIA Guidelines for Design and Construction of Healthcare Facilities.
   2. Minimum recommended room sizes are requirements, not suggestions.
   3. Enterprise IS Architecture (EISA) maintains several documents around standards. The primary standards list is the EISA Standards 2010 – Master List. Occasionally, there is a need to breakout specific standards for an area.

1.2 SUMMARY

A. This Section specifically details the facilities design and operations standards to be utilized for Intermountain Health Care's Data Rooms (TEC) and data closets (TDR).

1.3 COMMON REQUIREMENTS

A. Rack layout and mounting
   1. Standard room layouts are located on the plans.

B. Rack and wall mounting locations
   1. Rack and wall space use is pre-designated at the design stage. Before mounting any equipment on a wall or in a rack, the location must be verified by the Div 27 sub-contractor and the Data Center Operations.

1.4 DEFINITIONS

A. **Data Center** – Major computer/technology/network facilities providing a significant percentage of the data and application services for the enterprise.

B. **Data Rooms** – **((TEC) Technology Equipment Center)** – Purpose built buildings or rooms that provide communications point-of-presence along with some data and applications services for a local facility or region.

C. **TSER (Telecommunications Service Entrance Room)** – Houses the point at which data and voice circuits and services enter the facility and outdoor cabling interfaces with the building infrastructure. Typically, the TSER will be located in the TEC.

D. **Data Closets – ((TDR) Technology Distribution Room)** – Specific location within a facility that provides communication services for a specific area (floor, wing, office area) of that facility only. A secure, flexible, and easily managed location for the structured cabling systems, network electronics, clinical systems, nurse call systems, and other technology and communications equipment.

PART 2 - TECHNOLOGY ROOM SPECIFIC REQUIREMENTS

2.1 TECHNOLOGY EQUIPMENT CENTER (TEC)

A. Each Hospital will have a dedicated TEC which will serve as the main communications point-of-presence along with data and application services for the local facility or region. Houses the core networking equipment, application servers and data storage devices

that serve the buildings on the campus. The Telecommunications Service Entrance Room (TSER) will be in the same room.

2.2 TEC IN HOSPITALS

A. Physical Construction
1. The TEC should be in an area easily accessed for delivery of equipment and high traffic without disturbing patient care.
2. The size of the TEC will be based on the number of cabinets required to support the campus, plus 30% growth.
3. Walls will be constructed from the from the floor to the deck and be completely sealed from surrounding spaces.
4. A minimum 50% of open wall space will have ¾" fire rated plywood covering the walls.
5. Fire rated plywood shall be painted with fire resistant paint, leaving the fire rating stamp un-painted.
6. The TEC should not have a ceiling other than the deck.
7. Static Dissipative Tile is required in the TEC.
8. The door to the TEC shall be 8' tall and 4' wide to accommodate the cabinet height.
9. The walls of the TEC should not have any windows installed.

B. Layout
1. Cabinets will be in a cold isle configuration.
2. Containment will be installed, including removable ceiling panels and isle doors.

C. Electrical
1. The electrical distribution system will follow an A (BLUE) – B (RED) design.
2. Each system A (BLUE) and B (RED) will be backed up by a dedicated UPS.
3. Outlet type is L21-30
4. All power is to be run in conduit.
5. Lighting will be installed above each isle.

D. Mechanical
1. The mechanical system will be a precision cooling solution installed in an in row, N+1 configuration designed to maintain 72 degrees F at mid cabinet.
2. The mechanical system will be redundant and concurrently maintainable including on the electrical supply.
3. The system shall meet engineering specifications for the room at 110 degrees outside air at 4500 feet above sea level.
4. Chilled water, DX (Air Cooled) and Glycol (30% polyethylene glycol to water) are all acceptable cooling strategies.

E. Security
1. Doors will be fitted with an auditable card reader.

F. Fire System
1. A pre-action dry pipe fire system will be installed

G. Monitoring
1. Eaton Forseer system will be used to monitor all critical systems.
2. Forseeer cables will be run to all UPSs, cooling units and TDRs.
3. One Cat 6a F/UTP cable to each UPS.

2.3 TEC in Clinics and Office Buildings

A. Clinics and Offices will have a room which will serve as a TEC and TDR. This room will be sized to accommodate the multifunction of the space.

2.4 TEC/TDR in Clinics

A. Physical Construction

1. TDRs should be in a central location off the main corridor away from patient areas.
2. TDRs should be stacked from floor to floor.
3. TDR size will be at least 12’ x 14’.
4. Walls will be constructed from the floor to the deck and be completely sealed from surrounding spaces.
5. A minimum 50% of open wall space will have ¾” fire rated plywood covering the walls.
6. Fire rated plywood shall be painted with fire resistant paint, leaving the fire rating stamp un-painted.
7. The TDR should not have a ceiling other than the deck.
8. Flooring can be Static Dissipative Tile or Epoxy Paint.
9. 3’ wide door is required.
10. When permissible, doors shall swing out of the room to provide maximum available space and rapid egress.

B. Layout
1. Racks in a single row with the front being the cold isle.
2. The front of the racks should face the door.

C. Electrical
1. The electrical distribution system will follow an A (BLUE)-B (RED) design.
2. System A(BLUE) will be backed up by a dedicated UPS.
3. System B(RED) will be from a dedicated utility circuit.
4. Outlet type is L6-30 and L5-20.
5. All power is to be run in conduit.
6. Lighting will be installed above each isle.

D. Mechanical
1. TDRs will have redundant cooling
   a. Primary cooling is from the facility cooling system via a dedicated source.
   b. Secondary cooling is from a standalone split or ceiling mount source.
   c. The secondary system will be fed from the facility generator equipment electrical source if available.
   d. The Mechanical system will be designed to maintain 72 degrees F at mid rack.
   e. The coordination scheme between primary and secondary cooling systems can be accomplished by setting the primary system to 72 degrees F and the secondary system to 75 degrees F.

E. Security
1. Doors will be fitted with an auditable card reader.

F. Fire System
1. TDRs will utilize the facility fire detection and suppression systems.
2. Sprinkler heads should have a 200-degree fuse.
3. Sprinklers should be protected from accidental activation.

G. Monitoring
1. TDRs will be monitored using Eaton/Foreseer.
2. Run 3 foreseer cables to each TDR.
3. One Cat6a F/UTP cable to each UPS.

2.5 TEC/TDR in Offices

A. Physical Construction
1. TDRs should be in a central location off a main corridor.
2. TDRs should be stacked from floor to floor.
3. TDR size will be at least 12’ x 14’.
4. Walls will be constructed from the floor to the deck and be completely sealed from surrounding spaces.
5. A minimum 50% of open wall space will have ¾” fire rated plywood covering the walls.

6. Fire rated plywood shall be painted with fire resistant paint, leaving the fire rating stamp un-painted.
7. The TDR should not have a ceiling other than the deck.
8. Flooring can be Static Dissipative Tile or Epoxy Paint.
9. 3' wide door is required.
10. When permissible, doors shall swing out of the room to provide maximum available space and rapid egress.

B. Layout
1. Racks in a single row with the front being the cold isle.
2. The front of the racks should face the door.

C. Electrical
1. The electrical distribution system will follow an A (BLUE)-B (RED) design.
2. System A(BLUE) will be backed up by a dedicated UPS.
3. System B(RED) will be from a dedicated utility circuit.
4. Outlet type is L6-30 and L5-20.
5. All power is to be run in conduit.
6. Lighting will be installed above each row.

D. Mechanical
1. TDRs will have redundant cooling system designed to maintain 72 degrees F at mid rack.
   a. Primary cooling is from the facility cooling system via a dedicated source.
   b. Secondary cooling is from a standalone split or ceiling mount source.
      1) The secondary system will be fed from the facility generator equipment electrical source if available.
   c. The coordination scheme between primary and secondary cooling systems can be accomplished by setting the primary system to 72 degrees F and the secondary system to 75 degrees F.
2. Doors will be fitted with an auditable card reader.

E. Fire System
1. TDRs will utilize the facility fire detection and suppression systems.
2. Sprinkler heads should have a 200-degree fuse.
3. Sprinklers should be protected from accidental activation.

F. Monitoring
1. TDRs will be monitored using Eaton/Foreseer.
2. Run 3 foreseer cables to each TDR.
3. One Cat 6a F/UTP cable to each UPS.

2.6 TECHNOLOGY DISTRIBUTION ROOM (TDR)

A. There shall be a minimum of one TDR on each floor of the facility. TDR's shall be provided throughout the facility as necessary to meet the 292' (90-meter) maximum cables distance. The TDR is located on each floor within a facility to house equipment and cabling, providing communication and technology services for a specific area of that facility. Based on the different needs of different facilities, the TDR's will be broken down into three categories. Hospital, Clinic and Office spaces.

2.7 TDR IN HOSPITALS

A. Physical Construction
1. TDRs should be in a central location off a main corridor and away from patient areas.
2. TDRs should be stacked from floor to floor.
3. TDR size will be at least 14' x 16'.
4. Walls will be constructed from the floor to the deck and be completely sealed from surrounding spaces.
5. A minimum 50% of open wall space will have ¾" fire rated plywood covering the walls.

6. Fire rated plywood shall be painted with fire resistant paint, leaving the fire rating stamp un-painted.
7. The TDR should not have a ceiling other than the deck.
8. Flooring can be Static Dissipative Tile or Epoxy Paint.
9. 3’ wide door is required.
10. When permissible, doors shall swing out of the room to provide maximum available space and rapid egress.

B. Layout
1. Racks will be in a cold isle configuration.
2. Two rows with the cold isle in the middle.

C. Electrical
1. The electrical distribution system will follow an A (BLUE)-B (RED) design.
2. Each system A(BLUE) and B(RED) will be backed up by a dedicated UPS.
3. Outlet type is L6-30 and L5-20.
4. All power is to be run in conduit.
5. Lighting will be installed above each row.

D. Mechanical
1. TDRs will have redundant cooling designed to maintain 72 degrees F at mid rack.
   a. Primary cooling is from the facility cooling system via a dedicated source.
   b. Secondary cooling is from a standalone split or ceiling mount source.
   c. The secondary system will be fed from the facility generator equipment electrical source if available.
   d. The coordination scheme between primary and secondary cooling systems can be accomplished by setting the primary system to 72 degrees F and the secondary system to 75 degrees F.

E. Security
1. Doors will be fitted with an auditable card reader.

F. Fire System
1. TDRs will utilize the facility fire detection and suppression systems.
2. Sprinkler heads should have a 200-degree fuse.
3. Sprinklers should be protected from accidental activation.

G. Monitoring
1. TDRs will be monitored using Eaton/Foreseer.
2. Run 3 foreseer cables to each TDR.
3. One Cat 6a F/UTP cable to each UPS.

2.8 TDR in Clinics

A. Physical Construction
1. TDRs should be in a central location off a main corridor and away from patient areas.
2. TDRs should be stacked from floor to floor.
3. TDR size will be at least 10’ x 12’.
4. Walls will be constructed from the floor to the deck and be completely sealed from surrounding spaces.
5. A minimum 50% of open wall space will have ¾” fire rated plywood covering the walls.
6. Fire rated plywood shall be painted with fire resistant paint, leaving the fire rating stamp un-painted.
7. The TDR should not have a ceiling other than the deck.
8. Flooring can be Static Dissipative Tile or Epoxy Paint.
9. 3’ wide door is required.
10. When permissible, doors shall swing out of the room to provide maximum available space and rapid egress.

B. Layout
1. Racks in a single row with the front being the cold isle.

2. The front of the racks should face the door.

C. Electrical
1. The electrical distribution system will follow an A (BLUE)-B (RED) design.
2. System A(BLUE) will be backed up by a dedicated UPS.
3. System B(RED) will be from a dedicated utility circuit.
4. Outlet type is L6-30 and L5-20.
5. All power is to be run in conduit.
6. Lighting will be installed above each isle.

D. Mechanical
1. TDRs will have redundant cooling designed to maintain 72 degrees F at mid rack
   a. Primary cooling is from the facility cooling system via a dedicated source.
   b. Secondary cooling is from a standalone split or ceiling mount source.
   c. The secondary system will be fed from the facility generator equipment electrical source if available.
   d. The coordination scheme between primary and secondary cooling systems can be accomplished by setting the primary system to 72 degrees F and the secondary system to 75 degrees F.

E. Security
1. Doors will be fitted with an auditable card reader.

F. Fire System
1. TDRs will utilize the facility fire detection and suppression systems.
2. Sprinkler heads should have a 200-degree fuse.
3. Sprinklers should be protected from accidental activation.

G. Monitoring
1. TDRs will be monitored using Eaton/Foreseer.
2. Run 3 foreseer cables to each TDR.
3. One Cat 6a F/UTP cable to each UPS.

2.9 TDR in Offices

A. Physical Construction
1. TDRs should be in a central location off a main corridor.
2. TDRs should be stacked from floor to floor.
3. TDR size will be at least 10’ x 12’.
4. Walls will be constructed from the floor to the deck and be completely sealed from surrounding spaces.
5. A minimum 50% of open wall space will have ¾” fire rated plywood covering the walls.
6. Fire rated plywood shall be painted with fire resistant paint, leaving the fire rating stamp un-painted.
7. The TDR should not have a ceiling other than the deck.
8. Flooring can be Static Dissipative Tile or Epoxy Paint.
9. 3’ wide door is required.
10. When permissible, doors shall swing out of the room to provide maximum available space and rapid egress.

B. Layout
1. Racks in a single row with the front being the cold isle.
2. The front of the racks should face the door.

C. Electrical
1. The electrical distribution system will follow an A (BLUE)-B (RED) design.
2. System A(BLUE) will be backed up by a dedicated UPS.
3. System B(RED) will be from a dedicated utility circuit.
4. Outlet type is L6-30 and L5-20.
5. All power is to be run in conduit.
6. Lighting will be installed above each isle.

D. Mechanical

1. TDRs will have redundant cooling designed to maintain 72 degrees F at mid rack.
    a. Primary cooling is from the facility cooling system via a dedicated source.
    b. Secondary cooling is from a standalone split or ceiling mount source.
    c. The secondary system will be fed from the facility generator equipment electrical source if available.
    d. The coordination scheme between primary and secondary cooling systems can be accomplished by setting the primary system to 72 degrees F and the secondary system to 75 degrees F.

E. Security
1. Doors will be fitted with an auditable card reader.

F. Fire System
1. TDRs will utilize the facility fire detection and suppression systems.
2. Sprinkler heads should have a 200-degree fuse.
3. Sprinklers should be protected from accidental activation.

G. Monitoring
1. TDRs will be monitored using Eaton/Foreseer.
2. Run 3 foreseer cables to each TDR.
3. One Cat 6a F/UTP cable to each UPS.

PART 3 - EXECUTION

3.1 COMMON REQUIRED CHARACTERISTICS FOR TDR, TEC, & TSER

A. SECURITY - COMMON
1. Any visitor, vendor, or contractor requiring access to a Technology Room, who does not have appropriate approvals or clearances, must be escorted by a properly credentialed tech from the appropriate system.
2. The main technology equipment shall be secured in a dedicated, locked Technology Room.
3. Unused access jacks should be disconnected from the patch panels, and unused switch ports disabled.
4. Technology Rooms shall be dedicated to the data and telecommunications functions.
5. Access to the Technology Room shall be restricted to authorized service personnel and shall not be shared with building services that may interfere with the main networking interfaces, the networking equipment, the application servers, data storage devices, and telecommunications equipment systems.
6. Technology Rooms shall not be used for building maintenance services, custodial services, or be used for general storage.
7. Security cameras may be installed in each Technology Room upon owner’s preference.
    a. At entrances
    b. At the end of each row of equipment racks
    c. In electrical and mechanical rooms serving the Technology Room
    d. Approved camera manufacturers: Axis and Bosch
8. Access to a Technology Room shall be restricted and controlled by an auditable access control system. The access control system shall comply with the requirements of this document.
9. All secure data areas must be secured by an auditable badge reader system.
    a. Refer to plans or quotes for detailed information
    b. Approved supplier: Intermountain Lock and Security Supply / 3106 S Main St / Salt Lake City, UT 84115 / 801-486-0079
    c. Owner of security locks and badge readers: Intermountain Healthcare Data Center
    d. For programing on the Medeco XT Electronic Keys contact: Intermountain Healthcare Data Center

B. PHYSICAL ENVIRONMENT

1. The Technology Room shall be in a dry area not subject to flooding and should be as close as possible to the electrical service room in order to reduce the length of the bonding conductor to electrical grounding system.

2. The Technology Room shall be in an accessible, non-sterile area.
3. Access to the Technology Room shall be directly off a corridor and not through another space.
4. The Technology Room shall be located to avoid large ducts, beams, and other building elements that may interfere with proper cable routing and may limit future access.
5. Mechanical and electrical equipment or fixtures not directly and exclusively related to the support of the Technology Room shall not be installed in, pass through, or enter the Technology Room.
6. Technology rooms shall not be located on exterior walls.
7. Technology rooms shall not have windows or other exterior openings.

3.2 TECHNOLOGY DISTRIBUTION ROOM (TDR) / DATA CLOSET

A. ELECTRICAL ENVIRONMENT

1. Separation from sources of EMI shall be in accordance with ANSI/TIA/EIA-569-C and local codes.
2. Communication grounding/earthing and bonding shall be in accordance with applicable codes and regulations. It is recommended that the requirements of IEC/TR3 61000-5-2 - Ed. 1.0, ANSI-J-STD-607-C, or both be observed throughout the entire cabling system.
    a. All racks, equipment frames, furniture, flooring, ductwork within the IT space shall be bonded to the Central Ground bar provided and installed by Division 26.
        1) No AC electrical equipment bonding will be done at the Central Ground Bar. AC electrical grounding and bonding will be done according to the NEC.
3. Some TDRs will require redundant power and data feeds. See plans and drawings.
4. Lighting in the TDRs should be a minimum of 500 lx (50-foot candles) at the lowest point of termination.
    a. Light switch should be easily accessible when entering the room.
    b. Lighting will be fed from the generator system or have fixtures with battery backup.
5. A minimum of two dedicated duplex or two dedicated simplex electrical outlets, each on a separate 120V 20A circuit, should be provided for equipment power. Additional convenience duplex outlets should be placed at 1.8 m (6 ft) intervals around the perimeter walls.
    a. Only twist lock receptacles will be used for rack power points. Type L-6-30R for 208 volt and type Nema L-5-20R for 120 volt
6. All power is to originate from the facilities generator backup system with one system (A-B) originating from the critical system.
7. All circuits serving the TDR and the equipment within it shall be dedicated to serving the TDR.

8. TDRs shall be connected by a backbone of insulated, #6 (minimum) to 3/0 AWG stranded copper cable between all technology rooms. This cable shall be provided and installed by Division 26.

B. MECHANICAL ENVIRONMENT

1. Reliable cooling shall be provided.
    a. Based on criticality tiering structure individual rooms may require redundant, concurrently maintainable cooling systems.
    b. Tier structure level shall be determined from the design guide.

2. Heat load shall be calculated at 4KW per equipment rack
3. Temperature and humidity in the TDR shall be controlled to an operating range of 64 to 75 degrees F (18 to 24 degrees C) with 30 to 55 percent relative humidity.

C. EQUIPMENT
1. Each TDR shall be connected to the TEC (Technology Equipment Center) to provide a building-wide network and communications system.
2. All racks, cabinets, sections of cable tray, and metal components of the technology system that do not carry electrical current shall be grounded.

3.3 TECHNOLOGY EQUIPMENT CENTER (TEC) / DATA ROOM

A. ELECTRICAL ENVIRONMENT
1. The TDR and TEC electrical environments shall match with the following exceptions:
2. All circuits serving the TEC and the equipment within it shall be dedicated to serving the TEC.

B. MECHANICAL ENVIRONMENT
1. TEC and TSER have the same mechanical environment.
2. Reliable cooling shall be provided.
3. Heat load shall be calculated at 4KW per equipment rack
4. Temperature and humidity in the TEC shall be controlled to an operating range of 64 to 75 degrees F (18 to 24 degrees C) with 30 to 55 percent relative humidity.

C. EQUIPMENT
1. Each TEC shall be connected to the TSER (Telecommunications Service Entrance Room) to provide an enterprise-wide network and communications system.
2. All racks, cabinets, sections of cable tray, and metal components of the technology system that do not carry electrical current shall be grounded.

3.4 TELECOMMUNICATION SERVICE ENTRANCE ROOM (TSER) / D-MARC

A. PURPOSE
1. The TSER (Telecommunications Service Entrance Room) equipment subsystem shall consist of shared (common) electronic communications equipment in the TEC or the TSER required to interface this equipment and distribution hardware to the transmission media of enterprise Wide Area Network (WAN) infrastructure.
2. The TSER shall be equipped to contain telecommunications equipment, cable terminations, and associated cross-connects.
   a. Note that the AIA/State guidelines specify that the minimum size for a TSER is 12’ by 14’.
   b. Doors shall swing out of the room to provide maximum available space and rapid egress.
      1) Exception: where prohibited by fire or safety code.
3. The TSER shall be dedicated to the telecommunications function.

B. MECHANICAL ENVIRONMENT
1. Reliable cooling and heating shall be provided.
2. Temperature and humidity in the TSER shall be controlled to an operating range of 64 to 75 degrees F (18 to 24 degrees C) with 30 to 55 percent relative humidity.

C. EQUIPMENT
1. The TSER (Telecommunications Service Entrance Room) shall be connected to the specified WAN equipment to provide connectivity to the enterprise-wide network and communications system.
2. All racks, cabinets, sections of cable tray, and metal components of the technology system that do not carry electrical current shall be grounded.

END OF SECTION

SECTION 271116 - CABINETS, RACKS, FRAMES, AND ENCLOSURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Cabinets and racks specifications are in TIA569-C and in the ET pages of the plans.

PART 2 - PRODUCTS

2.1 APPROVED PRODUCT

A. OPEN RACKS
   1. For rack-mounted installations in a telecommunications room the installer shall use a 19 inch by 3-inch-deep equipment rack.
      a. Equipment Rack 19" X 8', 52 RU, Black – Chatsworth 55053-715
      b. Equipment Rack 19” X 7’, 45 RU, Black – Chatsworth 55053-703
      c. Exception: Where other size cabinets are specified by design team at owner’s direction

B. WIRE MANAGERS
   1. Part Numbers
      a. Vertical Wire Manager, Double Sided, Black 10” wide x 8’ tall – Chatsworth 40096-715
      b. Vertical Wire Manager, Double Sided, Black 10” wide x 7’ tall – Chatsworth 40096-703
      c. Horizontal Wire Manager, 4U – Panduit PEHF4
   2. Typical Standard Layout
      a. Layout is 10” vertical manager, then 19” rack, then 10” vertical manager, then 19” rack, then 10” vertical manager.
      b. Where more than 2 racks are called for, maintain the pattern of 10” vertical wire management on the ends, and 10” vertical management between racks.

C. CABINETS
   1. Standard Cabinet
      a. 2-Sided Cabinet – Vertiv E4562121120001S
      b. 1-Sided Cabinet – Vertiv E4562122120001S
   2. Wall Mount Cabinet
      a. Vertical Wall Mount Cabinet – Legrand VWMSD-4RU-42-B
      b. Vertical Wall Mount Cabinet – Legrand VWMSD-8RU-42-B
      c. Fixed Mounting Rail Kit – Legrand VWM-RR-4RU
      d. Fixed Mounting Rail Kit – Legrand VWM-RR-8RU
      e. Pivoting Mounting Rail Kit – Legrand VWM-PIV-4RU
      f. Fan Kits with 115 VAC fans – Legrand VWMFK-115
      g. Top Brush Grommet Kit – Legrand VWMBGK
      h. Circular Knockout Grommet Kit – Legrand VWMGR-30

END OF SECTION

SECTION 271119 - TERMINATION BLOCKS AND PATCH PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Requirements of the following Division 26 sections apply to this section
   1. Basic electrical requirements
   2. Basic electrical materials and methods
   3. Grounding, Earthing, and Bonding

PART 2 - PRODUCTS

2.1 APPROVED PRODUCT

A. PATCH PANELS – COPPER
   1. 48 Port CAT 6A Shielded, 1RU Angled Patch Panel with Outlets – Siemon Z6AS-PA-48A
   2. 48 Port CAT 6A Shielded, 1RU Flat Patch Panel with Outlets – Siemon Z6AS-PNL-U48K
   3. 24 Port CAT 6A Shielded, 1RU Plat Patch Panel with Outlets – Siemon Z6AS-PNL-U24K
   4. 48 Port CAT 5e, 2RU Angled Patch Panel, 110 Style – Siemon HD5-48A
   5. 48 Port CAT 5e, 2RU Flat Patch Panel, 110 Style – Siemon HD5-48
   6. 24 Port CAT 5e, 1RU Angled Patch Panel, 110 Style – Siemon HD5-24A
   7. 24 Port CAT 5e, 1RU Flat Patch Panel, 110 Style – Siemon HD5-24
   8. 19” Angled Blank Filler Panel, 1U, Black – Siemon PNL-BLNKA-1
      a. Provide blank fillers where appropriate.
   9. 19” Flat Blank Filler Panel, 1U, Black – Siemon PNL-BLNK-1
      a. Provide blank fillers where appropriate.

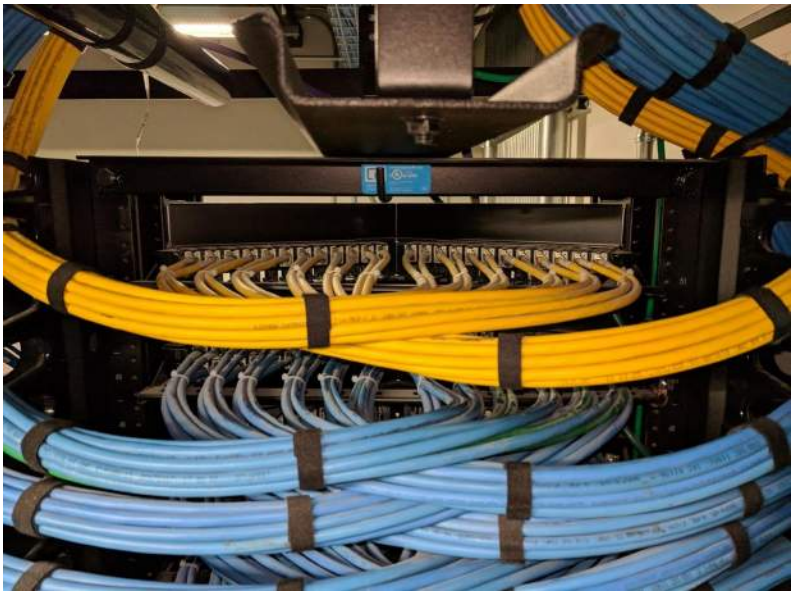
B. PATCH PANELS – FIBER
   1. Rack Mount Fiber Enclosure – Siemon RIC3-48E-01
   2. Wall Mount Fiber Enclosure – Siemon SWIC3G-AA-01
   3. Blank Adapter Plate, Black – Siemon RIC-F-BLANK-01
   4. 12F-LCUPC-SM-Loaded–Splice Cassette - Siemon – RSC12-LCUSMA-B1

C. CABINET PATCH PANEL – FIBER
   1. Lightstack Surface Mount Module Enclosure – Siemon – LSE-01
   2. Lightstack Surface Mount Splice Enclosure – Siemon – LSS-01
   3. LightStack LC Adapter Plate – Siemon LS-LS12-01C-AQ

PART 3 - EXECUTION

3.1 INSTALLATION

A. For angled patch panels, the terminations shall cross in the back to the opposite path of the patch panel to maximize available cable bend radius.
B. See illustration below in this section:



END OF SECTION

SECTION 271300 - BACKBONE CABLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawing and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this section.
B. Section 27 05 28 – Pathways for Communications Systems.

1.2 DEFINITIONS

A. INTRA-BUILDING CABLING
   1. Cable that runs between telecommunications rooms (TRs) inside a building. Can be vertical or horizontal in physical orientation. It consists of the backbone transmission media between these locations and the associated connecting hardware terminating this media.
B. INTER-BUILDING / CAMPUS CABLING
   1. Cable that runs between buildings in a campus environment. It is normally a first-level backbone cable beginning at the main cross-connect in the equipment room of the hub building and extending to the intermediate cross-connect in the equipment room of a satellite building. Campus Backbones require optical fiber cable to be installed to support high speed data applications.
   2. Customer owned outside plant (OSP) cabling.

PART 2 - PRODUCTS

2.1 PERMITTED BACKBONE MEDIA

A. Cables allowed for use in the backbone include:
   1. CAT 6A F/UTP Riser, Blue, Data – Siemon 9A6R4-A5-06-R1A
   2. CAT 6A F/UTP Plenum, Blue, Data – Siemon 9A6P4-A5-06-R1A
   3. 50 Pair Category 3 Riser Cable Gray – General Cable 2133161 or equal
   4. Fiber Optic Cable, Single-mode, 24 Strand, Armored Indoor/Outdoor Cable, Black – Siemon 9BG8P024L-E201A
   5. Fiber Optic Cable, Single-mode, 24 Strand, Armored, Riser Cable, Yellow – Siemon 9BC8P024L-205A
   6. Fiber Optic cable, Multi-mode, OM4, 12 Strand, Armored, Riser Cable, Aqua – Siemon 9BC5P012G-T512A (Data Centers must be OM4 or better)
B. The cable shall support voice, data and imaging applications. The bending radius and pulling strength requirements of all backbone cables shall be observed during handling and installation.
C. Multi-pair twisted pair cable is intended to support analog voice applications and shall be tested for continuity only.
D. In addition to meeting the applicable performance specifications, all copper and optical fiber cable shall be appropriate for the environment in which it is installed.

2.2 MEDIA PRODUCTS

A. COPPER

   1. The total channel length between the Campus Distributor/Main Cross-connect and to any floor Distributor/Horizontal Cross-connect shall not exceed the following length limits for copper cabling:

a. 2,000 m (6,560 ft) for balanced twisted pair for PBX/Class A (100 kHz) applications.
b. 200 m (656 ft) for balanced twisted pair for Class B (≤ 1 MHz) applications.
c. 100 m (328 ft) for balanced twisted-pair categories 6, 6A & 7 (per Backbone segment when providing a two-level Backbone).

B. MULTIMODE OPTICAL FIBER
1. See Siemon website for supportable fiber distances
a. Laser qualified 50/125□m multimode fiber optical fiber cables shall be in compliance with the following standards ISO/IEC 11801:2002 OM3, ANSI/TIA-568-C.3, ANSI/TIA-568-C.1 and Telcordia GR-409-CORE as well as the guaranteed application distances, attenuation, bandwidth, and group index of refraction requirements.
b. Specifications:
1) Shall support 10GBASE-SX for all horizontal workstations, risers and short length backbone (<300 m) locations.
2) Constructed for overfilled launch (OFL) and restricted mode launch (RML) bandwidth to ensure compatibility with both LED and laser light sources.
3) Have an Aqua Outer Jacket and be available in cable ratings including OFNR and OFNP.

C. SINGLE MODE OPTICAL FIBER
1. See Siemon website for supportable fiber distances
2. Single-mode optical fiber cable shall be used for 1st and 2nd Level Backbone applications only.
3. All fiber is to fusion spliced terminations.

PART 3 - EXECUTION

3.1 TOPOLOGY

A. The Backbone cabling shall use a conventional hierarchal star topology.
1. There shall be no more than two (2) levels of cross-connects between the campus distributor/main cross –connect (CD/MC) and any given floor distributor/horizontal cross-connect (FD/HC).
2. From the FD/HC no more than one cross-connect shall be passed through to reach the CD/MC.

B. Splicing of UTP, F/UTP and S/FTP copper cables is not permitted.

3.2 TYPICAL TDR BACKBONE

A. A typical TDR backbone for a hospital campus shall consist of:
1. Redundant (2 ea.) 24 strand single-mode fiber each routed in a separate path.
2. One 50 pair copper feed line.

END OF SECTION

SECTION 271500 - HORIZONTAL CABLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this section.
B. Section 27 05 28 - Pathways for Communications Systems

1.2 SUMMARY

A. This section includes requirements and guidelines for the installation of F/UTP, ScTP, and Fiber horizontal cabling.
   1. Horizontal cable and its connecting hardware provide the means of transporting signal between the telecommunications outlet/connector and the horizontal cross-connect located in the communications termination room This cabling and its connecting hardware are called "permanent link," a term that is used in the testing protocols.

PART 2 - EXECUTION

2.1 HORIZONTAL CABLE

A. Quantity
   1. Two horizontal cables shall be routed to each work area. Cable connected to information outlets shall be CAT6A F/UTP, 4-pair, 100Ω balanced twisted-pair.
      a. A work area is approximately 100 sq. ft. and includes the components that extend from the telecommunications outlet/connectors to the station equipment.
      b. Two (2) standard cables shall be run to each wireless access point location per current best practice.
      c. One (1) standard horizontal cable may be run to the following locations:
         1) Each building control system enclosure as directed by the building controls vendor.
         2) Each IP Video Surveillance Camera at each of the designated locations.
         3) Each wall phone.
         4) Each wall monitor/display.
   2. For voice or data applications, 4-pair balanced twisted-pair or fiber optic cables shall be run using a star topology from the telecommunications room serving that floor to every individual information outlet. The customer prior to installation of the cabling shall approve all cable routes.
   3. Installation interfaces shall be T568B wiring standards.
B. Maximum Length
   1. All horizontal cables, regardless of media type, shall not exceed 90 m (295 ft.) from the telecommunications outlets in the work area to the Floor
   2. Distributor/Horizontal Cross connect (FD/HC) located in the Telecommunication Room.
   3. The combined length of jumpers, patch cords inclusive of equipment cables in the Floor Distributor/Horizontal Cross-connect shall not exceed 5m (16 ft.).
   4. The maximum length of Work Area equipment cables shall be 5m (16 ft.) If a

      MuTOA (Multiple User Telecommunication Outlet) environment exists, then the maximum equipment cable shall not exceed 22m (72 ft.) (Lake Park Facility)

5. Terminate all conductors; no cable shall contain un-terminated elements. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.

C. Minimum Length
   1. It is recommended that a minimum horizontal cable distance of 15m (49 ft.) shall be maintained between the telecommunications room and the work area. This will provide adequate Insertion Loss/Attenuation for applications over 1 Gig.
   2. For installations with consolidation points, a minimum horizontal cable distance of 15m (49 ft.) shall be maintained between the telecommunications room and consolidation point, and 5m (16 ft.) between the consolidation point and the work area. This will provide adequate Insertion Loss/Attenuation for applications over 1 Gig.

D. Splice Free
   1. Each run of balanced twisted-pair cable between Floor Distributor/Horizontal Cross-connect in the telecommunication room and the information outlet at the Work Area shall not contain splices.
   2. Bridged taps and splices shall not be installed in the horizontal cabling

E. Protection
   1. Horizontal distribution cables shall not be run in under slab raceways that are damp or wet locations unless suitably rated for the environment.
      a. Under slab conduits that are outside of the building are considered wet locations.

F. Slack -Service Loop – Routing
   1. In the work area, a minimum of 1m (3 ft) should be left for balanced twisted-pair cables and fiber cables.
   2. In telecommunications rooms a minimum of 3m (10 ft) of slack should be left for all cable types. This slack must be neatly managed on trays or other support types

2.2 SEPARATION

A. Separation from EMI sources
   1. Installation shall comply with BICSI TDMM and TIA/EIA-569-B for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.
   2. Separation between open communications cables or cables in nonmetallic raceways and unshielded power conductors and EMI Source shall be as follows:
      a. EMI Source Rating Less Than 2 kVA: A minimum clearance of 5 inches.
      b. EMI Source Rating between 2 and 5 kVA: A minimum clearance of 12 inches.
      c. EMI Source Rating More Than 5 kVA: A minimum clearance of 24 inches.
   3. Separation between communications cables in grounded metallic raceways and unshielded power lines or EMI Source shall be as follows:
      a. EMI Source Rating Less Than 2 kVA: A minimum clearance of 2-1/2 inches.
      b. EMI Source Rating between 2 and 5 kVA: A minimum clearance of 6 inches.
      c. EMI Source Rating More Than 5 kVA: A minimum clearance of 12 inches.
   4. Separation between communications cables in grounded metallic raceways and power lines and EMI Source located in grounded metallic conduits or enclosures shall be as follows:
      a. EMI Source Rating Less Than 2 kVA: A minimum clearance of 2 inches.
      b. EMI Source Rating between 2 and 5 kVA: A minimum clearance of 3 inches.
      c. EMI Source Rating More Than 5 kVA: A minimum clearance of 6 inches.
   5. Separation between Communications Cables and Electrical Motors and Transformers, 5 kVA or 1 HP and Larger: A minimum clearance of 48 inches.

6. Separation between Communications Cables and Fluorescent Fixtures: A minimum clearance of 5 inches

B. Other Clearances
1. Horizontal pathways used for telecommunications cabling shall be dedicated for telecommunications use and not shared by other building services.
2. In a false ceiling environment, a minimum of 75 mm (3 in) shall be observed between the cable supports and the false ceiling.

2.3 PATHWAY

A. Cable Tie Wraps
1. Cable Tie Wraps are not permitted as a pathway device or support.
2. Tie Wraps shall only be used to provide strain relief at termination points.
3. Tie wraps shall not be over tightened to the point of deforming or crimping the cable sheath.

B. Constraints
1. Horizontal cables shall be installed in “dry” locations that provide protection from moisture levels above the intended operating range of inside plant (ISP) cables.
   a. If cabling is intentionally or unintentionally exposed to water or otherwise coated with or exposed to direct contact with solvents, paints, adhesives, sealants or other third-party materials, Siemon will not warranty the cabling product or if after the warranty has been issued, it would become void. Therefore, any cabling that has been exposed as listed above, must be removed and replaced.
2. Horizontal pathways shall be installed or selected such that the minimum bend radius of horizontal cables is kept within manufacturer specifications both during and after installation.
3. A minimum of a 1” diameter conduit is recommended for new construction. Existing conduits will require the reduction of the number of cables placed in the conduit to meet the required fill ratio.
   a. The Contractor shall observe the bending radius and pulling strength requirements of the 4-pair balanced twisted-pair and fiber optic cable during handling and installation.
      1) 4-Pair UTP, F/UTP, S/FTP bend radius = 4 times outside diameter of cable under no-load conditions. 8 times the outside diameter under load (pulling 110 N/25 lbf.) conditions.
      2) Multi-pair or Hybrid cable bend radius = 10 times the outside diameter under all conditions.
      3) 2-Fiber and 4 Fiber cables bend radius = 25mm (1 in.) under no-load conditions. 50mm (2 in.) under load (pulling 222 N 50 lbf)
4. Cable shall not be run through structural members or in contact with pipes, ducts, or other potentially damaging items.
5. Cable that passes through non-Intermountain Healthcare spaces must be installed in conduit.
6. Horizontal cabling shall contain no more than one transition point or consolidation point between the horizontal cross-connect and the telecommunications outlet/connector.
7. Do not install bruised, kinked, scored, deformed, abraded cable or otherwise damaged cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
8. During Cold-Weather Installation, bring cable to room temperature before de-reeling. Heat lamps shall not be used for heating.

C. Capacity

1. The number of horizontal cables placed in a cable support or pathway shall be limited to the number of cables that will not alter the geometric shape of the cables.

2. Maximum pathway (cable tray/basket tray/wireway) capacity shall not exceed a calculated fill ratio of 50% to a maximum of 75 mm (3 in) inside depth.
3. Maximum conduit pathway capacity shall not exceed a 40% fill. However, perimeter and furniture fill are limited to 60% fill for move and changes. A 40% fill ratio is the maximum fill for CAT6A F/UTP cables.
4. All unused cables shall be removed
    a. Or labeled at both ends designating future purpose and locations of each end.

END OF SECTION

SECTION 271513 - COPPER CABLE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 PALLETTE

A. Color palette shall be in accordance with Section 27 05 53

1.3 SUMMARY

A. This Section covers approved F/UTP cable types
B. Systems shall be CAT6A F/UTP unless a written deviation has been approved.
C. CAT6A UTP and CAT6A F/UTP shall not be mixed on the same campus.
D. This cable shall be used for both voice and data applications and shall be plenum rated where required by code

PART 2 - PRODUCT

2.1 APPROVED PRODUCT

A. TYPE 6A F/UTP (foil over unshielded twisted pair) - Siemon
   1. CAT 6A F/UTP Riser, (CMR) – Siemon 9A6R4-A5-(XX)-R1A
   2. CAT 6A F/UTP Plenum, (CMP) – Siemon 9A6P4-A5-(XX)-R1A
      a. (XX) = Color – 06, Blue – 05, Yellow – 09, Orange

END OF SECTION

SECTION 271543 - FACEPLATES AND CONNECTORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 DEFINITION

A. Work-Area Cabling
   1. The work area is comprised of work area outlet/connectors, faceplates, outlet boxes and equipment cords. It acts as the interface to the horizontal cabling from the horizontal cross-connect (HC) to telephone, network equipment, wireless access points (WAP) and OIP devices.

PART 2 - PRODUCT

2.1 OUTLETS

A. Category 6A Jack – Siemon Z6A-S(XX)
   1. Use (XX) to specify color.
   2. Universal design allows the same outlet to be mounted in a flat or angled orientation.
B. Category 6A Z-Plug WO Latch Protector – Siemon ZP1-6AS-(00)S
C. Voice Outlet, Single Gang Faceplate, White W/Wall Hung Phone W/6A Insert – Siemon MX-WP-Z6AS-SS

2.2 FACEPLATES/BOXES

A. 10G Single Gang Faceplate, White, 4 Position – Siemon 10GMX-FP-04-02
B. MAX Single Gang Faceplate, White – Siemon MX-FP-S-(XX)-02
   1. USE (XX) to specify the number of ports.
C. MAX Single Gang Faceplate, Stainless Steel, 4 Position, with Label Holder – Siemon MX-FP-S-04-SS-L
   1. To be used in the Operation Rooms
D. Surface Mount Box, White, 2 Position – Siemon MX-SMZ2-02
E. Furniture Faceplate, Black – Siemon MX-UMA-01
F. Conference Room Table Inserts should include and HDMI port.

PART 3 - EXECUTION

3.1 WORK AREA TERMINATION

A. All balanced twisted-pair cables wired to the telecommunications outlet/connector, shall have 4-pairs terminated in eight-position modular outlets in the work area. All pairs shall be terminated.
B. Outlet/connector back boxes shall be a minimum 4-11/16 square box (4-11/16” x 4-11/16” x 3”) with a minimum single gang 5/8” mud ring for new construction to accommodate the CAT6A connectors.
C. Existing back boxes will require a faceplate stand-off and/or a faceplate that can accommodate a bezel to extend the CAT6A jack out to allow the installation of the CAT6A connectors.
D. All outlets need to be installed in the angled position.

END OF SECTION

SECTION 271619 – PATCH CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

PART 2 - PATCH CABLES

2.1 PATCH CABLES

PART 3 -

PART 4 - GENERAL

A.

4.2 SUMMARY

A. This section is issued as a guide for patch cable installations in the Data Center, wiring closets (TDR) and user areas where patch cables are required for connectivity to IP and TDM phones, and IP data connectivity needs for Intermountain Healthcare. All patch cables will support voice, data, and imaging applications within the Intermountain Healthcare Enterprise.

PART 5 - PRODUCTS

A.

5.2 APPROVED PRODUCT

A.

B. Patch Cable, CAT 6A Shielded - Siemon SP6A-S (XX)-(XX)
   1. Use 1st (xx) to specify length. Use 2nd (xx) for color.

C. Patch Cable, CAT 5e, Orange – Siemon MC5-(XX)-0909
   1. Use (xx) to specify length. For use with NURSE CALL only.

D. Patch Cable, CAT 5e, White – Siemon MC5-(XX)-0202
   1. Use (xx) to specify length.
   2. For use in the TEC for the Copper Backbone Patch only.

E. Patch Cable, Fiber, Singlemode Duplex W/LC Connectors, Yellow –
   1. Siemon FJ2-LCULCUL-(xx)
   2. Use (xx) to specify length.

F. Patch Cable, Fiber, Multimode Duplex W/LC Connectors, Aqua –

PRODUCT DATA SHEET 1 - Siemon FJ2-LCLC5V-(xx)AQ

1. Use (xx) to specify length. For use in the Data Center.
    a.

PART 6 - EXECUTION

A.

6.2 PALLETTE

A.

B. Patch Cable Color Codes
1. The Intermountain Healthcare Enterprise standard for patch cable color is in Section 27 05 53.
2. The patch cable color shall match the feed cable color to identify the service provided.

C. Contractor furnished
1. All patch cables for the TEC, TDR's shall be included in the low voltage contract and will be required to match or exceed the existing level of the installed structured cabling system.
2. All patch cables for the user areas shall be Owner furnished and will be required to match or exceed the existing level of the installed structured cabling system.
3. All patch cables shall be Owner installed.
4. The quantity of patch cables to be provided by the low voltage contractor shall be specified in the plans.
    a. 50% 5ft – 30% 7ft – 15% 10ft – 5% 15ft
    b.

PART 7 -

PART 8 - END OF SECTION

SECTION 274100 - GENERAL TECHNOLOGY SYSTEMS REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes general requirements for Technology systems installations:

1. Summary of work.
2. Project Coordination.
3. References and Standards.
4. Industry Standards.
5. Allowances.
6. Unit Prices.
7. Submittals.
8. Substitutions.
9. Materials and Equipment.
10. Summary Test Report.
11. Warranties.
12. Permits.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions apply to this section of Division 27.

B. The following general and basic sections of Division 27 pertain to all system specific sections of Division 27. These general and basic information sections shall be complied with by all Technology systems contractors:

1. General Technology Systems Requirements
2. Basic Technology Systems Requirements
3. Basic Technology Systems Materials and Methods

1.3 SUMMARY OF WORK

B. The work consists of, but is not limited to, the construction of integrated audio, video, and control systems. Refer to individual Division 27 sections for additional work summaries and responsibilities.

C. Owner furnished items: The Owner will furnish material and equipment as indicated in the contract documents to be incorporated into the Work. These items are assigned to the installer and costs for receiving, handling, storage, if required, and installation are included in the Contract Sum.

1. The Installer's responsibilities are the same as if the Installer furnished the materials or equipment.
2. The Owner will arrange and pay for delivery of Owner-furnished items FOB job site and the installer will inspect deliveries for damage. If Owner-furnished items are damaged, defective or missing, document damaged items with the transport company and the Owner will arrange for replacement. The Owner will also arrange for manufacturer's field services, and the delivery of manufacturer's warranties and bonds to the Installer.
3. The Installer is responsible for designating the delivery dates of Owner-furnished items and for receiving, unloading and handling Owner- furnished items at the site. The

Installer is responsible for protecting Owner-furnished items from damage, including damage from exposure to the elements, and to repair or replace items damaged as a result of his operations.

D. General: Comply with requirements of Owner for completion of work. The work will be conducted to provide the least possible interference to the activities of the Owner's personnel and operations.

1.4 PROJECT COORDINATION

A. General: Well in advance of installation of every major unit of work which requires coordination and interfacing with other work, meet at project site with installers and representatives of manufacturers and fabricators who are involved in or affected by unit of work and in its coordination and integration with other work which has preceded or will follow. Do not proceed with the work if associated pre-installation conference cannot be concluded successfully. Instigate actions to resolve impediments to performance of the work.

B. Millwork Contractor: Coordinate with the Owner's Millwork contractor the wiring configuration, connection requirements, and dimensional layout of the furniture to be provided. Determine whether proposed furniture design will interface with Technology systems design as shown. Notify Architect/Engineer of any discrepancy.

1.5 REFERENCE STANDARDS AND DEFINITIONS

A. General: Basic Contract definitions are included in the General Conditions.

B. Indicated: The term "indicated" refers to graphic representations, notes, or schedules on the Drawings, other paragraphs or schedules in the Specifications, and similar requirements in the Contract Documents. Where terms such as "shown," "noted," "scheduled," and "specified" are used, it is to help the reader locate the reference; no limitation on location is intended.

C. Directed: Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean "directed by the Engineer," "requested by the Engineer," and similar phrases.

D. Approve: The term "approved," where used in conjunction with the Engineer's action on the Contractor's submittals, applications, and requests, is limited to the Engineer's duties and responsibilities as stated in General and Supplementary Conditions.

E. Regulation: The term "Regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.

F. Furnish: The term "furnish" is used to mean "supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations."

G. Install: The term "install" is used to describe operations at project site including the actual "unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations."

H. Provide: The term "provide" means "to furnish and install, complete and ready for the intended use."

I. Installer: An "Installer" is the Contractor or an entity engaged by the Contractor, either as an employee, subcontractor, or sub-subcontractor, for performance of a particular construction

activity, including installation, erection, application, and similar operations. Installers are required to be experienced in the operations they are engaged to perform.

J. Substitutions: Requests for changes in products, materials, equipment, and methods of construction required by Contract Documents proposed by the Contractor after award of the Contract are considered requests for "substitutions."

1.6 INDUSTRY STANDARDS

A. Applicability of Standards: Except where the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Where the date of issue of a referenced standard is not specified, comply with the standard in effect as of date of Contract Documents.

C. Conflicting Requirements: Where compliance with two or more standards is specified, and the standards establish different or conflicting requirements for minimum quantities or quality levels, refer requirements that are different, but apparently equal, and uncertainties to the Architect/Engineer for a decision before proceeding.

1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. In complying with these requirements, indicated numeric values are minimum or maximum, as appropriate for the context of the requirements. Refer uncertainties to the Architect/Engineer for a decision before proceeding.
2. Clarification methods: At the time of bidding, bidders shall familiarize themselves with the drawings and specifications. Any questions, misunderstandings, conflicts, deletions, discontinued products, catalog number discrepancies, discrepancies between the equipment supplied and the intent or function of the equipment, etc., shall be submitted to the Architect/Engineer in writing for clarification prior to issuance of the final addendum and bidding of the project. Where discrepancies or multiple interpretations occur, the most stringent (which is generally recognized as the most costly) that meets the intent of the documents shall be enforced.

D. Copies of Standards: Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to that entity's construction activity. Copies of applicable standards are not bound with the Contract Documents, but can be obtained through the following addresses and telephone numbers:

ANSI American National Standards Institute
11 West 42nd Street, 13th Floor
New York, NY 10036 (212) 642-3300

ASTM American Society for Testing and Materials
1916 Race St.
Philadelphia, PA 19103 (215) 299-5400

EIA Electronic Industries Assoc.
2001 Pennsylvania Ave., NW, Suite 1100
Washington, DC 20006 (202) 457-4900

ETL ETL Testing Laboratories, Inc.
P.O. Box 2040

Route 11, Industrial Park
Cortland, NY 13045 (607) 753-6711

ICEA Insulated Cable Engineers
Association Inc.
P.O. Box 440
South Yarmouth, MA 02664 (617) 394-4424

IEC International Electrotechnical Commission
(Available from ANSI)
1430 Broadway
New York, NY 10018 (212) 354-3300

IEEE Institute of Electrical and Electronic Engineers
345 E. 47th St.
New York, NY 10017 (212) 705-7900

NEC National Electric Code (Now NFPA)

NECA National Electrical Contractors Association
7315 Wisconsin Ave., Suite 1300 W
Bethesda, MD 20814 (301) 657-3110

NEMA National Electrical Manufacturers Association
2101 L St., NW, Suite 300
Washington, DC 20037 (202) 457-8400

NFPA National Fire Protection Association
One Batterymarch Park
PO Box 9101
Quincy, MA 02269-9101 (617) 770-3000

UL Underwriters Laboratories
333 Pfingsten Rd.
Northbrook, IL 60062 (708) 272-8800

FS Federal Specification (from GSA)
Specifications Unit (WFSIS)
7th and D St., SW
Washington, DC 20407 (202) 708-9205

1.7 ALLOWANCES

A. General: Follow the requirements specified in Division 1 Section "ALLOWANCES." Use the contingency allowance only as directed for the Owner's purposes, and only by Change Orders which designate amounts to be charged to the allowance. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

1.8 UNIT PRICES

A. General: A unit price is an amount proposed by Bidders and stated on the Bid Form as a price per unit of measurement for materials or services that will be added to or deducted from the Contract Sum by Change Order in the event the estimated quantities of Work required by the Contract Documents are increased or decreased. Include all necessary material, overhead, profit and applicable taxes. Comply with unit price requirements identified in individual Division 27 sections.

1.9 SUBMITTALS

A. Submit in accordance with Sections 013300, Submittal Procedures Shop Drawings, Product Data and Samples.

B. General: Follow the procedures specified in Division 27 Sections under "SUBMITTALS." As a minimum, all data shall be submitted as dictated in 013300 and labeled as to project, date, and installer. Include Installers' signature indicating his unqualified approval that the equipment will fit in the space shown, and is complete with all requirements of the plans and specifications. Provide space for "Action" marking. Do not proceed without appropriate "Action" marking. Allow 2 weeks for review.

C. Action Stamp: The Engineer will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows, to indicate the action taken:

1. Final Unrestricted Release: Where submittals are marked "Approved," that part of the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.
2. Final-But-Restricted Release: When submittals are marked "Approved as Noted," that part of the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.
3. Returned for Resubmittal: When submittal is marked "Not Approved, Revise and Resubmit," do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different action mark.

    a. Do not permit submittals marked "Not Approved, Revise and Resubmit" to be used at the Project site, or elsewhere where Work is in progress.

4. Other Action: Where a submittal is primarily for information or record purposes, special processing or other activity, the submittal will be returned, marked "Action Not Required".

1.10 SUBSTITUTIONS

A. Substitution Request Submittal: Requests for substitution may be considered or rejected at the discretion of the Architect, Engineer, Designer, and/or Owner. In addition to the below requirements, comply with Substitution Procedures Section 012500. As specified in Special Project Note #1, substitution requests to change equipment items from those identified in the Acceptable Types column in the Audio-Video Equipment List found in the accompanying drawings must be completed prior to bidding in compliance with the bidding schedule set forth by the project General Contractor.

1. Submit 3 copies of each request for substitution for consideration. Submit requests in the form and in accordance with procedures required for Change Order proposals.
2. Identify the product, or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:

    a. Product Data, including Drawings and descriptions of products, fabrication and installation procedures.
    b. Samples, where applicable or requested.

c. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified.
d. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and other Contractors, that will become necessary to accommodate the proposed substitution.
e. A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
f. Cost information, including a proposal of the net change, if any in the Contract Sum.
g. Certification by the Contractor that the substitution proposed is equal-to or better in every significant respect to that required by the Contract Documents, and that it will perform adequately in the application indicated. Include the Contractor's waiver of rights to additional payment or time, that may subsequently become necessary because of the failure of the substitution to perform adequately.

1.11 MATERIALS AND EQUIPMENT

A. Source Limitations: To the fullest extent possible, provide products of the same kind, from a single source where products are part of a single assembly.

B. Compatibility of Options: When the Contractor is given the option of selecting between two or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.

1. If a dispute arises between Contractors over concurrently selectable, but incompatible products, the Architect/Engineer will determine which products shall be retained and which are incompatible and must be replaced.

C. Manufacturers: Select equipment from the manufacturers as identified in the schedules contained in the drawings.

1.12 SUMMARY TEST REPORT

A. Prepare summary test report in accordance with the requirements in each Division 27 Section. Make all tests required by the authorities having jurisdiction, by the Architect and his consultants, and the Owner. Make tests of the indicated installed conditions, and:

1. Include tests from final punch list.
2. If there are any abnormal conditions, they shall be brought to the attention of the Engineer in writing as a part of this submittal.

1.13 WARRANTY REQUIREMENTS

A. Reference Section 017800, Closeout Submittals.

B. Warranty for a minimum of one year after date of substantial completion all Technology systems equipment and workmanship. When a warranty call is requested by the owner, respond with an on-site service call within 24 hours of the initial call, regardless of if initial contact is made via installing company's personnel or through messaging services.

C. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

D. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement of rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty.

E. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.

F. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefitted from use of the Work through a portion of its anticipated useful service life.

G. Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.

1. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.

H. The Owner reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.

1.14 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to the project properly identified with names, model numbers, types, grades, compliance labels, and other information needed for identification.

1.15 PERMITS, FEES

A. Obtain and pay all city, state, or local ordinance electrical permits and inspections before beginning construction.

B. Pay electric, telephone, and cable TV fees or reimbursable construction costs to the utilities in a timely manner so as not to delay construction.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and unused at the time of installation.

1. Provide products complete with all accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.
2. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.

B. Product Selection Procedures: Product selection is governed by the Contract Documents and governing regulations, not by previous Project experience. Procedures governing product selection include the following:

1. Proprietary Specification Requirements: Where only a single product or manufacturer is named, provide the product indicated. No substitutions will be permitted.
2. Compliance with Standards, Codes and Regulations: Where the Specifications only require compliance with an imposed code, standard or regulation, select a product that complies with the standards, codes or regulations specified.
3. Visual Matching: Where Specifications require matching an established Sample, the Architect's decision will be final on whether a proposed product matches satisfactorily.

    a. Where no product available within the specified category matches satisfactorily and also complies with other specified requirements, comply with provisions of the Contract Documents concerning "substitutions" for selection of a matching product in another product category, or for noncompliance with specified requirements.

4. Visual Selection: Where specified product requirements include the phrase "...as selected from manufacturer's standard colors, patterns, textures..." or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Architect will select the color, pattern and texture from the product line selected.

2.2 SUBSTITUTIONS

A. Conditions: A Contractor's substitution request will be received and considered by the Architect/Engineer when one or more of the following conditions are satisfied, as determined by the Architect/Engineer; otherwise requests will be returned without action except to record noncompliance with these requirements.

1. Extensive revisions to Contract Documents are not required.
2. Proposed changes are in keeping with the general intent of Contract Documents.
3. The request is timely, fully documented and properly submitted. All substitution requests shall be received a minimum of two weeks prior to the bid opening.
4. The request is directly related to an "or equal" clause or similar language in the Contract Documents.
5. The specified product or method of construction cannot be provided within the Contract Time. The request will not be considered if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly, or an unwillingness to pay special freight or factory charges to reduce the time of manufacturing.
6. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
7. A substantial advantage is offered the Owner, in terms of cost, time, or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear. Additional responsibilities for the Owner may include additional compensation to the Architect for redesign and evaluation services, increased cost of other construction by the Owner or separate Contractors, and similar considerations.
8. The specified product or method of construction cannot be provided in a manner that is compatible with other materials, and where the Contractor certifies that the substitution will overcome the incompatibility.
9. The specified product or method of construction cannot be coordinated with other materials, and where the Contractor certifies that the proposed substitution can be coordinated.

10. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provide the required warranty.
11. Where a proposed substitution involves more than one Contractor, each Contractor shall cooperate with the other Contractors involved to coordinate the Work, provide uniformity and consistency, and to assure compatibility of products.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION PROVISIONS

A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.

C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged or defective items. Do not repair damaged or defective items. Replace all damaged or defective items with new items.

D. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.

E. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.

F. Recheck measurements and dimensions, before starting each installation.

F. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.

G. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.

H. Mounting Heights: Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Architect for final decision.

I. Internet Access: The Owner will NOT provide internet access in the new building, or any other location for use by the AV installer during the installation.

3.2 CLEANING AND PROTECTION

A. During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

B. Clean and maintain completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

C. Limiting Exposures: Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.3 PROJECT CLOSEOUT

A. General: Comply with final punch list requirements.

B. Operating and Maintenance Instructions: Arrange for each installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives. Include a detailed review of the following items:

1. Maintenance manuals.
2. Record documents.
3. Spare parts and materials.
4. Tools.
5. Identification systems.
6. Control sequences.
7. Hazards.
8. Cleaning.
9. Warranties and bonds.
10. Maintenance agreements and similar continuing commitments.

C. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

1. Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.

    a. Remove labels that are not permanent labels.
    b. Clean transparent materials. Replace chipped or broken lenses and other damaged transparent materials.
    c. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition.
    d. Wipe surfaces of all Technology equipment clean.

D. System Start Up: Provide a senior technician who is proficient with all specified systems, who is intimately familiar with this project, and who personally participated in the planning and installation of this project. Assign technician to be on site during the first week (5 business days) of building occupancy from 7:00 a.m. to 4:00 p.m. Technician will work closely with the Owner's technical support personnel, and will assist the Owner with any and all needs relative to the newly installed audio, video and control systems. Tasks will include, but not be limited to, reports of technical problems, correction of malfunctioning systems, clarification of operating instructions, and assistance with help desk calls. Include all associated costs in the base bid for this project.

E. Occupancy Adjustments: When requested by the Owner or the A/V Consultant within one year of date of substantial completion, provide on-site assistance for any reason related to the audio, video and control system. Possible reasons for occupancy adjustments may include, but not be limited to changing levels; making minor programming changes to digital signal processors, control systems, or other similar devices; calibration of projectors; changing

transformer taps, or adjusting controls to suit actual occupied conditions. Include ten (10) occupancy adjustment trips to the site in the base bid for this project.

END OF SECTION 27 4100

SECTION 274101 - BASIC TECHNOLOGY SYSTEMS REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions apply to this section.

1.2 SUMMARY

A. This Section includes general administrative and procedural requirements for technology systems installations. The following administrative and procedural requirements are included in this Section:

1. Submittals.
2. Coordination drawings.
3. Record documents.
4. Maintenance manuals.
5. Rough-ins.
6. Technology systems installations.
7. Cutting and patching.

B. Related Sections: All Division 27 sections contain requirements that relate to this section.

C. Related Sections: Several Division 26 sections contain requirements that relate to this section.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced Installer licensed for the work to be performed in the state and/or locality in which the work is performed. Licenses shall be carried at all times and shown upon request. Installer shall be a dully authorized representative of the manufacturer of technology systems equipment.

1.4 SUBMITTALS

A. Provide eight copies of submittals. One copy will be retained by the technology systems Consulting Engineer.

1. Shop Drawings: 1 additional black-line prints.
2. Product Data: 1 additional copy of each item.

B. Additional copies may be required by individual sections of these Specifications.

1.5 COORDINATION DRAWINGS

A. Prepare coordination drawings to a scale of 1/4"=1'-0" or larger; detailing major elements, components, and systems of technology systems equipment and materials in relationship with other systems, installations, and building components. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the Work, including (but not necessarily limited to) the following:

1. Where deviations from contract documents are proposed, submit proposed changes prior to proceeding with the work.

1.6 RECORD DOCUMENTS

A. Prepare record documents in accordance with the requirements in Section 017839 Project Record Documents. Maintain during the course of construction a set of contract drawings and shop drawings in clean, undamaged condition, with mark-up of actual installations which vary substantially from the work originally shown. Mark with red erasable pencil. Mark-up new information which is recognized to be of importance to Owner, but was for some reason not shown the drawings. Give particular attention to concealed work, which would be difficult to measure and record at a later date. In addition to the requirements specified in Division 1, indicate installed conditions for:

1. Redline changes or information from construction set.
2. Cable pathways, size and location.
3. Equipment locations.
4. Approved substitutions, Contract Modifications, and actual equipment and materials installed.

1.7 MAINTENANCE MANUALS

A. Prepare maintenance manuals in accordance with Division 1 Section "PROJECT CLOSEOUT"; however, in no case shall fewer than 3 maintenance manuals in three ring binders be provided. In addition to the requirements specified in Division 1, include the following information for equipment items:

1. Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.
2. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions.
3. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.
4. Servicing instructions charts and schedules.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to the project properly identified with names, model numbers, types, grades, compliance labels, and other information needed for identification.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 ROUGH-IN

A. Since the drawings of floor and ceiling installations are made at a small scale, outlets, devices, equipment, etc., are indicated only in their approximate location. Do not scale technology systems drawings. Refer to the architectural and mechanical drawings and dimensions. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected.

B. Refer to equipment specifications in Divisions for rough-in requirements.

3.2 TECHNOLOGY SYSTEMS INSTALLATIONS

A. General: Sequence, coordinate, and integrate the various elements of technology systems, materials, and equipment. Comply with the following requirements:

1. Coordinate technology systems, equipment, and materials installation with other building components.
2. Verify all dimensions by field measurements.
3. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for technology systems installations.
4. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.
5. Sequence, coordinate, and integrate installations of technology systems materials and equipment for efficient flow of the Work. Give particular attention to large equipment.
6. Where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible.
7. Coordinate and obtain written approval from Owner's representative at least 7 days in advance for technology systems service interruption.
8. Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Architect.
9. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.
10. Install technology systems equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.
11. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.

3.3 CUTTING AND PATCHING

A. General: Perform cutting and patching where required to complete the technology systems installation. Perform cutting and patching in compliance with the following requirements:

1. Perform cutting, fitting, and patching of technology systems equipment and materials required to:

    a. Uncover Work to provide for installation of ill-timed Work.
    b. Remove and replace defective Work.
    c. Remove and replace Work not conforming to requirements of the Contract Documents.
    d. Remove samples of installed Work as specified for testing.
    e. Install equipment and materials in existing structures.
    f. Upon written instructions from the Architect, uncover and restore Work to provide for Architect observation of concealed Work.

2. Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.
3. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.
4. Protection of Installed Work: During cutting and patching operations, protect adjacent installations.

5. Patch existing finished surfaces and building components using new materials matching existing materials and experienced Installers. Installers' qualifications refer to the materials and methods required for the surface and building components being patched.

    a. Refer to Division 1 Section "DEFINITIONS AND STANDARDS" for definition of experienced "Installer."

6. Patch finished surfaces and building components using new materials specified for the original installation and experienced Installers. Installers' qualifications refer to the materials and methods required for the surface and building components being patched.

    a. Refer to Division 1 Section "DEFINITIONS AND STANDARDS" for definition of experienced "Installer."

3.4 FINAL PUNCH LIST

A. General: In addition to the requirements of Division 1 for substantial completion, include the following:

1. Prerequisite personnel for technology systems final punch list:

    a. Technology systems project engineer must be present.
    b. Technology systems installer job foreman must be present.
    c. Additional personnel may be required by other sections of this specification.

2. Other prerequisites for technology systems final punch list:

    a. List of incomplete items, value of incompletion, and reasons for being incomplete.
    b. Submit record drawings, record specifications, maintenance manuals, warranties, and summary test report.
    c. Deliver tools, spare parts, extra stocks of materials, and similar physical items to Owner. Provide delivery receipt signed by Owner's representative.
    d. Complete start-up testing of systems and instructions of Owner's operating/maintenance personnel.
    e. Clear access shall be provided to all devices and equipment.
    f. Installer shall have pad and pencil to list all deficient items noted.
    g. All corrections and adjustments shall be done after the inspection, not during. These items will appear on the final punch list.
    h. Required keys for panels and doors.

3. Comply with other prerequisites as specified in other sections of the specification.

END OF SECTION 274101

SECTION 27 4102 – BASIC TECHNOLOGY SYSTEMS MATERIALS AND METHODS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes limited scope general construction materials and methods for application with technology systems installations as follows:

1. Selective demolition including:

a. Nondestructive removal of materials and equipment for reuse or salvage as indicated.
b. Dismantling technology systems materials and equipment made obsolete by these installations.

2. Miscellaneous metals for support of technology systems materials and equipment.
3. Wood grounds, nailers, blocking, fasteners, and anchorage for support of technology systems materials and equipment.
4. Joint sealers for sealing around technology systems materials and equipment; and for sealing penetrations in fire and smoke barriers, floors, and foundation walls.
5. Access panels and doors in walls, ceilings, and floors for access to technology systems materials and equipment.
6. Painting of technology systems materials and equipment.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Requirements specified in Division 27 Section "Basic technology systems Requirements" apply to this Section.

1.3 SUBMITTALS

A. Submit in accordance with Sections 013310, Submittal Procedures, and 013323, Shop Drawings, Product Data Samples.

B. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

C. Product data for the following products:

1. Joint sealers.

D. Shop drawings detailing fabrication and installation for metal fabrications, and wood supports and anchorage for technology systems materials and equipment.

E. Schedules indicating proposed methods and sequence of operations for selective demolition prior to commencement of Work. Include coordination for shut-off of technology systems service, and details for dust and noise control.

1. Coordinate sequencing with construction phasing and Owner occupancy specified in Division 1 Section "Summary of Work."

2. Submit shop drawings indicating technology systems modifications to existing systems.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer for the installation. Refer to section 27 41 16.00 for definition of an experienced installer.

B. Fire-Resistance Ratings: Where a fire-resistance classification is indicated, provide UL listed assemblies to maintain specified rating where technology systems or technology systems components penetrate rated assemblies. Refer to manufacturers listed in the UL "Building Materials Directory" for rating shown. Products include, but are not limited to:

1. Access doors.
2. Conduit penetrations.
3. Communication outlets.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver joint sealer materials in original unopened containers or bundles with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multi-component materials.

B. Store and handle joint sealer materials in compliance with the manufacturers' recommendations to prevent their deterioration and damage.

1.6 PROJECT CONDITIONS

A. Conditions Affecting Selective Demolition: The following project conditions apply:

1. Protect adjacent materials indicated to remain. Install and maintain dust and noise barriers to keep dirt, dust, and noise from being transmitted to adjacent areas. Remove protection and barriers after demolition operations are complete.
2. Locate, identify, and protect technology systems services passing through demolition area and serving other areas outside the demolition limits. Maintain services to areas outside demolition limits. When services must be interrupted, install temporary services for affected areas.

B. Environmental Conditions: Apply joint sealers under temperature and humidity conditions within the limits permitted by the joint sealer manufacturer. Do no apply joint sealers to wet substrates.

1.7 SEQUENCE AND SCHEDULING

A. Coordinate the shut-off and disconnection of technology systems service with the Owner.

B. Notify the Architect at least 5 days prior to commencing demolition operations.

C. Perform demolition in phases as indicated.

1.8 PAINTING

A. Paint exposed surfaces whether or not colors are designated in "schedules," except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces. If color or finish is not designated, the Architect will select from standard colors or finishes available.

1. Painting includes field painting hangers, exposed steel and iron work, and primed metal surfaces of technology systems equipment.

PART 2 - PRODUCTS

2.1 MISCELLANEOUS METALS

A. Steel plates, shapes, bars, and bar grating: ASTM A 36.

B. Cold-Formed Steel Tubing: ASTM A 500.

C. Hot-Rolled Steel Tubing: ASTM A 501.

D. Steel Pipe: ASTM A 53, Schedule 40, welded.

E. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout, recommended for interior and exterior applications.

F. Fasteners: Zinc-coated, type, grade, and class as required.

2.2 MISCELLANEOUS LUMBER

A. Framing Materials: Standard Grade, light-framing-size lumber of any species. Number 3 Common or Standard Grade boards complying with WCLIB or AWPA rules, or Number 3 boards complying with SPIB rules. Lumber shall be preservative treated in accordance with AWPB LP-2, and kiln dried to a moisture content of not more than 19 percent.

B. Construction Panels: Plywood panels; APA C-D PLUGGED INT, with exterior glue; thickness as indicated, or if not indicated, not less that 3/4 inches and painted with suitable fire rated paint material where required.

2.3 JOINT SEALERS

A. General: Joint sealers, joint fillers, and other related materials compatible with each other and with joint substrates under conditions of service and application.

B. Colors: As selected by the Architect from manufacturer's standard colors.

C. Fire-Resistant Joint Sealers: Two-part, foamed-in-place, silicone sealant formulated for use in through-penetration fire-stopping around cables, conduit, pipes, and duct penetrations through fire- rated walls and floors. Sealants and accessories shall have fire- resistance ratings indicated, as established by testing identical assemblies in accordance with ASTM E 814, by Underwriters' Laboratories, Inc., or other testing and inspection agency acceptable to authorities having jurisdiction.

D. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Bar-Co., Inc.
2. J.L. Industries.
3. Karp Associates, Inc.
4. Milcor Div. Inryco, Inc.
5. Nystrom, Inc.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting installation and application of joint sealers and access panels. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION FOR JOINT SEALERS

A. Surface Cleaning for Joint Sealers: Clean surfaces of joints immediately before applying joint sealers to comply with recommendations of joint sealer manufacturer.

B. Apply joint sealer primer to substrates as recommended by joint sealer manufacturer. Protect adjacent areas from spillage and migration of primers, using masking tape. Remove tape immediately after tooling without disturbing joint seal.

3.3 SELECTIVE DEMOLITION

A. All obsolete technology systems equipment shall remain the property of the owner.

B. General: Demolish, remove, de-mount, and disconnect abandoned technology systems materials. Coordinate with other work, including technology systems wiring work, as necessary to interface installation of existing equipment with other work. New technology systems equipment and apparatus shall be coordinated and connected into the existing systems. Relocate existing technology systems devices, conduit and/or equipment that for any reason obstructs construction. All technology systems equipment and apparatus in the building not remodeled shall be connected and remain in working condition. Include any equipment having technology systems connections that requires disconnecting and re-connection at the same or another location throughout the course of construction.

C. Disposal and Cleanup: Remove from the site and legally dispose of demolished materials and equipment.

3.4 ERECTION OF METAL SUPPORTS AND ANCHORAGE

A. Cut, fit, and place miscellaneous metal fabrications accurately in location, alignment, and elevation to support and anchor technology systems materials and equipment.

B. Field Welding: Comply with AWS "Structural Welding Code."

3.5 ERECTION OF WOOD SUPPORTS AND ANCHORAGE

A. Cut, fit, and place wood grounds, nailers, blocking, and anchorage accurately in location, alignment, and elevation to support and anchor technology systems materials and equipment.

B. Select fastener sizes that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood members.

C. Attach to substrates as required to support applied loads.

D. Install 4' X 8' X 3/4" plywood terminal boards in enclosures or mounted on walls where indicated in the drawings.

3.6 SEISMIC BRACING

A. General: Provide vibration isolators, flexible connections, rigid steel frames, concrete inertia bases, anchors, inserts, hangers, and attachments, seismic bracing and snubbers as required for seismic control and prevention of the transmission of vibration for both isolated and non-isolated systems. Comply with seismic requirements for the proper seismic zone for all support systems. Comply with sections 014100 and 274548.

1. Vibration isolated equipment shall be mounted on rigid steel frames or concrete bases. Each spring mounted base shall have a minimum of four all directional seismic snubbers that are double acting and located as close to the vibration isolators as possible to facilitate attachment both to the base and the structure. The snubbers shall consist of interlocking steel members restrained by shock absorbent rubber materials compounded to bridge bearing specifications.
2. Non-isolated equipment shall be installed according to UBC Sec. 2312 (g); Cp Factor Table 23J, I Factor Table 23K.4.C In addition, the vertical forces restrain requirements shall be computed as the ½ the value of the horizontal forces.

3.7 APPLICATION OF JOINT SEALERS

A. General: Comply with joint sealer manufacturers' printed application instructions applicable to products and applications indicated, except where more stringent requirements apply.

1. Comply with recommendations of ASTM C 962 for use of elastomeric joint sealants.
2. Comply with recommendations of ASTM C 790 for use of acrylic- emulsion joint sealants.

B. Tooling: Immediately after sealant application and prior to time shinning or curing begins, tool sealants to form smooth, uniform beads; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

C. Installation of Fire-Stopping Sealant: Install sealant, including forming, packing, and other accessory materials, to fill openings around technology systems services penetrating floors and walls, to provide fire-stops with fire-resistance ratings indicated for floor or wall assembly in which penetration occurs. Comply with installation requirements established by testing and inspecting agency.

END OF SECTION 27 4102

SECTION 27 4113 – AUDIO SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. The audio system will provide for voice amplification and media device audio program amplification. Media device audio program and voice audio amplification will originate from various media sources and microphones, be switched through a source selection switcher, and/or be mixed, processed and amplified to the speaker system. In addition provide multi-channel audio routing between all processors.

B. This Section includes requirements for audio system components including, but not limited to, the following:
   1. Microphones
   2. Mixers
   3. Power Amplifiers
   4. Cabinets
   5. Racks
   6. Loudspeaker Systems
   7. Microphone Inputs
   8. Processors
   9. Combiners
   10. Source Devices
   11. Digital Signal Processors
   12. Wire, Cable, and Connectors

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Related Sections: The following Division 27 sections contain requirements that relate to this section:
   1. General Technology Systems Requirements
   2. Basic Technology Systems Requirements
   3. Basic Technology Systems Materials and Methods
   4. Video Systems
   5. Control Systems

C. Related Sections: Several sections of Division 26 contain requirements that relate to this section.

1.3 SYSTEM DESCRIPTION

A. General: The audio systems shall be a complete systems for amplifying sound signals from microphones and media source equipment and distributing them to loudspeakers at various locations.

B. Functional Performance: Components and system features and functions shall include, but are not limited to, the following:
   1. Meet the following performance parameters as measured in 1/3 octave bands:
      a. From 100 Hz to 2kHz, flat within plus or minus 2dB.
      b. Above 2kHz, slope down along an approximate 3dB octave slope to 8kHz.
   2. Sound pressure levels at 2kHz octave band shall not deviate more than plus or minus 2dB.
   3. When driven to maximum output, clipping shall first occur in power amplifiers.
   4. No noise, hum, RFI pickup or distortion shall be audible under normal operating conditions.
   5. Sound system shall reproduce program material at a level of 90 dBA without audible distortion.

1.4 SUBMITTALS

A. Submit in accordance with Sections 013310, Submittal Procedures, and 013323, Shop Drawings, Product Data and Samples.

B. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections:
   1. Product data for each type of product specified.
   2. Shop drawings detailing audio system including, but not limited to the following:
      a. Connection panels.
      b. Rack elevations showing component arrangement inside equipment racks.
      c. Complete layouts of all DSP devices. Including but not limited to audio routing, control, logic, level control, etc...
   3. Wiring Diagrams detailing wiring for power, signal, and control. Provide actual hook-up drawings showing the connection point of each conductor. Single line drawings will not be accepted. Include all cable labeling on wiring diagrams. Identify terminal numbers and wiring color codes to facilitate installation, operation, and maintenance.
   4. Maintenance data for materials and products, for inclusion in Operating and Maintenance Manual specified in Division 1 and Division 27 Section "Basic A/V System Requirements." Provide complete operations and maintenance manual material concurrently with system submittal and provide updated final versions of manuals one month before completion of construction and final system turnover. Include the following:
      a. Equipment list showing quantity, make, model, and serial number.
      b. System operating instructions.
      c. System maintenance instructions.
      d.
   5. Proposed DSP configuration showing individual processor blocks with block resources identified, and signal flow.
   6. Wiring codes for all system cable. (See "labeling", this section).
   7. Proposed labeling for system components. (See "labeling", this section).
   8. All special submittal instructions indicated on supplied design drawings.

1.5 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of sound system, components and accessories, of types, capacities and characteristics required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. Installer's Qualifications: Firms with at least 5 years of successful installation experience of A/V system projects similar to that required for this project. In addition, installers must have successfully completed a minimum of 3 similar installations over a period of 2 years prior to the date of the bid opening for this project. System installations must have included similar automatic mixers, matrices, digital signal processors, and echo cancellor hardware and software. To qualify as similar, audio systems must have included complete installation, set up, programming, balancing, and equalization of automatic mixers, matrix routers, echo cancellors, and digital signal processors. All such installation, set up, programming, balancing, and equalization work must have been completed by a factory trained and certified technician of the specified mixer, matrix, echo cancellor, and digital audio processor manufacturer. The certified technician must have successfully completed all relevant training courses recommended by the manufacturers of the above referenced equipment for proficiency in these skill sets. In addition, the certified technician must have been, and now be, a direct employee of the installer, in a permanent office staffed with factory qualified technicians, working for a minimum of 40 hours per week as a direct employee of the installer. The certified technician and factory trained installers must be the direct employees of the installer; sub-contracted, third party maintenance agreements, or similar arrangements are expressly prohibited, and do not qualify. Upon request, submit evidence of such qualifications to the Designer/Engineer. All of the above requirements must be complied with prior to the bid opening for this project.

C. Manufacturer Training:Installer shall have a manufacturer (Extron or Crestron) trained and certified technician on staff and on site during the installation of all headend devices.

D. Electrical Component Standard: Provide work complying with applicable requirements of NFPA 70 "National Electrical Code."

E. EIA Compliance: Comply with the following Technology Industries Association Standards:
   1. Sound Systems, EIA-160.
   2. Loudspeaker, Dynamic Magnetic Structures, and Impedance, EIA-299-A.
   3. Racks, Panels, and Associated Equipment, EIA-310-A.
   4. Amplifiers for Sound Equipment, SE-101-A.
   5. Speakers for Sound Equipment, SE-103.
   6. Microphones for Sound Equipment, SE-105.

F. UL Compliance: Comply with requirements of UL 50.

G. All installation practices shall be in accordance with, but not limited to, these specifications and drawings. Installation shall be performed in accordance with the applicable standards, requirements, and recommendations of the Uniform Building Code, the National Electrical Code and all local authorities having jurisdiction. All installation work shall follow "standard broadcast wiring" and installation practices, as excerpted from "Recommended Wiring Practices," Sound System Engineering, (2nd Edition), D. Davis, and performed to the highest standards of acknowledged industry practices.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in factory containers. Store in clean, dry space in original containers. Protect products from fumes and construction traffic. Handle carefully to avoid damage.

1.7 WARRANTY REQUIREMENTS

A. Audio system shall be subject to warranty requirements as stated in section 27 4100.

PART 2 - PRODUCTS

1.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by those manufacturers identified in the equipment list. Firms regularly engaged in manufacture of sound system components and accessories, of types, capacities and characteristics required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. All equipment and material shall be new, and must have been commercially available for at least one year prior to bid.

C. All equipment must be UL listed or built to UL standards.

1.2 SYSTEM REQUIREMENTS

A. General: Provide complete and fully functional audio systems using materials and equipment of types, sizes, ratings, and performances as indicated in the equipment list in the accompanying drawings. Use materials and equipment that comply with referenced standards and manufacturers' standard design and construction in accordance with published product information. Coordinate the features of materials and equipment so they form an integrated system with components and interconnections matched for optimum performance of specified functions.

B. Provide all wire, cable, and connectors as required to complete the installation of all systems as designed and specified.

1.3 EQUIPMENT AND MATERIALS

A. General: Provide equipment selected from equipment list on drawings, or as substituted following the proscribed substitution process, using all solid-state components fully rated for continuous duty at the ratings indicated or specified. Select equipment for normal operation on input power supplied at 105-130 V, 60 Hz.

PART 3 - EXECUTION

1.1 EXAMINATION

A. Examine conditions for compliance with requirements and other conditions affecting the performance of the Audio System work.

B. Do not proceed until unsatisfactory conditions have been corrected.

1.2 INSTALLATION

A. General: Install system in accordance with NFPA 70 and other applicable codes. Install equipment in accordance with manufacturer's written instructions.

B. All equipment shall be firmly secured in place unless requirements of portability dictate otherwise. Fastenings and supports shall be adequate to support their loads with a safety factor of at least three times the weight of the equipment being installed. Any structural mounting that is not able to meet this requirement due to the specific nature of the equipment, manufacturer's requirements or limitations of the facility, shall not be installed without prior approval of the Engineer. Install all boxes, equipment, hardware, and other materials plumb, level, and square.

C. Install all technology equipment and support equipment in podium, and the other millwork in a neat and cosmetically dressed-out manner. All saw cuts, holes and recesses into laminates and woodwork shall be straight, all radius and circular cuts shall be consistent, and all uneven surfaces shall be corrected. This shall include the use of moldings, grommets, bushings, laminates, and wood products as required to dress out the installation of equipment. Assure that the installation of equipment and panels in the technology racks and podiums are completed by using matching screws, hardware and grommets.

D. Speakers:
   1. Confirm polarity of speaker before installation and wire to maintain uniform polarity.
   2. Mount transformers with screws securely to speaker brackets or enclosures.
   3. Neatly mount speaker grilles, panels, connector plates, control panels, etc., tight, plumb, and square unless indicated otherwise on drawings.
   4. Provide brackets, screws, adapters, springs, rack mounting kits, etc., recommended by manufacturer for correct assembly and installation of speaker assemblies and technology components.
   5. Make speaker cable connections with rosin core solder or wire nut or equivalent connections.
   6. Loosely but completely fill speaker back boxes that do not have fiberglass installed with fiberglass.
   7. Seal cone speakers to backbox so air will not pass from one side of speaker to another.
   8. Securely mount theater style speaker systems to custom wall mount brackets as detailed in the supplied design drawings. Comply with applicable seismic codes and requirements.

E. Technology:
   1. Assure sufficient ventilation for adequate cooling of equipment.
   2. Mount amplifiers at top of equipment cabinet. Install vent rack panels in unused spaces. Install vent panels at top and bottom and above each power amplifier.
   3. Securely fasten equipment plumb and square in place. Where equipment is installed in rack cabinets, utilize all fastening holes and cover open spaces with perforated panels.

4. Securely fasten relays and small components. Do not use sticky-back tape for fasteners.
5. Install balancing transformer on each unbalanced input or output that connects to device outside equipment cabinet, or that connects to balanced input or output within equipment cabinet.
6. Connect powered components to 120 VAC outlets on transient voltage surge suppressors. Do not connect to outlets on other components.
7. Leave sufficient service loops of uniform length on cables to allow operation of system with chassis outside cabinet.
8. All equipment shall be held firmly in place with proper types of mounting hardware as recommended and/or supplied by the manufacturer. All mounting hardware provided with equipment shall be used when practical. This shall include, but not be limited to, front and rear rack rails, angle brackets and rack mount kits. All equipment shall be installed so as to provide reasonable safety to the operator.

F. Cable, Wire, and Connectors:
1. All cable and wire shall be new and unspliced. Splicing of cables and conductors is expressly prohibited in any location other than the equipment racks. Splicing of audio and video cables will not be allowed in any location. Splicing of control conductors shall be accomplished via punch block or terminal strip connections only.
2. Additional cable length shall be provided at all connector locations. Duplex box, junction box, and floor box locations shall be installed with sufficient cable length behind cover plates to permit wiring maintenance and connector replacement in the future.
3. When cable runs utilize the vertical cable raceways located within walls, the acoustic integrity of the walls shall be maintained. All cables that pass through cover plates of junction boxes and raceways, through slab-to-slab walls, and through conduit lines shall be properly gasketted and sealed and all acoustic material shall be restored or replaced.
4. Separation between system cables and all other services shall be maximized to prevent and/or minimize the potential for electro-magnetic interference (EMI). Particular care shall be taken to ensure at least a 12" separation from electrical lines whenever feasible. At points where separation is unavoidable, distribution cables shall cross other services at right angles whenever practical to minimize EMI.
5. Cables shall be installed in a manner that shall ensure no signal cables are placed on top of any lighting fixtures, ceiling speakers, video projector lifts, projection screens, HVAC controls or sensing devices, fire safety and sprinkler system detection technology, or any other technology or mechanical equipment.
6. No cables shall be laid directly on top of T-bar grid ceiling tiles. Support cables installed outside of conduit at a maximum of four foot intervals from the building structure. Do not utilize support wires from other trades or systems.
7. System cables shall be installed in a manner that will not block access to other equipment or services, across removable service panels and/or in any other manner to prohibit routine maintenance of HVAC systems, fire safety equipment and building mechanical control systems.
8. All exposed conductors inside of equipment racks shall be dressed with heavy duty neoprene heat-shrink tubing.
9. All inter-rack cabling shall be neatly laced, dressed, strain relieved and adequately supported.
10. After completion of wiring and cable installation, all trough and box covers shall be notched out and grommetted for clearance of the various cable bundles, (i.e., separate audio, video, and control). These panel covers shall be screwed back in place and all gaskets shall be restored or replaced.

11. Do not place any wires and cables for this system in any conduit, raceway, wire way or cable tray that is used for the mechanical systems of the building.
12. Provide connectors of the type and quality as detailed in this contract, and/or as required to meet the minimum bandwidth requirements of the equipment to which the connectors are terminated. The overall quantity of connectors shall not be limited by the quantities indicated in the drawings and shall be provided as required.
13. No connectors shall be installed in non-accessible locations or used for splicing cables. All connectors shall be new.
14. All connectors shall incorporate strain relief mechanisms which firmly grip the jacket of connected cables. All connectors shall be properly polarized to prevent improper seating. Connectors shall provide appropriate electrical characteristics for the circuitry to which they are attached.
15. All inner-rack cables shall be grouped according to the signals being carried to reduce signal contamination. Separate groups shall be formed for the following:
    a. Power
    b. Control
    c. Video
    d. Audio cables carrying signals less than -20 dBM.
    e. Audio cables carrying signals between -20 dBM and +20 dBM.
    f. Audio cables carrying signals over +20 dBM.
16. Route all cable and wiring within equipment racks, cabinets and millwork according to function, separating wires of different signal levels (microphone, line level, amplifier output, AC, control, etc.) by as much distance as possible. Neatly arrange, harness and bundle all cable with nylon U/V rated ties.
17. As a general practice, all power cables, control cables, and high level cables shall be run on the left side of equipment racks as viewed from the rear. All other cables shall be run on the right side of all equipment racks as viewed from the rear.
18. All cables, except video cables which must be cut to an electrical length, shall be cut to the length dictated by the cable run.
19. Terminal blocks, boards, strips or connectors, shall be furnished by the installer for all cables which interface with racks, cabinets, consoles, or equipment modules. Affix terminal blocks, boards, strips or connectors to equipment racks using screws only. Double sided tape will not be accepted.
20. Comply with industry standard circuit polarity and loudspeaker wiring polarity. No cables shall be terminated with a polarity reversal between connectors at either end.
21. All system wire, after being cut and stripped, shall have the wire strands twisted back to their original lay and be terminated by approved soldered or mechanical means. No bare wire ends shall be accepted.
22. Heat-shrink type tubing shall be used to insulate and dress the ends of all wire and cables including a separate tube for the ground or drain wire.
23. All solder connections shall be made with rosin-core solder. Temperature controlled soldering irons rated at least 60 watts shall be used for all soldering work. No soldering guns, gas or butane, or temperature unregulated irons shall be used on the job site.
24. All mechanical connections shall be made with approved crimp lugs of the correct size and type for the connection. Wire nuts shall not be permitted except inside speaker enclosures. Each connector shall be attached with the proper size controlled-duty-cycle ratcheting crimp tool which has been approved by the manufacturer of the connectors.
25. Conventional non-ratcheting type crimping tools are unacceptable, and shall not be used on the job site. The presence of such tools on the job site shall constitute evidence of mechanical connections made with unauthorized tools and shall provide sufficient grounds for rejection of all mechanical connections in the system, and the subsequent re-work of same.

26. Shields for audio cables shall be grounded at the input end only, of the various equipment items on the system to prevent potential for ground loops.
27. Where AV cable is installed in areas that are exposed to the view of end users, install AV cable and associated power cables inside nylon braided sleeving (wire loom). Examples of such areas include, but are not limited to cables installed to projectors and monitors, and cables installed to devices in/on lecterns such as touch panels and document cameras. Where security cables are specified for physical security to such devices, install the specified security cables inside the nylon braided sleeving along with the AV cables.

G. Identification and Labeling:
1. All cables, regardless of length, shall be identified with a machine-printed wrap-around labeling system at both ends. These labels shall be self laminating to ensure durability. The label format used shall be equal, or better than, the system detailed.
2. There shall be no unmarked cables any place in the system.
3. Marking codes used on cables shall correspond to codes provided with submittals, and/or the written documentation of the "as built" drawings.
4. All connectors, controls, equipment components, terminal blocks and equipment racks are to be permanently labeled in a format approved during the submittal process.
5. All equipment labels are to be permanently engraved in metal. Any alternative method shall be approved during the submittal process.
6. Clearly and permanently label all jacks, controls, connections, and so forth. Embossed or printed label tape shall not be used and is considered unacceptable for this system. Attach labels with double stick tape as required.
7. All labeling shall be completed prior to acceptance of the final system.

H. Repairs: Wherever walls, ceilings, floors, or other building finishes are cut for installation, or accidentally marred during installation, repair, restore, and refinish to original appearance.

1.3 GROUNDING

A. Provide equipment grounding connections for audio system as indicated. Tighten connections to comply with tightening torques specified in UL Standard 486A to assure permanent and effective grounds.

B. Ground equipment, conductor, and cable shields to eliminate shock hazard and to eliminate ground loops, common mode returns, noise pickup, cross talk, and other impairments. Provide 5-ohm ground at main equipment location. Measure, record, and report ground resistance.

C. Provide one #6 ground conductor with green insulation between all equipment racks and the main electrical panel ground bus. Connect at each end.

1.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Services: Provide services of a factory authorized service representative to supervise the field assembly and connection of components and the pretesting, testing, and adjustment of the system.

B. Pretesting: Upon completing installation of the system, align, adjust, and balance the system and perform complete pretesting. Determine, through pretesting, the conformance of the system to the requirements of the Drawings and Specifications. Correct deficiencies observed in pretesting. Replace malfunctioning or damaged items with new, and retest until materials satisfactory performance and conditions are achieved.

C. Balance and Equalization: Perform the final balance and equalization. Comply with the equalization requirements stated above.

D. Designer/Engineer Final Review:
   1. Contractor shall assist Designer/Engineer in performing the final review, and spot checking the balance and equalization.
   2. Coordinate final inspection schedule with Designer/Engineer two weeks minimum prior to Consultant's final inspection.
   3. Have copy of red-lined as-built documents available at time of inspection.
   4. Have loose equipment (microphones, cables, etc) available at time of inspection.
   5. Assist Sound/Acoustic Consultant in final inspection of completed system.
   6. Provide the following test equipment in good working order:
      a. Battery operated hand-held 1/3 octave real-time audio spectrum analyzer with SPL meter and precision microphone.
      b. Digitally generated random pick noise generator, 20Hz-20kHz, minimum 2 hr repetition rate.
      c. Direct reading audio impedance meter, minimum 3 frequencies, 10% accuracy.
      d. Digital Volt-Ohmmeter.
      e. Audio oscillator, variable frequency, 20Hz-20kHz.
      f. Battery operated oscilloscope, 1 MHz minimum bandwidth.
      g. Necessary charger, cables, test leads, adapter, power strip, etc, for test equipment.
   7. Correct minor items so Designer/Engineer may certify satisfactory completion during his visit.
   8. Pay Designer/Engineer's additional fees and expenses if building or systems have not been completed properly or sufficiently, requiring Designer/Engineer to make subsequent visits to balance, equalize, inspect, or certify completion.

1.5 COMMISSIONING

A. Train Owner's maintenance personnel in the procedures and schedules involved in operating, troubleshooting, servicing, and preventative maintenance of the system. Comply with the requirements identified in section 27 41 16.00, project closeout.

B. Train Owner's non-technical users, and technical support personnel in the procedures and schedules involved in operating, troubleshooting, servicing, and preventative maintenance of the system. Provide a minimum of 4 hours training on two non-consecutive days (8 hours total). Provide training on days when training sessions are not provided to comply with the training requirements specified in other related sections. Include separate training sessions for non-technical users and for technical support personnel. Have ready, and refer to, all project documentation including, but not limited to, operating and maintenance instructions and As-built drawings. Allow the Owner to record any or all training sessions using audio and/or video recording equipment at their discretion.

C. Schedule training with Owner through the Architect, with at least 21 days advance notice.

1.6 CLEANING AND PROTECTION

A. Prior to final acceptance, clean system components and protect from damage and deterioration.

END OF SECTION 27 4113

SECTION 274114 – VIDEO SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. The video systems will provide for monitor display of multiple video sources in multiple video resolutions and formats. Video signals will originate in media devices, be processed, selected and displayed.

B. This Section includes requirements for video system components including, but not limited to, the following:
   1. Switchers
   2. Matrix Switchers
   3. Computer Interfaces
   4. Various Media Source Devices
   5. Scalers
   6. Distribution Amplifiers
   7. Monitors
   8. Video Distribution Systems
   9. Racks
   10. Wire, Cable, and Connectors

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions apply to this Section.

B. Related Sections: The following Division 27 sections contain requirements that relate to this section:
   1. General Technology Systems Requirements
   2. Basic Technology Systems Requirements
   3. Basic Technology Systems Materials and Methods
   4. Audio Systems
   5. Control Systems

C. Related Sections: Several sections of Division 26 contain requirements that relate to this section.

1.3 SYSTEM DESCRIPTION

A. General: The video systems shall be complete and fully functioning systems for the selection, processing, distribution, and display of video signals on multiple types and sizes of monitors and projectors.

B. Video Functional Performance: Components and system features and functions shall include, but not be limited to:
   1. Switching, processing, routing, distribution, and display of any video, data, or graphic signal up to and including native resolutions of 1920 x 1200.

2. Switching, processing, routing, distribution, and display of the specified video signal input formats include, but are not limited to computer video, HDMI video, and DisplayPort video.

C. Digital Signage System: The building will have a digital signage and TV distribution system. The system will be required to receive signals from a cable provider as well as computer based content and distribute it throughout the building. All monitors will have the ability to receive and display custom content. Content delivery and routing will be accomplished via the building network.

1.4 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

B. Product data for each type of product specified.

C. Shop drawings detailing video system including, but not limited to the following:

D.

1. Product data for each type of product specified.
2. Shop drawings detailing video system including, but not limited to the following:
   a. Connection panels.
   b. Rack elevations showing component arrangement inside equipment racks.
3. Wiring Diagrams detailing wiring for power, signal, and control. Provide actual hook-up drawings showing the connection point of each conductor. Single line drawings will not be accepted. Include all cable labeling on wiring diagrams. Identify terminal numbers and wiring color codes to facilitate installation, operation, and maintenance.
4. Maintenance data for materials and products, for inclusion in Operating and Maintenance Manual specified in Division 1 and Division 27 Section "Basic Technology Systems Requirements." Provide complete operations and maintenance manual material concurrently with system submittal and provide updated final versions of manuals one month before completion of construction and final system turnover. Include the following:
   a. Equipment list showing quantity, make, model, and serial number.
   b. System operating instructions.
   c. System maintenance instructions.
5. Wiring codes for all system cable. (See "labeling", this section).
6. Proposed labeling for system components. (See "labeling", this section).
7. All special submittal instructions indicated on supplied design drawings.

1.5 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of video system, components and accessories, of types, capacities and characteristics required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. Installer's Qualifications: Firms with at least 5 years of successful installation experience of A/V system projects similar to that required for this project. In addition, installers must have successfully completed a minimum of 3 similar installations over a period of 2 years prior to the date of the bid opening for this project. System installations must have included similar switchers, matrices, scalers, processors, and monitors. To qualify as similar, video systems must have included complete installation, set up, programming, calibration, and equalization of

switchers, matrix routers, scalers, processors, and monitors. All such installation, set up, programming, calibration, and equalization work must have been completed by a factory trained and certified technician of the specified switchers, matrix routers, scalers, and processors manufacturer. The certified technician must have successfully completed all relevant training courses recommended by the manufacturers of the above referenced equipment for proficiency in these skill sets. In addition, the certified technician must have been, and now be, a direct employee of the installer, in a permanent office staffed with factory qualified technicians, working for a minimum of 40 hours per week as a direct employee of the installer. The certified technician and factory trained installers must be the direct employees of the installer; sub-contracted, third party maintenance agreements, or similar arrangements are expressly prohibited, and do not qualify. Upon request, submit evidence of such qualifications to the Designer/Engineer. All of the above requirements must be complied with prior to the bid opening for this project.

C. Manufacturer Training: Installer shall have a manufacturer (Extron or Crestron) trained and certified technician on staff and on site during the installation of all headend devices.

D. Electrical Component Standard: Provide work complying with applicable requirements of NFPA 70 "National Electrical Code."

E. EIA Compliance: Comply with the following Technology Industries Association Standards.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in factory containers. Store in clean, dry space in original containers. Protect products from fumes and construction traffic. Handle carefully to avoid damage.

1.7 WARRANTY REQUIREMENTS

A. Video system shall be subject to warranty requirements as stated in section 27 4100.

PART 2 - PRODUCTS

1.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by those manufacturers identified in the equipment list.

1.2 SYSTEM REQUIREMENTS

A. General: Provide a complete and fully functional video system using materials and equipment of types, sizes, ratings, and performances as indicated in the project drawings. Use materials and equipment that comply with referenced standards and manufacturers' standard design and construction in accordance with published product information. Coordinate the features of materials and equipment so they form an integrated system with components and interconnections matched for optimum performance of specified functions.

B. Video Projection System: Provide complete projection system set up services including but not limited to convergence, focusing, preset programming, and alignment. Include manufacturer direct services and on site support.

1. Set Up: Provide complete setup and convergence services as defined in the manufacturer's installation manual. Assure that all display devices automatically lock onto all owner designated horizontal scan frequencies and save to memory locations. Provide all equipment required to accomplish programming. At a minimum, without implying limitation, and in addition to those horizontal scan frequencies requested by the owner during the final system set up phase, program display systems to automatically lock onto horizontal scan frequencies for the following resolutions:
   a. NTSC
   b. VGA
   c. WGA
   d. SVGA
   e. XGA
   f. WXGA
   g. WXGA+
   h. SXGA
   i. SXGA+
   j. WSXGA+
   k. UXGA
   l. WUGA
   m. QXGA
   n. WQXGA
   o. MAC II
   p. MAC QUADRA
   q. IBM workstations
   r. UNIX workstations
   s. SUN workstations
   t. 720p
   u. 1080i
   v. 1080p
   w. 1920 x 1200
2. All monitor images shall be free of visible vibration and/or motion. Provide vibration isolation and dampening equipment where required.

1.3 EQUIPMENT AND MATERIALS

A. General: Provide equipment selected from equipment list on drawings, or as substituted following the proscribed substitution process, using all solid-state components fully rated for continuous duty at the ratings indicated or specified. Select equipment for normal operation on input power supplied at 105-130 V, 60 Hz.

B. Furnish and install adaptor cables and patch cables which comply with all requirements specified in the project notes.

PART 3 - EXECUTION

1.1 EXAMINATION

A. Examine conditions, with the Installer present, for compliance with requirements and other conditions affecting the performance of the video system work.

B. Do not proceed until unsatisfactory conditions have been corrected.

1.2 INSTALLATION

A. General: Install system in accordance with NFPA 70 and other applicable codes. Install equipment in accordance with manufacturer's written instructions.

B. All equipment shall be firmly secured in place unless requirements of portability dictate otherwise. Fastenings and supports shall be adequate to support their loads with a safety factor of at least three times the weight of the equipment being installed. Any structural mounting that is not able to meet this requirement due to the specific nature of the equipment, manufacturer's requirements or limitations of the facility shall not be installed without prior approval of the Architect. Install all boxes, equipment, hardware, and other materials plumb, level, and square.

C. Install all technology equipment and support equipment in all podiums, and the other millwork in a neat and cosmetically dressed-out manner. All saw cuts, holes and recesses into laminates and woodwork shall be straight, all radius and circular cuts shall be consistent, and all uneven surfaces shall be corrected. This shall include the use of moldings, grommets, bushings, laminates, and wood products as required to dress out the installation of equipment. Assure that the installation of equipment and panels in the technology racks and podiums are completed by using matching screws, hardware and grommets.

D. Electronics:
   1. Assure sufficient ventilation for adequate cooling of equipment.
   2. Install vent rack panels in unused spaces.
   3. Securely fasten equipment plumb and square in place. Where equipment is installed in rack cabinets, utilize all fastening holes and cover open spaces with perforated panels.
   4. Securely fasten relays and small components. Do not use sticky-back tape for fasteners.
   5. Install balancing transformer on each unbalanced input or output that connects to device outside equipment cabinet, or that connects to balanced input or output within equipment cabinet.
   6. Connect powered components to 120 VAC outlets on transient voltage surge suppressors. Do not connect to outlets on other components.
   7. Leave sufficient service loops of uniform length on cables to allow operation of system with chassis outside cabinet.
   8. All equipment shall be held firmly in place with proper types of mounting hardware as recommended and/or supplied by the manufacturer. All mounting hardware provided with equipment shall be used when practical. This shall include, but not be limited to, front and rear rack rails, angle brackets and rack mount kits. All equipment shall be installed so as to provide reasonable safety to the operator.

E. Cable, Wire, and Connectors:
   1. All cable and wire shall be new and unspliced. Splicing of cables and conductors is expressly prohibited in any location other than the equipment racks. Splicing of audio and video cables will not be allowed in any location. Splicing of control conductors shall be accomplished via punch block or terminal strip connections only.
   2. Additional cable length shall be provided at all connector locations. Duplex box, junction box, and floor box locations shall be installed with sufficient cable length behind cover plates to permit wiring maintenance and connector replacement in the future.

3. When cable runs utilize the vertical cable raceways located within walls, the acoustic integrity of the walls shall be maintained. All cables that pass through cover plates of junction boxes and raceways, through slab-to-slab walls, and through conduit lines shall be properly gasketted and sealed and all acoustic material shall be restored or replaced.
4. Separation between system cables and all other services shall be maximized to prevent and/or minimize the potential for electro-magnetic interference (EMI). Particular care shall be taken to ensure at least a 12" separation from electrical lines whenever feasible. At points where separation is unavoidable, distribution cables shall cross other services at right angles whenever practical to minimize EMI.
5. Cables shall be installed in a manner that shall ensure no signal cables are placed on top of any lighting fixtures, ceiling speakers, HVAC controls or sensing devices, fire safety and sprinkler system detection technology, or any other technology or mechanical equipment.
6. No cables shall be laid directly on top of T-bar grid ceiling tiles. Support cables installed outside of conduit at a maximum of four foot intervals from the building structure. Do not utilize support wires from other trades or systems.
7. System cables shall be installed in a manner that will not block access to other equipment or services, across removable service panels and/or in any other manner to prohibit routine maintenance of HVAC systems, fire safety equipment and building mechanical control systems.
8. All exposed conductors inside of equipment racks shall be dressed with heavy duty neoprene heat-shrink tubing.
9. All inter-rack cabling shall be neatly laced, dressed, strain relieved and adequately supported.
10. After completion of wiring and cable installation, all trough and box covers shall be notched out and grommeted for clearance of the various cable bundles, (i.e., separate audio, video, and control). These panel covers shall be screwed back in place and all gaskets shall be restored or replaced.
11. Do not place any wires and cables for this system in any conduit, raceway, wireway or cable tray that is used for the mechanical systems of the building.
12. Provide connectors of the type and quality as detailed in this contract, and/or as required to meet the minimum bandwidth requirements of the equipment to which the connectors are terminated. The overall quantity of connectors shall not be limited by the quantities indicated in the drawings and shall be provided as required.
13. No connectors shall be installed in non-accessible locations or used for splicing cables. All connectors shall be new.
14. All connectors shall incorporate strain relief mechanisms which firmly grip the jacket of connected cables. All connectors shall be properly polarized to prevent improper seating. Connectors shall provide appropriate electrical characteristics for the circuitry to which they are attached.
15. All inner-rack cables shall be grouped according to the signals being carried to reduce signal contamination. Separate groups shall be formed for the following:
    a. Power
    b. Control
    c. Video
    d. Audio cables carrying signals less than -20 dBM.
    e. Audio cables carrying signals between -20 dBM and +20 dBM.
    f. Audio cables carrying signals over +20 dBM.
16. Route all cable and wiring within equipment racks, cabinets and millwork according to function, separating wires of different signal levels (microphone, line level, amplifier output, AC, control, etc.) by as much distance as possible. Neatly arrange, harness and bundle all cable with nylon U/V rated ties.

17. As a general practice, all power cables, control cables, and high level cables shall be run on the left side of equipment racks as viewed from the rear. All other cables shall be run on the right side of all equipment racks as viewed from the rear.
18. All cables, except video cables which must be cut to an electrical length, shall be cut to the length dictated by the cable run.
19. Terminal blocks, boards, strips or connectors, shall be furnished by the installer for all cables which interface with racks, cabinets, consoles, or equipment modules. Affix terminal blocks, boards, strips or connectors to equipment racks using screws only. Double sided tape will not be accepted.
20. Comply with industry standard circuit polarity and loudspeaker wiring polarity. No cables shall be terminated with a polarity reversal between connectors at either end.
21. All system wire, after being cut and stripped, shall have the wire strands twisted back to their original lay and be terminated by approved soldered or mechanical means. No bare wire ends shall be accepted.
22. Heat-shrink type tubing shall be used to insulate and dress the ends of all wire and cables including a separate tube for the ground or drain wire.
23. All solder connections shall be made with rosin-core solder. Temperature controlled soldering irons rated at least 60 watts shall be used for all soldering work. No soldering guns, gas or butane, or temperature unregulated irons shall be used on the job site.
24. All mechanical connections shall be made with approved crimp lugs of the correct size and type for the connection. Wire nuts shall not be permitted except inside speaker enclosures. Each connector shall be attached with the proper size controlled-duty-cycle ratcheting crimp tool which has been approved by the manufacturer of the connectors.
25. Conventional non-ratcheting type crimping tools are unacceptable, and shall not be used on the job site. The presence of such tools on the job site shall constitute evidence of mechanical connections made with unauthorized tools and shall provide sufficient grounds for rejection of all mechanical connections in the system, and the subsequent re-work of same.
26. Shields for audio cables shall be grounded at the input end only, of the various equipment items on the system to prevent potential for ground loops.
27. Where AV cable is installed in areas that are exposed to the view of end users, install AV cable and associated power cables inside nylon braided sleeving (wire loom). Examples of such areas include, but are not limited to cables installed to monitors, and cables installed to devices in/on lecterns such as touch panels and document cameras. Where security cables are specified for physical security to such devices, install the specified security cables inside the nylon braided sleeving along with the AV cables.

F. Identification and Labeling:
1. All cables, regardless of length, shall be marked with wrap-around, or better, number or letter cable markers at both ends. These labels shall be self laminating to ensure durability. The label format used shall be equal, or better than, the system detailed.
2. There shall be no unmarked cables any place in the system.
3. Marking codes used on cables shall correspond to codes provided with submittals, and/or the written documentation of the "as built" drawings.
4. All connectors, controls, equipment components, terminal blocks and equipment racks are to be permanently labeled in a format approved during the submittal process.
5. All equipment labels are to be permanently engraved in metal or plastic laminate and affixed with double-stick tape. Any alternative method shall be approved during the submittal process.
6. Clearly and permanently label all jacks, controls, connections, and so forth, with engraved laminated plastic labels. Embossed or printed label tape shall not be used and is considered unacceptable for this system. Attach labels with double stick tape as required.
7. All labeling shall be completed prior to acceptance of the final system.

G. Extended Display Identification Data (EDID):
   1. All devices shall provide complete compatibility with analog and digital EDID data, facilitating display image specifications to source devices. Set EDID values in all equipment items in compliance with the native resolution of the specified display devices and the manufacturer's recommended practices.

H. High-bandwidth Digital Content Protection (HDCP):
   1. All digital video devices shall provide complete compatibility with HDCP content protection ensuring all HDCP content can be displayed on all monitors.

I. Repairs: Wherever walls, ceilings, floors, or other building finishes are cut for installation , repair, restore, and refinish to original appearance.

1.3 GROUNDING

A. Provide equipment grounding connections for satellite earth-station systems and components, including dish antenna and supporting structures, and lead-in wires to antenna-discharge units. Tighten connections in accordance with manufacturer's recommended tightening torques. If not manufacturer-specified, comply with tightening torques specified in UL Stds 486A and B to assure permanent and effective grounds.

B. Provide equipment grounding connections for audio system as indicated. Tighten connections to comply with tightening torques specified in UL Standard 486A to assure permanent and effective grounds.

C. Ground equipment, conductor, and cable shields to eliminate shock hazard and to eliminate ground loops, common mode returns, noise pickup, cross talk, and other impairments. Provide 5-ohm ground at main equipment location. Measure, record, and report ground resistance.

D. Provide one #6 ground conductor with green insulation between all equipment racks and the main electrical panel ground bus. Connect at each end.

1.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Services: Provide services of a factory authorized service representative to supervise the field assembly and connection of components and the pretesting, testing, and adjustment of the system.

B. Pretesting: Upon completing installation of the system, align, adjust, and balance the system and perform complete pretesting. Determine, through pretesting, the conformance of the system to the requirements of the Drawings and Specifications. Correct deficiencies observed in pretesting. Replace malfunctioning or damaged items with new, and retest until materials satisfactory performance and conditions are achieved.

C. Designer/Engineer Final Testing, Image Observation, and Review:
   1. Contractor shall assist Designer/Engineer in performing the final testing, image observation, and review.
   2. Coordinate final inspection schedule with Designer/Engineer two weeks minimum prior to Consultant's final inspection.
   3. Have copy of red-lined as-built documents available at time of inspection.
   4. Have loose equipment (monitors, patch cables, etc) available at time of inspection.

5. Assist Designer/Engineer in final review, testing, and image observation of completed system(s).
6. Provide the following test equipment in good working order:
    a. Digitally generated test signal generator for all signals identified above. At a minimum, without implying limitation, signal generator shall output cross hatch, alternating pixel, grey scale, and color bar patterns.
    b. Digital Volt-Ohmmeter.
    c. Field strength meter.
    d. Battery operated oscilloscope, 1 MHz minimum bandwidth.
    e. Necessary charger, cables, test leads, adapter, power strip, etc, for test equipment.
7. Correct minor items so Designer/Engineer may certify satisfactory completion during his visit.
8. Pay Designer/Engineer's additional fees and expenses if building or system have not been completed properly or sufficiently, requiring Designer/Engineer to make subsequent visits to balance, equalize, inspect, or certify completion.

1.5 COMMISSIONING

A. Train Owner's maintenance personnel in the procedures and schedules involved in operating, troubleshooting, servicing, and preventative maintenance of the system. Comply with the requirements identified in section 27 41 16.00, project closeout.

B. Train Owner's non-technical users, and technical support personnel in the procedures and schedules involved in operating, troubleshooting, servicing, and preventative maintenance of the system. Provide a minimum of 4 hours training on two non-consecutive days (8 hours total). Include separate training sessions for non-technical users and for technical support personnel. Have ready, and refer to, all project documentation including, but not limited to, operating and maintenance instructions and As-built drawings. Allow the Owner to record any or all training sessions using audio and/or video recording equipment at their discretion.

C. Schedule training with Owner through the Architect, with at least 21 days advance notice.

1.6 CLEANING AND PROTECTION

A. Prior to final acceptance, clean system components and protect from damage and deterioration.

END OF SECTION 27 4114

SECTION 274115 – CONTROL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. The control system will be a microprocessor based, modular card frame and card system, with control system intercommunication via a serial loop. Human interface will occur using color, programmable touch screen control panel(s), and/or miscellaneous control panels. The control system will control all room A/V functions and equipment. The control system will interface to components via Ethernet, infra-red, serial, and contact closure control signals. The control system will include all hardware, firmware, software, and programming to provide complete system control functions including but not limited to all requirements specified in the programming outline included herein.

B. Not Used.

C. This Section includes requirements for control system hardware and software components including, but not limited to, the following:
   1. Touch Panels
   2. Button Panels
   3. Control cards
   4. Volume controllers
   5. General bus devices
   6. Racks
   7. Wireless Access Points
   8. Ethernet Network Switches
   9. Control systems software
   10. Video processing software
   11. Audio processing software
   12. Wire, Cable, and Connectors

D. Related Sections: The following Division 27 sections contain requirements that relate to this section:
   1. General Technology Systems Requirements
   2. Basic Technology Systems Requirements
   3. Basic Technology Systems Materials and Methods
   4. Audio Systems
   5. Video Systems

E. Related Sections: Several sections of Division 26 contain requirements that relate to this section.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions apply to this Section.

B. Related Sections: The following Division 27 sections contain requirements that relate to this section:
   1. General Technology Systems Requirements
   2. Basic Technology Systems Requirements
   3. Basic Technology Systems Materials and Methods
   4. Audio Systems
   5. Video Systems

C. Related Sections: Several sections of Division 26 contain requirements that relate to this section.

1.3 SYSTEM DESCRIPTION

A. Comply with the Control System Programming Outline in developing the software programming for control system operations. The programming outline provides an in-depth narrative which describes the touch panel page design and specific button operating details. All button panel labels, and all touch panel buttons, graphics, and page configurations shall be developed and designed by the installer as required to produce a fully functioning system. All final page layouts shall be approved by the Designer/Engineer and the Owners representative prior to final programming. This shall include all "help" pages, and all new pages and/or buttons which may not be described in the programming outline, but, nevertheless are required to provide a fully functional A/V control system. Submit proposed page layouts for approval in conjunction with the specified submittal process. The intent of the programming outline is not to eliminate the field engineering required of the contractor, but rather to give a clear course of logic desired for the touch panel buttons and pages.

B. The control panels shall communicate with all specified A/V system components via the specified control system devices. All programming source code required to make the touch panel/button panel buttons operational shall be developed and written by the installer as required to produce a fully functioning system.

C. The Installer shall provide the complete source code to the Owner for the completed functioning control system. The source code shall be un-locked, and in a format that can be fully accessed by the Owner. In addition, the Installer must relinquish ownership of said software code, in writing, to the Owner.

D. The control system shall facilitate easy operation of all room functions from a single unified panel within the room. This shall include all "technician level" set-up parameters, default settings, presets, and other operational functions as described in this specification and/or required to accomplish fully functioning system.

E. The control system shall include complete help functions as detailed in the Control System Programming Outline.

F. The control system shall include operation of power controllers to energize the designated rack mounted system equipment per the Control System Programming requirements, and the system installation guidelines.

G. The control system hardware shall be supplied by a manufacturer that offers factory-level training in advanced control operations and system programming. This training shall be available to enable the Owner's technical staff to acquire the technician-level skills needed to maintain the control system, and make programming modifications after the initial programming and installation of these systems, at the completion of the warranty period.

H. The control system, and its associated equipment, shall interface and operate all equipment and devices, as detailed in the control system programming outline, and as illustrated in the supplied design.

I. The control system shall include a "technician level" of operation separate from the "user level" of operation. This shall be provided to prevent unauthorized manipulation of set-up and control parameters, as detailed in the control system programming section, and as deemed appropriate by the owner. This shall include additional features as dictated by equipment and control operations.

1.4 SUBMITTALS

A. Submit in accordance with Sections 013310, Submittal Procedures, and 013323, Shop Drawings, Product Data and Samples.

B. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections:
   1. Product data for each type of product specified.
   2. Shop drawings detailing control system including, but not limited to the following:
      a. Document of proposed system programming logic tree, showing integrated control of all specified equipment, as well as the type of control signal planned for each type of equipment.
      b. Paper document of proposed touch panel programming showing scaled, color printout’s of all touch panel pages which identify button colors, configurations, icons, graphics, and text.
      c. Rack elevations showing component configuration inside equipment racks.
      d. Proposed modular control card for A/V, system component to be controlled.
   3. Wiring Diagrams detailing wiring for power, signal, and control. Provide actual hook-up drawings showing the connection point of each conductor. Single line drawings will not be accepted. Include all cable labeling on wiring diagrams. Identify terminal numbers and wiring color codes to facilitate installation, operation, and maintenance.
   4. Maintenance data for materials and products, for inclusion in Operating and Maintenance Manual specified in Division 1 and Division 27 Section "Basic A/V System Requirements." Provide complete operations and maintenance manual material concurrently with system submittal and provide updated final versions of manuals one month before completion of construction and final system turnover. Include the following:
      a. Equipment list showing quantity, make, model, and serial number.
      b. System operating instructions.

c. System maintenance instructions.
d.

5. List of AV equipment to be connected to the Owner’s data network. (See “IP Address Assignments”, this section).
6. Wiring codes for all system cable. (See "labeling", this section).
7. Proposed labeling for system components. (See "labeling", this section).
8. All special submittal instructions indicated on supplied design drawings.

1.5 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of control system, components and accessories, of types, capacities and characteristics required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. Installer's Qualifications: Firms with at least 5 years of successful installation experience of A/V system projects similar to that required for this project. In addition, installers must have successfully completed a minimum of 3 similar installations over a period of 2 years prior to the date of the bid opening for this project. System installations must have included similar control system hardware and software. To qualify as similar, control systems must have included touch panel(s), central processing unit(s), and custom programming for touch panel pages. All custom programming code writing must have been written and de-bugged by a factory trained Extron or Crestron Certified programmer who has successfully completed all relevant training courses recommended by the control system manufacturer for proficiency in system programming. In addition, the certified programmer must have been, and now be, a direct employee of the installer, in a permanent office staffed with factory qualified technicians, working for a minimum of 40 hours per week as a direct employee of the installer. The certified programmer and factory trained installers must be the direct employees of the installer; sub-contracted, third party maintenance agreements, or similar arrangements are expressly prohibited, and do not qualify. Upon request, submit evidence of such qualifications to the Designer/Engineer. All of the above requirements must be complied with prior to the bid opening for this project.

C. Manufacturer Training: Installer shall have a manufacturer (Extron or Crestron) trained and certified technician on staff and on site during the installation of all headend devices.

D. Electrical Component Standard: Provide work complying with applicable requirements of NFPA 70 "National Electrical Code."

E. Codes and Standards: Comply with the following Codes and Standards:
   1. Racks, Panels, and Associated Equipment, EIA-310-A.
   2. NESC Compliance: Comply with National Electrical Safety Code requirements.
   3. FCC Compliance: Comply with Subpart J of PART 15, FCC Rules pertaining to computing devices including Class A, Class B, personal and peripheral types. Provide equipment which complies with technical standards for both radiated and power line conducted interference.
   4. UL Compliance: Comply with applicable requirements of UL Standards 486A and B, 813, 983, 1409, 1410, 1412, 1414, 1416, 1417, and 1418 pertaining to control system products. Provide control system and components which are UL-listed and labeled.

5. All installation practices shall be in accordance with, but not limited to, these specifications and drawings. Installation shall be performed in accordance with the applicable standards, requirements, and recommendations of the Uniform Building Code, the National Electrical Code and all local authorities having jurisdiction. All installation work shall follow "standard broadcast wiring" and installation practices, as excerpted from "Recommended Wiring Practices," Sound System Engineering, (2nd Edition), D. Davis, and performed to the highest standards of acknowledged industry practices.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in factory containers. Store in clean, dry space in original containers. Protect products from fumes and construction traffic. Handle carefully to avoid damage.

1.7 WARRANTY REQUIREMENTS

A. Control system shall be subject to warranty requirements as stated in section 27 4100.

PART 2 - PRODUCTS

1.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by those manufacturers identified in the equipment list.

1.2 SYSTEM REQUIREMENTS

A. General: Provide a complete and fully functional control system using materials and equipment of types, sizes, ratings, and performances as identified in the equipment list. Use materials and equipment that comply with referenced standards and manufacturers' standard design and construction in accordance with published product information. Coordinate the features of materials and equipment so they form an integrated system with components and interconnections matched for optimum performance of specified functions.

B. The control system programming outline, as defined in these specifications, constitutes the minimum control system requirements for adequate control of the A/V systems. The programming outline is a guideline only, provided for the sole purpose of demonstrating intent. It is likely that touch panel/control system buttons, pages, and/or programming will be required which are not identified in the programming outline. During the final software programming, the installer shall work in a close and cooperative manner with the Designer/Engineer and Owner's representative as described in Part 3E to make additional modifications, and/or changes in programming procedural events, changes in touch panel functions, and changes in programming features as needed at no additional cost to the owner. These adjustments to the system programming outline in this section shall include, but not be limited to, changes in the system programming code, page layouts, equipment operating modes, and system logic from

the parameters outlined here to ensure the flexible and user friendly operation of the A/V system. Include all costs necessary to make moderate changes to the control system programming code and touch panel buttons and pages in the base bid.

C. The final program shall have sufficient "remark statements" at various points in the program to enable easy identification of blocks of programming code.

D. A/V system components will be controlled utilizing the most advanced protocol available. In every case, two way, serial control or Ethernet control will be used where available.

E. Not used

F. Upon completion of system installation, a complete set of backup source code programs for the touch panels and mainframe technology of each room shall be provided on thumb drive or CD to the owner's representative.

1.3 EQUIPMENT AND MATERIALS

A. General: Provide equipment selected from equipment list on drawings, or as substituted following the proscribed substitution process, using all solid-state components fully rated for continuous duty at the ratings indicated or specified. Select equipment for normal operation on input power supplied at 105-130 V, 60 Hz.

PART 3 - EXECUTION

1.1 EXAMINATION

A. Examine conditions for compliance with requirements and other conditions affecting the performance of the control system work.

B. Do not proceed until unsatisfactory conditions have been corrected.

C. Verify compliance of following items before beginning control equipment installation.
1. No cables spliced except at standard barrier terminal blocks or approved method inside equipment racks.
2. Cables marked at each end with permanent wire labels such as Brady or equal.
3. Specified conduit, cables, enclosures and equipment cabinets are properly installed.
4. Location and angle of loudspeaker cabinets.
5. Location and stability of projection system mounting supports.

1.2 INSTALLATION

A. General: Install system in accordance with NFPA 70 and other applicable codes. Install equipment in accordance with manufacturer's written instructions.

B. IP Address Assignments: The Owner's Information Technology Department will assign an IP address space for all AV equipment requiring an Ethernet network connection to be provided as part of this project in compliance with the following:

C.

1. All AV equipment will connect directly to an isolated VLAN on the Owner's data network. The AV equipment does not need to be VLAN aware.
2. Any modifications with respect to the mandated IP Address Assignment Procedure must be approved during the submittal process.
3. IP Address Assignment Procedures:
4.

a. The AV Contractor shall provide a list of AV equipment to be connected to the Owner's data network at least three (3) working days prior to installation. The AV equipment list shall be provided to the Owner in a spreadsheet or comma-delimited file format. The equipment information shall include the following:

b.

1) Manufacturer
2) Model Number
3) Serial Number
4) Media Access Control (MAC) address
5) Project room number where the equipment is to be installed
6)

c. The Owner's Information Technology Department will register the above provided AV equipment and MAC addresses for use on the Owner's network, and assign an IP address to each piece of equipment.
d. The Owner will provide the equipment list file back to the AV contractor with IP address assignments within three (3) working days of receipt of the equipment list.
e. The AV Contractor shall submit an updated equipment list with any equipment changes or configuration modifications that occur during the course of the project.
f.

5. Network Connection:
   a. The AV contractor shall provide a labeled data patch cable per the project specifications, and connect the AV equipment directly to the lowest numbered data outlet provided at each classroom lectern, instructor station, and monitor location. Each subsequent piece of AV equipment shall be connected to the next lowest sequentially numbered data outlet. Provide data patch cables with a purple jacket.

D. System Programming and Programming Outline: Provide complete control system programming services including but not limited to the creation of custom software required to meet all contract document requirements including but not limited to the programming outline specified below. Include manufacturer direct services and on site support. Please note that not all equipment, functions, and/or controls may not be specified or required for all rooms. Program software based on the following programming outline as applicable to individual single line diagrams identified in the accompanying drawings.

E. The control system programmer is to work closely with the design consultant and owner's representative and shall meet a minimum of three times during this process: 1st before initial programming to determine general scope and functionality; 2nd after initial programming to review the program before it is implemented; 3rd four months after building completion to review

the system functionality. The programmer will make adjustments after each of these meetings to the owner's satisfaction at no cost to the owner.

F.

1. GENERAL PROGRAMMING REQUIREMENTS: The following programming outline contains control system programming requirements. In addition to these requirements, these specifications mandate the use of previously written code blocks, and system functionality descriptions prepared by the control system manufacturer. Where non-touch panel user interfaces are specified, follow the concepts and general control system logic identified in the Programming Outline for touch panels when programming the functionality of the non-touch panel user interfaces.
2. SYSTEM ACTIVATION: When the A/V system has been deactivated by the system off button, or when the touch panel has entered its "time out" mode, display the following message on the touch screen: "TOUCH SCREEN TO ACTIVATE". This message will remain constantly on, and shift positions if recommended by the manufacturer to prevent burn in.
3. INDIVIDUAL SYSTEM SHUTDOWN: Regardless of the time of day, the control system CPU in each individual room shall monitor system usage. If a control command has not been issued within a user adjustable period of time, a pop up window will ask "Do you want the A/V system to remain on?" with a "yes" button. If the yes button is engaged within 30 seconds, the system will remain on. If the yes button is not engaged within 30 seconds, a system off command will be issued, and the A/V system will proceed through orderly shut down. In addition, the control system in each room will automatically issue an off command each day at a user adjustable time of day.
4. Not used
5. GLOBAL OFF COMMAND: At a certain Owner identified time each day (for example, 10:00 p.m.), send an off command to all system electronics which can be damaged, or have component life shortened by remaining powered on for extended periods of time. At a minimum, without implying limitation, include flat display devices. Off command will power down all above identified equipment in an orderly shut down process at the appointed time.
6. BUTTON HIGHLIGHTING: When any button is engaged on any touch panel control page, that button shall be highlighted for the duration of physical contact between the finger and touch screen. In addition, when a any system function is activated/selected, the button will remain highlighted to identify the active status of the control system. In addition, comply with additional button highlighting requirements stated in the programming outline.
7. PAGE FLIPS AND POP UP WINDOWS: Page flips and pop up windows are specified throughout the programming outline. If, at a specific location in the touch panel pages, the programmer believes one is more appropriate than the other, the programmer is encouraged to consult with the AV designer. Where pop-up windows are used, program automatic time outs so that the pop up window will be automatically removed from the screen after a user adjustable period of time.
8. BUTTON CONTROL PANEL: The below description of menu bars and buttons applies directly to touch panels. Where button panels are specified rather than touch panels, apply similar logic to button functions and nomenclature. Include button panel layouts with descriptions of individual button functionality with touch panel page submittals.

9. GREETING PAGE: Upon first touching the screen a GREETING PAGE shall be displayed. This page will contain the OWNER'S LOGO, a welcome message, the DATE, the TIME, have the SYSTEM ON button, a HELP button and a LIGHTS button.
    a. BUTTON - SYSTEM ON: Selecting will power on the AV system. Sequence power up of the AV system to power on the audio power amplifiers last. In addition, all A/V applicable system parameters shall be set to default values. As an example only, without implying limitation, all volume levels shall be set to default values; the audio and video mutes shall be disengaged if previously left on; etc.... Upon system power up, route the resident CPU to the lectern monitor as a default. In addition, selecting brings up a START PAGE containing all common button bars.
10. GENERAL CONCEPT COMMON BUTTON BARS (not all buttons apply to every room): With the exception of the greeting page, control system touch panel pages will contain all "common button bars" for the purpose of allowing access to fundamental control functions from any location in the touch panel page/software program. When a button in the common button bar group is selected, that button shall become highlighted, and remain highlighted until interaction with the corresponding page is terminated. At a minimum, without implying limitation, the common button bars shall contain the following:
    a. COMMON BUTTON BAR 1, GENERAL, (top center):
        1) BUTTON - SOURCE SELECT: Selecting brings up the source selection page.
        2) BUTTON - CONFERENCING (if applicable): Selecting brings up the conferencing select page.
        3) BUTTONS - SIGNAL ROUTING: Selecting brings up a graphic with origin and destinations for all rooms with signal routing capability (matrix switchers). Provide all buttons required to select signals and send them to the various destinations identified in the applicable single line diagrams.
        4) BUTTON – CURRENT STATUS: Selecting displays the current status of the AV system. Items to be identified include, but are not limited to: Power to individual system components, system muting, audio levels, input currently selected.
        5) BUTTON - DISPLAY MODIFY: Selecting brings up the display modify page.
        6) Not Used
        7) BUTTON - SYSTEM OFF: Selecting shall display a text prompt asking "Are you sure?" with a text message stating that a certain period of time must elapse (time to be determined by the monitor manufacturer) before the system can be powered on again; in addition, provide buttons YES, and NO. IF YES, the system shall power off the AC power controllers in reverse order of turn on, turning the audio amplifiers off first, followed, three (3) seconds later, by the rest of the designated A/V equipment. In addition, bring up a pop-up window which reminds the user to log off the resident CPU in the lectern. If NO, the system shall return the touch panel back to the previous page with no action taken.
        8) DISPLAY - DATE: Will display the correct date.
        9) DISPLAY - TIME: Will display the correct time of day.
    b. Not used
    c. COMMON BUTTON BAR, MISCELLANEOUS (bottom left):
    d.
        1) BUTTON - BACK: Selecting shall return the user to the previous page selected, similar to a common web browser. This function shall be provided

on every touch panel page except for the GREETING PAGE and START PAGE.

2) BUTTON - HELP: Selecting shall bring up a message which directs the user to open the lectern drawer, retrieve the telephone set, and call the Help Desk. A RETURN button shall be provided on the help page to return the operator to the previous page. In addition, the message will extinguish automatically after an Owner identified amount of time.

e. COMMON BUTTON BAR 3, VOLUME CONTROL, (right):

1) BUTTON – MICROPHONE VOLUME UP: Selecting shall simultaneously increase the input levels of all microphone inputs to the mixer. All mixer levels will change independently, without changing relative levels between microphone inputs. Minimum and maximum levels shall be programmed into the volume control which shall prevent complete inaudibility and/or feedback. Button shall operate incrementally and continuously. When selected incrementally, the volume shall increase incrementally within the preprogrammed minimum and maximum parameters. When touched continuously, the volume shall increase continuously within the preprogrammed minimum and maximum parameters. If microphones were muted prior to selection, disengage the mute function, display the bar graph, and engage the volume up control.

2) BUTTON - MICROPHONE VOLUME DOWN: Selecting shall simultaneously decrease the input levels of all microphone inputs to the mixer. All mixer levels will change independently, without changing relative levels between microphone inputs. Minimum and maximum levels shall be programmed into the volume control which shall prevent complete inaudibility and/or feedback. Button shall operate incrementally and continuously. When selected incrementally, the volume shall decrease incrementally within the preprogrammed minimum and maximum parameters. When touched continuously, the volume shall decrease continuously within the preprogrammed minimum and maximum parameters. If microphones were muted prior to selection, disengage the mute function, display the bar graph, and engage the volume down control.

3) DISPLAY - MICROPHONE VOLUME UP AND DOWN BAR GRAPH: Bar graph shall be continuously displayed adjacent to volume up and down buttons. Bar graph shall graphically display the window between the preprogrammed minimum and maximum volume settings. The bar graph shall be divided into a minimum of 10 segments which shall incrementally or continuously appear or disappear according to the volume button selected. The bar graph display shall be removed from the screen when the mute function is selected. The bar graph shall be restored to its previous setting when the mute function is toggled off.

4) BUTTON - MICROPHONE MUTE (toggle function): Selecting shall highlight and flash the button, and simultaneously mute all microphone inputs to the mixer. Mute shall be defined as a minimum 60 dBA decrease in sound pressure level. Bar graph display shall be removed. Selecting again will simultaneously un-mute all microphone inputs to the mixer, and the bar graph display will be restored showing its previous setting.

5) INDIVIDUAL MICROPHONE LEVEL CONTROL: Provide buttons required to select each individual microphone input and to control its level.

6) BUTTON - MEDIA SOURCE VOLUME UP: Selecting shall simultaneously increase the input levels of all media source inputs to the mixer. All mixer levels will change independently, without changing relative levels between microphone inputs. Minimum and maximum levels shall be programmed into the volume control which shall prevent complete inaudibility and/or feedback. Button shall operate incrementally and continuously. When selected incrementally, the volume shall increase incrementally within the preprogrammed minimum and maximum parameters. When touched continuously, the volume shall increase continuously within the preprogrammed minimum and maximum parameters. If the media source mixer inputs were muted prior to selection, disengage the mute function, display the bar graph, and engage the volume up control.

7) BUTTON - MEDIA SOURCE VOLUME DOWN: Selecting shall simultaneously decrease the input levels of all media source inputs to the mixer. All mixer levels will change independently, without changing relative levels between microphone inputs. Minimum and maximum levels shall be programmed into the volume control which shall prevent complete inaudibility and/or feedback. Button shall operate incrementally and continuously. When selected incrementally, the volume shall decrease incrementally within the preprogrammed minimum and maximum parameters. When touched continuously, the volume shall decrease continuously within the preprogrammed minimum and maximum parameters. If the media source mixer inputs were muted prior to selection, disengage the mute function, display the bar graph, and engage the volume down control.

8) DISPLAY - MEDIA SOURCE VOLUME UP AND DOWN BAR GRAPH: Bar graph shall be continuously displayed adjacent to volume up and down buttons. Bar graph shall graphically display the window between the preprogrammed minimum and maximum volume settings. The bar graph shall be divided into a minimum of 10 segments which shall incrementally or continuously appear or disappear according to the volume button selected. The bar graph display shall be removed from the screen when the mute function is selected. The bar graph shall be restored to its previous setting when the mute function is toggled off.

9) BUTTON - MEDIA SOURCE MUTE (Toggle function): Selecting shall highlight and flash the button, and simultaneously mute the media source inputs to the mixer. Mute shall be defined as a minimum 60 dBA decrease in sound pressure level. Bar graph display shall be removed. Selecting again will simultaneously un-mute the media source inputs to the mixer, and the bar graph display will be restored showing its previous setting.

10)

f. COMMON BUTTON BAR 5, MISCELLANEOUS, (bottom right):

g.

11. SOURCE SELECTION PAGE (Source devices vary in individual rooms. Refer to drawings for source devices specified for individual rooms):

12.

a. Not used.

b. BUTTON - AUDIO INPUT (TYPICAL): Selecting shall power up the applicable equipment (including source devices and displays if not already on), route the stereo audio through the audio reinforcement system to the appropriate audio

amplification system. In addition, selecting will bring up the audio input function control page.

c. BUTTON - VIDEO INPUT (TYPICAL OF HDMI, DVI, YC, AND COMPOSITE VIDEO INPUTS WHERE APPLICABLE): Selecting shall power up the applicable equipment (including source devices and displays if not already on), route the stereo audio and video through the switching technology and audio reinforcement system to the appropriate display devices and to the audio amplification system. In rooms where multiple display devices serve a single physical space, the appropriate display devices will be selected utilizing a pop up graphic of the applicable room floor plan. The floor plan will show a button icon representing each display device at the appropriate location within the room graphic, and prompt: “PLEASE SELECT DESIRED DISPLAY DEVICES”. As display devices are selected, buttons will become and remain highlighted. In addition, provide an ENTER button to implement display device selection commands to the switching technology. In addition, selecting will bring up the video input function control page.

13. DISPLAY MODIFY PAGE: Provide a room graphic of the applicable room floor plan or possible video window configurations. The floor plan will show a button icon representing each display device at the appropriate location within the room graphic. In addition, include a HELP button as specified above. Selecting a button shall bring up a pop up window with the following buttons:

14.

a. BUTTON - ON: Turns the selected display device on (including source devices and displays if not already on).

b. BUTTON - OFF: Turns the selected display device off (if not already off).

c. BUTTON - CLEAR: Clears all control commands issued to modify the source selection to the selected display device. Relinquish source selection control to the standard source selection specified above.

d. BUTTONS - AVAILABLE SOURCES: Provide one button icon for each available source device. Once a source device is selected, command the switching technology to route the selected source to the selected display device and remove the pop up window from the screen.

15. FUNCTION CONTROL PAGES: Provide function control pages for the following devices:

a. Not used

b. Video Conferencing Systems (CODECS) (if applicable)

c. Teleconferencing Systems (if applicable)

d.

1) Provide the following buttons on the respective function control pages for the above identified devices:

2)

a) BUTTONS: Provide all buttons necessary to control all functions of the selected device/system. As a general rule, without implying limitation, provide control buttons on touch panel function control pages or button control panels which duplicate the control buttons provided on or in the device/system control panel, remote controller, and/or control software. Where sensible, configure and label buttons on touch panel function control pages in the same way system/device control buttons are configured and labeled on their own control panels, remote controllers, and/or control software.

b) BUTTON – CLOSE: Selecting shall highlight button and display a text prompt asking "Are you sure?" with buttons YES, and NO. If YES is selected, discontinue all transport functions (if any) associated with the function control page. In addition, selecting shall return the user to the START PAGE. If NO, the system shall return the touch panel back to the previous page with no action taken.

c)

16. FUNCTION CONTROL PAGES: Provide pop-up messages for the following devices (applicable to touch panels only):

17.

a. Video Inputs (including all formats specified in the accompanying drawings)
b. Audio Inputs
c.

1) Provide the following messages on the respective function control pages for the above identified devices:

2)

a) TEXT MESSAGE: "You have selected computer input XX as an input source for display".

b) BUTTON - CLOSE: Selecting shall highlight button and display a text prompt asking "Are you sure?" with buttons YES, and NO. If YES is selected, discontinue all transport functions (if any) associated with the function control page. In addition, selecting shall return the user to the START PAGE. If NO, the system shall return the touch panel back to the previous page with no action taken.

c)

18. TECHNICIAN SET-UP PAGES: NOTE: Unlike all other control system pages, the technician set up pages are described in general terms. The intent is to provide the installer flexibility in page creation and software programming.

19.

a. BUTTONS - PASSWORD PROGRAMMING: Provide required buttons to program and save four digit password(s) for access to the specified pages. Password to be comprised of any combination of numbers and/or letters.
b. BUTTONS - DATE AND TIME SET: Provide required buttons to set and enter the correct date, including day, month, and year. Provide required buttons to set and enter the correct time of day including hours and minutes.
c. BUTTON - HELP: Provide as specified above.

1)

END OF PROGRAMMING OUTLINE

G. All equipment shall be firmly secured in place unless requirements of portability dictate otherwise. Fastenings and supports shall be adequate to support their loads with a safety factor of at least three times the weight of the equipment being installed. Any structural mounting that is not able to meet this requirement due to the specific nature of the equipment, manufacturer's requirements or limitations of the facility, shall not be installed without prior approval of the Designer/Engineer. Install all boxes, equipment, hardware, and other materials plumb, level, and square.

H. Install all technology equipment and support equipment in all podiums, and the other millwork in a neat and cosmetically dressed-out manner. All saw cuts, holes and recesses into laminates and woodwork shall be straight, all radius and circular cuts shall be consistent, and all uneven surfaces shall be corrected. This shall include the use of moldings, grommets, bushings, laminates, and wood products as required to dress out the installation of equipment. Assure that the installation of equipment and panels in the technology racks and podiums are completed by using matching screws, hardware and grommets.

I. Technology:
   1. Assure sufficient ventilation for adequate cooling of equipment.
   2. Install vent rack panels in unused spaces.
   3. Securely fasten equipment plumb and square in place. Where equipment is installed in rack cabinets, utilize all fastening holes and cover open spaces with perforated panels.
   4. Securely fasten relays and small components. Do not use sticky-back tape for fasteners.
   5. Connect powered components to 120 VAC outlets on transient voltage surge suppressors. Do not connect to outlets on other components.
   6. Leave sufficient service loops of uniform length on cables to allow operation of system with chassis outside cabinet.
   7. All equipment shall be held firmly in place with proper types of mounting hardware as recommended and/or supplied by the manufacturer. All mounting hardware provided with equipment shall be used when practical. This shall include, but not be limited to, front and rear rack rails, angle brackets and rack mount kits. All equipment shall be installed so as to provide reasonable safety to the operator.

J. Cable, Wire, and Connectors:

K.
   1. All cable and wire shall be new and unspliced. Splicing of cables and conductors is expressly prohibited in any location other than the equipment racks.
   2. Additional cable length shall be provided at all connector locations. Duplex box, junction box, and floor box locations shall be installed with sufficient cable length behind cover plates to permit wiring maintenance and connector replacement in the future.
   3. When cable runs utilize the vertical cable raceways located within walls, the acoustic integrity of the walls shall be maintained. All cables that pass through cover plates of junction boxes and raceways, through slab-to-slab walls, and through conduit lines shall be properly gasketted and sealed and all acoustic material shall be restored or replaced.
   4. Separation between system cables and all other services shall be maximized to prevent and/or minimize the potential for electro-magnetic interference (EMI). Particular care shall be taken to ensure at least a 12" separation from electrical lines whenever feasible. At points where separation is unavoidable, distribution cables shall cross other services at right angles whenever practical to minimize EMI.
   5. Cables shall be installed in a manner that shall ensure no signal cables are placed on top of any lighting fixtures, ceiling speakers, HVAC controls or sensing devices, fire safety and sprinkler system detection technology, or any other technology or mechanical equipment.
   6. No cables shall be laid directly on top of T-bar grid ceiling tiles. Support cables installed outside of conduit at a maximum of four foot intervals from the building structure. Do not utilize support wires from other trades or systems.

7. System cables shall be installed in a manner that will not block access to other equipment or services, across removable service panels and/or in any other manner to prohibit routine maintenance of HVAC system, fire safety equipment and building mechanical control system.
8. All exposed conductors inside of equipment racks shall be dressed with heavy duty neoprene heat-shrink tubing.
9. All inter-rack cabling shall be neatly laced, dressed, strain relieved and adequately supported.
10. After completion of wiring and cable installation, all trough and box covers shall be notched out and grommeted for clearance of the various cable bundles, (i.e., separate audio, video, and control). These panel covers shall be screwed back in place and all gaskets shall be restored or replaced.
11. Do not place any wires and cables for this system in any conduit, raceway, wireway or cable tray that is used for the mechanical systems, electrical systems, or voice/data systems of the building.
12. Provide connectors of the type and quality as detailed in this contract, and/or as required to meet the minimum bandwidth requirements of the equipment to which the connectors are terminated. The overall quantity of connectors shall not be limited by the quantities indicated in the drawings and shall be provided as required.
13. No connectors shall be installed in non-accessible locations or used for splicing cables. All connectors shall be new.
14. All connectors shall incorporate strain relief mechanisms which firmly grip the jacket of connected cables. All connectors shall be properly polarized to prevent improper seating. Connectors shall provide appropriate electrical characteristics for the circuitry to which they are attached.
15. All inner-rack cables shall be grouped according to the signals being carried to reduce signal contamination. Separate groups shall be formed for the following:
    a. Power
    b. Control
    c. Video
    d. Audio cables carrying signals less than -20 dBM.
    e. Audio cables carrying signals between -20 dBM and +20 dBM.
    f. Audio cables carrying signals over +20 dBM.
    g.
16. Route all cable and wiring within equipment racks, cabinets and millwork according to function, separating wires of different signal levels (microphone, line level, amplifier output, AC, control, etc.) by as much distance as possible. Neatly arrange, harness and bundle all cable with nylon U/V rated ties.
17. As a general practice, all power cables, control cables, and high level cables shall be run on the left side of equipment racks as viewed from the rear. All other cables shall be run on the right side of all equipment racks as viewed from the rear.
18. All cables, except video cables which must be cut to an electrical length, shall be cut to the length dictated by the cable run.
19. Terminal blocks, boards, strips or connectors, shall be furnished by the installer for all cables which interface with racks, cabinets, consoles, or equipment modules. Affix terminal blocks, boards, strips or connectors to equipment racks using screws only. Double sided tape will not be accepted.
20. Comply with industry standard circuit polarity and loudspeaker wiring polarity. No cables shall be terminated with a polarity reversal between connectors at either end.

21. All system wire, after being cut and stripped, shall have the wire strands twisted back to their original lay and be terminated by approved soldered or mechanical means. No bare wire ends shall be accepted.
22. Heat-shrink type tubing shall be used to insulate and dress the ends of all wire and cables including a separate tube for the ground or drain wire.
23. All solder connections shall be made with rosin-core solder. Temperature controlled soldering irons rated at least 60 watts shall be used for all soldering work
24. Conventional non-ratcheting type crimping tools are unacceptable, and shall not be used on the job site. The presence of such tools on the job site shall constitute evidence of mechanical connections made with unauthorized tools and shall provide sufficient grounds for rejection of all mechanical connections in the system, and the subsequent re-work of same.
25. All mechanical connections shall be made with approved crimp lugs of the correct size and type for the connection. Wire nuts shall not be permitted except inside speaker enclosures. Each connector shall be attached with the proper size controlled-duty-cycle ratcheting crimp tool which has been approved by the manufacturer of the connectors.
26. Shields for audio cables shall be grounded at the input end only, of the various equipment items on the system to prevent potential for ground loops.
27. Where AV cable is installed in areas that are exposed to the view of end users, install AV cable and associated power cables inside nylon braided sleeving (wire loom). Examples of such areas include, but are not limited to cables installed to monitors, and cables installed to devices in/on lecterns such as touch panels and document cameras. Where security cables are specified for physical security to such devices, install the specified security cables inside the nylon braided sleeving along with the AV cables.

L. Identification and Labeling:

M.

1. All cables, regardless of length, shall be marked with wrap-around number or letter cable markers at both ends. These labels shall be self laminating to ensure durability. The label format used shall be equal, or better than, the system detailed.
2. There shall be no unmarked cables any place in the system.
3. Marking codes used on cables shall correspond to codes provided with submittals, and/or the written documentation of the "as built" drawings.
4. All connectors, controls, equipment components, terminal blocks and equipment racks are to be permanently labeled in a format approved during the submittal process.
5. Clearly and permanently label all jacks, controls, connections, etc... Embossed or printed label tape shall not be used and is considered unacceptable for this system.
6. All labeling shall be completed prior to acceptance of the final system.

N. Repairs: Wherever walls, ceilings, floors, or other building finishes are cut for installation , repair, restore, and refinish to original appearance.

1.3 GROUNDING

A. Provide equipment grounding connections for audio system as indicated. Tighten connections to comply with tightening torques specified in UL Standard 486A to assure permanent and effective grounds.

B. Ground equipment, conductor, and cable shields to eliminate shock hazard and to eliminate ground loops, common mode returns, noise pickup, cross talk, and other impairments. Provide 5-ohm ground at main equipment location. Measure, record, and report ground resistance.

C. Provide one #6 ground conductor with green insulation between all equipment racks and the main electrical panel ground bus. Connect at each end.

1.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Services: Provide services of a factory authorized service representative to supervise the field assembly and connection of components and the pretesting, testing, and adjustment of the system.

B. Pretesting: Upon completing installation of the system, align, adjust, and balance the system and perform complete pretesting. Determine, through pretesting, the conformance of the system to the requirements of the Drawings and Specifications. Correct deficiencies observed in pretesting. Replace malfunctioning or damaged items with new, and retest until materials satisfactory performance and conditions are achieved.

C. Designer/Engineer Final Review:
1. Contractor shall assist Designer/Engineer in reviewing the final system set up.
2. Coordinate final inspection schedule with Designer/Engineer two weeks minimum prior to Consultant's final inspection.
3. Contractor shall have the actual control system programmer on site during the complete duration of the Final Review and Commissioning process. Other competent contractor staff will not comply with this requirement. Only the actual control system programmer will comply with this requirement.
4. Have copy of red-lined as-built documents available at time of inspection.
5. Have loose equipment (cables, etc) available at time of inspection.
6. Provide the following test equipment in good working order:
   a. Digital Volt-Ohmmeter.
7. Correct minor items so Designer/Engineer may certify satisfactory completion during his visit.
8. Pay Design/Engineer's additional fees and expenses if building or system have not been completed properly or sufficiently, requiring Designer/Engineer to make subsequent visits to inspect, or certify completion.

1.5 COMMISSIONING

A. Train Owner's maintenance personnel in the procedures and schedules involved in operating, troubleshooting, servicing, and preventative maintenance of the system. Comply with the requirements identified in section 27 4100, project closeout.

B. Train Owner's non-technical users, and technical support personnel in the procedures and schedules involved in operating, troubleshooting, servicing, and preventative maintenance of the system. Provide a minimum of 4 hours training on two non-consecutive days (8 hours total). Provide training on days when training sessions are not provided to comply with the training

requirements specified in other related sections. Have ready, and refer to, all project documentation including, but not limited to, operating and maintenance instructions and As-built drawings. Allow the Owner to record any or all training sessions using audio and/or video recording equipment at their discretion.

C. Schedule training with Owner through the Architect, with at least 21 days advance notice.

1.6 CLEANING AND PROTECTION

A. Prior to final acceptance, clean system components and protect from damage and deterioration.

END OF SECTION 274115

SECTION 27 5119 - SOUND MASKING SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes electronic noise generators, amplifiers, wiring, loudspeakers, controls, and auxiliary components to generate, amplify, distribute, and reproduce digitally synthesized and stabilized pink background noise to improve speech privacy in zones of coverage.

1.3 DEFINITIONS

A. Test and Calibration Conditions: Spaces completely furnished but unoccupied, lights and HVAC systems on, HVAC system testing and balancing completed, ceiling components in place.

B. Covered Spaces: Spaces above which masking speakers are installed.

C. Pink Noise: Random noise signal with equal energy in each octave.

D. Sound Masking: Covering up of one sound by another.

1.4 SYSTEM DESCRIPTION

A. Zones: Single-zone coverage.

B. Zones: Multiple-zone coverage.

C. Channels: Single channel of masking sound to each zone.

D. Channels: Separate channel of masking sound to each of two groups of speakers in each zone.

E. Channels: Separate channel of masking sound to each of three groups of speakers in each zone.

F. Signal Levels: Individually adjustable for each of 14 one-third octave bands centered at 200 through 4000 Hz, for sound-masking noise channels.

G. Sound-Power Level Produced by System: Match NC 40 contour between 400 and 2000 Hz, with smooth roll-off above and below those frequencies.

1. Initial Level: 40 dB, A-weighted.

2. Final Adjusted Level: 40 to 50 dB, A-weighted. Determine final level for each space individually by measurement as specified in Part 3.
3. Measurements: Made under calibration conditions.

H. Maximum Local Variance of Sound-Power Level: 6 dB for the 500-Hz octave band and 3 dB for the 1000-, 2000-, and 4000-Hz octave bands for 75 percent of the locations in covered spaces.

I. Maximum Average Range of Sound-Power-Level Deviation: 2 dB in the 250-, 2000-, and 4000-Hz octave bands and 1.5 dB for the 500- and 1000-Hz octave bands for all locations.

J. Directional Effect: People in covered spaces under calibration conditions cannot determine source of masking sound.

K. Uniformity with Respect to Time: One-minute time-averaged sound-pressure level of any octave band of masking sound from 250 to 8000 Hz remains constant in any space to within a standard deviation of 2 dB when measured over a 30-minute period.

L. Sound Quality: No audible hum or noise from this system in covered spaces when noise generators are off and power amplifiers are on with input volume controls set at 50 percent.

1.5 SUBMITTALS

A. Product Data: For each component. Include nationally recognized testing laboratory listing data.

B. Shop Drawings: Dimensioned plans and elevations showing minimum clearances and installed features and devices for system components. Show types and locations of masking speakers and their wiring connections, channel assignments, and axis orientations. Show ducts, beams, and other significant sound-reflecting and -absorbing elements in ceiling space and show locations of partitions below ceiling. Include a diagram showing interconnection of major system components for each zone and channel and indicating grounding connections.

1. Wiring Diagrams: Power, signal, and control wiring.

C. Product Certificates: For sound-masking equipment and components, signed by product manufacturer.

D. Qualification Data: For Installer.

E. Record of Final Field Tests and Measurements: Include final tuned tap and control adjustment settings of system.

F. Operation and Maintenance Data: For sound-masking equipment and components to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include data for each type of product, including all features and operating sequences, both automatic and manual.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Firms with at least 5 years of successful installation experience of masking system projects similar to that required for this project. In addition, installers must have successfully completed a minimum of 3 similar installations over a period of 2 years prior

to the date of the bid opening for this project. System installations must have included similar control system hardware and software.

B. Manufacturer Qualifications: A prime system manufacturer who maintains or sponsors a service center capable of providing training, parts, and emergency maintenance and repairs at Project site with a 24 -hour maximum response time.

C. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct testing of sound-masking systems according to ASTM E 548. Required experience includes having tested a minimum of five different systems within the last five years, each system similar in size and complexity to Project system.

D. Source Limitations: Obtain equipment components from a single source who assumes responsibility for compatibility of items used.

E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

F. Comply with NFPA 70.

G. Comply with UL 813, unless a more stringent standard is specified in Part 2.

1.7 COORDINATION

A. Coordinate quantity and arrangement of speaker assemblies with ceiling space configuration and with components occupying ceiling space, including structural members, pipes, air-distribution components, raceways, cable trays, recessed lighting fixtures, and other items.

1.8 EXTRA MATERIALS

A. Furnish extra products described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Sound-Masking Speaker Assemblies: One Insert number for each 10 of each type used, but no fewer than one.
2. Fuses: One for each type used, but no fewer than one.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Atlas Sound LP.

2.2 PRODUCTS AND EQUIPMENT

A. Components: Modular plug-in, heavy-duty, industrial-grade integrated circuit devices.

B. AC Supply Voltage Tolerance: 105 to 130 V with no degradation of system performance.

C. Protection from Power Line Surges: Integral surge suppressors listed under UL 1449; complying with IEEE C62.41, Category B; and with the following features:

1. Suppression Level: 300 V.
2. Maximum Response Time: 5 nanoseconds.
3. Circuit: Multistage, using inductors and silicon-avalanche zener diodes or equivalent.
4. Indicator Lamp: Neon or light-emitting diode located on control panel and arranged to extinguish on failure of protection.
5. Fuses: Externally accessible.

D. Component Housings: Suitable for mounting in standard 19-inch (480-mm) relay racks, with connections at rear and controls either on rear panel or protected by a screw-fastened security cover.

2.3 NOISE GENERATOR AND FILTER UNITS

A. Pink Noise Generator: Output octave bands from 30 to 4000 Hz.

B. Filters for One-Third Octave Bands: Adjustable from 10 dB of boost to 10 dB of cut at each center frequency.

C. High-Pass Filter: Approximate range of cutoff adjustment is 37 to 400 Hz.

D. Low-Pass Filter: Approximate range of cutoff adjustment is 3.4 to 20 kHz.

E. High-Cut Filter: Approximate range of cutoff adjustment is 180 to 9000 Hz with slope varying to 12 dB per octave.

2.4 PROGRAMMABLE AUDIO-LEVEL CONTROL UNIT

A. Automatic Sound-Power-Level Changes: Six system channel changes, four times per day, and capable of different time settings for each day of week.

B. Level Changes: Programmable from front panel of unit, and automatically incremented over a period long enough for sound-level variations to be imperceptible to occupants of covered spaces.

C. Program Memory: Nonvolatile for one year, minimum, without power. When re-energized after a power outage, control starts at zero level and automatically advances system sound level at same rate used for programmed level changes.

2.5 POWER AMPLIFIERS

A. Power Amplifiers: Comply with EIA SE-101-A, and have the following minimum features:

1. Mounting: Rack mounted.

2. Output Regulation: Less than 2 dB from zero to full load.
3. Total Harmonic Distortion: Less than 3 percent, at rated power output from 50 to 12,000 Hz.
4. Signal-to-Noise Ratio: 60 dB or greater, at rated output.
5. Frequency Response: Within plus or minus 2 dB from 50 to 12,000 Hz.

2.6 MASKING SPEAKER ASSEMBLIES

A. Speakers: Comply with EIA SE-103; cone type, with the following minimum features:

1. Minimum Axial Sensitivity: 45 dB.
2. Frequency Response: Within plus or minus 3 dB from 50 to 15,000 Hz.
3. Size: 8 inches (200 mm) with 1-inch (25-mm) voice coil and minimum 5-oz. (142-g) ceramic magnet, unless otherwise indicated.
4. Dispersion Angle: 100 degrees.
5. Rated Output Level: 10 W.

B. Configuration: Dual 8-inch (200-mm) and dual 5-inch (125-mm) units mounted on metal baffles and arranged for optimum, multidirectional, angular sound distribution. Arrange units for suspension from the building structure above the ceiling.

C. Matching Transformers: Comply with EIA-160, full-power rated with 4 standard taps, and a maximum insertion loss of 0.5 dB.

D. Assemblies installed in air-handling spaces shall comply with NFPA 70 requirements for rate of heat-release and rate of smoke-release characteristics. Tests for these requirements shall be according to UL 2043.

2.7 WIRE

A. Speaker Wire: Untinned, twisted-pair, solid-copper wire with PVC jacket; listed and labeled for environmental air plenums where cable is indicated in plenum spaces and is not indicated to be in raceway.

2.8 COMPONENT MOUNTING RACKS

A. Configuration: Comply with EIA-310-D. Factory-fabricated units designed for interchangeable mounting, forced or convection air cooling, wiring connection, and enclosure of standard 19-inch (482-mm) relay rack modules.

B. Mounting Provisions: Equipped for freestanding floor mounting.

C. Cabinet: Factory-finished steel with component mounting rails and prewired plug strips for component power connections. Full front and rear doors with continuous hinges, handles, and cylindrical keyed locks.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Speaker Assemblies: Suspend with chains from building structure above ceilings so bottom of assembly is 6 to 8 inches (150 to 200 mm) above upper plane of finished ceiling material. Use eyebolts on speaker assemblies for attachment. Suspend independently of supports for components of other building systems.

B. Speaker Connections: For two- or three-channel systems, connect speaker assemblies alternatively so masking sound is redundant throughout zones of coverage.

C. Wiring Method: Install wiring in raceways, unless otherwise indicated. Conceal raceways, except in unfinished indoor spaces.

D. Wiring Method: Install wiring in raceways, except in accessible indoor ceiling spaces and attics and in hollow gypsum board partitions, and unless otherwise indicated. Conceal raceways and wiring, except in unfinished spaces.

E. Wiring Method: Cable. Conceal cable in accessible ceilings, walls, and floors where possible.

F. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points with no excess. Provide and use lacing bars and distribution spools.

G. Pulling Cable: Do not exceed manufacturer's recommended pulling tensions. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between normal termination points. Remove and discard cable where damaged during installation and replace it with new cable.

H. Exposed Cable: Install parallel to building lines, follow surface contours, and support as recommended by manufacturer.

I. Grounding: As recommended by manufacturers, unless more stringent requirements are indicated. Ground equipment and conductors to eliminate shock hazard and to minimize ground loops, common-mode returns, noise pickup, cross talk, and other impairments. Install 5-ohm ground at main equipment location. Measure, record, and report ground resistance.

J. Impedance Matching: For system components, including connecting cable, provide end-to-end level and impedance-matched signal paths. Use matching networks and balancing devices at connections where necessary to avoid mismatches.

K. Splices, Taps, and Terminations: Make splices, taps, and terminations on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.

3.2 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals according to Division 26 Section "Identification for Electrical Systems." Use color-coded conductors and apply wire and cable marking tape to designate wires and cables so media are identified in coordination with system wiring diagrams.

B. Label speaker assemblies as to channel and zone.

3.3 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Testing Agency: Engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

C. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections, and to assist in field testing. Report results in writing. Include the following:

1. Operational Test: Start system to confirm proper operation. Remove malfunctioning units, replace with new units, and retest. Make initial sound-spectrum and -level adjustments for each zone.
2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
3. Inspection: Verify that units and controls are properly labeled and interconnecting wires and terminals are identified.
4. Pretesting: Tune, align, and adjust system and pretest components, wiring, and functions to verify they comply with specified material, installation, and performance requirements. Correct deficiencies and retest until satisfactory performance and conditions are achieved.
5. Masking Sound-Power-Level Adjustments: Adjust independently for each space to minimum level between 40 and 50 dB that will provide speech privacy between adjacent workstations while complying with other system requirements.

D. Final Acceptance Testing: Provide a minimum of 10 days' notice of acceptance test performance schedule. Schedule tests after pretesting has been successfully completed.

1. Test Conditions: As defined in "Test and Calibration Conditions" Paragraph in Part 1 of this Section. Perform tests as specified below, as required by ASTM E 1041, and as required to verify performance specified in Part 2 "System Description" Article.
2. Instrumentation: Use a professional-quality, sound-level meter with octave-band filters and documentation of recent calibration against recognized standards.
3. Record test observations, readings, and corrective actions.
4. System Tests: Include the following for each system zone:

a. Speaker Circuit Impedance Test: Measure impedance at 1 kHz with amplifier disconnected, using a professional impedance meter or bridge. Locate and correct faults denoted by abnormal readings.
b. Ambient Sound-Level Tests: With system off, measure ambient sound level in one-third octave bands. Also measure ambient sound level as a single, wide-band, A-weighted reading.
c. Amplifier Noise Test: Check for performance specified in "System Description" Article with masking noise generator off and amplifiers on.
d. System Noise Test: With masking noise signal on and amplifiers adjusted at a working level 10 dB above ambient sound level, check for hum, buzz, rattle, or other operating deficiencies.
e. Spatial Uniformity Test: Measure sound level at locations no greater than 15 feet (4.6 m) o.c. throughout covered spaces to determine compliance with specified performance level.
f. Frequency Response Adjustment and Test: Adjust one-third octave frequency bands and other unit filters to provide response. Coordinate with NC 40 contour

defined below between 200 and 2000 Hz, with smooth natural roll-off from those frequencies.

BAND	RELATIVE SOUND-POWER LEVEL - dB	ENCLOSED OFFICES
200	Plus 4	Minus 2
250	Plus 3	Minus 2
315	Plus 2	Minus 2.5
400	Plus 1	Minus 3
500	0	Minus 4
630	Minus 1	Minus 5
800	Minus 2	Minus 6
1000	Minus 3	Minus 7
1250	Minus 4	Minus 8.5
1600	Minus 5	Minus 10
2000	Minus 6	Minus 12

5. Adjust level of masking sound for each space so one-third octave band centered at 500 Hz has final selected sound-power level for that space. Measure deviation from listed values in one-third octave bands from 400 to 2000 Hz. Measured values must not deviate from those listed by more than 4 dB for open plan areas and 8 dB for enclosed offices. The total of individual band deviations in eight bands must not exceed 16 dB for open plan areas and 30 dB for enclosed offices.
6. Walk-through Test: People in covered spaces cannot discern speaker locations.
7. Temporal Stability Test: Check for uniformity of time by measuring sound level in each of 14 octave bands at one-minute intervals over a 30-minute test period. Deviations must not exceed limits specified in Part 2 "System Description" Article.

E. Retest: Correct deficiencies identified by tests and observations and retest until meeting specified requirements.

F. Recording Control Settings and System Adjustments: Record final control settings and programming, and final tap setting of speaker matching transformers. Record final sound-level measurements and observations.

3.4 ADJUSTING

A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain services. Refer to Division 01 Section "Demonstration and Training."

END OF SECTION 27 5119

SECTION 275319 - INTERNAL CELLULAR, PAGING AND ANTENNA SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
B. Requirements of the following Division 26 Sections apply to this Section:
   1. Basic Electrical Requirements.
   2. Basic Electrical Materials and Methods.

1.2 SUMMARY

A. This Section includes the installation of a complete distributed antenna system (DAS).
B. This section requires that rough-in materials for this section be provided by the Division 26 installer for installation under Division 26. Rough-in materials include but are not limited to conduit, junction boxes, and device enclosures. Cable for this section is to be provided by the DAS (Distributed Antenna System) installer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Approved Vendor & Installer
   1. Hunt Electric
   2. Anchorcom LLC
   3. Cache Valley Electric

2.2 SYSTEM REQUIREMENTS

A. General: Provide complete and fully functional DAS system using materials and equipment of types, sizes, ratings, and performances as indicated. Use materials and equipment that comply with referenced standards and manufacturers' standard design and construction in accordance with published product information. Coordinate the features of materials and equipment so they form an integrated system with components and interconnections matched for optimum performance of specified functions.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install system in accordance with NFPA 70 and other applicable codes. Install equipment in accordance with manufacturer's written instructions, and UL, ETL, CSA and other applicable listings.
B. Install equipment located in TDRs in the assigned rack.
C. The location of wall mounted equipment will be coordinated with the Data Center Operations.
D. Specific power requirements will be provided at the beginning of the project.

3.2 FIELD QUALITY CONTROL

A. Pre-testing: Upon completing installation of the system, align, adjust, and balance the system and perform a complete pretest. Determine the conformance of the system to the requirements of the Drawings and Specifications. Correct deficiencies observed. Replace malfunctioning or damaged items with new, and retest until materials satisfactory performance and conditions are achieved.
B. Provide a heat map of the facility before and after installation is required.

3.3 COMMISSIONING

A. Occupancy Adjustments: When requested by the Architect or the Electrical Consultant within one year of date of substantial completion, provide on-site assistance in adjusting levels to suit actual occupied conditions. Provide two trips for this purpose.

3.4 CLEANING AND PROTECTION

A. Prior to final acceptance, clean system components and protect from damage and deterioration.

END OF SECTION

SECTION 276001 - APPENDIX 01 – DEVIATION REQUEST PROCESS

PART 1 - GENERAL

1.1 DEFINITIONS

A. Cable Plant Deviation
   1. A business need to not fully comply with the requirements of the “Division 27 – Communications and Structured Cabling Specification document”

B. Cable Plant Deviation Request form.
   1. The document is available from the Facilities Planning team, the Data Center Ops team, or the Infrastructure Cabling team.
   2. Usage:
      a. The deviation request form shall be used if there is a business need to not comply with the requirements of the “Division 27 – Communications and Structured Cabling Specification document”
      b. The deviation request form should also be used to propose a change to that document. Always verify that you are using the current version of the Standard before requesting a modification.

PART 2 - PROCESS

2.1 STANDARDS MODIFICATION

A. Check the box and explain why the standard should be modified.

2.2 ALTERNATE PRODUCT

A. The deviation form must be completed, submitted through channels, and approved prior to any deviation from the specifications. This includes issuing change orders.

2.3 AUTHORIZED SIGNATURES

A. Both the Standards Holder and the DCO Manager signatures are required for a deviation to be valid.

2.4 DEVIATION REVIEW PROCESS STEPS

A. First be sure that there is an actual need. Then be certain that your manager, supervisor, or project manager agrees with the requested deviation. Be sure to state this or obtain their signature on the deviation form. By doing so you are confirming that your supervisor or project manager has approved.

B. The requestor will then complete sections 1, 2, and 3 of the deviation form.
   1. The requestor should then digitally sign in the designated location at the end of Section 3. Do not write in the sections below 3.

C. Forward the saved copy of this form to the Standards Holder via email.
   1. Email to: melissa.lopez2@imail.org

D. The Standards Holder will then review and evaluate the request. The requestor should be prepared to provide plans, specifications, and competitive bids if requested. Any email threads or meeting discussions regarding the issue will be taken into consideration.

E. The Standards Holder will then cast an Approve or Deny vote and forward the request to the DCO Manager for a decision.

F. When the decision has been made by the Operations Manager, the Standards Holder will then notify the requestor by returning the completed and signed form via email.

G. An approved deviation will have the final disposition button ‘Approved’ and be signed by

at least 2 people. One will be from the Standards Holder, and the other the DCO Manager. Other signatures may be required for specific features and areas such as Safety, Security, Print, Medical group, etc.

PART 3 - EXECUTION

3.1 POST DECISION EXECUTION

A. DENIED
   1. If the requester is not satisfied with the decision, they may file an appeal with the Data Center Operations manager (shawn.folkman@imail.org), who will then escalate the issue to the appropriate business leaders as needed. The decision from the appeal is final.

B. APPROVED
   1. If a deviation is approved for contracted material, labor, or method; the facilities project manager will arrange for fulfillment or contract adjustment as needed via appropriate contract channels such as change orders.

END OF SECTION

SECTION 276002 - APPENDIX 02 – DOCUMENT REFRESH PROCESS

PART 1 - GENERAL

1.1 NOT USED

PART 2 - PRODUCTS

2.1 APPROVED PRODUCT

A. The purpose of this section is to help ensure a current standards document.
B. The product delivered will be a current revision or version of the Cable Plant Standards Document.
C. All changes must be approved by Enterprise Infrastructure Cabling team.

PART 3 - EXECUTION

3.1 REVIEWS AND UPDATES

A. Minor updates
    1. Changes that do not significantly affect scope of work, or contract pricing will be made, and the Rev number will be updated. (i.e. updated part numbers, etc.)
    2. Significant changes will be added to the Change Log for review and approval from the DCO/Infrastructure Cabling Team.
        a. When approved, they will be submitted for approval; and then implemented in the new Version.
B. Major updates
    1. The DCO/Infrastructure Cabling Team will review the entire document at least once every three years.
    2. This review will coincide with the release of new versions of NFPA70 (National Electrical Code) (2017, 2020, etc. - to be completed by the end of each designated year).
    3. The review will cover standards adjustments that may be deemed necessary and ensure compliance with applicable codes and standards.
    4. Upon completion of the reviews and updates, the standards document will be submitted for approval.

END OF SECTION

SECTION 276003 - APPENDIX 03 – DATA CENTER, TEC, TDR PART NUMBERS

ITEM	MANUFACTURER	PART NO.	DESCRIPTION
Blanking Panel	Upsite Hotlok	10031	Blanking Panel 1U
Blanking Panel	Upsite Hotlok	10033	Blanking Panel 2U
UPS	Eaton	9PX1500R	Eaton Powerware 9PX-1500V
UPS Network Card	Eaton	NETWORK-M	Card for 9PX-1500VA
PDU	Eaton	ePBZ79	Horizontal Mount ePDU 208vac
PDU	Eaton	ePBZ82	Horizontal Mount ePDU 120vac
PDU	Server Technology	C1S24VS-YCFA13C9	Vertical 30A PDU (Blue) for TEC
PDU	Server Technology	C1L24VS-YCFA13C9	Vertical 30A PDU (Red) for TEC
PDU	Server Technology	C2SG36TE-YCMFAM66/C	Vertical 30A PDU (Blue) for Data Centers
PDU	Server Technology	C2LG36TE-YCMFAM66/C	Vertical 30A PDU (Red) for Data Centers
PDU	Server Technology	C2SG36TE-DQME2M66/ZB	Vertical 60A PDU (Blue) for Data Centers
PDU	Server Technology	C2LG36TE-DQME2M66/ZR	Vertical 60A PDU (Red) for Data Centers
UPS	Eaton	K41512000000000	Eaton 9155-15kVA UPS
Modbus Card	Eaton	103005425-5591	Eaton Modbus Card X-Slot
Reverse Transfer UPS System	Eaton	9GPV15C0009E00R2	Eaton 93PM-150kW Reverse Transfer UPS System
CRAC Cooling Unit	Liebert	DE363G	
Vertical Wall Mount Cabinets	Legrand	VWMSD-4RU-42-B	42” 12” 4RU Fixed
Vertical Wall Mount Cabinets	Legrand	VWMSD-8RU-42-B	42” 18” 8RU Fixed
Rail Accessories	Legrand	VWM-RR-4RU	Fixed Mounting Rail Kit, 4RU
Rail Accessories	Legrand	VWM-RR-8RU	Fixed Mounting Rail Kit, 8RU
Rail Accessories	Legrand	VWM-PIV-4RU	Pivoting Mounting Rail Kit, 4RU
Fan Kit	Legrand	VWMFK-115	VWM Fan Kit w/115 VAC Fans (includes 2 fans and mounting hardware) (2 kits needed for 8RU cabinet)
VWM Top Brush Grommet Kit	Legrand	VWMBGK	VWM Top Brush Grommet Kit
Circular Knockout Grommet Kit	Legrand	VWMGR-30	Circular Knockout Grommet Kit
Vertical Wall-Mount Cabinets	Hubbell	IR221APG	Refrigerated cabinet 24”
Vertical Wall-Mount Cabinets	Hubbell	IR321APG	Refrigerated cabinet 36”
Vertical Wall-Mount Cabinets	Hubbell	IR421APG	Refrigerated cabinet 48”
Air Conditioners	Hubbell	IRAC1	Air conditioner for Hubbell refrigerated cabinets
Cylinder	Medeco	100500 G	1 ¼” Mortise Cylinder
Cylinder	Medeco	100400H G	Rim Cylinder, Horizontal Tailpiece
Cylinder	Medeco	EA-100108	Small Format Interchangeable Core (SFIC) Cylinder
Cylinder	Medeco	20200S1 G	Cylinder Package for Schlage
Cam Lock	Medeco	EN-150002-219	7/8” Cam Lock Assembly, Key Retaining
Cam Lock	Medeco	EN-150003-219	1 1/8” Cam Lock Assembly, Key Retaining

Cylinder for Legrand cabinet front door	Medeco	232301S 800 G	Modular Profile Cylinder – 30mm Half Profile - Assembled
Electronic Key	Medeco	94-0271	Medeco Slim Line Key (G2) & Charger Bundle
Programming Station for Small Locations	Medeco	EA-100109	Medeco XT Desktop USB Programming Station (not preferred)
Programming Station for Large Locations	Medeco	EA-100158	Medeco XT Wall USB Programming Station (preferred)
Wall Mount for Wall Programmer	Medeco	94-0294	Medeco XT Remote Wall Programmer Wall Mount Kit
Padlock for use with Electronic Cylinder	Master	6842D045KZ	Padlock
Red C20 C19 Dual Lock 12 gauge 6'	Stay Online	5914	Red C20 C19 Dual Lock 12 gauge 6'
Blue C20 C19 Dual Lock 12 gauge 6'	Stay Online	6766	Blue C20 C19 Dual Lock 12 gauge 6'
Red C14 Locking C15 Notched 14 gauge 6'	Stay Online	9144	Red C14 Locking C15 Notched 14 gauge 6'
Blue C14 Locking C15 Notched 14 gauge 6'	Stay Online	9138	Blue C14 Locking C15 Notched 14 gauge 6'
Red C14 C13 Dual Lock 18 gauge 6'	Stay Online	5656	Red C14 C13 Dual Lock 18 gauge 6'
Blue C14 C13 Dual Lock 18 gauge 6'	Stay Online	6694	Blue C14 C13 Dual Lock 18 gauge 6'

SECTION 276004 - APPENDIX 04 – REFERENCE STANDARDS

PART 1 - GENERAL

1.1 REFERENCE STANDARDS

A. Codes and Standards (Most recent editions with addenda/TSB, etc.) All materials, installation and workmanship shall meet or exceed the applicable requirements and standards addressed within the references listed below:

1. ANSI/TIA-568.0-D and addenda “Generic Telecommunications Cabling for Customer Premises
2. ANSI/TIA-568.1-D and addenda “Commercial Building Telecommunications Cabling Standard
3. ANSI/TIA-568.2-D and addenda “Balanced Twisted-Pair Telecommunications Cabling and Components
4. ANSI/TIA-568.3-D and addenda “Optical Fiber Cabling Components Standard”
5. ANSI/TIA-568.4-D and addenda “Broadband Coaxial Cabling and Components Standard”
6. ANSI/TIA-569-D and addenda “Telecommunications Pathways and Spaces”
7. ANSI/TIA-606-C and addenda “Administration Standard for Commercial Telecommunications Infrastructure”
8. ANSI/TIA-607-D and addenda “Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises”
9. ANSI/TIA-758-B “Customer-Owned Outside Plant Telecommunication Infrastructure Standard”
10. IEEE 802.3at PoE Plus and Next Gen PoE CFI March 2013 and IEEE P802.3ba latest draft revision and amendments.
11. “Media Access Control Parameters, Physical Layers and Management Parameters for 40 Gbp/s and 100 Gbp/s Operation”.
12. ANSI/TIA-526-7-A “Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant”
13. ANSI/TIA/EIA-526-14-C “Optical Power Loss Measurements of Installed Multimode Fiber Cable Plant”
14. ANSI/TIA-942-B “Telecommunications Infrastructure Standard for Data Centers”
15. ANSI/TIA – 1179-A “Healthcare Facility Telecommunications Infrastructure Standard”
16. IEC/TR3 61000-5-2 - Ed. 1.0 and amendments “Electromagnetic compatibility (EMC) - Part 5: Installation and mitigation guidelines - Section 2: Earthing and cabling”
17. ISO/IEC 11801-1 (2017) and amendments “Information technology - Generic cabling for customer premises – PART 1: General Requirements”
18. EN 50173-1 and amendments “Information Technology - Generic cabling systems – PART 1 General Requirements”
19. AIA Guidelines for Design and Construction of Hospital and Healthcare Facilities
20. Construction Specification Institute Master Format
21. BICSI: Comply with the most current editions of the following BICSI manuals:
    a. BICSI - Telecommunications Distribution Methods Manual
    b. BICSI – Installation Transport Systems Information Manual
    c. BICSI – Network Design Reference Design Manual
    d. BICSI – Outside Plant Design Reference Manual
    e. BICSI – Wireless Design Reference Manual
    f. BICSI -Electronic Safety and Security Design Reference Manual
    g. Infocomm/BICSI – AV Design Reference Manual
22. Underwriters Laboratories (UL) Cable Certification and Follow-Up Program.
23. National Electrical Manufacturers Association (NEMA)

24. American Society for Testing Materials (ASTM)
25. National Electrical Code (NEC) NFPA70 2020
26. National Electrical Safety Code (NESC) 2017
27. Institute of Electrical and Electronic Engineers (IEEE)
28. UL Testing Bulletin
29. Building Industry Consulting Services International (BICSI) Information Transport Systems Methods Manual (ITSMM)
30. Local, county, state and federal regulations and codes in effect as of date of installation.
31. Equipment of foreign manufacture must meet U.S. codes and standards. It shall be indicated in the proposal the components that may be of foreign manufacture, if any, and the country of origin.

END OF SECTION

SECTION 276005 - APPENDIX 05 – DEFINITIONS AND ABBREVIATIONS

PART 1 - GENERAL

1.1 RELATED TERMS

A. Codes and Standards (Most recent editions with addenda/TSB, etc.) All materials, installation and workmanship shall meet or exceed the applicable requirements and standards addressed within the references listed below:

1. Basket Cable Tray: A fabricated structure consisting of wire mesh bottom and side rails.
2. BICSI: Building Industry Consulting Service International.
3. CBC: Coupled Bonding Conductor
4. CFCI: Customer Furnished Customer Installed
5. Cable Run - A single cable to a single location
6. Cable Drop - Two cables to a single location
7. Cable Tri Drop - Three cables to a single location
8. CT Coupler A type of wall connector made by the Siemon Company
9. DCO: Data Center Operations
10. Div.1: Division 1 General and Performance Requirements
11. Div. 23: Division 23 Heating, Ventilating, and Air Conditioning
12. Div. 22: Division 22 Plumbing
13. Div. 26: Division 26 Electrical
14. Div. 27: Division 27 Communications and Audio Visual
15. Div. 28: Division 28 Electronic Safety and Security
16. E.E.: Electrical Engineer
17. EMI: Electromagnetic Interference
18. F/UTP: Foil over Unshielded Twisted Pair. Individual pairs are unshielded.
19. GC: General Contractor
20. GE: Ground Equalizer
21. Horizontal Cabling: The cable and connecting hardware utilized to transport communications signals
22. ICT: Infrastructure Cabling Team
23. LAN: Local Area Network
24. N/A: Not Applicable
25. NIC: Not in Contract
26. OFCI: Owner Furnished Contractor Installed
27. OFOI: Owner Furnished Owner Installed
28. OTDR: Optical Time Domain Reflectometer
29. Outlet/Connectors: A connecting device in the work area on which horizontal cable or outlet cable terminates.
30. RCDD: Registered Communications Distribution Designer
31. RFI: Radio Frequency Interference
32. TBA or TBD: To Be Determined
33. TDR: Technology Distribution Room
34. TEC: Technology Equipment Center
35. TGB: Telecommunications Ground Bus Bar
36. TMBC: Telecommunications Main Bonding Conductor
37. TMGB: Telecommunications Main Grounding Bus Bar
38. TSER: Telecommunications Service Entrance Room
39. UTP: Unshielded Twisted Pair
40. Work Area: approx. 100 sq. ft. equipped for workstation equipment
41. DCO = Data Center Operations – Boe.Sausedo@imail.org
42. ICT = Information and Communications Technology – Melissa.Lopez2@imail.org

END OF SECTION

SECTION 276006 - APPENDIX 06 – MATERIAL SUPPLIERS

PART 1 - GENERAL

1.1 RELATED TERMS

A. Siemon Authorized Suppliers are listed below. To help prevent counterfeiting and support warranties, known, factory authorized distributers are recommended.
   1. Approved Suppliers of Siemon cable, patch panels, jacks, and parts:

Anixter

Randi Whittaker
Inside Sales — Main Phone: (801) 973-2121
3775 W. California Ave. Ste 400 — Fax: (801) 973-4472
Salt Lake City, UT 84104 US — Email: randi.whittaker@anixter.com

Karl Bartlam
End User/Outside Sales — Main Phone: (801) 973-2121
3775 W. California Ave. Ste 400 — Fax: (801) 973-4472
Salt Lake City, UT 84104 US — Email: karl.bartlam@anixter.com

Graybar Electric

Elizabeth Vaughn
Inside Sales — Main Phone: (801) 656-3016
2841 South 900 West — Fax: (801) 973-4314
Salt Lake City, UT 84119 US — Email: Elizabeth.Vaughn@graybar.com

Erika Morrison
Contractor Outside Sales — Main Phone: (801) 656-3014
2841 South 900 West — Fax: (801) 973-4314
Salt Lake City, UT 84119 US — Email: Erika.Morrison@graybar.com

WESCO / CSC

Brian Walters
Inside Sales — Main Phone: (801) 975-0600
3210 South 900 West — Fax: (801) 907-4450
Salt Lake City, UT 84119 US — Email: Bwalters@gocsc.com

Adam Tueller
Contractor Outside Sales — Main Phone: (801) 975-0600
3210 South 900 West — Direct: (801) 618-6665
Salt Lake City, UT 84119 US — Email: Atueller@wesco.com

B. The Siemon Company is represented locally by: Marc.Lovestrand@Siemon.com

END OF SECTION

SECTION 276007 - APPENDIX 07 – SIEMON CERTIFIED INSTALLATION FIRMS

PART 1 - GENERAL

1.1 RELATED TERMS

A. NOTE: Cable installers have rigorous requirements to be certified for Siemon cables and products. Validation of certification is required prior to accepting a bid.

B. The firms selected to bid must be pre-approved by the local facility IT manager. Installation firms desiring to do work for Intermountain Healthcare must be selected from the official CI list below.

C. Current Siemon Approved/Certified Cable Installers for Siemon Network Cable. This list is up to date as of 2018-12-01.

1. **Orion Integration Group**: 8880 W. Barnes Street, Boise, ID 83709 / Phone 208 321 8000
2. **ACS Systems**: 925 North Main St. Meridian, ID 83642 / Phone 208 331 8554
3. **IES Commercial**: 1960 S. Milestone, Suite D, Salt Lake City, UT 84104
   a. Jason King – Branch Manager // Phone 801 975 8182 / Fax 385 242 7366 / Mobile 801 381 1508 // Jason.King@iescomm.com / www.iescomm.com
   b. Boyd Evans – Project Manager // Phone 801 975 8191 / Fax 385 242 7366 Mobile 801 381 1518 // Boyd.Evans@iescomm.com / www.iescomm.com
4. **Cache Valley Electric**: 1338 S. Gustin Rd., Salt Lake City, UT 84104
   a. Travis Grant – Acct. Manager // Phone 801 908 4170 / Fax 801 908 7401 Mobile 801 870 7226 // Travis.Grant@cve.com / www.cve.com
   b. Brad Readicker – Acct. Manager // Phone 801 908 2686 / Fax 801 908 7401 // Brad.Readicker@cve.com / www.cve.com
5. **Data Tech Professionals**: 1199 S 520 W, Payson, UT 84651
   a. Jesse Pierce – President // Phone 801 960 2202 / Mobile 801 420 0463 Jesse@datatechprofessionals.com / www.datatechprofessionals.com
6. **Hunt Electric, Inc**.: 1863 W. Alexander St., Salt Lake City, UT 84119
   a. Darrin Guevara – Division Manager // Phone 801 975 8844 Darrin@huntelectric.com / www.huntelectric.com
7. **NCNS Communications:** 419 West Universal Circle, Sandy, UT 84070
   a. Jayson Nosack – Owner // Phone 801 361 4572 Jnosack@ncns-co.com / www.ncns-co.com
8. **Data Plus**: 769 Middlegate Road, Henderson, NV 89118
   a. Chris Tettamanti – Project Manager // Phone 702 795 3282 Chris@dpcnv.com
9. **Bombard Electric**: 4380 West post Road, Las Vegas, NV 89118
   a. Bob Reese – Project/Division Manager // Phone 702 263 3570 Bob.reese@bombardelec.com / www.bombardelectric.com
10. **Rosendin Electric**: 7470 Dean Martin Dr. #112, Las Vegas, NV 89139
    a. Cora Shadbolt – Assistant Project Mgr. // Phone 702 258 1443 cshadbolt@rosendin.com
    b. Adrian Youngblood – Sr. Estimator // Phone 702 258 1455 ayoungblood@rosendin.com
    c. Breck Hardesty – Sr. Project Mgr. // Phone 702 258 1428 bhardesty@rosendin.com / www.rosendin.com
11. **Mojave Electric**: 3755 W. Hacienda Ave., Las Vegas, NV 89118 Phone 702 798 2970
12. **The Morse Group**: 3874 Silvestri Lane, Las Vegas, NV 89120 Phone 702 257 4400

END OF SECTION

SECTION 276008 - APPENDIX 08 – LEAD WALL PENETRATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Sections 13090 & 134900

1.2 RELATED TERMS

Procedure Name: New Port and Electrical Box Installation Lead Lined Walls

Document Detail Information: (This section must be completed in full.)

Implements Policy:	Click here to enter policy title		
Content Owner	Craig Allen, Safety Security Environment Health Director, Central Office Jeremy Hawk Medical Physicist Radiation Safety Coordinator	**Content Consultant(s):**	Jeremy Hawk, Radiation Safety Officer, Medical Physicist Imaging John Ellis, Facilities Management Director, Central Office Steve Kelly, System Project Facility Design Manager, Planning Melissa Lopez, Cabling, IS
Date of Final Draft:	12/29/2015	**Who Reviewed Content?**	<Name, Title, Dept> <Name, Title, Dept> <Name, Title, Dept> <Committee Name>
Keywords (must have at least 3):	Searchable Keywords (e.g., PHI, EMTALA, Coding)		

1.3 PURPOSE

A. Maintain radiation safety controls in lead lined walls during installation of new power and data outlets in existing lead lined walls.

1.4 SCOPE

A. Intermountain Hospitals, Intermountain Clinics Medical Group

1.5 DEFINITIONS

A. Lead lined Walls – Structured element designed to provide a barrier to block radiation penetration beyond the designated space.
B. Maintenance Manager – The person responsible for plant maintenance operations or his/her delegate.
C. Radiation Safety Coordinator – The person responsible for Radiation Safety or his/her

Delegate. Medical Physicist.

D. Worker – The person responsible for completing work with the lead lined wall. This includes Intermountain Employees as well as any outside supplier or contractor.

1.6 PROVISIONS

A. The Radiation Safety Program is following Utah regulation R313-15-101, R313-28 and U.S. Nuclear Regulatory Commission Regulation 1- CFR Part 20-1101.

1.7 PROCEDURE

A. Prior to any work within a lead lined wall, the Worker reports to the Radiation Safety Coordinator, Maintenance Manager and completed a review of planned work “ACWP” Identification of specific description related to the lead lined wall planned work.
   1. Intermountain workers, outside suppliers or contractors hired to work in any Intermountain facility must contact the Maintenance Manager and Radiation Safety Coordinator prior to beginning work to discuss the project and ensure that the planned work will not interfere with facility operations, maintenance, or other projects.
   2. Failure to scheduled and complete the planning meeting described above may results in the delay or rescheduling of work. Outside suppliers or contractors are responsible for any costs incurred because of their failure to schedule and complete this meeting.

B. The Radiation Safety Coordinator, Maintenance Manager and the worker conduct a pre-work inspection of the areas in which work is to be performed. This inspection identified the following:
   1. Areas of special concern or sensitivity, including those noted or described on the facility Life Safety records and drawings, and Radiation Safety records and drawings.
   2. Appropriate areas or structures to use for support of any work, as applicable.
   3. Existing deficiencies in Barriers.
   4. The as act assemblies impacted by the work.
   5. The type of shielding material acceptable in the area.
      a. Lead lined boxes
      b. Lead lined wall “inside wall” installation, and OR
      c. Lead shielding for wall installation of “outside wall” maintaining radiation safety barriers.
   6. The exact condition of the areas upon completion of work.

C. Upon completion of the work and before closing the wall, the worker, Radiation Safety Coordinator and Maintenance Manager conduct a post-work inspection of the area in which the work was performed, this inspection verifies the following:
   1. No Tools, Supplies or debris are left within the walls.
   2. Lead lining is installed to maintain radiation safety protection according to regulatory requirements.
   3. All work affecting Radiation Safety Lead Barriers has been properly sealed.
   4. The overall condition of the area meets the expectation outline in the per-work inspection.

E. The Maintenance Manager and Radiation Safety Coordinator signs and logs the completed “ACWP”

1.8 EXCEPTIONS

A. None.

1.9 PRIMARY SOURCES

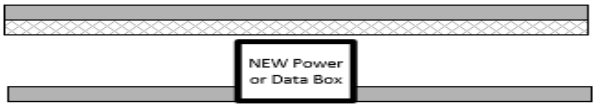
A. List the regulatory references upon which the procedure is based (cite the code, the title, and the statute).

1.10 SECONDARY MATERIALS

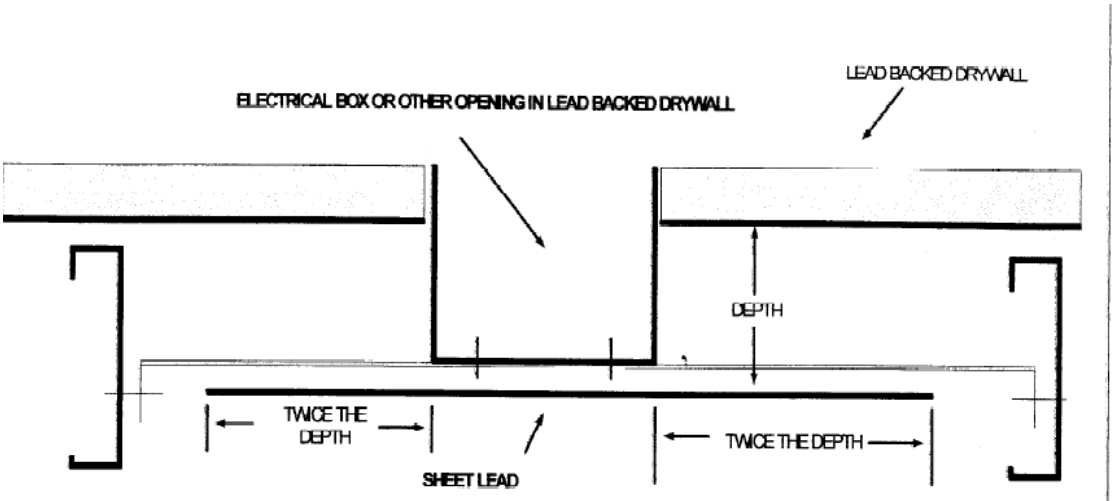
A. Radiation Safety Policy
B. Above Ceiling Work Permit
C. Lead lined wall requirements as defined by Radiation Safety Building Requirements

Option 1: worker to install new power utility wall box and add Lead Lining to wall behind box
If worker can access posterior wall entry

Option 2: worker to install new power utility wall box – box is lead Lined by manufacturer



Option 3: worker to install new power utility wall box - no additional lead lining required if installation does not disrupt the existing shielding



TYPICAL BACKING OF ELECTRICAL OR OTHER OPENINGS

END OF SECTION

SECTION 283101 - FIRE ALARM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes fire alarm systems.

B. Related Sections include the following:

1. Division 8 Section "Door Hardware" for door closers and holders with associated smoke detectors, electric door locks, and release devices that interface with the fire alarm system.

1.3 DEFINITIONS

A. FACP: Fire alarm control panel.

B. LED: Light-emitting diode.

C. NICET: National Institute for Certification in Engineering Technologies.

D. Definitions in NFPA 72 apply to fire alarm terms used in this Section.

1.4 SYSTEM DESCRIPTION

A. Noncoded, analog-addressable system; automatic sensitivity control of certain smoke detectors; and multiplexed signal transmission dedicated to fire alarm service only.

1.5 PERFORMANCE REQUIREMENTS

A. Comply with NFPA 72.

B. Fire alarm signal initiation shall be by one or more of the following devices:

1. Manual stations.
2. Heat detectors.
3. Smoke detectors.
4. Verified automatic alarm operation of smoke detectors.
5. Automatic sprinkler system water flow.

6. Fire extinguishing system operation.

7. Fire standpipe system.

C. Fire alarm signal shall initiate the following actions:

1. Alarm notification appliances shall operate continuously.
2. Identify alarm at the FACP and remote annunciators.
3. De-energize electromagnetic door holders.
4. Transmit an alarm signal to the remote alarm receiving station.
5. Unlock electric door locks in designated egress paths.
6. Release fire and smoke doors held open by magnetic door holders.
7. Activate voice/alarm communication system.
8. Switch heating, ventilating, and air-conditioning equipment controls to fire alarm mode.
9. Close smoke dampers in air ducts of system serving zone where alarm was initiated.
10. Record events in the system memory.

D. Supervisory signal initiation shall be by one or more of the following devices or actions:

1. Operation of a fire-protection system valve tamper.

E. System trouble signal initiation shall be by one or more of the following devices or actions:

1. Open circuits, shorts and grounds of wiring for initiating device, signaling line, and notification-appliance circuits.
2. Opening, tampering, or removal of alarm-initiating and supervisory signal-initiating devices.
3. Loss of primary power at the FACP.
4. Ground or a single break in FACP internal circuits.
5. Abnormal ac voltage at the FACP.
6. A break in standby battery circuitry.
7. Failure of battery charging.
8. Abnormal position of any switch at the FACP or annunciator.

F. System Trouble and Supervisory Signal Actions: Ring trouble bell and annunciate at the FACP and remote annunciators.

1.6 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings:

1. Shop Drawings shall be prepared by persons with the following qualifications:

a. Trained and certified by manufacturer in fire alarm system design.
b. Fire alarm certified by NICET, minimum Level III.

2. System Operation Description: Detailed description for this Project, including method of operation and supervision of each type of circuit and sequence of operations for manually and automatically initiated system inputs and outputs. Manufacturer's standard descriptions for generic systems are not acceptable.
3. Device Address List: Coordinate with final system programming.

4. System riser diagram with device addresses, conduit sizes, and cable and wire types and sizes.
5. Wiring Diagrams: Power, signal, and control wiring. Include diagrams for equipment and for system with all terminals and interconnections identified. Show wiring color code.
6. Batteries: Size calculations.
7. Duct Smoke Detectors: Performance parameters and installation details for each detector, verifying that each detector is listed for the complete range of air velocity, temperature, and humidity possible when air-handling system is operating.
8. Ductwork Coordination Drawings: Plans, sections, and elevations of ducts, drawn to scale and coordinating the installation of duct smoke detectors and access to them. Show critical dimensions that relate to placement and support of sampling tubes, the detector housing, and remote status and alarm indicators. Locate detectors according to manufacturer's written recommendations.
9. Floor Plans: Indicate final outlet locations showing address of each addressable device. Show size and route of cable and conduits.

C. Qualification Data: For Installer.

D. Field quality-control test reports.

E. Operation and Maintenance Data: For fire alarm system to include in emergency, operation, and maintenance manuals. Comply with NFPA 72, Appendix A, recommendations for Owner's manual. Include abbreviated operating instructions for mounting at the FACP.

F. Submittals to Authorities Having Jurisdiction: In addition to distribution requirements for submittals specified in Division 1 Section "Submittals," make an identical submittal to authorities having jurisdiction. To facilitate review, include copies of annotated Contract Drawings as needed to depict component locations. Resubmit if required to make clarifications or revisions to obtain approval. On receipt of comments from authorities having jurisdiction, submit them to Architect for review.

G. Documentation:

1. Approval and Acceptance: Provide the "Record of Completion" form according to NFPA 72 to Owner, Architect, and authorities having jurisdiction.
2. Record of Completion Documents: Provide the "Permanent Records" according to NFPA 72 to Owner, Architect, and authorities having jurisdiction. Format of the written sequence of operation shall be the optional input/output matrix.

    a. Hard copies on paper to Owner, Architect, and authorities having jurisdiction.
    b. Electronic media may be provided to Architect and authorities having jurisdiction.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Personnel shall be trained and certified by manufacturer for installation of units required for this Project.

B. Installer Qualifications: Work of this Section be performed by a UL-listed company.

C. Installer Qualifications: Personnel certified by NICET as Fire Alarm Level II.

D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.8 PROJECT CONDITIONS

A. Interruption of Existing Fire Alarm Service: Do not interrupt fire alarm service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary guard service according to requirements indicated:

1. Notify Owner no fewer than 7 days in advance of proposed interruption of fire alarm service.
2. Do not proceed with interruption of fire alarm service without Owner's written permission.

1.9 SEQUENCING AND SCHEDULING

A. Existing Fire Alarm Equipment: Maintain fully operational until new equipment has been tested and accepted. As new equipment is installed, label it "NOT IN SERVICE" until it is accepted. Remove labels from new equipment when put into service and label existing fire alarm equipment "NOT IN SERVICE" until removed from the building.

B. Equipment Removal: After acceptance of the new fire alarm system, remove existing disconnected fire alarm equipment.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Match Existing (use Fire Protection Systems as vendor)

2.2 FACP

A. General Description:

1. Modular, power-limited design with electronic modules, UL 864 listed.
2. Addressable initiation devices that communicate device identity and status.

a. Smoke sensors shall additionally communicate sensitivity setting and allow for adjustment of sensitivity at the FACP.
b. Temperature sensors shall additionally test for and communicate the sensitivity range of the device.

3. Addressable control circuits for operation of mechanical equipment.

B. Alphanumeric Display and System Controls: Arranged for interface between human operator at the FACP and addressable system components including annunciation and supervision.

Display alarm, supervisory, and component status messages and the programming and control menu.

1. Annunciator and Display: Liquid-crystal type, three line(s) of 80 characters, minimum.
2. Keypad: Arranged to permit entry and execution of programming, display, and control commands; and to indicate control commands to be entered into the system for control of smoke-detector sensitivity and other parameters.

C. Circuits:

1. Signaling Line Circuits: NFPA 72, Class A, Style 6.
2. Notification-Appliance Circuits: NFPA 72, Class A, Style Z.
3. Actuation of alarm notification appliances, annunciation, elevator recall, and actuation of suppression systems shall occur within 10 seconds after the activation of an initiating device.
4. Electrical monitoring for the integrity of wiring external to the FACP for mechanical equipment shutdown and magnetic door-holding circuits is not required, provided a break in the circuit will cause doors to close and mechanical equipment to shut down.

D. Smoke-Alarm Verification:

1. Initiate audible and visible indication of an "alarm verification" signal at the FACP.
2. Activate a listed and approved "alarm verification" sequence at the FACP and the detector.
3. Sound general alarm if the alarm is verified.
4. Cancel FACP indication and system reset if the alarm is not verified.

E. Notification-Appliance Circuit: Operation shall sound in a temporal pattern, complying with ANSI S3.41.

F. Elevator Controls: Heat detector operation shuts down elevator power by operating a shunt trip in a circuit breaker feeding the elevator.

G. Elevator Controls: Water-flow alarm connected to sprinkler in an elevator shaft and elevator machine room shuts down elevators associated with the location without time delay.

1. A field-mounted relay actuated by the fire detector or the FACP closes the shunt trip circuit and operates building notification appliances and annunciator.

H. Power Supply for Supervision Equipment: Supply for audible and visual equipment for supervision of the ac power shall be from a dedicated dc power supply, and power for the dc component shall be from the ac supply.

I. Alarm Silencing, Trouble, and Supervisory Alarm Reset: Manual reset at the FACP and remote annunciators, after initiating devices are restored to normal.

1. Silencing-switch operation halts alarm operation of notification appliances and activates an "alarm silence" light. Display of identity of the alarm zone or device is retained.
2. Subsequent alarm signals from other devices or zones reactivate notification appliances until silencing switch is operated again.
3. When alarm-initiating devices return to normal and system reset switch is operated, notification appliances operate again until alarm silence switch is reset.

J. Walk Test: A test mode to allow one person to test alarm and supervisory features of initiating devices. Enabling of this mode shall require the entry of a password. The FACP and

annunciators shall display a test indication while the test is underway. If testing ceases while in walk-test mode, after a preset delay, the system shall automatically return to normal.

K. Remote Smoke-Detector Sensitivity Adjustment: Controls shall select specific addressable smoke detectors for adjustment, display their current status and sensitivity settings, and control of changes in those settings. Allow controls to be used to program repetitive, time-scheduled, and automated changes in sensitivity of specific detector groups. Record sensitivity adjustments and sensitivity-adjustment schedule changes in system memory, and make a print-out of the final adjusted values on the system printer.

L. Transmission to Remote Alarm Receiving Station: Automatically transmit alarm, trouble, and supervisory signals to a remote alarm station through a digital alarm communicator transmitter and telephone lines.

M. Service Modem: Ports shall be RS-232 for system printer and for connection to a dial-in terminal unit.

1. The dial-in port shall allow remote access to the FACP for programming changes and system diagnostic routines. Access by a remote terminal shall be by encrypted password algorithm.

N. Primary Power: 24-V dc obtained from 120-V ac service and a power-supply module. Initiating devices, notification appliances, signaling lines, trouble signal, supervisory and digital alarm communicator transmitter shall be powered by the 24-V dc source.

1. The alarm current draw of the entire fire alarm system shall not exceed 80 percent of the power-supply module rating.
2. Power supply shall have a dedicated fused safety switch for this connection at the service entrance equipment. Paint the switch box red and identify it with "FIRE ALARM SYSTEM POWER."

O. Secondary Power: 24-V dc supply system with batteries and automatic battery charger and an automatic transfer switch.

1. Batteries: Sealed lead calcium.
2. Battery and Charger Capacity: Comply with NFPA 72.

P. Surge Protection:

1. Install surge protection on normal ac power for the FACP and its accessories. Comply with Division 26 Section "Transient Voltage Suppression" for auxiliary panel suppressors.
2. Install surge protectors recommended by FACP manufacturer. Install on all system wiring external to the building housing the FACP.

Q. Instructions: Computer printout or typewritten instruction card mounted behind a plastic or glass cover in a stainless-steel or aluminum frame. Include interpretation and describe appropriate response for displays and signals. Briefly describe the functional operation of the system under normal, alarm, and trouble conditions.

2.3 MANUAL FIRE ALARM BOXES

A. Description: UL 38 listed; finished in red with molded, raised-letter operating instructions in contrasting color. Station shall show visible indication of operation. Mounted on recessed outlet box; if indicated as surface mounted, provide manufacturer's surface back box.

1. Double-action mechanism requiring two actions to initiate an alarm, pull-lever type. With integral addressable module, arranged to communicate manual-station status (normal, alarm, or trouble) to the FACP.
2. Station Reset: Key- or wrench-operated switch.

2.4 SYSTEM SMOKE DETECTORS

A. General Description:

1. UL 268 listed, operating at 24-V dc, nominal.
2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to the FACP.
3. Multipurpose type, containing the following:

    a. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to the FACP.

4. Plug-in Arrangement: Detector and associated electronic components shall be mounted in a plug-in module that connects to a fixed base. Provide terminals in the fixed base for connection of building wiring.
5. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
6. Integral Visual-Indicating Light: LED type. Indicating detector has operated and power-on status.
7. Remote Control: Unless otherwise indicated, detectors shall be analog-addressable type, individually monitored at the FACP for calibration, sensitivity, and alarm condition, and individually adjustable for sensitivity from the FACP.

    a. Rate-of-rise temperature characteristic shall be selectable at the FACP for 15 or 20 deg F (8 or 11 deg C) per minute.
    b. Fixed-temperature sensing shall be independent of rate-of-rise sensing and shall be settable at the FACP to operate at 135 or 155 deg F (57 or 68 deg C).
    c. Provide multiple levels of detection sensitivity for each sensor.

B. Photoelectric Smoke Detectors:

1. Sensor: LED or infrared light source with matching silicon-cell receiver.
2. Detector Sensitivity: Between 2.5 and 3.5 percent/foot (0.008 and 0.011 percent/mm) smoke obscuration when tested according to UL 268A.

C. Ionization Smoke Detector:

1. Sensor: Responsive to both visible and invisible products of combustion. Self-compensating for changes in environmental conditions.
2. Detector Sensitivity: Between 0.5 and 1.7 percent/foot (0.0016 and 0.0056 percent/mm) smoke obscuration when tested according to UL 268A.

D. Duct Smoke Detectors:

1. Photoelectric Smoke Detectors:

    a. Sensor: LED or infrared light source with matching silicon-cell receiver.

b. Detector Sensitivity: Between 2.5 and 3.5 percent/foot (0.008 and 0.011 percent/mm) smoke obscuration when tested according to UL 268A.

2. Ionization Smoke Detectors:

a. Sensor: Responsive to both visible and invisible products of combustion. Self-compensating for changes in environmental conditions.
b. Detector Sensitivity: Between 0.5 and 1.7 percent/foot (0.0016 and 0.0056 percent/mm) smoke obscuration when tested according to UL 268A.

3. UL 268A listed, operating at 24-V dc, nominal.
4. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to the FACP.
5. Plug-in Arrangement: Detector and associated electronic components shall be mounted in a plug-in module that connects to a fixed base. The fixed base shall be designed for mounting directly to the air duct. Provide terminals in the fixed base for connection to building wiring.

a. Weatherproof Duct Housing Enclosure: UL listed for use with the supplied detector. The enclosure shall comply with NEMA 250 requirements for Type 4X.

6. Self-Restoring: Detectors shall not require resetting or readjustment after actuation to restore them to normal operation.
7. Integral Visual-Indicating Light: LED type. Indicating detector has operated and power-on status.
8. Remote Control: Unless otherwise indicated, detectors shall be analog-addressable type, individually monitored at the FACP for calibration, sensitivity, and alarm condition, and individually adjustable for sensitivity from the FACP.
9. Each sensor shall have multiple levels of detection sensitivity.
10. Sampling Tubes: Design and dimensions as recommended by manufacturer for the specific duct size, air velocity, and installation conditions where applied.
11. Relay Fan Shutdown: Rated to interrupt fan motor-control circuit.

2.5 HEAT DETECTORS

A. General: UL 521 listed.

B. Heat Detector, Combination Type: Actuated by either a fixed temperature of 135 deg F (57 deg C) or rate-of-rise of temperature that exceeds 15 deg F (8 deg C) per minute, unless otherwise indicated.

1. Mounting: Plug-in base, interchangeable with smoke-detector bases.
2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to the FACP.

C. Heat Detector, Fixed-Temperature Type: Actuated by temperature that exceeds a fixed temperature of 190 deg F (88 deg C).

1. Mounting: Plug-in base, interchangeable with smoke-detector bases.
2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to the FACP.

2.6 NOTIFICATION APPLIANCES

A. Description: Equipped for mounting as indicated and with screw terminals for system connections.

1. Combination Devices: Factory-integrated audible and visible devices in a single-mounting assembly.

B. Horns: Electric-vibrating-polarized type, 24-V dc; with provision for housing the operating mechanism behind a grille. Horns shall produce a sound-pressure level of 90 dBA, measured 10 feet (3 m) from the horn.

C. Visible Alarm Devices: Xenon strobe lights listed under UL 1971, with clear or nominal white polycarbonate lens mounted on an aluminum faceplate. The word "FIRE" is engraved in minimum 1-inch- (25-mm-) high letters on the lens.

1. Rated Light Output: As required to meet NFPA requirements for specific location.
2. Strobe Leads: Factory connected to screw terminals.

2.7 SPRINKLER SYSTEM REMOTE INDICATORS

A. Remote status and alarm indicator and test stations, with LED indicating lights. Light is connected to flash when the associated device is in an alarm or trouble mode. Lamp is flush mounted in a single-gang wall plate. A red, laminated, phenolic-resin identification plate at the indicating light identifies, in engraved white letters, device initiating the signal and room where the smoke detector or valve is located. For water-flow switches, the identification plate also designates protected spaces downstream from the water-flow switch.

2.8 MAGNETIC DOOR HOLDERS

A. Description: Units are equipped for wall or floor mounting as indicated and are complete with matching door plate.

1. Electromagnet: Requires no more than 3 W to develop 25-lbf (111-N) holding force.
2. Wall-Mounted Units: Flush mounted, unless otherwise indicated.
3. Rating: 120-V ac.

B. Material and Finish: Match door hardware.

2.9 REMOTE ANNUNCIATOR

A. Description: Duplicate annunciator functions of the FACP for alarm, supervisory, and trouble indications. Also duplicate manual switching functions of the FACP, including acknowledging, silencing, resetting, and testing.

1. Mounting: Flush cabinet, NEMA 250, Class 1.

B. Display Type and Functional Performance: Alphanumeric display same as the FACP. Controls with associated LEDs permit acknowledging, silencing, resetting, and testing functions for alarm, supervisory, and trouble signals identical to those in the FACP.

2.10 ADDRESSABLE INTERFACE DEVICE

A. Description: Microelectronic monitor module listed for use in providing a system address for listed alarm-initiating devices for wired applications with normally open contacts.

B. Integral Relay: Capable of providing a direct signal.

2.11 DIGITAL ALARM COMMUNICATOR TRANSMITTER

A. Listed and labeled according to UL 632.

B. Functional Performance: Unit receives an alarm, supervisory, or trouble signal from the FACP, and automatically captures one or two telephone lines and dials a preset number for a remote central station. When contact is made with the central station(s), the signal is transmitted. The unit supervises up to two telephone lines. Where supervising 2 lines, if service on either line is interrupted for longer than 45 seconds, the unit initiates a local trouble signal and transmits a signal indicating loss of telephone line to the remote alarm receiving station over the remaining line. When telephone service is restored, unit automatically reports that event to the central station. If service is lost on both telephone lines, the local trouble signal is initiated.

C. Secondary Power: Integral rechargeable battery and automatic charger. Battery capacity is adequate to comply with NFPA 72 requirements.

D. Self-Test: Conducted automatically every 24 hours with report transmitted to central station.

2.12 GUARDS FOR PHYSICAL PROTECTION

A. Description: Welded wire mesh of size and shape for the manual station, smoke detector, gong, or other device requiring protection.

1. Factory fabricated and furnished by manufacturer of the device.
2. Finish: Paint of color to match the protected device.

2.13 WIRE AND CABLE

A. Wire and cable for fire alarm systems shall be UL listed and labeled as complying with NFPA 70, Article 760.

B. Signaling Line Circuits: Twisted, shielded pair, No. 18 AWG.

1. Circuit Integrity Cable: Twisted shielded pair, NFPA 70 Article 760, Classification CI, for power-limited fire alarm signal service. UL listed as Type FPL, and complying with requirements in UL 1424 and in UL 2196 for a 2-hour rating.

C. Non-Power-Limited Circuits: Solid-copper conductors with 600-V rated, 75 deg C, color-coded insulation.

1. Low-Voltage Circuits: No. 16 AWG, minimum.

2. Line-Voltage Circuits: No. 12 AWG, minimum.

PART 3 - EXECUTION

3.1 EQUIPMENT INSTALLATION

A. Connecting to Existing Equipment: Verify that existing fire alarm system is operational before making changes or connections.

1. Connect new equipment to the existing control panel in the existing part of the building.
2. Connect new equipment to the existing monitoring equipment at the Supervising Station.
3. Expand, modify, and supplement the existing control equipment as necessary to extend the existing control functions to the new points. New components shall be capable of merging with the existing configuration without degrading the performance of either system.

B. Smoke or Heat Detector Spacing:

1. Smooth ceiling spacing shall not exceed 30 feet (9 m).
2. Spacing of heat detectors for irregular areas, for irregular ceiling construction, and for high ceiling areas, shall be determined according to Appendix A in NFPA 72.
3. Spacing of heat detectors shall be determined based on guidelines and recommendations in NFPA 72.

C. HVAC: Locate detectors not closer than 3 feet (1 m) from air-supply diffuser or return-air opening.

D. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend the full width of the duct.

E. Heat Detectors in Elevator Shafts: Coordinate temperature rating and location with sprinkler rating and location.

F. Remote Status and Alarm Indicators: Install near each smoke detector and each sprinkler water-flow switch and valve-tamper switch that is not readily visible from normal viewing position.

G. Audible Alarm-Indicating Devices: Install not less than 6 inches (150 mm) below the ceiling. Install bells and horns on flush-mounted back boxes with the device-operating mechanism concealed behind a grille.

H. Visible Alarm-Indicating Devices: Install adjacent to each alarm bell or alarm horn and at least 6 inches (150 mm) below the ceiling.

I. Device Location-Indicating Lights: Locate in public space near the device they monitor.

J. FACP: Surface mount with tops of cabinets not more than 72 inches (1830 mm) above the finished floor.

K. Annunciator: Install with top of panel not more than 72 inches (1830 mm) above the finished floor.

3.2 WIRING INSTALLATION

A. Install wiring according to the following:

1. NECA 1.
2. TIA/EIA 568-A.

B. Wiring Method: Install wiring in metal raceway according to Division 26 Section "Raceways and Boxes."

1. Fire alarm circuits and equipment control wiring associated with the fire alarm system shall be installed in a dedicated raceway system. This system shall not be used for any other wire or cable.

C. Wiring within Enclosures: Separate power-limited and non-power-limited conductors as recommended by manufacturer. Install conductors parallel with or at right angles to sides and back of the enclosure. Bundle, lace, and train conductors to terminal points with no excess. Connect conductors that are terminated, spliced, or interrupted in any enclosure associated with the fire alarm system to terminal blocks. Mark each terminal according to the system's wiring diagrams. Make all connections with approved crimp-on terminal spade lugs, pressure-type terminal blocks, or plug connectors.

D. Cable Taps: Use numbered terminal strips in junction, pull, and outlet boxes, cabinets, or equipment enclosures where circuit connections are made.

E. Color-Coding: Color-code fire alarm conductors differently from the normal building power wiring. Use one color-code for alarm circuit wiring and a different color-code for supervisory circuits. Color-code audible alarm-indicating circuits differently from alarm-initiating circuits. Use different colors for visible alarm-indicating devices. Paint fire alarm system junction boxes and covers red.

F. Risers: Install at least two vertical cable risers to serve the fire alarm system. Separate risers in close proximity to each other with a minimum 1-hour-rated wall, so the loss of one riser does not prevent the receipt or transmission of signals from other floors or zones.

G. Wiring to Remote Alarm Transmitting Device: 1-inch (25-mm) conduit between the FACP and the transmitter. Install number of conductors and electrical supervision for connecting wiring as needed to suit monitoring function.

3.3 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals according to Division 26 Section "Electrical Identification."

B. Install instructions frame in a location visible from the FACP.

C. Paint power-supply disconnect switch red and label "FIRE ALARM."

3.4 GROUNDING

A. Ground the FACP and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to the FACP.

3.5 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections, and to assist in field testing. Report results in writing.

B. Perform the following field tests and inspections and prepare test reports:

1. Before requesting final approval of the installation, submit a written statement using the form for Record of Completion shown in NFPA 72.
2. Perform each electrical test and visual and mechanical inspection listed in NFPA 72. Certify compliance with test parameters. All tests shall be conducted under the direct supervision of a NICET technician certified under the Fire Alarm Systems program at Level III.

    a. Include the existing system in tests and inspections.

3. Visual Inspection: Conduct a visual inspection before any testing. Use as-built drawings and system documentation for the inspection. Identify improperly located, damaged, or nonfunctional equipment, and correct before beginning tests.
4. Testing: Follow procedure and record results complying with requirements in NFPA 72.

    a. Detectors that are outside their marked sensitivity range shall be replaced.

5. Test and Inspection Records: Prepare according to NFPA 72, including demonstration of sequences of operation by using the matrix-style form in Appendix A in NFPA 70.

3.6 ADJUSTING

A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project outside normal occupancy hours for this purpose.

B. Follow-Up Tests and Inspections: After date of Substantial Completion, test the fire alarm system complying with testing and visual inspection requirements in NFPA 72. Perform tests and inspections listed for three monthly, and one quarterly, periods.

C. Semiannual Test and Inspection: Six months after date of Substantial Completion, test the fire alarm system complying with the testing and visual inspection requirements in NFPA 72. Perform tests and inspections listed for monthly, quarterly, and semiannual periods. Use forms developed for initial tests and inspections.

D. Annual Test and Inspection: One year after date of Substantial Completion, test the fire alarm system complying with the testing and visual inspection requirements in NFPA 72. Perform tests and inspections listed for monthly, quarterly, semiannual, and annual periods. Use forms developed for initial tests and inspections.

3.7 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain the fire alarm system, appliances, and devices. Refer to Division 1 Section "Closeout Procedures."

END OF SECTION 283101

MARK	REVISION	DATE
1	ADDENDUM #01	10/16/2020

DESIGN CRITERIA

BUILDING SIZE: 238,874 S.F. EXISTING SPREAD OVER (4) EXISTING STORIES (SF PROVIDED BY ARCHITECT FROM PREVIOUS REMODEL (NO CHANGE IN SIZE)
<u>21,174 SF. REMODEL AREA</u>

BUILDING CODES:
2018 INTERNATIONAL BUILDING CODE.
(1) 2018 INTERNATIONAL EXISTING BUILDING CODE (LEVEL 2)
2018 INTERNATIONAL FIRE CODE.
2018 INTERNATIONAL MECHANICAL CODE.
2018 INTERNATIONAL PLUMBING CODE.
2017 NATIONAL ELECTRICAL CODE.
2018 INTERNATIONAL ENERGY CONSERVATION CODE.
ICCA117.1-2009.
UTAH STATE CODE AMENDMENTS, EFFECTIVE 1 JULY 2019
STANDARDS FOR HEALTH FACILITY LICENSURE RULES, TITLE 432
NFPA 101 - LIFE SAFETY CODE, 2009 EDITION
UTAH STATE CODE AMENDMENTS, EFFECTIVE 1 JULY 2019

OCCUPANCY CLASSIFICATION: B (OFFICE) PRIMARY, A3 (ASSEMBLY), A2 (ASSEMBLY), S1 (STORAGE) - PROVIDED BY ARCHITECT FROM PREVIOUS REMODEL (NO CHANGE IN OCCUPANCY)

OCCUPANCY REQUIREMENTS: B (IBC 304.1), A (IBC 303), S (IBC 311)

TYPE OF CONSTRUCTION: I-B (IBC TABLE 503)

AUTOMATIC FIRE SPRINKLERS: AN AUTOMATIC FIRE SPRINKLER SYSTEM IS EXISTING AND TO BE MODIFIED THROUGHOUT REMODELED AREA TO BE IN COMPLIANCE WITH NFPA 13 (IBC 903.3.1). SEE PLUMBING DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.

ALLOWABLE FLOOR AREA: UNLIMITED (IBC TABLE 506.2)

ALLOWABLE HEIGHT IN STORIES: 12 STORIES ABOVE GRADE (IBC 504.4)

BUILDING HEIGHT: 75'-9" EXISTING (180' MAX, IBC 503 AND IBC 504.4)

SEPARATION OF OCCUPANCIES: NO CHANGE (1) HOUR BETWEEN B AND A-3 IN AUDITORIUM (IBC TABLE 508.3)

CORRIDOR FIRE RESISTANCE: 0 HOURS (IBC TABLE 1020.1), 2 HOURS EXTENSION OF STAIR EXIT (EXISTING CONDITION TO BE MAINTAINED)

VERTICAL EXIT ENCLOSURES: 2 HOURS FIRE BARRIERS (IBC 1023.2). WITH 90 MIN. DOORS AND OPENING PROTECTIVES PER IBC TABLE 716.1(2)

SHAFT ENCLOSURES: SHAFT ENCLOSURES TO BE 2 HOUR FIRE BARRIERS WHERE CONNECTING MORE THAN (4) STORIES (IBC 713.4)

OCCUPANT LOAD:
GROSS REMODELED AREA = 21,174 SF
NON BUSINESS (1/150) USE = 9,091 SF
BUSINESS AREA (1/150) = 21,174 - 9,091 = (12,083 SF) / 150 = 81
STORAGE AREAS (WAREHOUSE AT 1/500) = 2,851 SF / 500 = 6
ASSEMBLY (NON-CONCENTRATED TABLES AND CHAIRS 1/15)
ASSEMBLY AUDITORIUM (1/15) = 2,119 SF / 15 = 142
OTHER ASSEMBLY (1/15) = 2,052 SF / 15 = 137
EXERCISE (1/50) = 2,071 SF / 50 = 42
<u>TOTAL OCCUPANTS FOR REMODEL = 407</u>

ACTUAL OCCUPANT LOAD SHOULD BE REDUCED FROM ORIGINAL WHEREAS IBC BUSINESS AREA CHANGING FROM 1/100 IN PREVIOUS VERSIONS OF THE CODE TO 1/150 IN THIS IBC 2018 CODE CYCLE

EGRESS WIDTH: ADDRESSING FIRST FLOOR REMODELED AREA ONLY:
AUDITORIUM WILL EXIT THROUGH ATRIUM AND IS NOT COUNTED 407 - 142 = (265) * .2 = 53" REQUIRED (IBC 1005.3.1),
MAJORITY OF CORRIDORS ARE 76" MINIMUM, MINIMUM WIDTH IN CORRIDOR 111 = 62"
TOTAL DOOR WIDTH REQUIRED = 407 *.2 = 82"
PROVIDED = 204"

PLUMBING FIXTURES: REMODELED LEVEL 1 AREA ONLY IS PART OF THIS ANALYSIS:

<u>WATER CLOSETS:</u>
407 OCCUPANTS / 2 = 204 PER GENDER
USING BUSINESS OCCUPANCY (MOST RESTRICTIVE - 1/25 FOR FIRST 50, AND 1/50 FOR REMAINING (IBC TABLE 2902.1)
REQUIRED = 5 PER GENDER
PROVIDED = 9 PER GENDER (INCLUDING (1) EXISTING NON-CONFORMING (NON-ADA RESTROOMS) ON WEST SIDE THAT ARE EXISTING TO REMAIN WITH UPDATED FINISHES)

<u>LAVATORIES:</u>
USING BUSINESS OCCUPANCY (MOST RESTRICTIVE - 1/40 FOR FIRST 80, AND 1/80 FOR REMAINING (IBC TABLE 2902.1)
REQUIRED PER GENDER = 4
PROVIDED PER GENDER = 6 (INCLUDING (1) EXISTING NON-CONFORMING RESTROOM ON WEST SIDE)

<u>SHOWERS:</u>
REQUIRED = 0 (IBC TABLE 2902.1)
PROVIDED PER GENDER = 4 WITH (1) BEING ADA

<u>DRINKING FOUNTAINS:</u>
USING BUSINESS OCCUPANCY (MOST RESTRICTIVE = 1/100
REQUIRED = 5
PROVIDED = 3 WITH 2 ADDITIONAL BOTTLE FILLERS AND 2 WATER DISPENSERS WITH 1 BEING A HI / LOW (IN EXERCISE #121)
TOTAL PROVIDED = 7

<u>MOP SINK:</u>
REQUIRED = 1 (IBC TABLE 2902. 1)
PROVIDED = 1

(1) PER IEBC REQUIREMENTS TO SPEND UP TO 20% OF THE PROJECT BUDGET FOR ACCESSIBILITY UPGRADES, RESTROOMS 108 AND 109 ARE BEING UPGRADED TO PROVIDE BETTER CLEARANCE FOR THE ADA STALL AND TO PROVIDE AMBULATARY ACCESSIBLE STALLS.

DESIGN CRITERIA

EXTERIOR WALL PROTECTION: 0 HOUR EXTERIOR WALL PROTECTION IS REQUIRED BASED ON SITE LAYOUT WHERE ALL FIRE SEPARATION DISTANCES ARE GREATER THAN 10'-0" (IBC TABLE 601 & 602).

MINIMUM ROOF CLASSIFICATION: B (IBC TABLE 1505.1).

INTERIOR WALL AND CEILING FINISHES:
GROUP B (IBC TABLE 803.13):
B EXIT ENCLOSURES AND PASSAGEWAYS.
B CORRIDORS.
C ROOMS AND ENCLOSED SPACES

INTERIOR FLOOR FINISHES: TO BE INSTALLED IN ACCORDANCE WITH IBC 804

TRAVEL DISTANCE: 250 FEET: A OCCUPANCY, 300 FEET: B OCCUPANCY (IBC TABLE 1017.2)

COMMON PATH OF EGRESS TRAVEL: 75 FEET: A OCCUPANCY, 100 FEET: B OCCUPANCY, (IBC TABLE 1006.2.1)

FIRE RESISTIVE REQUIREMENTS:
ORIGINAL BUILDING DESIGN CRITERIA BASED ON UBC ON LEFT IBC 2018 SHOWN IN (#) (IBC 601)
3 (2) HOUR PRIMARY STRUCTURE , BEARING WALLS INTERIOR AND EXTERIOR
0 (0) HOUR NON-BEARING WALLS AND PARTITIONS INTERIOR
2 (2) HOUR FLOOR CONSTRUCTION AND ASSOCIATED SECONDARY MEMBERS
2 (1) HOUR ROOF CONSTRUCTION AND ASSOCIATED SECONDARY MEMBERS

DEAD-END CORRIDOR LENGTH: MAXIMUM DEAD-END CORRIDOR LENGTH NOT TO EXCEED 20' FOR A OCCUPANCY, 50' FOR OTHERS (IBC 1020.4 EXCEPTION 2).

EXIT: TWO EXITS REQUIRED. (IBC TABLE 1006.2.1)
THREE EXITS PROVIDED

ELEVATORS: ELEVATOR HOISTWAY ENCLOSURES AND ELEVATOR EQUIPMENT ROOMS TO BE LOCATED IN TWO-HOUR FIRE BARRIERS (IBC 713.4, 3002.1, AND 3006.4). DOORS AT HOISTWAY ENCLOSURES AND ELEVATOR EQUIPMENT ROOMS TO BE 90 MINUTE RATED (IBC TABLE 716.5).

ELEVATOR LOBBY ENCLOSURES NOT REQUIRED WHEREAS THE BUILDING IS PROTECTED BY AN AUTOMATIC SPRINKLER SYSTEM. (IBC 713.14.1 EXCEPTION 4).

ELEVATOR HOISTWAY VENTING IS NOT REQUIRED WHEREAS THE BUILDING IS PROTECTED BY AN AUTOMATIC SPRINKLER SYSTEM (IBC 3004.1 EXCEPTION 1).

SIGNAGE: TO BE PROVIDED IN ACCORDANCE WITH IBC 1011.4 AND 1110.

DRAFT STOPPING: NOT REQUIRED WHEREAS THE BUILDING IS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM (IBC 718.4.3)

ACCESSIBILITY: ACCESSIBILITY (IBC CHAPTER II AND ICC A117.1-2009

FIRE ALARM: REQUIRED. (IBC 907.2.2)
FIRE RESISTIVE REQUIREMENTS (IBC TABLE 601).
FLAME-SPREAD CLASSIFICATIONS (IBC TABLE 803.9)

ADDITIONAL REQUIREMENTS: CONTRACTOR TO SUBMIT FIRE SPRINKLER AND FIRE ALARM PLANS TO THE CITY FIRE DEPARTMENT FOR REVIEW AND APPROVAL PRIOR TO COMMENCEMENT OF WORK.

ONE 2A10BC FIRE EXTINGUISHER FOR EVERY 6,000 S.F. SPACED WITHIN 75' TRAVEL DISTANCE MAXIMUM [IBC TABLE 906.3(1)].
4 REQUIRED FOR REMODELED AREA
5 PROVIDED (ADDING ONE ADDITIONAL ABOVE WHAT WAS PROVIDED PREVIOUSLY (DUE TO TRAVEL DISTANCE REQUIREMENTS)

BIDDING INFORMATION

THESE DOCUMENTS ARE INTENDED TO BE USED FOR COMPETITIVE GENERAL CONTRACTORS.

THE ARCHITECT WILL CLARIFY INFORMATION WITHIN THESE DOCUMENTS DURING BIDDING TO THE GENERAL CONTRACTOR ONLY. REQUESTS FOR CLARIFICATION SHALL BE DIRECTED TO CURTIS MINER ARCHITECTURE BY THE GENERAL CONTRACTOR. CALLS FROM SUBCONTRACTORS WILL BE REFERRED TO THE GENERAL CONTRACTOR.

IF CONFLICTS ARE DISCOVERED BETWEEN ANY DRAWINGS WITHIN THIS SET, THE SPECIFICATIONS, OR OTHER BIDDING DOCUMENTS PROVIDED BY AN OWNER CONTRACTED CONSULTANT, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT DURING THE BIDDING PHASE AND REQUEST CLARIFICATION. IF CLARIFICATION IS NOT REQUESTED OR PROVIDED DURING THE BIDDING PHASE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR AND BID THE MORE EXPENSIVE INTERPRETATION.

DEFERRED SUBMITTALS

DEFERRED SUBMITTALS ARE TO BE MADE IN COMPLIANCE WITH SECTION 107.3.4.1 OF THE 2018 INTERNATIONAL BUILDING CODE. DEFERRED SUBMITTAL DOCUMENTS SHALL RESUBMITTED TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE WHO SHALL REVIEW THEM AND FORWARD THEM TO THE BUILDING OFFICIAL HAVING JURISDICTION WITH A NOTATION INDICATING THAT THE DEFERRED SUBMITTAL DOCUMENTS HAVE BEEN REVIEWED AND THAT THEY HAVE BEEN FOUND TO BE IN GENERAL COMPLIANCE WITH THE DESIGN OF THE PROJECT. THE DEFERRED SUBMITTAL ITEMS SHALL NOT BE INSTALLED UNTIL THEIR DESIGN AND SUBMITTAL DOCUMENTS HAVE BEEN REVIEWED AND APPROVED. THE DEFERRED SUBMITTAL SHALL BE SUBMITTED TO THE BUILDING OFFICIAL HAVING JURISDICTION PRIOR TO INSPECTIONS. THE WORK RELATED TO THE DEFERRED SUBMITTALS IS NOT TO COMMENCE UNTIL THE BUILDING OFFICIAL HAS APPROVED THE SUBMITTAL. THE FOLLOWING CONSTRUCTION DOCUMENTS SHALL BE SUBMITTED AS A DEFERRED SUBMITTAL.

1. FIRE SUPPRESSION SYSTEM

SPECIAL INSPECTIONS

SPECIAL INSPECTIONS SHALL BE PROVIDED BY THE OWNER IN ACCORDANCE WITH 2018 INTERNATIONAL BUILDING CODE CHAPTER 17.

THE SPECIAL INSPECTOR SHALL BE A QUALIFIED PERSON WHO SHALL DEMONSTRATE COMPETENCE, TO THE SATISFACTION OF THE BUILDING OFFICIAL, FOR INSPECTION OF THE PARTICULAR TYPE OF CONSTRUCTION OR OPERATION REQUIRING SPECIAL INSPECTION.

THE SPECIAL INSPECTOR SHALL OBSERVE THE WORK ASSIGNED FOR CONFORMANCE WITH THE APPROVED PLANS AND SPECIFICATIONS.

THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE OWNER, THE BUILDING OFFICIAL, THE ARCHITECT OF RECORD, THE ENGINEER OF RECORD, AND TO THE CONTRACTOR. ALL DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION, THEN, IF UNCORRECTED, TO THE PROPER DESIGN AUTHORITY AND TO THE BUILDING OFFICIAL PRIOR TO THE COMPLETION OF THAT PHASE OF THE WORK.

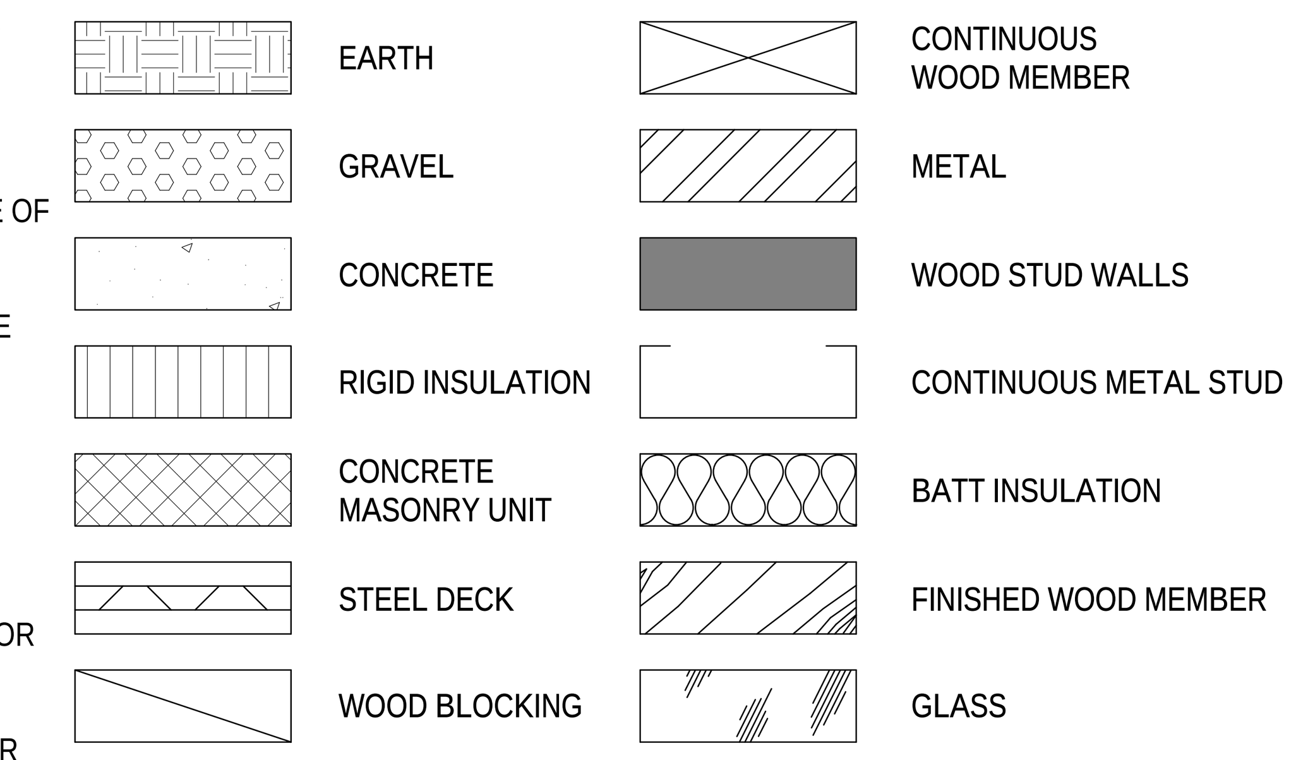
THE SPECIAL INSPECTOR SHALL SUBMIT A FINAL SIGNED REPORT DOCUMENTING THAT THE SPECIAL INSPECTION WORK WAS, TO THE BEST OF HIS KNOWLEDGE, IN CONFORMANCE TO THE APPROVED PLANS AND SPECIFICATIONS AND THE APPLICABLE WORKMANSHIP PROVISIONS OF THE 2018 INTERNATIONAL BUILDING CODE.

SPECIAL INSPECTION IS REQUIRED FOR THE FOLLOWING WORK: SUSPENDED CEILING SYSTEMS AND THEIR ANCHORAGE (CITY INSPECTORS MAY PERFORM THIS INSPECTION).

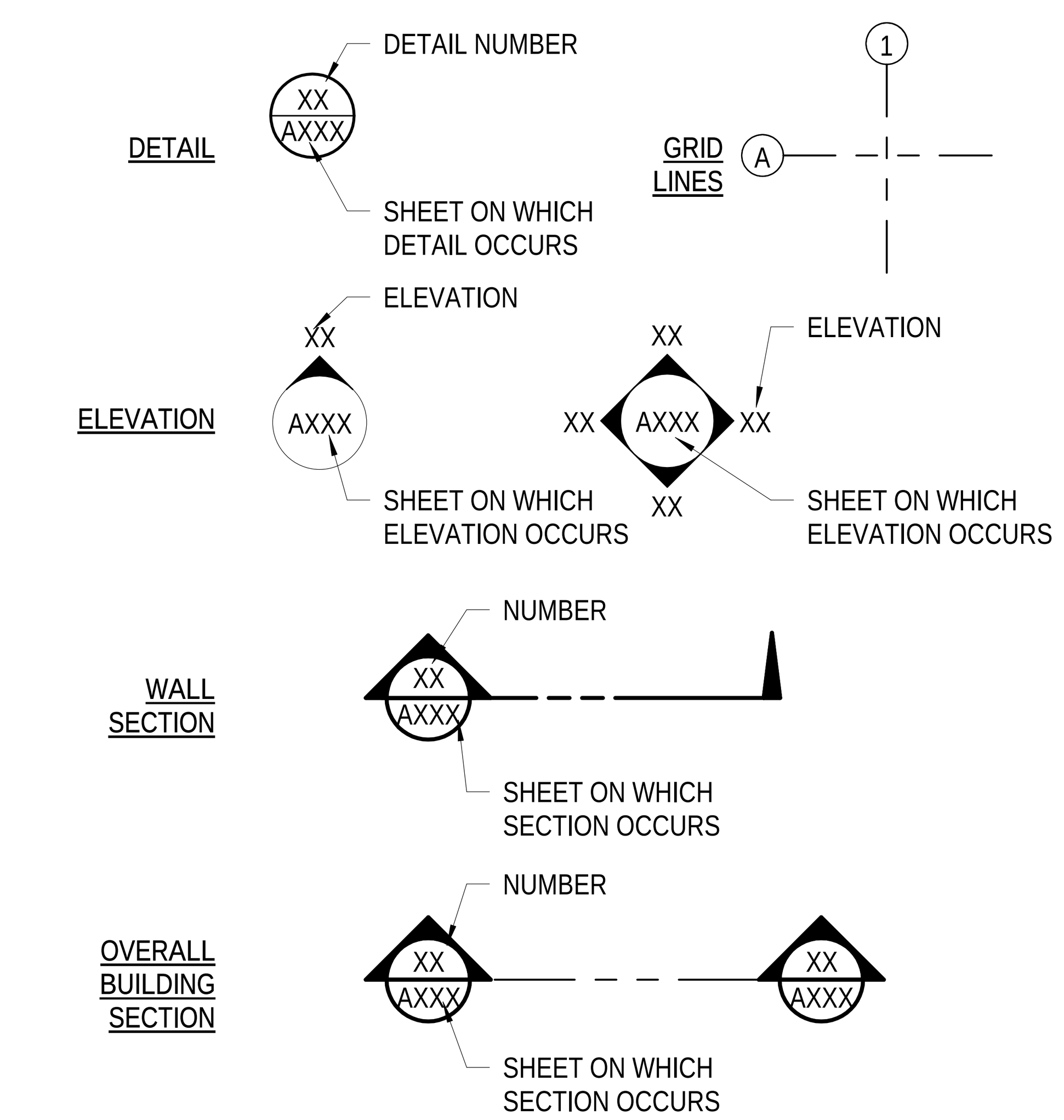
DIMENSION NOTES

1. GRID LINES ARE PROVIDED FOR REFERENCE, BUT ARE DIFFICULT TO LOCATE. THEREFORE, DIMENSIONS DO NOT GO TO GRIDLINES. ALL PLAN DIMENSIONS, UNLESS OTHERWISE NOTED, ARE TO:
   - A. NOMINAL FACE OF FINISHED WALL.
   - B. ON EXTERIOR WALLS TO THE INTERIOR FACE OF THE WINDOW FRAME.
2. DOOR LOCATIONS NOT DIMENSIONED ARE:
   - A. JAMB FACE 4" FROM FACE OF STUD.
   - B. CENTERLINE OF DOOR ON CENTERLINE OF DOOR OR CORRIDOR.
3. NOTED DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALE DIMENSIONS; DETAILS OVER SMALLER SCALE DRAWINGS.
4. "FLOOR LINE" REFERS TO TOP OF CONCRETE SLABS. FOR DEPRESSED FLOORS AND CURBS, SEE STRUCTURAL DRAWINGS.
5. VERIFY ALL ROUGH-IN, CONCRETE PAD, OR PLATFORM DIMENSIONS FOR EQUIPMENT PROVIDED IN THIS PROJECT, OR BY OTHERS.
6. FINISHED FLOOR ELEVATIONS ARE TO TOP OF CONCRETE OR GYPCRETE, UNLESS NOTED OTHERWISE.
7. CEILING HEIGHT DIMENSIONS ARE TO FINISHED SURFACES, UNLESS NOTED OTHERWISE.

MATERIALS LEGEND



SYMBOL LEGEND



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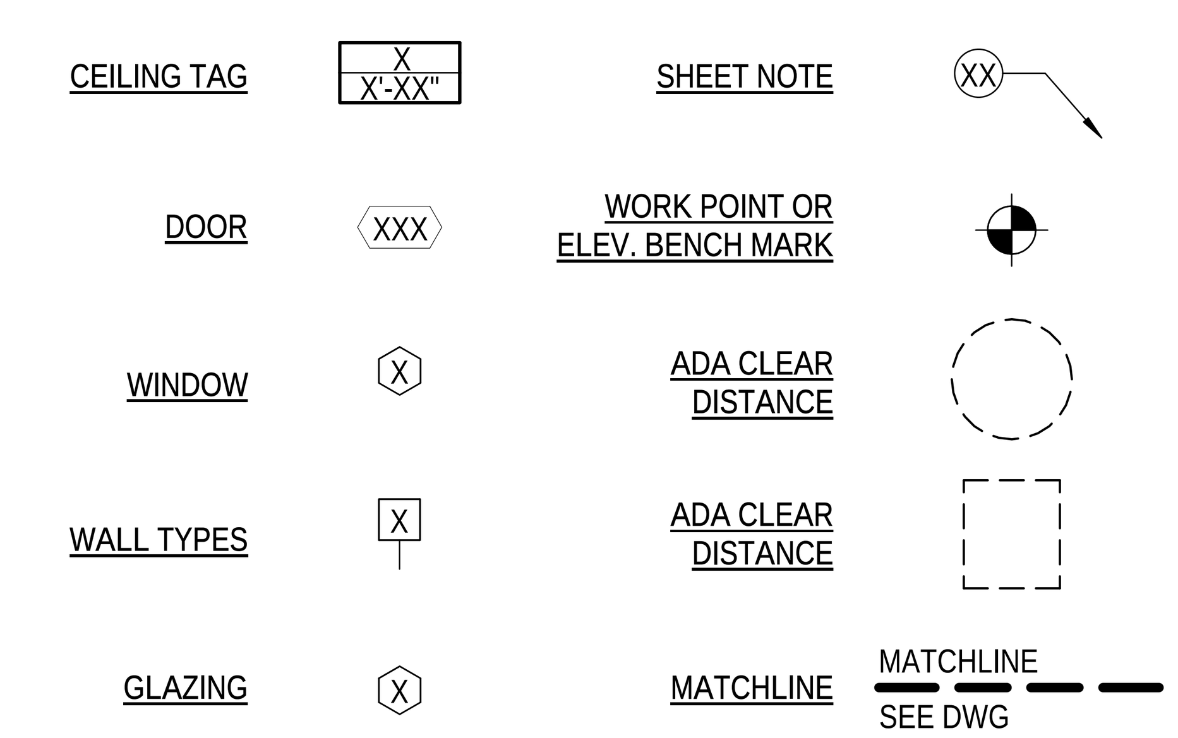


CURTIS MINER ARCHITECTURE
233 SOUTH PLEASANT GROVE BLVD. SUITE #105
PLEASANT GROVE, UTAH 84062
PHONE: (801) 769-3000
cma@cmautah.com

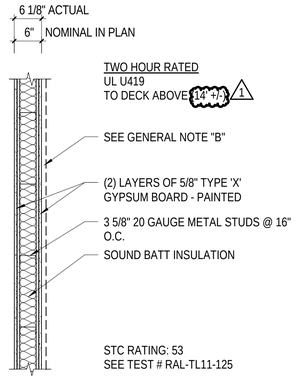
DATE: SEPTEMBER 23, 2020
PROJECT #: 20-020
PROJ. MAN.: JSJ
CHECKED BY: GWT

PROJECT:
INTERMOUNTAIN LAKE PARK LEVEL 1 REMODEL
4646 LAKE PARK BLVD
WEST VALLEY CITY, UTAH 84120

SHEET DESCRIPTION:
CODE COMPLIANCE & GENERAL DRAWING INFORMATION

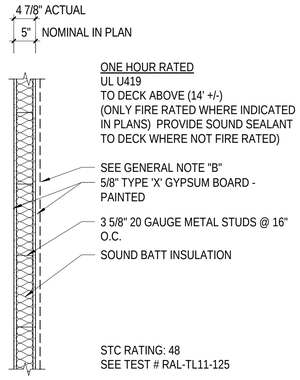
SHEET: G001

MARK	REVISION	DATE
1	ADDENDUM #01	10/16/2020



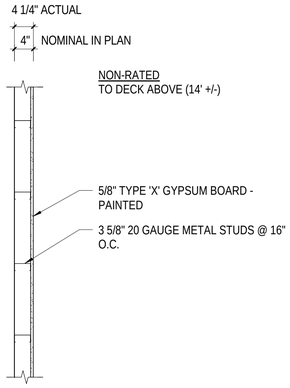
A WALL TYPE

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



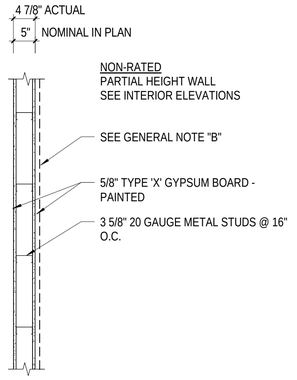
B WALL TYPE

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



C WALL TYPE

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



D WALL TYPE

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

GENERAL NOTES

A. WALL TYPES DO NOT ADDRESS TILE LOCATIONS. SEE INTERIOR ELEVATIONS FOR TILE LOCATIONS. GYPSUM BOARD IN RESTROOMS AND BEHIND ALL TILE SHALL BE 5/8" TYPE X AND RATED AS CODE COMPLIANT TILE BACKER (GEORGIA PACIFIC DENSHIELD OR EQUAL).

B. WALL TYPES DO NOT ADDRESS CHAIR RAIL DETAIL. SEE DETAIL A5/A551 AND A/101 FOR LOCATIONS,. THIS DETAIL IS TO BE BID AS A DEDUCTIVE ALTERNATE (INCLUDE IN BASE BID) AND REQUIRES AN EXTRA LAYER OF 5/8" TYPE X GYPSUM BOARD (ABOVE WHAT IS SPECIFIED IN THE WALL TYPES) TO MATCH LEVEL 2-4 STANDARD WHERE SPECIFIED. ADDITIONALLY, PROVIDE AN ADD ALTERNATE TO SIMPLY PROVIDE THE WOOD CHAIR RAIL WITHOUT THE ADDITIONAL DRYWALL AND REVEALS.

CURTIS MINER ARCHITECTURE
233 SOUTH PLEASANT GROVE BLVD. SUITE #105
PLEASANT GROVE, UTAH 84062
PHONE: (801) 769-3000
cma@cmautah.com

DATE:	SEPTEMBER 23, 2020
PROJECT #:	20-020
PROJ. MAN.:	JSJ
CHECKED BY:	GWT

PROJECT:
INTERMOUNTAIN LAKE PARK LEVEL 1 REMODEL

4646 LAKE PARK BLVD
WEST VALLEY CITY, UTAH 84120

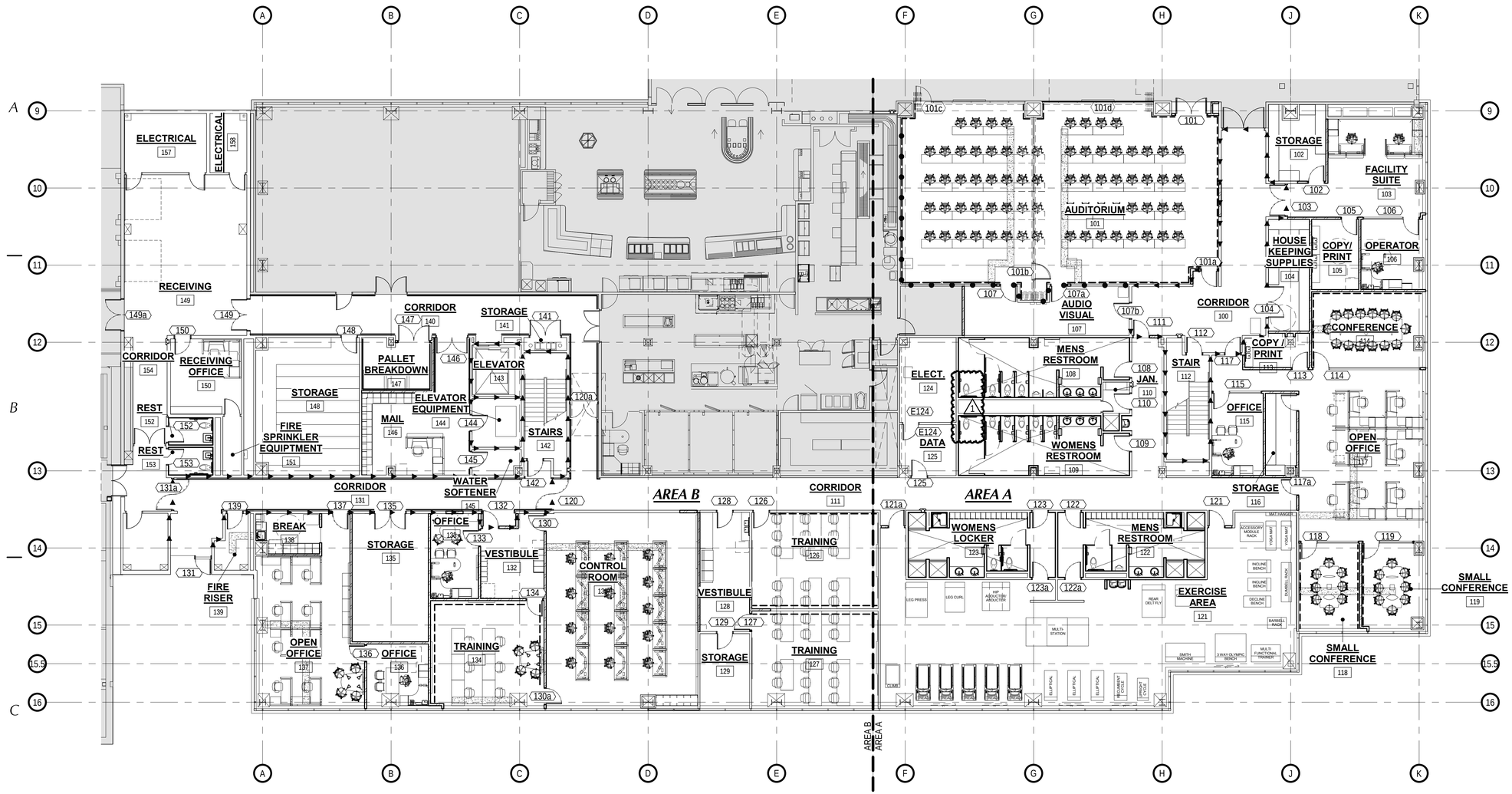
SHEET DESCRIPTION:
WALL TYPES & MISCELLANEOUS DETAILS

SHEET:
G003

MARK	REVISION	DATE
1	ADDENDUM #01	10/16/2020

GENERAL NOTES

A. THIS PLAN IS A REFERENCE PLAN. SEE THE ENLARGED AREA PLANS (A101A AND A101B) FOR SPECIFIC INSTRUCTIONS.



N

C2 LEVEL 1 FLOOR PLAN

A101 | SCALE: 3/32" = 1'-0"

SEPARATION LEGEND

▼ - *TWO HOUR FIRE BARRIER*

● - *ONE-HOUR FIRE PARTITION*

CURTIS MINER ARCHITECTURE

233 SOUTH PLEASANT GROVE BLVD. SUITE #105
PLEASANT GROVE, UTAH 84062
PHONE: (801) 769-3000
cma@cmautah.com

DATE: SEPTEMBER 23, 2020
PROJECT #: 20-020
PROJ. MAN.: JSJ
CHECKED BY: GWT

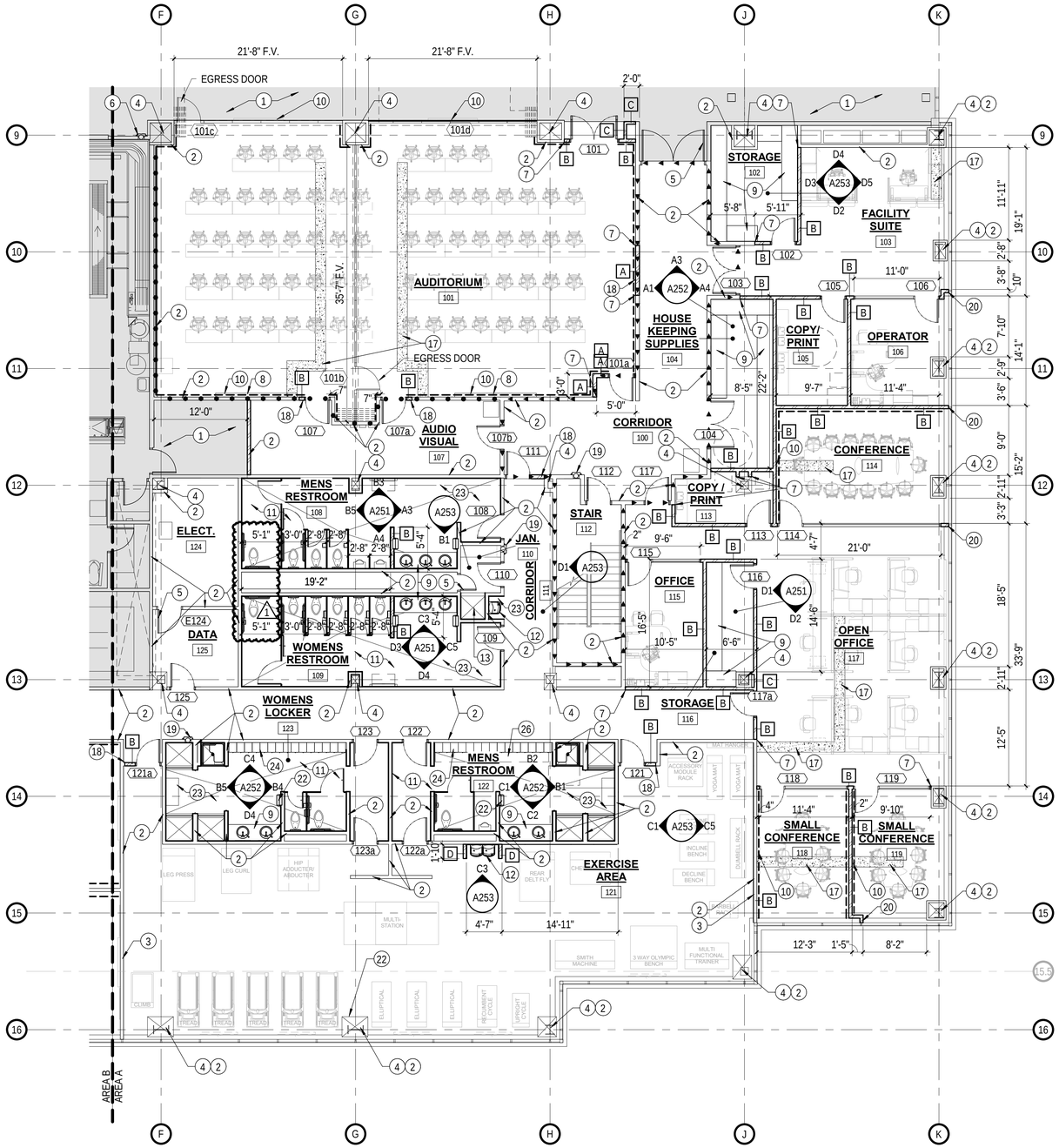
PROJECT:
INTERMOUNTAIN LAKE PARK LEVEL 1 REMODEL

4646 LAKE PARK BLVD
WEST VALLEY CITY, UTAH 84120

SHEET DESCRIPTION:
OVERALL LEVEL 1 FLOOR PLAN

SHEET:
A101

C:\Users\jonathanj\Desktop\LOCALS\20-020 IHC Lake Park Level 1 Remodel - jonathanj.rvt
10/16/2020 9:29:03 PM



SEPARATION LEGEND

- TWO HOUR FIRE BARRIER
- ONE-HOUR FIRE PARTITION

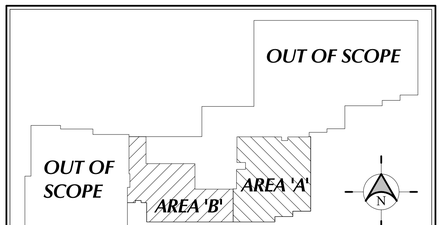
GENERAL NOTES

A. ITEMS NOT NOTED ARE EXISTING TO REMAIN.
B. GENERAL CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS PRIOR TO CONSTRUCTION. REPORT ANY SIGNIFICANT DISCREPANCIES TO THE ARCHITECT.
C. GENERAL CONTRACTOR SHALL BE RESPONSIBLE TO PATCH AND REPAIR ANY EXISTING ITEMS WHICH ARE TO REMAIN, AND WHICH ARE DAMAGED DURING THE COURSE OF DEMOLITION AND CONSTRUCTION. SEVERAL DOORS ARE BEING REMOVED AND REPLACED IN THE SAME LOCATIONS PATCH AND REPAIR ADJACENT CONSTRUCTION AS REQUIRED.
D. COORDINATE INSTALLATIONS OF ALL "AFTER CONTRACT" ASSEMBLIES WITH THE OWNER PRIOR TO CONSTRUCTION OF ADJOINING OR RELATED STRUCTURES.
E. SOME AREAS WITHIN THE SCOPE OF THE PROJECT REQUIRE SIGNIFICANT DRYWALL PATCHING. INTENT IS TO PATCH AND REPAIR ALL WALLS AND CEILINGS TO A LEVEL 5 SMOOTH TEXTURE FINISH. FIELD VERIFY EXISTING CONDITIONS AND BID ACCORDINGLY.
F. SOME EXISTING WALLS INTERSECTED WITH THE EXTERIOR WINDOW SYSTEM THAT INCLUDED A RADIANT HEATING SYSTEM. PATCH AND REPAIR THE EXTERIOR WALL / WINDOW AND RADIANT HEATER SYSTEM AS REQUIRED TO MATCH EXISTING ADJACENT CONDITIONS.
G. GENERAL CONTRACTOR SHALL REVIEW AND APPROVE ALL APPLIANCES WITH OWNER PRIOR TO PURCHASING EQUIPMENT AND FABRICATING MILLWORK.
H. PROVIDE BLOCKING/BACKING PER G002 SHEET, PROVIDE BLOCKING FOR ALL WALL MOUNTED ACCESSORIES AND EQUIPMENT AS REQUIRED. PATCH AND REPAIR EXISTING WALLS AS REQUIRED FOR NEW BLOCKING.
I. STRUCTURAL COLUMNS AND BEAMS ARE PROTECTED WITH FIRE RETARDANT SPRAY AND ARE TO REMAIN. SPRAY MUST BE REPLACED IF REMOVED OR DAMAGED TO MAINTAIN EXISTING FIRE RATINGS.
J. SEE G002 FOR TYPICAL FIXTURE MOUNTING HEIGHTS.
K. REFER TO THE CURRENT EDITION OF THE HANDBOOK FOR CERAMIC TILE INSTALLATION PUBLISHES BY THE COUNCIL OF AMERICA, INC. FOR PROPER CERAMIC TILE INSTALLATION MATERIALS AND METHODS.
L. PROVIDE 18" MINIMUM CLEAR FLOOR SPACE AT PULL SIDE OF ALL DOORS. PROVIDE 12" MINIMUM CLEAR FLOOR SPACE AT PUSH SIDE OF ALL DOORS.
M. THE CONTRACTOR SHALL MODIFY THE EXISTING FIRE SPRINKLER SYSTEM THROUGHOUT THE REMODELED SPACE(S) IN COMPLIANCE WITH NFPA 13. THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE ALL DRAWINGS, SPECIFICATIONS AND CALCULATIONS REQUIRED BY THE FIRE MARSHAL. SEE PLUMBING DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
N. SEE SHEET A151 FOR REFLECTED CEILING PLAN.
O. SEE SHEET A600'S FOR DOOR AND WINDOW INFORMATION
P. SEE SHEET A250S FOR INTERIOR ELEVATIONS.
Q. PROVIDE BACKING FOR WALL MOUNTED ITEMS AND EQUIPMENT AS REQUIRED.
R. LOCATE DOOR JAMBS 4" FROM WALL UNLESS NOTED OTHERWISE.
S. SEE G000 FOR LEGENDS, SYMBOLS, AND OTHER ARCHITECTURAL GENERAL INFORMATION.
T. SEE G003 FOR WALL TYPES.
U. FURNITURE IS SHOWN, BUT NOT NOTED SPECIFICALLY. OWNER PROVIDED, OWNER INSTALLED. CONTRACTOR TO COORDINATE ALL POWER REQUIREMENTS. SEE AP101 FOR ADDITIONAL INSTRUCTIONS.
V. DUE TO NEW ELECTRICAL DEVICES EXISTING WALLS, SOME AREAS WILL HAVE SECTIONS OF THE GYPSUM BOARD THAT WILL NEED TO BE REMOVED. COORDINATE THE EXTENT OF THIS WORK WITH THE ELECTRICAL. PATCH AND REPAIR ALL EXISTING WALLS AND CEILINGS THAT ARE TO REMAIN AS REQUIRED FOR NEW ELECTRICAL DEVICES, NEW BACKING OR ANY OTHER REASON.
W. THIS BUILDING IS OF TYPE I (NON-COMBUSTIBLE CONSTRUCTION). COMBUSTIBLE MATERIALS ARE NOT ALLOWED EXCEPT AS IDENTIFIED IN IBC 2018 SECTION 603.
X. CONTRACTOR SHALL ASSURE THAT ALL FIRE EXTINGUISHERS WITHIN THE CONSTRUCTION AREA SHALL HAVE CURRENT INSPECTION TAGS AND SHALL HAVE A MINIMUM RATING OF 2A10BC.
Y. SEE DETAIL A4/A701 FOR TYPICAL WALL BRACING.
Z. SEE MECHANICAL AND ELECTRICAL SHEETS FOR ADDITIONAL INFORMATION.
AA. PATCH AND REPAIR THE ROOF FOR ANY NEW PENETRATIONS AS REQUIRED BY CODE OR MANUFACTURER.
BB. UPON COMPLETION OF PROJECT, CLEAN ALL AREAS WITHIN SCOPE OF PROJECT, INCLUDING FLOORS, CEILINGS, AND WINDOWS.
CC. DO NOT SCALE DRAWINGS.

MARK	REVISION	DATE
1	ADDENDUM #01	10/16/2020

SHEET NOTES

1. SHADED AREA INDICATES OUT OF SCOPE AREA. UNLESS OTHERWISE NOTED, NO WORK IN THIS AREA.
2. EXISTING WALL TO REMAIN. PROTECT DURING CONSTRUCTION. PROVIDE NEW MATERIALS AS INDICATED BY OTHER SHEET NOTES OR AS NOTED WITH WALL TYPES. PATCH AND REPAIR AS REQUIRED.
3. EXISTING WALL TO REMAIN. EXTEND EXISTING WALL CONSTRUCTION WITH INSULATION TO DECK OR PROVIDE ROCKFON PLENUM BARRIER OR EQUAL TO DECK. PATCH AND REPAIR AS REQUIRED.
4. EXISTING STRUCTURAL COLUMN TO REMAIN. PROTECT DURING CONSTRUCTION.
5. EXISTING DOOR TO REMAIN. PROTECT DURING CONSTRUCTION. PROVIDE REPLACEMENT DOOR HARDWARE AS/IF INDICATED IN THE DOOR SCHEDULE AND SPECIFICATIONS.
6. EXISTING FIRE EXTINGUISHER TO REMAIN.
7. ALIGN NEW WALL WITH EXISTING. CREATE SMOOTH TRANSITION.
8. REPLACE DRYWALL WHERE IT WAS REMOVED ONCE ELECTRICAL DEVICES HAVE BEEN INSTALLED WITH 5/8" TYPE X GYPSUM BOARD.
9. NEW MILLWORK / SHELVING AS PER INTERIOR ELEVATIONS. REMOVE AND REPLACE GYPSUM BOARD AS REQUIRED TO PROVIDE NECESSARY BLOCKING / BACKING.
10. WALL MOUNTED TELEVISION. PROVIDE BACKING IN WALL. SEE AUDIO VISUAL PACKAGE WITHIN ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION.
11. NEW PLUMBING FIXTURES WITHIN ENTIRE ROOM. RELOCATE PLUMBING FIXTURES AS REQUIRED TO FIT WITHIN THE NEW TOILET PARTITION LAYOUT DIMENSIONS IN ORDER TO PROVIDE ADA COMPLIANCE WITHIN MAIN RESTROOMS. FIXTURES IN OTHER RESTROOMS ARE TO BE INSTALLED IN GENERALLY THE SAME LOCATIONS (ADA CLEARANCES ARE TO BE MAINTAINED / PROVIDED). SEE PLUMBING.
12. NEW DRINKING FOUNTAIN. SEE PLUMBING.
13. NEW MOP SINK. SEE PLUMBING.
14. WATER DISPENSER. OWNER PROVIDED OWNER INSTALLED. PROVIDE WATER SUPPLY AND DRAINAGE AS PER PLUMBING.
15. REFRIGERATOR. PROVIDE POWER AS PER ELECTRICAL.
16. VENDING MACHINE. OWNER PROVIDED, OWNER INSTALLED. PROVIDE POWER AS PER ELECTRICAL.
17. PATCH CONCRETE FLOOR WHERE TRENCH OCCURRED FOR PLUMBING OR ELECTRICAL MODIFICATIONS.
18. INFILL WALL WHERE DOOR / FRAME WAS REMOVED TO MATCH EXISTING CONSTRUCTION. PROVIDE SOUND INSULATION AS REQUIRED.
19. NEW SEMI-RECESSED FIRE EXTINGUISHER CABINET AND FIRE EXTINGUISHER TO BE INSTALLED IN EXISTING LOCATION. JL INDUSTRIES COSMOPOLITAN STAINLESS STEEL 1037V10. INTENT IS TO MATCH LEVEL 2-4 STANDARD. SEE DETAIL D3/A701.
20. EXTEND NEW WALL TO WINDOW MULLION PER DETAIL D1/A602. EXISTING WINDOW HAS A RADIANT HEATER SYSTEM ATTACHED. TEMPORARILY REMOVE RADIANT HEATER CAP AT INTERSECTION AND INSTALL ROCK WOOL BATT INSULATION AT WALL INTERSECTION AS REQUIRED TO FILL VOID. REPLACE CAP AND BUILD NEW WALL AROUND THE RADIANT HEATER SYSTEM.
21. PROVIDE WALL MOUNTED 24"X24" METAL ACCESS PANEL AS REQUIRED TO ACCESS NEW PLUMBING POWER SUPPLIES. PAINT TO MATCH WALL.
22. ADA COMPLIANT PAPER TOWEL DISPENSER. BOBRICK B-262.
23. PROVIDE NEW 3/8" TYPE X CODE COMPLIANT TILE BACKER (GEORGIA PACIFIC DENSSHIELD OR EQUAL) BEHIND ALL NEW TILE IN ENTIRE ROOM.
24. NEW ADA COMPLIANT METAL LOCKERS IN EXISTING LOCATION - 12' WIDE X 15" DEEP X 60" TALL (1 TIER) NO BASE. BASIS OF DESIGN: JORGENSON LOCKERS, SIGNATURE SERIES, STANDARD VENTS, RECESSED LOCK WITH DIGILOCK RANGE KEYPAD LOCK - COLOR: 401 GRAY.
25. NEW ADA COMPLIANT METAL LOCKERS IN EXISTING LOCATION - 12' WIDE X 15" DEEP X 72" TALL (2 TIER) 4" CHANNEL BASE. BASIS OF DESIGN: JORGENSON LOCKERS, SIGNATURE SERIES, STANDARD VENTS, RECESSED LOCK WITH DIGILOCK RANGE KEYPAD LOCK - COLOR: 401 GRAY.
26. EXISTING SHELF TO REMAIN.



KEY PLAN:

CURTIS MINER ARCHITECTURE
233 SOUTH PLEASANT GROVE BLVD.
SUITE #105
PLEASANT GROVE, UTAH 84062
PHONE: (801) 769-3000
cma@cmautah.com

DATE:	SEPTEMBER 23, 2020
PROJECT #:	20-020
PROJ. MAN.:	JSJ
CHECKED BY:	GWT

PROJECT:
INTERMOUNTAIN LAKE PARK LEVEL 1 REMODEL

4646 LAKE PARK BLVD
WEST VALLEY CITY, UTAH 84120

SHEET DESCRIPTION:
LEVEL 1 FLOOR PLAN - AREA A

SHEET:
A101A

D2 LEVEL 1 FLOOR PLAN - AREA 'A'
A101A | SCALE: 1/8" = 1'-0"

D2 LEVEL 1 FLOOR PLAN - AREA 'B'

A101B | SCALE: 1/8" = 1'-0"

SEPARATION LEGEND

- TWO HOUR FIRE BARRIER
- ONE-HOUR FIRE PARTITION

GENERAL NOTES

A. ITEMS NOT NOTED ARE EXISTING TO REMAIN.
B. GENERAL CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS PRIOR TO CONSTRUCTION. REPORT ANY SIGNIFICANT DISCREPANCIES TO THE ARCHITECT.
C. GENERAL CONTRACTOR SHALL BE RESPONSIBLE TO PATCH AND REPAIR ANY EXISTING ITEMS WHICH ARE TO REMAIN, AND WHICH ARE DAMAGED DURING THE COURSE OF DEMOLITION AND CONSTRUCTION. SEVERAL DOORS ARE BEING REMOVED AND REPLACED IN THE SAME LOCATIONS PATCH AND REPAIR ADJACENT CONSTRUCTION AS REQUIRED.
D. COORDINATE INSTALLATIONS OF ALL "AFTER CONTRACT" ASSEMBLIES WITH THE OWNER PRIOR TO CONSTRUCTION OF ADJOINING OR RELATED STRUCTURES.
E. SOME AREAS WITHIN THE SCOPE OF THE PROJECT REQUIRE SIGNIFICANT DRYWALL PATCHING. INTENT IS TO PATCH AND REPAIR ALL WALLS AND CEILINGS TO A LEVEL 5 SMOOTH TEXTURE FINISH. FIELD VERIFY EXISTING CONDITIONS AND BID ACCORDINGLY.
F. SOME EXISTING WALLS INTERSECTED WITH THE EXTERIOR WINDOW SYSTEM THAT INCLUDED A RADIANT HEATING SYSTEM. PATCH AND REPAIR THE EXTERIOR WALL / WINDOW AND RADIANT HEATER SYSTEM AS REQUIRED TO MATCH EXISTING ADJACENT CONDITIONS.
G. GENERAL CONTRACTOR SHALL REVIEW AND APPROVE ALL APPLIANCES WITH OWNER PRIOR TO PURCHASING EQUIPMENT AND FABRICATING MILLWORK.
H. PROVIDE BLOCKING/BACKING PER G002 SHEET, PROVIDE BLOCKING FOR ALL WALL MOUNTED ACCESSORIES AND EQUIPMENT AS REQUIRED. PATCH AND REPAIR EXISTING WALLS AS REQUIRED FOR NEW BLOCKING.
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MARK	REVISION	DATE
1	ADDENDUM #01	10/16/2020

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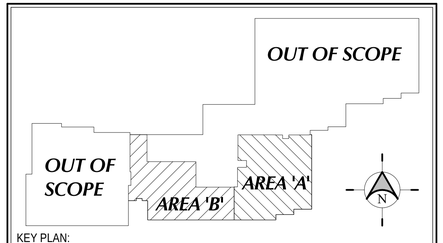

KEY PLAN:

CURTIS MINER ARCHITECTURE
233 SOUTH PLEASANT GROVE BLVD, SUITE #105
PLEASANT GROVE, UTAH 84062
PHONE: (801) 769-3000
cma@cmautah.com

DATE:	SEPTEMBER 23, 2020
PROJECT #:	20-020
PROJ. MAN.:	JSJ
CHECKED BY:	GWT

PROJECT:
INTERMOUNTAIN LAKE PARK LEVEL 1 REMODEL

4646 LAKE PARK BLVD
WEST VALLEY CITY, UTAH 84120

SHEET DESCRIPTION:
LEVEL 1 FLOOR PLAN - AREA B

SHEET:
A101B

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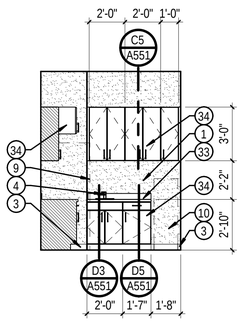
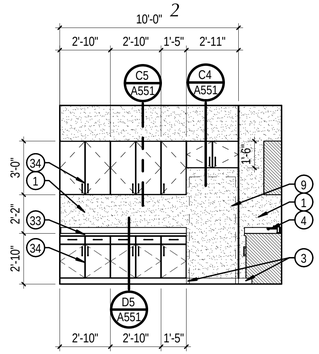


A1 BREAK 138
A251 | SCALE: 1/4" = 1'-0"



A2 BREAK 138
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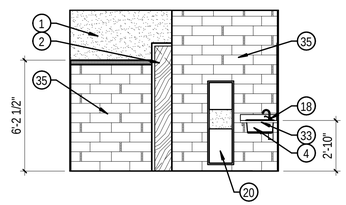
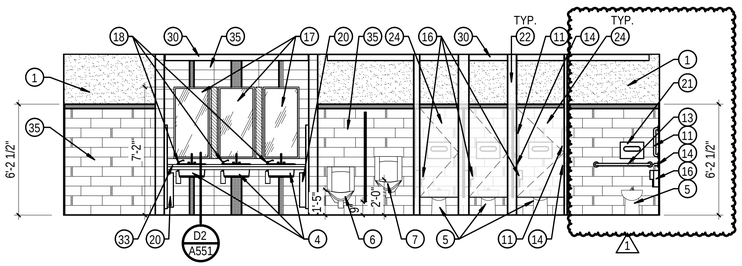


A3 MENS 108
A251 | SCALE: 1/4" = 1'-0"



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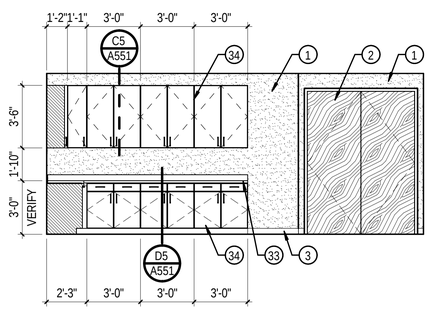
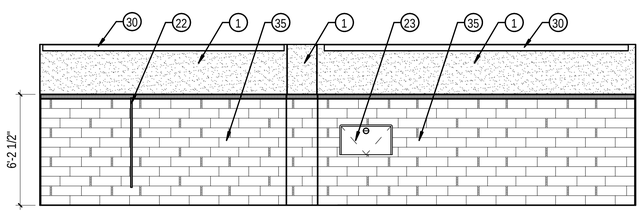


B1 MAIL 146
A251 | SCALE: 1/4" = 1'-0"



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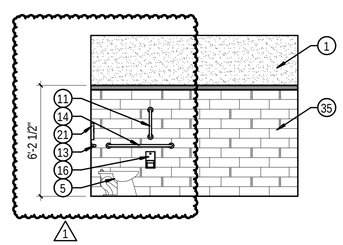

B5 MENS 108
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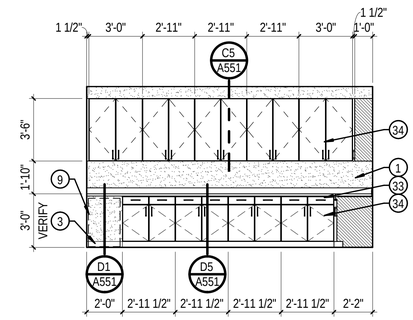

C1 MAIL 146
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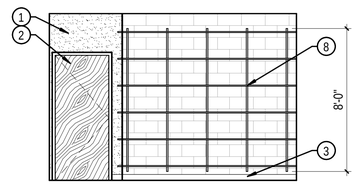

C2 RECEIVING OFFICE 150
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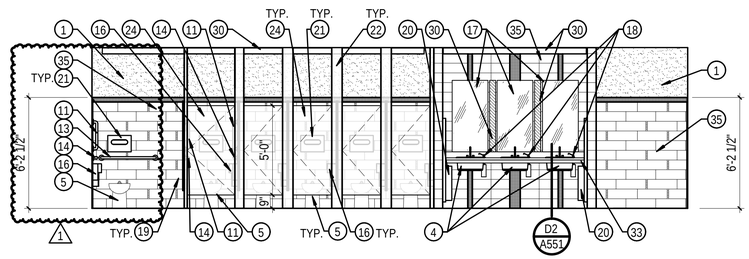
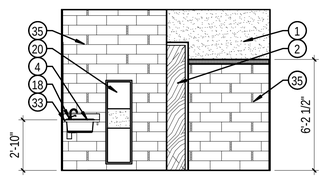


C3 WOMENS 109
A251 | SCALE: 1/4" = 1'-0"



C5 WOMENS 109
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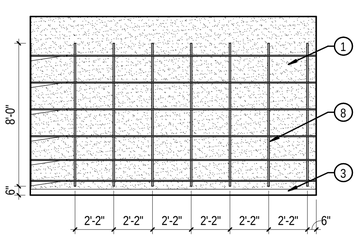

D1 STORAGE 116
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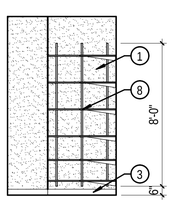
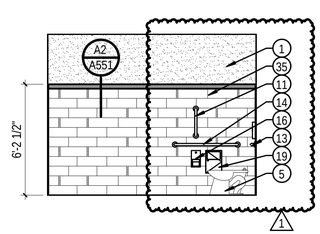
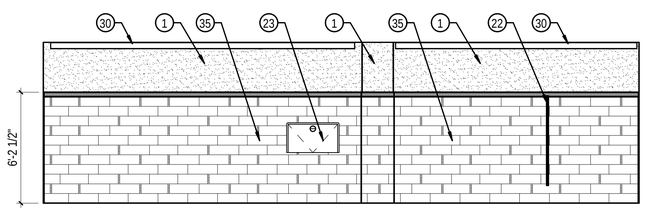


D2 STORAGE 116
A251 | SCALE: 1/4" = 1'-0"



D3 WOMENS 109
A251 | SCALE: 1/4" = 1'-0"



D4 WOMENS 109
A251 | SCALE: 1/4" = 1'-0"

MARK	REVISION	DATE
1	ADDENDUM #01	10/16/2020

SHEET NOTES

1. PAINTED GYPSUM BOARD / EXISTING BLOCK WALL. SEE AI101 FOR COLORS.
2. DOOR SYSTEM. SEE FLOOR PLANS AND DOOR TYPES (A601).
3. SCHEDULED BASE. SEE AI101.
4. ADA COMPLIANT SINK. SEE PLUMBING.
5. ADA COMPLIANT TOILET. SEE PLUMBING.
6. ADA COMPLIANT URINAL. SEE PLUMBING.
7. STANDARD HEIGHT URINAL. SEE PLUMBING.
8. HEAVY DUTY KV TRACK STYLE SHELVING SYSTEM WITH (6) SHELVES. PROVIDE BACKING / BLOCKING AS RECOMMENDED BY MANUFACTURER.
9. REFRIGERATOR. OWNER FURNISHED, OWNER INSTALLED. VERIFY SIZING WITH OWNER.
10. WATER DISPENSER. OWNER FURNISHED, OWNER INSTALLED. VERIFY SIZING WITH OWNER.
11. ADA COMPLIANT VERTICAL 18" GRAB BAR. BOBRICK B-6806 x 18. PROVIDE (1) PER ADA RESTROOM STALL, AND (2) PER AMBULATORY STALL.
12. ADA COMPLIANT VERTICAL 24" GRAB BAR. BOBRICK B-6806 x 24. PROVIDE WHERE SHOWN.
13. ADA COMPLIANT HORIZONTAL 36" GRAB BAR. B-6806 x 36. PROVIDE (1) PER ADA RESTROOM STALL.
14. ADA COMPLIANT HORIZONTAL 42" GRAB BAR. BOBRICK B-6806 x 42. PROVIDE (1) PER ADA RESTROOM STALL, AND (2) PER AMBULATORY STALL.
15. ADA COMPLIANT "L" SHAPED SHOWER GRAB BAR. BOBRICK B-68616. PROVIDE (1) PER ADA SHOWER. PROVIDE (1) 18" VERTICAL GRAB BAR PER ADA SHOWER STALL.
16. ADA COMPLIANT TOILET PAPER DISPENSER. BOBRICK B-2888. PROVIDE (1) RESTROOM STALL.
17. ADA COMPLIANT WALL MIRROR. BOBRICK B-290 2448. TILE TO AROUND MIRROR.
18. COUNTER MOUNTED ADA COMPLIANT SOAP DISPENSER. BOBRICK B-824. PROVIDE HARDWIRED KIT AS REQUIRED. COORDINATE ALL DETAILS WITH ELECTRICAL CONTRACTOR. PROVIDE (1) PER COUNTERTOP SINK.
19. ADA COMPLIANT SANITARY NAPKIN DISPOSAL. BOBRICK B-270. PROVIDE (1) PER FEMALE RESTROOM STALL.
20. ADA COMPLIANT SEMI-RECESSED PAPER TOWEL DISPENSER / WASTE RECEPTACLE (AUTOMATIC PAPER TOWEL DISPENSER). BOBRICK B-3974.
21. ADA COMPLIANT TOILET COVER DISPENSER. BOBRICK B-221. PROVIDE (1) PER TOILET.
22. ADA COMPLIANT POWDER COATED STEEL TOILET PARTITIONS AS REQUIRED TO MATCH EXISTING LEVEL 2-4 STANDARD (1/4" MAXIMUM GAP).
23. ADA COMPLIANT BABY CHANGING STATION. BOBRICK KB110-SSWM.
24. COAT HANGER. BOBRICK B-7672. PROVIDE (1) PER TOILET STALL AND (1) PER SHOWER. MOUNT TOP AT 48" ABOVE FLOOR FOR ADA STALLS, AND AT 60" FOR NON-ADA LOCATIONS.
25. ADA COMPLIANT FOLDING SHOWER SEAT. BOBRICK B-5181. PROVIDE (1) PER ADA SHOWER STALL.
26. SHOWER CURTAIN, ROD, AND HOOKS SYSTEM AS REQUIRED. BOBRICK B-207, BOBRICK B-204-1, BOBRICK B-204-2. PROVIDE (1) PER SHOWER STALL.
27. ADA MOVEABLE CHANGING ROOM BENCH. SALSBURY ALUMINUM ADA LOCKER BENCH - 42" LONG X 20" WIDE X 18" HIGH. PROVIDE (1) PER SHOWER ROOM.
28. MOP HOLDER AND SHELF. BOBRICK B-224 X 36.
29. ADA COMPLIANT DRINKING FOUNTAIN(S). WHEELCHAIR ADA HEIGHT FOUNTAIN TO INCLUDE BOTTLE FILLER. SEE PLUMBING.
30. LIGHT FIXTURE. SEE ELECTRICAL.
31. FITNESS ROOM MIRRORS TO MATCH EXISTING OR MODIFY AS REQUIRED.
32. MOP SINK. SEE PLUMBING.
33. SCHEDULED COUNTERTOP. SEE AI101.
34. PLASTIC LAMINATE MILLWORK. SEE AI101.
35. WALL TILE AS SHOWN. SEE A551 AND AI101.
36. NEW LOCKER SYSTEM AS PER A101A AND A101B.

GENERAL NOTES

A. GENERAL CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS PRIOR TO CONSTRUCTION. REPORT ANY SIGNIFICANT DISCREPANCIES TO THE ARCHITECT.
B. SEE MECHANICAL, PLUMBING, AND ELECTRICAL SHEETS FOR ADDITIONAL INFORMATION.
C. SEE FLOOR PLANS AND A601 FOR DOOR INFORMATION.
D. GENERAL CONTRACTOR SHALL REVIEW AND APPROVE ALL APPLIANCES WITH OWNER PRIOR TO PURCHASING EQUIPMENT AND FABRICATING MILLWORK.
E. SEE G003 FOR WALL TYPES. SEE G001 FOR LEGENDS, SYMBOLS, ABBREVIATIONS AND OTHER ARCHITECTURAL GENERAL INFORMATION. WALL TYPES SHOWN DO NOT ADDRESS CERAMIC TILE INSTALLATION ON WALL SURFACES AS SHOWN ON THE FLOOR PLANS. REFER TO THE CURRENT EDITION OF THE HANDBOOK FOR CERAMIC TILE INSTALLATION PUBLISHED BY THE TILE COUNCIL OF AMERICA, INC., FOR PROPER INSTALLATION MATERIALS AND METHODS. TILE TO BE INSTALLED OVER TILE BACKER BOARD OR CODE COMPLIANT GYPSUM BOARD (DENSHIELD) OR EQUIVALENT.
F. SEE DETAILS G002 FOR TYPICAL FIXTURE MOUNTING HEIGHTS. PROVIDE BACKING/BLOCKING FOR WALL MOUNTED ITEMS-INCLUDING GRAB BARS, HANDRAILS, SIGNAGE AND EQUIPMENT AS REQUIRED.
G. SEE AI101 FOR FINISH DESIGNATIONS.
H. DO NOT SCALE DRAWINGS.

CURTIS MINER ARCHITECTURE
233 SOUTH PLEASANT GROVE BLVD. SUITE #105
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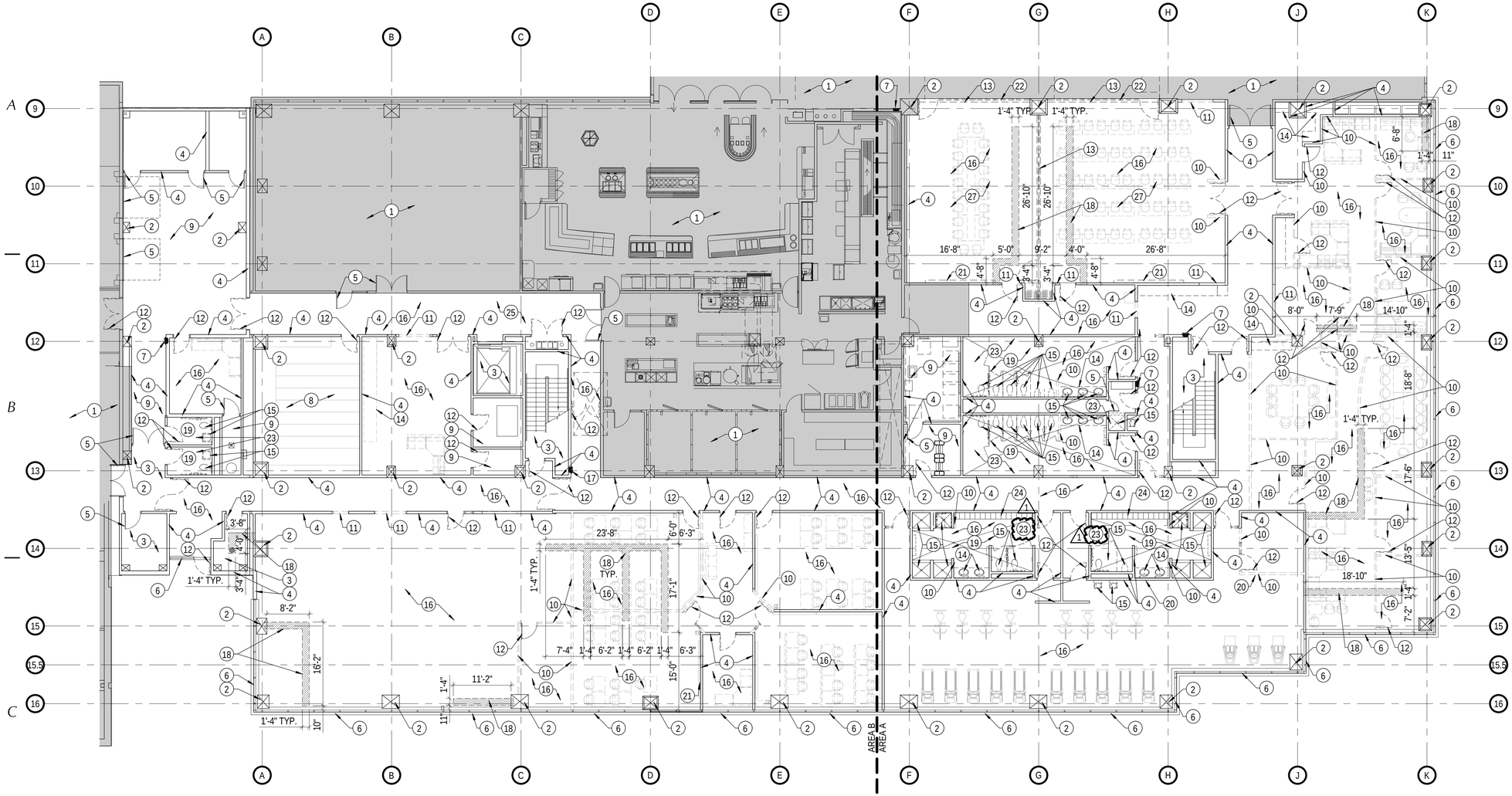
DATE:	SEPTEMBER 23, 2020
PROJECT #:	20-020
PROJ. MAN.:	JSJ
CHECKED BY:	GWT

PROJECT:
INTERMOUNTAIN LAKE PARK LEVEL 1 REMODEL

4646 LAKE PARK BLVD
WEST VALLEY CITY, UTAH 84120

SHEET DESCRIPTION:
INTERIOR ELEVATIONS

SHEET:
A251



N

C2 LEVEL 1 DEMOLITION FLOOR PLAN

AD101 | SCALE: 3/32" = 1'-0"

MARK	REVISION	DATE
1	ADDENDUM #01	10/16/2020

SHEET NOTES

1. SHADED AREA INDICATES OUT OF SCOPE AREA. UNLESS OTHERWISE NOTED, NO WORK IN THIS AREA.
2. EXISTING STRUCTURAL STEEL COLUMN TO REMAIN. PROTECT FROM DAMAGE.
3. EXISTING SPACE WITH FINISHES TO REMAIN. UNLESS NOTED OTHERWISE, NO MODIFICATIONS IN THIS AREA.
4. EXISTING WALL TO REMAIN. PROTECT DURING CONSTRUCTION. PATCH AND REPAIR WHERE NEEDED.
5. EXISTING DOOR TO REMAIN. PROTECT FROM DAMAGE.
6. EXISTING WINDOW SYSTEM TO REMAIN. PROTECT FROM DAMAGE.
7. EXISTING FIRE EXTINGUISHER CABINET TO REMAIN.
8. EXISTING HIGH DENSITY STORAGE SYSTEM AND FLOORING TO REMAIN.
9. EXISTING FLOORING FINISH TO REMAIN.
10. DEMOLISH EXISTING WALL. COORDINATE EXTENT WITH NEW CONSTRUCTION.
11. DEMOLISH EXISTING WALL FOR NEW DOOR. COORDINATE EXTENT/ LOCATION WITH NEW CONSTRUCTION.
12. DEMOLISH EXISTING DOOR, DOOR FRAME, AND ASSOCIATED HARDWARE. SOME HARDWARE WILL BE REUSED. SEE THE HARDWARE SETS FOR SPECIFIC INSTRUCTIONS.
13. DEMOLISH EXISTING FOLDING PARTITION DOOR. SOFFIT AND TRACK ARE TO REMAIN. PROTECT FROM DAMAGE.
14. DEMOLISH EXISTING MILLWORK CABINETS, SHELVING, AND COUNTERTOP (WHERE APPLICABLE).
15. DEMOLISH EXISTING PLUMBING FIXTURE. NEW FIXTURE TO BE PLACED IN THE SAME OR CLOSE PROXIMITY TO EXISTING. COORDINATE WITH NEW CONSTRUCTION AND PLUMBING.
16. DEMOLISH EXISTING WALL BASE AND FLOORING IN SPACE DOWN TO EXISTING CONCRETE. REMOVE ALL FLOOR RESIDUE.
17. DEMOLISH EXISTING FIRE EXTINGUISHER CABINET. NEW CABINET TO BE PLACED IN EXISTING LOCATION. ADJUST WALL OPENING AS REQUIRED FOR NEW CABINET AS REQUIRED.
18. SHADED AREA INDICATES A SAW CUT TRENCH IN CONCRETE FLOOR WHERE INDICATED FOR PLUMBING OR ELECTRICAL MODIFICATION AS DIMENSIONED AND AS REQUIRED. MINIMUM TRENCH WIDTH SHALL BE 16". SEE PLUMBING OR ELECTRICAL FOR ADDITIONAL INFORMATION.
19. DEMOLISH ALL EXISTING TOILET ACCESSORIES IN ROOM INCLUDING TOILET PARTITIONS AND MIRRORS.
20. CAREFULLY, REMOVE EXISTING MIRRORS. SALVAGE FOR REUSE IF POSSIBLE.
21. DEMOLISH GYPSUM BOARD ON THIS SIDE OF WALL TO ALL FOR NEW ELECTRICAL DEVICES TO BE ADDED.
22. DEMOLISH EXISTING ACOUSTICAL WALL PANEL AS REQUIRED FOR NEW TELEVISION. SEE AP101, ELECTRICAL AND AUDIO VISUAL.
23. DEMOLISH WALL TILE IN ENTIRE ROOM IN PREPARATION FOR NEW TILE / FINISHES. DEMOLISH DRYWALL / CEMENT BOARD SUBSTRATE AND REPLACE AS PART OF NEW CONSTRUCTION.
24. DEMOLISH EXISTING LOCKERS. REPAIR TO INSTALL NEW LOCKERS IN THE SAME LOCATION.
25. DEMOLISH EXISTING BUMPER RAILS THROUGHOUT CORRIDOR.
26. EXISTING SHELF TO REMAIN.
27. DEMOLISH EXISTING WALL COVERINGS (APPROXIMATELY 3' TALL) AND CHAIR RAIL IN ENTIRE ROOM. AT GENERAL CONTRACTOR'S OPTION, DRYWALL MAY REMOVED AND REPLACED. COORDINATE EXTENT AND DRYWALL REPLACEMENT WITH NEW CONSTRUCTION.

GENERAL NOTES

A. ITEMS NOT NOTED ARE EXISTING TO REMAIN. DASHED LINES GENERALLY INDICATE THAT AN ITEM IS TO BE DEMOLISHED. FOLLOW SHEET NOTES CAREFULLY. SEE MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS FOR ADDITIONAL INSTRUCTIONS. NOTIFY ARCHITECT OF ANY DISCREPANCIES.

B. SOME OF THE EXISTING WALLS AND DOORS ARE PRE-MANUFACTURED FURNITURE TYPE. COORDINATE WITH OWNER IF THESE ITEMS ARE TO SALVAGED.

C. FREE-STANDING FURNITURE SHOWN IS TO BE REMOVED BY OWNER'S FURNITURE VENDOR.

D. SEE DIMENSION NOTES ON G001 FOR DIMENSION INSTRUCTIONS.

E. GENERAL CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS AND THEIR COMPATIBILITY WITH NEW CONSTRUCTION PRIOR TO COMMENCEMENT OF DEMOLITION. REPORT ANY DISCREPANCIES TO THE ARCHITECT.

F. GENERAL CONTRACTOR SHALL PROVIDE TEMPORARY PROTECTION DURING DEMOLITION AND CONSTRUCTION FOR ALL EXISTING MATERIALS THAT ARE TO REMAIN. THIS MAY INCLUDE PROVIDING TEMPORARY BARRIERS OR PARTITIONS TO PROTECT ADJACENT AREAS FROM DUST AND/OR DAMAGE FOR WALLS, DOORS, FLOORS, CEILINGS, ETC.

G. STRUCTURAL COLUMNS AND BEAMS ARE PROTECTED WITH FIRE RETARDANT SPRAY AND ARE TO REMAIN. SPRAY MUST BE REPLACED IF REMOVED OR DAMAGED TO MAINTAIN EXISTING FIRE RATINGS.

H. CLEAN ADJACENT IMPROVEMENTS OF DUST, DIRT, AND DEBRIS CAUSED BY SELECTIVE DEMOLITION OPERATIONS. RETURN ADJACENT AREAS TO CONDITION EXISTING BEFORE SELECTIVE DEMOLITION OPERATIONS COMMENCED.

I. DEMOLISH PORTIONS OF EXISTING WALLS AS NEEDED TO PROVIDE NEW PLUMBING OR ELECTRICAL.

J. AREAS WHERE PLUMBING, MECHANICAL, OR ELECTRICAL WORK IS TO BE DONE ARE TO BE PATCHED AND REPAIRED TO MATCH EXISTING ADJACENT MATERIALS AND FINISHES UNLESS OTHERWISE NOTED. EXAMPLES INCLUDE HOLES LEFT BY REMOVAL OF PANELS, PHONES, CONDUITS, THERMOSTATS, PIPING, CONTROLS, ETC. COORDINATE WITH MECHANICAL, PLUMBING, AND ELECTRICAL FOR EXTENT OF WORK.

K. CONTRACTOR SHALL HAVE DEMOLISHED MATERIALS REMOVED FROM PREMISES AND DISPOSED OF LEGALLY.

L. THE CONTRACTOR SHALL MODIFY THE EXISTING FIRE SPRINKLER SYSTEM AS REQUIRED FOR MODIFICATIONS ACCORDING TO NFPA 13. THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE ALL DRAWINGS, SPECIFICATIONS AND CALCULATIONS REQUIRED BY THE FIRE MARSHAL. FIELD VERIFY ALL CONDITIONS. SEE PLUMBING DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.

M. REMOVE ALL EXISTING TELEVISIONS, PROJECTORS, SCREENS, OR OTHER SIMILAR ITEMS. COORDINATE WITH OWNER IF THESE ITEMS ARE TO BE SALVAGED OR DEMOLISHED.

N. SOME ADDITIONAL DRYWALL, BEYOND WHAT IS SPECIFIED, MAY NEED TO BE REMOVED IN ORDER TO INSTALL BACKING / BLOCKING FOR VARIOUS ITEMS (SPECIFICALLY SHELVING. THE CONTRACTOR IS RESPONSIBLE TO COORDINATE ALL SCOPES AND EXTENTS OF DEMOLITION AND RECONSTRUCTION.

O. SEE ENGINEERING SHEETS FOR ADDITIONAL INFORMATION.

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DATE: SEPTEMBER 23, 2020
PROJECT #: 20-020
PROJ. MAN.: JSJ
CHECKED BY: GWT

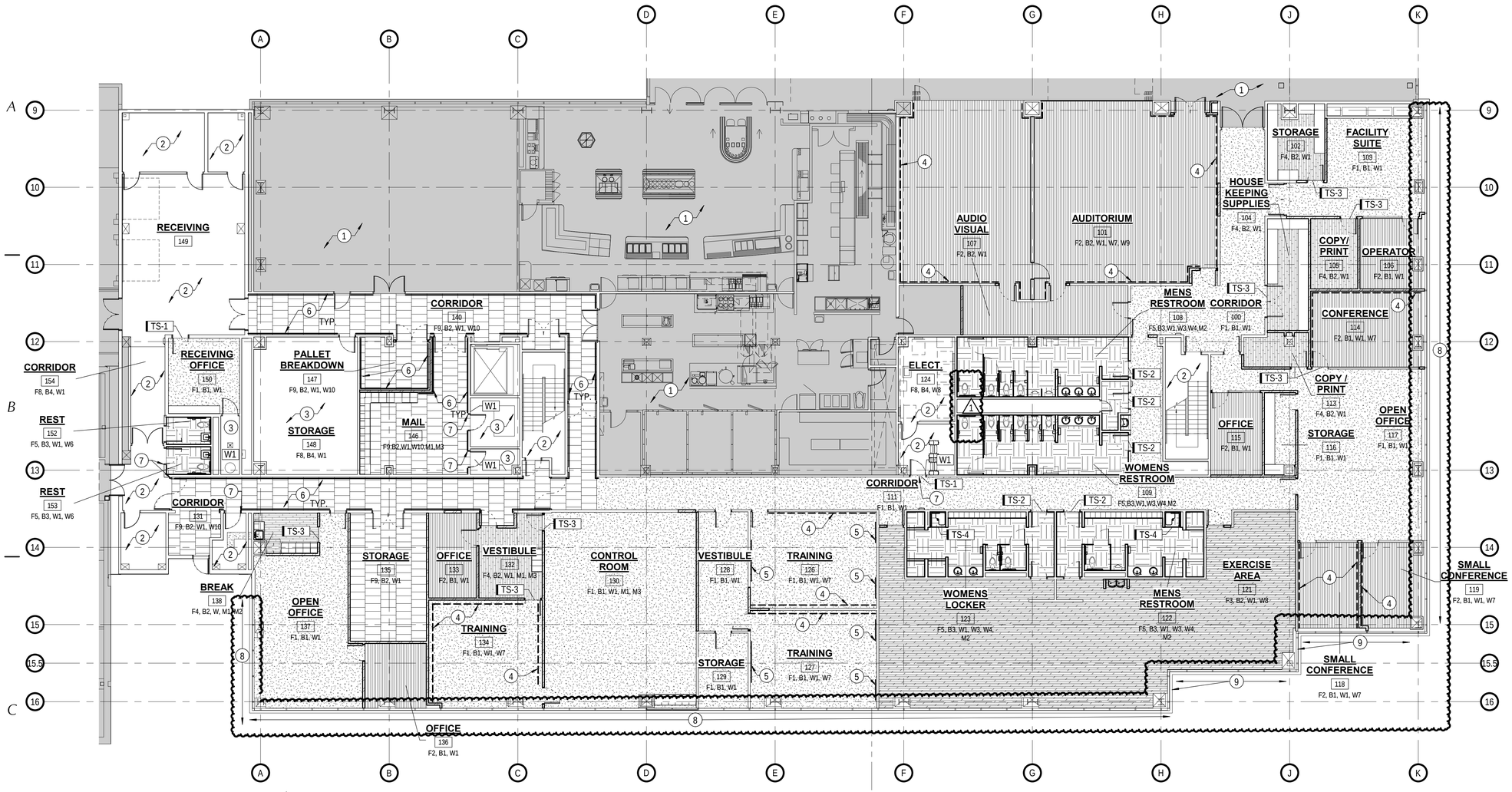
PROJECT:
INTERMOUNTAIN LAKE PARK LEVEL 1 REMODEL

4646 LAKE PARK BLVD
WEST VALLEY CITY, UTAH 84120

SHEET DESCRIPTION:
DEMOLITION LEVEL 1 FLOOR PLAN

SHEET:
AD101

MARK	REVISION	DATE
1	ADDENDUM #01	10/16/2020



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C2 LEVEL 1 INTERIOR FINISH PLAN

AI101 | SCALE: 3/32" = 1'-0"

SHEET NOTES

1. SHADED AREA INDICATES OUT OF SCOPE AREA. UNLESS OTHERWISE NOTED, NO WORK IN THIS AREA.
2. EXISTING FINISHES TO REMAIN IN THIS AREA. NO CHANGES.
3. EXISTING FLOORING TO REMAIN.
4. DASHED LINE INDICATES RECESSED WOOD CHAIR RAIL WITH EXTRA LAYER OF 5/8" DRYWALL BEYOND WHAT IS SPECIFIED IN THE WALL TYPES. PER DETAIL A5/A551. BID AS A DEDUCTIVE ALTERNATE. BID AS AN ADD ALTERNATE TO JUST PROVIDE THE WOOD CHAIR RAIL WITHOUT THE EXTRA DRYWALL. VERIFY MOUNTING HEIGHT WITH FURNITURE SUPPLIER PRIOR TO INSTALLATION.
5. WHITEBOARD BY OWNER'S FURNITURE SUPPLIER.
6. DARK LINE INDICATES NEW BUMPER RAIL AND WALL PROTECTION AS PER DETAIL B3/A551. SEE FINISH W10.
7. TOUCH UP PAINT WHERE DOORS ARE BEING REPLACED.
1. 8. PROVIDE WINDOW SHADE PER GENERAL NOTE "G". APPROXIMATELY 6'-0" TALL. FIELD VERIFY ALL CONDITIONS.
9. PROVIDE WINDOW SHADE PER GENERAL NOTE "G". APPROXIMATELY 8'-0" TALL. FIELD VERIFY ALL CONDITIONS.

GENERAL NOTES

A. GENERAL CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS PRIOR TO CONSTRUCTION. REPORT ANY SIGNIFICANT DISCREPANCIES TO THE ARCHITECT.
B. PAINTED GYPSUM BOARD CEILINGS SHALL BE P2. PAINTED HOLLOW METAL DOOR FRAMES SHALL BE P1. SEE FINISH SCHEDULE.
C. MILLWORK SHOWN FOR CLARITY. PROVIDE FLOORING UNDER EQUIPMENT, MILLWORK AND COUNTERTOPS.
D. PROVIDE SUBMITTALS FOR ALL FINISHES.
E. CONTRACTOR TO VERIFY TRANSITION STRIP DIMENSIONS WITH MATERIAL THICKNESS. ALL TRANSITIONS SHALL BE ADA COMPLIANT. SEE DETAILS C1/A701 AND C2/A701.
F. PROVIDE 4' TALL STAINLESS STEEL CORNER GUARDS ON ALL EXTERIOR CORNERS THROUGHOUT SCOPE OF PROJECT.
1. G. PROVIDE NEW WINDOW SHADES ON ALL IN-SCOPE EXTERIOR WINDOWS AS REQUIRED. HUNTER DOUGLAS SHADE TO MATCH LEVEL 2-4 STANDARD. SHADES SHALL BE MANUAL CHAIN OPERATED WITH A TOP ENCLOSURE AND ARE TO BE BROKEN AT EACH VERTICAL MULLION (TYPICAL SPACING AT 5' O.C.
H. EXTEND FLOORING UNDER MILLWORK.
I. SEE SHEET A551 FOR TILE PATTERN DETAILS.

FINISH SYMBOLS

TRANSITION STRIP TAG — TS-? — TRANSITION STRIP NUMBER

WALL & BASE FINISH SPECIFIC — W1, B1 — WALL FINISH / MATERIAL TRANSITION / BASE FINISH

TRANSITION STRIP SCHEDULE

CODE	TRANSITION	SPECIFICATION
TS-1	CARPET TO CONC.	SCHLUTER, RENO-U AEU35, COLOR AS APPROVED BY ARCHITECT, 1/8"
TS-2	CARPET TO TILE	SCHLUTER, SCHIENE AE45, COLOR AS APPROVED BY ARCHITECT, 3/8"
TS-3	CARPET TO LVT	JOHNSONITE, SLIM LINE NOSING SLN-XXB, COLOR AS APPROVED BY ARCHITECT, 0.8" TO 1/4"
TS-4	ADA THRESHOLD	DALTILE CHIARO BEIGE M710 MARBLE THRESHOLD; SEE DETAIL C2/A701

FINISH SCHEDULE / LEGEND

NOTE: SEE INTERIOR ELEVATIONS FOR EXTENT OF FINISHES

	CODE	MATERIAL
FLOOR	F1	9" X 36" CARPET TILES - SHAW CONTRACT, COLOR FORM 5T112, PARADOX 81500, INSTALL QUARTER TURN
	F2	24" X 24" CARPET TILES (ACCENT)- SHAW CONTRACT, COLOR FRAME 5T061, PARADOX 81500, INSTALL MONOLITHIC
	F3	24" x 24" RUBBER ATHLETIC FLOORING - MANNINGTON COMMERCIAL,STYLE: RESET; COLOR: GRAY TONES (827).
	F4	4" X 36" LUXURY VINYL TILE - MANNINGTON COMMERCIAL, NATURES PATH- DISSOLVE, COLOR: RECEDE 12327, ASHLAR INSTALL
	F5	MOSAIC FLOOR TILE - DALTILE, KEYSTONES 2X2 HEX, COLOR- ARTISAN BROWN D144
	F6	12" x 12" STATIC DISSIPATING TILE - NOT USED
FLOOR	F7	SEALED CONCRETE
	F8	EXISTING FLOOR
	F9	17.5" x 35" RUBBER TILE - MANNINGTON COMMERCIAL, TELES, COLOR BEACH STONE 853TRC; ASHLAR INSTALL
BASE	B1	CARPET BASE (MATCH CARPET TYPE)
	B2	4" RUBBER BASE - MANNINGTON, BURKE BASE TYPE TV COLOR: JACKALOPE
	B3	CERAMIC TILE BASE - MATCH WALL TILE
	B4	EXISTING BASE- CLEAN EXISTING
WALL	W1	PAINTED GYPSUM BOARD - GENERAL SHERWIN WILLIAMS SW6252 ICE CUBE, SEMI-GLOSS FINISH
	W2	PAINTED GYPSUM BOARD - ACCENT COLOR 1 SHERWIN WILLIAMS SW7024 FUNCTIONAL GRAY, SEMI-GLOSS FINISH
WALL	W3	RESTROOM GENERAL WALL TILE 6.5" X 20" PORCELAIN TILE - CAESAR, VERANDA SERIES, FOG P542
	W4	RESTROOM ACCENT WALL TILE 1" X 1" GLASS TILE- VOGUEBAY, LASER GLASS, COLOR: BLEND- MISSION BROWN
	W5	WALL TILE- ACCENT BREAK ROOM/DRINKING FOUNTAIN DALTILE, SEMI-GLOSS, COLOR: KEY LIME 3" X 6"
	W6	WALL TILE- ACCENT BREAK ROOM/DRINKING FOUNTAIN DALTILE, SEMI-GLOSS, COLOR: ARCTIC WHITE 3" X 6"
	W7	CHAIR RAIL- MAPLE, STAINED TO MATCH EXISTING CHAIR RAIL
	W8	EXISTING WALL MATERIAL TO REMAIN-TOUCH UP AS NEEDED
	W9	OPERABLE PARTITION WALL COVERING- MODERCO; ORLEANS COLOR BEIGNET R921-01
	W10	WALL PROTECTION- COLOR 4Y KOALA, TEXTURE: P1 DUNE KOROGARD C400 SERIES WALL PROTECTION SYSTEMS- 4" VINYL CRASH RAIL AND CONTINUOUS ALUMINUM RETAINER AND .040" THICK SOLID PROTECTIVE WALLCOVERING.
MILLWORK	M1	WOOD VENEER MILLWORK- TREE FROG WHITE OAK 60204, STRAIGHT GRAIN
	M2	QUARTZ COUNTERTOP- CAMBRIA WHITEHALL 0120
	M3	PLASTIC LAMINATE COUNTERTOP - WILSONART GESSO TRACERY 4962-38
	M4	TOILET PARTITIONS - METPAR DUR-A-TEX, CLEAR COAT NICKEL SILVER; PATTERN TO RUN VERTICALLY 1/4" MAXIMUM GAPS
OTHER	TS1	FLOOR TRANSITION SLT-XX-C COLOR: JOHNSONITE 28E TOAST
	P1	PAINT- HOLLOW METAL DOOR FRAMES- SHERWIN WILLIAMS : REQUISITE GRAY SW7024; SEMI- GLOSS FINISH
	P2	PAINTED GYPSUM BOARD CEILING- SHERWIN WILLIAMS: EXTRA WHITE SW7006; SATIN FINISH

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DATE: SEPTEMBER 23, 2020
PROJECT #: 20-020
PROJ. MAN.: JSJ
CHECKED BY: GWT

PROJECT:
INTERMOUNTAIN LAKE PARK LEVEL 1 REMODEL

4646 LAKE PARK BLVD
WEST VALLEY CITY, UTAH 84120

SHEET DESCRIPTION: **LEVEL 1 INTERIOR FINISH PLAN**

SHEET: **AI101**

N

C2 LEVEL 1 FURNISHINGS PLAN

AP101 | SCALE: 3/32" = 1'-0"

MARK	REVISION	DATE
1	ADDENDUM #01	10/16/2020

SHEET NOTES

1. SHADED AREA INDICATES OUT OF SCOPE AREA. UNLESS OTHERWISE NOTED, NO WORK IN THIS AREA.
2. FLOOR BOX WITH POWER AND DATA WITH FURNITURE WHIP TERMINATIONS. VERIFY ALL DETAILS WITH ELECTRICAL AND FURNITURE SUPPLIER.
3. FLOOR BOX WITH POWER AND DATA (AND AUDIO VISUAL WHERE INDICATED) WITH NORMAL TERMINATIONS. VERIFY ALL DETAILS WITH ELECTRICAL AND FURNITURE SUPPLIER.
4. FLOOR BOX WITH POWER ONLY WITH NORMAL TERMINATIONS. VERIFY ALL DETAILS WITH ELECTRICAL AND FURNITURE SUPPLIER.
5. PROVIDE POWER AND ALL INFRASTRUCTURE FOR ADA DOOR OPENER (PB) AND CARD READER (CR) AS REQUIRED. COORDINATE ALL DETAILS BETWEEN TRADES.
6. PROVIDE POWER AND DATA ABOVE COPY ROOM WORK SURFACE. ORIENT ELECTRICAL BOXES HORIZONTALLY. COORDINATE ALL DETAILS AND HEIGHT WITH OWNER'S FURNITURE SUPPLIER (MIDWEST).
7. CEILING MOUNTED TELEVISION. SEE AUDIO VISUAL DRAWINGS FOR ADDITIONAL INFORMATION.
8. WALL MOUNTED TELEVISION. SEE AUDIO VISUAL DRAWINGS FOR ADDITIONAL INFORMATION.
9. WALL MOUNTED TELEVISION. REMOVE A LARGE ENOUGH SECTION OF ACOUSTICAL SOUND BOARD TO ALLOW FOR INSTALLATION. PATCH AND REPAIR AS REQUIRED. SEE AUDIO VISUAL DRAWINGS FOR ADDITIONAL INFORMATION.

SYMBOL LEGEND

- EXISTING DEVICE
- DUPLEX RECEPTACLE-SEE ELECTRICAL
- GFCI DUPLEX RECEPTACLE-SEE ELECTRICAL
- CEILING MOUNTED DUPLEX RECEPTACLE-SEE ELECTRICAL
- GFCI GFCI PROTECTED RECEPTACLE
- LIGHT SWITCH-SEE ELECTRICAL
- DATA-SEE ELECTRICAL
- CARD READER-SEE DOOR HARDWARE
- PUSH BUTTON FOR ADA DOOR OPENER-SEE DOOR HARDWARE
- MAG HOLD OPEN -REQUIRES LINE VOLTAGE
- MOTION SENSOR FOR ADA DOOR OPENER
- TELEVISION CONNECTIONS - SEE AUDIO VISUAL
- FLOOR BOXES - SEE ELECTRICAL
- AUDIO VISUAL CONNECTIONS - SEE AUDIO VISUAL
- LINE VOLTAGE FOR ADA OPERATOR (PROVIDE POWER ON THE DOOR LEAF DESIGNATED) OR HARDWIRE FURNITURE FEED AS REQUIRED
- SECURITY CAMERA-BY OWNER LOW VOLTAGE AS PER ELECTRICAL

GENERAL NOTES

A. THE INTENT OF THIS DRAWING IS TO PROVIDE SUPPLEMENTAL LOCATION AND DIMENSIONAL INFORMATION FOR CERTAIN ELECTRICAL DEVICES. IT IS NOT INTENDED TO SUPERSEDE ELECTRICAL INFORMATION OR SHEETS. REFER TO THE ELECTRICAL SHEETS FOR ADDITIONAL INFORMATION.

B. SEE G001 DIMENSION NOTES. DIMENSIONS TO FLOOR BOXES AND OTHER ELECTRICAL DEVICES ARE TO THE CENTERLINE OF THE COVER PLATES / BOXES. DIMENSIONS TO NOTIFY ARCHITECT IF MORE THAN A 2" DISCREPANCY IS FOUND. COORDINATE ALL DETAILS WITH FURNITURE SUPPLIER IN THE FIELD.

C. PROVIDE GFCI OUTLETS WHERE REQUIRED BY CODE. SEE ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION.

D. ALL DEVICES NEEDING TO BE ACCESSED, SHALL MEET ADA ACCESSIBLE REACH RANGES. SEE G002 FOR STANDARD HEIGHTS.

E. PROVIDE LIGHT SWITCHES IN UNIQUE LOCATIONS AS SHOWN ON THE PLAN.

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DATE: SEPTEMBER 23, 2020
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PROJECT:
INTERMOUNTAIN LAKE PARK LEVEL 1 REMODEL

4646 LAKE PARK BLVD
WEST VALLEY CITY, UTAH 84120

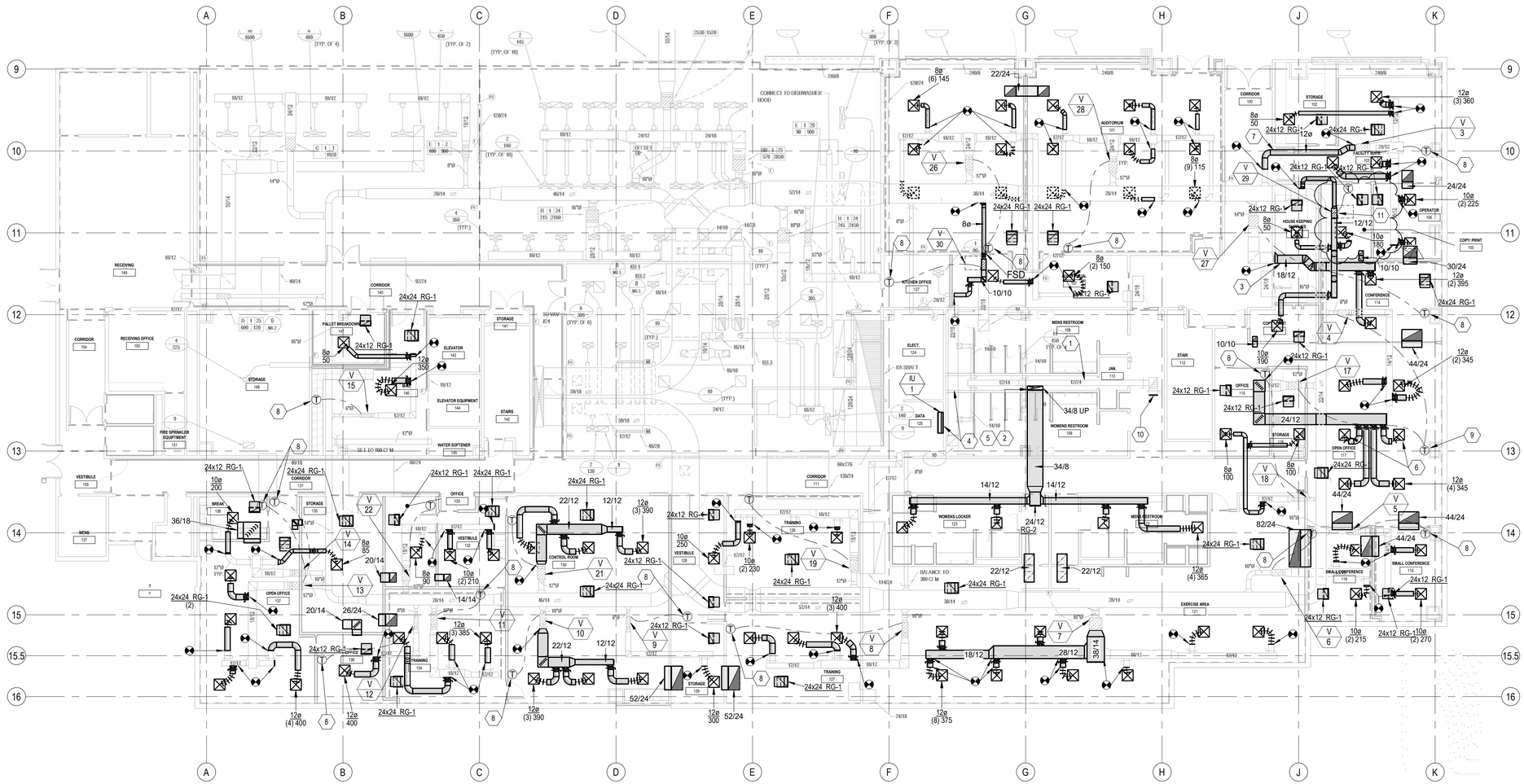
SHEET DESCRIPTION:
LEVEL 1 ARCHITECTURAL POWER PLAN

SHEET:
AP101

MARK	REVISION	DATE
1	Addendum #1	10-16-20

KEYED NOTES

1. EXISTING ELEMENTS SHOWN LIGHT, TYPICAL.
2. INSTALL OFFSETS AS NECESSARY FROM FLOOR TO FLOOR TO ACCOMMODATE EXISTING ELEMENTS.
3. RELOCATE EXISTING DUCTWORK TO AVOID NEW WALL.
4. RUN REFRIGERANT PIPING IN PLUMBING CHASE TO FOURTH FLOOR CEILING. EXIT CHASE AT FOURTH AND RUN IN FOURTH FLOOR CEILING TO OUTDOOR UNIT. VERIFY EXACT ROUTE.
5. INSTALL FIRE DAMPER AT LEVEL 2 FLOOR PENETRATION. FIRE WRAP DUCT WORK FROM LEVEL 2 FLOOR PENETRATION TO ROOF PENETRATION.
6. PAINT DIFFUSER TO MATCH CEILING COLOR.
7. RELOCATE EXISTING DUCTWORK OFF OF NEW WALL TO AVOID CONFLICT.
8. REUSE AND RELOCATE EXISTING THERMOSTATS.
9. TIE EXISTING VAV BOXES TO A SINGLE THERMOSTAT. REUSE EXISTING THERMOSTAT.
10. CAP AND SEAL EXISTING DUCTWORK.
11. TIE ALL NEW VAV BOXES TO EXISTING BMS, TYPICAL. CONTROLS CONTRACTOR SHALL BE CARRIER.



1 MECHANICAL PLAN LEVEL 1
MH101 | SCALE: 3/32" = 1'-0"

CURTIS MINER ARCHITECTURE
233 SOUTH PLEASANT GROVE BLVD.
SUITE #105
PLEASANT GROVE, UTAH 84062
PHONE: (801) 769-3000
cma@cmautah.com

DATE: SEPT 23,2020
PROJECT #: 20-020
PROJ. MAN.: JSJ
CHECKED BY: GWT

PROJECT:
INTERMOUNTAIN LAKE PARK LEVEL 1 REMODEL

4646 LAKE PARK BLVD
WEST VALLEY CITY, UTAH 84120

LICENSED PROFESSIONAL ENGINEER
No. 11599476-2202
DALLEN BLAIR ROMRIELL
09-23-20
STATE OF UTAH

SHEET DESCRIPTION:
MECHANICAL PLAN LEVEL 1

SHEET:
MH101

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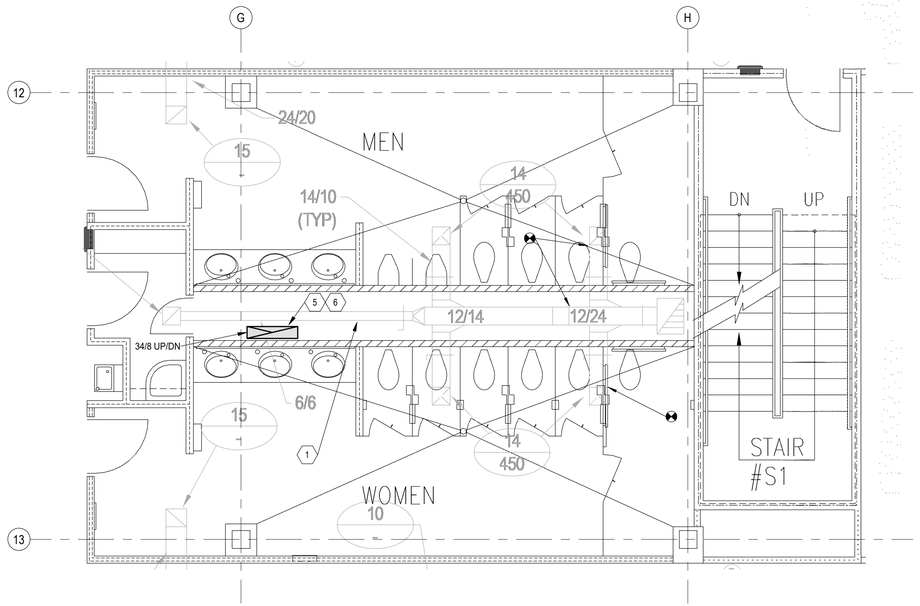
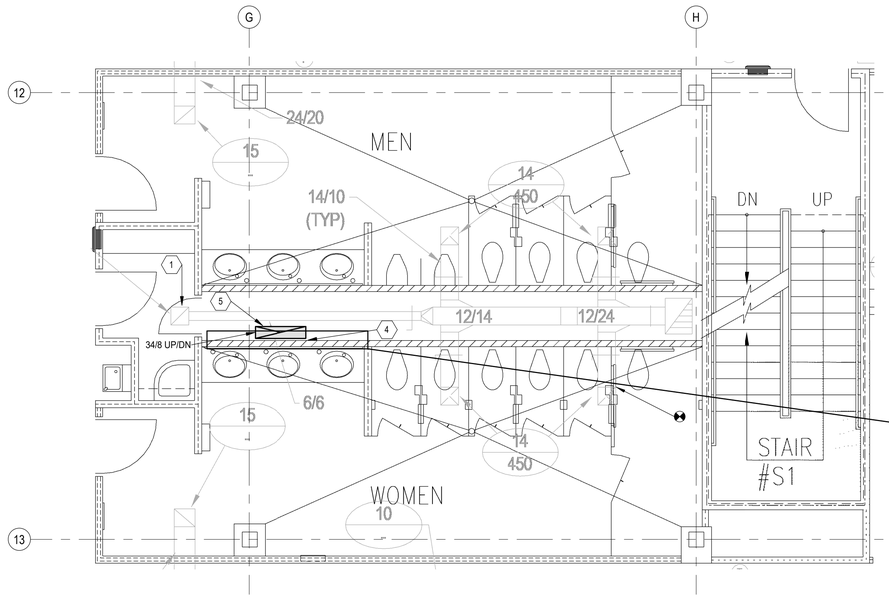


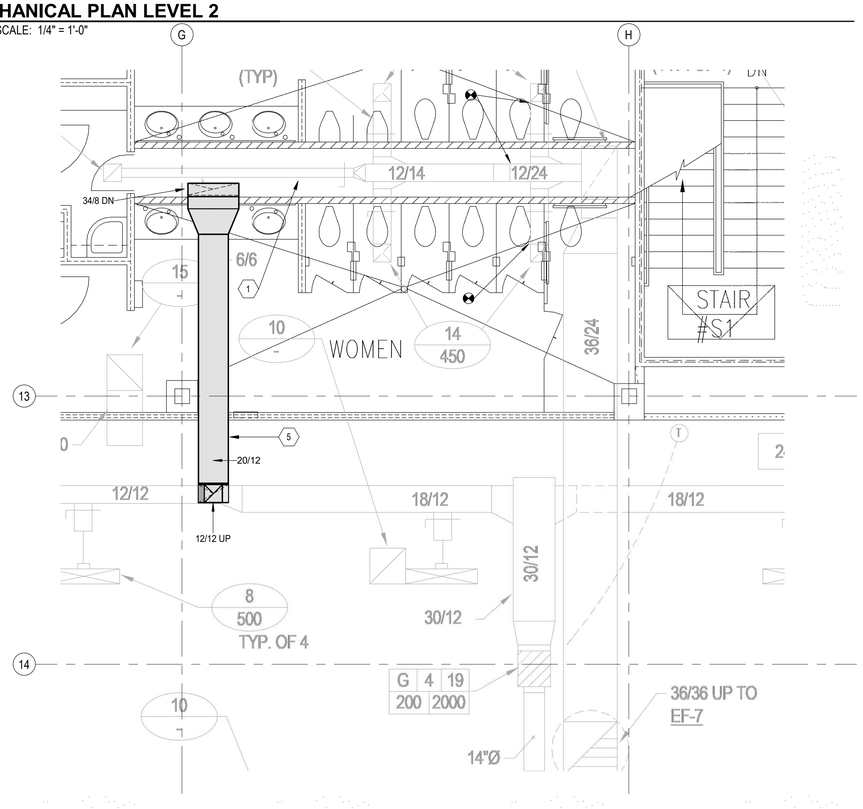
1 MECHANICAL PLAN LEVEL 2

MH102 | SCALE: 1/4" = 1'-0"



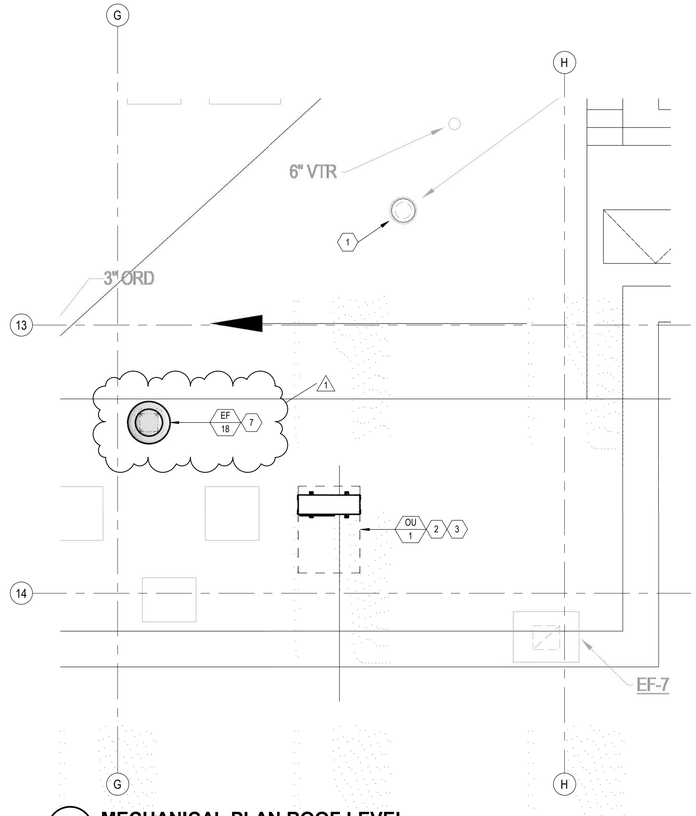
2 MECHANICAL PLAN LEVEL 3

MH102 | SCALE: 1/4" = 1'-0"



3 MECHANICAL PLAN LEVEL 4

MH102 | SCALE: 1/4" = 1'-0"



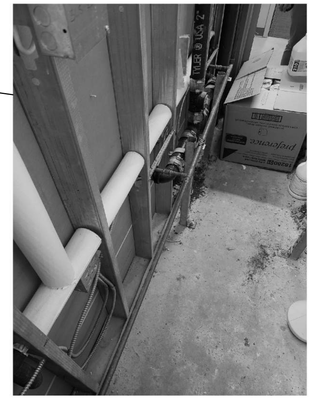
4 MECHANICAL PLAN ROOF LEVEL

MH102 | SCALE: 1/4" = 1'-0"

MARK	REVISION	DATE
1	Addendum #1	10-16-20

KEYED NOTES

1. EXISTING ELEMENTS SHOWN LIGHT, TYPICAL.
2. PLACE UNIT ON MIRO EQUIPMENT STAND OR EQUIVALENT.
3. PROTECT REFRIGERANT PIPING WITH METAL SHROUD AS PIPES PENETRATE ROOF.
4. RELOCATE PLUMBING THAT SERVE LAVATORIES AS NECESSARY TO ALLOW FOR NEW DUCT RUN.
5. FIRE WRAP DUCT WORK FROM LEVEL 2 FLOOR PENETRATION TO ROOF PENETRATION.
6. INSTALL FIRE DAMPER AT LEVEL 2 FLOOR PENETRATION.
7. TIE NEW FAN TO EXISTING BMS.



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DATE: SEPT 23,2020
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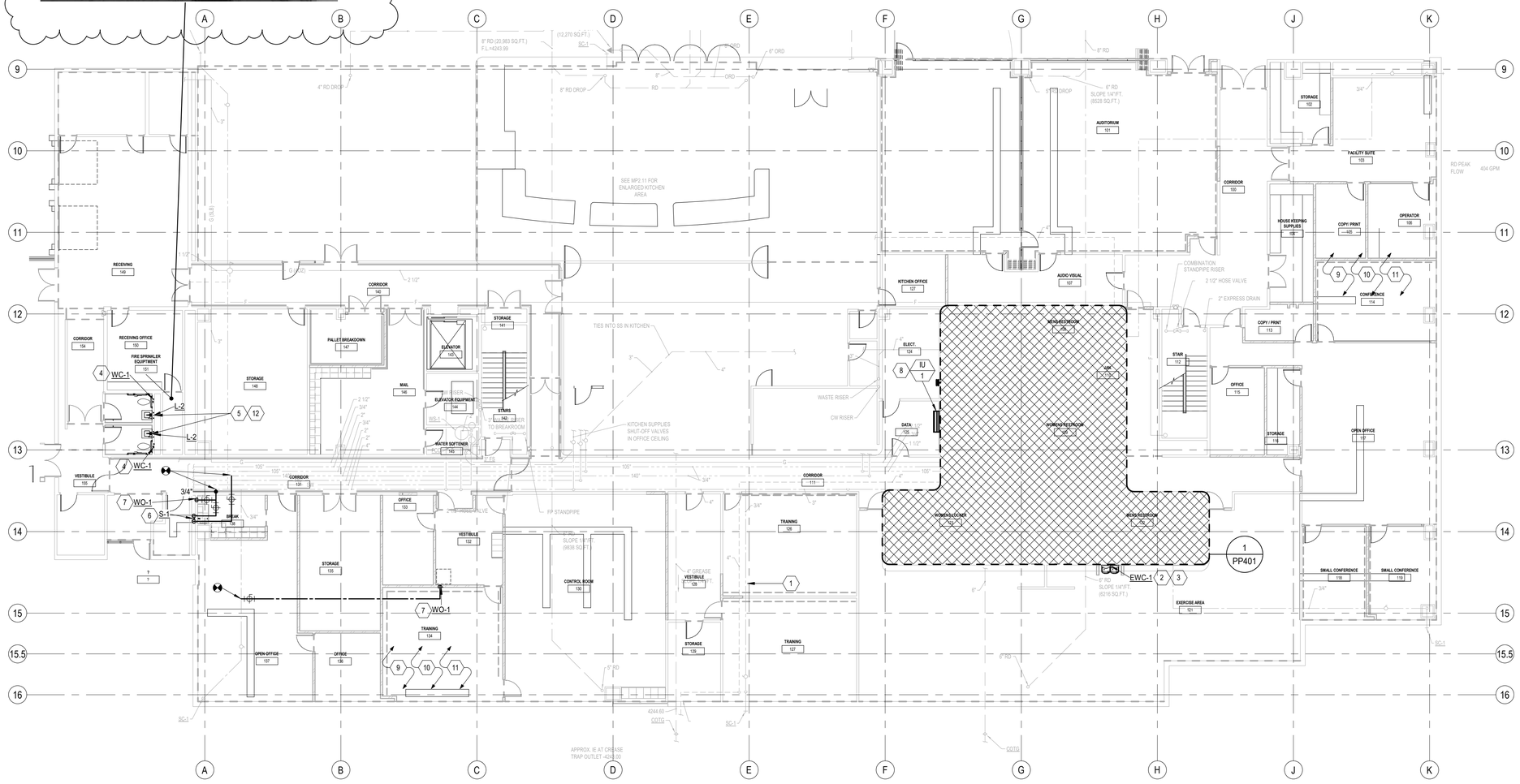
PROJECT:
INTERMOUNTAIN LAKE PARK LEVEL 1 REMODEL

4646 LAKE PARK BLVD
WEST VALLEY CITY, UTAH 84120

LICENSED PROFESSIONAL ENGINEER
No. 11599476-2202
DALLEN BLAIR ROMRIELL
09-23-20
STATE OF UTAH

SHEET DESCRIPTION:
MECHANICAL PLAN UPPER FLOORS

SHEET:
MH102



1 PLUMBING PLAN LEVEL 1

PP101 | SCALE: 3/32" = 1'-0"

MARK	REVISION	DATE
1	Addendum #1	10-16-20

KEYED NOTES

1. EXISTING ELEMENTS SHOWN LIGHT, TYPICAL.
2. PROVIDE NEW STOPS AT ALL NEW FIXTURES, TYPICAL.
3. REWORK EXISTING PLUMBING TO ACCOMMODATE NEW ELECTRIC WATER COOLER.
4. REWORK EXISTING WASTE AND VENT LINE TO ACCOMMODATE NEW FLOOR MOUNTED BACKOUTLET WATER CLOSET.
5. ELECTRICAL TO HARD WIRE NEW FAUCETS.
6. TRENCH WASTE TO FLOOR DRAIN AND CONNECT. RUN AND CONNECT VENT TO NEAREST 2" VENT LINE.
7. RUN CONDENSATE LINE TO NEAREST CONDENSATE MAIN OR SERVICE SINK. COORDINATE WITH OWNER PROVIDED EQUIPMENT.
8. ROUTE CONDENSATE LINE TO JAN (110) AND TERMINATE IN SS-1.
9. THE FIRE SPRINKLER CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF THE EXISTING FIRE SPRINKLERS. ADD/REPOSITION EXISTING SPRINKLER LOCATION WITH A NEW SPRINKLER HEAD AS NECESSARY FOR THE REMODELED SPACE, INCLUDING NEW FLOOR PLAN, CEILING PLAN AND CEILING HEIGHT ADJUSTMENTS, MODIFY SPRINKLER PIPING AS REQUIRED, TYPICAL FOR ENTIRE SCOPE OF THE PROJECT. REFER TO THE ARCHITECTURAL SHEETS FOR COMPLETE SCOPE OF THE PROJECT.
10. ALL SPRINKLERS IN THE REMODELED SCOPE OF WORK ARE TO BE REPLACED WITH QUICK RESPONSE TYPE TO MATCH THE RATING OF SPACE. REPLACEMENT OF SPRINKLERS SHALL EXTEND TO ALL WALLS OR SOFFIT BREAKS. ALL HEADS TO BE FLAT PLATE CONCEALED.
11. FIRE SPRINKLERS SHALL BE INSTALLED TO MEET NFPA 13-2016 REQUIREMENTS, TYPICAL FOR ENTIRE SCOPE OF THE PROJECT.
12. INSTALL TRANSFORMER FOR FAUCET BEHIND CHASE. SEE ARCHITECTURAL DRAWINGS FOR LOCATION OF ACCESS PANEL.
13. EXISTING FIRE SPRINKLER RISER. REMOVE EXISTING CHECK VALVE AND INSTALL DOUBLE CHECK BACKFLOW ASSEMBLY TO BRING RISER UP TO CURRENT CODE STANDARDS. ADD/REARRANGE PIPING AND OTHER VALVES AS NECESSARY TO ACCOMODATE THE UPGRADE OF THE RISER.

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PROJECT:
INTERMOUNTAIN LAKE PARK LEVEL 1 REMODEL

4646 LAKE PARK BLVD
WEST VALLEY CITY, UTAH 84120

LICENSED PROFESSIONAL ENGINEER
No. 11599476-2202
DALLEN BLAIR ROMRIELL
09-23-20
STATE OF UTAH

SHEET DESCRIPTION:
PLUMBING PLAN LEVEL 1

SHEET:
PP101

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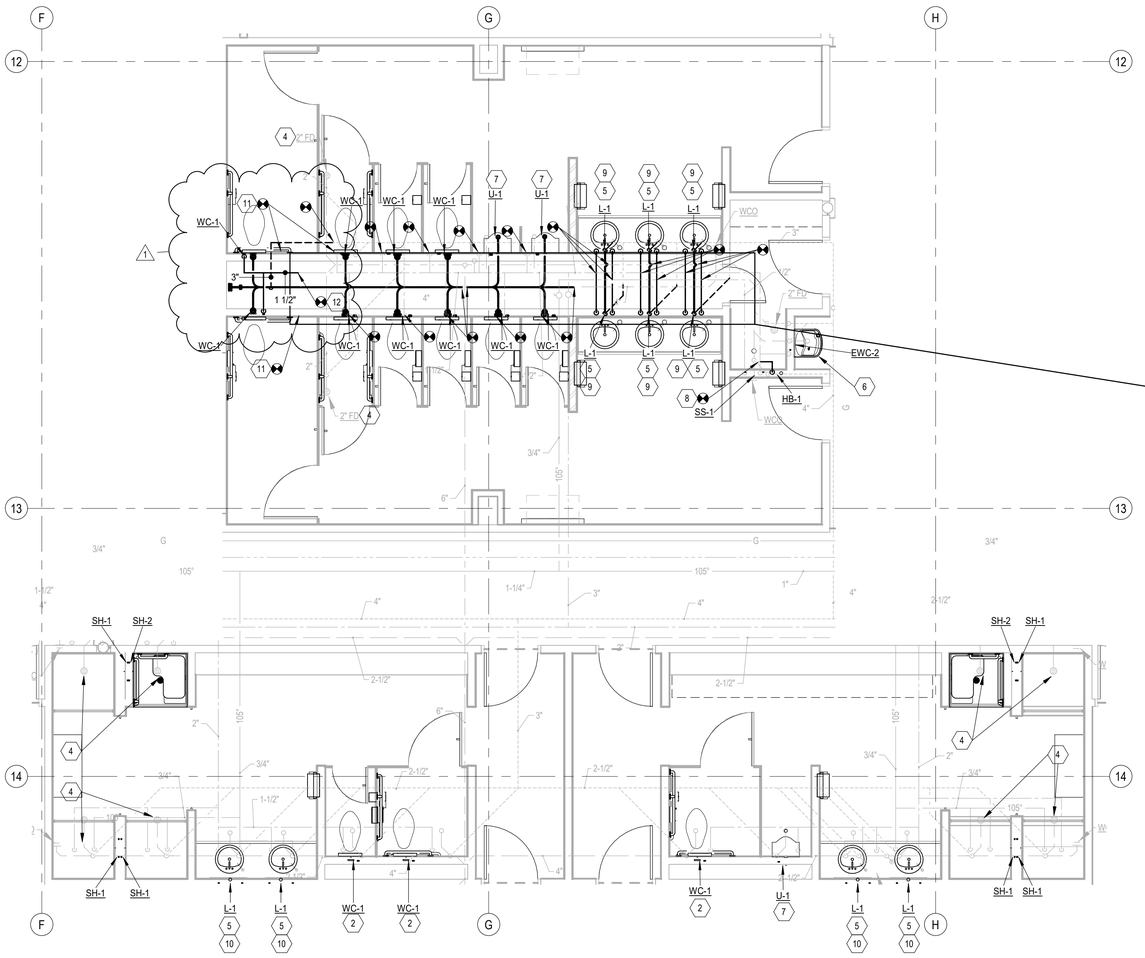
MARK	REVISION	DATE
1	Addendum #1	10-16-20

KEYED NOTES

1. EXISTING ELEMENTS SHOWN LIGHT, TYPICAL.
2. RECONNECT WASTE AND VENTING TO NEW BACKOUTLET WATER CLOSETS. MATCH EXISTING FLOORS ABOVE WHERE APPLICABLE.
3. PLUMBING CHASE ON LEVEL 3.
4. REPLACE GRATE ON ALL FLOOR SINKS AND SHOWERS MATCH EXISTING TYPE AND FINISH, TYPICAL.
5. REPLACE WITH NEW LAVATORY FIXTURE. REPLACE THERMOSTATIC MIXING VALVES, STOPS, AND CHECK VALVES.
6. REWORK EXISTING PLUMBING TO ACCOMMODATE NEW ELECTRIC WATER COOLER. PROVIDE WITH NEW STOP.
7. REWORK EXISTING PLUMBING TO ACCOMMODATE NEW URINAL. PROVIDE WITH NEW STOP.
8. PROVIDE SHUT OFF VALVE ON DCW LINE TO HOSE BIB.
9. INSTALL TRANSFORMER FOR FAUCETS BEHIND PLUMBING CHASE.
10. INSTALL TRANSFORMER FOR FAUCETS ABOVE CEILING. SEE ARCHITECTURAL DRAWINGS FOR LOCATION OF ACCESS PANEL.
11. RELOCATE DCW LINES TO WATER CLOSETS/ URINALS TO MATCH NEW LOCATIONS, TYPICAL.
12. EXTEND DCW TO NEW LOCATION.



1 **PLUMBING ENLARGED PLAN RESTROOMS**
PP401 | SCALE: 1/4" = 1'-0"

CURTIS MINER ARCHITECTURE
233 SOUTH PLEASANT GROVE BLVD. SUITE #105
PLEASANT GROVE, UTAH 84062
PHONE: (801) 769-3000
cma@cmautah.com

DATE:	SEPT 23,2020
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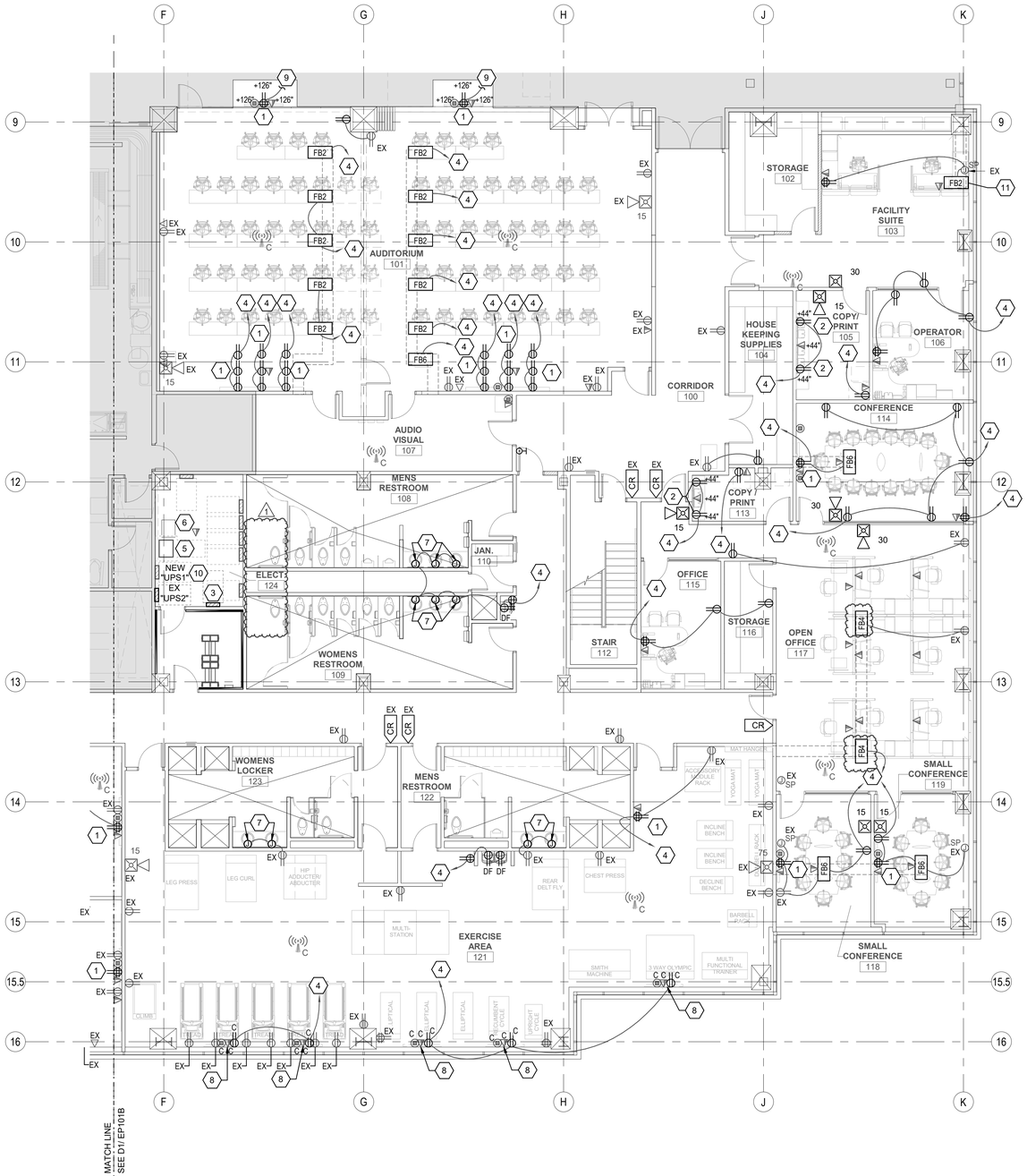
PROJECT:
INTERMOUNTAIN LAKE PARK LEVEL 1 REMODEL

4646 LAKE PARK BLVD
WEST VALLEY CITY, UTAH 84120

LICENSED PROFESSIONAL ENGINEER
No. 11599476-2202
DALLEN BLAIR ROMRIELL
09-23-20
STATE OF UTAH

SHEET DESCRIPTION:
PLUMBING ENLARGED RESTROOM PLAN

SHEET:
PP401



D1 LEVEL 1 POWER PLAN - AREA A

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

MARK	REVISION	DATE
1	Addendum #01	10/16/20

GENERAL SHEET NOTES

A HATCHED AREA IS NOT IN SCOPE.

B REFER TO AP101 FOR DIMENSIONS AND OTHER INSTRUCTIONS.

C REPLACE ALL EXISTING OUTLETS SHOWN AS EXISTING (EXCEPT FOR THOSE IN NOT IN SCOPE AREAS) WITH NEW RECEPTACLES AND CONNECT TO EXISTING WIRING.

SHEET KEYNOTES

1 COORDINATE MOUNTING HEIGHT OF MONITOR WITH A/V INSTALLER AND INSTALL OUTLET AT APPROPRIATE HEIGHT.

2 MOUNT OUTLETS HORIZONTALLY.

3 PROVIDE ADD ALTERNATE TO PROVIDE 100/3 SUBFEED BREAKER IN EXISTING 120/208V PANEL AND FEED NEW 100A, 42 CIRCUIT PANEL WITH (42) 20/1 SPARES.

4 CIRCUIT TO SPARE 20/1 BREAKER IN "1PSA" OR "1PSB".

5 EXISTING 45 KVA TRANSFORMER.

6 ELECTRICAL EQUIPMENT IS EXISTING TO REMAIN UNLESS NOTED OTHERWISE.

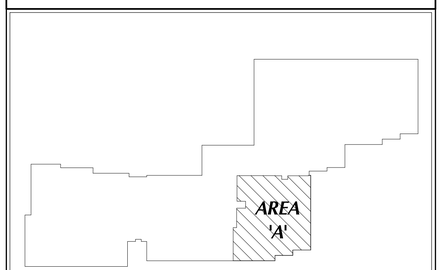
7 PROVIDE CONNECTIONS TO HARD-WIRE FAUCET. COORDINATE WITH PLUMBING CONTRACTOR.

8 OUTLETS MOUNTED IN CEILING FOR TV.

9 TO ROOM OUTLET CIRCUIT.

10 NEW PANEL TO BE FED FROM 45 KVA TRANSFORMER THEN RE-FEED EXISTING PANEL. SEE ONE-LINE DIAGRAM.

11 VERIFY EXISTING CONDITIONS. IF THERE IS EXISTING POWER AND DATA, NO FLOOR BOX IS NEEDED. BID WITH FLOOR BOX.



KEY PLAN:

CURTIS MINER ARCHITECTURE
233 SOUTH PLEASANT GROVE BLVD. SUITE #105
PLEASANT GROVE, UTAH 84062
PHONE: (801) 769-3000
cma@cmautah.com

DATE: SEPT 16, 2020
PROJECT #: 20-020
PROJ. MAN.: JSJ
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PROJECT:
INTERMOUNTAIN LAKE PARK LEVEL 1 REMODEL

4646 LAKE PARK BLVD
WEST VALLEY CITY, UTAH 84120

LICENSED PROFESSIONAL ENGINEER
No. 5148728
DAVID G. HINCKLEY
STATE OF UTAH

SHEET DESCRIPTION:
LEVEL 1 POWER PLAN - AREA A

SHEET:
EP101A

MARK	REVISION	DATE
1	Addendum #01	10/16/20

GENERAL SHEET NOTES

A HATCHED AREA IS NOT IN SCOPE.

B REFER TO AP101 FOR DIMENSIONS AND OTHER INSTRUCTIONS.

C REPLACE ALL EXISTING OUTLETS SHOWN AS EXISTING (EXCEPT FOR THOSE IN NOT IN SCOPE AREAS) WITH NEW RECEPTACLES AND CONNECT TO EXISTING WIRING.

SHEET KEYNOTES

1 COORDINATE MOUNTING HEIGHT OF MONITOR WITH A/V INSTALLER AND INSTALL OUTLET AT APPROPRIATE HEIGHT.

2 PROVIDE CONNECTIONS TO HARD-WIRE FAUCET. COORDINATE WITH PLUMBING CONTRACTOR.

3 CIRCUIT TO SPARE 20/1 BREAKER IN "1PSA" OR "1PSB".

4 PROVIDE CONNECTIONS TO AUTOMATED SOAP DISPENSER.

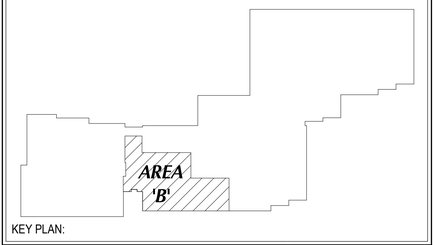
5 PROVIDE 30/2 CIRCUIT BREAKER IN ELECTRICAL ROOM 120/208V PANEL & CIRCUT TO THIS BREAKER WITH 2#10,#10GR. USE RECEPTACLE TYPE L6-30R.

6 PROVIDE 60/3 CIRCUIT BREAKER IN ELECTRICAL ROOM 120/208V PANEL & CIRCUT TO THIS BREAKER WITH 3#6,#10GR. USE RECEPTACLE TYPE 460R9W.

7 MOUNT OUTLETS HORIZONTALLY.

8 PROVIDE 30/1 BREAKER IN ELECTRICAL ROOM 120/208V PANEL & CIRCUIT TO THIS BREAKER WITH 2#10, #10GR. USE RECEPTACLE TYPE L5-30R.

KEY PLAN:



CURTIS MINER ARCHITECTURE
233 SOUTH PLEASANT GROVE BLVD. SUITE #105
PLEASANT GROVE, UTAH 84062
PHONE: (801) 769-3000
cma@cmautah.com

DATE:	SEPT 16, 2020
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INTERMOUNTAIN LAKE PARK LEVEL 1 REMODEL

4646 LAKE PARK BLVD
WEST VALLEY CITY, UTAH 84120

LICENSED PROFESSIONAL ENGINEER
No. 5148728
DAVID G. HINCKLEY
STATE OF UTAH

SHEET DESCRIPTION:
LEVEL 1 POWER PLAN - AREA B

SHEET:
EP101B

D1 LEVEL 1 POWER PLAN - AREA B
SCALE: 1/8" = 1'-0"

0 4' 8' 16'

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MARK	REVISION	DATE
1	Addendum #01	10/16/20

PANEL: "UPS1"

VOLTS/PHASE/WIRE:	PANEL SIZE & TYPE:	MAIN SIZE AND TYPE:	FED FROM:	CABINET:	LOCATION:	NOTES:
120/208V, 3 PH 4 WIRE	22" W x 6" D, BOLT-ON	150 AMPERE MAIN CB		SURFACE	ELECT, 124	

ACCESSORIES: PANEL DIRECTORY, IDENTIFICATION, GROUNDING BAR **AIC RATING:** 0

CKT	OCP			LOAD (kVA)				PHASE LOAD							LOAD (kVA)			OCP			CKT
NO	AMP	POLE	BKR	LTG	PWR	CO	DESCRIPTION	A		B		C		DESCRIPTION	CO	PWR	LTG	BKR	POLE	AMP	NO
1	20	1		0.0	0.0	0.4	CO OPEN OFFICE 137	0.4	1.1					CO OPEN OFFICE 137	1.1	0.0	0.0		1	20	2
3	20	1		0.0	0.0	0.4	CO OPEN OFFICE 137			0.4	0.4			CO OPEN OFFICE 137 SEC COMP	0.4	0.0	0.0		1	20	4
5	20	1		0.0	0.0	0.4	CO OPEN OFFICE 137					0.4	0.9	CO OPEN OFFICE 137	0.9	0.0	0.0		1	20	6
7	20	1		--	--	--	SPARE	0.0	0.9					CO OFFICE 136	0.9	0.0	0.0		1	20	8
9	20	1		0.0	0.0	0.5	CO CONTROL ROOM 130			0.5	0.4			CO CONTROL ROOM 130	0.4	0.0	0.0		1	20	10
11	20	1		0.0	0.0	1.4	CO CONTROL ROOM 130					1.4	0.7	CO CONTROL ROOM 130	0.7	0.0	0.0		1	20	12
13	20	1		0.0	0.0	1.4	CO CONTROL ROOM 130	1.4	1.4					CO CONTROL ROOM 130	1.4	0.0	0.0		1	20	14
15	20	1		0.0	0.0	0.7	CO CONTROL ROOM 130			0.7	0.4			CO CONTROL ROOM 130	0.4	0.0	0.0		1	20	16
17	20	1		0.0	0.0	0.7	CO CONTROL ROOM 130					0.7	0.4	CO CONTROL ROOM 130	0.4	0.0	0.0		1	20	18
19	20	1		0.0	0.0	0.7	CO CONTROL ROOM 130	0.7	0.4					CO CONTROL ROOM 130	0.4	0.0	0.0		1	20	20
21	20	1		--	--	--	SPARE			0.0	0.0			SPARE	--	--	--		1	20	22
23	20	1		--	--	--	SPARE					0.0	0.0	SPARE	--	--	--		1	20	24
25	20	1		--	--	--	SPARE	0.0	0.0					SPARE	--	--	--		1	20	26
27	20	1		--	--	--	SPARE			0.0	0.0			SPARE	--	--	--		1	20	28
29	20	1		--	--	--	SPARE					0.0	0.0	SPARE	--	--	--		1	20	30
31	--	--		--	--	--	SPACE	0.0	0.0					SPACE	--	--	--		--	--	32
33	--	--		--	--	--	SPACE			0.0	0.0			SPACE	--	--	--		--	--	34
35	--	--		--	--	--	SPACE					0.0	0.0	SPACE	--	--	--		--	--	36
37	--	--		--	--	--	SPACE	0.0	0.0					SPARE	--	--	--		3	125	38
39	--	--		--	--	--	SPACE			0.0	0.0			--	--	--	--		--	--	40
41	--	--		--	--	--	SPACE					0.0	0.0	--	--	--	--		--	--	42
TOTALS:							CONNECTED kVA PER PHASE	**6**		**3**		**5**		CONNECTED TOTAL kVA =				**14**			
							CONNECTED AMPS PER PHASE	**55**		**23**		**40**		AVERAGE CONNECTED AMPS PER PHASE =				**37**			

NEC DIVERSIFIED LOAD CALCULATIONS

LIGHTING & CONTINUOUS LOADS:
- 100% CONNECTED LOAD PLUS 25%

RECEPTACLES: **13.5 kVA @ 87% = 11.8 kVA**
- FIRST 10kVA @ 100%, REMAINDER @ 50%

ALL OTHER LOADS @ 100% : **0.0 kVA**
- MOTOR TOTALS INCLUDED IN ALL OTHER LOADS WITH LARGEST MOTOR CALCULATED @ 125% PER NEC

DIVERSIFIED TOTAL kVA = **12**

AVERAGE AMPS PER PHASE = **33**

BKR: GF=GFCI, GF3=30mA GFCI CAPABLE OF BEING LOCKED OUT IN OPEN POSITION, IG=ISOLATED GROUND, AF=AFCI, ST=SHUNT TRIP, RED=PROVIDE RED COLORED BREAKER, AF=ARC FAULT CURRENT INTERRUPTER, GA=COMBINATION OF GROUND FAULT AND ARC FAULT CIRCUIT INTERRUPTER, GS=COMBINATION OF SHUNT TRIP WITH GFCI

FLOORBOX SCHEDULE

ABBREVIATIONS

COMPARTMENT GANG
- - - NOT APPLICABLE
- A/V - A/V CONNECTIONS, REFER TO A/V DRAWINGS/SPECIFICATIONS
- D - DATA RECEPTACLE
- DR - DUPLEX RECEPTACLE
- QR - QUADRAPLEX RECEPTACLE

RATINGS
- 2H - 2-HOUR FIRE RATED, UL LISTED

USE
- CF - CONCRETE FLOOR

FINISH
- BL - ALUMINUM

CONNECTION
- C1 - RECESSED CABLE CONNECTIONS BELOW FLOOR WITH HINGED LID FOR ACCESS THAT CAN BE CLOSED WHILE IN USE.

NOTES:
1. PROVIDE ALL REQUIRED HARDWARE FOR COMPLETE INSTALLATION.
2. INCLUDE SEPARATION BARRIER BETWEEN SYSTEMS AND POWER.

COVER
- CV1 - FLANGED WITH CARPET INSERT FOR CARPET AREAS, FLANGELESS FLUSH GRAY BRUSHED ALUMINUM LID

ID	DESCRIPTION	FINISH	MANUFACTURER 1	PART #	MANUFACTURER 2	PART #	NOTES
FB2	FIRE RATED 2 GANG POWER FLOORBOX	BL	WIREMOLD	RFB2-OG-RFB2GFI-FPCTCBK	HUBBELL	CFB2G30CR-24GCCVRBK	
FB4	FIRE RATED 4 GANG POWER/DATA FLOOBOX FURNITURE FEED	BL	WIREMOLD	RFB4-FPFFBK	HUBBELL	CFB4G30CR-24GCFFCVRBK	
FB6	FIRE RATED 6 GANG POWER/DATA AND A/V FLOORBOX	BL	WIREMOLD	RFB6-OG-RFB2GFI-FPCTCBK	HUBBELL	CFB4G30CR-24GCCVRBK	

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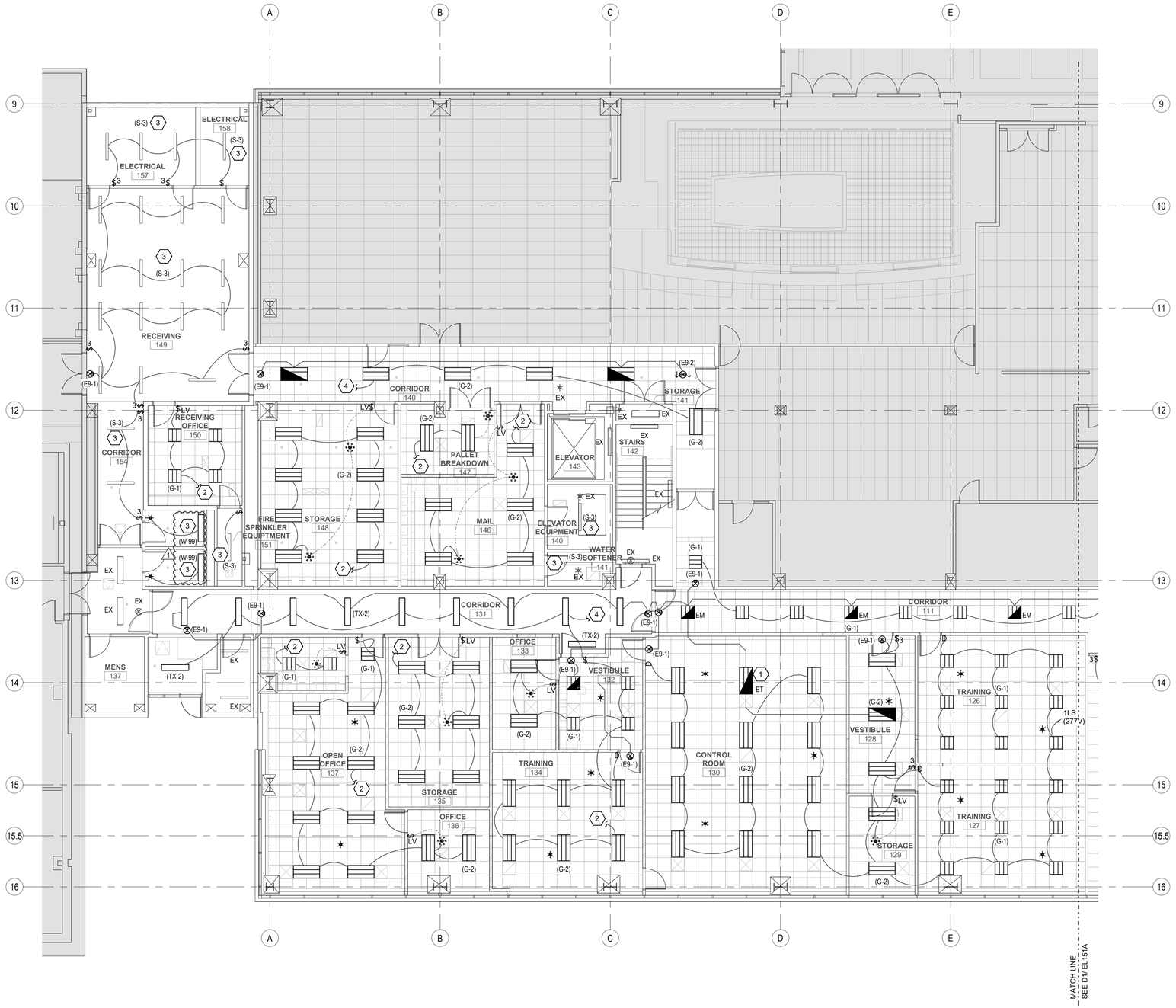
STATE OF UTAH

SHEET DESCRIPTION:
PANEL SCHEDULES

SHEET:
EP602



D1 LEVEL 1 LIGHTING PLAN - AREA B

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

0 4' 8' 16'

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MARK	REVISION	DATE
1	Addendum #01	10/16/20

GENERAL SHEET NOTES

A HATCHED AREA IS NOT IN SCOPE.

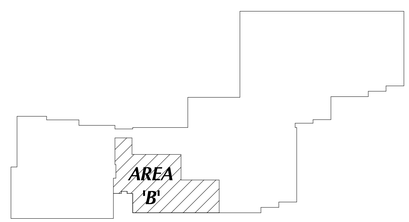
SHEET KEYNOTES

1 PROVIDE EMERGENCY TRANSFER DEVICE TO ALLOW FIXTURE TO BE SWITCHED/DIMMED WITH ROOM LIGHTING AND TRANSFER TO THE EM CIRCUIT.

2 TO EXISTING LIGHTING CIRCUIT SERVING THIS ROOM.

3 REPLACE EXISTING LIGHT FIXTURES IN ROOM WITH NEW FIXTURE. CONNECT TO EXISTING WIRING.

4 TO EXISTING CIRCUIT SERVING HALLWAY.



KEY PLAN:

CURTIS MINER ARCHITECTURE
233 SOUTH PLEASANT GROVE BLVD. SUITE #105
PLEASANT GROVE, UTAH 84062
PHONE: (801) 769-3000
cma@cmautah.com

DATE: SEPT 16, 2020
PROJECT #: 20-020
PROJ. MAN.: JSJ
CHECKED BY: GWT

PROJECT:
INTERMOUNTAIN LAKE PARK LEVEL 1 REMODEL

4646 LAKE PARK BLVD
WEST VALLEY CITY, UTAH 84120

LICENSED PROFESSIONAL ENGINEER
No. 5148728
DAVID G. HINCKLEY
STATE OF UTAH

SHEET DESCRIPTION:
LEVEL 1 LIGHTING PLAN - AREA B

SHEET:
EL151B

INTERIOR LIGHTING FIXTURE SCHEDULE

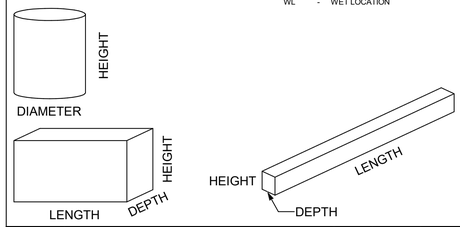
ABBREVIATIONS

MOUNTING

B - BASE
C - CEILING
F - FLANGE
G - GRID
P - PENDANT
PL - POLE
R - RECESSED
S - SURFACE
W - WALL

LUMINAIRE OPTIONS

ARHR - AIR RETURN AND HEAT REJECTION
DL - DAMP LOCATION
EQC - EARTHQUAKE CLIPS
F - FUSING
HLD - HINGED AND LATCHED DOOR
HS - HOUSE SIDE SHIELD
PS - PHOTOCELL SWITCH
QRS - QUARTZ RESTRIKE
ST - STATIC
WG - WIRE GUARD
WL - WET LOCATION



FINISH

MW - MATTE WHITE
BL - BLACK
SL - SILVER
GL - GOLD
CL - CLEAR
PW - PAINTED WHITE
EA - EXTRUDED ALUMINUM
S - STEEL
GS - GALVANIZED STEEL
C - CAST
CBA - COLOR BY ARCHITECT
SCBA - STANDARD COLOR BY ARCHITECT
CCA - CUSTOM COLOR BY ARCHITECT
FS 209D - MEETS FEDERAL STANDARD 209D
TP - THERMALLY PROTECTED
FL - FLUSH
R - REGRESS
M - MITERED

DIFFUSER/LENS

#A - ACRYLIC #THICK
#OA - ACRYLIC #THICK (OPAL)
GC - GLASS (CLEAR)
GO - GLASS (OPAL)
GF - GLASS (FROSTED)
SGL - SOFT GLOW LENS
HPL - HIGH PERFORMANCE LENS
DO - DROP OPAL
CGL - CONVEX GLASS LENS
S - SATIN LENS

REFLECTOR

OP - NONE/OPEN
SP - SPECULAR
SS - SEMI-SPECULAR
D - DIFFUSE (WHITE ENAMEL)
SC - SPECULAR (COLORED)
PR - PRISMATIC
FDR - FULL DEPTH REFLECTOR
DS - DIFFUSE (SEMI SPECULAR) SILVER
LI - LOW IRIDESCENT
IR - IRIDESCENT
SL - SILVER
GL - GOLD
CA - CLEAR ALZAK

NOTES

GENERAL NOTES

1. PROVIDE UNIT PRICES AND FIXTURE BRAND SELECTED FOR ADD/DELETE CHANGES FOR EACH FIXTURE TYPES SHOWN WITHIN 48 BUSINESS HOURS OF THE BID DATE. FAILURE TO COMPLY WITH THIS REQUIREMENT MAY DISQUALIFY THE PRODUCTS AND EMPOWER THE ENGINEER TO DETERMINE FAIR VALUE FOR FIXTURE AND INSTALLATION CHANGES, WITHOUT FURTHER INPUT FROM THE CONTRACTOR OR INSTALLER.
2. CONTRACTOR ALLOWANCE PRICES ARE ACCURATE WHEN THIS JOB WAS SPECIFIED, CONTRACTOR AND ELECTRICAL DISTRIBUTOR SHALL VERIFY THIS ALLOWANCE AND REPORT ANY PROBLEMS TO THE ENGINEER BEFORE THE BID. ALLOWANCE PRICE MAY OR MAY NOT INCLUDE LAMP(S) OR FREIGHT AS NOTED, AND DO NOT INCLUDE ANY TAXES.
3. SUBSTITUTIONS AND/OR EQUAL FIXTURES MUST RECEIVE APPROVAL PRIOR TO BIDDING, THEY MUST BE SUBMITTED TO THE ENGINEER NO LESS THAN 2 WEEKS PRIOR TO BID OPENING.
4. SAMPLES MUST BE PROVIDED FOR ANY AND ALL FIXTURES UPON A/E REQUEST PRIOR TO RELEASING FIXTURES.
5. ALL FIXTURES SHALL BE LISTED AND APPROVED FOR THEIR INTENDED USE AND LOCATION.
6. VERIFY THE PROPER MOUNTING KITS OR ACCESSORIES TO FACILITATE INSTALLATION AS SHOWN AT EACH LOCATION ON THE DRAWINGS.
7. COMPLY WITH THE "INTERIOR LIGHTING" SECTION OF THE SPECIFICATIONS.
8. REFER TO SPECIFICATIONS FOR IMPORTANT TECHNICAL REQUIREMENTS FOR LIGHTING FIXTURES, DRIVERS, AND LAMPS.
9. ALL LIGHT FIXTURES TO BE EITHER "DLC" OR "LIGHTING FACTS" LISTED OR TO BE APPROVED BY ARCHITECT/ENGINEER AND OWNER.

							MANUFACTURER (CATALOG SERIES)			
ID	DESCRIPTION	TYPE	COLOR TEMP	VOLTAGE	WATTS	FIXTURE LUMENS	OPTION 1	OPTION 2	OPTION 3	OPTION 4
(CT-14)	SUSPENDED LINEAR PENDANT 14' (EXCEPT FOR 4' SECTION SHOWN AS EM). CONTRACTOR ALLOWANCE $1,358	LED	4000K	120/277	100	10000	FINELITE S12 LED ID DCO 14' 2E SO 3500K OPEN MC 277 FC FE	LITECONTROL SAE-106-P-LPA-14'-8-SOF-C1-35K-080-6D-D01-1C -UNV-FA1-	MOJO L450-64-4000-35K-010-M-A4-G-WH-XX	
(DX-6)	6" ROUND RECESSED DOWNLIGHT	LED	4000K	120/277	17	1500	HALO HC615D010HM61283561MDH	PRESCOLITE LF6SL-6LFSL15L35K	LIGHTOLIER 6RNP6RDL15835CCZ10U	LITHONIA LDN6 35/15 L06AR LSS MVOLT EZ10
(DX-6S)	SAMES AS DX-6, WITH WET LOCATION LISTING (FOR SHOWER)	LED	4000K	120/277	17	1500				
(E9-1)	EXIT SIGN CONTRACTOR ALLOWANCE $115	LED	GREEN	120/277	2	0	LSI VER-6-G-1C-WB-WH	EVENLITE SOV-EM-G-1C-WH-SC-UC	CHLORIDE ER44RLDU1WG	ISOLITE ELT-EM-G-1C-AG-WH-MT
(E9-2)	EXIT SIGN (DOUBLE FACE) CONTRACTOR ALLOWANCE $125	LED	GREEN	120/277	2	0	LSI VER-6-G-2M-WB-WH	EVENLITE SOV-EM-G-2C-WH-SC-UC	CHLORIDE ER44RLDU2WG	ISOLITE ELT-EM-G-2C-AG-WH-MT
(G-1)	2x2 LED VOLUMETRIC TROFFER CONTRACTOR ALLOWANCE PRICE $162	LED	4000K	120/277	30	3000	METALUX 22SR-LD1-29-C-UNV-L840-CD1-U	LITHONIA 2AVL2-30LSE-MDR-EZ1-LP835	DAYBRITE CF-S-22-G-PD-30L-35-U-DZT	
(G-2)	2x4 LED VOLUMETRIC TROFFER CONTRACTOR ALLOWANCE PRICE $215	LED	4000K	120/277	40	4000	METALUX 24SR-LD1-45-S-UNV-L840-CD1-U	LITHONIA 2AVL4-40LSE-MDR-EZ1-LP835	DAYBRITE CF-S-24-G-PD-38L-35-U-DZT	
(S-3)	STRIP LIGHT	LED	4000K	120/277	40	4000	METALUX 4SNLED-LD5-44SL-UNV-L	COLUMBIA MPS4-35LW-CW-EDU	DAYBRITE FSS440L835-UNV-DIM	
(TX-1a)	RECESSED FLUSH LED (FLUSH LENS, GRID CEILING)	LED	4000K	120/277	200	21000	NULITE RG4-06-L35-UNV-D-1C-ST-F-XX	PINNACLE EV4D-A-835HO-XX-U-OL2	AXIS BBRLED-750-80-35-FL-XX-W-UNV-DP-1	MARK SL4L-LOP-XX-FLP-XX-80CRI-35K-800LMF-UNV
(TX-1b)	RECESSED FLUSH LED (FLUSH LENS, GRID CEILING)	LED	4000K	120/277	130	13500	NULITE RG4-06-L35-UNV-D-1C-ST-F-XX	PINNACLE EV4D-A-835HO-XX-U-OL2	AXIS BBRLED-750-80-35-FL-XX-W-UNV-DP-1	MARK SL4L-LOP-XX-FLP-XX-80CRI-35K-800LMF-UNV
(TX-1c)	WALL VERTICAL NEXT TO MIRRORS CONTRACTOR ALLOWANCE $485.75	LED	4000K	120/277	40	3200	AXIS ARWLED-B2-800-40-S-4-SCBA-UNV-1			
(TX-2)	2" SURFACE SLOT	LED	4000K	120/277	30	3000	MARK S2LS-LCB-4FT-MSL4-80CRI-35K-800LMF-MIN1-MVOLT	PINNACLE EX2D-A-N-835HO-4'-S-U-OL2-1-W	AXIS B2SQSLED-750-80-35-SO-4-W-UNV-DP-1-SC	NULITE RR2-06-L35-UNV-1C-ST-F-WH-4'
(W-3)	WRAPAROUND	LED	4000K	120/277	40	4000	METALUX 4WNLED-LD1-41-F-UNV-L835-CD1-U	LITHONIA LBL4-40L-LP835	COLUMBIA LWC4-35ML-EU	DAYBRITE OWL440L835-UNV-DIM
(W-99)	WRAPAROUND CORNER MOUNT CONTRACTOR ALLOWANCE $18,882.50 TOTAL FOR ALL (W-99)	LED	4000K	120/277	28	4000	ECLIPSE 575-4-LED30-40K-UNV-WH			

MARK	REVISION	DATE
1	Addendum #01	10/16/20

CURTIS MINER ARCHITECTURE
233 SOUTH PLEASANT GROVE BLVD.
SUITE #105
PLEASANT GROVE, UTAH 84062
PHONE: (801) 769-3000
cma@cmautah.com

DATE: SEPT 16, 2020
PROJECT #: 20-020
PROJ. MAN.: JSJ
CHECKED BY: GWT

PROJECT:
INTERMOUNTAIN LAKE PARK
LEVEL 1 REMODEL

4646 LAKE PARK BLVD
WEST VALLEY CITY, UTAH 84120

LICENSED PROFESSIONAL ENGINEER
No. 5148728
DAVID G. HINCKLEY
STATE OF UTAH

SHEET DESCRIPTION:
INTERIOR LIGHTING FIXTURE SCHEDULE

SHEET:
EL601

D1 LEVEL 1 AV ROUGH-IN PLAN - AREA A

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

MARK	REVISION	DATE
1	ADDENDUM #1	2020-10-16

GENERAL SHEET NOTES

A COORDINATE EXACT LOCATION OF ALL FLOOR BOXES WITH ARCHITECT PRIOR TO INSTALLATION.

B COORDINATE EXACT JUNCTION BOX LOCATIONS SO THAT THEY ARE EASILY ACCESSIBLE AND ARE NOT BEHIND DOORS, FURNITURE, MONITORS, ETC.

C ELECTRICAL INSTALLER TO ENSURE ALL WALL MOUNTED ELECTRICAL DEVICES (AV JUNCTION BOXES, DATA JACKS, ETC.) ARE PLUMB, LEVEL, AND VERTICALLY ALIGNED WHERE APPLICABLE.

SHEET KEYNOTES

1 CAMERA TO BE MOUNTED BELOW MONITOR BY AV INSTALLER.

2 AV CONNECTION PANEL TO BE INSTALLED IN TABLE TECHNOLOGY WELL BY AV INSTALLER.

3 AV CABLE TO BE PULLED THROUGH FLOOR BOX BY AV INSTALLER.

4 INSTALL JUNCTION BOX FOR WALL-POSITION SENSOR WHERE IT WILL NOT INTERFERE WITH OPERABLE WALL OPERATION.

5 MONITOR AND SPEAKER TO BE MOUNTED IN CAFE ON WALL ABOVE OPERABLE WALL. COORDINATE EXACT LOCATION WITH ARCHITECT.

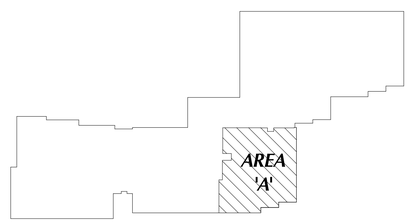
6 EXISTING AV EQUIPMENT CABINET TO BE REMOVED. AV INSTALLER TO MOUNT NEW CABINET IN SAME LOCATION.

7 INSTALL JUNCTION BOX FOR CAMERA IN HEADER WITHIN 12" OF TOP OF OPERABLE WALL.

8 INSTALL JUNCTION BOXES FOR INDICATED DEVICES IN COLUMN. REMOVE ALL EXISTING AV CABLING AND CONNECTION PANELS.

9 REMOVE ALL EXISTING AV CABLING AND CONNECTION PANELS. COORDINATE WITH CONTRACTOR TO PATCH WALL.

10 EXISTING MONITOR LOCATION. REUSE CABLING AND REPLACE MONITOR AND MOUNT.



KEY PLAN:

CURTIS MINER ARCHITECTURE
233 SOUTH PLEASANT GROVE BLVD. SUITE #105
PLEASANT GROVE, UTAH 84062
PHONE: (801) 769-3000
cma@cmautah.com

DATE: SEPT 16, 2020
PROJECT #: 20-020
PROJ. MAN.: JSJ
CHECKED BY: GWT

PROJECT:
INTERMOUNTAIN LAKE PARK LEVEL 1 REMODEL

4646 LAKE PARK BLVD
WEST VALLEY CITY, UTAH 84120

LICENSED PROFESSIONAL ENGINEER
No. 5148728
DAVID G. HINCKLEY
STATE OF UTAH

SHEET DESCRIPTION:
LEVEL 1 AV ROUGH-IN PLAN - AREA A

SHEET:
EJ101A

N

0 4' 8' 16'

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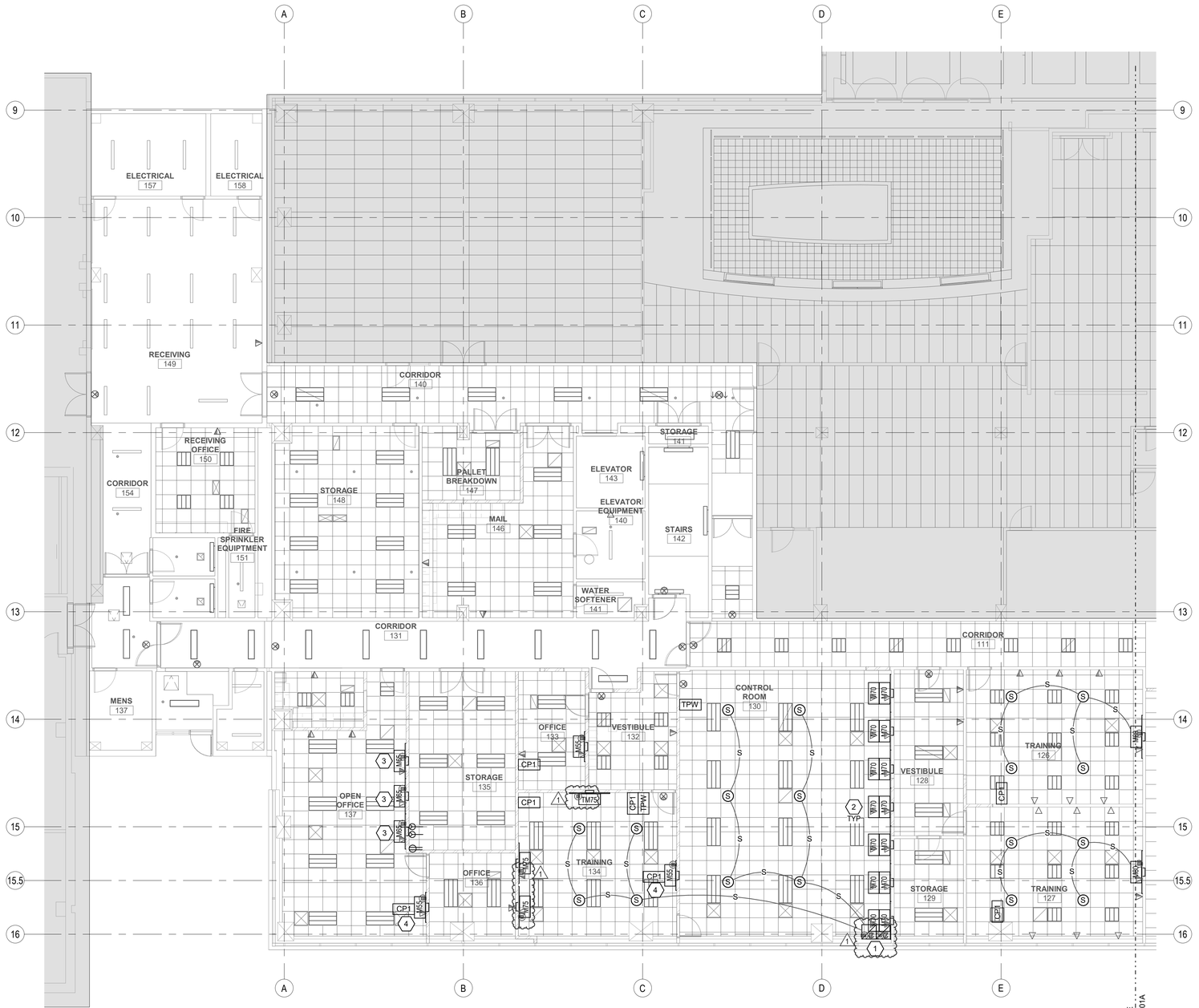


D1 LEVEL 1 AV ROUGH-IN PLAN - AREA B

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

0 4' 8' 16'

MARK	REVISION	DATE
1	ADDENDUM #1	2020-10-16

GENERAL SHEET NOTES

1

A COORDINATE EXACT LOCATION OF ALL FLOOR BOXES WITH ARCHITECT PRIOR TO INSTALLATION.

B COORDINATE EXACT JUNCTION BOX LOCATIONS SO THAT THEY ARE EASILY ACCESSIBLE AND ARE NOT BEHIND DOORS, FURNITURE, MONITORS, ETC.

C ELECTRICAL INSTALLER TO ENSURE ALL WALL MOUNTED ELECTRICAL DEVICES (AV JUNCTION BOXES, DATA JACKS, ETC.) ARE PLUMB, LEVEL, AND VERTICALLY ALIGNED WHERE APPLICABLE.

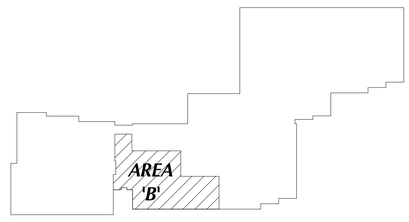
SHEET KEYNOTES

1 INSTALL LARGE JUNCTION BOX FOR EQUIPMENT RACK IN EAST WALL AT +18" AFF TO CENTER OF BOX. BOX TO BE MOUNTED COMPLETELY WITHIN CREDENZA. COORDINATE WITH ARCHITECT.

2 PROVIDE A SINGLE LARGE JUNCTION BOX AT +84" AFF FOR EACH VERTICAL PAIR OF MONITORS.

3 PROVIDE A LARGE JUNCTION BOX AT 84" AFF FOR EACH MONITOR. MONITORS TO BE RELOCATED FROM EXISTING SPACE.

4 INSTALL JUNCTION BOX FOR AV CONNECTION DIRECTLY BELOW MONITOR AT ELECTRICAL OUTLET HEIGHT.



KEY PLAN:

CURTIS MINER ARCHITECTURE
233 SOUTH PLEASANT GROVE BLVD. SUITE #105
PLEASANT GROVE, UTAH 84062
PHONE: (801) 769-3000
cma@cmautah.com

DATE: SEPT 16, 2020
PROJECT #: 20-020
PROJ. MAN.: JSJ
CHECKED BY: GWT

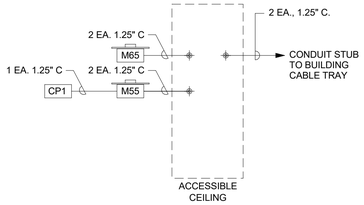
PROJECT:
INTERMOUNTAIN LAKE PARK LEVEL 1 REMODEL

4646 LAKE PARK BLVD
WEST VALLEY CITY, UTAH 84120

LICENSED PROFESSIONAL ENGINEER
No. 5148728
DAVID G. HINCKLEY
STATE OF UTAH

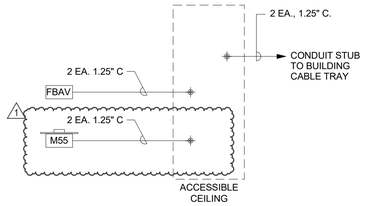
SHEET DESCRIPTION:
LEVEL 1 AV ROUGH-IN PLAN - AREA B

SHEET:
EJ101B



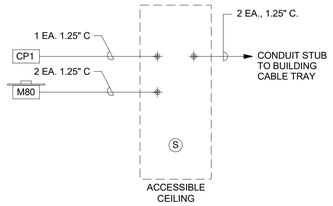
OPEN OFFICE 137 AV CONDUIT RISER DIAGRAM

A1 NO SCALE



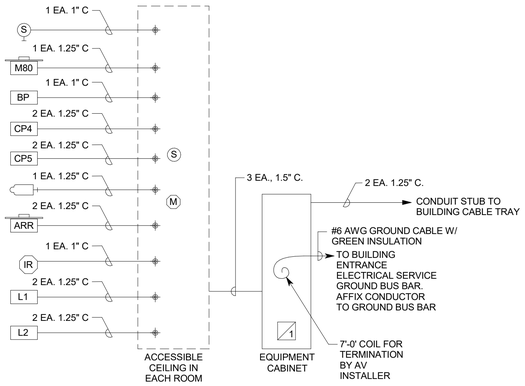
SMALL CONFERENCE AV CONDUIT RISER DIAGRAM

B1 NO SCALE - (TYPICAL OF ROOMS 118, 119)



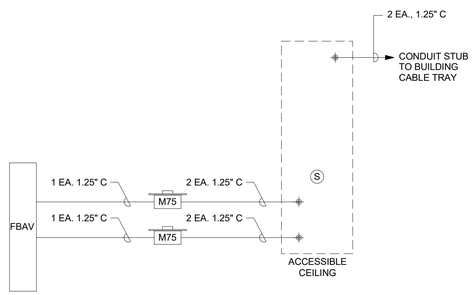
TRAINING AV CONDUIT RISER DIAGRAM

B2 NO SCALE - (TYPICAL OF ROOMS 126, 127)



AUDITORIUM 101 AV CONDUIT RISER DIAGRAM

C1 NO SCALE

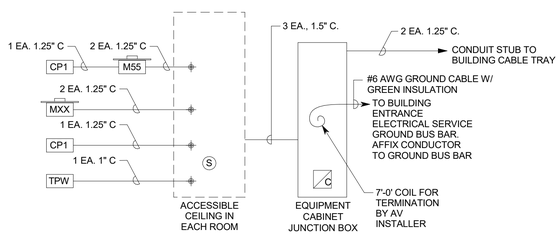


CONFERENCE 114 AV CONDUIT RISER DIAGRAM

D1 NO SCALE

AUDIO-VIDEO ROUGH-IN SYSTEMS SCHEDULE

SYMBOL	DESCRIPTION	MOUNTING	SPECIAL INSTRUCTIONS
CP1	JUNCTION BOX, 4-11/16" BOX W/ 2-GANG MUD RING, MINIMUM 3" DEEP	FLUSH IN THE WALL AT ELECTRICAL OUTLET HEIGHT, EXCEPT WHERE NOTED ON THE DRAWINGS	
CP4 CP5	JUNCTION BOX, 4-GANG, MINIMUM 3" DEEP	FLUSH IN THE WALL AT ELECTRICAL OUTLET HEIGHT	
CP2 CP3	TABLETOP CONNECTION PANEL	IN TABLE	FURNISHED AND INSTALLED BY AV INSTALLER
L1 FBAV	FLOOR BOX	FLOOR	REFER TO 'EP' SHEETS FOR TYPE AND LOCATION
L2	LECTERN LOCATION 3-GANG JUNCTION BOX, MINIMUM 3" DEEP	FLUSH IN WALL AT ELECTRICAL OUTLET HEIGHT	
BP	BUTTON CONTROL PANEL, JUNCTION BOX, 4-11/16" SQUARE BOX W/ 2-GANG MUD RING	FLUSH IN WALL AT ELECTRICAL SWITCH HEIGHT	
TPW	TOUCH CONTROL PANEL, JUNCTION BOX, 4-11/16" SQUARE BOX W/ 2-GANG MUD RING	FLUSH IN WALL AT ELECTRICAL SWITCH HEIGHT	
IR	INFRARED SENSOR, JUNCTION BOX, 4-11/16" SQUARE BOX W/ 1-GANG MUD RING	FLUSH IN HEADER PER PLAN SHEET KEYNOTE	
M	MICROPHONE	FLUSH IN FINISHED CEILING	FURNISHED AND INSTALLED BY AV INSTALLER
S	SPEAKER LOCATION	FLUSH IN FINISHED CEILING	SPEAKER FURNISHED AND INSTALLED BY AV INSTALLER, TRIM RING INSTALLED BY ELECTRICAL. SEE DETAIL A5/EJ501
1 S1,2	MASKING SPEAKER	ABOVE CEILING	FURNISHED AND INSTALLED BY AV INSTALLER
S	SURFACE MOUNTED SPEAKER LOCATION, 4-11/16" BOX WITH 2-GANG MUD RING	FLUSH IN VERTICAL WALL, SEE PLAN SHEET NOTES	
	TV JACK 1-GANG JUNCTION BOX WITH PLATE MOUNTED F-CONNECTOR	MOUNTED INSIDE MONITOR OR EQUIPMENT RACK JUNCTION BOX	
	CAMERA LOCATION	WITHIN 12" OF TOP OF PARTITION HEADER	
	CAMERA LOCATION	BELOW MONITOR	FURNISHED AND INSTALLED BY AV INSTALLER
MXX	FLAT PANEL MONITOR JUNCTION BOX, CHIEF PAC 526FCW	FLUSH IN THE WALL AT APPROXIMATELY +60" AFF TO BOTTOM OF BOX, OR AS NOTED ON PLAN SHEETS	COORDINATE WITH STRUCTURAL BACKING, AND COORDINATE EXACT ELEVATION WITH ARCHITECTURAL ELEVATIONS, SEE DETAILS A4/EJ501 AND B5/EJ501
MXX	CEILING MOUNTED MONITOR JUNCTION BOX, 4-11/16" SQUARE BOX W/ 2-GANG MUD RING	FLUSH IN CEILING WITHIN 4" OF MONITOR MOUNT	COORDINATE EXACT LOCATION WITH AV INSTALLER, SEE DETAIL B4/EJ501
ARR	MONITOR ARRAY JUNCTION BOX, CHIEF PAC 526FCW	FLUSH IN THE WALL AT APPROXIMATELY +60" AFF TO BOTTOM OF BOX	COORDINATE STRUCTURAL BACKING AND EXACT ELEVATION WITH ARCHITECT PROVIDE ONE BOX FOR EACH ARRAY
C	EQUIPMENT RACK "C", 14-1/2" SQUARE JUNCTION BOX AT +18" AFF TO CENTER OF BOX, CHIEF PAC 526FCW	FLUSH IN WALL INSIDE CABINET, SEE PLAN SHEET NOTES	
1	EQUIPMENT RACK "1" LOCATION, EXISTING		REMOVE EXISTING WALL RACK. INSTALL NEW RACK IN SAME LOCATION
	CONDUIT, 3/4" MINIMUM	CONCEALED BEHIND FINISHED SURFACES, UNLESS OTHERWISE NOTED	REFER TO RISER DIAGRAMS FOR EXACT SIZES & QUANTITIES.



CONTROL ROOM 130, OFFICE 133, TRAINING 134 AV CONDUIT RISER DIAGRAM

D3 NO SCALE

GENERAL SHEET NOTES

1. INSTALL ALL CONDUIT IN A CONCEALED FASHION. SURFACE MOUNTED CONDUIT WILL NOT BE ACCEPTED. CONDUITS AND BOXES ABOVE CEILING HEIGHT MAY BE INSTALLED EXPOSED AND PAINTED TO MATCH SURROUNDING EQUIPMENT.
2. MAINTAIN MAXIMUM SEPARATION BETWEEN A/V SYSTEM CONDUIT AND ALL POWER CONDUIT. MINIMUM SEPARATION REQUIREMENTS IS 24".
3. INSTALL NYLON PULL STRINGS IN ALL A/V SYSTEM CONDUIT.
4. INSTALL ALL EQUIPMENT IN COMPLIANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS, SEISMIC CODES, AND INDUSTRY WIDE ACCEPTED RIGGING PRACTICES. SUPPORT EQUIPMENT WEIGHT FROM STRUCTURE. DURING THE SUBMITTAL PROCESS, PROVIDE SHOP DRAWINGS WHICH DETAIL PROPOSED MOUNTING FOR ALL SUCH EQUIPMENT.
5. IF THE BOXES, ENCLOSURES, & CABINETS SPECIFIED ARE NOT PROVIDED FROM THE MANUFACTURER WITH THE REQUIRED KNOCK OUTS FOR THE SPECIFIED CONDUIT, FIELD CUT ALL REQUIRED KNOCK OUTS TO TERMINATE THE QUANTITY AND SIZES OF THE SPECIFIED CONDUITS.
6. THE ROUGH-IN LOCATIONS FOR PROJECTORS SHOWN ON THE FLOOR PLAN DRAWINGS ARE APPROXIMATE. COORDINATE WITH AV CONTRACTOR FOR ACTUAL PROJECTION DISTANCES. LOCATE ROUGH-IN FOR PROJECTORS IN COMPLIANCE WITH THE DISPLAY DEVICE SCHEDULE.
7. ALL ROUGH-IN SHALL BE IN COMPLIANCE WITH ANSI/TIA/EIA 569-B WHICH INCLUDES, BUT IS NOT LIMITED TO, ALL CONDUITS HAVING NO MORE THAN TWO 90 DEGREE BENDS.
8. ALL CONDUIT FOR AV ROUGH-IN SHALL BE EMT.
9. ALL CONNECTION PANELS SHALL BE WITHIN 12" OF POWER AND DATA OUTLETS. NOTIFY ENGINEER IF DISCREPANCY IS FOUND.
10. ALL AV CONDUITS SHALL BE INSTALLED USING SHORTEST RUNS POSSIBLE. THERE SHOULD BE NO UNNECESSARY BENDS IN CONDUIT RUNS.
11. CONDUITS AND JUNCTION BOXES SHOWN NO RISER DIAGRAMS ARE TYPICAL FOR EACH DEVICE IN ROOM.
12. COVER ALL JUNCTION BOXES WITH A BLANK NYLON COVER PLATE.

DEFINITIONS

NOTE: ALL DEFINITIONS MAY NOT BE USED.

INDICATED: THE TERM "INDICATED" REFERS TO GRAPHIC REPRESENTATIONS, NOTES, OR SCHEDULES ON THE DRAWINGS, OTHER PARAGRAPHS OR SCHEDULES IN THE SPECIFICATIONS, AND SIMILAR REQUIREMENTS IN THE CONTRACT DOCUMENTS. WHERE TERMS SUCH AS "SHOWN", "NOTED", "SCHEDULED", AND "SPECIFIED" ARE USED, IT IS TO HELP THE READER LOCATE THE REFERENCE, NO LIMITATION ON LOCATION IS INTENDED.

DIRECTED: TERMS SUCH AS "DIRECTED", "REQUESTED", AUTHORIZED", "SELECTED", "APPROVED", "REQUIRED", AND "PERMITTED" MEAN "DIRECTED BY THE ENGINEER", "REQUESTED BY THE ENGINEER", AND SIMILAR PHRASES.

APPROVE: THE TERM "APPROVED", WHERE USED IN CONJUNCTION WITH THE ENGINEER'S ACTION ON THE CONTRACTOR'S SUBMITTALS, APPLICATIONS, AND REQUESTS, IS LIMITED TO THE ENGINEER'S DUTIES AND RESPONSIBILITIES AS STATED IN GENERAL AND SUPPLEMENTARY CONDITIONS.

FURNISH: THE TERM "FURNISH" IS USED TO MEAN "SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS."

INSTALL: THE TERM "INSTALL" IS USED TO DESCRIBE OPERATIONS AT PROJECT SITE INCLUDING THE ACTUAL "UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS."

PROVIDE: THE TERM "PROVIDE" MEANS "TO FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE."

INSTALLER: AN "INSTALLER" IS THE CONTRACTOR OR AN ENTITY ENGAGED BY THE CONTRACTOR, EITHER AS AN EMPLOYEE, SUBCONTRACTOR, OR SUB-SUBCONTRACTOR, FOR PERFORMANCE OF A PARTICULAR CONSTRUCTION ACTIVITY, INCLUDING INSTALLATION, ERECTION, APPLICATION, AND SIMILAR OPERATIONS. INSTALLERS ARE REQUIRED TO BE EXPERIENCED IN THE OPERATIONS THEY ARE ENGAGED TO PERFORM.

TECHNOLOGY SYSTEMS: THE TERM "TECHNOLOGY SYSTEMS" IS USED TO DESCRIBE ALL LOW VOLTAGE SYSTEMS GENERALLY REFERRED TO AS "SPECIAL SYSTEMS". THESE SYSTEMS INCLUDE BUT ARE NOT NECESSARILY LIMITED TO ALL SYSTEMS WHICH UTILIZE VOLTAGES OF LESS THAN 71 VOLTS SUCH AS SOUND SYSTEMS, VIDEO SYSTEMS, TV SYSTEMS, SECURITY SYSTEMS, VOICE AND DATA CABLING SYSTEMS, ETC...

ABBREVIATIONS

NOTE: ALL ABBREVIATIONS MAY NOT BE USED.

"A"	AMP OR AMPS	"IG"	INSULATED GROUND
"ADJ"	ADJACENT	"IMC"	INTERMEDIATE METAL CND
"AFF"	ABOVE FINISHED FLOOR	"IN/IS"	INSULATED/ISOLATED
"AL"	ALUMINUM	"KVA"	KILO VOLT AMPERES
"C"	CONDUIT	"KW"	KILOWATTS
"CB","C/B"	CIRCUIT BREAKER	"LFMC"	LIQUID TIGHT FLEXIBLE METAL CONDUIT
"CKT"	CIRCUIT		
"CO"	CONVENIENCE OUTLET	"LFNC"	LIQUID TIGHT FLEXIBLE NONMETALLIC CONDUIT
"C.O.R."	CONTRACTING OFFICER'S REPRESENTATIVE		
"CU"	COPPER	"MCA"	MINIMUM CIRCUIT AMPS
"EA"	EACH	"MLO"	MAIN LUGS ONLY
"ELEC"	ELECTRICAL	"N.C."	NORMALLY CLOSED
"EM"	EMERGENCY	"N.I.C."	NOT IN CONTRACT
"EMT"	ELECTRICAL METALLIC TUBING	"N.O."	NORMALLY OPEN
"ENT"	ELECTRICAL NONMETALLIC TUBING	"O.C."	ON CENTER
"EQUIP"	EQUIPMENT	"OCP"	OVER CURRENT PROTECTION
"EX"	EXISTING	"QTY"	QUANTITY
"FA"	FIRE ALARM	"R"	REMOVE
"FACP"	FIRE ALARM CONTROL PANEL	"RMC"	RIGID METAL CONDUIT
"FLA"	FULL LOAD AMPS	"RNC"	RIGID NONMETALLIC CONDUIT
"FMC"	FLEXIBLE METAL CONDUIT	"RR"	REMOVE AND RELOCATE
"F.O.B."	FREIGHT ON BOARD	"TYP"	TYPICAL
"GFI"	GROUND FAULT INTERRUPTER	"UF"	UNDER FLOOR
"GR"	GROUND	"UG"	UNDER GROUND
"HOA"	HAND-OFF-AUTO	"W/"	WITH
"HP"	HORSE POWER	"WP"	WEATHER PROOF
		"XFMR"	TRANSFORMER

MARK	REVISION	DATE
1	ADDENDUM #1	2020-10-16

CURTIS MINER ARCHITECTURE
233 SOUTH PLEASANT GROVE BLVD, SUITE #105
PLEASANT GROVE, UTAH 84062
PHONE: (801) 769-3000
cma@cmautah.com

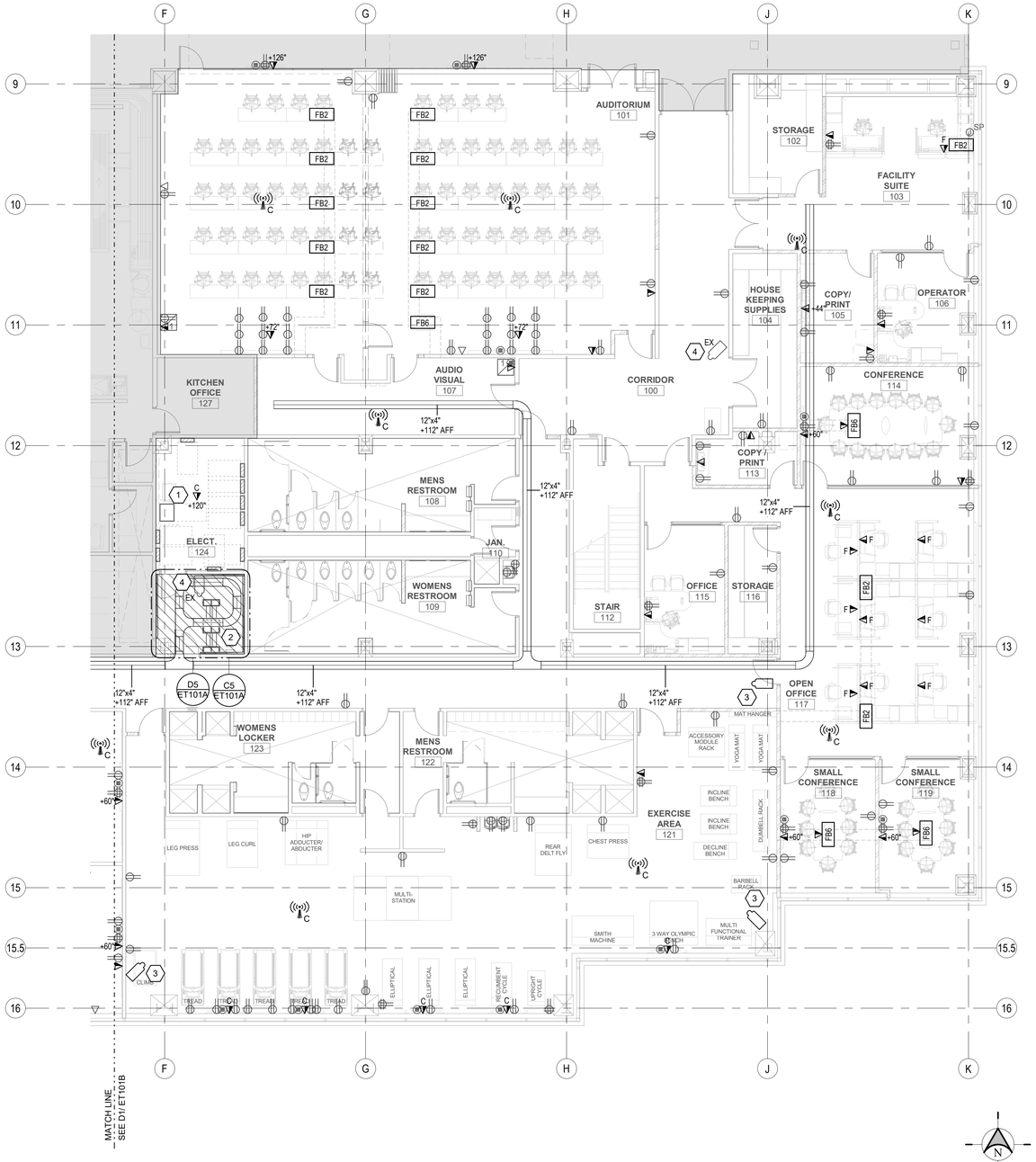
DATE: SEPT 16, 2020
PROJECT #: 20-020
PROJ. MAN.: JSJ
CHECKED BY: GWT

PROJECT:
INTERMOUNTAIN LAKE PARK LEVEL 1 REMODEL
4646 LAKE PARK BLVD
WEST VALLEY CITY, UTAH 84120

LICENSED PROFESSIONAL ENGINEER
No. 5148728
DAVID G. HINCKLEY
STATE OF UTAH

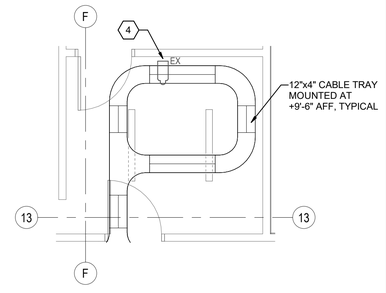
SHEET DESCRIPTION:
AV ROUGH-IN SCHEDULES, NOTES AND RISER DIAGRAMS

SHEET:
EJ601



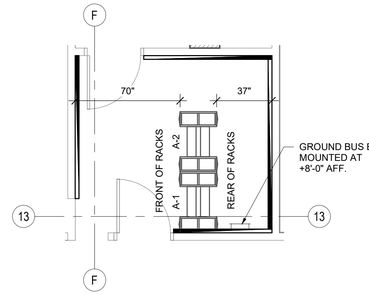
D1 LEVEL 1 TELECOM PLAN - AREA A

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



C5 ENLARGED EXISTING IDF CABLE TRAY PLAN

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



D5 ENLARGED EXISTING IDF EQUIPMENT RACK PLAN

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

MARK	REVISION	DATE
1	ADDENDUM #1	2020-10-16

GENERAL SHEET NOTES

1 HATCHED AREA IS NOT IN SCOPE.

2 PROVIDE BONDING OF CABLE TRAY. COMPLY WITH NEC 392.60A REQUIREMENTS.

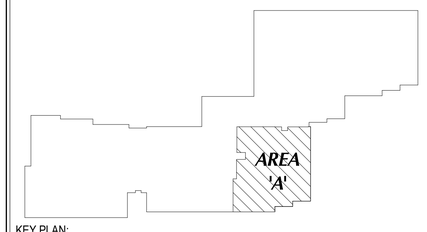
SHEET KEYNOTES

1 PROVIDE 0.75" THICK X 8" HIGH FIRE-TREATED, PAINTED PLYWOOD ON ALL WALLS OF COMMUNICATIONS ROOMS.

2 ALL NEW DATA CABLE TO TERMINATE IN EXISTING 8'-0" TALL RACK ADJACENT TO THE WALL IN TDR.

3 NEW SECURITY CAMERA LOCATION. PROVIDE CATEGORY 6A/FUTP CABLE.

4 EXISTING SECURITY CAMERA LOCATION. REMOVE AND REPLACE CABLE WITH NEW CATEGORY 6A/FUTP CABLE.



KEY PLAN:

CURTIS MINER ARCHITECTURE
233 SOUTH PLEASANT GROVE BLVD. SUITE #105
PLEASANT GROVE, UTAH 84062
PHONE: (801) 769-3000
cma@cmautah.com

DATE: SEPT 16, 2020
PROJECT #: 20-020
PROJ. MAN.: JSJ
CHECKED BY: GWT

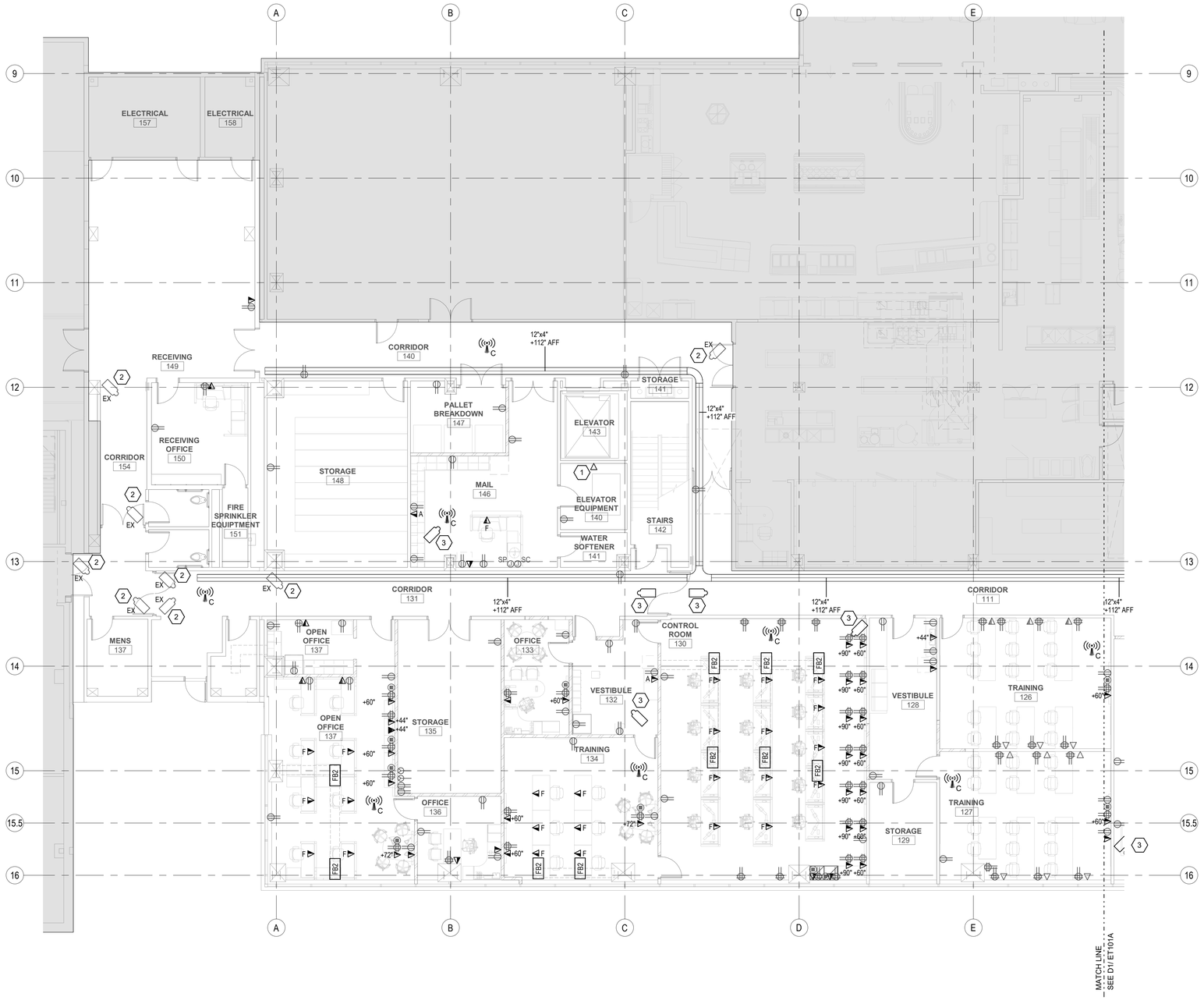
PROJECT:
INTERMOUNTAIN LAKE PARK LEVEL 1 REMODEL

4646 LAKE PARK BLVD
WEST VALLEY CITY, UTAH 84120

LICENSED PROFESSIONAL ENGINEER
No. 5148728
DAVID G. HINCKLEY
STATE OF UTAH

SHEET DESCRIPTION:
LEVEL 1 TELECOM PLAN - AREA A

SHEET:
ET101A



D1 LEVEL 1 TELECOM PLAN - AREA B

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

0 4' 8' 16'

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10/15/2020 8:54:46 AM

MARK	REVISION	DATE
1	ADDENDUM #1	2020-10-16

GENERAL SHEET NOTES

1 HATCHED AREA IS NOT IN SCOPE.

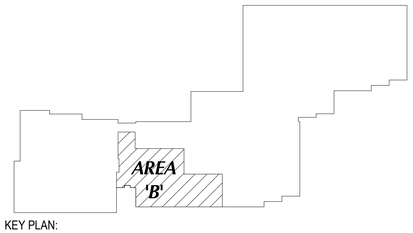
2 PROVIDE BONDING OF CABLE TRAY. COMPLY WITH NEC 392.60A REQUIREMENTS.

SHEET KEYNOTES

1 COORDINATE FINAL TERMINATION LOCATION OF DATA DEVICE WITH ELEVATOR INSTALLER.

2 EXISTING SECURITY CAMERA LOCATION. REMOVE AND REPLACE CABLE WITH NEW CATEGORY 6A/FUTP CABLE.

3 NEW SECURITY CAMERA LOCATION. PROVIDE CATEGORY 6A/FUTP CABLE.



KEY PLAN:

CURTIS MINER ARCHITECTURE
233 SOUTH PLEASANT GROVE BLVD. SUITE #105
PLEASANT GROVE, UTAH 84062
PHONE: (801) 769-3000
cma@cmautah.com

DATE: SEPT 16, 2020
PROJECT #: 20-020
PROJ. MAN.: JSJ
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PROJECT:
INTERMOUNTAIN LAKE PARK LEVEL 1 REMODEL

4646 LAKE PARK BLVD
WEST VALLEY CITY, UTAH 84120

LICENSED PROFESSIONAL ENGINEER
No. 5148728
DAVID G. HINCKLEY
STATE OF UTAH

SHEET DESCRIPTION:
LEVEL 1 TELECOM PLAN - AREA B

SHEET:
ET101B

AUDIO AND VIDEO SYSTEM EQUIPMENT LIST

THE ITEMS INDICATED BELOW SHALL NOT BE CONSTRUED AS A "BILL OF MATERIALS". THIS LIST IDENTIFIES ITEMS OF SIGNIFICANCE USED DURING THE DESIGN OF THE ELECTRONIC SYSTEMS INSTALLATION. WHERE THE ITEMS INDICATED ARE ONE PORTION OF AN ASSEMBLY, THE ENTIRE ASSEMBLY SHALL BE PROVIDED UNLESS SPECIFIED OTHERWISE. PROVIDE ALL MISCELLANEOUS HARDWARE AND SUPPORTS WHICH MAY NOT BE LISTED HERE. FOR A COMPLETE INSTALLATION. COMPARE CATALOG NUMBERS WITH DESCRIPTIONS AND NOTIFY ENGINEER OF DISCREPANCIES PRIOR TO BID. IF CATALOG NUMBERS DO NOT MATCH DESCRIPTIONS, THE DESCRIPTIONS TAKE PRECEDENCE. PROVIDE COMPLETE SUBMITTAL FOR APPROVAL PRIOR TO PURCHASING ANY EQUIPMENT OR CABLE. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

SYMBOL	DESCRIPTION	QUANTITY	ACCEPTABLE TYPES
WR	WIRELESS MICROPHONE SYSTEM WITH BODY WORN AND HANDHELD TRANSMITTER, LAVALIER MICROPHONE	OFP	SHURE ULXD4Q
		4	ULXD2/SM86 HANDHELD TRANSMITTER
		4	ULXD1 BODYPAK TRANSMITTER AND WL183 LAPEL MIC
	HEAD WORN ELEMENTS	2	COUNTRYMAN E6i
MIC	MICROPHONE, LECTERN, 18" GOOSENECK	OFP	SHURE MX418/C
TPW	WALL MOUNTED TOUCH SCREEN CONTROL PANEL, 10", PoE	OFP	CRESTRON TSW-1060-B-S
MON	MONITOR LED 23", NATIVE RESOLUTION, 1920x1280, BLACK IN COLOR	OFP	NEC EX231W HP 2311XI OR AS APPROVED
	LECTERN, MULTIMEDIA W/ FRONT DOORS, REMOVABLE BACK, AND SIDE SHELF, FIXED (NO CASTERS)	2	DWI ENTERPRISES DM400SE-2, W/ EXTRON CABLE CUBBY 500, AND EQUIPMENT AS DETAILED, ARCHITECT TO SELECT FINISH
/1	EQUIPMENT RACK #1, WALL MOUNTED, PIVOTING, ENCLOSED E/ FRONT AND REAR RAILS, FRONT DOOR, ZERO CLEARANCE LATCH AND FANS	OFP	MIDDLE ATLANTIC SR40-32/ VFD-40/ DWR-RR40/ QFANFANCORD, OR APPROVED EQUIVALENT, NOTE #15
UPS	UNINTERRUPTIBLE POWER SUPPLY, 20 AMP	OFP	MIDDLE ATLANTIC UPS-2200R
CRX	CAMERA AND CAMERA CONTROL UNIT, PTZ, TP CONNECTIVITY, 20X ZOOM	OFP	VADDIO ROBOSHOT 20 UHD 999-9950-000 W/ ONELINK INTERFACE AND WALL MOUNT
	POWER AMPLIFIER, 2-CHANNEL, 100 WATTS PER CHANNEL	OFP	CRESTRON AMP-2210T
M	CEILING MICROPHONE, STEARABLE, DANTE	OFP	SHURE MXA910W
ASP1	AUDIO DIGITAL SIGNAL PROCESSOR, OPEN ARCHITECTURE W/ AEC	OFP	QSC QSYS CORE 110F WITH DANTE
ARR	MONITOR ARRAY, 3X3	OFP	PLANAR VMC49MXX9 WITH ALL REQUIRED MOUNTING AND CONNECTION ACCESSORIES
STB	DISH/CABLE SUPPLIER SET TOP BOX	OFCI	
AVB	AUDIO-VIDEO TO USB BRIDGE	OFP	VADDIO AV BRIDGE 999-8210-000
DAA	OPTICAL TO ANALOG AUDIO CONVERTER	A/R	GEFFEN GTV-DIGAUD-2-AAUD
S	SURFACE MOUNTED SPEAKER, FULL RANGE	OFP	COMMUNITY DS8 W/ WALL MOUNT BRACKET ARCHITECT TO SELECT COLOR
ALS	ASSISTED LISTENING SYSTEM, WI-FI & RF	OFP	LISTEN LCS-120-01
IR	INFRARED DOOR POSITION SENSOR	OFP	CRESTRON GLS-PART-CN
ASP2	AUDIO DIGITAL SIGNAL PROCESSOR, 2X2 W/ DANTE AND USP	OFP	SHURE INTELLIMIX P300
AM	WIRELESS VIDEO RECEIVER	OFP	CRESTRON AIRMEDIA 2
BPW	BUTTON CONTROL PANEL, WALL MOUNTED, PoE	OFP	CRESTRON MPC3-302-B
BPT	BUTTON CONTROL PANEL, TABLE TOP MOUNTED, PoE	OFP	CRESTRON MPC3-302-B WITH TTK-MP/MPC/IPAC-B-T

SOUND MASKING SYSTEM EQUIPMENT LIST

THE ITEMS INDICATED BELOW SHALL NOT BE CONSTRUED AS A "BILL OF MATERIALS". THIS LIST IDENTIFIES ITEMS OF SIGNIFICANCE USED DURING THE DESIGN OF THE ELECTRONIC SYSTEMS INSTALLATION. WHERE THE ITEMS INDICATED ARE ONE PORTION OF AN ASSEMBLY, THE ENTIRE ASSEMBLY SHALL BE PROVIDED UNLESS SPECIFIED OTHERWISE. PROVIDE ALL MISCELLANEOUS HARDWARE AND SUPPORTS WHICH MAY NOT BE LISTED HERE, FOR A COMPLETE INSTALLATION. COMPARE CATALOG NUMBERS WITH DESCRIPTIONS AND NOTIFY ENGINEER OF DISCREPANCIES PRIOR TO BID. IF CATALOG NUMBERS DO NOT MATCH DESCRIPTIONS, THE DESCRIPTIONS TAKE PRECEDENCE. PROVIDE COMPLETE SUBMITTAL FOR APPROVAL PRIOR TO PURCHASING ANY EQUIPMENT OR CABLE. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

SYMBOL	DESCRIPTION	QUANTITY	ACCEPTABLE TYPES
NG	MASKING NOISE GENERATOR, MULTI-CHANNEL W/ EQUALIZATION, EXISTING	0	ATLAS SOUND ASP-MG24 TDB
S 1,2	MASKING SPEAKER ASSEMBLY, UPWARD RADIATING W/ 8" SPEAKER, SUSPENSION CHAIN, AND ROTARY TAP SELECTION	OFP	ATLAS SOUND M1000, SEE DETAILS D1/TM001 AND D3/TM001
PA	POWER AMPLIFIER, 2-CHANNEL, 70V, MINIMUM 200 WATTS PER CHANNEL, EXISTING	0	CROWN DCi 2-300 QSC-CX302V
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR, 20 AMP, EXISTING	0	TRIPP LITE IBAR12-20ULTRA
	J-HOOKS, SEE DETAIL D1/TM001	A/R	CADDY HILTI
	SPEAKER CABLE, PLENUM RATED, 16AWG, TWISTED PAIR	A/R	BELDEN 6200UE WEST PENN 25226B

A/R = AS REQUIRED OFP = OBTAIN FROM PLANS RMK = RACK MOUNT KIT

AUDIO AND VIDEO SYSTEM EQUIPMENT LIST

THE ITEMS INDICATED BELOW SHALL NOT BE CONSTRUED AS A "BILL OF MATERIALS". THIS LIST IDENTIFIES ITEMS OF SIGNIFICANCE USED DURING THE DESIGN OF THE ELECTRONIC SYSTEMS INSTALLATION. WHERE THE ITEMS INDICATED ARE ONE PORTION OF AN ASSEMBLY, THE ENTIRE ASSEMBLY SHALL BE PROVIDED UNLESS SPECIFIED OTHERWISE. PROVIDE ALL MISCELLANEOUS HARDWARE AND SUPPORTS WHICH MAY NOT BE LISTED HERE, FOR A COMPLETE INSTALLATION. COMPARE CATALOG NUMBERS WITH DESCRIPTIONS AND NOTIFY ENGINEER OF DISCREPANCIES PRIOR TO BID. IF CATALOG NUMBERS DO NOT MATCH DESCRIPTIONS, THE DESCRIPTIONS TAKE PRECEDENCE. PROVIDE COMPLETE SUBMITTAL FOR APPROVAL PRIOR TO PURCHASING ANY EQUIPMENT OR CABLE. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

SYMBOL	DESCRIPTION	QUANTITY	ACCEPTABLE TYPES
S	SPEAKER, 6.5", CEILING MOUNTED, W/ GRILLE AND TILE RAILS	OFP	COMMUNITY D6 W/ REQUIRED ACCESSORIES
NS	NETWORK SWITCH, POE, GIGABIT, MANAGED, PoE+	A/R	CISCO SG350-52-MP
DPP	DATA PATCH PANEL, CAT6, 24-PORT	A/R	
DTX DRX	TWISTED PAIR DIGITAL VIDEO TRANSMITTER/ RECEIVER PAIR IN, W/ MOUNTING HARDWARE	OFP	CRESTRON HD-MD-400-C-E
UTX URX	TWISTED PAIR USB TRANSMITTER/ RECEIVER PAIR, W/ MOUNTING HARDWARE	OFP	EXTRON USB EXTENDER PLUS SERIES
	POWER AMPLIFIER, 70V, MONO, 50 WATT	OFP	CRESTRON AMP150-70
CP#	CONNECTION PANELS #1, #4, #5	OFP	PLATE W/ CUSTOM CONNECTIONS AND ENGRAVING AS DETAILED. SEE DETAILS ON SHEET TA501.
CP2 CP3	CONNECTION PANELS #2, #3	OFP	EXTRON AAP PLATES, SEE DETAILS B4/TA501 AND C4/TA501
HTX	TWISTED PAIR DIGITAL VIDEO TRANSMITTER W/ MOUNTING HARDWARE	OFP	CRESTRON DM-TX-4KZ-202-C
HRX	TWISTED PAIR DIGITAL VIDEO RECEIVER W/ MOUNTING HARDWARE	OFP	CRESTRON DM-RMC-4KZ-100-C
M49	FLAT PANEL DISPLAY, 49", LCD, 4K	OFP	LG 49UT640S
	CEILING MOUNT	OFP	CHIEF LCM1U W/ ALL NECESSARY ACCESSORIES
M55	FLAT PANEL DISPLAY, 55", LCD, 4K	OFP	LG 55UT640S, OR AS APPROVED
	FIXED WALL MOUNT, LANDSCAPE	OFP	CHIEF MSTU W/ ALL NECESSARY ACCESSORIES, INCLUDING CAMERA SHELF
M65	FLAT PANEL DISPLAY, 65", LCD, 4K	OFCI	
	ARTICULATING WALL MOUNT, LANDSCAPE	OFP	CHIEF TS318TW/ ALL NECESSARY ACCESSORIES, INCLUDING CPU MOUNT
M70	FLAT PANEL DISPLAY, 70", LCD, 4K	OFP	LG 70UL3E, OR AS APPROVED
	VIDEO WALL MOUNTING SYSTEM WITH RAILS	OFP	CHIEF LVS1U W/ ALL NECESSARY ACCESSORIES
M75	FLAT PANEL DISPLAY, 75", LCD, 4K	OFP	LG 75UT640S, OR AS APPROVED
	FIXED WALL MOUNT W/ MONITOR MATING PLATE	OFP	CHIEF XSM1U W/ ALL NECESSARY ACCESSORIES
TM75	TOUCH MONITOR, 75" DIAGONAL, 4K W/ WALL MOUNT BRACKET	OFP	LG 75TC3D
	FIXED WALL MOUNT W/ MONITOR MATING PLATE	OFP	CHIEF XSM1UW/ REQUIRED ACCESSORIES
M80	FLAT PANEL DISPLAY, 86", LCD, 4K	OFP	LG 86UT640S, OR AS APPROVED
	TILT WALL MOUNT W/ MONITOR MATING PLATE	OFP	CHIEF LTM1U W/ ALL NECESSARY ACCESSORIES
COD CTRL POEI	VIDEO CONFERENCING/ COLLABORATION SYSTEM, INCLUDING TRACKING CAMERA, AND CONTROL TOUCH PANEL	OFP	CISCO WEBEX ROOM KIT PLUS W/ CISCO WALL MOUNT AND PoE INJECTOR
MIC	VIDEO CONFERENCING MICROPHONE	OFP	CISCO TABLE MICROPHONE 20
CPU	SMALL FORMAT COMPUTER, OWNER FURNISHED AND INSTALLED	0	AV INSTALLER TO CONNECT CPU TO AV SYSTEM
	CONNECTORS, SEE NOTE 5	A/R	
	POWER SUPPLIES, MISC. TRANSFORMERS, SIGNAL SENSORS, PROTOCOL CONVERTERS, SEE NOTES 4, 7, 8	A/R	
	PATCH CORDS, SEE NOTE 6	A/R	
	ADAPTER CABLES, SEE NOTE 9	A/R	
	CABLE, SEE AUDIO-VIDEO SYSTEMS CABLE SCHEDULE	A/R	
	HDMI CONNECTOR SUPPORT BRACKETS	A/R	EXTRON LOCKIT
	NYLON BRAIDED EXPANDABLE SLEEVING	A/R	TECH FLEX FLEXO PET
TXC	TRANSCODER CHASIS	OFP	CRESTRON DMF-CI-8 W/
	ENCODER MODULES	OFP	CRESTRON DM-NVX-E30C
	DECODER MODULES	OFP	CRESTRON DM-NVX-D30C
IPTX	NETWORK VIDEO ENCODER	OFP	CRESTRON DM-NVX-352
IPRX	NETWORK VIDEO ENCODER	OFP	CRESTRON DM-NVX-D30
SC	STREAMING VIDEO CONTROLLER	OFP	CRESTRON DM-XIO DIR-80
C	EQUIPMENT RACK, 14 RU, CABINET MOUNTED	OFP	MIDDLE ATLANTIC SRSR-2-14
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR AT MONITORS	OFP	SURGEX SA82 OR TRIPP LITE ISOBAR6
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR, 20 AMP, RACK MOUNT	OFP	TRIPP LITE IBAR12-20ULTRA

A/R = AS REQUIRED, OFP = OBTAIN FROM PLANS, OFCI = OWNER FURNISHED CONTRACTOR INSTALLED

MARK	REVISION	DATE
1	ADDENDUM #1	2020-10-16

CURTIS MINER ARCHITECTURE
233 SOUTH PLEASANT GROVE BLVD. SUITE #105
PLEASANT GROVE, UTAH 84062
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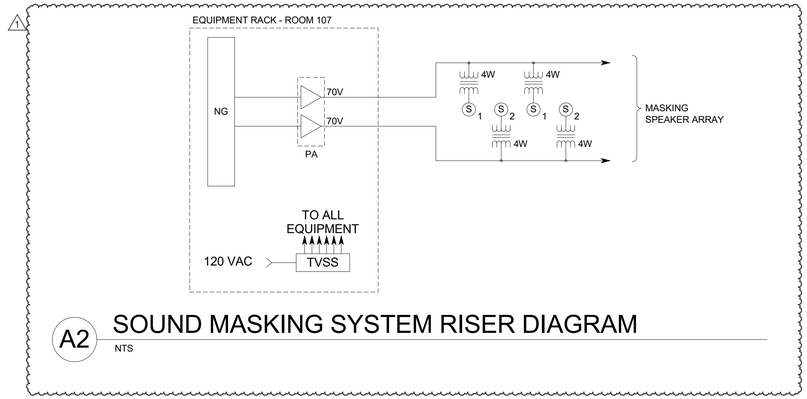
4646 LAKE PARK BLVD
WEST VALLEY CITY, UTAH 84120

LICENSED PROFESSIONAL ENGINEER
No. 5148728
DAVID G. HINCKLEY
STATE OF UTAH

SHEET DESCRIPTION:
AUDIO-VIDEO SYSTEMS EQUIPMENT LIST

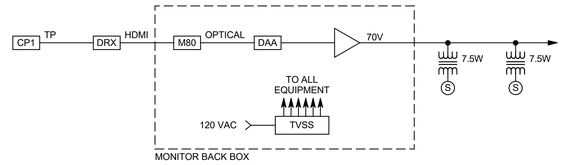
SHEET:
TA002

MARK	REVISION	DATE
1	ADDENDUM #1	2020-10-16



A2 SOUND MASKING SYSTEM RISER DIAGRAM

NTS

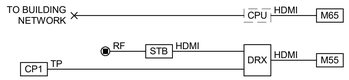


A4 TRAINING ROOMS 126, 127 AV SYSTEM RISER DIAGRAM

NO SCALE

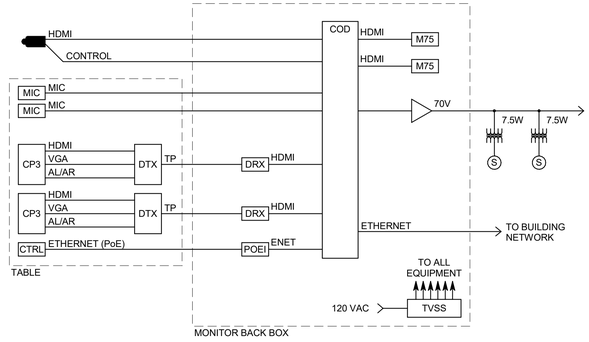
B2 EXERCISE AREA 121 SYSTEM RISER DIAGRAM

NO SCALE



B3 OPEN OFFICE 137 AV SYSTEM RISER DIAGRAM

NO SCALE

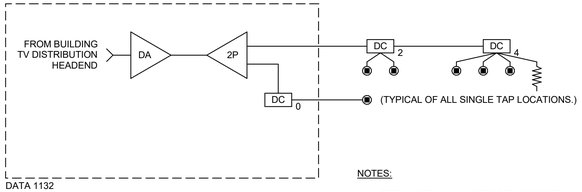


C4 CONFERENCE 114 AV SYSTEM RISER DIAGRAM

NO SCALE

TV DISTRIBUTION EQUIPMENT LIST

SYMBOL	DESCRIPTION	QTY	ACCEPTABLE TYPES
4P	MULTI-PORT SPLITTER	OFP	2-PORT BLONDER TONGUE SXRS-2 4-PORT BLONDER TONGUE SXRS-4
DA	BROADBAND AMPLIFIER	OFP	BLONDER TONGUE MUVB-25
DC X	DIRECTIONAL COUPLER (X = NUMBER OF PORTS)	OFP	BLONDER TONGUE SRT-4A, SRT-2A
	WALL TAP PLATE	OFP	BLONDER TONGUE VERSATAP SERIES MODEL V-1GF-FT W/ COVER PLATE
	RF TERMINATOR	A/R	75 OHM TERMINATOR
T	COAXIAL CABLE, HORIZONTAL DROP	A/R	RG-6 (SEE SPECIFICATIONS)
TR	COAXIAL CABLE, TRUNK	A/R	RG-11 (SEE SPECIFICATIONS)

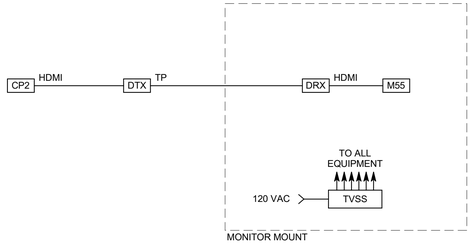


NOTES:

1. TERMINATE ALL UNUSED DEVICE PORTS WITH 75 OHM TERMINATING CONNECTORS.
2. ALL TV OUTLET JACKS SHALL PROVIDE AT LEAST +2dBmV OF VIDEO SIGNAL.
3. PROVIDE A SIGNAL GREATER THAN OR EQUAL TO 25dbm.

D2 TV DISTRIBUTION SYSTEM DIAGRAM

NO SCALE



D4 SMALL CONFERENCE ROOMS 118, 119 AV SYSTEM RISER DIAGRAM

NO SCALE

CURTIS MINER ARCHITECTURE
233 SOUTH PLEASANT GROVE BLVD. SUITE #105
PLEASANT GROVE, UTAH 84062
PHONE: (801) 769-3000
cma@cmautah.com

DATE: SEPT 16, 2020
PROJECT #: 20-020
PROJ. MAN.: JSJ
CHECKED BY: GWT

PROJECT:
INTERMOUNTAIN LAKE PARK LEVEL 1 REMODEL

4646 LAKE PARK BLVD
WEST VALLEY CITY, UTAH 84120

LICENSED PROFESSIONAL ENGINEER
No. 5148728
DAVID G. HINCKLEY
STATE OF UTAH

SHEET DESCRIPTION:
AV SYSTEMS DIAGRAMS

SHEET:
TA601