ADDENDUM TO
REQUEST FOR PROPOSALS
ALTADENA MAIN LIBRARY
RENOVATION PROJECT
Altadena Library District

ADDENDUM NO. 4

DATE: September 19, 2025

This addendum is issued to modify the previously issued RFP documents and/or given for informational purposes, and is hereby made a part of the RFP documents. **The proposer shall acknowledge receipt of any and all addenda, listing the Addenda by number(s) and date(s) in their Letter of Interest.**

Changes and Clarifications to RFP:

1. **Anticipated Solicitation Timeline:** The anticipated solicitation timeline is revised to the following:

   August 18, 2025 – RFP Issued
   August 27, 2025 – Job Walk
   September 29, 2025 – 2nd Job Walk
   October 15, 2025 – Questions Due
   November 12, 2025 – Proposals Due
   December 15, 2025 – Board of Trustees Award of Contract
   January 5, 2026 – Notice to Proceed, Begin Preconstruction Activities
   March 3, 2026 – Begin Site Construction Activities
   May 6, 2027 – Construction Completion

2. **Completion of Work:** All work shall be completed within:
   · Building Renovation and Improvements, 487 Calendar Days from Notice to Proceed.
   NOTE: Before actual construction may commence a Conditional Use Permit (CUP) must be issued by Los Angeles County. The Library anticipates issuance of the CUP by **March 2, 2026.** In the event issuance is delayed beyond that date, the Completion Date will be extended on a day-for-day basis until the CUP is issued. Prior to issuance of the CUP the selected contractor will be expected to perform pre-construction tasks following issuance of the Notice to Proceed.

3. **Additional Job Walk:** As noted in the revised timeline above, an additional Mandatory

Pre-Proposal Job Walk is scheduled for September 29, 2025 at 2:00 pm at 600 E. Mariposa Street, Altadena, CA 91001**. NOTE: Attendance at at least one job walk is mandatory. If you already attended the September 4, 2025 job walk, you are not required to attend the September 2, 2025 job walk.**

General Clarifications and Information:

1. Refer to ABA Bid Addendum No. 004, attached, for additional clarifications and responses to Bid RFIs.

2. Additional Addenda will be issued to respond to RFIs not addressed herein.

Questions and Answers:

1. **Question**: Is a bid bond required for this project? If so, does the district have a bid bond form?

   Answer: A bid bond is not required for this project.

2. **Question**: Is the contractor responsible for the audio visual system (devices, cabling, programming, etc) as noted on the AV plans? If so, please provide Audio Visual Technical Specification

   Answer: See attached ABA Bid Addendum No. 004 for AV scope clarifications and responses to related questions.

3. **Question:** Can the site be made available for a subcontractor jobwalk?

   Answer: Yes, email Jennifer.pearson@huckabee-inc.com to coordinate.

4. **Question**: The RFP does not provide a date for response to these questions, however at the job walk on 9/4/2025 it was stated that answers shall be published 9/24/2025, one week before proposals are due. As the answers to the questions could have large impact on pricing, it is requested to have an extension to the due date of two weeks to 10/15/2025 to allow for any impacts after release of clarifying answers.

   Answer: The anticipated solicitation timeline has been revised as indicated above.

5. **Question**: The RFP states that the work shall be completed 487 Calendar Days from Notice to Proceed. Please confirm that this is for the Construction Phase only and does not include Preconstruction activities. The note that the conditional use permit is anticipated to be issued 1/20/26 and that completion date will start from that date or from when CUP is issued conflicts with nomenclature that Notice to Proceed will be provided 11/10/2025, which coincides with the beginning of preconstruction activities. All 487 Calendar Days will be needed in construction phase for equipment long lead times. Please clarify.

   Answer: The construction duration of 487 calendar days begins at Notice to Proceed and includes the period of time prior to issuance of the CUP. The intent is for the preconstruction period to allow for submittal review and procurement of long lead items, mobilization, site investigation, etc., while still allowing approximately 14 months of on-

site construction. As stated in the RFP, if the CUP issuance is delayed, the construction duration will be extended by the same number of days to maintain this on-site construction period.

6. **Question**: What is the estimated permit cost for this project?

   Answer: All permit fees will be paid directly by the District.

7. **Question**: Are there authorities other than LA DPW B&S in jurisdiction on this project?

   Answer: LA County Regional Planning, Department of Public Works, LA County Fire Department, and SQAMD all have jurisdiction over this project.

8. **Question**: 01 14 00 Please list required drug and background screening of Contractor personnel working on site as required by the owner.

   Answer: No drug or background screening is required by the Owner.

9. **Question**: 01 31 00 1.8.C asks for use of web-based project management software package. Can you please confirm that Architects shall accept formats and respond to communications listed in C.1 in the web-based project management software?

   Answer: Confirmed. In addition, if the contractor does not have a preferred project management software, Huckabee can provide access to Autodesk Construction Cloud for project management.

10. **Question**: 01 31 00 1.10.E Please state client's preference for frequency of progress meetings during construction.

    Answer: During construction, weekly meetings will be required.

11. **Question**: 01 40 00 1.9 States Owner will engage Special Tests and Inspections. Please state delineation of responsibility for special inspection.

    Answer: The District will procure and pay for all special tests and inspections required by authorities having jurisdiction or as requested by the District. Contractor will be responsible for timely requests for inspections and payment for reinspection and/or retesting work that fails to comply, as indicated in paragraph 1.8A.3. Additional responsibilities are delineated throughout the spec section.

12. **Question**: Do subcontractors need to provide the same minimum limits of insurance as the general contractor, which are $2 million / $2 million / $2 million / $5 million? Many subcontractors have smaller policy limits, which can impact pricing.

    Answer: Per the Insurance Requirements in Part 2 of the RFP, “Contractor shall include all subcontractors as insureds under its policies or shall furnish separate certificates and endorsements for each subcontractor. All coverages for subcontractors shall be subject to all of the requirements stated herein.”

13. **Question**: Will the Construction Manager consider providing software such as Procore to

manage the project during construction?

Answer: Huckabee will provide access to Autodesk Construction Cloud for project management.

14. **Question**: Per Section 3.02. Permits and Regulations of the RFP, the Contractor is to secure and pay for permits and licenses associated with the Work. Are these costs to be incorporated into the Contractor's proposal and could you please advise as to what the approximate costs are for the permits and licenses associated with this project for the City of Altadena?

    Answer: Altadena is an unincorporated town subject to L.A. County jurisdiction. All permit fees and other fees required by the County of Los Angeles will be paid directly by the District.

15. **Question**: Per page 2 of the instructions, it seems that just a letter of bendability is required. Is this correct?

    Answer: Yes, proposers shall submit a letter of bondability as part of their proposal package.

16. **Question**: Are appliances to be Owner furnished?

    Answer: Yes.

17. **Question**: What is the construction schedule for this project? When does it start and when is it expected to be completed by?

    Answer: See above for the revised anticipated timeline.

ANDERSON BRULÉ ARCHITECTS

BID ADDENDUM NO. 004

PROJECT:	Altadena Main Library 600 E. Mariposa Street Altadena, CA 91001	DATE ISSUED:	9/19/2025
OWNER:	**Altadena Library District**	ARCHITECT'S PROJECT NO.:	21-1101-0
FROM:	Anderson Brulé Architects 325 S First Street, 4th Floor San José, CA 95113		
TO:	Jennifer Pearson 8640 National Boulevard Culver City, CA 90232		

TO ALL BIDDERS SUBMITTING PROPOSALS FOR THE CAPTIONED PROJECT: THIS ADDENDUM IS HEREBY MADE PART OF THE ORIGINAL CONTRACT DOCUMENTS TO THE SAME EXTENT AS THOUGH IT WERE ORIGINALLY INCLUDED THEREIN AND TAKES PRECEDENCE OVER THE ORIGINAL DOCUMENTS. ACKNOWLEDGE RECEIPT OF THE ADDENDUM ON BID FORM.

THE FOLLOWING DOCUMENTS AND DRAWINGS ARE ATTACHED:

1) Drawings:
    A. Landscape:
        I. L301 – SOIL MANAGEMENT PLAN
2) Specification Sections:
    A. 27 41 16 INTEGRATED AUDIO-VIDEO SYSTEMS AND EQUIPMENT
    B. 27 41 26.01 - APPENDIX G - AV EQUIPMENT LIST
3) For Reference Only Drawings:
    A. P-1 ORIGINAL IRRIGATION PLAN

I. CHANGES AND CLARIFICATIONS TO AV AND TELECOMUNICATIONS SCOPE

A. AV Scope and Coordination:

1. All AV equipment will be Owner Furnished, Owner Installed (OFOI), with the following exceptions:
    a. All ceiling speakers and associated cabling will be Contractor Furnished, Contractor Installed (CFCI). This includes AV system speakers as well as Paging system speakers. Zone and cabling shall be per drawings and Specification Section 27 4 16. Coil 30' of cable at the rack for each home run to be dressed and terminated by others.
    b. Projection Screen shall be CFCI per Specification Section 11 52 13
2. All infrastructure for AV systems, as called out and detailed on the EAV plans, including conduit, boxes, display back boxes, and pathways, shall be provided and installed by the General Contractor (GC).
3. At all display locations, backing shall be installed by the GC. The GC shall also be responsible for installing owner-furnished mounts for flat panels, digital signage, projectors, and projection screens. See EAV details and Architectural details for backing information.

B. Telecommunication Scope (E-rate Contractor Coordination)

1. The E-rate contractor will furnish and install the following Owner Furnished, Owner Installed (OFOI) items:
    a. WAPs (Wireless Access Points)
    b. Data racks, patch panels, and cable management

c. Cabling to all data drops indicated on Telecom drawings
d. All cable termination

2. All infrastructure associated with telecommunications—including conduit, boxes, power, and IDF ladder racks—as called out and detailed on the telecom drawings and specifications, shall be provided and installed by the GC. IDF ground system and buss bar shall be CFCI per Specification Section 27 05 26. This ensures all supporting infrastructure for telecommunications is in place prior to E-rate contractor installation.

II. CHANGES AND CLARIFICATIONS TO LANDSCAPE DRAWINGS

A. Sheet L301 – Soil Management Plan:
1. Add L301 to drawings.

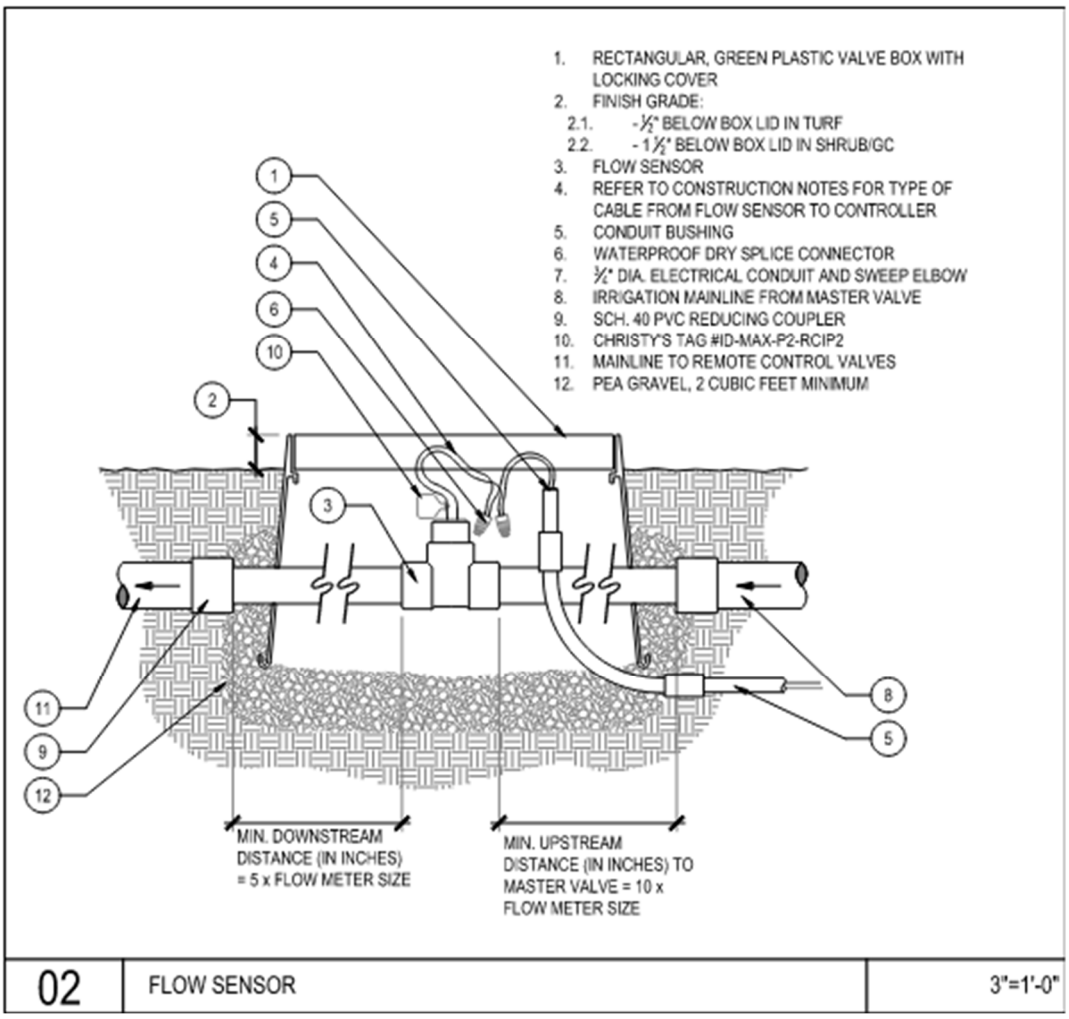
III. CHANGES TO SPECIFICATIONS

A. Section 27 41 16 – Integrated Audio-Video Systems and Equipment: Add Specification Section 27 41 16 to project specifications

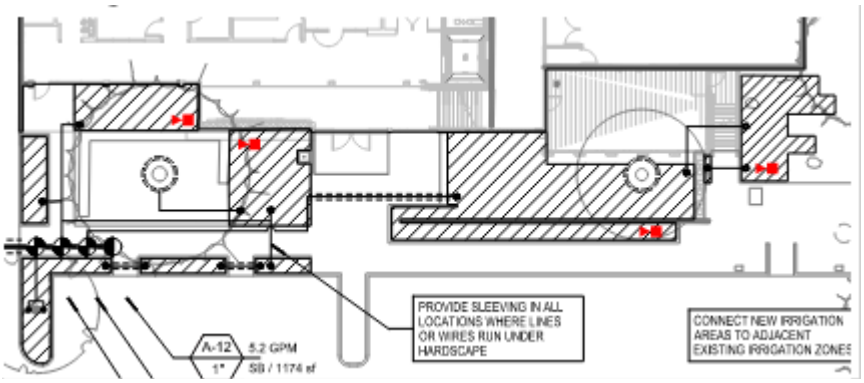
IV. BID RFIS

1. In case of conflicts between the Project Manual (Technical specifications) and the Construction Drawings. Please clarify which one shall take precedence.
   a. Response: Per Irrigation Note 14, Sheet L200 and Planting Note 20, Sheet L300: DEFER TO DRAWING SHEET NOTES AND CALLOUTS IN ALL INSTANCES WHERE DRAWINGS AND SPECIFICATIONS CONTRADICT.
2. There is no sheet L003 - Irrigation Demolition Plan as listed in the Sheet Index on sheet G000 - Cover Sheet. Please clarify.
   a. Response: There is no longer a sheet L003 Irrigation Demolition Plan.
3. There is no sheet L301 - Soil Management Plan as listed in the Landscape Sheet Index on sheet L000 - Landscape Title Sheet. Please clarify.
   a. Response: Sheet L301 should be included in the bid set and is attached to this addendum.
4. Please provide as-built plan for irrigation.
   a. Response: There is no as-built plan for irrigation. The original irrigation design drawing from 1966 is attached, however it is unknown how much of the original design remains. The precise condition of the existing irrigation is unknown. Please use the proposed irrigation plan as a basis for bidding. Per Irrigation Note 2, sheet L200, the Landscape Contractor is to perform an Irrigation Audit to determine the existing conditions. Please work closely with the library facilities group to confirm existing conditions and submit findings per Note 2.
5. Refer to irrigation legend on sheet L200, mainline size 1" to 2" shall be PVC schedule 80. However, refer to technical specs 328400/2.1C-1&2, mainline 2" shall be Class 315 and mainline 1" shall be PVC schedule 40. Please clarify the material of mainline.
   a. Response: Defer to drawing sheet- 1" to 2" shall be PVC schedule 80.
6. How many available stations does the existing controller have? The project is installing 14 new remote control valves besides 5 new remote control valves at existing valves locations. However, refer to sheet L211, the Irrigation controller schedule dated 02/12/2025 shows 10 available stations which are from station 15 to station 24. Please clarify.
   a. Response: As of last site visit, the existing RainBird controller has 9 available zones and room for an additional 8 zone module (17 total available zones)

7. Refer to irrigation legend on sheet L200, valve boxes for all the valves shall be RainBird. However, refer to technical specs 328400/2.8A, all valve boxes shall be as manufactured by Applied Engineering Products. Please clarify.
   a. Response: Defer to drawing sheet- Use Rain Bird boxes
8. Refer to technical specs 328400/2.8C, only master valve and large basket strainer shall have common brick to support the valve boxes. However, refer to irrigation detail 4, master valve valve box does not have brick support, while other details of remote control valve, remote control drip valve, and quick coupler, they show brick support under valve boxes. Please clarify.
   a. Response: Defer to drawing sheet details.
9. Refer to technical specs 328400/3.3B-6, all mainlines, lateral lines, and RCV wires shall have a minimum clearance of 12 inches from each other. However, refer to specs 328400/2.1, the sand backfill clearance between mainline and wires shall be 4 inches. Please clarify.
   a. Response: Defer to lowest distance- 4 inches.
10. Refer to detail 3 on sheet L210, call out no.5 shows about flow sensor cable and conduit. However, there is no new flow sensor in this project as it is not shown on plan or legend on sheet L200. Please confirm there is no flow sensor required for this project.
   a. Response: Please provide a flow sensor immediately after the Master Valve: Hunter Flow-Click Flow Sensor in Rainbird VBSTD box, hardwired to controller via shielded min. 18 AWG wire. See attached detail.
   b.



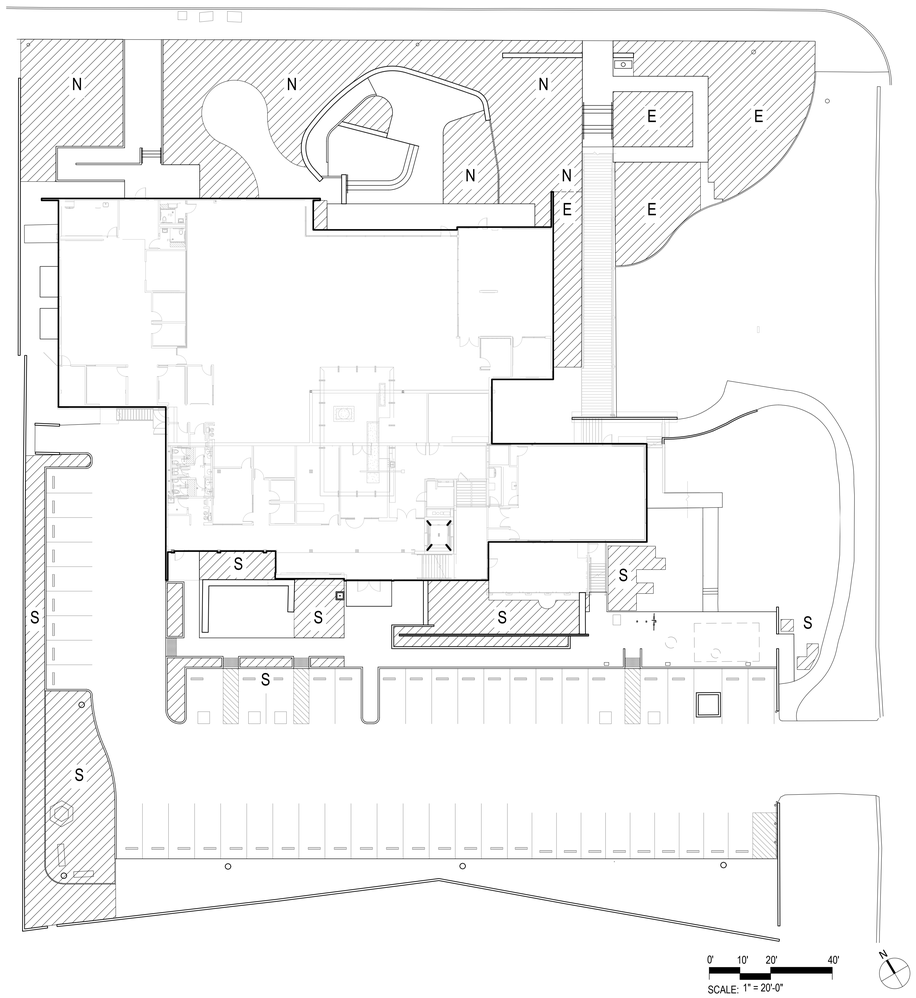
11. Please confirm if the master valve cable shall be enclosed in conduit or not. If yes, please provide material and size of the master valve conduit.
    a. Response: Conduit for master valve cable not required.
12. Refer to 328400/2.1C-8, sand backfill shall be 4" between mainline and RCV wires, and 4" below entire mainline. However, refer to detail 3 on sheet L210, approved top soil or sand backfill shall be 3" under pipe and 6" above pipe. Please clarify the depth of the backfill.
    a. Response: Defer to drawings- 3" under / 6" over.
13. Refer to 328400/2.1C-8, backfill material between mainline and RCV wires, and below entire mainline shall be sand. However, refer to detail 3 on sheet L210, approved top soil or sand backfill shall be used. Please clarify the preferred material in this project.
    a. Response: Sand backfill is preferred.
14. Refer to 328400/2.1C-8, sand backfill shall be 4" between mainline and RCV wires, and 4" below entire mainline. However, refer to detail 4 on sheet L210, sand backfill shall be 6" under pipe and 6" above sleeves. Please clarify the depth of the sand backfill for sleeve.
    a. Response: Defer to drawings.
15. Refer to technical specs 329000/3.10, the plant establishment is mentioned but there is no duration provided, only the plant maintenance duration is shown, which is 60 days. Please clarify the plant establishment period.
    a. Response: Plant Establishment Period as mentioned in specs is to occur simultaneous to Maintenance Period of 90 days.
16. Refer to technical specs 329000/3.10B-5, the plant maintenance period shall be 60 days. However, refer to planting note no.16 on sheet L300, and irrigation note no.10, the maintenance period shall be 90 days. Please clarify.
    a. Response: Defer to sheet drawings- Maintenance Period of 90 days is required.
17. Refer to planting details 1 and 2, depth of planting pit equals to root ball's size. However, refer to technical specs 329000/3.5A, depth of planting pit shall be 1-1/2 times the depth of the original plant container. Please clarify.
    a. Response: Defer to drawings
18. Per Detail 3 on sheet L310, it states that length of root barrier shall be equal to the mature dripline of the particular tree. Please clarify the length of root barrier.
    a. Response: Sheet L300 graphically indicates the root barrier length at two tree locations, with the planting legend specifying 80 linear feet total.
19. Please provide material and size of wire conduit as shown on irrigation legend on sheet L200 as details 2, & 3 on sheet L210 don't mention conduits.
    a. Response: Where the control wires run separate from the mainline please provide PVC Sch.40 conduit, sized 2x diameter of wire bundle.
20. Per note no.4/ Planting note on sheet L300, it states that herbicide shall not be used on this project. However, refer to Section 329000/3.4, it requires fertilizer and herbicide for weed control. Please clarify.
    a. Response: Defer to drawings- no herbicide, hand remove weeds where required.
21. The drip air relief valve is not shown on the legend and plan, but it is mentioned in detail in 10 on sheet L210. Please help us clarify.
    a. Response: Drip air relief valve is not required for surface drip irrigation, ignore detail.
22. Per Watts's website, the backflow preventer model 719-QT has been discontinued and replaced by LF719-QT 2. Please provide an equivalent model.
    a. Response: Please use Watts LF719-QT2.
23. The legend of the drip flush valve on sheet L200 states that it shall be installed at the end of each drip zone, but the symbol of the flush valve does not show in a few of the drip areas on the plan. Please help us clarify.
    a. Response: Please provide 4 additional flush valves on the south side of the building as shown in the diagram below.

b. 

24. In reference to specification section 328400, part 2.1.C which states that the mainline fitting shall be schedule 80, but the detail 7/ L210 shows schedule 40. Please help us clarify.
    a. Response: Defer to Drawings- use Schedule 40
25. Please help us confirm that the irrigation system is a potable water system or a reclaimed water system. If it is a potable water system, please help revise the model of the valve ID tag as mentioned in specification section 328400, part 2.2 & 2.3 for the quick coupler valve and gate valve, and detail 4/L210 for the master valve.
    a. Response: The irrigation is potable. Tags are not required for Quick Coupler Valves and Gate Valves. For the master valve please include Christy's ID.MAX.Y2.PW017.
26. Please help us clarify if the existing controller is a 2-wire system or a conventional system.
    a. Response: Conventional 2-wire system
27. 01 56 39 States Contractor shall protect in place existing irrigation system. Please provide drawings of current irrigation system.
    a. Response: There is no as-built plan for irrigation. The original irrigation design drawing from 1966 is attached, however it is unknown how much of the original design remains. The precise condition of the existing irrigation is unknown. Please use the proposed irrigation plan as a basis for bidding. Per Irrigation Note 2, sheet L200, the Landscape Contractor is to perform an Irrigation Audit to determine the existing conditions. Please work closely with the library facilities group to confirm existing conditions and submit findings per Note 2.
28. Is there an AV spec that you can provide for the AV systems shown on the plans?
    a. Response: Refer to Specification 274116
29. Please provide the AV equipment list (Appendix G) for this project? This is usually included with Waveguide designed projects but it wasn't included here. This is NEEDED as the plans only show device IDs and there is no legend or AV specs that explains what the devices should be.
    a. Response: Appendix G from 274116 is being provided
30. Please provide a mounting detail for the Projection Screen in the Community Room.
    a. Response: AV Contractor shall provide mounting details in AV Shop Drawings
31. Please provide a mounting detail for the Flat Panel Displays throughout this project.
    a. Response: AV Contractor shall provide mounting details in AV Shop Drawings
32. Will the AV contractor be expected to provide any Structural Stamped details for this project? IF YES, then please clarify which parts.
    a. Response: See specification section 274116, subparagraph 3.2.A.5
33. Does the AV cabling for this project need to be plenum rated? Please confirm.
    a. Response: Yes
34. Plans are only showing a fixed Assistive listening systems in the Community room. Should any portable assistive listening systems be provided to cover the other spaces? Please clarify.
    a. Response: No
35. Where is the Paging Headend located at? Should an equipment rack be provided here? Please clarify.
    a. Response: Storage Room 220

36. Would the Leviton/Berk-Tek Cat 6A Atlas-X1 and SST Cable end-to-end solutions be suitable for consideration on this project?
    a. Response: Telecom cabling scope is OFOI
37. T301 TELECOM RACK ELEVATIONS, DETAIL-1, NOTE-5 DETAIL-1, KEYNOTE-5 CALLS OUT FOR A FIBER PATCH PANEL. PLEASE CONFIRM IF FIBER CABLING IS REQUIRED FOR THIS PROJECT? IF SO, PLEASE CONFIRM WHERE FIBER IS REQUIRED AND TYPE OF FIBER REQUIRED?
    a. Response: No. Telecom cabling scope is OFOI
38. T100 TELECOM SITE PLAN, SHEET NOTE-1 SHEET NOTE-1 CALLS AT FOR 1.25" INNERDUCT. PLEASE CONFIRM WHERE INNERDUCT IS REQUIRED?
    a. Response: Not needed.
39. AV205/AV305 The Creston DM matrix required for this is End of Life and will no longer be available by the time of installation. Should we find another HBase T matrix or should we use a video over IP solution? Pease Advise.
    a. Response: AV equipment shall be OFOI
40. AV405.2 Sheet AV405.2 refers to plan sheet AV405.1. That sheet was not provided in the bid set. Please provide.
    a. Response: Refer to sheet AV405
41. AV205/AV305 The Digital Projection E-vision 11000 4K-UHD is discontinued! Do you want the new EV10000i 4K RGB…assuming you need 4K resolution. If not, could you use the EV10000i? Please advise.
    a. Response: AV equipment shall be OFOI
42. AV205/AV305 How many wireless microphones is there 4 or 8?
    a. Response: AV equipment shall be OFOI
43. AV302/AV402 The Microsoft Surface Hub 2S 50 includes the camera. What is the Poly TC-8 needed for?
    a. Response: AV equipment shall be OFOI
44. Reference made to plan sheet C-6.0 which calls out construction note 9 for a "tire wash area per detail 6 on page C-6.1". Is the intent for us to remove a section of the existing asphalt to allow for this detail to be installed? Can this requirement be omitted? Will shaker plates only be sufficient? Please advise.
    a. Response: The BMP is intended to demarcate an area for tire washing as needed. If the GC does not require on site tire washing it can be omitted.

END OF ADDENDUM



SOIL MANAGEMENT LEGEND	
SYMBOL	DESCRIPTION
	APPROXIMATE EXTENT OF SOIL AMENDMENTS. PREPARE SOILS PER THE RECOMMENDATIONS LISTED IN THE SOILS REPORT BELOW. AMEND ALL BACKFILL OF TREES, SHRUBS, AND GROUNDCOVER AS RECOMMENDED. DO NOT TILL OR AMEND SOILS WHERE EXISTING TREE ROOTS ARE PRESENT. N= NORTH SIDE E= EAST SIDE S = SOUTH SIDE

WALLACE LABS
365 Coral Circle
El Segundo, CA 90245
(310) 615-0116

SOILS REPORT

Print Date Feb. 7, 2025 Receive Date 2/6/25

Location Altadena Main Library

Requester Ben McCoy, Department of Space

graphic interpretation: * very low, ** low, *** moderate, **** high, ***** very high

ammonium bicarbonate/DTPA extractable - mg/kg soil

Interpretation of data: low medium high

	Sample ID Number	25-38-01		25-38-02		25-38-03	
	Sample Description	#1 North Side, 6-18"		#2 East Side, 6-18"		#3 South Side, 6-18"	
	elements		graphic		graphic		graphic
0 - 7 8-15 over 15	phosphorus	15.84	*****	29.20	*****	11.32	***
0-60 60 -120 121-180	potassium	313.33	*****	77.00	***	87.69	***
0 - 4 4 - 10 over 10	iron	52.50	*****	25.72	*****	85.33	*****
0- 0.5 0.6- 1 over 1	manganese	3.74	****	3.90	****	4.10	****
0 - 1 1 - 1.5 over 1.5	zinc	22.87	*****	17.46	*****	16.85	*****
0- 0.2 0.3- 0.5 over 0.5	copper	9.06	*****	9.24	*****	3.06	*****
0- 0.2 0.2- 0.5 over 1	boron	0.55	***	0.39	***	0.57	***
	calcium	595.44	****	529.68	****	595.17	****
	magnesium	214.11	*****	240.03	*****	304.09	*****
	sodium	18.86	*	50.79	**	216.04	****
	sulfur	24.62	**	30.82	**	71.19	***
	molybdenum	0.08	***	0.09	***	0.09	***
	nickel	0.67	*	0.56	*	0.31	*
The following trace	aluminum	0.58	***	n d	*	22.12	*****
elements may be toxic	arsenic	0.20	*	0.21	*	0.11	*
The degree of toxicity	barium	1.10	*	0.87	*	0.78	*
depends upon the pH of	cadmium	0.42	*	0.47	*	0.92	*
the soil, soil texture,	chromium	0.02	*	0.02	*	n d	*
organic matter, and the	cobalt	n d	*	0.04	*	0.11	*
concentrations of the	lead	17.74	***	13.24	***	12.67	***
individual elements as	lithium	0.23	*	0.17	*	0.22	*
well as to their interactions.	mercury	n d	*	n d	*	n d	*
	selenium	n d	*	n d	*	n d	*
The pH optimum depends	silver	n d	*	n d	*	n d	*
upon soil organic	strontium	3.17	*	3.01	*	3.92	*
matter and clay content-	tin	n d	*	n d	*	n d	*
for clay and loam soils:	vanadium	0.29	*	0.29	*	1.29	**
under 5.2 is too acidic							
6.5 to 7 is ideal	**Saturation Extract**						
over 9 is too alkaline	pH value	7.28	***	7.77	****	6.96	***
The ECe is a measure of	EC e (milli-mho/cm)	0.61	**	0.62	**	1.23	***
the soil salinity:			millieq/l		millieq/l		millieq/l
1-2 affects a few plants	calcium	88.9	4.4	70.7	3.5	106.3	5.3
2-4 affects some plants,	magnesium	28.6	2.4	26.1	2.2	44.4	3.7
> 4 affects many plants.	sodium	12.3	0.5	35.4	1.5	127.0	5.5
	potassium	35.1	0.9	4.5	0.1	6.4	0.2
	cation sum		8.2		7.3		14.7
problems over 150 ppm	chloride	37	1.0	24	0.7	158	4.5
	nitrate as N	2	0.1	2	0.2	4	0.3
	phosphorus as P	1.6	0.1	1.8	0.1	0.6	0.0
toxic over 800	sulfate as S	28.3	1.8	40.7	2.5	90.2	5.6
	anion sum		3.0		3.5		10.4
toxic over 1 for many plants	boron as B	0.19	*	0.16	*	0.24	**
increasing problems start at 3	SAR	0.3	*	0.9	*	2.6	**
est. gypsum requirement-lbs./1000 sq. ft.		3		9		55	
calculated infiltration rate inches/hour		2.28		2.22		3.15	
soil texture		sandy loam	gravel > 2 mm	sandy loam	gravel > 2 mm	sandy loam	gravel > 2 mm
sand		59.9%	8.9%	63.2%	8.3%	64.8%	9.2%
silt		27.2%	gravel > 1/4 inch	25.9%	gravel > 1/4 inch	24.9%	gravel > 1/4 inch
clay		12.8%	3.8%	10.9%	1.8%	10.3%	2.7%
lime (calcium carbonate)		no	gravel > 1/2 inch	no	gravel > 1/2 inch	no	gravel > 1/2 inch
Total nitrogen		0.304%	0.0%	0.243%	0.0%	0.386%	0.0%
Total carbon		3.655%		2.674%		7.175%	
carbon:nitrogen ratio		12.0		11.0		18.6	
organic matter based on carbon		7.31%	hydrophobic	5.35%		14.35%	
moisture content of soil		11.9%		10.9%		14.3%	
half saturation percentage		27.3%		23.7%		35.1%	

Elements are expressed as mg/kg dry soil or mg/l for saturation extract.
pH and ECe are measured in a saturation paste extract. nd means not detected.
Analytical data determined on soil fraction passing a 2 mm sieve.

ANDERSON BRULÉ ARCHITECTS

325 South First Street, 4th Floor
San Jose, California 95113
408.298.1885 | www.aba-arch.com

409 Harvard Avenue, Suite 201
Claremont, CA 91711

PROPERTY OWNER

ALTADENA LIBRARY DISTRICT
600 E MARIPOSA STREET
ALTADENA, CA 91001
CONTACT: NIKKI WINSLOW
PHONE: (626) 798-0833

BID SET

CONSULTANTS LOGO

DEPARTMENT OF SPACE
SITE DESIGN STUDIO

Department of Space, Inc.
480 N Indian Hill Blvd, Suite 2B
Claremont, CA 91711
909-532-1460

STAMP

REGISTERED LANDSCAPE ARCHITECT
BENJAMIN F. MCCOY No. 6180
Signature
12/31/2026
Expiration Date
2/13/2025
Date
STATE OF CALIFORNIA

NO. DATE REVISIONS

NO.	DATE	REVISIONS

PROJECT TITLE:

ALTADENA MAIN LIBRARY

600 E MARIPOSA STREET
ALTADENA, CA 91001

PROJECT NO.	2111010
DATE:	08-14-25

SHEET TITLE:

SOIL MANAGEMENT PLAN

SCALE: AS SHOWN

L301

7/15/2022 11:26:03 AM

WALLACE LABORATORIES, LLC
365 Coral Circle
El Segundo, CA 90245
phone (310) 615-0116 fax (310) 640-6863

February 10, 2025

Ben McCoy, ben@deptofspace.com
Department of Space
480 N. Indian Hill Ave, Suite 2B
Claremont, CA 91711

RE: Soil Management Report
Altadena Main Library
Three samples received Feb. 6, 2025

Dear Ben,

#1 North Side, 6-18"

The pH is modestly alkaline at 7.28. The salinity is modest at 0.61 millimho/cm. Chloride is 37 parts per million in the saturation extract.

Nitrogen is low. Sulfur is modest. Phosphorus, potassium, iron, manganese, zinc, copper, boron and magnesium are high. Zinc is 23 parts per million. Plant-available lead is moderate at 18 parts per million. Aluminum is moderate.

Available sodium is low SAR (sodium adsorption ratio) is 0.3.

The texture is sandy loam. Based on the non-gravel fraction, it contains 59.9% sand, 27.7% silt and 12.8% clay. The gravel content is 8.9%.

Soil organic matter is high at 7.31% on a dry weight basis. The carbon:nitrogen ratio is good at 12.0. The soil organic matter is mature.

The estimated rate of water percolation based on Soil Water Characteristics version 6.02.74 model developed by Keith Saxton of the USDA is moderate at 2.28 inches per hour for normal soil compaction. The model is based on the soil texture, percent gravel and percent soil organic matter.

The soil is hydrophobic. It is difficult to wet. Water beads up on the soil surface initially and then slowly moves into the soil.

#2 East Side, 6-18"

The pH is moderately alkaline at 7.77. The salinity is modest at 0.62 millimho/cm. Chloride is 24 parts per million in the saturation extract.

Nitrogen is low. Sulfur is modest. Potassium and boron are moderate. Phosphorus, iron, manganese, zinc, copper and magnesium are high. Zinc is 17 parts per million. Plant-available lead is moderate at 13 parts per million.

Available sodium is modest. SAR is 0.9.

The texture is sandy loam. Based on the non-gravel fraction, it contains 63.2% sand, 25.9% silt and 10.9% clay. The gravel content is 8.3%.

Soil organic matter is moderate at 5.35% on a dry weight basis. The carbon:nitrogen ratio is good at 11.0. The soil organic matter is mature.

The estimated rate of water percolation is moderate at 2.22 inches per hour for normal soil compaction.

#3 South Side, 6-18"

The pH is neutral at 6.96. The salinity is moderate at 1.23 millimho/cm. Chloride is 158 parts per million in the saturation extract.

Nitrogen is low. Phosphorus, potassium and sulfur are moderate. Iron, manganese, zinc, copper, boron and magnesium are high. Zinc is 17 parts per million. Plant-available lead is moderate at 13 parts per million. Aluminum is high.

Available sodium is modestly elevated. SAR is 2.6.

The texture is sandy loam. Based on the non-gravel fraction, it contains 64.8% sand, 24.9% silt and 10.3% clay. The gravel content is 9.2%.

Soil organic matter is high at 14.4% on a dry weight basis. The carbon:nitrogen ratio is elevated at 18.6. The soil organic matter is not fully mature.

The estimated rate of water percolation is moderate at 3.15 inches per hour for normal soil compaction.

Evaluations

Aluminum restricts growth by interfering with the metabolism of phosphorus and calcium. It causes stunting and discoloration. Foliage may turn a dull gray green. Aluminum is high in poorly aerated soil and in overly acidic soils. Soluble calcium helps to reduce the toxicity of aluminum.

The optimal concentration of zinc is several parts per million. Sensitive plants such as woody plants need plant available zinc below about 30 parts per million. Herbaceous plants including vegetables generally need zinc below about 50 parts per million. Grasses are fairly tolerant of high zinc. Excessively high levels of zinc cause stunting, dieback, discoloration and diseases. High zinc restricts the uptake of potassium and other micronutrients. Roots are generally short and stubby.

Normally for edible produce, plant-available lead should be less than about 30 parts per million. Lead is more readily absorbed in leafy greens, stem crops and root crops than in fruits and grains.

The effects of heavy metals are cumulative and the concurrent presence of them increases their toxicity. The threshold concentrations may need to be reduced.

Many native plants are not tolerant of low soil aeration, especially manzanita and toyon

Recommendations

Avoid zone of elevated zinc and lead for sensitive plants such as woody plants. Deeper soils may be more suitable.

Use nitrate sources of nitrogen for the South Side. Do not use ammonium-based sources of nitrogen. Calcium nitrate (15.5-0-0) can be applied at 6 pounds per 1,000 square feet about once per quarter. Nitrate helps to increase soil aeration.

General soil preparation on a square foot basis. Broadcast the following uniformly; rates are per 1,000 square feet for a 6-inch lift. Incorporate them homogeneously 6" deep.

Ammonium sulfate (21-0-0) – 5 pounds for well aerated soil, alkaline soil
or Calcium ammonium nitrate (27-0-0) – 4 pounds for poorly aerated soil
calcium nitrate (15.5-0-0) – 6 pounds for South Side
Potassium sulfate (0-0-50) – 6 pounds for East and South Side
Triple superphosphate (0-45-0) – 3 pounds for South Side
Agricultural gypsum - 10 pounds

For the preparation on a volume basis, homogeneously blend the following materials into the soil. Rates are expressed per cubic yard:

Ammonium sulfate (21-0-0) – 1/4 pound for well aerated soil, alkaline soil
or Calcium ammonium nitrate (27-0-0) – 1/4 pound for poorly aerated soil
Calcium nitrate (15.5-0-0) – 1/4 pound for South Side
Potassium sulfate (0-0-50) – 1/4 pound for East and South Side
Triple superphosphate (0-45-0) – 1/4 pound for South Side
Agricultural gypsum – 1/2 pound for all

Normally irrigate deeply but not frequently. Balance soil moisture with soil aeration.

Irrigate hydrophobic areas slowly. Use multiple starts and soaking periods between irrigation cycles. Slightly moist soils are easier to wet than dry soils. Balance soil aeration with soil moisture.

For site maintenance, apply ammonium sulfate (21-0-0) at 5 pounds per 1,000 square feet about once per quarter for well aerated soil. Apply calcium ammonium nitrate (27-0-0) at 4 pounds per 1,000 square feet about once per quarter for poorly aerated soil.

Ammonium sulfate (21-0-0) helps to reduce alkalinity while calcium ammonium nitrate (27-0-0) helps to increase soil aeration. Calcium nitrate (15.5-0-0) is more effective for increasing soil aeration.

Monitor the plantings and soils with periodic soil and leaf tissue testing. Adjust the maintenance program as needed.

Sincerely,

Garn A. Wallace

Garn A. Wallace, Ph. D.
GAW:n

SECTION 27 41 16 – INTEGRATED AUDIO-VIDEO SYSTEMS AND EQUIPMENT

Table of Contents for this Section Page

PART 1 - GENERAL

1.1. SUMMARY

A. The work covered under this section consists of furnishing all labor, material and services to install a complete audiovisual system as shown on the drawings and in these specifications.

B. The Integrator shall do all work which is shown on the drawings, mentioned in the specifications or reasonably implied as necessary to complete the contract for this project.

C. The Integrator is responsible for assessing the conditions of the job site, and facilities for delivering, storing, placing, handling and installing of materials and equipment.

D. The Integrator is responsible for assessing the conditions of the job site including the radio frequency (RF) environment for all deployed wireless AV technologies.

E. The Integrator is responsible for assessing the conditions of the job site including the RF environment for the wireless AV Ethernet network for all AV systems.

F. Failure to assess the site conditions or failure to examine any and all construction documents will in no way relieve the Integrator from the requirement of furnishing all materials and equipment, or performing any work, that may be required to complete the work in accordance with the construction documents.

G. Neglect of above requirements will not be accepted as reason for delay in the work or additional compensation.

H. The Scope includes but is not limited to:

1. Equipment and installation labor, including installation of Owner Furnished Equipment (OFE) as noted on the drawings, for a fully functional system
2. Miscellaneous components, hardware, interconnections and terminations required for proper operation of all systems
3. All components or systems shown on the drawings, referenced in these specifications, or both
4. Verification of accuracy and completeness of equipment lists, dimensions, mounting details, and equipment compatibility
5. Coordination with Owner of AV connectivity to Owner networks
6. Accurate documentation of the equipment and installation
7. Warranty as defined in Paragraph 1.11
8. Test equipment, tools, ladders, lifts and scaffolding required for installation
9. Daily and final cleanup of debris caused by installation
10. Owner training – 10 hours minimum.

1.2. DEFINITIONS

A. Unless otherwise noted, the term Owner shall refer to Altadena Library District

B. Unless otherwise noted, the term Architect shall refer to Anderson Brule Architects

C. Unless otherwise noted, the term General Contractor shall refer to Contractor of Record

D. Unless otherwise noted, the term Consultant shall refer to Waveguide LLC

E. Unless otherwise noted, the term Integrator shall refer to the AV Systems Integrator

1.3. BASE SYSTEM DESCRIPTION

A. Altadena Library District is renovating the existing Main Library in Altadena, CA. It will include interior space reconfigurations, replacement of aged building infrastructure, and modernized AV spaces with newer technology.

B. Community Room

1. Use Cases

a. Presentations
b. Community events (Storytimes, screenings, key speaker events)
c. Musical events (Acoustic Concerts (orchestral, string, wind), Electric Concerts)
d. Board meetings (public Board of Trustees (hybrid) meetings, public meetings)
e. Panel discussions
f. Storytime
g. Screening
h. Banquet/dining

2. Room Modes

a. Presentations
b. Board Meetings

3. Display

a. Ceiling mounted projector
b. Motorized projection screen

4. Sources

a. Multiple floor AV connectivity centers

1) Lectern positions
2) Board member dais
3) Back of house technician position

b. Wireless presentation appliance
c. DVD player
d. OFE room computer

1) Lectern position
2) AV equipment rack

5. Video streaming

a. PTZ cameras with presets
b. Video capture via Youtube

6. Audio

a. Ceiling speakers
b. Wired and wireless microphone systems

7. Control

a. Touch panel at multiple locations

1) Wall mount
2) Lectern position
3) Back-of-house technician position

b. Provide power shutdown during an emergency fire event. Coordinate with Fire Alarm contractor to provide a dry contact relay at the AV equipment rack to activate audio amplifier shutdown

C. Staff meeting room

1. Use cases

a. Staff meetings
b. Collaboration
c. Web conferences

2. Display

a. Microsoft Surface Hub Display

1) Includes camera, microphone, speakers

b. Table top connectivity center

1) HDMI
2) Power and USH charging

3. Sources

a. Wireless presentation through MS Surface Hub Display

4. Audio

a. Speakers in MS Surface Hub Display

5. Control

a. Handheld remote

D. Tele Meeting Room

1. Use cases

a. Meetings (by Public users)
b. Interviews
c. Collaboration

2. Display

a. Flat panel display with speakers

3. Sources

a. Wall mounted input panel

1) HDMI
2) USB return for camera

b. Wireless presentation appliance

4. Audio

a. Speakers in display for web conference audio

5. Conferencing

a. USB camera with microphone for web conferencing

6. Control

a. Wall mounted button panel

E. Gaming room

1. Use cases

a. Gaming
b. Additional tele meeting room

2. Display

a. Flat panel display with speakers

3. Sources

a. Wall mounted input panel

1) HDMI
2) USB return for camera

b. Wall mounted input panel for gaming console
c. Wireless presentation appliance

4. Audio

a. Speakers in display

5. Conferencing

a. USB camera with microphone for web conferencing

6. Control

a. Wall mounted button panel

F. Open work area

1. Use cases

a. All-hands meetings
b. Web conferences
c. Feed from Community Room

2. Display

a. Flat panel display with speakers

3. Sources

a. OFE room computer

4. Audio

a. Speakers in display for web conference audio

5. Conferencing

a. USB camera with microphone for web conferencing

G. Digital signage

1. Locations

a. Lower level lobby at laptop checkout (Room 100)
b. Main level lobby (Room 322)
c. Children's Area (Room 303)
d. Adults' Area (Room 304)
e. Mid-level Lobby (Room 200)
f. Young Adults (Room 307)

2. Display

a. Flat panel display

3. Sources

a. OFE small form-factor computer

1.4. ALTERNATE(S) DESCRIPTION

A. None

1.5. REGULATORY REQUIREMENTS

A. All equipment and installations under this contract shall conform to the following:

1. ANSI/NFPA 70 National Electrical Code.
2. ANSI/IEEE C2 National Electrical Safety Code TIA/EIA Standards 568 A (including TSB 67), 569 and 607.

3. IEEE/ANSI 142 1982 Recommended Practice for Grounding of Industrial and Commercial Power Systems.

B. Integrator shall be solely responsible to possess or obtain all permits and certificates required to complete this project.

C. Integrator and employees shall perform all work in compliance with current Occupational Safety and Health Administration (OSHA) guidelines and regulations.

1.6. RELATED WORK

A. The Integrator shall coordinate with other trades and interface with other base building systems to ensure proper integration and operation of AV systems. The Integrator should request from the Owner, General Contractor or Architect complete project design drawings and specifications to coordinate their work with the work of others.

B. The Integrator shall coordinate with the General Contractor to establish AV room ready dates. See Appendix C.

C. A representative of the Integrator shall attend the weekly construction meeting at the job site. This representative shall have the authority to make commitments on behalf of the Integrator.

D. Refer to Appendix A for specific system demarcations between the Integrator and other trades.

E. AV system and control system software.

1. Integrator shall design all graphical user interface (GUI) design for all AV control touch screens for the AV systems noted in these specifications and on the drawings. The Integrator shall review these designs with the Owner and Consultant for approval.
2. Integrator shall create all customized code for all control systems noted in these specifications and on the drawings.
3. Integrator shall load software and configuration files (provided by others) into all programmable AV and control system devices.
4. Integrator shall set up and configure all programmable AV and control system devices as specified in Paragraph 3.2 and as directed by the Consultant.

1.7. REFERENCES

A. InfoComm International; AV Design Reference Manual, copyright 2006

http://www.infocomm.org/cps/rde/xchg/SID-DA7A8DE5-23A2EBBE/infocomm/hs.xsl/35545.htm

B. Guide for Performing a Wireless Site Survey 2.4 GHz IEEE 802.11g/802.11b/802.15.4 by AMX
http://trade.amx.com/assets/whitePapers/AMX.Wireless.Site.Survey.Guide.pdf

C. Guide to Graphical User Interface Design - 68-1930-01 Rev. C by Extron
http://www.extron.com/download/files/guides/gui_standards_guide_C.pdf

D. Dashboard for Controls Design Reference by InfoComm International
https://www.infocomm.org/fileStore/Dashboard_for_Controls_Design_Reference.pdf

E. Dashboard for Controls Design Guide by InfoComm International
https://www.infocomm.org/fileStore/Dashboard_for_Controls_Design_Guide.pdf

1.8. PROJECT/SITE CONDITIONS

A. Refer to Division 1 of the general construction documents for this project for coordination with other trades on this project.

B. Coordinate all access to the site at all times with the General Contractor and the Owner.

C. Adhere to the safety standards established by the General Contractor and the Owner while performing work on site.

D. All employees of the Integrator shall wear identification clearly indicating the Integrator's company while on site.

E. All employees of the Integrator shall comply with rules and policies established by the Owner.

F. All vehicles of the Integrator or employees shall be parked in areas designated by the Owner.

G. Store equipment in a manner that will not interfere with others. Coordinate secured storage at the site with the General Contractor and the Owner.

H. Do not install equipment in any space not designated by the General Contractor as "AV room ready". See Appendix C.

I. Protect all work and equipment installed under this contract from damage by others.

J. Protect all existing work in place by others from damage by the Integrator, the Integrator's agents/sub Integrators, or any employees, agents or sub Integrators of the Integrators vendors. The Integrator will be solely responsible for any/all damage to work in place by others.

K. Keep areas around and inside of each piece of equipment and each rack free from dust, dirt and debris throughout the project. Equipment that is not properly maintained during installation shall be replaced at no cost to the Owner before final payment is made to the Integrator.

L. All equipment and materials stored at the Integrators facility(s) or stored and/or installed at the project site will remain the property of the Integrator unless ownership is specifically assumed in writing by the Owner. The Integrator shall be solely responsible for the protection of all equipment from damage, theft or vandalism regardless of cause, until ownership is specifically assumed in writing by the Owner or the work described herein is accepted by the Owner at the time of official turnover.

1.9. REQUIREMENTS SPECIFIC TO THIS PROJECT

A. NONE.

1.10. SUBMITTALS

A. General

1. Unless directed otherwise in writing by the Consultant, the Integrator is not authorized to proceed with the acquisition, assembly or installation of any systems or components until the submittals outlined in this Section have been approved by the Consultant. Any acquisition, assembly or installation of any systems or components without the Consultant's approval will be subject to removal at the Integrator's expense. Submittals requiring approval prior to acquisition, assembly or installation include:

    a. Project Plan Submittal (See Paragraph 1.10.D)
    b. Long Lead Time Equipment Submittal (See Paragraph 1.10.E)
    c. Full Project Submittal (See Paragraph 1.10.G)

2. A submittal package consists of all items (forms, lists, drawings, etc.) specified for that submittal.
3. All specified items for each submittal shall be provided at the same time. Partial or incomplete submittals will be rejected.
4. The Integrator shall coordinate with the Consultant prior to the delivery of each Submittal to obtain the proper quantities of submittals to each recipient.
5. Refer to Paragraph 1.10.B for deadlines for each submittal.
6. Product cut sheets shall not be submitted for products listed in Part 2 or Appendix G of this specification.
7. Product cut sheets shall be submitted for all products provided by the Integrator that are not listed in Part 2 or that are indicated as "Equal as Approved" or "Or Equal" in Appendix G of this specification.
8. Product cut sheets shall accompany all requests for product substitutions for any reason.

9. Provide samples of each label type to be used. See Paragraph 3.2.D.
10. Architect will notify Integrator if any sample products are required for fit or finish coordination. Samples shall be provided by the Integrator at no additional cost to the project, Consultant or Architect.
11. The Integrator's drawings shall conform to the following.

    a. Fonts must be legible (suggested minimum 1/16" on 11x17 prints)
    b. CAD files must be exportable to Autodesk Drawing (.dwg) format.
    c. AV plans for indicating AV equipment layouts shall be scaled to be not less 1/8" = 1'-0". Details for particular equipment mounting shall be scaled to be not less than 1/4" = 1'-0".

B. Anticipated Project Milestone and Submittal Dates

1. Below are anticipated project milestones target dates. Note that while milestones may vary due to site or other conditions the anticipated first use date will not change without written approval of the Owner.

MILESTONE / DELIVERABLE	CALENDAR DAYS OR SPECIFIC DATE	SPECIFICATION PARAGRAPH REFERENCE
Weekly Status Reports	Start 10 days after Letter of Intent (every week until Contract Closeout)	1.10.C
Project Plan Submittal	30 days after Letter of Intent	1.10.D
Long Lead Time Equipment Submittal	30 days after Letter of Intent	1.10.D
Full Project Submittal	TBD by Integrator	1.10.G
Cross Connect Submittal	Submit with Full Project Submittal	1.10.H
Shop Staging	TBD by Integrator	3.3.D
Full Verification	10 days prior to Final Verification	3.3.F
Final Verification	10 days prior to First-Use	3.3.G
Training	10 days prior to First-Use	3.3.H
First Use	Per project schedule	-
Contract Closeout	Per project schedule	3.4

C. Weekly Status Reports

1. The Integrator shall provide weekly status reports using the Consultant's "Weekly Status Report" form noted in Appendix B (or equivalent form approved by the Consultant).
2. Weekly status reports shall be provided at least one business day prior to each weekly Owner's meeting from the date of the Letter of Intent to Award until the Contract Closeout.
3. These reports shall be provided to the Architect, General Contractor and Consultant via email.

4. The Weekly Status Report shall not be used as an official means of communications. It does not replace any part of a submittal, request for information, proposed change order, report of field conditions, schedule issues, etc. No official response will be given to the Weekly Status Report.
5. As part of the Weekly Status Report, Integrator shall keep project team apprised of the status of equipment shipping in the form of Appendix G. Integrator shall include information about lead times and any relevant tracking information.

D. Project Plan Submittal

1. Submit project team list. Include names and all contact information (email address, cell phone, etc.) for the Integrator's Project Manager, Lead Engineer, Lead Installer and any other pertinent team members. Include names and contact information for all sub-contractors.

2. Submit project schedule in both Portable Document Format (.pdf) and native file formats.

   a. Include all milestones listed in Paragraph 1.10.B above as well as other significant milestones, activities or deadlines by others that may impact the project schedule.
   b. Integrator shall revise and keep the schedule current and accurate throughout installation and shall publish updated schedules as required
   c. Include shop rack assembly, onsite cable installation, all staging, onsite equipment installation and all Consultant verifications.
   d. Schedule shall be coordinated with the general construction schedule and shall include the General Contactor's anticipated AV room ready dates and completion date of lighting presets programming where applicable - Appendix C.
   e. Schedule shall meet the anticipated first use of the Owner with adequate time allowed for setup, verification and punchlist correction of all systems.
   f. Indicate the sequence and anticipated dates of acquisition of major equipment and installation milestones.
   g. Indicate the sequence of installation and completion by room and/or system.
   h. Work shall not commence without the approval of the General Contractor and the Owner.

E. Long Lead Time Equipment Submittal

1. Submit a list of long lead items.

   a. These are items that must be ordered before Full Project Submittals are due to not adversely impact the project schedule.
   b. Do not include equipment that will be ordered later.
   c. This list shall be in the format of the equipment list noted in Appendix G.

2. The Integrator shall use reasonable judgment as to which products are legitimate long lead items.
3. Failure to include an item that may require long lead time shall not relieve the Integrator of the responsibility of furnishing said item to meet the project schedule.

F. Sample Drawing Submittal - None

1. Equipment list in the form of Appendix G. Provide in Portable Document Format (.pdf).
2. The Integrator shall submit sample drawings in Portable Document Format (.pdf) for rooms X, Y and Z for approval of the Integrator's drawing style and detail methodology.
3. Include all information required in Paragraph 1.10.A. and Appendix F.

G. Full Project Submittal

1. Equipment list in the form of Appendix G. Provide in Portable Document Format (.pdf).
2. Shop drawings

a. All sheets shall be the same size, oriented the same direction, and shall be bound, not folded. Provide electronic copies in Portable Document Format (.pdf). Verify hard copy quantity with Consultant prior to submittal.
b. All information required in Paragraph 1.10.A. and Appendix F shall be included
c. All information and corrections from the sample drawing review shall be included.

3. Product cut sheets and samples as specified in Paragraph 1.10.A. Provide in Portable Document Format (.pdf).

H. Cross Connect Submittal

1. Submit a cross connect in Excel (.xlsx) format requesting voice and data coordination information from the Owner or Using Agency. Integrator shall supply unique equipment reference corresponding to approved shop drawings, make, model, serial number, MAC address, etc. and will request IP addressing and SIP registration information for applicable equipment.
2. The Consultant will provide a template to be used for this project for this submittal.

I. User Interface Submittal

1. Submit a report describing the user interfaces for each system.
2. Include all touch panel screens with basic functional descriptions of graphical user interface and system behaviors.
3. Provide keypad layouts, including engraving, with functional descriptions of interface feedback and system behaviors.
4. Submittal shall be in accordance with Appendix E.

J. AV Device Finish Schedule

1. Submit a list of all AV products visible to user prior to purchasing with color and finish options, including products where finish is specified or implied in the specifications, drawings, or in Appendix G.
2. Colors and finished must be approved by owner/architect prior to purchasing equipment.

K. Shop Staging Verification Notification

1. Three days prior to each shop staging verification by the Consultant listed in Paragraph 3.3.D, the Integrator shall provide notification to the Consultant stating that all rooms listed in Paragraph 3.3.D for each staging session meet all conditions listed in Paragraph 3.3.D.
2. Notification shall be in accordance with Appendix D.

L. Onsite Staging Verification Notification - NONE

1. Three days prior to onsite staging verification by the Consultant the Integrator shall provide notification to the Consultant stating that all rooms listed in Paragraph 3.3.E. meet all conditions listed in Paragraph 3.3.E.
2. Notification shall be in accordance with Appendix D.

M. Full Verification Notification

1. Three days prior to full verification by the Consultant the Integrator shall provide notification to the Consultant stating that all rooms listed in Paragraph 3.3.F meet all conditions listed in Paragraph 3.3.F.
2. Notification shall be in accordance with Appendix D.

N. Final Verification Notification

1. Three days prior to final verification by the Consultant the Integrator shall provide notification to the Consultant stating that all rooms listed in Paragraph 3.3.G meet all conditions listed in Paragraph 3.3.G.
2. Notification shall be in accordance with Appendix D.

O. Preliminary Project Record Documents Submittal

1. The Integrator shall submit preliminary project record documents at final verification.
2. Preliminary project record documents shall:

    a. Be based on corrected/updated shop drawings.
    b. Include an updated equipment list in the form of Appendix G.
    c. Include half size drawings modified to reflect the actual installation.
    d. Include a CD-ROM with manufacturer's operation manuals arranged alphabetically, and current drawings Autodesk Drawing (.dwg) format, current DSP configuration and control software files.

P. Project Record Documents Submittal

1. Within 30 days following final verification, the Integrator shall submit complete project record documents.
2. Project record documents shall include corrections and markups from the preliminary project record documents.
3. Project record documents shall consist of:

    a. Full size record drawings

        1) drawings shall meet all requirements listed in Paragraph 1.10.A.
        2) drawings shall be based on approved Preliminary Project Record Documents.
        3) drawings shall show the actual "As Built" condition of all AV systems. Include all information listed in Appendix F.
        4) All calculated figures shall be replaced with field verified values.
        5) All equipment "as left" settings and adjustments shall be indicated on drawings. Include all information listed in Appendix F.

    b. Product information binders shall consist of the following information, with section dividers.

        1) Title page and table of contents
        2) Warranty Statement
        3) Provide a one year system warranty as indicated in Paragraph 1.11. Indicate warranty start and end dates, scope of warranty and conditional limitations. Indicate excluded items.
        4) Indicate procedure for obtaining telephone support and onsite service. Include a list indicating Integrator's name, address, e-mail address and service department telephone number.
        5) Provide placeholder dates for the preventive maintenance service calls
        6) Equipment List: Final equipment list broken out per room with serial numbers for each device. Include the ending date of the manufacturer's warranty period for each product.
        7) Equipment manuals: Alphabetically arrange manufacturer's operation manuals
        8) Key schedule with three duplicates of each key required for operation of the systems
        9) Half-size set of Record drawings

    c. Provide electronic copies to the Owner of the following:

        1) Software based control system code (user interface software and program)
        2) All custom or purpose created software, including original source code written with remark statements to document function of sub routines, macro's and program requirements
        3) All DSP and specific device application software in its final configuration
        4) All equipment "as left" settings, levels, and adjustments indicated on drawings
        5) Final equipment list with warranty and serial number information as noted in Paragraph 1.10.P.3.b.6)
        6) Record drawings in Portable Document Format (.pdf) format
        7) Record drawings in Autodesk Drawing (.dwg) format

1.11. WARRANTY

A. Provide warranty repair or replacement for one year on all products provided by the Integrator (including products having a manufacturer's warranty of less than one year) and all Integrator workmanship at no additional cost, except in case of obvious abuse. Consumable items such as lamps, batteries, tapes, etc. are not covered.

B. During the warranty period the Integrator shall:

1. Provide telephone support within 4 hours of a call requesting service.
2. Provide onsite support within 24 hours of a call requesting service that was not corrected by telephone support.
3. Repair or replace faulty items within 72 hours of onsite service or within manufacturers' specific repair program whichever is quicker.

C. Integrator shall not involve the Owner with removing, re installing equipment, shipping or receiving equipment being repaired under warranty, nor shall the Owner or Using Agency be responsible for any shipping or freight charges associated with any item under warranty.

D. Both the Consultant and the Owner shall be copied with all paperwork related to any/all warranty work during the Warranty period.

E. The Warranty Period will commence no sooner than the date of first beneficial use by the Owner (whoever is first) and no later than the date of Contract Closeout.

F. Include, at no additional cost, four (4) preventive maintenance visits to make adjustments to video projectors as needed. Check audio and video system settings, review control system functionality and otherwise ensure that the system is in proper working order.

1. 90 days (±15 days) after the commencement of the Warranty Period.
2. 180 days (±15 days) after the commencement of the Warranty Period.
3. 270 days (±15 days) after the commencement of the Warranty Period.
4. 20 days (±10 days) before the end of the Warranty Period

PART 2 - PRODUCTS

2.1. GENERAL

A. Acceptable Products are listed below and in Appendix G and establish the basis for design for the AV systems.

B. Specified products establish the basis for design however an equivalent product by another manufacturer may be submitted for approval where noted in Appendix G. Products specified are not intended to limit the selection of equal products from other manufacturers; however, the design and technical intent shall conform to the functional, technical and reliability requirements.

C. Integrator shall be fully responsible for making a substitute product match the requirements, description and functionality of the originally specified product regarding all options, accessories and external interface requirements.

D. Color and finish of all AV products visible to a user shall be approved by the Owner and Architect prior to acquisition, including products where finish is specified or implied in the specifications, drawings or in Appendix G.

E. Where a comparable product by another manufacturer is listed but a specific model number is not indicated, the comparable product must meet all listed specifications of the primary specified product as a minimum, and the primary specified product (manufacturer and model number) shall be used as the basis of design.

F. All products shall be new and under warranty at the time of installation.

G. Where the specification lists several manufacturers for a major item, or group of items, the Integrator shall provide all of those items from one manufacturer (i.e., all Type A loudspeakers shall be brand “X” not a combination of brands “X” and “Y”).

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

I. The acceptability of a proposed substitution shall be considered under the following terms listed in the “Substitutions” column of Appendix G:

1. The term "No Substitutions" shall denote that only the listed product(s) are acceptable and no substitutions will be considered or approved.
2. The term "Equal as Approved" shall denote that equivalent products will be considered as substitutes for the specified products.
3. The term "Or Equal" shall denote that functionally equivalent products shall be acceptable without written approval by the Consultant.

J. Where a specified item has been discontinued by the manufacturer and/or replaced by a new model, the Consultant may require submission of the new model for evaluation prior to acceptance as a substitute.

K. Product substitution is allowed only by expressed written consent of the Consultant and only before the Bid is received.

L. Unless a specified product has been discontinued by the manufacturer, there shall be no product substitution after the issuance of the Contract Award, Notice to Proceed, or Letter of Intent to Award, whichever is earlier.

M. The Integrator is solely responsible for the completeness and accuracy of take-offs and bids.

1. Appendix G is the Consultant’s good faith effort to provide an AV equipment list based on the drawings and specifications. However, Integrators are cautioned that the list may not be complete, may have discrepancies against the drawings, and may not indicate all pertinent information required to prepare an accurate bid.
2. Determination of final quantities to meet the function of the design shall be the sole responsibility of the Integrator.

2.2. AV CONTROL AND VIDEO SWITCH SYSTEM COMPONENTS

1. All AV control system and video transport components shall be as specified, or equal from acceptable manufacturers:

a. Crestron
b. Extron
c. Or Equal

2.3. DEVICE PLATES

A. Wall / Floor/ Ceiling Mounted Device Plates:

1. NEMA gang type plates shall be standard or jumbo size as required at each plate location.
2. Plates larger than NEMA 2-gang type plates shall be 1/8" aluminum or 1/16" stainless steel.
3. All plates shall be sized to cover the mounting box and rough opening.
4. All text and graphics shall be engraved.
5. Finish to be approved by Architect.
6. Connectors shall be fixed to plates and panels using screws and nuts, or by using the mounting method integral to the connector. Rivets are not acceptable.
7. Detailed drawings of plates panels showing information required in Appendix F shall be submitted prior to fabrication. No exceptions.

8. Provide blank plates with approved finish for ALL AV System wall, floor and ceiling boxes that do not have receptacles.
9. At all non connectorized pass-throughs provide a secured grommet in ceiling, wall or plate.
10. Acceptable manufacturers
    a. ProCo Plateworks® / Captain NEMA®, RCI, Wireworks, Whirlwind, Panel Authority, Panel Crafters
    b. Integrator

B. Rack Mounted Panels

1. Rack panels with connectors, switches, controls, etc., shall be 16-gauge, flanged construction.
2. All text and graphics shall be engraved.
3. Finish shall match rack unless noted otherwise.
4. Detailed drawings of panels showing information required in Appendix F shall be submitted prior to fabrication. No exceptions.
5. Acceptable manufacturers
    a. ProCo Plateworks® / Captain NEMA®, RCI, Wireworks, Whirlwind, Panel Authority, Panel Crafters
    b. Integrator

2.4. FIXED INSTALLATION CABLE

A. General

1. Following are cable types for fixed installation within the base building raceway and within fixed AV equipment racks. Unless specifically noted elsewhere, these are NOT acceptable for user interface cables used in lecterns/ credenzas or for connection of portable equipment.
2. Do not exceed cable manufacture's pull-force or bend radius recommendations.
3. All cable used on this project shall be rated for plenum use unless specified otherwise.
4. All speaker cable shall be sized by the Integrator to produce less than 1dB of loss in the speaker/cable circuit.
5. All video cable shall be sized by the Integrator to meet the criteria listed in Paragraph 3.3.
6. Integrator shall select the proper STP/UTP cable type (Cat 5, Cat5e, Cat6, "media"/"low skew", etc.) for correct operation of AV over STP/UTP equipment. Consult with manufacturer for their recommended cable type.

B. EIA/TIA rated Category 6 STP, Plenum rated

1. Liberty Cables: 24-4P-P-L6SH-* (* indicates cable color)
2. Comparable product by Belden, Comm/Scope, Gepco, West Penn.

C. EIA/TIA rated Category 6 STP, Non-Plenum rated

1. Liberty Cables: 24-4P-L6SH-* (* indicates cable color)
2. Comparable product by Belden, Comm/Scope, Gepco, West Penn.

D. HDBaseT STP, Plenum rated

1. Liberty Cables: 24-4P-P-L7SH-BLU
2. Comparable product by Belden, Comm/Scope, Crestron, Extron.

E. HDBaseT STP, Non-plenum rated

1. Liberty Cables: 24-4P-L7SH-BLU
2. Comparable product by Belden, Comm/Scope, Crestron, Extron.

F. AMX or Crestron Control Cable: Two pair - one pair shielded, one pair unshielded. Unshielded pair #18 AWG; shielded pair #22 AWG. NOTE: Also acceptable for use within lecterns.

1. Liberty AXLINK-P
2. Comparable product by West Penn Wire, Belden.

G. Mic or Line Level Signal: Single twisted pair, overall shield, #22 AWG.

1. Liberty 22-2C-PSH-WHT
2. Comparable product by West Penn Wire, Belden, Gepco.

H. Mic or Line Level Signal with Pair for Contact closure: Two pair- one pair shielded, one pair unshielded. Both pair #22 AWG.

1. Liberty 22-2P-PINDSH-WHT
2. Comparable product by West Penn Wire, Belden, Gepco.

I. Speaker Level: 16/2 UTP with overall jacket.

1. Liberty 16-2C-TTP-* (* = color designator)
2. Comparable product by West Penn Wire, Belden, Gepco.

J. Speaker Level: 14/2 UTP with overall jacket.

1. Liberty 14-2C-TTP-* (* = color designator)
2. Comparable product by West Penn Wire, Belden, Gepco.

K. Speaker Level: 12/2 UTP with overall jacket.

1. Liberty 12-2C-TTP-* (* = color designator)
2. Comparable product by West Penn Wire, Belden, Gepco.

L. Speaker Level: 10/2 UTP with overall jacket.

1. Liberty 10-2C-TTP-WHT
2. Comparable product by Belden.

M. RG8 (50 Ohm) Non-Plenum

1. Liberty Cables: RG8-CMR-BLK
2. Comparable product by West Penn Wire, Belden, Gepco

N. RG8 (50 Ohm) Plenum

1. Belden Cables: 89913
2. Comparable product by West Penn Wire, Belden, Gepco

O. Wireless Mic Antenna Coax Cable (less than 75'): RG-58/U

1. Liberty RG58-CMP-WHT
2. Comparable product by West Penn Wire, Canare, Gepco, Comm/Scope.

P. Base Band Video Cable: RG-59/U

1. Liberty RG59-CCTV-PL-WHT
2. Comparable product by West Penn Wire, Belden, Canare, Gepco, Comm/Scope.

Q. CATV, MATV, or CCTV Trunk Line: RG-11/U Quad Shield

1. Liberty RG11-QUAD-PL-WHT
2. Comparable product by West Penn Wire, Canare, Gepco, Comm/Scope.

R. CATV, MATV, or CCTV Drop Line: RG-6/U Quad Shield

1. Liberty RG6-QUAD-CMP-WHT
2. Comparable product by Belden, Canare, Gepco, West Penn Wire, Comm/Scope.

S. ASE/EBU Cable: Plenum

1. Liberty Cables: 24-1P-P-DIG-AUDIO
2. Comparable product by Belden, Canare, Gepco, West Penn Wire, Comm/Scope

T. ASE/EBU Cable: Non-Plenum

1. Liberty Cables: 24-1P-DIG-AUDIO
2. Comparable product by Belden, Canare, Gepco, West Penn Wire, Comm/Scope

U. HD, SDI, and video tie lines: RG-6/U

1. Belden 1695A
2. Comparable product by Liberty, Extron, Canare, Gepco, West Penn Wire, Comm/Scope

V. HDMI Cable male to male. Lengths as required.

1. Keydigital KD-HDBC*
2. Comparable product by Liberty.

W. Plenum HDMI Cable male to male. Lengths as required.

1. Liberty P-HDM-M
2. Comparable product by Atlona.

X. DVI Cable male to male. Lengths as required.

1. Extron DVID DL Pro/*
2. Comparable product by Atlona.

Y. DisplayPort Cable male to male. Lengths as required.

1. Extron DisplayPort M-M/*
2. Comparable product by Atlona.

Z. General Control Cable: Plenum rated, AWG, number of conductors, pairs and/or shield depending on specific control function (e.g., IR, RS 232, dry closure, etc.).

1. Liberty model # as required to meet functionality
2. Comparable product by Belden, Gepco, West Penn Wire, Comm/Scope

AA. Lectern, credenza, cart and portable cables:

1. Use highly flexible, pre made or molded cables.
2. Select AWG, number of conductors, pairs and/or shield as required depending on specific function.
3. Acceptable Manufacturers: Bi Tronics, HOSA, Mogami, Extron, Canare, MarkerTek, Tek Net, Comprehensive or HAVE.

BB. Additional cable types as required. Cable type shall be approved by the Consultant prior to use.

2.5. PRE-MANUFACTURED AND ADAPTER CABLES

A. VGA Cables with Audio

1. Extron: MVGA-A-M-M/* (* indicate cable length 3’, 6’, 12’)
2. Comparable by Liberty Cables

B. VGA Cables

1. Extron: Model: MVGA M-M/* (* indicate cable length 3’, 6’, 12’)
2. Comparable by Liberty Cables

C. HDMI Cables

1. Extron: HDMI Ultra/* (* indicate cable length 6’, 9’, 12’, 15’)
2. Comparable by Key Digital:

D. Audio Cables w 1/8” TRS

1. Extron: A-Mini/* (* indicate cable length 2’, 6’, 12’)
2. Comparable by Liberty Cables

E. Toslink Optical Cable

1. Liberty Cables: Z500NTOS* (* indicate cable length 1’, 7’, 13’, 20’, 33’, 50’)
2. Comparable by Comprehensive

F. SPDIF Cable

1. Liberty Cables: 20 SD-RCAM-M-* (* indicate cable length 3’, 20’, 25’, 35’)
2. Comparable by Extron

2.6. CONNECTORS

A. 1/4 Inch Cable Connectors: Non long frame type.

1. Neutrik “NP” Series
2. Comparable product by Switchcraft.

B. BNC Cable Connectors: 3 piece, true 75Ω crimp type.

1. Acceptable manufacturers: Kings, Liberty, Extron, Canare, ADC, Trompeter, Cambridge
2. Connector shall be compatible with cable type.

C. Loudspeaker Cable Connectors: 4 or 8 pole.

1. Neutrik Speakon NL4FC or NL8FC
2. Comparable product by Switchcraft.

D. IHF (RCA) Audio Cable Connectors: For all IHF (RCA) audio jacks, gold center pin, spring type strain relief.

1. Canare F 09
2. Comparable product by Switchcraft.

E. IHF (RCA) 75Ω Video Cable Connectors: For all IHF (RCA) video jacks.

1. Canare RCAP C series
2. Comparable product by Trompeter
3. Connector shall be compatible with cable type and shall be installed using factory approved tool and die.

F. XLR Cable Connectors: Number of pins as required.

1. Black shell with gold pins, unless otherwise noted.
2. Neutrik “XX” series
3. Comparable product by Switchcraft

G. 3-pole XLR with 1/4" Panel Connectors, non-switching, solder cups: All conductors shall be insulated from panel.

1. Neutrik NCJ6FI-S
2. Comparable product by Switchcraft

H. Recessed BNC Panel Connectors: Shield shall be insulated from panel, shell finish to match adjacent surfaces.

1. Neutrik NBB75DFIB
2. Comparable product by Canare

I. Non-recessed BNC Panel Connectors: Shield shall be insulated from panel, shell finish to match adjacent surfaces.

1. Neutrik NBB75FI
2. Comparable product by Canare (with insulating washers) for floor boxes (non recessed).

J. Loudspeaker Panel Connectors: 4 or 8 pole.

1. Neutrik Speakon NL4MP or NL8MP

2. Comparable product by Switchcraft

K. IHF (RCA) 75 Ohm Video Panel Connectors: Shield shall be insulated from panel. Color code as shown on the drawings.

1. Canare RJ RU
2. Comparable product by Switchcraft.

L. RJ 45 Panel Connectors: Recessed Cat 5 or Cat 5e compliant, 8 contacts, Latch hook Retention of RJ45 plugs, 110 Punch down IDC terminals on rear.

1. Neutrik NE8FAV Y110
2. Comparable product.

M. Shielded RJ45 Connectors: Shielded 8 position 8 contact (8P8C) plug connector, RoHS compliant and UL rated.

1. Crestron DM-8G-CONN
2. Extron XTP DTP 24 Plug
3. Comparable product.

N. XLR Panel Connectors: Black shell, gold pins.

1. Neutrik “D” Series
2. Comparable product by Switchcraft.

O. 3.5mm (1/8”) Cable Connectors: Mini TRS for balanced mono audio or unbalanced 2 channel audio.

1. Canare F-12
2. Comparable product by Switchcraft.

P. BNC Terminators: 75Ω, 1%.

1. Canare BCP *
2. Comparable product by Trompeter, ADC.

2.7. RACKS AND RACK ACCESSORIES

A. All accessories shall be from the same manufacturer as the rack enclosure.

B. Provide the following accessories for each rack shown on the drawings.

1. Side panels for each individual rack or for end racks of each group of racks.
2. Solid or fan top as shown on the drawings and solid rear door.
3. Grounding stud in top rear of rack.
4. Full-height rear mounting rails
5. Full-height solid copper bus bar bonded to rack.
6. Rack work light.
7. Horizontal lacing bars (as required).
8. Blank panels as necessary to close front of rack.
9. Vents, blowers, fans and fan packs as necessary to properly dissipate heat.
10. Power distribution as required.
11. Caster base as shown on the drawings or as dictated by field conditions.

PART 3 - EXECUTION

3.1. PREPARATION

A. Before starting installation, verify proper installation of the following:

1. Backboxes and conduit– installed per the drawings and these specifications.

a. Stub outs finished with j boxes or insulated bushings on end of conduit.

b. Pull boxes installed per NEC based on total number of turns and angles and on linear feet of conduit.
c. Pull strings inside all conduits.

2. 120VAC power circuits, isolated ground conductors and equipment ground conductors.
3. Fixed millwork.
4. Cable tray.
5. Supports or blocking for flat panel displays.
6. Projector lifts or support for ceiling mounted projectors.

B. Copies of these specifications and approved shop drawings shall be readily available for all in shop and onsite integration work.

C. Provide written notification to the General Contractor and Consultant of any problems impacting the Integrator's work. Failure of the Integrator to notify the General Contractor and Consultant in a timely manner of incomplete, inadequate, unfinished, or otherwise unacceptable pre requisite work by other trades in the base building infrastructure will not relieve the Integrator of the responsibility to complete the work under this contract.

3.2. INSTALLATION

A. General

1. All equipment and enclosures described in this specification shall be installed plumb and square unless specifically detailed otherwise.
2. All equipment, except that designated as movable, portable or loose equipment, shall be secured and permanently attached to racks or structure in a manner which will require the use of a tool (e.g., screw driver, nut driver, etc.) for removal.
3. All supports shall meet or exceed the load requirements of the intended application with a minimum safety factor of five.
4. Support hardware shall have SAE Grade 8 load rating (min.).
5. All equipment mounted overhead that has a composite weight, including mounting hardware and brackets, of forty pounds or more shall be mounted using plans and specifications, which shall bear the seal and signature of a registered professional structural engineer with applicable license to approve the work. All fees and expenses related to structural engineering shall be paid by the Integrator.
6. All equipment mounted in wall that has a composite weight, including mounting hardware and brackets, of two hundred pounds or more shall be mounted using plans and specifications, which shall bear the seal and signature of a registered professional structural engineer with applicable license to approve the work. All fees and expenses related to structural engineering shall be paid by the Integrator.

B. Firmware

1. The Integrator shall install the firmware versions selected by the Consultant for all programmable or configurable devices.
2. The Integrator shall be responsible for up to two additional firmware changes per device until project closeout.
3. Integrator shall notify the Consultant prior to any change of firmware in any programmable or configurable device until the Integrator is released from all installation and warranty responsibilities.

C. Equipment Racks, Conduit, and Raceways

1. Electrical power distribution

a. Provide labels on receptacles within AV racks indicating branch panel and circuit number.
b. See the drawings for details of power raceway entering and mounting inside rack.

2. Provide a full height, technical ground bus bar in each equipment rack, mount adjacent to the power raceway and electrically bond to rack.

3. Install rack mounted equipment as indicated on the approved AV shop drawings, and make connections within the racks before delivery to job site.
4. Provide insulated connections between the building electrical raceway and the equipment racks.
5. Provide insulated connections between the AV raceway and the equipment racks.
6. Provide EMT stubs, with insulated bushings to protect cable, into the above ceiling area for routing cable into the equipment racks.
7. Segregate circuit types as noted in Paragraph 3.2.F.2.
8. Do not exceed 40% conduit fill.

D. Labeling

1. General

    a. Handwritten labels are not acceptable.
    b. Do not indicate the Integrator's name on movable, portable or loose equipment, touch panels, cables, or wall plates.
    c. Integrator's name may be displayed on rack panel only as shown on the drawings.
    d. Label type, text and graphics shall be approved by the Consultant before fabrication of labeling, plates or other labeled items.
    e. All labels shall be legible.

2. Provide permanent, self-adhesive labels on the front panel of rack mounted equipment to indicate system designation/functionality (e.g., Automixer 3, Press Feed ADA, Speech Amp-Zone A, etc.).
3. Provide permanent, self-adhesive labels on the back of rack mounted equipment.

    a. Indicate system designation/functionality.
    b. Text shall be identical to equipment front panels.
    c. Indicate IP address for all networked equipment located in secured racks or locations.
    d. Phone number.

4. Provide permanent label on plug end of power cords of all rack mounted equipment identifying the power cord with the equipment.
5. Provide labels for front panel input and output buttons of AV routers, switches, mixers, etc.
6. Provide text/graphics engraved directly on receptacle plates, panels, and rack panels.

    a. Use eighth inch letters with contrasting fill color.
    b. Label all plate mounted connectors and receptacles as shown on approved shop drawings
    c. Label plates with plate designation shown on approved shop drawings.

7. For all installed wiring provide permanent labels using wire numbers or designation as shown on approved shop drawings.

    a. Wire labels shall be one of the following types

        1) Self-adhesive label under clear heat shrink,
        2) Direct printed heat shrink
        3) Direct printed, self-adhesive, self-laminating

    b. Position labels as shown in wiring standard details on the drawings.
    c. Provide wire labels on both ends of cable.

E. Wiring

1. Do not make any in line cable splices unless specifically noted.
2. Use only cable pulling lubricants approved by the cable manufacturer.
3. Provide grommets or chase nipples at cable entry where conduit is not installed.
4. Provide cable anchors for any cable or cable bundle larger than 1 inch diameter, permanently installed and not in conduit. Do not use sticky back cable anchors.

5. Provide a service loop for each cable that connects to equipment in racks or AV furniture. Service loop length shall be sufficient to allow one re-termination without removing cable ties.
6. All cables connecting to a movable lectern, cart, or desk or lectern shall be highly flexible cable, specifically designed by the manufacturer to be flexed repeatedly. Permanent install type cable is not acceptable for this application.
7. All cable bundles of more than one cable connecting to a movable lectern, cart, or desk or lectern shall be enclosed in a flexible braided sleeve and be of the minimum length extending from the furniture edge as noted on the drawings.
8. The Integrator shall take precautions to ensure that cabling is not kinked, compressed or otherwise damaged such that performance is compromised.
9. Bend radius shall not be less than recommended by the cable manufacturer.
10. Do not exceed the maximum permissible pulling tension. Consult the cable manufacturer for exact data.
11. Use soft Velcro based cable ties located at random distances apart for installation of specialty cable such as HD-SDI, Category cable, fiber, etc.

F. Service and segregation of installed cables

1. Refer to the drawings for

    a. Standard wiring termination
    b. Labeling details
    c. Special wiring details

2. Standard cable segregation – similar signal types or signal levels may be grouped together as approved by the Consultant.

    a. Microphone: below -30 dBu
    b. Line: -30 dBu to +24 dBu
    c. Loudspeaker: Greater than +24 dBu
    d. Video: 1 volt peak-peak into 75 Ohms
    e. Control Circuits: 0-28 Volt into <50k Ohms and Data: 2 Volt peak-peak into 100 Ohms
    f. Fiber

G. Terminations

1. Use crimping tools recommended by the termination manufacturer. Use ratcheting crimp tools for spade lugs and Molex pins.
2. Provide insulated spade lugs for screw terminals, two lugs per terminal maximum.
3. Use properly sized spade lugs for cable gauge and screw size.
4. Conductors in phoenix type connectors shall not be tinned.
5. Ferrules in phoenix type connectors shall not be used.
6. Terminate conductors with proper mating connectors.
7. Wire Nuts are not acceptable.
8. Audio shield/drain wires shall not be connected to the connector body at any time.
9. Only one cable or set of wires shall be installed into any single connector; do not loop cable in and out of a connector. Provide a terminal block to parallel any audio signal wiring.
10. Dual channel audio circuits using 5 pin XLR type connectors shall be made using a dual twisted pair type cable (Canare Star Quad, ProCo Ameriquad, or equivalent).
11. If multiple connection types are available on a given piece of equipment, the screw terminal type (including phoenix type) shall be used as first choice, with XLR connections used as second choice, and other connectors as last choice.
12. Maintain proper polarity when wiring components and loudspeakers.
13. Provide vertically mounted 1/2 inch, painted plywood or 1/8 inch thick blank panels for mounting terminal strips. Do not mount terminal strips on the bottom of racks.
14. Use only true 75 Ohm BNC cable end connectors designed for the intended coaxial cable required. Apply connector with a crimp die certified to be used with the intended coaxial cable and BNC. Feed through must also strictly maintain 75 Ohms.

15. For HD-SDI, do not use any connectors or feed-throughs not specifically rated through 3gHz digital bit rate.
16. Bi-directional serial terminations shall always be assumed to be at minimum 5-wire in the absence of approved information which indicates otherwise.

3.3. QUALITY CONTROL AND INSTALLATION VERIFICATION

A. General

1. The Integrator shall plan for the following shop or site visits by the Consultant:
    a. Shop staging verification
    b. Full verification
    c. Final verification and training
2. The Integrator shall setup all rooms and systems to conform to the conditions listed below for each shop or site verification and shall notify the consultant that all required rooms are ready for each verification in accordance with Paragraph 1.10.H and Appendix D.
3. At the Consultant's request, the Integrator shall provide proof of conformance for any room or system that the Consultant concludes to be non-conforming.
4. Proof of conformance shall be the responsibility of the Integrator.
5. Incomplete systems or failure to complete the room setup prior to the Consultant arriving for the shop or site verification will result in additional trips for the Consultant. The Integrator will be financially responsible for all additional fees and expenses associated with these trips.
6. The Integrator shall make adjustments to all rooms and systems as directed by the Consultant during the shop or site verifications.

B. Shop Staging Verification Criteria

1. Audio
    a. The Integrator shall adjust all AV sources to provide source to source variation of less than 3dB SPL (measured A-weighted slow).
    b. Signal to noise ratio of the any complete audio path shall be greater than 60dB.
    c. Total harmonic distortion of any complete audio path shall not exceed 0.1%
2. Video
    a. Set the brightness and contrast of displays using a pluge test or similar test pattern.
    b. Setup color of displays using color bar test pattern.
    c. Set displays to accommodate the resolutions shown on the drawings.
    d. Set projectors to accommodate the following resolutions: 1024x768, 1280 x 1024, 1280x720, 1366x768, 1280x800, 1280x768, 1920x1080, 1920x1200, 1400x1050, 1600x1200, 1600x1050, 3840x2160, and 4096 × 2160
    e. 4:3 and 5:4 aspect ratios presented on a 16:9, 16:10, or 15:9 display shall fill the screen height. This shall be accomplished with no external or internal scaling or stretching.
    f. A display generated test pattern shall fill the screen and be plumb, square, and true.
    g. Video signals passing through UTP transmitters and receivers, computer interfaces, and other video processing equipment shall be adjusted so that the signals appear identical to signals directly connected to the display.
    h. Set the outputs of scalers and scaling switchers to accommodate the resolutions shown on the drawings.
    i. Set transition effects, switching modes, picture-in-picture (PIP), or other scaler/switcher display and codec settings as directed by Consultant.
3. Control Systems
    a. Control system shall be fully connected and communicating with all controllable devices.
    b. Control of building or environmental systems shall be demonstrated by use of mock-ups or proxies.

c. Control system program shall be loaded and functional.

4. RF Systems

a. RF system shall be free of noise and crosstalk
b. RF level at lowest and highest rated system channel shall be between +6dBmV and +12dBmV.

C. Onsite Verification Criteria

1. Audio

a. Set the audio system to provide seat to seat variation of +/-4dB in the 2kH octave band (measured A-weighted slow).
b. Audio path shall maintain absolute system polarity such that:

1) Positive acoustic pressure at the front of all microphones creates a positive voltage at the positive terminal of all line outputs and a positive acoustic pressure at all loudspeakers.
2) Positive voltage at the positive terminal of all line inputs creates a positive voltage at the positive terminal of all line outputs and a positive acoustic pressure at all loudspeakers.

2. Video

a. Projected images shall be in focus, free of any keystone (no digital keystone allowed), free from any obstruction.
b. All images shall be free from ghosting or smearing.
c. Analog RGBHV signal amplitude through any signal path shall not exceed +/-3dB across the operational bandwidth up to 450 MHz.

1) Cable type shall be selected to meet this requirement
2) Video line drivers or peaking amplifiers shall be added only when signal loss due to cable length exceeds this requirement and cannot be corrected by selecting a lower loss cable.
3) Video line drivers or peaking amplifiers shall be adjusted to provide the least amount of correction to bring the signal within this requirement.

3. Control Systems

a. Control system program shall be loaded into all controllable devices including touch panels.
b. Control of building or environmental systems shall be fully functional.
c. All controllable devices and systems shall be controllable from the control system touch panel or button panel.

4. RF Systems

a. RF level at lowest and highest rated system channel at all cable outlets shall be between +6dBmV and +12dBmV.

5. AV Wireless Ethernet

a. Perform a wireless site survey to identify existing active wireless access points in the area along with channel allocations, SSID information and Security Information and determine the number and placement for additional types (802.11a, 802.11b/g, 802.11i, etc.) of access points, gateways and repeaters necessary to provide proper coverage and network performance throughout the facility for the wireless Ethernet devices listed in Appendix G.
b. Develop and recommend a channel allocation map with non-overlapping channels for each area within the buildings to maximize wireless network performance.
c. Procedures for the wireless site survey are referenced in Paragraph 1.7.B.

D. Shop Staging and Verification

1. The Integrator shall stage in their shop one of each of the following room types: Community Room, Staff Meeting Room
2. If only conducting one shop staging event, delete the following paragraph. If shop staging will be split into multiple events, use the following paragraph to identify the rooms in each. Add additional sessions as warranted; confirm this aligns with our proposal.
3. For verification the Integrator shall demonstrate to the Consultant complete functionality of each room or room type selected for the shop staging event.
4. The Integrator's project manager or senior field technician shall be present for all shop staging events and will be responsible for field implementation of directives and instructions from the Consultant during the shop verification.
5. All systems shall be configured to the Shop Staging Verification Criteria identified in Paragraph 3.3.B.

E. Onsite Staging and Verification - NONE

1. The Integrator shall accelerate the construction of one of each room or room type.
2. The Integrator shall accelerate the construction of one of each of the following room types: Rooms A, B and C.
3. Multiple onsite staging sessions shall be conducted as follows:
    a. Onsite Staging 1 – Rooms A, B and C
    b. Onsite Staging 2 – Rooms X, Y and Z
4. The Integrator shall accelerate the construction of one of each room or room type for the Onsite Staging.
5. All Owner furnished equipment shall be installed and working properly in all rooms selected for onsite staging. All software that is required for integration with AV system shall be installed by the Owner (or by the Integrator under the coordination/ supervision of the Owner), and functioning properly
6. For verification the Integrator shall demonstrate to the Consultant complete functionality of each room or room type selected Onsite Staging.
7. During the Onsite Staging the Integrator shall implement changes to the installation and setup as directed by the Consultant and will implement the changes throughout the project as directed by the Consultant.
8. All systems shall be configured to meet the Shop Staging Verification Criteria identified in Paragraph 3.3.B and the Onsite Verification Criteria identified in Paragraph 3.3.C.

F. Full Verification

1. All AV systems that are a part of this project shall be completely installed and functional.
2. All Consultant's directions and all criteria identified in Paragraphs 3.3.B and 3.3.C shall be applied to all audio, video, control, RF and AV wireless Ethernet systems throughout the project.
3. All Owner furnished equipment shall be installed and working properly in all rooms. All software that is required for integration with AV system shall be installed by the Owner (or by the Integrator under the coordination/ supervision of the Owner), and functioning properly.
4. Incomplete systems or failure to complete the room setup prior to the Consultant arriving will result in additional trips for the Consultant. The Integrator will be financially responsible for all additional fees and expenses associated with these trips.
5. The Integrator's project manager or a senior technician who is familiar with the system shall demonstrate the complete functionality of each AV system to the Consultant.
6. The Consultant will create a punchlist of deficiencies that must be corrected by the Integrator prior to final verification.
7. Items added to the punchlist during this verification will not be re-verified or removed from the punchlist during this verification.

G. Final Verification

1. All items listed in the punchlist created during the full verification shall be corrected.
2. The Integrator's Project Manager or a senior technician who is familiar with the system shall demonstrate that all items in the punchlist have been corrected.
3. Punchlist items or other installation issues not corrected and resulting in the inability to demonstrate the complete functionality of all AV systems will result in additional trips for the Consultant. The Integrator will be financially responsible for all additional fees and expenses associated with these trips

H. Training

1. The Integrator shall train the Owner in the proper operation of the system.
2. The Integrator's project manager or senior technician who is familiar with the system shall lead this training.
3. Provide 10 Hours minimum of training.

3.4. CONTRACT CLOSEOUT

A. Contract closeout will be based on completion of final verification, completion of punchlist items, acceptance of project record documents and completion of training.

END OF SECTION 27 41 16

SECTION 27 41 16.01 - APPENDICES FOR SECTION 27 41 16

Table of Contents for this Subsection Page

APPENDIX A - DEMARCATION LIST

A. General: This appendix describes demarcation points in the work to determine where the Integrator's responsibilities end in the specific instances noted below.

B. Electrical System Connections: The Integrator shall coordinate with the General Contractor to extend the AV AC power circuits and insulated ground wires into each equipment rack.

C. Raceway (conduit and backboxes): The Integrator shall provide blank plates or panels for all AV floor, wall and ceiling boxes that are shown on the drawings, but do not have AV devices and/or connectors at this time. Colors and types shall be coordinated with the Architect. Devices and plates for other trades (HV power, voice/data, etc.) within the AV floor boxes are by others.

D. Where equipment installed by the Integrator, including Owner-furnished equipment, is shown installed in furniture, millwork, or casework provided by others, the Integrator shall coordinate with the General Contractor with respect to cutting furniture/millwork/casework to accommodate flip-top devices, grommets, microphones, etc.

E. Cabling: All audio, video and control cabling shall be provided, installed and terminated by the Integrator as noted on the Integrator's construction documents. Voice/data cabling, unless specifically noted otherwise, are the responsibility of others.

F. Cable Termination: Where cable installation is required, this will include wall and/or floor jacks, plates and terminations at room devices, and service loops at patch bay locations.

G. Projector and Monitor Mounts: The Integrator shall install all projectors and monitor mounts as indicated on the approved shop drawings. Integrator shall verify location and structural suitability before attaching projectors, monitors and mounts. Integrator shall satisfy the requirements in Paragraph 3.2.A.

H. Low Voltage Connections to Base-Building Devices:

1. Low voltage control interfaces for lighting dimmers, window treatments and electric projection screens will be installed by others as a part of the base building. Integrator shall verify proper operation of these control systems before any interconnection to the AV control system.
2. Integrator shall investigate all hardware and software control conflicts between the base building control systems and the AV control system before interconnecting the systems. Report any conflicts, potential or existing, to the General Contractor, in writing, before interconnecting the systems. Damage caused to the base building control systems due to the improper connection of AV control systems shall be the sole responsibility of the Integrator.
3. Where indicated, Integrator shall select and install the appropriate cable type from the AV control system to the base building control systems interface locations.
4. Integrator shall verify proper operation of both the base building control systems and the AV control system after interconnecting the systems, and verify proper operation of both.

I. AV Control System Connections and Devices: Integrator shall set up control system equipment with IP addresses and proprietary control network addresses, install all necessary hardware cards, and adjust all appropriate DIP switch settings, and any other equipment settings such as baud rate and protocol settings. Integrator shall include all of this information in Project Record Documents.

APPENDIX B - AV WEEKLY STATUS REPORT

A. The form on the following page is the Consultant's "AV Weekly Status Report". The Integrator shall provide weekly status reports in this format or an equivalent format approved by the General Contractor and Consultant in advance.

AV WEEKLY STATUS REPORT

WEEK OF: _____

INTEGRATOR: _____ BY: _____

CLIENT / PROJECT NAME: _____

ROOM NAMES / NUMBERS: _____

Provide a summary for each of the following areas. Use additional sheets as needed.

General:

Purchases (see attached lead times):

Assembly:

Field Conditions:

Issues of Concern:

APPENDIX C - AV ROOM READY CONDITIONS

A. Before installing AV equipment onsite, the following conditions must be met for each space where AV equipment is to be installed.

1. All water piping completely installed and tested
2. Dirt and dust sources removed. HVAC running with filters in place and AV-rooms "broom-clean"
3. Major construction activities completed, especially activities that may create physical damage to equipment or racks such as:

    a. Overhead work that may cause debris or dust
    b. Chemical work such as concrete cleaning and finishing
    c. Welding or grinding
    d. Activities that may cause excessive vibration

4. Building systems and finishes

    a. Ceiling work completed (ceiling tiles installed, lighting installed and operational)
    b. Shades and screens installed and operational
    c. Floor finish installation complete
    d. Wall treatments complete

5. Security

    a. AV areas secure

        1) For equipment, rack and tool storage
        2) Staging and work area for final assembly work on racks or in furniture and millwork
        3) Equipment installation areas that are not yet turned over to the owner

    b. Keys provided to integrator with limited distribution
    c. Security badges and clearances obtained for all onsite personnel

6. AV system infrastructure

    a. AV field cabling pulls complete
    b. All AV construction related items completed
    c. All AV power wiring in place, tested and on
    d. All millwork and furniture containing AV equipment in place
    e. System interfaces installed (lighting, screens, motorized drapes, etc.)
    f. Cabling by others in place (data/telecom, cable TV, fiber)
    g. Lighting installed and available for use in AV spaces

B. Before adjusting AV equipment to meet the conditions in Paragraph 3.3, C, the following conditions must be met, in addition to the items listed above, for each space where AV equipment is to be installed.

1. HVAC balanced
2. Lighting system configured (lighting presets programmed)
3. Shade system configured
4. IT services activated

APPENDIX D - STAGING AND VERIFICATION NOTIFICATION

A. The following text shall be used to notify the Consultant that the specified rooms or entire project is ready for checkout.

B. One letter of notification is required for each of the following:

1. Shop Staging, Paragraphs 1.10.H and 3.3.D
2. Full Verification, Paragraphs 1.10.M and 3.3.F
3. Final Verification, Paragraphs 1.10.N and 3.3.G

C. The Integrator shall copy or retype the text of the following letter onto the Integrator’s letterhead and fill in or select the appropriate text.

D. See sample letter at the end of Appendix D.

This letter serves as notification to Waveguide that (insert Integrator's name) has completed the required setup and is ready for (select one of the following: Shop Staging, Onsite Staging, Full Verification or Final Verification).

(Insert Integrator's name) acknowledges that all rooms and systems specified for this staging or verification meet all specified installation and setup requirements.

_____

Printed name of Project Manager

_____

Signature of Project Manager Date

(Insert Integrator's name) acknowledges that incomplete systems or failure to complete the room setup as specified prior to the Consultant arriving for staging or verification will result in additional trips for the Consultant.

(Insert Integrator's name) acknowledges that (Insert Integrator's name) will be financially responsible for all additional fees and expenses associated with these trips.

As (Insert Integrator's name) duly authorized representative, I have read and agree to this agreement.

_____

Printed name of signatory

_____

Signature Date

APPENDIX E - CONTROL SYSTEM

A. The AV control systems design and development effort is being undertaken by the Integrator. However, the Owner may wish to provide colors and/or layout preferences to ensure that the interface design and appearance fits their needs and existing standards. The AV integrator is responsible for requesting and receiving these assets from the Owner and modifying them as needed to fit the Owner's desired appearance and functionality. The integrator is responsible for loading all control software onto the applicable hardware, updating the applicable firmware, thoroughly testing to ensure all buttons trigger the correct response from the controlled equipment, and generating periodic punch-lists with adequate time to meet deadlines.

B. The AV Contractor shall coordinate all network requirements with the Owner's IT department prior to and during implementation. The primary information gathering effort will take place during the CSP meetings, but subsequent coordination will also be required.

C. The Integrator shall organize and schedule a Control System Programming (CSP) meeting which include the Integrator, Owner's facilities/IT representative, and AV consultant.

1. The CSP meeting shall review the Integrator's approach to designing and implementing all AV control parameters throughout the project with the Owner and Consultant, verify what control features are required to support each location and type of user, and define the Owner's preferences for the below systems:

    a. All touch panels
    b. All key/button panels

2. CSP Meeting:

    a. The Consultant shall review the AV system functionality that will be supported in each space with Owner and Integrator. The Owner will provide the AV Integrator with samples of existing control panels (if available) as reference for basis of the control system programmer's designs.
    b. The Integrator shall gather information/standards from the Owner that informs how the control panels will need to be designed to support the room functionality
    c. After the meeting, the programmer shall provide a report including layouts for all user interfaces in AV-enabled rooms in the project
    d. After reviewing layouts, the Owner's representative shall provide any additional comments to the Integrator.

D. The AV integrator and Owner's IT team shall discuss the network requirements required to provide a fully functional AV system. This can happen during the CSP meetings or during separate AV/IT coordination meetings. These coordination items include, but are not limited to, AV VLAN QoS, firewall porting, AV VLAN IP ranges, internet/VPN access, administrator rights, user access levels, credentials, real-time reporting requirements vs periodic reporting, polling frequency, VLAN's/Subnets, bandwidth, and all other network related preferences.

E. The CSP capabilities and requirements described in this specification are not intended to be all-inclusive. They are intended to indicate the general intent and system functionality at the various levels described. It shall be the responsibility of the Integrator to fully evaluate the specific functionality required by the Owner and to provide a complete system that is intuitive to use and logical in its basic structure.

F. Environmental Control: Environmental controls shall be automated as part of a room's startup.

G. Motorized projection screens: Motorized projection screens shall operate through low voltage wall switches and through the AV control system. The projection screens shall be programmed for Up, Down, and Stop control functions. Provision for low voltage projection screen control is accommodated through a low voltage interface provided by the AV contractor.

H. Fire and Life Safety Shutdown: Provision for turning AV system off through communication to the building fire-life system. Coordinate with the Fire/Life Safety contractor to provide a dry contact closure from fire-life safety system to the AV control processors to shut down AV system upon an emergency

condition. Integrator shall coordinate with the FLS contractor to verify whether a normal-open/fail-close or normal-close/fail-open trigger is being used and program the systems accordingly.

I. Power Control: Power sequencing is an essential part of managing energy consumption. As a standard, when the system is turned on, the command to turn on all system devices will be given. All devices shall be ready for the user once the system is started.

1. Use discrete on/off power commands when available
2. Essential system startup devices shall always remain on.
3. These items include AV control system
4. As a fail-safe procedure, all essential system startup devices shall receive a discrete power on command when the system is turned on.
5. Do not give the user the ability to turn devices on or off from the control system (i.e. independent of system Power On or Off) to help prevent an out-of-sync condition between the source and the display device.
6. The integrator shall implement power sequencing. The power sequencers shall control power to the nonessential system startup devices (e.g. amplifiers, document cameras, DVD players, etc.).
7. Confirm power off command with user.

J. Source select: buttons shall be provided on the interface to select all available in-room and remote sources. Then, the control system shall execute all audio and video paths for the selected source. Button panel controllers shall enable hard button transport controls for the selected source.

1. Primary Displays:

a. The default source input is selected as part of the system startup.
b. User level controls shall include:

1) On
2) Off

K. Audio Control:

1. All audio feeds will be muted on system shutdown and reset to default settings/levels on startup.
2. Program Audio: This includes audio for AV sources like laptop, auxiliary AV input, in-room PC, DVD, etc.
3. These sources will be controlled with a single volume control with Up, Down, and Mute.
4. The volume and mute will control the program audio for the in-room participants.
5. Upon system startup the program volume control will be reset to a default level with program audio un-muted. Default level to be determined at installation.

L. The following parts of this appendix describe the intent of the control system programming required for the project that might not be evident from looking at the system one-lines and the Anticipated Functionality section noted above. This is not intended to be an exhaustive description of all required functionality. Additional information will likely be uncovered during the CSP review meetings. The Integrator will not seek compensation for additional CSP functionality uncovered during the CSP discovery process, unless the request for additional functionality is unreasonable for systems of similar scope or comes after GUI acceptance. The general non-apparent functional requirements are as follows:

M. Reconfigurable Spaces

1. The Community Room can be reconfigured and will have two modes. When the user turns on the system from the touch panel, they shall be prompted with an option to select which furniture layout and/or lectern plug-in locations are being used.
2. The room will have three modes - presentation, board meeting, or community event. Each room configuration will trigger various source routing, audio mixing, and camera aiming presets appropriate for the use case. Final configuration will be determined during the CSP meeting.

3. Start-up defaults

a. Upon system start-up, the Integrator shall program the system to execute default settings for source select, and audio levels, and shall coordinate these default preferences during the CSP meetings.

4. Source Routing and Control

a. Video Routing

1) The GUI shall give the user the ability to select any available video source and route it to any and all endpoints, including specific sources and endpoints in remote locations in the local building for overflow purposes (coordinate these during the CSP meetings). After routing a source to an endpoint, both shall remain highlighted or in a pressed state to indicate to the user the current route. The source routing approach will involve the user pressing the button for the source, then pressing the button for the endpoint. Do not use drag-and-drop assignment.

5. Audio control

a. Basic Mode (default setting at all touch panels) is accessible in technician mode by selecting “basic mode” on the GUI)

1) Volume fader for program audio, with mute button on ribbon.
2) Volume fader for the presenter microphone, with mute button.
3) All wireless microphone channels (excluding the presenter’s microphone) shall be configured to the same perceivable loudness level, then all microphone channels volumes are raised/lower together via this fader.
4) Program audio routing will follow video source routing.

b. Technician Mode (Technician mode is accessible in basic mode by selecting “advanced mode” on the GUI and entering the password):

1) Volume fader for program audio, with mute button on ribbon.
2) Volume fader for the presenter microphone, with mute button.
3) Audio mixing page with individual faders and mutes for each microphone and program audio channel.
4) Program audio routing will follow video source routing. However, the advanced mode shall have an audio page that allows the user to manually route different audio sources (separate from the routed video source) to the speakers and record/stream feeds instead.

N. Wireless Video systems

1. Wireless systems will be deployed throughout the project. The Integrator shall coordinate with the Owner’s IT team to develop a strategy for providing the below:
2. Owner-approved approach for allowing employees and/or guests to sign on to the required Wifi network and for wireless video systems. Coordinate security certificates as required.
3. Adequate bandwidth allocations and QoS for wireless streaming while simultaneous viewing of videos on the internet via WiFi.
4. If the wireless video system uses proprietary non-network RF communication via the use of dongles, ensure that the system is configured for the correct frequencies, the driver software is loaded to typical presentation devices, and that all devices are paired

.

APPENDIX F - SUBMITTAL DRAWING CHECKLIST

A. FORM (ALL SHEETS)

1. Submittal copy quantity requirements satisfied
2. Submittal content satisfied
3. Adequate sheet size for drawing
4. All notes and other text legible throughout the drawing set
5. Contact info for each responsible party (architect, owner, Integrator, etc…) clearly printed on the drawings
6. Table of contents with necessary fields present (Sheet Title, Sheet Number, Description, etc…)
7. Drawing titles and sheet names match the Table of Contents
8. Sheet titles make sense
9. Drawing order makes sense
10. Spelling checked and corrected

B. FIT (EQUIPMENT LAYOUT PLAN, RCP, ELEVATION, DETAILS)

1. All of the equipment shown on plan view in the correct position
2. All equipment uniquely identified
3. Equipment clearances throw distances, and elevations clearly marked, dimensioned and noted
4. If in scope, detail drawings for the hanging/installation/mounting of projectors, screens, cameras, surface mounted loudspeakers, ceiling suspended loud speakers, wall or floor mounted racks, displays, microphones, antennas and sensors, and camera/speaker housings
5. Equipment mounting details for equipment (composite weight including hardware) over 40 lbs. include the stamp of the Approved Licensed Structural Engineer.
6. Details contain manufacturer and model numbers for each part, detail key referenced back to Equipment layout, weight, and clearance requirements
7. Detail reference keys for every piece of equipment permanently installed overhead

C. FIT (CABLE FILL FORM, OR PLAN AND RCP)

1. Conduits uniquely identified
2. Cable types identified by make and model number
3. Cables leaving rooms uniquely identified
4. Cable quantities/types correct
5. Cables segregated by type/signal level when possible

D. FIT (RACK, FURNITURE RACK LAYOUTS AND ELEVATIONS)

1. Racks have a unique ID
2. All equipment uniquely identified within each rack layout
3. Blanks, vents, and fans positioned properly with respect to the actual heat generating equipment
4. Layout functional for daily use
5. Mounting of any external equipment such as monitors, speakers, and desk shelves detailed
6. Detail covering grounding, bonding, and the pass through of conduits to and from the racks

E. FIT (CUSTOM FURNITURE DRAWINGS)

1. Furniture drawings accurately show the form fit and function of the original design intent
2. Cable pass-troughs and equipment access panels appropriate for daily use
3. Finish samples provided unless finishes are pre-approved by owner/architect
4. Furniture uniquely identified and keyed to Equipment Layout Plans, Rack elevations, and System Line Diagrams
5. Furniture drawings contain enough detail for custom fabrication by furniture vendor

F. FIT (CUSTOM PANELS AND PLATES)

1. Plate drawings include the following manufacturing details: material type and thickness; plate finish; engraving/screening size, color, and font style; bevel and mounting hole details; connectors and switches identified by make and model number; and connector mounting method (pressure fitting, nuts and bolts, etc...)
2. All plates uniquely identified and keyed to match line diagrams and equipment layouts

G. FUNCTION (SYSTEM LINE DIAGRAMS)

1. Signal flow from input to output, left to right
2. Wiring notes make sense
3. System line diagrams accurately reflect the original system design intent
4. Equipment shown identified by manufacturer, model number, and a product description
5. All of the equipment shown has a unique ID matching the plate drawings, rack elevations, and equipment layout plans and RCP's
6. All field and rack wires uniquely identified by number
7. All terminal strips identified by locations and numbered
8. All rack power circuits and power control sequencing circuits identified, and all sequenced and controlled power devices identified in a table with means of controlling power state identified
9. All pre-made cables indicated by manufacturer, make, and model number
10. Calculated measurements for RF level for taps, drops, splitters, and amps
11. All wires identified by signal type (MIC, Line, RGB, Serial, Etc…)
12. Details for DIP switch settings, IP Addresses, Baud Rates or equipment modifications
13. Detailed pin outs for all Integrator manufactured cables
14. System line diagrams contain detail markers of where to find pin out details
15. System line diagrams indicate the impedance at amplifier outputs for all speaker lines

H. MISC (MISC CONSTRUCTION DETAILS)

1. Details and elevations for any custom built equipment, architectural oddities, or any other Integrator work not covered elsewhere

I. EQUIPMENT LIST

1. Variances from the original basis of design clearly marked
2. All of the necessary equipment accessories included
3. Equipment identifiers match those on the drawings
4. Equipment quantities match those of the drawings

APPENDIX G - EQUIPMENT LIST SPREADSHEET

A. Attached to this section is the Consultant's suggested AV equipment list based on the AV System drawings and Specifications. This information may be used by the potential bidders as a starting point in determining overall quantities of items and to indicate the allocation of devices budgeted in individual areas.

B. Integrators are cautioned that while the Consultant has made a good faith effort in preparing this list to be as coordinated and complete as possible, this list may not be complete, may have discrepancies against the drawings, and may not indicate all pertinent information required to prepare an accurate bid.

C. The Integrator is solely responsible for the completeness and accuracy of take-offs and bids.

D. All information indicated on this equipment list, including but not limited to quantities, manufacturers, model numbers and room allocations are non-binding, and neither the Owner nor the Consultant is obligated to accept the information, in original or altered form, from the Integrator as the final Bill of Quantities.

E. The Integrator shall supply a complete and operable system meeting the requirements of the construction documents (drawings and specifications) regardless of information indicated on the AV Systems Equipment List.

F. This spreadsheet is included may be obtained from the Consultant in Microsoft Excel (.xls) format for use in the preparation of the Bids.

APPENDIX G - EQUIPMENT LIST SPREADSHEET
Altadena LD Main Library
August 15, 2025

Itemized Equipment

Verify per-room/system quantities of AV equipment with line item pricing for each along with project total quantity for Base Bid and each Alternate shown.

		Category	Reference	Description	Manufacturer	Model	Substitution	Unit Price	Base Bid Subtotals: Tele Meeting Room	Staff Meeting Room	Digital Signage	Gaming Room	Community Room	Open Work Area	Digital Signage 2	Paging	Digital Signage 3 in Kiosk	Base Bid	Alternate Subtotals: Tele Meeting Room	Alternate
A	001	Audio	A-ALS ANT-A	ALS Antenna - Universal Kit	Listen Technologies	LA-123	Equal as Approved						1					1		0
	002	Audio	A-ALS EAR-A	ALS Single Ear Bud	Listen Technologies	LA-161	Equal as Approved						2					2		0
	003	Audio	A-ALS HPH-A	ALS stereo headphones	Listen Technologies	LA-165	Equal as Approved						2					2		0
	004	Audio	A-ALS RX-A	ALS Body Pack Display FM Receiver	Listen Technologies	LR-4200-072	Equal as Approved						4					4		0
	005	Audio	A-ALS TX-A	ALS RF Transmitter	Listen Technologies	LT-800-72-01	Equal as Approved						1					1		0
	006	Audio	A-AMP-AA	Audio Amplifier, 60 W/CH, 2 CH-8, 250 W/CH-70V, 1 CH-70v	QSC	SPA2-60	Equal as Approved						1					1		0
	007	Audio	A-AMP-DD	Audio Amplifier, 280 W/CH, 8 CH-8, 250 W/CH-70V, 8 CH-70V, Dante	Yamaha	XMV8280-D	Equal as Approved									1		1		0
	008	Audio	A-AMP-XX	8-channel Dante enabled amplifier	Yamaha	XMV8140-D	Equal as Approved									1		1		0
	009	Audio	A-CLG SPKR-A	Ceiling loudspeaker, integrated back can	JBL	Control 226C/T	Equal as Approved						9					9		0
	010	Audio	A-CLG SPKR-C	6" ceiling loudspeaker - Blind mount	Atlas	FAP62T	Equal as Approved									32		32		0
	011	Audio	A-CLG SPKR-D	6" ceiling loudspeaker PI unit	Atlas	FA62T-8MB	Equal as Approved									2		2		0
	012	Audio	A-CLG SPKR-X	4" pendant loudspeaker	Atlas	PM4FA	Equal as Approved									18		18		0
	013	Audio	A-DANTE HP AMP-X	Dante Network to Stereo Headphone Amplifier	RDL	AV-NH1	Equal as Approved						1					1		0
	014	Audio	A-DSP DAN LIC-X	Q-SYS Software-based Dante 16x16 Channel License	QSC	SLDAN-16-P	Equal as Approved						1			1		2		0
	015	Audio	A-DSP-P	Network I/O DSP	QSC	Q-SYS Core Nano	Equal as Approved						1			1		2		0
	016	Audio	A-MIC LINE IN-X	4 Mic/Line input	QSC	QIO-ML4I	Equal as Approved						1			1		2		0
	017	Audio	A-MIC LINE OUT-X	4 MIC/Line output	QSC	QIO-L4O	Equal as Approved						1					1		0
	018	Audio	A-MIC WS G ANT-A	Wireless access point tranceiver for Shure Microflex - 8 channel	Shure	MXWAPT8	Equal as Approved						1					1		0
	019	Audio	A-MIC WS TX-X	Wireless Mic Desktop base Transmitter	Shure	MXW8	Equal as Approved						8					8		0
	020	Audio	A-MIC-N	Cardioid gooseneck condenser microphone	Shure	MX412D/C	Equal as Approved									1		1		0
	021	Audio	A-MIC-X	10" Gooseneck Microphone	Shure	MX410	Equal as Approved						8					8		0
	022	Audiovisual	AV-32 LCD-X	32" DISPLAY	LG	32SM5J-B	Equal as Approved										1	1		0
	023	Video	AV-98 LCD-X	98" Display	LG	98UH5J	Equal as Approved						1					1		0
	024	Video	AV-AIR MEDIA-A	Wireless presentation gateway	Crestron	AM-3200	Equal as Approved		1			1	1					6	1	1
	025	Video	AV-BLUE RAY-X	Blue ray player	Tascam	BD-MP1	Equal as Approved						1					1		0
	026	Video	AV-BRIDGE-C	USB 3.0 Powered 3G-SDI Capture	AJA	U-TAP SDI	Equal as Approved						1					1		0
	027	Video	AV-CONF SYST-Y	All-in-one Video conference system	Poly	Studio R30	Equal as Approved		1			1		1				6	1	1
	028	Video	AV-DM IN CRD-D	4K input card with downmixing	Crestron	DMC-4KZ-C-DSP	Equal as Approved						5					5		0
	029	Video	AV-DM IN CRD-G	4K HDMI input card for DM switchers	Crestron	DMC-4K-HD-DSP	Equal as Approved						4					4		0
	030	Video	AV-DM OUT CRD-B	2 4K HDMI with stereo audio output card	Crestron	DMC-4KZ-HDO	Equal as Approved						1					1		0
	031	Video	AV-DM OUT CRD-C	2 DM 4K with 1 HDMI loop output card	Crestron	DMC-4KZ-CO-HD	Equal as Approved						2					2		0
	032	Integration Support	AV-DM PSU-X	16-Port PoDM+ Power Supply for DM 8G+ I/O Cards	Crestron	DM-PSU-16-PLUS	Equal as Approved						1					1		0
	033	Video	AV-DM RTR-B	16X16 DigitalMedia router frame	Crestron	DM-MD16X16-CPU3-RPS	Equal as Approved						1					1		0
	034	Video	AV-DM RX-B	DM 4k scaling receiver	Crestron	DM-RMC-4KZ-SCALER-C	Equal as Approved						2					2		0
	035	Video	AV-DM RX-D	DM RX PLATE 4K HDMI	Crestron	DM-RMC-4K-100-C-1G	Equal as Approved			1			2					3		0
	036	Video	AV-DM TX-D	DM TX PLATE 4K HDMI	Crestron	DM-TX-4KZ-100-C-1G	Equal as Approved			1			4					5		0
	037	Display Systems	AV-LCD-C	Display, 55 in, Speakers, Rotatable, 4 K	LG	55UH5F-H	Equal as Approved				1	1			1			7		0
	038	Display Systems	AV-LCD-D	Display, 65 in, Speakers, Rotatable, 4 K	LG	65UH7J-H	Equal as Approved		1									4	1	1
	039	Video	AV-REC STRM-X	Recorder/streaming player with 3G SDI - 400 GB SSD	Extron	SMP 351 3G-SD (60-1324-	Equal as Approved						1					1		0
	040	Control	C-KEYPAD-C	Wall mounted button panel	Crestron	C2N-CBD-E	Equal as Approved		1			1						5	1	1
	041	Control	C-LAN SWITCH-X	8 Port Gigabit Network Switch	NETGEAR	GS308EPP	Equal as Approved						1					1		0
	042	Control	C-PROCESSOR-A	Series 4 Control System Processor	Crestron	DIN-AP4	Equal as Approved		1			1						5	1	1
	043	Control	C-PROCESSOR-E	Series 4 control system with ethernet	Crestron	CP4N	Equal as Approved						1					1		0
	044	Control	C-PTZ CONTROL-X	PTZ Control	SKAARHOJ	PTZ FLY	Equal as Approved						1					1		0
	045	Control	C-TOUCHPANEL-C	10.1" tabletop touch panel - coordinate color	Crestron	TS-1070-W(B)-S	Equal as Approved						2					2		0
	046	Control	C-TOUCHPANEL-D	10" wall-mounted touch panel Coordinate color with owner.	Crestron	TSW-1070-W(B)-S	Equal as Approved						1					1		0
	047	Control	C-TOUCHPANEL-Z	7" Table Top Touchpanel	QSC	TSC-70-G3	Equal as Approved									1		1		0
	048	Control	C-USB RX-X	USB Receiver	Crestron	DM-NUX-R2	Equal as Approved						2					2		0
	049	Control	C-USB RX-Y	USB Extension Receiver – 1 gang	Crestron	DM-NUX-R2-1G-B	Equal as Approved						1					1		0
	050	Control	C-USB TX-X	USB Transmitter	Crestron	DM-NUX-L2	Equal as Approved						2					2		0
	051	Video	O-DISPLAY-X	Owner provided monitor	OFE	TBD BY Owner	Equal as Approved						1					1		0
	052	Video	O-PC-X	Ower Provided PC	OFE	TBD By Owner	Equal as Approved						1	1				2		0
	053	Audiovisual	O-SIGNAGE-X	Owner provided signage appliance	OFE	TBD By Owner	Equal as Approved				1				1		1	7		0
	054	Video	V-CAMERA-X	PTZ CAMERA	QSC	NC12X80	Equal as Approved						4					4		0
	055	Video	V-HDSDI RTR-A	12x12 6G HDSDI router	Blackmagic Design	Smart Videohub Clean Swi	Equal as Approved						1					1		0
	056	Video	V-MULTIVIEW-X	4 input multiview	Blackmagic Design	Multiview 4	Equal as Approved						1					1		0
	057	Video	V-PROJ LENS-X	Lens for Projector (1.71-2.25:1 Zoom)	Digital Projection, Inc.	118-560	Equal as Approved						1					1		0
	058	Video	V-PROJECTOR-X	7500 Lumens Projector	Digital Projection, Inc.	E-Vision Laser 4K-UHD	Equal as Approved						1					1		0
	059	Video	V-SUR HUB CAM-X	Included with Display	MICROSOFT	SURFACE HUB CAM	Equal as Approved			1								1		0
	060	Integration Support	X-FLAT PANEL MOUNT-E	Low profile tilt adjustable flat panel wall	Chief Mfg	XTM1U	Equal as Approved		1									4	1	1
	061	Integration Support	X-FP MOUNT-X	Display mount	RPV	RPWM-32MAXBF-XMS-UN	Equal as Approved						1					1		0
	062	Integration Support	X-FP MOUNT-Z	Micro adjustable display mount	Chief Mfg	MTM1U	Equal as Approved				1	1			1			7		0
	063	Integration Support	X-PROJECTOR MOUNT-A	RPA series projector mount	Chief Mfg	RPA Series	Equal as Approved						1					1		0
	064	Integration Support	X-RACK-A	44RU Gangable Rack Enclosure	Middle Atlantic	GRK-44-30HLRD	Equal as Approved						1					1		0
	065	Integration Support	X-S ARM MOUNT-X	Swing Arm Display Mount	Chief Mfg	TS218SU	Equal as Approved										1	1		0

Equipment Subtotals

		Description	Instructions	Base Bid Subtotals: Tele Meeting Room	Staff Meeting Room	Digital Signage	Gaming Room	Community Room	Open Work Area	Digital Signage 2	Paging	Digital Signage 3 in Kiosk	Base Bid	Alternate Subtotals: Tele Meeting Room	Alternate
Provide per-room/system subtotals for itemized equipment above with misc. costs and shipping/handling.	B 1	Itemized Equipment	Sum product of Item Room / System Quantity and Unit Price above per each system	-	-	-	-	-	-	-	-	-	-	-	-
	2	Miscellaneous Materials	Miscellaneous materials costs										-		-
	C	Equipment Subtotals Subtotals	Sum of equipment subtotals above for each system	-	-	-	-	-	-	-	-	-	-	-	-

Labor Subtotals

		Description	Instructions	Base Bid Subtotals										Alternate Subtotals	
Provide per-room/system labor breakdown as shown.	D 1	Integrator Installation Labor	Integrator installation labor costs										-		-
	E	Labor Subtotals Subtotals	Sum of labor subtotals above for each system	-	-	-	-	-	-	-	-	-	-	-	-

Taxes + Fees

		Description	Instructions	Base Bid Subtotals										Alternate Subtotals	
Taxable costs passed through.	F 1	Sales Tax	Sales tax as applicable										-		-
	G	Taxes + Fees Subtotals	Sum of taxes + fees above for each system	-	-	-	-	-	-	-	-	-	-	-	-

System Subtotals

		Total / Subtotal Description	Instructions	Base Bid Subtotals										Alternate Subtotals	
Per-room/system subtotals, project room/system multipliers and extended system subtotals.	H	Total Installed Systems Costs	Sum of Equipment (C), Labor (E), Taxes + Fees (G) costs above per each system	-	-	-	-	-	-	-	-	-	-	-	-
	I	System Multipliers	The quantity of room / system types in the bid per Drawings	4	1	3	1	1	1	3	1	1	16	1	1
	J	System Subtotals Subtotals	Product of Total Installed Systems Costs (H) and System Multipliers (I) for each system	-	-	-	-	-	-	-	-	-	-	-	-

Bid Totals

		Description	Instructions	Base Bid Total	Alternate Total
	K	BID TOTALS	Sum of all System Subtotals Subtotals (J)	-	-

END OF SECTION 27 41 16.01

APPENDIX G - EQUIPMENT LIST SPREADSHEET
Altadena LD Main Library
August 15, 2025

Itemized Equipment

Verify per-room/system quantities of AV equipment with line item pricing for each along with project total quantity for Base Bid and each Alternate shown.

		Category	Reference	Description	Manufacturer	Model	Substitution	Unit Price	Base Bid Subtotals: Tele Meeting Room	Staff Meeting Room	Digital Signage	Gaming Room	Community Room	Open Work Area	Digital Signage 2	Paging	Digital Signage 3 in Kiosk	Base Bid	Alternate Subtotals: Tele Meeting Room	Alternate
A	001	Audio	A-ALS ANT-A	ALS Antenna - Universal Kit	Listen Technologies	LA-123	Equal as Approved						1					1		0
	002	Audio	A-ALS EAR-A	ALS Single Ear Bud	Listen Technologies	LA-161	Equal as Approved						2					2		0
	003	Audio	A-ALS HPH-A	ALS stereo headphones	Listen Technologies	LA-165	Equal as Approved						2					2		0
	004	Audio	A-ALS RX-A	ALS Body Pack Display FM Receiver	Listen Technologies	LR-4200-072	Equal as Approved						4					4		0
	005	Audio	A-ALS TX-A	ALS RF Transmitter	Listen Technologies	LT-800-72-01	Equal as Approved						1					1		0
	006	Audio	A-AMP-AA	Audio Amplifier, 60 W/CH, 2 CH-8, 250 W/CH-70V, 1 CH-70v	QSC	SPA2-60	Equal as Approved						1					1		0
	007	Audio	A-AMP-DD	Audio Amplifier, 280 W/CH, 8 CH-8, 250 W/CH-70V, 8 CH-70V, Dante	Yamaha	XMV8280-D	Equal as Approved									1		1		0
	008	Audio	A-AMP-XX	8-channel Dante enabled amplifier	Yamaha	XMV8140-D	Equal as Approved									1		1		0
	009	Audio	A-CLG SPKR-A	Ceiling loudspeaker, integrated back can	JBL	Control 226C/T	Equal as Approved						9					9		0
	010	Audio	A-CLG SPKR-C	6" ceiling loudspeaker - Blind mount	Atlas	FAP62T	Equal as Approved									32		32		0
	011	Audio	A-CLG SPKR-D	6" ceiling loudspeaker PI unit	Atlas	FA62T-8MB	Equal as Approved									2		2		0
	012	Audio	A-CLG SPKR-X	4" pendant loudspeaker	Atlas	PM4FA	Equal as Approved									18		18		0
	013	Audio	A-DANTE HP AMP-X	Dante Network to Stereo Headphone Amplifier	RDL	AV-NH1	Equal as Approved						1					1		0
	014	Audio	A-DSP DAN LIC-X	Q-SYS Software-based Dante 16x16 Channel License	QSC	SLDAN-16-P	Equal as Approved						1			1		2		0
	015	Audio	A-DSP-P	Network I/O DSP	QSC	Q-SYS Core Nano	Equal as Approved						1			1		2		0
	016	Audio	A-MIC LINE IN-X	4 Mic/Line input	QSC	QIO-ML4I	Equal as Approved						1			1		2		0
	017	Audio	A-MIC LINE OUT-X	4 MIC/Line output	QSC	QIO-L4O	Equal as Approved						1					1		0
	018	Audio	A-MIC WS G ANT-A	Wireless access point tranceiver for Shure Microflex - 8 channel	Shure	MXWAPT8	Equal as Approved						1					1		0
	019	Audio	A-MIC WS TX-X	Wireless Mic Desktop base Transmitter	Shure	MXW8	Equal as Approved						8					8		0
	020	Audio	A-MIC-N	Cardioid gooseneck condenser microphone	Shure	MX412D/C	Equal as Approved									1		1		0
	021	Audio	A-MIC-X	10" Gooseneck Microphone	Shure	MX410	Equal as Approved						8					8		0
	022	Audiovisual	AV-32 LCD-X	32" DISPLAY	LG	32SM5J-B	Equal as Approved										1	1		0
	023	Video	AV-98 LCD-X	98" Display	LG	98UH5J	Equal as Approved						1					1		0
	024	Video	AV-AIR MEDIA-A	Wireless presentation gateway	Crestron	AM-3200	Equal as Approved		1			1	1					6	1	1
	025	Video	AV-BLUE RAY-X	Blue ray player	Tascam	BD-MP1	Equal as Approved						1					1		0
	026	Video	AV-BRIDGE-C	USB 3.0 Powered 3G-SDI Capture	AJA	U-TAP SDI	Equal as Approved						1					1		0
	027	Video	AV-CONF SYST-Y	All-in-one Video conference system	Poly	Studio R30	Equal as Approved		1			1		1				6	1	1
	028	Video	AV-DM IN CRD-D	4K input card with downmixing	Crestron	DMC-4KZ-C-DSP	Equal as Approved						5					5		0
	029	Video	AV-DM IN CRD-G	4K HDMI input card for DM switchers	Crestron	DMC-4K-HD-DSP	Equal as Approved						4					4		0
	030	Video	AV-DM OUT CRD-B	2 4K HDMI with stereo audio output card	Crestron	DMC-4KZ-HDO	Equal as Approved						1					1		0
	031	Video	AV-DM OUT CRD-C	2 DM 4K with 1 HDMI loop output card	Crestron	DMC-4KZ-CO-HD	Equal as Approved						2					2		0
	032	Integration Support	AV-DM PSU-X	16-Port PoDM+ Power Supply for DM 8G+ I/O Cards	Crestron	DM-PSU-16-PLUS	Equal as Approved						1					1		0
	033	Video	AV-DM RTR-B	16X16 DigitalMedia router frame	Crestron	DM-MD16X16-CPU3-RPS	Equal as Approved						1					1		0
	034	Video	AV-DM RX-B	DM 4k scaling receiver	Crestron	DM-RMC-4KZ-SCALER-C	Equal as Approved						2					2		0
	035	Video	AV-DM RX-D	DM RX PLATE 4K HDMI	Crestron	DM-RMC-4K-100-C-1G	Equal as Approved			1			2					3		0
	036	Video	AV-DM TX-D	DM TX PLATE 4K HDMI	Crestron	DM-TX-4KZ-100-C-1G	Equal as Approved			1			4					5		0
	037	Display Systems	AV-LCD-C	Display, 55 in, Speakers, Rotatable, 4 K	LG	55UH5F-H	Equal as Approved				1	1			1			7		0
	038	Display Systems	AV-LCD-D	Display, 65 in, Speakers, Rotatable, 4 K	LG	65UH7J-H	Equal as Approved		1									4	1	1
	039	Video	AV-REC STRM-X	Recorder/streaming player with 3G SDI - 400 GB SSD	Extron	SMP 351 3G-SD (60-1324-	Equal as Approved						1					1		0
	040	Control	C-KEYPAD-C	Wall mounted button panel	Crestron	C2N-CBD-E	Equal as Approved		1			1						5	1	1
	041	Control	C-LAN SWITCH-X	8 Port Gigabit Network Switch	NETGEAR	GS308EPP	Equal as Approved						1					1		0
	042	Control	C-PROCESSOR-A	Series 4 Control System Processor	Crestron	DIN-AP4	Equal as Approved		1			1						5	1	1
	043	Control	C-PROCESSOR-E	Series 4 control system with ethernet	Crestron	CP4N	Equal as Approved						1					1		0
	044	Control	C-PTZ CONTROL-X	PTZ Control	SKAARHOJ	PTZ FLY	Equal as Approved						1					1		0
	045	Control	C-TOUCHPANEL-C	10.1" tabletop touch panel - coordinate color	Crestron	TS-1070-W(B)-S	Equal as Approved						2					2		0
	046	Control	C-TOUCHPANEL-D	10" wall-mounted touch panel Coordinate color with owner.	Crestron	TSW-1070-W(B)-S	Equal as Approved						1					1		0
	047	Control	C-TOUCHPANEL-Z	7" Table Top Touchpanel	QSC	TSC-70-G3	Equal as Approved									1		1		0
	048	Control	C-USB RX-X	USB Receiver	Crestron	DM-NUX-R2	Equal as Approved						2					2		0
	049	Control	C-USB RX-Y	USB Extension Receiver – 1 gang	Crestron	DM-NUX-R2-1G-B	Equal as Approved						1					1		0
	050	Control	C-USB TX-X	USB Transmitter	Crestron	DM-NUX-L2	Equal as Approved						2					2		0
	051	Video	O-DISPLAY-X	Owner provided monitor	OFE	TBD BY Owner	Equal as Approved						1					1		0
	052	Video	O-PC-X	Ower Provided PC	OFE	TBD By Owner	Equal as Approved						1	1				2		0
	053	Audiovisual	O-SIGNAGE-X	Owner provided signage appliance	OFE	TBD By Owner	Equal as Approved				1				1		1	7		0
	054	Video	V-CAMERA-X	PTZ CAMERA	QSC	NC12X80	Equal as Approved						4					4		0
	055	Video	V-HDSDI RTR-A	12x12 6G HDSDI router	Blackmagic Design	Smart Videohub Clean Swi	Equal as Approved						1					1		0
	056	Video	V-MULTIVIEW-X	4 input multiview	Blackmagic Design	Multiview 4	Equal as Approved						1					1		0
	057	Video	V-PROJ LENS-X	Lens for Projector (1.71-2.25:1 Zoom)	Digital Projection, Inc.	118-560	Equal as Approved						1					1		0
	058	Video	V-PROJECTOR-X	7500 Lumens Projector	Digital Projection, Inc.	E-Vision Laser 4K-UHD	Equal as Approved						1					1		0
	059	Video	V-SUR HUB CAM-X	Included with Display	MICROSOFT	SURFACE HUB CAM	Equal as Approved			1								1		0
	060	Integration Support	X-FLAT PANEL MOUNT-E	Low profile tilt adjustable flat panel wall	Chief Mfg	XTM1U	Equal as Approved		1									4	1	1
	061	Integration Support	X-FP MOUNT-X	Display mount	RPV	RPWM-32MAXBF-XMS-UN	Equal as Approved						1					1		0
	062	Integration Support	X-FP MOUNT-Z	Micro adjustable display mount	Chief Mfg	MTM1U	Equal as Approved				1	1			1			7		0
	063	Integration Support	X-PROJECTOR MOUNT-A	RPA series projector mount	Chief Mfg	RPA Series	Equal as Approved						1					1		0
	064	Integration Support	X-RACK-A	44RU Gangable Rack Enclosure	Middle Atlantic	GRK-44-30HLRD	Equal as Approved						1					1		0
	065	Integration Support	X-S ARM MOUNT-X	Swing Arm Display Mount	Chief Mfg	TS218SU	Equal as Approved										1	1		0

Equipment Subtotals

		Description	Instructions	Base Bid Subtotals: Tele Meeting Room	Staff Meeting Room	Digital Signage	Gaming Room	Community Room	Open Work Area	Digital Signage 2	Paging	Digital Signage 3 in Kiosk	Base Bid	Alternate Subtotals: Tele Meeting Room	Alternate
Provide per-room/system subtotals for itemized equipment above with misc. costs and shipping/handling.	B 1	Itemized Equipment	Sum product of Item Room / System Quantity and Unit Price above per each system	-	-	-	-	-	-	-	-	-	-	-	-
	2	Miscellaneous Materials	Miscellaneous materials costs										-		-
	C	Equipment Subtotals Subtotals	Sum of equipment subtotals above for each system	-	-	-	-	-	-	-	-	-	-	-	-

Labor Subtotals

		Description	Instructions	Base Bid Subtotals	Alternate Subtotals
Provide per-room/system labor breakdown as shown.	D 1	Integrator Installation Labor	Integrator installation labor costs		-
	E	Labor Subtotals Subtotals	Sum of labor subtotals above for each system	-	-

Taxes + Fees

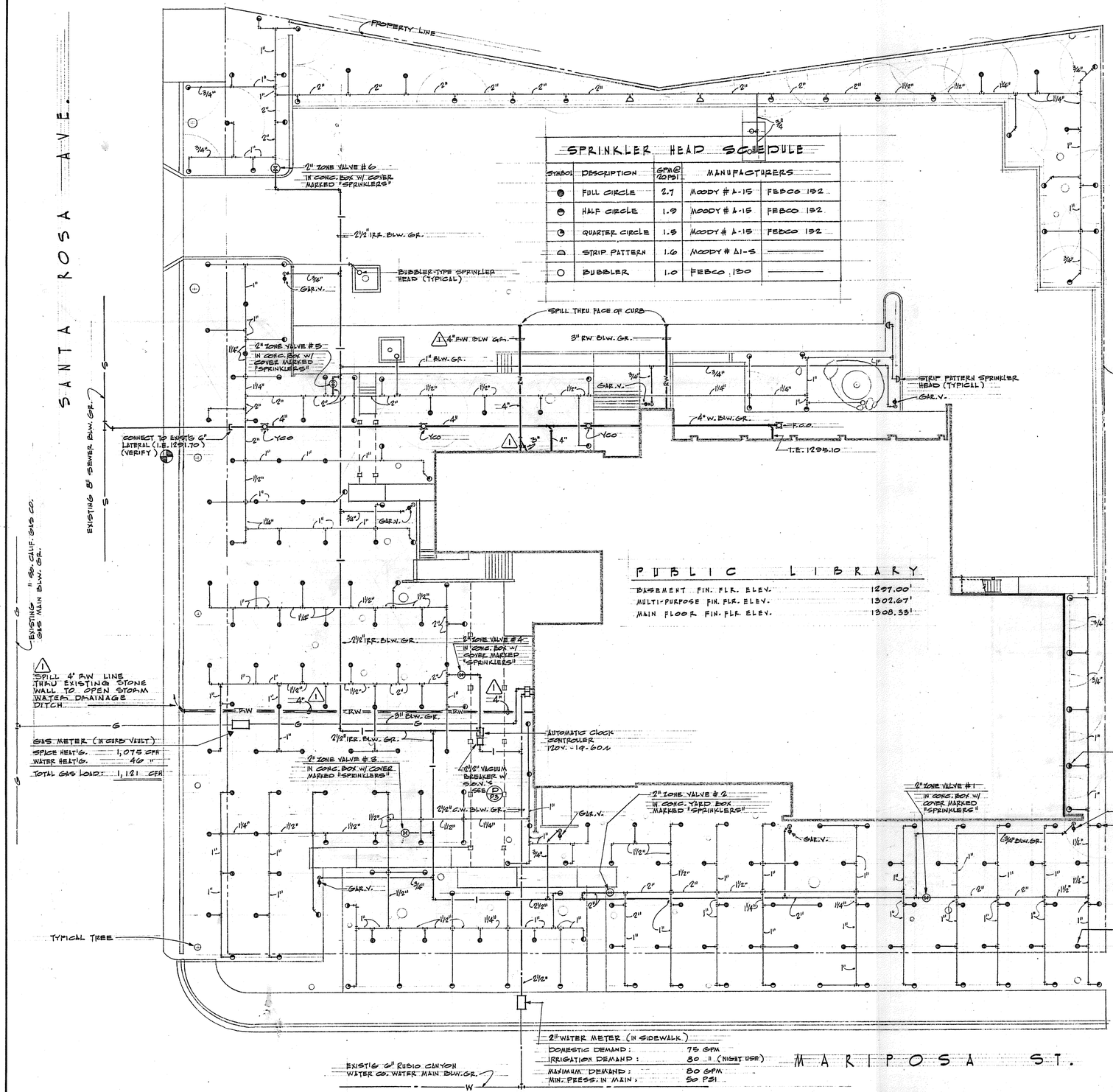
		Description	Instructions	Base Bid Subtotals	Alternate Subtotals
Taxable costs passed through.	F 1	Sales Tax	Sales tax as applicable		-
	G	Taxes + Fees Subtotals	Sum of taxes + fees above for each system	-	-

System Subtotals

		Total / Subtotal Description	Instructions	Base Bid Subtotals	Alternate Subtotals
Per-room/system subtotals, project room/system multipliers and extended system subtotals.	H	Total Installed Systems Costs	Sum of Equipment (C), Labor (E), Taxes + Fees (G) costs above per each system	-	-
	I	System Multipliers	The quantity of room / system types in the bid per Drawings	4 1 3 1 1 1 3 1 1 16	1 1
	J	System Subtotals Subtotals	Product of Total Installed Systems Costs (H) and System Multipliers (I) for each system	- - - - - - - - - - -	- -

Bid Totals

		Description	Instructions	Base Bid Total	Alternate Total
	K	BID TOTALS	Sum of all System Subtotals Subtotals (J)	-	-



SITE PLAN

MARK NO.	DESCRIPTION	CONNECTIONS W	V	CW	HW	G	REMARKS
1	WATER CLOSET, PUBLIC	4"	2"	1½"	•	•	WALL HUNG, FLUSH VALVE
2	WATER CLOSET, PRIVATE	4"	2"	¾"	•	•	WALL HUNG, TANK TYPE
3	URINAL	2"	1½"	1¼"	•	•	WALL HUNG. MOUNTING HEIGHTS: MEN'S TOILET RM.: 24" TO LIP BOY'S TOILET RM: 18" TO LIP
4	LAVATORY	2"	1½"	½"	½"	•	20" x 15" WALL HUNG
5	LAVATORY	2"	1½"	½"	½"	•	18" DIA. COUNTERTOP
6	SERVICE SINK	3"	1½"	¾"	¾"	•	20" x 24" TRAP STANDARD
7	SINK, STAINLESS STEEL	2"	1½"	½"	½"	•	16" x 20" SINGLE COMPARTMENT
8	SINK, CAST IRON	2"	1½"	½"	½"	•	32" x 21" DOUBLE COMPARTMENT
9	DRINKING FOUNTAIN	2"	1½"	½"	•	•	SURFACE MOUNTED
10	WATER COOLER, ELECTRIC	2"	1½"	½"	•	•	⅓ H.P. 115V.-1Φ-60∼ SEMI-RECESSED
11	DOMESTIC WATER HEATER	•	•	1¼"	1¼"	¾"	50,000 BTU/HR., 50 GAL. STORAGE CAPACITY
12	HOT WATER CIRCULATOR	•	•	•	¾4"	•	1/12 H.P. 120 V.-1Φ-60∼
13	KITCHEN UNIT (SEE BID ALT. "A")	2"	1½"	½"	½"	•	9,860 WATT RANGE & OVEN ⅓ H.P. GARB. DISP. 120/208V.-3Φ-60∼
14	FLOOR DRAIN	2"	1½" OR 2"	•	•	•	5" DIA. BRONZE STRAINER
15	FLOOR DRAIN	2"	1½" OR 2"	•	•	•	COMBINATION DRIP DRAIN W/ 6" DIA. FUNNEL & 8" DIA. STRAINER
16	FLOOR SINK	2"	1½"	•	•	•	12" SQ. x 8" DEEP
17	ROOF DRAIN	•	•	•	•	•	BOTTOM OUTLET 3" & 2"
18	ROOF DRAIN	•	•	•	•	•	SIDE OUTLET 2" & 3"

PLUMBING EQUIPMENT SCHEDULE

ABBREVIATION	DESCRIPTION	SYMBOL
S	EXISTING SEWER LINE	—S—
W	EXISTING WATER LINE	—W—
S & W	SEWER & WASTE, CAST IRON PIPE	
S	SEWER, VITRIFIED CLAY PIPE	
RW	RAINWATER PIPING, CAST IRON OR GALV. STEEL	—RW—
RW	RAINWATER PIPING, VITRIFIED CLAY PIPE	— RW —
V, VTR	VENT, VENT THROUGH ROOF	
CW	COLD WATER	
HW	HOT WATER	
HWR	HOT WATER RETURN	
G	GAS	—G—
YCO, WCO, FCO	YARD CLEANOUT, WALL CLEANOUT, FLOOR CLEANOUT	
D.S.	DOWNSPOUT	
S.O.V.	SHUT-OFF VALVE	
P.O.C.	POINT OF CONNECTION	⊕
P.T.	PLUGGED TEE	
I.E.	INVERT ELEVATION	
C.D.	CONDENSATE DRAIN	—CD—
IRR.	IRRIGATION WATER	—I—
H.B., GAR.V.	HOSE BIBB, GARDEN VALVE	⊖
	MARK NO.	⬡
	ROOM NO.	○

LEGEND

1. ALL WORK MUST CONFORM TO REQUIREMENTS OF GOVERNING CODES & AUTHORITIES HAVING JURISDICTION.
2. ALL PIPING & EQUIPMENT MUST BE INSTALLED IN ACCORDANCE WITH DRAWINGS & SPECIFICATIONS. OBTAIN APPROVAL IN WRITING FROM ARCHITECT FOR ANY DEVIATION.
3. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS & MOUNTING HEIGHTS OF ALL PLUMBING FIXTURES.
4. ALL PIPING TO BE CONCEALED UNLESS OTHERWISE NOTED OR SHOWN.
5. (G) UNDER GENERAL CONTRACTOR WORK SECTION.
6. (M) UNDER HEATING & AIR CONDITIONING WORK SECTION.
7. (P) UNDER PLUMBING WORK SECTION.
8. (E) UNDER ELECTRICAL WORK SECTION.

GENERAL NOTES

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

REV.	NOTES	DATE
1	BLDG. DEPT. CORRECTIONS.	7-5-66

REV. 6-1-66
DRAWN BY RD
DATE AUG 19 '66

APPROVED: Robert McWilliams, Board President
Earl Georgi, AIA C-614

STRUCTURAL ENGINEER HILLMAN, BIDDISON & LOEVENGUTH 624-8748 LOS ANGELES
MECHANICAL ENGINEER THOS. H. PARRY & ASSOC. PASADENA 792-2277
ELECTRICAL ENGINEER WILLIAM H. KING PASADENA 792-5789

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