



CITY OF PITTSBURG

**NOTICE TO CONTRACTORS, CONTRACT BID PROPOSAL, SAMPLE CONTRACT
DOCUMENTS AND SPECIAL PROVISIONS**

FOR THE CONSTRUCTION OF

**CONTRACT NO. 2021-24
CITY COUNCIL CHAMBERS UPGRADE PROJECT**

IN

PITTSBURG, CALIFORNIA



**RICHARD D. ABONO
CITY ENGINEER**

January 2023

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Notice Inviting Bids

1. **Bid Submission.** The **City of Pittsburg** (“City”) will accept sealed bids for its City Council Chambers Upgrade Project, Contract 2021-24 (“Project”), by or before February 8, 2023, at 2:00 p.m., at City Hall first floor, located at 65 Civic Avenue, Pittsburg, California, at which time the bids will be publicly opened and read aloud.
2. **Project Information.**
 - 2.1 **Location and Description.** The Project is located at Pittsburg City Hall, 65 Civic Avenue, Pittsburg, CA 94565 and is described as follows: The work of this Contract consists of Audio Visual, Electrical and Lighting upgrades to the City Council Chambers and all other work necessary for a complete project in accordance with the Plans and Specifications.
 - 2.2 **Time for Final Completion.** The Project must be fully completed within 185 calendar days from the start date set forth in the Notice to Proceed. City anticipates that the Work will begin on or about March 21, 2023, but the anticipated start date is provided solely for convenience and is neither certain nor binding. The Contractor shall procure all necessary equipment, parts, and labor prior to start of demolition activity and construction shall begin and be fully completed during the City Council summer break which is between August 24 and September 12, 2023. No work shall be allowed outside of this period, except for minor adjustments or fine tuning.
 - 2.3 **Estimated Cost.** The estimated construction cost is \$380,000.
3. **License and Registration Requirements.**
 - 3.1 **License.** This Project requires a valid California contractor’s license for the following classification(s): C7, C10, and B Licenses.
 - 3.2 **DIR Registration.** City may not accept a Bid Proposal from or enter into the Contract with a bidder, without proof that the bidder is registered with the California Department of Industrial Relations (“DIR”) to perform public work pursuant to Labor Code § 1725.5, subject to limited legal exceptions.
4. **Contract Documents.** The plans, specifications, bid forms and contract documents for the Project, and any addenda thereto (“Contract Documents”) may be downloaded from City’s website located at: <https://www.pittsburgca.gov/business/current-bidding-opportunities>. A printed copy of the Contract Documents is not available.
5. **Bid Security.** The Bid Proposal must be accompanied by bid security of ten percent of the maximum bid amount, in the form of a cashier’s or certified check made payable to City, or a bid bond executed by a surety licensed to do business in the State of California on the Bid Bond form included with the Contract Documents. The bid security must guarantee that within ten days after City issues the Notice of Potential Award, the successful bidder will execute the Contract and submit the payment and performance bonds, insurance certificates and endorsements, and any other submittals required by the Contract Documents and as specified in the Notice of Potential Award.

6. Prevailing Wage Requirements.

6.1 General. Pursuant to California Labor Code § 1720 et seq., this Project is subject to the prevailing wage requirements applicable to the locality in which the Work is to be performed for each craft, classification or type of worker needed to perform the Work, including employer payments for health and welfare, pension, vacation, apprenticeship and similar purposes.

6.2 Rates. The prevailing rates are on file with the City and are available online at <http://www.dir.ca.gov/DLSR>. Each Contractor and Subcontractor must pay no less than the specified rates to all workers employed to work on the Project. The schedule of per diem wages is based upon a working day of eight hours. The rate for holiday and overtime work must be at least time and one-half.

6.3 Compliance. The Contract will be subject to compliance monitoring and enforcement by the DIR, under Labor Code § 1771.4.

7. Performance and Payment Bonds. The successful bidder will be required to provide performance and payment bonds, each for 100% of the Contract Price, as further specified in the Contract Documents.

8. Substitution of Securities. Substitution of appropriate securities in lieu of retention amounts from progress payments is permitted under Public Contract Code § 22300.

9. Subcontractor List. Each Subcontractor must be registered with the DIR to perform work on public projects. Each bidder must submit a completed Subcontractor List form with its Bid Proposal, including the name, location of the place of business, California contractor license number, DIR registration number, and percentage of the Work to be performed (based on the base bid price) for each Subcontractor that will perform Work or service or fabricate or install Work for the prime contractor in excess of one-half of 1% of the bid price, using the Subcontractor List form included with the Contract Documents.

10. Instructions to Bidders. All bidders should carefully review the Instructions to Bidders for more detailed information before submitting a Bid Proposal. The definitions provided in Article 1 of the General Conditions apply to all of the Contract Documents, as defined therein, including this Notice Inviting Bids.

11. Bidders' Conference. A bidders' conference will be held on January 25, 2023 at 9:00 A.M., at the following location: City Council Chambers, 3rd floor, 65 Civic Ave. Pittsburg, CA to acquaint all prospective bidders with the Contract Documents and the Worksite. The bidders' conference is mandatory. A bidder who fails to attend a mandatory bidders' conference may be disqualified from bidding.

By:  Date: 1/4/23

Richard Abono, City Engineer

Publication Date: January 4, 2023

END OF NOTICE INVITING BIDS

Instructions to Bidders

Each Bid Proposal submitted to the **City of Pittsburg (“City”)** for its **City Council Chambers Upgrade Project, Contract 2021-24** (“Project”) must be submitted in accordance with the following instructions and requirements:

1. Bid Submission.

- 1.1 General.** Each Bid Proposal must be signed, sealed and submitted to City, using the form provided in the Contract Documents, by or before the date and time set forth in Section 1 of the Notice Inviting Bids, or as amended by subsequent addendum. Faxed or emailed Bid Proposals will not be accepted, unless otherwise specified. Late submissions will be returned unopened. City reserves the right to postpone the date or time for receiving or opening bids. Each bidder is solely responsible for all of its costs to prepare and submit its bid and by submitting a bid waives any right to recover those costs from City. The bid price(s) must include all costs to perform the Work as specified, including all labor, material, supplies, and equipment and all other direct or indirect costs such as applicable taxes, insurance and overhead.
- 1.2 Bid Envelope.** The envelope containing the sealed Bid Proposal and all required forms and attachments must be clearly labeled and addressed as follows:

BID PROPOSAL:

City Council Chambers Upgrade Project
Contract No. 2021-24

City Clerk
City of Pittsburg
65 Civic Avenue
Pittsburg, CA 94565

The envelope must also be clearly labeled, as follows, with the bidder’s name, address, and its registration number with the California Department of Industrial Relations (“DIR”) for bidding on public works contracts (Labor Code §§ 1725.5 and 1771.1):

[Contractor company name]
[street address]
[city, state, zip code]
DIR Registration No: _____

- 1.3 DIR Registration.** Subject to limited legal exceptions for joint venture bids and federally-funded projects, City may not accept a Bid Proposal from a bidder without proof that the bidder is registered with the DIR to perform public work under Labor Code § 1725.5. If City is unable to confirm that the bidder is currently registered with the DIR, City may disqualify the bidder and return its bid unopened. (Labor Code §§ 1725.5 and 1771.1(a).)
- 2. Bid Proposal Form and Enclosures.** Each Bid Proposal must be completed in ink using the Bid Proposal form included with the Contract Documents. The Bid Proposal form must be fully completed without interlineations, alterations, or erasures. Any necessary corrections must be clear and legible, and must be initialed by the bidder’s authorized representative. A Bid Proposal submitted with exceptions or terms such as “negotiable,” “will negotiate,” or similar, will be considered nonresponsive. Each Bid Proposal must be

accompanied by bid security, as set forth in Section 4 below, and by a completed Subcontractor List and Non-Collusion Declaration using the forms included with the Contract Documents, and any other required enclosures, as applicable.

- 3. Authorization and Execution.** Each Bid Proposal must be signed by the bidder's authorized representative. A Bid Proposal submitted by a partnership must be signed in the partnership name by a general partner with authority to bind the partnership. A Bid Proposal submitted by a corporation must be signed with the legal name of the corporation, followed by the signature and title of two officers of the corporation with full authority to bind the corporation to the terms of the Bid Proposal, under California Corporations Code § 313.
- 4. Bid Security.** Each Bid Proposal must be accompanied by bid security of ten percent of the maximum bid amount, in the form of a cashier's check or certified check, made payable to the City, or bid bond using the form included in the Contract Documents and executed by a surety licensed to do business in the State of California. The bid security must guarantee that, within ten days after issuance of the Notice of Potential Award, the bidder will: execute and submit the enclosed Contract for the bid price; submit payment and performance bonds for 100% of the maximum Contract Price; and submit the insurance certificates and endorsements and any other submittals, if any, required by the Contract Documents or the Notice of Potential Award. A Bid Proposal may not be withdrawn for a period of 60 days after the bid opening without forfeiture of the bid security, except as authorized for material error under Public Contract Code § 5100 et seq.
- 5. Requests for Information.** Questions or requests for clarifications regarding the Project, the bid procedures, or any of the Contract Documents must be submitted in writing to 2021-24BidInfo@pittsburgca.gov. Oral responses are not authorized and are not binding on the City. Bidders should submit any such written inquiries at least five Working Days before the scheduled bid opening. Questions received any later might not be addressed before the bid deadline. An interpretation or clarification by City in response to a written inquiry will be issued in an addendum.
- 6. Pre-Bid Investigation.**

 - 6.1 General.** Each bidder is solely responsible at its sole expense for diligent and thorough review of the Contract Documents, examination of the Project site, and reasonable and prudent inquiry concerning known and potential site and area conditions prior to submitting a Bid Proposal. Each bidder is responsible for knowledge of conditions and requirements which reasonable review and investigation would have disclosed. However, except for any areas that are open to the public at large, bidders may not enter property owned or leased by the City or the Project site without prior written authorization from City.
 - 6.2 Document Review.** Each bidder is responsible for review of the Contract Documents and any informational documents provided "For Reference Only," e.g., as-builts, technical reports, test data, and the like. A bidder is responsible for notifying City of any errors, omissions, inconsistencies, or conflicts it discovers in the Contract Documents, acting solely in its capacity as a contractor and subject to the limitations of Public Contract Code § 1104. Notification of any such errors, omissions, inconsistencies, or conflicts must be submitted in writing to the City no later than five Working Days before the scheduled bid opening. (See Section 5, above.) City expressly disclaims responsibility for assumptions a bidder might draw from the presence or absence of information provided by City.
 - 6.3 Project Site.** Questions regarding the availability of soil test data, water table elevations, and the like should be submitted to the City in writing, as specified in

Section 5, above. Any subsurface exploration at the Project site must be done at the bidder's expense, but only with prior written authorization from City. All soil data and analyses available for inspection or provided in the Contract Documents apply only to the test hole locations. Any water table elevation indicated by a soil test report existed on the date the test hole was drilled. The bidder is responsible for determining and allowing for any differing soil or water table conditions during construction. Because groundwater levels may fluctuate, difference(s) in elevation between ground water shown in soil boring logs and ground water actually encountered during Project construction will not be considered changed Project site conditions. Actual locations and depths must be determined by bidder's field investigation. The bidder may request access to underlying or background information on the Project site in City's possession that is necessary for the bidder to form its own conclusions, including, if available, record drawings or other documents indicating the location of subsurface lines, utilities, or other structures.

6.4 Utility Company Standards. The Project must be completed in a manner that satisfies the standards and requirements of any affected utility companies or agencies (collectively, "utility owners"). The successful bidder may be required by the third party utility owners to provide detailed plans prepared by a California registered civil engineer showing the necessary temporary support of the utilities during coordinated construction work. Bidders are directed to contact the affected third party utility owners about their requirements before submitting a Bid Proposal.

7. Bidders Interested in More Than One Bid. No person, firm, or corporation may submit or be a party to more than one Bid Proposal unless alternate bids are specifically called for. However, a person, firm, or corporation that has submitted a subcontract proposal or quote to a bidder may submit subcontract proposals or quotes to other bidders.

8. Addenda. Any addenda issued prior to the bid opening are part of the Contract Documents. Subject to the limitations of Public Contract Code § 4104.5, City reserves the right to issue addenda prior to bid time. Each bidder is solely responsible for ensuring it has received and reviewed all addenda prior to submitting its bid. Bidders should check City's website periodically for any addenda or updates on the Project at: <http://www.pittsburgca.gov>.

9. Brand Designations and "Or Equal" Substitutions. Any specification designating a material, product, thing, or service by specific brand or trade name, followed by the words "or equal," is intended only to indicate quality and type of item desired, and bidders may request use of any equal material, product, thing, or service. All data substantiating the proposed substitute as an equal item must be submitted with the written request for substitution. A request for substitution must be submitted within 35 days after Notice of Potential Award unless otherwise provided in the Contract Documents. This provision does not apply to materials, products, things, or services that may lawfully be designated by a specific brand or trade name under Public Contract Code § 3400(c).

10. Bid Protest. Any bid protest against another bidder must be submitted in writing and received by the City at City of Pittsburg, 65 Civic Avenue, Pittsburg California, 94565, Attn: City Clerk, before 5:00 p.m. no later than two Working Days following bid opening ("Bid Protest Deadline") and must comply with the following requirements:

10.1 General. Only a bidder who has actually submitted a Bid Proposal is eligible to submit a bid protest against another bidder. Subcontractors are not eligible to submit bid protests. A bidder may not rely on the bid protest submitted by another bidder, but must timely pursue its own protest. If required by City, the protesting bidder must submit a non-refundable fee in the amount specified by City, based

upon City's reasonable costs to administer the bid protest. Any such fee must be submitted to City no later than the Bid Protest Deadline, unless otherwise specified. For purposes of this Section 10, a "Working Day" means a day that City is open for normal business, and excludes weekends and holidays observed by City. Pursuant to Public Contract Code § 4104, inadvertent omission of a Subcontractor's DIR registration number on the Subcontractor List form is not grounds for a bid protest, provided it is corrected within 24 hours of the bid opening or as otherwise provided under Labor Code § 1771.1(b).

- 10.2 Protest Contents.** The bid protest must contain a complete statement of the basis for the protest and must include all supporting documentation. Material submitted after the Bid Protest Deadline will not be considered. The protest must refer to the *specific* portion or portions of the Contract Documents upon which the protest is based. The protest must include the name, address, email address, and telephone number of the protesting bidder and any person submitting the protest on behalf of or as an authorized representative of the protesting bidder.
 - 10.3 Copy to Protested Bidder.** Upon submission of its bid protest to City, the protesting bidder must also concurrently transmit the protest and all supporting documents to the protested bidder, and to any other bidder who has a reasonable prospect of receiving an award depending upon the outcome of the protest, by email or hand delivery to ensure delivery before the Bid Protest Deadline.
 - 10.4 Response to Protest.** The protested bidder may submit a written response to the protest, provided the response is received by City before 5:00 p.m., within two Working Days after the Bid Protest Deadline or after actual receipt of the bid protest, whichever is sooner (the "Response Deadline"). The response must attach all supporting documentation. Material submitted after the Response Deadline will not be considered. The response must include the name, address, email address, and telephone number of the person responding on behalf of or representing the protested bidder if different from the protested bidder.
 - 10.5 Copy to Protesting Bidder.** Upon submission of its response to the bid protest to the City, the protested bidder must also concurrently transmit by email or hand delivery, by or before the Response Deadline, a copy of its response and all supporting documents to the protesting bidder and to any other bidder who has a reasonable prospect of receiving an award depending upon the outcome of the protest.
 - 10.6 Exclusive Remedy.** The procedure and time limits set forth in this Section are mandatory and are the bidder's sole and exclusive remedy in the event of a bid protest. A bidder's failure to comply with these procedures will constitute a waiver of any right to further pursue a bid protest, including filing a Government Code Claim or initiation of legal proceedings.
 - 10.7 Right to Award.** City reserves the right, acting in its sole discretion, to reject any bid protest that it determines lacks merit, to award the Contract to the bidder it has determined to be the responsible bidder submitting the lowest responsive bid, and to issue a Notice to Proceed with the Work notwithstanding any pending or continuing challenge to its determination.
- 11. Reservation of Rights.** City reserves the unfettered right, acting in its sole discretion, to waive or to decline to waive any immaterial bid irregularities; to accept or reject any or all bids; to cancel or reschedule the bid; to postpone or abandon the Project entirely; or to perform all or part of the Work with its own forces. The Contract will be awarded, if at all,

within 60 days after opening of bids or as otherwise specified in the Special Conditions, to the responsible bidder that submitted the lowest responsive bid. Any planned start date for the Project represents the City's expectations at the time the Notice Inviting Bids was first issued. City is not bound to issue a Notice to Proceed by or before such planned start date, and it reserves the right to issue the Notice to Proceed when the City determines, in its sole discretion, the appropriate time for commencing the Work. The City expressly disclaims responsibility for any assumptions a bidder might draw from the presence or absence of information provided by the City in any form. Each bidder is solely responsible for its costs to prepare and submit a bid, including site investigation costs.

- 12. Bonds.** Within ten calendar days following City's issuance of the Notice of Potential Award to the apparent low bidder, the bidder must submit payment and performance bonds to City as specified in the Contract Documents using the bond forms included in the Contract Documents. All required bonds must be calculated on the maximum total Contract Price as awarded, including additive alternates, if applicable.
- 13. License(s).** The successful bidder and its Subcontractor(s) must possess the California contractor's license(s) in the classification(s) required by law to perform the Work. The successful bidder must also obtain a City business license within 10 days following City's issuance of the Notice of Potential Award. Subcontractors must also obtain a City business license before performing any Work.
- 14. Ineligible Subcontractor.** Any Subcontractor who is ineligible to perform work on a public works project under Labor Code §§ 1777.1 or 1777.7 is prohibited from performing work on the Project.
- 15. Safety Orders.** If the Project includes construction of a pipeline, sewer, sewage disposal system, boring and jacking pits, or similar trenches or open excavations, which are five feet or deeper, each bid must include a bid item for adequate sheeting, shoring, and bracing, or equivalent method, for the protection of life or limb, which comply with safety orders as required by Labor Code § 6707.
- 16. Subcontractor Work Limits.** The prime contractor must perform at least 50% of the Work on the Project, calculated as a percentage of the base bid price, with its own forces, except for any Work identified as "Specialty Work" in the Contract Documents. The total bid amount for any such Specialty Work, as shown on the Bid Schedule, may be deducted from the base bid price before computing the 35% self-performance requirement. The remaining Work may be performed by qualified Subcontractor(s).

END OF INSTRUCTIONS TO BIDDERS

Bid Proposal

City Council Chambers Upgrade Project, Contract 2021-24

_____ (“Bidder”) hereby submits this Bid Proposal to the City of Pittsburg (“City”) for the above-referenced project (“Project”) in response to the Notice Inviting Bids and in accordance with the Contract Documents referenced in the Notice.

1. **Base Bid.** Bidder proposes to perform and fully complete the Work for the Project as specified in the Contract Documents, within the time required for full completion of the Work, including all labor, materials, supplies, and equipment and all other direct or indirect costs including, but not limited to, taxes, insurance and all overhead for the following price (“Base Bid”):
\$ _____.

2. **Addenda.** Bidder agrees that it has confirmed receipt of or access to, and reviewed, all addenda issued for this bid. Bidder waives any claims it might have against the City based on its failure to receive, access, or review any addenda for any reason. Bidder specifically acknowledges receipt of the following addenda:

| Addendum: | Date Received: | Addendum: | Date Received: |
|-----------|----------------|-----------|----------------|
| #01 | _____ | #05 | _____ |
| #02 | _____ | #06 | _____ |
| #03 | _____ | #07 | _____ |
| #04 | _____ | #08 | _____ |

3. **Bidder’s Certifications and Warranties.** By signing and submitting this Bid Proposal, Bidder certifies and warrants the following:
- 3.1 **Examination of Contract Documents.** Bidder has thoroughly examined the Contract Documents and represents that, to the best of Bidder’s knowledge, there are no errors, omissions, or discrepancies in the Contract Documents, subject to the limitations of Public Contract Code § 1104.
 - 3.2 **Examination of Worksite.** Bidder has had the opportunity to examine the Worksite and local conditions at the Project location.
 - 3.3 **Bidder Responsibility.** Bidder is a responsible bidder, with the necessary ability, capacity, experience, skill, qualifications, workforce, equipment, and resources to perform or cause the Work to be performed in accordance with the Contract Documents and within the Contract Time.
 - 3.4 **Responsibility for Bid.** Bidder has carefully reviewed this Bid Proposal and is solely responsible for any errors or omissions contained in its completed bid. All statements and information provided in this Bid Proposal and enclosures are true and correct to the best of Bidder’s knowledge.
 - 3.5 **Nondiscrimination.** In preparing this bid, the Bidder has not engaged in discrimination against any prospective or present employee or Subcontractor on grounds of race, color, ancestry, national origin, ethnicity, religion, sex, sexual orientation, age, disability, or marital status.
 - 3.6 **Iran Contracting Act.** If the Contract Price exceeds \$1,000,000, Bidder is not identified on a list created under the Iran Contracting Act, Public Contract Code § 2200 et seq. (the “Act”),

as a person engaging in investment activities in Iran, as defined in the Act, or is otherwise expressly exempt under the Act.

4. **Award of Contract.** By signing and submitting this Bid Proposal, Bidder agrees that if Bidder is awarded the Contract for the Project, within ten days following issuance of the Notice of Potential Award to Bidder, Bidder will do all of the following:
- 4.1 **Execute Contract.** Enter into the Contract with City in accordance with the terms of this Bid Proposal, by signing and submitting to City the Contract prepared by City using the form included with the Contract Documents;
 - 4.2 **Submit Required Bonds.** Submit to City a payment bond and a performance bond, each for 100% of the Contract Price, using the bond forms provided and in accordance with the requirements of the Contract Documents; and
 - 4.3 **Insurance Requirements.** Submit to City the insurance certificate(s) and endorsement(s) as required by the Contract Documents.
5. **Bid Security.** As a guarantee that, if awarded the Contract, Bidder will perform its obligations under Section 4 above, Bidder is enclosing bid security in the amount of ten percent of its maximum bid amount in one of the following forms (check one):

_____ A cashier's check or certified check payable to City and issued by _____ [Bank name] in the amount of \$_____.

_____ A bid bond, using the Bid Bond form included with the Contract Documents, payable to City and executed by a surety licensed to do business in the State of California.

This Bid Proposal is hereby submitted on _____, 20__.

s/ _____

Name and Title

s/ _____
[See Section 3 of Instructions to Bidders]

Name and Title

Company Name

License #, Expiration Date, and Classification

Address

DIR Registration #

City, State, Zip

Phone

Contact Name

Contact Email

END OF BID PROPOSAL

Bid Schedule

This Bid Schedule must be completed in ink and included with the sealed Bid Proposal. Pricing must be provided for each Bid Item as indicated. Items marked "(SW)" are Specialty Work that must be performed by a qualified Subcontractor. The lump sum or unit cost for each item must be inclusive of all costs, whether direct or indirect, including profit and overhead. The sum of all amounts entered in the "Extended Total Amount" column must be identical to the Base Bid price entered in Section 1 of the Bid Proposal form.

AL = Allowance CF = Cubic Feet CY = Cubic Yard EA = Each LB = Pounds
 LF = Linear Foot LS = Lump Sum SF = Square Feet TON = Ton (2000 lbs)

| BID ITEM NO. | ITEM DESCRIPTION | EST. QTY. | UNIT | UNIT COST | EXTENDED TOTAL AMOUNT |
|--------------|---|-----------|------|-----------|-----------------------|
| 1 | Furnish and install complete audiovisual and electrical upgrade of City Council Chambers. Full compensation shall be considered as included in this price paid for work involved and no additional compensation will be allowed therefore. | 1 | L.S. | \$ | \$ |

* Final Pay Quantity

TOTAL BASE BID: \$ _____

Note: The amount entered as the "Total Base Bid" should be identical to the Base Bid amount entered in Section 1 of the Bid Proposal form.

BIDDER NAME: _____

END OF BID SCHEDULE

Noncollusion Declaration

TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

The undersigned declares:

I am the _____ [title] of _____
[business name], the party making the foregoing bid.

The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder. All statements contained in the bid are true. The bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, to effectuate a collusive or sham bid, and has not paid and will not pay, any person or entity for such purpose.

This declaration is intended to comply with California Public Contract Code § 7106 and Title 23 U.S.C § 112.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on _____ [date], at _____ [city], _____ [state].

s/ _____

Name [print]

END OF NONCOLLUSION DECLARATION

Bid Bond

_____ (“Bidder”) has submitted a bid, dated _____, 20____ (“Bid”), to the City of Pittsburg (“City”) for work on the **City Council Chambers Upgrade Project, Contract 2021-24** (“Project”). Under this duly executed bid bond (“Bid Bond”), Bidder as Principal and _____, its surety (“Surety”), are bound to City as obligee in the penal sum of ten percent of the maximum amount of the Bid (the “Bond Sum”). Bidder and Surety bind themselves and their respective heirs, executors, administrators, successors and assigns, jointly and severally, as follows:

1. **General.** If Bidder is awarded the Contract for the Project, Bidder will enter into the Contract with City in accordance with the terms of the Bid.
2. **Submittals.** Within ten days following issuance of the Notice of Potential Award to Bidder, Bidder must submit to City the following:
 - 2.1 **Contract.** The executed Contract, using the form provided by City in the Project contract documents (“Contract Documents”);
 - 2.2 **Payment Bond.** A payment bond for 100% of the maximum Contract Price, executed by a surety licensed to do business in the State of California using the Payment Bond form included with the Contract Documents;
 - 2.3 **Performance Bond.** A performance bond for 100% of the maximum Contract Price, executed by a surety licensed to do business in the State of California using the Performance Bond form included with the Contract Documents; and
 - 2.4 **Insurance.** The insurance certificate(s) and endorsement(s) required by the Contract Documents, and any other documents required by the Instructions to Bidders or Notice of Potential Award.
3. **Enforcement.** If Bidder fails to execute the Contract and to submit the bonds and insurance certificates as required by the Contract Documents, Surety guarantees that Bidder forfeits the Bond Sum to City. Any notice to Surety may be given in the manner specified in the Contract and delivered or transmitted to Surety as follows:

Attn: _____
Address: _____
City/State/Zip: _____
Phone: _____
Fax: _____
Email: _____

4. **Duration and Waiver.** If Bidder fulfills its obligations under Section 2, above, then this obligation will be null and void; otherwise, it will remain in full force and effect for 60 days following the bid opening or until this Bid Bond is returned to Bidder, whichever occurs first. Surety waives the provisions of Civil Code §§ 2819 and 2845.

[Signatures are on the following page.]

This Bid Bond is entered into and effective on _____, 20_____.

SURETY:

Business Name

s/ _____

Date

Name, Title

(Attach Acknowledgment with Notary Seal and Power of Attorney)

BIDDER:

Business Name

s/ _____

Date

Name, Title

END OF BID BOND

Bidder's Questionnaire

City Council Chambers Upgrade Project, Contract 2021-24

Within 48 hours following a request by City, a bidder must submit to City a completed, signed Bidder's Questionnaire using this form and all required attachments, including clearly labeled additional sheets as needed. City may request the Questionnaire from one or more of the apparent low bidders following the bid opening, and may use the completed Questionnaire as part of its investigation to evaluate a bidder's qualifications for this Project. The Questionnaire must be filled out completely, accurately, and legibly. Any errors, omissions, or misrepresentations in completion of the Questionnaire may be grounds for rejection of the bid or termination of a Contract awarded pursuant to the bid.

Part A: General Information

Bidder Business Name: _____ ("Bidder")

Check One: Corporation (State of incorporation: _____)
 Partnership
 Sole Proprietorship
 Joint Venture of: _____
 Other: _____

Main Office Address and Phone: _____

Local Office Address and Phone: _____

Website address: _____

Owner of Business: _____

Contact Name and Title: _____

Contact Phone and Email: _____

Bidder's California Contractor's License Number(s): _____

Bidder's DIR Registration Number: _____

Part B: Bidder Experience

1. How many years has Bidder been in business under its present business name? ____ years
2. Has Bidder completed projects similar in type and size to this Project as a general contractor?
____ Yes ____ No
3. Has Bidder ever been disqualified from a bid on grounds that it is not responsible, or otherwise disqualified or disbarred from bidding under state or federal law?
____ Yes ____ No

If yes, provide additional information on a separate sheet regarding the disqualification or disbarment, including the name and address of the agency or owner of the project, the type and size of the project, the reasons that Bidder was disqualified or disbarred, and the month and year in which the disqualification or disbarment occurred.

4. Has Bidder ever been terminated for cause, alleged default, or legal violation from a construction project, either as a general contractor or as a subcontractor?

_____ Yes _____ No

If yes, provide additional information on a separate sheet regarding the termination, including the name and address of the agency or owner of the subject project, the type and size of the project, whether Bidder was under contract as a general contractor or a subcontractor, the reasons that Bidder was terminated, and the month and year in which the termination occurred.

5. Provide information about Bidder's past projects performed as general contractor as follows:

- 5.1 Six most recently completed public works projects within the last three years;
- 5.2 Three largest completed projects within the last three years; and
- 5.3 Any project which is similar to this Project including scope and character of the work.

6. Use separate sheets to provide all of the following information for each project identified in response to the above three categories:

- 6.1 Project name, location, and description;
- 6.2 Owner (name, address, email, and phone number);
- 6.3 Prime contractor, if applicable (name, address, email, and phone number);
- 6.4 Architect or engineer (name, email, and phone number);
- 6.5 Project and/or construction manager (name, email, and phone number);
- 6.6 Scope of work performed (as general or as subcontractor);
- 6.7 Initial contract price and final contract price (including change orders);
- 6.8 Original scheduled completion date and actual date of completion;
- 6.9 Time extensions granted (number of days);
- 6.10 Number and amount of stop notices or mechanic's liens filed;
- 6.11 Amount of any liquidated damages assessed against Bidder; and
- 6.12 Nature and resolution of any project-related claim, lawsuit, mediation, or arbitration involving Bidder.

Part C: Safety

1. Provide Bidder's Experience Modification Rate (EMR) for the last three years:

| Year | EMR |
|------|-----|
| | |
| | |
| | |

2. Complete the following, based on information provided in Bidder's CalOSHA Form 300 or Form 300A, Annual Summary of Work-Related Illnesses and Injuries, from the most recent past calendar year:

- 2.1 Number of lost workday cases: _____
- 2.2 Number of medical treatment cases: _____
- 2.3 Number of deaths: _____

3. Has Bidder ever been cited, fined, or prosecuted by any local, state, or federal agency, including OSHA, CalOSHA, or EPA, for violation of any law, regulation, or requirements pertaining to health and safety?

_____ Yes _____ No

If yes, provide additional information on a separate sheet regarding each such citation, fine, or prosecution, including the name and address of the agency or owner of the project, the type and size of the project, the reasons for and nature of the citation, fine, or prosecution, and the month and year in which the incident giving rise to the citation, fine, or prosecution occurred.

4. Name, title, and email for person responsible for Bidder's safety program:

Name Title Email

Part D: Verification

In signing this document, I, the undersigned, declare that I am duly authorized to sign and submit this Bidder's Questionnaire on behalf of the named Bidder, and that all responses and information set forth in this Bidder's Questionnaire and accompanying attachments are, to the best of my knowledge, true, accurate and complete as of the date of submission. **I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.**

Signature: _____ Date: _____

By: _____
Name and Title

END OF BIDDER'S QUESTIONNAIRE

Contract

This public works contract ("Contract") is entered into by and between the City of Pittsburg ("City") and _____ ("Contractor"), for work on the **City Council Chambers Upgrade Project, Contract 2021-24** ("Project").

The parties agree as follows:

1. **Award of Contract.** In response to the Notice Inviting Bids, Contractor has submitted a Bid Proposal to perform the Work to construct the Project. On _____, 20____, City authorized award of this Contract to Contractor for the amount set forth in Section 4, below.
2. **Contract Documents.** The Contract Documents incorporated into this Contract include and are comprised of all of the documents listed below. The definitions provided in Article 1 of the General Conditions apply to all of the Contract Documents, including this Contract.
 - 2.1 Notice Inviting Bids;
 - 2.2 Instructions to Bidders;
 - 2.3 Addenda, if any;
 - 2.4 Bid Proposal and attachments thereto;
 - 2.5 Contract;
 - 2.6 Payment and Performance Bonds;
 - 2.7 General Conditions;
 - 2.8 Special Conditions;
 - 2.9 Project Plans and Specifications;
 - 2.10 Change Orders, if any;
 - 2.11 Notice of Potential Award;
 - 2.12 Notice to Proceed; and
 - 2.13 The following: No other documents
3. **Contractor's Obligations.** Contractor will perform all of the Work required for the Project, as specified in the Contract Documents. Contractor must provide, furnish, and supply all things necessary and incidental for the timely performance and completion of the Work, including all necessary labor, materials, supplies, tools, equipment, transportation, onsite facilities, and utilities, unless otherwise specified in the Contract Documents. Contractor must use its best efforts to diligently prosecute and complete the Work in a professional and expeditious manner and to meet or exceed the performance standards required by the Contract Documents.
4. **Payment.** As full and complete compensation for Contractor's timely performance and completion of the Work in strict accordance with the terms and conditions of the Contract Documents, City will pay Contractor \$_____ ("Contract Price") for all of Contractor's direct and indirect costs to perform the Work, including all labor, materials, supplies, equipment, taxes, insurance, bonds and all overhead costs, in accordance with the payment provisions in the General Conditions.
5. **Time for Completion.** Contractor will fully complete the Work for the Project, meeting all requirements for Final Completion, within 185 calendar days from the commencement date given in the Notice to Proceed ("Contract Time"). By signing below, Contractor expressly waives any claim for delayed early completion.
6. **Liquidated Damages.** As further specified in Section 5.4 of the General Conditions, if Contractor fails to complete the Work within the Contract Time, City will assess liquidated damages in the amount of \$2,700 per day for each day of unexcused delay in achieving

Final Completion, and such liquidated damages may be deducted from City's payments due or to become due to Contractor under this Contract.

7. Labor Code Compliance.

7.1 General. This Contract is subject to all applicable requirements of Chapter 1 of Part 7 of Division 2 of the Labor Code, including requirements pertaining to wages, working hours and workers' compensation insurance, as further specified in Article 9 of the General Conditions.

7.2 Prevailing Wages. This Project is subject to the prevailing wage requirements applicable to the locality in which the Work is to be performed for each craft, classification or type of worker needed to perform the Work, including employer payments for health and welfare, pension, vacation, apprenticeship and similar purposes. Copies of these prevailing rates are available online at <http://www.dir.ca.gov/DLSR>.

7.3 DIR Registration. City may not enter into the Contract with a bidder without proof that the bidder and its Subcontractors are registered with the California Department of Industrial Relations to perform public work pursuant to Labor Code § 1725.5, subject to limited legal exceptions.

8. Workers' Compensation Certification. Pursuant to Labor Code § 1861, by signing this Contract, Contractor certifies as follows: "I am aware of the provisions of Labor Code § 3700 which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the Work on this Contract."

9. Conflicts of Interest. Contractor, its employees, Subcontractors and agents, may not have, maintain or acquire a conflict of interest in relation to this Contract in violation of any City ordinance or requirement, or in violation of any California law, including Government Code § 1090 et seq., or the Political Reform Act, as set forth in Government Code § 81000 et seq. and its accompanying regulations. Any violation of this Section constitutes a material breach of the Contract.

10. Independent Contractor. Contractor is an independent contractor under this Contract and will have control of the Work and the means and methods by which it is performed. Contractor and its Subcontractors are not employees of City and are not entitled to participate in any health, retirement, or any other employee benefits from City.

11. Notice. Any notice, billing, or payment required by or pursuant to the Contract Documents must be made in writing, signed, dated and sent to the other party by personal delivery, U.S. Mail, a reliable overnight delivery service, or by email as a PDF file. Notice is deemed effective upon delivery, except that service by U.S. Mail is deemed effective on the second working day after deposit for delivery. Notice for each party must be given as follows:

City of Pittsburg
Department of Public Works, Engineering Division
65 Civic Avenue
Pittsburg, CA 94565
Attn: Richard Abono

Contractor:

Name: _____
Address: _____
City/State/Zip: _____
Phone: _____
Attn: _____
Email: _____
Copy to: _____

12. General Provisions.

12.1 Assignment and Successors. Contractor may not assign its rights or obligations under this Contract, in part or in whole, without City’s written consent. This Contract is binding on Contractor’s and City’s lawful heirs, successors and permitted assigns.

12.2 Third Party Beneficiaries. There are no intended third party beneficiaries to this Contract.

12.3 Governing Law and Venue. This Contract will be governed by California law and venue will be in the Contra Costa County Superior Court, and no other place. Contractor waives any right it may have pursuant to Code of Civil Procedure § 394, to file a motion to transfer any action arising from or relating to this Contract to a venue outside of Contra Costa County, California.

12.4 Amendment. No amendment or modification of this Contract will be binding unless it is in a writing duly authorized and signed by the parties to this Contract.

12.5 Integration. This Contract and the Contract Documents incorporated herein, including authorized amendments or Change Orders thereto, constitute the final, complete, and exclusive terms of the agreement between City and Contractor.

12.6 Severability. If any provision of the Contract Documents is determined to be illegal, invalid, or unenforceable, in whole or in part, the remaining provisions of the Contract Documents will remain in full force and effect.

12.7 Iran Contracting Act. If the Contract Price exceeds \$1,000,000, Contractor certifies, by signing below, that it is not identified on a list created under the Iran Contracting Act, Public Contract Code § 2200 et seq. (the “Act”), as a person engaging in investment activities in Iran, as defined in the Act, or is otherwise expressly exempt under the Act.

12.8 Authorization. Each individual signing below warrants that he or she is authorized to do so by the party that he or she represents, and that this Contract is legally binding on that party. If Contractor is a corporation, signatures from two officers of the corporation are required pursuant to California Corporation Code § 313.

The parties agree to this Contract as witnessed by the signatures below:

CITY:

Approved as to form:

s/ _____

s/ _____

Name, Title

Name, Title

Date: _____

Date: _____

Attest:

s/ _____

Name, Title

Date: _____

CONTRACTOR: _____
Business Name

s/ _____

Seal:

Name, Title

Date: _____

Second Signature (See Section 12.8):

s/ _____

Name, Title

Date: _____

Contractor's California License Number(s) and Expiration Date(s)

END OF CONTRACT

Payment Bond

The City of Pittsburg ("City") and _____ ("Contractor") have entered into a contract for work on the **City Council Chambers Upgrade Project, Contract 2021-24** ("Project"). The Contract is incorporated by reference into this Payment Bond ("Bond").

- 1. General.** Under this Bond, Contractor as principal and _____, its surety ("Surety"), are bound to City as obligee in an amount not less than \$ _____, under California Civil Code § 9550 et seq., to ensure payment to authorized claimants. This Bond is binding on the respective successors, assigns, owners, heirs, or executors of Surety and Contractor.
- 2. Surety's Obligation.** If Contractor or any of its Subcontractors fails to pay a person authorized in California Civil Code § 9100 to assert a claim against a payment bond, any amounts due under the Unemployment Insurance Code with respect to work or labor performed under the Contract, or any amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of Contractor and its Subcontractors under California Unemployment Insurance Code § 13020 with respect to the work and labor, then Surety will pay the obligation.
- 3. Beneficiaries.** This Bond inures to the benefit of any of the persons named in California Civil Code § 9100, so as to give a right of action to those persons or their assigns in any suit brought upon this Bond. Contractor must promptly provide a copy of this Bond upon request by any person with legal rights under this Bond.
- 4. Duration.** If Contractor promptly makes payment of all sums for all labor, materials, and equipment furnished for use in the performance of the Work required by the Contract, in conformance with the time requirements set forth in the Contract and as required by California law, Surety's obligations under this Bond will be null and void. Otherwise, Surety's obligations will remain in full force and effect.
- 5. Waivers.** Surety waives any requirement to be notified of alterations to the Contract or extensions of time for performance of the Work under the Contract. Surety waives the provisions of Civil Code §§ 2819 and 2845. City waives the requirement of a new bond for any supplemental contract under Civil Code § 9550. Any notice to Surety may be given in the manner specified in the Contract and delivered or transmitted to Surety as follows:

Attn: _____
Address: _____
City/State/Zip: _____
Phone: _____
Email: _____

- 6. Law and Venue.** This Bond will be governed by California law, and venue for any dispute pursuant to this Bond will be in the Contra Costa County Superior Court, and no other place. Surety will be responsible for City's attorneys' fees and costs in any action to enforce the provisions of this Bond.

[Signatures are on the following page.]

7. **Effective Date; Execution.** This Bond is entered into and is effective on _____,
20__.

SURETY:

Business Name

s/ _____

Date

Name, Title

(Attach Acknowledgment with Notary Seal and Power of Attorney)

CONTRACTOR:

Business Name

s/ _____

Date

Name, Title

APPROVED BY CITY:

s/ _____

Date

Name, Title

END OF PAYMENT BOND

Performance Bond

The City of Pittsburgh ("City") and _____ ("Contractor") have entered into a contract for work on the **City Council Chambers Upgrade Project, Contract 2021-24** ("Project"). The Contract is incorporated by reference into this Performance Bond ("Bond").

1. **General.** Under this Bond, Contractor as principal and _____, its surety ("Surety"), are bound to City as obligee for an amount not less than \$_____ to ensure Contractor's faithful performance of its obligations under the Contract. This Bond is binding on the respective successors, assigns, owners, heirs, or executors of Surety and Contractor.
2. **Surety's Obligations.** Surety's obligations are co-extensive with Contractor's obligations under the Contract. If Contractor fully performs its obligations under the Contract, including its warranty obligations under the Contract, Surety's obligations under this Bond will become null and void. Otherwise, Surety's obligations will remain in full force and effect.
3. **Waiver.** Surety waives any requirement to be notified of and further consents to any alterations to the Contract made under the applicable provisions of the Contract Documents, including changes to the scope of Work or extensions of time for performance of Work under the Contract. Surety waives the provisions of Civil Code §§ 2819 and 2845.
4. **Application of Contract Balance.** Upon making a demand on this Bond for completion of the Work prior to acceptance of the Project, City will make the Contract Balance available to Surety for completion of the Work under the Contract. For purposes of this provision, the Contract Balance is defined as the total amount payable by City to Contractor as the Contract Price minus amounts already paid to Contractor, and minus any liquidated damages, credits, or backcharges to which City is entitled under the terms of the Contract.
5. **Contractor Default.** Upon written notification from City of Contractor's termination for default under Article 13 of the Contract General Conditions, time being of the essence, Surety must act within the time specified in Article 13 to remedy the default through one of the following courses of action:
 - 5.1 Arrange for completion of the Work under the Contract by Contractor, with City's consent, but only if Contractor is in default solely due to its financial inability to complete the Work;
 - 5.2 Arrange for completion of the Work under the Contract by a qualified contractor acceptable to City, and secured by performance and payment bonds issued by an admitted surety as required by the Contract Documents, at Surety's expense; or
 - 5.3 Waive its right to complete the Work under the Contract and reimburse City the amount of City's costs to have the remaining Work completed.
6. **Surety Default.** If Surety defaults on its obligations under the Bond, City will be entitled to recover all costs it incurs due to Surety's default, including legal, design professional, or delay costs.
7. **Notice.** Any notice to Surety may be given in the manner specified in the Contract and sent to Surety as follows:

Attn: _____
Address: _____

City/State/Zip: _____
Phone: _____
Fax: _____
Email: _____

8. **Law and Venue.** This Bond will be governed by California law, and venue for any dispute pursuant to this Bond will be in the Contra Costa County Superior Court, and no other place. Surety will be responsible for City's attorneys' fees and costs in any action to enforce the provisions of this Bond.
9. **Effective Date; Execution.** This Bond is entered into and effective on _____, 20__.

SURETY:

Business Name

s/ _____

Date

Name, Title

(Attach Acknowledgment with Notary Seal and Power of Attorney)

CONTRACTOR:

Business Name

s/ _____

Date

Name, Title

APPROVED BY CITY:

s/ _____

Date

Name, Title

END OF PERFORMANCE BOND

General Conditions

Article 1 - Definitions

Definitions. The following definitions apply to all of the Contract Documents unless otherwise indicated, e.g., additional definitions that apply solely to the Specifications or other technical documents. Defined terms and titles of documents are capitalized in the Contract Documents, with the exception of the following (in any tense or form): “day,” “furnish,” “including,” “install,” “work day” or “working day.”

Allowance means a specific amount that must be included in the Bid Proposal for a specified purpose.

Article, as used in these General Conditions, means a numbered Article of the General Conditions, unless otherwise indicated by the context.

Change Order means a written document duly approved and executed by City, which changes the scope of Work, the Contract Price, or the Contract Time.

City means the municipality which has entered into the Contract with Contractor for performance of the Work, acting through its City Council, officers, employees, City Engineer, and any other authorized representatives.

City Engineer means the City Engineer for City and his or her authorized delegee(s).

Claim means a separate demand by Contractor for a change in the Contract Time or Contract Price, that has previously been submitted to City in accordance with the requirements of the Contract Documents, and which has been rejected by City, in whole or in part; or a written demand by Contractor objecting to the amount of Final Payment.

Contract means the signed agreement between City and Contractor for performing the Work required for the Project, and all documents expressly incorporated therein.

Contract Documents means, collectively, all of the documents listed as such in Section 2 of the Contract, including the Notice Inviting Bids; the Instructions to Bidders; addenda, if any; the Bid Proposal, and attachments thereto; the Contract; the Notice of Potential Award and Notice to Proceed; the payment and performance bonds; the General Conditions; the Special Conditions; the Project Plans and Specifications; any Change Orders; and any other documents which are clearly and unambiguously made part of the Contract Documents. The Contract Documents do not include documents provided “For Reference Only,” or documents that are intended solely to provide information regarding existing conditions.

Contract Price means the total compensation to be paid to Contractor for performance of the Work, as set forth in the Contract and as may be amended by Change Order or adjusted for an Allowance. The Contract Price is not subject to adjustment due to inflation or due to the increased cost of labor, material, supplies or equipment following submission of the Bid Proposal.

Contract Time means the time specified for complete performance of the Work, as set forth in the Contract and as may be amended by Change Order.

Contractor means the individual, partnership, corporation, or joint-venture that has signed the Contract with City to perform the Work.

Day means a calendar day unless otherwise specified.

Design Professional means the licensed individual(s) or firm(s) retained by City to provide architectural, engineering, or electrical engineering design services for the Project. If no Design Professional has been retained for this Project, any reference to Design Professional is deemed to refer to the Engineer.

DIR means the California Department of Industrial Relations.

Drawings has the same meaning as Plans.

Engineer means the City Engineer for the **City of Pittsburg** and his or her authorized delegees.

Excusable Delay is defined in Section 5.3(B), Excusable Delay.

Extra Work means new or unforeseen work added to the Project, as determined by the Engineer in his or her sole discretion, including Work that was not part of or incidental to the scope of the Work when the Contractor's bid was submitted; Work that is substantially different from the Work as described in the Contract Documents at bid time; or Work that results from a substantially differing and unforeseeable condition.

Final Completion means Contractor has fully completed all of the Work required by the Contract Documents to the City's satisfaction, including all punch list items and any required commissioning or training, and has provided the City with all required submittals, including the instructions and manuals, product warranties, and as-built drawings.

Final Payment means payment to Contractor of the unpaid Contract Price, including release of undisputed retention, less amounts withheld or deducted pursuant to the Contract Documents.

Furnish means to purchase and deliver for the Project.

Government Code Claim means a claim submitted pursuant to California Government Code § 900 et seq.

Hazardous Materials means any substance or material identified now or in the future as hazardous under any Laws, or any other substance or material that may be considered hazardous or otherwise subject to Laws governing handling, disposal, or cleanup.

Including, whether or not capitalized, means "including, but not limited to," unless the context clearly requires otherwise.

Inspector means the individual(s) or firm(s) retained or employed by City to inspect the workmanship, materials, and manner of construction of the Project and its components to ensure compliance with the Contract Documents and all Laws.

Install means to fix in place for materials, and to fix in place and connect for equipment.

Laws means all applicable local, state, and federal laws, regulations, rules, codes, ordinances, permits, orders, and the like enacted or imposed by or under the auspices of any governmental entity with jurisdiction over any of the Work or any performance of the Work, including health and safety requirements.

Non-Excusable Delay is defined in Section 5.3(D), Non-Excusable Delay.

Plans means the City-provided plans, drawings, details, or graphical depictions of the Project requirements, but does not include Shop Drawings.

Project means the public works project referenced in the Contract.

Project Manager means the individual designated by City to oversee and manage the Project on City's behalf and may include his or her authorized delegee(s) when the Project Manager is unavailable. If no Project Manager has been designated for this Project, any reference to Project Manager is deemed to refer to the Engineer.

Recoverable Costs is defined in Section 5.3(F), Recoverable Costs.

Request for Information or **RFI** means Contractor's written request for information about the Contract Documents, the Work or the Project, submitted to City in the manner and format specified by City.

Section, when capitalized in these General Conditions, means a numbered section or subsection of the General Conditions, unless the context clearly indicates otherwise.

Shop Drawings means drawings, plan details or other graphical depictions prepared by or on behalf of Contractor, and subject to City acceptance, which are intended to provide details for fabrication, installation, and the like, of items required by or shown in the Plans or Specifications.

Specialty Work means Work that must be performed by a specialized Subcontractor with the specified license or other special certification, and that the Contractor is not qualified to self-perform.

Specifications means the technical, text specifications describing the Project requirements, which are prepared for and incorporated into the Contract by or on behalf of City, and does not include the Contract, General Conditions or Special Conditions.

Subcontractor means an individual, partnership, corporation, or joint-venture retained by Contractor directly or indirectly through a subcontract to perform a specific portion of the Work. The term Subcontractor applies to subcontractors of all tiers, unless otherwise indicated by the context. A third party such as a utility performing related work on the Project is not a Subcontractor, even if Contractor must coordinate its Work with the third party.

Technical Specifications has the same meaning as Specifications.

Work means all of the construction and services necessary for or incidental to completing the Project in conformance with the requirements of the Contract Documents.

Work Day or **Working Day**, whether or not capitalized, means a weekday when the City is open for business, and does not include holidays observed by the City.

Worksite means the place or places where the Work is performed, which includes, but may extend beyond the Project site, including separate locations for staging, storage, or fabrication.

Article 2 - Roles and Responsibilities

2.1 City.

(A) **City Council.** The City Council has final authority in all matters affecting the Project, except to the extent it has delegated authority to the Engineer.

(B) **Engineer.** The Engineer, acting within the authority conferred by the City Council, is responsible for administration of the Project on behalf of City, including authority to provide directions to the Design Professional and to Contractor to ensure proper and timely completion of the Project. The Engineer's decisions are final and

conclusive within the scope of his or her authority, including interpretation of the Contract Documents.

(C) **Project Manager.** The Project Manager assigned to the Project will be the primary point of contact for the Contractor and will serve as City's representative for daily administration of the Project on behalf of City. Unless otherwise specified, all of Contractor's communications to City (in any form) will go to or through the Project Manager. City reserves the right to reassign the Project Manager role at any time or to delegate duties to additional City representatives, without prior notice to or consent of Contractor.

(D) **Design Professional.** The Design Professional is responsible for the overall design of the Project and, to the extent authorized by City, may act on City's behalf to ensure performance of the Work in compliance with the Plans and Specifications, including any design changes authorized by Change Order. The Design Professional's duties may include review of Contractor's submittals, visits to any Worksite, inspecting the Work, evaluating test and inspection results, and participation in Project-related meetings, including any pre-construction conference, weekly meetings, and coordination meetings. The Design Professional's interpretation of the Plans or Specifications is final and conclusive.

2.2 Contractor.

(A) **General.** Contractor must provide all labor, materials, supplies, equipment, services, and incidentals necessary to perform and timely complete the Work in strict accordance with the Contract Documents, and in an economical and efficient manner in the best interests of City, and with minimal inconvenience to the public.

(B) **Responsibility for the Work and Risk of Loss.** Contractor is responsible for supervising and directing all aspects of the Work to facilitate the efficient and timely completion of the Work. Contractor is solely responsible for and required to exercise full control over the Work, including the construction means, methods, techniques, sequences, procedures, safety precautions and programs, and coordination of all portions of the Work with that of all other contractors and Subcontractors, except to the extent that the Contract Documents provide other specific instructions. Contractor's responsibilities extend to any plan, method or sequence suggested, but not required by City or specified in the Contract Documents. From the date of commencement of the Work until either the date on which City formally accepts the Project or the effective date of termination of the Contract, whichever is later, Contractor bears all risks of injury or damage to the Work and the materials and equipment delivered to any Worksite, by any cause including fire, earthquake, wind, weather, vandalism or theft.

(C) **Project Administration.** Contractor must provide sufficient and competent administration, staff, and skilled workforce necessary to perform and timely complete the Work in accordance with the Contract Documents. Before starting the Work, Contractor must designate in writing and provide complete contact information, including telephone numbers and email address, for the officer or employee in Contractor's organization who is to serve as Contractor's primary representative for the Project, and who has authority to act on Contractor's behalf. A Subcontractor may not serve as Contractor's primary representative.

(D) **On-Site Superintendent.** Contractor must, at all times during performance of the Work, provide a qualified and competent full-time superintendent acceptable to City, and assistants as necessary, who must be physically present at the Project site while any aspect of the Work is being performed. The superintendent must have full authority to act and communicate on behalf of Contractor, and Contractor will be bound by the

superintendent's communications to City. City's approval of the superintendent is required before the Work commences. If City is not satisfied with the superintendent's performance, City may request a qualified replacement of the superintendent. Failure to comply may result in temporary suspension of the Work, at Contractor's sole expense and with no extension of Contract Time, until an approved superintendent is physically present to supervise the Work. Contractor must provide written notice to City, as soon as practicable, before replacing the superintendent.

(E) **Standards.** Contractor must, at all times, ensure that the Work is performed in an efficient, skillful manner following best practices and in full compliance with the Contract Documents and Laws and applicable manufacturer's recommendations. Contractor has a material and ongoing obligation to provide true and complete information, to the best of its knowledge, with respect to all records, documents, or communications pertaining to the Project, including oral or written reports, statements, certifications, Change Order requests, or Claims.

(F) **Meetings.** Contractor, its project manager, superintendent and any primary Subcontractors requested by City, must attend a pre-construction conference, if requested by City, as well as weekly Project progress meetings scheduled with City. If applicable, Contractor may also be required to participate in coordination meetings with other parties relating to other work being performed on or near the Project site or in relation to the Project, including work or activities performed by City, other contractors, or other utility owners.

(G) **Construction Records.** Contractor will maintain up-to-date, thorough, legible, and dated daily job reports, which document all significant activity on the Project for each day that Work is performed on the Project. The daily report for each day must include the number of workers at the Project site; primary Work activities; major deliveries; problems encountered, including injuries, if any; weather and site conditions; and delays, if any. Contractor will take date and time-stamped photographs to document general progress of the Project, including site conditions prior to construction activities, before and after photographs at offset trench laterals, existing improvements and utilities, damage and restoration. Contractor will maintain copies of all subcontracts, Project-related correspondence with Subcontractors, and records of meetings with Subcontractors. Upon request by the City, Contractor will permit review of and/or provide copies of any of these construction records.

(H) **Responsible Party.** Contractor is solely responsible to City for the acts or omissions of any Subcontractors, or any other party or parties performing portions of the Work or providing equipment, materials or services for or on behalf of Contractor or the Subcontractors. Upon City's written request, Contractor must promptly and permanently remove from the Project, at no cost to City, any employee or Subcontractor or employee of a Subcontractor who the Engineer has determined to be incompetent, intemperate or disorderly, or who has failed or refused to perform the Work as required under the Contract Documents.

(I) **Correction of Defects.** Contractor must promptly correct, at Contractor's sole expense, any Work that is determined by City to be deficient or defective in any way, including workmanship, materials, parts or equipment. Workmanship, materials, parts or equipment that do not conform to the requirements under the Plans, Specifications and every other Contract Document, as determined by City, will be considered defective and subject to rejection. Contractor must also promptly correct, at Contractor's sole expense, any Work performed beyond the lines and grades shown on the Plans or established by City, and any Extra Work performed without City's prior written approval. If Contractor fails to correct or to take reasonable steps toward correcting defective Work within five days following notice from City, or within the time specified in City's notice to correct, City

may elect to have the defective Work corrected by its own forces or by a third party, in which case the cost of correction will be deducted from the Contract Price. If City elects to correct defective Work due to Contractor's failure or refusal to do so, City or its agents will have the right to take possession of and use any equipment, supplies, or materials available at the Project site or any Worksite on City property, in order to effectuate the correction, at no extra cost to City. Contractor's warranty obligations under Section 11.2, Warranty, will not be waived nor limited by City's actions to correct defective Work under these circumstances. Alternatively, City may elect to retain defective Work, and deduct the difference in value, as determined by the Engineer, from payments otherwise due to Contractor. This paragraph applies to any defective Work performed by Contractor during the one-year warranty period under Section 11.2.

(J) **Contractor's Records.** Contractor must maintain all of its records relating to the Project in any form, including paper documents, photos, videos, electronic records, approved samples, and the construction records required pursuant to paragraph (G), above. Project records subject to this provision include complete Project cost records and records relating to preparation of Contractor's bid, including estimates, take-offs, and price quotes or bids.

(1) Contractor's cost records must include all supporting documentation, including original receipts, invoices, and payroll records, evidencing its direct costs to perform the Work, including, but not limited to, costs for labor, materials and equipment. Each cost record should include, at a minimum, a description of the expenditure with references to the applicable requirements of the Contract Documents, the amount actually paid, the date of payment, and whether the expenditure is part of the original Contract Price, related to an executed Change Order, or otherwise categorized by Contractor as Extra Work. Contractor's failure to comply with this provision as to any claimed cost operates as a waiver of any rights to recover the claimed cost.

(2) Contractor must continue to maintain its Project-related records in an organized manner for a period of five years after City's acceptance of the Project or following Contract termination, whichever occurs first. Subject to prior notice to Contractor, City is entitled to inspect or audit any of Contractor's records relating to the Project during Contractor's normal business hours. The record-keeping requirements set forth in this subsection 2.2(J) will survive expiration or termination of the Contract.

(K) **Copies of Project Documents.** Contractor and its Subcontractors must keep copies, at the Project site, of all Work-related documents, including the Contract, permit(s), Plans, Specifications, Addenda, Contract amendments, Change Orders, RFIs and RFI responses, Shop Drawings, as-built drawings, schedules, daily records, testing and inspection reports or results, and any related written interpretations. These documents must be available to City for reference at all times during construction of the Project.

2.3 Subcontractors.

(A) **General.** All Work which is not performed by Contractor with its own forces must be performed by Subcontractors. City reserves the right to approve or reject any and all Subcontractors proposed to perform the Work, for reasons including the subcontractor's poor reputation, lack of relevant experience, financial instability, and lack of technical ability or adequate trained workforce. Each Subcontractor must obtain a City business license before performing any Work.

(B) **Contractual Obligations.** Contractor must require each Subcontractor to comply with the provisions of the Contract Documents as they apply to the Subcontractor's portion(s) of the Work, including the generally applicable terms of the Contract Documents, and to likewise bind their subcontractors. Contractor will provide that the rights that each Subcontractor may have against any manufacturer or supplier for breach of warranty or guarantee relating to items provided by the Subcontractor for the Project, will be assigned to City. Nothing in these Contract Documents creates a contractual relationship between a Subcontractor and City, but City is deemed to be a third-party beneficiary of the contract between Contractor and each Subcontractor.

(C) **Termination.** If the Contract is terminated, each Subcontractor's agreement must be assigned by Contractor to City, subject to the prior rights of any surety, but only if and to the extent that City accepts, in writing, the assignment by written notification, and assumes all rights and obligations of Contractor pursuant to each such subcontract agreement.

(D) **Substitution of Subcontractor.** If Contractor requests substitution of a listed Subcontractor under Public Contract Code § 4107, Contractor is solely responsible for all costs City incurs in responding to the request, including legal fees and costs to conduct a hearing, and any increased subcontract cost to perform the Work that was to be performed by the listed Subcontractor. If City determines that a Subcontractor is unacceptable to City based on the Subcontractor's failure to satisfactorily perform its Work, or for any of the grounds for substitution listed in Public Contract Code § 4107(a), City may request removal of the Subcontractor from the Project. Upon receipt of a written request from City to remove a Subcontractor pursuant to this paragraph, Contractor will immediately remove the Subcontractor from the Project and, at no further cost to City, will either (1) self-perform the remaining Work to the extent that Contractor is duly licensed and qualified to do so, or (2) substitute a Subcontractor that is acceptable to City, in compliance with Public Contract Code § 4107, as applicable.

2.4 Coordination of Work.

(A) **Concurrent Work.** City reserves the right to perform, have performed, or permit performance of other work on or adjacent to the Project site while the Work is being performed for the Project. Contractor is responsible for coordinating its Work with other work being performed on or adjacent to the Project site, including by any utility companies or agencies, and must avoid hindering, delaying, or interfering with the work of other contractors, individuals, or entities, and must ensure safe and reasonable site access and use as required or authorized by City. To the full extent permitted by law, Contractor must hold harmless and indemnify City against any and all claims arising from or related to Contractor's avoidable, negligent, or willful hindrance of, delay to, or interference with the work of any utility company or agency or another contractor or subcontractor.

(B) **Coordination.** If Contractor's Work will connect or interface with work performed by others, Contractor is responsible for independently measuring and visually inspecting such work to ensure a correct connection and interface. Contractor is responsible for any failure by Contractor or its Subcontractors to confirm measurements before proceeding with connecting Work. Before proceeding with any portion of the Work affected by the construction or operations of others, Contractor must give the Project Manager prompt written notification of any defects Contractor discovers which will prevent the proper execution of the Work. Failure to give notice of any known or reasonably discoverable defects will be deemed acknowledgement by Contractor that the work of others is not defective and will not prevent the proper execution of the Work. Contractor must also promptly notify City if work performed by others, including work or activities performed by City's own forces, is operating to hinder, delay, or interfere with Contractor's timely

performance of the Work. City reserves the right to backcharge Contractor for any additional costs incurred due to Contractor's failure to comply with the requirements in this Section 2.4.

2.5 Submittals. Unless otherwise specified, Contractor must submit to the Engineer for review and acceptance, all schedules, Shop Drawings, samples, product data, and similar submittals required by the Contract Documents, or upon request by the Engineer. Unless otherwise specified, all submittals, including Requests for Information, are subject to the general provisions of this Section, as well as specific submittal requirements that may be included elsewhere in the Contract Documents, including the Special Conditions or Specifications. The Engineer may require submission of a submittal schedule at or before a pre-construction conference, as may be specified in the Notice to Proceed.

(A) **General.** Contractor is responsible for ensuring that its submittals are accurate and conform to the Contract Documents.

(B) **Time and Manner of Submission.** Contractor must ensure that its submittals are prepared and delivered in a manner consistent with the current City-accepted schedule for the Work and within the applicable time specified in the Contract Documents, or if no time is specified, in such time and sequence so as not to delay the performance of the Work or completion of the Project.

(C) **Required Contents.** Each submittal must include the Project name and contract number, Contractor's name and address, the name and address of any Subcontractor or supplier involved with the submittal, the date, and references to applicable Specification section(s) and/or drawing and detail number(s).

(D) **Required Corrections.** If corrections are required, Contractor must promptly make and submit any required corrections as specified in full conformance with the requirements of this Section, or other requirements that apply to that submittal.

(E) **Effect of Review and Acceptance.** Review and acceptance of a submittal by City will not relieve Contractor from complying with the requirements of the Contract Documents. Contractor is responsible for any errors in any submittal, and review or acceptance of a submittal by City is not an assumption of risk or liability by City.

(F) **Enforcement.** Any Work performed or any material furnished, installed, fabricated or used without City's prior acceptance of a required submittal is performed or provided at Contractor's risk, and Contractor may be required to bear the costs incident thereto, including the cost of removing and replacing such Work, repairs to other affected portions of the Work or material, and the cost of additional time or services required of City, including costs for the Design Professional, Project Manager, or Inspector.

(G) **Excessive RFIs.** A RFI will be considered excessive or unnecessary if City determines that the explanation or response to the RFI is clearly and unambiguously discernable from the Contract Documents. City's costs to review and respond to excessive or unnecessary RFIs may be deducted from payments otherwise due to Contractor.

2.6 Shop Drawings. When Shop Drawings are required by the Specifications or requested by the Engineer, they must be prepared according to best practices at Contractor's expense. The Shop Drawings must be of a size and scale to clearly show all necessary details. Unless otherwise specified by City, Shop Drawings must be provided to the Engineer for review and acceptance at least 30 days before the Work will be performed. If City requires changes, the corrected Shop Drawings must be resubmitted to the Engineer for review within the time specified by the Engineer. For all Project components

requiring Shop Drawings, Contractor will not furnish materials or perform any Work until the Shop Drawings for those components are accepted by City. Contractor is responsible for any errors or omissions in the Shop Drawings, shop fits and field corrections; any deviations from the Contract Documents; and for the results obtained by the use of Shop Drawings. Acceptance of Shop Drawings by City does not relieve Contractor of Contractor's responsibility.

- 2.7 Access to Work.** Contractor must afford prompt and safe access to any Worksite by City and its employees, agents, or consultants authorized by City; and upon request by City, Contractor must promptly arrange for City representatives to visit or inspect manufacturing sites or fabrication facilities for items to be incorporated into the Work.
- 2.8 Personnel.** Contractor and its Subcontractors must employ only competent and skillful personnel to perform the Work. Contractor and its Subcontractor's supervisors, security or safety personnel, and employees who have unescorted access to the Project site must possess proficiency in English sufficient to read, understand, receive, and implement oral or written communications or instructions relating to their respective job functions, including safety and security requirements. Upon written notification from the Engineer, Contractor and its Subcontractors must immediately discharge any personnel who are incompetent, disorderly, disruptive, threatening, abusive, or profane, or otherwise refuse or fail to comply with the requirements of the Contract Documents or Laws, including Laws pertaining to health and safety. Any such discharged personnel may not be re-employed or permitted on the Project in any capacity without City's prior written consent.

Article 3 - Contract Documents

3.1 Interpretation of Contract Documents.

(A) **Plans and Specifications.** The Plans and Specifications included in the Contract Documents are complementary. If Work is shown on one but not on the other, Contractor must perform the Work as though fully described on both, consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results. The Plans and Specifications are deemed to include and require everything necessary and reasonably incidental to completion of the Work, whether or not particularly mentioned or shown. Contractor must perform all Work and services and supply all things reasonably related to and inferable from the Contract Documents. In the event of a conflict between the Plans and Specifications, the Specifications will control, unless the drawing(s) at issue are dated later than the Specification(s) at issue. Detailed drawings take precedence over general drawings, and large-scale drawings take precedence over smaller scale drawings. Any arrangement or division of the Plans and Specifications into sections is for convenience and is not intended to limit the Work required by separate trades. A conclusion presented in the Plans or Specifications is only a recommendation. Actual locations and depths must be determined by Contractor's field investigation. Contractor may request access to underlying or background information in City's possession that is necessary for Contractor to form its own conclusions.

(B) **Duty to Notify and Seek Direction.** If Contractor becomes aware of a changed condition in the Project, or of any ambiguity, conflict, inconsistency, discrepancy, omission, or error in the Contract Documents, including the Plans or Specifications, Contractor must promptly submit a Request for Information to the Engineer and wait for a response from City before proceeding further with the related Work. The RFI must notify City of the issue and request clarification, interpretation or direction. The Engineer's clarification, interpretation or direction will be final and binding on Contractor. If Contractor proceeds with the related Work before obtaining City's response, Contractor will be responsible for any resulting costs, including the cost of correcting any incorrect or

defective Work that results. Timely submission of a clear and complete RFI is essential to avoiding delay. Delay resulting from Contractor's failure to submit a timely and complete RFI to the Engineer is Non-Excusable Delay. If Contractor believes that City's response to an RFI justifies a change to the Contract Price or Contract Time, Contractor must perform the Work as directed, but may submit a timely Change Order request in accordance with the Contract Documents. (See Article 5 and 6.)

(C) **Figures and Dimensions.** Figures control over scaled dimensions.

(D) **Technical or Trade Terms.** Any terms that have well-known technical or trade meanings will be interpreted in accordance with those meanings, unless otherwise specifically defined in the Contract Documents.

(E) **Measurements.** Contractor must verify all relevant measurements in the Contract Documents and at the Project site before ordering any material or performing any Work, and will be responsible for the correctness of those measurements or for costs that could have been avoided by independently verifying measurements.

(F) **Compliance with Laws.** The Contract Documents are intended to comply with Laws and will be interpreted to comply with Laws.

3.2 Order of Precedence. Information included in one Contract Document but not in another will not be considered a conflict or inconsistency. Unless otherwise specified in the Special Conditions, in case of any conflict or inconsistency among the Contract Documents, the following order of precedence will apply, beginning from highest to lowest, with the most recent version taking precedent over an earlier version:

- (A) Change Orders;
- (B) Addenda;
- (C) Contract;
- (D) Notice to Proceed;
- (E) Attachment B – Federal Contract Requirements (only if used);
- (F) Special Conditions;
- (G) General Conditions;
- (H) Payment and Performance Bonds;
- (I) Specifications;
- (J) Plans;
- (K) Notice of Potential Award;
- (L) Notice Inviting Bids;
- (M) Attachment A – Federal Bidding Requirements (only if used);
- (N) Instructions to Bidders;
- (O) Contractor's Bid Proposal and attachments;
- (P) the City's standard specifications, as applicable; and
- (Q) Any generic documents prepared by and on behalf of a third party, that were not prepared specifically for this Project, such as the Caltrans Standard Specifications or Caltrans Special Provisions.

3.3 Caltrans Standard Specifications. Any reference to or incorporation of the Standard Specifications of the State of California, Department of Transportation ("Caltrans"), including "Standard Specifications," "Caltrans Specifications," "State Specifications," or "CSS," means the most current edition of Caltrans' Standard Specifications, unless otherwise specified ("Caltrans Standard Specifications"), including the most current amendments as of the date that Contractor's bid was submitted for this Project. The following provisions apply to use of or reference to the Caltrans Standard Specifications or Special Provisions:

(A) **Limitations.** The “General Provisions” of the Caltrans Standard Specifications, i.e., sections 1 through 9, do not apply to these Contract Documents with the exception of any specific provisions, if any, which are expressly stated to apply to these Contract Documents.

(B) **Conflicts or Inconsistencies.** If there is a conflict or inconsistency between any provision in the Caltrans Standard Specifications or Special Provisions and a provision of these Contract Documents, as determined by City, the provision in the Contract Documents will govern.

(C) **Meanings.** Terms used in the Caltrans Standard Specifications or Special Provisions are to be interpreted as follows:

(1) Any reference to the “Engineer” is deemed to mean the City Engineer.

(2) Any reference to the “Special Provisions” is deemed to mean the Special Conditions, unless the Caltrans Special Provisions are expressly included in the Contract Documents listed in Section 2 of the Contract.

(3) Any reference to the “Department” or “State” is deemed to mean City.

3.4 For Reference Only. Contractor is responsible for the careful review of any document, study, or report provided by City or appended to the Contract Documents solely for informational purposes and identified as “For Reference Only.” Nothing in any document, study, or report so appended and identified is intended to supplement, alter, or void any provision of the Contract Documents. Contractor is advised that City or its representatives may be guided by information or recommendations included in such reference documents, particularly when making determinations as to the acceptability of proposed materials, methods, or changes in the Work. Any record drawings or similar final or accepted drawings or maps that are not part of the Contract Documents are deemed to be For Reference Only. The provisions of the Contract Documents are not modified by any perceived or actual conflict with provisions in any document that is provided For Reference Only.

3.5 Current Versions. Unless otherwise specified by City, any reference to standard specifications, technical specifications, or any City or state codes or regulations means the latest specification, code or regulation in effect at the time the Contract is signed.

3.6 Conformed Copies. If City prepares a conformed set of the Contract Documents following award of the Contract, it will provide Contractor with two hard copy (paper) sets and one copy of the electronic file in PDF format. It is Contractor’s responsibility to ensure that all Subcontractors, including fabricators, are provided with the conformed set of the Contract Documents at Contractor’s sole expense.

3.7 Ownership. No portion of the Contract Documents may be used for any purpose other than construction of the Project, without prior written consent from City. Contractor is deemed to have conveyed the copyright in any designs, drawings, specifications, Shop Drawings, or other documents (in paper or electronic form) developed by Contractor for the Project, and City will retain all rights to such works, including the right to possession.

Article 4 - Bonds, Indemnity, and Insurance

4.1 Payment and Performance Bonds. Within ten days following issuance of the Notice of Potential Award, Contractor is required to provide a payment bond and a performance bond, each in the penal sum of not less than 100% of the Contract Price, and each

executed by Contractor and its surety using the bond forms included with the Contract Documents.

(A) **Surety.** Each bond must be issued and executed by a surety admitted in California. If an issuing surety cancels the bond or becomes insolvent, within seven days following written notice from City, Contractor must substitute a surety acceptable to City. If Contractor fails to substitute an acceptable surety within the specified time, City may, at its sole discretion, withhold payment from Contractor until the surety is replaced to City's satisfaction, or terminate the Contract for default.

(B) **Supplemental Bonds for Increase in Contract Price.** If the Contract Price increases during construction by five percent or more over the original Contract Price, Contractor must provide supplemental or replacement bonds within ten days of written notice from City pursuant to this Section, covering 100% of the increased Contract Price and using the bond forms included with the Contract Documents.

4.2 Indemnity. To the fullest extent permitted by law, Contractor must indemnify, defend, and hold harmless City, its Council, officers, officials, employees, agents, volunteers, and consultants (individually, an "Indemnitee," and collectively the "Indemnitees") from and against any and all liability, loss, damage, claims, causes of action, demands, charges, fines, costs, and expenses (including, without limitation, attorney fees, expert witness fees, paralegal fees, and fees and costs of litigation or arbitration) (collectively, "Liability") of every nature arising out of or in connection with the acts or omissions of Contractor, its employees, Subcontractors, representatives, or agents, in bidding or performing the Work or in failing to comply with any obligation of Contractor under the Contract, except such Liability caused by the active negligence, sole negligence, or willful misconduct of an Indemnitee. This indemnity requirement applies to any Liability arising from alleged defects in the content or manner of submission of Contractor's bid for the Contract. Contractor's failure or refusal to timely accept a tender of defense pursuant to this Contract will be deemed a material breach of the Contract. City will timely notify Contractor upon receipt of any third-party claim relating to the Contract, as required by Public Contract Code § 9201. Contractor waives any right to express or implied indemnity against any Indemnitee. Contractor's indemnity obligations under this Contract will survive the expiration or any early termination of the Contract.

4.3 Insurance. No later than ten days following issuance of the Notice of Potential Award, Contractor must procure and provide proof of the insurance coverage required by this Section in the form of certificates and endorsements acceptable to City. The required insurance must cover the activities of Contractor and its Subcontractors relating to or arising from the performance of the Work, and must remain in full force and effect at all times during the period covered by the Contract, through the date of City's acceptance of the Project. All required insurance must be issued by a company licensed to do business in the State of California, and each such insurer must have an A.M. Best's financial strength rating of "A" or better and a financial size rating of "VIII" or better. If Contractor fails to provide any of the required coverage in full compliance with the requirements of the Contract Documents, City may, at its sole discretion, purchase such coverage at Contractor's expense and deduct the cost from payments due to Contractor, or terminate the Contract for default. The procurement of the required insurance will not be construed to limit Contractor's liability under this Contract or to fulfill Contractor's indemnification obligations under this Contract.

(A) **Policies and Limits.** The following insurance policies and limits are required for this Contract, unless otherwise specified in the Special Conditions:

(1) **Commercial General Liability ("CGL") Insurance:** The CGL insurance policy must be issued on an occurrence basis, written on a comprehensive general

liability form, and must include coverage for liability arising from Contractor's or its Subcontractor's acts or omissions in the performance of the Work, including contractor's protected coverage, contractual liability, products and completed operations, and broad form property damage, with limits of at least \$2,000,000 per occurrence and at least \$4,000,000 general aggregate. The CGL insurance coverage may be arranged under a single policy for the full limits required or by a combination of underlying policies with the balance provided by excess or umbrella policies, provided each such policy complies with the requirements set forth in this Section, including required endorsements.

(2) *Automobile Liability Insurance*: The automobile liability insurance policy must provide coverage of at least \$2,000,000 combined single-limit per accident for bodily injury, death, or property damage, including hired and non-owned auto liability.

(3) *Workers' Compensation Insurance and Employer's Liability*: The workers' compensation and employer's liability insurance policy must comply with the requirements of the California Labor Code, providing coverage of at least \$1,000,000 or as otherwise required by the statute. If Contractor is self-insured, Contractor must provide its Certificate of Permission to Self-Insure, duly authorized by the DIR.

(4) *Pollution Liability Insurance*: The pollution liability insurance policy must be issued on an occurrence basis, providing coverage of at least \$2,000,000 for all loss arising out of claims for bodily injury, death, property damage, or environmental damage caused by pollution conditions resulting from the Work.

(5) *Builder's Risk Insurance*: The builder's risk insurance policy must be issued on an occurrence basis, for all-risk or "all perils" coverage on a 100% completed value basis on the insurable portion of the Project for the benefit of City.

(B) **Notice**. Each certificate of insurance must state that the coverage afforded by the policy or policies will not be reduced, cancelled or allowed to expire without at least 30 days written notice to City, unless due to non-payment of premiums, in which case ten days written notice must be made to City.

(C) **Waiver of Subrogation**. Each required policy must include an endorsement providing that the carrier will waive any right of subrogation it may have against City.

(D) **Required Endorsements**. The CGL policy, automobile liability policy, pollution liability policy, and builder's risk policy must include the following specific endorsements:

(1) The City, including its Council, officials, officers, employees, agents, volunteers and consultants (collectively, "Additional Insured") must be named as an additional insured for all liability arising out of the operations by or on behalf of the named insured, and the policy must protect the Additional Insured against any and all liability for personal injury, death or property damage or destruction arising directly or indirectly in the performance of the Contract. The additional insured endorsement must be provided using ISO form CG 20 10 11 85 or an equivalent form approved by the City.

(2) The inclusion of more than one insured will not operate to impair the rights of one insured against another, and the coverages afforded will apply as though separate policies have been issued to each insured.

(3) The insurance provided by Contractor is primary and no insurance held or owned by any Additional Insured may be called upon to contribute to a loss.

(4) This policy does not exclude explosion, collapse, underground excavation hazard, or removal of lateral support.

(E) **Contractor's Responsibilities.** This Section 4.3 establishes the minimum requirements for Contractor's insurance coverage in relation to this Project, but is not intended to limit Contractor's ability to procure additional or greater coverage. Contractor is responsible for its own risk assessment and needs and is encouraged to consult its insurance provider to determine what coverage it may wish to carry beyond the minimum requirements of this Section. Contractor is solely responsible for the cost of its insurance coverage, including premium payments, deductibles, or self-insured retentions, and no Additional Insured will be responsible or liable for any of the cost of Contractor's insurance coverage.

(F) **Deductibles and Self-Insured Retentions.** Any deductibles or self-insured retentions that apply to the required insurance (collectively, "deductibles") in excess of \$100,000 are subject to approval by the City's Risk Manager, acting in his or her sole discretion, and must be declared by Contractor when it submits its certificates of insurance and endorsements pursuant to this Section 4.3. If the City's Risk Manager determines that the deductibles are unacceptably high, at City's option, Contractor must either reduce or eliminate the deductibles as they apply to City and all required Additional Insured; or must provide a financial guarantee, to City's satisfaction, guaranteeing payment of losses and related investigation, claim administration, and legal expenses.

(G) **Subcontractors.** Contractor must ensure that each Subcontractor is required to maintain the same insurance coverage required under this Section 4.3, with respect to its performance of Work on the Project, including those requirements related to the Additional Insureds and waiver of subrogation, but excluding pollution liability or builder's risk insurance unless otherwise specified in the Special Conditions. A Subcontractor may be eligible for reduced insurance coverage or limits, but only to the extent approved in writing in advance by the City's Risk Manager. Contractor must confirm that each Subcontractor has complied with these insurance requirements before the Subcontractor is permitted to begin Work on the Project. Upon request by the City, Contractor must provide certificates and endorsements submitted by each Subcontractor to prove compliance with this requirement. The insurance requirements for Subcontractors do not replace or limit the Contractor's insurance obligations.

Article 5 - Contract Time

5.1 Time is of the Essence. Time is of the essence in Contractor's performance and completion of the Work, and Contractor must diligently prosecute the Work and complete it within the Contract Time.

(A) **General.** Contractor must commence the Work on the date indicated in the Notice to Proceed and must fully complete the Work in strict compliance with all requirements of the Contract Documents and within the Contract Time. Contractor may not begin performing the Work before the date specified in the Notice to Proceed.

(B) **Authorization.** Contractor is not entitled to compensation or credit for any Work performed before the date specified in the Notice to Proceed, with the exception of any schedules, submittals, or other requirements, if any, that must be provided or performed before issuance of the Notice to Proceed.

(C) **Rate of Progress.** Contractor and its Subcontractors must, at all times, provide workers, materials, and equipment sufficient to maintain the rate of progress necessary to ensure full completion of the Work within the Contract Time. If City determines that Contractor is failing to prosecute the Work at a sufficient rate of progress, City may, in its sole discretion, direct Contractor to provide additional workers, materials, or equipment, or to work additional hours or days without additional cost to City, in order to achieve a rate of progress satisfactory to City. If Contractor fails to comply with City's directive in this regard, City may, at Contractor's expense, separately contract for additional workers, materials, or equipment or use City's own forces to achieve the necessary rate of progress. Alternatively, City may terminate the Contract based on Contractor's default.

5.2 Schedule Requirements. Contractor must prepare all schedules using standard, commercial scheduling software acceptable to the Engineer, and must provide the schedules in electronic and paper form as requested by the Engineer. In addition to the general scheduling requirements set forth below, Contractor must also comply with any scheduling requirements included in the Special Conditions or in the Technical Specifications.

(A) **Baseline (As-Planned) Schedule.** Within ten calendar days following City's issuance of the Notice to Proceed (or as otherwise specified in the Notice to Proceed), Contractor must submit to City for review and acceptance a baseline (as-planned) schedule using critical path methodology showing in detail how Contractor plans to perform and fully complete the Work within the Contract Time, including labor, equipment, materials and fabricated items. The baseline schedule must show the order of the major items of Work and the dates of start and completion of each item, including when the materials and equipment will be procured. The schedule must also include the work of all trades, reflecting anticipated labor or crew hours and equipment loading for the construction activities, and must be sufficiently comprehensive and detailed to enable progress to be monitored on a day-by-day basis. For each activity, the baseline schedule must be dated, provided in the format specified in the Contract Documents or as required by City, and must include, at a minimum, a description of the activity, the start and completion dates of the activity, and the duration of the activity.

(1) **Specialized Materials Ordering.** Within five calendar days following issuance of the Notice to Proceed, Contractor must order any specialized material or equipment for the Work that is not readily available from material suppliers. Contractor must also retain documentation of the purchase order date(s).

(B) **City's Review of Schedules.** City will review and may note exceptions to the baseline schedule, and to the progress schedules submitted as required below, to assure completion of the Work within the Contract Time. Contractor is solely responsible for resolving any exceptions noted in a schedule and, within seven days, must correct the schedule to address the exceptions. City's review or acceptance of Contractor's schedules will not operate to waive or limit Contractor's duty to complete the Project within the Contract Time, nor to waive or limit City's right to assess liquidated damages for Contractor's unexcused failure to do so.

(C) **Progress Schedules.** After City accepts the final baseline schedule with no exceptions, Contractor must submit an updated progress schedule and three-week look-ahead schedule, in the format specified by City, for review and acceptance with each application for a progress payment, or when otherwise specified by City, until completion of the Work. The updated progress schedule must: show how the actual progress of the Work as constructed to date compares to the baseline schedule; reflect any proposed changes in the construction schedule or method of operations, including to achieve Project milestones within the Contract Time; and identify any actual or potential impacts

to the critical path. Contractor must also submit periodic reports to City of any changes in the projected material or equipment delivery dates for the Project.

(1) *Float*. The progress schedule must show early and late completion dates for each task. The number of days between those dates will be designated as the "float." Any float belongs to the Project and may be allocated by the Engineer to best serve timely completion of the Project.

(2) *Failure to Submit Schedule*. Reliable, up-to-date schedules are essential to efficient and cost-effective administration of the Project and timely completion. If Contractor fails to submit a schedule within the time periods specified in this Section, or submits a schedule to which City has noted exceptions that are not corrected, City may withhold up to ten percent from payment(s) otherwise due to Contractor until the exceptions are resolved, the schedule is corrected and resubmitted, and City has accepted the schedule. In addition, Contractor's failure to comply with the schedule requirements in this Section 5.2 will be deemed a material default and a waiver of any claims for Excusable Delay or loss of productivity arising during any period when Contractor is out of compliance, subject only to the limits of Public Contract Code § 7102.

(D) **Recovery Schedule**. If City determines that the Work is more than one week behind schedule, within seven days following written notice of such determination, Contractor must submit a recovery schedule, showing how Contractor intends to perform and complete the Work within the Contract Time, based on actual progress to date.

(E) **Effect of Acceptance**. Contractor and its Subcontractors must perform the Work in accordance with the most current City-accepted schedule unless otherwise directed by City. City's acceptance of a schedule does not operate to extend the time for completion of the Work or any component of the Work, and will not affect City's right to assess liquidated damages for Contractor's unexcused delay in completing the Work within the Contract Time.

(F) **Posting**. Contractor must at all times prominently post a copy of the most current City-accepted progress or recovery schedule in its on-site office.

(G) **Reservation of Rights**. City reserves the right to direct the sequence in which the Work must be performed or to make changes in the sequence of the Work in order to facilitate the performance of work by City or others, or to facilitate City's use of its property. The Contract Time or Contract Price may be adjusted to the extent such changes in sequence actually increase or decrease Contractor's time or cost to perform the Work.

(H) **Authorized Working Days and Times**. Contractor is limited to working Monday through Friday, excluding holidays, during City's normal business hours, except as provided in the Special Conditions or as authorized in writing by City. City reserves the right to charge Contractor for additional costs incurred by City due to Work performed on days or during hours not expressly authorized in the Contract Documents, including reimbursement of costs incurred for inspection, testing, and construction management services.

5.3 Delay and Extensions of Contract Time.

(A) **Notice of Delay**. If Contractor becomes aware of any actual or potential delay affecting the critical path, Contractor must promptly notify the Engineer in writing, regardless of the nature or cause of the delay, so that City has a reasonable opportunity to mitigate or avoid the delay.

(B) **Excusable Delay.** The Contract Time may be extended if Contractor encounters "Excusable Delay," which is an unavoidable delay in completing the Work within the Contract Time due to causes completely beyond Contractor's control, and which Contractor could not have avoided or mitigated through reasonable care, planning, foresight, and diligence, provided that Contractor is otherwise fully performing its obligations under the Contract Documents. Grounds for Excusable Delay may include fire, natural disasters including earthquake or unusually severe weather, acts of terror or vandalism, epidemic, unforeseeable adverse government actions, unforeseeable actions of third parties, encountering unforeseeable hazardous materials, unforeseeable site conditions, or suspension for convenience under Article 13. The Contract Time will not be extended based on circumstances which will not unavoidably delay completing the Work within the Contract Time based on critical path analysis.

(C) **Weather Delays.** A "Weather Delay Day" is a Working Day during which Contractor and its forces, including Subcontractors, are unable to perform more than 40% of the critical path Work scheduled for that day due to adverse weather conditions which impair the ability to safely or effectively perform the scheduled critical path Work that day. Adverse weather conditions may include rain, saturated soil, and Project site clean-up required due to adverse weather. Determination of what constitutes critical path Work scheduled for that day will be based on the most current, City-approved schedule. Contractor will be entitled to a non-compensable extension of the Contract Time for each Weather Delay Day in excess of the normal Weather Delay Days within a given month as determined by reliable records, including monthly rainfall averages, for the preceding ten years (or as otherwise specified in the Special Conditions or Specifications).

(1) Contractor must fully comply with the applicable procedures in Articles 5 and 6 of the General Conditions regarding requests to modify the Contract Time.

(2) Contractor will not be entitled to an extension of time for a Weather Delay Day to the extent Contractor is responsible for concurrent delay on that day.

(3) Contractor must take reasonable steps to mitigate the consequences of Weather Delay Days, including prudent workforce management and protecting the Work, Project Site, materials, and equipment.

(D) **Non-Excusable Delay.** Delay which Contractor could have avoided or mitigated through reasonable care, planning, foresight and diligence is "Non-Excusable Delay." Contractor is not entitled to an extension of Contract Time or any compensation for Non-Excusable Delay, or for Excusable Delay that is concurrent with Non-Excusable Delay. Non-Excusable Delay includes delay caused by:

(1) weather conditions which are normal for the location of the Project, as determined by reliable records, including monthly rainfall averages, for the preceding ten years;

(2) Contractor's failure to order equipment and materials sufficiently in advance of the time needed for completion of the Work within the Contract Time;

(3) Contractor's failure to provide adequate notification to utility companies or agencies for connections or services necessary for completion of the Work within the Contract Time;

- (4) foreseeable conditions which Contractor could have ascertained from reasonably diligent inspection of the Project site or review of the Contract Documents or other information provided or available to Contractor;
- (5) Contractor's failure, refusal, or financial inability to perform the Work within the Contract Time, including insufficient funds to pay its Subcontractors or suppliers;
- (6) performance or non-performance by Contractor's Subcontractors or suppliers;
- (7) the time required to respond to excessive RFIs (see Section 2.5(G));
- (8) delayed submission of required submittals, or the time required for correction and resubmission of defective submittals;
- (9) time required for repair of, re-testing, or re-inspection of defective Work;
- (10) enforcement of Laws by City, or outside agencies with jurisdiction over the Work; or
- (11) City's exercise or enforcement of any of its rights or Contractor's duties pursuant to the Contract Documents, including correction of defective Work, extra inspections or testing due to non-compliance with Contract requirements, safety compliance, environmental compliance, or rejection and return of defective or deficient submittals.

(E) **Compensable Delay.** Pursuant to Public Contract Code § 7102, in addition to entitlement to an extension of Contract Time, Contractor is entitled to compensation for costs incurred due to delay caused solely by City, when that delay is unreasonable under the circumstances involved and not within the contemplation of the parties ("Compensable Delay"). Contractor is not entitled to an extension of Contract Time or recovery of costs for Compensable Delay that is concurrent with Non-Excusable Delay. Delay due to causes that are beyond the control of either City or Contractor, including Weather Delay Days, discovery of Historic or Archeological Items pursuant to Section 7.18, or the actions or inactions of third parties or other agencies, is not Compensable Delay, and will only entitle Contractor to an extension of time commensurate with the time lost due to such delay.

(F) **Recoverable Costs.** Contractor is not entitled to compensation for Excusable Delay unless it is Compensable Delay, as defined above. Contractor is entitled to recover only the actual, direct, reasonable, and substantiated costs ("Recoverable Costs") for each working day that the Compensable Delay prevents Contractor from proceeding with more than 50% of the critical path Work scheduled for that day, based on the most recent progress schedule accepted by City. Recoverable Costs will not include home office overhead or lost profit.

(G) **Request for Extension of Contract Time or Recoverable Costs.** A request for an extension of Contract Time or any associated Recoverable Costs must be submitted in writing to City within ten calendar days of the date the delay is first encountered, even if the duration of the delay is not yet known at that time, or any entitlement to the Contract Time extension or to the Recoverable Costs will be deemed waived. In addition to complying with the requirements of this Article 5, the request must be submitted in compliance with the Change Order request procedures in Article 6 below. Strict compliance with these requirements is necessary to ensure that any delay or consequences of delay may be mitigated as soon as possible, and to facilitate cost-

efficient administration of the Project and timely performance of the Work. Any request for an extension of Contract Time or Recoverable Costs that does not strictly comply with all of the requirements of Article 5 and Article 6 will be deemed waived.

(1) *Required Contents.* The request must include a detailed description of the cause(s) of the delay and must also describe the measures that Contractor has taken to mitigate the delay and/or its effects, including efforts to mitigate the cost impact of the delay, such as by workforce management or by a change in sequencing. If the delay is still ongoing at the time the request is submitted, the request should also include Contractor's plan for continued mitigation of the delay or its effects.

(2) *Delay Days and Costs.* The request must specify the number of days of Excusable Delay claimed or provide a realistic estimate if the duration of the delay is not yet known. If Contractor believes it is entitled to Recoverable Costs for Compensable Delay, the request must specify the amount and basis for the Recoverable Costs that are claimed or provide a realistic estimate if the amount is not yet known. Any estimate of delay duration or cost must be updated in writing and submitted with all required supporting documentation as soon as the actual time and cost is known. The maximum extension of Contract Time will be the number of days, if any, by which an Excusable Delay or a Compensable Delay exceeds any concurrent Non-Excusable Delay. Contractor is entitled to an extension of Contract Time, or compensation for Recoverable Costs, only if, and only to the extent that, such delay will unavoidably delay Final Completion.

(3) *Supporting Documentation.* The request must also include any and all supporting documentation necessary to evidence the delay and its actual impacts, including scheduling and cost impacts with a time impact analysis using critical path methodology and demonstrating the unavoidable delay to Final Completion. The time impact analysis must be submitted in a form or format acceptable to City.

(4) *Burden of Proof.* Contractor has the burden of proving that: the delay was an Excusable or Compensable Delay, as defined above; Contractor has fully complied with its scheduling obligations in Section 5.2, Schedule Requirements; Contractor has made reasonable efforts to mitigate the delay and its schedule and cost impacts; the delay will unavoidably result in delaying Final Completion; and any Recoverable Costs claimed by Contractor were actually incurred and were reasonable under the circumstances.

(5) *Legal Compliance.* Nothing in this Section 5.3 is intended to require the waiver, alteration, or limitation of the applicability of Public Contract Code § 7102.

(6) *No Waiver.* Any grant of an extension of Contract Time, or compensation for Recoverable Costs due to Compensable Delay, will not operate as a waiver of City's right to assess liquidated damages for Non-Excusable Delay.

(7) *Dispute Resolution.* In the event of a dispute over entitlement to an extension of Contract Time or compensation for Recoverable Costs, Contractor may not stop Work pending resolution of the dispute, but must continue to comply with its duty to diligently prosecute the performance and timely completion of the Work. Contractor's sole recourse for an unresolved dispute based on City's rejection of a Change Order request for an extension of Contract Time or compensation for Recoverable Costs is to comply with the dispute resolution provisions set forth in Article 12 below.

5.4 Liquidated Damages. It is expressly understood that if Final Completion is not achieved within the Contract Time, City will suffer damages from the delay that are difficult to determine and accurately specify. Pursuant to Public Contract Code § 7203, if Contractor fails to achieve Final Completion within the Contract Time due to Contractor's Non-Excusable Delay, City will charge Contractor in the amount specified in the Contract for each calendar day that Final Completion is delayed beyond the Contract Time, as liquidated damages and not as a penalty. Any waiver of accrued liquidated damages, in whole or in part, is subject to approval of the City Council or its authorized delegee.

(A) **Liquidated Damages.** Liquidated damages will not be assessed for any Excusable or Compensable Delay, as set forth above.

(B) **Milestones.** Liquidated damages may also be separately assessed for failure to meet milestones specified elsewhere in the Contract Documents.

(C) **Setoff.** City is entitled to deduct the amount of liquidated damages assessed against any payments otherwise due to Contractor, including progress payments, Final Payment, or unreleased retention. If there are insufficient Contract funds remaining to cover the full amount of liquidated damages assessed, City is entitled to recover the balance from Contractor or its performance bond surety.

(D) **Occupancy or Use.** Occupancy or use of the Project in whole or in part prior to Final Completion does not constitute City's acceptance of the Project and will not operate as a waiver of City's right to assess liquidated damages for Contractor's Non-Excusable Delay in achieving Final Completion.

(E) **Other Remedies.** City's right to liquidated damages under this Section applies only to damages arising from Contractor's Non-Excusable Delay or failure to complete the Work within the Contract Time. City retains its right to pursue all other remedies under the Contract for other types of damage, including damage to property or persons, costs or diminution in value from defective materials or workmanship, costs to repair or complete the Work, or other liability caused by Contractor.

Article 6 - Contract Modification

6.1 Contract Modification. Subject to the limited exception set forth in subsection (D) below, any change in the Work or the Contract Documents, including the Contract Price or Contract Time, will not be a valid and binding change to the Contract unless it is formalized in a Change Order, including a "no-cost" Change Order or a unilateral Change Order. Changes in the Work pursuant to this Article 6 will not operate to release, limit, or abridge Contractor's warranty obligations pursuant to Article 11 or any obligations of Contractor's bond sureties.

(A) **City-Directed Changes.** City may direct changes in the scope or sequence of Work or the requirements of the Contract Documents, without invalidating the Contract. Such changes may include Extra Work as set forth in subsection (C) below, or deletion or modification of portions of the Work. Contractor must promptly comply with City-directed changes in the Work in accordance with the original Contract Documents, even if Contractor and City have not yet reached agreement as to adjustments to the Contract Price or Contract Time for the change in the Work or for the Extra Work. Contractor is not entitled to extra compensation for cost savings resulting from "value engineering" pursuant to Public Contract Code § 7101, except to the extent authorized in advance by City in writing, and subject to any applicable procedural requirements for submitting a proposal for value engineering cost savings.

(B) **Disputes.** In the event of a dispute over entitlement to or the amount of a change in Contract Time or a change in Contract Price related to a City-directed change in the Work, Contractor must perform the Work as directed and may not delay its Work or cease Work pending resolution of the dispute, but must continue to comply with its duty to diligently prosecute the performance and timely completion of the Work, including the Work in dispute. Likewise, in the event that City and Contractor dispute whether a portion or portions of the Work are already required by the Contract Documents or constitute Extra Work, or otherwise dispute the interpretation of any portion(s) of the Contract Documents, Contractor must perform the Work as directed and may not delay its Work or cease Work pending resolution of the dispute, but must continue to comply with its duty to diligently prosecute the performance and timely completion of the Work, including the Work in dispute, as directed by City. If Contractor refuses to perform the Work in dispute, City may, acting in its sole discretion, elect to delete the Work from the Contract and reduce the Contract Price accordingly, and self-perform the Work or direct that the Work be performed by others. Alternatively, City may elect to terminate the Contract for convenience or for cause. Contractor's sole recourse for an unresolved dispute related to changes in the Work or performance of any Extra Work is to comply with the dispute resolution provisions set forth in Article 12, below.

(C) **Extra Work.** City may direct Contractor to perform Extra Work related to the Project. Contractor must promptly perform any Extra Work as directed or authorized by City in accordance with the original Contract Documents, even if Contractor and City have not yet reached agreement on adjustments to the Contract Price or Contract Time for such Extra Work. If Contractor believes it is necessary to perform Extra Work due to changed conditions, Contractor must promptly notify the Engineer in writing, specifically identifying the Extra Work and the reason(s) the Contractor believes it is Extra Work. This notification requirement does not constitute a Change Order request pursuant to Section 6.2, below. Contractor must maintain detailed daily records that itemize the cost of each element of Extra Work, and sufficiently distinguish the direct cost of the Extra Work from the cost of other Work performed. For each day that Contractor performs Extra Work, or Work that Contractor contends is Extra Work, Contractor must submit no later than the following Working Day, a daily report of the Extra Work performed that day and the related costs, together with copies of certified payroll, invoices, and other documentation substantiating the costs ("Extra Work Report"). The Engineer will make any adjustments to Contractor's Extra Work Report(s) based on the Engineer's records of the Work. When an Extra Work Report(s) is agreed on and signed by both City and Contractor, the Extra Work Report(s) will become the basis for payment under a duly authorized and signed Change Order. Failure to submit the required documentation by close of business on the next Working Day is deemed a full and complete waiver for any change in the Contract Price or Contract Time for any Extra Work performed that day.

(D) **Minor Changes and RFIs.** Minor field changes, including RFI replies from City, that do not affect the Contract Price or Contract Time and that are approved by the Engineer acting within his or her scope of authority, do not require a Change Order. By executing an RFI reply from City, Contractor agrees that it will perform the Work as clarified therein, with no change to the Contract Price or Contract Time.

(E) **Remedy for Non-Compliance.** Contractor's failure to promptly comply with a City-directed change is deemed a material breach of the Contract, and in addition to all other remedies available to it, City may, at its sole discretion, hire another contractor or use its own forces to complete the disputed Work at Contractor's sole expense, and may deduct the cost from the Contract Price.

6.2 Contractor Change Order Requests. Contractor must submit a request or proposal for a change in the Work, compensation for Extra Work, or a change in the Contract Price or Contract Time as a written Change Order request or proposal.

(A) **Time for Submission.** Any request for a change in the Contract Price or the Contract Time must be submitted in writing to the Engineer within ten calendar days of the date that Contractor first encounters the circumstances, information or conditions giving rise to the Change Order request, even if the total amount of the requested change in the Contract Price or impact on the Contract Time is not yet known at that time. If City requests that Contractor propose the terms of a Change Order, unless otherwise specified in City's request, Contractor must provide the Engineer with a written proposal for the change in the Contract Price or Contract Time within five working days of receiving City's request, in a form satisfactory to the Engineer.

(B) **Required Contents.** Any Change Order request or proposal submitted by Contractor must include a complete breakdown of actual or estimated costs and credits, and must itemize labor, materials, equipment, taxes, insurance, subcontract amounts, and, if applicable, Extra Work Reports. Any estimated cost must be updated in writing as soon as the actual amount is known.

(C) **Required Documentation.** All claimed costs must be fully documented, and any related request for an extension of time or delay-related costs must be included at that time and in compliance with the requirements of Article 5 of the General Conditions. Upon request, Contractor must permit City to inspect its original and unaltered bidding records, subcontract agreements, subcontract change orders, purchase orders, invoices, or receipts associated with the claimed costs.

(D) **Required Form.** Contractor must use City's form(s) for submitting all Change Order requests or proposals, unless otherwise specified by City.

(E) **Certification.** All Change Order requests must be signed by Contractor and must include the following certification:

"The undersigned Contractor certifies under penalty of perjury that its statements and representations in this Change Order request are true and correct. Contractor warrants that this Change Order request is comprehensive and complete as to the Work or changes referenced herein, and agrees that any known or foreseeable costs, expenses, or time extension requests not included herein, are deemed waived."

6.3 Adjustments to Contract Price. The amount of any increase or decrease in the Contract Price will be determined based on one of the following methods listed below, in the order listed with unit pricing taking precedence over the other methods. Markup applies only to City-authorized time and material Work, and does not apply to any other payments to Contractor. For Work items or components that are deleted in their entirety, Contractor will only be entitled to compensation for those direct, actual, and documented costs (including restocking fees), reasonably incurred before Contractor was notified of the City's intent to delete the Work, with no markup for overhead, profit, or other indirect costs.

(A) **Unit Pricing.** Amounts previously provided by Contractor in the form of unit prices, either in a bid schedule or in a post-award schedule of values pursuant to Section 8.1, Schedule of Values, will apply to determine the price for the affected Work, to the extent applicable unit prices have been provided for that type of Work. No additional markup for overhead, profit, or other indirect costs will be added to the calculation.

(B) **Lump Sum.** A mutually agreed upon, all-inclusive lump sum price for the affected Work with no additional markup for overhead, profit, or other indirect costs.

(C) **Time and Materials.** On a time and materials basis, if and only to the extent compensation on a time and materials basis is expressly authorized by City in advance of Contractor's performance of the Work and subject to any not-to-exceed limit. Time and materials compensation for increased costs or Extra Work (but not decreased costs or deleted Work), will include allowed markup for overhead, profit, and other indirect costs, calculated as the total of the following sums, the cumulative total of which may not exceed the maximum markup rate of 15%:

- (1) All direct labor costs provided by the Contractor, excluding superintendence, project management, or administrative costs, plus 15% markup;
- (2) All direct material costs provided by the Contractor, including sales tax, plus 15% markup;
- (3) All direct plant and equipment rental costs provided by the Contractor, plus 15% markup;
- (4) All direct additional subcontract costs plus 10% markup for Work performed by Subcontractors; and
- (5) Increased bond or insurance premium costs computed at 1.5% of total of the previous four sums.

6.4 Unilateral Change Order. If the parties dispute the terms of a proposed Change Order, including disputes over the amount of compensation or extension of time that Contractor has requested, the value of deleted or changed Work, what constitutes Extra Work, or quantities used, City may elect to issue a unilateral Change Order, directing performance of the Work, and authorizing a change in the Contract Price or Contract Time for the adjustment to compensation or time that the City believes is merited. Contractor's sole recourse to dispute the terms of a unilateral Change Order is to submit a timely Claim pursuant to Article 12, below.

6.5 Non-Compliance Deemed Waiver. Contractor waives its entitlement to any increase in the Contract Price or Contract Time if Contractor fails to fully comply with the provisions of this Article. Contractor will not be paid for unauthorized Extra Work.

Article 7 - General Construction Provisions

7.1 Permits, Fees, Business License, and Taxes.

(A) **Permits, Fees, and City Business License.** Contractor must obtain and pay for all permits, fees, or licenses required to perform the Work, including a City business license. Contractor must cooperate with and provide notifications to all government agencies with jurisdiction over the Project, as may be required. Contractor must provide City with copies of all records of permits and permit applications, payment of required fees, and any licenses required for the Work.

(B) **Taxes.** Contractor must pay for all taxes on labor, material and equipment, except Federal Excise Tax to the extent that City is exempt from Federal Excise Tax.

7.2 Temporary Facilities. Contractor must provide, at Contractor's sole expense, any and all temporary facilities for the Project, including an onsite staging area for materials and equipment, a field office, sanitary facilities, utilities, storage, scaffolds, barricades, walkways, and any other temporary structure required to safely perform the Work along with any incidental utility services. The location of all temporary facilities must be

approved by the City prior to installation. Temporary facilities must be safe and adequate for the intended use and installed and maintained in accordance with Laws and the Contract Documents. Contractor must fence and screen the Project site and, if applicable, any separate Worksites, including the staging area, and its operation must minimize inconvenience to neighboring properties. Additional provisions pertaining to temporary facilities may be included in the Specifications or Special Conditions.

(A) **Utilities.** Contractor must install and maintain the power, water, sewer and all other utilities required for the Project site, including the piping, wiring, internet and wifi connections, and any related equipment necessary to maintain the temporary facilities.

(B) **Removal and Repair.** Contractor must promptly remove all such temporary facilities when they are no longer needed or upon completion of the Work, whichever comes first. Contractor must promptly repair any damage to City's property or to other property caused by the installation, use, or removal of the temporary facilities, and must promptly restore the property to its original or intended condition.

7.3 Noninterference and Site Management. Contractor must avoid interfering with City's use of its property at or adjacent to the Project site, including use of roadways, entrances, parking areas, walkways, and structures. Contractor must also minimize disruption of access to private property in the Project vicinity. Contractor must coordinate with affected property owners, tenants, and businesses, and maintain some vehicle and pedestrian access to their residences or properties at all times. Temporary access ramps, fencing or other measures must be provided as needed. Before blocking access to a private driveway or parking lot, Contractor must provide effective notice to the affected parties at least 48 hours in advance of the pending closure and allow them to remove vehicles. Private driveways, residences and parking lots must have access to a roadway during non-Work hours.

(A) **Offsite Acquisition.** Unless otherwise provided by City, Contractor must acquire, use and dispose of, at its sole expense, any Worksites, licenses, easements, and temporary facilities necessary to access and perform the Work.

(B) **Offsite Staging Area and Field Office.** If additional space beyond the Project site is needed, such as for the staging area or the field office, Contractor may need to make arrangements with the nearby property owner(s) to secure the space. Before using or occupying any property owned by a third party, Contractor must provide City with a copy of the necessary license agreement, easement, or other written authorization from the property owner, together with a written release from the property owner holding City harmless from any related liability, in a form acceptable to the City Attorney.

(C) **Traffic Management.** Contractor must provide traffic management and traffic controls as specified in the Contract Documents, as required by Laws, and as otherwise required to ensure public and worker safety, and to avoid interference with public or private operations or the normal flow of vehicular, bicycle, or pedestrian traffic.

7.4 Signs. No signs may be displayed on or about City's property, except signage which is required by Laws or by the Contract Documents, without City's prior written approval as to size, design, and location.

7.5 Project Site and Nearby Property Protections.

(A) **General.** Contractor is responsible at all times, on a 24-hour basis and at its sole cost, for protecting the Work, the Project site, and the materials and equipment to be incorporated into the Work, until the City has accepted the Project, excluding any exceptions to acceptance, if any. Except as specifically authorized by City, Contractor

must confine its operations to the area of the Project site indicated in the Plans and Specifications. Contractor is liable for any damage caused by Contractor or its Subcontractors to the Work, City's property, the property of adjacent or nearby property owners and the work or personal property of other contractors working for City, including damage related to Contractor's failure to adequately secure the Work or any Worksite.

(1) Subject to City's approval, Contractor will provide and install safeguards to protect the Work; any Worksite, including the Project site; City's real or personal property and the real or personal property of adjacent or nearby property owners, including plant and tree protections.

(2) City wastewater systems may not be interrupted. If the Work disrupts existing sewer facilities, Contractor must immediately notify City and establish a plan, subject to City's approval, to convey the sewage in closed conduits back into the sanitary sewer system. Sewage must not be permitted to flow in trenches or be covered by backfill.

(3) Contractor must remove with due care, and store at City's request, any objects or material from the Project site that City will salvage or reuse at another location.

(4) If directed by Engineer, Contractor must promptly repair or replace any property damage, as specified by the Engineer. However, acting in its sole discretion, City may elect to have the property damage remedied otherwise, and may deduct the cost to repair or replace the damaged property from payment otherwise due to Contractor.

(5) Contractor will not permit any structure or infrastructure to be loaded in a manner that will damage or endanger the integrity of the structure or infrastructure.

(B) **Securing Project Site.** After completion of Work each day, Contractor must secure the Project site and, to the extent feasible, make the area reasonably accessible to the public unless City approves otherwise. All excess materials and equipment not protected by approved traffic control devices must be relocated to the staging area or demobilized. Trench spoils must be hauled off the Project site daily and open excavations must be protected with steel plates. Contractor and Subcontractor personnel may not occupy or use the Project site for any purpose during non-Work hours, except as may be provided in the Contract Documents or pursuant to prior written authorization from City.

(C) **Unforeseen Conditions.** If Contractor encounters facilities, utilities, or other unknown conditions not shown on or reasonably inferable from the Plans or apparent from inspection of the Project site, Contractor must immediately notify the City and promptly submit a Request for Information to obtain further directions from the Engineer. Contractor must avoid taking any action which could cause damage to the facilities or utilities pending further direction from the Engineer. The Engineer's written response will be final and binding on Contractor. If the Engineer's subsequent direction to Contractor affects Contractor's cost or time to perform the Work, Contractor may submit a Change Order request as set forth in Article 6 above.

(D) **Support; Adjacent Properties.** Contractor must provide, install, and maintain all shoring, bracing, and underpinning necessary to provide support to City's property and adjacent properties and improvements thereon. Contractor must provide notifications to adjacent property owners as may be required by Laws. See also, Section 7.15, Trenching of Five Feet or More.

(E) **Notification of Property Damage.** Contractor must immediately notify the City of damage to any real or personal property resulting from Work on the Project. Contractor must immediately provide a written report to City of any such property damage in excess of \$500 (based on estimated cost to repair or replace) within 24 hours of the occurrence. The written report must include: (1) the location and nature of the damage, and the owner of the property, if known; (2) the name and address of each employee of Contractor or any Subcontractor involved in the damage; (3) a detailed description of the incident, including precise location, time, and names and contact information for known witnesses; and (4) a police or first responder report, if applicable. If Contractor is required to file an accident report with another government agency, Contractor will provide a copy of the report to City.

7.6 Materials and Equipment.

(A) **General.** Unless otherwise specified, all materials and equipment required for the Work must be new, free from defects, and of the best grade for the intended purpose, and furnished in sufficient quantities to ensure the proper and expeditious performance of the Work. Contractor must employ measures to preserve the specified quality and fitness of the materials and equipment. Unless otherwise specified, all materials and equipment required for the Work are deemed to include all components required for complete installation and intended operation and must be installed in accordance with the manufacturer's recommendations or instructions. Contractor is responsible for all shipping, handling, and storage costs associated with the materials and equipment required for the Work. Contractor is responsible for providing security and protecting the Work and all of the required materials, supplies, tools and equipment at Contractor's sole cost until City has formally accepted the Project as set forth in Section 11.1, Final Completion. Contractor will not assign, sell, mortgage, or hypothecate any materials or equipment for the Project, or remove any materials or equipment that have been installed or delivered.

(B) **City-Provided.** If the Work includes installation of materials or equipment to be provided by City, Contractor is solely responsible for the proper examination, handling, storage, and installation in accordance with the Contract Documents. Contractor must notify City of any defects discovered in City-provided materials or equipment, sufficiently in advance of scheduled use or installation to afford adequate time to procure replacement materials or equipment as needed. Contractor is solely responsible for any loss of or damage to such items which occurs while the items are in Contractor's custody and control, the cost of which may be offset from the Contract Price and deducted from any payment(s) due to Contractor.

(C) **Intellectual Property Rights.** Contractor must, at its sole expense, obtain any authorization or license required for use of patented or copyright-protected materials, equipment, devices or processes that are incorporated into the Work. Contractor's indemnity obligations in Article 4 apply to any claimed violation of intellectual property rights in violation of this provision.

7.7 Substitutions.

(A) **"Or Equal."** Any Specification designating a material, product, or thing (collectively, "item") or service by specific brand or trade name, followed by the words "or equal," is intended only to indicate the quality and type of item or service desired, and Contractor may request use of any equal item or service. Unless otherwise stated in the Specifications, any reference to a specific brand or trade name for an item or service that is used solely for the purpose of describing the type of item or service desired, will be deemed to be followed by the words "or equal." A substitution will only be approved if it is a true "equal" item or service in every aspect of design, function, and quality, as

determined by City, including dimensions, weight, maintenance requirements, durability, fit with other elements, and schedule impacts.

(B) **Request for Substitution.** A post-award request for substitution of an item or service must be submitted in writing to the Engineer for approval in advance, within the applicable time period provided in the Contract Documents. If no time period is specified, the substitution request may be submitted any time within 35 days after the date of award of the Contract, or sufficiently in advance of the time needed to avoid delay of the Work, whichever is earlier.

(C) **Substantiation.** Any available data substantiating the proposed substitute as an equal item or service must be submitted with the written request for substitution. Contractor's failure to timely provide all necessary substantiation, including any required test results as soon as they are available, is grounds for rejection of the proposed substitution, without further review.

(D) **Burden of Proving Equality.** Contractor has the burden of proving the equality of the proposed substitution at Contractor's sole cost. City has sole discretion to determine whether a proposed substitution is equal, and City's determination is final.

(E) **Approval or Rejection.** If the proposed substitution is approved, Contractor is solely responsible for any additional costs or time associated with the substituted item or service. If the proposed substitution is rejected, Contractor must, without delay, install the item or use the service as specified by City.

(F) **Contractor's Obligations.** City's approval of a proposed substitution will not relieve Contractor from any of its obligations under the Contract Documents. In the event Contractor makes an unauthorized substitution, Contractor will be solely responsible for all resulting cost impacts, including the cost of removal and replacement and the impact to other design elements.

7.8 Testing and Inspection.

(A) **General.** All materials, equipment, and workmanship used in the Work are subject to inspection and testing by City at all times and locations during construction and/or fabrication and at any Worksite, including at shops and yards as well as at the Project site. All manufacturers' application or installation instructions must be provided to the Inspector at least ten days prior to the first such application or installation. Contractor must, at all times, make the Work available for testing or inspection. Neither City's inspection or testing of Work, nor its failure to do so, operate to waive or limit Contractor's duty to complete the Work in accordance with the Contract Documents.

(B) **Scheduling and Notification.** Contractor must cooperate with City in coordinating the inspections and testing. Contractor must submit samples of materials, at Contractor's expense, and schedule all tests required by the Contract Documents in time to avoid any delay to the progress of the Work. Contractor must notify the Engineer no later than noon of the Working Day before any inspection or testing and must provide timely notice to the other necessary parties as specified in the Contract Documents. If Contractor schedules an inspection or test beyond regular Work hours, or on a Saturday, Sunday, or recognized City holiday, Contractor must notify the Engineer at least two Working Days in advance for approval. If approved, Contractor must reimburse City for the cost of the overtime inspection or testing. Such costs, including the City's hourly costs for required personnel, may be deducted from payments otherwise due to Contractor.

(C) **Responsibility for Costs.** City will bear the initial cost of inspection and testing to be performed by independent testing consultants retained by City, subject to the following exceptions:

(1) Contractor will be responsible for the costs of any subsequent tests which are required to substantiate compliance with the Contract Documents, and any associated remediation costs.

(2) Contractor will be responsible for inspection costs, at City's hourly rates, for inspection time lost because the Work is not ready or Contractor fails to appear for a scheduled inspection.

(3) If any portion of the Work that is subject to inspection or testing is covered or concealed by Contractor prior to the inspection or testing, Contractor will bear the cost of making that portion of the Work available for the inspection or testing required by the Contract Documents, and any associated repair or remediation costs.

(4) Contractor is responsible for properly shoring all compaction test sites deeper than five feet below grade, as required under Section 7.15 below.

(5) Any Work or material that is defective or fails to comply with the requirements of the Contract Documents must be promptly repaired, removed, replaced, or corrected by Contractor, at Contractor's sole expense, even if that Work or material was previously inspected or included in a progress payment.

(D) **Contractor's Obligations.** Contractor is solely responsible for any delay occasioned by remediation of defective or noncompliant Work or material. Inspection of the Work does not in any way relieve Contractor of its obligations to perform the Work as specified. Any Work done without the required inspection(s) will also be subject to rejection by City.

(E) **Distant Locations.** If required off-site testing or inspection must be conducted at a location more than 100 miles from the Project site, Contractor is solely responsible for the additional travel costs required for testing and/or inspection at such locations.

(F) **Final Inspection.** The provisions of this Section 7.8 also apply to final inspection under Article 11, Completion and Warranty Provisions.

7.9 Project Site Conditions and Maintenance. Contractor must at all times, on a 24-hour basis and at its sole cost, maintain the Project site and staging and storage areas in clean, neat, and sanitary condition and in compliance with all Laws pertaining to safety, air quality, and dust control. Adequate toilets must be provided, and properly maintained and serviced for all workers on the Project site, located in a suitably secluded area, subject to City's prior approval. Contractor must also, on a daily basis and at its sole cost, remove and properly dispose of the debris and waste materials from the Project site.

(A) **Air Emissions Control.** Contractor must not discharge smoke or other air contaminants into the atmosphere in violation of any Laws.

(B) **Dust and Debris.** Contractor must minimize and confine dust and debris resulting from the Work. Contractor must abate dust nuisance by cleaning, sweeping, and immediately sprinkling with water excavated areas of dirt or other materials prone to cause dust, and within one hour after the Engineer notifies Contractor that an airborne nuisance exists. The Engineer may direct that Contractor provide an approved water-spraying truck for this purpose. If water is used for dust control, Contractor will only use

the minimum necessary. Contractor must take all necessary steps to keep waste water out of streets, gutters, or storm drains. See Section 7.19, Environmental Control. If City determines that the dust control is not adequate, City may have the work done by others and deduct the cost from the Contract Price. Contractor will immediately remove any excess excavated material from the Project site and any dirt deposited on public streets.

(C) **Clean up.** Before discontinuing Work in an area, Contractor must clean the area and remove all debris and waste along with the construction equipment, tools, machinery, and surplus materials.

(1) Except as otherwise specified, all excess Project materials, and the materials removed from existing improvements on the Project site with no salvage value or intended reuse by City, will be Contractor's property.

(2) Hauling trucks and other vehicles leaving the Project site must be cleaned of exterior mud or dirt before traveling on City streets. Materials and loose debris must be delivered and loaded to prevent dropping materials or debris. Contractor must immediately remove spillage from hauling on any publicly traveled way. Streets affected by Work on the Project must be kept clean by street sweeping.

(D) **Disposal.** Contractor must dispose of all Project debris and waste materials in a safe and legal manner. Contractor may not burn or bury waste materials on the Project site. Contractor will not allow any dirt, refuse, excavated material, surplus concrete or mortar, or any associated washings, to be disposed of onto streets, into manholes or into the storm drain system.

(E) **Completion.** At the completion of the Work, Contractor must remove from the Project site all of its equipment, tools, surplus materials, waste materials and debris, presenting a clean and neat appearance. Before demobilizing from the Project site, Contractor must ensure that all surfaces are cleaned, sealed, waxed, or finished as applicable, and that all marks, stains, paint splatters, and the like have been properly removed from the completed Work and the surrounding areas. Contractor must ensure that all parts of the construction are properly joined with the previously existing and adjacent improvements and conditions. Contractor must provide all cutting, fitting and patching needed to accomplish that requirement. Contractor must also repair or replace all existing improvements that are damaged or removed during the Work, both on and off the Project site, including curbs, sidewalks, driveways, fences, signs, utilities, street surfaces and structures. Repairs and replacements must be at least equal to the previously existing improvements, and the condition, finish and dimensions must match the previously existing improvements. Contractor must restore to original condition all property or items that are not designated for alteration under the Contract Documents and leave each Worksite clean and ready for occupancy or use by City.

(F) **Non-Compliance.** If Contractor fails to comply with its maintenance and cleanup obligations or any City clean up order, City may, acting in its sole discretion, elect to suspend the Work until the condition(s) is corrected with no increase in the Contract Time or Contract Price, or undertake appropriate cleanup measures without further notice and deduct the cost from any amounts due or to become due to Contractor.

7.10 Instructions and Manuals. Contractor must provide to City three copies each of all instructions and manuals required by the Contract Documents, unless otherwise specified. These must be complete as to drawings, details, parts lists, performance data, and other information that may be required for City to easily maintain and service the materials and equipment installed for this Project.

(A) **Submittal Requirements.** All manufacturers' application or installation instructions must be provided to City at least ten days prior to the first such application. The instructions and manuals, along with any required guarantees, must be delivered to City for review.

(B) **Training.** Contractor or its Subcontractors must train City's personnel in the operation and maintenance of any complex equipment or systems as a condition precedent to Final Completion, if required in the Contract Documents.

7.11 As-built Drawings. Contractor and its Subcontractors must prepare and maintain at the Project site a detailed, complete and accurate as-built set of the Plans which will be used solely for the purpose of recording changes made in any portion of the original Plans in order to create accurate record drawings at the end of the Project.

(A) **Duty to Update.** The as-built drawings must be updated as changes occur, on a daily basis if necessary. City may withhold the estimated cost for City to have the as-built drawings prepared from payments otherwise due to Contractor, until the as-built drawings are brought up to date to the satisfaction of City. Actual locations to scale must be identified on the as-built drawings for all runs of mechanical and electrical work, including all site utilities installed underground, in walls, floors, or otherwise concealed. Deviations from the original Plans must be shown in detail. The exact location of all main runs, whether piping, conduit, ductwork or drain lines, must be shown by dimension and elevation. The location of all buried pipelines, appurtenances, or other improvements must be represented by coordinates and by the horizontal distance from visible above-ground improvements.

(B) **Final Completion.** Contractor must verify that all changes in the Work are depicted in the as-built drawings and must deliver the complete set of as-built drawings to the Engineer for review and acceptance as a condition precedent to Final Completion and Final Payment.

7.12 Existing Utilities.

(A) **General.** The Work may be performed in developed, urban areas with existing utilities, both above and below ground, including utilities identified in the Contract Documents or in other informational documents or records. Contractor must take due care to locate identified or reasonably identifiable utilities before proceeding with trenching, excavation, or any other activity that could damage or disrupt existing utilities. This may include excavation with small equipment, potholing, or hand excavation, and, if practical, using white paint or other suitable markings to delineate the area to be excavated. Except as otherwise provided herein, Contractor will be responsible for costs resulting from damage to identified or reasonably identifiable utilities due to Contractor's negligence or failure to comply with the Contract Documents, including the requirements in this Article 7.

(B) **Unidentified Utilities.** Pursuant to Government Code § 4215, if, during the performance of the Work, Contractor discovers utility facilities not identified by City in the Contract Documents, Contractor must immediately provide written notice to City and the utility. City assumes responsibility for the timely removal, relocation, or protection of existing main or trunkline utility facilities located on the Project site if those utilities are not identified in the Contract Documents. Contractor will be compensated in accordance with the provisions of the Contract Documents for the costs of locating, repairing damage not due to Contractor's failure to exercise reasonable care, and removing or relocating utility facilities not indicated in the Plans or Specifications with reasonable accuracy, and for equipment on the Project necessarily idled during such work. Contractor will not be

assessed liquidated damages for delay in completion of the Work, to the extent the delay was caused by City's failure to provide for removal or relocation of the utility facilities.

7.13 Notice of Excavation. Contractor must comply with all applicable requirements in Government Code §§ 4216 through 4216.5, which are incorporated by reference herein. Government Code § 4216.2 requires that, except in an emergency, Contractor must contact the appropriate regional notification center, or Underground Services Alert, at least two working days, but not more than 14 calendar days, before starting any excavation if the excavation will be conducted in an area that is known, or reasonably should be known, to contain subsurface installations. Contractor may not begin excavation until it has obtained and submitted to Engineer an inquiry identification number from Underground Services Alert.

7.14 Trenching and Excavations of Four Feet or More. As required by Public Contract Code § 7104, if the Work includes digging trenches or other excavations that extend deeper than four feet below the surface, the provisions in this Section apply to the Work and the Project.

(A) **Duty to Notify.** Contractor must promptly, and before the following conditions are disturbed, provide written notice to City if Contractor finds any of the following conditions:

(1) Material that Contractor believes may be a hazardous waste, as defined in § 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with the provisions of existing Laws;

(2) Subsurface or latent physical conditions at the Project site differing from those indicated by information about the Project site made available to bidders prior to the deadline for submitting bids; or

(3) Unknown physical conditions at the Project site of any unusual nature, materially different from those ordinarily encountered and generally recognized as inherent in work of the character required by the Contract Documents.

(B) **City Investigation.** City will promptly investigate the conditions and if City finds that the conditions materially differ from those indicated, apparent, or reasonably inferred from information about the Project site made available to bidders, or involve hazardous waste, and cause a decrease or increase in Contractor's cost of, or the time required for, performance of any part of the Work, City will issue a Change Order.

(C) **Disputes.** In the event that a dispute arises between City and Contractor regarding any of the conditions specified in subsection (B) above, or the terms of a Change Order issued by City, Contractor will not be excused from completing the Work within the Contract Time, but must proceed with all Work to be performed under the Contract. Contractor will retain any and all rights provided either by the Contract or by Laws which pertain to the resolution of disputes between Contractor and City.

7.15 Trenching of Five Feet or More. As required by Labor Code § 6705, if the Contract Price exceeds \$25,000 and the Work includes the excavation of any trench or trenches of five feet or more in depth, a detailed plan must be submitted to City for acceptance in advance of the excavation. The detailed plan must show the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation. If the plan varies from the shoring system standards, it must be prepared by a California registered civil or structural engineer. Use of a shoring,

sloping, or protective system less effective than that required by the Construction Safety Orders is prohibited.

7.16 New Utility Connections. Except as otherwise specified, City will pay connection charges and meter costs for new permanent utilities required by the Contract Documents, if any. Contractor must notify City sufficiently in advance of the time needed to request service from each utility provider so that connections and services are initiated in accordance with the Project schedule.

7.17 Lines and Grades. Contractor is required to use any benchmark provided by the Engineer. Unless otherwise specified in the Contract Documents, Contractor must provide all lines and grades required to execute the Work. Contractor must also provide, preserve, and replace if necessary, all construction stakes required for the Project. All stakes or marks must be set by a California licensed surveyor or a California registered civil engineer. Contractor must notify the Engineer of any discrepancies found between Contractor's staking and grading and information provided by the Contract Documents. Upon completion, all Work must conform to the lines, elevations, and grades shown in the Plans, including any changes directed by a Change Order.

7.18 Historic or Archeological Items.

(A) **Contractor's Obligations.** Contractor must ensure that all persons performing Work at the Project site are required to immediately notify the Project Manager, upon discovery of any potential historic or archeological items, including historic or prehistoric ruins, a burial ground, archaeological or vertebrate paleontological site, including fossilized footprints or other archeological, paleontological or historical feature on the Project site (collectively, "Historic or Archeological Items").

(B) **Discovery; Cessation of Work.** Upon discovery of any potential Historic or Archeological Items, Work must be stopped within an 85-foot radius of the find and may not resume until authorized in writing by City. If required by City, Contractor must assist in protecting or recovering the Historic or Archeological Items, with any such assistance to be compensated as Extra Work on a time and materials basis under Article 6, Contract Modification. At City's discretion, a suspension of Work required due to discovery of Historic or Archeological Items may be treated as Excusable Delay pursuant to Article 5, or as a suspension for convenience under Article 13.

7.19 Environmental Control. Contractor must not pollute any drainage course or its tributary inlets with fuels, oils, bitumens, acids, insecticides, herbicides or other harmful materials. Contractor must prevent the release of any hazardous material or hazardous waste into the soil or groundwater, and prevent the unlawful discharge of pollutants into City's storm drain system and watercourses as required below. Contractor and its Subcontractors must at all times in the performance of the Work comply with all Laws concerning pollution of waterways.

(A) **Stormwater Permit.** Contractor must comply with all applicable conditions of the State Water Resources Control Board National Pollutant Discharge Elimination System General Permit for Waste Discharge Requirements for Discharges of Stormwater Runoff Associated with Construction Activity ("Stormwater Permit").

(B) **Contractor's Obligations.** If required for the Work, a copy of the Stormwater Permit is on file in City's principal administrative offices, and Contractor must comply with it without adjustment of the Contract Price or the Contract Time. Contractor must timely and completely submit required reports and monitoring information required by the conditions of the Stormwater Permit. Contractor also must comply with all other Laws

governing discharge of stormwater, including applicable municipal stormwater management programs.

- 7.20 Noise Control.** Contractor must comply with all applicable noise control Laws. Noise control requirements apply to all equipment used for the Work or related to the Work, including trucks, transit mixers or transient equipment that may or may not be owned by Contractor.
- 7.21 Mined Materials.** Pursuant to the Surface Mining and Reclamation Act of 1975, Public Resources Code § 2710 et seq., any purchase of mined materials, such as construction aggregate, sand, gravel, crushed stone, road base, fill materials, and any other mineral materials must originate from a surface mining operation included on the AB 3098 List, which is available online at:
<ftp://ftp.consrv.ca.gov/pub/omr/AB3098%20List/AB3908List.pdf>.

Article 8 - Payment

- 8.1 Schedule of Values.** Prior to submitting its first application for payment, Contractor must prepare and submit to the Project Manager a schedule of values apportioned to the various divisions and phases of the Work, including mobilization and demobilization. If a Bid Schedule was submitted with Contractor's bid, the amounts in the schedule of values must be consistent with the Bid Schedule. Each line item contained in the schedule of values must be assigned a value such that the total of all items equals the Contract Price. The items must be sufficiently detailed to enable accurate evaluation of the percentage of completion claimed in each application for payment, and the assigned value consistent with any itemized or unit pricing submitted with Contractor's bid.
- (A) **Measurements for Unit Price Work.** Materials and items of Work to be paid for on the basis of unit pricing will be measured according to the methods specified in the Contract Documents.
- (B) **Deleted or Reduced Work.** Contractor will not be compensated for Work that City has deleted or reduced in scope, except for any labor, material or equipment costs for such Work that Contractor reasonably incurred before Contractor learned that the Work could be deleted or reduced. Contractor will only be compensated for those actual, direct and documented costs incurred, and will not be entitled to any mark up for overhead or lost profits.
- 8.2 Progress Payments.** Following the last day of each month, or as otherwise required by the Special Conditions or Specifications, Contractor will submit to the Project Manager a monthly application for payment for Work performed during the preceding month based on the estimated value of the Work performed during that preceding month.
- (A) **Application for Payment.** Each application for payment must be itemized to include labor, materials, and equipment incorporated into the Work, and materials and equipment delivered to the Project site, as well as authorized and approved Change Orders. Each payment application must be supported by the unit prices submitted with Contractor's Bid Schedule and/or schedule of values and any other substantiating data required by the Contract Documents.
- (B) **Payment of Undisputed Amounts.** City will pay the undisputed amount due within 30 days after Contractor has submitted a complete and accurate payment application, subject to Public Contract Code § 20104.50. City will deduct a percentage from each progress payment as retention, as set forth in Section 8.5, below, and may withhold additional amounts as set forth in Section 8.3, below.

8.3 Adjustment of Payment Application. City may adjust or reject the amount requested in a payment application, including application for Final Payment, in whole or in part, if the amount requested is disputed or unsubstantiated. Contractor will be notified in writing of the basis for the modification to the amount requested. City may also deduct or withhold from payment otherwise due based upon any of the circumstances and amounts listed below. Sums withheld from payment otherwise due will be released when the basis for that withholding has been remedied and no longer exists.

(A) For Contractor's unexcused failure to perform the Work as required by the Contract Documents, including correction or completion of punch list items, City may withhold or deduct an amount based on the City's estimated cost to correct or complete the Work.

(B) For loss or damage caused by Contractor or its Subcontractors arising out of or relating to performance of the Work or any failure to protect the Project site, City may deduct an amount based on the estimated cost to repair or replace.

(C) For Contractor's failure to pay its Subcontractors and suppliers when payment is due, City may withhold an amount equal to the total of past due payments and may opt to pay that amount separately via joint check pursuant to Section 8.6(B), Joint Checks.

(D) For Contractor's failure to timely correct rejected, nonconforming, or defective Work, City may withhold or deduct an amount based on the City's estimated cost to correct or complete the Work.

(E) For any unreleased stop notice, City may withhold 125% of the amount claimed.

(F) For Contractor's failure to submit any required schedule or schedule update in the manner and within the time specified in the Contract Documents, City may withhold an amount equal to five percent of the total amount requested until Contractor complies with its schedule submittal obligations.

(G) For Contractor's failure to maintain or submit as-built documents in the manner and within the time specified in the Contract Documents, City may withhold or deduct an amount based on the City's cost to prepare the as-builts.

(H) For Work performed without Shop Drawings that have been accepted by City, when accepted Shop Drawings are required before proceeding with the Work, City may deduct an amount based on the estimated cost to correct unsatisfactory Work or diminution in value.

(I) For fines, payments, or penalties assessed under the Labor Code, City may deduct from payments due to Contractor as required by Laws and as directed by the Division of Labor Standards Enforcement.

(J) For any other costs or charges that may be withheld or deducted from payments to Contractor, as provided in the Contract Documents, including liquidated damages, City may withhold or deduct such amounts from payment otherwise due to Contractor.

8.4 Early Occupancy. Neither City's payment of progress payments nor its partial or full use or occupancy of the Project constitutes acceptance of any part of the Work.

8.5 Retention. City will retain five percent of the full amount due on each progress payment (i.e., the amount due before any withholding or deductions pursuant to Section 8.3, Adjustment of Payment Application), or the percentage stated in the Notice Inviting Bids, whichever is greater, as retention to ensure full and satisfactory performance of the Work.

Contractor is not entitled to any reduction in the rate of withholding at any time, nor to release of any retention before 35 days following City's acceptance of the Project.

(A) **Substitution of Securities.** As provided by Public Contract Code § 22300, Contractor may request in writing that it be allowed, at its sole expense, to substitute securities for the retention withheld by City. Any escrow agreement entered into pursuant to this provision must fully comply with Public Contract Code § 22300 and will be subject to approval as to form by City's legal counsel. If City exercises its right to draw upon such securities in the event of default pursuant to section (7) of the statutory Escrow Agreement for Security Deposits in Lieu of Retention, pursuant to subdivision (f) of Public Contract Code § 22300 ("Escrow Agreement"), and if Contractor disputes that it is in default, its sole remedy is to comply with the dispute resolution procedures in Article 12 and the provisions therein. It is agreed that for purposes of this paragraph, an event of default includes City's rights pursuant to these Contract Documents to withhold or deduct sums from retention, including withholding or deduction for liquidated damages, incomplete or defective Work, stop payment notices, or backcharges. It is further agreed that if any individual authorized to give or receive written notice on behalf of a party pursuant to section (10) of the Escrow Agreement are unavailable to give or receive notice on behalf of that party due to separation from employment, retirement, death, or other circumstances, the successor or delegee of the named individual is deemed to be the individual authorized to give or receive notice pursuant to section (10) of the Escrow Agreement.

(B) **Release of Undisputed Retention.** All undisputed retention, less any amounts that may be assessed as liquidated damages, retained for stop notices, or otherwise withheld pursuant to Section 8.3, Adjustment of Payment Application, will be released as Final Payment to Contractor no sooner than 35 days following recordation of the notice of completion, and no later than 60 days following acceptance of the Project by City's governing body or authorized designee pursuant to Section 11.1(C), Acceptance, or, if the Project has not been accepted, no later than 60 days after the Project is otherwise considered complete pursuant to Public Contract Code § 7107(c).

8.6 Payment to Subcontractors and Suppliers. Each month, Contractor must promptly pay each Subcontractor and supplier the value of the portion of labor, materials, and equipment incorporated into the Work or delivered to the Project site by the Subcontractor or supplier during the preceding month. Such payments must be made in accordance with the requirements of Laws pertaining to such payments, and those of the Contract Documents and applicable subcontract or supplier contract.

(A) **Withholding for Stop Notice.** Pursuant to Civil Code § 9358, City will withhold 125% of the amount claimed by an unreleased stop notice, a portion of which may be retained by City for the costs incurred in handling the stop notice claim, including attorneys' fees and costs, as authorized by law.

(B) **Joint Checks.** City reserves the right, acting in its sole discretion, to issue joint checks made payable to Contractor and a Subcontractor or supplier, if City determines this is necessary to ensure fair and timely payment for a Subcontractor or supplier who has provided services or goods for the Project. As a condition to release of payment by a joint check, the joint check payees may be required to execute a joint check agreement in a form provided or approved by the City Attorney's Office. The joint check payees will be jointly and severally responsible for the allocation and disbursement of funds paid by joint check. Payment by joint check will not be construed to create a contractual relationship between City and a Subcontractor or supplier of any tier beyond the scope of the joint check agreement.

- 8.7 Final Payment.** Contractor's application for Final Payment must comply with the requirements for submitting an application for a progress payment as stated in Section 8.2, above. Corrections to previous progress payments, including adjustments to estimated quantities for unit priced items, may be included in the Final Payment. If Contractor fails to submit a timely application for Final Payment, City reserves the right to unilaterally process and issue Final Payment without an application from Contractor in order to close out the Project. For the purposes of determining the deadline for Claim submission pursuant to Article 12, the date of Final Payment is deemed to be the date that City acts to release undisputed retention as final payment to Contractor, or otherwise provides written notice to Contractor of Final Payment or that no undisputed funds remain available for Final Payment due to offsetting withholdings or deductions pursuant to Section 8.3, Adjustment of Payment Application. If the amount due from Contractor to City exceeds the amount of Final Payment, City retains the right to recover the balance from Contractor or its sureties.
- 8.8 Release of Claims.** City may, at any time, require that payment of the undisputed portion of any progress payment or Final Payment be contingent upon Contractor furnishing City with a written waiver and release of all claims against City arising from or related to the portion of Work covered by those undisputed amounts subject to the limitations of Public Contract Code § 7100. Any disputed amounts may be specifically excluded from the release.
- 8.9 Warranty of Title.** Contractor warrants that title to all work, materials, or equipment incorporated into the Work and included in a request for payment will pass over to City free of any claims, liens, or encumbrances upon payment to Contractor.

Article 9 - Labor Provisions

- 9.1 Discrimination Prohibited.** Discrimination against any prospective or present employee engaged in the Work on grounds of race, color, ancestry, national origin, ethnicity, religion, sex, sexual orientation, age, disability, or marital status is strictly prohibited. Contractor and its Subcontractors are required to comply with all applicable Laws prohibiting discrimination, including the California Fair Employment and Housing Act (Govt. Code § 12900 et seq.), Government Code § 11135, and Labor Code §§ 1735, 1777.5, 1777.6, and 3077.5.
- 9.2 Labor Code Requirements.**
- (A) **Eight Hour Day.** Pursuant to Labor Code § 1810, eight hours of labor constitute a legal day's work under this Contract.
- (B) **Penalty.** Pursuant to Labor Code § 1813, Contractor will forfeit to City as a penalty, the sum of \$25.00 for each day during which a worker employed by Contractor or any Subcontractor is required or permitted to work more than eight hours in any one calendar day or more than 40 hours per calendar week, except if such workers are paid overtime under Labor Code § 1815.
- (C) **Apprentices.** Contractor is responsible for compliance with the requirements governing employment and payment of apprentices, as set forth in Labor Code § 1777.5, which is fully incorporated by reference.
- (D) **Notices.** Pursuant to Labor Code § 1771.4, Contractor is required to post all job site notices prescribed by Laws.

9.3 Prevailing Wages. Each worker performing Work under this Contract that is covered under Labor Code §§ 1720 or 1720.9, including cleanup at the Project site, must be paid at a rate not less than the prevailing wage as defined in §§ 1771 and 1774 of the Labor Code. The prevailing wage rates are on file with the City and available online at <http://www.dir.ca.gov/dlsr>. Contractor must post a copy of the applicable prevailing rates at the Project site.

(A) **Penalties.** Pursuant to Labor Code § 1775, Contractor and any Subcontractor will forfeit to City as a penalty up to \$200.00 for each calendar day, or portion thereof, for each worker paid less than the applicable prevailing wage rate. Contractor must also pay each worker the difference between the applicable prevailing wage rate and the amount actually paid to that worker.

(B) **Federal Requirements.** If this Project is subject to federal prevailing wage requirements in addition to California prevailing wage requirements, Contractor and its Subcontractors are required to pay the higher of the currently applicable state or federal prevailing wage rates.

9.4 Payroll Records. Contractor must comply with the provisions of Labor Code §§ 1771.4, 1776, and 1812 and all implementing regulations, which are fully incorporated by this reference, including requirements for monthly electronic submission of payroll records to the DIR.

(A) **Contractor and Subcontractor Obligations.** Contractor and each Subcontractor must keep accurate payroll records, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed in connection with the Work. Each payroll record must contain or be verified by a written declaration that it is made under penalty of perjury, stating both of the following:

(1) The information contained in the payroll record is true and correct; and

(2) Contractor or the Subcontractor has complied with the requirements of Labor Code §§ 1771, 1811, and 1815 for any Work performed by its employees on the Project.

(B) **Certified Record.** A certified copy of an employee's payroll record must be made available for inspection or furnished to the employee or his or her authorized representative on request, to City, to the Division of Labor Standards Enforcement, to the Division of Apprenticeship Standards of the DIR, and as further required by the Labor Code.

(C) **Enforcement.** Upon notice of noncompliance with Labor Code § 1776, Contractor or Subcontractor has ten days in which to comply with the requirements of this section. If Contractor or Subcontractor fails to do so within the ten-day period, Contractor or Subcontractor will forfeit a penalty of \$100.00 per day, or portion thereof, for each worker for whom compliance is required, until strict compliance is achieved. Upon request by the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement, these penalties will be withheld from payments then due to Contractor.

9.5 Labor Compliance. Pursuant to Labor Code § 1771.4, the Contract for this Project is subject to compliance monitoring and enforcement by the DIR.

Article 10 - Safety Provisions

10.1 Safety Precautions and Programs. Contractor and its Subcontractors are fully responsible for safety precautions and programs, and for the safety of persons and property in the performance of the Work. Contractor and its Subcontractors must at all times comply with all applicable health and safety Laws and seek to avoid injury, loss, or damage to persons or property by taking reasonable steps to protect its employees and other persons at any Worksite, materials and equipment stored on or off site, and property at or adjacent to any Worksite.

(A) **Reporting Requirements.** Contractor must immediately notify the City of any death, serious injury or illness resulting from Work on the Project. Contractor must immediately provide a written report to City of each recordable accident or injury occurring at any Worksite within 24 hours of the occurrence. The written report must include: (1) the name and address of the injured or deceased person; (2) the name and address of each employee of Contractor or of any Subcontractor involved in the incident; (3) a detailed description of the incident, including precise location, time, and names and contact information for known witnesses; and (4) a police or first responder report, if applicable. If Contractor is required to file an accident report with a government agency, Contractor will provide a copy of the report to City.

(B) **Legal Compliance.** Contractor's safety program must comply with the applicable legal and regulatory requirements. Contractor must provide City with copies of all notices required by Laws.

(C) **Contractor's Obligations.** Any damage or loss caused by Contractor arising from the Work which is not insured under property insurance must be promptly remedied by Contractor.

(D) **Remedies.** If City determines, in its sole discretion, that any part of the Work or Project site is unsafe, City may, without assuming responsibility for Contractor's safety program, require Contractor or its Subcontractor to cease performance of the Work or to take corrective measures to City's satisfaction. If Contractor fails to promptly take the required corrective measures, City may perform them and deduct the cost from the Contract Price. Contractor agrees it is not entitled to submit a Claim for damages, for an increase in Contract Price, or for a change in Contract Time based on Contractor's compliance with City's request for corrective measures pursuant to this provision.

10.2 Hazardous Materials. Unless otherwise specified in the Contract Documents, this Contract does not include the removal, handling, or disturbance of any asbestos or other Hazardous Materials. If Contractor encounters materials on the Project site that Contractor reasonably believes to be asbestos or other Hazardous Materials, and the asbestos or other Hazardous Materials have not been rendered harmless, Contractor may continue Work in unaffected areas reasonably believed to be safe, but must immediately cease work on the area affected and report the condition to City. No asbestos, asbestos-containing products or other Hazardous Materials may be used in performance of the Work.

10.3 Material Safety. Contractor is solely responsible for complying with § 5194 of Title 8 of the California Code of Regulations, including by providing information to Contractor's employees about any hazardous chemicals to which they may be exposed in the course of the Work. A hazard communication program and other forms of warning and training about such exposure must be used. Contractor must also maintain Safety Data Sheets ("SDS") at the Project site, as required by Laws, for materials or substances used or consumed in the performance of the Work. The SDS will be accessible and available to Contractor's employees, Subcontractors, and City.

(A) **Contractor Obligations.** Contractor is solely responsible for the proper delivery, handling, use, storage, removal, and disposal of all materials brought to the Project site and/or used in the performance of the Work. Contractor must notify the Engineer if a specified product or material cannot be used safely.

(B) **Labeling.** Contractor must ensure proper labeling on any material brought onto the Project site so that any persons working with or in the vicinity of the material may be informed as to the identity of the material, any potential hazards, and requirements for proper handling, protections, and disposal.

10.4 Hazardous Condition. Contractor is solely responsible for determining whether a hazardous condition exists or is created during the course of the Work, involving a risk of bodily harm to any person or risk of damage to any property. If a hazardous condition exists or is created, Contractor must take all precautions necessary to address the condition and ensure that the Work progresses safely under the circumstances. Hazardous conditions may result from, but are not limited to, use of specified materials or equipment, the Work location, the Project site condition, the method of construction, or the way any Work must be performed.

10.5 Emergencies. In an emergency affecting the safety or protection of persons, Work, or property at or adjacent to any Worksite, Contractor must take reasonable and prompt actions to prevent damage, injury, or loss, without prior authorization from the City if, under the circumstances, there is inadequate time to seek prior authorization from the City.

Article 11 - Completion and Warranty Provisions

11.1 Final Completion.

(A) **Final Inspection and Punch List.** When the Work required by this Contract is fully performed, Contractor must provide written notification to City requesting final inspection. The Engineer will schedule the date and time for final inspection, which must include Contractor's primary representative for this Project and its superintendent. Based on that inspection, City will prepare a punch list of any items that are incomplete, missing, defective, incorrectly installed, or otherwise not compliant with the Contract Documents. The punch list to Contractor will specify the time by which all of the punch list items must be completed or corrected. The punch list may include City's estimated cost to complete each punch list item if Contractor fails to do so within the specified time. The omission of any non-compliant item from a punch list will not relieve Contractor from fulfilling all requirements of the Contract Documents. Contractor's failure to complete any punch list item within the time specified in the punch list will not waive or abridge its warranty obligations for any such items that must be completed by the City or by a third party retained by the City due to Contractor's failure to timely complete any such outstanding item.

(B) **Requirements for Final Completion.** Final Completion will be achieved upon completion or correction of all punch list items, as verified by City's further inspection, and upon satisfaction of all other Contract requirements, including any commissioning required under the Contract Documents and submission of all final submittals, including instructions and manuals as required under Section 7.10, and complete, final as-built drawings as required under Section 7.11, all to City's satisfaction.

(C) **Acceptance.** The Project will be considered accepted upon City Council action during a public meeting to accept the Project, unless the Engineer is authorized to accept

the Project, in which case the Project will be considered accepted upon the date of the Engineer's issuance of a written notice of acceptance. In order to avoid delay of Project close out, the City may elect, acting in its sole discretion, to accept the Project as complete subject to exceptions for punch list items that are not completed within the time specified in the punch list.

(D) **Final Payment and Release of Retention.** Final Payment and release of retention, less any sums withheld pursuant to the provisions of the Contract Documents, will not be made sooner than 35 days after recordation of the notice of completion. If Contractor fails to complete all of the punch list items within the specified time, City may withhold up to 150% of City's estimated cost to complete each of the remaining items from Final Payment and may use the withheld retention to pay for the costs to self-perform the outstanding items or to retain a third party to complete any such outstanding punch list item.

11.2 Warranty.

(A) **General.** Contractor warrants that all materials and equipment will be new unless otherwise specified, of good quality, in conformance with the Contract Documents, and free from defective workmanship and materials. Contractor further warrants that the Work will be free from material defects not intrinsic in the design or materials required in the Contract Documents. Contractor warrants that materials or items incorporated into the Work comply with the requirements and standards in the Contract Documents, including compliance with Laws, and that any Hazardous Materials encountered or used were handled as required by Laws. At City's request, Contractor must furnish satisfactory evidence of the quality and type of materials and equipment furnished. Contractor's warranty does not extend to damage caused by normal wear and tear, or improper use or maintenance.

(B) **Warranty Period.** Contractor's warranty must guarantee its Work for a period of one year from the date of Project acceptance (the "Warranty Period"), except when a longer guarantee is provided by a supplier or manufacturer or is required by the Specifications or Special Conditions. Contractor must obtain from its Subcontractors, suppliers and manufacturers any special or extended warranties required by the Contract Documents.

(C) **Warranty Documents.** As a condition precedent to Final Completion, Contractor must supply City with all warranty and guarantee documents relevant to equipment and materials incorporated into the Work and guaranteed by their suppliers or manufacturers.

(D) **Subcontractors.** The warranty obligations in the Contract Documents apply to Work performed by Contractor and its Subcontractors, and Contractor agrees to be co-guarantor of such Work.

(E) **Contractor's Obligations.** Upon written notice from City to Contractor of any defect in the Work discovered during the Warranty Period, Contractor or its responsible Subcontractor must promptly correct the defective Work at its own cost. Contractor's obligation to correct defects discovered during the Warranty Period will continue past the expiration of the Warranty Period as to any defects in Work for which Contractor was notified prior to expiration of the Warranty Period. Work performed during the Warranty Period ("Warranty Work") will be subject to the warranty provisions in this Section 11.2 for a one-year period that begins upon completion of such Warranty Work to City's satisfaction.

(F) **City's Remedies.** If Contractor or its responsible Subcontractor fails to correct defective Work within ten days following notice by City, or sooner if required by the circumstances, City may correct the defects to conform with the Contract Documents at Contractor's sole expense. Contractor must reimburse City for its costs in accordance with subsection (H), below.

(G) **Emergency Repairs.** In cases of emergency where any delay in correcting defective Work could cause harm, loss or damage, City may immediately correct the defects to conform with the Contract Documents at Contractor's sole expense. Contractor or its surety must reimburse City for its costs in accordance with subsection (H), below.

(H) **Reimbursement.** Contractor must reimburse City for its costs to repair under subsections (F) or (G), above, within 30 days following City's submission of a demand for payment pursuant to this provision. If City is required to initiate legal action to compel Contractor's compliance with this provision, and City is the prevailing party in such action, Contractor and its surety are solely responsible for all of City's attorney's fees and legal costs expended to enforce Contractor's warranty obligations herein, in addition to any and all costs City incurs to correct the defective Work.

11.3 Use Prior to Final Completion. City reserves the right to occupy or make use of the Project, or any portions of the Project, prior to Final Completion if City has determined that the Project or portion of it is in a condition suitable for the proposed occupation or use, and that it is in its best interest to occupy or make use of the Project, or any portions of it, prior to Final Completion.

(A) **Non-Waiver.** Occupation or use of the Project, in whole or in part, prior to Final Completion will not operate as acceptance of the Work or any portion of it, nor will it operate as a waiver of any of City's rights or Contractor's duties pursuant to these Contract Documents, and will not affect nor bear on the determination of the time of substantial completion with respect to any statute of repose pertaining to the time for filing an action for construction defect.

(B) **City's Responsibility.** City will be responsible for the cost of maintenance and repairs due to normal wear and tear with respect to those portions of the Project that are being occupied or used before Final Completion. The Contract Price or the Contract Time may be adjusted pursuant to the applicable provisions of these Contract Documents if, and only to the extent that, any occupation or use under this Section actually adds to Contractor's cost or time to complete the Work within the Contract Time.

11.4 Substantial Completion. For purposes of determining "substantial completion" with respect to any statute of repose pertaining to the time for filing an action for construction defect, "substantial completion" is deemed to mean the last date that Contractor or any Subcontractor performs Work on the Project prior to City acceptance of the Project, except for warranty work performed under this Article.

Article 12 - Dispute Resolution

12.1 Claims. This Article applies to and provides the exclusive procedures for any Claim arising from or related to the Contract or performance of the Work.

(A) **Definition.** "Claim" means a separate demand by Contractor, submitted in writing by registered or certified mail with return receipt requested, for a change in the Contract Time, including a time extension or relief from liquidated damages, or a change in the Contract Price, when the demand has previously been submitted to City in accordance with the requirements of the Contract Documents, and which has been

rejected or disputed by City, in whole or in part. A Claim may also include that portion of a unilateral Change Order that is disputed by the Contractor.

(B) **Limitations.** A Claim may only include the portion of a previously rejected demand that remains in dispute between Contractor and City. With the exception of any dispute regarding the amount of money actually paid to Contractor as Final Payment, Contractor is not entitled to submit a Claim demanding a change in the Contract Time or the Contract Price, which has not previously been submitted to City in full compliance with Article 5 and Article 6, and subsequently rejected in whole or in part by City.

(C) **Scope of Article.** This Article is intended to provide the exclusive procedures for submission and resolution of Claims of any amount and applies in addition to the provisions of Public Contract Code § 9204 and § 20104 et seq., which are incorporated by reference herein.

(D) **No Work Delay.** Notwithstanding the submission of a Claim or any other dispute between the parties related to the Project or the Contract Documents, Contractor must perform the Work and may not delay or cease Work pending resolution of a Claim or other dispute, but must continue to diligently prosecute the performance and timely completion of the Work, including the Work pertaining to the Claim or other dispute.

(E) **Informal Resolution.** Contractor will make a good faith effort to informally resolve a dispute before initiating a Claim, preferably by face-to-face meeting between authorized representatives of Contractor and City.

12.2 Claims Submission. The following requirements apply to any Claim subject to this Article:

(A) **Substantiation.** The Claim must be submitted to City in writing, clearly identified as a "Claim" submitted pursuant to this Article 12 and must include all of the documents necessary to substantiate the Claim including the Change Order request that was rejected in whole or in part, and a copy of City's written rejection that is in dispute. The Claim must clearly identify and describe the dispute, including relevant references to applicable portions of the Contract Documents, and a chronology of relevant events. Any Claim for additional payment must include a complete, itemized breakdown of all known or estimated labor, materials, taxes, insurance, and subcontract, or other costs. Substantiating documentation such as payroll records, receipts, invoices, or the like, must be submitted in support of each component of claimed cost. Any Claim for an extension of time or delay costs must be substantiated with a schedule analysis and narrative depicting and explaining claimed time impacts.

(B) **Claim Format and Content.** A Claim must be submitted in the following format:

(1) Provide a cover letter, specifically identifying the submission as a "Claim" submitted under this Article 12 and specifying the requested remedy (e.g., amount of proposed change to Contract Price and/or change to Contract Time).

(2) Provide a summary of each Claim, including underlying facts and the basis for entitlement, and identify each specific demand at issue, including the specific Change Order request (by number and submittal date), and the date of City's rejection of that demand, in whole or in part.

(3) Provide a detailed explanation of each issue in dispute. For multiple issues included within a single Claim or for multiple Claims submitted concurrently, separately number and identify each individual issue or Claim, and include the following for each separate issue or Claim:

- a. A succinct statement of the matter in dispute, including Contractor's position and the basis for that position;
- b. Identify and attach all documents that substantiate the Claim, including relevant provisions of the Contract Documents, RFIs, calculations, and schedule analysis (see subsection (A), Substantiation, above);
- c. A chronology of relevant events; and
- d. Analysis and basis for claimed changes to Contract Price, Contract Time, or any other remedy requested.

(4) Provide a summary of issues and corresponding claimed damages. If, by the time of the Claim submission deadline (below), the precise amount of the requested change in the Contract Price or Contract Time is not yet known, Contractor must provide a good faith estimate, including the basis for that estimate, and must identify the date by which it is anticipated that the Claim will be updated to provide final amounts.

(5) Include the following certification, executed by Contractor's authorized representative:

"The undersigned Contractor certifies under penalty of perjury that its statements and representations in this Claim submittal are true and correct. Contractor warrants that this Claim submittal is comprehensive and complete as to the matters in dispute, and agrees that any costs, expenses, or delay not included herein are deemed waived."

(C) ***Submission Deadlines.***

(1) A Claim disputing rejection of a request for a change in the Contract Time or Contract Price must be submitted within 15 days following the date that City notified Contractor in writing that a request for a change in the Contract Time or Contract Price, duly submitted in compliance with Article 5 and Article 6, has been rejected in whole or in part. A Claim disputing the terms of a unilateral Change Order must be submitted within 15 days following the date of issuance of the unilateral Change Order. These Claim deadlines apply even if Contractor cannot yet quantify the total amount of any requested change in the Contract Time or Contract Price. If the Contractor cannot quantify those amounts, it must submit an estimate of the amounts claimed pending final determination of the requested remedy by Contractor.

(2) With the exception of any dispute regarding the amount of Final Payment, any Claim must be filed on or before the date of Final Payment or will be deemed waived.

(3) A Claim disputing the amount of Final Payment must be submitted within 15 days of the effective date of Final Payment, under Section 8.7, Final Payment.

(4) Strict compliance with these Claim submission deadlines is necessary to ensure that any dispute may be mitigated as soon as possible, and to facilitate cost-efficient administration of the Project. ***Any Claim that is not submitted within the specified deadlines will be deemed waived by Contractor.***

12.3 City's Response. City will respond within 45 days of receipt of the Claim with a written statement identifying which portion(s) of the Claim are disputed, unless the 45-day period is extended by mutual agreement of City and Contractor or as otherwise allowed under Public Contract Code § 9204. However, if City determines that the Claim is not adequately substantiated pursuant to Section 12.2(A), Substantiation, City may first request in writing, within 30 days of receipt of the Claim, any additional documentation supporting the Claim or relating to defenses to the Claim that City may have against the Claim.

(A) **Additional Information.** If additional information is thereafter required, it may be requested and provided upon mutual agreement of City and Contractor. If Contractor's Claim is based on estimated amounts, Contractor has a continuing duty to update its Claim as soon as possible with information on actual amounts in order to facilitate prompt and fair resolution of the Claim.

(B) **Non-Waiver.** Any failure by City to respond within the times specified above will not be construed as acceptance of the Claim, in whole or in part, or as a waiver of any provision of these Contract Documents.

12.4 Meet and Confer. If Contractor disputes City's written response, or City fails to respond within the specified time, within 15 days of receipt of City's response or within 15 days of City's failure to respond within the applicable 45-day time period under Section 12.3, respectively, Contractor may notify City of the dispute in writing sent by registered or certified mail, return receipt requested, and demand an informal conference to meet and confer for settlement of the issues in dispute. If Contractor fails to notify City of the dispute and demand an informal conference to meet and confer in writing within the specified time, Contractor's Claim will be deemed waived.

(A) **Schedule Meet and Confer.** Upon receipt of the demand to meet and confer, City will schedule the meet and confer conference to be held within 30 days, or later if needed to ensure the mutual availability of each of the individuals that each party requires to represent its interests at the meet and confer conference.

(B) **Location for Meet and Confer.** The meet and confer conference will be scheduled at a location at or near City's principal office.

(C) **Written Statement After Meet and Confer.** Within ten working days after the meet and confer has concluded, City will issue a written statement identifying which portion(s) of the Claim remain in dispute, if any.

(D) **Submission to Mediation.** If the Claim or any portion remains in dispute following the meet and confer conference, within ten working days after the City issues the written statement identifying any portion(s) of the Claim remaining in dispute, the Contractor may identify in writing disputed portion(s) of the Claim, which will be submitted for mediation, as set forth below.

12.5 Mediation and Government Code Claims.

(A) **Mediation.** Within ten working days after the City issues the written statement identifying any portion(s) of the Claim remaining in dispute following the meet and confer, City and Contractor will mutually agree to a mediator, as provided under Public Contract Code § 9204. Mediation will be scheduled to ensure the mutual availability of the selected mediator and all of the individuals that each party requires to represent its interests. If there are multiple Claims in dispute, the parties may agree to schedule the mediation to address all outstanding Claims at the same time. The parties will share the costs of the mediator and mediation fees equally, but each party is otherwise solely and separately

responsible for its own costs to prepare for and participate in the mediation, including costs for its legal counsel or any other consultants.

(B) **Government Code Claims.**

(1) Timely presentation of a Government Code Claim is a condition precedent to filing any legal action based on or arising from the Contract. Compliance with the Claim submission requirements in this Article 12 is a condition precedent to filing a Government Code Claim.

(2) The time for filing a Government Code Claim will be tolled from the time Contractor submits its written Claim pursuant to Section 12.2, above, until the time that Claim is denied in whole or in part at the conclusion of the meet and confer process, including any period of time used by the meet and confer process. However, if the Claim is submitted to mediation, the time for filing a Government Code Claim will be tolled until conclusion of the mediation, including any continuations, if the Claim is not fully resolved by mutual agreement of the parties during the mediation or any continuation of the mediation.

- 12.6 Tort Claims.** This Article does not apply to tort claims and nothing in this Article is intended nor will be construed to change the time periods for filing tort-based Government Code Claims.
- 12.7 Arbitration.** It is expressly agreed, under Code of Civil Procedure § 1296, that in any arbitration to resolve a dispute relating to this Contract, the arbitrator's award must be supported by law and substantial evidence.
- 12.8 Burden of Proof and Limitations.** Contractor bears the burden of proving entitlement to and the amount of any claimed damages. Contractor is not entitled to damages calculated on a total cost basis, but must prove actual damages. Contractor is not entitled to speculative, special, or consequential damages, including home office overhead or any form of overhead not directly incurred at the Project site or any other Worksite; lost profits; loss of productivity; lost opportunity to work on other projects; diminished bonding capacity; increased cost of financing for the Project; extended capital costs; non-availability of labor, material or equipment due to delays; or any other indirect loss arising from the Contract. The Eichleay Formula or similar formula will not be used for any recovery under the Contract. The City will not be directly liable to any Subcontractor or supplier.
- 12.9 Legal Proceedings.** In any legal proceeding that involves enforcement of any requirements of the Contract Documents, the finder of fact will receive detailed instructions on the meaning and operation of the Contract Documents, including conditions, limitations of liability, remedies, claim procedures, and other provisions bearing on the defenses and theories of liability. Detailed findings of fact will be requested to verify enforcement of the Contract Documents. All of the City's remedies under the Contract Documents will be construed as cumulative, and not exclusive, and the City reserves all rights to all remedies available under law or equity as to any dispute arising from or relating to the Contract Documents or performance of the Work.
- 12.10 Other Disputes.** The procedures in this Article 12 will apply to any and all disputes or legal actions, in addition to Claims, arising from or related to this Contract, including disputes regarding suspension or early termination of the Contract, unless and only to the extent that compliance with a procedural requirement is expressly and specifically waived by City. Nothing in this Article is intended to delay suspension or termination under Article 13.

Article 13 - Suspension and Termination

13.1 Suspension for Cause. In addition to all other remedies available to City, if Contractor fails to perform or correct Work in accordance with the Contract Documents, including non-compliance with applicable environmental or health and safety Laws, City may immediately order the Work, or any portion of it, suspended until the circumstances giving rise to the suspension have been eliminated to City's satisfaction.

(A) **Notice of Suspension.** Upon receipt of City's written notice to suspend the Work, in whole or in part, except as otherwise specified in the notice of suspension, Contractor and its Subcontractors must promptly stop Work as specified in the notice of suspension; comply with directions for cleaning and securing the Worksite; and protect the completed and in-progress Work and materials. Contractor is solely responsible for any damages or loss resulting from its failure to adequately secure and protect the Project.

(B) **Resumption of Work.** Upon receipt of the City's written notice to resume the suspended Work, in whole or in part, except as otherwise specified in the notice to resume, Contractor and its Subcontractors must promptly re-mobilize and resume the Work as specified; and within ten days from the date of the notice to resume, Contractor must submit a recovery schedule, prepared in accordance with the Contract Documents, showing how Contractor will complete the Work within the Contract Time.

(C) **Failure to Comply.** Contractor will not be entitled to an increase in the Contract Time or Contract Price for a suspension occasioned by Contractor's failure to comply with the Contract Documents.

(D) **No Duty to Suspend.** City's right to suspend the Work will not give rise to a duty to suspend the Work, and City's failure to suspend the Work will not constitute a defense to Contractor's failure to comply with the requirements of the Contract Documents.

13.2 Suspension for Convenience. City reserves the right to suspend, delay, or interrupt the performance of the Work in whole or in part, for a period of time determined to be appropriate for City's convenience. Upon notice by City pursuant to this provision, Contractor must immediately suspend, delay, or interrupt the Work and secure the Project site as directed by City except for taking measures to protect completed or in-progress Work as directed in the suspension notice, and subject to the provisions of Section 13.1(A) and (B), above. If Contractor submits a timely request for a Change Order in compliance with Articles 5 and 6, the Contract Price and the Contract Time will be equitably adjusted by Change Order pursuant to the terms of Articles 5 and 6 to reflect the cost and delay impact occasioned by such suspension for convenience, except to the extent that any such impacts were caused by Contractor's failure to comply with the Contract Documents or the terms of the suspension notice or notice to resume. However, the Contract Time will only be extended if the suspension causes or will cause unavoidable delay in Final Completion. If Contractor disputes the terms of a Change Order issued for such equitable adjustment due to suspension for convenience, its sole recourse is to comply with the Claim procedures in Article 12.

13.3 Termination for Default. City may declare that Contractor is in default of the Contract for a material breach of or inability to fully, promptly, or satisfactorily perform its obligations under the Contract.

(A) **Default.** Events giving rise to a declaration of default include Contractor's refusal or failure to supply sufficient skilled workers, proper materials, or equipment to perform the Work within the Contract Time; Contractor's refusal or failure to make prompt

payment to its employees, Subcontractors, or suppliers or to correct defective Work or damage; Contractor's failure to comply with Laws, or orders of any public agency with jurisdiction over the Project; evidence of Contractor's bankruptcy, insolvency, or lack of financial capacity to complete the Work as required within the Contract Time; suspension, revocation, or expiration and nonrenewal of Contractor's license or DIR registration; dissolution, liquidation, reorganization, or other major change in Contractor's organization, ownership, structure, or existence as a business entity; unauthorized assignment of Contractor's rights or duties under the Contract; or any material breach of the Contract requirements.

(B) **Notice of Default and Opportunity to Cure.** Upon City's declaration that Contractor is in default due to a material breach of the Contract Documents, if City determines that the default is curable, City will afford Contractor the opportunity to cure the default within ten days of City's notice of default, or within a period of time reasonably necessary for such cure, including a shorter period of time if applicable.

(C) **Termination.** If Contractor fails to cure the default or fails to expediently take steps reasonably calculated to cure the default within the time period specified in the notice of default, City may issue written notice to Contractor and its performance bond surety of City's termination of the Contract for default.

(D) **Waiver.** Time being of the essence in the performance of the Work, if Contractor's surety fails to arrange for completion of the Work in accordance with the Performance Bond within seven calendar days from the date of the notice of termination pursuant to paragraph (C), City may immediately make arrangements for the completion of the Work through use of its own forces, by hiring a replacement contractor, or by any other means that City determines advisable under the circumstances. Contractor and its surety will be jointly and severally liable for any additional cost incurred by City to complete the Work following termination, where "additional cost" means all cost in excess of the cost City would have incurred if Contractor had timely completed Work without the default and termination. In addition, City will have the right to immediate possession and use of any materials, supplies, and equipment procured for the Project and located at the Project site or any Worksite on City property for the purposes of completing the remaining Work.

(E) **Compensation.** Within 30 days of receipt of updated as-builts, all warranties, manuals, instructions, or other required documents for Work installed to date, and delivery to City of all equipment and materials for the Project for which Contractor has already been compensated, Contractor will be compensated for the Work satisfactorily performed in compliance with the Contract Documents up to the effective date of the termination pursuant to the terms of Article 8, Payment, subject to City's rights to withhold or deduct sums from payment otherwise due pursuant to Section 8.3, and excluding any costs Contractor incurs as a result of the termination, including any cancellation or restocking charges or fees due to third parties. If Contractor disputes the amount of compensation determined by City, its sole recourse is to comply with the Claim Procedures in Article 12, by submitting a Claim no later than 30 days following notice from City of the total compensation to be paid by City.

(F) **Wrongful Termination.** If Contractor disputes the termination, its sole recourse is to comply with the Claim procedures in Article 12. If a court of competent jurisdiction or an arbitrator later determines that the termination for default was wrongful, the termination will be deemed to be a termination for convenience, and Contractor's damages will be strictly limited to the compensation provided for termination for convenience under Section 13.4, below. Contractor waives any claim for any other damages for wrongful termination including special or consequential damages, lost

opportunity costs, or lost profits, and any award of damages is subject to Section 12.8, Burden of Proof and Limitations.

13.4 Termination for Convenience. City reserves the right, acting in its sole discretion, to terminate all or part of the Contract for convenience upon written notice to Contractor.

(A) **Compensation to Contractor.** In the event of City's termination for convenience, Contractor waives any claim for damages, including for loss of anticipated profits from the Project. The following will constitute full and fair compensation to Contractor, and Contractor will not be entitled to any additional claim or compensation:

(1) **Completed Work.** The value of its Work satisfactorily performed as of the date notice of termination is received, based on Contractor's schedule of values and unpaid costs for items delivered to the Project site that were fabricated for incorporation in the Work;

(2) **Demobilization.** Demobilization costs specified in the schedule of values, or if demobilization costs were not provided in a schedule of values pursuant to Section 8.1, then based on actual, reasonable, and fully documented demobilization costs; and

(3) **Termination Markup.** Five percent of the total value of the Work performed as of the date of notice of termination, including reasonable, actual, and documented costs to comply with the direction in the notice of termination for convenience, and demobilization costs, which is deemed to cover all overhead and profit to date.

(B) **Disputes.** If Contractor disputes the amount of compensation determined by City pursuant to paragraph (A), above, its sole recourse is to comply with the Claim procedures in Article 12, by submitting a Claim no later than 30 days following notice from City of total compensation to be paid by City.

13.5 Actions Upon Termination for Default or Convenience. The following provisions apply to any termination under this Article, whether for default or convenience, and whether in whole or in part.

(A) **General.** Upon termination, City may immediately enter upon and take possession of the Project and the Work and all tools, equipment, appliances, materials, and supplies procured or fabricated for the Project. Contractor will transfer title to and deliver all completed Work and all Work in progress to City.

(B) **Submittals.** Unless otherwise specified in the notice of termination, Contractor must immediately submit to City all designs, drawings, as-built drawings, Project records, contracts with vendors and Subcontractors, manufacturer warranties, manuals, and other such submittals or Work-related documents required under the terms of the Contract Documents, including incomplete documents or drafts.

(C) **Close Out Requirements.** Except as otherwise specified in the notice of termination, Contractor must comply with all of the following:

(1) Immediately stop the Work, except for any Work that must be completed pursuant to the notice of termination and comply with City's instructions for cessation of labor and securing the Project and any other Worksite(s).

(2) Comply with City's instructions to protect the completed Work and materials, using best efforts to minimize further costs.

(3) Contractor must not place further orders or enter into new subcontracts for materials, equipment, services or facilities, except as may be necessary to complete any portion of the Work that is not terminated.

(4) As directed in the notice, Contractor must assign to City or cancel existing subcontracts that relate to performance of the terminated Work, subject to any prior rights, if any, of the surety for Contractor's performance bond, and settle all outstanding liabilities and claims, subject to City's approval.

(5) As directed in the notice, Contractor must use its best efforts to sell any materials, supplies, or equipment intended solely for the terminated Work in a manner and at market rate prices acceptable to City.

(D) **Payment Upon Termination.** Upon completion of all termination obligations, as specified herein and in the notice of termination, Contractor will submit its request for Final Payment, including any amounts due following termination pursuant to this Article 13. Payment will be made in accordance with the provisions of Article 8, based on the portion of the Work satisfactorily completed, including the close out requirements, and consistent with the previously submitted schedule of values and unit pricing, including demobilization costs. Adjustments to Final Payment may include deductions for the cost of materials, supplies, or equipment retained by Contractor; payments received for sale of any such materials, supplies, or equipment, less re-stocking fees charged; and as otherwise specified in Section 8.3, Adjustment of Payment Application.

(E) **Continuing Obligations.** Regardless of any Contract termination, Contractor's obligations for portions of the Work already performed will continue and the provisions of the Contract Documents will remain in effect as to any claim, indemnity obligation, warranties, guarantees, submittals of as-built drawings, instructions, or manuals, record maintenance, or other such rights and obligations arising prior to the termination date.

Article 14 - Miscellaneous Provisions

- 14.1 Assignment of Unfair Business Practice Claims.** Under Public Contract Code § 7103.5, Contractor and its Subcontractors agree to assign to City all rights, title, and interest in and to all causes of action it may have under section 4 of the Clayton Act (15 U.S.C. § 15) or under the Cartwright Act (Chapter 2 (commencing with § 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the Contract or any subcontract. This assignment will be effective at the time City tenders Final Payment to Contractor, without further acknowledgement by the parties.
- 14.2 Provisions Deemed Inserted.** Every provision of law required to be inserted in the Contract Documents is deemed to be inserted, and the Contract Documents will be construed and enforced as though such provision has been included. If it is discovered that through mistake or otherwise that any required provision was not inserted, or not correctly inserted, the Contract Documents will be deemed amended accordingly.
- 14.3 Waiver.** City's waiver of a breach, failure of any condition, or any right or remedy contained in or granted by the provisions of the Contract Documents will not be effective unless it is in writing and signed by City. City's waiver of any breach, failure, right, or remedy will not be deemed a waiver of any other breach, failure, right, or remedy, whether or not similar, nor will any waiver constitute a continuing waiver unless specified in writing by City.

- 14.4 Titles, Headings, and Groupings.** The titles and headings used and the groupings of provisions in the Contract Documents are for convenience only and may not be used in the construction or interpretation of the Contract Documents or relied upon for any other purpose.
- 14.5 Statutory and Regulatory References.** With respect to any amendments to any statutes or regulations referenced in these Contract Documents, the reference is deemed to be the version in effect on the date that bids were due.
- 14.6 Survival.** The provisions that survive termination or expiration of this Contract include Contract Section 11, Notice, and subsections 12.1, 12.2, 12.3, 12.4, 12.5, and 12.6, of Section 12, General Provisions; and the following provisions in these General Conditions: Section 2.2(J), Contractor's Records, Section 2.3(C), Termination, Section 3.7, Ownership, Section 4.2, Indemnity, Article 12, Dispute Resolution, and Section 11.2, Warranty.

END OF GENERAL CONDITIONS

Special Conditions

15. Authorized Work Days and Hours.

- 15.1 **Authorized Work Days.** Except as expressly authorized in writing by City, Contractor is limited to performing Work on the Project on the following days of the week, excluding holidays observed by City: Monday through Friday.
- 15.2 **Authorized Work Hours.** Except as expressly authorized in writing by City, Contractor is limited to performing Work on the Project during the following hours: 7 AM to 5 PM.
- 15.3 **Work on Premises.** No work shall be performed until all the equipment and material has been sourced and received in good conditions by the contractor. Only upon submittal of proof of this requirement, the Contractor will be allowed access to the work areas.

16. **Pre-Construction Conference.** City will designate a date and time for a pre-construction conference with Contractor following Contract execution. Project administration procedures and coordination between City and Contractor will be discussed, and Contractor must present City with the following information or documents at the meeting for City's review and acceptance before the Work commences:

- 16.1 Name, 24-hour contact information, and qualifications of the proposed on-site superintendent;
- 16.2 List of all key Project personnel and their complete contact information, including email addresses and telephone numbers during regular hours and after hours;
- 16.3 Staging plans that identify the sequence of the Work, including any phases and alternative sequences or phases, with the goal of minimizing the impacts on operations of the City Council meetings.
- 16.4 Draft baseline schedule for the Work as required under Section 5.2, to be finalized within ten days after City issues the Notice to Proceed;
- 16.5 Breakdown of lump sum bid items, to be used for determining the value of Work completed for future progress payments to Contractor;
- 16.6 Schedule with list of Project submittals that require City review, and list of the proposed material suppliers;
- 16.7 Plan for coordination with affected utility owner(s) and compliance with any related permit requirements;
- 16.8 Videotape and photographs recording the conditions throughout the pre-construction Project site, showing the existing improvements and current conditions.

- 16.9 If requested by City, Contractor's cash flow projections; and
- 16.10 Any other documents specified in the Special Conditions or Notice of Potential Award.

17. Value Engineering. The Contractor may be entitled to additional compensation for cost reduction changes made pursuant to a value engineering proposal submitted by the Contractor, subject to the limitations of Public Contract Code § 7107, and in strict compliance with this Section. Contractor will not be entitled to any such additional compensation unless all of the following requirements have been met:

- 17.1 The Contractor must submit a written proposal for changes to the Plans or Specifications for the Project, in which it:
 - (A) Identifies the written proposal as a proposal for cost reduction changes with reference to this section;
 - (B) Clearly and specifically identifies the proposed cost reduction changes by describing in detail each of the changes proposed with specific references to each of the Specifications and Plans involved in the proposed changes, and providing proposed revised Specifications and Plans as applicable; and
 - (C) Estimates the net amount of the cost reduction and provides the basis for that estimate.
- 17.2 The proposed changes have been identified and developed solely by the Contractor, and not, in whole or in part, by the City.
- 17.3 The City accepts the proposed changes in whole or in part in a writing signed by the Engineer. The Contractor will only be entitled to additional compensation for those changes specifically accepted by the City. The Engineer will determine the net savings in construction costs from any such changes that are both accepted and implemented by the City. Contractor will not be entitled to more than 50% of the net savings as determined by the Engineer, acting in his or her sole discretion.

18. Support Services During Warranty Period. The Contractor shall provide the following additional support services during the one-year warranty period:

- 18.1 1 hour phone response from 8 AM until 8 PM during normal business days.
- 18.2 Options for EMERGENCY response to City Council Chamber on Monday and Tuesday evenings from 5 PM – 8 PM within 30 minutes of verifying issue cannot be resolved remotely.
- 18.3 Regular inspections of system to ensure latest firmware/software updates are completed in a timely manner and testing of all equipment to ensure in proper working condition.

- 18.4** Provide training to the users of the upgraded broadcast system as well as detailed technical training to the City's Information Technology Dept. staff.

END OF SPECIAL CONDITION

SECTION 01 10 00 – SUMMARY**PART 1 - GENERAL****1.1 SUMMARY**

- A. This section describes the contract and other work, plus project requirements.
- B. Related Sections:
 - 1. Division 00 – General Conditions.

1.2 CONTRACT DESCRIPTION

- A. Contract: Perform Work of Contract under stipulated sum contract with City per Contract Documents.
- B. Responsible Parties: Construction of the Project is governed by the agreement between the City and the Contractor. Statements in the specifications are directed to this contractor, who has overall responsibility for the subcontractors.
- C. Project Manager: The City will provide a Project Manager who will administer the project during the contract.

1.3 WORK UNDER OTHER CONTRACTS

- A. Separate Contracts: The City may award separate contracts for performance of certain construction operations at the site. Those operations will be conducted simultaneously with the work under the Contract. The Contracts are described in Division 00 Article 2 Section 2.4 – Coordination of Work.

1.4 SCHEDULE OF VALUES

- A. Schedule of Values: The Schedule of Values and Bid Schedule are described in Article 8 of General Conditions – Payment. Any bid item may be deleted in total or in part prior to or after award of Contract without compensation in any form or adjustment of other bid items or prices, therefore.

1.5 MISCELLANEOUS WORK

- A. Miscellaneous Work Requirements: Coordinating, handling, transporting, and installing items such as field testing of systems; leveling; furnishing, coordinating, and installing sleeves, anchors, and other embedded items; posting of signs; performing traffic routing work; providing operating and maintenance data and instruction of the City Project Manager; performing warranty work as required; and doing incidental and related work to place all systems and structures in operating condition as designed and as required by Federal, State and Local

codes and regulations. Refer to Division 00 – General Conditions for a summary of work requirements.

1.6 OWNER-FURNISHED PRODUCTS

A. Owner's Responsibilities:

1. Arrange for and deliver Owner-reviewed Shop Drawings, Product Data, and Samples to Contractor.
2. Upon delivery, inspect products jointly with Contractor.
3. Submit claims for transportation damage and replace damaged, defective, or deficient items.
4. Arrange for manufacturers' warranties, inspections, and service.

B. Contractor's Responsibilities:

1. Review Owner-reviewed Shop Drawings, Product Data, and Samples.
2. Receive and unload products at Site; inspect for completeness or damage jointly with Owner.
3. Arrange and pay for delivery to Site. Retrieve items from City Corporation Yard or other designated location, as required, and transport to site. Transport salvaged items to City Corporation Yard.
4. Handle, store, install, and finish products.
5. Repair or replace items damaged after receipt.

1.7 WORK SEQUENCE

- ### A. Stages: Construct Work in stages and at times to accommodate City operation requirements during the construction period; coordinate construction schedule and operations with Project Manager.

1.8 COOPERATION OF CONTRACTOR AND COORDINATION WITH OTHER WORK

- ### A. Coordination: Coordinate with City and any City forces, or other contractors and forces, as required by General Conditions' Article 2, Section 2.4 – Coordination of Work.

1.9 CONTRACTOR USE OF PREMISES

- ### A. General: During the construction period the Contractor shall have full use of the premises within the "limits of work" for construction operations, including use of the site. The Contractor's use of the premises is limited only by the City's right to perform work or to retain other contractors on portions of the Project.

B. Use of the Site:

1. **Stored Materials:** The Contractor assumes all responsibility for protection and safekeeping of material stored on the premises. Moving stored materials which interfere with the operations of the City or other contractors is the responsibility of the Contractor.

2. Condition of Site: Maintain work areas in a safe condition at all times, remove all graffiti and accumulated rubbish and surplus materials at the end of each work day, and clean and restore the work site at completion of the work to the condition that existed prior to the start of work.

C. Security of the Contractor's Work Area: The security of the Contractor's work areas and its property, equipment, construction materials, and all other items contained in the Contractor's staging areas or elsewhere on the construction site shall be solely the Contractor's responsibility at all times.

1.10 MAINTENANCE

A. Contractor's Responsibility: Cost of maintenance of systems and equipment prior to Final Acceptance will be considered as included in prices bid and no direct or additional payment will be made therefore.

1.11 OCCUPANCY REQUIREMENTS

A. Early Occupancy: Whenever, in the opinion of Project Manager, Work or any part thereof is in a condition suitable for use, and the best interest of City requires such use, City may take beneficial occupancy of and connect to, open for public use, or use the Work or such part thereof. In such case, City will inspect the Work or part thereof, and issue a Certificate of Substantial Completion for that part of Work.

B. Repairs: Prior to date of Final Acceptance of the Work by City, all necessary repairs or renewals in Work or part thereof so used, not due to ordinary wear and tear, but due to defective materials or workmanship or to operations of Contractor, shall be made at expense of Contractor, as required in Division 00 Article 11 – Completion and Warranty Provisions.

C. Acceptance: Use by City of Work or part thereof as contemplated by this section shall in no case be construed as constituting acceptance of Work or any part thereof. Such use shall neither relieve Contractor of any responsibilities under Contract, nor act as waiver by City of any of the conditions thereof.

D. Partial Completion: City may specify in the Contract Documents that portions of the Work, including electrical and mechanical systems or separate structures, shall be substantially completed on milestone dates prior to substantial completion of all of the Work. Contractor shall notify Project Manager in writing when Contractor considers any such part of the Work ready for its intended use and substantially complete and request Project Manager to issue a Certificate of Substantial Completion for that part of the Work.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 01 10 00

SECTION 01 22 00 –UNIT PRICES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies procedures and requirements for measurement and payment for unit price items listed on the Bid Form for each unit of work described herein.
- B. Refer to the Instruction to Bidders and General Conditions and Article 8 – Payment for related requirements pertaining to change orders, payments and unit prices.
- C. Prices:
 - 1. In addition to Base Bid, Bidder shall quote unit prices, in appropriate spaces on Bid Form for each unit of work as described herein. Change Orders will be based on unit prices quoted on Bid Form for applicable work.
 - 2. In event any unit price quoted appears to compare unfavorably with currently established prices for type of work, City reserves the right to require quoted price to be substantiated or adjusted prior to execution of contract.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.1 MEASUREMENT

- A. Measurement of quantities for payment will be made or determined by City's Inspector.
 - 1. Delivery and installation of any equipment shall be based on information included with Drawings and additional measurements obtained by Inspector, or by combination of such information, or in a manner which, in the opinion of the Inspector, is best suited to obtain necessary accuracy.
 - 2. Equipment delivered to the site, but not incorporated in the work, will not be paid for.

3.2 UNIT PRICE ITEMS

Bid Item No. 1: Furnish and Install Complete Audiovisual and Electrical Upgrade of City Council Chambers

1. Basis of Measurement: By Lump Sum as specified in the bid form.
2. Breakdown of Lump Sum: Per section 16.5 of Special Conditions, the Contractor shall provide the City a breakdown of the lump sum bid item at the Pre-Construction Conference.
3. Basis of Payment: Includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals. Payment will be made for actual quantity of work performed at contract unit price, as directed, and accepted, in accordance with requirements of the General Conditions. Full compensation shall be considered included in this price paid for work involved and no additional compensation will be allowed, therefore.

END OF SECTION 01 22 00

SECTION 01 25 00 – SUBSTITUTION PROCEDURES**PART 1 - GENERAL****1.1 SUMMARY**

- A. This Section includes administrative and procedural requirements for handling requests for substitutions made after award of the Contract.
- B. Related Sections:
 - 1. [Notice Inviting Bidders](#)
 - 2. [Instructions to Bidders](#)
 - 3. [General Conditions Article 7.](#)

1.2 DEFINITIONS

- A. Definitions in this Article do not change or modify the meaning of other terms used in the Contract Documents.
- B. Substitutions: Changes in products, materials, equipment, and methods of construction required by the Contract Documents proposed by the Contractor after award of the Contract are considered to be requests for substitutions.
 - 1. Substitutions will not be considered during the Bid process.
 - 2. The following are not considered to be requests for substitution:
 - a. Revisions to the Contract Documents requested by the Owner or Architect/Engineer.
 - b. Specified options of products and construction methods included in the Contract Documents.
 - 3. The following are considered to be requests for substitution:
 - a. Any manufacturer, product, process, or method identified in the Special Conditions, specifications or on the Drawings as either “or equal” or “equal products of another manufacturer when approved in advance by the Architect/Engineer per this Section 01 25 00 – Substitution Procedures”.

1.3 SUBMITTALS

- A. Request for Substitution (RFS) Submittal:
 - 1. Receipt:
 - a. The Architect/Engineer will consider requests for substitution (RFS) if received within thirty-five (35) calendar days after the Notice to Proceed.
 - b. Requests received after thirty-five (35) calendar days after the Notice to Proceed may be considered or rejected at the discretion of the Project Manager and/or Architect/Engineer.

1. Submit three (3) copies of each request for substitution for consideration. Submit requests in the form and according to the procedures required in [General Conditions](#).
2. Identify the product or the fabrication or installation method to be replaced in each request. Include related Special Conditions, Specification Section and Drawing numbers.
3. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:
 - a. Coordination information, including a list of change or modifications needed to other parts of the Work and to construction performed by the Owner and separate contractors that will be necessary to accommodate the proposed substitution.
 - b. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements, such as performance, weight, size, durability, operations, maintenance, and visual effect.
 - c. Product Data, including Drawings and descriptions of products and fabrication and installation procedures.
 - d. Samples, where applicable or requested.
 - e. A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without the approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
 - f. Cost information, including a proposal of net change, if any, in the Contract Sum.
 - g. The Contractor's certification that the proposed substitution conforms to the requirements in the Contract Documents, in every respect and is appropriate for the applications indicated.
 - h. The Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the substitution to perform adequately.
4. Architect/Engineer Action: If necessary, the Architect/Engineer will request additional information or documentation for evaluation within fourteen (14) calendar days of receipt of a request for substitution. The Project Manager will route to the Contractor, the Architect/Engineer's acceptance or rejection of the substitution within fourteen (14) days of the receipt of the request, or receipt of addition information or documentation.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Conditions: The Architect/Engineer will receive and consider the Contractor's request for substitution when one or more of the following conditions are satisfied, as determined by the Architect/Engineer. If the following conditions are not

satisfied, the Architect/Engineer will return the requests without action except to record non-compliance with these requirements:

1. Extensive revisions to the Contract Documents are not required.
 2. Proposed changes are in keeping with the general intent of the Contract Documents.
 3. The request is timely, fully documented, and properly submitted.
 4. The request is directly related to an “or-equal” clause or similar language in the Contract Documents.
 5. The requested substitution offers the Owner a substantial advantage, in cost, time, energy conservation, maintainability, or other considerations, after deducting additional responsibilities the Owner must assume. The Owner’s additional responsibilities may include compensation to the Architect/Engineer for redesign and evaluation services, compensation to the Project Manager for additional management and coordination, increased cost of other construction by the Owner, and similar considerations.
 6. The specified product or method of construction cannot be provided in a manner that is compatible with other materials and where the Contractor certifies that the substitution will overcome the incompatibility.
 7. The specified product or method of construction cannot be coordinated with other materials and where the Contractor certifies that the proposed substitution can be coordinated.
 8. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provides the required warranty.
- B. The Contractor’s submittal and the Architect/Engineer acceptance of Shop Drawings, Product Data, or Samples for construction activities not complying with the Contract Documents do not constitute an acceptable or valid request for substitution, nor do they constitute approval.

PART 3 - EXECUTION

NOT USED

END OF SECTION 01 25 00

SECTION 01 26 00 – CONTRACT MODIFICATION PROCEDURES**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section describes general procedural requirements for alterations, modifications and extras.
- B. Related Sections:
 - 1. [General Conditions, Articles 5, 6, and 8](#)
 - 2. [Section 01 29 00 – Payment Procedures](#)

1.2 GENERAL

- A. Any change in scope of work or deviation from Drawings, Special Conditions, or Specifications shall be accomplished only when authorized in writing by Project Manager.
- B. Changes in scope of Work or deviation from Drawings, Special Conditions, or Specifications may be initiated only by Contractor or Project Manager.
 - 1. Contractor may initiate changes by submitting Requests for Interpretation (RFI), Requests for Substitution (RFS), Notice of Concealed or Unknown Conditions, or Notice of Hazardous Waste Conditions.
 - a. RFIs shall be submitted to seek clarification of Contract Documents in accordance with [Section 01 26 13 – Requests for Interpretation](#).
 - b. RFSs shall be submitted in accordance with [Section 01 25 00 – Substitution Procedures](#) to request substitution of materials or methods of execution.
 - c. Notices of Concealed or Unknown Conditions shall be submitted in accordance with [General Conditions](#).
 - d. Notices of Hazardous Waste Conditions shall be submitted in accordance with [General Conditions](#).
 - 2. Contractor shall be responsible for its costs to implement and administer RFIs and RFSs throughout the Contract duration. Regardless of the number of RFIs submitted, Contractor will not be entitled to additional compensation. Contractor shall be responsible for both City's and Architect/Engineer's administrative costs for answering its RFIs where the answer could reasonably be found by reviewing the Contract Documents, as determined by City; such costs will be deducted from progress payments.
 - 3. The City may initiate changes by issuing a Supplemental Instruction.
 - 4. Project Manager may initiate changes in the Work or Contract Time by issuing Requests for Proposal (RFP) to Contractor. Such RFPs will detail all proposed changes in the Work and request a quotation of changes in Contract Sum and Contract Time from Contractor.

1.3 PROCEDURE

- A. Contractor shall submit RFI to Project Manager in accordance with [Section 01 26 13 – Requests for Interpretation](#). Contractor shall reference each RFI to an activity of Progress Schedule and shall note time criticality of the RFI.
1. If Contractor is satisfied with the Clarification and does not request change in Contract Sum or Contract Time, then the Clarification shall be considered executed without a change.
 2. If Contractor believes that the Clarification results in change in Contract Sum or Contract Time, Contractor shall notify Project Manager who may then deny request for change or issue RFP.
- B. Contractor shall submit RFS to Project Manager who may then approve or deny request. If denied, Project Manager shall set forth in writing reasons for the denial. Contractor may revise and resubmit submittal with a rebuttal based on Section 3400 Public Contract Code CA. The RFS should set forth:
1. Reason for substitution
 2. Any deviations from Special Conditions or specifications
 3. Cost increase or decrease
 4. Any necessary revisions to drawings/related work
 5. Schedule impacts.
- C. Contractor shall submit Notices of Concealed or Unknown Conditions to resolve unanticipated conditions incurred in the execution of the Work. Procedures in [General Conditions](#) shall be followed. If Project Manager determines that a change in Contract Sum or Contract Time is justified, Project Manager shall issue RFP.
- D. Contractor shall submit Notices of Hazardous Waste Conditions to resolve problems regarding hazardous materials encountered in the execution of the Work. Procedures in [General Conditions](#) shall be followed. If Project Manager determines that a change in Contract Sum or Contract Time is justified, Project Manager shall issue RFP.
- E. Project Manager may issue Supplemental Instruction from the Architect/Engineer to Contractor. Contractor shall not proceed with Supplemental Instruction until Project Manager approves it in writing.
1. If Contractor is satisfied with Supplemental Instruction and does not request change in Contract Sum or Contract Time, then Supplemental Instruction shall be executed without a Change Order.
 2. If Contractor believes that Supplemental Instruction results in change in Contract Sum or Contract Time, Contractor shall notify Project Manager. Project Manager may then deny request for change, cancel Supplemental Instruction or issue RFP.
- F. If Project Manager issues to Contractor an RFP, then Contractor shall respond to the RFP within fifteen (15) working days by furnishing a complete breakdown of costs of credits, deducts, extra costs or cost savings, resulting from the change in

the Work. Contractor shall itemize materials, labor, taxes, overhead and profit. Subcontract work shall be so indicated.

- G. Upon approval of RFP, Project Manager will issue a Change Order directing Contractor to proceed with extra work. If the parties do not agree on the price for an RFP, the Project Manager may decide the issue per [General Conditions](#).
- H. Payment shall be made as follows:
 - 1. Change Orders which increase or decrease the Contract Sum or Contract Time shall be included by Contract Modification Form, signed by Project Manager, accepted by Contractor.
 - 2. Payment shall be made for Change Order work along with other work in progress payment following completion of Change Order work. Partial completion of Change Order work shall be paid for that part completed during the period covered by the monthly payment request.

1.4 COST DETERMINATION

- A. Total cost of extra work or of work omitted shall be the sum of labor cost (hourly rate plus employer paid benefits, taxes, insurance, etc.), material costs, equipment rental costs and specialist costs as defined herein plus overhead and profit as allowed herein. This limit applies in all cases of claims for extra work, whether calculating Change Orders, RFPs, or calculating claims of all types, and applies even in the event of fault, negligence, strict liability, or tort claims of all kinds, including strict liability or negligence. No other costs arising out of or connected with the performance of extra work, of any nature, may be recovered by Contractor. No special, incidental or consequential damages may be claimed or recovered against City, their officers, agents, employees, and consultants (including, but not limited to Architect/Engineer or Construction Manager), whether arising from breach of contract, negligence or strict liability, unless specifically authorized in the Contract Documents.
- B. Overhead and Profit:
 - 1. "Overhead and Profit" may also be referred to as "Markup".
 - 2. Overhead shall be defined in Paragraph 1.8 below.
 - 3. Overhead and profit on labor for extra work shall be thirty-five percent (35%).
 - 4. Overhead and profit on materials shall be fifteen percent (15%).
 - 5. Overhead and profit on equipment rental for extra work shall be fifteen percent (15%).
 - 6. When extra work is performed by a first tier subcontractor, Contractor shall receive a ten percent (10%) markup on subcontractors' total costs of extra work.
- C. Taxes:
 - 1. Contra Costa County Sales Tax shall be included.
 - 2. Federal and Excise Tax shall not be included.

- D. Owner Operated Equipment:
1. When owner-operated equipment is used to perform extra work, Contractor will be paid for equipment and operator as follows:
 - a. Payment for equipment will be made in accordance with Paragraph 1.5.C below.
 - b. Payment for cost of labor will be made at no more than rates of such labor established by collective bargaining agreements for type of worker and location of work, whether or not owner-operator is actually covered by such an agreement.

1.5 COST BREAKDOWN

- A. Labor: Contractor will be paid cost of labor for workers (including forepersons when authorized by Project Manager) used in actual and direct performance of extra work. Labor rate, whether employer is Contractor, subcontractor or other forces, will be sum of following:
1. Actual Wages: Actual wages paid shall include any employer payments to or on behalf of workers for health and welfare, pension, vacation and similar purposes.
 2. Labor Surcharge: Payments imposed by City, County, State and Federal laws and ordinances, and other payments made to, or on behalf of, workers, other than actual wages as defined in subparagraph 1 above, such as taxes and insurances. Labor surcharge shall be as set forth in California Department of Transportation official labor surcharges schedule which is in effect on date upon which extra work is accomplished and which schedule is incorporated herein by reference, as though fully set forth herein.
- B. Material: Only materials furnished by Contractor and necessarily used in performance of extra work will be paid for. Cost of such materials will be cost, including sales tax, to purchaser (Contractor, subcontractor or other forces) from supplier thereof, except as the following are applicable:
1. If cash or trade discount by actual supplier is offered or available to purchaser, it shall be credited to City notwithstanding the fact that such discount may not have been taken.
 2. For materials salvaged upon completion of extra work, salvage value of materials shall be deducted from cost, less discount, of materials.
 3. If cost of a material is, in opinion of Project Manager, excessive, then cost of material shall be deemed to be lowest current wholesale price at which material is available in quantities concerned delivered to Site, less any discounts as provided in subparagraph 1 above.
- C. Equipment Rental:
1. For Contractor- or subcontractor-owned equipment, payment will be made at rental rates listed for equipment in California Department of Transportation official equipment rental rate schedule which is in effect on date upon which extra work is accomplished and which schedule is incorporated herein by reference as though fully set forth herein. For rented equipment, payment will

be made based on actual rental invoices. Equipment used on extra work shall be of proper size and type. If, however, equipment of unwarranted size or type and cost is used, cost of use of equipment shall be calculated at rental rate for equipment of proper size and type. Rental rates paid shall be deemed to cover cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance, and all incidentals. Unless otherwise specified, manufacturer's ratings, and manufacturer-approved modifications, shall be used to classify equipment for determination of applicable rental rates. Individual pieces of equipment or tools not listed in said publication and having a replacement value of five hundred dollars (\$500) or less, whether or not consumed by use, shall be considered to be small tools and no payment will be made therefore as payment is included in payment for labor. Rental time will not be allowed while equipment is inoperative due to breakdowns.

2. For equipment on Site, rental time to be paid for equipment shall be time equipment is in operation on extra work being performed or on standby as approved by Project Manager. The following shall be used in computing rental time of equipment:
 - a. When hourly rates are listed, less than thirty (30) minutes of operation shall be considered to be one-half (1/2) hour of operation.
 - b. When daily rates are listed, less than four (4) hours of operation shall be considered to be one-half (1/2) day of operation.
 3. For equipment which must be brought to Site to be used exclusively on extra work, cost of transporting equipment to Site and its return to its original location shall be determined as follows:
 - a. City will pay for costs of loading and unloading equipment.
 - b. Cost of transporting equipment in low bed trailers shall not exceed hourly rates charged by established haulers.
 - c. Cost of transporting equipment shall not exceed applicable minimum established rates of California Public Utilities Commission.
 - d. Payment for transporting, and loading and unloading equipment as above provided will not be made if equipment is used on Work in any other way than upon extra work.
 4. Rental period shall begin at time equipment is unloaded at Site of extra work and terminate at end of day on which City's Project Manager directs Contractor to discontinue use of equipment. Excluding Saturdays, Sundays, and legal holidays, unless equipment is used to perform extra work on such days, rental time to be paid shall be four (4) hours for zero (0) hours of operation, six (6) hours for four (4) hours of operation and eight (8) hours for eight (8) hours of operation, time being prorated between these parameters. Hours to be paid for equipment which is operated less than eight (8) hours due to breakdowns, shall not exceed eight (8) less number of hours equipment is inoperative due to breakdowns.
- D. Work Performed by Special Forces or Other Special Services:
1. When the City's Project Manager and Contractor, by agreement, determine that special service or item of extra work cannot be performed by forces of

Contractor or those of any subcontractors, service or extra work item may be performed by specialist. Invoices for service or item of extra work on basis of current market price thereof may be accepted without complete itemization of labor, material, and equipment rental costs when it is impracticable and not in accordance with established practice of special service industry to provide complete itemization. In those instances, wherein Contractor is required to perform extra work necessitating a fabrication or machining process in a fabrication or machine shop facility away from Site, charges for that portion of extra work performed in such facility may, by agreement, be accepted as a specialist billing. The City's Project Manager must be notified in advance of all off-site work. To specialist invoice price, less credit to City for any cash or trade discount offered or available, whether or not such discount may have been taken, will be added 15 percent (15%) in lieu of overhead and profit provided in Paragraph 1.4.B.

1.6 FORCE-ACCOUNT

- A. City may, at any time, require Contractor to perform Work on a Force Account (time and materials, cost not to exceed) basis. When Contractor performs Force Account Work, the labor, materials and equipment used in performing such Force Account Work shall be subject to City's approval.
- B. Whenever any Force-Account work is in progress, definite price for which has not been agreed on in advance, Contractor shall report to the City's Project Manager each day in writing in detail amount and cost of labor and material used, and any other expense incurred in Force-Account work on preceding work day as required herein. No claim for compensation for Force-Account work will be allowed unless report shall have been made. City may authorize Force Account Work with specific limits on price, which Contractor shall perform up to such limit.
- C. Force Account work shall be paid as extra work under this [Section 01 26 00 – Contract Modification Procedures](#). Above described methods of determining payment for work and materials shall not apply to performance of work or furnishings of material which, in judgment of the City's Project Manager, may properly be classified under items for which prices are established in Contract.

1.7 CITY FURNISHED MATERIALS

- A. City reserves right to furnish materials as it deems advisable, and Contractor shall have no claims for costs and overhead and profit on such materials.

1.8 OVERHEAD DEFINED

- A. The following constitutes charges that are deemed included in overhead for all contract modifications, including Force-Account work for the entire Contract Time:
 - 1. Drawings: Field drawings, shop drawings, etc. including submissions of drawings
 - 2. Routine field inspection of work proposed

3. General superintendence
4. General administration and preparation of change orders
5. Computer services
6. Reproduction services
7. Salaries of project engineer, project manager, superintendent, timekeeper, storekeeper and secretaries
8. Janitorial services
9. Temporary on-site facilities
10. Offices
11. Telephones
12. Plumbing
13. Electrical: Power, lighting
14. Platforms
15. Fencing, etc.
16. Home office expenses.
17. Insurance and Bond premiums.
18. Procurement and use of vehicles and fuel used coincidentally in base bid work.
19. Surveying
20. Estimating
21. Protection of work
22. Final cleanup
23. Other incidental work
24. Labor liability insurance

1.9 RECORDS AND CERTIFICATION

- A. Force-Account (cost reimbursement) charges shall be recorded daily upon Cost Breakdown for Contract Modification Form obtained from Inspector. Contractor or authorized representative shall complete and sign form. Inspector shall sign form for approval. Contract Modification Form shall provide names and classifications of workers and hours worked by each, itemize materials used, and also list size type and identification number of equipment, and hours operated, and shall indicate work done by specialists.
- B. No payment for Force-Account work shall be made until Contractor submits original invoices substantiating materials and specialist charges.
- C. City shall have the right to audit all records in possession of Contractor relating to activities covered by Contractor's claims for modification of Contract, including Force-Account work, as set forth in [General Conditions](#).
- D. Further, City shall have right to audit, inspect, or copy all records maintained in connection with this Contract, including financial records, in possession of Contractor relating to any transaction or activity occurring or arising out of, or by virtue of, Contract. If Contractor is a joint venture, right of City shall apply

collaterally to same extent to records of joint venture sponsor, and of each individual joint venture member.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 01 26 00

DAILY EXTRA WORK REPORT

COST BREAKDOWN FORM FOR CONTRACT MODIFICATION
SHEET 1 OF 3

One separate form shall be used by Contractor, each first tier subcontractor and each lower tier subcontractor. One form for each shall be used for each change order. One form for each, for each day shall be used for Force-Account work.

CHANGE ORDER NUMBER: _____ DATE: _____

CHANGE ORDER DESCRIPTION: _____

CONTRACTOR: _____

| LABOR | | | | |
|---|----------------|-------|------|-------|
| NAME | CLASSIFICATION | HOURS | RATE | TOTAL |
| | | | | |
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| | | | | |
| | | | | |
| TOTAL LABOR COSTS (Enter here and on Line 1 of Sheet 3) | | | | |

COST BREAKDOWN FORM FOR CONTRACT MODIFICATION
SHEET 2 OF 3

| MATERIALS | |
|--|------|
| DESCRIPTION | COST |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| TOTAL MATERIAL COSTS (Enter here and on Line 4 of Sheet 3) | |

| EQUIPMENT RENTAL | | | | |
|---|--------|-------|------|-------|
| SIZE AND TYPE | I.D. # | HOURS | RATE | TOTAL |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| TOTAL EQUIPMENT RENTAL COSTS (Enter here and on Line 8) | | | | |

| SPECIALIST | |
|--|------|
| DESCRIPTION | COST |
| | |
| | |
| TOTAL SPECIALIST COSTS (Enter here and on Line 11) | |

COST BREAKDOWN FORM FOR CONTRACT MODIFICATION
SHEET 3 OF 3

| TOTAL COSTS | | |
|--|--|--|
| 1. TOTAL LABOR COSTS | | |
| 2. 10 % of Line 1 | | |
| 3. ADD Lines 1 and 2 | | |
| 4. TOTAL MATERIAL COSTS | | |
| 5. 10 % of Line 4 | | |
| 6. 8.25 % of line 4 | | |
| 7. ADD Lines 4, 5 and 6 | | |
| 8. TOTAL EQUIPMENT RENTAL COSTS | | |
| 9. 10 % of Line 8 | | |
| 10. ADD Lines 8 and 9 | | |
| 11. TOTAL SPECIALIST COSTS | | |
| 12. 10 % of Line 11 | | |
| 13. ADD Lines 11 and 12 | | |
| 14. TOTAL COST OF EXTRA WORK (ADD Lines 3, 7, 10 and 13) | | |

CONTRACTOR OR AUTHORIZED REPRESENTATIVE: _____

APPROVED BY INSPECTOR: _____

SECTION 01 26 13 – REQUESTS FOR INTERPRETATION**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section describes procedural requirements for requests for interpretation, information, and/or clarification.
- B. Related Sections:
 - 1. [General Conditions](#)
 - 2. [Section 01 26 00 – Contract Modification Procedures](#)

1.2 GENERAL

- A. Description: Submit RFI to the Project Manager promptly upon identification of need, and in reasonable time so as not to affect the progress of the Work.
- B. Submission Procedures:
 - 1. Pre-submission Review: Before submitting request to the Project Manager, conduct a review to determine that the information requested, including items submitted by subcontractors or suppliers, is not shown in the Contract Documents.
 - 2. Category of Request: Submit requests for interpretation when one or more of the following conditions occur.
 - a. Need for Clarification: When information shown or indicated in the Contract Documents is unclear in its intent.
 - b. Unforeseen Condition: Discovery of unforeseen condition or circumstance that is not shown or indicated in the Contract Documents.
 - c. Conflict Within Documents: Discovery of an apparent inconsistency, conflict, or discrepancy between different portions of the Contract Documents, where the intent cannot be reasonably inferred from information shown or indicated.
 - d. Omission: Discovery of what appears to be an omission in the Contract Documents, where the intent cannot be reasonably inferred from information shown or indicated.
 - e. Coordination Problem: Discovery of unforeseen condition in coordinating placement of work that is specifically related to the Contract Documents.
 - 3. Unacceptable Requests:
 - a. General: Do not submit RFIs for confirmation of any action already taken by the Contractor. Requests will not be accepted that imply confirmation of any unauthorized change to the Work.

- b. **Untimely Submission:** An RFI that is submitted in a belated manner without proper coordination and scheduling of the Work of related subcontractors will not be reviewed and will be returned to the Contractor.
 - c. **Submittal:** An RFI that is included as part of a submittal will not be processed; see [Section 01 33 00 – Submittal Procedures](#).
 - d. **Substitution:** An RFI that is a request for substitution will not be processed; see [Section 01 25 00 – Substitution Procedures](#).
 - e. **Exclusionary Submission:** A request that implies that specific portions of the work are assumed to be excluded or considering a separate portion of the Contract Documents in part rather than as a whole will not be processed.
- C. **Log:** Prepare and maintain the official log of RFIs. Review status of log at each job progress meeting.

PART 2 - PRODUCTS

A. SUBMISSION REQUIREMENTS:

1. **Request for Interpretation (RFI) Form:**
 - a. **General:** Provide a completed and legible PDF of an RFI form that includes the following required information.
 - b. **RFI Number:** Identify RFIs sequentially starting from number one (1); number re-submissions with same number as original and add letter designation A, B, C, etc., in order submitted, until resolution is achieved.
 - c. **PDF Name:** Include RFI number and reference to name of project in file name; if space allows include brief description of subject in RFI file name.
 - d. **Contractor:** Provide company name and mailing address with signature of contact person responsible for work on the subject project, certifying to review of RFI.
 - e. **Subcontractor and/or Supplier** Provide company name, mailing address, telephone number and name and email of contact person responsible for work on the subject project.
 - f. **RFI Description:**
 - 1) **General:** Describe subject of RFI completely.
 - 2) **Drawing References:** Identify specific drawing number and/or detail number or note under consideration.
 - 3) **Specifications References:** Identify specification section number and paragraph number under consideration.
 - 4) **Attachments:** Identify as required, to support description.
 - 5) **Contractor's Proposed Resolution:**
 - a) **General:** Describe suggested resolution; support with attachments as required.

- b) Cost Impact: Indicate impact on costs; explain Contractor's original basis for bid and, based on the current request, reason that additional costs should be considered.
- c) Time Impact: Indicate effect on schedule; explain Contractor's original basis for bid and, based on the current request, why a time extension should be considered.

PART 3 - EXECUTION

A. PROJECT MANAGER'S RESPONSE:

- 1. General: Project Manager will respond on the RFI Form and include attachments, as referenced. Verbal responses to such requests are to be considered informational; official written response will only be given on annotated PDF of original RFI Form.
- 2. Project Manager's Review:
 - a. General: Allow ten (10) working days after receipt. If more than ten (10) requests are received within one (1) calendar week, the Project Manager will specifically schedule and extend response time as required to accomplish the reviews.
 - b. Prioritization: If more than five (5) requests have been received by the Project Manager, the Contractor shall identify the order of requests most critical to the schedule of the Project.

B. DISTRIBUTION:

- 1. General: Submit PDF of original, signed copy. PDF with the official response will be returned to the Contractor.
- 2. Consultants: The Project Manager will distribute copies of requests for information to project consultants, as required for their participation. Direct communication and response between project consultants and Contractor will be considered informational only.
- 3. Response: The Contractor will make and distribute copies of the official response to subcontractors and suppliers, as required.

END OF SECTION 01 26 13

SECTION 01 29 00 – PAYMENT PROCEDURES**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section describes the procedures for preparation and submittal of Progress Payment Requests.
- B. Related Sections:
 - 1. [General Conditions](#)
 - 2. [Section 01 32 16 - Construction Progress Schedule](#)

1.2 REFERENCES

- A. California Public Contract Code

1.3 SCOPE OF WORK

- A. Payment for the various items of the Schedule of Bid Prices, as further specified herein, shall include all compensation to be received by the Contractor for furnishing all tools, equipment, supplies, and manufactured products, and for all labor, operations, overhead and profit, applicable taxes, and incidentals appurtenant to the items of Work being described, as necessary to complete the various items of work as specified and as shown on the Drawings. No separate payment will be made for any item that is not specifically set forth in the Schedule of Bid Prices, and all costs therefore shall be included in the prices named in the Schedule of Bid Prices for the various appurtenant items of Work.
- B. Contract Prices shall be deemed to include all bonds and insurance, all appurtenances necessary to complete the required Work, including all costs for compliance with the regulations of the public agencies having jurisdiction, including Health and Safety Requirements of the California Division of Industrial Safety and the Occupational Safety and Health Administration of the U.S. Department of Labor (OSHA), and including all costs for loss or damage arising from the Work, or from action of the elements, for any unforeseen difficulties which may be encountered, and for all risks of every description connected with the prosecution of the Work until Project Completion, also for all expenses incurred in consequence of the suspension or discontinuance of the Work as provided in the Contract. Unless the Contract Documents expressly provide otherwise, the Contract Sum shall be deemed to include:
 - 1. Any and all costs arising from any unforeseen difficulties which may be encountered during, and all risks of any description connected with, prosecution of Work until acceptance by City;

2. All expenses incurred due to suspension, or discontinuance of Work as provided in Contract;
 3. Escalation to allow for cost increases between time of Contract Award and completion of Work.
- C. Whenever it is specified herein that Contractor is to do work or furnish materials of any class for which no price is fixed in the Contract, it shall be understood that Contractor is to do such work or furnish such materials without extra charge or allowance or direct payment of any sort, and that cost of doing work or furnishing materials is to be included in price bid, unless it is expressly specified herein, in particular cases, that work or material is to be paid for as extra work.
- D. Neither the payment of any estimate nor of any retained percentages shall relieve Contractor of its obligation to make good all defective work or material.

1.4 DETERMINATION OF QUANTITIES

- A. Quantity of work to be paid for under any item for which a unit price is fixed in Contract shall be number, as determined by Project Manager, of units of work satisfactorily completed in accordance with Drawings, Technical Specifications, and Specifications and as directed pursuant to Drawings, Technical Specifications, and Specifications. Unless otherwise provided, determination of number of units of work so completed will be based, so far as practicable, on actual measurement or count within prescribed or ordered limits, and no payment will be made for work done outside of limits. Measurements and computations will be made by methods as City's Project Manager may consider appropriate for class of work measured.

1.5 BASIS OF PAYMENT

- A. Unit Pay Quantities: When estimated quantity for specific portions of Work is listed in Bid Form, quantity of work to be paid for shall be actual number of units satisfactorily completed in accordance with Drawings, Technical Specifications, and Specifications.
- B. Lump Sum: When estimated quantity for specific portion of Work is not indicated and unit is designated as Lump Sum, payment will be on a Lump Sum basis for Work satisfactorily completed in accordance with Drawings, Technical Specifications, and Specifications.
- C. City does not expressly, or by implication, agree, warrant, or represent in any manner, that actual amount of Work will correspond with amount shown or estimated and reserves right to increase or decrease amount of any class or portion of Work, to leave out entire Bid Item or Items, or to add work not included in Bid, when in its judgment such change is in best interest of City. No change in Work shall be considered waiver of any other condition of Contract. No claim shall be made for anticipated profit, for loss of profit, for damages, or for extra payment whatever, except as otherwise expressly provided for in Contract Documents,

because of any differences between amount of work actually done and estimated amount as set forth herein, or for elimination of extra Bid Items.

- D. Monthly payment requests shall be based upon information developed at monthly Application for Payment meetings and shall be prepared by Contractor. The approved Schedule of Values will be the basis for Contractor's payment requests.
1. No partial progress payment shall be made to Contractor until all cost information requested by the City is submitted and reviewed.
 2. The following information shall also be submitted with and as part of the Contractor's progress payment application; all information, noted below, will cover the same period of the progress payment application.
 - a. Progress Schedule: Submittal of one (1) copy of the progress schedule updated to include the progress achieved as of the date of the Application for Payment in accordance with this Section.
 - 1) Contractor shall, at the time any payment request is submitted, certify in writing the accuracy of the payment request and that Contractor has fulfilled all scheduling requirements of [General Conditions](#) and [Section 01 32 16 - Construction Progress Schedule](#), including updates and revisions. The certification shall be executed by a responsible officer of the Contractor.
 - b. Project Record Drawings: Submit project record drawings with each progress payment application for the City's Project Manager's review. The drawings shall be returned to the Contractor within fourteen (14) calendar days of submittal.
 - c. Certified Payroll: Certified payroll for all Contractor and subcontractor staffing pursuant to Section 1776 of the California Labor Code and including all subcontractors, suppliers, or creditors for all labor and materials incorporated into the work.
 - d. Lien Releases: Conditional or Unconditional lien release for the requested payment. Unconditional lien release for the previous payment.
 3. No progress payment will be processed prior to Project Manager receiving all requested information.
- E. The City will not be liable for costs arising from the delay in making progress payments.

1.6 PROGRESS PAYMENT PROCEDURES

- A. If requested by Contractor, progress payments will be made monthly.

B. Schedule of Values:

1. Within ten (10) calendar days from issuance of Notice of Award and prior to the Contractor's application for the first progress payment, the Contractor shall submit a detailed breakdown of its bid by scheduled Work items and/or activities. This breakdown shall be referred to as the Schedule of Values.
2. If City's Project Manager requires substantiating data, Contractor shall submit information requested by Project Manager, with cover letter identifying Project, payment request number and date, and detailed list of enclosures. Contractor shall submit one copy of substantiating data and cover letter for each Payment request submitted.

C. Payment Requests:

1. On or about the 25th of each month, the Contractor may submit to the City's Project Manager one (1) copy of an itemized Application of Payment on a standard form acceptable to the City's Project Manager covering the Work completed as of the date of the Application for payment. The following information and/or documentation will be provided as part of the Application for Payment:
 - a. Payment requests may include, but not necessarily limited to the following:
 - 1) Materials, equipment, and labor incorporated into the Work, less any previous payments for the same;
 - 2) A maximum of ninety percent (90%) of the cost of major equipment, if purchased and delivered to the site or stored offsite, as under control of the City, but not installed by the Contractor.
 - 3) Contractor's application for payment shall be accompanied by a bill of sale, invoice, or other documentation warranting that the City has received the materials and equipment free and clear of all liens and evidence that the materials and equipment area covered by appropriate property insurance and other arrangements to protect the City's interest therein.
 - b. Such requests for progress payments shall be based upon Schedule of Values prices of all labor and materials incorporated in the Work during the preceding one-month period, less the aggregate of previous payments.
 - c. Each payment request shall list each Change Order executed prior to the date of submission, including the Change Order Number, a description of the work activities, consistent with the descriptions of original work activities.
 - 1) Contractor shall submit a monthly Change Order status log to the City's Project Manager as part of that Progress Payment Request.
2. Monthly progress payments shall be made, based on total value of activities completed or partially completed, as determined by City with participation of Contractor, and based upon approved activity costs. Accumulated retainage will be shown as separate item in payment summary. If Contractor fails or

refuses to participate in construction progress evaluation with City, Contractor shall not receive current payment until Contractor has participated fully in providing construction progress information and schedule update information for City.

D. Progress Payments:

1. Upon receiving Contractor's payment request, Project Manager will review the payment request and make necessary adjustments to percent of completion of each activity. One copy will be returned to Contractor with description of adjustments made. All parties will update percentage of completion values in the same manner, i.e., express value of an accumulated percentage of completion to date.
2. The payment request may be reviewed by Project Manager for the purpose of determining that the payment request is a proper payment request, and shall be rejected, revised or approved by Project Manager pursuant to the cost breakdown prepared in accordance with this Section.
3. If it is determined that the payment request is not a proper payment request suitable for payment, Project Manager shall return it to the Contractor as soon as practicable, but no later than seven (7) working days after receipt, together with a document setting forth in writing the reasons why the payment request is not proper. If Project Manager determines that portions of the payment request are not proper or not due under the Contract Documents, then Project Manager may approve the other portions of the payment request and, in the case of disputed items or defective work not remedied, may withhold up to 150% of the disputed amount from the progress payment.
4. Pursuant to Public Contract Code, Section 20104.50, if City fails to make any progress payment within thirty (30) days after receipt of an undisputed and properly submitted payment request from a contractor, City shall pay interest to the Contractor equivalent to the legal rates set forth in subdivision (a) of Section 685.010 of the Code of Civil Procedure. The thirty (30) day period shall be reduced by the number of days by which City exceeds the seven (7) day return requirement set forth herein.
5. As soon as practicable after approval of each request for progress payment, City will pay to Contractor in manner provided by law, the amounts provided for below:
 - a. City shall pay an amount equal to ninety percent (90%) of Project Manager's estimate, which amount shall remain in effect until such time, if any, that the retention is reduced by Project Manager pursuant to the other provisions of this paragraph.
 - b. At any time after fifty percent (50%) in value of the Work as set forth in the Schedule of Values has been completed and the retained funds are equal to five percent (5%) of the Contract Sum (including Change Orders, if applicable), and if the progress of the Work under the Progress Schedule is satisfactory, Project Manager may, at its sole discretion, but shall not be obligated to, authorize any remaining

- progress payment to be made in the amount of ninety-five percent (95%) of the amount approved for payment.
- c. When Project Manager determines that at least ninety-five percent (95%) in value of the Work as set forth in the Schedule of Values is completed, Project Manager may, at its sole discretion, but shall not be obligated to, reduce the amount of the retained funds to one hundred twenty-five percent (125%) of the value of the Work yet to be completed, as determined by Project Manager.
 - d. After all Work is completed in accordance with Contract, the remaining retention amount shall be paid to the Contractor in accordance with Paragraph 1.9, below.
 - e. If a lesser payment amount is provided in the Contract Documents, such lesser amount shall apply instead of the amounts set forth above in this paragraph.
 - f. Progress payments may at any time be withheld if, in judgment of Project Manager, Work is not proceeding in accordance with Contract, or Contractor is not complying with requirements of Contract, or to comply with stop notices or to offset liquidated damages accruing or expected.
6. Retention will not be reduced if Contractor, in the opinion of the Project Manager, is behind schedule. If retention is reduced at any point during Contract and Contractor subsequently falls behind schedule, retention may be raised back to original percentage.
 7. Before any progress payment or final payment is made, the Contractor may be required to submit satisfactory evidence that Contractor is not delinquent in payments to employees, subcontractors, suppliers, or creditors for labor and materials incorporated into Work.
 8. City reserves and shall have the right to withhold payment for any equipment and/or specifically fabricated materials that, in the sole judgment of Project Manager, is not adequately and properly protected against weather and/or damage, prior to or following incorporation into the Work.
 9. Approval of progress payment and payment by City, or receipt thereof by Contractor, shall not be understood as constituting in any sense acceptance of Work or of any portion thereof, and shall in no way lessen liability of Contractor to replace unsatisfactory work or material, though unsatisfactory character of work or material may have been apparent or detected at time payment was made.
 10. When City shall charge sum of money against Contractor under any provision of Contract, amount of charge shall be deducted and retained by City from amount of next succeeding progress payment or from any other monies due or that may become due Contractor under Contract. If, on completion or termination of Contract, such monies due Contractor are found insufficient to cover City's charges against Contractor, City shall have right to recover balance from Contractor or Sureties.

1.7 SUBSTITUTION OF SECURITIES IN LIEU OF RETENTION

- A. Pursuant to provisions of Public Contract Code, Section 22300, substitution of securities for any monies withheld under Contract to insure performance is permitted under the following conditions:
1. At request and expense of Contractor, securities listed in Section 16430 of the Government Code, bank or savings and loan certificates of deposit, interest bearing demand deposit accounts, standby letters of credit, or any other security mutually agreed to by Contractor and City which are equivalent to the amount withheld under retention provisions of Contract shall be deposited with Controller or with a state or federally chartered bank in California, as the escrow agent, who shall then pay such monies to Contractor. Upon satisfactory completion of Contract, securities shall be returned to Contractor.
 2. Alternatively, Contractor may request and City shall make payment of retentions earned directly to the escrow agent at the expense of the Contractor. At the expense of the Contractor, the Contractor may direct the investment of the payments into securities and the Contractor shall receive the interest earned on the investments upon the same terms provided for in this section for securities deposited by the Contractor. Upon satisfactory completion of the Contract, the Contractor shall receive from escrow agent all securities, interest, and payments received by the escrow agent from City, pursuant to the terms of this section. The Contractor shall pay to each subcontractor, not later than twenty (20) days after receipt of the payment, the respective amount of interest earned, net of costs attributed to retention withheld from each subcontractor, on the amount of retention withheld to insure the performance of the Contractor.
 3. Contractor shall be beneficial owner of securities substituted for monies withheld and shall receive any interest thereon.
 4. Contractor shall enter into escrow agreement with Controller according to Document 00 53 00 - Escrow Agreement for Security Deposits in Lieu of Retention, as authorized under Public Contract Code, Section 22300, specifying amount of securities to be deposited, terms and conditions of conversion to cash in case of default of Contractor, and termination of escrow upon completion of Contract.

1.8 APPLICATION FOR PAYMENT OF SUBSTANTIAL COMPLETION

- A. Following issuance of the Certificate of Substantial Completion, submit an Application for Payment.
1. This application shall reflect Certificates of Partial Substantial Completion issued previously for City occupancy of designated portions of the Work.
 2. Administrative actions and submittals that shall precede or coincide with this application include:
 - a. Occupancy permits and similar approvals.

- b. Warranties, guarantees, and maintenance agreements.
- c. Test/adjust/balance records.
- d. Operations and Maintenance instructions.
- e. Meter readings.
- f. Startup performance reports.
- g. Changeover information related to City's occupancy, use, operation, and maintenance.
- h. Final cleaning.
- i. Application for reduction of retainage and consent of surety.
- j. Final progress photographs.
- k. List of incomplete Work, recognized as exceptions to Architect/Engineer's Certificate of Substantial Completion.

1.9 FINAL PAYMENT

- A. As soon as practicable after all required Work is completed in accordance with Contract, including Contractor maintenance after Final Acceptance, City will pay to Contractor, in manner provided by law, unpaid balance of contract price of Work, or whole contract price of Work if no progress payment has been made, determined in accordance with terms of Contract, less sums as may be lawfully retained under any provisions of Contract or by law.
- B. Prior progress payments shall be subject to correction in the final payment. Project Manager's determination of amount due as final payment shall be final and conclusive evidence of amount of Work performed by Contractor under Contract, and shall be full measure of compensation to be received by Contractor.
- C. Contractor and each assignee under an assignment in effect at time of final payment shall execute and deliver at time of final payment and as a condition precedent to final payment, the enclosed form (Document 00 52 14 - Agreement and Release of Any and All Claims), discharging City of Pittsburg, their officers, agents, employees, and consultants (including, but not limited to Architect/Engineer and Construction Manager) of and from liabilities, obligations, and claims arising under Contract.
- D. Final Payment Application: Administrative actions and submittals that must precede or coincide with submittal of the final Application for Payment include the following:
 - 1. Completion of Project closeout requirements.
 - 2. Completion of items specified for completion after Substantial Completion.
 - 3. Ensure that unsettled claims will be settled.
 - 4. Ensure that incomplete Work is not accepted and will be completed without undue delay.
 - 5. Transmittal of required Project construction records to the City.
 - 6. Certified property survey.
 - 7. Proof that taxes, fees, and similar obligations were paid.
 - 8. Removal of temporary facilities and services.

9. Removal of surplus materials, rubbish, and similar elements.
10. Change of door locks to City's access.
11. All as-built drawings.
12. Lien releases from Contractor and subcontractors.

1.10 EFFECT OF PAYMENT

- A. Payment will be made by City, based on Project Manager's observations at the site and the data comprising the Application for Payment. Payment will not be a representation that Project Manager has:
 1. made exhaustive or continuous on-site inspections to check the quality or quantity of Work;
 2. reviewed construction means, methods, techniques, sequences or procedures;
 3. reviewed copies of requisitions received from subcontractors and material suppliers and other data requested by City to substantiate Contractor's right to payment; or
 4. made examination to ascertain how or for what purpose Contractor has used money previously paid on account of the Contract Sum.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 01 29 00

00 52 14 – AGREEMENT AND RELEASE OF ANY AND ALL CLAIMS

This Agreement and Release of Claims ("Agreement and Release"), made and entered into this _____ day of _____, 20_____, by and between the City of Pittsburg ("City"), and _____ ("Contractor"), whose place of business is at _____.

RECITALS

- 1. City and Contractor entered into Contract No. _____ in the City of Pittsburg, County of Contra Costa, State of California.
- 2. The Work under Contract No. _____ has been completed.

Now, therefore, it is mutually agreed between City and Contractor as follows:

AGREEMENT

- 3. Contractor will not be assessed liquidated damages except as detailed below:

Original Contract Sum \$ _____

Modified Contract Sum \$ _____

Payment to Date \$ _____

Liquidated Damages \$ _____

Payment Due Contractor \$ _____

- 4. Subject to the provisions of this Agreement and Release, City shall forthwith pay to Contractor the sum of \$_____ Dollars and _____ Cents under Contract No. _____, less any amounts withheld under the Contract or represented by any "Stop Notice" on file with City as of the date of such payment.
- 5. Contractor acknowledges and hereby agrees that there are no unresolved or outstanding claims in dispute against City arising from the performance of work under Contract No. _____. It is the intention of the parties in executing this Agreement and Release that this Agreement and Release shall be effective as a full, final and general release of all claims, demands, actions, causes of action, obligations, costs, expenses, damages, losses and liabilities of Contractor against , City of Pittsburg, and all their respective directors, agents, officers, volunteers, consultants (including, but not limited to, Project Construction Manager and Architect/Engineer), employees, inspectors, assignees and transferees except for the Disputed Claims set forth in Paragraph 6, and continuing obligations described

in Paragraph 8, below.

- 6. The following claims are disputed (hereinafter, the "Disputed Claims") and are specifically excluded from the operation of this Agreement and Release:

| <u>Claim No.</u> | <u>Date Submitted</u> | <u>Description of Claim</u> | <u>Amount of Claim</u> |
|------------------|-----------------------|-----------------------------|------------------------|
|------------------|-----------------------|-----------------------------|------------------------|

- 7. Consistent with California Public Contract Code, Contractor hereby agrees that, in consideration of the payment set forth in Paragraph 4, above, Contractor hereby releases and forever discharges City, all its respective directors, agents, officers, volunteers, employees, inspectors, assignees and transferees from any and all liability, claims, demands, actions or causes of action of whatever kind or nature arising out of or in any way concerned with the work under the Contract.
- 8. Guarantees and warranties for the Work, and any other continuing obligation of Contractor, shall remain in full force and effect as specified in the Contract Documents.
- 9. Contractor shall immediately defend, indemnify and hold harmless City of Pittsburg, and all its respective directors, agents, officers, volunteers, consultants, employees, inspectors, assignees and transferees from any and all claims, demands, actions, causes of action, obligations, costs, expenses, damages, losses and liabilities that may be asserted against them by any of Contractor's suppliers and/or subcontractors of any tier and/or any suppliers to them for any and all labor, materials, supplies and equipment used, or contemplated to be used in the performance of Contract No. _____, except for the Disputed Claims set forth in Paragraph 6, above.
- 10. Contractor hereby waives the provisions of California Civil Code, Section 1542, which provides as follows:

A general release does not extend to claims which the creditor does not know or suspect to exist in his favor at the time of executing the release, which if known by him, must have materially affected his settlement with the debtor.
- 11. The provisions of this Agreement and Release are contractual in nature and not mere recitals and shall be considered independent and severable, and if any such provision or any part thereof shall be at any time held invalid in whole or in part under any federal, state, city, municipal or other law, ruling or regulations, then such provision, or part thereof shall remain in force and effect only to the extent permitted

by law, and the remaining provisions of this Agreement and Release shall also remain in full force and effect, and shall be enforceable.

- 12. All rights of City shall survive completion of the Work or termination of Contract, and execution of this Release.

* * * CAUTION: THIS IS A RELEASE - READ BEFORE EXECUTING * * *

CITY OF PITTSBURG

CONTRACTOR

BY: _____ BY: _____

Date: _____ Date: _____

SECTION 01 31 00 – PROJECT MANAGEMENT AND COORDINATION**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section describes requirements for coordination and meetings.
- B. Related Sections:
 - 1. [General Conditions, Article 2](#)
 - 2. [Section 01 32 16 - Construction Progress Schedule](#)

1.2 COORDINATION

- A. The Contractor shall be responsible for all Project coordination.
- B. Duties of Contractor:
 - 1. Coordinate Work of all subcontractors.
 - 2. Establish on-site lines of authority and communication. Schedule and conduct progress meetings with City and subcontractors.
 - 3. Construction schedules:
 - a. Prepare detailed schedule of operations of all subcontractors on Project in accordance with [Section 01 32 16 – Construction Progress Schedule](#).
 - b. Monitor and update schedules as Work progresses.
 - c. Observe Work to monitor compliance with schedule.
 - 4. Temporary facilities:
 - a. Prepare temporary facilities site plan for City's approval.
 - b. Allocate space for temporary structures furnished by subcontractors.
 - c. Monitor use of temporary utilities.
 - d. Verify that adequate services are provided to comply with requirements for Work and climatic conditions.
 - e. Coordinate traffic control.
 - f. Administer traffic and parking controls.
 - 5. Changes:
 - a. Recommend necessary or desirable changes to Architect/Engineer.
 - b. Review subcontractor's request for changes and for substitutions.
 - c. Submit recommendations to Architect/Engineer, through the Project Manager.
 - d. Process Change Orders.
 - 6. Permits and fees: Verify that subcontractors have obtained permits for inspections.
 - 7. Review all Shop Drawings, Product Data, and Samples for compliance with Contract Documents prior to submittal to Project Manager.

8. Interpretation of Contract Documents:
 - a. Consult with Project Manager and Architect/Engineer to obtain interpretations.
 - b. Assist in resolution of questions which may arise.
 - c. Transmit written interpretations to concerned parties.
9. Maintain reports and records at Project Site:
 - a. Daily log progress of Work; make available to Project Manager and Architect/Engineer.
 - b. Records.
 - c. Contracts.
 - d. Purchases.
 - e. Materials and equipment.
 - f. Applicable handbooks, codes and standards.
 - g. Obtain information from subcontractors and maintain record documents. Assemble documentation for handling of claims and disputes.
10. Verify that specified cleaning is done during progress of Work and at completion of each contract.
11. For project requiring building permit, coordinate with the Building Division, City of Pittsburg, for inspections.
12. Start-up:
 - a. Direct the checkout of utilities, operational systems and equipment.
 - b. Assist in initial start-up testing.
 - c. Record dates of start of operation of systems and equipment.
 - d. Submit to City written notice of beginning of Warranty period for equipment put in service.

1.3 COORDINATION REQUIREMENTS

- A. Coordination: Contractor shall coordinate the Work as stated in the [General Conditions](#). Contractor shall also coordinate Work under the Contract with work under separate contracts by City. Contractor shall cooperate with City and others as directed by City in scheduling and sequencing the incorporation into the Work of City Furnished/Contractor installed products identified in the Contract Drawings, Special Conditions, and Specifications.
- B. Relationship of Contract Documents: Drawings, Special Conditions, Specifications, and other Contract Documents in the Project Manual are intended to be complementary. What is required by one shall be as if required by all. What is shown or required, or may be reasonably inferred to be required, or that is usually and customarily provided for similar work, shall be included in the Work.
- C. Discrepancies in Contract Documents: In the event of error, omission, ambiguity or conflict in Drawings, Special Conditions, or Specifications, Contractor shall bring the matter to the Architect/Engineer's attention, through the Project Manager, in a timely manner, for the Architect/Engineer's determination and direction in accordance with provisions of [General Conditions](#).

- D. Construction Interfacing and Coordination: Layout, scheduling and sequencing of Work shall be solely Contractor's responsibility. Contractor shall bring together the various parts, components, systems, and assemblies as required for the correct interfacing and integration of all elements of Work.
- E. Contractor shall coordinate Work to correctly and accurately connect abutting adjoining, overlapping and related elements, including work under separate contracts by City, utility agencies and companies.

1.4 COORDINATION OF SUBCONTRACTS AND SEPARATE CONTRACTS

- A. Superintendence of Work: Contractor shall appoint a field superintendent who shall directly supervise and coordinate Work shown on the Drawings, Special Conditions, and in the Specifications at all times. In order to maintain an uninterrupted construction schedule, the field superintendent shall not be replaced by the Contractor, for other than extenuating circumstances, without prior approval by the Architect/Engineer and/or City.
- B. Subcontractors, Trades and Materials Suppliers: Contractor shall require all subcontractors, trades, crafts and suppliers to coordinate their portions of Work with the Superintendent, Engineer and Construction Project Manager to prevent scheduling, sequencing, dimensional and other conflicts and omissions.
- C. Coordination with Work under Separate Contracts: Contractor shall coordinate and schedule Work under the Contract with work being performed for Project under separate contracts by City, serving utilities and public agencies. Contractor shall make direct contacts with parties responsible for work of the Project under separate contracts, in order to provide timely notifications and to facilitate information exchanges.

1.5 PRECONSTRUCTION CONFERENCE

- A. Project Manager will call for and administer Preconstruction Conference at time and place to be announced. Conference will occur as soon after award as can be reasonably scheduled.
- B. Contractor, all subcontractors, and major suppliers shall attend Preconstruction Conference.
- C. Agenda will include, but not be limited to, the following items:
 - 1. Lines of Communication
 - 2. Schedules
 - 3. Employment Goals
 - 4. Personnel
 - 5. Use of premises
 - 6. Location of Contractor's on-site facilities
 - 7. Project access

8. Employee parking
9. Security
10. NPDES Storm Water Pollution Prevention BMPs
11. Contractor's Questions
12. Housekeeping
13. Submittals
14. Inspection and testing procedures, on-site and off-site
15. Utility shutdown procedures
16. Control and reference point survey procedures
17. Injury and Illness Prevention Program
18. Contractor's Initial CPM Schedule
19. Preparation of Record Documents.

- D. Project Manager will distribute copies of minutes to attendees. Attendees shall have five (5) working days to submit comments or additions to minutes. Minutes will constitute final memorialization of results of the Preconstruction Conference.

1.6 SCHEDULING MEETINGS

- A. Meet with Project Manager no later than Start Date of Contract and conduct initial review of Contractor's Initial Progress Schedule submittal, draft Shop Drawing and Sample Submittal Schedule, and draft Schedule of Values ("Schedule Review Meeting").
- B. Authorized representative in Contractor's organization, designated in writing, who will be responsible for working and coordinating with Project Manager's representative(s) relative to preparation and maintenance of Progress Schedule, shall attend initial Schedule Review Meeting.
- C. Contractor shall, within thirty (30) calendar days from the Notice to Proceed date, meet with City to review Contractor's Original CPM Schedule submittal, and final Shop Drawing and Sample Submittal Schedule, and final Schedule of Values.
 1. Contractor shall have its manager, superintendent, scheduler, and key subcontractor representatives, as required by City, in attendance. The meeting will take place over a continuous one-day period.
 2. City's review of Schedule Submittals will be limited to conformance to Contract requirements, including, but not limited to, coordination requirements. However, review may also include:
 - a. Clarifications of Contract Requirements
 - b. Directions to include activities and information missing from submittal
 - c. Requests to Contractor to clarify its schedule
 3. Within five (5) working days of the initial Schedule Review Meeting, Contractor shall respond in writing to all questions and comments expressed by City at the meeting.
- D. Project Manager will administer scheduling meetings and shall distribute minutes of scheduling meetings to attendees. Attendees shall have five (5) working days

to submit comments or additions to minutes. Minutes will constitute final memorialization of results of the scheduling meetings.

1.7 PROGRESS MEETINGS

- A. A progress meeting will be held weekly to review the schedule update submittal and progress payment application. At this meeting, at a minimum, the following items will be reviewed:
 - 1. Previous meeting notes.
 - 2. Percent complete of each activity
 - 3. Time impact evaluations for Change Orders and Time Extension Request
 - 4. Actual and anticipated activity sequence changes
 - 5. Actual and anticipated duration change
 - 6. Actual and anticipated contractor delays
 - 7. Interface requirement
 - 8. Status on submittals
 - 9. Documentation of information for payment request.
- B. These meetings are considered a critical component of overall monthly schedule update submittal and Contractor shall have appropriate personnel attend. At a minimum, these meetings shall be attended by Contractor's General Superintendent and Scheduler.
- C. Project Manager will record and distribute minutes to Contractor, Building and/or Special Inspector, Architect/Engineer, and all other participants, and those affected by decisions made at the meeting, within five (5) working days after the meeting. Attendees shall have five (5) working days to submit comments or additions to the minutes. The Minutes will constitute final memorialization of the results of the progress meeting.

1.8 SPECIAL MEETINGS

- A. Special meetings may be called by any party by notifying all desired participants, Project Manager, and Building and/or Special Inspector five (5) working days in advance, giving reason for meeting. Special Meetings may be held without advance notice in emergency situations.
- B. At any time during the progress of the Work, any party shall have the right to require attendance at conference, and notice of such conference shall be duly observed and complied with by Contractor.
- C. Contractors shall schedule and conduct coordination meetings as necessary to discharge coordination responsibilities in [General Conditions](#). Project Manager shall be given five (5) working days written notice of coordination meetings. Contractors shall maintain minutes of coordination meetings. Attendees shall have five (5) working days to submit comments or additions to minutes. Minutes will constitute final memorialization of results of the meetings.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 01 31 00

SECTION 01 32 00 – CONSTRUCTION PROGRESS DOCUMENTATION**PART 1 - GENERAL**

1.1 SUMMARY

A. Section Includes:

1. Preconstruction photographs and videos.
2. Periodic construction photographs and videos.

B. Submittals:

1. Key Plan: Submit key plan of project site and construction with notation of vantage points marked for location and direction of each photograph and video.
2. Construction Photographs: Submit digital copy of photographs in PDF and JPEG form in a CD or a USB flash drive with a folder containing pictures of each point of interest in subfolders.
3. Identification: Identify the project by Contract Number. Identify each photograph by naming it according to the drawings.
4. Digital Images:
 - a. General: Identify electronic media with date photographs were taken. Submit images that have same aspect ratio as the sensor, uncropped.
 - b. Usage Rights: Submit statement of transfer copyright usage rights to City allowing unlimited reproduction of photographic documentation.
5. Video:
 - a. General: Submit videos on acceptable electronic transfer medium to the Project Manager, accompanied by a detailed log, including descriptions and corresponding counter numbers to facilitate the quick location of information. Videos will be maintained by the Project Manager during construction and may be viewed at any time by Contractor upon request. Upon final acceptance, the videos will become the permanent property of the City.
 - b. Submit video documentations to the Project Manager prior to start of construction work and as otherwise required.
 - c. Usage Rights: Submit statement of transfer copyright usage rights to City allowing unlimited reproduction of videographic documentation.

PART 2 - PRODUCTS

2.1 PHOTOGRAPHIC MEDIA

- A. Digital Images: Provide images capable of a digital capture resolution of not less than 2240x1680 - 4 Megapixels.

- B. Videos: Provide videos in high resolution digital format with audio capability.

PART 3 - EXECUTION

3.1 CONSTRUCTION PHOTOGRAPHS

- A. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.
- B. Key Plan: Maintain with each set of construction photographs that identifies each photographic location.
- C. Digital Images:
 - 1. General: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
 - 2. Date and Time: Include date and time in filename for each image.
 - 3. Field Office Images: Maintain one set of images on acceptable electronic transfer medium in the field office at Project Site, available at all times for reference. Identify images same as for those submitted to Project Manager.
- D. Preconstruction Photographs:
 - 1. General: Before starting construction, take color photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Project Manager.
 - 2. Construction Limits: Flag before taking construction photographs.
 - 3. Adjacent Conditions:
 - a. General: Take three (3) color photographs, from different views, to show existing conditions adjacent to property before starting the Work.
 - b. Existing Buildings: Take three (3) color photographs, different views, of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.

3.2 CONSTRUCTION VIDEOS

- A. Preconstruction Videos: Document existing conditions of adjacent areas that might be affected by construction operations. Take care to record all existing conditions which exhibit deterioration, imperfections, structural failures, or situations that would be considered substandard.
- B. All Videos: Provide temporary lighting as necessary to properly videotape areas where natural lighting is insufficient (shadows, etc.). Include an audio soundtrack to provide the following information:
 - 1. Detailed description of location being viewed.
 - 2. Direction (N, E, S, W, looking up, looking down, etc.) of camera view.

3. Date, time, temperature, environmental conditions at time of videotaping.
4. Describe in detail areas not readily visible by video. Unless otherwise approved by the Project Manager, do not perform videotaping during inclement weather or when the ground is covered partially or totally with leaves or debris.

END OF SECTION 01 32 00

SECTION 01 32 16 – CONSTRUCTION PROGRESS SCHEDULE**PART 1 - GENERAL**

1.1 SUMMARY

- A. Scheduling of Work under this Contract shall be performed by Contractor in accordance with requirements of this Section.
 - 1. Development of schedule, cost and resource loading of the schedule, monthly payment requests and project status reporting requirements of the Contract shall employ scheduling as required in this Document.
 - 2. The Schedule shall be cost loaded based on Schedule of Values as approved by City.
 - 3. Submit schedules and reports as specified in [General Conditions](#).
- B. Upon Award of Contract, Contractor shall immediately commence development of Initial Schedule to ensure compliance with schedule submittal requirements.
- C. Related Sections
 - 1. [Contract](#)
 - 2. [General Conditions, Article 5](#)
 - 3. [Section 01 10 00 – Summary](#)
 - 4. [Section 01 29 00 – Payment Procedures](#)
 - 5. [Section 01 31 00 – Project Management and Coordination](#)
 - 6. [Section 01 33 00 – Submittal Procedures](#)

1.2 GENERAL

- A. Progress Schedule shall be based on and incorporate milestone and completion dates specified in Contract Documents.
- B. Overall time of completion and time of completion for each milestone shown on Progress Schedule shall adhere to times in the [Contract](#), unless an earlier (advanced) time of completion is requested by Contractor and agreed to by City. Any such agreement shall be formalized by a Change Order.
 - 1. City is not required to accept an earlier (advanced) schedule, i.e., one that shows early completion dates for the Contract Times.
 - 2. Contractor shall not be entitled to extra compensation in event agreement is reached on an earlier (advanced) schedule and Contractor completes its Work, for whatever reason, beyond completion date shown in earlier (advanced) schedule but within the Contract Times.
 - 3. A schedule showing the work completed in less than the Contract Times, which has been accepted by City, shall be considered to have Project Float. The Project Float is the time between the scheduled completion of the work

and Contract Substantial Completion. Project Float is a resource available to both City and Contractor.

- C. Progress Schedule shall be the basis for evaluating job progress, payment requests, and time extension requests. Responsibility for developing Contract schedule and monitoring actual progress as compared to Progress Schedule rests with Contractor.
- D. Failure of Progress Schedule to include any element of the Work or any inaccuracy in Progress Schedule will not relieve Contractor from responsibility for accomplishing the Work in accordance with the Contract. City's acceptance of Schedule shall be for its use in monitoring and evaluating job progress, payment requests, and time extension requests, and shall not, in any manner, impose a duty of care upon City, or act to relieve Contractor of its responsibility for means and methods of construction.
- E. Transmit each item per [Section 01 33 00 – Submittal Procedures](#) under form approved by City.
 - 1. Identify Project with the City Contract number, and name of Contractor.
 - 2. Provide space for Contractor's approval stamp and City's review stamps.
 - 3. Submittals received from sources other than Contractor will be returned to Contractor without City's review.

1.3 INITIAL AND ORIGINAL SCHEDULE

- A. Initial Schedule submitted for review at the pre-construction conference shall serve as Contractor's schedule for up to thirty (30) calendar days after the Notice to Proceed.
- B. Indicate detailed plan for the Work to be completed in first thirty (30) calendar days of the Contract; details of planned mobilization of plant and equipment; sequence of early operations; and procurement of materials and equipment. Show Work beyond thirty (30) calendar days in summary form.
- C. Original (or "Baseline") Schedule shall be submitted for review no later than Contractor's first progress payment application submittal.
- D. All schedules shall be time-scaled.
- E. All schedules shall be cost and resource loaded. Accepted cost and resource loaded schedule will be used as basis for monthly progress payments. Use of Initial Schedule for progress payments shall not exceed thirty (30) calendar days.
- F. City and Contractor shall meet to review and discuss the Schedule within seven (7) calendar days after it has been submitted to City.
 - 1. City's review and comment on the schedule shall be limited to Contract conformance (with sequencing, coordination, and milestone requirements).

2. Contractor shall make corrections to Schedule necessary to comply with Contract requirements and shall adjust Schedule to incorporate any missing information requested by City. Contractor shall resubmit Initial Schedule if requested by City.

1.4 CONSTRUCTION SCHEDULE FORMAT AND LEVEL OF DETAIL

- A. The Construction Schedule is to indicate all separate fabrication and field construction activities required for completion of the work, including but not limited to the following:
 1. All Contractor, Subcontractor and assigned Contractor work shall be shown in a logical work sequence that demonstrates a coordinated plan of work for all contractors. The intent is to provide a common basis of acceptance, understanding and communication, as well as interface with other contractors.
 2. Activities related to the delivery of City-furnished equipment to be contractor-installed per Contract shall be shown.
 3. All activities shall be identified through codes or other identification to indicate the building (i.e. buildings, site work) and Contractor/subcontractor responsibility to which they pertain.
 4. Contractor shall break up the work schedule into activities of durations of approximately fifteen (15) calendar days or less each, except for non-field construction activities or as otherwise deemed acceptable by the Project Manager.
- B. Seasonal weather conditions (which do not constitute a delay as defined herein) shall be considered in the planning and scheduling of all work influenced by high or low ambient temperatures or presence of high moisture for the completion of the work within the allotted contract time.
- C. In conformance with the Contract Documents Contractor shall furnish a breakdown of the bid by assigning dollar values (cost estimated) to each applicable network activity, which cumulatively equals the bid. Upon acceptance by City, the values will be used as the basis for determining progress payments. Contractor's overhead, profit, and cost of bonds and insurance, shall be prorated through all activities.
- D. Failure by Contractor to include any element of work required for performance of the work on the detailed construction schedule shall not excuse Contractor from completing all work required within the Contract time.
- E. A two-week "look ahead" detailed, daily bar chart schedule shall be updated and issued weekly, no later than the time of the scheduled weekly meeting.
- F. Contractor shall utilize computer scheduling software, such as PRIMAVERA or approved equivalent software for all scheduling including schedule updates.

Contractor shall supply computer data files for all schedules including the original schedule and monthly schedule updates.

1.5 MONTHLY SCHEDULE UPDATE SUBMITTALS

- A. Following acceptance of Contractor's Initial Schedule, Contractor shall monitor progress of Work and adjust schedule each month to reflect actual progress and any anticipated changes to planned activities.
 - 1. Each schedule update submitted shall be complete, including all information requested for the Initial Schedule submittal.
 - 2. Each update shall continue to show all work activities including those already completed. These completed activities shall accurately reflect "as built" information by indicating when activities were actually started and completed.
- B. A meeting will be held after the first Project Meeting of each month to review the schedule update submittal and progress payment application.
 - 1. At this meeting, at a minimum, the following items will be reviewed: percent complete of each activity; time impact evaluations for change orders and time extension requests; actual and anticipated activity sequence changes; actual and anticipated duration changes; and actual and anticipated contractor delays.
 - 2. These meetings are considered a critical component of overall monthly schedule update submittal and Contractor shall have appropriate personnel attend. At a minimum, these meetings shall be attended by Contractor's General Superintendent and Scheduler.
 - 3. Contractor shall plan on the meeting taking no less than two (2) hours.
- C. Within five (5) working days after monthly schedule update meeting, Contractor shall submit the updated Schedule update.
- D. Within five (5) working days of receipt of above noted revised submittals, City will either accept or reject monthly schedule update submittal.
 - 1. If accepted, percent complete shown in monthly update will be basis for Application for Payment by Contractor. The schedule update shall be submitted as part of Contractor's Application for Payment.
 - 2. If rejected, update shall be corrected and resubmitted by Contractor before the Application for Payment is submitted.
- E. Neither updating, changing or revising of any report, curve, schedule or narrative submitted to City by Contractor under this Contract, nor City's review or acceptance of any such report, curve, schedule or narrative, shall have the effect of amending or modifying, in any way, the Contract Substantial Completion date or milestone dates or of modifying or limiting, in any way, Contractor's obligations under this Contract.

1.6 SCHEDULE REVISIONS

- A. Updating the Schedule to reflect actual progress shall not be considered revisions to the Schedule. Since scheduling is a dynamic process, revisions to activity durations and sequences are expected on a monthly basis.
- B. To reflect revisions to the schedule, Contractor shall provide City with a written narrative with a full description and reasons for each Work activity revised. For revisions affecting the sequence of work, Contractor shall provide a schedule diagram which compares the original sequence to the revised sequence of work. Contractor shall provide the written narrative and schedule diagram for revisions two (2) calendar days in advance of the monthly schedule update meeting.
- C. Schedule revisions shall not be incorporated into any schedule update until the revisions have been reviewed by City. City may request further information and justification for schedule revisions and Contractor shall, within three (3) calendar days, provide City with a complete written narrative response to City's request.
- D. If Contractor's revision is still not accepted by City, and Contractor disagrees with City's position, Contractor has seven (7) calendar days from receipt of City's letter rejecting the revision, to provide a written narrative providing full justification and explanation for the revision. Contractor's failure to respond in writing within seven (7) calendar days of City's written rejection of a schedule revision shall be contractually interpreted as acceptance of City's position, and Contractor waives its rights to subsequently dispute or file a claim regarding City's position.
- E. At City's discretion, Contractor can be required to provide subcontractor certifications of performance regarding proposed schedule revisions affecting said subcontractors.

1.7 RECOVERY SCHEDULE

- A. If the Schedule Update shows a substantial completion date twenty-one (21) calendar days beyond the Contract Substantial Completion date, or individual milestone completion dates, Contractor shall submit to City the proposed revisions to recover the lost time within seven (7) calendar days. As part of this submittal, Contractor shall provide a written narrative for each revision made to recapture the lost time. If the revisions include sequence changes, Contractor shall provide a schedule diagram comparing the original sequence to the revised sequence of work.
- B. The revisions shall not be incorporated into any schedule update until the revisions have been reviewed by City.
- C. If Contractor's revisions are not accepted by City, City and Contractor shall follow the procedures in paragraph 1.6.C, 1.6.D and 1.6.E above.

- D. At City's discretion, Contractor can be required to provide subcontractor certifications for revisions affecting said subcontractors.

1.8 TIME EXTENSIONS

- A. Contractor is responsible for requesting time extensions for time impacts that, in the opinion of Contractor, impact the critical path of the current schedule update. Notice of time impacts shall be given in accord with [General Conditions, Article 5](#).
- B. Where an event for which City is responsible impacts the projected Substantial Completion date, Contractor shall provide a written mitigation plan, including a schedule diagram, which explains how the impact can be mitigated (e.g., increase crew size, overtime, etc.). Contractor shall also include a detailed cost breakdown of the labor, equipment and material Contractor would expend to mitigate City caused time impact. Contractor shall submit its mitigation plan to City within ten (10) working days from the date of discovery of said impact. Contractor is responsible for the cost to prepare the mitigation plan.
- C. Failure to request time or provide the required mitigation plan will result in Contractor waiving its right to a time extension and cost to mitigate the delay.
- D. No time will be granted under this Contract for cumulative effect of changes.
- E. City will not be obligated to consider any time extension request unless requirements of Contract Documents are satisfied.
- F. Failure of Contractor to perform in accordance with the current schedule update shall not be excused by submittal of time extension requests.

1.9 PROJECT STATUS REPORTING

- A. In addition to submittal requirements for scheduling identified in this Section, Contractor shall provide a monthly project status report (i.e., written narrative report) to be submitted in conjunction with each Schedule as specified herein. Status reporting shall be in form specified below.
- B. Contractor shall prepare monthly written narrative reports of status of Project for submission to City. Written status reports shall include:
 1. Status of major Project components (percent complete, amount of time ahead or behind schedule) and an explanation of how Project will be brought back on schedule if delays have occurred.
 2. Progress made on critical activities indicated on Schedule, inspections and visits by the Building and/or Special Inspection Inspector.
 3. Explanations for any lack of work on critical path activities planned to be performed during last month.
 4. Explanations for any schedule changes, including changes to logic or to activity durations.
 5. List of critical activities scheduled to be performed next month.

6. Status of major material and equipment procurement.
7. Any delays encountered during reporting period.
8. Contractor shall provide a printed report indicating actual versus planned resource loading for each trade and each activity. This report shall be provided on weekly and monthly basis.
 - a. Actual resource shall be accumulated in field by Contractor, and shall be as noted on Contractor's daily reports. These reports will be basis for information provided in monthly and weekly printed reports.
 - b. Contractor shall explain all variances and mitigation measures.
9. Contractor may include any other information pertinent to status of Project. Contractor shall include additional status information requested by City at no additional cost.
10. Status reports, and the information contained therein, shall not be construed as claims, notice of claims, notice of delay, or requests for changes or compensation.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 01 32 16

SECTION 01 33 00 – SUBMITTAL PROCEDURES**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section describes general requirements for submittals for the Work:
1. Procedures
 2. Schedule of Shop Drawing and Sample Submittals
 3. Safety Plan
 4. Progress Schedule
 5. Product Data
 6. Shop drawings
 7. Samples
 8. Quality Control Submittals
 - a. Design Data
 - b. Test Reports
 - c. Certificates
 - d. Manufacturers' Instructions
 9. Machine Inventory Sheets
 10. Operations and Maintenance Manuals
 11. Keys
 12. Project Record Documents
- B. Related Sections:
1. [General Conditions, Article 2](#)
 2. [Section 01 10 00 - Summary](#)
 3. [Section 01 25 00 – Substitution Procedures](#)
 4. [Section 01 26 00 – Contract Modification Procedures](#)
 5. [Section 01 29 00 – Payment Procedures](#)
 6. [Section 01 32 16 – Construction Progress Schedule](#)
 7. [Section 01 78 00 – Closeout Submittals](#)

1.2 PROCEDURES

- A. Upon issuance of the “Notice to Proceed”, the Contractor shall have thirty-five (35) calendar days to submit, at Contractor/Vendor expense, sets of the following: Schedule of Shop Drawing and Sample Submittals, Safety Plans, Progress Schedule, Product Data, Shop Drawings, Samples, Quality Control Data, Machine Inventory Sheets, Operations and Maintenance Manuals, and Project Record Documents required by the Contract Documents. Submit these submittals to Project Manager for review and approval in accordance with accepted schedule of Shop Drawings and Samples submittals.

- B. Transmit each item with a standard letter of transmittal. Identify project, Contractor, subcontractor, major supplier, pertinent drawing sheet and detail number, technical specifications, and specification section number as appropriate. Provide space for Contractor, Project Manager and Architect/Engineer review stamps. Where manufacturer's standard drawings or data sheets are used, they shall be marked clearly to show those portions of the data which are applicable to this project. The transmittal sheet will include the following:
1. Date
 2. Project and Contract Name and Number
 3. Subcontractor or supplier as appropriate
 4. Trade
 5. Contractor Review Stamp
- C. The data shown on the Shop Drawings shall be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to show Project Manager and Architect/Engineer the materials and equipment Contractor proposes to provide and to enable Project Manager and Architect/Engineer to review the information for the limited purposes specified below. Samples shall be identified clearly as to material, supplier; pertinent data such as catalog numbers and the use for which it is intended and otherwise as Project Manager and Architect/Engineer may require enabling Project Manager and Architect/Engineer to review the submittal.
- D. At the time of each submission, Contractor shall give City specific written notice of all variations, if any; that the Shop Drawing or Sample submitted may have from the requirements of the Contract Documents, and the reasons therefore. This written notice shall be a separate document from the submittal. In addition, Contractor shall cause a specific notation to be made on each Shop Drawing and Sample submitted to City for review and approval of each such variation. If City accepts deviation, City shall issue appropriate Contract Modification.
- E. Submittal coordination and verification of contract compliance is responsibility of Contractor; this responsibility shall not be delegated in whole or in part to subcontractors or suppliers. Before submitting each Shop Drawing or Sample, Contractor shall have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents, and shall have determined and verified:
1. All field measurements, quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar information with respect thereto;
 2. All materials with respect to intended use, fabrication, shipping, handling, storage, assembly and installation pertaining to the performance of the Work; and
 3. All information relative to Contractor's sole responsibilities and of means, methods, techniques, sequences and procedures of construction and safety precautions and programs incident thereto.

- F. Contractor's submission to City of a Shop Drawing or Sample submittal will constitute Contractor's representation that it has satisfied its obligations under the Contract Documents, and as set forth immediately above, with respect to Contractor's review and approval of that submittal.
- G. After review by Project Manager and Architect/Engineer of each of Contractor's submittals, one set of materials will be returned to Contractor with actions defined as follows:
1. NO EXCEPTIONS TAKEN - Accepted subject to its compatibility with future submittals and additional partial submittals for portions of the work not covered in this submittal. Does not constitute approval or deletion of specified or required items not shown on the submittal.
 2. MAKE CORRECTIONS NOTED (NO RESUBMISSIONS REQUIRED) - Same as 1. above, except that minor corrections as noted shall be made by Contractor.
 3. AMEND AND RESUBMIT - Rejected because of major inconsistencies or errors which shall be resolved or corrected by Contractor prior to subsequent review by Project Manager and Architect/Engineer.
 4. REJECTED - RESUBMIT - Submitted material does not conform to Plans and Specifications in major respect, i.e.: wrong size, model, capacity, or material.
- H. It is considered reasonable that Contractor shall make a complete and acceptable submittal at least by second submission. City reserves the right to deduct monies from payments due Contractor to cover additional costs of Project Manager's and Architect/Engineer's review beyond the second submission. Illegible submittals will be rejected and returned to Contractor for resubmission.
- I. Favorable review will not constitute acceptance by City of any responsibility for the accuracy, coordination and completeness of the submittals. Accuracy, coordination, and completeness of Submittals shall be sole responsibility of Contractor, including responsibility to back check comments, corrections, and modifications resulting from City's review which shall be incorporated in design before fabrication. Submittals may be prepared by Contractor, subcontractors, or suppliers, but Contractor shall ascertain that submittals meet requirements of Contract Documents, while conforming to structural space and access conditions at point of installation. Project Manager and Architect/Engineer's review will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as indicated by the Contract Documents. Favorable review of submittal, method of work, or information regarding materials and equipment Contractor proposes to furnish shall not relieve Contractor of responsibility for errors therein and shall not be regarded as assumption of risks or liability by Architect/Engineer or City, or any officer or employee thereof, and Contractor shall have no claim under Contract on account of failure or partial failure or inefficiency or insufficiency of any plan or method of work or material and equipment so accepted. Favorable review shall be considered to mean merely that Architect/Engineer or City has no objection to

Contractor using, upon his own full responsibility, plan or method of work proposed, or furnishing materials and equipment proposed.

- J. City's review shall not be construed as approval of means, methods, techniques, sequences or procedures of construction or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
- K. Submit complete initial submittal for those items where required by individual technical specifications, or specification sections. Complete submittal shall contain sufficient data to demonstrate that items comply with Specifications, shall meet minimum requirements for submissions cited in technical specifications, shall include motor data and seismic anchorage certifications, where required, and shall include necessary revisions required for equipment other than first named. If Contractor submits incomplete initial submittal, when complete submittal is required, submittal may be returned to Contractor without review.
- L. It shall be Contractor's responsibility to copy, conform and distribute reviewed submittals in sufficient numbers for Contractor's files, subcontractors and vendors.
- M. After Project Manager's and Architect/Engineer's review of submittal, revise and resubmit as required. Identify changes made since previous submittal.
 - 1. Begin no fabrication or work which require submittals until return of submittals not requiring re-submittal.
 - 2. Normally, submittals will be processed and returned to Contractor within fifteen (15) calendar days of receipt.
- N. Distribute copies of reviewed submittals to concerned persons. Instruct recipients to promptly report any inability to comply with provisions.

1.3 SCHEDULE OF SHOP DRAWING AND SAMPLE SUBMITTALS

- A. Submit preliminary Schedule of Shop Drawing and Sample Submittals as required by [General Conditions](#) or as elsewhere specified in the Contract Documents. Submit three (3) copies and PDF of final and accepted schedule of submittals of shop drawings and samples as required by [General Conditions](#), and in no event later than thirty-five (35) calendar days following Notice to Proceed.
- B. Schedule of Shop Drawing and Sample Submittals will be used by Project Manager and Architect/Engineer to schedule their activities relating to review of submittals. Schedule of submittals shall indicate a spreading out of submittals and early submittals of long-lead-time items and of items which require extensive review.
- C. Schedule of Shop Drawing and Sample Submittals shall be reviewed by Project Manager and shall be revised and resubmitted until accepted by Project Manager.

1.4 SAFETY PLAN

- A. Submit three (3) copies of Safety Plan specific to this Contract to Project Manager within fifteen (15) calendar days of issuance of the Notice to Proceed.
- B. One (1) copy of accepted Safety Plan will be returned to Contractor.
- C. No on-site work shall be started until Safety Plan has been reviewed and accepted by City. Acceptance of Safety Plan shall not affect Contractor's responsibility for maintaining a safe working place and instituting safety programs in connection with project.

1.5 PROGRESS SCHEDULE

- A. See [Section 01 32 16 – Construction Progress Schedule](#) for schedule and report requirements.
- B. Submit three (3) copies and PDF of schedule at each of the following times:
 - 1. Initial CPM Schedule at the Preconstruction Conference (covering in detail first thirty (30) calendar days of contract performance, and at a summary level for remainder of contract).
 - 2. Original CPM Schedule within thirty (30) calendar days of the Notice to Proceed date (covering in detail entire Work of Contract to completion).
 - 3. Adjustments to the CPM Schedule as required.
 - 4. CPM Schedule updates weekly, two (2) calendar days prior to weekly progress meeting.
- C. Submit three (3) copies and PDF of the reports listed in [Section 01 32 16 – Construction Progress Schedule](#) with:
 - 1. Initial CPM Schedule
 - 2. Original CPM Schedule
 - 3. Each weekly Schedule update
- D. Progress Schedules and Reports shall be submitted electronically and stored in a USB flash drive in addition to hard copies specified above.

1.6 PRODUCT DATA

- A. Within ten (10) calendar days after Start Date of the Contract Times, submit copies of complete list of major products and equipment proposed for use, with name of manufacturer, trade name, and model number of each product.
- B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.
- C. Tabulate products by Special Conditions and Specification Section Number.

- D. Supplemental Data: Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturer's standard data to provide information unique to Project.
- E. Provide copies for Project Record Documents described in [Section 01 78 00 – Closeout Submittals](#).

1.7 SHOP DRAWINGS

- A. Submit three (3) copies and PDF of shop drawings.
- B. Minimum Sheet Size: 8-1/2 inches by 11 inches. All others: Multiples of 8-1/2 inches by 11 inches, 22 inches by 34 inches (ANSI D) maximum.
- C. Original sheet or reproducible transparency will be marked with Project Manager's and/or Architect/Engineer's review comments and returned to Contractor.
- D. Mark each copy to identify applicable Products, models, options, and other data; supplement manufacturers' standard data to provide information unique to Work.
- E. Include manufacturers' installation instructions when required by technical specifications or specification section.

1.8 SAMPLES

- A. Submit full range of manufacturers' standard colors, textures, and patterns for Project Manager's selection where not indicated in documents or for substitutions or "equals".
- B. Submit samples to illustrate functional and aesthetic characteristics of Product, with integral parts and attachment devices. Coordinate submittal of different categories for interfacing work.
- C. Include identification on each sample, giving full information.
- D. Submit three (3) samples unless otherwise specified.
- E. Sizes: Unless otherwise specified, provide the following:
 - 1. Paint Chips: Manufacturers' standard.
 - 2. Flat or Sheet Products: Minimum 6 inches square, maximum 12 inches square.
 - 3. Linear Products: Minimum 6 inches, maximum 12 inches long.
 - 4. Bulk Products: Minimum 1 pint, maximum 1 gallon.
- F. Full size samples may be used in Work upon approval.
- G. Mock-ups:

1. Erect field samples and mock-ups at Project site in accordance with requirements of Special Conditions or Specification sections.
2. Modify or make additional field samples and mock-ups as required to provide appearance and finishes approved by Project Manager.
3. Approved field samples and mock-ups may be used in Work upon approval.

1.9 QUALITY CONTROL SUBMITTALS

- A. Design Data: Three (3) copies and PDF.
- B. Test Reports: Three (3) copies and PDF.
 1. Indicate that material or product conforms to or exceeds specified requirements.
 2. Reports may be from recent or previous tests on material or product, but must be acceptable to Project Manager. Comply with requirements of each individual technical specifications or specification Section.
- C. Certificates: Three (3) copies and PDF.
 1. Indicate that material or product conforms to or exceeds specified requirements.
 2. Submit supporting reference data, affidavits, and certifications as appropriate.
 3. Certificates may be recent or from previous test results on material or product, but must be acceptable to Project Manager.
- D. Manufacturers' Instructions: Three (3) copies and PDF.
 1. Include manufacturer's printed instructions for delivery, storage, assembly, installation, startup, adjusting, and finishing.
 2. Identify conflicts between manufacturer's instructions and Contract Documents.

1.10 MACHINE INVENTORY SHEETS

- A. Submit three (3) copies of machine inventory sheets including inventory list for spare parts and materials. If necessary, copies will be marked with Project Manager's and/or Architect/Engineer's review comments and returned to Contractor for correction until satisfactory information is provided. City will retain satisfactorily corrected sheets for its own use.

1.11 OPERATIONS AND MAINTENANCE MANUALS

- A. Submit three (3) copies and PDF of manufacturers' operations and maintenance manuals. If necessary, copies will be marked with City's review comments and returned to Contractor for correction until satisfactory information is provided. City will retain satisfactorily corrected manuals for its own use.
- B. Operations and maintenance manuals shall include the following as appropriate:
 1. Operating instructions.
 2. Preventive maintenance instructions.

3. Cleaning instructions.
 4. Safety precautions.
 5. Trouble shooting procedures.
 6. Theory of operation to discrete component level.
 7. Schematic diagrams, flow diagrams, wiring diagrams, logic diagrams, etc. to discrete component level.
 8. Parts lists showing all discrete components with part number, current prices and availability.
 9. List of replaceable supplies; paper, ink, ribbon, etc. with part numbers, current prices and availability.
 10. Recommended levels of spare parts and supplies to keep on hand.
 11. Manufacturers' service and maintenance technical manuals.
 12. Names, addresses and telephone numbers of service and repair firms for the equipment.
- C. Manuals shall be the same as are used by manufacturers' authorized technicians to completely service and repair the equipment.
- 1.12 KEYS
- A. Submit two (2) complete sets of keys for the Project and all related facilities.
 - B. Submit an inventory list of keys.
- 1.13 PROJECT RECORD DOCUMENTS
- A. Submit copies of each of the Project Record Documents as listed in [Section 01 78 00 – Closeout Submittals](#).

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 01 33 00

SECTION 01 41 00 – REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes some of the key regulatory requirements applicable to Contract, provided for the Contractor's convenience only, and not intended as a complete list of all currently applicable regulatory requirements.

1.2 REFERENCES TO REGULATORY REQUIREMENTS

- A. Codes, laws, ordinances, rules and regulations referred to shall have full force and effect as though printed in full in these specifications.
- B. Conform to referenced codes, laws, ordinances, rules and regulations which are in effect on date of receipt of bids.

1.3 CODES

- A. Codes which apply to Contract include, but are not limited to, the following:
 - 1. California Building Code (CBC) – Latest Edition:
 - a. California Administrative Code: Title 24, Part 1.
 - b. California Building Code: Title 24, Part 2 (Includes the California Historical Building Code, Part 8 and California Existing Building Code, Part 10).
 - c. California Residential Code: Title 24, Part 2.5
 - d. California Electrical Code: Title 24, Part 3.
 - e. California Mechanical Code: Title 24, Part 4.
 - f. California Plumbing Code: Title 24, Part 5.
 - g. California Energy Code: Title 24, Part 6.
 - h. California Fire Code: Title 24, Part 9.
 - i. California Green Building Standards Code (CALGreen): Title 24, Part 11.
 - j. California Referenced Standards Code: Title 24, Part 12.

1.4 LAWS, ORDINANCES, RULES AND REGULATIONS

- A. During prosecution of Work to be done under Contract, comply with applicable laws, ordinances, rules and regulations, including, but not limited to, the following:
 - 1. Federal/National:
 - a. Americans with Disabilities Act (ADA): Latest edition; Civil Rights Division, Office on the Americans with Disabilities Act, U.S. Department of Justice

- b. National Fire Protection Association (NFPA): Life Safety Code - NFPA 101.
 - c. U. S. Environmental Protection Agency (EPA): Laws and regulations.
 - d. 29 CFR, Section 1910.1001, Asbestos
 - e. 40 CFR, Subpart M, National Emission Standards for Asbestos
 - f. Executive Order 11246
2. State of California:
- a. California Code of Regulations, Titles 5, 8, 19, 21, 24
 - b. California Education Code
 - c. California Public Contract Code
 - d. California Health and Safety Code
 - e. California Government Code
 - f. California Labor Code
 - g. California Civil Code
 - h. California Code of Civil Procedure
 - i. CPUC General Order 95, Rules for Overhead Electric Line Construction
 - j. CPUC General Order 128, Rules for Construction of Underground Electric Supply and Communications Systems
3. State of California Agencies:
- a. State and Consumer Services Agency
 - b. Department of Industrial Relations – Public Works
 - c. Office of the State Fire Marshal
 - d. California Environmental Protection Agency (CalEPA): State regulations and standards.
 - e. California Integrated Waste Management Board:
 - 1) General: Sustainable Building Guidelines.
 - 2) Construction Waste Management: Construction and Demolition Debris Recycling.
 - f. California State Water Resources Control Board (SWRCB): SWPPP Standards.
 - g. California Department of Toxic Substances Control (DTSC): Hazardous Waste Management standards.
4. City Codes:
- a. Pittsburg Municipal Code
5. Local Agencies:
- a. Bay Area Air Quality Management
 - b. County of Contra Costa
 - c. City of Pittsburg

1.5 RESERVED

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 01 41 00

SECTION 01 42 00 – REFERENCES**PART 1 - GENERAL****1.1 SUMMARY****A. Section Includes:**

1. This section includes reference standards, symbols and definitions used in Contract Documents.
2. Material and workmanship specified by reference to number, symbol, or title of specific standard such as state standard, commercial standard, federal specifications, technical society, or trade association standard, or other similar standard shall comply with requirements of standards except when more rigid requirements are specified or required by applicable codes.
3. Standards referred to, except as modified herein, shall have full force and effect as though printed in the Contract Documents. Standards are not furnished to Contractor, since manufacturers and trades involved are assumed to be familiar with their requirements.

1.2 REFERENCE TO STANDARDS AND SPECIFICATIONS OF TECHNICAL SOCIETIES; REPORTING AND RESOLVING DISCREPANCIES:

- A. Latest in Effect: Reference to standards, specifications, manuals or codes of any technical society, organization or association, or to the laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard, specification, manual, code or laws or regulations in effect at the time of opening of Bids, except as may be otherwise specifically stated in the Contract Documents.
- B. Discrepancies: If during the performance of the Work, Contractor discovers any conflict, error, ambiguity or discrepancy within the Contract Documents or between the Contract Documents and any provision of any such law or regulation applicable to the performance of the Work or of any such standard, specification, manual or code or of any instruction of any supplier, Contractor shall report it in writing at once to Inspector, with copies to Project Manager and Architect/Engineer, and Contractor shall not proceed with the Work affected thereby until consent to do so is given by Project Manager.
- C. Precedence: Except as otherwise specifically stated in the Contract Documents, including Division 00 – General Conditions, Article 3, or as may be provided by Change Order, or supplemental instruction, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity or discrepancy between the provisions of the Contract Documents and:

1. The provisions of any such standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or
2. The provisions of any such laws or regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such law or regulation).
3. No provision of any such standard, specification, manual, code or instruction shall be effective to change the duties and responsibilities of City, Contractor, Project Manager, or Architect/Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents, nor shall it be effective to assign to City, Architect/Engineer, Project Manager, or any of their consultants, agents or employees any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

1.3 STANDARDS

| | |
|--------|---|
| AASHTO | American Association of State Highway and Transportation Officials |
| ACI | American Concrete Institute |
| AI | The Asphalt Institute |
| AIA | American Institute of Architects |
| AISC | American Institute of Steel Construction |
| AISI | American Iron and Steel Institute |
| AITC | American Institute of Timber Construction |
| ANSI | American National Standards Institute, Inc. |
| APA | American Plywood Association |
| APWA | American Public Works Association |
| AREMA | The American Railway Engineering and Maintenance-of-Way Association |
| ASCE | American Society of Civil Engineers |
| ASLA | American Society of Landscape Architects |
| ASME | American Society of Mechanical Engineers |

| | |
|----------|---|
| ASSE | American Society of Sanitary Engineering |
| ASTM | American Society for Testing and Materials |
| AWS | American Welding Society |
| AWWA | American Water Works Association |
| BASMAA | Bay Area Stormwater Management Agencies Association |
| BBC | Basic Building Code, Building Officials and Code Administrators International |
| BFL | Bay Friendly Landscaping |
| CALOSHA | California Occupational Safety and Health Administration |
| CA MUTCD | California Manual on Uniform Traffic Control Devices |
| CALTRANS | State of California Department of Transportation |
| CBC | California Building Code |
| CCR | California Code of Regulations |
| CLFMI | Chain Link Fence Manufacturer's Institute |
| CRSI | Concrete Reinforcing Steel Institute |
| DDW | Division of Drinking Water |
| EIA | Electronic Industries Association |
| IAPMO | International Association of Plumbing and Mechanical Officials |
| ICBO | International Conference of Building Officials |
| IEEE | Institute of Electrical and Electronics Engineers |
| ISO | International Organization for Standardization |
| ITE | Institute of Traffic Engineers |
| MSS | Manufacturers Standardization Society |
| NACE | National Association of Corrosion Engineers |
| NBS | National Bureau of Standards |
| NEC | National Electrical Code |

| | |
|------|---|
| NEMA | National Electrical Manufacturer's Association |
| NFPA | National Fire Protection Association |
| OSHA | Occupational Safety and Health Administration (Federal) |
| PCA | Portland Cement Association |
| PUC | Public Utilities Commission |
| SSPC | Steel Structures Painting Council |
| STA | Seal of Testing Assurance Program |
| UL | Underwriters Laboratories, Inc |
| USCC | U S Composting Council |

1.4 SYMBOLS

- A. Symbols, used only on Drawings, are shown thereon.

1.5 DEFINITIONS

- A. Wherever any of the words or phrases defined below, or a pronoun used in place thereof, is used in any part of the City Standard Specifications, it shall have the meaning here set forth:
1. ADDENDUM/ADDENDA: Written or graphic instruments issued prior to the opening of Bids which clarify, correct or change the bidding requirements or the Contract Documents.
 2. ADDITIVE BID: The sum to be added to the Base Bid if the change in scope of work as described in Additive Bid is accepted by City.
 3. AGREEMENT The Contract executed by the parties as further defined in Division 00 – General Conditions, Article 1.
 4. ALTERNATE: Work added to or deducted from the Base Bid, if accepted by City.
 5. APPROVED EQUAL: Approved in writing by City as being of equivalent quality, utility and appearance.
 6. ARCHITECT/ENGINEER:
 - a. Design Architect: The person holding a valid California State Architect's or Landscape Architect's license, whose firm has been designated within the Contract Documents to provide architectural or landscape architectural services on the project, and who may have engaged engineering subconsultants to provide services on Project.
 - b. Design Engineer: The person holding a valid California State Engineering license, whose firm has been designated within the Contract Documents to provide civil, structural, traffic or other

- engineering services on the project, and who may have engaged engineering subconsultants to provide services on Project.
- c. When the Architect/Engineer is referred to within the Contract Documents and no Architect or Engineer has in fact been designated, then the matter shall be referred to City. The term Architect/Engineer shall be construed to include all his or her consultants retained for the Project, as well as employees of the Architect/Engineer. When the designated Architect/Engineer is an employee of City, his or her authorized representatives on the Project within the district will be included under the term Architect/Engineer.
7. AS-BUILTS: Project Record Documents as required by the General Conditions and [Section 01 78 00 – Closeout Submittals](#).
 8. BID: The offer or proposal of the Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 9. BIDDER: One who submits a Bid.
 10. BY CITY: Work that will be performed by City or its agents at the City's expense.
 11. BY OTHERS: Work that is outside scope of Work to be performed by Contractor under this Contract, which will be performed by City, other contractors, or other means.
 12. CITY: City of Pittsburg, acting through its City Council or any of its authorized agents.
 13. CITY CORPORATION YARD: Located at 357 East 12th Street, Pittsburg, CA 94565-2628.
 14. CITY ENGINEER: City employee in charge of Engineering.
 15. CITY-FURNISHED, CONTRACTOR-INSTALLED: Items furnished by City at its cost for installation by Contractor at its cost under this Contract.
 16. CITY'S PROJECT MANAGER(S): The person or persons assigned by City to be City's agent(s) or representative(s) at the site. City's authorized agent representing City on all matters of the Contract. Project Manager may authorize agents and representatives to act in carrying out Project Manager's duties, including a "Construction Manager", to act under the authority of the Project Manager. As City's agent, the Project Manager is the beneficiary of all contract obligations of Contractor to City, including without limitation, all releases and indemnities.
 17. CHANGE ORDER: A written instrument prepared by City and signed by City and Contractor, stating their agreement upon all of the following:
 - a. a change in the Work,
 - b. the amount of the adjustment in the Contract Sum, if any, and
 - c. the amount of the adjustment in the Contract Time, if any.
 18. CONCEALED: Work not exposed to view in the finished Work, including within or behind various construction elements.
 19. CONTRACT CONDITIONS: Conditions of the Contract define basic rights, responsibilities and relationships of Contractor and City and consists of two parts: General Conditions and Supplementary Conditions.

- a. General Conditions are general clauses which are common to the City Contracts.
- b. Supplementary conditions modify or supplement General Conditions to meet specific requirements for this Contract.
20. CONTRACT DOCUMENTS: Contract Documents shall consist of the documents identified as the Contract Documents in [General Conditions, Article 1](#), plus all changes, addenda and modifications thereto.
21. CONTRACT MODIFICATION: Either:
 - a. a written amendment to Contract signed by Contractor and City; or
 - b. a Change Order; or
 - c. a written directive for a minor change in the Work issued by City.
22. CONTRACT SUM: The sum stated in the Agreement and, including authorized adjustments, the total amount payable by City to Contractor for performance of the Work and the Contract Documents. The Contract Sum is also referred to as the Contract Price or the Contract Amount.
23. CONTRACT TIMES or CONTRACT TIME: The number or numbers of days or the dates stated in the Agreement (i) to achieve substantial completion of the Work or designated milestones and/or (ii) to complete the Work so that it is ready for final payment and is accepted.
24. CONSTRUCTION MANAGER: A representative of City with authority to act on behalf of City, as specified by City or Project Manager.
25. CONTRACTOR: The person or entity identified as such in the Agreement and referred to throughout the Contract Documents as if singular in number and neuter in gender. The term "Contractor" means the Contractor or its authorized representative.
26. CONTRACTOR'S EMPLOYEES: Persons engaged in execution of Work under Contract as direct employees of Contractor, as subcontractors, or as employees of subcontractors.
27. DATE OF SUBSTANTIAL COMPLETION: Date of Substantial Completion of Work or designated portion thereof is date certified by Project Manager when construction is sufficiently complete in accordance with Contract Documents for City to occupy Work or designated portion thereof and have beneficial use of it for the purposes intended.
28. DAY: One calendar day, unless the word "day" is specifically modified to the contrary.
29. DEFECTIVE: An adjective which, when modifying the word "Work", refers to Work that is unsatisfactory or unsuited for the use intended, faulty, or deficient, that it does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents (including but not limited to approval of samples and "or equal" items), or has been damaged prior to final payment (unless responsibility for the protection thereof has been assumed by City). Project Manager is the judge of whether Work is defective.
30. DRAWINGS: The graphic and pictorial portions of Contract Documents, wherever located and whenever issued, showing the design, location and

- dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.
31. EQUAL: Equal in opinion of Project Manager. Burden of proof of equality is responsibility of Contractor.
 32. EXPOSED: Work exposed to view in the finished Work, including behind louvers, grilles, registers and various other construction elements.
 33. FINAL ACCEPTANCE or FINAL COMPLETION: City's acceptance of the Work as satisfactorily completed in accordance with Contract Documents. Requirements for Final Acceptance/Final Completion include, but are not limited to:
 - a. All Systems having been tested and accepted as having met requirements of Contract Documents.
 - b. All required instructions and training sessions having been given by Contractor.
 - c. All as-built drawings, operations and maintenance manuals, and other closeout submittals having been submitted by Contractor, and reviewed and accepted by City.
 - d. All punch list work, as directed by City, having been completed by Contractor.
 - e. All Work, except Contractor maintenance after Final Acceptance, having been completed to satisfaction of City.
 - f. See [Section 01 29 00 – Payment Procedures](#), 1.9.D regarding Final Payment.
 - g. See [Section 01 77 00 – Closeout Requirements](#).
 34. FORCE ACCOUNT: Work directed to be performed without prior agreement as to lump sum or unit price cost thereof, and which is to be billed at cost for labor, materials, equipment, taxes, and other costs, plus a specified percentage for overhead and profit.
 35. FURNISH: Supply and deliver to the jobsite.
 36. INDICATED: Shown or noted on the Drawings.
 37. INSPECTOR: The person engaged by City to inspect the workmanship, materials, or manner of construction of buildings or portions of buildings, to determine if such construction complies with the Contract Documents and applicable codes.
 38. INSTALL: Anchor, fasten, or connect in place and adjust for use; place or apply in proper position and location; establish in place for use or service.
 39. LATENT: Not apparent by reasonable inspection, including but not limited to, the inspections and research required as a condition to bidding under the General Conditions.
 40. MATERIAL OR MATERIALS: These words shall be construed to embrace machinery, manufactured articles, materials of construction (fabricated or otherwise), and any other classes of material to be furnished in connection with Contract, except where a more limited meaning is indicated by context.
 41. MILESTONE: A principal event specified in Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all Work.

42. MODIFICATION: Same as Contract Modification.
43. NOT IN CONTRACT: Work that is outside the scope of work to be performed by Contractor under this Contract.
44. NOTICE OF AWARD: A written notice given by City to lowest responsive, responsible bidder advising that Bidder's bid and other qualifying information is acceptable to City, requiring Bidder to fulfill the requirements of Article 4 of [General Conditions](#).
45. NOTICE TO PROCEED: A written notice given by City to Contractor fixing the date on which the Contract Time will commence to run and on which contractor shall start to perform Contractor's obligations under the Contract Documents.
46. OFF SITE: Outside geographical location of the Project.
47. OWNER: City of Pittsburg, acting through its officers, employees, or its authorized agent.
48. PROGRESS REPORT: A periodic report submitted by Contractor to City with progress payment invoices accompanying actual work accomplished to the Program Schedule. See [Section 01 32 16 - Construction Progress Schedule](#) and Reports required in [General Conditions](#).
49. PROJECT: Total construction of which Work performed under this Contract may be whole or part.
50. PROJECT MANUAL: Project Manual consists of Bidding Requirements, Agreement, Bonds, Certificates, Contract Conditions, Technical Specifications, and Specifications.
51. PROVIDE: Furnish and install.
52. REQUESTS FOR INTERPRETATION ("RFI"): A document prepared by Contractor requesting interpretation, information, and/or clarification regarding the Project or Contract Documents.
53. SAMPLES: Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
54. SHOP DRAWINGS: All drawings, diagrams, illustrations, schedules and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the work.
55. SITE/JOBSITE: The particular geographical location of Work performed pursuant to Contract.
56. TECHNICAL SPECIFICATIONS: Divisions 01 through 34 – Technical Specifications, which states project-specific requirements.
57. SPECIFICATIONS: The written portion of the Contract Documents consisting of requirements for materials, equipment, construction systems, standards and workmanship for the Work, and performance of related services; and are contained in Divisions 01 through 48.
58. SPECIFIED: As written in Technical Specifications and Specifications.
59. SUBCONTRACTOR: A person or entity who has a direct contract with Contractor to perform a portion of the Work at the site. The term "subcontractor" is referred to throughout the Contract Documents as if

singular in number and neuter in gender and means a subcontractor or an authorized representative of the subcontractor. The term "subcontractor" does not include a separate contractor or subcontractors of a separate contractor.

60. SUBMITTALS: Shop drawings, samples and other items specified in [Section 01 33 00 - Submittal Procedures](#).
 61. SUBSTANTIAL COMPLETION: The Work (or a specified part thereof) has progressed to the point where, in the opinion of the Project Manager and Architect/Engineer and as evidenced by a Certificate of Substantial Completion, the Work is sufficiently complete, in accordance with Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended; or if no such certificate is issued, when the Work is complete and ready for final payment as evidenced by written recommendation of Project Manager and/or Architect/Engineer for final payment. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof. See [Section 01 29 00 – Payment Procedures](#), 1.8.A.2 regarding application for payment of Substantial Completion and [Section 01 77 00 – Closeout Requirements](#).
 62. SUPPLEMENTAL INSTRUCTION: A written work change directive to Contractor from Project Manager or Architect/Engineer, approved by Project Manager, ordering alterations or modifications which do not result in change in Contract Sum or Contract Times, and do not substantially change Drawings, Technical Specifications, or Specifications.
 63. UNDERGROUND FACILITIES: All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments, and any encasements containing such facilities which have been installed underground to furnish any of the following services or materials: Electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or other control systems or water.
 64. WORK: The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents within the Contract Time. Work includes and is the result of performing or furnishing labor and furnishing and incorporating materials and equipment into the construction, and performing or furnishing services and furnishing documents, all as required by the Contract Documents including the Drawings, Technical Specifications, and Specifications. Wherever the word "work" is used, rather than the word "Work", it shall be understood to have its ordinary and customary meaning.
 65. WORKING DAY. A working day is defined as any day, except as follows:
 - a. Saturdays, Sundays, and legal holidays
 - b. Days on which the Contractor is prevented from performing work by inclement weather or conditions resulting therefrom.
- B. Wherever words "as directed", "as required", "as permitted", or words of like effect are used, it shall be understood that direction, requirements, or permission of City

or Project Manager is intended. Words "sufficient", "necessary", "proper", and the like shall mean sufficient, necessary or proper in judgment of City or Project Manager. Words "approved", "acceptable", "satisfactory", or words of like import, shall mean approved by, or acceptable to, or satisfactory to, City or Project Manager.

- C. Wherever the word "may" is used, the action to which it refers is discretionary. Wherever the word "shall" is used, the action to which it refers is mandatory. Where a colon (:) is used within sentences or phrases, the words "shall" or "shall be" are included by inference. Such imperative statements in the specifications are directed to the Contractor, who has overall responsibility for the subcontractors.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 01 42 00

SECTION 01 42 13 - ABBREVIATIONS

PART 1 - GENERAL

1.1 GENERAL

- A. Wherever in these Specifications references are made to the Standards, Specifications or other published data of the various national, regional, or local organizations, such organization may be referred to by their acronym or abbreviation only. As a guide to the use of these Specifications, the following acronyms or abbreviations which may appear in these Specifications shall have the meaning indicated herein.

1.2 ABBREVIATIONS AND ACRONYMS

| | |
|--------|---|
| AASHTO | American Association of State Highway and Transportation Officials |
| ACI | American Concrete Institute |
| AGC | Associated General Contractors |
| AI | The Asphalt Institute |
| AIA | American Institute of Architects |
| AISC | American Institute of Steel Construction |
| AISI | American Iron and Steel Institute |
| AITC | American Institute of Timber Construction |
| ANSI | American National Standards Institute, Inc. |
| APA | American Plywood Association |
| APWA | American Public Works Association |
| AREMA | The American Railway Engineering and Maintenance-of-Way Association |
| ASCE | American Society of Civil Engineers |
| ASLA | American Society of Landscape Architects |

| | |
|----------|---|
| ASME | American Society of Mechanical Engineers |
| ASSE | American Society of Sanitary Engineering |
| ASTM | American Society for Testing and Materials |
| AWS | American Welding Society |
| AWWA | American Water Works Association |
| BASMAA | Bay Area Stormwater Management Agencies Association |
| BBC | Basic Building Code, Building Officials and Code Administrators International |
| BFL | Bay Friendly Landscaping |
| CALOSHA | California Occupational Safety and Health Administration |
| CA MUTCD | California Manual on Uniform Traffic Control Devices |
| CALTRANS | State of California Department of Transportation |
| CBC | California Building Code |
| CCR | California Code of Regulations |
| CFC | California Fire Code |
| CLFMI | Chain Link Fence Manufacturer's Institute |
| CPC | California Plumbing Code |
| CRSI | Concrete Reinforcing Steel Institute |
| CVC | California Vehicle Code |
| DBE | Disadvantaged Business Enterprise |
| DDW | Division of Drinking Water |
| EIA | Electronic Industries Association |
| ICBO | International Conference of Building Officials |
| IEEE | Institute of Electrical and Electronics Engineers |
| ISO | International Organization for Standardization |
| ITE | Institute of Traffic Engineers |

| | |
|------|---|
| MSS | Manufacturers Standardization Society |
| NACE | National Association of Corrosion Engineers |
| NBS | National Bureau of Standards |
| NEC | National Electrical Code |
| NEMA | National Electrical Manufacturer's Association |
| NFPA | National Fire Protection Association |
| OSHA | Occupational Safety and Health Administration (Federal) |
| PCA | Portland Cement Association |
| PUC | Public Utilities Commission |
| SSPC | Steel Structures Painting Council |
| STA | Seal of Testing Assurance Program |
| UL | Underwriters Laboratories, Inc |
| USCC | U S Composting Council |

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 01 42 13

SECTION 01 43 00 – QUALITY ASSURANCE

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes administrative and procedural requirements for quality assurance.
 - 1. Workmanship: Quality of work.
 - 2. Tolerances: Finished surfaces.
- B. References:
 - 1. General: Refer to [General Conditions](#) and [Section 01 42 00 - References](#). Products or workmanship specified in the Project Manual by association, trade, or other consensus standards shall conform to the requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
 - 2. Contractual Relationship: The contractual duties and responsibilities of the parties of the Contract and those of the Project Manager shall not be altered from the requirements of the Contract Documents by any statement or inference in any reference document.
- C. Testing: Refer to [Section 01 45 00 – Quality Control](#).

PART 2 - PRODUCTS

- 2.1 Refer to [Section 01 60 00 – Product Requirements](#); assure a consistent quality of products furnished by suppliers and manufacturers as indicated throughout the Project Manual.

PART 3 - EXECUTION

3.1 PERFORMANCE

- A. Refer to [Section 01 70 00 – Execution](#).
- B. Workmanship: Perform shop and field work with mechanics, crafts persons, artisans, and workers skilled and experienced in the fabrication and installation of work specified. Install and erect work plumb, level, square, and true, or true to indicated angle, and in proper alignment and relationship to other work. Finished work shall be free from defects and damage. Quality of work shall conform to the highest established standards and practices of the various trades required. The Project Manager reserves the right to reject materials and work quality which

does not meet accepted standards. Repair or replace substandard material or work as directed, at no additional cost to the City.

3.2 INSTALLATION

- A. General: Conduct quality control in concert with suppliers, products, services, site conditions, and workmanship, to produce work of specified quality.
- B. Manufacturer's Instructions:
 - 1. General: Follow manufacturer's instructions, including each step in progression of installation. If manufacturer's instructions conflict with Contract Documents, request clarification from Project Manager before commencing Work.
 - 2. Installer: Manufacturer approved, as required in the technical sections of the Project Manual.
 - 3. Field Services: Coordinate with manufacturer of a product, system, or assembly which requires special knowledge and skill for proper application/installation of the product, system, or assembly to obtain field service, consultation and inspection as required for the application/installation work at no additional cost to the City.
- C. Reference Standards: Conform to specified standards as minimum quality for the Work except where more stringent codes or specified requirements indicate higher standards or more precise workmanship.
- D. Anchorage: Secure products in place with positive anchorage devices designed and sized to withstand stress, vibration, physical distortion, or disfigurement.
- E. Tolerances: Adjust products to appropriate dimensions; position before securing in place. Monitor and control tolerances of installed products to produce acceptable Work.

END OF SECTION 01 43 00

SECTION 01 45 00 – QUALITY CONTROL

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for quality-control services.
- B. Quality-control inspections will be conducted by the City's Information Technology (IT) staff. These services do not relieve Contractor of responsibility for compliance with Contract Document requirements.
- C. Specified inspections and related actions do not limit Contractor's quality-control procedures that facilitate compliance with Contract Document requirements.

1.2 RESPONSIBILITIES

- A. Owner's Responsibilities: Unless otherwise indicated as the responsibility of another identified entity, the City's IT staff will conduct inspections to satisfy their general requirements.
- B. Where individual Sections specifically indicate that certain inspections, tests, and other quality-control services are the Contractor's responsibility, the Contractor shall employ and pay a qualified independent testing agency to perform quality-control services. Costs for these services are included in the Contract Sum.

1.3 SUBMITTALS

- A. Unless the Contractor is responsible for this service, the independent testing agency shall submit a certified written report, in duplicate, of each inspection, test, or similar service to the Owner. If the Contractor is responsible for the service, submit a certified written report, in duplicate, of each inspection, test, or similar service through the Contractor.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

- A. General: Upon completion of inspection, testing, sample taking and similar services, repair damaged construction and restore substrates and finishes. Comply with Contract Document requirements for [Section 01 70 00 - Execution](#).

END OF SECTION 01 45 00

SECTION 01 56 10 – PROTECTION OF PROPERTY**PART 1 - GENERAL**

1.1 SUMMARY

A. Section Includes:

1. Existing Utilities and Improvements
2. Safeguarding of Existing Facilities
3. Restoration of Pavement
4. Emergency Work
5. Preconstruction Site Documentation

B. Related Sections:

1. [Section 01 50 00 – Temporary Facilities and Controls](#)
2. [Section 01 32 00 – Construction Progress Documentation](#)

1.2 EXISTING UTILITIES AND IMPROVEMENTS

A. Verify the actual locations and depths of all wiring indicated or marked. Make a sufficient number of exploratory searches of wiring and utility installations that may interfere with the Work sufficiently in advance of construction to avoid possible delays to Contractor's work.

1. Notify the City when such exploratory explorations show the utility location as shown or as marked to be in error.
2. When utility lines are encountered within the area of Contractor's operations, notify the Project Manager and the Owner(s) of the utility lines sufficiently in advance for the necessary protection measures to be taken to prevent interruption of service or delay to Contractor's operations.

1.3 SAFEGUARDING OF EXISTING FACILITIES

A. Damage: Perform all work in such a manner as to avoid damage to existing fire sprinkler system, power lines, lighting standards, and all other existing utilities, facilities, and structures. The Contractor will be held responsible for any damage due to its failure to exercise due care, and at no cost to the City.

B. Removal and Disposal: Debris, and the like, shall be immediately removed from the property site as the Contractor's property and disposed of in a legal manner.

C. Existing Facilities: Exercise due care to avoid damage to existing pipe and coating, wrapping, conduit, or other existing facilities and structures. Should the Contractor damage or displace any of the above, repair same to the satisfaction of the Project Manager; all expenses in connection therewith shall be borne solely by the Contractor.

1.4 EMERGENCY WORK

- A. General: At all times have adequate personnel, materials, and equipment available at short notice to protect the property, maintain, or make emergency repairs. If during the progress of the Contract, the Contractor's construction crews should be absent from the location of the work at a time when any failure or faulty condition of the Contractor's work requires emergency action in the public interest, the City shall have the right to make repairs and corrections as required with its own forces at the Contractor's expense.
- B. Contact Information: Furnish the Project Manager with names and telephone numbers of at least three (3) persons to contact in case of emergencies; these persons shall be authorized to perform such work as deemed necessary by the Project Manager.

1.5 PRECONSTRUCTION SITE DOCUMENTATION

- A. Prevention of Damage: Use such methods and take adequate precautions to prevent damage to existing buildings, structures, and other improvements during the prosecution of the work.
- B. Joint Examination: After the Contract is awarded and before the commencement of work, the Project Manager will arrange for a joint examination of the work, as applicable, which might be damaged by the Contractor's operations
- C. Scope of Examination: The examination will include the exterior of existing buildings, structures, and other improvements located within twenty-five (25) feet of the construction area. Examination will be made jointly by authorized representatives of the Contractor and the City under the supervision of the Project Manager.
- D. Photos and Videos: Take photos and videos during the joint examination review. Provide digital photos and videos to the Project Manager within thirty (30) consecutive days of the date taken.
- E. Use of Records and Photographs: Any and all records and photographs are intended for use as indisputable evidence in ascertaining the extent of any damage which may occur as a result of the Contractor's operations. They are for the protection of the adjacent property owners, the Contractor, and the City and will be a means of determining whether and to what extent damage, resulting from the Contractor operations, occurred during the Contract Work.
- F. Requirements for Photographs and Videos: Refer to [Section 01 32 00 – Construction Progress Documentation](#).

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 01 56 10

SECTION 01 60 00 – PRODUCT REQUIREMENTS**PART 1 - GENERAL****1.1 SUMMARY**

- A. This Section includes administrative and procedural requirements governing the Contractor's selection of products for use in the Project.

1.2 DEFINITIONS

- A. Products:
 - 1. General: Items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 2. Named Products: Items identified by the manufacturer's product name, including make or model number or other designation, shown or listed in the manufacturer's published product literature, that is current as of the date of the Contract Documents.
 - 3. Materials: Components shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.
 - 4. Equipment: Product with operational parts, whether motorized or manually operated, that requires service connections, such as wiring or piping.

1.3 QUALITY ASSURANCE

- A. Source Limitations: To the fullest extent possible, provide products of the same kind from a single source.
- B. Compatibility of Options: When the Contractor is given the option of selecting between 2 or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. General: Deliver, store, and handle products according to the manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft.
 - 1. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.
 - 2. Coordinate delivery with installation time to assure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.

3. Deliver products to the site in an undamaged condition in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products upon delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
5. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.
6. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.
7. Store products subject to damage by the elements above ground, under cover in a weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

PART 2 - PRODUCTS

2.1 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Products complying with specified reference standards or description.
- B. Products Specified by Naming One or More Manufacturers: Products of one of manufacturers named and complying with Specifications; no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with Provision for Substitutions: Submit Request for Substitution for any manufacturer not named, according to [Section 01 25 00 - Substitution Procedures](#).

PART 3 - EXECUTION

3.1 INSTALLATION OF PRODUCTS:

- A. General: Refer to [Section 01 70 00 – Execution](#).
- B. Product Handling: Assure that Work is manufactured and/or fabricated in ample time to not delay construction progress. Transport, handle, store and protect products in accordance with manufacturer's instructions.

END OF SECTION 01 60 00

SECTION 01 71 13 – MOBILIZATION**PART 1 - GENERAL**

1.1 SUMMARY

- A. Section includes but not limited to:
1. mobilization and demobilization;
 2. preparatory work and activities those necessary for the movement of personnel, equipment, supplies, and incidentals to the job site;
 3. for the establishment of all offices, building, trailers, and other facilities necessary for work on the project;
 4. submittals, bonding and insurance requirements;
 5. public notifications in English and Spanish;
 6. contacting and notifying the utility companies;
 7. fabricating and installing project identification signs;
 8. private property owner agreement for storage facilities;
 9. and for all other work and activities which must be performed or costs incurred prior to beginning work on the various contract items on the project site.

1.2 REFERENCES

- A. Cal/OSHA – California Division of Occupation Safety and Health
- B. Underground Services Alert (USA)

1.3 SUBMITTALS

- A. [Section 01 33 00 - Submittal Procedures](#): Requirements for submittals.
- B. Measurement and Payment:
1. When mobilization is included as a bid item, measurement will be made as a percentage of the costs incurred according to the list submitted except that not more than 75% of the bid price shall be paid prior to the final estimate for payment being due, said remaining 25% paid upon completion of cleanup and removal and demobilization with final payment.
 2. When the contract does not include a contract pay item for mobilization, full compensation for any necessary mobilization required shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefore.

3. The contract price paid for mobilization shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in mobilization and demobilization including the items listed in Part 1.1 of this Section as specified herein, and no additional compensation shall be made therefor.
4. Mobilization shall be considered as a non-adjustable contract item. Any contract change orders shall be considered as including full compensation for mobilization.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.1 MOBILIZATION

- A. Mobilization shall consist of preparatory work and activities listed in Part 1.1 above.
- B. The Contractor shall insure that adequate existing sanitation facilities are available or the Contractor shall provide and maintain adequate sanitation facilities. All wastes and refuse from sanitary facilities provided by the Contractor's operations shall be disposed of away from the site in accordance with all laws and regulations pertaining thereto.
- C. Mobilization shall also include demobilization upon completion of work and cleanup of the site.
- D. The contractor shall provide all labor, materials, equipment and incidentals to prepare the site for the timely start and efficient completion of all work. This includes obtaining all necessary licenses and permits, providing required submittals including but not limited to a detailed project schedule.
- E. Mobilization shall also include notifications to all existing utility companies as shown on the Drawings as first order of work.

END OF SECTION 01 71 13

SECTION 01 73 29 – CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SUMMARY

- A. General: This section includes requirements for cutting and patching.

1.2 QUALITY ASSURANCE

- A. Installers: Employ skilled and experienced installers to perform cutting and patching.

1.3 SUBMITTALS

- A. Written Request: Submit written request in advance of cutting or altering elements affecting:
 - 1. Structural integrity of element.
 - 2. Integrity of weather-exposed or moisture-resistant elements.
 - 3. Efficiency, maintenance, or safety of element.
 - 4. Visual qualities of sight-exposed elements.
 - 5. Work of Owner or separate contractor.
- B. Request Requirements: Project name and location; description of all affected work; explanation of necessity for cutting, alteration or excavation; impact on the work of the Owner or any separate contractor, or on the structural or weatherproof integrity of the building; description of proposed work, including scope of cutting, patching, alteration, or excavation, products proposed to be used, trades who will complete the work, and extent of refinishing to be done; alternatives to cutting and patching; cost proposal, when applicable; written permission from any separate contractor whose work will be affected.
- C. Product Substitutions: Should conditions of Work or schedule indicate change of products from original installation, submit request for substitution as specified in [Section 01 25 00 - Substitution Procedures](#).
- D. Field Observation: Submit written notice to Project Manager designating date and time work will be uncovered.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. General: Inspect existing conditions; include elements subject to damage or movement during cutting and patching.
- B. After Uncovering Work: Inspect conditions affecting the installation of products, or performance of Work.
- C. Unsatisfactory Conditions: Report unsatisfactory or questionable conditions to the Project Manager in writing; do not proceed with work until Project Manager has provided further instructions.

3.2 PREPARATION

- A. Temporary Support: Provide as necessary to assure structural value or integrity of affected portion of Work.
- B. Protection:
 - 1. Provide devices and methods to protect other portions of the Project from damage.
 - 2. Provide protection from elements for that portion of the Project which may be exposed by cutting and patching, and maintain excavations free from water.

3.3 PERFORMANCE

- A. Cutting and Patching: Execute cutting, fitting, and patching, including excavation and fill if required, to complete Work and to:
 - 1. Fit the several parts together, to integrate with other Work.
 - 2. Uncover Work to install or correct ill-timed Work.
 - 3. Remove and replace defective and nonconforming Work.
 - 4. Remove samples of installed Work for testing.
 - 5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.
- B. Methods: Execute Work by methods to avoid damage to other Work and to provide proper surfaces to receive patching and finishing. Cut masonry and concrete materials using masonry saw or core drill.
- C. Restoration: Restore Work with new products according to requirements of Contract Documents. In the case of failure to protect existing or new work, Contractor shall be responsible for costs to repair damage and for restoring the work.

- D. Penetrations: Fit Work tight to pipes, sleeves, ducts, conduits, and other penetrations through surfaces. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.
- E. Refinishing: Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for assembly, refinish entire unit.
- F. Hazardous Conditions: Identify hazardous substances or conditions exposed during the Work to Project Manager for decision or remedy.

END OF SECTION 01 73 29

SECTION 01 74 19 – CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL**PART 1 - GENERAL**

1.1 SUMMARY

- A. Description: Provide Construction Waste Management including salvaging, recycling, and disposing of nonhazardous construction waste, as shown and specified per Contract Documents.

PART 2 - PRODUCTS

2.1 WASTE MANAGEMENT PLAN

- A. General: Develop plan, consisting of waste identification and construction methods employed to reduce the amount of waste generated, including separate sections for demolition and construction waste, to re-use and recycle minimum 75% of construction waste materials generated by the Work. Indicate quantities by weight or volume; use same units of measure throughout waste management plan.
- B. Quality Requirements: Refer to [Section 01 42 00 - References](#) for reference standards, applicable codes and definitions, and to the following:
1. American National Standards Institute (ANSI): ANSI 10.2 - Safety Code for Building Construction.
 2. American Society for Testing and Materials (ASTM): Materials and testing standards as identified throughout this Section or within referenced manufacturers' standard specifications.
 3. California Building Code (CBC): California Green Building Standards Code (CALGreen), latest edition: Title 24, Part 11.
 4. California Department of Resources Recycling and Recovery (CalRecycle):
 - a. General: Sustainable Building Guidelines.
 - b. Recycling and Recovery: Construction and Demolition Debris Recycling guidelines.
 5. California Occupational Safety and Health Administration (CalOSHA): Construction Safety Orders; 29 CFR, PART 1926 Safety and Health Regulations for Construction.
 6. Construction & Demolition Recycling Association (CDRA): Standards and guidelines.
 7. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

PART 3 - EXECUTION**3.1 PREPARATION**

- A. General: Review Waste Management Plan procedures and identify locations established for salvage, recycling, and disposal. Designate and label specific areas on the site for separating materials to be salvaged, recycled, reused, donated, and sold.

3.2 IMPLEMENTATION

- A. City of Pittsburg Construction & Demolition (C&D) Recycling and Waste Management requires at least 65% job-site waste materials diverted from the landfill.
- B. For newly constructed buildings, demolition projects and all locally permitted additions and alterations to non-residential buildings or structures, Contractor shall submit the C&D Debris Waste Management Plan (WMP) showing diverting from landfills at least 65% of the construction materials generated by the project.
- C. Contractor may deliver all approved recycling materials such as wood, metal, plastics, concrete, roofing, cardboard, dirt, sheetrock, tires, appliances, mattresses, box springs, propane tanks, and electronic waste to Contra Costa Waste Service also known as Recycling Center & Transfer Station (RCTS), located at 1300 Loveridge Road, Pittsburg, California. All materials shall be weighed at the RCTS. For any material code of "CD" (Construction & Demolition Material Processing), 100% diversion rate will be applied to receipts indicating the material code "CW" (Clean Wood), "CG" (Clean Green), or "CR" (Clean Roofing).
- D. Recycled Materials: Separate recyclable waste from other waste materials, trash, and debris. Provide properly marked containers or bins for controlling recyclable waste until they are removed from Project site. Store materials away from construction area, off the ground and protect from the weather; do not store within drip line of remaining trees. Transport recyclable waste off Owner's property to recycling receiver or processor.
- E. Disposal: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction. Except as otherwise specified, do not allow waste materials that are to be disposed of to accumulate on-site. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas. Burning and burying of materials is not allowed.
- F. Contractor shall submit the following WMP and Water Assessment table forms.



CITY OF PITTSBURG
65 Civic Avenue
Pittsburg, CA 94565

**CONSTRUCTION AND DEMOLITION DEBRIS
WASTE MANAGEMENT PLAN (WMP)**

| For City Use Only | |
|--------------------------|------------------------------------|
| Project No. | _____ |
| Date | _____ Fee \$ _____ |
| Deposit Amount \$ | _____ |
| <input type="checkbox"/> | Approved WMP |
| <input type="checkbox"/> | Approved Infeasibility Exemption |
| <input type="checkbox"/> | Denied _____ |
| <input type="checkbox"/> | Further information required _____ |
| Staff Initials | _____ |

The City of Pittsburg C&D Recycling and Waste Management requirement states that at least 75% diversion of job-site waste materials from the landfill. In order to process the application request, the following form must be completed, signed and submitted with an application fee.

- WMP Application Approval Request WMP Infeasibility Exemption Request

Property Owner Name/Ph.# _____
 Job-site Address: _____
 Contractor/Project Manager: _____
 Address: _____
 Phone Number: _____
 Cellular Phone Number: _____
 Fax Number: _____

Property Owner's Signature / Date

Contractor/Project Manager's Signature / Date

1. Briefly state how materials will be sorted for recycling and/or salvage on the job site. See *Waste Assessment Table on back page*. Attach additional pages if necessary. *If no materials are targeted for recycling or salvage, please state why.

2. Will this project require the use of sub-contractors? Yes No If yes, briefly state how you plan to inform and ensure participation by the sub-contractors of your job-site recycling and waste management responsibility.

Complete Other Side →

WASTE ASSESSMENT TABLE

- I. BEFORE START OF PROJECT: Identify the type of materials to be recycled, salvaged or disposed from the job-site in **Section I** of the Waste Assessment table. Identify the handling procedure, hauler and/or destination of each material type.
- II. UPON COMPLETION OF PROJECT: **Section II** is to be filled out with supporting documentation upon completion of project. Indicate the material **types and quantities** recycled, salvaged or disposed from this job-site. Official weight tags must be submitted with this completed report identifying 1) job site address, 2) weight of load(s), 3) material type(s) and 4) if materials were recycled, salvaged or disposed.

| Material Type ↓ | Section I Identify materials (✓) | | | Handling procedure, hauler or final destination of materials* (See #1) | Section II Quantity of each material (lbs) | | | City Use Only Acceptable weight tag(s) (staff initials) |
|---|-------------------------------------|---------|----------|--|---|----------|------------|--|
| | Recycle | Salvage | Landfill | | Recycled | Salvaged | Landfilled | |
| Asphalt & Concrete | | | | | | | | |
| Brick, Tile | | | | | | | | |
| Building materials-doors, windows, fixtures, cabinets | | | | | | | | |
| Cardboard | | | | | | | | |
| Dirt/Clean Fill | | | | | | | | |
| Drywall | | | | | | | | |
| Carpet padding/ Foam | | | | | | | | |
| Plate/window Glass | | | | | | | | |
| Scrap Metals (steel, aluminum, brass, copper, etc.) | | | | | | | | |
| Unpainted Wood & Pallets | | | | | | | | |
| Yard Trimmings (brush, trees, stumps, etc.) | | | | | | | | |
| Other: | | | | | | | | |
| Garbage | | | | | | | | |
| TOTALS | | | | | | | | % Recycled |

FOR CITY USE ONLY – PROJECT COMPLETION (version 11-08)

Full Compliance
 Good Faith Effort to Comply
 Non-Compliance
 Return of Deposit
 Yes
 No
 Amount \$ _____
 Staff Signature _____ / _____
 Date _____

END OF SECTION 01 74 19

SECTION 01 77 00 – CLOSEOUT REQUIREMENTS**PART 1 - GENERAL****1.1 SUMMARY**

- A. This section describes contract closeout procedures including:
 - 1. Removal of temporary construction facilities
 - 2. Substantial completion
 - 3. Final completion
 - 4. Final cleaning
 - 5. Miscellaneous Project Record Submittals
 - 6. Release of claims

1.2 REMOVAL OF TEMPORARY CONSTRUCTION FACILITIES

- A. Remove temporary materials, equipment, services, and construction prior to Substantial Completion Inspection.
- B. Clean and repair damage caused by installation or use of temporary facilities.
- C. Restore permanent facilities used during construction to specified condition.

1.3 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.
 - 1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete.
 - 2. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.
 - 3. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.
- B. Advise the Project Manager of pending insurance changeover requirements.
- C. Submit warranty bonds, final certifications, and similar documents.
- D. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.

- E. Submit record drawings in PDF or hard copies in addition to CAD files, maintenance manuals, final project photographs, damage or settlement surveys, property surveys, and similar final record information.
- F. Deliver tools, spare parts, extra stock, and similar items.
- G. Make final changeover of permanent locks and transmit keys to the Owner. Advise the Owner's personnel of changeover in security provisions.
- H. Complete startup testing of systems and instruction of the Owner's operation and maintenance personnel. Discontinue and remove temporary facilities from the site, along with mockups, construction tools, and similar elements.
- I. Complete final cleanup requirements, including touchup painting.
- J. Touch up and otherwise repair and restore marred, exposed finishes.
- K. Inspection Procedures: On receipt of a request for inspection, the Project Manager will either proceed with inspection or advise the Contractor of unfilled requirements. The Project Manager will prepare the Certificate of Substantial Completion following inspection or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.
- L. The Project Manager will repeat inspection when requested and assured that the Work is substantially complete.
- M. Results of the completed inspection will form the basis of requirements for final acceptance.

1.4 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.
- B. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and completed operations where required.
- C. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
- D. Submit a certified copy of the Project Manager's final inspection list of items to be completed or corrected, endorsed and dated by the Project Manager. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance and shall be endorsed and dated by the Project Manager.

- E. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of Substantial Completion or when the Owner took possession of and assumed responsibility for corresponding elements of the Work.
 - F. Submit consent of surety to final payment.
 - G. Submit a final liquidated damages settlement statement.
 - H. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 - I. Re-inspection Procedure: The Project Manager will re-inspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to the Project Manager.
 - 1. Upon completion of re-inspection, the Project Manager will prepare a certificate of final acceptance. If the Work is incomplete, the Project Manager will advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
 - 2. If necessary, re-inspection will be repeated.
 - J. Maintenance Manuals: Organize operation and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual, heavy-duty, 2-inch 3-ring, vinyl-covered binders, with pocket folders for folded sheet information. Provide two (2) paper copies and a PDF. Mark appropriate identification on front and spine of each binder. Include the following types of information:
 - 1. Emergency instructions.
 - 2. Spare parts list.
 - 3. Copies of warranties.
 - 4. Wiring diagrams.
 - 5. Recommended "turn-around" cycles.
 - 6. Inspection procedures.
 - 7. Shop Drawings and Product Data.
 - 8. Fixture lamping schedule.
- 1.5 FINAL CLEANING
- A. Execute final cleaning prior to final inspection.
 - B. Clean interior and exterior surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
 - C. Clean equipment and fixtures to a sanitary condition, clean or replace filters of mechanical equipment operated during construction, clean ducts, blowers and coils of units operated without filters during construction.

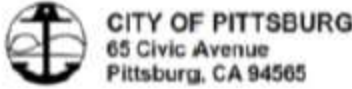
- D. Employ skilled workers for final cleaning.
- E. Clean Site; mechanically sweep paved areas.
- F. Remove waste and surplus materials, rubbish, and construction facilities from Site.

1.6 MISCELLANEOUS PROJECT RECORD SUBMITTALS

- A. Refer to Technical Specifications or other Specification Sections for miscellaneous record keeping requirements and submittals in connection with various construction activities. Immediately prior to Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for use and reference. Submit to the Project Manager for City's records.

1.7 RELEASE OF CLAIMS

- A. Contract will not be closed out and final payment will not be made, subject to provisions of Section 7100 Public Contract Code until all pertinent aspects of [General Conditions](#) regarding undisputed/settled amounts are completed per requirements elsewhere in the Technical Specifications and/or Specifications and executed by Contractor and City.
- B. Contractor shall submit the following Agreement and Release of Any and All Claims Form.



AGREEMENT AND RELEASE OF ANY AND ALL CLAIMS

This Agreement and Release of Claims ("Agreement and Release"), made and entered into this ____ day of _____, 20____, by and between the City of Pittsburg ("City"), and _____ ("Contractor"), whose place of business is at _____.

RECITALS

1. City and Contractor entered into Contract No. _____ in the City of Pittsburg, County of Contra Costa, State of California.
2. The Work under Contract No. _____ has been completed.

Now, therefore, it is mutually agreed between City and Contractor as follows:

AGREEMENT

3. Contractor will not be assessed liquidated damages except as detailed below:

| | |
|------------------------|----------|
| Original Contract Sum | \$ _____ |
| Modified Contract Sum | \$ _____ |
| Payment to Date | \$ _____ |
| Liquidated Damages | \$ _____ |
| Payment Due Contractor | \$ _____ |

4. Subject to the provisions of this Agreement and Release, City shall forthwith pay to Contractor the sum of \$ _____ Dollars and _____ Cents under Contract No. _____, less any amounts withheld under the Contract or represented by any "Stop Notice" on file with City as of the date of such payment.
5. Contractor acknowledges and hereby agrees that there are no unresolved or outstanding claims in dispute against City arising from the performance of work under Contract No. _____. It is the intention of the parties in executing this Agreement and Release that this Agreement and Release shall be effective as a full, final and general release of all claims, demands, actions, causes of action, obligations, costs, expenses, damages, losses and liabilities of Contractor against , City of Pittsburg, and all their respective directors, agents, officers, volunteers, consultants (including, but not limited to, Project Construction Manager and Architect/Engineer), employees, inspectors, assignees and transferees except for the Disputed Claims set forth in Paragraph 6, and continuing obligations described in Paragraph 8, below.



CITY OF PITTSBURG
 65 Civic Avenue
 Pittsburg, CA 94565

6. The following claims are disputed (hereinafter, the "Disputed Claims") and are specifically excluded from the operation of this Agreement and Release:

| <u>Claim No.</u> | <u>Date Submitted</u> | <u>Description of Claim</u> | <u>Amount of Claim</u> |
|------------------|-----------------------|-----------------------------|------------------------|
|------------------|-----------------------|-----------------------------|------------------------|

7. Consistent with California Public Contract Code, Contractor hereby agrees that, in consideration of the payment set forth in Paragraph 4, above, Contractor hereby releases and forever discharges City, all its respective directors, agents, officers, volunteers, employees, inspectors, assignees and transferees from any and all liability, claims, demands, actions or causes of action of whatever kind or nature arising out of or in any way concerned with the work under the Contract.
8. Guarantees and warranties for the Work, and any other continuing obligation of Contractor, shall remain in full force and effect as specified in the Contract Documents.
9. Contractor shall immediately defend, indemnify and hold harmless City of Pittsburg, and all its respective directors, agents, officers, volunteers, consultants, employees, inspectors, assignees and transferees from any and all claims, demands, actions, causes of action, obligations, costs, expenses, damages, losses and liabilities that may be asserted against them by any of Contractor's suppliers and/or subcontractors of any tier and/or any suppliers to them for any and all labor, materials, supplies and equipment used, or contemplated to be used in the performance of Contract No. _____, except for the Disputed Claims set forth in Paragraph 6, above.
10. Contractor hereby waives the provisions of California Civil Code, Section 1542, which provides as follows:
- A general release does not extend to claims which the creditor does not know or suspect to exist in his favor at the time of executing the release, which if known by him, must have materially affected his settlement with the debtor.
11. The provisions of this Agreement and Release are contractual in nature and not mere recitals and shall be considered independent and severable, and if any such provision or any part thereof shall be at any time held invalid in whole or in part under any federal, state, city, municipal or other law, ruling or regulations, then such provision, or part thereof shall remain in force and effect only to the extent permitted by law, and the remaining provisions of this Agreement and Release shall also remain in full force and effect, and shall be enforceable.
12. All rights of City shall survive completion of the Work or termination of Contract, and execution of this Release.



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65 Civic Avenue
Pittsburg, CA 94565

*** CAUTION: THIS IS A RELEASE - READ BEFORE EXECUTING ***

CITY OF PITTSBURG

CONTRACTOR

BY: _____ BY: _____

Date: _____ Date: _____

END OF SECTION 01 77 00

SECTION 01 78 00 – CLOSEOUT SUBMITTALS**PART 1 - GENERAL**

1.1 SUMMARY

- A. This section describes contract closeout submittals including:
1. Project record documents
 2. Project guarantee
 3. Warranties

1.2 PROJECT RECORD DOCUMENTS

- A. Project Record Documents required include:
1. Marked-up copies of Contract Drawings
 2. Marked-up copies of Shop Drawings
 3. Project Record Drawings
 4. Marked-up copies of Technical Specifications, Specifications, Addenda and Change Orders
 5. Marked-up Project Data submittals
 6. Record Samples
 7. Field records for variable and concealed conditions
 8. Record information on Work that is recorded only schematically
 9. Warranty Bonds
- B. Specific Project Record Documents requirements that expand requirements of this Section are included in the individual Sections of Divisions 2 through 48 (when provided).
- C. General Project closeout requirements are included in [Section 01 77 00 - Closeout Requirements](#).
- D. Maintenance of Documents and Samples:
1. Store Project Record Documents and samples in the field office apart from Contract Documents used for construction.
 2. Do not permit Project Record Documents to be used for construction purposes.
 3. Maintain Project Record Documents in good order, and in a clean, dry, legible condition.
 4. Make documents and samples available at all times for inspection by Architect and Project Manager.
- E. City will provide one set of reproducibles and one set of the construction drawing prints and one project manual for the Contractor's use and copying during construction.

- F. Mark-up Procedure: During the construction period, maintain a set of Contract Drawings and Shop Drawings for Project Record Document purposes.
1. Mark these Drawings to indicate the actual installation where the installation varies appreciably from the installation shown originally. Give particular attention to information on concealed elements which would be difficult to identify or measure and record later. Items required to be marked include but are not limited to:
 - a. Dimensional changes to the Drawings
 - b. Revisions to details shown on the Drawings
 - c. Depths of foundations below the first floor
 - d. Locations and depths of underground utilities
 - e. Revisions to routing of piping and conduits
 - f. Revisions to electrical circuitry
 - g. Actual equipment locations
 - h. Duct size and routing
 - i. Locations of concealed internal utilities
 - j. Changes made by Change Order
 - k. Details not on original Contract Drawings
 2. Mark completely and accurately Project Record Drawing prints of Contract Drawings or Shop Drawings, whichever is the most capable of showing actual physical conditions. Where Shop Drawings are marked, show cross-reference on Contract Drawings location.
 3. Mark Project Record Drawing sets with red ink; use other colors to distinguish between changes for different categories of the Work at the same location.
 4. Mark important additional information which was either shown schematically or omitted from original Drawings.
 5. Note construction change directive numbers; alternate numbers; Change Order numbers and similar identification.
 6. Responsibility for Mark-up: Where feasible, the individual or entity who obtained Project Record Drawing data, whether the individual or entity is the installer, subcontractor, or similar entity, is required to prepare the mark-up on Project Record Drawings.
 - a. Accurately record information in an understandable and legible drawing technique.
 - b. Record data as soon as possible after it has been obtained. In the case of concealed installations, record and check the mark-up prior to concealment.
- G. Preparation of Transparencies: Prior to inspection for Certification of Substantial Completion, review completed marked-up Project Record Drawings with the Project Manager. When authorized, prepare a full set of correct reproducible of Contract Drawings and Shop Drawings.
1. Incorporate changes and additional information previously marked on print sets. Erase, redraw, and add details and notations where applicable. Identify and date each Drawing; include the printed designation "PROJECT RECORD DRAWINGS" in a prominent location on each Drawing.
 2. Refer instances of uncertainty to the Project Manager for resolution.

3. Review of Reproducible: Before copying and distributing, submit corrected reproducible and the original marked-up prints to the Project Manager for review. When acceptable, the Project Manager will initial and date each transparency, indicating acceptance of general scope of changes and additional information recorded, and of the quality of drafting.
 - a. Reproducibles and the original marked-up prints will be returned to the Contractor for organizing into sets, printing, binding, and final submittal.
 4. Copies and Distribution: After completing the preparation of reproducible Project Record Drawings, print one hard copy and a PDF of each Drawing, whether or not changes and additional information were recorded. Organize the copies into manageable sets. Bind each set with durable paper cover sheets, with appropriate identification, including titles, dates and other information on cover sheets.
 - a. Organize and bind original marked-up set of prints that were maintained during the construction period in the same manner.
 - b. Organize Project Record Drawings reproducible into sets matching the print sets. Place these sets in durable tube-type drawing containers with end caps.
- H. Distribution of Marked-Up Drawings and Transparencies: Submit the marked-up Project Record Drawings sets, reproducible, and one copy to the Project Manager for City's records.
- I. Project Record Technical Specifications and Specifications:
1. During the construction period, maintain one copy of the Project Manual, including addenda and modifications issued, for Project Record Document purposes.
 2. Mark the Project Record Manual to indicate the actual installation where the installation varies substantially from that indicated in Specifications and Modifications issued. Note related Project Record Drawing information, where applicable. Give particular attention to substitutions, selection of product options, and information on concealed installation that would be difficult to identify or measure and record later.
 - a. In each Technical Specifications and Specification Section where products, materials or units of equipment are specified or scheduled, mark the copy with the proprietary name and model number of the product furnished.
 - b. Record the name of the manufacturer, supplier and installer, and other information necessary to provide a record of selections made and to document coordination with Project Record Product Data submittals and maintenance manuals.
 - c. Note related Project Record Product Data, where applicable, for each principal product specified, indicate whether Project Record Product Data has been submitted in maintenance manual instead of submitted as Project Record Product Data.

3. Upon completion of mark-up, submit Project Record Manual to the Project Manager for City's records.
- J. Project Record Product Data:
1. During the construction period, maintain one copy of each Project Record Product Data submittal for Project Record Document purposes.
 - a. Mark Project Record Product Data to indicate the actual product installation where the installation varies substantially from that indicated in Project Record Product Data submitted. Include significant changes in the product delivered to the site, and changes in manufacturer's instructions and recommendations for installation.
 - b. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - c. Note related Change Orders and mark-ups of Project Record Drawings, where applicable.
 - d. Upon completion of mark-up, submit a complete set of Project Record Product Data to the Project Manager for City's records.
 - e. Where Project Record Product Data is required as part of maintenance manuals, submit marked-up Project Record Product Data as an insert in the manual, instead of submittal as Project Record Product Data.
- K. Material, Equipment and Finish Data:
1. Provide data for primary materials, equipment and finishes as required under each Technical Specifications/Specification section.
 2. Submit one set prior to final inspection, bound in 8-1/2 inches by 11 inches three-ring binders with durable plastic covers and a PDF; provide typewritten table of contents for each volume.
 3. Arrange by Technical Specifications/Specification division and give names, addresses, and telephone numbers of subcontractors and suppliers. List:
 - a. Trade names.
 - b. Model or type numbers.
 - c. Assembly diagrams.
 - d. Operating instructions.
 - e. Cleaning instructions.
 - f. Maintenance instructions.
 - g. Recommended spare parts.
 - h. Product data.
- L. Periodic Review:
1. Make additions to the Project Record Documents as they occur.
 2. Make the Project Record Documents available to the Project Manager for periodic review. The Project Manager's review of the current status of Project Record Documents is a requisite to approval of requests for progress payment.
 3. Prior to submitting each request for progress payment, secure the Project manager's approval of the current status of the Project Record Documents.

4. Prior to submitting request for final Payment, submit the final Project Record Documents to the Project Manager for approval.
- M. Submittal: At the completion of Project, deliver record documents to Project Manager.
- N. Network Documentation: Provide network schematic showing logical connections of all network connected devices, including IP address and VLAN information. Coordinate with City's Information Technology department for development of VLAN requirements and IP address scheme for AV equipment.
- O. Wiring Schematic: Provide complete, detailed wiring schematic for all systems, based on the contract documents but including cable types, identification by number and color codes, and detailed wiring of connections, both at equipment and between equipment racks and wiring in conduit.

1.3 PROJECT GUARANTEE

- A. Requirements for Contractor's guarantee of completed Work are included in Section 11.2 of the [General Conditions](#). Contractor shall guarantee Work done under Contract against failures, leaks or breaks or other unsatisfactory conditions due to defective equipment, materials or workmanship, and perform repair work or replacement required, at Contractor's sole expense, for period of one year, unless otherwise subject to any special warranty periods of longer duration, from date of Final Acceptance.
- B. Neither recordation of final acceptance nor final certificate for payment nor provision of the Contract nor partial or entire use or occupancy of premises by City shall constitute acceptance of Work not done in accordance with Contract Documents nor relieve Contractor of liability in respect to express warranties or responsibility for faulty materials or workmanship.
- C. City may make repairs to defective Work as set forth in Section 2.2 (I) of the General Conditions, if, within five (5) working days after mailing of written notice of defective work to Contractor or authorized agent, Contractor shall neglect to make or undertake repair with due diligence; provided, however, that in case of leak or emergency where, in opinion of City, delay would cause hazard to health or serious loss or damage, repairs may be made without notice being sent to Contractor, and Contractor shall pay cost thereof.
- D. If, after installation, operation or use of materials or equipment to be furnished under Contract proves to be unsatisfactory to Project Manager, City shall have right to operate and use materials or equipment until it can, without damage to City, be taken out of service for correction or replacement. Period of use of defective materials or equipment pending correction or replacement shall in no way decrease guarantee period required for acceptable corrected or replaced items of materials or equipment.

- E. Nothing in this Section shall be construed to limit, relieve or release Contractor's, subcontractors' and equipment suppliers' liability to City for damages sustained as result of latent defects in equipment caused by negligence of suppliers' agents, employees or subcontractors. Stated in another manner, warranty contained in the Contract Documents shall not amount to, nor shall it be deemed to be, waiver by City of any rights or remedies (or time limits in which to enforce such rights or remedies) it may have for defective workmanship or defective materials under laws of this State pertaining to acts of negligence.

1.4 WARRANTIES

- A. Execute Contractor's submittals and assemble warranty documents executed or supplied by subcontractors, suppliers, and manufacturers.
 - 1. Provide table of contents and assemble in 8-1/2 inches by 11 inches three-ring binder with durable plastic cover.
 - 2. Assemble in Technical Specifications/Specification Section order.
 - 3. Submit material prior to final application for payment.
 - 4. For equipment put into use with City's permission during construction, submit within ten (10) working days after first operation.
 - 5. For items of Work delayed materially beyond Date of Substantial Completion, provide updated submittal within ten (10) working days after acceptance, listing date of acceptance as start of warranty period.
 - 6. Warranties are intended to protect City against failure of work and against deficient, defective and faulty materials and workmanship, regardless of sources.
 - 7. Limitations: Warranties are not intended to cover failures which result from the following:
 - a. Unusual or abnormal phenomena of the elements
 - b. Vandalism after substantial completion
 - c. Insurrection or acts of aggression including war.
- B. Related Damages and Losses: Remove and replace Work which is damaged as result of defective Work, or which must be removed and replaced to provide access for correction of warranted Work.
- C. Warranty Reinstatement: After correction of warranted Work, reinstate warranty for corrected Work to date of original warranty expiration or to a date not less than ninety (90) days after corrected Work was done, whichever is later.
- D. Replacement Cost: Replace or restore failing warranted items without regard to anticipated useful service lives.
- E. Warranty Forms: Submit drafts to Project Manager for approval prior to execution. Forms shall not detract from or confuse requirements or interpretations of Contract Documents.
- F. Warranty shall be countersigned by manufacturers.

- G. Where specified, warranty shall be countersigned by subcontractors and installers.
- H. Rejection of Warranties: City reserves right to reject unsolicited and coincidental product warranties which detract from or confuse requirements or interpretations of Contract Documents.
- I. Term of Warranties: For materials, equipment, systems and workmanship warranty period shall be one-year minimum from date of final completion of entire Work except where:
 - 1. Detailed specifications for certain materials, equipment or systems require longer warranty periods.
 - 2. Materials, equipment or systems are put into beneficial use of City prior to Final Completion as agreed to in writing by Project Manager.
- J. Warranty of Title: No material, supplies, or equipment for Work under Contract shall be purchased subject to any chattel mortgage, security agreement, or under a conditional sale or other agreement by which an interest therein or any part thereof is retained by seller or supplier. Contractor warrants good title to all material, supplies, and equipment installed or incorporated in Work and agrees upon completion of all work to deliver premises, together with improvements and appurtenances constructed or placed thereon by Contractor, to City free from any claim, liens, security interest, or charges, and further agrees that neither Contractor nor any person, firm, or corporation furnishing any materials or labor for any Work covered by Contract shall have right to lien upon premises or improvement or appurtenances thereon. Nothing contained in this Paragraph, however, shall defeat or impair right of persons furnishing materials or labor under bond given by Contractor for their protection or any rights under law permitting persons to look to funds due Contractor in hands of City.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 01 78 00

SECTION 26 05 00 - BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Work included in this Section: All materials, labor, equipment, services, and incidentals necessary to provide and install the Electrical Work as shown on the drawings and as specified hereinafter, including, but not limited to the following:
1. New panelboard, circuit breakers, and feeders.
 2. Branch circuit wiring, wiring devices and connections to all equipment requiring electrical service.
 3. Lighting fixtures completely lamped, including controls, raceways and wiring.
 4. All required incidental work, such as coring, electrical testing, title 24 acceptance testing, and temporary power.
 5. Any other electrical work as might reasonably be implied as required, even though not specifically mentioned herein or shown on the the drawings.
 6. It is the intent of the drawings and specifications that systems be complete and, except as otherwise noted, be ready for operation.
 7. Refer also to the related AV Upgrade drawings issued with this set of plans (for reference).

1.2 RELATED WORK

- A. Division 1 - General Requirements

1.3 INCORPORATED DOCUMENTS

- A. Requirements of the General Conditions, Supplementary Conditions, and Division 1 Sections apply to all work in this Section, unless modified herein.
- B. Published specifications, standard tests or recommended methods of trade, industry or government organizations apply to work of this Section where cited by abbreviations noted below, unless modified herein.
1. 2022 California Code of Regulations.
 2. 2022 California Building Standards Administrative Code, Part 1, Title 24, C.C.R.
 3. 2022 California Building Code (CBC), Part 2, Title 24, C.C.R. (Based on 2021 International Building Code with 2022 California Amendments).
 4. 2022 California Electrical Code (CEC), Part 3, Title 24, C.C.R. (Based on 2017 National Electrical Code with 2022 California Amendments).
 5. California Energy Code, Part 6, Title 24, C.C.R.
 6. 2022 California Fire Code (CFC), Part 9, Title 24, C.C.R. (Based on 2021 International Fire Code with 2022 California Amendments).
 7. 2022 California Green Building Standards (CALGreen) Code, Part 11.
 8. American Society of Civil Engineers 7-16 (ASCE/SEI), Minimum Design Loads for Buildings and Other Structures.
 9. Underwriters' Laboratories, Inc. (UL).
- C. All State and Municipal Codes and Ordinances.

1.4 CONDITIONS AT SITE:

- A. Visit to site is required of all bidders prior to submission of bid. All will be held to have familiarized themselves with all discernible conditions and no extra payment will be allowed for work required because of these conditions, whether specifically mentioned or not.
- B. Lines of other services that are damaged as a result of this work shall promptly be repaired at no expense to the City to the complete satisfaction of the City.

1.5 QUALITY ASSURANCE

- A. Conformance:
 - 1. All work shall conform to the applicable requirements of Article 1.3 above.
 - 2. The Contractor shall notify the City, prior to submission of bid, about any part of the design, which fails to comply with abovementioned requirements.
 - 3. If after contract is awarded, minor changes and additions are required by aforementioned authorities, even though such work is not shown on the drawings or covered in the specifications, they shall be included at Contractor's expense.
- B. Coordination:
 - 1. The Contractor shall become familiar with the conditions at the job site, and with the drawings and specifications and plan the installation of the electrical work to conform with the existing conditions and that shown and specified so as to provide the best possible assembly of the combined work of all trades.
 - 2. The Contractor shall work out in advance all "tight" conditions, involving all trades and if found necessary, supplementary drawings shall be prepared by this Contractor, for the City's approval, before work proceeds in these areas. No additional costs will be considered for work, which must be relocated due to conflicts with the work of other trades.
 - 3. The Contractor shall coordinate and verify all backbox, device, lighting fixture, or equipment mounting requirements with the devices or equipment to be installed, prior to rough in.

1.6 SUBMITTALS

- A. Product Data:
 - 1. Comply with the provisions of Section 01 33 00 - Submittals.
 - 2. Within 15 days after award of the Contract, submit:
 - a. Complete electrical and lighting systems material list of all items proposed to be furnished and installed under this Division. Provide manufacturers data sheets for all devices, raceways, fixtures, equipment, and related products to be used for the Division 26 work.
 - b. Manufacturers' specifications and other data required demonstrating compliance with the specified requirements.
 - c. Manufacturers' recommended installation procedures which, when approved by the City, shall become the basis for inspecting and accepting or rejecting actual installation procedures used on the work.
 - 3. Shop Drawings: Furnish shop drawings and/or equipment cuts for the following:

- a. Light fixtures including drivers / power supplies.
 - b. Panelboard. Panelboard submittals shall include diagrams of the circuit breaker arrangements in the panels. Arrange circuit breakers in panels exactly as shown on the panel schedules in the construction documents.
4. Test Reports:
- a. Factory Tests: As specified for specific equipment.
 - b. Field Tests: Performance tests as specified for specific equipment.
 - c. Megger Tests: As specified under TESTING.
 - d. When series rated circuit breakers are used, provide a letter from the manufacturer of the equipment confirming that U.L. series rating exists for all protective devices. State the available fault current from the Utility Company and indicate that the overcurrent devices exceed the available fault current at the respective point of protection.
5. Maintenance and Operating Manuals:
- a. Systems Description: Description of operating procedures.
 - b. Controls: Diagrams and description of operation of each system.
 - c. Equipment: Manufacturer's brochures, ratings, certified shop drawings, maintenance data, and parts lists with part numbers. Mark each sheet with equipment identification number and actual installed condition.
 - d. Materials and Accessories: Manufacturer's brochures, parts lists with part numbers, and maintenance data where applicable. Mark each sheet with identification number of system and location of installation.
 - e. The Maintenance and Operation Manual shall be presented in a bookmarked PDF file with tabbed sections as stated below. Provide all information in each section as stated below.
 - 1) 26 2700:
 - (a) Insert the approved submittals for the panelboards.
 - (b) Provide the names, addresses and telephone numbers of the manufacturer and the two closest manufacturer's representatives of the equipment.
 - 2) 26 5101:
 - (a) Insert the approved submittals for the light fixtures.
 - (b) Highlight the lamp type that was installed for each light fixture.
 - (c) Provide the names, address and telephone numbers of the manufacturer and the closest manufacturer's representative for each light fixture.
 - 3) 26 0800:
 - (a) Insert all systems testing results.

6. Record Documents: "As-builts": As specified under Paragraph 3.2 of this Section.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during, and after installation and to protect the work and materials of all trades.
- B. Delivery and Storage: Deliver all materials to the job site in their original containers with all labels intact and legible at time of use. Store in strict accordance with approved manufacturers' recommendations.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the City and at no additional cost to the City.

- D. This Contractor shall personally, or through an authorized representative, check all materials upon receipt at jobsite for conformance with approved shop drawings and/or plans and specifications.

1.8 SCHEDULING/SEQUENCING

- A. Place orders for all equipment in time to prevent any delay in construction schedule or completion of project. If any materials or equipment are not ordered in time, additional charges made by equipment manufacturers to complete their equipment in time to meet the construction schedule, together with any special handling charges, shall be borne by this Contractor.
- B. The Contractor shall coordinate production and delivery schedule for all City-supplied equipment with the equipment suppliers to ensure that all City-supplied equipment is delivered to site in coordination with the construction schedule and in such a manner as to cause no delays in completion of the Contract as scheduled.

1.9 REQUIREMENTS

- A. The contract drawings indicate the extent and general arrangements of the conduit wiring systems, etc. If any departures from the contract drawings are deemed necessary by the Contractor, details of such departures and the reasons therefore shall be submitted as soon as practicable, and within (15) fifteen days after award of the electrical contract.
- B. Unless material list and data is received as a complete and all-inclusive submittal within the stipulated time all items shall be provided as specified, with no deviations permitted.
- C. Any and all additional costs incurred by the substitution of electrical material or equipment, or installation thereof, shall be borne by the Contractor under this Section.
- D. Burden of proof of equality of any substitution for a specified product is the responsibility of this Contractor.
- E. Where required by City to ascertain equality of substitute product, Contractor may be requested to provide the specified item and the submitted substitution for comparison, at no additional cost to the City.

1.10 DESCRIPTION OF DEMOLITION AND REPLACEMENT WORK

- A. This project includes the demolition and replacement, modification, or enhancement of existing facilities. As such, the project scope for this contractor shall include all associated electrical, lighting, and signal system upgrades and demolition/removal work at the existing building. The intent is that all systems will be complete and functional at the completion of this contract and that all old systems, equipment, feeders, circuits, wiring, and related devices (no longer used) be completely and neatly removed. Where discrepancies between the drawings and existing conditions are noted, the City shall be notified immediately for resolution.

- B. As with every renovation project, the electrical work will include (and require) exploration and other field work on a daily basis to complete the new designed equipment and connections within the constraints of the existing building and existing site conditions.
- C. The contractor shall include as part of the base bid, sufficient labor hours to provide such exploration and field work throughout the duration of the project. Change orders for miscellaneous coordination of existing conditions will not be approved unless specific and latent conditions are uncovered that warrant such additional compensation or require additional work not shown on the drawings or included in the specifications, or implied by the designed conditions.
- D. New raceways and wiring to new and renovated equipment are to be installed unless otherwise noted. Where raceways are installed in accessible concealed locations (i.e. unfinished spaces or electrical / mechanical / attic spaces), EMT with wire shall be used. Where new wiring is required to be routed through existing walls and ceilings that cannot readily be accessible for new conduit, MC cable or flex conduit and wiring may be installed, fished through and secured in each space as required by Code. Non-metallic sheathed cable shall not be utilized on this project.
- E. For exposed raceways at ceilings, paint to match adjacent finishes after installation, similar to existing raceways.
- F. Unless otherwise noted, all new raceways shall be installed concealed and all new equipment installed flush.

1.11 GUARANTEE

- A. This Contractor shall guarantee that all work executed under this Section will be free from defects of materials and workmanship for a period of one (1) year or as per the General Conditions of this project, whichever is longer. Dates shall be from the date of final acceptance of the building. The contractor shall further guarantee that he will, at his own expense, repair and replace all such defective work, and all other work damaged thereby, which becomes defective during the term of the guarantee. Such repair or replacement shall be guaranteed for one (1) year from the date of repair or replacement.

1.12 PERMITS AND INSPECTIONS

- A. This Contractor shall arrange for and obtain all required permits and inspections.
- B. Do not allow or cause any of the work to be covered or enclosed until it has been tested and/or inspected.

1.13 IDENTIFICATION

- A. Switchgear, switchboards, distribution panels, and feeder circuit breakers therein, panels, disconnect switches, motor starters, transformers, motor disconnect switches, cabinets, and other apparatus used for the operation of, or control of circuits, appliances or equipment, shall be properly identified by means of engraved laminated plastic descriptive nameplates mounted

on apparatus using stainless steel screws. Nameplates shall have white letters with black background and be submitted to the City for approval. Cardholders in any form are not acceptable.

- B. Provide p-touch style labeling of circuit designations for all receptacles shown on these plans (existing and new).
- C. Each branch circuit of panel boards to have a permanently fixed number with load directory, mounted under celluloid on inside of cabinet door, showing circuit numbers and typewritten description of equipment supplied by breakers. Where changes are made to existing panelboards, newly typewritten circuit directories shall be prepared to replace existing directories.
- D. Provide silk-screened or engraved identification labels on all switch box covers identifying specific loads that are not readily apparent to the user. Submit proposed labels to City for approval prior to manufacture of labels.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Refer to applicable Division 26 Sections for complete products specifications.

2.2 MATERIALS

- A. Materials of the same type or classification, used for the same purpose, shall be the product of the same manufacturer.

2.3 ACCEPTABLE MANUFACTURERS

- A. Materials shall be of make mentioned elsewhere in this specification. All materials shall be the best of their several kinds, perfectly new and approved by the Underwriters' Laboratories.
- B. Where material, equipment, apparatus or other products are specified by manufacturer, brand name, type or catalog number, such designation is to establish standards of desired quality, style and utility and shall be the basis of the bid. Materials so specified shall be furnished under the contract unless changed by written approval of the City. Where two or more designations are listed, choice shall be optional with this Contractor, but this Contractor must submit his choice for final approval.

2.4 POSTED OPERATING INSTRUCTIONS

- A. Furnish approved operating instructions for systems and equipment where indicated in the technical sections for use by operation and maintenance personnel. The operating instructions shall include wiring diagrams, control diagrams, and control sequence for each principal system and equipment. Print or engrave operating instructions and frame under glass or in approved laminated plastic. Post instructions as directed. Attach or post operating instructions adjacent to each principal system and equipment including startup, proper adjustment, operating, lubrication, shutdown, safety precautions, procedure in the event of equipment failure, and

other items of instruction as recommended by the manufacturer of each system or equipment. Provide weather-resistant materials or weatherproof enclosures for operating instruction exposed to the weather. Operating instruction shall not fade when exposed to sunlight and shall be secured to prevent easy removal or peeling.

2.5 CATALOGED PRODUCTS/SERVICE AVAILABILITY

- A. Materials and equipment shall be current products by manufacturers regularly engaged in the production of such products. Products shall have been in satisfactory commercial or industrial use for 2 years prior to bid opening. The 2-year period shall include applications of equipment and materials under similar circumstances and of similar size. The 2-year period shall be satisfactorily completed by a product for sale on the commercial market through advertisements, manufacturers' catalogs, or brochures. Products having less than a 2-year field service record will be acceptable if a certified record of satisfactory field operation for not less than 6,000 hours, exclusive of the manufacturers' factory or laboratory tests, is furnished. The equipment items shall be supported by service organizations which are reasonable convenient to the equipment installation in order to render satisfactory service to the equipment on a regular and emergency basis during the warranty period of the contract.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions under which the work of this Section will be installed. Correct conditions detrimental to the proper and timely completion of the Work. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Drawings:
1. The general arrangement and location of wiring and equipment is shown on the electrical drawings and shall be installed in accordance therewith, except for minor changes required by conflict with the work of other trades.
 2. The Contractor shall coordinate and verify all backbox, device, lighting fixture, or equipment mounting requirements with the devices or equipment to be installed, prior to rough in.
 3. Drawings indicate the circuit and panel which supplies each device or fixture. Provide and install conduit and conductors to make all connections from panel to nearest device and from first device to additional devices on same circuit. Conduit size and fill shall satisfy NEC requirements. Two or three different phases supplied by a 3-phase panel may share a single neutral only if circuit positions are adjacent in the panel. Do not exceed 4 #12 or 3 #10 conductors in a 1/2" conduit, 7 #12 or 5 #10 in a 3/4" conduit, and 11 #12 or 9 #10 in a 1" conduit, unless otherwise noted. Provide common handle-tie on breakers for multi-wire branch circuits (with common neutral), per NEC. If more than three current carrying conductors are installed in one conduit, conductor size shall be increased as required per NEC. Do not share neutrals for branch circuit runs to electronic equipment or where noted on the drawings.
 4. All branch circuit wiring No. 12 or No. 10 as noted, all control wiring No. 14, except as noted next to "slash marks" on the drawings, or as noted under "Wire," as specified herein.

5. Maintain "as-built" records at all times, showing the exact location of concealed conduits and feeders installed under this contract, and actual numbering of each circuit. Upon completion of work, and before acceptance can be considered, this Contractor must forward to the City, updated CAD plans, corrected to show the electrical work as actually installed.
 6. All standard 20A branch circuit conductors shall be #12 minimum for up to 75 linear circuit feet, #10 minimum for up to 150 linear circuit feet, and #8 for runs longer than 150 feet.
- B. Measurements: Before ordering any material or closing in any work, verify all measurements on the job. Any differences found between dimensions on the drawings and actual measurements shall be brought to the City's attention for consideration before proceeding.

3.3 FIELD QUALITY CONTROL

- A. All workmanship shall be first class and carried out in a manner satisfactory to and approved by the City.
- B. This Contractor shall personally, or through an authorized and competent representative, constantly supervise the work and so far as possible keep the same foreman and workmen on the job throughout.

3.4 INSTALLATION/APPLICATION/ERECTION

- A. All electrical raceways and devices shall be installed concealed (for raceways) and/or flush mounted (for devices), unless otherwise noted. Provide cut-in boxes and "fish" flexible MC or flex conduit and wire through existing walls to remain, unless shown otherwise on plans. Cut and patch to facilitate such installation to match adjacent and original finish.
- B. All cutting, repairing and structural reinforcing for the installation of this work shall be done by the General Contractor in conformance with the City's requirements.

3.5 EMERGENCY POWER SOURCES

- A. All emergency source circuits shall be installed in separate raceways (from normal power), per 2022 CEC 700.10(B).

3.6 TEMPORARY LIGHTING AND POWER

- A. Provide and install temporary lighting and power systems for the duration of construction, of adequate size to accommodate the required lighting and power loads. Coordinate with other trades to insure adequate sizing.
- B. Provide distribution equipment as required to support all construction activities.

3.7 FIRE STOPPING AND FIRE RATED PENETRATIONS

- A. All electrical equipment mounted in, on, or through fire rated construction shall be installed to maintain the fire rating of the construction.

- B. Provide fire rated pads (or other suitable assembly) around all electrical junction boxes in fire rated walls/ceilings/floors to maintain the fire rating.
- C. Provide fire rated construction around all recessed light fixtures and/or panel board / cabinets mounted flush in fire rated walls to maintain the fire rating. Coordinate depth of construction with other trades to avoid conflicts.
- D. Conduit sleeves shall be provided as a means of routing cables through fire-rated walls or floors. Openings in sleeves and conduits used for system cables and those which remain (empty) spare shall be sealed with an approved fireproof, removable sagging material. Sleeves which pass vertically from floor to floor shall be sealed in a similar manner using an approved re-enterable system. Additional penetrations through rated assemblies necessary for passage of tel/data wiring shall be made using an approved method and permanently sealed after installation of cables.

3.8 ADJUSTING AND CLEANING

- A. All electrical equipment, including existing equipment not "finish painted" under other sections, shall be touched up where finished surface is marred or damaged.
- B. All equipment, lighting fixtures, etc., shall be left in clean condition, with all shipping and otherwise unnecessary labels removed there from.

3.9 SCHEDULES

- A. Coordination: Coordinate installation of electrical items with the schedule for other work to prevent unnecessary delays in the total Work.

3.10 WARNING SIGN MOUNTING

- A. Provide the number of signs required to be readable from each accessible side, but space the signs a maximum of 30 feet apart.

3.11 PAINTING OF EQUIPMENT

- A. Factory Applied: Electrical equipment shall have factory-applied painting systems which shall, as a minimum, meet the requirements of NEMA ICS 6 corrosion-resistance test, except equipment specified to meet requirements of ANSI C37.20 shall have a finish as specified in ANSI C37.20.
- B. Field Applied: Paint electrical equipment as required to match finish or meet safety criteria. Painting shall be as specified in the respective equipment section.

3.12 TESTS

- A. Testing and inspection: See Section 26 08 00 - Testing.

END OF SECTION

SECTION 26 08 00 - TESTING

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Work Included in This Section: All materials, labor, equipment, services, and incidentals necessary to perform the testing and inspection of the electrical work, including but not limited to the general systems noted below:
1. Grounding system.
 2. Lighting system.
 3. Distribution system.
 4. Title 24 Acceptance Testing.
 5. Any other electrical work as might reasonably be implied as required, even though not specifically mentioned herein or shown on the drawings.
 6. All work shall comply with Sections 26 05 00 and 26 27 00.
 7. In addition to the general system tests and inspections indicated above, the Contractor shall perform the following inspections and tests. The Contractor shall provide all material, equipment, labor, and technical supervision to perform such tests and inspections:
 - a. System Grounding.
 - b. Panelboards.
 - c. Feeders.
 8. The purpose of these tests is to assure that all tested electrical equipment is operational and within industry and manufacturer's tolerances and is installed in accordance with design specifications.

1.2 APPLICABLE CODES, STANDARDS, AND REFERENCES

- A. All inspections and tests shall be in accordance with the International Electrical Testing Association - Acceptance Testing Specifications ATS-2021 (referred to herein as NETA ATS-2021).

1.3 QUALIFICATIONS

- A. Qualifications of the Testing Firm shall be as listed in NETA ATS-2021.

PART 2 - PRODUCTS

2.1 THIS ARTICLE DOES NOT APPLY TO TESTING.

PART 3 - EXECUTION

3.1 GENERAL

- A. Final test and inspection to be conducted in presence of the Authority having Jurisdiction (AHJ) or Inspector of Record (IOR). Test shall be conducted at the expense of, and managed

by, the Contractor, at a mutually agreed time. Submit written test report of all tests, with test result values and overall outcome.

- B. All portions of the electrical installation shall be inspected and tested to ensure safety to building occupants, operating personnel, conformity to code authorities and Contract Documents, and for proper system operation.

3.2 INSPECTIONS AND TESTS

- A. Tests: Field tests shall be performed and reports submitted, as per Section 26 05 00, Part 1.
 - 1. Final Inspection Certificates: Prior to final payment approval, deliver to the City, signed certificates of final inspection by the appropriate local authority having jurisdiction.
 - 2. Grounding System:
 - a. All ground connections shall be checked and the entire system shall be checked for continuity.
 - b. Ground tests shall meet or exceed the requirements of the National Electric Code.
 - 3. Lighting Systems:
 - a. The interior lighting systems shall be checked for proper local controls and operation of entire installation, including the operation of the low voltage lighting control system.
 - 4. Power Distribution System:
 - a. Test distribution boards and panelboards for grounds and shorts with mains disconnected from feeders, branch circuits connected and circuit breakers closed, all fixtures in place and permanently connected and grounding jumper to neutral lifted and with all wall switches closed.
 - b. Test each individual circuit at each panelboard with equipment connected for proper operation. Inspect the interior of each panel.
 - c. Check verification of color coding, tagging, numbering, and splice make-up.
 - d. Verify that all conductors associated with each circuit are in same conduit.
 - e. Demonstrate that all lights, jacks, switches, outlets, and equipment operate satisfactorily and as called for.
 - f. Perform megger tests of all new distribution system feeders prior to energizing. All Cables failing megger tests or with evidence of damage shall be removed and replaced in their entirety (no splices), at no cost to the City. Damaged cables may not be field repaired without specific approval of the City.
- B. Title 24 Acceptance Testing: Contractor shall complete the requirements for Title 24 Acceptance Testing, as per CA Title 24, Part 6.
 - 1. Perform testing requirements as per Title 24 Lighting Acceptance requirements. Testing shall include construction inspection of installed controls, occupancy / motion sensor testing, manual daylighting controls testing, automatic time switch controls testing, and demand response system interface, as applicable.
 - 2. Complete and submit all required forms for complete Acceptance Testing.
 - 3. Acceptance tests must be performed or overseen by certified Acceptance Test Technicians.
 - 4. Obtain required review and approval of Acceptance Forms to allow final certificate of occupancy to be granted.

END OF SECTION

SECTION 26 27 00 - BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Work included in this Section: All materials, labor, equipment, services, and incidentals necessary to install the electrical work as shown on the drawings and as specified hereinafter, including but not limited to the work listed below:
 - 1. Raceways, feeders, branch circuit wiring, wiring devices, safety switches and connections to all equipment requiring electric service.
- B. Any other electrical work as might reasonably be implied as required, even though not specifically mentioned herein or shown on the drawings.
- C. All work shall comply with Section 26 05 00.

1.2 SUBMITTALS

- A. Comply with the provisions of Section 26 05 00.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Refer to Section 26 05 00, Basic Electrical Requirements, Part 2 - Products.
- B. List of Equipment Manufacturers:
- C. Conduit and Conduit Fittings
 - 1. Allied Tube and Conduit, Wester Tube and Conduit, LTV Steel Tubular, National Electric Products, AFC, Republic Steel Corporation, Rome Cable Corporation, United States Steel Corporation, Killark Electric Manufacturing Company, Raco, VAW Aluminum Company, Bridgeport, Steel City, Thomas & Betts, Carlon, O.Z. Gedney, Appleton, Regal.
- D. Wire and Cable (600V)
 - 1. American Wire Company, General Wire and Cable Corporation, Okonite Company, Rome Cable Corporation, Cerrowire, American Insulated Wire, AFC Cable Systems, Essex, Simplex Wire and Cable Company, Southwire.
- E. Solderless Lugs and Grounding Connections
 - 1. Burndy Engineering Company Inc, O.Z. Gedney Company Inc, Penn Union Electric Corporation, Thomas and Betts Company Inc.
- F. Pull Boxes, Gutters, Special Cabinets
 - 1. Schneider-Square D Company, Columbia Electric Manufacturing Company, General Electric Company, Eaton Inc.

G. Outlet Boxes

1. Appleton Electric Company, Killark Electric Manufacturing Company, Lew Electric Fittings Company, National Electric Products Corporation, Raco, Steel City Electric Company, Carlon, Bowers.

H. Wiring Devices

1. Leviton, Arrow-Hart, Cooper, Hubbell, Lutron, Bryant.

I. Conduit Racks, Hangers

1. General Electric Company, Killark Electric Manufacturing Company, Caddy, National Electric Products Corporation, Republic Steel Corporation, Rome Cable Corporation, United States Steel Corporation, VAW Aluminum Company, Superstrut, B-Line.

J. Firestopping

1. 3M, Nelson.

2.2 MATERIALS

A. Panelboards:

1. Surface (or flush where indicated on the drawings) mounted, with branch circuits as indicated on the drawings.
2. Enclosures: code gauge galvanized sheet steel with welded full flange end pieces, stretcher- leveled steel trim, backpan and door.
3. Bussing of copper with silver-plated contact surfaces.
4. Trims on surface-mounted cabinets secured with nickel-plated screws with cup washers, bottom of all trims to have lugs for resting on cabinet flange.
5. Panels shall be 20 inches minimum in width, provided with approved gutter space, barriers and adjustable supports. Doors mounted with concealed hinges provided with combination spring latch and lock. Doors and trims and surface mounted cabinets primed and finished with one coat baked on gray enamel. All visible panel enclosures and covers in finished (occupied) areas shall be painted to match adjacent wall finish.
6. Breakers on same phase to be aligned horizontally. Each panel provided with quantity (5) spare handle locks. Install handle locks on all breakers serving fire alarm equipment.
7. Each branch circuit of panelboards to have a permanently fixed number with one word directory, mounted under celluloid on inside of cabinet door, showing circuit numbers and typewritten description of outlets controlled by breakers. Color code mains and each breaker terminal, same as conductor insulation.
8. Each panel shall be equipped with a copper ground bus.
9. All panels shall be fully bussed to accept future circuit breakers, with breaker hardware provided where indicated on the drawings.
10. Panel board submittals shall include diagrams of the circuit breaker arrangements in the panels. Arrange circuit breakers in panels exactly as shown on the panel schedules in the construction documents - no deviations permitted.

B. Circuit Breakers:

1. General: Circuit breakers shall be molded case rated for 240 volts, multiple or single pole and amperage rating as shown on the drawings, bolt on, manually operated with "de-ion" arc chutes.

2. Distribution circuit breakers shall be rated for the amps interrupting capacity noted on the drawings or U.L. series rated with the main circuit breaker.
 3. Branch circuit breakers shall be rated for the amps interrupting capacity or U.L. series rated with the distribution and main circuit breakers, General Electric type THQB or equal, minimum 10,000 A.I.C for 120/208 volt.
- C. Raceways: Only the raceways specified below shall be utilized on this project. Substitutions shall be pre-approved in writing. All bare conduit ends (stub-ups or stub-outs) shall be provided with bushed ends or manufactured insulated throat connectors:
1. Electrical metallic tubing shall be used exposed in interior electrical and mechanical rooms, in interior unfinished spaces, and in interior concealed and furred spaces, made up with steel watertight or steel set screw type fittings and couplings. EMT shall not be used in under-building crawl spaces or other areas subject to moisture. Set screws shall have hardened points. Die-cast zinc fittings are unacceptable.
 2. Use flexible conduit for all motor, transformer and recessed fixture connections, minimum ½"; "Seal tite" type used outdoors and in all wet locations, provide with code size (minimum No. 12) bare ground wire in all flexible conduit.
 3. All conduit cuts (factory or field cut) shall be perfectly square to the length of the conduit and cut ends shall be reamed with a reaming tool to provide a smooth edge to the passing conductors and to remove all burs and scrapes. Use of a hand file is not acceptable.
 4. All electrical raceways shall be installed concealed, unless otherwise noted. Cut and patch to facilitate such installation to match adjacent and original finish. All exposed conduits, where required, shall be installed parallel to building members.
 5. All emergency source circuits shall be installed in separate raceways (from normal power), per 2022 NEC 700.10(B), or the applicable code at the time of permitting.
 6. Where existing conditions preclude the installation of EMT in existing walls to remain, provide and install cut-in type boxes and "fish" flexible MC or flex conduit and wire through existing walls to remain, unless shown otherwise on plans.
 7. Fasten conduits securely to boxes with locknuts and bushings to provide good electrical continuity.
 8. Provide chrome escutcheon plates at all exposed wall, ceiling and floor conduit penetrations.
 9. Support individual suspended conduits with heavy malleable strap or rod hangers; supports for ½ inch or ¾ inch conduit placed on maximum 7-foot centers; maximum 10-foot centers on conduits 1 inch or larger.
 10. Support multiple conduit runs from Kindorf B907 channels with C-105 and C-106 straps.
 11. Conduit bends - long radius.
 12. To facilitate pulling of feeder conductors, install junction boxes as shown or required.
- D. Outlet Boxes and Junction Boxes. Verify all backbox requirements with devices to be installed prior to rough-in.
1. One piece steel knockout type drawn boxes, unless otherwise noted, sized as required for conditions at each outlet or as noted.
 2. Flush-mounted boxes equipped with galvanized steel raised covers for device mounting flush with finished surface. Provide extension rings as required on all acoustical or additional wall treatment areas to bring top of cover flush with finished surface (coordinate with Architectural drawings). Devices shall be capable of being tightly mounted to boxes without distorting or bending device or mounting hardware.
 3. Boxes for fixture outlets: 4-inch octagon or larger as required, or as noted.

4. Switch and receptacle outlets - not smaller than 4-inch-square in furred walls, with raised cover for single device; ganged where required.
 5. All connectors from conduit to junction or outlet boxes shall have insulated throats. Connectors shall be manufactured with insulated throats as integral part. Insertable insulated throats are unacceptable.
 6. Conduit Bodies: Malleable iron type, with lubricated spring steel clips over edge of conduit body, O-Z/Gedney type EW, or equal.
- E. Wire and Cable (line voltage and signal systems):
1. 600-volt class where used for or run with line voltage power wiring, insulation color coded, minimum No. 12 AWG for power branch circuits, No. 14 for power control circuits, and wiring size and type as directed by signal system manufacturer for each signal system.
 2. All conductors shall be copper.
 3. Size and insulation type:
 - a. Standard locations: #12 to #1 AWG: THWN for wet locations and THHN for dry locations. #1/0 through #4/0 AWG: XHHW (55 Mils). 250MCM and larger: XHHW (65 Mils). All wire sizes used shall be based on a 75 degree insulation rating, unless specifically used with 90 degree rated breakers and devices.
 - b. All wiring (power and signal) installed underground between buildings, or in wet or damp locations, shall be outside listed and rated for wet locations.
 - c. High temperature and non-standard locations: Provide wire type and insulation category suitable for area of use as defined in NEC table 310-13.
 4. Conductors No. 8 and larger and as otherwise noted on drawings shall be stranded. Power conductors No. 12 and No. 10 shall be solid or stranded. Power conductors No. 14 or smaller shall be solid.
 5. Install all wiring branch circuits and feeders (low voltage and line voltage) in conduit unless noted otherwise on the drawings. Contractor shall mandrel all feeders and pass a "sock" (or utilize other suitable means) through each raceway prior to pull to remove all water and construction debris. All raceways shall be completely clear of any obstructions or debris and all cut ends shall be reamed, prior to pull. Utilize pulling compound on all runs to insure minimum friction and pulling tension.
 6. Megger test all feeders prior to energizing. See section 26 08 00 for additional information.
 7. Approximately balance branch circuits about the neutral conductors in panels.
 8. Connections to devices from "thru-feed" branch circuit conductors to be made with pigtails, with no interruption of the branch circuit conductors.
 9. Neutral conductor identified by white outer braid, with different tracers of "EZ" numbering tags used where more than one neutral conductor is contained in a single raceway.
 10. Neatly arrange and "marlin" wires in panels and distribution panelboards with "T and B Ty-rap" or approved equal plastic type strapping.
 11. All wire and cable shall bear the Underwriters' Label, brought to the job in unbroken packages; wire color-coded as follows:

| | | | | | |
|------------|---------|-------|-----|------|-------|
| a. Voltage | Phasing | A | B | C | N |
| b. 120/208 | 3PH4W | Black | Red | Blue | White |
| c. 2083PH | 3W | Black | Red | Blue | -- |
 12. The equipment grounding conductor shall be insulated copper; where it is insulated, the insulation shall be colored green.

13. Label each wire of each electrical system in each pull box, junction box, outlet box, terminal cabinet, and panelboard in which it appears with "EZ" numbering tags indicating the connected circuit numbers.
 14. Install feeder cables in one continuous section unless splices are approved by City. Exercise care in pulling to avoid damage or disarrangement of conductors, using approved grips. No cable shall be bent to smaller radius than the spool on which it was delivered from the manufacturer. Color code feeder cables at terminals. Provide identifying linen tags in each pullbox.
- F. Receptacles: Mounting straps and contacts shall be one piece design, constructed of minimum .050" solid brass. Base shall be high strength, heat resistant, glass reinforced nylon. Device shall accept up to #10 wire, side or back wired with screw terminals - no plug-in terminations. Hubbell, Leviton, Pass & Seymore, or equal. Color to be selected by City, unless otherwise noted. Numbers listed below are Hubbell:
1. 20A 3PG 125 volt duplex - No. HBL5362
 2. 20A 3PG 125 volt ground fault interrupter receptacle; GFI receptacles shall conform to the 2006 UL requirements to a) interrupt power to the unit in the event of internal failure, or b) provide an audible or visual indication of internal failure of the GFI; No. GF20 or equal. Through wiring to down stream GFI designated receptacles is not acceptable.
- G. Plates: Leviton, or equal, except as noted:
1. The color of all faceplates shall match the color of the devices installed under/in the faceplate, except as specifically noted otherwise.
 2. For flush outlet boxes, for switches, and receptacles: nylon, color to be selected by City, unless otherwise noted.
 3. Plates for surface-mounted outlets: galvanized steel unless otherwise noted.
- H. Lugs and Connectors: Thomas and Betts "lock-tite", for No. 4 and larger wire; 3M "Scotchlock" fixed spring screw-on type wire connectors with insulator for No. 6 and smaller wire.
1. All splices shall be made up with screw-on type connectors - no plug-in or push-in style connectors acceptable. Wires shall be solidly twisted together with electricians pliers before screw-on connector is installed to ensure a proper connection in the event of wire nut failure. No exceptions.
 2. Connectors listed or labeled for "no wire twisting required" are not an acceptable substitute for actual wire twisting.
 3. Utilize porcelain type connectors in all high temperature environments (above 105 degrees Celsius).
- I. Splice Insulation: "Scotch" electrical tape with vinyl plastic backing or rubber tape with protective friction tape for interior work.
- J. Identification: Refer to Section 26 05 00.
- K. Firestopping: as manufactured by 3M Fire Protection Products or equal.
1. Fire-rated and smoke barrier construction: Maintain barrier and structural floor fire and smoke resistance ratings including resistance to cold smoke at all penetrations, connections with other surfaces or types of construction, at separations required to permit building movement and sound vibration absorption, and at other construction gaps.

2. Systems or devices listed in the UL Fire Resistance Directory under categories XHCR and XHEZ may be used, providing that it conforms to the construction type, penetration type, annular space requirements and fire rating involved in each separate instance, and that the system be symmetrical for wall penetrations. Systems or devices must be asbestos free.

PART 3 - EXECUTION

3.1 REFER TO BASIC ELECTRICAL REQUIREMENTS - SECTION 26 05 00 FOR WORK UNDER THIS SECTION.

3.2 TESTS

A. Testing and Inspection: See Section 26 08 00 - Testing.

END OF SECTION

SECTION 26 51 01 - LIGHTING

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Luminaires (i.e., lighting fixtures): Refer to the Luminaire Schedule and provide a complete and working lighting system. Catalog numbers in the Luminaire Schedule are design series references and may not represent the exact catalog number as specified or as required for particular installations. Provide complete luminaires to correspond with the number of LEDs, power supply, wattage, mounting hardware, ceiling type, trim, size, and special requirements as specified in the Luminaire Schedule for each luminaire type. Additional features, accessories, and options specified, described, scheduled, or necessary for installation shall be included.
- B. LEDs and power supplies.
- C. Exit and Emergency Egress lighting where indicated and where required.
- D. Supports for outlet boxes and luminaires, including seismic restraint slack wires for recessed luminaires in suspended ceilings per code and backing in walls as required to keep luminaires secure and level.

1.2 INCORPORATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this section.
- B. Section 26 05 00 and 26 27 00 apply to all work in this section.

1.3 RELATED WORK

- A. Ceiling Access panels where required for access to equipment, outlets, transformers, etc., located above suspended ceilings, sheet rock or plaster ceilings. Coordinate with the City and other trades.

1.4 SUBMITTALS

- A. Submit under provisions of Division 1 and Section 26 05 00.
- B. Submit a bookmarked PDF lighting submittal for review by the project team. The submittals shall include the following information:
 - 1. Product Index: The following information shall be included in the product index.
 - a. Luminaire Type. The index shall list, in alphabetical order, each luminaire type per the Luminaire Schedule.
 - b. Manufacturer's Catalog Number. Outstanding information required to make a complete catalog number shall be clearly identified in the index.
 - c. LED Data. Provide the Manufacturer's name for each LED array including wattage, color temperature, lumen output, and color rendering index.

2. Manufacturer's literature for every luminaire listed on the Luminaire Schedule.
 - a. Catalog Information:
 - 1) Luminaire Data Sheet: The manufacturer's cut sheet shall include the following:
 - (a) Photometrics: Candlepower distribution curve or table with horizontal readings at 0, 22.5, 45, and 90 degrees and vertical readings from 0 to 180 degrees in 5 degree increments in accordance with the Illuminating Engineering Society published test procedures.
 - (b) Catalog Number Nomenclature
 - (c) Coefficient of Utilization Tables
 - (d) Luminaire Line Drawing
 - (e) Power supply (each type)
 3. Data sheets for wallbox controls, where shown on the drawings.
 4. Shop Drawings:
 - a. Detailed shop drawings of all cove, beam, column, or box mounted luminaires containing the following information:
 - 1) Exact field measured length (clear inside dimension) of cove pocket, beam width, or box.
 - 2) Exact luminaire length and arrangement of luminaires.
- C. For Any Luminaires Substituted For Those Specified:
1. Refer to Division 1 - Product Requirements, for all substitution procedures.
 2. Provide Independent Testing Laboratories, Inc., or equal, photometric test report for each Luminaire type and lamp combination listed on the Luminaire Schedule. Test reports shall be based on Illuminating Engineering Society published test procedures and shall contain polar coordinate candlepower distribution curves in five lateral planes for luminaires with asymmetric distributions and luminaire luminance data for vertical angles above 45 degrees from nadir. Test results shall indicate luminaire efficiency for the lamp and aperture assembly specified. luminaires with efficiencies more than 2% below the values of specified luminaires are not acceptable and will be rejected.
 3. Provide photometric calculations for each room or area where a substituted luminaire is proposed. Such calculations shall be made using comprehensive lighting software, such as AGi32, and include point-by-point illuminance values at IES recommended heights, average illuminance, and maximum-to-minimum and average-to-minimum uniformity ratios. Room dimensions, configurations (including sloping ceilings), room surface reflectances, light loss factors, and heights of suspended luminaires shall match the heights specified in the contract documents.
 4. Due to the variety of lumen outputs and light distributions of LED Luminaires, substitutions will require additional review on the part of the Engineer or City to ascertain the equivalency of the substituted luminaires. Substitutions will be reviewed to determine their aesthetic, construction, and photometric equivalency to maintain similar design impact and performance in their intended environment. The Engineer and City have not included such unknown and unquantifiable review time in their scope of work and are not compensated by the City for such services. The Contractor shall reimburse the Engineer and City for labor costs to review substitutions.
 5. Prior approval does not guarantee final approval by the Engineer. The Contractor shall be responsible for providing luminaires that meet or exceed the quality and performance of the specified products in their entirety. All deviations in quality and performance from the specified products must be listed and individually signed off by the engineer.

6. The City reserves the right to reject a proposed substitution based on their agent's professional judgment as to the utility, quality, performance, visual appropriateness, or finish of substitutions.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site and store in unopened cartons in protected location. Inspect products immediately and report all damage accordingly.

1.6 GUARANTEE AND WARRANTIES

- A. All work performed under this section must be guaranteed to be free of defects in products or workmanship for one year after date of acceptance by City, unless noted otherwise in General Conditions.
- B. Warranties:
 1. Electronic power supplies must be warranted against failure for at least five years after date of substantial completion.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide luminaires as indicated in Luminaire Schedule; if conflict exists between Luminaire Schedule and Specifications, the more stringent requirement shall take precedence.
- B. Provide luminaires new and complete with mounting accessories, junction boxes, trims, and lamps.
- C. Provide products with UL labels appropriate to intended installation conditions, or with labels from other testing laboratories whose results are acceptable to local inspector, showing compliance with UL standards. Labels must be concealed from normal viewing angles.
- D. All products of same type by same manufacturer.

2.2 SOLID STATE LUMINAIRES

- A. Housing, where applicable:
 1. Steel bonderized or equal rust protected, or aluminum, rigid construction. Minimum gauge thickness shall be as follows:
 - a. Interior locations: No. 20-gauge steel, No. 16-gauge aluminum.
- B. Finish:
 1. Baked enamel finish (except when otherwise specified).
 - a. Concealed interior surfaces (this applies to interior hardware, circuit boards, etc.) matte black.
 - b. Concealed exterior surfaces: matte black.

- c. Visible surfaces: color and texture as specified below for each luminaire type or as selected.

C. Light Emitting Diode (LED) requirements:

1. Correlated color temperature (CCT) for phosphor-coated white LEDs must have one of the following designated CCTs, as specified on the Luminaire Schedule, and fall within the following binning standards.
 - a. 3000K defined as 3045 +/- 175K
 - b. 3500K defined as 3465 +/- 245K
2. Color spatial uniformity shall be limited to variations in chromaticity for different directions (i.e. changes in viewing angle) within 0.004 from the weighted average point on the CIE 1976 (u',v') diagram.
3. Color maintenance shall be limited to a maximum change in chromaticity of 0.007 on the CIE 1976 (u',v') diagram over the lifetime of the product.
 - a. Color rendering index: Color rendering index to be determined using ANSI C78.377-2008 and applicable IESNA standards.
 - b. Laboratory tests must be produced using specific module(s)/array(s) and power supply combination that will be used in production.
 - c. Manufacturers must provide a test report from a laboratory accredited by NVLAP or one of its MRA signatories
4. Lumen depreciation
 - a. Lumen depreciation to be measured using IESNA LM-80-08 and TM-21-11 standard for IES approved method of measuring lumen maintenance of LED light sources.
 - b. Phosphor-coated white LED modules/arrays shall deliver at least 70% of initial lumens for a minimum of 50,000 hours when installed in-situ and operated at 100% output and the maximum specified operating temperature.
 - c. Colored LED modules/arrays shall deliver at least 50% of initial lumens for a minimum of 50,000 hours when installed in-situ and operated at 100% output and the maximum specified operating temperature.
5. Acceptable LED manufacturers:
 - a. Cree
 - b. Nichia
 - c. Osram Opto Semiconductors
 - d. Philips Lumileds
 - e. Xicato

D. Luminaire Efficacy:

1. Luminaire efficiency shall be measured using IESNA LM-79-08 standard for electrical and photometric measurements of solid state lighting products.
2. Manufacturer shall provide published luminaire efficacy, which is defined as luminaire light output divided by luminaire input power measured in a 25 degree Celsius environment. Efficacy shall include power supply, thermal, optical, and luminaire losses.

E. Thermal Management:

1. Solid state luminaire shall not exceed LED manufacturer's maximum junction temperature requirements when operated in-situ at luminaire manufacturer's maximum ambient operating temperature and 100% light output.
2. Solid state luminaires shall be thermally protected using one or more of the following thermal management techniques:

- a. Metal core board
 - b. Gap pad
 - c. Internal monitoring firmware
3. Solid state luminaire housing shall be designed to transfer heat from the LED board to the outside environment.
- F. Power Supplies (LED Drivers) requirements:
1. Power factor of 0.90 or greater for primary application
 2. Input current shall have Total Harmonic Distortion (THD) of less than 20%.
 3. Minimum operating temperature of minus 20 degrees Celsius or below when used in luminaires intended for outdoor applications.
 4. Operating frequency equal to or greater than 120 Hz.
 5. Operate with sustained input variations of +/- 10% (voltage and frequency) with no damage to the driver.
 6. Tolerate sustained open circuit and short circuit output conditions without damage and without need for external fuses or trip devices.
 7. Output shall be regulated to +/- 5% across published load range.
 8. Class A sound rating.
 9. Outputs shall have current limiting protection.
 10. Operate LEDs at constant and regulated current levels. LEDs shall not be overdriven beyond the diode manufacturer's specified nominal voltage and current.
 11. Inrush currents not exceeding peak currents specified in NEMA 410.
- G. Solid State Lighting Controls:
1. Control interface to dimmable power supplies shall consist of one of the following:
 - a. Line Voltage Dimming. Controls to be rated for magnetic or electronic low voltage transformer operation.
 - b. Low voltage (0-10V) control. Controls to be compatible with either current sink or current source operation.
 2. Dimmable LED power supplies shall use pulse width modulation (PWM) or constant current reduction (CCR) to regulate power to LEDs.
 - a. PWM power supplies shall have 12-bit or greater resolution to obtain flicker-free operation throughout their dimming range.
 - b. PWM power supplies shall be provided in luminaires that will be dimmed lower than 40% and must maintain consistent color temperature.
 - c. CCR power supplies shall be provided in areas that have strict electromagnetic interference (EMI) requirements, high motion activity, or rotating machinery.
- H. System Installation
1. Hardwired connections to solid state luminaires shall be reverse polarity protected and provide high voltage protection in the event connections are reversed or shorted during the installation process.
 2. All solid state luminaires (100% of each lot) shall undergo a minimum eight-hour burn-in test during manufacturing. Solid state lighting installations shall be UL Listed as a low-voltage lighting system including, but not limited to, luminaire, power supply, controller, keypad, and wiring.
- I. Warranty

1. Luminaires, drivers, and controllers for solid state lighting systems shall be covered by a five-year warranty against defects in workmanship or material. Warranty shall include in-warranty service program providing for payment of authorized labor charges incurred in replacement of inoperative in-warranty equipment.

2.3 LUMINAIRE CONSTRUCTION

- A. Sheet metal: materials and thicknesses shall be 20 gauge (0.7 mm or 0.027") min., free of dents, scratches, oil-can, or other defects.
- B. Painted luminaires: exposed weld marks, joints, and seams shall be filled and sanded smooth before finishing.
- C. All edges cleaned and dressed to remove sharp edges or burrs.
- D. Extrusions: 1/10" min. wall thickness, smooth and free of tooling lines, with cast end plates that exactly match extrusion profiles.
- E. Castings: smooth, free of pits, scales, gate marks, or blemishes.
- F. Spinings shall have 1/32" min. thickness, smooth, free of spinning lines or blow-back, with clean edges.
- G. Welds: Follow recommendations of American Welding Society. All welds continuous and free of spatter, residue, or warping.
- H. No light leaks visible in finished room. Ensure that downlight housings mounted in wood slat ceilings are not visible from below. Field paint exterior of housing with high temperature paint if necessary.
- I. Exposed end plates and joiners, with concealed fasteners.
- J. End-to-end mounted luminaires: Verify row configurations and provide joiners, aligning splines, and trims to suit.
- K. Hardware:
 1. Steel or aluminum interior luminaires: cadmium-plated hardware.
 2. Steel or aluminum exterior luminaires: stainless steel hardware.
 3. Stainless steel luminaires: stainless steel hardware.
 4. Copper alloy luminaires: brass hardware.
- L. Raceways: Where used for through wiring, luminaires must be approved for use as raceways.

2.4 TRIMS

- A. Trims must fit tightly and be held in by gravity, spring clips, or mechanical fasteners. Trims must not drop out under normal conditions or seismic forces which do not exceed the design criteria of the building.

- B. Aluminum parabolic cones shall be smooth, properly shaped, with Alzak finish in colors as indicated.
 - 1. No hot spots or lamp images visible at angles shallower than lamp shielding angle.
 - 2. Self-flange cones must bend parallel to ceiling and cover ceiling hole without additional trim ring. Unpainted flange, shall have the same finish as cone interior.
 - 3. Cones and louvers for fluorescent luminaires must have permanent anti-iridescence treatment.

- C. Lenses, diffusers, and patterned glass: glass or virgin acrylic as noted, with patterns as noted.
 - 1. Finished thickness 2 mm (1/10") min. unless noted otherwise.
 - 2. Linear runs over 1200 mm (4'-0") long shall be in equal-length pieces.

2.5 FINISHES

- A. Steel Reflectors: Unless otherwise specified, the reflector surface finish shall be of synthetic white enamel or polyester powder coating. Finish shall show no indication of chipping, cracking, flaking or any other sign of loss of adhesion. The initial reflection factor shall be not less than 88 percent averaging 5 randomly selected points on the reflector. After 100 hours of exposure to the radiation of a glass enclosed carbon arc lamp, such as a Fade-O-Meters, the reflectance of the exposed portion shall not be less than 5 percent and finish shall show no appreciable color change. The carbon arc lamp shall be operated at appreciable color change. The carbon arc lamp shall be operated at 13 plus or minus 0.5 amperes at 140 volts. The reflector shall be placed ten inches from the arc and the lamp so ventilated that the temperature of the exposed portion does not exceed 105 degrees F.

- B. Aluminum Reflectors: Reflecting surfaces shall be provided with either a specular or diffuse finish as indicated. Reflection factors shall be not less than 83 percent for specular reflecting surfaces. Each reflecting surface shall be protected by dense coating of oxide weighing not less than 5.0 milligrams per square inch, applied by an anodic process. The reflector shall be given a sealing treatment that will prevent staining of the reflecting surface when subjected to a stain test. All aluminum reflectors & louvers shall be a low iridescent equivalent to that provided by Coil Anodizers.

- C. Non-Reflecting Surfaces: Unless otherwise specified, the finish on all non-reflecting exterior surfaces shall be aluminum oxide or aluminum; white, gray or aluminum paint on steel; nickel or chromium plating on copper alloy. Fastening devices shall be nickel, chromium, cadmium or zinc plated. All painted surfaces shall be free of tears, star marks, blisters, pinholes, chipping and any other defects that may impair appearance or serviceability.

2.6 LAMPS

- A. Relamp luminaires or replace LED boards and power supplies at no cost to City if lamps or LEDs exhibit color variation, flicker, or burn out within 90 days of substantial completion date.

- B. LEDs:
 - 1. LED quantity, wattage, and color temperature as specified for each LED luminaire.
 - 2. 3500 deg. K color temperature for interior luminaires, 3000 deg. K for exterior luminaires, unless otherwise specified.

2.7 DRIVERS AND TRANSFORMERS

A. General:

1. Verify input voltages and match to branch circuit voltages.
2. Remote drivers or transformers: Provide suitable enclosures and mounting hardware, and install in accessible, ventilated locations.
 - a. Secondary wiring: provide number and size of conductors as required, with 3% max. voltage drop between transformer and last lamp.
 - b. Keep transformers at least 300 mm (12") apart and do not stack vertically.

B. LED Drivers:

1. High power factor, thermally-protected.
2. Compatible with LED lamps being used.
3. Capable of dimming LED source without perceptible flicker or stroboscopic effects.

2.8 WALL-BOX DIMMERS

A. Provide dimmer controls as specified on the drawings.

B. Ganging and Labeling:

1. Dimmers and matching switches in same location shall be installed in same gang box.
2. Follow dimmer manufacturer's instructions for gang-box sizes. Do not break off fins on dimmers (if applicable) unless noted otherwise.
 - a. 1+1, 4+1, 7+1 installation: to gang an even number of small devices without breaking off fins, provide multi-gang box as indicated (1, 4, or 7 gangs) and provide additional single-gang box at end, with ears of single box 70 mm (2-3/4") o.c. from last set of ears on multi-gang box.
 - b. When rows of devices are stacked vertically space rows 230 mm (9") o.c. to allow heat dissipation.
3. Provide Lutron multi-gang plates to cover each group of devices.
4. Plates with "-NFB" in catalog number with no fins broken.
5. Plates with "-FB" in catalog number: break off all interior fins on devices, but do not break off outside fins at either end of row.
6. Nova-T: install aligning backplate (provided by Lutron with each multi-gang plate) between wall and devices.
7. Labels: text as indicated 3 mm (1/8") high, all capital letters, engraved on device faceplate, filled with black paint and wiped clean.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Reflected Ceiling Plans and Elevations shall govern exact location and mounting conditions for all luminaires. Contractor shall coordinate luminaire mounting and compatibility with ceiling construction and other trades.

- B. Coordinate work with other trades. Location of lighting has priority over location of new framing (except major structural members), ducts, diffusers, sprinklers, speakers, smoke detectors, and other obstructions.
- C. If obstructions are encountered which prevent installation of luminaires according to drawings, notify City immediately and do not proceed until conflict has been resolved.
- D. Coordinate the location of luminaires in mechanical or unfinished spaces. Locations shown on Drawings may be adjusted by the Contractor to suit conditions. Install luminaires to avoid obstructions and maximize light output, 2100 mm (7'-0") min. mounting height.
- E. Coordinate the location of any exposed conduit used to feed luminaires with the City prior to installation and paint to match adjacent finishes, similar to the existing installation.

3.2 INSTALLATION

A. General:

1. Contractor shall be responsible for handling and installation of luminaires including all supports, hangers and hardware necessary for a complete installation. Luminaires shall be clean, plumb, level in straight lines, without distortion. Luminaires must be installed so they do not shift during relamping or adjustment. Remedy any light leaks which may develop after installation of recessed or enclosed luminaires.
2. Install luminaires at locations and heights as indicated, in accordance with luminaire manufacturer's written instructions, applicable requirements of NEC, NECA's "Standard of Installation", NEMA standards, and with recognized industry practices to ensure that luminaires fulfill requirements.
3. Point-source luminaires shall be located as dimensioned, or in center of tile or on tile joint as drawn; 6 mm (1/4") max. off-center tolerance.
4. Linear luminaires shall have 3 mm (1/8") max. horizontal or vertical alignment variation in any 5 m (16-ft.) portion of run.
5. Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for equipment connectors. Where manufacturer's torqueing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Stds. 486 A and B, and the National Electrical Code.
6. Clean luminaires of dirt and construction debris upon completion of installation. Clean fingerprints and smudges from lenses.
7. Remove and replace luminaires that may have been damaged during construction at no additional cost to the City.
8. Protect installed luminaires from damage during remainder of construction period.
9. Provide equipment grounding connections for luminaires as indicated. Tighten connections to comply with tightening torques specified in UL 486 A to assure permanent and effective grounds.
10. Install luminaires, lamps, lenses, etc., after building is enclosed, weather tight and environmental conditions are nominally the same as expected for the complete spaces. All lenses, glass, reflectors, and refractors shall be clean and free of chips, cracks, and scratches.

11. All wall mounted luminaires and all ceiling mounted surface luminaires including exit lights shall be fed through a luminaire Stud/Hickey/Nipple assembly and with provisions to prevent luminaire turning.
12. All junction box cover plates for the lighting branch circuit system shall be clearly marked with a permanent ink felt pen identifying the branch circuit and control relay (panel number, circuit number, lighting control cabinet designation and control relay number) contained in the box.

B. Ceiling-Mounted and Pendant Luminaires:

1. Provide support for outlet boxes and suspension points so luminaires can be installed securely, including seismic supports per code.
 - a. Luminaire weight less than 23 kg (50 lb) at each suspension point: hang from strap or stud on outlet box, or at non-feed points, provide 1/4"-20 stud projecting 20 mm (3/4") below ceiling.
 - b. Luminaire weight 23 kg (50 lb) or more at each suspension point: hang directly from structure, either independent of outlet box or from stud extending through outlet box to structure, unless the outlet box is listed for not less than the weight to be supported. Boxes used as the sole support of luminaires weighing more than 50 pounds must be listed and marked by the manufacturer with the maximum weight.
2. Pendants:
 - a. Provide horizontal bracing from suspension points to ceiling framing to prevent sideways shifting.
 - b. Provide diagonal seismic restraint wires above ceiling per code.
 - c. Furnish suspended luminaires with universal joint type hanger canopy (and longitudinal sway adapter at each stem connection point for linear luminaires), to permit 45 degree swivel on 360 degree circle from Nadir at canopy (and 45 degree longitudinal movement at sway adapter).
 - d. Luminaires over 450 mm (18") wide shall be provided with supports at all corners.
 - e. Install pendants plumb and level.
 - f. Verify luminaire weights and provide backing in ceiling as required.

C. Wall-Mounted Luminaires:

1. Mounting heights shown on Drawings are measured from finished floor to centerline of outlet box or recessed housing, unless otherwise noted.
2. Verify luminaire weights and provide backing in wall as required. Luminaires must not droop or tilt away from wall.
3. Wet locations: install sealant between luminaire and outlet box.
4. In circulation areas, wall-mounted luminaires must not project more than 100 mm (4") from wall if mounted above 685 mm (27") and below 2030 mm (80").

3.3 DELIVERY, STORAGE, & HANDLING:

- A. Deliver luminaires in factory-fabricated containers or wrappings, which properly protect luminaires from damage. Inspect luminaires immediately upon delivery to ensure correct shipment without damage.
- B. Store luminaires in original packaging. Store inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, humidity, laid flat and blocked off ground.

- C. Handle luminaires carefully to prevent damage, breaking, and scoring of finishes. Do not install damaged units or components; replace with new. Protection wrapping on louvered (parabolic) luminaires shall not be removed until luminaires are ready for operation.

3.4 SEQUENCING AND SCHEDULING:

- A. General:
 - 1. Coordinate with other work including wires/cables, electrical boxes and fittings, and raceways, to properly interface installation of luminaires with other work.
 - 2. Sequence lighting installation with other work to minimize possibility of damage and soiling during remainder of construction.

3.5 PROJECT CLOSEOUT

- A. Clean luminaires and remove plaster and paint spatters.
- B. Clean fingerprints and dust from downlight reflectors. Refer to manufacturer's instructions.
- C. Verify that luminaires and controls are working at time of final acceptance by City.
 - 1. Repair or replace lighting control devices that are inoperable.
 - 2. Repair or replace LED modules or entire LED luminaires that are inoperable.
 - 3. Repairs and/or replacements shall be at no additional cost to the City.
- D. Test emergency lighting system for 90 minutes in presence of City's representative, check each luminaire for proper operation at end of 90-minute test, then recharge for 24 hours and briefly test each luminaire again for proper operation.
- E. Install and aim adjustable lighting as directed by City.
 - 1. Provide personnel, lifts, ladders, and walkie-talkies as required.
 - 2. Aiming will occur at night, outside of normal working hours, at times as approved by the City.
- F. Prepare the Lighting Systems Maintenance Manual consisting of the following in a bookmarked PDF file. Provide to City.
 - 1. One complete set of approved submittals, including product data and shop drawings.
 - 2. Luminaire cleaning instructions, including chemicals to be used or avoided.
 - 3. Instructions for code-required testing and maintenance of emergency lighting system.

END OF SECTION

SECTION 27 41 00 - COMMON WORK RESULTS FOR AUDIOVISUAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes, but is not necessarily limited to:
 - 1. Common standards and procedures for the Audiovisual Work.
 - 2. Design, engineer and provide complete, all means of support, suspension, attachment, fastening, bracing, and restraint (hereinafter "support") of the Audiovisual Systems. Provide engineering of such support by parties licensed to perform work of this type in the Project jurisdiction.

- B. Provisions of this Section apply to Audiovisual Work, including the following Sections:
 - 1. Section 27 41 01 – Grounding and Bonding for Audiovisual Systems
 - 2. Section 27 41 02 – Hangers and Supports for Audiovisual Systems
 - 3. Section 27 41 03 – Conduits and Backboxes for Audiovisual Systems
 - 4. Section 27 41 06 – Noise and Vibration Controls for Audiovisual Systems
 - 5. Section 27 41 07 – Identification for Audiovisual Systems
 - 6. Section 27 41 08 – Audiovisual Cabinets, Racks, Frames and Enclosures
 - 7. Section 27 41 09 – Audiovisual Cable Management
 - 8. Section 27 41 16 – Integrated Audio-Video Systems and Equipment

1.2 REFERENCES

- A. Usage: In accordance with Division 1 - Regulatory Requirements

- B. American National Standards Institute (ANSI)
 - 1. ANSI/TIA/EIA-568-B.1-2001, Commercial Building Telecommunications Cabling Standard – Part 1: General Requirements
 - 2. ANSI/TIA/EIA-568-B.2-2001, Commercial Building Telecommunications Cabling Standard – Part 2: Balanced Twisted Pair Cabling Components
 - 3. ANSI/TIA/EIA-568-B.3-2000, Optical Fiber Cabling Components Standard
 - 4. ANSI/TIA/EIA-606-A-2002, Administration Standard for Commercial Telecommunications Infrastructure

1.3 DEFINITIONS

- A. General Abbreviations used in these specifications. Refer additionally to the abbreviations list appearing on the Drawings.
 - 1. ADA Americans with Disabilities Act.
 - 2. AFC Above Finished Ceiling.
 - 3. AFF Above Finished Floor.
 - 4. BLDG Building
 - 5. CAT Category
 - 6. CL Centerline
 - 7. DIV Division
 - 8. (E) Existing
 - 9. FBU Furnished By Owner

| | | |
|-----|------|-------------------------------------|
| 10. | HR | Home Run |
| 11. | ID | Inside Diameter |
| 12. | LAN | Local Area Network |
| 13. | MAX | Maximum |
| 14. | NIC | Not In Contract. |
| 15. | OD | Outside Diameter |
| 16. | PSRH | Project Standard Receptacle Height. |
| 17. | PSSH | Project Standard Switch Height. |
| 18. | TYP | Typical |
| 19. | UFE | Owner Furnished Equipment. |
| 20. | UON | Unless Otherwise Noted. |

B. Electrical and electronics terms used in the Audiovisual Sections shall be as defined in:

1. ANSI/TIA/EIA-568-B.1
2. ANSI/TIA/EIA-568-B.2
3. ANSI/TIA/EIA-568-B.3
4. ANSI/TIA/EIA-569-B
5. ANSI/TIA/EIA-606-A
6. IEEE Std 100
7. This Section.

C. Open Cable - Cabling that is not run in a raceway as defined by NFPA 70. This refers to cabling that is open to the space in which the cable has been installed and is therefore exposed to the environmental conditions associated with that space.

D. Open Office - A floor space division provided by furniture, moveable partitions, or other means instead of by building walls.

E. Pathway - A physical infrastructure utilized for the placement and routing of Audiovisual cable.

1.4 SUBMITTALS

A. Within bidding documentation, Contractor to provide a room by room equipment list.

B. Comply with Section 013300 and the following:

1. Submit all materials for review arranged in same order as Specifications, individually referenced to Specification Section, Paragraph and Contract Drawing number. Conform in every detail as applies to each referencing Section.
2. Submit 8 1/2" x 11" items bound in volumes and drawings in edge bound sets. Submit all drawings on sheets of the same size.
3. Make each specified submittal as a coordinated package complete with all information specified herein. Incomplete or uncoordinated submittals will be returned with no review action.
4. Progress Schedule: Comply with Section 013300.

C. Contractor and Key Personnel Experience.

1. A minimum of 30 days prior to installation, submit documentation of the experience of the low voltage systems, equipment and infrastructure contractor(s) and of their key personnel.
2. Qualifications shall be provided for:
 - a. the low voltage systems, equipment and infrastructure contractor(s),
 - b. the low voltage systems, equipment and infrastructure installers,

- c. and the supervisor(s) (if different from the installers).
- 3. Refer to Quality Assurance paragraph in this section for complete requirements.

D. Manufacturer's Product Data:

- 1. Manufacturer's Product Data Sheets. Collate in sequence of List of Materials:
- 2. Data sheet for each item in each Audiovisual Section, including all accessories, clearly marked for proposed product.
- 3. Material Safety Data Sheet, where applies.
- 4. List of Materials Schedule. For each item, include:
 - a. Referencing Specification Section
 - b. Referencing Paragraph
 - c. Referencing Drawing, if specified only on plans
 - d. Manufacturer.
 - e. Model number.
 - f. Listing, including name of Nationally Recognized Testing Laboratory.
 - g. Precede each submittal book with a summary schedule, with columns for each item above and rows for each item submitted.

1) Example:

| Specification Section | Paragraph | Contract Drawing Reference | Manufacturer | Model No. | UL/CLA Listed |
|-----------------------|-----------|----------------------------|--------------|-----------|---------------|
| 27 41 00 | 2.3 C. | | XYZ | 123 | Y |
| 27 41 03 | 2.7 A. 1. | | AAA | 34-56 | Y |
| 27 41 16 | 2.8 A | (Drawing Symbol) | ZZY | 456 | Y |

E. Field (Installation) Drawings:

- 1. General
 - a. Drawings shall present the proposed installation using the makes and models of devices proposed for use this project; replace vendor neutral-nomenclature used in bid set with specific makes and models of devices proposed.
 - b. Where the existing systems and/or infrastructure are used and integrated into the work of the project, indicate them on drawings, including points of interface and demarcation of existing and new work.
 - c. Collate, in sequence, at least the following minimum drawings, for each infrastructure and system to be installed under the work of this contract:
- 2. Drawing index/symbol sheet.
- 3. Site plans, floor plans and reflected ceiling plans.
 - a. General
 - 1) The identifier for each termination and cable shall appear on the drawings, either directly on the floor plans, through an associated schedule or a unique identifier associated with a fully annotated single line diagram.
 - 2) Include wiring diagrams and installation details of equipment indicating proposed location, layout and arrangement, control panels, accessories, piping, ductwork, and other items that must be shown to ensure a coordinated installation. Drawings shall indicate adequate clearance for operation, maintenance, and replacement of operating equipment devices.
 - 3) At scale of Contract Documents, show:
 - (1) Device locations and type
 - (2) Rough-in.
 - (3) Mounting height.
 - (4) Conduit size.

- (5) J-hook routes
 - (6) Wire type.
 - (7) Wire fill.
 - 4) On the floor plans, indicate floor and wall mounted devices and pathway below a height of 7 feet above finish floor. Indicate the locations of the Audiovisual Program and Control Rooms and provide reference to the enlarged Audiovisual Program and Control Rooms plans.
 - 5) On the reflected ceiling plan, indicate ceiling and wall mounted devices and pathway above a height of 7 feet above finish floor. Indicate the locations of the Audiovisual Program and Control Rooms and provide reference to the enlarged Audiovisual Program and Control Rooms plans.
 - b. Audiovisual Systems, including KMVT Systems
 - 1) Indicate:
 - (1) Device locations, orientation and depict integration of systems that need to be viewed from the complete building perspective.
 - (2) For distributed speaker systems, indicate limits of zones of coverage.
 - (3) Vertical and horizontal pathways
 - (4) Equipment rooms and racks
 - (5) Reference to enlarged plans and related details.
4. Enlarged Plans
 - a. General
 - 1) Indicate at least as much information as is provided in the Contract Documents, supplemented by the dimensions and arrangement of the proposed equipment, trade coordination and field conditions.
 - b. Audiovisual Systems:
 - 1) At equipment rooms
 - (1) Rack elevations, showing
 - (a) all equipment occupying the actual number of rack units required
 - (b) blank panels
 - (c) vent panels
 - (d) aux panels
 - (e) power strips
 - (f) UPS
 - (g) Reference mounting details.
5. System Conduit and Riser Diagrams,
 - a. General:
 - 1) Wiring diagrams shall identify circuit terminals and indicate the internal wiring for each item of equipment and the interconnection between each item of equipment.
 - 2) Single line diagram of structured wiring
 - 3) Grounding and bonding scheme
 - 4) Terminal cabinets.
 - 5) Coordination with floor plans.
 - 6) Wire runs not shown on floor plans.
 - 7) Wire type.
 - 8) Wire fill.
 - 9) Interface to work provided by work of other Sections, Owner Furnished Equipment, existing equipment and/or future equipment.
 - 10) For Audiovisual Systems, indicate digital or analog signal type and voltage levels (dBmV, microphone, line level, loudspeaker level) or optical signal levels.
6. Detail Drawings

- a. Mounting details:
 - 1) Specific details of restraints including anchor bolts submitted under the Section 27 41 02 – Hangers and Supports for Audiovisual Systems for mounting and maximum loading at each location, showing compliance and coordination with Code and the project Architectural, Structural and Mechanical Documents.
 - 2) Stamped and signed by an Engineer licensed in the Project jurisdiction for work of this type.
 - (1) Submit an accompanying Engineering analysis stamped and signed by an Engineer licensed in California for work of this type, indicating that the Equipment Enclosure System will comply with California Building Code for the Project Seismic Zone when loaded with the weight of the equipment submitted.
 - (2) Show calculations on drawings or in bound volume for review by Authorities having jurisdiction.
 - 3) Show loads, type and strength of connections, sizes, dimensions, materials, etc.
 - 4) Provide details for:
 - (1) Equipment Rack anchorage.
 - (2) Wall and ceiling mounted projection screens.
 - (3) Wall and ceiling mounted projectors.
 - (4) Cameras and loudspeakers weighing 20 pounds or more.
 - (5) Wall and ceiling mounted flat panel displays.
- b. Faceplate and Receptacles
 - 1) Receptacle and jack arrangement for each condition.
 - 2) Labeling of receptacle/jacks and plate
 - 3) Plate material.
 - 4) Plate finish.
 - 5) Connector types.
 - 6) Connector dimensioned layout.
- c. Pathway
 - 1) Firestopping
 - 2) Details of flexible raceway connections to be made to vibrating equipment
 - 3) Details of J-Box and sealant application for the typical conditions listed in Section 27 41 06 – Noise and Vibration Controls for Audiovisual System, and a schedule of rooms to receive application of mastic and sealant at J-Boxes
 - 4) An itemized list of all items of equipment to be fitted with flexible electrical connections.
 - 5) Conduit racking details.
- d. California Access Compliance Manual and Americans with Disabilities Act (ADA) compliance.
- e. For systems with contractor or manufacturer programmed control and human interfaces submit at least:
 - 1) Narrative of the sequence of operation.
 - 2) Color, full-size layouts of each touchpanel and/or computer screen (menu) image, cross-referenced to the sequence of operations.
 - 3) Show chaining of sub-menus.
- f. Terminal cabinets: Terminations.
- g. Voice cable plant: Cut sheets for use by Owner's Telephone Systems Contractor

F. Samples: Samples for review by the Owner's Representative of all finishes/materials which will be visible to the public, including but not limited to:

1. The Contractor shall submit a sample of each type of label to be used for labeling cables, patch panels, termination frames, and faceplates for the telephone and data systems.

G. Test Plan

1. Submit complete documentation of the proposed test plan and equipment to be used to document that the performance of the cabling, equipment, sub-systems and complete systems installed under the work of this project conform to the performance standards outlined in each specification section.
2. Submit not less than 45 days prior to the proposed test date. Include procedures for certification, validation, and testing.

H. Test Reports

1. Manufacturer's Field Reports
 - a. Factory reel tests
2. Project Site Test Reports:
 - a. Submit following system completion and prior to and as condition precedent to Acceptance Review and Testing of the Work of this Section.
 - b. Schedule: Submit test reports in timely manner relative to Project schedule such that the Owner's Representative may conduct verification of submitted test data without delay of scheduled progress.
 - c. Project Site test report:
 - d. Content: Include at least:
 - 1) Time and date of test.
 - 2) Personnel conducting test.
 - 3) Test equipment, including serial and date of calibration.
 - 4) Test object.
 - 5) Procedure used.
 - 6) Results of test
 - 7) Numerical or graphical presentation.
 - e. Submit copy of final results on paper and in electronic form, organized by circuit number, consistent with circuit numbering scheme used in preparing submittal drawings and in labeling receptacles and terminations.
 - 1) Submit machine-generated documentation and raw data of all test results in electronic form on CD-R media
 - 2) Where the electronic documentation requires use of a proprietary computer program to view the data, provide the Owner with 1 licensed copy of the software.

1.5 QUALITY ASSURANCE

- A. Contractor Firm and Personnel Qualifications:
- B. Designated Supervisor: Provide a designated supervisor present and in responsible charge in the fabrication shop and on the Project Site during all phases of installation and testing of the Work of this Section. This supervisor shall be the same individual through the execution of the Work unless illness, loss of personnel, or other circumstances reasonably beyond the control of the Contractor intervene.
- C. Reference Documents: At all times when the work is in progress, maintain at the workplace, fabrication shop or Project Site as applies.
 1. A complete set of the latest stamped, actioned submittals of record.

2. A complete set of manufacturer's original operation, instruction and service manuals for each equipment item.
- D. Standard Products
1. Audiovisual Systems Equipment. Provide Audiovisual Systems materials and equipment that are products of manufacturers regularly engaged in the production of such products which are of equal material, design and workmanship. Products shall have been in satisfactory commercial or industrial use for six months prior to bid opening. The six month period shall include applications of equipment and materials under similar circumstances and of similar size. The product shall have been on sale on the commercial market through advertisements, manufacturers' catalogs, or brochures during the six month period.
 - a. Alternative Qualifications. Products having less than a 1-year field service record will be acceptable if a certified record of satisfactory field operation for not less than 2500 hours, exclusive of the manufacturers' factory or laboratory tests, is furnished.
 2. Material and Equipment Manufacturing Date
 - a. Products manufactured more than 3 years prior to date of delivery to site shall not be used, unless specified otherwise.
- E. Test Equipment
1. Requirements:
 - a. Maintain and operate test equipment at the fabrication shop and the job site for both routine and Acceptance Testing of the Work of this Section.
 - b. Maintain test equipment at the job site while work is in progress from installation of equipment racks until Owner Acceptance of this Work; thereafter remove all of this test equipment from the job site.
 - c. Unless otherwise indicated, test equipment shall remain property of the Contractor.
 - d. Provide all required test cables, jigs and adapters.
 - e. Provide equipment with traceable calibration, with calibration date not greater than one year prior to the date of the use of the equipment to perform the specified testing.
- F. Qualifications
1. Audiovisual Qualifications
 - a. Audiovisual Systems work shall be performed by and the equipment shall be provided by the Audiovisual Systems contractor and key personnel. Qualifications shall be provided for:
 - 1) the Audiovisual Systems contractor,
 - 2) the Audiovisual Systems installer,
 - 3) and the supervisor (if different from the installer).
 - b. A minimum of 30 days prior to installation, submit documentation of the experience of the Audiovisual Systems and of the key personnel.
 2. Audiovisual Systems Installer
 - a. The installer of the Audiovisual systems shall be a firm regularly and professionally engaged in the business of installation, configuration and testing of the specified Audiovisual systems and equipment.
 - 1) Where the manufacturers of the specified and contractor proposed systems provide mandatory installer and programming training programs, the Contractor's programming and installation staff shall provide documentation to demonstrate their successful completion of the relevant training programs for the types and versions of equipment proposed for installation on this Project.

- 2) Where the manufacturer of the specified and contractor proposed systems and equipment lawfully restricts sales of their equipment to a network of dealers, the contractor shall provide documentation to their standing as such a dealer in good standing at the time of bid submittal.
 - 3) The Audiovisual systems contractor shall demonstrate experience in providing successful Audiovisual systems of a similar scope and nature of those required by the work of this Project within the past 3 years.
 - 4) Submit documentation for a minimum of three and a maximum of five successful Audiovisual system installations for the Audiovisual systems contractor.
- b. Key Personnel
- 1) Provide key personnel who are regularly and professionally engaged in the business of the installing, programming, configuring and testing of the specified Audiovisual systems and related presentations and equipment.
 - (1) There may be one key person or more key persons proposed for this project depending upon how many of the key roles each has successfully provided.
 - (2) Each of the key personnel shall demonstrate experience in providing successful Audiovisual systems of a similar nature scope and extent to those required by the work of this Project within the past 3 years.

1.6 REGULATORY REQUIREMENTS

- A. Regulations Applicable: Including but not limited to those defined in Section 014200 – Definitions, References, and Regulations:
1. Nothing in the Contract Documents shall be construed to permit Work not conforming to applicable laws, ordinances, rules, or regulations.
 2. Safety Agency Listing: All devices provided under the Work of this Section which are connected to the Project electrical system shall be listed by a Nationally Recognized Testing Laboratory, and shall be so labeled.
 3. In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word, "shall" had been substituted for "should" wherever it appears. Interpret references in these publications to the "authority having jurisdiction," or words of similar meaning, to mean the Owner's Representative. Equipment, materials, installation, and workmanship shall be in accordance with the mandatory and advisory provisions of NFPA 70 unless more stringent requirements are specified or indicated.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Procedures:
1. As specified in the individual sections of Division 27 and the following.
 - a. Provide protection from weather, moisture, extreme heat and cold, dirt, dust, and other contaminants for cabling and equipment placed in storage.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Connecting hardware shall be rated for operation under ambient conditions of 32 to 140 degrees F and in the range of 0 to 95 percent relative humidity, non-condensing.

1.9 SEQUENCING

- A. Not Used

1.10 OPERATING AND MAINTENANCE DATA

- A. Commercial off the shelf manuals shall be furnished for operation, installation, configuration, and maintenance of products provided as a part of the low voltage systems, equipment and infrastructure work of this Project. Precede the manuals with a systems narrative specific to this Project, outlining the major systems functionality, the major systems components, and identifying which manuals document the performance of which subsystems.
 - 1. Submit operations and maintenance data in accordance with Section 017800 – Project Record Documents and as specified herein not later than 2 months prior to the date of beneficial occupancy.

1.11 PROJECT RECORD DOCUMENTS

- A. Comply with Section 017800 – Project Record Documents, and the following. Include at least as much information as required for the submittal drawings.
 - 1. Record Drawings
 - a. CAD.
 - 1) Use a computer aided drafting (CAD) system in the preparation of record drawings for this Project. CAD system shall produce files in AutoCAD® .DWG format, version 2000 or later.
 - b. Except where prohibited by Contract, Owner’s Representative will furnish CAD backgrounds in AutoCAD® .DWG format, for use by the Contractor in preparing Record Drawings.
 - c. Contractor shall be responsible for updating building and Audiovisual plans to reflect as-built conditions.
 - 1) Indicate actual work on Drawings; indicate actual products used, replace vendor neutral nomenclature used in bid set with makes and models of actual installed devices.
 - d. Disk copy of Record Drawings: Provide 2 separate copies of each drawing file in the format noted above. Submit on CD-R disk.
 - e. Reproduceables: Provide 1 set of Mylars.
 - 2. Software
 - a. Controls and DSP Systems
 - 1) Provide licensing for project specific software programming at programmable devices.
 - 2) Provide licensing and original software copies for each device provided that uses software for operation, configuration or control.
 - 3) Provide licensing for required workstation operating systems, and required third party software.
 - 4) For controls systems, provide a complete copy of the source code, including the device interface driver code modules.
 - 5) Upgrade each software package to the release in effect at the end of the Warranty Period.
 - b. Provide at least a copy of software with at least 1 user license if required to view submitted test data.
 - 3. Spare Parts
 - a. In addition to the requirements of Division 01 – Record Documents, provide a complete list of parts and supplies, with current unit prices and source of supply, and a list of spare parts recommended for stocking.

1.12 WARRANTY SERVICE

- A. In addition to provisions of Section 017800 – Guaranties, Warranties, Bonds and Maintenance Contracts, provide the following.
 - 1. Response Time: Provide a qualified technician familiar with the work at the Project Site within 24 hours after receipt of a notice of malfunction. Provide the Owner’s Representative with telephone number attended 8 hours a day, 5 days a week, to be called in the event of a malfunction.
- B. Provide all additional Warranties as defined in each Communication Systems Section.

1.13 ACCEPTANCE REVIEW AND TESTING PROCEDURES

- A. Complete all Work of this Section. Submit Test Report. Submit review copies of Operating and Maintenance Manuals, less reduced set of Record Drawings. Notify the Owner’s Representative in writing that the Work of these Sections is complete and fully complies with the Contract Documents. Request Acceptance Review and Testing. The Owner’s Representative will conduct Verification of Submitted Test Data, and otherwise direct testing and adjustment of this Work. These procedures may be performed at any hour of the day or night as required by the Owner’s Representative to comply with the Project Schedule and avoid conflict with Residents. Provide all specified personnel and equipment at any time without claim for additional cost or time.
- B. Personnel: Provide services of the designated supervisor and additional technicians familiar with work of this Section. Provide quantity of technicians as required to comply with Project Schedule.
- C. In Addition, Provide:
 - 1. All tools appropriate for performance of adjustment of and corrections to this Work. Include spare wire and connectors and specified tooling for application.
 - 2. Ladders, scaffolding and/or lifts as required to access high devices.
 - 3. All test equipment.
 - 4. Complete set of latest stamped, actioned submittals of record for reference.
 - 5. Complete set of Test Reports.
 - 6. Complete set of manufacturer's original operation, instruction and service manuals for each equipment item for reference.
 - 7. Demonstrate: Complete operation of all systems and equipment, including Portable Equipment.
 - 8. Adjust: As directed by the Owner’s Representative.
 - 9. Correct: In timely manner, failure to comply with the Contract Documents, as reasonably determined by the Owner’s Representative.
- D. Temporary Equipment: Provide and operate, without claim for additional cost or time, temporary equipment and/or systems to provide reasonably equivalent function, as determined by the Owner’s Representative, in place of the Work of this Section which is incomplete or found not in conformance with the Contract Documents as of seven (7) days prior to the scheduled completion date. Provide such temporary equipment until Acceptance of the Work of this Section. Thereafter, remove such temporary equipment.

1.14 CLOSEOUT

- A. **Punch List:** Perform any and all remedial work, at no claim for additional cost or time. Where required, retest and submit Test Report. Notify the Owner's Representative of completion of Punch List.
- B. **Portable Equipment:** Furnish all portable equipment and spares to the Owner's Representative, along with complete documentation of the materials presented. Where applicable, furnish portable equipment in the original manufacturer's packing.
- C. **Operating and Maintenance Data:** Install framed operating and maintenance instructions. Submit Manuals.
- D. **Project Record Documents:** Submit print and digital copies. Digital files shall be in CAD system shall produce files in AutoCAD® .DWG format, latest version at time of bid. (Owner Standard, no substitution permitted) as defined above.
- E. **Keys:** If applicable, replace construction locks with permanent locks. Provide 5 sets of keys to the Owner's Representative.
- F. **Instruction:** Conduct specified instruction.
- G. **Warranty:** Submit Warranty dated to run from date of Acceptance of the Work of this Section.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Where a particular material, device, piece of equipment or system is specified directly, the current manufacturer's specification for the same shall be considered to be a part of these specifications, as if completely contained herein in every detail.
- B. Each material, device or piece of equipment shall comply with all of the manufacturer's current published specifications for that item.
- C. Products shall be made by manufacturers regularly engaged in the production of such products.
- D. Provide quantity as shown on Contract Drawings, or as otherwise indicated.
- E. Provide all auxiliary and incidental materials and equipment necessary for the operation and protection of the Work of this Section as if specified in full herein.
- F. Unless recycled content is specified, provide new materials.
- G. Provide the manufacturer's latest design/model, permanently labeled with the manufacturer's name, model number and serial number.
- H. Where products are of similar type or use, provide products of the same manufacturer, unless otherwise indicated.
- I. **Components**

1. UL or third party certified. Cabling and interconnecting hardware and components for Audiovisual systems shall be UL listed or third party independent testing laboratory certified, and shall comply with NFPA 70 and conform to the requirements specified herein.
 2. Where equipment or materials are specified to conform to industry and technical society reference standards of the organizations, submit proof of such compliance.
 - a. The label or listing by the specified organization will be acceptable evidence of compliance.
 - b. In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing, and approved by the Owner's Representative.
 - c. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard.
- J. Enclosures:
1. Provide steel frames and enclosures designed and wired to eliminate all induced currents.
 2. Make bolted connections with self-locking devices.
- K. Finishes: Any item or component of the Work of this Section which is visible shall comply with the following.
1. Finishes noted or scheduled on the Contract Drawings take precedence.
 2. Where design location requires that products, materials or equipment are visible to the public, no manufacturer's logos larger than 1/2 inch shall be visible. Unless otherwise noted or directed, neatly remove or permanently paint out such logos.
 3. Where finishes are not noted or otherwise defined in the Contract Documents, submit manufacturer's standard finish samples for selection by the Owner's Representative.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine existing conditions before starting work. Submit conflicts in a timely manner for resolution

3.2 WIRING CLASSIFICATION AND RELATED

- A. Audio Signal Wiring Classification:
1. Type A-1: Microphone level wiring less than -30 dBu, 20 Hz to 20 kHz.
 2. Type A-2: Line level wiring -30 dBu to +24 dBu, 20 Hz to 20 kHz.
 3. Type A-3: Loudspeaker level or circuit wiring greater than +24 dBu, from 20 Hz to 20 kHz.
- B. Video and Related Signal Wiring Classification:
1. Type V-1: Baseband and composite video wiring 1 volt peak-to-peak into 75 ohms, 0 to 10.0 MHz.
 2. Type V-2: Synchronization and switching pulse wiring 4 volts peak-to-peak into 75 ohms, 15.62 to 15.75 kHz.
 3. Type V-3: Color subcarrier wiring 0 to 4 volts peak-to-peak into 75 ohms, 3.57 to 4.43 MHz.

4. Type V-4: KMVT system wiring 0.1 to 1000 microVolts peak-to-peak into 50 or 75 ohms, 47 to 890 MHz.
- C. Control Signal Wiring Classifications:
1. Type C-1: DC control wiring 0 to 50 volts.
 2. Type C-2: Synchronous control or data wiring 0 to 40 volts, peak-to-peak.
 3. Type C-3: AC control wiring 0 to 48 volts, 60 Hz.
- D. Additional Wiring Classifications:
1. Type M-1: DC power wiring 0 to 48 volts.
 2. Type M-2: AC power wiring greater than 50 volts, 60 Hz.
 3. Wiring Combinations:
- E. Except as indicated herein, conduit, wireways and cable bundles shall contain only wiring of a single classification. The following combinations are acceptable in conduit, or cable harnesses. Additional acceptable combinations may be indicated on the Drawings.
1. Types A-1, C-1, and M-1.
 2. Types A-2, C-1, C-2, and M-1, runs less than 20 feet.
 3. Types A-2, C-1, and M-1.
 4. Types A-3, C-1, C-2, and M-1.
 5. Types A-2, V-1, and V-3.
 6. Types V-1, V-2, V-3, and C-1.
 7. Types M-2 and C-3.

3.3 PREPARATION

- A. Protection: Cover all computers, electronic equipment, desks, chairs, furniture and other articles when working at ceiling level and/or performing dust producing tasks.

3.4 REPAIR AND RESTORATION

- A. Where working in spaces occupied by the Owner, return to their original positions any furniture or articles relocated to perform the work.

3.5 CLEANING

- A. Where working in spaces occupied by the Owner:
1. Immediately after completing work within each space, clean up and remove all materials, scrap and dust.
 2. All scrap material in work area shall be picked up and removed from the building at the end of each day. See also Section 017800 - Project Record Documents for additional requirements.
 3. All dust resulting from work performed shall be vacuumed up daily.
 4. All scrap material shall be removed and disposed of in an authorized disposal site. Refer to Section 017410 - LEED Waste Management.

END OF SECTION

CITY OF PITTSBURG, CA
CITY COUNCIL CHAMBERS

AUDIOVISUAL UPGRADES
Smith, Fause, & McDonald, Inc.

SECTION 27 41 01 - GROUNDING AND BONDING FOR AUDIOVISUAL SYSTEMS

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Section includes grounding and bonding of Audiovisual Work, including but not limited to:
 - 1. Audiovisual Raceways
 - 2. Cable Runway
 - 3. Cable Shields
 - 4. Protector Fields
 - 5. Audiovisual Cabinets and enclosures.

- B. Related Work Under Other Sections
 - 1. Section 27 41 00 – Common Work Results for Audiovisual Systems
 - 2. Section 27 41 02 – Hangers and Supports for Audiovisual Systems
 - 3. Section 27 41 03 – Conduits and Backboxes for Audiovisual Systems
 - 4. Section 27 41 08 – Audiovisual Cabinets, Racks, Frames and Enclosures
 - 5. Section 27 41 09 – Audiovisual Cable Management
 - 6. Section 27 41 16 – Integrated Audio-Video Systems and Equipment

1.2 SYSTEM DESCRIPTION

- A. Provide Audiovisual system grounding conductor as described herein and indicate on drawings.

- B. Except as otherwise indicated, the complete Audiovisual installation including the metallic conduits and raceways, cable trays, boxes, cabinets and equipment shall be completely and effectively grounded in accordance with all code requirements, whether or not such connections are specifically shown or specified.

- C. Resistance:
 - 1. Resistance from the farthest ground bus through the ground electrode to earth shall not exceed 5 Ohms or the requirements of ANSI-J-STD-607-A-2002, whichever is more restrictive.

1.3 REFERENCES

- A. American National Standards Institute (ANSI)
 - 1. ANSI/TIA/EIA-606-A-2002 Administration Standard for Commercial Telecommunications Infrastructure
 - 2. ANSI-J-STD-607-A-2002 Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications
 - 3. Underwriters Laboratories (UL)
 - 4. UL 467 (1993); R 2004 Grounding and Bonding Equipment

1.4 SUBMITTALS

- A. Conform with the requirements of Division 1 and Section 27 41 00 - Common Work Results for Audiovisual Systems.

PART 2 - PRODUCTS

- A. Equipment Rack, Wall-Mount, 4RU
- B. Drawing Reference: WR4
- C. Features:
 - 1. Dimensions: 7.5"H, 19.75"W, 21.63"D.
 - 2. Weight capacity: 75 lbs.
 - 3. Rack Spaces: 4U Shipping Weight 21 lbs.
- D. Manufacturer:
 - 1. Middle Atlantic SPM-4
 - 2. Great Lakes WR4
 - 3. Or equal.
- E. Zone 4 Slide Out Rack, Steel Enclosure
 - 1. Drawing Reference: R35
 - 2. Features:
- F. Rack cabinet, 1 bay, steel frame mounted, with slide out inner frame for rear access of equipment from front of rack, floor supported.
- G. Zone 4 rated for up to 500 pounds of uniformly distributed load.
- H. 41 useable rack units.
- I. Fan System, 100 cfm minimum mounted into slide out inner frame.
- J. Locking, vented front doors.
- K. No rear doors.
- L. 26" deep inner frame, 32" deep outer frame.
- M. Open top outer frame.
 - 1. Manufacturer:
- N. Middle Atlantic Products AXS Slide Out System in MRK Steel Host Enclosure, configured with:
- O. MRK-4431AXS-26
- P. MRK Z4 mounting brackets
- Q. AXS-WT50 Cable Management Tray
- R. TRACK50 Service Track
- S. TRACKL Service Stand for Steel Cabinets
- T. 1 each MW-4FT fan top (openings only) in outer frame

- U. 2 each AXS-FAN with GUARD, 2 fans installed in the top of inner frame.
- V. 1 each FC-4-1C Thermostatic Fan Control
- W. At raised floor conditions, provide with SRB series base to match floor construction.
- X. Or equal (no known equal).

2.2 MANUFACTURERS

- A. Equal products by the following manufacturers will be considered providing that all features of the specified product are provided:
 - 1. Ground Rod:
 - a. High strength high carbon steel, with electrolytically bonded jacket of copper on surface
 - b. UL spec. 467
 - c. ANSI C-33.8-1072.
 - d. Manufacturer:
 - 1) Allied Bolt
 - 2) Inwesco 12A60
 - 3) Blackburn
 - 4) Cooper Power Systems
 - 5) Weaver.
 - 6) Erico "Cadweld" Products, Inc.
 - 7) ITT Blackburn.
 - 8) Or equal.
 - 2. Ground Wells:
 - a. Christy Concrete Products, Inc.
 - b. Forni Corp.
 - c. Or equal.
 - 3. Ground Bushings, Connectors, Jumpers and Bus:
 - a. O-Z/Gedney.
 - b. Thomas & Betts Corp.
 - c. Or equal.
 - 4. Compression Connector Lug
 - a. Panduit
 - b. B-Line SB-479 Series
 - c. Thomas & Betts
 - d. Or equal.
 - 5. Audiovisual Ground Bus Bar
 - a. CPI
 - b. B-Line
 - c. Panduit
 - d. or equal.
 - 6. Rack and Cabinet Grounding
 - a. Panduit Structured Ground Kit
 - b. Chatsworth Products Inc.
 - c. or equal.
 - 7. Bonding Ribbon:
 - a. Annealed solid copper 3/8 inch wide x 1/16 inch thick, tin plated.
 - b. Manufacturer:

- 1) Inwesco 12A55
 - 2) Corning Cable Systems
 - 3) Preformed Line Products.
 - 4) or equal.
8. Bonding Ribbon Clamp:
- a. Soft lead
 - b. 1/16 inch thick
 - c. Bolt hole for attachment
 - d. Manufacturer:
 - 1) Inwesco 12A56
 - 2) Corning Cable Systems
 - 3) Preformed Line Products.
 - 4) Or equal.
9. Fargo Clamp:
- a. Cast copper, silver plated, furnished with copper bolt.
 - b. RUS Listed
 - c. Manufacturer:
 - 1) Allied Bolt
 - 2) Inwesco 12A57
 - 3) Corning Cable Systems
 - 4) or equal.
10. Ground Inserts:
- a. Cast Bronze w 1/4 Copper Rod.
 - b. Provide minimum one each maintenance hole or vault.
 - c. Manufacturer:
 - 1) Inwesco 12H69
 - 2) or equal by vault or manhole manufacturer.
 - 3) or equal.

2.3 GROUND CONDUCTORS

- A. General purpose insulated: UL listed and code sized copper conductor, with dual rated THHN/THWN insulation, color identified green. Where continuous color-coded conductors are not commercially available, provide a minimum 4" long color band with green, non-aging, plastic tape in accordance with NEC.
- B. Bonding pigtails: Insulated copper conductor, identified green, sized per code, and provided with termination screw or lug. Provide solid conductors for #10 AWG or smaller and stranded conductors for #8 AWG or larger.

2.4 COMPRESSION CONNECTOR LUG

- A. Description
 1. Connector lug with compression connection to conductor.
 2. Copper alloy body.
 3. Provide lug size to match conductor being terminated.
 4. Provide 2-hole pattern lugs.
 5. Provide each lug with silicon bronze hardware, including 2 bolts, 2 split lock washers and 2 nuts.

2.5 INSULATED GROUNDING BUSHINGS

- A. Plated malleable iron or steel body with 150 degree Centigrade molded plastic insulating throat and lay-in grounding lug.

2.6 CONNECTIONS TO PIPE

- A. For cable to pipe: UL listed bolted connection complying with CEC requirements.

2.7 CONNECTIONS TO STRUCTURAL STEEL, GROUND RODS, OR SPLICES

- A. Where required by the Drawings or Specifications, grounding conductors shall be spliced together, connected to ground rods or connected to structural steel using exothermic welds or high pressure compression type connectors.
 - 1. Exothermic welds shall be used for cable-to-cable and cable-to-ground rod and for cable to structural steel surfaces. Exothermic weld kits shall be as manufactured by Cadweld, Thermoweld or equal. Each particular type of weld shall use a kit unique to that type of weld.
 - 2. High-pressure compression type connectors shall be used for cable-to-cable and cable-to-ground rod connections. Connections shall be as manufactured by Thomas & Betts #53000 series, Burndy "Hy-Ground" or equal.

2.8 EXTRA FLEXIBLE, FLAT BONDING JUMPERS

- A. Where required by the drawing or specified herein.

PART 3 - EXECUTION

3.1 GENERAL

- A. Provide Grounding and Bonding according to the most restrictive requirements of:
 - 1. ANSI-J-STD-607-A.
 - 2. California Electrical Code Article 250 and references therein.
 - 3. California Electrical Code Article 800.
- B. In the event of conflicting requirements, National Electrical Code requirements shall prevail.
- C. Point of Connection
 - 1. Under Work of this Section, make connections to Audiovisual Ground Busbars. Coordinate with District Electrical Representative and conform to District requirements for electrical Grounding and Bonding
 - 2. Mechanical Connections
- D. Make connections bare metal to bare metal.
 - 1. Where required, remove paint to bare metal, make grounding or bonding connection, and touch up paint.
 - 2. Torque threaded fasteners to manufacturer's recommended values.
- E. Compression Connections
 - 1. Make compression connections with the lug or fitting manufacturer's recommended tooling, with the tooling set to the recommended force and stroke.

- F. Audiovisual Raceways and Sleeves
 - 1. Bond metallic raceway and sleeves to the Audiovisual Ground Busbar at the Audiovisual Room that serves the related Audiovisual Receptacle.
 - 2. Where a metallic raceway connects two or more Audiovisual Rooms, bond to the Audiovisual Ground Busbar at each.
- G. Cable Shields
 - 1. Comply with California Electrical Code Article 800.
- H. Protector Fields
 - 1. Comply with California Electrical Code Article 800.
- I. Audiovisual Cabinets and enclosures
 - 1. Bond to the Audiovisual Ground Busbar at the Audiovisual Room.

3.2 LABELING

- A. Provide labeling according to the requirements of:
 - 1. ANSI/TIA/EIA-606-A.
 - 2. Section 27 41 07 - Identification for Audiovisual Systems.

END OF SECTION

SECTION 27 41 02 - HANGERS AND SUPPORTS FOR AUDIOVISUAL SYSTEMS

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. The work covered under this section consists of the furnishing of all necessary labor, supervision, materials, equipment, and services to completely execute the provision of Audiovisual supports and cable hook system as described in this specification, including but not limited to:
 - 1. Strut supports
 - 2. Cable Hooks (J-hooks)
 - 3. Beam clamps
 - 4. Concrete Fasteners
 - 5. Touch-Up Materials
 - 6. Conduit supports.
 - 7. Equipment supports.
 - 8. Fastening hardware.

- B. Related work: Consult all other Sections, determine the extent and character of related work and properly coordinate work specified herein with that specified elsewhere to produce a complete installation.
 - 1. Section 27 41 00 – Common Work Results for Audiovisual Systems
 - 2. Section 27 41 01 – Grounding and Bonding for Audiovisual Systems
 - 3. Section 27 41 03 – Conduits and Backboxes for Audiovisual Systems
 - 4. Section 27 41 06 – Noise and Vibration Controls for Audiovisual Systems
 - 5. Section 27 41 07 – Identification for Audiovisual Systems
 - 6. Section 27 41 08 – Audiovisual Cabinets, Racks, Frames and Enclosures
 - 7. Section 27 41 09 – Audiovisual Cable Management
 - 8. Section 27 41 16 – Integrated Audio-Video Systems and Equipment

1.2 SYSTEM DESCRIPTION

- A. Provide devices specified in this Section and related Sections for support of Audiovisual equipment specified for this Project.

- B. Provide support systems that are adequate for the weight of equipment, conduit and wiring to be supported.

1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM A123/A123M-02 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
 - 2. ASTM A153/A153M-04 Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
 - 3. ASTM B633-98e1 Specification for Electro-deposited Coatings of Zinc on Iron and Steel.
 - 4. ASTM A653/A653M-04a Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

- B. American National Standards Institute (ANSI)
 - 1. ANSI/TIA/EIA-568-B.1-2001, Commercial Building Telecommunications Cabling Standard – Part1: General Requirements
 - 2. ANSI/TIA/EIA-568-B.2-2001, Commercial Building Telecommunications Cabling Standard – Part2: Balanced Twisted Pair Cabling Components
 - 3. ANSI/TIA/EIA-568-B.3-2000, Optical Fiber Cabling Components Standard
 - 4. ANSI/ TIA/ EIA 569-B Commercial Building Standard for Telecommunications Pathways and Spaces
- C. National Fire Protection Association
 - 1. NFPA 70, National Electrical Code

1.4 SUBMITTALS

- A. Conform with Division 1 and Section 27 41 00 - Common Work Results for Audiovisual Systems and the following:
 - 1. As part of the project submittals, the contractor to provide engineered shop drawings indicating the proposed design for mounting all work of this Division weighing more than 20 pounds, inclusive of mounting systems, and for equipment mounted at the exterior, inclusive of its effective wind load under conditions the range of conditions experience
 - a. Shop drawings to be accompanied by anchorage calculations indicating that it shall remain attached to the mounting surface after experiencing forces in conformance with CCR, Title 24, Table 23P, Part II and with Section 2312 "Earthquake Regulations" of the "Uniform Building Code" for Seismic Zone 4 Area, Importance Factor of 1.25.
 - b. Structural Calculations shall be prepared and signed by a California Registered Structural Engineer. Specify proof loads for drilled-in anchors, if used.

1.5 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new and unused, and of current manufacturer.
- B. Cable hooks shall be listed and labeled by Underwriters Laboratories (UL) as required.
- C. Cable hooks shall have the manufacturers name and part number stamped in the part itself for identification.
- D.

PART 2 - PRODUCTS

2.1 SUPPORTING DEVICES

- A. General
 - 1. Supports to be sized to suit load and selected to match mounting conditions
- B. Manufacturers
 - 1. Equal products by the following manufacturers will be considered providing that all features of the specified product are provided:
 - a. Concrete fasteners:

- 1) Phillips "Red-Head".
 - 2) Remington.
 - 3) Ramset.
 - 4) Hilti
 - 5) Simpson Strong-Tie
 - 6) or equal.
 - b. Concrete inserts and construction channel:
 - 1) Unistrut Corp.
 - 2) GS Metals "Globe Strut."
 - 3) Thomas & Betts "Kindorf" Corp.
 - 4) Or equal.
 - c. Conduit straps:
 - 1) O-Z/Gedney.
 - 2) Erico "Caddy" Fastening Products.
 - 3) Thomas & Betts "Kindorf" Corp.
 - 4) Or equal.
 - d. Beam Clamps
 - 1) Cooper B-Line
 - 2) SuperStrut
 - 3) Unistrut
 - 4) or equal
 - e. Aircraft Cable Sway Braces
 - 1) Mason Industries
 - 2) M.W. Sausse/Vibrex
 - 3) Loos & Company, Inc.
 - 4) or equal.
- C. Concrete Fasteners
1. Provide expansion-shield type concrete anchors.
 2. Provide powder driven concrete fasteners with washers. Obtain approval by Owner's Representative prior to use.
- D. Concrete Inserts
1. Provide pressed galvanized steel, concrete spot insert, with oval slot capable of accepting square or rectangular support nuts of 1/4 inch to 1/2 inch diameter thread for rod support.
- E. Aircraft cable sway braces
1. Steel rope sized to meet load.
- F. Construction Channel:
1. Construction:
 - a. 1-5/8" square galvanized channel formed from U.S.S.G No. 12 or 0.109 inch cold formed steel with 17/32-inch diameter bolt holes, and 1-1/2 inch on center in the base of the channel.
 - b. 10 foot sections.
 2. All supporting materials by same manufacturer.
- G. Beam Clamps
1. Malleable iron electro-galvanized steel beam clamps selected to match building structural steel members.

- H. Conduit Straps
 - 1. One hole strap, steel or malleable iron, with malleable iron clamp-back spacer for surface mounted wall and ceiling applications.
 - a. Use malleable strap with spacers for exterior and wet locations.
 - b. Use steel strap without spacers for interior locations.
 - 2. Steel channel conduit strap for support from construction channel.
 - 3. Steel conduit hanger for pendant support with threaded rod
 - 4. Steel wire conduit support strap for support from independent #12 gauge hanger wires.
- I. Threaded rods, couplings, screws and nuts:
 - 1. Electrolytically coated with zinc, 2 oz. zinc per square foot of surface, ASTM A123 or A153.
- J. Miscellaneous Parts
 - 1. Hot dipped galvanized after fabrication; after cutting, de-burring and hole drilling. Coated with zinc, 2 oz. zinc per square foot of surface, ASTM A123 or A153.
- K. Paint/Tape for Touch-up:
 - 1. Zinc: CRC "Zinc-It", Glyptal, Enterprise Galvanizing "Galambra", or equal.

2.2 CABLE HANGERS

- A. Ceiling Hung J-Hooks
 - 1. Drawing Reference(s):
 - a. WMJ
 - b. ACJ
 - 2. Features/Functions/Construction
 - a. Specifically intended to carry the load of up to 50 Audiovisual cables without applying excess forces to cables at bottom of bundle.
 - b. Integral broad bottom edge to spread cable load with flat bottom and provide a minimum of 1-5/8 inch cable bearing surface.
 - c. Integral hanger rod attachment hardware at top.
 - d. Load rated for application.
 - e. Incorporates smooth 90-degree radiused edges to prevent snagging cable jackets on installation.
 - f. Designed so the mounting hardware is recessed to prevent cable damage.
 - g. Integral mechanical cable latch retainer to provide containment of cables within the hook. The retainer shall be removable and reusable.
 - h. Suitable for direct attachment to walls, hanger rods, beam flanges, purlins, strut, floor posts, etc. to meet job conditions.
 - i. Multi-tiered cable hooks to be used where required to provide separate cabling compartments, or where additional capacity is needed.
 - j. Finishes:
 - 1) Cable hooks for non-corrosive areas shall be pre-galvanized steel, ASTM A653. Where additional strength is required, cable hooks shall be spring steel with a zinc-plated finish, ASTM B633, SC3.
 - 2) Cable hooks for corrosive areas shall be stainless steel, AISI Type 304.
 - 3. Manufacturer
 - a. Cooper B-Line series BCH21, BCH32, BCH64
 - b. Caddy/Erico CableCat
 - c. or equal.

PART 3 - EXECUTION

3.1 GENERAL

- A. The Owner's Representative reserves the right to request additional supports where in their sole opinion said supports are required. Any additional supports shall be installed at no additional cost to the Owner.

3.2 EXAMINATION

- A. Thoroughly examine site conditions for acceptance of supporting device installation to verify conformance with manufacturer and specification tolerances. Do not commence with installation until all conditions are made satisfactory.

3.3 PREPARATION

- A. Coordinate size, shape and location of concrete pads required for equipment installation with Base Building General Contractor.
- B. Layout support devices to maintain headroom, neat mechanical appearance and to support the equipment loads.
- C. Where shown on the Drawings or Specifications, install freestanding Audiovisual equipment on concrete pads.

3.4 INSTALLATION

- A. Furnish and install supporting devices as noted throughout the Audiovisual Systems work.
- B. Audiovisual device and conduit supports shall be independent of all other system supports that are not structural elements of the building, unless otherwise noted.
- C. Fasten hanger rods, conduit clamps, outlet and junction boxes to building structure using precast inserts, expansion anchors, preset inserts or beam clamps.
- D. Use toggle bolts or hollow wall fasteners in hollow masonry, plaster or gypsum board partitions and walls.
- E. Use expansion anchors or preset inserts in solid masonry walls.
- F. Use self-drilling anchors, expansion anchor, or preset inserts on concrete surfaces.
- G. Use sheet metal screws in sheet metal studs and wood screws in wood construction.
- H. Do not fasten supports to piping, ductwork, mechanical equipment, conduit, or acoustical ceiling suspension wires.
- I. Do not drill structural steel members unless first approved in writing by the Owner's Representative.
- J. Fabricate supports from structural steel or steel channel, rigidly welded or bolted to present a neat appearance. Use hexagon head bolts with spring lock washers under all nuts.

- K. Install surface-mounted cabinets with minimum of four anchors. Provide additional support backing in stud walls prior to sheet rocking as required to adequately support cabinets and panels.
- L. Bridge studs top and bottom with channels to support flush mounted cabinets and panelboards in stud walls.

3.5 ERECTION OF METAL SUPPORTS

- A. Cut, fit, and place miscellaneous metal fabrications accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- B. Field Welding: Comply with AWS "Structural Welding Code."

3.6 WOOD SUPPORTS

- A. Cut, fit, and place wood grounds, nailers, blocking, and anchorage accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

3.7 DISTRIBUTION PATHWAY VIA CEILING HUNG CABLE HOOKS (J-HOOKS):

- A. Void, Plenum or Suspended Ceiling Exposed Cable Installation. Where drawings specifically show or permit use of exposed cable installation in voids, conform to the most restrictive requirements of Code, TIA-569-B and this Section.
- B. Provide support for all cabling. Do not place or attach directly to T-bar grid, concealed spline grid, flexible or rigid ductwork, HVAC registers, sprinkler piping or fixtures, light fixtures or building structure. Conform to the California Electric Code.
- C. Placement:
 - 1. All pathways created by ceiling hung cable hooks shall be reviewed by the Owner's Representative prior to installation.
 - 2. Ceiling hung cable hooks and cabling supported by same shall not obscure access to access doors, hatches, air dampers, valves, filter sections, VAV boxes, cable trays, junction boxes, pull boxes or similar areas of access required by other trades.
 - 3. All ceiling hung cable hooks shall be mounted close enough together such that upon completion of the station cable installation a minimum amount of cable droop occurs between adjacent rings. The distance between supporting rings shall not exceed 48 inches or as required by the current edition of TIA-569-B.
- D. Follow manufacturer's recommendations for allowable fill capacity for each size of cable hook.
 - 1. Cable hooks shall be capable of supporting a minimum of 30 pounds with a safety factor of 3.
 - 2. Spring steel cable hooks shall be capable of supporting a minimum of 100 pounds with a safety factor of 3 where extra strength is required.

END OF SECTION

SECTION 27 41 03 - CONDUITS AND BACKBOXES FOR AUDIOVISUAL SYSTEMS

PART 1 - GENERAL

1.1 SCOPE OF WORK:

- A. Provide Audiovisual pathways in accordance with EIA TIA/EIA-569-B, as specified in this Section and as shown on the plans. Provide system furniture pathways in accordance with UL 1286. Provision of all low voltage Audiovisual Systems Pathway, including:
1. Rigid steel conduit and fittings.
 2. PVC insulated rigid steel conduit and fittings.
 3. Intermediate metal conduit and fittings.
 4. Electrical metallic tubing and fittings.
 5. Flexible metallic conduit and fittings.
 6. Liquidtight flexible metallic conduit and fittings.
 7. Miscellaneous conduit fittings and products.
 8. Junction Boxes
 9. Floor Boxes
 10. Hinged cover enclosures.
 11. Pullboxes and Terminal Cabinets.
- B. At Hazardous Occupancies, installation conforms to the requirements of California Electric Code for Class and Division rating of spaces.

1.2 RELATED WORK IN OTHER SECTIONS:

- A. Patching and Painting – Patching, painting, and repair of existing finishes shall be coordinated by the Contractor with District Representatives.
- B. Related work: Consult all other Sections, determine the extent and character of related work and properly coordinate work specified herein with that specified elsewhere to produce a complete installation.
1. Section 27 41 00 – Common Work Results for Audiovisual Systems.
 2. Section 27 41 01 – Grounding and Bonding for Audiovisual Systems
 3. Section 27 41 02 – Hangers and Supports for Audiovisual Systems
 4. Section 27 41 03 – Conduits and Backboxes for Audiovisual Systems
 5. Section 27 41 06 – Noise and Vibration Controls for Audiovisual Systems
 6. Section 27 41 16 – Integrated Audio-Video Systems and Equipment

1.3 REFERENCES

- A. Usage: In accordance with Section 14200—Definitions, References, and Regulations.
1. American National Standards Institute (ANSI)
 - a. ANSI C80.1 1994 Rigid Steel Conduit - Zinc Coated
 - b. ANSI C80.3 1991 Electrical Metallic Tubing - Zinc Coated
 2. National Electrical Manufacturers Association (NEMA)
 - a. NEMA 250-2003 Enclosures for Electrical Equipment (1000 Volts Maximum)
 - b. NEMA FB 1 (ANSI/NEMA FB 1-2003) Fittings, Cast Metal Boxes and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable

- c. FB 2.10 2000 Selection and Installation Guidelines For Fittings For Use With Non-Flexible Metallic Conduit Or Tubing (Rigid Metal Conduit, Intermediate Metal Conduit, And Electrical Metallic Tubing).
 - d. FB 2.20 2000 Selection and Installation Guidelines for Fittings for use with Flexible Electrical Conduit and Cable
 - e. NEMA ICS 6 1988 (Rev. 1) Enclosures for Industrial Control and Systems
 - f. NEMA OS 3-2002 Selection and Installation Guidelines for Electrical Outlet Boxes.
 - g. NEMA RN 1-1998 Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
 - h. NEMA TC 7 2000 Smooth Wall Coilable Polyethylene Electrical Plastic Duct
 - i. NEMA TC 13 2000 Electrical Nonmetallic Tubing (ENT).
 - j. NEMA TC 14 1984(R 1986) Filament-Wound Reinforced Thermosetting Resin Conduit and Fittings
3. Underwriters Laboratories, Inc. (UL)
- a. UL 1 2000 Flexible Metal Conduit
 - b. UL 6 2004 Electrical Rigid Metal Conduit - Steel
 - c. UL 50 (1995; R 1999, Bul. 2001) Enclosures for Electrical Equipment
 - d. UL 360 1986 (Bul. 1991) (R 1993) Liquid-Tight Flexible Steel Conduit
 - e. UL 514A 1991 (R 2004) Metallic Outlet Boxes
 - f. UL 514B 1989 (R 2004) Conduit, Tubing and Cable Fittings
 - g. UL 514C 1996 (R 2000) Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers.
 - h. UL 651 1989 (R 1989) (Bul. 1993) Schedule 40 and 80 Rigid PVC Conduit.
 - i. UL 797 1993 (R 2004) Electrical Metallic Tubing - Steel
 - j. UL 1242 1983 (R1993) (Bul. 1993) Intermediate Metal Conduit.
 - k. UL 1286(1999; R 2001, Bul. 2002) Office Furnishings
 - l. UL 1479 Fire Tests of Through Penetration Firestops
 - m. UL Fire Resistance Directories

1.4 SUBMITTALS

- A. Conform with the requirements of Division 1 and Section 27 41 00 - Common Work Results for Audiovisual Systems.

1.5 QUALITY ASSURANCE

- A. All materials, equipment and parts comprising the units specified herein shall be new and unused, and of current manufacturer.
- B. Only products and applications listed in this Section may be used on the project unless otherwise submitted and approved by the Owner's Representative.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide the following types of conduit systems listed by their commonly used generic name.

2.2 RACEWAY

- A. Manufacturers:
1. Raceway:
 - a. Allied Tube and Conduit Co.
 - b. Triangle PWC, Inc.
 - c. Western Tube and Conduit Corp.
 - d. Spring City Electrical Manufacturing Co.
 - e. Occidental Coating Co. (OCAL).
 - f. Alflex Corp.
 - g. American Flexible Metal Conduit Co.
 - h. Anaconda.
 - i. Or equal.
 2. Fittings:
 - a. Appleton Electric Co.
 - b. OZ/Gedney.
 - c. Thomas & Betts Corp.
 - d. Spring City Electrical Manufacturing Co.
 - e. Occidental Coating Co. (OCAL).
 - f. Carlon.
 - g. or equal.
- B. Rigid Steel Conduit.
1. Drawing and Spec Reference: RSC.
 2. Construction:
 - a. Conduit: Full weight, threaded, hot-dip galvanized steel, conforming to ANSI C80.1 and UL 6.
 - b. Standard threaded couplings, locknuts, bushings, and elbows: Only materials of steel or malleable iron are acceptable. Locknuts shall be bonding type with sharp edges for digging into the metal wall of an enclosure.
 - c. Three piece couplings: Electroplated, cast malleable iron.
 - d. Insulating bushings: Threaded polypropylene or thermosetting phenolic rated 150 degree C minimum.
 - e. Insulated grounding bushings: Threaded cast malleable iron body with insulated throat and steel "lay-in" ground lug with compression screw.
 - f. Insulated metallic bushings: Threaded cast malleable iron body with plastic insulated throat rated 150 degrees C.
 - g. All fittings and connectors shall be threaded.
- C. Coated Rigid Steel Conduit:
1. Drawing and Spec Reference: CRSC.
 2. Conduit: Full weight, threaded, hot-dip galvanized steel, conforming to ANSI C80.1 and NEMA RN-1 with nominal 40 mil thermoplastic vinyl coating, heat fused and bonded to the exterior of the conduit.
 3. Fittings:
 - a. Conduit couplings and connectors shall be as specified for galvanized rigid steel conduit and shall be factory PVC coated with an insulating jacket equivalent to that of the coated material.
 - b. Fittings over-sleeve to extend 1 conduit diameter or 1-1/2" beyond fitting, whichever is less.
 4. Performance:

- a. Tensile Strength: 3500 psi.
5. Approvals:
 - a. NEMA RN1 (Type 40 - 40 mils thick)
 - b. CalTrans Type 2
6. Manufacturers:
 - a. Plastibond by RobRoy Industries.
 - b. Occal-40 by Occidental Coating Company.
 - c. KorKap by Plastic Applicators.
 - d. Ocal-Blue
 - e. or equal.
- D. Intermediate Metal Conduit
 1. Drawing Reference: IMC
 2. Conduit: Hot dip galvanized steel meeting the requirements of CEC Article 345 and conforming to ANSI C80.6 and UL 1242.
 3. Fittings: Conduit couplings, connector and bushing shall be as specified for galvanized rigid steel conduit. Integral retractable type IMC couplings are also acceptable.
- E. Electrical Metallic Tubing.
 1. Drawing and Spec Reference: EMT.
 2. Conduit: Shall be formed of cold rolled strip steel, electrical resistance welded continuously along the longitudinal seam and hot dip galvanized after fabrication. Conduit shall conform to ANSI C80.3 specifications and shall meet UL classifications.
 3. Set screw type couplings: Electroplated, steel or cast malleable iron, UL listed concrete tight. Use set screw type couplings with four setscrews each of conduit sizes over 2 inches. Setscrews shall be of case hardened steel with hex head and cup point to firmly seat in wall of conduit for positive grounding.
 4. Set screw type connectors: Electroplated steel or cast malleable iron UL listed concrete tight with male hub and insulated plastic throat, 150 degree C temperature rated. Setscrew shall be same as for couplings.
 5. Raintight couplings: Electroplate steel or cast malleable iron; UL listed raintight and concrete tight, using gland and ring compression type construction.
 6. Raintight connectors: Electroplated steel or cast malleable iron, UL listed raintight and concrete tight, with insulated throat, using gland and ring compression type construction.
- F. Flexible Conduit:
 1. Drawing Reference: FLEX
 2. Construction:
 - a. Flexible steel, zinc coated on both inside and outside by hot-dipping process.
 - b. Interlocking spirally wound continuous steel strip.
 - c. 3/4" minimum size.
 3. Fittings: Connectors shall be of the single screw clamp variety with steel or cast malleable iron bodies and threaded male hubs with insulated throats. Exception: Pressure cast screw-in connectors shall be acceptable for fixture connection in suspended ceilings and cut-in outlet boxes within existing furred walls.
 4. Approvals:
 - a. UL 1
- G. Liquidtight Flexible Metallic Conduit
 1. Drawing Reference: Liquidtight
 2. Conduit: Shall be fabricated in continuous lengths from galvanized steel strips, interlocking

spirally wound, covered with extruded liquid-tight jacket of polyvinyl chloride (PVC) and conforming to UL 360. Provide conduit with a continuous copper-bonding conductor wound spirally between the convolutions.

3. Fittings: Connector body and gland nut shall be of cadmium plated steel or cast malleable iron, with tapered, male, threaded hub; insulated throat and neoprene "O" ring gasket recessed into the face of the stop nut. The clamping gland shall be of molded nylon with an integral brass push-in ferrule.

2.3 MISCELLANEOUS CONDUIT FITTINGS AND PRODUCTS

A. General

1. UL 514B.
2. Listed in UL Electrical Construction Materials List.

B. Conduit Fittings, Insulated Throat Grounding Bushings

1. Description
 - a. Threaded for Rigid Steel Conduit and Intermediate Metal Conduit.
 - b. UL Listed for use with copper conductors.
 - c. Thermoplastic insulated liner for 105 degrees Celsius.
 - d. Body of malleable iron, zinc plated; or die cast zinc.
2. Manufacturer
 - a. Thomas & Betts (Steel City) BG-801 Series
 - b. O-Z/Gedney
 - c. or equal.

C. Watertight conduit entrance seals: Steel or cast malleable iron bodies and pressure clamps with PVC sleeve, neoprene sealing grommets and PVC coated steel pressure rings. Fittings shall be supplied with neoprene sealing rings between the body and PVC sleeve.

D. Watertight cable sealing bushings: One piece, compression molded sealing ring with PVC coated steel pressure disks, stainless steel sealing screws and zinc plated cast malleable iron locking collar.

E. Expansion fittings: Multi-piece unit comprised of a hot dip galvanized malleable iron or steel body and outside pressure bussing designed to allow a maximum of 4" conduit movement (2" in either direction). Furnish with external braid tinned copper bonding jumper. Unit shall be UL listed for wet or dry locations.

F. Expansion/deflection couplings: Multi-piece unit comprised of a neoprene sleeve with internal flexible tinned copper braid attached to bronze end couplings with stainless steel bands. Coupling shall accommodate .75-inch deflection, expansion, or contraction in any direction, and allow 30-degree angular deflections. Flexible, corrosion-resistant, watertight, moisture and heat resistant molded rubber jacket and stainless steel jacket clamps. Unit shall comply with UL467 and UL514.

1. Manufacturer:
 - a. OZ/Gedney Type DX
 - b. Steel City Type EDF
 - c. or equal.

G. Fire rated penetration seals:

1. UL classified.
2. Conduit penetrations in fire rated separation shall be sealed with a UL classified assembly consisting of fill, void or cavity materials.

3. The fire rated sealant material shall be the product best suited for each type of penetration, and may be a caulk, putty, composite sheet or wrap/strip.
4. Penetrations of rated floors shall be sealed with an assembly having both F and T ratings at least equal to rating of the floor.
5. Penetrations of rated walls shall be sealed with an assembly having an F rating at least equal to the rating of the wall.

H. Standard products not herein specified:

1. Submit for review a listing of standard electrical conduit hardware and fittings not herein specified prior to use or installation, i.e. locknuts, bushings, etc.
2. Listing shall include manufacturers name, part numbers, and a written description of the item indicating type of material and construction.
3. Miscellaneous components shall be equal in quality, material, and construction to similar items herein specified.

I. Hazardous area fittings: UL listed for the application.

2.4 JUNCTION AND DEVICE BOXES

A. Junction and Device Boxes

1. Drawing References: As shown on Symbol Schedule
2. Construction:
 - a. Concealed/Flush Mounted:
 - b. One or two piece welded knockout boxes.
 - c. UL 514A, cadmium or zinc-coated 1.25 oz/sq. ft., if ferrous metal.
 - d. Pressed sheet steel, for indoor locations.
 - e. UL 514C approved if non-metallic.
 - f. At hollow masonry, tile walls and plaster walls, provide with device rings as required.
 - g. Surface mounted:
 - 1) Exterior - Conform to the Junction and/or PullBox construction scheduled on the Plans. Where construction not otherwise scheduled or noted on the plans, conform to the following:
 - (1) Cast iron or aluminum with threaded hubs and mounting lugs.
 - (2) Gasketed cover with spring lid.
 - 2) Concrete floor embedded:
 - (1) Cast iron concrete pour boxes with screwed brass cover, unless otherwise noted.
 - (2) Cadmium plated screw cover attachment at least 6" on center.
 - h. If size not otherwise noted, at least 4S (4" square) by 2-1/8" deep, or Code minimum size, whichever is larger.
 - 1) Wherever 4S is indicated, contractor may at their option substitute 4-11/16" square boxes while maintaining the minimum depth required by these specifications and the drawings.
 - 2) At recessed masonry wall installations, provide gangable masonry boxes.
 - i. Provide complete with approved type of connectors and required accessories, including attachment lugs or hangers. Provide raised device covers as required to accept scheduled device.
3. Approvals.
 - a. UL 514A
4. Manufacturers:
 - a. Interior:
 - 1) Steel City.

- 2) Bowers
- 3) or equal.
- b. Exterior, exposed with cover of same construction.
 - 1) Appleton
 - 2) Pyle-National
 - 3) or equal.
- c. Other conditions:
 - 1) Any meeting approvals and requirements.

B. Floor Box High Capacity, 4 Compartment

1. Spec Reference: FC6, FW6, FR6
2. Features
 - a. UL Listed
 - b. Box
 - 1) Size at least 13.5 inches by 12 inches by 6 inches deep.
 - 2) Four compartments, with voltage barriers, with standard electrical plate mounting brackets for at least:
 - (1) One 6 gang
 - (2) One 3 gang
 - (3) Two single gang
 - c. Knockouts concentric, combination 1 inch and 1.25 inch.
 - d. Select cover for to match floor finish
 - 1) At carpet floor surfaces provide with carpet flange and coordinate carpet cut and insertion.
 - 2) At smooth finish floor surfaces, including exposed concrete, provide smooth cover and omit carpet flange.
 - e. Cover size approximately 14 inches by 12.5 inches.
 - f. At least 11 gage steel.
 - g. Carpet flange of mitered brass or aluminum edging.
 - 1) Option of brass or aluminum to be selected by the City's Representative.
 - 2) Option of 0.25 inch or 0.5 inch flange height to be selected by the City's Representative.
 - h. Within cover, provide a lift-off, full-access door, open area approximately 6.5 inches by 8 inches.
 - i. Within the lift-off, full-access door, provide a hinged, fold-back cable exit port.
 - j. Open area of cable pass-through approximately 2 inches by 2 inches.
 - k. Flush in closed position.
3. Applications:

- a. FC6: Concrete floor systems. Provide "pour pan" protection or manufacturer's equivalent protection system at slab on grade conditions. At upper floor conditions, provide UL listed 3 hour rated assembly per UL 263.
 - b. FR6: Raised Floor Conditions.
 - c. FW6: Wooden Floor Conditions.
4. Approvals:
- a. UL 514A scrub water
 - b. UL 263 at applications above grade level.
5. Manufacturers
- a. FSR Inc.
 - 1) FC6: FL-600P-(cover flange code)-6. Supply larger boxes where scheduled and indicated plates and jacks require it.
 - (1) Provide manufacturer's "Pour Pan" FL-GRD2 or FL-GRD4 to protect from moisture at installations at grade level.
 - (2) At floor levels above grade, provide FL-605P-6-FRK system with required cover.
 - 2) FW6, FR6: FL-640P-(cover flange code)-6. Supply larger boxes where scheduled and indicated plates and jacks require it.
 - b. RCI Systems, Inc.
 - c. Wiremold
 - d. Hubbell
 - e. Or equal

C. Flat-panel Wall Box

1. Drawing reference: FPWB
2. Features, functions and construction:
 - a. Box provides means to install Audiovisual, network and power receptacles flush in wall behind flat-panel display. With box cover installed, connectors are concealed and cables, both power and communications pass through slot at base of cover plate into connection points on back of flat-panel.
 - b. Cover plate protrudes less than 1/2" from face of wall.
 - c. 16 gauge box construction with 1/16" inch thick minimum cover plate, white finish baked enamel or powder coat, field paintable
 - d. Box incorporates provisions to mount up to two electrical device boxes for provision of duplex power receptacles either from above or below.
 - e. Additionally box mounts manufacturers low-voltage conduit entry box which accommodates manufacturer's line of Audiovisual connector inserts. Design of FP WB permits installation of up to two low-voltage conduit entry boxes, which may be mounted either above or below the FPWB.
 - f. Manufacturers Audiovisual insert line shall support at least the following receptacles:
 - 1) BNC, in combinations of 1 to 5 BNC's, color-coded for composite, component analog and RGBHV video formats, as required.
 - 2) RCA, in combinations of 1 to 3 RCA's color-coded for Composite and component analog video formats, as required.

- 3) S-Video.
 - 4) XLR, 3 and 4 pin.
 - 5) DB-15
 - 6) DB-9
 - 7) Neutrik Speakon.
 - 8) DVI
 - 9) HDMI
 - 10) 1/4" and mini TRS.
 - g. Provide with manufacturer's connector inserts as required to terminate cabling types and applications indicated on the single-line diagrams. Punch blank panel inserts and provide other receptacle types as required or indicated to fulfill the requirements of the contract documents. Fill remaining openings with blank inserts.
 3. Manufacturers:
 - a. FSR Inc. PWB-100 with:
 - 1) (2) low voltage backboxes
 - 2) (2) electrical gem boxes
 - 3) Connectors and inserts from manufacturer's IPS series.
 - b. Or equal (no known equal).
- D. Large-Capacity Wall-Mounted Facilities Panel, 24 Neutrik D panel mount holes
1. Drawing Reference: WB1
 2. Features:
 - a. Flush in wall
 - b. Lockable cover plate with cable-pass-thru.
 - c. Space for 24 Neutrik D compatible jacks
 - d. Side and top and bottom knock-outs
 - e. Field Paintable
 3. Manufacturer:
 - a. FSR WB-X2-XLR-B w/ FSR WB-X2 CVR BLK
 - b. ProCo
 - c. Or Equal.

2.5 CABINETS AND ENCLOSURES

- A. Terminal Cabinets:
1. Drawing Reference: As Scheduled.
 2. Construction:
 - a. Zinc Coated Sheet Steel, code gauge with standard concentric knockouts for conduit terminations.
 - b. Interior dimensions not less than those scheduled.
 - c. Finish: Manufacturer's standard gray baked enamel finish.
 - d. Covers: Trim fitted, continuous hinged steel door, flush catch – lockable and keyed to match. Screw fastened doors not acceptable.
 - 1) Door face to be not less than 95% of panel interior dimensions.
 - e. Provide with 3/4" fire retardant treated ply backboard.
 3. Mounting:
 - a. Flush cabinets shall be furnished with concealed trim clamps and shall be not less than 4 inches deep.
 - b. Surface cabinets shall be furnished with screw cover trim, flush hinged door and shall not be less than 6 inches deep.
 - c. Interior Applications:

- 1) NEMA 250 Type 1, unless otherwise noted. Refer to plans and schedules.
- d. Exterior Applications:
 - 1) NEMA 250 Type - As Scheduled, not less than NEMA 3R.
4. Manufacturers:
 - a. B-Line Electrical Enclosures
 - b. Circle AW Products.
 - c. Hammond
 - d. Henessey.
 - e. Hoffman.
 - f. Myers Electric Products
 - g. Rittal.
 - h. or equal.

PART 3 - EXECUTION

3.1 CONDUIT APPLICATION

- A. General: Install the following types of conduits and fittings in the locations listed, unless otherwise noted in the drawings:
 1. Exterior, Exposed:
 - a. Type RSC for applications up to 8 feet AFF or to first pull box, whichever is first, applications subject to physical abuse or for applications greater than 4" diameter.
 - b. EMT acceptable in all other applications not noted above up to 4", where used in conjunction with specified Raintight (compression) couplers.
 2. Interior, Exposed, Wet and Damp Locations:
 - a. Type RSC.
 - b. At interior locations over 8 feet above finished floor, EMT acceptable.
 3. Interior, Hazardous Locations
 - a. Type RSC
 - b. Type IMC, where permitted by the CEC.
 4. Interior, exposed or concealed, dry locations:
 - a. RSC, if subject to physical abuse.
 - b. EMT, if not subject to physical abuse.
 5. Interior, concealed, damp locations, including in masonry walls.
 - a. RSC
 6. Embedded in Concrete
 - a. RSC or rigid non-metallic conduit.
 - b. PVC Type DB-120.
 7. Transition from walls to open plan furniture systems:
 - a. Liquidtight

3.2 GENERAL REQUIREMENTS

- A. Refer to the manufacturer's instructions and conform thereto.
- B. Distribution Pathway via EMT Raceway:
 1. The EMT conduit is to be installed meeting the NEC handbook Article 348 Installation Specifications.
 2. Provide escutcheon plates for all through wall conduit stubs.
 3. All ends of conduits shall be cut square, reamed and fitted with insulated bushing.

4. All conduit which passes through fire walls shall be sealed with fire stop putty after all station wire has been installed.

3.3 MOUNTING AND INSTALLATION – DEVICE BOXES

- A. Conform to the more restrictive of NEMA OS 3-2002 and the following.
- B. Provide backboxes at all Audiovisual systems devices. Installation of device plates directly to wall surface without use of a backbox, unless specifically directed on plans, is unacceptable.
- C. The distance between pull boxes shall not exceed 150 feet or more than two 90 degree bends.
- D. Align boxes plumb with floor and surrounding construction. At door frames, locate 4" from frame. Verify placement with Owner's Representative details to ensure that box clears all trim, etc.
- E. Support and fasten boxes securely. At stud walls use rigid bar hangers, attached to hanger with stud and nut.
- F. At existing locations, provide cutting, patching and finishing as required to maintain or restore finishes so that resulting installation is integrated into the Architectural decor of the particular location.
- G. Mounting Height: the mounting height of a wall-mounted outlet box is defined as the height from the finished floor to the horizontal center line of the cover plate.
- H. Mount outlet boxes with the long axis vertical. Three or more gang boxes shall be mounted with the long axis horizontal.
- I. Install wiring jacks and outlet devices only in boxes which are clean; free from excess building materials, dirt, and debris.
- J. Install wiring jacks and outlet devices after wiring work is complete.

3.4 TERMINAL CABINETS, JUNCTION BOXES AND PULL BOXES

- A. General
 1. Thoroughly examine site conditions for acceptance of cabinets and enclosures installation to verify conformance with manufacturer and specification tolerances. Do not commence with installation until all conditions are made satisfactory.
- B. Set cabinets and enclosures plumb and symmetrical with building lines. Furnish and install all construction channel bolts, angles, etc. required to mount all equipment furnished under this Section of the Specifications.
- C. Cabinets and enclosures shall be anchored and braced to withstand seismic forces calculated in accordance with standards referenced in Section 27 41 02 – Hangers and Supports for Audiovisual Systems.
- D. "Train" interior wiring, bundle and clamp using specified plastic wire wraps. Separate power and signal wiring.

- E. Replace doors or trim exhibiting dents, bends, warps or poor fit that may impede ready access, security or integrity.
- F. Terminate conduit in cabinet with lock nut and grounding bushing.
- G. Cleaning
 - 1. Touch-up paint any marks, blemishes or other finish damage suffered during installation.
 - 2. Vacuum clean cabinet on completion of installation.

3.5 SUPPORT

- A. Provide supports for raceways as specified in Section 27 41 02 – Hangers and Supports for Audiovisual Systems.
- B. All raceways installed in exposed dry locations shall be grouped in a like arrangement and supported by means of conduit straps, wall brackets or trapeze hangers in accordance with Code and the requirements of the this Section and Section 27 41 02 – Hangers and Supports for Audiovisual Systems. Fasten all hangers from the building structural system.
- C. Provide supports and mounting attachments per the most restrictive of Code and the following.

| Raceway Size (inches) | No of cables in run | Location | Support Spacing (feet) | |
|-----------------------|---------------------|--|------------------------|-----|
| | | | RSC | EMT |
| Horizontal Runs | | | | |
| ½, ¾ | 1-2 | Flat Ceiling Wall Runs | 5 | 5 |
| ½, ¾ | 1-2 | Where access limited to building structure | 7 | 7 |
| ½, ¾ | 3≥ | Any location | 7 | 7 |
| 1≥ | 1-2 | Flat ceiling or wall | 6 | 6 |
| 1≥ | 1-2 | Where access limited to building structure | 10 | 10 |
| 1≥ | 3≥ | Any locations | 10 | 10 |
| Any | Any | Concealed | 10 | 10 |
| Vertical Runs | | | | |
| ½, ¾ | Any | Exposed | 7 | 7 |
| 1, 1-¼ | Any | Exposed | 8 | 8 |
| 1-1/2≥ | Any | Exposed | 10 | 10 |

- D. Install no more than one coupling or device between supports.
- E. Conduit support
 - 1. As specified in Section 27 41 02 – Hangers and Supports for Audiovisual Systems
- F. The Owner’s Representative reserves the right to request additional supports where in their sole opinion said supports are required. Any additional supports shall be installed at no additional cost to the Owner.

3.6 PENETRATIONS

- A. Gypsum Wall Board Penetrations: Provide circular penetrations maximum 1/8" inch larger than outer diameter of conduit being used. On both sides of the wall fill space between conduit and wall with joint compound, depth to match gypsum board thickness.

- B. Install UL listed fire-stop system whenever a raceway penetrates a firewall in conformance with the manufacturer's directions, the published systems assembly requirements, CBC Section 709 and 710 and CEC 300-21, whichever is the most restrictive. At cable tray penetrations, provide pillow type removable fire stop per CBC Section 709 and 710, the published systems assembly requirements and the manufacturer's directions, whichever is the most restrictive.
- C. All Audiovisual systems conduit openings in walls and floors are the responsibility of the Contractor. Install sleeves shown on the drawings when the concrete is poured. Any openings required after the concrete has set maybe core drilled.

3.7 RACEWAY INSTALLATION, GENERAL

- A. Raceway runs are shown schematically. Install concealed unless specifically shown otherwise. Supports, pull boxes, junction boxes and similar generally not indicated. Provide where designated.
 - 1. Install exposed conduit and raceway parallel and perpendicular to nearby surfaces or exposed structural members, and follow the surface contours. Level and square conduit and raceway runs.
 - 2. Raceway runs shall be mechanically and electrically continuous between all each equipment rack and utility demarcation point, receptacle and/or surface raceway strip, as applies.
 - 3. Each conduit shall enter and be securely connected to a cabinet, junction box, pull box, or outlet by means of a locknut on the outside and a bushing on the inside or by means of a liquid-tight, threaded, self-locking, cold-weld type wedge adapter.
 - 4. Bends
 - a. All bends or elbows shall have a minimum radius as follows:

| Conduit Size | Min. Radius (Inches) |
|--------------|----------------------|
| 3/4" | 8 |
| 1" | 12 |
| 1-1/4" | 18 |
| 2" | 24 |
| 2-1/2" | 24 |
| 3" | 30 |
| 3-1/2" | 30 |
| 4" | 30 |
| 5" | 36 |
| 6" | 42 |
 - b. Use factory elbows or machine bends for conduit bends 1-1/4" and larger.
 - 5. Make bends and offsets so the inside diameter is not effectively reduced. Make bends in parallel or banked runs from the same center line so that the bends are parallel.
 - 6. Install at least one (1) 3/8", 200 pound strength nylon pull cord in all empty raceways.
 - 7. Raceways crossing building expansion joints or in straight runs exceeding 100 feet shall be provided with UL listed expansion fittings.
 - 8. Install conduit seals and drains to prevent accumulated moisture in conduits from entering Audiovisual System enclosures.
- B. Do not install conduit in concrete slabs unless specifically directed by Owner's Representative. Embedded conduits in concrete slab walls, and columns shall be installed in center third between upper and lower layers of reinforcing steel as directed by the Owner's Representative. Space conduits 8" on center except at cabinet locations where slab thickness shall be increased as directed by the Owner's Representative.

- C. All conduits to be kept 12" away from steam or hot water lines. Install horizontal conduit and raceway runs below water and steam piping.
- D. Conduit dropping down to equipment shall be as straight as possible without any offsets, parallel or perpendicular to walls, ceilings and other building features.
- E. Conduit installed on any equipment shall be run symmetrical with the equipment and in such a manner as to:
 - 1. not to be exposed to damage;
 - 2. not interfere with access to components of the equipment that will interfere with maintenance operation or;
 - 3. not to be in a manner that the Owner deems detrimental to its operation.
- F. Whenever an installation such as that listed occurs, the Contractor shall make all necessary changes at no additional cost to the Owner.
- G. All cut ends of conduit, scratches, tool marks, etc. on any metallic raceway installed in the ground or on the exterior of the building shall be treated with two coats of specified Touch Up Paint/Tape.
- H. Exposed conduit and metallic surface raceway installed in finished spaces shall be painted to match surrounding surfaces using paint and methods directed by the Owner's Representative.
- I. All raceways stubbing up into equipment or racks shall be sealed. Raceways with conductors shall be plugged with duct-seal. Spare raceways shall be capped. Prevent foreign matter from entering conduit and raceway; use temporary closure protection. Replace conduits containing concrete, varnish or other foreign material.
- J. Complete installation of conduit and raceway runs before starting installation of cables/wires within conduit and raceway.
- K. Use specified conduit and raceway fittings that are of types compatible with the associated conduit and raceway and suitable for the use and location. Join and terminate conduit and raceway with fittings designed and approved for the purpose of the conduit and raceway system and make up tight.
- L. Where chase nipples are used, align the raceway and coupling square to the box and tighten the chase nipple so no threads are exposed.
- M. Horizontal conduit or EMT runs, where required and permitted, shall be installed as close to ceiling or ceiling beams as practical.
- N. Conduit and EMT connected to wall outlets shall be run in such a manner that they will not cross water, steam or waste pipes or radiator branches.
- O. Conduit and EMT shall not be run through beams, purlins or columns except where permission is granted by Owner's Representative in writing.
- P. Bond installed metallic raceway in accordance with the requirements of the CEC.

3.8 HAZARDOUS LOCATIONS

- A. Use rigid steel conduit only.

- B. Install UL listed sealing fittings that prevent passage of explosive vapors in accordance with the manufacturers written instructions. Locate fittings at suitable, accessible locations and fill them with UL-listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank coverplate having a finish similar to that of adjacent plates or surfaces.
- C. Install raceway sealing fittings at the following points and elsewhere as indicated:
 - 1. Where conduits enter or leave hazardous locations.

END OF SECTION

SECTION 27 41 06 - NOISE AND VIBRATION CONTROLS FOR AUDIOVISUAL SYSTEMS

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Provisions of:
 - 1. Flexible Audiovisual raceway connections to vibrating machinery
 - 2. Sealing of Audiovisual device boxes related installed in sound rated walls.
 - 3. Coordination of airtight installation requirements at Mechanical and Electrical Rooms and/or duct enclosures.

1.2 RELATED WORK IN OTHER SECTIONS

- A. Consult all other Sections, determine the extent and character of related work and properly coordinate work specified herein with that specified elsewhere to produce a complete installation.
 - 1. Division 15
 - a. Energy Management Panels mounted on vibrating equipment connected to the Audiovisual Work.
 - 2. Division 27
 - a. UPS equipment connected to the Audiovisual Work.
 - b. Section 27 41 03 - Conduits and Backboxes for Audiovisual Systems

1.3 REFERENCES

- A. American National Standards Institute (ANSI)
 - 1. ANSI/UL 1479-2003 Fire Tests of Through Penetration Firestops
- B. American Society for Testing and Materials (ASTM)
 - 1. ASTM E814-02 Standard Test Method for Fire Tests of Through Penetration Fire Stops.
- C. Underwriters Laboratories, Inc. (UL)
 - 1. UL Fire Resistance Directories

1.4 SUBMITTALS

- A. Comply with the requirements of University's Division 1 – General Requirements and Section 27 41 00 – Common Work Results for Audiovisual Systems.

PART 2 - PRODUCTS

2.1 FLEXIBLE AUDIOVISUAL CONNECTIONS:

- A. Make Audiovisual connections to vibrating equipment flexible as follows:
 - 1. For conduit over 1" O.D. make Audiovisual connections to vibrating equipment via a flexible expansion/deflection conduit coupling sized as required. Coupling shall have flexible and watertight outer jacket, internal grounding strap, plastic inner sleeve to maintain smooth wireway, and end hubs with threads to fit standard threaded metal conduit.

2. Manufacturers:
 - a. XD Xpansion Deflection Coupling by Crouse-Hinds of Syracuse, N.Y.
 - b. Type DF Expansion and Deflection fitting by Spring City Electrical Mfg. Co.
 - c. or equal.
3. For conduit under 1" O.D. utilize FLEX or LIQUIDTIGHT conduit as specified in Section 27 41 03 – Conduits and Backboxes for Audiovisual Systems with slack at least 3' or 15 diameters long, whichever is the longer or provide a flexible coupling as defined above.

2.2 J-BOX MASTIC:

- A. At all electrical boxes penetrating sound isolating partitions, utilize sheet form adhesive mastic as directed elsewhere herein
- B. Manufacturers:
 1. Insul-Pad by Dottie Corp.
 2. Duct-Seal by Gardner Bender, Inc.
 3. Duxseal by Manville
 4. Outlet Pad by Lowry
 5. or equal.

2.3 RESILIENT PENETRATIONS:

- A. For conduit:
 1. Sleeves: Sleeves of appropriate gage galvanized sheet metal shall be formed to at least the thickness of the penetrated construction and 3/4" to 1" larger in each cross-sectional dimension than the penetrating element.
 - a. Manufacturers:
 - 1) Century-Line Sleeves by Thunderline Corporation
 - 2) Custom by Contractor
 - 3) or equal.
 2. Batt: Glass fiber of batt or mineral wool, 1 to 3 lb./cu. ft. density.
 - a. Manufacturers:
 - 1) Certain-Teed
 - 2) Johns-Manville
 - 3) Owens-Corning
 - 4) or equal.
 3. Acoustical Sealant:
 - a. Manufacturers:
 - 1) DAP
 - 2) Pecora
 - 3) Tremco
 - 4) U.S. Gypsum
 - 5) or equal.
 4. Firestop Sealant:
 - a. Where required, resilient firestop caulking may be used in lieu of Acoustical Sealant when installed in strict conformance with the manufacturer's directions. Fully hardened firestop caulk shall develop a Shore A hardness of no greater than 35. Refer to the requirements of Section 27 41 03 – Conduits and Backboxes for Audiovisual Systems.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS, CONNECTION TO VIBRATING EQUIPMENT

- A. The Contractor shall not install any vibrating equipment or conduit attached thereto which makes rigid contact with the "building" unless it is approved in this specification or by the Owner's Representative. "Building" includes, but is not limited to slabs, beams, columns, walls, partitions, ceilings, studs, ceiling framing and suspension systems.
- B. Prior to installation, the Contractor shall bring to the Owner' Representative's attention any conflicts between trades which will result in unavoidable rigid contact at equipment, conduit, piping, ducts, etc., as described herein, due to inadequate space or other unforeseen conditions. Corrective work necessitated by conflicts after installation shall be at the responsible contractor's expense.
- C. The Contractor shall obtain inspection and approval from the Owner's Representative of any installation to be covered or enclosed, prior to such closure.

3.2 INSPECTION OF CONDITIONS:

- A. Examine related Work and surfaces before starting Work of this Section. Report to the Owner's Representative, in writing, conditions which will prevent proper provision of this work. Beginning the Work of this Section without reporting unsuitable conditions to the Owner's Representative constitutes acceptance of such conditions by Contractor. Perform any required removal, repair, or replacement of this Work caused by unsuitable conditions at no additional cost to the Owner.
- B. Coordination
 - 1. Coordinate with the work of the Base Building Construction Contract. Coordinate Work of this Section with all other impacted trades.

3.3 INSTALLATION REQUIREMENTS, FLEXIBLE ELECTRICAL CONNECTIONS

- A. The installation of flexible electrical connections to vibration isolated equipment shall in no way impair or restrain the function of the vibration isolation installed by the work by Others.
 - 1. Using gross slack. Install flexible conduit in a grossly slack loop form or shallow "U" form. Install stranded conductors with sufficient slack to accommodate maximum possible movement.
 - 2. Using flexible coupling. The flexible coupling shall be free and not in contact with any nearby building construction and shall be installed slack, and free of strain in any direction. Install stranded conductors as above

3.4 INSTALLATION REQUIREMENTS, J-BOX MASTIC

- A. Application: All Audiovisual Systems work in sound isolating assemblies, including but not limited to residential rooms, offices, mechanical rooms, electrical rooms and related to utilize backboxes for all services, including but not limited to low voltage communication. Installation of backboxes to conform with following:
 - 1. Space outlet boxes on opposite faces of the wall by more than 24" o.c. Where daisy chained conduits indicated on the plans, connect such boxes by slack flexible conduit (2 times longer than distance between outlets).
 - 2. Cutouts for electrical boxes and penetrating piping/conduit shall be no more than 1/4" oversize.

3. Caulk gap between drywall and electrical boxes and/or piping/conduit airtight with Acoustical Sealant. Apply J-Box mastic to back of all penetrating electrical boxes and press firmly at joint to wallboard to provide an airtight seal.

3.5 INSTALLATION REQUIREMENTS, RESILIENT PENETRATIONS

- A. Penetrations included in this Section of the Specifications include all Audiovisual conduit connected to vibrating equipment within 30 feet of such equipment
- B. Method for round or rectangular penetrations.
 1. Cut a clean opening in the penetrated construction very nearly the size of the sleeve for each penetrating element. Provide lintels above, relief structure below and vertical framing between and to the sides, as required. Provide the above, escutcheon plates and such related construction as is necessary to make the penetrated structure as solid and massive near the penetrations as the surrounding construction.
 2. Set the metal sleeve into the penetrated construction in an airtight manner around its outer periphery, using grout, dry packing, plaster or drywall compound full depth and all around - but only to a maximum width of ½" - or the requirements of the above paragraph shall not have been satisfied.
 3. Pack annular opening with glass fiber between metal sleeve and penetrating element full depth, all around to a firm degree of compaction. Leave a ½" deep annular opening free at each end of the metal sleeve; fill this fully with sealant.

3.6 MECHANICAL AND ELECTRICAL ROOMS REQUIREMENTS

- A. All mechanical and electrical rooms, plenums, duct shafts and drywall duct enclosures and other enclosures of high noise sources shall be constructed airtight. This means that every precaution shall be taken to maintain construction completely airtight around a room so designated. Construction joints, duct penetrations, electrical boxes, frames, supports, cabinets, doors, access panels, fixtures, etc., all shall be built or installed in such a manner as to prevent sound transmission through any construction enclosing a room horizontally or vertically. Appropriate lintels, frames, blocking, escutcheons, grouting, gaskets, packing, caulking, taping, filling, etc., all shall be employed to prevent sound transmission. Refer to requirements of this Section for Resilient Penetrations.
- B. All work under this section is to comply with the above. Contractor to report to Owner's Representative any construction conditions which arise which might compromise compliance with this requirement.

END OF SECTION

SECTION 27 41 07 - IDENTIFICATION FOR AUDIOVISUAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY:

- A. Provide all labor, materials, tools, and equipment required for permanent intelligible labeling on, or adjacent to, all cabling, connectors, innerduct, faceplates, jacks, receptacles, controls, fuses, circuit breakers, patching jacks, and racks.
- B. This section includes minimum requirements for the following:
 - 1. Labeling Audiovisual Cabling
 - 2. Labeling Closet Hardware
 - 3. Labeling Work Stations
 - 4. Labeling Pathways, Spaces, Grounding and Bonding.
- C. Refer to detailed plans for additional requirements.
- D. Clearly and distinctly indicate the function of the item.
- E. Coordinate with Record Drawings

1.2 REFERENCES:

- A. Usage: In accordance with University's Division 1 – General Requirements.
- B. American Society for Testing and Materials (ASTM)
 - 1. ASTM D 709(2001) Laminated Thermosetting Materials
- C. Electronic Industries Alliance (EIA)
 - 1. EIA TIA/EIA-606-A(2002) Administration Standard for Commercial Telecommunications Infrastructure (ANSI/TIA/EIA-606)
- D. Underwriters Laboratories (UL)
 - 1. UL 969 (1995; R 2001) Marking and Labeling Systems

1.3 QUALITY ASSURANCE

- A. Identification and administration work specified herein shall comply with the applicable requirements of:
 - 1. ANSI/TIA/EIA – 606-A Administration Standards.
 - 2. ANSI/TIA/EIA – 569B Pathway and Spaces
 - 3. ANSI/TIA/EIA – 568B Telecommunications Cabling Standard.
 - 4. BICSI Telecommunications Distribution Methods Manual.
 - 5. UL 969 (1995; R 2001) Marking and Labeling Systems.

1.4 SUBMITTALS

- A. Conform with University's Division 1 – General Requirements and Section 27 41 00 - Common Work Results for Audiovisual Systems.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Procedures: In accordance with University's Division 1 – General Requirements.

1.6 SEQUENCING

- A. Not Used.

PART 2 - PRODUCTS

2.1 COMMUNICATION CABLING LABELS, INTERIOR

- A. Shall meet the legibility, defacement, exposure and adhesion requirements of UL 969.
- B. Shall be preprinted or computer printed type. Hand written labels are not acceptable.
- C. Provide vinyl substrate with a white printing area and black print. If cable jacket is white, provide cable label with printing area that is any other color than white, preferably orange or yellow – so that the labels are easily distinguishable.
- D. Shall be flexible vinyl or other substrates to apply easy and flex as cables are bent.
- E. Shall use aggressive adhesives that stay attached even to the most difficult to adhere to jacketing.
- F. Manufacturers:
 - 1. Cable Type – Audiovisual Cabling, General Purpose
 - a. Brady TLS2200 labels – PTL-31-427, PTL-32-427
 - b. Brady Laser tab labels – LAT-18-361, LAT-53-361
 - c. Hubbell
 - d. Leviton
 - e. Panduit.
 - f. or equal.
 - 2. Cable Type – RG-6 Coax
 - a. Brady TLS2200 labels – PTL-31-427, PTL-32-427
 - b. Brady Laser tab labels –LAT-18-361, LAT-53-361
 - c. Panduit.
 - d. or equal.
 - 3. Cable Type – RG-59 Coax
 - a. Brady TLS2200 labels – PTL-31-427, PTL-32-427
 - b. Brady Laser tab labels – LAT-18-361, LAT-53-361
 - c. Panduit.
 - d. or equal.
 - 4. Cable Bundles
 - a. Brady TLS2200 labels – PTL-12-109
 - b. Panduit.
 - c. or equal.

2.2 GROUNDING AND BONDING, PATHWAY, AND SPACE LABELS

- A. Shall meet the legibility, defacement, exposure and adhesion requirements of UL 969.

B. Shall be preprinted or computer printed type. Hand written labels are not acceptable.

C. Manufacturers:

1. Brady Corporation

a. TLS2200 labels

- 1) PTL-20-422, Size 2.0" x 1.0"
- 2) PTL-22-422, Size 3.0" x 1.0"
- 3) PTL-37-422, Size 3.0" x 1.9"
- 4) PTL-23-422, Size 4.0" x 1.0"
- 5) PTL-38-422, Size 4.0" x 1.0"

b. Laser tab labels

- 1) LAT-13-747, Size 1.875" x 0.833"
- 2) LAT-24-747, Size 1.75" x 1.0"
- 3) LAT-32-747, Size 3.0" x 0.9 "
- 4) LAT-33-747, Size 2.0" x 1.437"
- 5) LAT-34-747, Size 3.0" x 1.437"

c. Continuous tape for TLS2200

- 1) PTL-8-422, Size 0.5" white polyester
- 2) PTL-8-430, Size 0.5" clear polyester
- 3) PTL-8-439, Size 0.5" white vinyl
- 4) PTL-42-439, Size 1.0" white vinyl
- 5) PTL-43-439, Size 1.9" white vinyl

2. Panduit.

3. or equal.

2.3 NAMEPLATES

A. Field Fabricated Nameplates

1. Features/Function/Construction

- a. Provide laminated plastic nameplates for each equipment enclosure, relay, switch, and device; as specified or as indicated on the drawings.
- b. Comply with ASTM D 709.
- c. Each nameplate inscription shall identify the function and, when applicable, the position.
- d. Nameplates shall be melamine plastic, 0.125 inch thick, white with black center core.
- e. Surface shall be matte finish.
- f. Corners shall be square.
- g. Accurately align lettering and engrave into the core.
- h. Minimum size of nameplates shall be one by 2.5 inches.
- i. Lettering shall be a minimum of 0.25 inch high normal block style

PART 3 - EXECUTION

3.1 GENERAL

A. Apply labeling to clean surfaces free of oil, dust, solvents or loose material.

B. Apply after Project painting in area of application is complete.

- C. Apply to locations where labeling will not be damaged, covered over or in the way of the ordinary maintenance and operation of the installed Audiovisual infrastructure or system.
- D. Apply labeling right side up, parallel to major edges of surfaces to which it is applied. When no line is evident, apply parallel to floor line. Correct conditions of labeling applied out of true.
- E. Protect installed labeling from damage.
- F. Replace labeling that is defaced, illegible or peeling off of the surface to which it is applied.

3.2 IDENTIFICATION & LABELING

- A. Pathways
 - 1. Pathways shall be marked at each endpoint and at all intermediate pull or junction boxes. In the case of partitioned pathways (i.e. innerduct) each partition shall have a unique identifier.
 - 2. Label pathways using the appropriate abbreviation and a number.
 - 3. Use adhesive type labels.
- B. Labels shall be affixed at the entry to all Audiovisual Control Rooms and spaces (Includes entrance facilities, communication equipment rooms, communication equipment spaces and work areas)
 - 1. Use adhesive type labels for all Audiovisual space labeling,
 - 2. Affix labels to entrance doors – coordinate location with Owner's Representative.
- C. Cables
 - 1. Horizontal shall be marked within 12" of each endpoint or to innerduct in which the cable is installed.
 - 2. Except where installed in innerduct or conduit, all backbone fiber optic cable shall have affixed to the outer jacket, labels of a bright color that contain at least the legend "FIBER OPTIC CABLE." These labels must be affixed at separations no greater than 10 ft.
 - 3. Any cable installed in conduit shall be labeled at all intermediate pull or junction boxes.
 - 4. Label cables using the appropriate circuit ID.
 - 5. Use adhesive type labels for all AV cable labels.
 - 6. Affix labels to cables – marking cable is not permitted.
 - 7. Where cable is fully encased in innerduct label the outside of the innerduct with the cable label and, where the contents are fiber optic cabling, the "FIBER OPTIC CABLE" label.
- D. Grounding and Bonding
 - 1. The AVGB(s) (Audiovisual main ground bar) shall be labeled as such with an adhesive type label(s) affix label(s) to TMGB.
 - 2. The conductor connecting the AVGB (Audiovisual main ground bar) to the building ground shall be labeled at each end with an affixed label in a visible location as close as practicable to the bonding point at each end of the conductor.
- E. Firestopping
 - 1. Each firestopping location shall be labeled at each location where firestopping is installed, on each side of the penetrated fire barrier, within 12 in. of the firestopping material.

END OF SECTION

CITY OF PITTSBURG, CA
CITY COUNCIL CHAMBERS

AUDIOVISUAL UPGRADES
Smith, Fause, & McDonald, Inc.

SECTION 27 41 08 - AUDIOVISUAL RACKS, CABINETS, & ACCESSORIES

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Audiovisual racks and cabinets.
- B. Production Desks and Mobile Production Racks.

1.2 RELATED WORK IN OTHER SECTIONS

- A. Section 27 41 01 – Grounding and Bonding for Audiovisual Systems
 - 1. Bonds racks and cabinets.
- B. Section 27 41 03 – Conduits and Backboxes for Audiovisual Systems
 - 1. Signal systems raceways at Audiovisual Control Rooms

1.3 REFERENCES

- A. American National Standards Institute (ANSI)
 - 1. EIA-310-D (1992) Cabinets, Racks, Panels, and Associated Equipment (ANSI/EIA/310-D)
 - 2. ANSI-J-STD-607-A Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications (ANSI/J-STD-607-A-2002)
- B. International Conference of Building Officials (ICBO)
 - 1. AC156 ICBO ES Acceptance Criteria for Seismic Qualification Testing of Nonstructural Components (Jul. 2004)
- C. Telecordia Technologies
 - 1. Network Equipment Building System (NEBS) GR-63-CORE (Seismic Zone 4)

1.4 SUBMITTALS

- A. Conform with the requirements University's Division 1 – General Requirements and Section 27 41 00 - Common Work Results for Audiovisual Systems.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Procedures: In accordance with University's Division 1 – General Requirements.

PART 2 - PRODUCTS

2.1 GENERAL

- A. KEYS
 - 1. Key all boxes, cabinets, enclosures, panels, controls, doors and related provided for similar usage within a system identically.

2.2 EQUIPMENT ENCLOSURE SYSTEMS

A. General:

1. Provide enclosure systems including, but not limited to enclosures, cabinets, cases and related panels and accessories as specified herein. Provide size and quantity as shown on drawings or scheduled.
2. Provide color as shown on drawings. If no color is shown on drawings, submit manufacturer's standard color chips for selection.
3. Provide enclosure systems conforming to the UBC/CBC, latest edition, for seismic design.
4. Equipment Enclosures: Each rack provided with frame angles tapped 10-32, ANSI/EIA 310-D Universal Spaced.

B. Zone 4 Slide Out Rack, Steel Enclosure

1. Drawing Reference: R35
2. Features
 - a. Rack cabinet, 1 bay, steel frame mounted, with slide out inner frame for rear access of equipment from front of rack, floor supported.
 - b. Zone 4 rated for up to 500 pounds of uniformly distributed load.
 - c. 41 useable rack units.
 - d. Fan System, 100 cfm minimum mounted into slide out inner frame.
 - e. No front except where called for on the plans - at such conditions, provide fully perforated steel door.
 - f. No rear doors
 - g. Locking side panels.
 - h. Open top outer frame
 - i. Raised floor base - provide engineered means of support where installation at raised floor conditions are indicated sufficient to maintain racks Zone 4 rating.
 - j. Provide vertical power strips in accordance with Section 27 11 26.
 - k. Provide sliding shelf.
3. Manufacturer:
 - a. Middle Atlantic Products AXS Slide Out System in MRK Steel Host Enclosure, configured with:
 - 1) MRK-4426AXS-Z4
 - 2) AXS-WT50 Cable Management Tray
 - 3) TRACK50 Service Track.
 - 4) TRACKL Service Stand for Steel Cabinets.
 - 5) 1 each MW-4FT fan top (openings only) in outer frame.
 - 6) 2 each AXS-FAN with GUARD, 2 fans installed in the top of inner frame.
 - 7) 1 each FC-4-1C Thermostatic Fan Control
 - 8) At raised floor conditions, provide with SRB series base to match floor construction.
 - 9) or equal (No known equal)

C. Equipment Rack, Undercounter, Pullout and Pivoting

1. Drawing Reference: R18
2. Features/Construction:
 - a. EIA compliant 19" rotating slide-out equipment rack intended for permanent installation and integration into a millwork or cabinet opening.
 - b. Overall dimensions of rack shall be not more than 19.25" wide x 20" deep.
 - c. Rackspace:
 - 1) Provide 16 RU rack spaces, 30"H max.

- 2) Rack shall support up to a 300 pound loading, in closed and pull-out operation.
 - 3) Rack shall pull out 19" on integrated ball bearing slides and rotate 90° for equipment servicing. When rotating rack, allows rack to lock in place at 0, 60 and 90 degrees of rotation.
 - 4) Rackrail shall be 11-gauge steel with tapped 10-32 holes in universal EIA spacing. Rackrail shall be finished in black e-coat with marked rackspaces.
 - 5) Rough-in pan shall be 14-gauge steel.
 - 6) Finish on assembly shall be durable flat black powder coat.
 - 7) Trim/locking panel shall lock rack in closed position and be 11-gauge aluminum with brushed black anodized finish.
 - 8) Unless otherwise noted, completely enclose interior of enclosure, or ensembles of enclosures with equipment, blank or vent panels.
3. Blower panel.
 - a. Exhausts hot air from rear to front of rack.
 - b. Minimum 100 CFM free air rating.
 - c. Quiet, maximum 35 dB sound level.
 - d. 1 rackspace high.
 - e. Half-height power receptacle strip(s)
 - 1) Vertical power strip, no higher than rack height.
 - 2) Not less than ten (10) 20A receptacles; Provide multiple strips if required
 - 3) Integral circuit breaker
 - 4) NEMA 5-20 plug on a minimum 6' cord.
 - 5) UL Listed Assembly
 - 6) Provide mounting hardware as necessary to attach vertically to rack interior.
 4. Manufacturers:
 - a. Middle Atlantic SRSR-4-XX; where XX indicated quantity of rack units, Middle Atlantic QBP-2 blower, and power strip(s).
 - b. Or equal (no known equal)
- D. Zone 4 Equipment Rack, Front, Rear and Side Access.
1. Drawing Reference: R33
 2. Construction:
 - a. Manufacturer tested Zone 4 assembly, rated for at least 900 pounds of uniformly distributed load under Zone 4 forces.
 - b. Vertical Height (Min): 44 RU
 - c. Overall Depth: 27" minimum.
 - d. Overall Width: Nominally 24"
 - e. No Front Door
 - f. Lockable wire mesh rear door.
 - g. Fully Adjustable 19" Mounting Rails, 10-32 threaded openings on EIA spacing standard
 - h. Full height vertical receptacle strip, at least one (1) circuit, 20A, unless otherwise noted, as specified elsewhere in Section 27 11 26 - Communications Rack Mounted Power Protection and Power Strips.
 - i. Provide each rack with the following accessory shelves:
 - 1) One (1) Exhaust Fan Panel, at top or rear doors, at least 200 CFM.
 - j. Gangable. Racks have been designed such that they are suitable for installation either as a single, standalone unit, or in a row of identical racks (gangable).
 - 1) Single rack installation. Provide side panels at both sides.

- 2) Multirack installation in a row. Bolt racks together using means provided by manufacturer. Omit side panels except at ends of row of racks – provide at ends of rows of racks
3. Manufacturers. Provide manufacturer's accessories or 3rd party accessories as specified elsewhere in this Section for other specified elements. Coordinate selected shelves, fans and similar with rack submitted for finish and mounting means.:
 - a. Middle Atlantic WRK-44-27LRD, MW-LVRD-44 rear door, WRK-Z4 Mounting Brackets, MW-4FT top w/ 4 fans.
 - b. APC
 - c. AFCO
 - d. Hoffmann
 - e. Lowell
 - f. Wrightline
 - g. Or equal

2.3 RACK PANELS AND ACCESSORIES

- A. Rack Mounting Screws:
 1. Screws 10-32; length as required for at least 1/4" excess when fully seated; oval head with black plastic non marring cup washer or equivalent ornamental head; nickel, cadmium or black plated; Phillips, Allen Hex, Square-Tip or Torx drive. Slotted screws are not acceptable.
- B. Sliding Shelf:
 1. Plan Reference: SLIDING SHELF
 2. Construction/Features:
 - a. 16 gauge minimum cold rolled steel
 - b. Powder coat finish to match rack color, unless otherwise noted
 - c. 19" Wide Pull out with handhole or knob.
 - d. Solid or perforated surface
 - e. Depth: At least 20", u.o.n.
 - f. 50 pound minimum load capacity
 3. Manufacturers:
 - a. Atlas Sound
 - b. BGW Systems, Inc. Sliding Shelves
 - c. Chatsworth Products 32" Deep Megaframe Sliding Shelf.
 - d. Elkay SLSH series
 - e. Homaco Adjustable Pull-Out Equipment Shelves
 - f. Hubbell MCCTELSHLF
 - g. Middle Atlantic Heavy-Duty Sliding Shelf
 - h. APW SSDC30.
 - i. AFCO AS-SO-19-24.
 - j. Or equal.
- C. Fixed Shelf - 4 post rack applications
 1. Plan Reference(s):
 - a. FIXED SHELF
 - b. SHELF
 2. Construction:
 - a. 16 gauge minimum cold rolled steel
 - b. Powder coat finish to match rack color, unless otherwise noted
 - c. Holds 100 lbs load

- d. Mounts to front and rear rails, U.O.N.
- e. Solid or Perforated bottom panel to suit equipment being mounted.
- f. Depth to equal not less than 75% of depth of equipment rack.
- g. Not more than 1 RU in height.
3. Manufacturers:
 - a. Atlas Sound Heavy Duty Shelves, SH series.
 - b. BGW Systems, Inc. Rack Mount Trays
 - c. Elkay SSH Series
 - d. Homaco Adjustable Equipment Shelves and Fixed Dual Shelves
 - e. Lowell Rack Mounted Utility Shelves
 - f. Middle Atlantic Universal Rackshelves
 - g. Rack Innovations, Inc.
 - h. ZERO/Stantron Stationary Shelves
 - i. AFCO AS-SF-19-24
 - j. APW ESDC30.
 - k. Hubbell MCCPSHLF
 - l. Chatsworth Products 29" Deep Megaframe Fixed Shelves.
 - m. or equal
- D. Keyboard/Mouse Shelf
 1. Drawing Reference: Keyboard/Mouse Shelf
 2. Stores fullsize keyboard and mouse inside rack.
 3. Upon retraction to rack front, pivots 90 degrees for operator access.
 4. Manufacturers
 - a. APC 19" Rotating Keyboard Drawer.
 - b. Middle Atlantic
 - c. or equal.
- E. Grommet Panel
 1. Features/Functions/Construction
 - a. 1 RU steel or aluminum panel with 18" wide x 1" tall smooth edged
 - b. opening in face
 - c. Cable management panel protrudes below opening perpendicular to rear face.
 2. Manufacturers:
 - a. Middle Atlantic BR1
 - b. Custom by Contractor using Blank Panel
 - c. or equal.
- F. Blank Panels:
 1. Construction
 - a. 16 gauge minimum cold rolled steel
 - b. Powder coat finish to match rack color, unless otherwise noted
 2. Manufacturers
 - a. Middle Atlantic Products SB Series.
 - b. Atlas Sound S19 Series.
 - c. BGW Systems Inc. Flanged Steel Blank Panels
 - d. Dukane
 - e. Elkay
 - f. Lowell Series L3
 - g. Zero ZP112000 Series.
 - h. Hubbell

- i. or equal.

G. Vent Panels:

1. Construction
 - a. 20 gauge minimum cold rolled steel
 - b. 1/8" minimum holes, at least 70% open total panel cross-section.
 - c. Powder coat finish to match rack color, unless otherwise noted
2. Manufacturers
 - a. Atlas Sound SVP Series.
 - b. BGW Systems Inc. Perforated Vent Panels
 - c. House of Metal Enclosures (HOME) Series PRP.
 - d. Lowell Series L5
 - e. Middle Atlantic Products VT Series.
 - f. Zero.
 - g. or equal.

H. Drawers

1. Construction
 - a. 16 gauge minimum cold rolled steel
 - b. Powder coat finish to match rack color, unless otherwise noted
 - c. Suitable for mounting from face of 4 post rack
 - d. At least 14-1/2" deep.
 - e. Full extension ball bearing slides with trigger release disconnect.
 - f. Rated for at least 100 pound load.
 - g. Flush handle does not protrude from drawer face.
 - h. Provide key lock where indicated.
2. Manufacturers
 - a. BGW Systems Inc. Rack Mount Drawer Systems.
 - b. Middle Atlantic Heavy Duty D or TD series.
 - c. Atlas Sound SD*-165FP Series.
 - d. Elkay SSD Series.
 - e. or equal.

I. Vertical Lacer Strips

1. 44RU high vertical steel strips with points for attachment of velco cable ties at at least 6" o.c.
2. Manufacturers:
 - a. Middle Atlantic LACE-44LP
 - b. APW
 - c. or equal.

J. Horizontal Lacer Bars

1. EIA 19" Width steel strips or bars suitable to provide support to large cable dressed horizontally through racks
2. Size to suit load and mounting width.
3. Manufacturers:
 - a. Middle Atlantic LBP-1R4, LBP-1.5 and LBP-1S.
 - b. APW
 - c. or equal.

K. Seismic Hold-down Equipment Straps

1. Drawing Reference: None - Provide as required to secure equipment that cannot be screw

- fastened to mounting shelves.
2. Manufacturers:
 - a. BGW Systems
 - b. Everest Electronic Equipment Lock Down Kit
 - c. Ergotron
 - d. Chatsworth Products
 - e. Middle Atlantic Products
 - f. Q-Safety, Inc.
 - g. or equal.

PART 3 - EXECUTION

3.1 MOUNTING

- A. Unless otherwise noted, all floor supported equipment racks shall be bolted to the structure in accordance with the requirements of the CBC, the UBC and the contractors approved structural engineering submittal demonstrating the method to be used to conform to these requirements.
- B. Rows of identical racks shall be bolted together in addition to being bolted to the floor and bonded to form a single electrical ground plane.
- C. Wall mounted equipment racks and cabinets shall similarly be bolted to structural members in accordance with the requirements of the CBC, the UBC and the contractors approved structural engineering submittal demonstrating the method to be used to conform to these requirements.

3.2 EQUIPMENT ENCLOSURE (RACK) AND EQUIPMENT BACKBOARD FABRICATION

- A. Combustible material, other than incidental trim of indicated equipment, is prohibited within equipment racks.
- B. Provide permanent labels for all equipment and devices.
- C. Floor racks to be bolted floor unless otherwise indicated.
- D. Access shall not require demounting or de-energizing of equipment. Install access covers, hinged panels, or pull-out drawers to insure complete access to terminals and interior components.
- E. Provide a permanent label on the front of each equipment rack including the rack designation, and the circuit breaker number and associated electrical distribution panel designation servicing same.
- F. Where wiring of mixed types are called for on the plans, maintain separation of wiring classifications as specified in the individual sections of the Audiovisual Work. Separately dress, route and land microphone, audio line level and data cables and related on the right side of the equipment enclosure, as viewed from the rear; dress, route, and land loudspeaker level, data and control cables on the left side of the equipment enclosure, as viewed from the rear.
- G. Provide vertical wire management of cabling within the rack independent of the adjustable EIA mounting rails. Vertical wiring management provided by the contractor within the rack shall not prevent such rails from being moved as required by the Owner.
- H. Dress and support cabling at a minimum of 24 inch on center.

- I. Access shall not require demounting or de-energizing of equipment or cabling. Install access covers, hinged panels, or pull-out drawers to insure complete access to terminals and interior components.
- J. Fasten removable covers containing any wired component with a continuous hinge along one side, with associated wiring secured and dressed to provide an adequate service loop. Provide an appropriate stop locks to hold all hinged panels and drawers in a serviceable position.
- K. Provide permanent labels for all equipment and devices. Where possible, fasten such labels to the rack frame or to blank or vent panels which will remain in place when active equipment is removed for possible service.
- L. At audio and video jackfields, provide service loop to permit removal of jackfields from rack sufficient to conveniently access all jack contacts for routine cleaning and maintenance. Organize the service loop and harness such that reasonable reconnection of jacks and jack normals is possible without cutting apart the harness.
- M. Coordinate the design and execution of wire harnessing of multi-bay audio and video rack ensembles with conditions of delivery to installation locations at Project Site, and with the requirement herein for test of the completely wired system in the shop prior to delivery to the Project Site. Organize the wiring harnesses such that they will fold within one shippable unit without risk of damage, or provide polarized multipin connectors and related interconnect systems as specified elsewhere herein.

3.3 SIGNAL GROUNDING & BONDING PROCEDURES

- A. Comply with National Electrical Code and the California Electric Code. Bond equipment racks to ground in accordance with the California Electric Code and ANSI/ EIA/ TIA 607 and Section 27 41 01 – Grounding and Bonding for Audiovisual Systems.
- B. Unless otherwise noted maintain a unipoint ground scheme.
- C. Equipment enclosures shall not be permitted to touch each other unless bolted together and electrically bonded.

END OF SECTION

CITY OF PITTSBURG, CA
CITY COUNCIL CHAMBERS

AUDIOVISUAL UPGRADES
Smith, Fause, & McDonald, Inc.

SECTION 27 41 09 - AUDIOVISUAL CABLE MANAGEMENT

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Section includes provision of cable management for cabling installed under the work of this Project as well as for Owner furnished patch cords at equipment racks
- B. Scope includes:
 - 1. Innerduct
 - 2. Cable End Spillway
- C. Backboard Cable Management
- D. Patch Panel Cable Management at racks and cabinets

1.2 RELATED WORK IN OTHER SECTIONS

- 1. Section 27 41 03 – Conduits and Backboxes for Audiovisual Systems
- 2. Section 27 41 07 – Identification for Audiovisual Systems
- 3. Section 27 41 08 – Audiovisual Cabinets, Racks, Frames and Enclosures

1.3 REFERENCES

- A. American Society For Testing and Materials (ASTM)
 - 1. ASTM D2239-03 Standard Specification for Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter
- B. Underwriters Laboratories (UL)
 - 1. UL 910 Test for Flame-Propagation and Smoke-Density Values for Electrical and Optical-Fiber Cables used in Spaces Transporting Environmental Air (Nov. 1998)

1.4 SUBMITTALS

- A. Conform with the requirements of University's Division 1 – General Requirements and Section 27 41 00 - Common Work Results for Audiovisual Systems.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Procedures: In accordance University's Division 1 – General Requirements.

PART 2 - PRODUCTS

2.1 INNERDUCT

- A. Innerduct, Single Chamber
 - 1. Drawing and spec reference(s):
 - a. ID*, Innerduct ("*" denotes cross sectional area of innerduct referenced to standard conduit trade size).

- b. IDP*, Innerduct, Plenum ("*" denotes cross sectional area of innerduct referenced to standard conduit trade size).
 2. Construction:
 - a. Selected product suitable for:
 - 1) underground installation in ductbank,
 - 2) plenum (IDP)
 - 3) exposed, in interior utility rooms where indicated.
 - b. High density polyethylene.
 - c. Ribbed or similar exterior construction to resist crushing surface to promote fiber cable installation.
 - d. Provides an interior chamber with a capacity equal to a trade size conduit referenced above.
 3. Approvals:
 - a. ASTM D2239(1985) Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter.
 - b. IDP - UL Standard Test Method 2024 of UL 910.
 4. Manufacturers, ID in underground ductbanks:
 - a. Carlon Optic-Gard/PE.
 - b. Arnco.
 - c. Vikimatic.
 - d. or equal.
 5. Manufacturers, ID in interior, non-plenum applications:
 - a. Carlon Optic-Gard/PVC.
 - b. Arnco.
 - c. Vikimatic.
 - d. or equal.
 6. Manufacturers, IDP:
 - a. Carlon Plenum-Gard.
 - b. Arnco.
 - c. Vikimatic.
 - d. or equal.
- B. Innerduct, Multi-Chamber:
 1. Drawing and spec reference: #ID*, Innerduct ("#" denotes number of chambers, "*" denotes cross sectional area of each chamber referenced to standard conduit trade size).
 2. Construction:
 - a. Multi-Chamber Innerduct shall be installed within an outer diameter CRSC or PVC Conduit per manufacturer's recommendation, and as described elsewhere herein.
 - b. Shall provide independent interior chambers each with a capacity equal to a trade size conduit referenced above.
 3. Approvals:
 - a. ASTM D2239(1985) Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter.
 4. Manufacturers, MultiChamber Innerduct:
 - a. AMP OptiDuct (Design Basis) Provide in combinations to meet scheduled requirement.
 - 1) 3ID1 - Provide one (1) Three Cell innerduct in one-half of a 4" diameter PVC conduit. Each cell to have 1" cross-sectional area.
 - 2) 1ID3 - Provide one (1) Single Cell innerduct in one-half of a 4" diameter PVC conduit, with 3" cross-sectional area.
 - 3) 2ID1.25 - Provide one (1) Two cell innerduct in one-half of a 4" diameter PVC

- conduit. Each cell to have 1.25" cross-sectional area.
- b. Carlon Multi-Gard
 - c. North Supply Multi-Guard Multi-Cell Conduit.
 - d. Tamaqua.
 - e. or equal
5. Manufacturers - Independent InnerDuct runs in overall PVC conduit - Multiple runs of single chamber inner duct may be provided in lieu of single, multiple chamber innerduct provided above. Contractor bears burden of selected innerduct quantity to provide an exact match of cross-sectional area of each chamber of multi-chamber assembly and to re-size overall PVC conduit to accommodate this use.
- a. Carlon.
 - b. American Plastics
 - c. Vikimatic
 - d. Or equal
6. Manufacturers, for direct burial or boring:
- a. Tamaqua
 - b. Carlon
 - c. Or equal
- C. Innerduct, UV Rated
1. Drawing Reference: ID, UV Rated*, where "*" denotes cross sectional area of each chamber referenced to standard conduit trade size).
 2. Approvals:
 - a. ASTM D2239(1985) Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter.
 3. Construction.
 - a. Listed for UV exposure.
 4. Manufacturers:
 - a. Tamaqua Plus II Series Telecom Duct.
 - b. Allwire Black AllDuct.
 - c. or equal.
- D. Woven Mesh Innerduct
1. Drawing Reference: MID, WMID
 2. Features/Functions
 - a. Three inch wide woven mesh assembly contains at least three continuous pullable sleeves, each can accommodate a cable of at least 1" diameter.
 - b. Systems providing fewer than 3 integrally woven sleeves per WMID assembly not acceptable.
 - c. Includes color coded pull tape in each sleeve.
 - d. Pre-Lubricated for cable pulling
 - e. Non-Hydroscopic
 - f. 2500 Pound Tensile Strength
 - g. 480 degree F melting point.
 - h. At least 5 years prior field use including at least 25 million feet of product in use.
 - i. Provide plenum rated assembly at plenum locations as defined by the California Electric Code.
 3. Manufacturers:
 - a. Maxcell/TVC 3" 3-cell in three unique colors per duct.
 - b. or equal (No known equal with identical 3 sleeves woven into a single assembly nor equal industry usage).

2.2 CONDUIT CABLE MANAGEMENT

- A. Conduit End Waterfall Spillway
 - 1. Drawing Reference: CEW
 - 2. Features/Functions
 - a. Spillway fastens to end of EMT conduit, provides radius sweep, open on top, solid from below
 - b. Maintains proper bend radii for fiber/cable
 - c. Provides tie points for fire pillow retention
 - d. Supports up to 100 lbs. of hanging fiber/cable
 - e. Clamp for securing to EMT
 - f. Self-fastening tie down system for supporting cabling
 - 3. Construction:
 - a. Fire Retardant ABS
 - 4. Manufacturers:
 - a. Bejed BJ-2049 Spillway.
 - b. or equal (no known equal).

PART 3 - EXECUTION

3.1 INNERDUCT INSTALLATION

- A. Schedule of Application
 - 1. At plenum tray conditions, provide IDP.
 - 2. At 4" and larger interior conduits, provide WMID. Provide plenum rated WMID at plenum ceiling conditions.

3.2 CONDUIT END WATERFALL

- A. Fasten securely to conduit end wherever cabling will exit conduit 18" or more above the cable tray to prevent damage due to cabling due to weight of cable bearing on a conduit end.
- B. Secure cabling with integral cable restraint system.

END OF SECTION

SECTION 27 41 16 - INTEGRATED AUDIOVISUAL SYSTEMS AND EQUIPMENT

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Provide all labor, materials, transportation and equipment to complete the furnishing, installation, assembly, set up, and testing of the Sound and Audiovisual System work indicated on the drawings and specified herein. Notwithstanding any detailed information in this Section, provide complete, working systems.
- B. Design, engineer and provide complete, all means of support, suspension, attachment, fastening, bracing, and restraint (hereinafter "support") of the Work of this Section. Provide engineering of such support by parties licensed to perform work of this type in the Project jurisdiction.

1.2 AUDIOVISUAL SYSTEMS AND EQUIPMENT

- A. Provide the following, in addition to work shown on the drawings, along with any additional equipment and accessories required for a complete, working system:
 - 1. Remove existing Council Chambers, 3rd Floor Lobby, and AV Control Room audiovisual equipment and associated cabling as indicated by drawings. Protect in place existing infrastructure and pathway for re-use. Coordinate disposition/disposal of removed equipment and cabling with Owner's representative.
 - 2. Provide and install (N) audiovisual equipment and cabling in Council Chambers, 3rd Floor Lobby, AV Control Room, Closed Session Conference Room, 2nd Floor Break Room, 1st Floor Divisible Conference Room, and 1st Floor Lobby as indicated by drawings. Re-use existing pathway between spaces where possible. Install (N) pathway where required. Provide RSC (rigid steel conduit) and metal backboxes/enclosures painted to match adjacent assemblies/finishes at all exposed locations where new pathway is required. Coordinate installation of (N) pathway and cabling with Owner's representatives ensuring work is scheduled to minimize disruption to other areas of City Hall.
 - 3. Commission, aim, test, and verify maximum sound pressure levels of installed devices.
 - 4. Develop user interface for control systems for both video/broadcast production (e.g. Video Production Switch) and audiovisual layers (e.g. DSP, AV Matrix Switch) of installed system with Owner Representatives familiar with the operation and production requirements of Meetings and other Events within the space.
 - 5. Provide system programming, training, and support to Owner during first-beneficial-use of (N) systems and equipment.
- B. Loudspeaker/Audio Processing, general:
 - 1. Program audio and speech content to output through overhead loudspeakers.
- C. Racking compartment, general:
 - 1. Provide blank plates at all unused openings.
 - 2. Provide fans as required to keep the interior of each equipment rack at a temperature at least 5-10 degrees cooler than equipment manufacturer's recommended operating temperature.
 - a. Fans to emit not more than 30 dB of noise.

- D. Control Systems, general:
 - 1. Review all push button and touch panel button nomenclature with Owner Representative prior to system programming.
 - 2. Provide graphic indication of program volume level on control touch panel when volume control is selected.
 - 3. Provide Main Menu selection button on all touch panel screens to route user back to main touch panel menu.

- E. Broadcast Control Systems and Templating
 - 1. Review video-production requirements for:
 - a. 100% In-person meetings
 - b. Hybrid meetings where some persons are in Chambers and some participants connect remotely via video-teleconference.
 - c. 100% remote meetings where all participants except City Staff officiating meeting connect remotely via video-teleconference.
 - 2. Provide programming and initial set-up of camera control and video production equipment to create presets for the above meeting scenarios. Provide means for recall of presets via the AV Control Layer.
 - 3. Provide “blank” presets and means for their recall via the AV Control Layer to allow Owner to implement additional use-cases at the Broadcast Control layer and recall them without requiring additional programming of AV control system.

- F. Control Functions:
 - 1. Control: Confirm all control functions and layouts with Owner Representative prior to system programming.
 - 2. Functions to operate by scene/mode, not by device.
 - 3. Provide user-interface (manual) selection to operate system in unified or subdivided modes, depending on how the Multipurpose Room’s moveable partitions are configured.
 - 4. End user selection of a single A/V input source (push buttons) automates:
 - a. Presets recalled.
 - b. Sets audio chain to loudspeakers.
 - c. End user selection on an Audio Only input automates:
 - 1) Sets audio chain.
 - d. Touch Panel Menus:
 - 1) Startup Page: “Press here to Begin”
 - 2) Home Page:
 - (1) “Select Source”: provides sub-menus of source selections.
 - (2) “Power Off”: Provides sub-menu selection of “Do you want to power off the system?” with “Yes” and “No” selections. Upon selection of “Yes”, menu reads “Please wait, shutting down system.”
 - 3) All menus, except Home Page, to include “Home” button to revert back to Home Page.

1.3 REFERENCE STANDARDS

- A. Conform to the applicable portions of the current standards published by these organizations:
 - 1. SMPTE Society of Motion Picture and Television Engineers.
 - 2. NAB National Association of Broadcasters.
 - 3. EIA Electrical Industries Association of America.

4. UL Underwriters Laboratories.
5. AES Audio Engineering Society.
6. NEC National Electrical Code.
7. UBC Uniform Building Code.
8. NFPA National Fire Protection Association.
9. EIAJ Electrical Industries Association of Japan.
10. IEC International Electrotechnical Commission.
11. FCC Federal Communications Commission.
12. NTC Network Transmission Committee of the Video Transmission Engineering Advisory Committee.
13. NCTA National Cable Television Association.
14. BTSC Broadcast Television Stereo Committee.
15. TASO Television Allocation Study Organization.

B. Conform additionally to the following specific standards:

1. American National Standards Institute (ANSI)
 - a. ANSI S1.4-1983 (R2001) American National Standard Specification for Sound Level Meters
 - b. ANSI S1.11-1986 (R2001) American National Standard Specification for Octave-Band and Fractional Octave-Band Analog and Digital Filters
 - c. ANSI S1.42-1986 (R2001) American National Standard Design Response of Weighting Networks for Acoustical Measurements
 - d. ANSI IT 7.214-89 Audio-visual Systems - Front Projection Screens (Tripod/Free-Standing) - Methods for Testing and Reporting Performance Characteristics.
2. Audio Engineering Society Incorporated (AES)
 - a. AES2-1984 (r1997) AES Recommended Practice Specification of Loudspeaker Components Used in Professional Audio and Sound Reinforcement
 - b. AES5-1998 (Revision of AES5-1984) AER recommended practice for professional digital audio – Preferred sampling frequencies for applications employing pulse-code modulation
 - c. AES14-1992 (r1998) AES standard for professional audio equipment – Application of connectors, part 1, XLR-type polarity and gender
 - d. AES20-1996 AES recommended practice for professional audio – Subjective evaluation of loudspeakers
 - e. AES26-2001 Revision of AES26-1995 AES recommended practice for professional audio interconnections – Conservation of the polarity of audio signals
 - f. AES-R2-1998 AES project report for articles on professional audio and for equipment specifications – Notations for expressing levels
3. Electronic Industries Association of America (EIA)
 - a. EIA-160 Sound Systems
 - b. EIA-310-E Racks, Panels and Associated Equipment
 - c. EIA-101-A Amplifiers for Sound Equipment
 - d. SE-103 Speakers for Sound Equipment
 - e. SE-104 Engineering Specifications for Amplifiers for Sound Equipment
4. International Electrotechnical Commission (IEC)
 - a. IEC 268-3 (1988) Sound system equipment – Part 3: Amplifiers
 - b. IEC 268-5 (1989) Sound system equipment – Part 5: Loudspeakers
 - c. IEC 268-12 (1987) Sound system equipment – Part 12: Application of Connectors for Broadcast and Similar Use
 - d. IEC 651 (1979) Sound level meters

5. International Organization for Standardization (ISO)
 - a. ISO 1996-1 Acoustics – Description and measurement of environmental noise – Part 1: Basic quantities and – Composite Analog Video Signal – NTSC for Studio Applications
6. Federal Specifications (FS)
 - a. GG-S-00172D Screen, Projection. Federal Supply Classification (FSC) 670.
7. Federal Standards (Fed-Std)
 - a. 191A Textile Test Methods.
 - 1) 5760 Mildew Resistance of Textile Materials; Mixed Culture Method.
 - 2) 5903.1 Flame Resistance of Cloth; Vertical.
8. NFPA
 - a. 255 Method of Testing Surface Burning Characteristics of Building Materials.
 - b. 701 Methods of Fire Tests for Flame-Resistant Textiles and Films.
9. Society of Motion Picture Engineers (SMPTE).
 - a. SMPTE 196M-86 Motion Picture - Screen Luminance and Viewing Conditions - Indoor Theater Projection Guide.
 - b. SMPTE 202M-1998 Motion Pictures – B Chain Electroacoustic Response – Dubbing Theaters, Review Rooms and Indoor Theaters
 - c. SMPTE RP167-1995 Alignment of NTSC Color Picture Monitors
 - d. SMPTE EG1-1990 Alignment Color Bar Test Signal for Television Picture Monitors
 - e. SMPTE EG27-1994 Supplemental Information for ANSI/SMPTE 170M and Background on the Development of NTSC Color Standards (R1999)
 - f. RP 94 Recommended Practice for Gain Determination of Front Projection Screens.
 - g. SMPTE RP 95 Recommended Practice for Installation of Gain Screens.
 - h. SMPTE RP 98 Recommended Practice for Measurement of Screen Luminance in Theatres.
10. Underwriters Laboratories Incorporated (UL)
 - a. UL 813 Commercial Audio Equipment 1996
 - b. UL 1419 Professional Video and Audio Equipment 1997
 - c. UL 1492 Audio-Video products and Accessories 1996
 - d. UL 6500 Audio/Video and Musical Instrument Apparatus for Household, Commercial and Similar General Use 1999

1.4 RELATED WORK IN OTHER SECTIONS

- A. Section 27 41 01 – Grounding and Bonding for Audiovisual Systems
- B. Section 27 41 02 – Hangers and Supports for Audiovisual Systems
- C. Section 27 41 03 – Conduits and Backboxes for Audiovisual Systems
 1. Raceway system for work of this Project, including floorboxes.
- D. Section 27 41 06 – Noise and Vibration Controls for Audiovisual Systems
 1. Outlet box pads for the work of this Project.
- E. Section 27 41 07 – Identification for Audiovisual Systems
- F. Section 27 41 08 – Audiovisual Cabinets, Racks, Frames
 1. Floor Mounted and Casework Equipment Racks for the work of this Section.
- G. Section 27 41 09 – Audiovisual Cable Management

1.5 QUALITY ASSURANCE

- A. Test Equipment - Refer to 27 41 00:
 - 1. Sound Systems:
 - a. Wide band oscilloscope, 50 MHz, analog. (Example: Tektronix TAS-250 or 2212).
 - b. True RMS audio digital volt-ohm-millimeter (Example: Fluke 8060A).
 - c. Integrated audio test set (Example: Audio Precision or Neutrik A1 or A2 System).
 - d. Acoustic polarity tester (Example: BSS Audio Ltd. Phasecheck System AR 130).
 - e. Pink Noise generator (Example: Ivie IE-20B).
 - f. Calibrated microphone and pre-amplifier assembly (Example: Ivie IE-2P preamplifier/power supply with Ivie/ACCO, Bruel & Kjaer, or Larson-Davis microphone capsule).
 - g. Real time audio spectrum analyzer, one-third octave (Example: Ivie IE-30A or JBL Smaart system).
 - h. Frequency/time audio analyzer (Example: Crown TEF system or JBL Smaart system).
- B. Baseband Video Systems:
 - 1. Wide band oscilloscope, 50 MHz, analog. (Example: Tektronix TAS-250 or 2212).
 - 2. Analog composite test generator (Example: Tektronix TSG 170A or TSG 100 Opt. 01).
 - 3. Analog composite waveform/vector monitor (Example: Tektronix 1740A or WFM 90).
- C. RGBHV Wideband Component Analog Video Systems:
 - 1. Wide band oscilloscope, 200 MHz, analog. (Example: Tektronix TAS-485).
 - 2. RGBHV test generator (Example: Extron VTG 100).
- D. Projection Systems:
 - 1. Luminance meter. (Example: Tektronix J17/J18 with J1803 8 degree luminance head.).
 - 2. Grey scale chart.
 - 3. Precision optical comparator. (Example: Phillips or Tektronix J17/J18 with J1810/J1820 chromaticity head.).
- E. High-bandwidth Digital Content Protection (HDCP) check
 - 1. Quantum Data 882E HDMI-HDCP Compliance Test Tool
- F. Any other items of equipment or materials required to demonstrate conformance with the Contract Documents.

1.6 SUBMITTALS

- A. Conform with Section 27 41 00 - Common Work Results for Audiovisual Systems and Division 1.

1.7 CONFLICTS

- A. Present any conflicts between codes, regulations, specifications and/or requirements at least thirty (30) days prior to the commencement of the scheduled work.

1.8 SYSTEM PERFORMANCE REQUIREMENTS, AUDIO-VISUAL SYSTEM

- A. Using the listed test equipment, document that the installed systems meet or exceed the performance standards below.

- B. Audio Playback and Sound Reinforcement Systems:
 - 1. Electrical Performance; Source Input to Power Amplifier Output:
 - a. Frequency Response (Equalizer flat): +0.5 dB 30 Hz to 15 kHz.
 - b. Total Harmonic Distortion (THD): Less than 0.5%, 30 Hz to 15 kHz, +4 dBm line level.
 - c. Signal to Noise: At least 70 dB, 30 Hz to 15 kHz, referenced to input of +4 dBm.
 - d. Crosstalk: At least -60 dB, 30 Hz to 15 kHz.
 - 2. Electro/Acoustic Performance:
 - a. Uniformity of Coverage: ± 4 dBA, 5 feet above the floor.
 - b. Minimum Sound Pressure Level at Center of Target - at indicated aiming point, down centerline of device. 83 dBA, 5 feet above the floor.
 - 3. Equipment: Specified individually.
 - 4. Audio Signal Path: Shall not degrade performance of connected equipment.
- C. Video Systems:
 - 1. Video Signal System: NTSC to EIA RS-170A, except as noted.
 - 2. Video Signal Path: To EIA RS-250B short haul where equalized, otherwise to the performance limit of the specified video cable.
- D. RGBS Video Systems:
 - 1. Video Signal: Pass 300 Hz to 120 MHz sine wave from any input to any output with losses of less than 1 dB over cable loss at cable manufacturer specified performance points without amplification.
- E. Projection and Display Systems:
 - 1. Consistent with performance of specified displays, projectors and screens.
 - 2. Brightness, convergence per ANSI standard procedures for device.
- F. High-bandwidth Digital Content Protection (HDCP) check
 - 1. At spaces with HDMI transmission:
 - a. Run HDCP check to ensure all devices are HDCP compliant.
 - b. Test with sample source device with quantity of HDCP keys as required to operate by the system.

1.9 TRAINING

- A. Conduct training on completed system at reasonable convenience of the Owner during normal business hours.
- B. Operator Training: Sixteen (16) hours.
- C. Initial Use Support: Provide standby trainer/system engineer during two (2) system uses, each not to exceed four (4) hours of training.

1.10 DEFINITIONS

- A. Definitions of Terms: The following definitions and conditions apply to each of the respective parameters and the measurements of those parameters, unless specifically stated otherwise:

1. Frequency Response: The minimum acceptable frequency band over which the amplitude response is within 3 dB (or any specified range), or the specified limits of the response relative to the reference frequency (1 kHz for audio, 1.0 MHz for video) under design load conditions, at any operating level up to and including the specified maximum output while fully in compliance with all other performance specifications.
 2. Maximum Output Level: The minimum acceptable maximum signal output level (voltage, current or power) attained under design load conditions attained while fully in compliance with all other performance specifications.
 3. Harmonic Distortion: The maximum acceptable harmonic distortion measured at any operating level, up to and including the specified maximum output, with an applied sine wave signal of any frequency in the range of the specified frequency response.
 4. Audio Intermodulation Distortion: The maximum acceptable intermodulation distortion resulting from the introduction of 60 Hz and 7 kHz signals in a ratio of 4:1 under design load conditions at any operating level up to and including the specified maximum output level.
 5. Signal to Noise Ratio: The minimum acceptable ratio of signal to noise levels derived from broadband measurements under design load at maximum output over the entire range of the specified frequency response.
 6. Clipping Level: The minimum acceptable maximum level of signal applied to the device under design load conditions while fully in compliance with all other performance specifications.
 7. Sensitivity: The maximum acceptable level of input signal applied to the device that is necessary to provide the maximum output under design load conditions.
 8. Design Load: The load (in ohms) specified by usage of the particular device input or output.
 9. Composite Triple Beat Ratio: The ratio of visual carrier level to composite third order distortion products.
 10. Cross Modulation Ratio: The ratio of visual carrier level to coherent spurious signal level (i.e. intermodulation products).
 11. Carrier to Noise Ratio: The ratio of visual carrier to noise levels derived from broadband measurements under design load at maximum output over the entire range of the specified frequency response.
- B. Signal Levels: The following voltage levels shall be considered the standard operating levels for the particular circuitry, unless specifically noted otherwise (0.775 Volt = 0 dBu = 0 dbm for a 600 ohms terminated circuit):
1. Microphone Circuits: -30 dBu or less.
 2. Audio Line Level Circuits: -30 dBu to +24 dBu; equivalent to -30 dBm to +24 dBm for a 600 ohms terminated circuit.
 3. Loudspeaker Level Circuits: More than +24 dBu.
 4. Video Line Level Circuits: 1.0 Volt, peak to peak composite signal.
 5. Radio Frequency (RF), Television (TV) Circuits: +6 to +72 dBmV (0 dBmV = 1,000 microvolts).
- C. Characteristic Impedances: The following operating impedances shall be considered to be the standard operating impedances for the particular circuitry, unless specifically noted otherwise:
1. Microphone Circuits: 50-250 ohms source, 150-1500 ohms terminating, electrostatically and electromagnetically balanced to ground.
 2. Audio Line Level Circuits: 600 ohms maximum source, 600 ohms minimum terminating, line to line, electrostatically and electromagnetically balanced to ground.
 3. Video Line Level Circuits: 75 ohms maximum source, 75 ohms minimum terminating to shield and signal ground, with Vertical Standing Wave Ratio (VSWR) not to exceed 1.2.

4. Radio Frequency (RF) Television Circuits: 75 ohms nominal to shield and signal ground, with Vertical Standing Wave Ratio (VSWR) not to exceed 1.2.

1.11 SOFTWARE LICENSING

- A. Provide licensing for project specific software programming at programmable devices.
- B. Provide licensing and original software copies for each device provided under Work of this Section that uses software for operation, configuration or control.
 1. Provide licensing for required workstation operating systems, and required third party software.
 2. For the Control System, provide a complete copy of the source code, including the device interface driver code modules.
- C. Upgrade each software package to the release in effect at the end of the Warranty Period.

PART 2 - PRODUCTS

2.1 POWER AMPLIFIERS AND RELATED

- A. Power Amplifiers, General
 1. Drawing Symbol: PA [number].
 2. Provide the following functions and/or features
 - a. Employ solid state devices (integrated circuits and/or transistors) throughout and employ positive protection of circuit components.
 - b. With amplifier input driven 10 dB beyond input level required to produce full rated output, amplifier shall withstand for at least 15 seconds any of the following load conditions without instability or operation of main over current protection (i.e. no blown fuses or circuit breakers).
 - 1) "Short" circuit of 0.1 ohm.
 - 2) Open circuit (no load).
 - 3) Standard Reactive Load: 5.4 ohms in series with the parallel combination of 12.5 microhenrys; 800 microfarads and 18.3 ohms resistive.
 - c. Peak voltage of turn-on and/or turn-off transients not greater than 20 dB below maximum rated amplifier output.
 - 1) Time duration of transients not to exceed 3 seconds.
 - d. Input level controls for each output channel to be calibrated, stepped attenuators with at least 50 dB range.
 - 1) For 0 to 34 dB of attenuation, steps not to be greater than 2.0 dB.
 - 2) Attenuators to track calibration within 0.5 dB.
 - 3) Stepped attenuators are not required at Power Amplifiers where the connected driving source device includes a precision attenuator under digital control with precision not less than that specified herein.
 - e. Input Connectors: XLR connector or tip sleeve (standard) phone jack or barrier strip.
 - f. Output Connectors: Standard 0.75 inch spacing "5-way" binding posts, or barrier strip.
 - g. Where integral cooling fans are provided, such fans shall have a minimum life rating of 50,000 hours at 25 degree Centigrade ambient temperature.
 - h. Where indicated, provide balanced input, differential or transformer. Provide matching accessory to implement if not a standard feature of the product provided.

- i. Listed by a Nationally Recognized Testing Laboratory.
3. Minimum performance requirements with all channels driven
 - a. Power Output Per Channel: As scheduled on Drawings as Minimum Amplifier (Min Amp) and specified below; continuous average sine wave power into 70 Volt line over a bandwidth of 40 Hz to 20 kHz.
 - 1) Frequency Response: plus 0 dB, minus 0.5 dB, 40 Hz to 20 kHz at rated output.
 - 2) Total Harmonic Distortion: Less than 0.25 percent at rated output, 40 Hz to 20 kHz.
 - 3) Intermodulation Distortion: Less than 0.04 percent at rated output using frequencies of 60 Hz and 7 kHz, mixed in a ratio of 4:1.
 - 4) Input Impedance: 15,000 ohms minimum; unbalanced, or balanced as shown on drawings.
 - 5) Hum & Noise: At least 94 dB signal-to-noise ratio.
 - 6) Channel Separation: At least 75 dB at 1 kHz.
 - 7) Phase Shift: Less than plus 20 degrees from 20 Hz to 20 kHz.
 - 8) D.C. Offset: Less than 10 millivolts.
- B. Power Amplifiers, 2 Channel, Low Impedance
 1. Drawing Symbols
 - a. PA 25
 - b. PA100
 - c. PA200
 - d. PA300
 2. Comply with Power Amplifiers, General, in this Section.
 3. Power Output Per Channel, continuous average sine wave power into 8 ohm voice coil impedance, not less than:
 - a. PA25, 25 Watts
 - b. PA100, 100 Watts
 - c. PA200, 200 Watts
 - d. PA300, 275 Watts
 4. Dimensions
 - a. PA 25, not to exceed 1 rack unit for 2 channels.
 - b. PA100, PA200 and PA300, not to exceed 3 rack units for 2 channels.
 5. Manufacturer, PA25
 - a. Crown D-45
 - b. Stewart Electronics
 - c. Or equal
 6. Manufacturer, PA100
 - a. Crown CL1
 - b. Crown Cdi in low impedance mode.
 - c. QSC
 - d. Stewart Electronics
 - e. Electro-Voice
 - f. Peavey
 - g. Or equal
 7. Manufacturer, PA200
 - a. Crown CL1
 - b. Crown Cdi in low impedance mode.
 - c. QSC
 - d. Stewart Electronics

- e. Electro-Voice
- f. Peavey
- g. Or equal
- 8. Manufacturer, PA300
 - a. Crown CL1
 - b. Crown Cdi in low impedance mode.
 - c. QSC
 - d. Stewart Electronics
 - e. Electro-Voice
 - f. Peavey
 - g. Or equal

C. Power Amplifiers, 2 Channel, 70 Volt

- 1. Drawing Symbol
 - a. PA50-70
 - b. PA100-70
 - c. PA200-70
 - d. PA300-70
 - e. PA400-70
- 2. Comply with Power Amplifiers, General, in this Section.
- 3. Power Output Per Channel, continuous average sine wave power into 70 Volt line impedance, not less than.
 - a. PA50-70, 50 Watts
 - b. PA100-70, 100 Watts
 - c. PA200-70, 200 Watts
 - d. PA300-70, 300 Watts
 - e. PA400-70, 600 Watts
- 4. Dimensions: Not to exceed 3 rack units for 2 channels.
 - a. Manufacturer, PA50-70
 - 1) Stewart CVA-50-1
 - 2) Crown
 - 3) QSC
 - 4) Peavey
 - 5) Or equal
 - b. Manufacturer, PA100-70
 - 1) Crown CH-1
 - 2) QSC
 - 3) Peavey
 - 4) Or equal
 - c. Manufacturer, PA200-70
 - 1) Crown CH-1
 - 2) QSC
 - 3) Peavey
 - 4) Or equal
 - d. Manufacturer, PA300-70
 - 1) Crown CH-1
 - 2) QSC
 - 3) Peavey
 - 4) Or equal

- e. Manufacturer, PA400-70
 - 1) Crown CH-2
 - 2) QSC
 - 3) Peavey
 - 4) Or equal

2.2 DISTRIBUTED LOUDSPEAKER ASSEMBLIES AND RELATED

A. Compact Package 2-way Program Audio Speakers

- 1. Drawing Reference: SP (truss), SR (wall)
- 2. General:
 - a. Two-way speaker system, including
 - 1) Point source time-coherent driver system, or
 - 2) 6-1/2" Woofer and 1" Softdome HF driver
 - b. Minimum Features, Functions, Performance:
 - 1) Frequency Response, on axis: 80Hz to 16kHz + 2.5dB
 - 2) Power Handling Capacity: 100 watts rms, as per EIA RS-426-A.
 - 3) Pressure Sensitivity: Not less than 90 dB at 1M with 1 watt from 100Hz to 10kHz.
 - 4) Nominal Impedance: 4-8 ohms
 - 5) Dispersion: 120 degrees horizontal, 120 degrees vertical nominal 6dB down at 2 kHz.
 - c. Construction:
 - 1) Maximum Dimensions: 9" (H) x 6" (W) x 5" (D)
 - 2) Maximum Weight: 6 lbs.
 - 3) Integral anchorage for mounting hardware.
 - 4) All direction adjustable anchorage.
 - 5) Black or White Plastic enclosure, black or white painted grill. Color selected by City's Representative.
- 3. Manufacturers:
 - a. JBL Control 25 with Omnimount 60 WB mount.
 - b. Tannoy T8 or i7 Contour with Omnimount 60 WB mount.
 - c. Cambridge Sound Newton Series M60 or M80 with Omnimount 60 WB mount.
 - d. Or equal.

B. Loudspeaker, Near-field Monitor

- 1. Drawing Reference: NFM
- 2. Features/Functions:
 - a. 2-way full-range loudspeaker system
 - b. Frequency response: 20Hz-20kHz
 - c. Self-powered
- 3. Manufacturer:
 - a. JBL LSR305 MKii
 - b. Dynaudio
 - c. Or equal

C. Set-attached Sound Bar Speaker

- 1. Drawing Reference: SBS
- 2. Construction:
 - a. System Configuration 2-channel 2-way full-range for music / speech
 - b. Components & Loading (2) 3.5" long-throw woofers and (1) 0.75" tweeter per channel

- c. Recommended High-Pass Filter On-board 1st order @ 120 Hz; no outboard HP needed
 - d. Enclosure Type Low profile sealed enclosure
 - e. Enclosure Material Extruded ABS plastic with steel baffle insert
 - f. Finish: Black
 - g. Connectors Dual binding-head screws
 - h. Suspension Hardware Universal mounting kit for direct attachment to display
 - i. Grille Integral fabric wrap
3. Minimum Features/Function/Performance:
- a. Frequency Response: 120 – 20,000 Hz, +/- 3 dB
 - b. Sensitivity 90 dB @ 2.83 volts / 1M
 - c. Impedance 8 ohm
 - d. Power Handling 90 W long term (AES-2) (per channel)
 - e. Maximum Output 103 dB long term; 109 dB peak
 - f. Nominal Coverage Angles 100° H x 120° V
 - g. Nominal Dimensions
 - 1) height: 4.13 “
 - 2) width: match display wall
 - 3) depth: 2.06 ”
 - h. Net Weight 15 lbs
4. Manufacturers:
- a. Innovox FS-H2
 - b. Cambridge Sound
 - c. Or equal

2.3 AUDIO PROCESSING

A. Digital Signal Processing (DSP) System

1. Drawing Symbol(s): DSP
2. Function/Features:
 - a. Implement functions shown on Drawings using Digital Signal Processing (DSP) hardware and software.
 - b. System implements in software at least the following functions as indicated on the plans:
 - 1) AMIX - automatic microphone mixer - MIC and LINE INPUTS as indicated
 - 2) REMOTE - Remote power on/off, gain control, auxiliary mixer select, System Mode - controlled through interface to Control System specified elsewhere in this Section.
 - 3) DELAY - multi-channel delay, output quantity as indicated with 0-100 ms delay assignable to each output on selection of delay mode operation.
 - 4) LEVEL - Gain control under control of REMOTE
 - 5) X02WAY 24dB - Crossover network, 2 port, 24 dB/octave
 - 6) HP - High Pass Filter
 - 7) LIM - Limiter
 - 8) SHELF - Shelving Filter
 - 9) FBX - Automatic Feedback Suppressor
 - 10) PEQ* - Parametric Equalizer, where * indicates bands provided
 - 11) MIX* - Mixer, where * indicates channel count
 - 12) LP - Low pass filter
 - c. Field reconfigurable functions and parameters.
 - d. Performance:

- 1) Sample at 48 kHz or greater.
- 2) At least 20 bit input/output quantization.
- 3) Noise performance within 3 dB of theoretical limit.
- 4) Minimum of 24 bit internal processing.
- 5) Provide control with true status feedback.
- e. Priority volume attenuator implemented as indicated on the drawings/specification narrative.
3. Manufacturer - DSP System
 - a. Q-sys 110f
 - b. Biamp Systems AudiaFLEX configured with Audia IP2 input boards, Audia OP2 output boards and AudiaEXPO output expander as required.
 - c. Symetrix SymNet Series
 - d. Or equal..

2.4 ASSISTIVE LISTENING SYSTEM (ALS):

A. General

1. Provide Radio Frequency Type, Frequency Modulated
2. 72 MHz Assistive Listening band.
3. Quantity of Devices:

B. 3-Channel ALS Transmitter

1. Drawing Symbol: ALS TX
2. Features
 - a. Balanced bridging XLR/1/4" combo line input.
 - b. (2) RCA Phono connector line inputs
 - c. Rack mounted.
 - d. Connector for remote-mounted antenna.
 - e. Selectable transmitting frequency.
3. Manufacturer
 - a. Listen Technologies LT-803-072-01 Stationary Transmitter with LA-326 Rack Mounting Kit
 - b. Phonic Ear
 - c. Williams Sound Corp
 - d. Or equal.

C. ALS Remote Transmitting Antenna

1. Drawing Symbol: A
2. Features
 - a. Antenna system with mounting hardware, matching specified ALS TX.
3. Manufacturer
 - a. Listen Technologies LA-123
 - b. Phonic Ear
 - c. Williams Sound Corp
 - d. Or equal.

D. Receivers and Accessories

1. Receiver
 - a. Battery powered, rechargeable.

- b. Volume control.
 - c. Receptacle for earphone/accessory.
 - d. Rechargeable battery.
 - e. Tuneable to channel in use by the user.
 - f. Quantity: As Scheduled on the plans
 - 2. Earphone
 - a. Ear hung, not inserted in the ear canal.
 - b. Hearing-Aid Compatible - For hearing-aid compatible receivers:
 - c. Wireless neck loop compatible with "T" coil hearing aids.
 - d. Built-in antenna
 - e. Operates with provided receivers
 - 3. Manufacturer
 - a. Listen Technologies LR-500-072-0-M-C, LA-164 earphones, and LA-166 neck loops
 - b. Phonic Ear
 - c. Williams Sound Corp
 - d. Or equal.
- E. Battery Charger/Storage/Carry Case
- 1. Features
 - a. Store and charge up to 16 Receivers and related accessories.
 - b. Cover, latches and carrying handles.
 - c. Removable lid.
 - 2. Quantity: To simultaneously recharge each received as scheduled on the plans
 - a. Manufacturer
 - b. Listen Technologies LA-325
 - c. Phonic Ear
 - d. Williams Sound Corp
 - e. Or equal.

2.5 AUDIO SOURCES AND PROCESSING

- A. Gooseneck Microphone
- 1. Drawing Reference: GMIC
 - 2. General.
 - a. The microphone shall be a fixed-charge condenser designed for permanent installation or portable applications.
 - 3. Minimum Features/Functions/Performance:
 - a. It shall have a cardioid polar pattern with uniform 120° angle of acceptance and shall be capable of accepting optional interchangeable elements for additional polar patterns. It shall have a frequency response of 30 Hz to 20,000 Hz and be capable of handling sound input levels up to 138 dB with a dynamic range of 109 dB. Nominal open-circuit output voltage shall be 10.0 mV at 1 kHz, 1 Pascal. Output shall be low impedance balanced (250 ohms).
 - b. The microphone shall operate from an external 11V to 52V DC phantom power source. It shall offer outstanding rejection of radio frequency interference (RFI). The microphone shall be RoHS compliant.
 - c. The microphone shall be a double gooseneck design permitting highly flexible positioning and noiseless operation, with an overall length of 15 to 18 inches from the mounting surface.

- d. It shall incorporate a self-contained power module with an XLRM-type connector at the base for direct connection to a mating XLRF-type panel jack or cable connector. The power module shall include a recessed switch for low frequency roll-off. The low-frequency roll-off shall be a tailored roll-off at 80 Hz to minimize pickup of unwanted mechanical noise.
 - e. A universal isolation-type shock mount suitable for above or below surface installation shall be supplied for mounting the microphone in a solid surface. It shall be possible to firmly secure the microphone in the mount. The mount shall include appropriate hardware for installation.
 - f. A snap-on foam windscreen shall also be included.
4. Manufacturers:
- a. AudioTechnica ES915C or ES918C with included shock mount.
 - b. Shure Microflex MX418 with included shock mount.
 - c. or equal.

B. Wireless Gooseneck Microphone

- 1. Drawing Reference: WGMIC
- 2. Features/Functions:
 - a. Audio Input
 - 1) Microphone Connector: 6-pin connector for Shure MX405/10/15
 - 2) Configuration: Unbalanced
 - 3) Impedance: >20 k Ω
 - b. RF Output
 - 1) Antenna Type: Integrated PIFA
 - 2) Impedance: 50 Ω
 - 3) Occupied Bandwidth: <200 kHz
 - 4) Modulation Type: Shure proprietary digital
 - 5) Power: 1 mW, 10 mW, 20 mW
 - 6) See Frequency Range and Output Power table, varies by region
 - c. Gain Adjustment Range: 0 to 21 dB (in 3 dB steps)
 - d. Battery Type: Shure SB900/SB900A Rechargeable Li-Ion or AA batteries 1.5 V
 - e. Battery Runtime
 - 1) @ 10 mW
 - (1) Shure SB900: Up to 9 hours
 - (2) AA batteries: Up to 8 hours 20 minutes
 - f. Dimensions: 136.94 mm x 78.27 mm x 40.77 mm (5.39 in. x 3.08 in. x 1.60 in.) H x W x D
 - g. Weight: 293 g with AA batteries
 - h. Operating Temperature Range: 0°C (32°F) to 45°C (113°F)
 - i. Housing: Molded Plastic
- 3. Manufacturer
 - a. Shure ULXD8 with Networked Charging Stations for quantity specified on plans.
 - b. Or equal

C. Radio Frequency Receiver/Wireless Microphone System:

- 1. Drawing Reference(s):
 - a. WMRX
 - b. WMIC LAV - Wireless Mic, Lavalier
 - c. Wireless microphone symbol.

2. Provide quantity of complete systems to match quantity of WMIC LAV microphone symbols shown.
 - a. Coordinate operating frequency with other UHF local sources, including but not limited to current television operating frequencies and DTV frequency allocations and/or local public safety operating frequencies to eliminate any interference from outside RF sources.
 - b. Provide Receiver unit configured for diversity reception.
 - c. Allows the expansion of wireless microphone systems by splitting one pair of antennas to multiple receivers. It also amplifies RF signals to compensate for insertion loss that results from splitting signal power to multiple outputs. A single system can support up to four wireless receivers.
3. Function/Features/Performance:
 - a. WMRX/WMIC LAV
 - 1) Operating Range Under Typical Conditions: 100m (300 ft.) Note: actual range depends on RF signal absorption, reflection, and interference.
 - 2) Audio Frequency Response (+/- 2 dB): Minimum: 45 Hz; Maximum: 15 kHz
 - 3) Total Harmonic Distortion (ref. +/- 38 kHz deviation, 1 kHz tone): 0.5%, typical
 - 4) Dynamic Range: >100 dB A-weighted
 - 5) Operating Temperature Range: -18°C (0°F) to +57°C (+135°F)
Note: battery characteristics may limit this range
 - 6) Transmitter Audio Polarity: Positive pressure on microphone diaphragm (or positive voltage applied to tip of WA302 phone plug) produces positive voltage on pin 2 (with respect to pin 3 of low impedance output) and the tip of the high impedance 1/4-inch output.
4. Manufacturer, WMIC LAV System:
 - a. Shure QLXD24/SM58 Digital Wireless Handheld System w/ SM58 Cartridge, Shure QLXD14 Bodypack System, and Shure WCE6T Omnidirectional Condenser Rigid Earset Microphone, tan.
 - b. Or equal.

2.6 VIDEO SOURCES AND PROCESSING

- A. Rack-mounted Network-accessible Solid-State HD Video Recorder
 1. Drawing Reference: NVR
 2. Features/Functions/Performance:
 - a. Video Input: 1080i 25, 29.97, 30, 1080PsF 23.98, 24, 25*, 29.97*, 1080p 23.98, 24, 25, 29.97, 720p 23.98*, 25*, 29.97*, 50, 59.94, 60, 625i 25, 525i 29.97.
 - b. Codec Support: Apple ProRes 422, Apple ProRes 422 (HQ), Apple ProRes 422 (LT), Apple ProRes 422 (Proxy), Avid DNxHD HQX (220x), Avid DNxHD SQ (145), Avid DNxHD LD (36) only provides support for the 1080p format.
 - c. Removable Storage: 2-slots w/ rollover recording.
 - d. Video Input Digital: SD/HD SDI, SMPTE-259/292/296, 10-bit, Single Link 4:2:2 (2 x BNC, input selection in software), HDMI v1.3
 - e. Video Output Digital: SD/HD SDI, SMPTE-259/292/296, 10-bit, Single Link 4:2:2 (1 x BNC), HDMI v1.3
 - f. Audio Input Digital: 8-Channel, 24-bit SMPTE-272/299 SDI embedded audio, 48 kHz sample rate, synchronous; 8-Channel, 24-bit HDMI embedded audio, 48 kHz sample rate, synchronous; 8-Channel, 24-bit AES/EBU audio, 48 kHz sample rate, synchronous or nonsynchronous, internal sample rate conversion (4 x BNC)

- g. Audio Input Analog: 2-Channel, 24-bit A/D analog audio, 48 kHz sample rate, balanced (2 x XLR); +24 dBu full scale digital; +/- 0.2 dB 20Hz to 20 kHz frequency response (Note: Line or Mic selection via CONFIG menu parameters)
 - h. Audio Output Digital: 8-Channel, 24-bit SMPTE-272/299 SDI embedded audio, 48 kHz sample rate, synchronous; 8-Channel, 24-bit HDMI embedded audio, 48 kHz sample rate, synchronous; 8-Channel, 24-bit AES/EBU audio, synchronous or nonsynchronous, internal sample rate conversion (4 x BNC)
 - i. Audio Output Analog: 2-Channel, 24-bit D/A analog audio, 48 kHz sample rate, balanced (2 x XLR); +24 dBu full scale digital (0dbFS); +/- 0.2 dB 20 Hz to 20 kHz frequency response; Stereo unbalanced headphone (1 x 3.5mm mini jack)
 - j. Timecode: SDI RP188/SMPTE 12M via SDI BNC; HDMI (when used with compatible cameras); LTC Input (1 x BNC); LTC output (1 x BNC) (Note: active during playback not during record or EE)
 - k. RS-422 Machine Control
 - l. 1 RU
 - 3. Manufacturer:
 - a. Aja Ki Pro Rack
 - b. Or equal
- B. RTMP Streaming Encoder/Decoder
- 1. Drawing Reference: RTMP
 - 2. Features:
 - a. Streaming
 - 1) Encode Video Formats H.264 (MPEG-4 part 10 AVC)
 - 2) Decode Video Formats H.264, MJPEG
 - 3) Audio Formats AAC stereo
 - 4) Bitrates 96 to 25000 kbps
 - 5) H.264 Profiles Baseline Profile (BP), Main Profile (MP), High Profile (HiP)
 - 6) Streaming Protocols RTP, RTSP, SDP
 - 7) Container MPEG-2 transport stream (.ts) or none
 - 8) Session Initiation Modes By receiver (unicast), by transmitter (unicast), multicast via RTSP, multicast via UDP
 - 9) Streaming Input Resolutions Up to 1920x1080@60Hz (1080p60)
 - 10) Streaming Output Resolutions Auto (follows HDMI input), 176x144, 352x288, 528x384, 640x360, 640x480, 720x480, 800x480, 800x600, 1024x768, 1280x720, 1280x800, 1366x768, 1440x900, 1600x900, 1600x1200, 1680x1050, 1920x1080; at frame rates up to 60 Hz
 - b. Video
 - 1) Input Signal Types HDMI® (DVI & Dual-Mode DisplayPort compatible [1])
 - 2) Output Signal Types HDMI (DVI compatible [1])

- 3) Input Resolutions, Progressive 640x480@60Hz, 720x480@60Hz (480p), 720x576@50Hz (576p), 800x600@60Hz, 848x480@60Hz, 852x480@60Hz, 854x480@60Hz, 1024x768@60Hz, 1024x852@60Hz, 1024x1024@60Hz, 1280x720@50Hz (720p50), 1280x720@60Hz (720p60), 1280x768@60Hz, 1280x800@60Hz, 1280x960@60Hz, 1280x1024@60Hz, 1360x768@60Hz, 1365x1024@60Hz, 1366x768@60Hz, 1400x1050@60Hz, 1440x900@60Hz, 1600x900@60Hz, 1600x1200@60Hz, 1680x1050@60Hz, 1920x1080@24Hz (1080p24), 1920x1080@25Hz (1080p25), 1920x1080@50Hz (1080p50), 1920x1080@60Hz (1080p60), plus any other resolution allowed by HDMI up to 148MHz pixel clock
 - 4) Input Resolutions, Interlaced 720x480@30Hz (480i), 720x576@25Hz (576i), 1920x1080@25Hz (1080i25), 1920x1080@30Hz (1080i30), plus any other resolution allowed by HDMI up to 148MHz pixel clock
 - 5) Output Resolutions Auto (follows streaming input), 640x480@60Hz, 800x600@60Hz, 1024x768@60Hz, 1280x720@50Hz (720p50), 1280x720@60Hz (720p60), 1280x800@60Hz[2], 1366x768@60Hz[2], 1440x900@60Hz[2], 1600x900@60Hz[3], 1600x1200@60Hz, 1680x1050@60Hz[2], 1920x1080@50Hz (1080p50), 1920x1080@60Hz (1080p60), 1920x1200@60Hz[3]
- c. Audio
- 1) Input Signal Types HDMI (Dual-Mode DisplayPort compatible [1])
 - 2) Output Signal Type HDMI
 - 3) Input/Output Format 2-channel PCM
 - 4) Output Volume Control -80 to 0 dB
- d. Communications
- 1) Ethernet 10/100 Mbps, auto-switching, auto-negotiating, auto-discovery, full/half duplex, DHCP, IEEE 802.3af and 802.3at Type 1 compliant
 - 2) USB computer console; also supports loading of firmware via a USB mass storage device
 - 3) RS-232 2-way device control and monitoring up to 115.2k baud with hardware and software handshaking; computer console
 - 4) IR/Serial 1-way device control via infrared up to 1.1 MHz or serial TTL/RS-232 (0-5 Volts) up to 19.2k baud
 - 5) HDMI HDCP 1.2, EDID, CEC
 - 6) NOTE: Supports management of HDCP and EDID; supports management of CEC between the connected HDMI devices and a control system
- e. Connectors
- 1) CONSOLE, SERIAL (1) 8-pin RJ45 female;
(1) RS-232 computer console port
 - 2) CONSOLE, USB (1) USB Micro-AB female;
(1) USB computer console port
 - 3) IR 1 – 2 (1) 4-pin 3.5 mm detachable terminal block comprising (2) IR/Serial ports;
(1) IR output up to 1.1 MHz;
 - 4) 1-way serial TTL/RS-232 (0-5 Volts) up to 19200 baud
- f. COM (1) 5-pin 3.5 mm detachable terminal block, bidirectional RS-232 port;
1) Up to 115.2k baud, hardware and software handshaking support
- g. HDMI INPUT (1) 19-pin Type A HDMI female;
- h. HDMI digital video/audio input;
1) (DVI and Dual-Mode DisplayPort compatible)
- i. HDMI OUTPUT (1) 19-pin Type A HDMI female;

- j. HDMI digital video/audio output;
 - 1) (DVI compatible)
 - k. SERVICE (1) USB Type A female;
 - 1) Supports USB mass storage devices for firmware update
 - l. LAN PoE (1) 8-pin RJ45 female;
 - 1) 10Base-T/100Base-TX Ethernet port, Power over Ethernet compliant
 - m. 24VDC 0.75A (1) 2.1 x 5.5 mm DC power connector;
 - 1) 24 Volt DC power input;
 - 2) PW-2407WU power pack included
 - 3) Ground (1) 6-32 screw, chassis ground lug
 - n. Controls & Indicators
 - 1) PWR (1) Green LED, indicates operating power supplied via PoE or local power pack, flashes while booting
 - 2) RESET (1) Recessed pushbutton for hardware reset
 - 3) SETUP (1) Red LED and (1) recessed pushbutton for Ethernet setup
 - 4) MODE TX & RX (2) Green LEDs, indicate the current mode of operation
 - 5) ONLINE (1) Green LED, indicates connection to a control system via Ethernet
 - 6) HDMI IN & OUT (2) Green LEDs, indicate HDMI signal presence at the HDMI input or output
 - 7) LAN PoE (2) LEDs, green LED indicates Ethernet link status, amber LED indicates Ethernet activity
 - o. Power Requirements
 - 1) Power Pack 0.75 Amps @ 24 Volts DC;
 - 2) 100-240 Volts AC, 50/60 Hz power pack, model PW-2407WU included
 - 3) Power over Ethernet IEEE 802.3at Type 1 (802.3af compatible) Class 0 (12.95 W) PoE Powered Device
 - 4) Power Consumption 7.6 Watts (typical)
 - p. Environmental
 - 1) Temperature 32° to 104° F (0° to 40° C)
 - 2) Humidity 10% to 90% RH (non-condensing)
 - 3) Heat Dissipation 26 BTU/hr
 - q. Enclosure
 - 1) Chassis Metal, black finish, with (2) integral mounting flanges, vented sides
 - 2) Mounting Freestanding, surface mount, or attach to a single rack rail
 - r. Dimensions
 - 1) Height 6.42 in (163 mm)
 - 2) Width 7.40 in (188 mm)
 - 3) Depth 1.35 in (35 mm)
 - s. Weight
 - 1) 19.6 oz (554 g)
3. Manufacturer:
- a. Crestron DM-TXRX-100-STR
 - b. Extron
 - c. Or equal

C. HDMI Distribution Amplifier

- 1. Drawing Reference: HDDA-4, HDDA-6
- 2. Features/Functions:
 - a. Up to 4096x2160 at 60Hz 4:2:0, 8-bit

- b. HDMI 2.2, HDCP 1.4 compliant
 - c. 10.2 Gbps
 - d. RS-232 Serial Control
 - e. 1 HDMI Input, 6 HDMI Output
 3. Manufacturer:
 - a. Extron DA6 HD 4k
 - b. Kramer
 - c. Or equal
- D. Wireless Presentation System
 1. Drawing Symbol: AIR, AIRMEDIA
 2. Features/Functions:
 - a. Wireless presentation for up to 40 user-supplied wifi devices over captive wireless network
 - b. Moderator Preview/Authorization Function
 - c. Auto-renewable IP Address for access
 3. Manufacturer:
 - a. Crestron Airmedia
 - b. No known equal
- E. Bluray Recorder
 1. Drawings Symbol: BDR/DVD/CD
 2. Features:
 - a. HDMI input
 - b. HDMI Output
 - c. Serial/IP controllable
 3. Manufacturer:
 - a. Denon
 - b. Oppo
 - c. Or equal.
- F. Broadcast Production Switch
 1. Drawing Reference: PRODSW1
 2. Features/Functions:
 - a. Connections
 - 1) Total Video Inputs 21 with 20 active
 - 2) Total Video Outputs 16
 - 3) Total Aux Outputs 6
 - 4) SDI Rates 270Mb, 1.5G, 3G, 6G.
 - 5) Total Audio Inputs 2 x XLR. 2 x RCA.
 - 6) Total Audio Outputs 2 x XLR Program 2 x XLR Monitor.
 - 7) Timecode Connections 1 x XLR in and 1 x XLR out.
 - 8) Reference Input Tri-Sync or Black Burst.
 - 9) Video Input Re-Sync On all 20 inputs.
 - 10) SDI Video Inputs 20 x 10-bit SD/HD/Ultra HD 4K switchable. 2 channel embedded audio.
 - 11) HDMI Video Input 1 x HDMI type A. 10-bit SD/HD/Ultra
 - 12) HD 4K switchable. 2 channel embedded audio.
 - 13) SDI Audio Outputs 2 Ch embedded into SDI output on all outputs.
 - 14) SDI Program Outputs 3 x 10-bit SD/HD/Ultra HD 4K switchable.

- 15) HDMI Program Outputs 1 x HDMI type A, 10-bit SD/HD/Ultra HD 4K switchable.
 - 16) Down Converted SDI Program Outputs 1 x 10-bit (Ultra HD 4K to HD).
 - 17) SDI Preview Outputs 1 x 10-bit SD/HD/Ultra HD 4K switchable.
 - 18) Total Multi Views 2
 - 19) SDI Multi View Outputs 2
 - 20) HDMI Multi View Outputs 2
 - 21) Control Panel Connection Ethernet supports 10/100/1000 BaseT. Allows direct connection between panel and chassis, or via network.
 - 22) Tally Output Added via ethernet connection to Blackmagic Design GPI and Tally Interface product. (Not included.)
 - 23) Computer Interface 1 x USB 2.0 port.
- b. Standards
- 1) SD Video Standards
 - (1) 525i59.94 NTSC, 625i50 PAL
 - 2) HD Video Standards
 - (1) 720p50, 720p59.94
 - (2) 1080p23.98, 1080p24, 1080p25,
 - (3) 1080p29.97, 1080p50, 1080p59.94
 - (4) 1080i50, 1080i59.94
 - 3) Ultra HD Video Standards
 - (1) 2160p23.98, 2160p24, 2160p25,
 - (2) 2160p29.97
 - 4) SDI Compliance
 - (1) SMPTE 259M, SMPTE 292M, SMPTE 424M.
 - 5) Video Sampling 4:2:2
 - 6) Color Precision 10-bit
 - 7) Color Space REC 601, REC 709, REC 2020.
 - 8) HDMI Input Resolutions for Computers
 - (1) 720 x 480i 59.94Hz,
 - (2) 720 x 576i 50Hz,
 - (3) 1280 x 720 59.94Hz,
 - (4) 1280 x 720 50Hz,
 - (5) 1920 x 1080 50Hz,
 - (6) 1920 x 1080 59.94Hz,
 - (7) 3840 x 2160 23.98Hz,
 - (8) 3840 x 2160 24Hz,
 - (9) 3840 x 2160 25Hz,
 - (10) 3840 x 2160 29.97Hz.
 - (11) Note: Also supported are; 24, 30 and 60 Hz inputs when switcher is in 23.98, 29.97 and 59.94 Hz formats respectively.
- c. Product Specifics
- 1) Upstream Keyers 4 with Chroma/Linear/Luma key.
 - 2) Downstream Keyers 2
 - 3) Chroma Keyers 4
 - 4) Talkback Support None
 - 5) Mix Minus Support None
 - 6) Linear/Luma Keyers 7
 - 7) Transition Keyer (Stinger/DVE) 1 Stinger, 1 DVE.
 - 8) Total Number of Layers 13

- 9) Pattern Generators 8
 - 10) Color Generators 2
 - 11) DVE with 3D Borders & Drop Shadow 1
 - d. Control Panel
 - 1) Software or optional hardware panel
 - e. Media Players 2
 - 1) Channels Fill and key for each media-player.
 - 2) Media Pool Still Image Capacity 32 with fill and key
 - 3) Media Pool Clip Capacity 2 with fill and key.
 - 4) Media Player Clip Length in NTSC/ PAL 3600 frames.
 - 5) Media Player Clip Length in 720p 1600 frames
 - 6) Media Player Clip Length in 1080 720 frames
 - 7) Media Player Clip Length in Ultra HD 4K 180 frames
 - 8) Media Pool Still Image Format PNG, TGA, BMP, GIF, JPEG and TIFF.
 - 9) Media Pool Video File Format TGA Sequence.
 - 10) Media Pool Audio File Format WAV, MP3 and AIFF.
 - f. Multi View Monitoring
 - 1) 2 x 10 Views for 20 total views.
 - 2) Multi View Video Standard HD.
 - 3) Routable Windows 16
 - 4) Tally Red for program and green for preview indication.
 - 5) Windows Source Labels Yes
 - 6) Interface Minimum monitor resolution of 1366 x 768.
 - g. Front Panel
 - 1) Built in LCD monitor for video and 42 LED buttons for Aux switching.
 - h. Processing
 - 1) Colorspace Conversion Hardware based real time.
 - 2) Processing Delay < 2 Lines
 - 3) 4K to HD Down Conversion Yes, program x 1
 - i. Audio Mixer
 - 1) 22 input x 2 channel mixer.
 - 2) Selectable On/Off/Audio-Follow-Video.
 - 3) Level and Peak metering.
 - 4) Master gain control.
 - 5) Dedicated analog outputs for monitoring.
 3. Manufacturer:
 - a. Black Magic ATEM 2 M/E Production Studio 4k w/ ATEM 2 M/E Advanced Panel
 - b. Newtek
 - c. Or equal.
- G. LCD 42" Video Preview Monitor
1. Drawing Reference: LCD42
 2. Manufacturer:
 - a. LCD 43UN700-B
 - b. Or Equal
- H. LCD 23" Display Monitor (Staff)
1. Drawing Reference: LCD23
 2. Features/Functions:

- a. HDMI Input
 - b. 23" Diagonal
 - c. Low-profile adjustable mount
 3. Manufacturer:
 - a. Dell E24W22H w/ Ergotron NeoFlex mount
 - b. Or equal
- I. LCD 32" Video Workstation Display Monitor
1. Drawing Reference: LCD32
 2. Features/Functions:
 - a. HDMI Input
 3. Manufacturer:
 - a. NEC V321-2
 - b. Samsung HG32NE477SF
 - c. Or equal
- J. Tuner, FM and Television, RS232 Controlled
1. Drawing Reference: TUNER
 1. Function/Features/Performance:
 - a. Cable-ready tuner and FM tuner designed to integrated with AV control system by providing bi-directional status with ability to permit system control interfaces to display the TV station, radio channel frequency, present number, and other status.
 - b. Provides automated scan and search capabilities as well as standard incremental tuning and direct numeric entry.
 - c. ROHS compliant, meets California codes.
 - d. Front Panel
 - 1) Display: Red LED Channel Display, dot separated major and minor channel numbers, dot at end indicates Off-Air tuning
 - 2) IR: IR sensor
 - 3) Control: Power , Menu, and Select buttons, navigation using Up and Down (Channel Up and Down) buttons
 - 4) Left and Right (Volume Up and Down) buttons
 - 5) LEDs: RS-232 RX (Yellow), RS-232 TX (Red)
 - e. Rear Panel
 - 1) RF In: Air/Cable, 'F', female, 75 ohm impedance, -10 to 15 dBmV typical. Supports dual Cable and Air tuning with optional RF-AB RF A-B Switch
 - 2) AV Output:
 - (1) Simultaneous HDMI, RGB/Component, and video out – switchable RGB/Component.
 - (2) Simultaneous HDMI (PCM), digital coax and optical (AC-3 or PCM), stereo audio.
 - (3) Video Out: RCA composite video output, 1V p-p at 75 ohm impedance
 - (4) Simultaneous 480i Component Out: 3 RCA Y, Pr, Pb outputs (1080i/720p/480p/480i)
 - (5) Digital Audio S/PDIF: Coax and Toslink optical output, Dolby 5.1/PCM
 - (6) Analog Audio Out: Stereo RCA audio, Mono, Stereo, or SAP, variable level
 - (7) RGB Out: VGA RGBHV DB-15 female (1080i/720p/480p, 59.94 Hz)
 - (8) HDMI: HDMI receptacle, Type A, HD video and digital audio (in PCM mode), version 1.3 (1080i/720p/480p), HDCP

- 3) RS-232 Control: DB-9 male, RS-232 data link to control system or PC, link up to 9 tuners, 300-19,200 baud (9600 default)
- 4) A/C (Air/Cable): 3.5 mm output to operate the optional RF-AB RF Switch
- 5) IR In: 3.5 mm stereo input for external IR sensor or wired IR (no carrier, discrete codes available)
- f. Captioning
 - 1) All outputs, including composite video, display captioning from digital and analog channels
 - 2) The composite video signal also includes Line 21 captioning when tuned to digital channels
- g. Tuning
 - 1) Frequency Range: NTSC, ATSC (8-VSB) and Clear QAM (cable) television 55.25 to 801.25 MHz
 - 2) DTV Resolution: ATSC/QAM 1080i/720p/480p/480i
 - 3) Tuning: Off-air 14-69 (NTSC and 8-VSB) and CATV 1-135 (Analog, 64QAM, 256QAM, 8-VSB)
 - 4) Aspect Ratio: 4:3, 16:9 (Digital), 4:3, 16:9, Zoom (Analog channels)
 - 5) Captioning: DTV and analog, set by program or customized for size, font and display attributes
 - 6) Lock: Parental option for channels and/or rating
2. Manufacturers:
 - a. Contemporary Research 232-ATSC+ HDTV Tuner with Rack Mount Kit
 - a. or equal (no known equal)
- K. Captioning Device (O.F.C.I.)
 1. Drawing Reference: CAPTIONING
 2. Manufacturer: Per Owner.
- L. Interpreter's Station
 1. Drawing Reference: INT
 2. Features/Functions:
 - a. Controls for up to (2) simultaneous interpreters from single Floor feed
 - b. Headphone and microphone connections for (2) interpreters
 - c. Extensible via IP
 3. Manufacturer:
 - a. Williams AV IC-2
 - b. Or equal
- M. SDI to HDMI Signal Converter
 1. Drawing Reference: SDH
 2. Features/Functions:
 - a. HDMI Out
 - b. SDI In
 - c. SDI Out
 - d. Analog Audio Out
 3. Manufacturer:
 - a. Black Magic Mini Converter SDI to HDMI
 - b. Or equal

- N. HDMI to SDI Signal Converter
1. Drawing Reference: HDS D
 2. Features/Functions:
 - a. HDMI In
 - b. SDI Out (x2)
 - c. Analog Audio Out
 3. Manufacturer:
 - a. Black Magic Mini Converter HDMI to SDI
 - b. Or equal
- O. SD/SSD Record/Playback Device
1. Drawing Reference: HYPERDECK
 2. Features/Functions:
 - a. SDI Video Inputs: 1
 - b. SDI Video Outputs: 2
 - c. SDI Monitor Outputs: 1
 - d. SDI Rates: 270Mb, 1.5G, 3G, 6G
 - e. HDMI 2.0 Video Inputs: 1
 - f. HDMI 2.0 Video Outputs: 1
 - g. Built in Speaker: Mono
 - h. Audio Output: 1 x 6.35 mm headphone jack
 - i. Screen: 2.2 inch LCD
 - j. Reference Connections
 - 1) 1 x BNC In, 1 x BNC Out
 - 2) Tri-Sync or Black Burst
 - k. SDI Audio Inputs: 16 channels embedded audio
 - l. SDI Audio Outputs: 16 channels embedded audio
 - m. HDMI Audio Inputs: 8 channels embedded audio
 - n. HDMI Audio Outputs: 8 channels embedded audio
 - o. Remote Control: 1 x RS-422 In, 1 x RS-422 Out
 - p. Recorder Configuration: Via user interface or Blackmagic HyperDeck Ethernet Protocol
 - q. Ethernet: 1Gb/s
 - r. Computer Interface: 1 x USB Type-C 3.0 (up to 5Gb/s) for external drive recording, webcam out, software configuration and updates
 - s. Standards
 - 1) SD Video Standards: 525i59.94 NTSC, 625i50 PAL
 - 2) HD Video Standards
 - (1) 720p50, 720p59.94, 720p60, 1080i50, 1080i59.94, 1080i60, 1080p23.98, 1080p24, 1080p25, 1080p29.97, 1080p30, 1080p50, 1080p59.94, 1080p60, 1080PsF23.98, 1080PsF24, 1080PsF25, 1080PsF29.97, 1080PsF30
 - (2) 2K DCI Video Standards: 2Kp23.98 DCI, 2Kp24 DCI, 2Kp25 DCI, 2Kp29.97 DCI, 2Kp30 DCI
 - 3) Ultra HD Video Standards: 2160p23.98, 2160p24, 2160p25, 2160p29.97, 2160p30
 - 4) 4K DCI Video Standards: 4Kp23.98 DCI, 4Kp24 DCI, 4Kp25 DCI, 4Kp29.97 DCI, 4Kp30 DCI
 - 5) SDI Compliance: SMPTE 259M, SMPTE 292M, SMPTE 296M, SMPTE 372M, SMPTE 424M, SMPTE 425M level A and B, SMPTE 2081-1, SMPTE 2081-10, SMPTE 2084 and SMPTE 2108-1

- 6) SDI Metadata Support: HD RP188 and closed captioning CEA-708. HDR Metadata supported on SDI.
- 7) Supported HDMI Formats:
 - (1) 525i59.94 NTSC, 625i50 PAL, 720p50, 720p59.94, 720p60, 1080i50, 1080i59.94, 1080i60, 1080p23.98, 1080p24, 1080p25, 1080p29.97, 1080p30, 1080p50, 1080p59.94, 1080p60, 2Kp23.98 DCI, 2Kp24 DCI, 2Kp25 DCI, 2Kp29.97 DCI, 2Kp30 DCI, 2160p23.98, 2160p24, 2160p25, 2160p29.97, 2160p30, 4Kp23.98 DCI, 4Kp24 DCI, 4Kp25 DCI, 4Kp29.97 DCI, 4Kp30 DCI
- 8) Audio Sampling: Television standard 24-bit, 48 kHz sample rate.
- 9) Video Sampling: 4:2:2 YUV
- 10) Color Precision: 10-bit
- 11) Color Space: REC 601, REC 709, REC 2020. 33 point 3D LUTS can be applied to SDI monitor out.
- 12) HDR Support: Hybrid Log-Gamma, ST2084 300, ST2084 500, ST2084 800, ST2084 1000, ST2084 2000, ST2084 4000, ST2084
- 13) Multi Rate Support: Auto detection of SD, HD and 6G-SDI
- 14) Copy Protection: HDMI input is unable to capture from copy protected HDMI sources. Always confirm copyright ownership before capture or distribution of content.
- t. Media
 - 1) 2 x 2.5 inch disc slots
 - 2) 2 x SD card slots
 - 3) 1 x USB-C 3.0 expansion port for external recording of SD, HD, 2K DCI, Ultra HD and 4K DCI
- u. Media Type
 - 1) SATA-II or SATA-III 2.5 inch solid state media
 - 2) UHS-I and UHS-II SD cards
- v. Media Format: Can format media to ExFAT (Windows/Mac) or HFS+ (Mac) file systems
- w. Supported Codecs ProRes HQ QuickTime, ProRes 422 QuickTime, ProRes LT QuickTime, ProRes Proxy QuickTime for all formats up to 2160p30. Playback only of ProRes 4444 QuickTime up to 1080p60 with auto routing of fill and key over SDI A and B outputs. DNxHD 220x, DNxHD 220x MXF, DNxHD 145, DNxHD 145 MXF, DNxHD 45, DNxHD 45 MXF for 720p and 1080p HD formats up to 60fps. DNxHR HQX, DNxHR HQX MXF, DNxHR SQ, DNxHR SQ MXF, DNxHR LB, DNxHR LB MXF for 2K DCI and 2160p formats up to 30fps. H.264 SDI 4:2:2 10-bit, H.264 High 4:2:0 8-bit, H.264 Medium 4:2:0 8-bit, H.264 Low 4:2:0 8-bit for all formats up to 1080p60.
- x. Control
 - 1) Built in Control Panel: 16 buttons for transport and device control with search dial featuring electronic clutch and 2.2 inch color display.
 - 2) External Control: RS-422 deck control, SDI start/stop, timecode run. Includes Blackmagic HyperDeck Ethernet Protocol. Supports remote FTP file upload.
- y. Software
 - 1) Software Included
 - (1) Blackmagic OS
 - (2) Blackmagic HyperDeck Setup
 - 2) Internal Software Upgrade: Loaded at system start, or via Blackmagic HyperDeck Setup using USB port.
- z. Operating Systems
 - 1) Mac 10.15 Catalina

- 2) Mac 11.1 Big Sur or later
 - 3) Windows 10, 64-bit
 - aa. Displays
 - 1) Built in 2.2 inch LCD for video, audio and timecode monitoring and menu settings.
 - 2) LED bezel indicator lights around SSD media slots and LED indicator lights above the SD media slots.
 - bb. Power Requirements
 - 1) Power Supply
 - (1) 1 x Internal 100 - 240V AC 50/60Hz.
 - (2) 1 x 4 pin XLR 12V DC In for external power supply or battery use
 - 2) Power Usage: 100 W max.
 - cc. Physical Installation
 - 1) Physical Specifications
 - (1) Dimensions (H x W x D): 1.74 x 19 x 9.3 inches
 - (2) Weight: 4.65 lbs
 - dd. Environmental Specifications
 - 1) Operating Temperature: 0° to 40° C (32° to 104° F)
 - ee. Storage Temperature: -20° to 60° C (-4° to 140° F)
 - ff. Relative Humidity: 0% to 90% non-condensing
3. Manufacturer:
- a. Black Magic Designs HyperDeck Studio HD Pro
 - b. Newtek
 - c. Or equal
- P. SDI Matrix Controller
1. Drawing Reference: VHCONTROL
 2. Features/Functions
 - a. Compatible with Submitted SDI20x20 and SDI12x12 products
 3. Manufacturer:
 - a. Black Magic Designs Videohub Smart Control Pro
 - b. Newtek
 - c. Or equal
- Q. 12x12 SDI Matrix Switch
1. Drawing Reference: SDI12x12
 2. Features/Functions:
 - a. Connections
 - 1) SDI Video Inputs 12 x 10 bit SD-SDI, HD-SDI and 6G-SDI.
 - 2) SDI Video Outputs 12 x 10 bit SD-SDI, HD-SDI and 6G-SDI.
 - 3) SDI Rates DVB-ASI, 270Mb, 1.5G, 3G, 6G.
 - 4) Video Input Re-Sync None
 - 5) SDI Reclocking On all SDI outputs
 - 6) Reference Input Tri-Sync or Black Burst
 - b. Control Panel Connection Ethernet/Serial Control Connection RJ-7/RS-422.
 - c. Multi Rate Support Auto detection of SD, HD or 6G-SDI. Simultaneous routing of 4K, HD, SD video and DVB-ASI.
 - d. Updates USB
 - e. Router Control 13 buttons for local control of Videohub. 6 buttons and scroll wheel for control of LCD display or RJ45 Ethernet.

- f. Router Configuration Via front panel LCD or use either RJ45 Ethernet or USB 2.0 for setting IP address only.
 - g. RS-422 Router Control 1 x input for controlling router crosspoint switching.
 - h. Standards
 - 1) SD Video Standards 525i59.94 NTSC, 625i50 PAL
 - 2) HD Video Standards
 - (1) 720p50, 720p59.94, 720p60, 1080p23.98, 1080p24, 1080p25, 1080p29.97, 1080p30, 1080p50, 1080p59.94, 1080p60, 1080PsF23.98, 1080PsF24, 1080PsF25, 1080PsF29.97, 1080PsF30, 1080i50, 1080i59.94, 1080i60
 - 3) 2K Video Standards
 - (1) 2K DCI 23.98p, 2K DCI 24p, 2K DCI 25p, 2K DCI 23.98PsF, 2K DCI 24PsF, 2K DCI 25PsF
 - 4) Ultra HD Video Standards
 - (1) 2160p23.98, 2160p24, 2160p25, 2160p29.97, 2160p30
 - 5) 4K Video Standards
 - (1) 4K DCI 23.98p, 4K DCI 24p, 4K DCI 25p
 - 6) SDI Compliance
 - (1) SMPTE 259M, SMPTE 292M, SMPTE 296M, SMPTE 424M, SMPTE 425M Level A and B, ITU-R BT.656 and ITU-R BT.601.
 - 7) SDI Video Sampling 4:2:2 and 4:4:4
 - 8) SDI Audio Sampling Television standard sample rate of 48kHz and 24 bit.
 - 9) SDI Color Precision 4:2:2 and 4:4:4 10 bit.
 - 10) SDI Color Space YUV or RGB.
 - 11) SDI Auto Switching Automatically selects between SD-SDI, HD-SDI, 6G-SDI and DVB-ASI on each input so that each input can be running a different television standard.
 - 12) SDI Metadata Support Video payload identification ancillary data as per SMPTE 352M.
 - i. Built in Control Panel
 - 1) 12 buttons for local control of Videohub with 6 buttons and scroll wheel for menu control. 2.2 inch color display.
 - j. External Control Panel
 - 1) Includes Blackmagic Videohub software control panel for Mac and Windows. Supports Blackmagic Smart Control and Blackmagic Master Control hardware panels. Includes Blackmagic Videohub SDK and Ethernet Videohub Control Protocol.
 - k. Display Built in LCD for video and menu settings.
3. Manufacturer:
- a. Black Magic Design Smart Videohub Cleanswitch12x12
 - b. Newtek
 - c. Or equal
- R. 4-channel HD-SDI Multiviewer
- 1. Drawing Reference: VPM4
 - 2. Features Functions:
 - a. Simultaneously view of up to 4 sources on single display
 - b. Pass-thru
 - c. HD-SDI inputs and outputs
 - d. Ability to mix different HD and SD source resolutions
 - 3. Manufacturer:

- a. Black Magic Design Multiview 4
- b. Atem
- c. Or equal

S. HDMI TO USB Capture

1. Drawing Reference: HDU
2. Features/Functions:
 - a. HD/SD Capture up to 1080 60p over USB
 - b. 1x HDMI 1.4a with 2-channel embedded audio
 - c. 1x USB 3.0 (USB 3.2, Gen 1) connector
 - d. YCbCr 4:2:2 10-bit workflows supported
 - e. RGB 4:4:4 / YCbCr 4:4:4 10/12-bit (raster / frame rate dependent)
 - f. HD/SD and scaled (USB) raster support
 - g. Configurable behavior upon loss of input signal
 - h. UVC/UAC capture, no third-party driver required
 - i. Compact, silent and pocketable
 - j. Bus-powered, no power adapter required
 - k. macOS, Windows and Linux supported
 - l. Universal application compatibility
 - m. Three year warranty
 - n. Video Formats
 - 1) Video (HDMI)
 - (1) (HD) 1920 x 1080p 23.98, 24, 25, 29.97, 30, 50, 59.94, 60
 - (2) (HD) 1920 x 1080i 50, 59.94, 60
 - (3) (HD) 1280 x 720p 50, 59.94, 60
 - (4) (SD) 625p 25
 - (5) (SD) 625i 50
 - (6) (SD) 525p 29.97
 - (7) (SD) 525i 59.94
 - (8) YCbCr 4:2:2 10-bit (Raster and Frame rate dependent)
 - (9) YCbCr 4:4:4 8/10/12-bit (Raster and Frame rate dependent)
 - (10) RGB 4:4:4 8/10/12-bit (Raster and Frame rate dependent)
 - 2) Computer (HDMI), up to 60 Hz max for all formats
 - (1) 1920 x 1080p
 - (2) 1680 x 1050p
 - (3) 1600 x 1200p
 - (4) 1600 x 1024p
 - (5) 1280 x 1024p
 - (6) 1280 x 960p
 - (7) 1280 x 768p
 - (8) 1024 x 768p
 - (9) 800 x 600p
 - (10) 640 x 480p
 - 3) Scaled (USB), Frame rates for all formats: 7.5, 15, 25, 29.97, 30, 50, 59.94, 60
 - (1) 1920 x 1080p
 - (2) 1440 x 1080p
 - (3) 1280 x 720p
 - (4) 1024 x 576p
 - (5) 960 x 540p

- (6) 856 x 480p
 - (7) 800 x 600p
 - (8) 768 x 576p
 - (9) 720 x 576p
 - (10) 720 x 480p
 - (11) 640 x 480p
 - (12) 640 x 360p
 - (13) 432 x 240p
 - (14) 352 x 288p
 - (15) 320 x 240p
 - (16) 176 x 144p
 - 4) NOTE: Host system specifications/performance will govern what video formats are possible
 - o. Video Input Digital
 - 1) HDMI v1.4a, 24, 30 or 36-bits/pixel, RGB or YUV
 - p. Audio Input Digital
 - 1) 2-Channel, 24-bit HDMI embedded audio, 48 kHz sample rate
 - q. Capture Video
 - 1) 16-bits/pixel, YUV (input video will be truncated as required)
 - r. Capture Audio
 - 1) 2-Channel, 16-bit, 48 kHz sample rate (input audio will be truncated as required)
 - s. Device Interface
 - 1) USB 3.0 (USB 3.2, Gen 1) UVC/UAC compliant
 - t. Compatible Host Interfaces
 - 1) USB 3.0 (USB 3.2, Gen 1)
 - 2) USB 3.1 (USB 3.2, Gen 2)
 - 3) USB 3.2 (USB 3.2, Gen 2x2)
 - 4) USB 2.0
 - 5) Notes: For best performance USB 3.0 (USB 3.2, Gen 1) or better is required on the host computer. USB 2.0, and/or USB connections via Hubs may not always deliver sufficient power.
 - u. Size (w x d x h)
 - 1) 3.3" x 2.4" x 1.0" (83.82 x 60.96 x 25.4 mm)
 - v. Weight
 - 1) 0.3 lbs (0.2 kg)
 - w. Power
 - 1) 5V USB bus powered; 3.5W max
 - x. Environment
 - 1) Safe Operating Temperature: 0 to 40 C (32 to 104 F)
 - 2) Safe Storage Temperature (Power OFF): -40 to 60 C (-40 to 140 F)
 - 3) Operating Relative Humidity: 10-90% noncondensing
 - 4) Operating Altitude: <3,000 meters (<10,000 feet)
 - 3. Manufacturer
 - a. AJA U-TAP HDMI
 - b. Or equal
- T. PTZ Camera Controller:
- 1. Drawing Reference: CAMCTL
 - 2. Function/Features/Performance:

- a. Supports remote IP control of (6) or more of selected PTZ Camera (see above).
3. Manufacturers:
 - a. Sony RMIP 500/1
 - b. Panasonic
 - c. Or equal.
- U. Pan Tilt Zoom Camera
 1. Drawing Reference: PTZ
 2. Features/Functions:
 - a. PTZ Camera, Signal Extender and CCU assembly.
 - b. 1/3-Type Exmor High-speed, Progressive Scan CMOS Sensor with 1.3 Megapixels
 - c. Video Output Resolutions: HD: 1080p/60/59.94/50/30/25, 1080i/59.94/50, 720p/59.94/50, SD: 480i/NTSC & 576i/PAL (Crop, Squeeze or Letterbox mode)
 - d. Lens/ Focal Length 19X Optical Zoom, F=4.5mm wide to 85mm tele (F1.6-F2.9), Min. Focus Distance 1.0m
 - e. Horizontal Viewing Angle 58.1° Wide End to 3.2° Tele End - 16:9 Format
 - f. Video S/N Ratio >52 dB
 - g. Minimum Illumination 0.7 LUX (F1.6, 50IRE)
 - h. Serial Control Protocol RS-232 (Modified VISCA)
 - i. Pan Range Pan: +170 degrees to -170 degrees, Tilt: +90 degrees to -30 degrees, Invertible for Ceiling Mount.
 - j. Preset Positions 16 (internal), 6 recalled via IR Remote
 - k. Tally Light Available through RS-232 Control Connectors • 12 VDC Power Input: EIAJ-04 Coaxial Power Connector
 - l. HD Video Outputs: YPbPr on DE-15 (D-Sub 15-pin HD)
 - m. SD Video Output: BNC Connector
 - n. RS-232/IR Out: RJ-45 Jack (RS-232 Communication and IR Out (with Quick-Connect - SR Interfaces)
 - o. EZ Power HD Video: RJ-45 Jack, for use with Quick-Connect SR Interface or Quick-Connect DVI/HDMI
 - p. SR Interface. Supplies power to the camera and returns HD video from the camera to the Quick-Connect - SR Systems.
 - q. HD Video Select 16-Position Rotary Switch: Used to set HD Video Resolution Output
 - r. Camera Settings 10-Position Dip Switch: Settings for IR Select, Baud Rate 9600, Image Flip, SD LB and SQ, Test Bars
 - s. OSD (On Screen Display) for fine tuning
 3. Manufacturer:
 - a. ClearVIEW HD-19 North America 999-6940-000 (Black), 999-6940-000AW (Arctic White), confirm color with Owner's Representative prior to product submittal. Accessories:
 - 1) Thin Profile Wall Mount 535-2000-230 (Black), 535-2000-230W (White)
 - 2) EZIM HD-SDI Slot Card PN# 998-6900-007
 - b. Sony
 - c. Panasonic
 - d. Or equal.
- V. LCD, 42" Diagonal
 1. Drawing Reference: LCD46
 2. Features/Functions:

3. Manufacturer:
 - a. Sharp
 - b. NEC
 - c. Samsung
 - d. Or equal.

W. LCD, 82" Diagonal

1. Drawing Reference: LCD82
2. Features/Functions:
 - a. Panel Type: LCD, LED Backlighting
 - b. Professional/commercial grade display warranted by the manufacturer for continuous operation for not less than two years.
 - c. Minimum Viewable Panel Size: 82" diagonal, 16:9 aspect ratio
 - d. Maximum Pixel Pitch: 0.923 x 0.923 mm
 - e. Native Resolution: 1920 x 1080
 - f. Viewing Angle (H/V): 176°/176°
 - g. Brightness: 450 cd/m²
 - h. Maximum Response Time: 6 ms
 - i. Contrast Ratio: 5000:1
 - j. Inputs
 - 1) VGA (D-sub 15 pin)
 - 2) HDMI
 - 3) Stereo Mini Jack
 - k. Control:
 - 1) RS-232C
 - 2) RJ45
 - 3) IR, included IR Remote
 - l. Power Consumption: In accordance with California Code of Regulations, Title 20: Division 2, Chapter 4, Article 4, Sections 1601-1608: Appliance Efficiency Regulations
 - m. Weight: 70 lbs. Maximum
 - n. Operating Temperature: 5-40 degrees C
 - o. Operating Humidity: 20-80%
 - p. Dimensions: Less than 2" deep.
3. Manufacturer
 - a. Sharp PNR-803
 - b. Samsung
 - c. NEC
 - d. Or equal

X. Flat-Panel Display Wall Mount

1. Drawing Reference: None - provide at locations where wall mount of LCD display matrix occurs.
2. Functions:
 - a. Can support the required LCD and Plasma Panels supplied by the work of this Project.
 - b. Designed to allow any of the panels to be removed for service without disturbing the adjacent panels. Alternatively provide system that locks panel edges to frame with overall frame able to be moved out from wall to permit service of any one of the panels.
 - c. Designed to allow micro adjustment of on center spacing of panels to permit panels to be installed with minimum panel edge to edge of not greater than 1/8 inch.

- d. Allows the complete mount and display assembly to not protrude more than 4" out from wall surface.
 - e. Designed to mount to 16", 20", 24" center stud systems
 - f. Heavy duty construction with steel components
 - g. UL or ETL listed
 - h. California OSHPD OPA (seismic restraint pre-approval). Installation to be in accordance with OPA. Where product lacks OS HPD OPA provide equivalent certification by manufacturer's or Contractors structural engineer.
3. Manufacturers:
 - a. By matrix display manufacturer.
 - b. Chief Manufacturing, Inc.
 - c. Premier Mounts
 - d. Display Devices
 4. or equal
 - a.

2.7 CONTROL SYSTEM AND RELATED

A. General

1. Products provide under this Section shall be made by manufacturers regularly engaged in the production of programmable commercial audio-visual control systems. Such manufacturers shall have at least 5 years prior production experience in the manufacture of such goods.
2. Provide control system to perform functions scheduled on drawings and herein.
 - a. System to be field programmable.
 - b. Provide programming allowance to implement system as defined in Part 1 and as modified by Owner prior to first use. Provide an additional \$2,000 to implement system operation enhancements determined by Owner following first use.

B. USB Extender Balun

1. Drawing Reference: USB-X
2. Features:
 - a. USB extension up to 100 m (330 ft) over solid-core CAT5e (or better) unshielded twisted pair (UTP) cable [1]
 - b. USB Device Support USB 1.1 and 2.0 compatible including mass storage and isochronous devices [2]
 - c. USB Hub Support Any signal chain may include up to 4 USB hubs plus one USB-EXT-2 system [2]
 - d. Maximum USB Devices 30 USB devices, or 4 USB hubs with 26 USB devices
 - e. Host Computer OS Support Windows, macOS, Linux
 - f. USB Throughput USB 2.0 up to 480 Mbps;
 - g. USB 1.1 up to 12 Mbps
3. Connectors – Local Extender
 - a. 24V 1A (1) 2.1 x 5.5 mm DC power connector;
 - b. 24 Volt DC power input (power pack included)
 - c. Link (1) 8-pin RJ45 connector, female; Connects to Link port on the Remote Extender
 - d. USB (1) USB Type B connector, female (USB B to A cable included);
 - e. USB 2.0 device port for connection to the USB host computer, media server, game console, annotator, codec, etc.

- f. Config (front) (For factory use only)
 - 4. Connectors – Remote Extender
 - a. 24V 1A (1) 2.1 x 5.5 mm DC power connector;
 - b. 24 Volt DC power input (power pack included) [3]
 - c. Link (1) 8-pin RJ45 connector, female; Connects to Link port on the Local Extender
 - d. Config (front) (For factory use only)
 - e. USB (front) (2) USB Type A connectors, female; USB 2.0 host ports for connection of USB mice, keyboards, whiteboards, game controllers, cameras, audio devices, mobile devices, printers, flash drives, hard drives, hubs, and other USB devices. Available USB Power: 1 Amp maximum per port, 1.5 Amps maximum total.
 - 5. Indicators – Local Extender
 - a. Mode (1) Recessed pushbutton (for factory use only).
 - b. Power (1) Blue LED, indicates operating power is supplied via the local power pack or via the Link connection.
 - c. Link (1) Green LED, indicates a valid Link connection to the Remote Extender.
 - d. Host (1) Green LED, indicates a valid connection to the USB host.
 - e. Activity (1) Amber LED, indicates data activity on the Link interface.
 - 6. Indicators – Remote Extender
 - a. Power (1) Blue LED, indicates operating power is supplied via the local power pack or via the Link connection.
 - b. Link (1) Green LED, indicates a valid Link connection to the Local Extender.
 - c. Host (1) Green LED, indicates a valid connection to the USB host at the Local Extender.
 - d. Activity (1) Amber LED, indicates data activity on the Link interface.
 - e. Mode (rear) (1) Recessed pushbutton (for factory use only).
 - 7. Power
 - a. Power Pack (included)
 - b. Input: 100-240 Volts AC, 50/60 Hz; Output: 1 Amp @ 24 Volts DC.
 - c. Available USB Power Supplies 1 Amp maximum per each of two USB Type A ports, 1.5 Amps maximum total.
 - 8. Environmental
 - a. Temperature 32° to 122° F (0° to 50° C)
 - b. Humidity 20% to 80% RH (non-condensing)
 - 9. Construction (Typical per Unit)
 - a. Housing Metal, black finish, adhesive rubber feet
 - b. Mounting Includes four slots for wire ties or other third-party mounting hardware
 - 10. Dimensions (Typical per Unit)
 - a. Height 1.03 in (26 mm) without feet
 - b. Width 2.96 in (75 mm)
 - c. Depth 3.43 in (87 mm)
 - 11. Compliance
 - a. CE, IC, FCC Part 15 Class B digital device.
 - 12. Manufacturer:
 - a. Crestron USB EXT
 - b. Extron
 - c. Or equal
- C. Control Panel with integral processor and serial port, Hardwired, Module Style
- 1. Drawing References: CBP

2. Features:
 - a. Wall mount pushbutton control panel
 - b. Programmable buttons to accommodate control of a device's:
 - 1) Power On and Off
 - 2) Volume Up and Down
 - 3) Source Select Toggle
 - (1) Multiple pushes of a single button switches between controlled device's input sources
 - c. Communication: RS232
 - d. 1-gang, Decora wall-mountable
 3. Manufacturer:
 - a. Crestron BPC-8
 - b. SP Controls
 - c. or equal
- D. High Definition A/V Transmitter
1. Drawing Reference: DMTX
 2. Functions/Features:
 - a. Provides HDMI input
 - b. Provides LAN connectivity
 - c. Transmits audio, video and control signaling to specified receiver over a single UTP6-4P cable.
 - d. HDCP compatible.
 - e. Can be remotely powered by specified control system.
 - f. Mounts to underside of table.
 3. Manufacturer
 - a. Crestron DM-4KZ-202-C
 - b. Or equal.
- E. HDMI Output Plate
1. Drawing Reference: MP2
 2. Manufacturer:
 - a. Crestron DM-RMC-4K-100-C-1G-B-T
 - b. Extron
 - c. Or equal.
- F. HDMI w/ Stereo Audio Input Plate
1. Drawing Reference: MP1
 2. Features/Functions
 - a. Inputs
 - 1) HDMI
 - b. Supports resolutions up to 2048x1080 @ 24Hz
 - c. Communications
 - 1) Audio, video and control 330 feet over a single UTP Cat 6 cable.
 - 2) HDCP management, EDID format management, CEC
 - d. Compatible with specified switcher.
 - e. Remotely powered from switcher/headend equipment location.
 - f. 1 gang.
 3. Manufacturers

- a. Crestron DM-TX-4K-100
- b. Extron
- c. Or equal.

G. Multimedia Receiver w/ Scaler

1. Drawing Reference: DMRX
2. Features/Functions
 - a. Receives audio, video and control over a single UTP Cat 6 cable.
 - b. Outputs
 - 1) HDMI, DVI
 - 2) RS-232
 - 3) IR
 - 4) USB
 - 5) LAN
 - c. Communications: HDCP management, EDID format management, CEC
 - d. Supports resolutions up to 4k60:4:4:4
 - e. Compatible with specified switcher.
 - f. Enclosure
 - 1) Metal, black finish, vented sides and front
 - 2) 8" x 8" x 2"
 - g. Built-in video scaler: HD video scaler, motion-adaptive deinterlacer, interlacer, intelligent frame rate conversion, Deep Color support, 3D to 2D conversion, content-adaptive noise reduction
3. Manufacturers
 - a. Crestron DM-RMC-4KZ-100-C
 - b. Or equal.

H. Control Processor

1. Drawing Reference: CONTROL
2. Features/Functions/Performance:
 - a. Control System shall utilize a processor at no less that of sufficient capacity to provide the indicated control functions without degradation due to system overload.
 - b. I/O Ports:
 - 1) At least 3 RS-232/422/485 Ports.
 - 2) At least 8 IR/Serial Ports.
 - 3) At least 8 Isolated Relay Ports
 - 4) At least 8 I/O Ports.
 - 5) At least 1 Port for the control system manufacturer's proprietary A/V network.
 - 6) At least 1 TCP/IP Ethernet Network connection via an RJ-45 connector.
 - c. Control System shall be fully compatible with the control system manufacturer's projector and A/V equipment status monitoring and management software.
 - d. Control System shall include a 10/100 BaseT Ethernet Port that supports all of the following features:
 - 1) TCP/IP Communications
 - 2) DHCP and DNS Support
 - 3) IEEE 802.11b and Bluetooth Compatibility
 - 4) Native Email Client
 - 5) Remote Diagnostics
 - 6) Remote Program Loading and Administration

- 7) Built-In Web Server
 - 8) FAT32 File System for easy data management
 - 9) SSL security plug-in
 - 10) PDA Integration and Control, XPanel PDA - Pocket PC 2002
 - 11) WebTablet Integration and Control – Microsoft Tablet PC
 - 12) Self Generating Executable GUI, XPanel EXE – Microsoft Family of Operating Systems
 - 13) Self Generating ActiveX powered Microsoft Internet Explorer Integration and Control, XPanel Microsoft Internet Explorer.
 - 14) Self Generating Java powered Web Integration and Control
- e. Control System Processor shall utilize a real time, event driven, multitasking, multi-threaded operating system with a dual bus architecture.
 - f. High speed processor shall communicate directly with Ethernet, control ports and proprietary control network utilizing high-speed, parallel bus infrastructure. Control processors that communicate via a serial bus shall not be accepted.
 - g. Control processor shall contain sufficient memory for the applications indicated.
 - h. Control System processor shall utilize a FAT32 file structure.
 - i. Control System shall support internal communications speed via two, independent communications busses. First control bus speed shall be at least 40 mb/s, second control bus speed shall be at least 300 mb/s.
 - j. Full API (Applications Interface) directly to control system via TCP/IP for integration with Visual Basic, C++, Java, etc. applications. API support through included control system manufacturer's ActiveX modules and/or their Dynamic Link Library (.DLL) file.
 - k. Control system manufacturer's to continuously monitor the integrity of the A/V control network for wiring faults, marginal communication performance, network errors – all information is viewable.
 - l. System Support RS-485 token passing network with data communication for a minimum distance of 5000 feet.
 - m. Allow proprietary A/V Network network expansion via Ethernet or RS-232 ports, which can allow for high-speed network acceleration.
 - n. Support a minimum of 253 proprietary network devices simultaneously.
 - o. Control system shall support object-oriented logic based programming language and a C-like language programming language. Both programming types are supported to run simultaneously and integral to
 - q. each other.
 - r. Control system manufacture shall supply Windows-based graphical
 - s. programming software for drag and drop object oriented programming for the control system operation.
 - t. Control system manufacture shall provide Windows-based graphical
 - u. programming software, which is self-documenting in that it generates a
 - v. symbolic flow diagram printout from the system program.
 - w. The control system shall support a variety of wireless communication
 - x. modes, including one-way and two-way radio frequency and infrared
 - y. transmission.
3. Manufacturers:
 - a. Crestron Control 4 w/ power supply as required to remotely power connected control and transmit/receive devices as shown on drawings.
 - b. Extron
 - c. or equal.

- I. Control Distribution
 - 1. Drawing Reference: CTRL BUS EXPAN
 - 2. Features/Functions
 - a. Distribution block for up to (8) terminations of control cabling.
 - b. Power isolation
 - c. LEDs to indicate presence of power and data.
 - d. Surface mountable.
 - 3. Manufacturers
 - a. Crestron CNTBLOCK
 - b. Extron
 - c. Or equal.

- J. Control Panel/Touch, Topset (CTP) w/ Tabletop Kit; Wallmount (CTW) w/ Wallmount Kit.
 - 1. Drawing Reference: CTP (Topset); CTW (Wallmount)
 - 2. Features/Functions:
 - 3. Manufacturer:
 - a. Crestron TSW-760-B-S
 - b. Extron
 - c. Or equal

- K. Switcher, High Definition Video and MultiMedia 8x8, 16x16
 - 1. Drawing Reference: AVSW8x8, AVSW16x16
 - 2. Minimum Features/Functions/Performance:
 - a. Video
 - 1) Switcher: 8x8 or 16x16 combination digital/analog switch, resolution management,
 - 2) Input Signal Types:
 - (1) High Definition, Multi-format Media (HCAT) over twisted-pair copper wire),
 - (2) HDMI, DVI*, DisplayPort Multimode*, RGB, component (YPbPr), S-Video (Y/C), composite
 - 3) Output Signal Types: HCAT, HDMI,
 - 4) Formats: HDMI v.1.3a, DVI v.1.0, HDCP v.1.2 content protection support, RGBHV up to UXGA/WUXGA, HDTV up to 1080p60, NTSC or PAL
 - 5) Input Resolutions, HDMI up to 2048x1152@60Hz, plus any other resolution allowed by HDMI v.1.3a up to 165MHz pixel clock
 - 6) Input Resolutions, RGB up to [2048x1152@60Hz](#).
 - 7) Input Resolutions, Component up to 1080p60
 - 8) Input Resolutions, Composite and S-Video: 480i, 576i
 - 9) Output Resolutions: Matched to inputs
 - 10) Analog-To-Digital Conversion: 10-bit 165 MHz per each of 3 channels
 - b. Audio
 - 1) Switcher: Combination digital/analog switch, limited audio breakaway;
 - 2) Inputs: H CAT, HDMI, S/PDIF coaxial, analog stereo
 - 3) Independent input compensation and master volume adjustment for analog
 - 4) Output Signal Types: HCAT, HDMI v.1.3a, analog stereo
 - 5) Formats, HDMI only: Up to 8ch PCM Formats, HDMI and SPDIF: Dolby Digital AC3 5.1, Dolby Digital EX 5.1, DTS 5.1, DTS-ES Matrix 5.1, DTS-ES Discrete 6.1, DTS 96/24 5.1, 2ch PCM Formats, Analog: Stereo 2-Channel
 - 6) Analog-To-Digital Conversion: 24-bit 48 kHz
 - 7) Digital-To-Analog Conversion: 24-bit 48 kHz

- 8) Volume Gain Range (analog out): -80dB to 0dB, 1 dB steps
- 9) Input Compensation (analog out): ± 10 dB
- 10) Performance (analog): Frequency Response: 20Hz to 20kHz ± 0.75 dB;
- 11) S/N Ratio: >90 dB, 20Hz to 20kHz A-weighted;
- 12) THD+N: $<0.05\%$ @ 1kHz;
- 13) Stereo Separation: >90 dB
- c. Ethernet
 - 1) General: 10BaseT/100BaseTX, auto-switching, auto-negotiating, auto-discovery, full/half duplex, TCP/IP, UDP/IP, CIP, DHCP, IEEE 803.U compliant
 - 2) Switch: (1) 10BaseT/100BaseTX Ethernet port (rear panel); (4)
 - 3) 10BaseT/100BaseTX Ethernet ports (actual hardware ports are exposed on select outboard devices)
- d. USB
 - 1) Protocols: Supports USB HID class devices
- e. Connectors
 - 1) Provide input and outputs cards as required to accommodate the functionality as shown on the drawings.
- f. Minimum Environmental Performance Range:
 - 1) Temperature: 32° to 104°F (0° to 40°C)
 - 2) Humidity: 10% to 90% RH (non-condensing)
3. Manufacturers:
 - a. Crestron DM-MD8x8 or DM-MD16x16 w/ I/O cards as required
 - b. AMX
 - c. Extron
 - d. or equal.
- L. 24-Port PoE Network Switch (provide in quantity required for port count)
 1. Drawing References: NSW
 2. Port Count:
 - a. 24
 3. Construction.
 - a. 1 Rack Unit maximum
 - b. Provide accessories as required to rack mount.
 4. Manufacturers:
 - a. Cisco Catalyst WS-C2960S-24PS-L.
 - b. DLink
 - c. Hewlett Packard
 - d. or equal.

2.8 PRESENTATION LECTERN

- A. Chambers Presentation Lectern (stowable)
 1. Provide allowance of \$10k for selection of powered, adjustable-height Presentation Lectern by City for procurement and commissioning by Contractor. Make and Model tbd, e.g. Spectrum Industries 55544 w/ 55513 Logo Panel, 55514 Shelf, 96516 Underbridge Panel and Power Module, 55538 Locking Door, 97525B Rack Cube.

2.9 SPEAKER TIMING AND ELECTRONIC VOTING SYSTEMS

- A. Wireless Bluetooth Speaker Timing Controller & Speaker Timer

1. Drawing Reference: STC, ST
 2. Manufacturer:
 - a. DSAN Limitimer Wireless PRO-2000BT
 - b. Oretronix
 - c. Or equal
- B. Voting Button
1. Drawing Reference: VBP, RS422MP
 2. Features/Functions:
 - a. Yes/No/Abstain Pushbuttons
 - b. Serial/IP Based Topology
 - c. With Surface-mount/Topset Enclosure
 3. Manufacturer:
 - a. DSAN Deliberator and RS422 Control Multiplexer
 - b. Klikapad

2.10 SOUND CABLES AND RELATED

- A. General
1. Provide cable with electrical conductors of soft drawn annealed copper, bare or tinned, solid or concentric stranded as applies, conductivity not less than 98 percent of pure copper.
 2. Comply with applicable Code for insulation, jacket, marking and listing for applicable use.
 - a. Refer to California Electrical Code, Table 725-61. Cable Uses and Permitted Substitutions.
 3. Manufacturer part number specified is for a Listed Type CM construction to indicate intended cable construction and quality.
 - a. Code requirements take precedence.
 - b. Provide type required by Code at no additional cost to the Owner.
- B. Cable, Microphone and Line Level, General Purpose
1. Drawing Symbol(s): SP, 2A.
 2. Description: Shielded, single twisted pair, with #20 AWG color coded stranded conductors and foil shield with drain wire.
 3. Performance/Construction
 - a. Conductors AWG #20.
 - b. Conductors Stranding: 7 by 28.
 - c. D.C. Resistance Per 1000 feet: 15 ohms maximum.
 - d. Shield: Aluminum polyester foil with #20 AWG stranded tinned copper drain wire.
 - e. Diameter 0.24 inch maximum.
 4. Where 2A indicated, provide 2 each SP
 5. Manufacturer
 - a. Belden 8762
 - b. West Penn.
 - c. Or equal.
- C. Cable, Microphone and Line Level, Miniature
1. Drawing Symbol: SP, 2A
 2. Restriction: For use within fixed equipment racks only.

3. Description: Shielded, single twisted pair, with #22 AWG color coded stranded conductors and foil shield with drain wire.
 4. Performance/Construction:
 - a. Conductors AWG #22.
 - b. Conductors Stranding: 7 by 30.
 - c. D.C. Resistance Per 1000 feet: 20 ohms maximum.
 - d. Shield: Aluminum polyester foil with #24 stranded tinned copper drain wire.
 - e. Diameter 0.15 inch maximum.
 5. Where 2A indicated, provide 2 each SP
 6. Manufacturer
 - a. Belden 8451, 9451, 1266A.
 - b. Alpha.
 - c. West Penn.
 - d. Or equal.
- D. Cable, Antenna, Assistive Listening System and Wireless Microphone System
1. Description
 - a. Nominal 50 ohms (actual 51 or 52 ohms) coaxial cable.
 2. Minimum 97 percent shield coverage.
 3. Joint Army Navy (JAN) or Military (MIL) Construction
 - a. RG-8/U to JAN-C-17A
 - b. RG-8 A/U to MIL-C-17D
 - c. RG-9/U to JAN-C-17A.
 4. Manufacturer
 - a. Belden 8237, 9251 or 8242.
 - b. CommScope.
 - c. Or equal.
- E. Cable, Loudspeaker and D.C. Power
1. Drawing Symbol(s)
 - a. #18TP
 - b. #16TP
 - c. #14TP
 - d. #12TP
 2. Description
 - a. Twisted pair, jacketed, unshielded cables, #12, #14, #16, or #18, as shown on Drawings.
 3. Plenum rated where installed in open plenum return voids.
 4. Performance/Construction
 - a. Conductor, AWG: #12, #14, #16, and #18, as noted.
 - b. Maximum diameter
 - 1) 0.384 inch (#12)
 - 2) 0.332 inch (#14)
 - 3) 0.256 inch (#16)
 - 4) 0.224 inch (#18).
 5. Manufacturer
 - a. Belden.
 - 1) #12TP, Belden 8477
 - 2) #14TP, Belden 8473
 - 3) #16TP, Belden 8471

- 4) #18TP, Belden 9740
- 5) West Penn.
- 6) Or equal.

2.11 VIDEO CABLES, COPPER COAX AND RELATED

A. General

1. Provide cable with electrical conductors of soft drawn annealed copper, bare or tinned, solid or concentric stranded as applies, conductivity not less than 98 percent of pure copper.
2. Comply with applicable Code for insulation, jacket, marking and listing for applicable use.
 - a. Refer to California Electrical Code, Table 725-61. Cable Uses and Permitted Substitutions.
 - b. Manufacturer part number specified is for a Listed Type CM construction to indicate intended cable construction and quality.
3. Code requirements take precedence.
 - a. Provide type required by Code at no additional cost to the Owner.

B. Cable, Data Monitor Precision Video

1. Plan Reference(s):
 - a. D5
 - b. 5DVideo
2. Construction
 - a. 5 miniature high resolution coax cables in an overall shielded overall jacket to transmit analog component video based on the Red-Green-Blue-Horizontal Sync-Vertical Sync (RGBHV) transmission method.
 - b. Sub cables are color coded Red, Green, Blue, Black, Grey; or approved alternate color coding scheme.
 - c. Jacket: Code-approved equal for application.
 - d. Overall five sub cable assembly diameter: 0.56" maximum in raceway applications.
 - e. Center Conductor AWG: Twenty two (22) ga Silver Plated Copper.
 - f. Insulation: Foamed Teflon.
 - g. Shield:
 - 1) Each sub-cable is double shielded
 - 2) Overall cable has 100% tape shield.
3. Approval/Rating:
 - a. UL: Recognized Type CL2P (Article 725 of NEC) for plenum application, riser rated elsewhere.
4. Performance - each sub-cable:
 - a. Resistance: 0.0162 ohms/ft nominal @ 20C
 - b. Impedance: 75 ohm nominal
 - c. Capacitance: 17.5 pf/ft nominal
 - d. Velocity of Propagation: 80% nominal
 - e. Time Delay: 1.19ns/ft nominal
 - f. Maximum Attenuation Per 100':
 - 1) 10 MHz: 0.8 dB/100 ft.
 - 2) 50 MHz: 2.5 dB/100 ft.
 - 3) 100 MHz: 3.5 dB/100 ft.
 - 4) 200 MHz: 4.6 dB/100 ft.
 - 5) 300 MHz: 5.0 dB/100 ft.

- 6) 400 MHz: 7.2 dB/100 ft.
 - 7) 1000 MHz: 14.6 dB/100 ft.
 5. Manufacturers:
 - a. Altinex CB5100PL in plenum spaces, riser rated elsewhere.
 - b. Extron
 - c. Belden
 - d. Gepco.
 - e. or equal.
- C. HDMI/DVI Cabling
1. Drawing Reference: DVI/HDMI
 2. Features/Functions
 - a. The plans indicate the required distances for HDMI format transmission. Contractor to provide a transmission system appropriate to the indicated lengths. Contractor engineered solutions may consist of:
 - 1) Passive HDMI cabling, where the indicated length is within the service distance of such systems.
 - 2) Copper HDMI cabling and active HDMI repeaters
 - 3) Fiber Optic Cabling and HDMI transceivers.
 - b. Contractor to select and provide the method of transmission appropriate to the length and operating parameters of the selected transmission system as defined by the manufacturers of the cabling systems, the repeaters and/or transceivers and the HDMI transmission standard as defined at www.hdmi.com.
 3. Manufacturers, copper cabling and extenders:
 - a. Extron
 - b. Broaddata
 - c. Altinex
 - d. Liberty Cable
 - e. or equal.

2.12 CONTROL CABLING

- A. General
1. Provide cable with electrical conductors of soft drawn annealed copper, bare or tinned, solid or concentric stranded as applies, conductivity not less than 98 percent of pure copper.
 2. Comply with applicable Code for insulation, jacket, marking and listing for applicable use.
 - a. Refer to California Electrical Code, Table 725-61. Cable Uses and Permitted Substitutions.
 - b. Manufacturer part number specified is for a Listed Type CM construction to indicate intended cable construction and quality.
 3. Code requirements take precedence.
 - a. Provide type required by Code at no additional cost to the Owner.
- B. USB Cabling
1. Drawing Reference: USB
 2. Features/Functions:
 - a. Conforms with minimum USB 2.0 standard
 - b. Provides USB input in a single gang wall plate
 - c. Extends USB signal up to at least 200' or distance as required by project requirements.

3. Manufacturers:
 - a. Extron
 - b. Trulink
 - c. or equal.

C. High Speed, TIA/TIA Category Cabling

1. Drawing Reference:** UTP6-4, where ** denotes cable count
2. Construction:
 - a. Provide horizontal copper cable in accordance with:
 - 1) EIA ANSI/TIA/EIA-568-B.2
 - 2) UL 444,
 - 3) NEMA WC 66 (Performance Standard for Category 6 and Category 7 100 Ohm Shielded and Unshielded Twisted Pair)
 - 4) ICEA S-90-661
 - b. UTP (unshielded twisted pair),
 - c. 100 ohm impedance
 - d. Four each individually twisted pair, 22 or 24 AWG conductors,
 - 1) Color code
 - (1) Pair 1 White/Blue Blue
 - (2) Pair 2 White/Orange Orange
 - (3) Pair 3 White/Green Green
 - (4) Pair 4 White/Brown Brown
 - e. No shield in the sheath.
 - f. Jacket
 - 1) Thermoplastic jacket
 - 2) Color: Blue unless otherwise indicated.
 - 3) Cable imprinted with manufacturers name or identifier, flammability rating, gauge of conductor, transmission performance rating (category designation) at regular intervals not to exceed 2 feet.
 - 4) The word "FEET" or the abbreviation "FT" shall appear after each length marking.
 - 5) Provide communications general purpose (CM or CMG), communications plenum (CMP) or communications riser (CMR) rated cabling in accordance with NFPA 70.
 - 6) Type CMP and CMR may be substituted for type CM or CMG and type CMP may be substituted for type CMR in accordance with NFPA 70.
3. Certification
 - a. Warrantied by the manufacturer to provide Category 6 performance when installed in accordance with applicable EIA/TIA standards and when terminated with the jacks supplied by the Contractor for this Project.
4. Performance
 - a. Assembly electrically meets or exceeds EIA ANSI/TIA/EIA-568-B.2 Category 6 performance standards
5. Manufacturers:
 - a. Berk-Tek LANmark-1000
 - b. Belden/CDT
 - c. Berk-Tek
 - d. Commscope/Systimax
 - e. Commscope/Uniprise
 - f. General Cable
 - g. Mohawk/CDT

- h. Superior/Essex
- i. or equal

D. High Speed, Category 6 Cabling, Plenum Rated

- 1. Drawing Reference:** UTP6-4P, where ** denotes cable count
- 2. Construction:
 - a. As for non-plenum, with fire retardant overall jacket construction.
 - b. UL listed, NEC compliant for plenum installation.
 - c. CSA Certified type PCC FT4 FT6.
- 3. Manufacturers
 - a. As for non-plenum Cat-6, plenum construction.

2.13 MISCELLANEOUS PRODUCTS

A. Audio and Control Connectors and Related (e.g. ¼” TRS, XLRM, XLRF):

- 1. Circular Audio Connector, Cord, 3 through 5 contacts, gold plated contacts, captive cable clamp strain relief, matte black chrome finish over nickel metal shell
 - a. Neutrik C-Series, X-Series.
 - b. Switchcraft.
 - c. Or equal.
- 2. Circular Audio Connector, Panel mount, male and female devices to fit same panel cutout including fasteners, 3 through 5 contacts, gold plated contacts, matte black chrome finish over nickel metal shell, female receptacles locking type:
 - a. Neutrik D Series Version L.
 - b. Switchcraft
 - c. Or equal.
- 3. Loudspeaker Connector, Panel mount, female devices to fit same panel cutout including fasteners as other panel mount receptacles, 4 contacts, matte black finish Polyamid/graphite shell, female receptacles locking type. UL Component Recognized:
 - a. Neutrik NL4MP.
 - b. Switchcraft
 - c. Or equal.

B. Video Connectors and Related

- 1. Video Connector, BNC type, 75 ohms, Panel, recessed, flush with panel face, insulated from panel, double female
 - a. Manufacturer
 - 1) Canare BCJ-JRU.
 - 2) Tec Nec
 - 3) Liberty Wire & Cable/Panelcraft
 - 4) or equal.
- 2. Video Connector, BNC type, 75 ohms, Panel, recessed, flush with panel face, insulated from panel, single female to solder pin
 - a. Manufacturer
 - 1) Canare BCJ-RU.
 - 2) Tec Nec
 - 3) Liberty Wire & Cable/Panelcraft
 - 4) or equal.
- 3. Video connector, BNC type, 75 ohms, cord, crimp applied. Coordinate with cable.

- a. Manufacturer
 - 1) Amp.
 - 2) Amphenol.
 - 3) Augat/LRC Products
 - 4) Canare.
 - 5) Kings.
 - 6) Liberty Wire & Cable/Panelcraft
 - 7) RFI/Celltronics.
 - 8) Trompeter.
 - 9) or equal.
 4. Video Precision 75 ohms Terminator, BNC:
 - a. Manufacturer
 - 1) Canare BCP-TA
 - 2) Trompeter TNAI-1-75.
 - 3) or equal.
 5. DB15 Connectors
 - a. Drawing Reference HD15
 - b. Manufacturer
 - 1) Amp.
 - 2) Amphenol.
 - 3) Canare.
 - 4) Kings.
 - 5) Liberty Wire & Cable/Panelcraft
 - 6) RFI/Celltronics.
 - 7) or equal.
- C. Custom Facility Panels, Rackmount Auxiliary Panels, Rack Lighting
1. Drawing Reference(s):
 - a. MP* - Media Panels, where * is a number indicating the panel type.
 - b. FP* - Facility Panels, where * is a number indicating the panel type.
 - c. Aux Panel
 2. Provide connector types and plate finish as shown. If none shown, provide:
 - a. Rack mount panels:
 - 1) 16 gauge minimum, cold rolled steel or 1/8" minimum aluminum, finish to match rack finish.
 - 2) At contractor's option, fabricate using rack mount panels with Decora/Decorator openings and steel plates with specified connectors. Match insert color to panel color provided. Refer to Rack Panel with Decora Openings below.
 - b. Wall Panels: 16 gauge minimum cold rolled steel, finish to match surrounding electrical and other low voltage panels.
 3. Manufacturers, Rack Mount Panels
 - a. BGW Systems Inc.
 - b. Conquest
 - c. Middle Atlantic Products Universal Connector Panel
 - d. Middle Atlantic Products Universal Connector Panel, Modular Custom Connector Panel Systems
 - e. ProCo Sound, Inc.
 - f. Ultimate Plates and Panels
 - g. or equal.

4. Manufacturers, Wall Panels
 - a. PanelCrafters Division of Liberty Wire & Cable, Classic Series
 - b. FSR
 - c. RCI Systems
 - d. Middle Atlantic
 - e. Ultimate Plates and Panels
 - f. Whirlwind
 - g. Or equal.
5. Manufacturers, Decora/Decorator connector inserts:
 - a. Connector Plates by Radio Design Labs. Provide specified connectors rear mounted in D-Blank insert for connector combinations not available from RDL.
 - b. Grey by Pathway Connectivity Solutions. Provide specified connectors rear mounted in 5100 insert for connector combinations not available from Pathway Connectivity Solutions.
 - c. or equal.
6. Manufacturers, Rack Mount Decora Panel Openings
 - a. Lowell Manufacturing LD8-RMP with Lowell DBB-4 blank Decora plates at openings not fitted with equipment.
 - b. Middle Atlantic DECP Series
 - c. or equal.
7. Manufacturers, Rack Lighting
 - a. Middle Atlantic PDLT-815RV-RN.
 - b. or equal.

2.14 POWER DISTRIBUTION EQUIPMENT

- A. Comply with applicable Codes. Provide UL Listed devices suitable for commercial use. Provide all junction boxes, raceway, fittings, wire, supports and fastenings as required for complete installation. Contractor to coordinate plug end of selected strip with rack power receptacles installed under the work of Division 16. Unless otherwise noted, provide receptacles of NEMA 5-15R configuration.
- B. Power Sequencer System
 1. Drawing References: PSEQ
 - a. Power Sequencer
 - b. Fire Alarm Interface – provide where required to shunt system operation on receipt of closure from Fire Alarm system.
 - c. Solid State Relay (SSR) SSR1 through SSR7
 2. Features
 - a. Power sequencing system.
 - b. Solid state switching, zero crossing.
 - c. Sequencing on power up and power down.
 - d. Front panel button and external closure activation.
 - e. Alarm terminal to sequence the system down when tripped.
 - f. UL Listed.
 3. Manufacturer
 - a. FSR Inc. Power Products Group SPC-20 Power Sequencer and SPC-20X Solid State Relay
 - b. Furman
 - c. Or equal.

- C. Power Supplies and Related:
1. Drawing Reference: PS24.
 2. Relay and Lamp Power Supply:
 3. 24 VDC, regulated within 5%. Ripple not greater than 1.5%. Output current rating at least 150% of maximum possible load. Circuit breaker or intrinsic over current protection. UL Recognized or UL Listed.
- D. Full Height Receptacle Strip, One (1) Circuit, 15A
1. Features/Construction:
 - a. Not less than 60" Long
 - b. Not less than eleven (11) 15A receptacles
 - c. Integral circuit breaker
 - d. NEMA 5-15P plug on 6' cord.
 - e. UL Listed Assembly
 - f. Provide mounting hardware as necessary to attach to rack interior.
 2. Manufacturers.
 - a. Wiremold Series 7011ULBC.
 - b. Lowell ACS 1524
 - c. Geist NSVB200-101S15
 - d. Hubbell PR206
 - e. Leviton
 - f. Middle Atlantic
 - g. Chatsworth 12848-701
 - h. or equal.
- E. Full Height Receptacle Strip, One (1) Circuit, 20A
1. Features/Construction:
 - a. Not less than 70" Long
 - b. Not less than eleven (11) 15A receptacles
 - c. Integral circuit breaker
 - d. NEMA 5-20P plug on 6' cord.
 - e. UL Listed Assembly
 - f. Provide mounting hardware as necessary to attach to rack interior.
 2. Manufacturers. Contractor to coordinate selected strip with rack power receptacles installed under the work of Division 26.
 - a. Geist NSVB200-102S20
 - b. Hubbell PR20820DRTL
 - c. Leviton P104x series
 - d. Lowell ACS-2024
 - e. Middle Atlantic PD-1020C-NS
 - f. Wiremold Series 7011ULBC20.
 - g. Chatsworth 12848-705
 - h. or equal.
- F. Rackmount Power Panel, Horizontal Mount, User Aux device use:
1. Drawing Reference: POWER.
 2. Functions/Features:

- a. Front face of panel shall provide two electrical power outlets and a switch. An indicator lamp shall show the presence of AC power when on. The front face of panel shall have a black finish. The rear face shall provide a minimum of at least four receptacles. The panel shall be racked mounted in a maximum of two rack units. The panel shall be Code approved and UL rated for this application.
3. Manufacturers:
 - a. Hubbell MCCPSS19TS
 - b. Leviton 4515
 - c. Geist SP124-1020

2.15 POWER PANEL:

1. Drawing Reference: POWER.
2. Functions/Features:
 - a. Front face of panel shall provide two electrical power outlets and a switch. An indicator lamp shall show the presence of AC power when on. The front face of panel shall have a black finish. The rear face shall provide a minimum of at least four receptacles. The panel shall be racked mounted in a maximum of two rack units. The panel shall be Code approved and UL rated for this application.
3. Manufacturers:
 - a. Hubbell MCCPSS19TS
 - b. Geist SP124-1020
 - c. Or equal.
 - d.

PART 3 - EXECUTION

3.1 GENERAL

- A. Perform the Work of this Section in accordance with acknowledged industry and professional standards and practices, and the procedures specified herein.
- B. Furnish and install (herein, "provide") all materials, devices, components, and equipment required for complete, operational systems.
- C. Refer to Section 27 15 00 for additional execution requirements that apply to the work of this Section.

3.2 PRECONSTRUCTION PROGRAMMING MEETING

- A. Not less than 60 days prior to the scheduled completion of the project, Contractor to initiate a request of the Owner's Representative to schedule an Audiovisual Systems programming meeting.
 1. The Owner's Representative will schedule the meeting at the reasonable mutual convenience of the Contractor and the Owner's technical systems representatives.
 2. The purpose of the meeting is for the Owner's Representative to indicate to the contractor how the programmable interfaces of the Audiovisual systems are to be implemented, including:
 - a. Integration of VoIP conference dialing into AV controls.
 - b. Button assignments and labels for physical button panels
 - c. Touchscreen menu hierarchy, scene arrangement, button and background colors, text size, logos

- d. When multiple panels control the same systems, which screens appear on which touchpanels.
- e. Whether authorization codes or passwords will be required to access special functions/menus.
3. Contractor to document the information received from the Owner's Representatives at this meeting.
4. Contractor to submit the documentation of the requirements meeting, along with their proposed response to the Owner's programming requirements in the form of screen shots and system menu flow diagrams as required under Section 27 41 00 – Common Work Results for Audiovisual Systems, 1.4 D Submittals.

3.3 WIRING CLASSIFICATION AND RELATED

A. Audio Signal Wiring Classification:

1. Type A-1: Microphone level wiring less than -30 dB μ , 20 Hz to 20 kHz.
2. Type A-2: Line level wiring -30 dB μ to +24 dB μ , 20 Hz to 20 kHz.
3. Type A-3: Loudspeaker level or circuit wiring greater than +24 dB μ , from 20 Hz to 20 kHz.

B. Video and Related Signal Wiring Classification:

1. Type V-1: Baseband and composite video wiring 1 volt peak-to-peak into 75 ohms, 0 to 10.0 MHz.
2. Type V-2: Synchronization and switching pulse wiring 4 volts peak-to-peak into 75 ohms, 15.62 to 15.75 kHz.
3. Type V-3: Color subcarrier wiring 0 to 4 volts peak-to-peak into 75 ohms, 3.57 to 4.43 MHz.
4. Type V-4: TV system wiring 0.1 to 1000 uV peak-to-peak into 50 or 75 ohms, 47 to 890 MHz.

C. Control Signal Wiring Classifications:

1. Type C-1: DC control wiring 0 to 50 volts.
2. Type C-2: Synchronous control or data wiring 0 to 40 volts, peak-to-peak.
3. Type C-3: AC control wiring 0 to 48 volts, 60 Hz.

D. Additional Wiring Classifications:

1. Type M-1: DC power wiring 0 to 48 volts.
2. Type M-2: AC power wiring greater than 50 volts, 60 Hz.

E. Wiring Combinations:

1. Except as indicated herein, conduit, wireways and cable bundles shall contain only wiring of a single classification. The following combinations are acceptable in conduit, or cable harnesses. Additional acceptable combinations may be indicated on the Contract Drawings.
 - a. Types A-1, C-1, and M-1.
 - b. Types A-2, C-1, C-2, and M-1, runs less than twenty (20) feet.
 - c. Types A-2, C-1, and M-1.
 - d. Types A-3, C-1, C-2, and M-1.
 - e. Types A-2, V-1, and V-3.
 - f. Types V-1, V-2, V-3, and C-1.
 - g. Types M-2 and C-3.

3.4 WIRE AND CABLE INSTALLATION

- A. Provide permanent identification of run destination at all raceway terminations.
- B. All wire and cable shall be continuous and splice-free for the entire length of run between designated connections or terminations.
- C. All shielded cables shall be insulated. Do not permit shields to contact conduit, raceway, boxes, panels or equipment enclosures.
- D. Within buildings, make splices only in designated terminal cabinets and/or on designated equipment backboards. Outside buildings, make splices only in designated manholes and/or handholes. Protect splices outside of buildings with splicing kits equivalent to Scotchcast Re-enterable. Make splices only with connectors or terminal devices specified herein. Document all splices on Record Drawings.
- E. Verify that all raceway has been de-burred and properly joined, coupled, and terminated prior to installation of cables. Verify that all raceway is clear of foreign matter and substances prior to installation of wire or cable.
- F. Inspect all conduit bends to verify proper radius. Comply with Code for minimum permissible radius and maximum permissible deformation.
- G. Apply a chemically inert lubricant to all wire and cable prior to pulling in conduit. Do not subject wire and cable to tension greater than that recommended by the manufacturer. Use multi-spool rollers where cable is pulled in place around bends. Do not pull reverse bends.
- H. Provide a box loop for all wire and cable routed through junction boxes or distribution panels. Provide tool formed thermal expansion loops at cable at manholes, handholes and at both sides of all fixed mounted equipment. Cable loops and bends shall not be bent at a radius greater than that recommended by the manufacturer.
- I. Secure all wire and cable run vertically for continuous distances greater than thirty (30) feet. Secure robust non-coaxial cables with screw-flange nylon cable ties or similar devices appropriate to weight of cable. For all other cables, provide symmetrical conforming nonmetallic bushings or woven cable grips appropriate to weight of cable.

3.5 SIGNAL POLARITY CONVENTION

- A. Maintain consistent absolute signal polarity at all connectors, patch points and connection points accessible in the system. Comply with AES26-2001. Where applicable, a positive polarity electrical signal shall yield positive acoustic pressure from the loudspeakers.

- B. Audio signal connector convention: Comply with AES 14-1992 (r1998)

| | | |
|-------------------|-----------|--------------|
| Signal | Connector | Wire |
| Signal Phase | Pin 2 | Red or White |
| Signal Anti-Phase | Pin 3 | Black |
| Signal Ground | Pin 1 | Drain Wire |

- C. Video and RF/TV Connector Convention:

| | | |
|--------------|------------|------------------|
| Signal | Connector | Wire |
| Signal Phase | Center Pin | Center conductor |

| | | |
|-------------------|-------|--------|
| Signal Anti-Phase | Shell | Shield |
| Signal Ground | Shell | Shield |

3.6 WIRING PRACTICE

- A. Land all non-coaxial field wiring entering each equipment rack at specified terminal devices prior to connection to any equipment or devices within racks. At Contractor's option, such terminals may be located in the equipment racks or in the terminal cabinets provided. Coordinate such selection with Project construction sequence and test procedures specified herein.
- B. Identify all wire and cable clearly with permanent labels wrapped about the full circumference within one (1) inch of each connection. Indicate the number designated on the associated field or shop drawing or run sheet, as applies. Assign wire or cable designations consistently throughout a given system. Each wire or cable shall carry the same labeled designation over its entire run, regardless of intermediate terminations. Conform with the requirements of Section 27 41 00.
- C. Apply all crimp connectors only with manufacturer's recommended ratchet type tooling and correct crimp dies for connector and wire size. Plier type crimp tooling shall not be acceptable.
- D. Coordinate insulation displacement (quick connect) terminal devices with wire size and type. Comply with manufacturer's recommendations. Make connections with automatic impact type tooling set to recommended force.
- E. Make all connections to screw-type barrier blocks with insulated crimp-type spade lugs. Lugs are not required at captive compression terminal type blocks. Provide permanent designation strips designed for use with the terminal blocks provided. Make neat, intelligible markings with indelible markers equivalent to "Sharpie".
- F. Tin terminated shield drain wires and insulate with heat shrinkable tubing.
- G. Use only rosin core 60/40 tin/lead solder for all solder connections.
- H. Dress, lace or harness all wire and cable to prevent mechanical stress on electrical connections. No wire or cable shall be supported by a connection point. Provide service loops where harnesses of different classes cross, or where hinged panels are to be interconnected.
- I. Termination and build-out resistors and related circuit correction components shall be visible. Do not install in connector shells or internally modify equipment. Show locations on Record Drawings.
- J. Correct any and all of the following unacceptable wiring conditions:
 - 1. Deformed, brittle or cracked insulation.
 - 2. Insulation shrunken or stripped further than 1/8" away from the actual point of connection within a connector, or on a punch block.
 - 3. Cold solder joints.
 - 4. Flux joints.
 - 5. Solder splatter.
 - 6. Un-grommeted, un-bushed, or uninsulated wire or cable entries.
 - 7. Deformation or improper radius of wire or cable.

3.7 SIGNAL GROUNDING PROCEDURES

- A. Comply with National Electrical Code.
- B. Unless otherwise noted maintain a unipoint ground scheme.
- C. Signal and electrical system grounds shall be isolated except at the Project ground field connection.
- D. Equipment enclosures shall not be permitted to touch each other unless bolted together and electrically bonded.
- E. Ground and bond equipment racks and similar equipment enclosures containing powered equipment exclusively via the ground conductors provided under Division 27.
- F. At each rack, provide a ground bus within the rack. At each rack, provide a lug bonded to the rack frame with a #12 TW stranded wire to the rack Ground bus.
- G. At each ensemble of racks, provide a single labeled Ground tubular-clamp bus bar terminal strip to land the individual rack Isolated Ground bus ground conductors. Connect the main Isolated Ground conductor from the Technical Power panelboard at this point.
- H. Equipment signal ground shall be to the Ground System via the green wire of the equipment power cord. Where equipment uses two (2) wire power cord, provide #12 green bond wire to rack ground bus bar. At equipment, provide crimp lug and suitable hardware for bonding.
- I. Shielded cables of this section shall be grounded exclusively to Isolated Ground by a single path. Shield shall be tied to Ground at one end only, i.e., at the low potential (receiving) end of run, unless otherwise noted.
- J. Unless otherwise noted, at audio jackfields, tie source shield at jackbay frame. Float shields at connections to output jacks. Bus each row of jack frames and run individual #12 green ground wire for each row to rack IG bus bar.
- K. Signal Ground provisions shall realize less than 0.15 ohms to the primary ground connection.

3.8 FINISHES

- A. Finishes and materials for contractor fabricated assemblies such as racks, custom control panels, brackets, blank panels, equipment mounting in furniture or casework, speaker baffles, speaker grille material and in general any item or component herein which is visible shall adhere to the following:
 - 1. Finish shall be as directed by the Owner's Representative.
 - 2. In the event that the Owner's Representative provides no direction as to finish, finish shall match exactly the surrounding and adjacent surfaces.
 - 3. Wooden speaker back boxes and baffles shall be painted flat black if not otherwise finished or stained.

3.9 EQUIPMENT ENCLOSURE (RACK) AND EQUIPMENT FABRICATION

- A. Combustible material, other than incidental trim of indicated equipment, is prohibited within equipment racks.

- B. Within each equipment enclosure, provide a full-height multi-circuit ground outlet strip with branch circuit count as shown on drawings; locate on the left side of the equipment enclosure, as viewed from the rear. In each enclosure provide number of receptacles required by present and future equipment indicated on drawings, plus at least two spare receptacles. Provide flexible steel raceway and junction box for connection of power service. Bond internal raceway to rack frame.
- C. Provide a permanent label on the front of each equipment rack including the rack designation, and the circuit breaker number and associated electrical distribution panel designation servicing same.
- D. Maintain separation of wiring classifications as specified herein. Separately dress, route and land microphone and line level cables and related on the right side of the equipment enclosure, as viewed from the rear; dress, route, and land loudspeaker level and control cables on the left side of the equipment enclosure, as viewed from the rear.
- E. Access shall not require demounting or de-energizing of equipment. Install access covers, hinged panels, or pull-out drawers to insure complete access to terminals and interior components.
- F. Fasten removable covers containing any wired component with a continuous hinge along one side, with associated wiring secured and dressed to provide an adequate service loop. Provide an appropriate stop locks to hold all hinged panels and drawers in a serviceable position.
- G. Provide permanent labels for all equipment and devices. Where possible, fasten such labels to the rack frame or to blank or vent panels which will remain in place when active equipment is removed for possible service.
- H. At jackfields, provide service loop to permit removal of jackfields from rack sufficient to conveniently access all jack contacts for routine cleaning and maintenance. Organize the service loop and harness such that reasonable reconnection of jacks and jack normals is possible without cutting apart the harness.
- I. Coordinate the design and execution of wire harnessing of multi-bay rack ensembles with conditions of delivery to installation locations at Project Site, and with the requirement herein for test of the completely wired system in the shop prior to delivery to the Project Site. Organize the wiring harnesses such that they will fold within one shippable unit without risk of damage, or provide polarized multipin connectors and related interconnect systems as specified elsewhere herein.
- J. At each equipment backboard, provide UL Listed surge suppressing multioutlet assembly with at least six (6) receptacles.

3.10 EQUIPMENT RACK AND EQUIPMENT TESTING AND ADJUSTING PROCEDURES

- A. Conduct procedures in fabrication shop. Verify safe and proper operation of all components, devices, or equipment, establish nominal signal levels within the systems and verify the absence of extraneous or degrading signals. Make all preliminary adjustments and document the setting of all controls, parameters of all corrective networks, voltages at key system interconnection points, gains and losses, as applicable. Submit test report. Request and coordinate verification of submitted test data by the Owner's Representative. Correct all non-conforming conditions prior to shipment to Project Site. Perform at least the following procedures:
 - B. Preliminary: Verify:

1. Grounding of devices and equipment. Integrity of signal and electrical system ground connections.
 2. Proper provision of power to devices and equipment.
 3. Integrity of all insulation, shield terminations and connections.
 4. Integrity of soldered connections. Absence of solder splatter, solder bridges.
 5. Absence of debris of any kind, tools, etc.
 6. Routing and dressing of wire and cable.
 7. All wiring, including polarity and continuity, including conformance with wire designations on running sheets, field and shop drawings.
 8. Mechanical integrity of all support provisions.
- C. Rig temporary power and grounding. Comply with all applicable Codes, regulations and ordinances.
- D. Determine the proper sequence of energizing systems to minimize the risk of damage. Energize. Burn in for at least 168 hours.
- E. Sound Systems:
1. Gain control settings: Establish tentative normal settings for all gain controls. Set all equalizers flat. Set all automatic gain control devices to bypass. Terminate power amplifier outputs with power load resistors with resistance value within 10% the nominal output impedance of the respective amplifier. Adjust all gain controls on equipment for optimum signal-to-noise ratio and signal balance and, unless they are sub-panel mounted, cap them to prevent tampering. Unless specified or directed otherwise, adjust gains such that in a given system the "front end" operates at unity gain and maintains 10 dB of clip margin referenced to the first onset of clipping of the associated power amplifier(s). Measure and document system gains at 1 kHz. Settings may require further adjustment by the Contractor, a result of testing by the Owner's Representative.
 2. Freedom from parasitic oscillation and radio frequency pickup: Maintain previous setup. Set up for each mode of operation specified in the functional requirements; verify that all systems are free from spurious oscillation and radio-frequency pickup using broadband oscilloscope. Correct any such defects.
 3. Hum and noise level/signal to noise level/signal to crosstalk level: Maintain previous setup. Terminate microphone and line-level inputs with shielded resistors of 150 and 600 ohms, respectively. Set available variable gain controls such that full power amplifier output would be achieved with -40 dBm input level at a microphone input and +12 dBm at a line-level input. Measure and document the specified parameters of the system overall for each microphone input channel and line-level input channel. Compare with nominal signal level.
 4. Total Harmonic Distortion: Maintain previous setup. Measure at reference operating level at least at 63 Hz, 125 Hz, 1 kHz, 10 kHz.
- F. Baseband Video Systems:
1. Picture Monitors:
 - a. Apply crosshatch. Verify linearity.
 - b. Apply red field. Adjust purity.
 - c. Apply SMPTE bars and PLUGE. Adjust to standards.
 2. Video Path Test: Use manufacturer's procedures. Use full field or line signals.
- G. Data/Graphics Systems:
1. Projector:

- a. Apply crosshatch. Converge at design distance. Verify linearity.
- b. Apply red, green and blue field. Adjust purity.
2. Wideband Component Analog Video Path Test: Use manufacturer's procedures.

H. Control System:

1. Demonstrate complete operation.

3.11 PROJECTION SCREEN INSTALLATION

A. Inspection

1. General: Examine surfaces and rough framing to determine suitability to install screen and mount. Do not start work until unsatisfactory conditions are corrected.

B. Installation

1. Install screen and projector mount horizontal and plumb for proper operation per manufacturer's recommendations. Securely anchor to supporting structure to withstand all loading conditions and strain of service.

C. Adjustment

1. Adjust units as required for smooth operation and alignment as required.
2. Just prior to final acceptance of project, clean the screen surface according to the manufacturer's instructions.
3. Protect completed work from damage until acceptance by the Owner's Representative.

3.12 LOUDSPEAKER ASSEMBLY INSTALLATION

A. Loudspeakers:

1. Verify proper installation of loudspeaker enclosures and related support.
2. Verify that no loudspeaker assembly is subjected to stresses or loading effects in any way contributing to possible extraordinary failure.

3.13 VIDEO PROJECTOR ASSEMBLY INSTALLATION

- A. Design, engineer and provide complete, all means of support, suspension, attachment, fastening, bracing, and restraint (hereinafter "support") of such equipment. Provide engineering of such support by parties licensed to perform work of this type in the Project jurisdiction. Submit in timely manner.
- B. Comply with applicable Code and the requirements of the Authorities having jurisdiction.
- C. Provide safety factor greater than six (6) or as required by Code, whichever is greater.
- D. Do not apply any load to building structure without first obtaining written approval of the Owner's Representative. Obtain per Project procedures.
- E. During Acceptance Testing, adjust orientation of Video Projector as directed to achieve optimum picture. Provide workers and ladders as required. Perform such adjustment with no claim for additional cost or time.

3.14 SYSTEMS PERFORMANCE TESTING AND ADJUSTING PROCEDURES

- A. Upon completion of the installation of all equipment in an area, perform the following tests and record results. Verify safe and proper operation of all components, devices, or equipment, establish nominal signal levels within the systems and verify the absence of extraneous or degrading signals. Make all preliminary adjustments and document the setting of all controls, parameters of all corrective networks, voltages at key system interconnection points, gains and losses, as applicable. Submit test report. Correct all non-conforming conditions prior to requesting Acceptance Review and Testing. Perform at least the following procedures:
1. Mechanical: Verify:
 - a. Integrity of all support provisions.
 - b. Absence of debris of any kind, tools, etc.
 2. Power and Isolated Ground: Verify:
 - a. Isolation of Isolated Ground system from raceway and related ground.
 - b. Grounding of devices and equipment. Integrity of signal and technical power system ground connections.
 - c. Proper provision of power to devices and equipment.
 3. Signal Wiring: Verify:
 - a. Integrity of all insulation, shield terminations and connections.
 - b. Integrity of soldered connections. Absence of solder splatter, solder bridges.
 - c. Routing and dressing of wire and cable.
 - d. Continuity, including conformance with wire designations on running sheets, field and shop drawings.
 - e. Absence of ground faults.
 - f. Polarity.
 4. Use the proper sequence of energizing systems to minimize the risk of damage. Energize.
 5. Sound Systems, Electronic Tests; confirm:
 - a. Gain at 1 kHz.
 - b. Maximum output.
 - c. Input clipping level.
 - d. Frequency response.
 - e. Total harmonic distortion.
 - f. Signal to noise ration.
 - g. Signal to crosstalk ratio.
 6. Electro/Acoustic Tests:
 - a. Uniformity of coverage.
 - b. Electronic and acoustic frequency response/one-third octave equalization. Measure at ear level. Comply with applicable portions of ANSI (SMPTE) PH22.202M-1984, "B chain electro-acoustic response - control rooms and indoor theaters." Adjust to "curve X of B chain characteristic". Owner's Representative will direct final adjustment.
 - c. Maximum continuous sound pressure level (in the reverberant field). Drive systems with broadband pink noise. Sustain for at least five (5) minutes with no system damage. Measure for "A" and "C" weightings at ear level on loudspeaker axis. Turn off noise.
 - d. Acoustic signal-to-noise ratio referenced to the specified maximum continuous sound pressure level in the reverberant field. Measure for "A" and "C" weightings at ear level on loudspeaker axis with mechanical systems operating. Present comparison with previous measurement.
 7. Video Systems:
 - a. Picture Monitors:
 - 1) Apply crosshatch. Verify linearity.
 - 2) Apply red field. Adjust purity.

- 3) Apply SMPTE bars and PLUGE. Adjust to standards.
- b. Video Path Test: Use NTC Report No. 7 procedures. Use full field or line signals.
 - 1) Insertion Gain.
 - 2) Gain/Frequency Distortion.
8. Control System: Demonstrate complete operation.

3.15 LABELING

- A. Conform with the requirements of Section 27 41 07 – Identification for Audiovisual Systems.
- B. Provide permanent "wedge" type labels on all controls, as applies, to indicate correct settings after systems performance testing and adjustment procedures have been successfully completed.

END OF SECTION

Appendix A

Resolution 93-8022

BEFORE THE CITY COUNCIL OF THE CITY OF PITTSBURG

In the Matter of:

Establishing Voluntary Guidelines to)
Encourage Bidders on Public Works)
Projects to Increase the Utilization and)
Hiring of Local Contractors, Local) Res. No. 93-8022
Businesses and Members of the City's)
Minority Community)
_____)

The City Council of the City of Pittsburg DOES RESOLVE as follows:

A. The Council desires to take steps to encourage contractors on public works projects in the City to increase the utilization and hiring of local contractors, local businesses and members of the City's minority community.

B. Both historically and presently, the City has been home to a large and diverse population, including many members of minority communities. The City wishes to increase employment and business opportunities for members of the City's minority communities.

C. Many of the City's public works contracts are awarded to businesses which are not located in the City. The increased employment of City residents on projects located within the City would help to reduce traffic congestion and noise and air quality impacts.

D. Other Bay Area cities have adopted various programs or policies which are designed to heighten awareness and employment of minorities, local residents and local businesses. The adoption of a mandatory program which requires the employment of a fixed percentage of minorities, local residents and local businesses would require further study and must be supported by appropriate evidence. Additionally, findings would be required that either non-residents are a substantial cause of social and economic problems (e.g., unemployment, crime, homelessness, poverty) facing City residents or that the City itself has created disadvantages (e.g., higher business taxes, more stringent land use requirements) which have caused local businesses to suffer.

E. Rather than wait for studies to be completed and for statistical information from various governmental agencies to be compiled, the Council desires to take immediate action that will increase awareness and utilization of, and encourage employment opportunities for minorities, local residents, local businesses and suppliers within the City.

NOW, THEREFORE, the Council resolves:

Section 1. Minority Employment Guidelines

A. The Council declares that it is the policy of the City to increase awareness of the City's minority population and to encourage the employment of members of the City's minority communities.

B. Each bidder who is awarded a public works contract by the City is encouraged to use its best efforts to recruit minority candidates for employment positions. Each bidder is encouraged to employ and endeavor to maintain a minority work force of at least 20% on a craft-by-craft basis.

Section 2. Local Resident Employment Guidelines

A. The Council declares that it is the policy of the City to encourage employment of local residents.

B. Each bidder who is awarded a public works contract by the Council is encouraged to use its best efforts to recruit City residents for employment positions. Each bidder is encouraged to employ and endeavor to maintain a local City resident work force of at least 50% on a craft-by-craft basis.

Section 3. Local Business Guidelines

A. The Council declares that it is the policy of the City to promote growth and economic development for the City's local businesses and suppliers.

B. Each bidder who is awarded a public works contract by the Council is encouraged to use its best efforts to utilize local businesses and suppliers in connection with the contract. Each bidder is encouraged to allocate at least 20% of the dollar amount of the contract to the utilization of local businesses, such as in the purchase of services and supplies.

Section 4. Voluntary Program; Prohibition

A. This program is voluntary in nature and is not intended to supersede or conflict with any applicable State or Federal regulations nor any State or Federal laws pertaining to the funding of a public works project.

B. A copy of this resolution shall be provided as part of the contract documents to each bidder on a public works project conducted by the City. No City official or employee shall take

compliance with this resolution into account when making any decision concerning the letting or administration of a public works contract in the City.

Section 5. Monitoring and Reporting

Each bidder who is awarded a public works contract by the City is required to submit to the City a summary by percentages and/or dollar amount of minority, local resident, local business and local supplier participation in the contract. In its summary, each bidder is required to describe what actions, activities and efforts it used in meeting or attempting to meet the guidelines of this program and also any significant problems or difficulties it encountered in achieving the guidelines set forth above. Staff shall report findings concerning voluntary compliance with this resolution each six months. A copy of this resolution shall be integrated into or included with bid packets published by the City.

Section 6. Effective Date

This resolution shall take effect immediately upon its adoption.

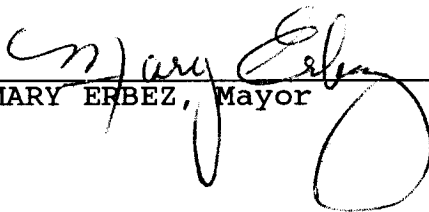
Passed and adopted on the 6th day of December, 1993, by the following vote:

AYES: Councilmembers Canciamilla, Davis, Lewis, Quesada and Mayor Erbez

NAYS: None

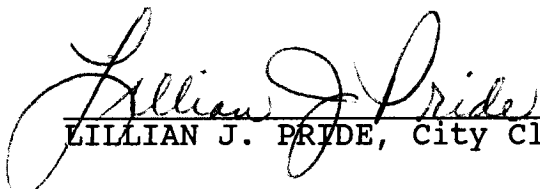
ABSTAINED: None

ABSENT: None



MARY ERBEZ, Mayor

Attest:



LILLIAN J. PRIDE, City Clerk

p\gen\local.res\c.nl.100

MICHAEL R. WOODS
SAMUEL T. CRUMP
LAURA J. ANDERSON


LAW OFFICES
MICHAEL R. WOODS
A PROFESSIONAL CORPORATION
18100 CARRIGER ROAD
SONOMA, CALIFORNIA 95476-4072
(707) 996-1776

FACSIMILE
(707) 935-0523

November 24, 1993

MEMORANDUM

TO: Mayor and Councilmembers
Chair and Board of Directors, Redevelopment Agency

FROM: Michael R. Woods, City Attorney
Laura J. Anderson 

RE: Local Employment Program

This memorandum is in response to the Council's request for information on a local contractor and minority preference program on public works contracts. Additionally, Councilman Canciamilla recently requested a resolution for Council consideration establishing a voluntary program which encourages the hiring of minorities, local residents and local small businesses in public works contracts.

A. Requirements for a Mandatory Preference Program

Before the City (or Agency) could adopt a mandatory program giving preference to local residents or local businesses in public works contracts, the Council would have to make at least one of the following findings:

- (1) non-residents are a "substantial cause" of social and economic problems (e.g. unemployment, crime, homelessness, poverty) facing city residents; or
- (2) the City has itself created disadvantages (e.g. higher business taxes, more stringent land use requirements) which cause local businesses to suffer.

The Council's findings would have to be based on substantial evidence such as statistical information, departmental studies, and testimony of city residents. The program adopted would have to be consistent with the findings, and the findings would have to be supported by appropriate evidence in the record of the Council's action. The program would have to be reasonable in light of the findings and evidence and could not favor local residents at the expense of non-residents in a way that would be disproportionate when considered against the findings and evidence.

Mayor and Councilmembers
Chair and Board of Directors
November 24, 1993
Page 2

If a mandatory program were adopted without the required findings or adequate supporting evidence, a non-resident could challenge the local preference program in court as a violation of his or her constitutional rights.

If the Council wishes to entertain a mandatory program, we suggest you direct staff to conduct a study and gather evidence concerning the findings that would have to be made, and return to the Council with a proposed program.

B. Proposed Resolution on Voluntary Program

The Council may adopt a voluntary contractor preference program without making the findings described above. The program must be truly voluntary, however; the City would not make any decision to grant a contract to a particular contractor based upon compliance with the program.

Enclosed for your consideration is a proposed resolution which recognizes increased employment of City residents and increased opportunities for local businesses are desirable for the City. The resolution encourages bidders on public works contracts to hire members of the minority community, local residents and local businesses. The guidelines set forth below are a suggestion only. The Council may wish to adjust the percentages to encourage maximum participation in the program.

The resolution will state the Council's policy that bidders promote employment opportunities for minorities, local residents and small local businesses, as follows:

(1) Minority Employment Guidelines. A bidder who is awarded a public works contract is encouraged to employ and maintain a minority work force of 20% on a craft-by-craft basis.

(2) Local Resident Employment Guidelines. A bidder who is awarded a public works contract is encouraged to employ and maintain a local resident work force of 50% on a craft-by-craft basis.

(3) Local Business Guidelines. A bidder who is awarded a public works contract is encouraged to award 20% of the total dollar amount of the contract to local small businesses through subcontracts.

If the Council wishes to adopt this voluntary program, it may do so by adopting the enclosed resolution, which would take effect immediately unless otherwise specified.

Mayor and Councilmembers
Chair and Board of Directors
November 24, 1993
Page 3

Please feel free to call if you have any questions or comments.

MRW:LJA:lr

Enclosure

cc: S. Anthony Donato, City Manager
Lillian J. Pride, Assistant City Manager/City Clerk
Nasser Shirazi, Community Development Director

pitts/general/mconpref/c.nl.100

BEFORE THE REDEVELOPMENT AGENCY OF THE CITY OF PITTSBURG

In the Matter of:

Establishing Voluntary Guidelines to)
Encourage Bidders on Public Works)
Projects to Increase the Utilization and)
Hiring of Local Contractors, Local) Res. No. 93-442
Businesses and Members of the City's)
Minority Community)
_____)

The Redevelopment Agency of the City of Pittsburg DOES RESOLVE as follows:

A. The Agency desires to take steps to encourage contractors on public works projects in the City to increase the utilization and hiring of local contractors, local businesses and members of the City's minority community.

B. Both historically and presently, the City has been home to a large and diverse population, including many members of minority communities. The City wishes to increase employment and business opportunities for members of the City's minority communities.

C. Many of the Agency's public works contracts are awarded to businesses which are not located in the City. The increased employment of City residents on projects located within the City would help to reduce traffic congestion and noise and air quality impacts.

D. Other Bay Area cities have adopted various programs or policies which are designed to heighten awareness and employment of minorities, local residents and local businesses. The adoption of a mandatory program which requires the employment of a fixed percentage of minorities, local residents and local businesses would require further study and must be supported by appropriate evidence. Additionally, findings would be required that either non-residents are a substantial cause of social and economic problems (e.g., unemployment, crime, homelessness, poverty) facing City residents or that the City itself has created disadvantages (e.g., higher business taxes, more stringent land use requirements) which have caused local businesses to suffer.

E. Rather than wait for studies to be completed and for statistical information from various governmental agencies to be compiled, the Agency desires to take immediate action that will increase awareness and utilization of, and encourage employment opportunities for minorities, local residents, local businesses and suppliers within the City.

NOW, THEREFORE, the Agency resolves:

Section 1. Minority Employment Guidelines

A. The Agency declares that it is the policy of the Agency to increase awareness of the City's minority population and to encourage the employment of members of the City's minority communities.

B. Each bidder who is awarded a public works contract by the Agency is encouraged to use its best efforts to recruit minority candidates for employment positions. Each bidder is encouraged to employ and endeavor to maintain a minority work force of at least 20% on a craft-by-craft basis.

Section 2. Local Resident Employment Guidelines

A. The Agency declares that it is the policy of the Agency to encourage employment of local residents.

B. Each bidder who is awarded a public works contract by the Agency is encouraged to use its best efforts to recruit City residents for employment positions. Each bidder is encouraged to employ and endeavor to maintain a local City resident work force of at least 50% on a craft-by-craft basis.

Section 3. Local Business Guidelines

A. The Agency declares that it is the policy of the Agency to promote growth and economic development for the City's local businesses and suppliers.

B. Each bidder who is awarded a public works contract by the Agency is encouraged to use its best efforts to utilize local businesses and suppliers in connection with the contract. Each bidder is encouraged to allocate at least 20% of the dollar amount of the contract to the utilization of local businesses, such as in the purchase of services and supplies.

Section 4. Voluntary Program; Prohibition

A. This program is voluntary in nature and is not intended to supersede or conflict with any applicable State or Federal regulations nor any State or Federal laws pertaining to the funding of a public works project.

B. A copy of this resolution shall be provided as part of the contract documents to each bidder on a public works project conducted by the Agency. No City official or employee shall take

compliance with this resolution into account when making any decision concerning the letting or administration of a public works contract by the Agency.

Section 5. Monitoring and Reporting

Each bidder who is awarded a public works contract by the Agency is required to submit to the Agency a summary by percentages and/or dollar amount of minority, local resident, local businesses and local supplier participation in the contract. In its summary, each bidder is required to describe what actions, activities and efforts it used in meeting or attempting to meet the guidelines of this program and also any significant problems or difficulties it encountered in achieving the guidelines set forth above. Staff shall report findings concerning voluntary compliance with this resolution each six months. A copy of this resolution shall be integrated into or included with bid packets published by the Agency.

Section 6. Effective Date

This resolution shall take effect immediately upon its adoption.

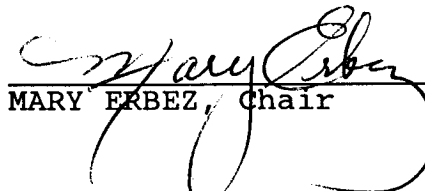
Passed and adopted on the 6th day of December, 1993, by the following vote:

AYES: Members Canciamilla, Davis, Lewis, Quesada & Chair Erbez.

NAYS: None.

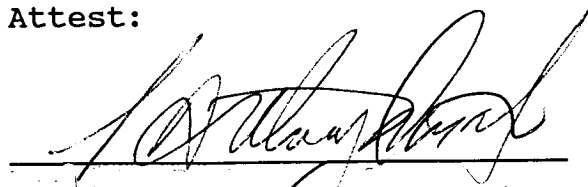
ABSTAINED: None.

ABSENT: None.



MARY ERBEZ, Chair

Attest:



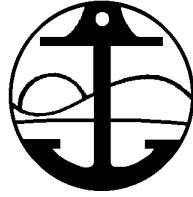
S. Anthony Donato, Executive Director

p\gen\rloc\res.ra\ra\nl.100

Appendix B

Contract Schedule

CONTRACT SCHEDULE

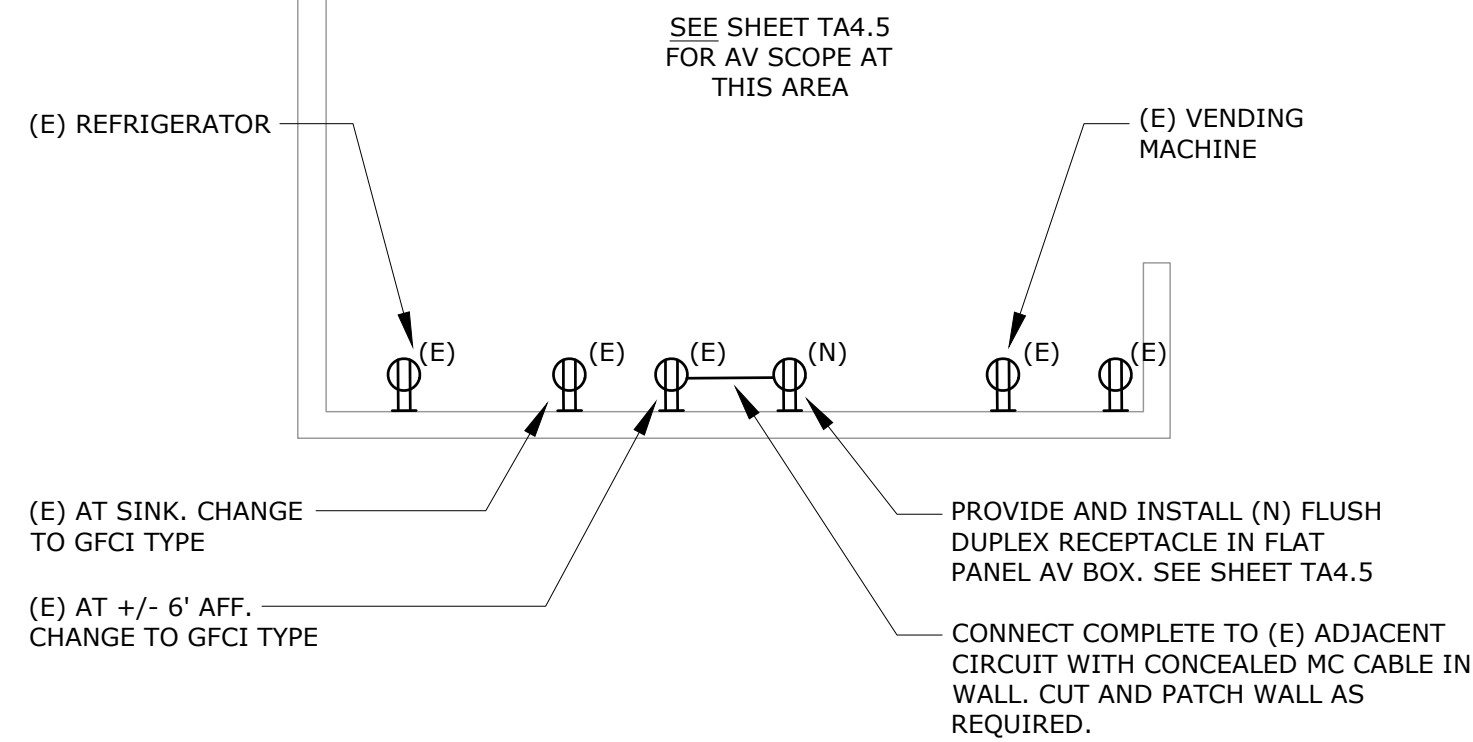


CONTRACT NUMBER 2021-24 CITY COUNCIL CHAMBERS UPGRADE PROJECT

| | |
|--|--|
| TO: ADVERTISEMENT | Wed. 1/4/2023 |
| Mandatory Pre-Bid Meeting | Wed. 1/25/2023 |
| BID OPENING Civic Center, 65 Civic Avenue 1st Floor Conference Room (Named the Shark Tank) | Wed. 2/08/2023 2:00 PM |
| CITY COUNCIL CONTRACT AWARD | Tues. 3/07/2023 |
| PRE-CONSTRUCTION CONFERENCE City Hall, 65 Civic Avenue 1st Floor Conference Room (Named the Shark Tank) | Tues. 3/21/2023 9:00 AM |
| NOTICE TO PROCEED | Tues. 3/21/2023 |

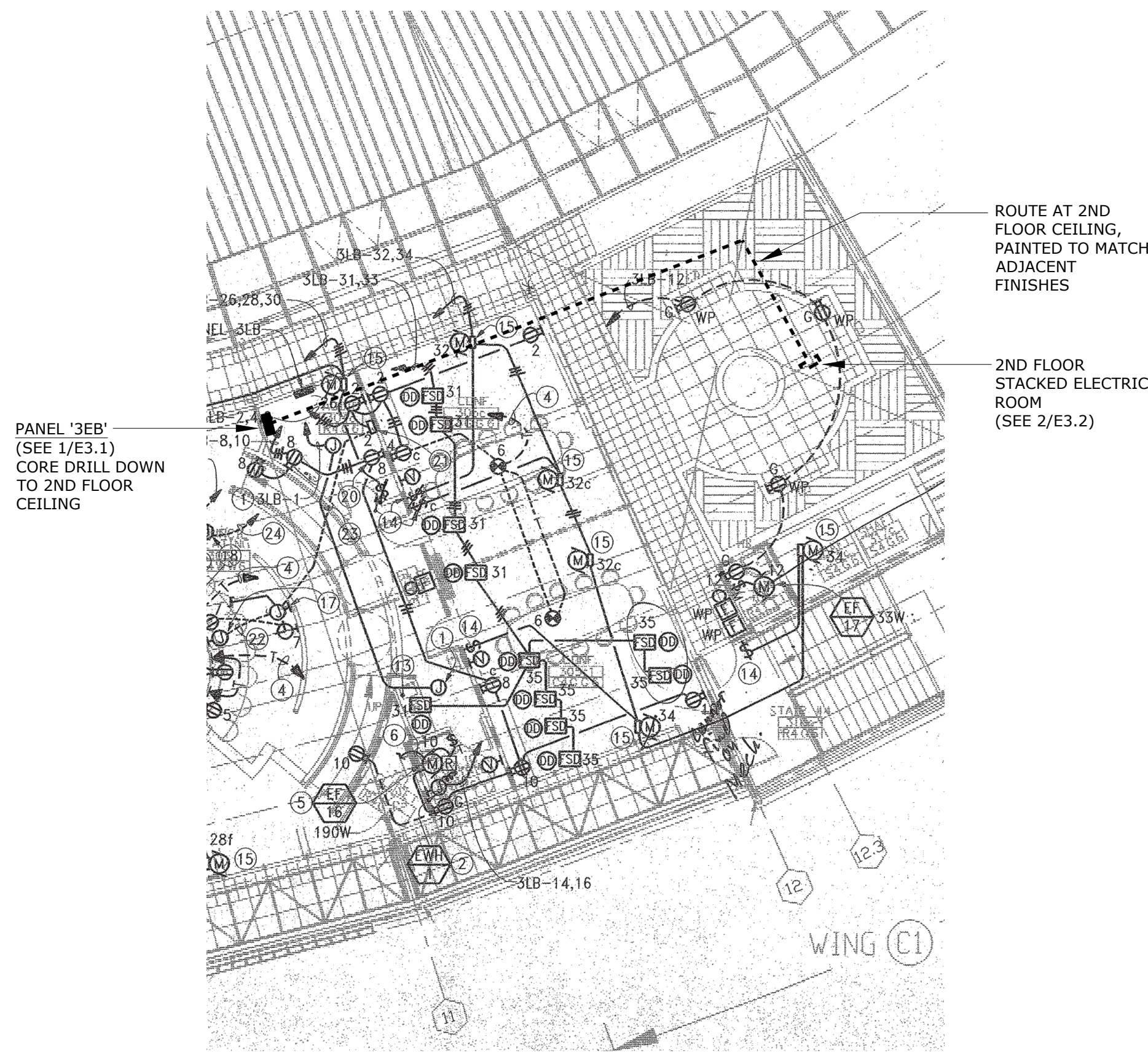
Appendix C

Contract Plans



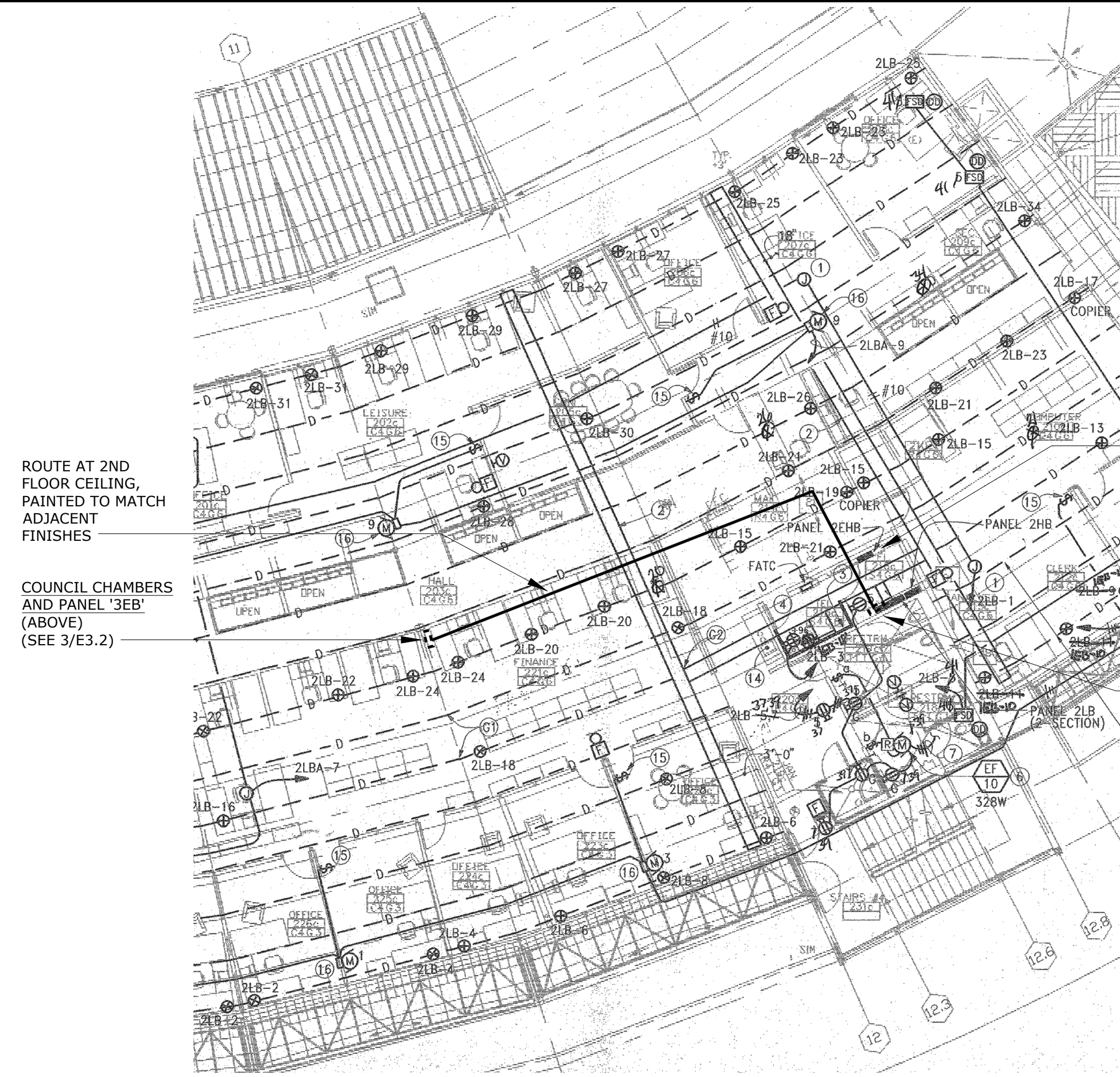
2ND FLOOR BREAK ROOM - PARTIAL PLAN
SCALE: NONE

4
E3.2



3RD FLOOR LOCATION PLAN
SCALE: NONE

3
E3.2

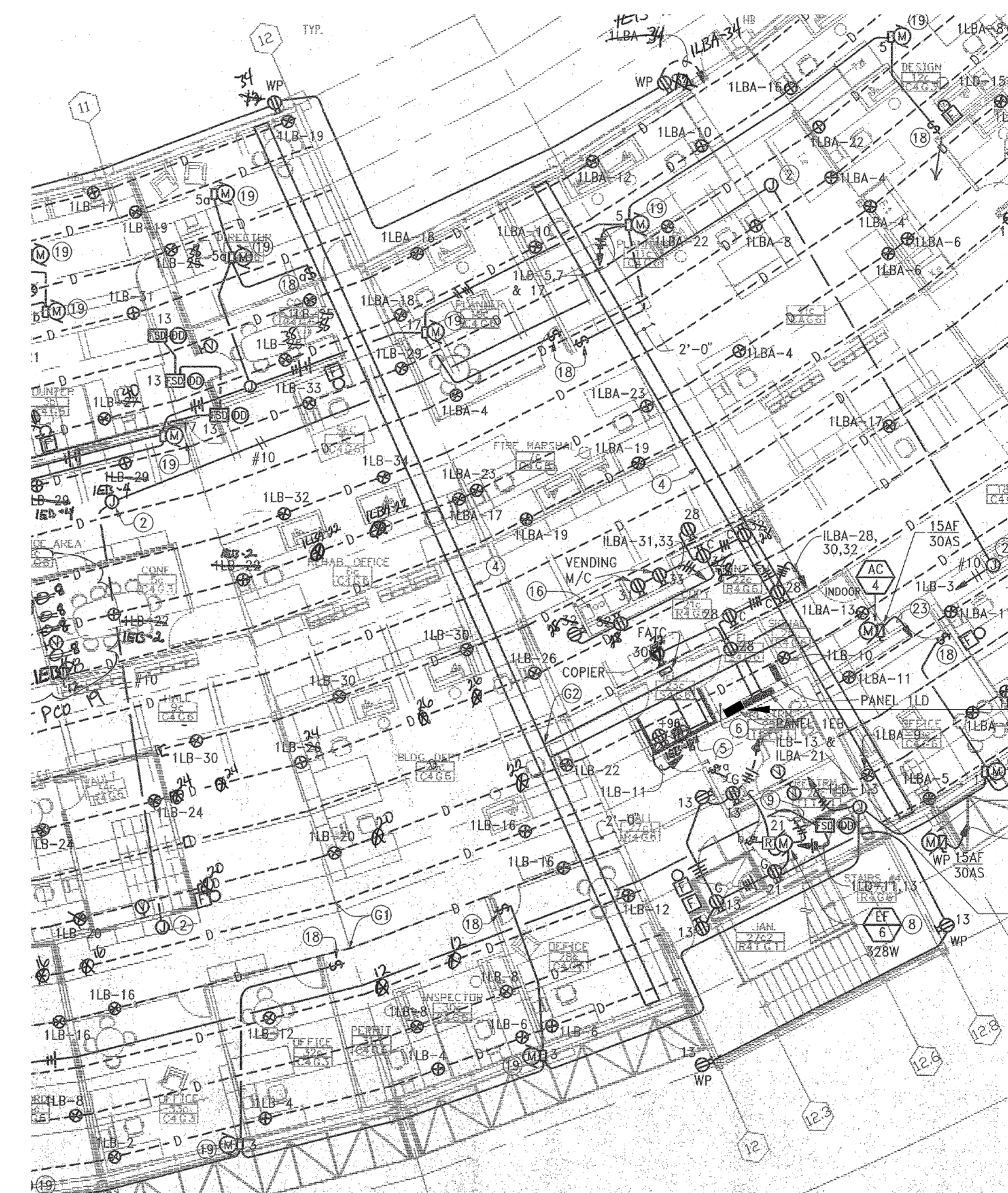


2ND FLOOR LOCATION PLAN
SCALE: NONE

2
E3.2

CONNECT (N) COUNCIL CHAMBERS LIGHTING LOADS (PER E2.1) TO (E) PANEL '2EHB' SPARE 20A/1P BREAKERS. ROUTE (N) BRANCH CIRCUITS IN PARALLEL WITH (N) PANEL '3EB' FEEDER, ALONG 2ND FLOOR CEILING AREA AS SHOWN.

2ND FLOOR ELECTRIC ROOM. CORE DRILL DOWN TO STACKED 1ST FLOOR ELECTRIC ROOM, TO PANEL '1EB' (SEE 1/E3.2)



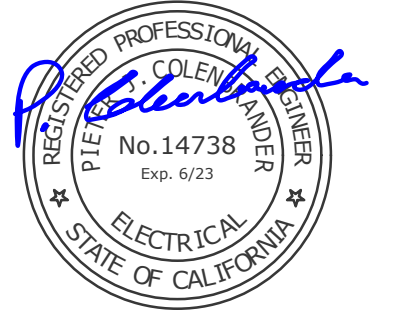
1ST FLOOR LOCATION PLAN
SCALE: NONE

1
E3.2

LUMINAIRE SCHEDULE

| TYPE | MOUNTING | DESCRIPTION | MFGR. | CATALOG # | SOURCE DETAILS | POWER SUPPLY | VOLTS | INPUT WATTS |
|-------------|---------------------------------|---|------------|---|---------------------------------|--|-------|-------------|
| AA1 | BRACKET-ARM/TRUSS-CHORD MOUNTED | MODIFIED INDIRECT LINEAR LED LUMINAIRE ASSEMBLY. BOTTOM-MOUNTED TO TOP FACE OF CUSTOM MOUNTING-ARM 'Z'-BRACKETS; NOM. 4-1/2"H x 4-1/2"W x 8'L EXTRUDED ALUMINUM RECTILINEAR HOUSINGS, FLAT ENDCAPS, STANDARD 'SIGNAL WHITE' FACTORY FINISH. FIELD-PAINTED WITH TWO (2) COATS HIGH-HEAT ENAMEL PAINT TO MATCH EXISTING ROOF TRUSS FINISH (SEE NOTES & DETAILS, SHEET E2.1). INTEGRAL ELECTRONIC DIMMING DRIVER COMPATIBLE WITH NEW LUTRON 'PICO' WIRELESS REMOTE DIMMER. VERY HIGH OUTPUT, 3500K, 90CRI, WITH ASYMMETRIC, SINGLE CIRCUIT CONTROL. SEE DETAIL 1/E2.1 FOR MOUNTING ON CUSTOM STEEL BRACKET ARMS AT BOTTOM CHORDS OF EXISTING ROOF TRUSS(ES). | FINELITE | HP4-S(MOD)-ID-8-V-930-ASY-L (CONFIRM)-120-SC-LUT-2W-FE; FIELD PAINTED CUSTOM COLOR. | LED 3000K 90 CRI 8,230LM | INTEGRAL ELECTRONIC LED DIMMING DRIVER LUTRON 2-WIRE | 120 | 73 |
| AA2 | BRACKET-ARM/TRUSS-CHORD MOUNTED | SAME AS AA1, EXCEPT 6FT L, LOWER WATTAGE. MOUNTING SIMILAR TO THAT SHOWN IN DETAIL 1/E2.1, EXCEPT BRACKETS ANGLED, AND DIFFERENT LENGTHS, FOR ANGLED INSTALLATION RELATIVE TO TRUSS CHORD, AS SHOWN ON PLANS. | FINELITE | HP4-S(MOD)-ID-6-V-930-ASY-L (CONFIRM)-120-SC-LUT-2W-FE; FIELD PAINTED CUSTOM COLOR. | LED 3000K 90 CRI 6,160LM | INTEGRAL ELECTRONIC LED DIMMING DRIVER LUTRON 2-WIRE | 120 | 49 |
| AB1 | BRACKET-ARM/TRUSS-CHORD MOUNTED | 12'-0" L EXTRUDED ALUMINUM SINGLE-CIRCUIT LIGHT TRACK RUN, FIELD CUT TO 11'-0" L, MOUNTED AT BOTTOM CHORD OF ROOF TRUSS INDICATED, ON CUSTOM MOUNTING-ARM 'Z'-BRACKETS (ALSO UTILIZED FOR MOUNTING OF TYPE 'AA1' UPLIGHT UNIT DESCRIBED ABOVE). PROVIDE ALL REQUIRED MOUNTING HARDWARE, JOINERS, DIRECT LIVE-END POWER FEED CONNECTOR FITTING, FOR FLEX CONDUIT CONNECTION, PROVIDED WITH FACTORY-STANDARD WHITE FINISH AND FIELD PAINTED AS DESCRIBED FOR 'AA1' ABOVE AFTER FULLY MASKING ENTIRE APERTURE SIDE. SEE NOTES & DETAILS, SHEET E2.1. | LIGHTOLIER | 6112NWH-6148NWH-26082/6146NWH; FIELD CUT TO 11FT; PAINT TO MAT | N/A | N/A | 120 | N/A |
| AB2 | BRACKET-ARM/TRUSS-CHORD MOUNTED | SAME AS AB1 EXCEPT 8'-0" L RUN. | LIGHTOLIER | 6108NWH-6148NWH-26082/6146NWH | N/A | N/A | 277 | N/A |
| AB3 | BRACKET-ARM/TRUSS-CHORD MOUNTED | SAME AS AB1 EXCEPT FULL 12FT LONG RUN. | LIGHTOLIER | 6112NWH-6148NWH-26082/6146NWH | N/A | N/A | 277 | N/A |
| AB4 | BRACKET-ARM/TRUSS-CHORD MOUNTED | SAME AS AB1 EXCEPT 4'-0" L RUN. | LIGHTOLIER | 6104NWH-6148NWH-26082/6146NWH | N/A | N/A | 277 | N/A |
| AC1 | TRACK MOUNTED | ADJUSTABLE LED SPOTLIGHT, TRACK MOUNTED, WITH INTEGRAL LUTRON 2-WIRE ELECTRONIC DIMMING DRIVER, ACCESSORY HOLDER, LINEAR SPREAD LENS, FLAT BLACK GLARE SNOOT, STANDARD FLAT BLACK FINISH. PROVIDE: (4) UNITS W/ 11deg. NARROW SPOT REFLECTOR; (9) UNITS WITH 17 deg. SPOT REFLECTOR, AND (5) UNITS WITH 24 deg. NARROW FLOOD REFLECTOR. NOTE: CONFIRM COMPATIBILITY WITH NEW DIMMING CONTROLS PRIOR TO RELEASE OF ORDER. | LIGHTOLIER | LLAV-30-930-BK-CW-LLAV12-RNS(4)-RS(9)-RNF(5)-LLAV12AHBK-23SNT6-LLAV12LS | LED 3000K 80 CRI 22,352LM | INTEGRAL ELECTRONIC LED DIMMING DRIVER LUTRON 2-WIRE | 277 | 34 |
| AD1 | TRACK MOUNTED | ADJUSTABLE LED FLOODLIGHT/WALLWASH UNIT, TRACK MOUNTED, WITH INTEGRAL LUTRON 2-WIRE ELECTRONIC DIMMING DRIVER, GLARE VISOR. NOTE: CONFIRM COMPATIBILITY WITH NEW DIMMING CONTROLS PRIOR TO RELEASE OF ORDER. | LIGHTOLIER | LWW-40-930-BK-BK-930-8124BK-MAELV- | LED 3500K 80 CRI 21,840LM | INTEGRAL ELECTRONIC LED DIMMING DRIVER LUTRON 2-WIRE | 277 | 41 |
| NOTE | AIMING SESSIONS: | BIDS SHALL INCLUDE TWO (2) LIGHTING AIMING SESSIONS, TO BE SCHEDULED IN ADVANCE BY THE CONTRACTOR. PROVIDE ALL REQUIRED LADDERS, LIFTS, MIN. TWO PERSONNEL TO PERFORM AIMING OF ALL NEW LUMINAIRES AS DIRECTED BY THE ELECTRICAL ENGINEER/LIGHTING DESIGN PROJECT MANAGER. ALL AIMING SHALL BE DONE IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE. | | | | | | |

OMAHONY & MYER
ELECTRICAL ENGINEERING and LIGHTING DESIGN
4340 REDWOOD HWY., SUITE 245
SAN RAFAEL, CALIFORNIA 94903
(415) 492-0420 / FAX (415) 479-9662
www.omconconsulting.com



PITTSBURG CITY HALL COUNCIL CHAMBERS - EM POWER & LIGHTING UPGRADE
PITTSBURG, CA

REVISIONS

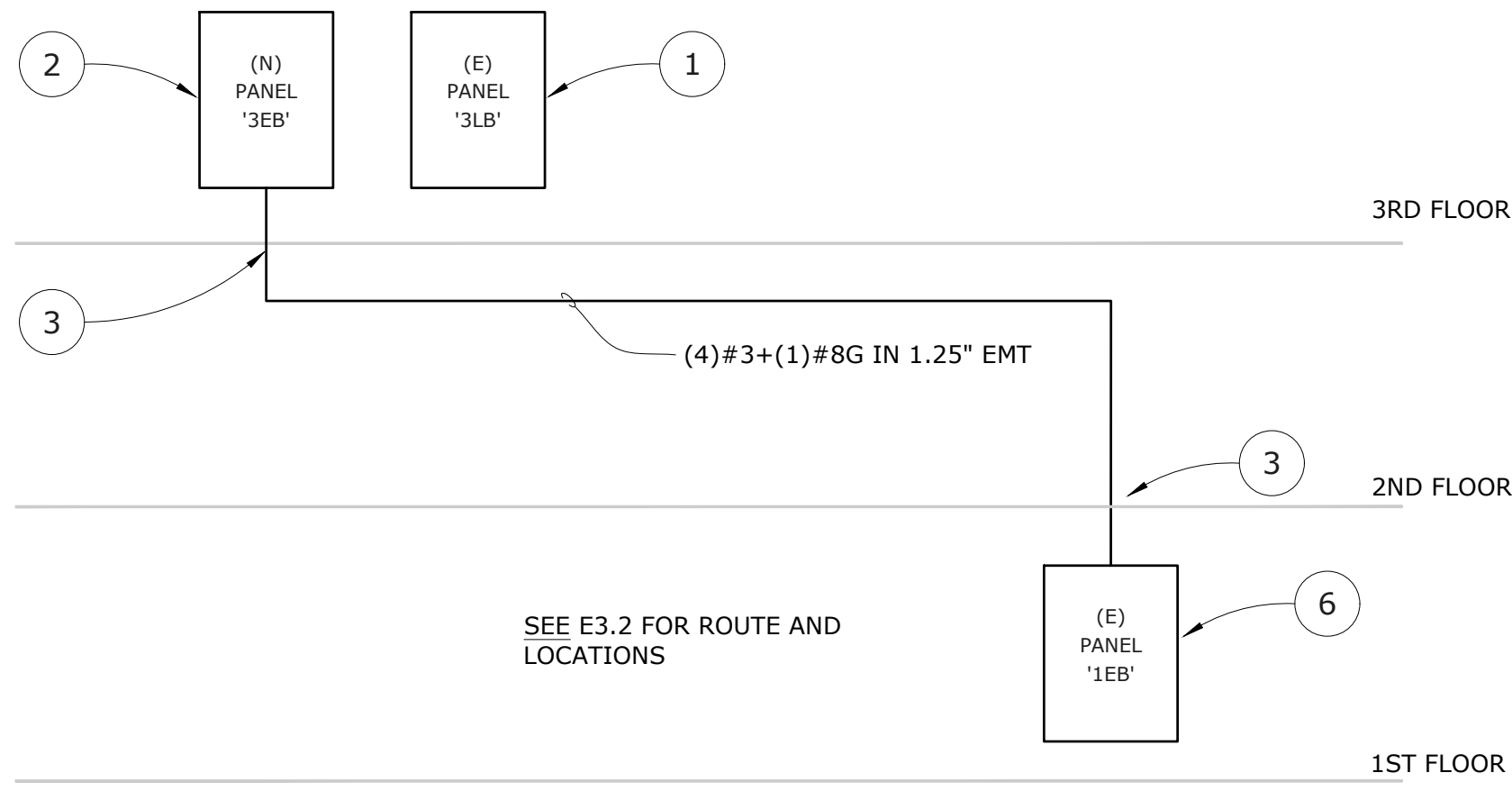
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| | | |
| | | |
| | | |
| | | |
| | | |

PROJECT NO: 221036
DRAWN BY: LNTV
DRAWING SCALE:

BID DOCUMENTS
SEPTEMBER 29, 2022

SHEET TITLE
(E) CONDITIONS ROUTING TO 1ST FLOOR + LUMINAIRE SCHEDULE

SHEET NUMBER
E3.2



SINGLE LINE RISER DIAGRAM - POWER

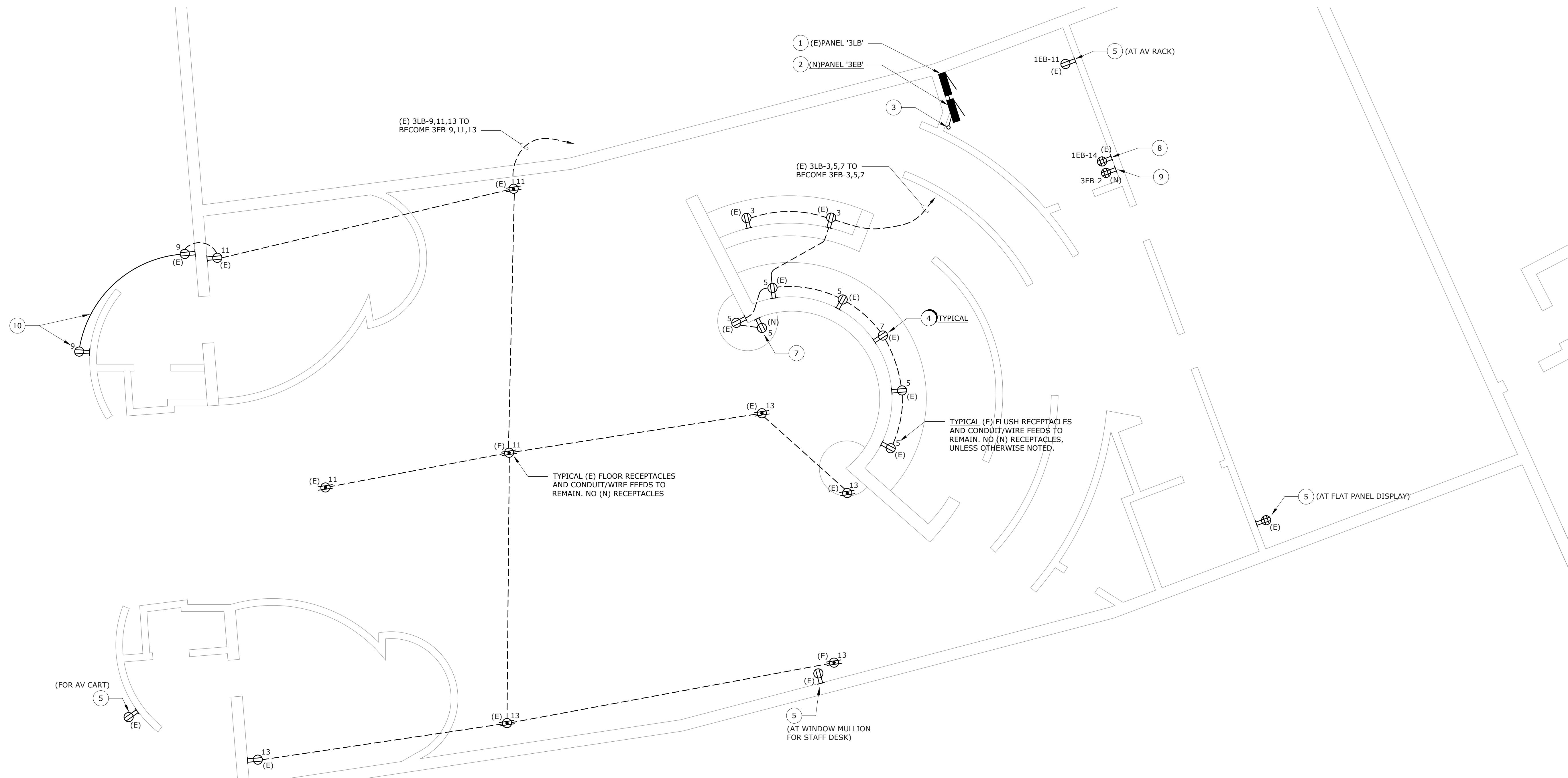
SCALE: NONE



| (N) PANEL 3EB | | | | | | | | | | | | | |
|--|------|-------------------------|------|---------------------------|---------------|----------------------|------|--------------------------|------|-----------------------|------|----------------------------|--|
| VOLTS: 120 / 208 | | PHASE: 3 PH | | WIRE: 4 W | | BUSSING: 100A | | POLES: 18P | | MAIN BRKR: MLO | | FEEDER: SEE 2/E3.1 | |
| CONDUIT: SEE 2/E3.1 | | MOUNTED: SURFACE | | AIC RATING: 10KAIC | | | | | | | | | |
| LOAD DESCRIPTION | TYPE | A | B | C | BRKR | CKT. | BRKR | A | B | C | TYPE | LOAD DESCRIPTION | |
| (N) DAIS INDIRECT UPLIGHTS | L | 0.70 | | | 20/1 | 1 | 2 | 20/1 | 1.00 | | R | RECEPT - AV EQUIPMENT ROOM | |
| (E) CHAMBERS COUNTERS - RECPT | R | | 0.90 | | 20/1 | 3 | 4 | 20/1 | | | | SPARE | |
| (E) CHAMBERS COUNTERS - RECPT | R | | | 0.90 | 20/1 | 5 | 6 | 20/1 | | | | SPACE | |
| (E) CHAMBERS FLOOR - RECPT | R | 0.54 | | | 20/1 | 7 | 8 | | | | | SPACE | |
| (E) CHAMBERS FLOOR - RECPT | R | | 0.80 | | 20/1 | 9 | 10 | | | | | SPACE | |
| (E) CHAMBERS FLOOR - RECPT | R | | | 1.09 | 20/1 | 11 | 12 | | | | | SPACE | |
| (E) CHAMBERS FLOOR - RECPT | R | 1.28 | | | 20/1 | 13 | 14 | | | | | SPACE | |
| SPACE | | | | | | 15 | 16 | | | | | SPACE | |
| SPACE | | | | | | 17 | 18 | | | | | SPACE | |
| | | 2.50 | 1.70 | 1.99 | | | | 1.00 | 0.00 | 0.00 | | | |
| DEMAND LOAD SUMMARY | | | | CONN. KVA | DEMAND FACTOR | DEMAND KVA | | | | | | | |
| TYPE "M": NON-CONTINUOUS / MISC. LOADS | | | | #REF! | 100% | #REF! | | PHASE A: 3.50 KVA | | | | | |
| TYPE "L": LIGHTING / CONTINUOUS LOADS | | | | #REF! | 125% | #REF! | | PHASE B: 1.70 KVA | | | | | |
| TYPE "R": RECEPTACLES (FIRST 10KVA) | | | | #REF! | 100% | #REF! | | PHASE C: 1.99 KVA | | | | | |
| TYPE "R": RECEPTACLES (OVER 10KVA) | | | | #REF! | 50% | #REF! | | | | | | | |
| TYPE "H": HVAC / MECHANICAL LOADS | | | | #REF! | 100% | #REF! | | | | | | | |
| TOTALS: | | | | #REF! | | #REF! | | 29.17 MAX AMPS / PHASE | | | | | |

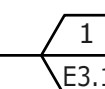
NUMBERED SHEET NOTES

- (E) BRANCH PANEL '3LB' TO REMAIN. RELOCATE (E) 20A, 120V BRANCH CIRCUITS 3LB-3,5,7,9,11,13 TO (N) ADJACENT PANEL '3EB'. SPLICE AS REQUIRED. SEE PANEL SCHEDULE. PROVIDE UPDATED FULLY TYPED PANEL DIRECTORY TO SHOW ALL (E) LOADS AND SPARE CIRCUITS. TURN OFF SPARE CIRCUIT BREAKERS.
- PROVIDE AND INSTALL (N) BRANCH PANEL '3EB' ON EMERGENCY DISTRIBUTION BRANCH. SEE SINGLE LINE DIAGRAM 2/E3.1 AND PANEL SCHEDULE.
- CORE DRILL (E) SLAB AT 3RD FLOOR AND 2ND FLOOR FOR (N) FEEDER DOWN TO 1ST FLOOR (E) PANEL '1EB'. SEE E3.2 FOR (E) PANEL LOCATION.
- FOR ALL (E) RECEPTACLES SHOWN ON THIS SHEET, REPLACE (E) P-TOUCH STYLE LABEL WITH (N) TO INDICATE (N) PANEL AND CIRCUIT DESIGNATION (FROM PANEL '3EB' INSTEAD OF '3LB'). ALSO PROVIDE A RED DOT STICKER ON EACH RECEPTACLE TO DESIGNATE BACK-UP POWER CAPABILITY (SIMILAR TO OTHER (E) RECEPTACLES AT THE COUNCIL CHAMBERS AREA).
- (E) RECEPTACLES TO REMAIN. NO CHANGE. SHOWN FOR AV REFERENCE ONLY. SEE SHEET TA4.1 AND TA4.3
- BUSS TAP OR 3-WAY SPLICE (N) FEEDER TO (E) SUPPLY SIDE FEEDER IN (E) PANEL '1EB'. (E) FEEDER OCPD IS 100A/3P BREAKER AT GENERATOR PANEL 'EDP', SO NO ADDITIONAL OCPD REQUIRED AT TAP.
- PROVIDE AND INSTALL (N) FLUSH RECEPTACLE, CONNECTED COMPLETE TO (E) ADJACENT DAIS POWER AS SHOWN, WITH LABELING SIMILAR TO NOTE 4 ABOVE.
- (E) RED DUPLEX RECEPTACLE TO BE REPLACED WITH (N) FLUSH RED QUAD RECEPTACLE IN SAME LOCATION. RECONNECT COMPLETE TO (E) EM CIRCUIT 1EB-14 AND LABEL SIMILAR TO NOTE 4 ABOVE. CUT AND PATCH WALL FOR (N) CUT-IN BOX AS REQUIRED.
- PROVIDE AND INSTALL (N) FLUSH RED QUAD RECEPTACLE ADJACENT TO (E) RECEPTACLE LOCATION. CONNECT COMPLETE TO (N) CIRCUIT SHOWN, WITH MC CABLE CONCEALED IN (E) WALL. CUT AND PATCH WALL AS REQUIRED AND LABEL SIMILAR TO NOTE 4 ABOVE.
- PROVIDE AND INSTALL (N) FLUSH DUPLEX RECEPTACLE IN CURVED WALL (+18" AFF). EXTEND (E) CIRCUIT FROM (E) RECEPTACLE LOCATION TO (N) LOCATION SHOWN AND CONNECT COMPLETE. ROUTE ALL (N) CONDUIT AND WIRE (OR MC CABLE) CONCEALED IN (E) CONSTRUCTION. FISH IN (E) CAVITIES OR CUT AND PATCH AS REQUIRED.

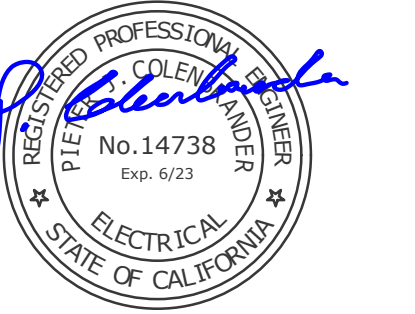


3RD FLOOR PLAN - POWER

SCALE: 1/4" = 1'-0"



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ELECTRICAL ENGINEERING AND LIGHTING DESIGN
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SAN RAFAEL, CALIFORNIA 94903
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PITTSBURG CITY HALL COUNCIL CHAMBERS - EM POWER & LIGHTING UPGRADE

PITTSBURG, CA

| REVISIONS | |
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PROJECT NO: 221036
DRAWN BY: LNTV
DRAWING SCALE:

BID DOCUMENTS
SEPTEMBER 29, 2022

SHEET TITLE
3RD FLOOR COUNCIL CHAMBERS FLOOR PLAN - POWER

SHEET NUMBER
E3.1

| SYMBOL | DEVICE | FUNCTION OR SERVICE | LOCATION | WORK OF | ROUGH-IN | RACEWAY | ELEVATION | CABLE FILL & HOMERUN DESTINATION, U.O.N. | FINISH | WEIGHT, LB | DETAIL SHEET(S) |
|---------|--|----------------------|---|----------|---|--------------------|--|--|--------|------------|-----------------|
| A | ANTENNA/EMITTER FOR RF ASSISTIVE LISTENING SYSTEM | AUDIO-VISUAL SYSTEMS | CEILING | 27 41 16 | 1-GANG W/ RING | R6 | ATTACHED TO (E) TRUSS | PER FUNCTIONAL AND AS NOTED | BLACK | 1 | N/A |
| CBP | CONTROL BUTTON PANEL | AUDIO-VISUAL SYSTEMS | WALL | 27 41 16 | 1-GANG W/ RING | R6 | +42" A.F.F. TO C.L., U.O.N. | PER FUNCTIONAL AND AS NOTED | WHITE | 1 | N/A |
| CTP | WALL-MOUNTED CONTROL PANELS, TOUCH, 10" DIAGONAL | AUDIO-VISUAL SYSTEMS | INDICATED | 27 41 16 | N/A | N/A | TABLE TOP | PER FUNCTIONAL AND AS NOTED | WHITE | 2 | N/A |
| FPWB | FLAT PANEL ROUGH-IN BOX | AUDIO VISUAL SYSTEMS | FLUSH IN WALL | 27 41 03 | FPWB | | 1-1/2" C. FROM EA. OF (2) LOW VOLTAGE COMPARTMENTS TO ABOVE ACCESSIBLE CEILING | PER FUNCTIONAL | WHITE | N/A | N/A |
| GMC | GOOSENECK MICROPHONE, TOPSET, WITH PUSHBUTTON CONTROL FOR LATCHING PUSH-TO-TALK | AUDIO VISUAL SYSTEMS | WORK SURFACE | 27 41 16 | PROVIDE 2" DIA. GROMMET FOR CABLE PASSTHRU IN WORK SURFACE. | N/A | WORK SURFACE | PER FUNCTIONAL AND AS NOTED | BLACK | 1 | N/A |
| LCD82 | FLAT DISPLAY PANEL, 82" DIAGONAL, 16:9 ASPECT RATIO | AUDIO-VISUAL SYSTEMS | FPWB IS FLUSH MTD WALL, PANEL IS SURFACE MOUNTED. | 27 41 16 | FPWB | (SEE FPWB) | CENTERLINE OF DISPLAY AT 60" A.F.F. | PER FUNCTIONAL | BLACK | 165 | N/A |
| LCD86 | FLAT DISPLAY PANEL, 86" DIAGONAL, 16:9 ASPECT RATIO | AUDIO-VISUAL SYSTEMS | FPWB IS FLUSH MTD WALL, PANEL IS SURFACE MOUNTED. | 27 41 16 | FPWB | (SEE FPWB) | CENTERLINE OF DISPLAY AT 60" A.F.F. | PER FUNCTIONAL | BLACK | 175 | N/A |
| LCD23 | FLAT DISPLAY PANEL, 23" DIAGONAL, 16:9 ASPECT RATIO | AUDIO-VISUAL SYSTEMS | FPWB IS FLUSH MTD WALL, PANEL IS SURFACE MOUNTED. | 27 41 16 | FPWB | (SEE FPWB) | CENTERLINE OF DISPLAY AT 60" A.F.F. | PER FUNCTIONAL | BLACK | 20 | N/A |
| LCD32 | FLAT DISPLAY PANEL, 32" DIAGONAL, 16:9 ASPECT RATIO | AUDIO-VISUAL SYSTEMS | FPWB IS FLUSH MTD WALL, PANEL IS SURFACE MOUNTED. | 27 41 16 | FPWB | (SEE FPWB) | CENTERLINE OF DISPLAY AT 60" A.F.F. | PER FUNCTIONAL | BLACK | 25 | N/A |
| MP1 | HDMI INPUT PLATE | AUDIO-VISUAL SYSTEMS | INDICATED | 27 41 16 | 1 GANG BACKBOX WITH 1 GANG RING, 2-3/4" DEEP | R6 | +42" A.F.F. TO C.L., U.O.N. | PER FUNCTIONAL AND AS NOTED | WHITE | N/A | N/A |
| MP2 | HDMI OUTPUT PLATE | AUDIO-VISUAL SYSTEMS | INDICATED | 27 41 16 | 1 GANG BACKBOX WITH 1 GANG RING, 2-3/4" DEEP | R6 | +42" A.F.F. TO C.L., U.O.N. | PER FUNCTIONAL AND AS NOTED | WHITE | N/A | N/A |
| MP3 | INTERPRETER STATION AUDIO PLATE | AUDIO-VISUAL SYSTEMS | INDICATED | 27 41 16 | 1 GANG BACKBOX WITH 1 GANG RING, 2-3/4" DEEP | R6 | +18" A.F.F. TO C.L. U.O.N. | PER FUNCTIONAL AND AS NOTED | WHITE | N/A | N/A |
| MP4 | CAMERA SDI/IP-CONTROL PLATE | AUDIO-VISUAL SYSTEMS | INDICATED | 27 41 16 | 1 GANG BACKBOX WITH 1 GANG RING, 2-3/4" DEEP | R6 | +18" A.F.F. TO C.L. U.O.N. | PER FUNCTIONAL AND AS NOTED | WHITE | N/A | N/A |
| MP5 | BROADCAST CONTROL PLATE | AUDIO-VISUAL SYSTEMS | INDICATED | 27 41 16 | 1 GANG BACKBOX WITH 1 GANG RING, 2-3/4" DEEP | R6 | +18" A.F.F. TO C.L. U.O.N. | PER FUNCTIONAL AND AS NOTED | WHITE | N/A | N/A |
| PTZ | PAN-TILT-ZOOM VIDEO CAMERA | AUDIO-VISUAL SYSTEMS | INDICATED | 27 41 16 | 1 GANG BACKBOX WITH 1 GANG RING, 2-1/8" DEEP | R6 | +84" A.F.F. TO C.L., U.O.N. | PER FUNCTIONAL | WHITE | 12 | N/A |
| R33 (E) | (E) FULL HEIGHT RACK, SEISMIC RATED | AUDIO-VISUAL SYSTEMS | FLOOR | 27 41 08 | (E) | (E) | FLOOR MOUNTED | PER FUNCTIONAL | BLACK | 350 | N/A |
| HSP | LOUDSPEAKER, CEILING, TRUSS/BEAM MOUNT | AUDIO-VISUAL SYSTEMS | CEILING | 27 41 16 | (E) | (E) | (E) TRUSS | PER FUNCTIONAL AND AS NOTED | BLACK | 10 | N/A |
| SBS | LOUDSPEAKER, SOUNDBAR TYPE | AUDIO-VISUAL SYSTEMS | ATTACHED TO DISPLAY | 27 41 16 | N/A | N/A | ATTACHED TO DISPLAY | PER FUNCTIONAL | BLACK | 12 | N/A |
| SR | LOUDSPEAKER, WALL MOUNTED | AUDIO-VISUAL SYSTEMS | MOUNTED TO WALL | 27 41 16 | (E) | (E) | INDICATED | PER FUNCTIONAL AND AS NOTED | BLACK | 20 | N/A |
| W | WIRELESS MICROPHONE ANTENNA | AUDIO-VISUAL SYSTEMS | CEILING | 27 41 16 | 1-GANG W/ PLATE | R6, LRI4 (SEE RCP) | CEILING | AS SCHEDULED | WHITE | 1 | N/A |
| WGMC | WIRELESS GOOSENECK MICROPHONE, TOPSET, WITH PUSHBUTTON CONTROL FOR LATCHING PUSH-TO-TALK | AUDIO VISUAL SYSTEMS | WORK SURFACE | 27 41 16 | N/A | N/A | WORK SURFACE | N/A | BLACK | 1 | N/A |
| [] | WALL SLEEVE/CONDUIT | PATHWAY | INDICATED | 27 41 03 | N/A | R11 | | | | | |

NOTE NO. DEVICE NOTES

- WORK OF NOTES
- WO1 PROVIDE CABLING AND ROUGH-IN UNDER WORK OF PROJECT - LIGHTING FIXTURE PROVIDED BY OWNER'S CONTRACTOR (N.I.C.).
- LOCATION & ROUGH-IN NOTES
- LRI1 INSTALLED ASSEMBLY, INCLUDING MONITOR SHALL NOT PROJECT MORE THAN 4" FROM FACE OF WALL. IF LEADING EDGE 27" TO 80" AFF
- LRI2 MATCH PROJECT SWITCH HEIGHT
- LRI3 4S BOX W/ 1 GANG RING BLANK COVER PLATE
- LRI4 CONCEAL CONDUITS AND BACKBOXES FOR AUDIOVISUAL DEVICES IN THE ROOF INSULATION LAYER. COORDINATE PRECISE LOCATION OF BOXES WITH ARCHITECTURAL REFLECTED CEILING PLAN. ROUTE CONDUITS ORTHOGONAL TO BUILDING GRID LINES. UTILIZE GRC CONDUIT AND CAST OUTLET BOXES OR OTHER APPROVED METHOD TO PROVIDE PHYSICAL PROTECTION OF CONCEALED RACEWAYS. PROVIDE FLUSH (RECESSED), CEILING ACCESSIBLE JUNCTION BOXES AS REQUIRED.
- LRI5 NOT USED
- LRI6 NOT USED
- LRI7 MANUFACTURER'S VENTED BACKBOX .
- LRI8 NOT USED

- LRI9 4S BOX, 2-1/8" DEEP MIN., W/ 1 GANG RING WITH LOCKING HINGED COVER PLATE (FSR WB-MR2G OR EQUAL).
- LRI10 NOT USED
- LRI11 PROVIDE BACKING AND SUPPORT FOR 5 POUND DEVICE.
- LRI12 PROVIDE DEVICE COMPLETE WITH BACKBOX, TILE SUPPORT RAILS AND CEILING CUTOUT TEMPLATE. COMPLY WITH SECTION 09 50 11 ACOUSTICAL PANEL CEILINGS.
- LRI13 PROVIDE BACKING IN WALL SUITABLE TO SUPPORT A 20 POUND DEVICE WITH A LOAD CENTROID 18 INCHES FROM THE FACE OF THE WALL.
- LRI14 PROVIDE BACKING IN WALL SUITABLE TO SUPPORT A 200 POUND DEVICE WITH A LOAD CENTROID 8 INCHES FROM THE FACE OF THE WALL.
- LRI15 AS DETAILED AND/OR SCHEDULED ON THE ARCHITECTURAL DRAWINGS.

RACEWAY NOTES

- R1 (4) 2" C. TO ABOVE ACCESSIBLE CEILING. IN ADDITION, PROVIDE END-TO-END CONDUIT FOR FIRE ALERT SYSTEM LOUDSPEAKER DEVICES
- R2 3/4" C. END-TO-END, H.R. TO FIRE ALERT SYSTEM HEAD-END IN IDF.
- R3 NOT USED
- R4 AS DETAILED AND/OR SCHEDULED
- R5 3/4" C. H.R. TO ACCESSIBLE CEILING OR FLOOR, OR TO SERVING BDF, IDF OR EQUIPMENT ROOM, U.O.N.
- R6 1" C. H.R. TO ACCESSIBLE CEILING OR FLOOR, OR TO SERVING BDF, IDF OR EQUIPMENT ROOM, U.O.N.
- R7 1-1/4" C. H.R. TO ACCESSIBLE CEILING OR FLOOR, OR TO SERVING BDF, IDF OR EQUIPMENT ROOM, U.O.N.
- R8 NOT USED
- R9 AT ACCESSIBLE CEILING, PROVIDE ABOVE CEILING PATHWAY USING CABLE HOOKS. WHERE MOUNTED IN GYP CEILING, EXTEND 3/4" C. TO ACCESSIBLE CEILING.
- R10 2 1-1/4" C TO 4 GANG COMPARTMENT, 1 - 1" TO 1 GANG COMPARTMENT, STUBBED TO ACCESSIBLE CEILING OR FLOOR EXTEND TO SERVER ROOM USING BASKET TRAY. SEE ELECTRICAL DRAWINGS FOR ELECTRICAL ROUGH-IN.

- R11 UNLESS OTHERWISE SHOWN, PROVIDE 1.5" EMT SLEEVE, WITH INSULATED THROAT BUSHING AT EACH END, STUBBED OUT 4 INCHES FROM FACE OF WALL, AT ELEVATION APPROXIMATELY 6 INCHES ABOVE ACCESSIBLE CEILING. INSTALL SLEEVE IN AN ACCESSIBLE LOCATION AS DEFINED IN CALIFORNIA ELECTRICAL CODE, ARTICLE 100 DEFINITIONS. PROVIDE FIRESTOPPING UNDER WORK OF SECTION 27 41 03. BOND TO GROUND. COMPLY WITH DIVISION 26 AND SECTION 27 41 01 GROUNDING.
- R12 4 1-1/4" C TO 6 GANG COMPARTMENT, 1 - 1.25" TO EA. 1 GANG COMPARTMENT, STUBBED TO ACCESSIBLE CEILING OR FLOOR, EXTEND TO SERVER ROOM IN BASKET TRAY. SEE ELECTRICAL DRAWINGS FOR ELECTRICAL ROUGH-IN TO 3 GANG COMPARTMENT.
- ACCESSIBLE CEILING IS A T-BAR OR SIMILAR GRID BASED, PANELIZED REMOVEABLE CEILING MEETING THE DEFINITION FOR ACCESSIBLE WIRING METHODS IN ARTICLE 100 OF THE CALIFORNIA ELECTRICAL CODE.



PITTSBURG CITY HALL COUNCIL
CHAMBERS
AUDIOVISUAL UPGRADES
PITTSBURG, CA

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BID DOCUMENTS
SEPTEMBER 29, 2022
SHEET TITLE

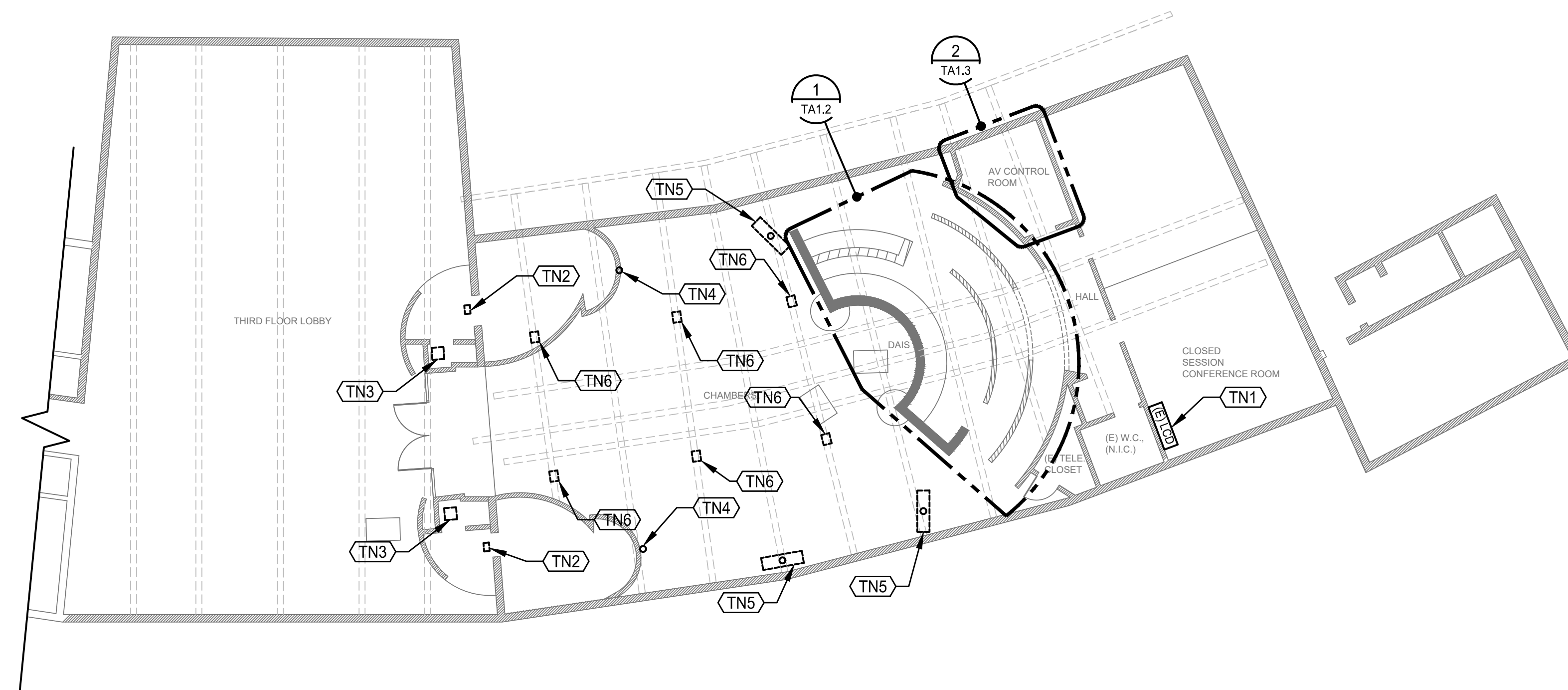
SYMBOL SCHEDULE

SHEET NUMBER

TA0.2

KEYNOTES

- TN COMMUNICATIONS SYSTEMS: WORK OF DIVISION 27.
- ⬡(TN1) (E) WALL-MOUNTED DISPLAY AND AUDIOVISUAL EQUIPMENT TO REMAIN.
- ⬡(TN2) (E) WALL-MOUNTED LOUDSPEAKER AND SPEAKER WIRE TO BE REMOVED, RE-USE BACKBOX AND PATHWAY. COORDINATE DISPOSITION/DISPOSAL WITH OWNER REPRESENTATIVE.
- ⬡(TN3) (E) PORTABLE LOUDSPEAKER TO BE REMOVED. COORDINATE DISPOSITION/DISPOSAL WITH OWNER REPRESENTATIVE.
- ⬡(TN4) (E) PTZ CAMERA AND CABLING TO BE REMOVED. RE-USE BACKBOX, PATHWAY AND MOUNT. COORDINATE DISPOSITION/DISPOSAL WITH OWNER REPRESENTATIVE.
- ⬡(TN5) (E) FLAT PANEL DISPLAY AND ASSOCIATED CABLING/BALUNS TO BE REMOVED. (E) TRUSS-ATTACHED POLE MOUNT TO REMAIN. COORDINATE DISPOSITION/DISPOSAL WITH OWNER REPRESENTATIVE.
- ⬡(TN6) (E) TRUSS-MOUNTED LOUDSPEAKER TO BE REMOVED. RE-USE BACKBOX/PATHWAY/MOUNT. COORDINATE DISPOSITION/DISPOSAL WITH OWNER REPRESENTATIVE.



1 THIRD FLOOR (EAST) OVERALL DEMO PLAN
 3/32"=1'-0"



**PITTSBURG CITY HALL COUNCIL
 CHAMBERS
 AUDIOVISUAL UPGRADES**
 PITTSBURG, CA

| REVISIONS | | |
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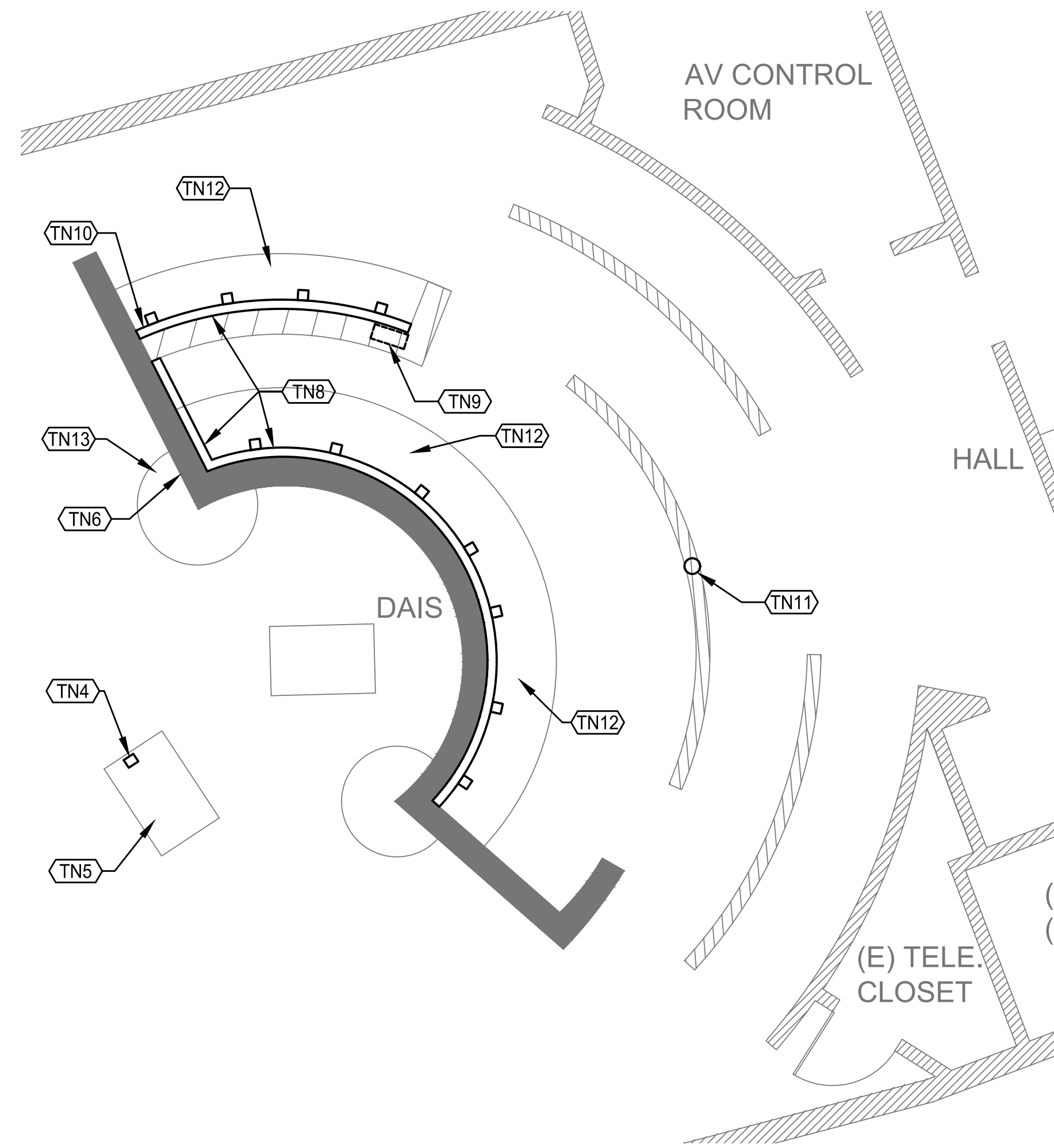
BID DOCUMENTS
 SEPTEMBER 29, 2022

SHEET TITLE

THIRD FLOOR (EAST)
 OVERALL DEMO PLAN

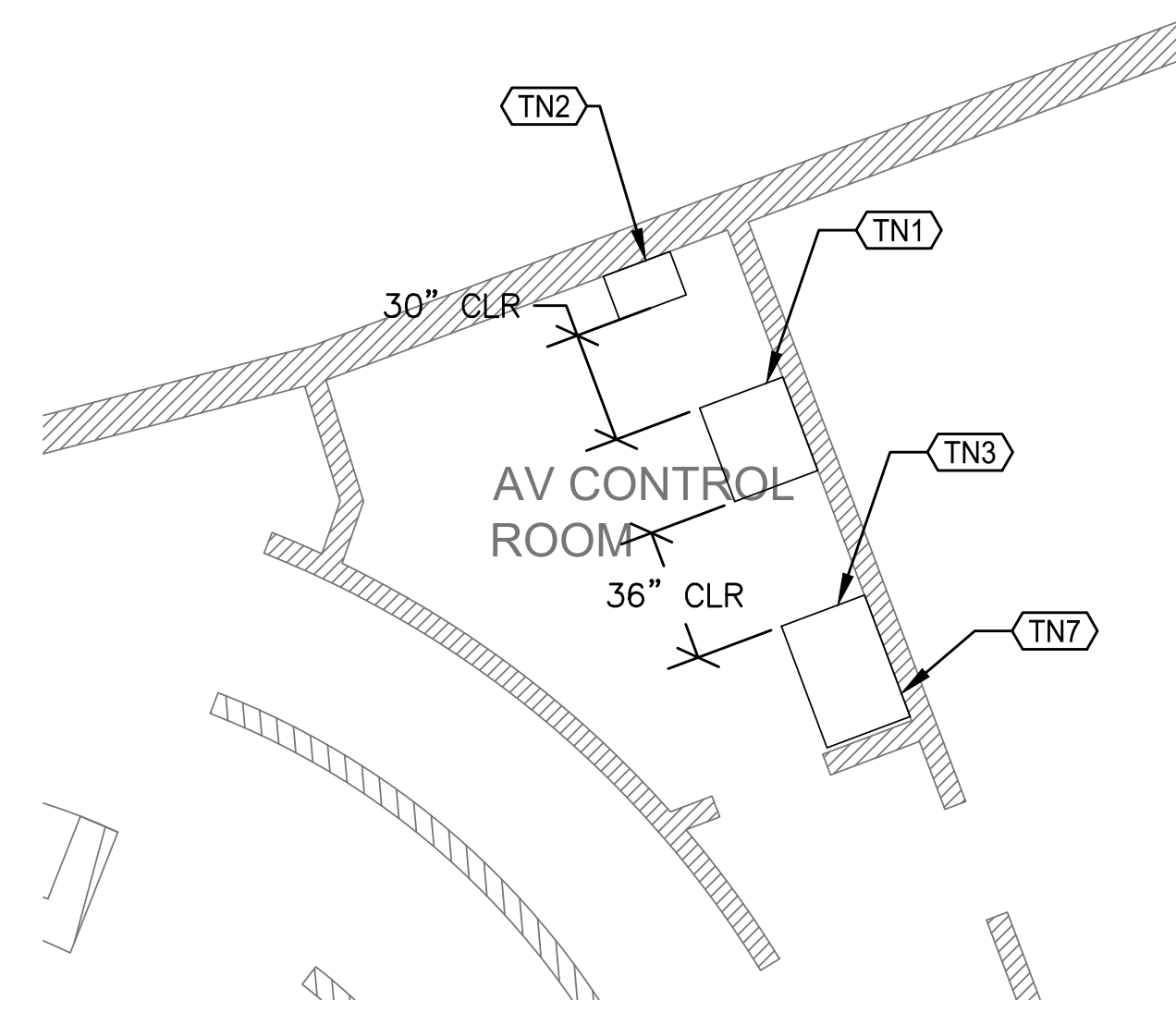
SHEET NUMBER

TA1.1



1 DAIS DEMO ENLARGED PLAN

1/4"=1'-0"



2 AUDIOVISUAL CONTROL ROOM DEMO ENLARGED PLAN

1/4"=1'-0"



KEYNOTES

- TN COMMUNICATIONS SYSTEMS: WORK OF DIVISION 27.
- ⓉN1 (E) WALL-MOUNT RADIO RACK TO REMAIN (N.I.C.)
- ⓉN2 (E) FULL-HEIGHT AV RACK TO REMAIN, SEE TA7.4 FOR DISPOSITION OF (E) EQUIPMENT.
- ⓉN3 (E) WORK SURFACE TO REMAIN.
- ⓉN4 (E) AV PAV/DATA POKE-THRU TO REMAIN. PROTECT IN PLACE. REMOVE UNUSED AUDIOVISUAL CABLING.
- ⓉN5 (E) REPOSITIONABLE LECTERN AND ASSOCIATED CABLING TO BE REMOVED. COORDINATE DISPOSITION/DISPOSAL WITH OWNER REPRESENTATIVE.
- ⓉN6 (E) 1G MEDIA PORT. REMOVE RECEIVER/BALUN AND CABLING. PROTECT BACKBOX IN PLACE.
- ⓉN7 (E) TABLE-TOP (E) CAMERA CONTROLLER AND ASSOCIATED CABLING TO BE REMOVED. COORDINATE DISPOSITION/DISPOSAL WITH OWNER REPRESENTATIVE. (E) MONITORS AND KEYBOARD TO REMAIN.
- ⓉN8 (E) AMX CONTROL PORTS, SURFACE RACEWAY, AMX CONTROL BOX, HDMI SPLITTERS AND ASSOCIATED CABLING TO BE REMOVED. COORDINATE DISPOSITION/DISPOSAL W/ OWNER REPRESENTATIVE. PATCH AND REPAIR WALL AS REQ'D.
- ⓉN9 (E) 12x18 RECESSED PULLBOX TO REMAIN. REMOVE ALL UNUSED LOW-VOLTAGE CABLING.
- ⓉN10 (E) CASSETTE RECORDER AND ASSOCIATED CABLING TO BE REMOVED. COORDINATE DISPOSITION/DISPOSAL W/ OWNER REPRESENTATIVE.
- ⓉN11 (E) PTZ CAMERA AND ASSOCIATED CABLING TO BE REMOVED. COORDINATE DISPOSITION/DISPOSAL W/ OWNER REPRESENTATIVE.
- ⓉN12 (E) GOOSENECK MICROPHONES AND ASSOCIATED CABLING TO BE REMOVED. COORDINATE DISPOSITION/DISPOSAL W/ OWNER REPRESENTATIVE.
- ⓉN13 (E) ASSISTIVE LISTENING SIGN TO REMAIN.



PITTSBURG CITY HALL COUNCIL CHAMBERS AUDIOVISUAL UPGRADES

PITTSBURG, CA

REVISIONS

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BID DOCUMENTS
 SEPTEMBER 29, 2022

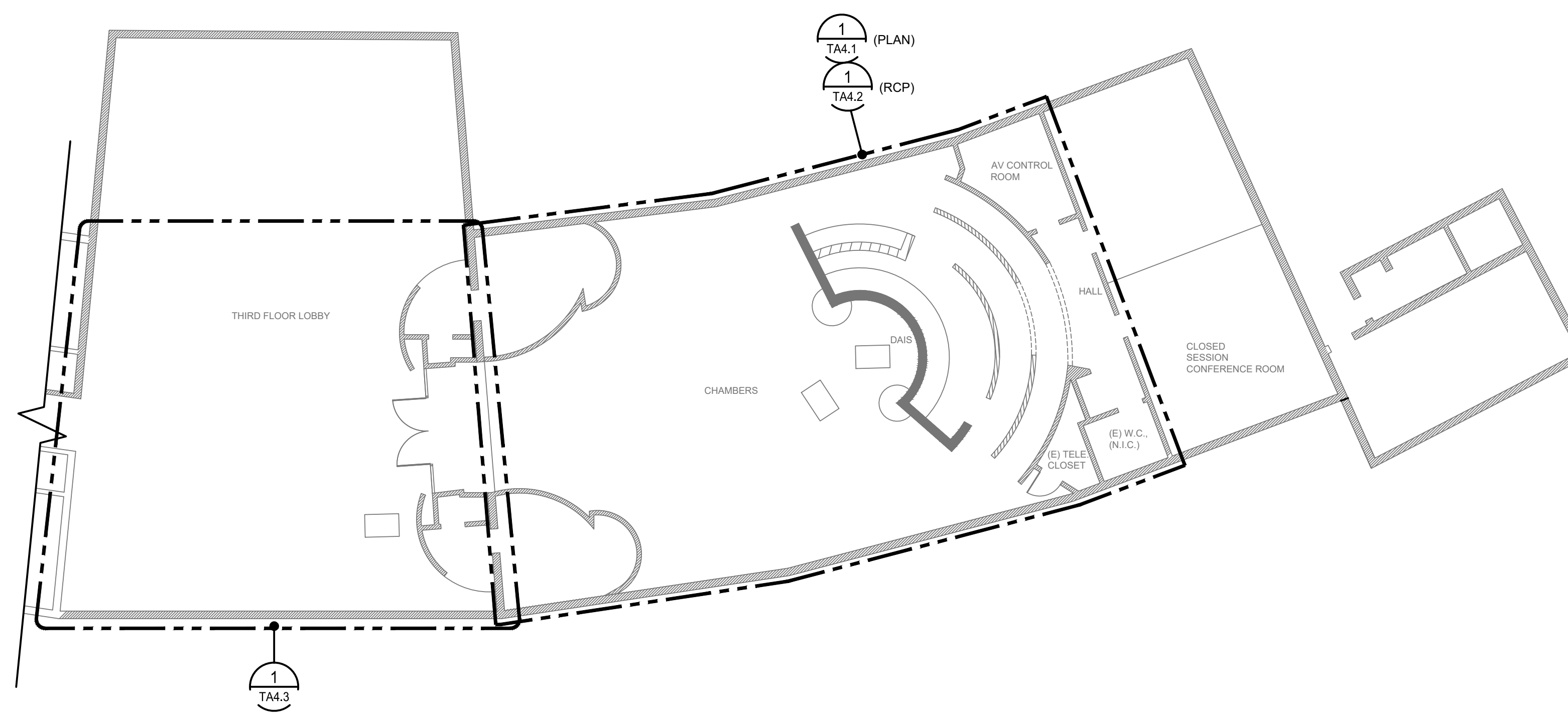
SHEET TITLE

AUDIOVISUAL
 DAIS DEMO AND CONTROL
 ROOM ENLARGED PLANS

SHEET NUMBER

TA1.2

PITTSBURG CITY HALL COUNCIL CHAMBERS AUDIOVISUAL UPGRADES
 PITTSBURG, CA



1 THIRD FLOOR (EAST) OVERALL PLAN 3/32"=1'-0" **NORTH**

REVISIONS

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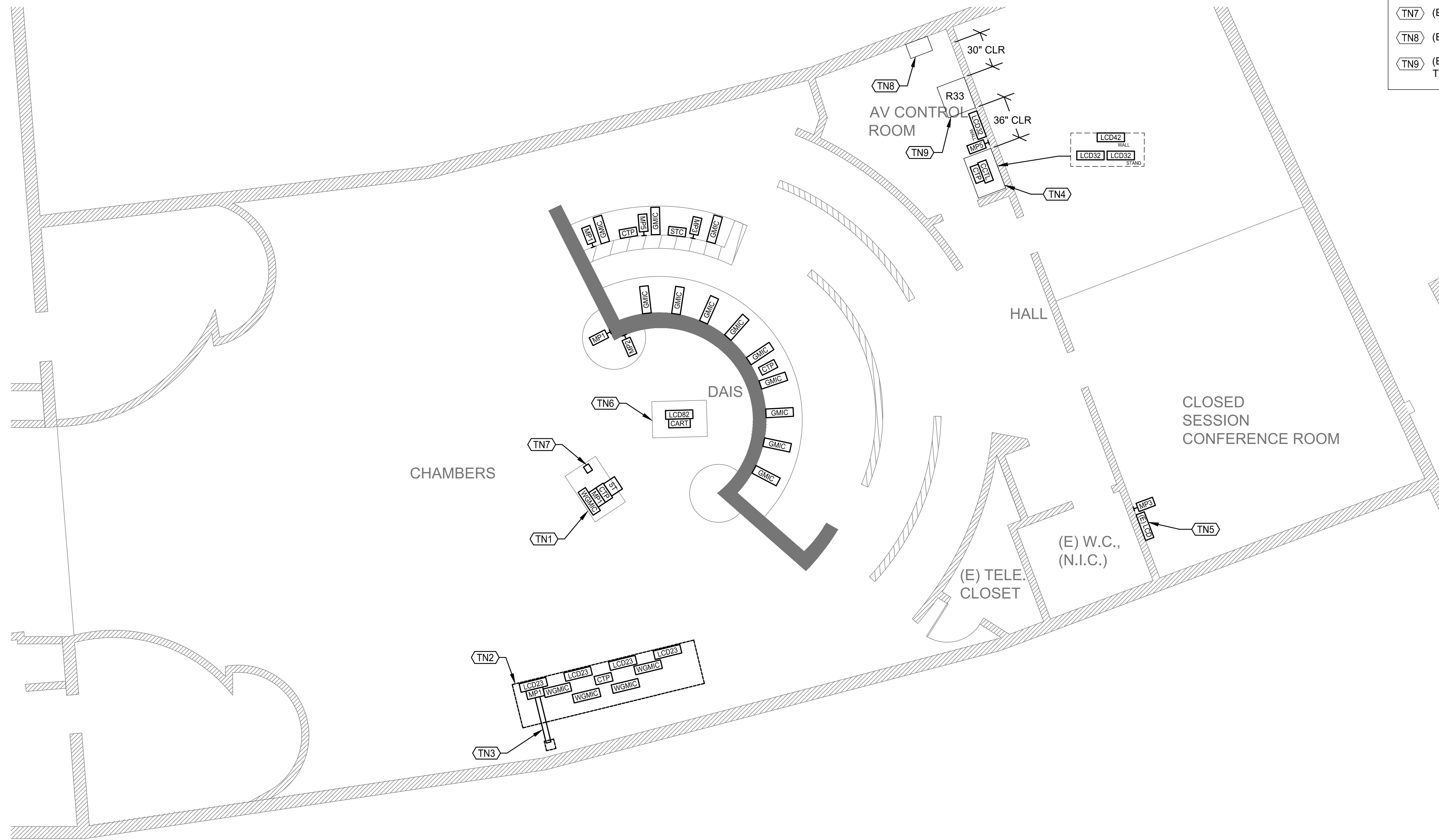
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BID DOCUMENTS
 SEPTEMBER 29, 2022
 SHEET TITLE

THIRD FLOOR (EAST)
 OVERALL PLAN

SHEET NUMBER
 TA2.1

| KEYNOTES | |
|----------|---|
| TN | COMMUNICATIONS SYSTEMS: WORK OF DIVISION 27. |
| TN1 | (N) REPOSITIONABLE PRESENTATION LECTERN. |
| TN2 | (E) REPOSITIONABLE STAFF TABLES. |
| TN3 | (N) ACCESSIBLE OVER FLOOR RACEWAY. |
| TN4 | (E) AV CONTROL ROOM WORK SURFACE. |
| TN5 | LOCATE (N) AV RECEIVER BEHIND (E) DISPLAY, REFER TO FUNCTIONAL DIAGRAM. |
| TN6 | REPOSITIONABLE FLAT PANEL DISPLAY/CART. |
| TN7 | (E) FLOOR MONUMENT. |
| TN8 | (E) RADIO RACK TO REMAIN, N.I.C. |
| TN9 | (E) FULL-HEIGHT 4-POST SEISMIC EQUIPMENT RACK TO REMAIN. |



1 ENLARGED PLAN NORTH
1/4"=1'-0"



PITTSBURG CITY HALL COUNCIL CHAMBERS AUDIOVISUAL UPGRADES
PITTSBURG, CA

| REVISIONS | | |
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DRAWN BY: _____
DRAWING SCALE: _____

BID DOCUMENTS
SEPTEMBER 29, 2022
SHEET TITLE

ENLARGED PLAN

SHEET NUMBER

TA4.1



| KEYNOTES | |
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| TN | COMMUNICATIONS SYSTEMS: WORK OF DIVISION 27. |
| TN1 | (N) OVERHEAD DISPLAY. SECURE TO (E) POLE-TRUSS MOUNT HARDWARE. BOTTOM OF DISPLAY AT MIN. +80" A.F.F. U.O.N., TYP. |
| TN2 | (N) PTZ CAMERA AT EXISTING LOCATION. REUSE (E) PATHWAY. |
| TN3 | H.R. TO RACK R33, AV CONTROL ROOM. |
| TN4 | (N) PTZ CAMERA AT FACE OF (E) GYP. SOFFIT, SEE 1/TA4.6. |
| TN5 | PAINT ALL EXPOSED METAL CONDUIT AND ENCLOSURES TO MATCH ADJACENT ASSEMBLY/STRUCTURE. SUBMIT PAINT SAMPLE FOR REVIEW AND ACCEPTANCE BY OWNER PRIOR TO PAINTING. |

1 ENLARGED RCP
 1/4"=1'-0" NORTH



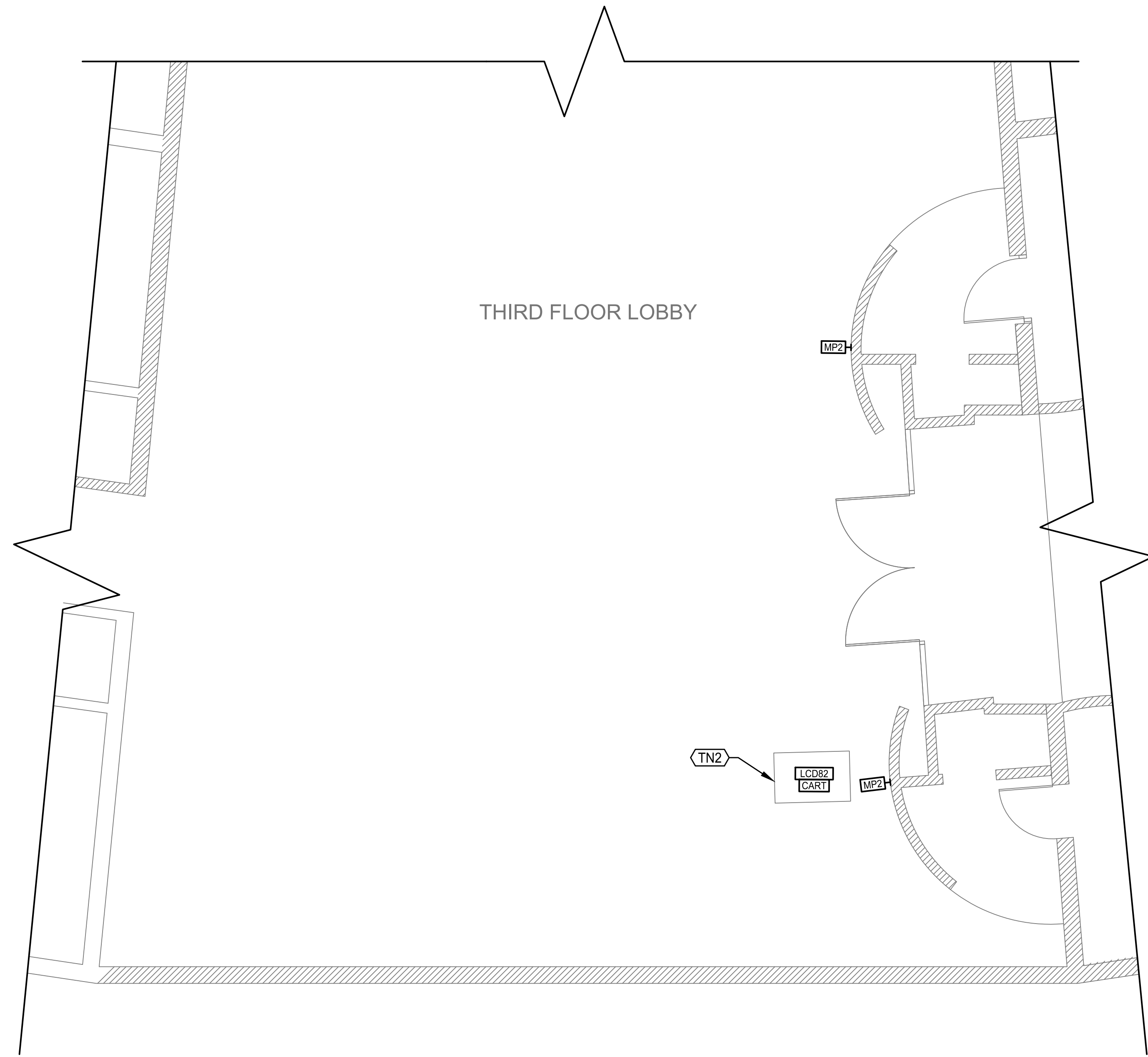
PITTSBURG CITY HALL COUNCIL CHAMBERS AUDIOVISUAL UPGRADES
 PITTSBURG, CA

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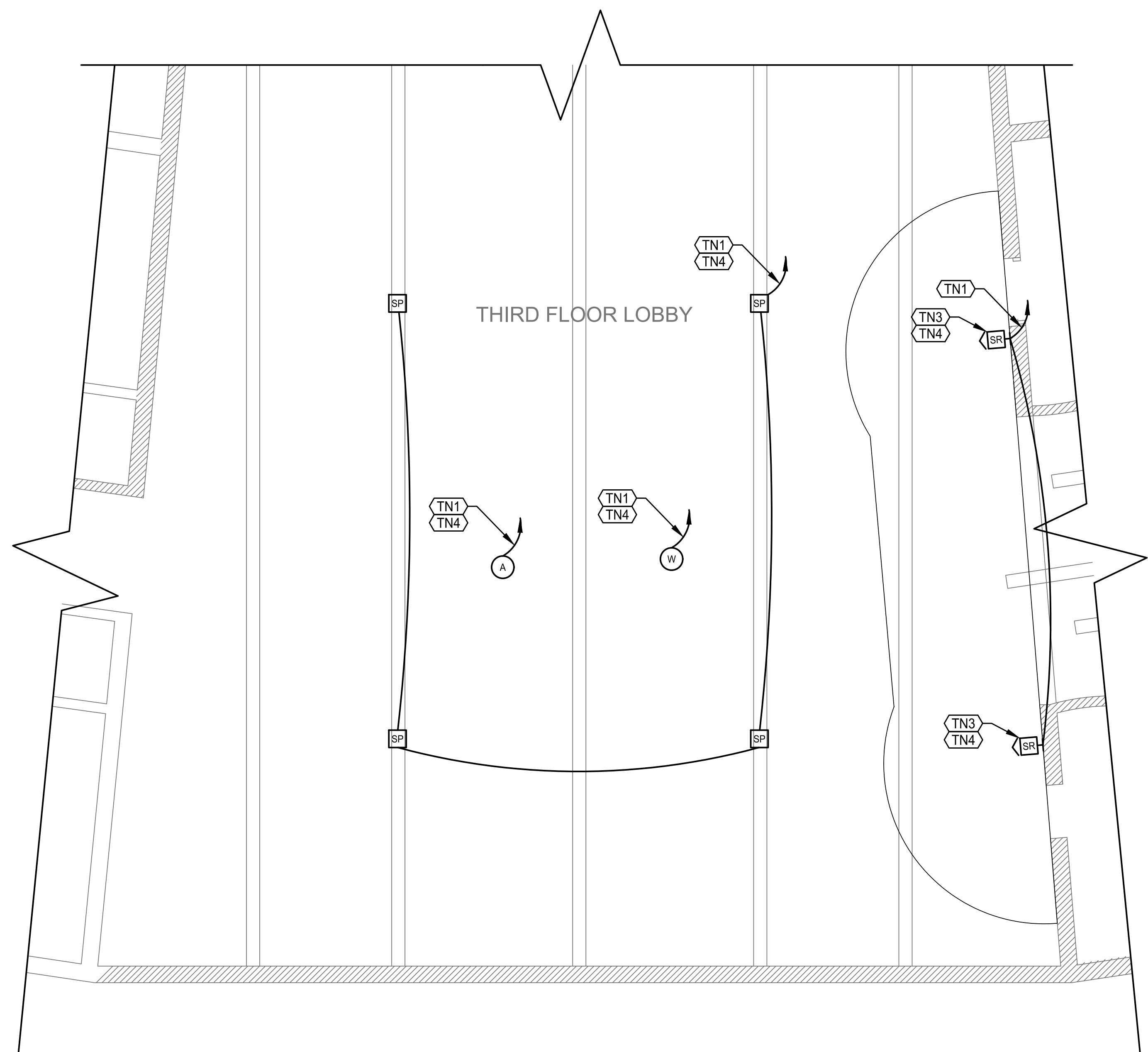
BID DOCUMENTS
 SEPTEMBER 29, 2022
 SHEET TITLE

ENLARGED RCP
 SHEET NUMBER
 TA4.2

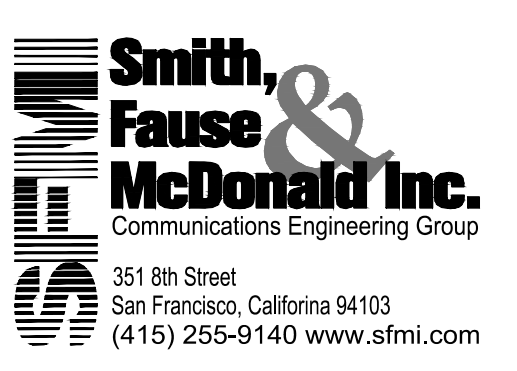


1 THIRD FLOOR LOBBY ENLARGED PLAN
 1/4"=1'-0" NORTH

| KEYNOTES | |
|----------|--|
| TN | COMMUNICATIONS SYSTEMS: WORK OF DIVISION 27. |
| TN1 | H.R. TO RACK R33 IN AV CONTROL ROOM. |
| TN2 | REPOSITIONABLE FLAT PANEL DISPLAY/CART. |
| TN3 | (N) WALL-MOUNTED LOUDPSPEAKER, REUSE EXISTING BACKBOX AND PATHWAY, TYP. |
| TN4 | PAINT ALL EXPOSED METAL CONDUIT AND ENCLOSURES TO MATCH ADJACENT ASSEMBLY/STRUCTURE. SUBMIT PAINT SAMPLE FOR REVIEW AND ACCEPTANCE BY OWNER PRIOR TO PAINTING. |



2 THIRD FLOOR LOBBY ENLARGED RCP
 1/4"=1'-0" NORTH



PITTSBURG CITY HALL COUNCIL CHAMBERS AUDIOVISUAL UPGRADES
 PITTSBURG, CA

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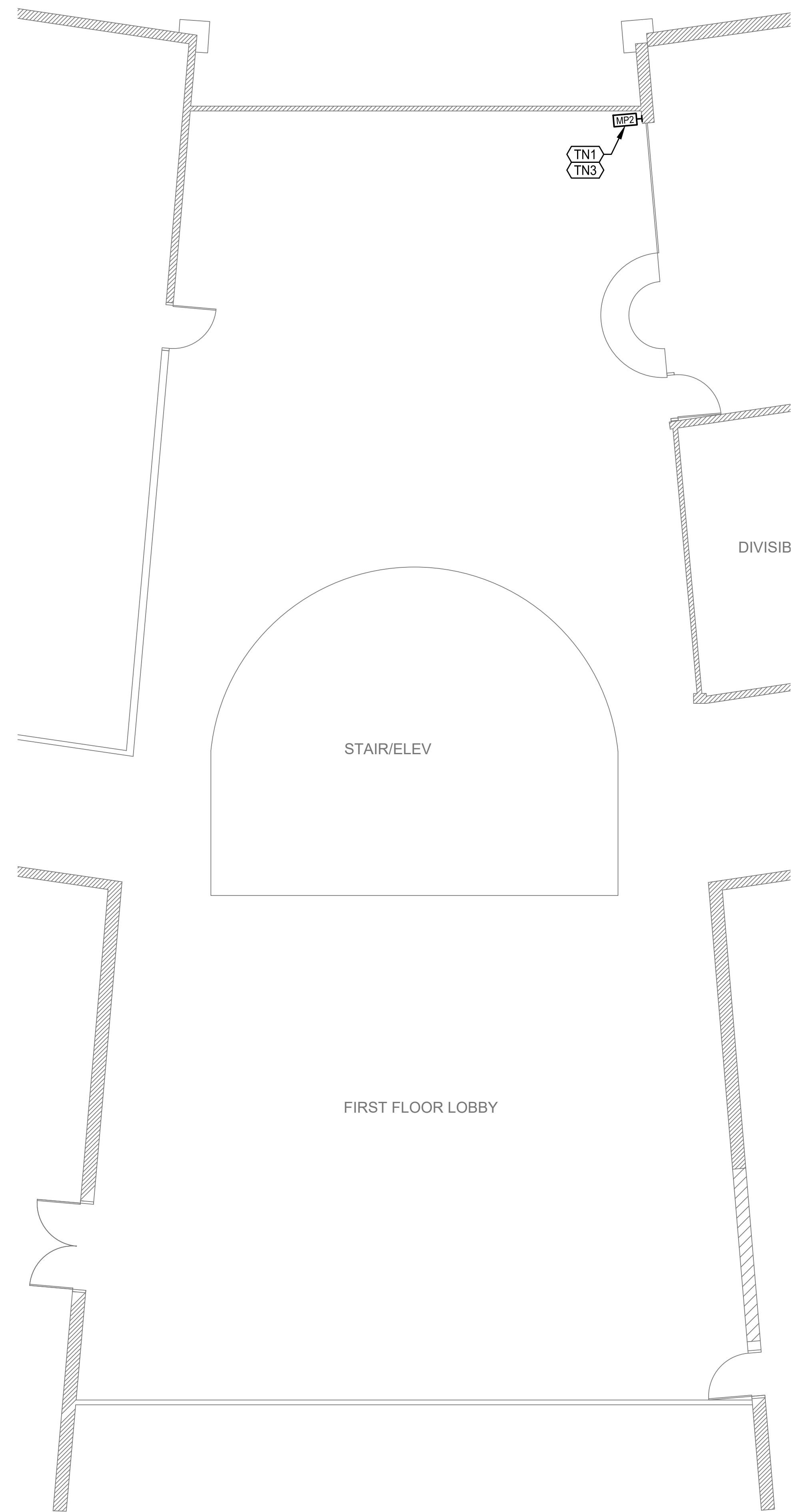
BID DOCUMENTS
SEPTEMBER 29, 2022
 SHEET TITLE

THIRD FLOOR LOBBY ENLARGED PLAN & RCP

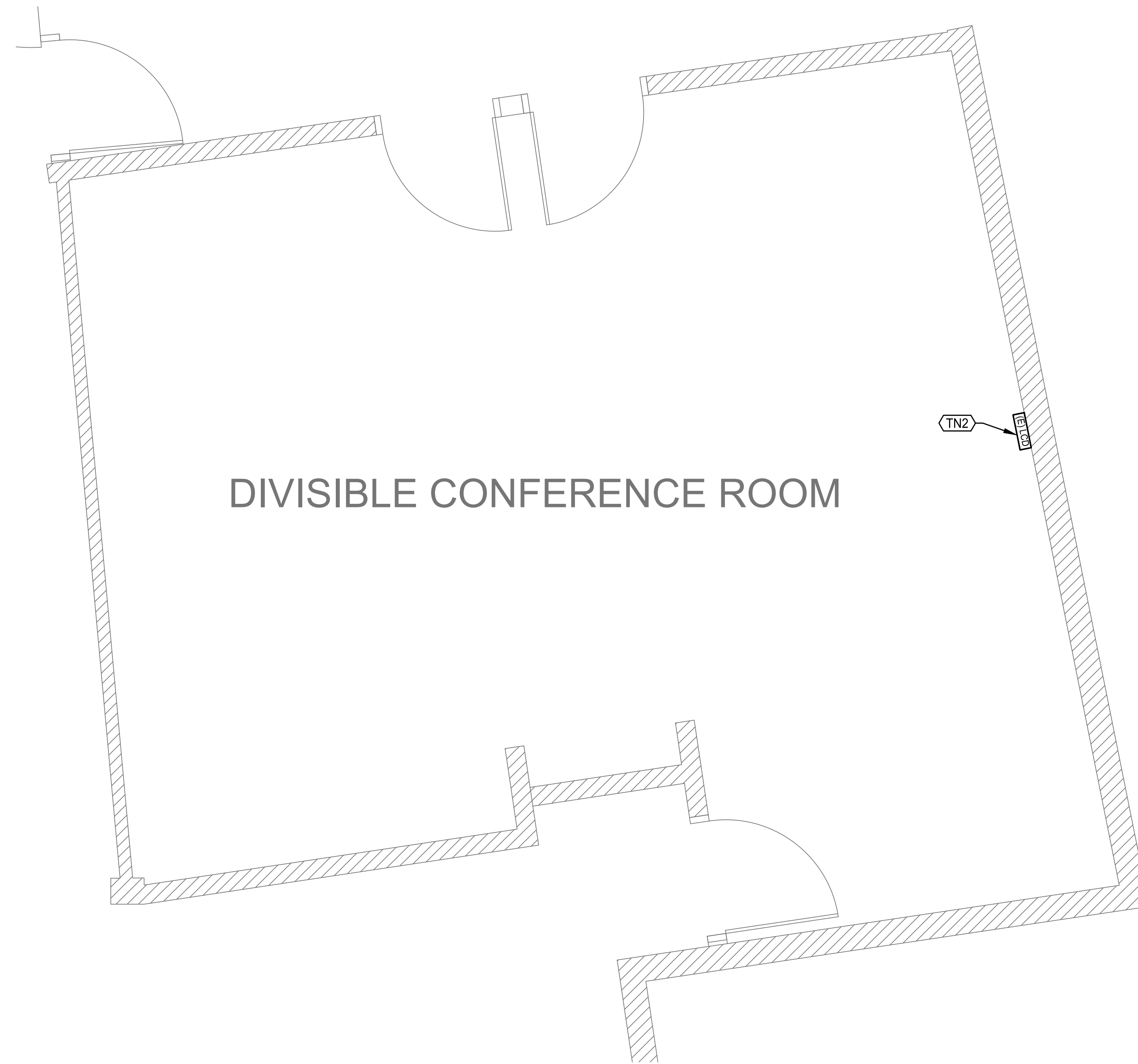
SHEET NUMBER
TA4.3

KEYNOTES

- TN COMMUNICATIONS SYSTEMS: WORK OF DIVISION 27.
- ⬠TN1 MEDIA PORT, SEE FUNCTIONAL DIAGRAM. PROVIDE SURFACE-MOUNT BACKBOX AT MULLION W/ LOCKING TAMPER-PROOF COVER.
- ⬠TN2 LOCATE (N) MEDIA RECEIVER BEHIND (E) DISPLAY. PROVIDE HDMI OUTPUT FROM RECEIVER TO SPARE HDMI INPUT ON (E) DISPLAY. REFER TO FUNCTIONAL DIAGRAM, SHEET TA7.xx.
- ⬠TN3 PAINT ALL EXPOSED METAL CONDUIT AND ENCLOSURES TO MATCH ADJACENT ASSEMBLY/STRUCTURE. SUBMIT PAINT SAMPLE FOR REVIEW AND ACCEPTANCE BY OWNER PRIOR TO PAINTING.



1 FIRST FLOOR LOBBY ENLARGED PLAN 3/16"=1'-0" NORTH



2 FIRST FLOOR CONFERENCE ROOM ENLARGED PLAN 1/2"=1'-0" NORTH



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FIRST FLOOR
ENLARGED PLANS

SHEET NUMBER

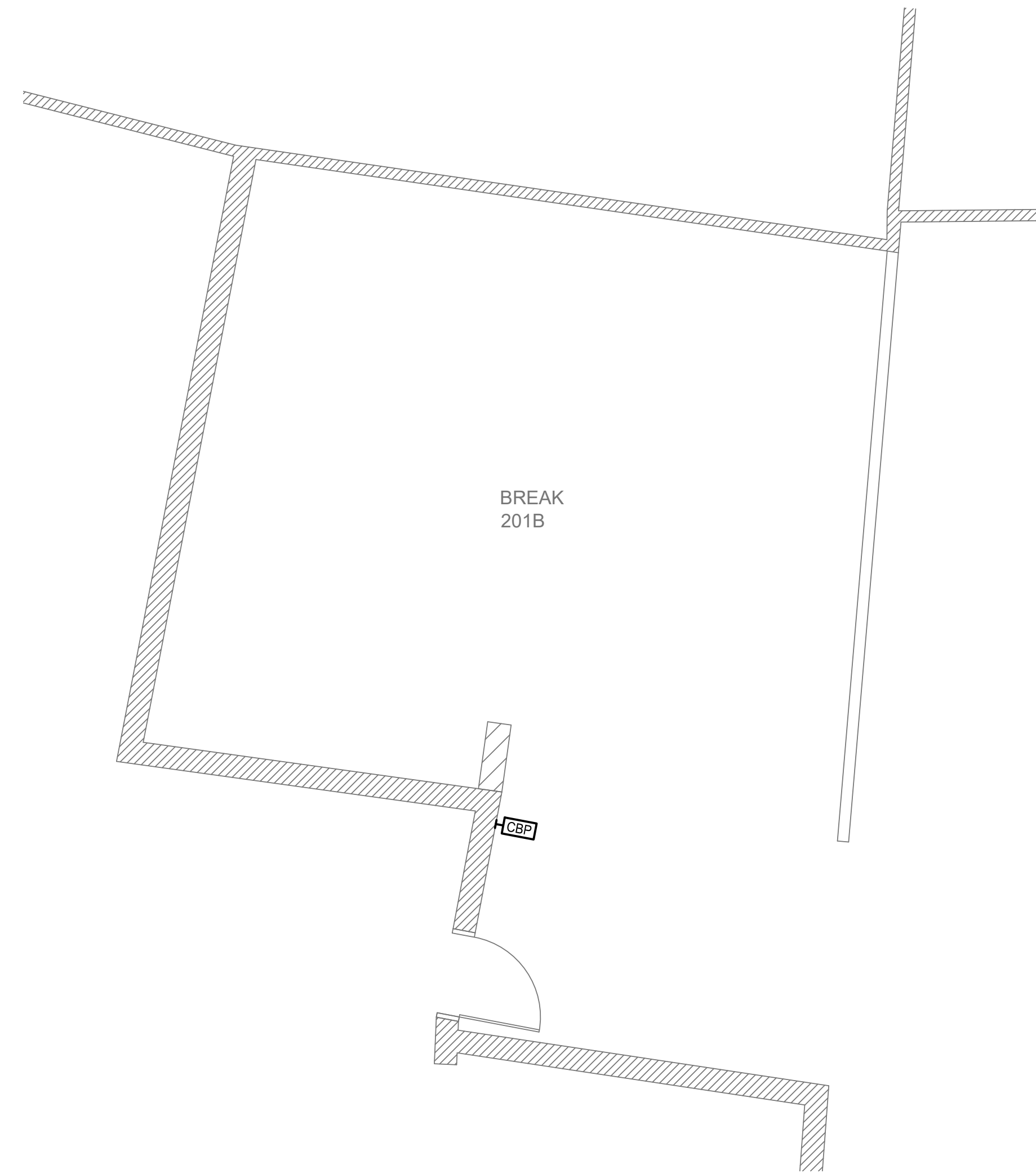
TA4.4

KEYNOTES

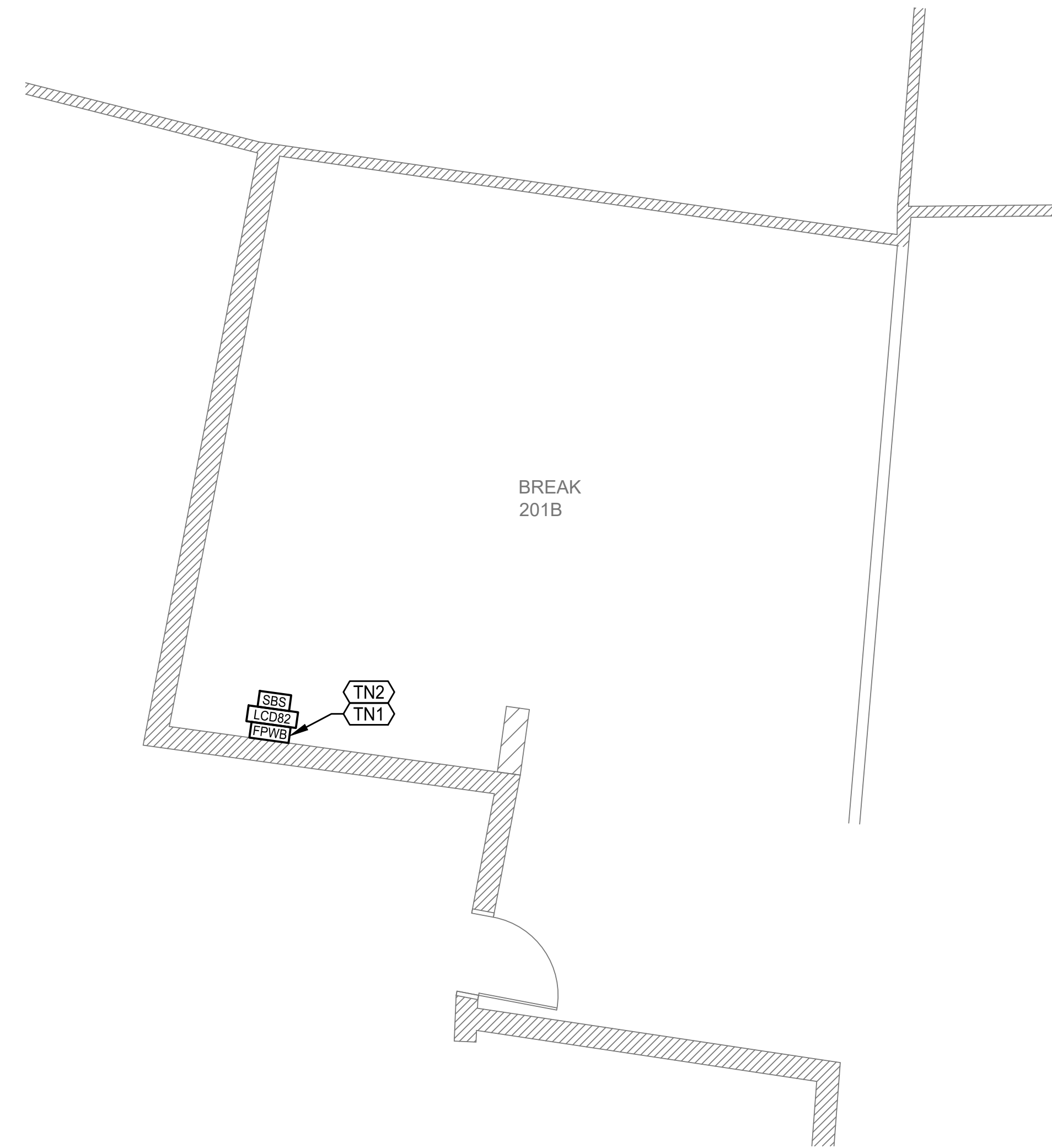
TN COMMUNICATIONS SYSTEMS: WORK OF DIVISION 27.

TN1 +120" A.F.F. TO CL OF FPWB AND DISPLAY.

TN2 PAINT ALL EXPOSED METAL CONDUIT AND ENCLOSURES TO MATCH ADJACENT ASSEMBLY/STRUCTURE. SUBMIT PAINT SAMPLE FOR REVIEW AND ACCEPTANCE BY OWNER PRIOR TO PAINTING.



1 SECOND FLOOR BREAK ROOM ENLARGED PLAN NORTH
1/4"=1'-0"



2 SECOND FLOOR BREAK ROOM ENLARGED RCP NORTH
1/4"=1'-0"



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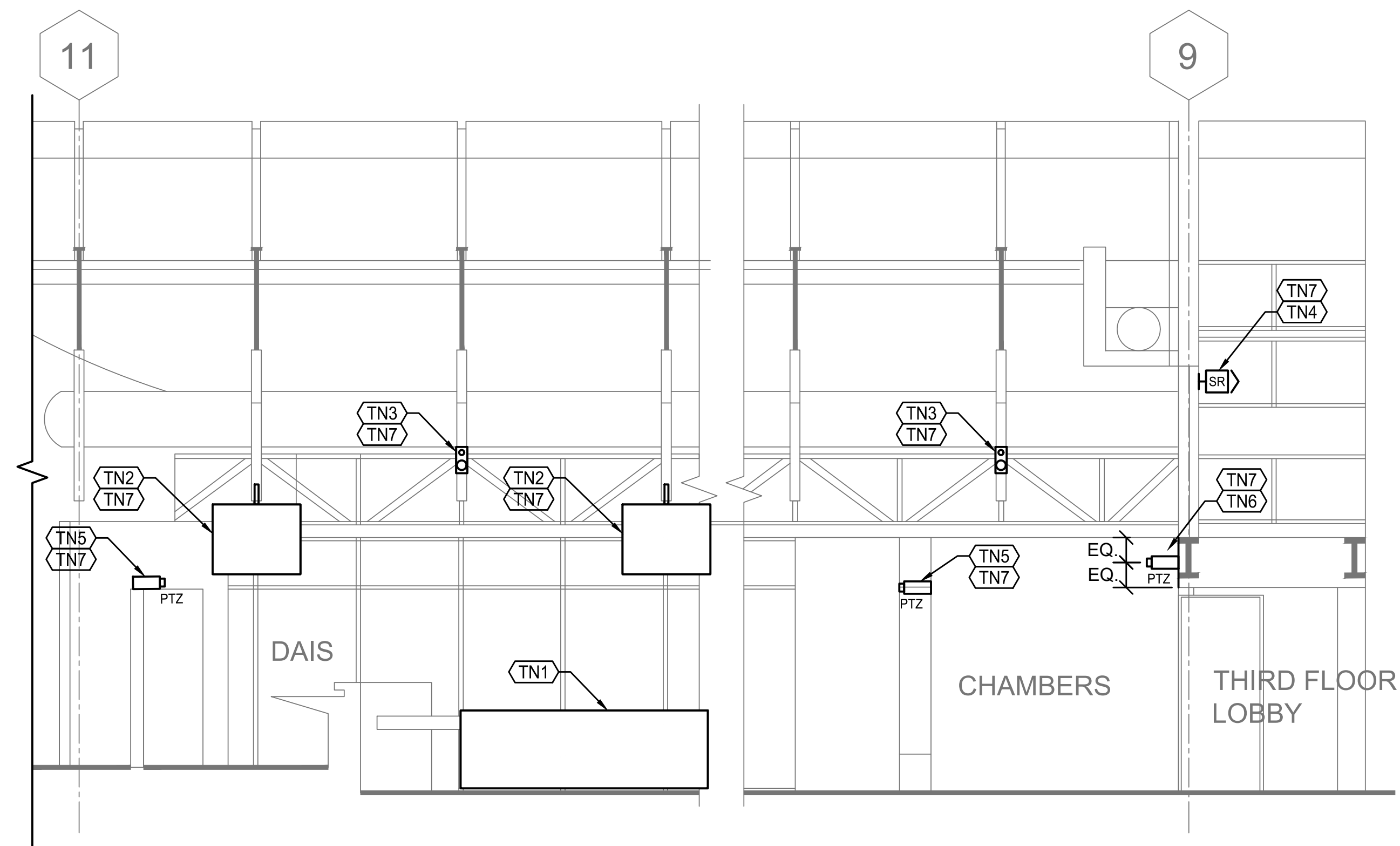
BID DOCUMENTS
SEPTEMBER 29, 2022

SHEET TITLE
SECOND FLOOR
BREAK ROOM ENLARGED
PLAN AND RCP

SHEET NUMBER
TA45

KEYNOTES

- TN COMMUNICATIONS SYSTEMS: WORK OF DIVISION 27.
- TN1** (E) REPOSITIONABLE STAFF TABLES, SEE DEVICE PLAN.
- TN2** (N) DISPLAY, REUSE (E) POLE-MOUNT AT TRUSS, SEE DEVICE RCP.
- TN3** (N) POLE/TRUSS MOUNTED LOUDSPEAKER, SEE DEVICE RCP.
- TN4** (N) WALL-MOUNTED LOUDSPEAKER AT (E) LOCATION, REUSE (E) PATHWAY.
- TN5** (N) PTZ CAMERA AT (E) LOCATION. REUSE (E) PATHWAY.
- TN6** PTZ CAMERA AT GYP. SOFFIT OVER ENTRY, TYP. FOR (2) LOCATIONS.
- TN7** PAINT ALL EXPOSED METAL CONDUIT AND ENCLOSURES TO MATCH ADJACENT ASSEMBLY/STRUCTURE. SUBMIT PAINT SAMPLE FOR REVIEW AND ACCEPTANCE BY OWNER PRIOR TO PAINTING.



1 CHAMBERS INTERIOR ELEVATION - SOUTH
1/4"=1'-0"



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SEPTEMBER 29, 2022

SHEET TITLE

CHAMBERS INTERIOR
ELEVATIONS

SHEET NUMBER

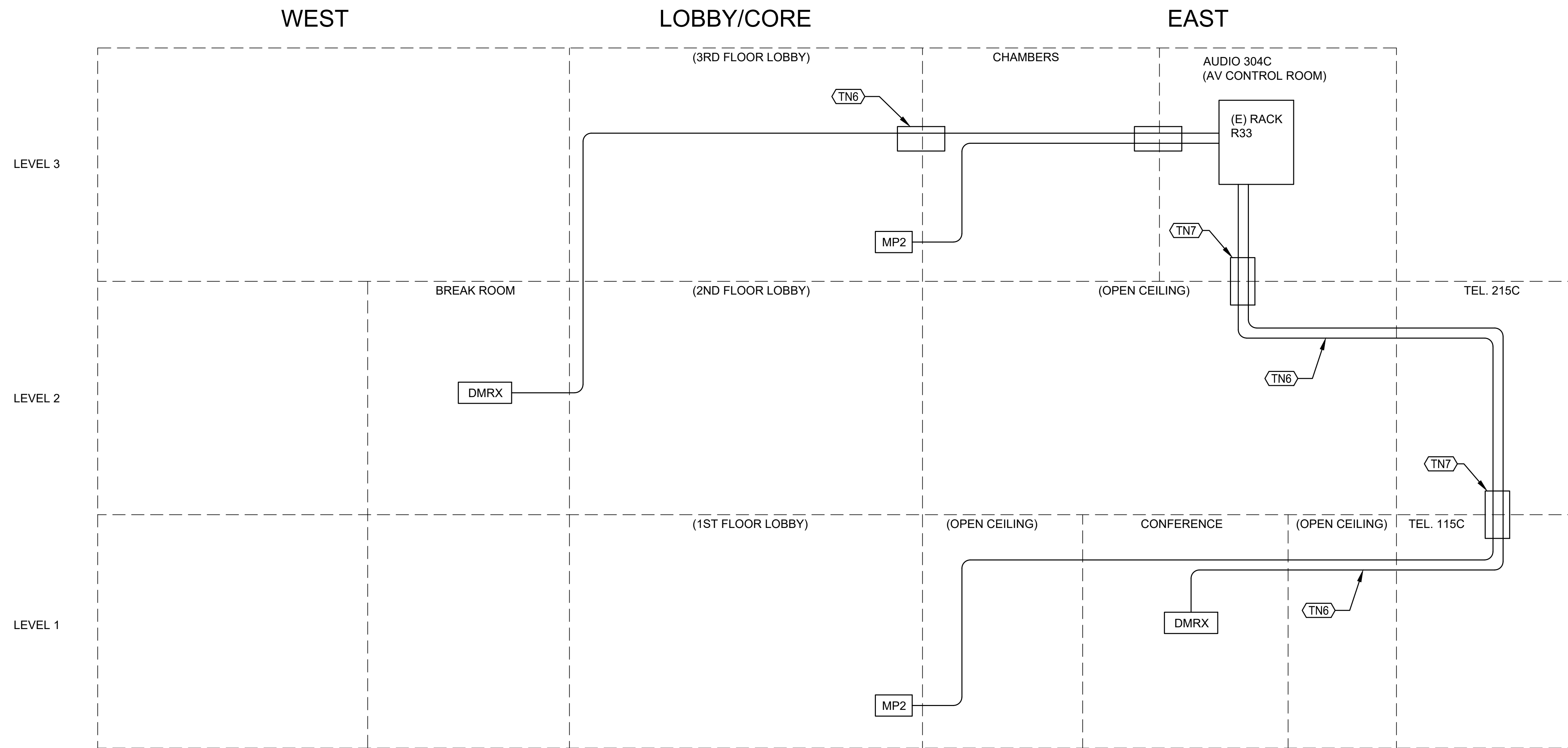
TA4.6

SHEET NOTES

- COORDINATE AND SCHEDULE ALL WORK ABOVE CEILINGS AND IN OFFICE/ADMINISTRATION AREAS WITH CITY REPRESENTATIVE TO MINIMIZE DISRUPTION TO OCCUPANTS.
- PATHWAY IN OPEN-CEILING/EXPOSED AREAS SHALL BE RIGID METAL CONDUIT AND SHALL BE PAINTED TO MATCH ADJACENT ASSEMBLY/STRUCTURE. SUBMIT PAINT SAMPLE FOR REVIEW AND ACCEPTANCE BY OWNER PRIOR TO PAINTING.

KEYNOTES

- TN1 AV FIBER TO FOLLOW TELECOMMUNICATION PATHWAYS BETWEEN LEVELS. REFER TO TN7.001.
- TN2 (1) 2" C.
- TN3 PROVIDE 2 STRAND OS2 SINGLE MODE FIBER, PLENUM RATED.
- TN4 PROVIDE 20' SLACK FIBER AND COIL INSIDE A FIBER MANAGEMENT RING (FMR) AS SPECIFIED ON SECTION 27 11 23. MOUNT ON THE BACKBOARD.
- TN5 PROVIDE WMID (WIRE MESH INNERDUCT) ON ALL FIBER CABLING INSTALLATION.
- TN6 MAINTAIN 2-HR RATING AT SEPARATION BETWEEN CHAMBERS AND 3RD FLOOR LOBBY>
- TN7 (E) 4" CONDUIT/SLEEVE, V.I.F. MAINTAIN FIRE-RATING.
- TN8 COORDINATE ROUTING AND INSTALLATION OF (N) LOW-VOLTAGE PATHWAY WITH (N) ELECTRICAL PATHWAY. REFER TO ELECTRICAL DRAWINGS.



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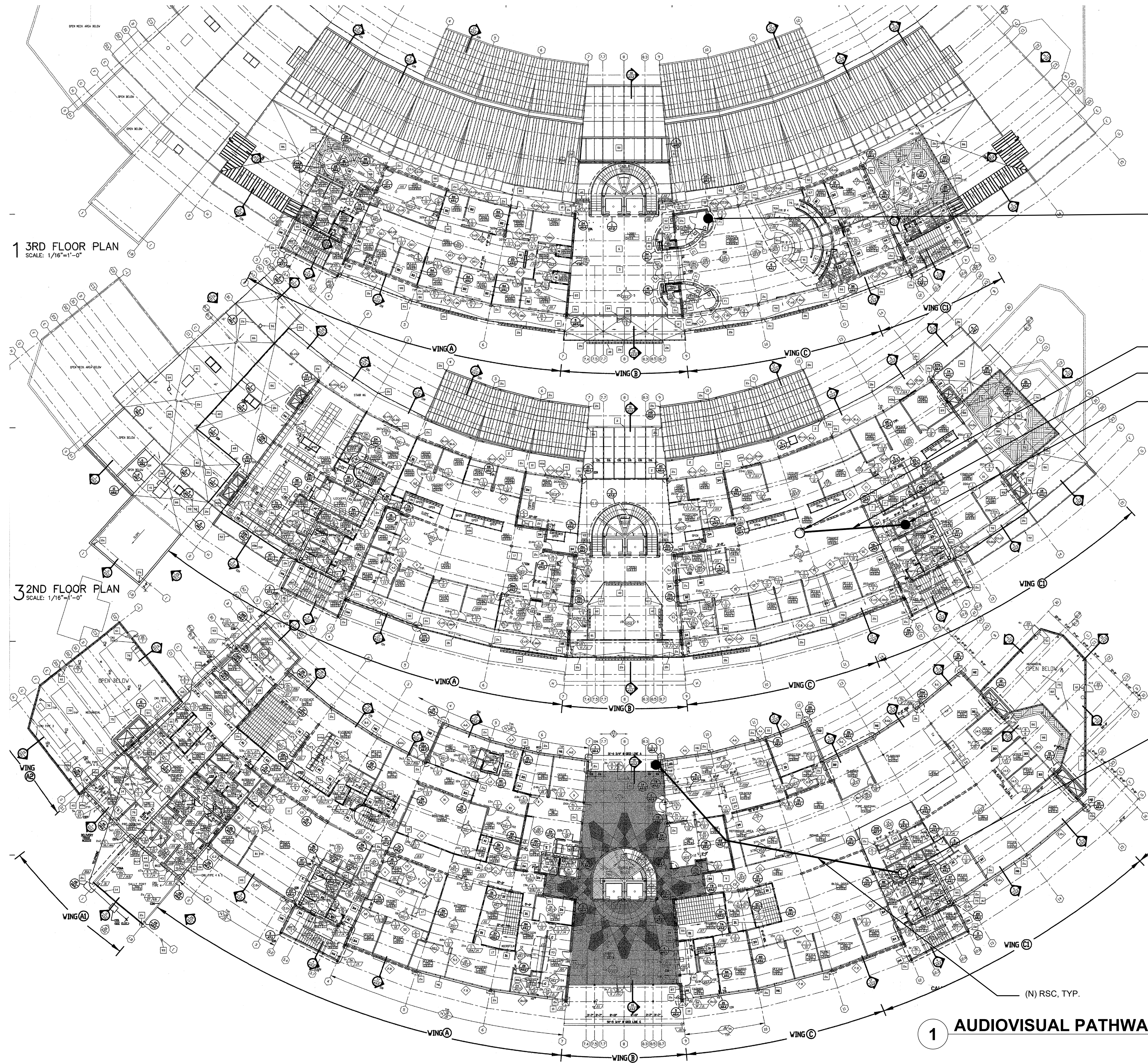
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 SEPTEMBER 29, 2022
 SHEET TITLE

AUDIOVISUAL RISER
 DIAGRAM

SHEET NUMBER

TA7.0A



1 3RD FLOOR PLAN
SCALE: 1/16"=1'-0"

3 2ND FLOOR PLAN
SCALE: 1/16"=1'-0"

(E) 4" CONDUIT
DOWN, V.I.F.

(E) 4" CONDUIT
UP, V.I.F.

(N) RSC, TYP.

(E) 4" CONDUIT
DOWN, V.I.F.

(E) 4" CONDUIT
UP, V.I.F.

(N) RSC, TYP.

1 AUDIOVISUAL PATHWAY DIAGRAM
1"=20'-0"



Smith, Fause & McDonald Inc.
Communications Engineering Group
351 8th Street
San Francisco, California 94103
(415) 255-9140 www.sfmi.com

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SEPTEMBER 29, 2022
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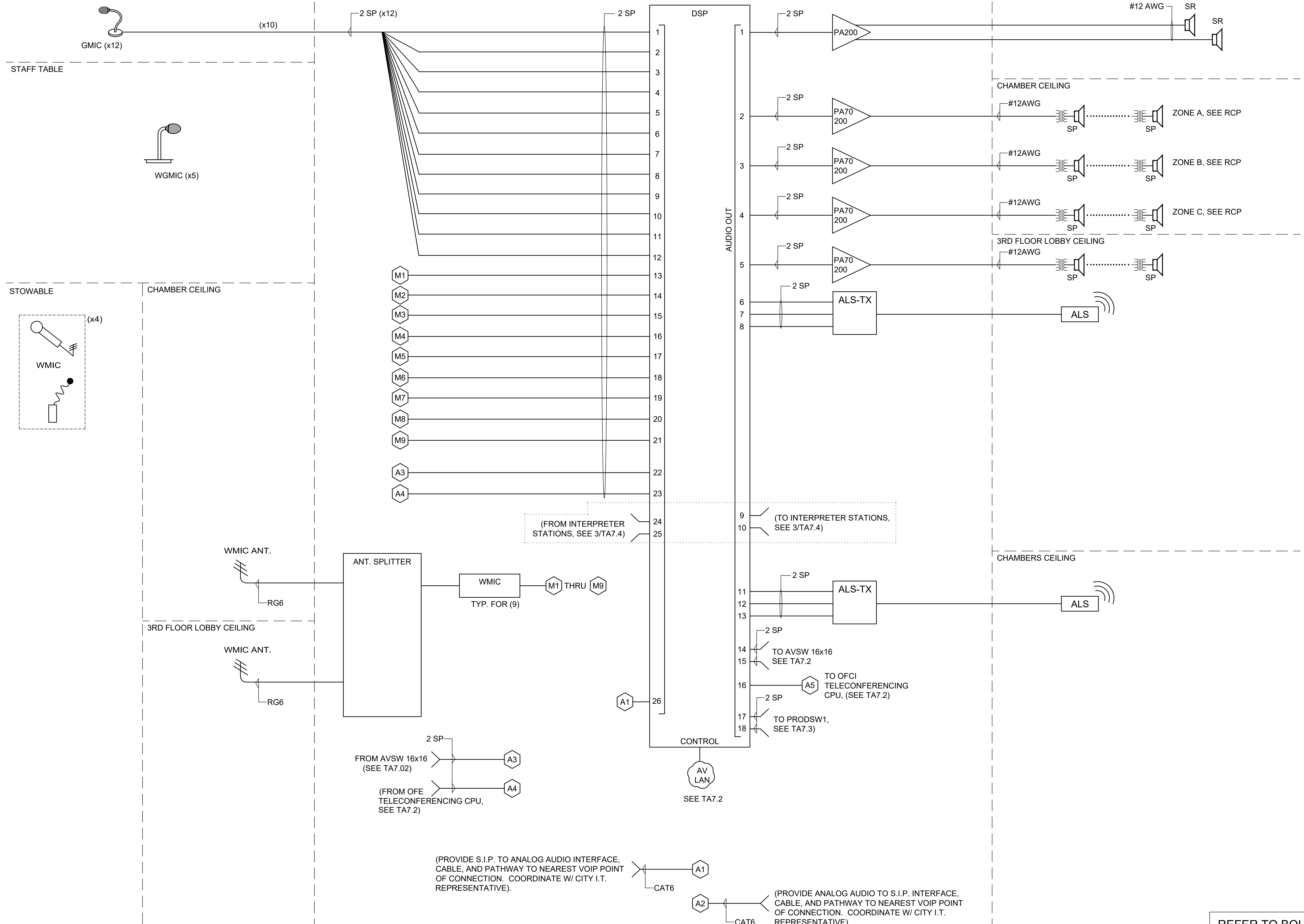
AUDIOVISUAL PATHWAY
DIAGRAM

SHEET NUMBER
TA7.0B

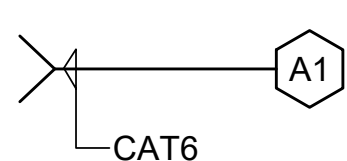
DAIS, FRONT AND REAR BENCH

RACK R33 IN AV CONTROL #117

3RD FLOOR LOBBY WALL



(PROVIDE S.I.P. TO ANALOG AUDIO INTERFACE, CABLE, AND PATHWAY TO NEAREST VOIP POINT OF CONNECTION. COORDINATE W/ CITY I.T. REPRESENTATIVE).



(PROVIDE ANALOG AUDIO TO S.I.P. INTERFACE, CABLE, AND PATHWAY TO NEAREST VOIP POINT OF CONNECTION. COORDINATE W/ CITY I.T. REPRESENTATIVE).

COUNCIL CHAMBERS AUDIO FUNCTIONAL DIAGRAM

1

NTS

REFER TO BOLD DASHED AREA ABOVE FOR ADDITIVE BID ALT. #1



PITTSBURG CITY HALL COUNCIL CHAMBERS AUDIOVISUAL UPGRADES

PITTSBURG, CA

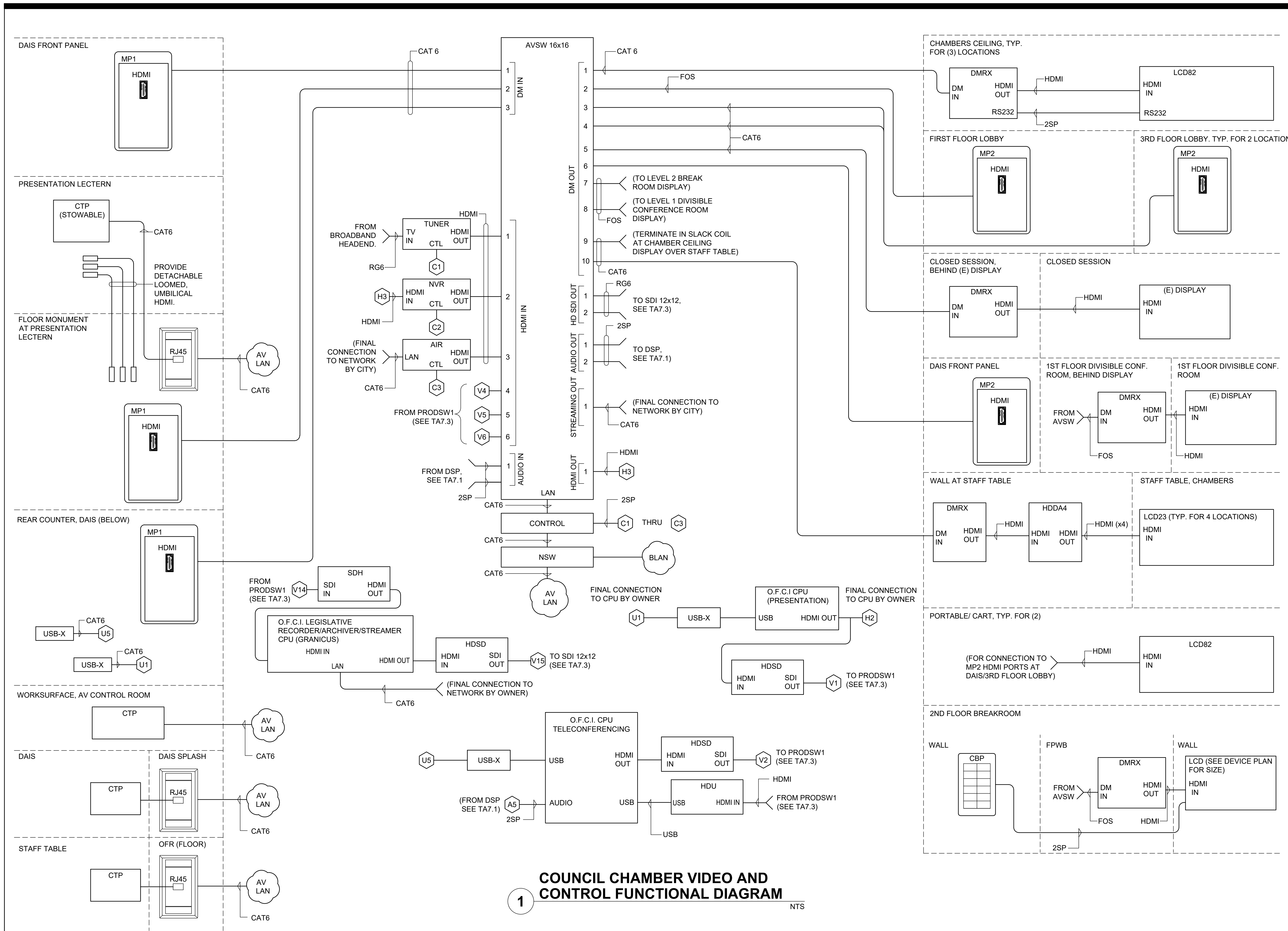
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COUNCIL CHAMBER AUDIO FUNCTIONAL DIAGRAM

SHEET NUMBER
TA7.1



1 COUNCIL CHAMBER VIDEO AND CONTROL FUNCTIONAL DIAGRAM
NTS

PITTSBURG CITY HALL COUNCIL CHAMBERS AUDIOVISUAL UPGRADES
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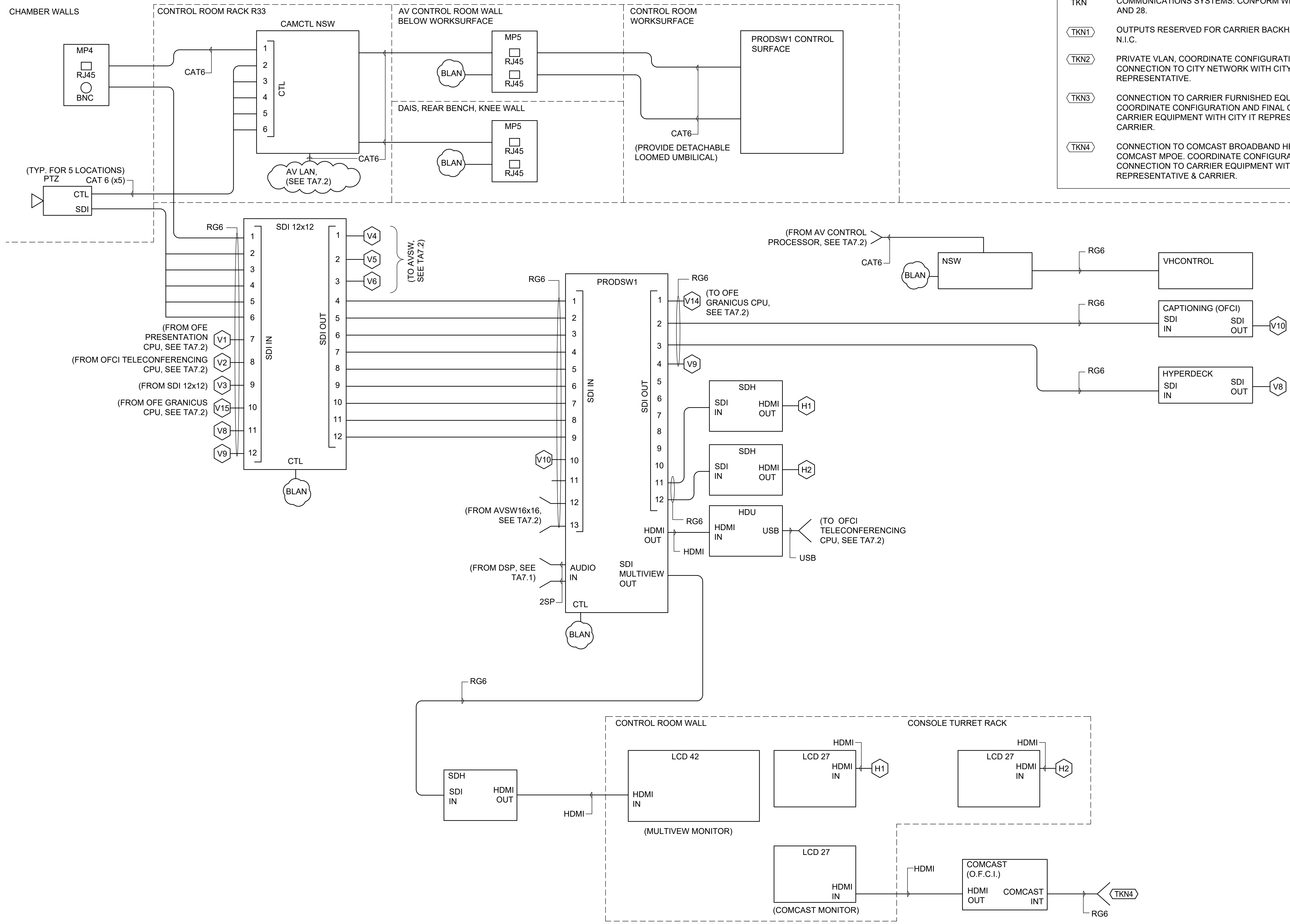
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SEPTEMBER 29, 2022
SHEET TITLE

COUNCIL CHAMBER VIDEO AND CONTROL FUNCTIONAL DIAGRAM

SHEET NUMBER
TA7.2

| KEYNOTES | |
|----------|---|
| TKN | COMMUNICATIONS SYSTEMS: CONFORM WITH DIVISION 27 AND 28. |
| TKN1 | OUTPUTS RESERVED FOR CARRIER BACKHAUL EQUIPMENT, N.I.C. |
| TKN2 | PRIVATE VLAN, COORDINATE CONFIGURATION AND FINAL CONNECTION TO CITY NETWORK WITH CITY IT REPRESENTATIVE. |
| TKN3 | CONNECTION TO CARRIER FURNISHED EQUIPMENT. COORDINATE CONFIGURATION AND FINAL CONNECTION TO CARRIER EQUIPMENT WITH CITY IT REPRESENTATIVE & CARRIER. |
| TKN4 | CONNECTION TO COMCAST BROADBAND HEADEND. AT COMCAST MPOE. COORDINATE CONFIGURATION AND FINAL CONNECTION TO CARRIER EQUIPMENT WITH CITY IT REPRESENTATIVE & CARRIER. |



PITTSBURG CITY HALL COUNCIL CHAMBERS AUDIOVISUAL UPGRADES
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BID DOCUMENTS
SEPTEMBER 29, 2022
 SHEET TITLE

COUNCIL CHAMBER
 PRODUCTION FUNCTIONAL
 DIAGRAM

SHEET NUMBER
TA7.3

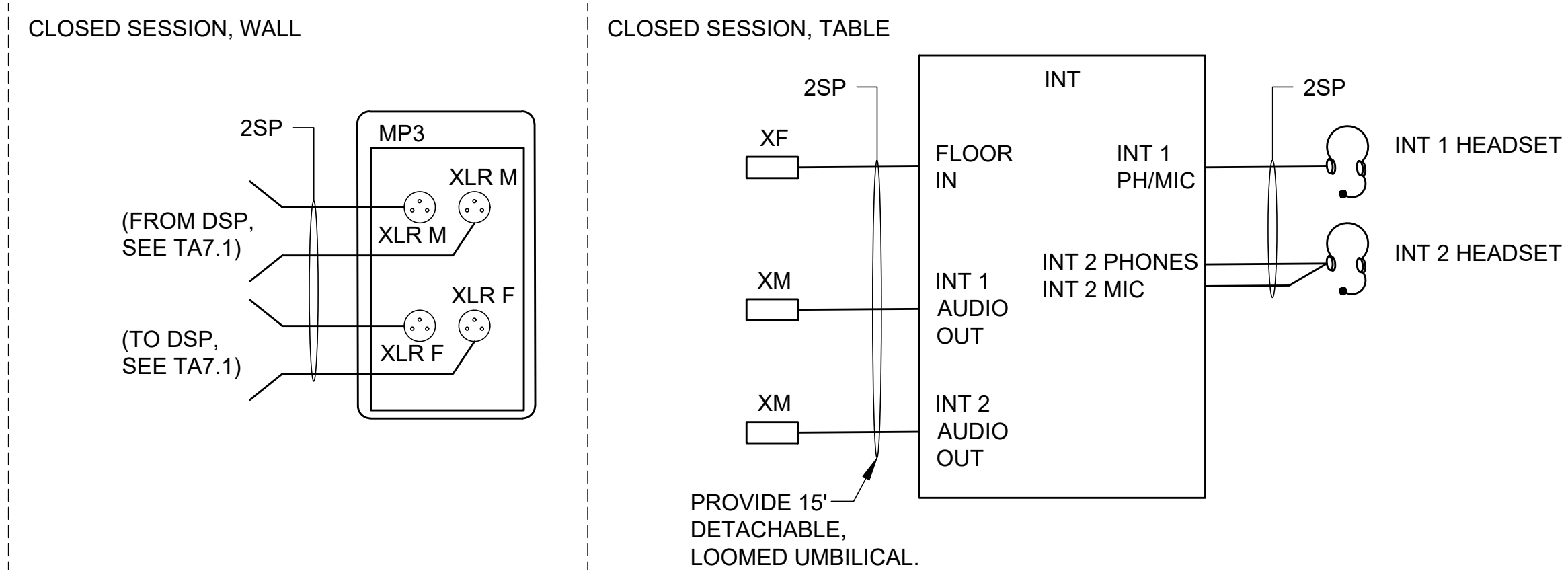
1 COUNCIL CHAMBER PRODUCTION FUNCTIONAL DIAGRAM NTS

| | |
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| (E) BLANK | 44 |
| (E) ALS | 43 |
| BLANK | 42 |
| (E) WMIC REC | 41 |
| (E) WMIC ANT | 40 |
| (E) WMIC REC | 39 |
| (E) WMIC ANT | 38 |
| (E) WMIC REC | 37 |
| (E) WMIC ANT | 36 |
| (E) WMIC REC | 35 |
| (E) WMIC ANT | 34 |
| (E) AUDIO MIXER | 33 |
| (E) AUDIO MIXER | 32 |
| BLANK | 31 |
| (E) EQ | 30 |
| (E) WMIC REC | 29 |
| (E) WMIC ANT | 28 |
| (E) AMX PS | 27 |
| (E) AMX PS | 26 |
| (E) AMX PS | 25 |
| (E) AMX CONTROLLER | 24 |
| (E) BLANK (STREAMBOX TOGGLE) | 23 |
| (E) ORTRONICS PATCH PANEL | 22 |
| (E) 45-PORT NSW | 21 |
| (E) 24-PORT NSW | 20 |
| (E) BLANK | 19 |
| (E) BLANK | 18 |
| (E) TRICASTER | 17 |
| (E) CROWN POWER AMP | 16 |
| (E) BLANK | 15 |
| (E) BLANK | 14 |
| (E) BLANK | 13 |
| (E) BLANK | 12 |
| (E) GRANICUS | 11 |
| (E) BLANK | 10 |
| (E) BLANK | 9 |
| (E) BLANK | 8 |
| (E) BLANK | 7 |
| (E) BLANK | 6 |
| (E) BLANK | 5 |
| (E) BLANK | 4 |
| (E) BLANK | 3 |
| (E) BLANK | 2 |
| (E) BLANK | 1 |

1 (E) AV RACK - EXISTING EQUIPMENT TO BE REMOVED
1 1/2"=1'-0"



2 COUNCIL CHAMBER SPEAKER TIMING SYSTEM FUNCTIONAL DIAGRAM
NTS



3 INTERPRETATION STATION FUNCTIONAL DIAGRAM
NTS

| REVISIONS | | |
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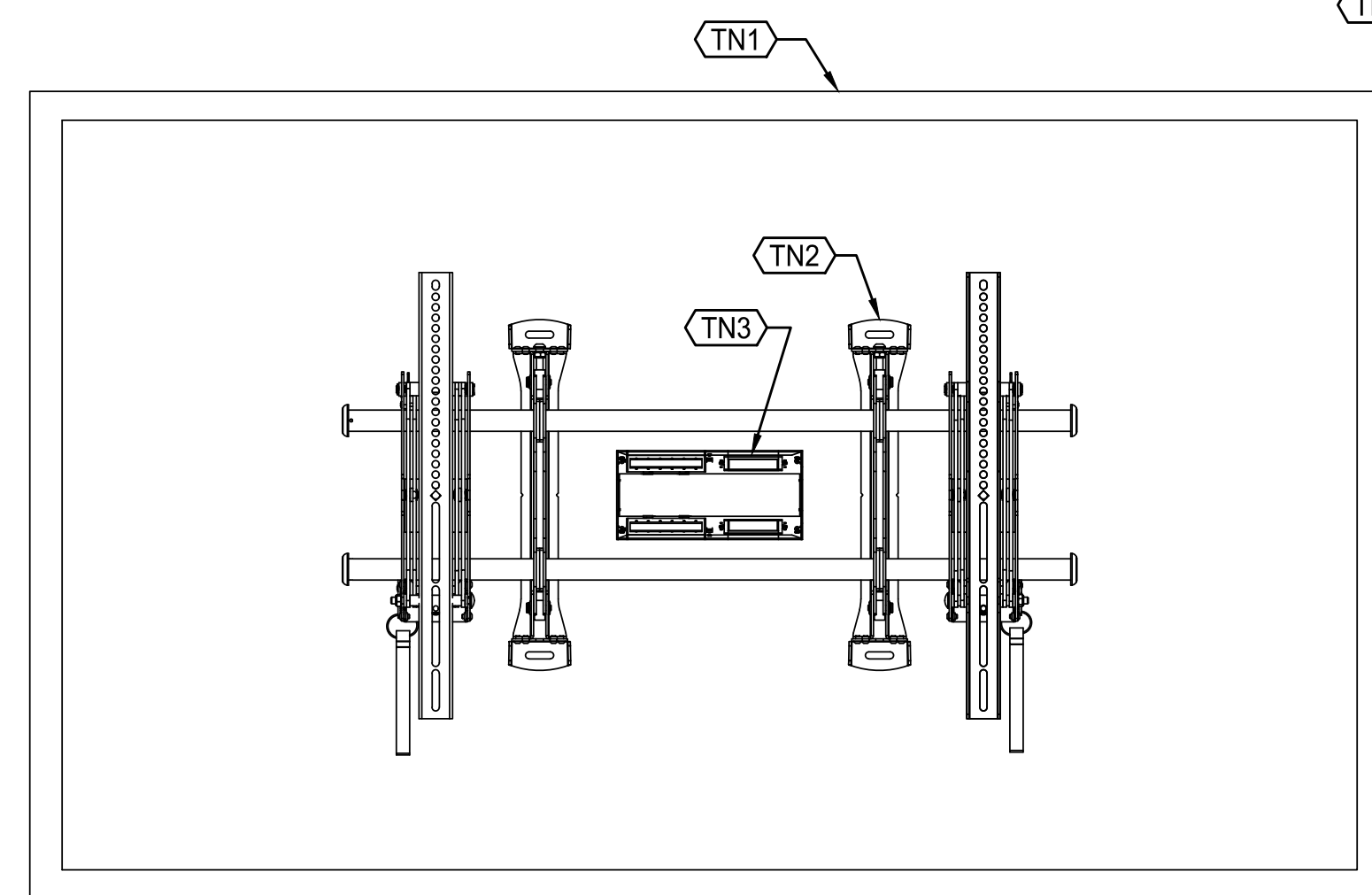
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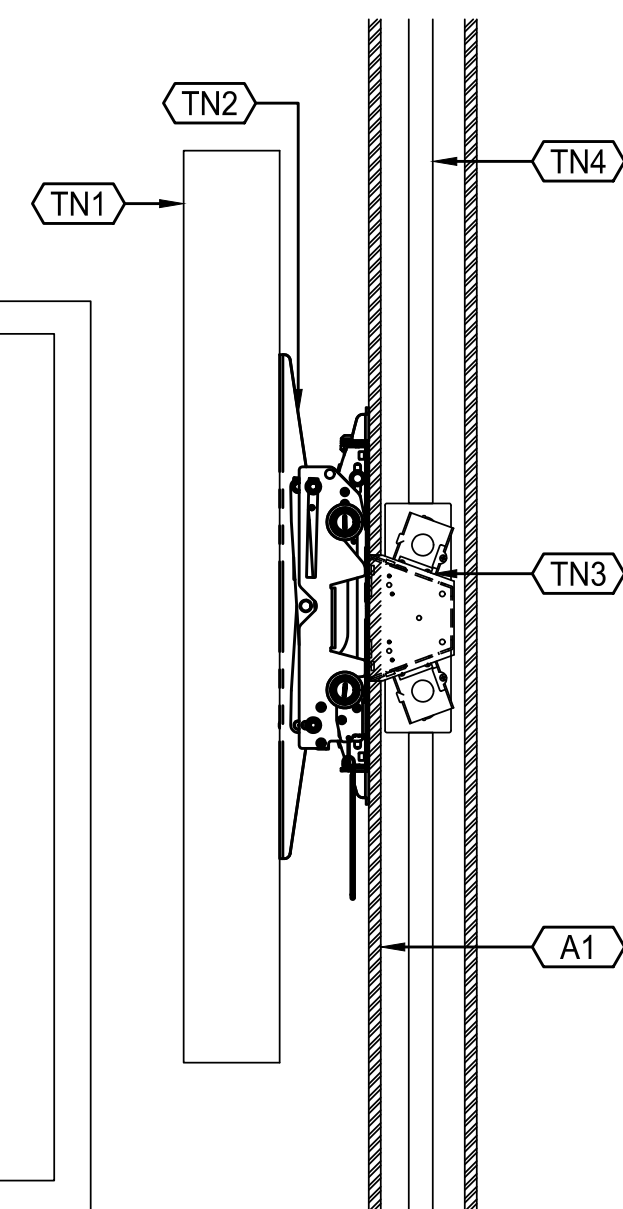
(E) RACK ELEVATION AND SPEAKER TIMING DIAGRAM

SHEET NUMBER

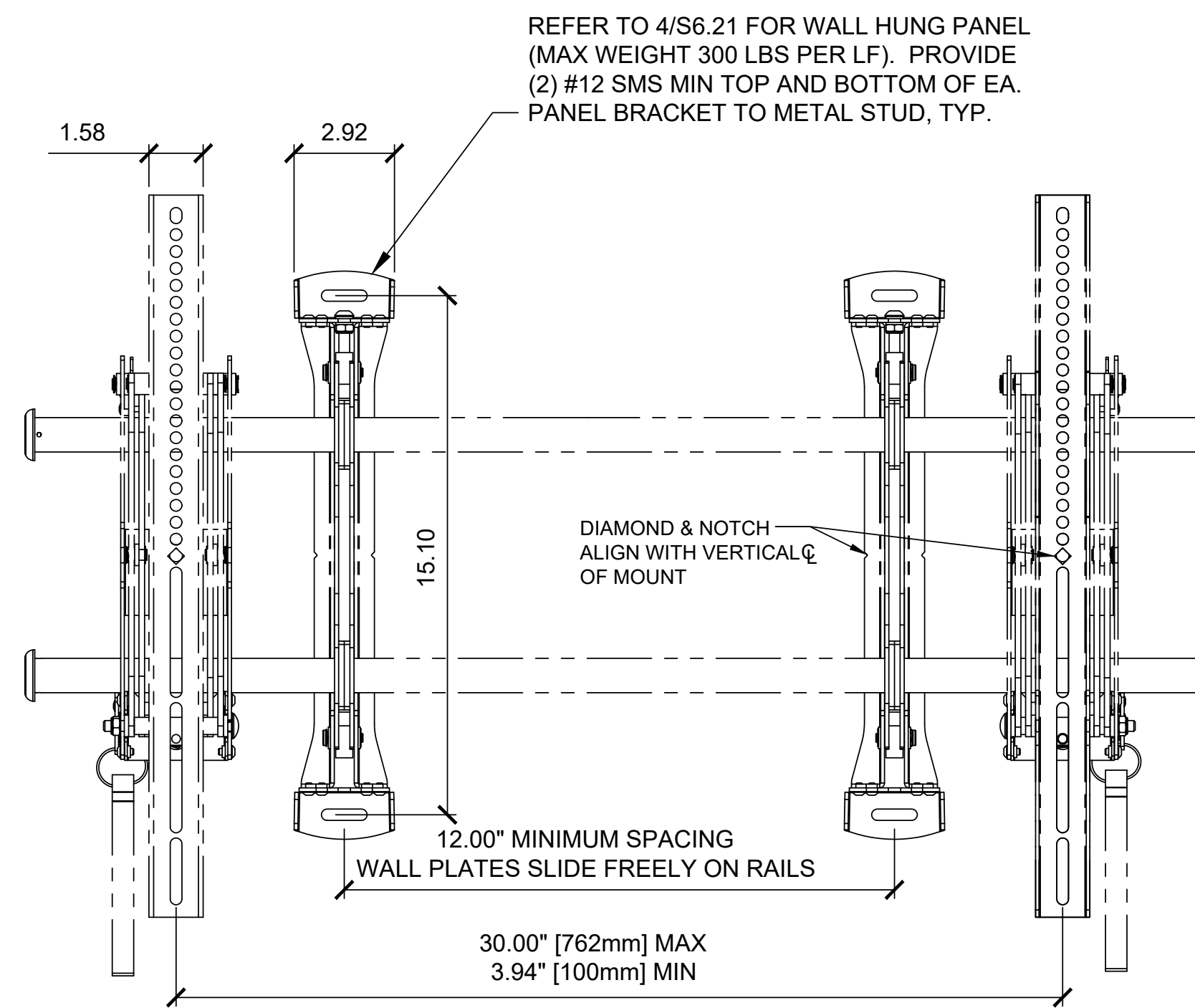
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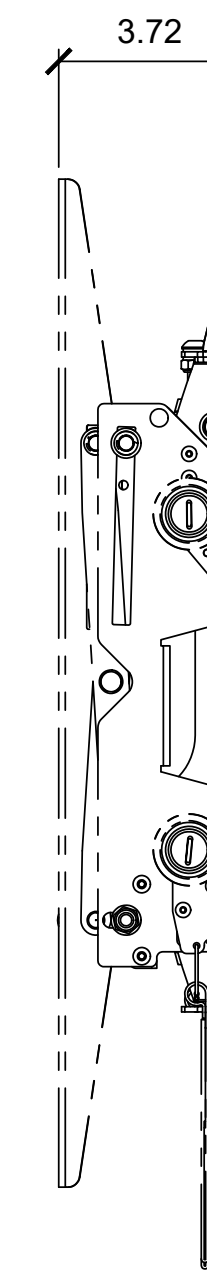
1A FRONT VIEW



1B SIDE VIEW



1C FRONT VIEW



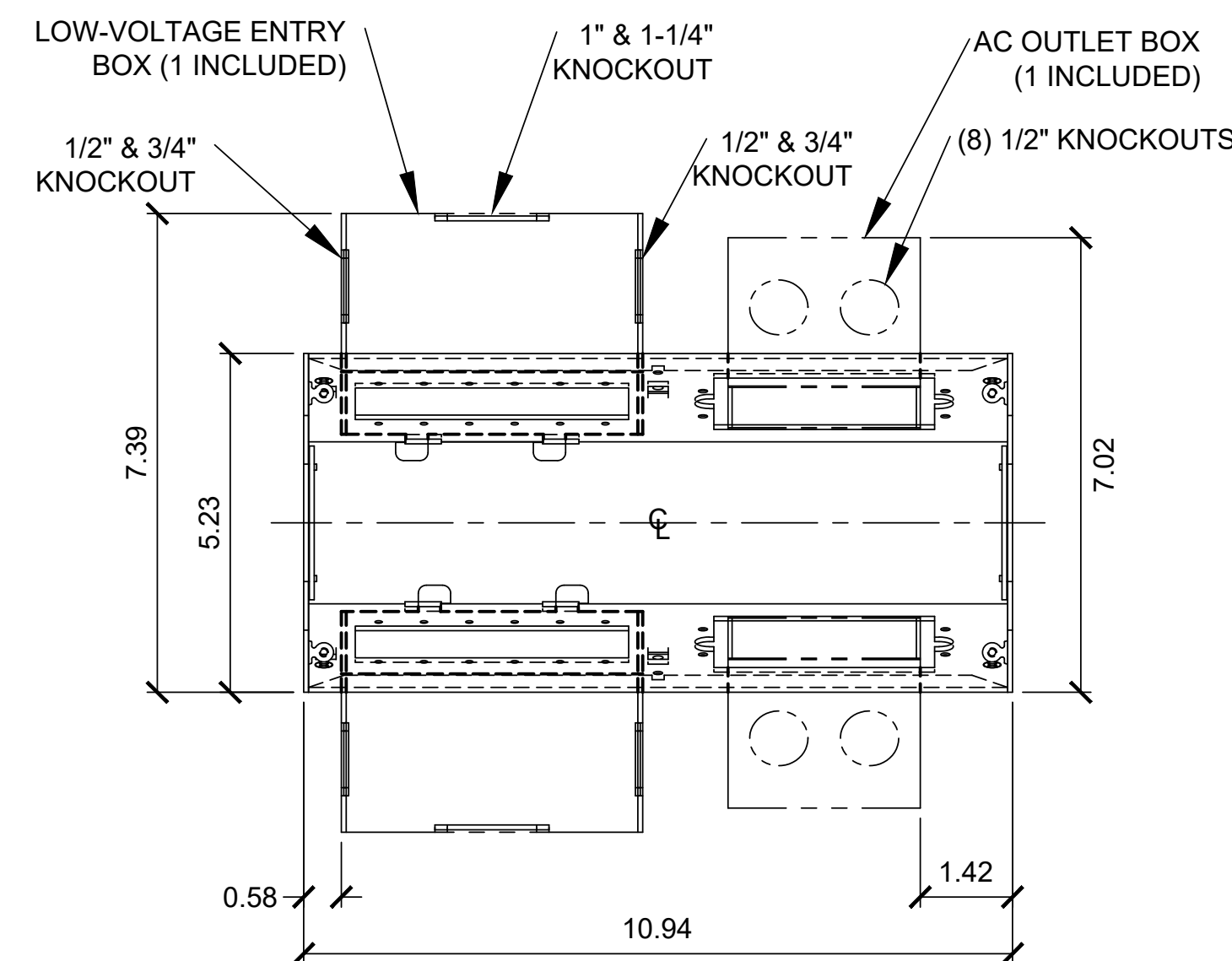
1D SIDE VIEW

KEYNOTES

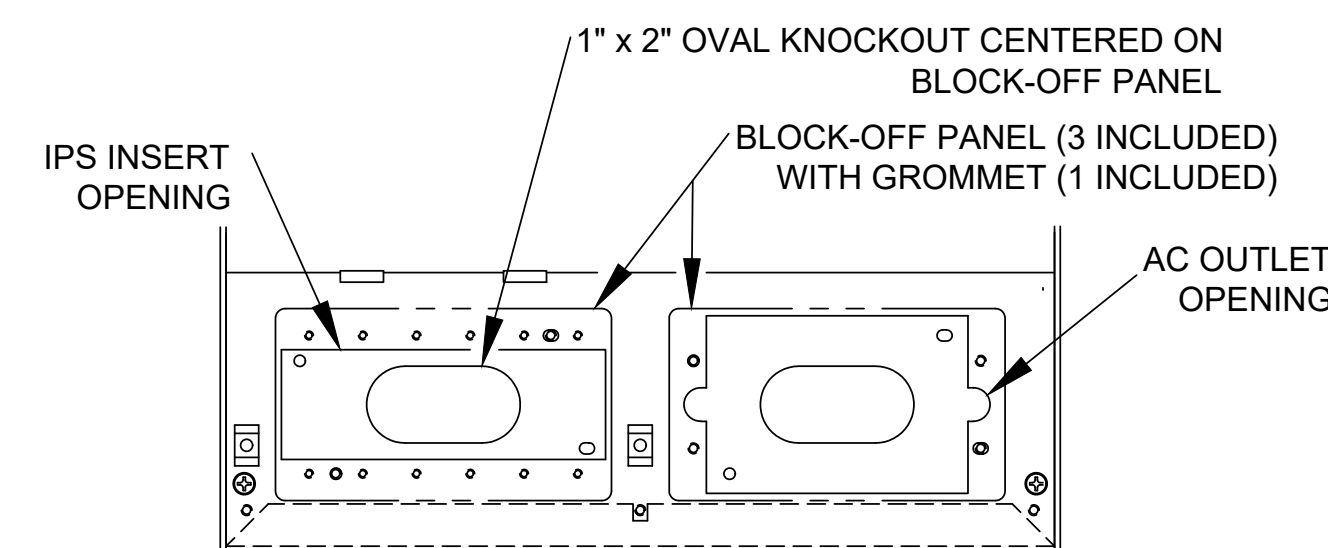
- A ARCHITECTURAL: COMPLY WITH DIVISIONS 2-14.
- A1 WALL ASSEMBLY W/ WITH MINIMUM 300 LB/LF BACKING.
- TN TELECOMMUNICATIONS SYSTEMS: COMPLY WITH DIVISION 27.
- TN1 FLAT PANEL DISPLAY/LCD.
- TN2 FLAT PANEL MOUNT - NET WEIGHT NOT TO EXCEED 40 LBS.
- TN3 FLAT PANEL WALL BOX, FPWB1, RECESSED FLUSH IN WALL.
- TN4 IN-WALL CONDUIT RACEWAY.

1 FLAT PANEL MOUNT ASSEMBLY

NTS



2A FRONT VIEW



2B TOP VIEW

2 FLAT PANEL WALL BOX - FPWB

NTS



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DETAILS - FLAT PANEL
WALL BOX AND
FLAT PANEL MOUNT

SHEET NUMBER

T90.1