



City of Richmond

REQUEST FOR QUOTATION 3992Q Supply and Installation of Sound Video and Control Equipment - OVAL

Quotations will be received at the Information Counter, Main Floor, Richmond City Hall, addressed to the Purchasing Section, 6911 No. 3 Road, Richmond, BC, V6Y 2C1, until

Tuesday, July 20, 2010 12:00 noon local time.

NOTES:

1. Quotations shall be in a sealed envelope or package marked with the bidder's Name, the RFQ Title and Number.
2. The Closing time will be conclusively deemed to be the time shown on the clock used by the City for this purpose.
3. Faxed quotations will not be received or considered.
4. Deadline for all questions: **Tuesday, July 13, 2010 12:00 pm**

All queries related to the RFQ shall be submitted
in writing to the attention of:

Sumita Dosanjh

Buyer II – Contracting Specialist

purchasing@richmond.ca

PART A – INSTRUCTIONS TO BIDDERS

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PART A – INSTRUCTIONS TO BIDDERS

REQUEST FOR QUOTATION 3992Q

Supply and Installation of Sound Video and Control Equipment – OVAL

Name of Bidder: _____

Address: _____

City: _____

Province: _____

Postal Code _____

Telephone Number _____

Contact Person _____

Title: _____

Email Address _____

Fax Number _____

PART A – INSTRUCTIONS TO BIDDERS

PART A – INSTRUCTIONS TO BIDDERS

1.0 Description of Requirement

- 1.1 Quotations are invited for the supply and installation of Sound Video and Control Equipment for the Richmond Olympic Oval as set out herein, for the City of Richmond.
- 1.2 Bidders are required to submit a quotation for the full requirement only. Partial responses will be put aside and given no further consideration.

2.0 Contract Term- Intentionally Omitted

3.0 Pricing

- 3.1 Prices quoted will be in Canadian currency and exclusive of all taxes, F.O.B. destination to the sites named herein, with all freight, unloading at destination, import duties, brokerage, royalties, handling, overhead, profit and all other costs included.

4.0 Inquiries and Clarifications

- 4.1 It is the responsibility of the Bidder to thoroughly examine these documents and satisfy itself as to the full requirements of this RFQ. Inquiries are to be in written form only, e-mailed to the contact person shown on the cover page. If required, an addendum will be posted to the City of Richmond website and BC Bid website. It is the sole responsibility of the Bidder to ensure all addenda are received.

5.0 Inspection of Site

- 5.1 Where applicable, Bidders shall inspect the Work Site(s) and make allowances in its Quotation for such conditions as in the sole opinion of the Bidder are warranted. The City makes no representation or warranties as to the condition of the sites. No consideration will be given for extras resulting from conditions that would have been evident during a routine site visit.
- 5.2 Note: There will be a site visit conducted on **Friday, July 9, 2010 10:00 am** with sign-in attendance forms. Potential Bidders are asked to meet at the site, in the front lobby of the Richmond Olympic Oval located at **6111 River Road, Richmond**. The City **strongly encourages** all potential Bidders to attend this tour. No other tours will be organized or arranged for this project.

6.0 Submission of Quotation

PART A – INSTRUCTIONS TO BIDDERS

- 6.1 The response to this Request for Quotations (RFQ) with all accompanying schedules, appendices or addenda submitted by the Bidder will be received up to the closing time on the date and in the place shown on the title page of this RFQ (the “Closing Time”). The Quotation shall be submitted on the forms provided in a sealed envelope or package, marked with the Bidder’s name and the RFQ title and number.
- 6.2 Quotations received after the Closing Time or in locations other than the address indicated, will not be accepted and will be returned unopened.
- 6.3 The Bidder shall submit three (3) copies of its Quotation in accordance with the instructions stated herein.
- 6.4 The Bidder must enter its corporate or legal business name on the final page of the Quotation Form. The Quotation Form must be signed in the place provided by an officer or employee having authority to bind the Bidder to the terms and conditions of this RFQ. All other pages of the Quotation Form must be initialled by the authorized signatory in the spaces provided.
- 6.5 Amendments to a Quotation may be submitted if delivered in writing prior to the Closing Time in a sealed envelope or package, marked with the Bidder’s name and the RFQ title and number.
- 6.6 Quotations may be withdrawn by written notice only, provided such notice is received at the Purchasing Services office prior to Closing Time.
- 6.7 All costs associated with the preparation and submission of the Quotation, including any costs incurred by the Bidder after the Closing Time, will be borne solely by the Bidder.
- 6.8 By submitting a Quotation, the Bidder acknowledges and agrees that the City will not be responsible for any costs, expenses, losses, damages (including damages for loss of anticipated profit) or liabilities incurred by the Bidder as a result of or arising out of submitting a Quotation for the proposed Contract, or due to the City’s acceptance or non-acceptance of their Quotation or any breach by the City of the bid contract between the City and each of the Bidders or arising out of any contract award not made in accordance with the express or implied terms of the Quotation documents.

7.0 Conflict of Interest

- 7.1 By submitting a Quotation, the Bidder warrants that neither it nor any of its officers or directors, or any employee with authority to bind the Bidder, has any financial or personal relationship or affiliation with any elected official or

PART A – INSTRUCTIONS TO BIDDERS

employee of the City or their immediate families which might in any way be seen by the City to create a conflict.

8.0 Evaluation of Quotations

- 8.1 Quotations will be evaluated on the basis of the overall best value to City based on quality, service, price and any other criteria set out herein including, but not limited to:
- a) the Bidder's ability to meet the Requirements, qualifications and competencies set out herein;
 - b) financial offer including but not limited to prices, operating and maintenance costs, warranty, and any life cycle considerations;
 - c) the Bidder's business and technical reputation and capabilities; experience and where applicable, the experience of its personnel; financial stability; track record; and references of current and former customers;
 - d) equipment quality, configuration, age and condition; and
 - e) any other criteria set out in the RFQ.
- 8.2 Prior to Contract award, the Bidder may be required to demonstrate financial stability. Should the City so request, the Bidder will be required to provide annual financial reports or a set of financial statements prepared by an accountant and covering the last two (2) fiscal years.
- 8.3 The City may, prior to Contract award, negotiate changes to the scope of the Work, the materials, the Specifications or any conditions with any one or more of the Bidders without having any duty or obligation to advise any other Bidders or to allow them to vary its prices as a result of changes to the scope of Work, the materials, the Specifications, or any conditions, and the City shall have no liability to any other Bidder as a result of such negotiations or modifications.
- 8.4 All sub-contractors of the Bidder will be subject to the same evaluation process. It is the responsibility of the Bidder to guarantee that all its sub-contractors will comply with all the Requirements and terms and conditions set out herein.
- 8.5 Preference may be given to Quotations offering environmentally beneficial products or services.

9.0 Acceptance and Rejection of Quotations

- 9.1 Notwithstanding any other provision in the Quotation documents, the City has in its sole discretion, the unfettered right to:
- a) accept any Quotation;

PART A – INSTRUCTIONS TO BIDDERS

- b) reject any Quotation;
 - c) reject all Quotations;
 - d) accept a Quotation which is not the lowest Quotation;
 - e) accept a Quotation that deviates from the Requirements, Specifications or the conditions specified in this Quotation;
 - f) reject a Quotation even if it is the only Quotation received by the City;
 - g) accept all or any part of a Quotation; and
 - h) split the Requirements between one or more Bidders.
- 9.2 All Quotations shall be irrevocable and remain open for a minimum of sixty (60) days after the Closing Time, whether or not another Quotation has been accepted.
- 9.3 The City may waive any non-compliance with the RFQ, the Requirements, the Specifications, or any conditions, including the timing of delivery of anything required by this RFQ and may elect to retain for consideration Quotations which are non-conforming, which do not contain the content or form required by the RFQ or which have not complied with the process for submission set out herein.

10.0 Award of Contract

- 10.1 Award of a Contract is contingent on funds being approved and the contract award being made by the appropriate City authority.
- 10.2 The purchase order, the Quotation, the RFQ and such other documents including all amendments or addenda, shall form the basis for the Contract between the Contractor and the City. In the event of a conflict between any of the Contract Documents, the following documents will take precedence and govern over each other in the following order of priority from highest to lowest:
- a) The City's purchase order including the standard purchase order terms and conditions;
 - b) Or any mutually agreed to amendments between the Bidder and the City;
 - c) The Quotation; and
 - d) The RFQ and any subsequent addenda.
- 10.3 Where the head office of the successful Bidder is located within the City of Richmond and/or where the successful Bidder is required to perform the Service at a site located within the City of Richmond, the successful Bidder is required to have a valid City of Richmond business license prior to Contract execution.
- 10.4 The City is not under any obligation to award a Contract and may elect to terminate this RFQ at anytime.

PART A – INSTRUCTIONS TO BIDDERS

11.0 Quantities

- 11.1 The quantities stated herein are the City's best estimates of its requirements and should not be relied on. Actual quantities may vary.

12.0 Brand Names – Intentionally Omitted

13.0 Alternates and/or Variations to Specifications

- 13.1 Except where stated otherwise herein, the Specifications describe what is considered necessary to meet the performance requirements of the City and Bidders should bid in accordance with such Specifications, or if the Bidder cannot meet the Specifications, the Bidder may offer an alternative which it believes to be the equivalent.
- 13.2 If in addition to bidding on goods, materials, equipment and/or services that meet the Specifications, the Bidder wishes to offer an alternative, the alternative Quotation shall be submitted separately in the same format as the initial Quotation.
- 13.3 The City is not obligated to accept any alternatives.
- 13.4 The City will determine what constitutes allowable variations.

14.0 Freedom of Information and Protection of Privacy Act

- 14.1 Bidders should note that the City of Richmond is subject to the Freedom of Information and Protection of Privacy Act (British Columbia), which imposes significant obligations on the City's contractors to protect all personal information acquired from the City in the course of providing any service to the City.

15.0 Confidentiality

- 15.1 Information about the City obtained by Bidders must not be disclosed unless prior written authorization is obtained from the City.
- 15.2 The Contractor agrees that this obligation of confidentiality will survive the termination of the Contract between the Contractor and the City.

16.0 Insurance

- 16.1 The contractor will be required to Indemnify and Insure the City as shown in the General Conditions of the Contract.
- 16.2 Bidders shall have the Undertaking of Liability Insurance Form Letter L1-1 within the document completed and submitted with their Quotation.

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- 16.3 All policies and certificates shall be submitted to the Purchasing Section before a contract is issued to carry out the work.
- 16.4 All bids shall be accompanied by an Undertaking of Liability Insurance.
- 17.0 **Bid Bond – Intentionally Omitted**

1.0 Definitions

The following words and terms, unless the context otherwise requires, shall have the meanings set out below. Words including the singular number include the plural and vice versa.

“Act of God” means a cataclysmic phenomenon of nature, including earthquake, flood or cyclone. Rain, snow, wind, high water or any other natural phenomenon, which might reasonably have been anticipated from historical records of the general locality of the City, shall be deemed not to be acts of God;

"Audio-Visual Consultant" means M^C Squared System Design Group, Inc., #323 – 900 West 3rd Street, North Vancouver, BC V7P 3P9, ph. 604-986-8181 fax 604-988-9751 email: 5539@mcsquared.com

"Audio-Visual Contractor" means the person, persons, or company who contract for performance of the sound system work specified herein. Other trades retained for performance of the work are deemed subcontractors to the Audio-Visual Contractor.

“Bidder” means the individual, partnership, corporation or combination thereof, including joint ventures, who or which sign the Quotation form set out in Part D of this RFQ;

“City” means the municipal corporation, generally known as the City of Richmond.

“City’s Designated Representatives” means the City’s employees or representatives who are authorized in writing to deal with the Contractor on behalf of the City in connection with the goods, materials, equipment and services or to make decisions in connection with the Contract;

“Closing Time” means the closing date, time, and place as set out on the title page of this RFQ;

“Contract” means the agreement formed between the City and the Contractor as evidenced by the purchase order issued to the Contractor by the City;

“Contract Documents” means the purchase order, the Contractor’s Quotation, the RFQ and such other documents as listed in the purchase order, including all amendments or addenda agreed between the parties;

“Contractor” means the successful Bidder individual, partnership, corporation or combination thereof, including joint ventures, who or which is awarded the Contract;

“Deliverables” means the supply, delivery, installation, documentation, final commissioning, testing of the Sound, Video & Control Equipment at the Oval.

“Delivery Date” means the date the City requires the Contractor to deliver the goods to the City’s Delivery Site;

“F.O.B.” means all costs of freight, insurance, brokerage, customs duties and all other costs of delivery to the site named as F.O.B. will be borne by the Contractor and that ownership and title to all goods, materials, and equipment are transferred to the City when same are delivered by the Contractor to the City and the risk of loss or damage to the goods, materials and equipment transfers to the City only at such time as same are received and accepted by the City at the site named as “F.O.B.”;

“GST” means the goods and services tax administered under the Excise Tax Act (Canada) and any successor tax or levy therefore in force from time-to-time;

“OHS Regulation” means the *Workers Compensation Act* (British Columbia), including without limitation, the Occupational Health & Safety Regulation (BC Regulation 296/97, as amended by BC Regulation 185/99) enacted pursuant to such Act, all as such Act or Regulations are amended or re-enacted from time to time.

“PST” means British Columbia provincial sales tax and any successor tax or levies therefore in force from time-to-time;

“Quotation” means the Bidder’s response made on the Quotation form set out on Part D of this RFQ with all appendices or addenda submitted by the Bidder in response to the RFQ;

“RFQ” means this Invitation to Quotation including, but not limited to: Part A - Instructions to Bidders; Part B - General Conditions; Part C- Requirements; Part D – Quotation Form;

“Requirements” means all of the Specifications, requirements and services set out in the RFQ that describes the general requirements that the goods, materials, equipment and services must meet and the Contractor must provide;

“Work” means all the labour, materials, equipment, supplies, services and other items necessary for the execution, completion and fulfilment of the Requirements;

“Work Site” means the site where the Work is being performed, Richmond, B.C., unless otherwise stated in this RFQ.

2.0 Sub-contractors

2.1 All sub-contractors are the responsibility of the Contractor.

2.2 The Contractor shall be held as fully responsible to the City for the acts and omissions of its sub-contractors and of persons directly or indirectly employed by the Contractor, as for the acts and omissions of persons directly employed by it.

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- 2.3 The Contractor agrees to ensure performance by every sub-contractor with the terms and requirements of the Contract Documents.
 - 2.4 No sub-contractors will be permitted except those expressly named by the Contractor in Part D – quotation form or subsequently permitted in writing by the City pursuant to Section 4.1 of these General Conditions.
 - 2.5 The Contractor will list below all subcontractors it intends to use in its performance of the Work, and what parts of the Work each subcontractor will be undertaking (the “Subcontractors”).
 - 2.6 The Contractor, if awarded the Contract, will engage the listed Subcontractors only, and no others in their stead, without prior written authorization of the City.
 - 2.7 The Contractor, if awarded the Contract, will ensure that every Subcontractor is bounded by a legal agreement with the same terms and conditions of the Contract.

3.0 Independent Contractor

- 3.1 The Contractor, its sub-contractors, the officers, directors, shareholders, partners, personnel, affiliates and agents of the Contractor and its sub-contractors are not, nor are they to be deemed to be, partners, appointees, employees or agents of the City.

4.0 Assignment

- 4.1 Subject to Sections 2.4 and 4.2, the Contractor will not assign, sublet, subcontract, or let out as task work any part of the Work or any of the Contractor’s obligations of the Contract Documents to any third party, and will not assign or otherwise transfer any of the rights of payment under the Contract Documents to any third party, without in each case the prior written consent of the City which consent the City may arbitrarily withhold.
- 4.2 Despite Section 4.1, the Contractor may utilize those sub-contractors expressly named in Section 10.1 of Part D – Quotation Form but only for the Area of Responsibility set out beside their name, provided always that the Contractor may not substitute or replace those sub-contractors, or permit those sub-contractors to further assign, sub-let, sub-contract, or let out as task work their obligations under the Contract documents, except in accordance with Section 4.1 above.
- 4.3 If the City should consent to any such assignment, subletting or letting out as task work of all or any part of the Work, the Contractor shall in no way be relieved from its responsibility for the fulfilment of the Work, but shall continue to be responsible for the same in the same manner as if all the Work had been performed by the Contractor.

5.0 Time of the Essence

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- 5.1 For all requests made by the City pursuant to the Contract, time is of the essence. The acceptance of a late performance, with or without objections or reservations by the City, shall not waive the right to claim damages for such breach nor constitute a waiver of the requirement of timely performance of any obligation remaining to be performed.

6.0 Laws, Permits and Regulations

- 6.1 The laws of British Columbia shall govern the Contract.
- 6.2 In carrying out its obligations hereunder, the Contractor shall familiarize itself and comply with all applicable laws, bylaws, regulations, ordinances, codes, specifications and requirements of all regulatory authorities, and shall obtain all necessary licenses, permits and registrations as may be required by law.

7.0 Inspection

- 7.1 The services are subject to inspection and in case any of the services are not in conformity with the Requirements of the Contract or the Contractors' warranty (expressed or implied), the City shall have the right either to reject them or to require correction.
- 7.2 The City shall be the final judge of the services and materials in respect of both quality and quantity and its decisions of all questions in dispute with regard thereto will be final.
- 7.3 The City will not be deemed to have accepted the services by virtue of a partial or full payment for it.

8.0 Quality of Workmanship and Materials

- 8.1 The Contractor shall perform the services with the degree of care, skill and diligence normally applied in the performance of services of a similar nature and in accordance with sound current professional practices and conforming to the requirements set out in the RFQ.
- 8.2 Materials, goods and equipment shall be the products of suppliers or manufacturers of established reputation engaged in the supply or manufacture of such materials of equipment.
- 8.3 Materials are to be applied in accordance with the manufacturer's directions and shall use the techniques and applications best suited for the type of material being used.

9.0 Warranty

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- 9.1 The Contractor warrants that the goods, materials, equipment and/or services supplied by the Contractor to the City will be in full conformity with the Specifications as well as samples, if any, then this is a sale by sample as well as by description within the meaning of the Sale of Goods Act (BC).
 - 9.2 The Contractor further warrants that the goods, materials and/or equipment are of merchantable quality, and fit for the intended use and will perform according to the requirements set out in the RFQ.
 - 9.3 Equipment and materials shall be new, free and clear of all liens, charges and encumbrances, the latest model, and shall be complete with all necessary accessories for operation. All equipment and materials shall be at the risk of the Contractor until delivered to and accepted by the City.
 - 9.4 At a minimum, a one (1) year parts and labour warranty shall be provided on all goods, materials, equipment and/or services provided under the Contract.
 - 9.5 The Contractor warrants that its employees have the qualifications, experience, knowledge, skills and abilities necessary for the fulfilment of the Contract.

10.0 Indemnification and Insurance

- 10.1 The Contractor shall indemnify, hold and save harmless the City from and against all claims, losses, damages, costs, actions and other proceedings made, sustained, brought or prosecuted in a manner based upon, occasioned by or attributable to any injury, including death, property damage, infringement or damage arising from any act or omission of the Contractor, its employees, officers, volunteers, servants, sub-contractors, or agents or persons from whom the Contractor has assumed responsibility in the performance or purported performance of the Requirements.
- 10.2 The Contractor shall indemnify the City from and against any and all liability or expenses by way of legal costs or otherwise in respect of any claim which may be made for a lien or charge at law or in equity or to any claim or liability under the Builders Lien Act, or to any attachment for debt, garnishee process or otherwise.
- 10.3 The Contractor shall assume the defence of, and indemnify and hold harmless the City and its officers, employees and agents, from and against all claims relating to materials, goods or equipment furnished and to inventions, copyrights, trade marks, or patents and rights thereto used by the Contractor in the execution of the Contract and in subsequent use and/or operation by the City.
- 10.4 The Contractor will indemnify, hold, and save harmless the City from and against all claims, losses, damages, costs, actions, and other proceedings, made, sustained, brought or prosecuted in manner, based upon, occasioned by, attributable to any injury, including death, property damage, infringement, or

damage arising from any act or omission of the Contractor, his employees, officers, volunteers, servants, or agents or persons from whom the Contractor has assumed responsibility in the performance or purported performance of this agreement

- 10.5 The Contractor shall, at his own expense, through the terms of the contract secure, maintain, and pay for the following coverage:
- a) Comprehensive General Liability Insurance with a limit of not less than \$5,000,000 inclusive per occurrence for bodily injury and property damage and \$5,000,000 for personal injury. The policy or policies shall cover all premises and operations necessary or incidental to the performance of this agreement and include but not necessarily be limited to the following coverage:
 - 1. Contractual liability assumed under this agreement.
 - 2. Contingent employer's liability with respect to operations of sub-contractors.
 - 3. City's protective liability.
 - 4. Cross liability.
 - 5. Automobile liability (non-owned, hired).
 - 6. Completed operations liability 24 months after completed operations.
 - 7. Voluntary medical payments.
 - b) "Course of Construction" Property Damage Insurance covering all risks of physical loss or damage on an occurrence basis, including loss of use of property, and including losses or damage from flood or earthquake. The coverage provided shall amount to no less than 80% of the total value of the work done and material delivered to the site, or under the control of the Contractor, payable to the City and Contractor as their interests may appear, and protecting each in such terms as will preclude subrogation claims by the insurer against anyone insured there-under.
- 10.6 The City, its officers, officials, and employees shall be added as an additional insured on all such policies. All such insurance provided by these policies shall be primary regardless of any insurance or self insurance that may be enforced at the time of any loss or claim that insures the City, its officers, officials, and employees.
- 10.7 The policy or policies shall be underwritten by an insurance company or companies licensed to do business in the Province of British Columbia and who meet with the reasonable approval of the City. Prior to the commencement of the work defined by this agreement, the Contractor shall furnish the City through the Office of the Manager Purchasing and Risk a certified original copy of all such

policies as evidence that such insurance is in force. The Contractor agrees that such insurance policies cannot be cancelled, lapsed, or materially changed without at least 30 days' written notice to the City.

- 10.8 Maintenance of such insurance and the performance of the Contractor of his obligations under this clause shall not relieve the Contractor of liability under the indemnification provisions here and above set forth. The foregoing insurance provisions shall not limit the insurance required by Municipal, Provincial, or Federal law
- 10.9 It shall be the full responsibility of the Contractor to determine whether any additional insurance coverage is necessary and advisable for its own protection and/or to fulfil its obligations under this Contract. Any such additional insurance shall be provided and maintained by the Contractor its own expense.
- 10.10 It is understood that this agreement is strictly between the Contractor and the City and the Contractor is an independent contractor for the City and no employment relationship, partnership, agency, or joint venture exists between the City, the employees of the Contractor and/or its agents and/or their employees, and/or its Contractors and/or their employees. Any disputes between the Contractor and any of its employees and/or its agents and/or their employees and/or their Contractors and/or their employees shall be resolved by the Contractor with no involvement by the City.

11.0 Termination

- 11.1 The City will advise the Contractor by written notice of its intent to terminate the whole or any part of the Contract in any one of the following circumstances:
- a) if the Contractor fails to make delivery of the goods, materials, equipment and/or services within the time specified, or fails to perform any other provisions, terms or conditions of the Contract within the time specified, or within a reasonable time if no time is specified;
 - b) in the event that the Contractor performs any act or does anything by which the City shall incur any liability whatsoever;
 - c) any failure of the Contractor to meet the safety requirements of the Contract;
 - d) in the event that any creditor of the Contractor causes a writ of execution or similar writ or court order to be served upon the City requiring the City to pay any portion due to the Contractor under the Contracts; or
 - e) in the event that the Contractor is adjudged bankrupt or if it makes a general assignment for the benefit of creditors or if it becomes insolvent or if it should take the benefit of any Act that may be in force for bankrupt or insolvent debtors.

11.2 Upon termination of the Contract, the City shall have no obligation to the Contractor except for such services and/or goods as have been supplied up to the date of the termination of the Contract(s).

11.3 Upon termination of the Contract(s) in whole or in part, the City may procure similar goods, materials, equipment and/or services and the Contractor shall be liable to the City for any excess costs for such similar goods, materials, equipment and/or services. The Contractor shall not be liable for any excess costs if failure to perform arises by reason of strikes, lockouts, Acts of God or acts of the City. The City will not be liable where Delivery Sites are not available due to strikes, lockouts or Acts of God.

12.0 Payments

12.1 The Contractor shall be paid net thirty (30) days from receipt of invoice and acceptance of the goods, materials, equipment and/or services, whichever is the later.

12.2 After completion of the Deliverables, the City shall have thirty (30) business days to either accept the Deliverables or state in writing to the Consultant the reason the Deliverables are unacceptable. Acceptance of each Deliverable shall be indicated by the written acceptance (“Acceptance”) by the City’s Designated Representative. The City shall hold back 25% of total fee until Acceptance by the City.

13.0 Taxes

13.1 Unless otherwise provided herein, the Contractor shall pay all sales or excise taxes in force during the term of the Contract, provided that any increase or decrease in such taxes shall increase or decrease the amount due under the Contract(s).

13.2 Invoices shall show the appropriate amounts for HST.

14.0 Non-resident Withholding Tax – Intentionally Omitted

15.0 Performance Bond – Intentionally Omitted

16.0 Protection of Person and Property

16.1 The Contractor shall use due care that no persons are injured, no property damaged or lost, and no rights are infringed in the performance of the services, and the Contractor shall be solely responsible for all loss, damages, costs and expenses in respect of any injury to persons, damage of property, or infringement of the rights of others incurred in the performance of the services or caused in any other manner whatsoever by the Contractor, or its employees.

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- 16.2 The Contractor shall effectively warn and protect the public and other personnel from any danger as a result of the services being done.

17.0 Clean Up

- 17.1 The Contractor shall at all times perform the services in an orderly and reasonably tidy manner, and shall at suitable intervals remove any accumulation of rubbish or refuse materials. At no time shall any person employed by the Contractor or by any of its sub-contractors discard any litter or garbage on or adjacent to the delivery site, except into a suitable container.

18.0 Character of Workers

- 18.1 On the written request of the City, the Contractor will remove any employee, Sub-Contractor or agent for any reason including but not limited to the following:
- a) Lack of or failure to obtain any required Security Clearance;
 - b) Intoxication;
 - c) Use of foul, profane, vulgar or obscene language or gestures;
 - d) Solicitation of gratuities or tips from any person for services performed under this Agreement;
 - e) Wilful, negligent or reckless action in disregard of safety or sanitary requirements or regulations; or
 - f) Any action which may constitute a public nuisance or disorderly conduct.
- 18.2 The Contractor will immediately comply with each such request and will then provide the City with all requested documentation verifying that the employee, Sub-Contractor or agent has been removed from further involvement with this Agreement.

19.0 Conduct of the Contract

- 19.1 The City of Richmond's Manager, Purchasing shall have the conduct of the RFQ and the Contract.

20.0 Rectification of Damage and Defects

- 20.1 The Contractor shall rectify any loss or damage for which, in the opinion of the City the Contractor is responsible, at no charge to the City and to the satisfaction of the City. Alternatively, the City may repair the loss or damage and the Contractor shall pay to the City the costs of repairing the loss or damage forthwith upon demand from the City. Where, in the opinion of the City, it is not practical or desirable to repair the loss or damage, the City may estimate the cost of the loss

or damage and deduct such estimated amount from the amount owing to the Contractor hereunder.

21.0 Failure to Perform

- 21.1 Should the Contractor neglect to execute the Requirement properly or fail to perform any provision of the Contract, the City may, without prejudice to any other right or remedy it may have, make good such deficiencies and may deduct the cost thereof from the payment due to the Contractor.
- 21.2 If the Contractor fails to perform any provision of the Contract due to reasons of strike, lockout or other work stoppages, the City may upon ten (10) days written notice to the Contractor terminate the Contract without prejudice to any other right or remedy the City may have.

22.0 Dispute Resolution

- 22.1 All claims, disputes or issues in dispute between the City and the Contractor shall be decided by mediation or arbitration, if the parties agree, or failing agreement, in a Court of competent jurisdiction with the Province of British Columbia and be governed by the laws of British Columbia.
- 22.2 In the event that the parties agree to arbitration pursuant to the above, the arbitration shall be governed by the rules of the British Columbia International Commercial Arbitration Centre, except that the arbitrator or arbitrators shall be agreed upon by the parties, and failing agreement by the parties, shall be appointed by a court of competent jurisdiction with the Province of British Columbia.
- 22.3 In the event that the parties agree to arbitration, the arbitration shall take place in the Lower Mainland, British Columbia and be governed by the laws of British Columbia.
- 22.4 The procedure set out in this section is not meant to preclude or discourage informal resolution of disagreements between the City and the Contractor.

23.0 Delivery

- 23.1 Deliveries shall be made to: 6111 River Road, Richmond

24.0 Changes in Requirements

- 24.1 The City, without invalidating the Contract, may make changes to the Contract by altering, adding or deducting from the Requirements. Subject to mutual agreement, the Contractor shall proceed with the amended Requirements and the amended Requirements shall be executed under the provisions of the Contract.

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- 24.2 The Contractor must not make any changes to from the terms of the Contract unless it shall first have received the written consent of the City and no claims for additional compensation shall be valid unless the change is so ordered.

PART C – REQUIREMENTS (SPECIFICATIONS)

1. OTHER TERMS

1.1. CONTRACT DOCUMENTS

1.1.1. In the text that follows, the words, "The Contractor Shall . . ." are implied.

1.2. DESCRIPTION OF WORK

1.2.1. Supply, install, and commission operating sound, video and control systems in the Richmond Olympic Oval, as indicated on the drawings identified in this specification. Note that this specification is complementary to the drawings; work shown in either is deemed to be in both.

1.2.2. Coordinate installation with all other contractors engaged in the project so work proceeds in a manner best serving the City. Resolve any conflicts caused by improper co-ordination at no extra cost to the contract. The Audio-Visual Consultant will not arbitrate between contractors.

1.2.3. Furnish equipment, materials and workmanship of the highest quality. Workmanship and materials will at all times be subject to acceptance by the Audio-Visual Consultant.

1.2.4. Include everything necessary or incidental to complete the sound, video and control systems herein described. Include all conduit, fittings, electrical devices, and wiring to connect systems equipment to AC outlets, panelboards, and dedicated ground points.

1.2.5. Provide structurally adequate mounting for the video projectors.

1.2.6. Provide earthquake restraints for all equipment racks, suspended audio and video equipment, and counter mounted audio and video equipment, where appropriate.

1.2.7. Allow for construction requirements such as lift equipment and night work.

1.3. RELATED WORK

1.3.1. The following work will be provided by other trades:

- 1.3.1.1. 120 volt AC service to equipment racks and adjacent to other sound, video and control system loads.
- 1.3.1.2. Conduit, cable tray, pull boxes and wall boxes, except as noted herein.
- 1.3.1.3. Painting and finishes, except as noted.
- 1.3.1.4. Equipment rooms and walls.

1.4. STANDARDS

1.4.1. Install equipment and materials in accordance with manufacturer's recommendations and accepted trade practice. Obey the following codes, regulations and standards:

- 1.4.1.1. Electrical standards of the of the City of Richmond, and the by-laws of the Municipal Electrical Inspection Department having authority over the area in which the work is being conducted, whichever is the most stringent.
- 1.4.1.2. The Province of British Columbia Rules and Regulations for installation and maintenance of electrical equipment.
- 1.4.1.3. Canadian Electrical Code in effect on closing date of tender.

1.4.2. Obtain any plan approvals required by Inspection Authorities prior to commencing construction.

1.4.3. Obtain all permits and licenses necessary for the execution of the work, and pay all fees associated thereto.

1.4.4. Deliver Certificate of Approval from the governing body at conclusion of installation, prior to total completion.

1.5. EXISTING CONDITIONS

1.5.1. Verify all conditions which pertain to the installation, including the work of other divisions, to ensure that the work as specified can be satisfactorily executed without changes. The facility is under construction and is available for inspection.

1.5.2. Drawings are generally schematic and are intended to show only major features of the work. Site information given on the drawings is not guaranteed.

1.5.3. Do not scale the drawings - confirm all dimensions on site prior to installation. Coordinate all mounting heights with surrounding features.

1.6. QUALIFICATIONS

- 1.6.1. The Audio-Visual Contractor must regularly engage in the supply and installation of commercial and industrial sound and audio-visual systems.
- 1.6.2. The Audio-Visual Contractor must maintain a suitably staffed and equipped service organization and must regularly offer maintenance services for systems of this type and size.
- 1.6.3. At the request of the City, demonstrate to the satisfaction of the Audio-Visual Consultant that adequate plant, equipment, staff, technical experience, and resources are available to pursue the work properly and expeditiously.
- 1.6.4. The Audio-Visual Contractor must provide the following support documentation one week prior to the close of tender,:
 - 1.6.4.1. A list of at least 5 projects of similar size and scope in British Columbia, with references, completed within the last 3 years.
 - 1.6.4.2. Certificate or letter from the control system manufacturer indicating the successful completion of Crestron programming course.
 - 1.6.4.3. The Audio-Visual Contractor must be able to deliver product with full manufacturer's warranty coverage, valid in Canada.

1.7. SUBSTITUTIONS

- 1.7.1. Particular products are specified, but proposals for equivalent or alternative products are welcome. The Audio-Visual Consultant, acting as the City's representative, will be the sole judge of equivalent performance. For substitutions, provide acceptable catalogue data, specifications, technical information and/or samples to the Audio-Visual Consultant at least five (5) working days prior to bid closing date. Accepted items will be confirmed only by Addendum to the bid documents.
- 1.7.2. If a specified item is not available or has been replaced by a newer item, notify the Audio-Visual Consultant prior to bid close.
- 1.7.3. If, after the work has been in progress for some time, the specified equipment or material is not available, obtain written approval from the Audio-Visual Consultant before making any substitutions.
- 1.7.4. Substitutions made without written approval are liable to rejection after installation. Replace any product so rejected with an approved item at no extra cost to the contract.

1.8. SHOP DRAWINGS

1.8.1. Shop drawings augment but do not alter contract documents. Review of shop drawings does not imply acceptance of the work.

1.8.2. Submit four (4) prints of the following drawings for review by the Consultant and the Audio-Visual Consultant:

1.8.2.1. Before proceeding with the work,

1.8.2.1.1. Manufacturer's specification cuts and quantity schedule for all items furnished under the contract.

1.8.2.1.2. Drawings and tables indicating proposed connector panel and control labelling, touch panel layout screen captures nomenclature, layout arrangements for equipment racks and panels, and wiring harnesses.

1.8.2.1.3. Details of video projection suspensions certified by a Professional Engineer registered in British Columbia (include cost of certificate in system bid).

1.8.2.1.4. Connection schedules.

1.8.2.1.5. A list of test points, and a proposed format for test records.

1.8.2.1.6. Details and descriptions of any other aspect of the sound, video or control system which must differ from the drawings due to field conditions.

1.8.3. Certify with signature and title that drawings submitted reflect the final issue intended for fabrication.

1.8.4. Co-ordinate documents of related divisions when joint submissions are required.

1.8.5. Maintain one copy of reviewed shop drawings on job site at all times.

1.9. TIMETABLE

1.9.1. After notification of contract award and discussion with the General Contractor and the Audio-Visual Consultant, submit a detailed construction timetable of all project milestones, including shop drawing submittal date, shop drawing approval date, shop work schedule, site work schedule, interim inspection dates, system testing date, system adjustment date, and project completion date. Submit within seven (7) days of notification of contract award.

1.9.2. Provide additional workers and equipment necessary to maintain the schedule.

1.10. AS-BUILT DRAWINGS

1.10.1. The City will provide the successful bidder with one (1) set of ACAD2004 DWG or PDF files, at no charge. Mark in red ink on one (1) set of white prints any changes, additions, and omissions not contained in the original documents, and any other pertinent information affecting future work. Maintain the record set on site at all times.

1.10.2. At Substantial Performance, the contractor will submit a clean set of marked up As-Built prints. Certify with signature and turn over to the Audio-Visual Consultant one (1) set of white prints so revised. Include in each operating and maintenance manual one set of white prints so revised.

1.11. ERRORS AND OMISSIONS

1.11.1. Check drawings and specifications for errors, omissions and conformity with applicable regulations prior to bidding. Report typos or discrepancies to the Audio-Visual Consultant prior to closing of bid.

1.11.2. Where the meaning of drawings or specifications is unclear, obtain clarification prior to closing of bid. No consideration will be given for failure to request clarification.

1.11.3. Omissions and errors within contract documents do not relieve the Audio-Visual System Contractor of responsibility for providing properly functioning systems as described herein.

1.12. CLEAN UP

1.12.1. Include in bid price the cost of cleaning each section of work after completion to permit immediate use of the area. Include cost of debris removal.

1.12.2. Make good all existing structures, surfaces, and utilities affected by cutting, coring or other new work.

1.13. WARRANTY AND MAINTENANCE

- 1.13.1. Warrant the completed systems against defects in materials and workmanship, including any required parts and labour, at no cost to the City, for a one (1) year period from date of Substantial Performance or first beneficial use, whichever occurs first. Pass on manufacturer warranties for individual items.
- 1.13.2. Visit the installation at least two (2) times during the warranty period to ensure that all equipment is functioning satisfactorily. Perform any maintenance services that may be required. The first visit shall occur approximately six months after commencement of the warranty period, with the last visit just prior to the end of the warranty period. Use only qualified service personnel.
- 1.13.3. Perform additional maintenance services requested during the warranty period, at no cost to the City. Maintenance services shall consist of, but not be limited to, operational tests and checks of all cable and equipment.
- 1.13.4. Any defect discovered during any maintenance visit shall be repaired or replaced under the terms of the warranty. The Audio-Visual System Contractor is not liable for equipment damaged by improper use, negligence, or acts of nature.

1.14. INTELLECTUAL PROPERTY

- 1.14.1. It is understood that the machine language or high level programming language will remain the property of the particular audio, video or control system product manufacturer, and the City of Richmond will have the use and benefit of this hardware/software for as long as they own this equipment.
- 1.14.2. The City will become the outright City of all value-added intellectual property in the form of all audio, video or control system programming (including objects, modules and macros) to adapt and configure the equipment for the specific functions and performance required by this specification, whether performed by the Audio-Visual Contractor or the product manufacturer. Supply one copy of the compiled and uncompiled source code for all the audio, video and control system value-added programming on 3.5" IBM compatible disks or PC compatible CD, complete with a printed copy of the available support documentation.
- 1.14.3. It is understood that the agreement to turn over the AV system value-added programming to the City as part of this contract will in no way limit or prevent the Audio-Visual Contractor from reusing the programming knowledge, techniques, methods, macros, and programming details or graphic user interface elements in other projects for other clients.
- 1.14.4. The City will not knowingly resell, or transfer for profit, the value-added AV system programming to any other AV vendor or contractor for use on any AV systems other than the systems described by this specification.

1.15. ASSISTANCE TO CITY

- 1.15.1. After the system has been tested as fully operational, provide 6 hours of instruction to designated representatives of the City in the features of the systems and the proper methods of operation. This may be provided in one or more sessions to suit the City's timetable.
- 1.15.2. Provide operating assistance for the first two major uses of the completed system in each room. Provide this assistance at the times required by the City even if outside the normal working day.

1.16. OPERATION AND MAINTENANCE MANUALS

- 1.16.1. Assemble four (4) physical copies of a manual, formatted as follows:
 - A. List of Equipment Provided
 - B. Simplified Operating Instructions
 - C. As-Built and Reviewed Shop Drawings
 - D. Performance Measurements
 - E. Service and Adjustment Instructions
- 1.16.2. Submit a draft copy of the manual at completion of testing under Clause 3.8. This will be returned during adjustments under Clause 3.10.
- 1.16.3. Forward both final copies to the Audio-Visual Consultant, who will deliver the manuals, if satisfactory, to the City through the Consultant.
- 1.16.4. Use standard 8 1/2 inch x 11 inch post binders, labelled for project and date. Neatly fold oversized drawings into individual plastic sheet holders properly punched and inserted into the binders.
- 1.16.5. Include in the complete listing of all supplied equipment and materials receipts for loose or portable items delivered to the City. Provide a schedule of terminations, cross-referenced to test results.
- 1.16.6. Should the manuals be rejected after two (2) reviews, bear the cost of further review by the Audio-Visual Consultant at a rate of \$120.00 per hour.

1.17. SYSTEMS OVERVIEW

1.17.1. Room 1124 & 1125

1.17.1.1. The AV systems will be identical in these two rooms. Two new ceiling mounted video projectors will be controlled by a wall mounted button panel, with a volume control adjusting the audio volume on the projector. The variable audio out will feed a volume mounted amplifier to drive the existing four ceiling speakers. The floor box VGA extender will be cabled directly to the projector. A wall mounted plate will have a VGA HD-15 extender and a DVI-D input extender that will run to the projector location. All input switching will be handled by the projector.

1.17.2. Legacy Room 3023

1.17.2.1. The audio system will make use of the existing AV rack from 1124/1125 and will be reconfigured for use in room 3032. The system will utilize existing ceiling speakers to provide speech and music coverage of the entire room. The system will have a DSP audio matrix to allow separate volume control adjustment of both voice and A/V source levels. One wireless handheld and wireless lavalier microphone will be available for use with a single UHF wireless microphone receiver permanently mounted in the equipment rack. There will be two additional microphone and line level inputs on the input panel. A permanently mounted DVD will have its audio output connected to the audio system for CD audio playback. Two computer inputs will be located in the front wall box and rack location panel for presentations, the computer audio will be connected to the DSP. There will be a Cobranet output extender delivering paging audio and overall background music from the central paging processor.

1.17.2.2. The HD format video projector will be supplied by the City of Richmond, and will be installed, integrated and adjusted by the successful A/V contractor as part of this contract. There will be a new motorized screen that will be installed by the AV contractor, who will also connect the LV screen controls to the control system. There will be one City supplied Blu-Ray DVD combo that is installed in the rack. The HDMI output will be connected to the DVI-D input on the projector so that the HDCP compliant digital signal chain is maintained from the Blu-Ray DVD. All input switching on the projectors will be activated by the touch panel control system.

1.17.2.3. The control systems has a 6" colour touch panel and a central processor equipped with a Crestron E-Control card. This unit will be connected to the LAN with a local switch to provide Ethernet connection between the control system and the audio DSP. The control system will have e-Control using both a browser interface and dedicated Xpanel application.

1.17.3. Mezzanine Fitness Area

1.17.3.1. There will be a new sound system installed in the mezzanine fitness area. A new sound system rack will be located at fitness reception desk (room 3002). There will be a pair of speakers in each bay, with a local volume control in each bay and in the reception and lobby bays. There will be a separate amplifier channel for each zone. The system will have the ability to accept two iPod inputs, one Shaw tuner input, one paging input, one overall building BGM feed, one CD player with pitch control and an iPod dock, one DVD audio only player, plus two microphone inputs.

1.17.4. Paging System Modifications

1.17.4.1. The paging system central paging processor will be reprogrammed to accommodate four outputs on Cobranet using the existing sound system Ethernet switch. These will be configured

in the BSS software to deliver building BGM on one channel and zone paging on the second output to the Legacy Room and Mezzanine Fitness.

1.18. SCOPE OF WORK

- 1.18.1. The Contractor shall provide complete, turnkey audiovisual systems performing all of the services and functions as described herein, together with all other apparatus, cable, materials, labour, tools, transportation, and any other resources necessary to provide complete systems.
- 1.18.2. Specifically, the work shall include, but is not limited to:
- 1.18.3. The existing AV equipment rack and the video projector will be removed from room 1125 and will be reused in Legacy Room 3032 with some modifications. The ceiling speakers will remain in 1124 and 1125.
- 1.18.4. The two new systems in meeting rooms 1124 and 1125 will be simplified to be a projector with wall mounted control panel and input connections. There will also be a pole mounted amplifier included to drive the existing ceiling speakers at 70V. A new video projector will be installed in each room. The projector ceiling mount assembly is already mounted in room 1125. A new ceiling mount projector bracket will be required in room 1124.
- 1.18.5. The existing VGA and audio cabling from the floor boxes in room 1124 and 1125 will be re-used and extended with connectorized cable to the ceiling mount projector locations.
- 1.18.6. There will be a wall mounted input plate added in each room, equipped with a DVI/3.5mm connector and a VGA HD-15/3.5mm connector. Provide cabling from the wall plate to the projector on the ceiling.
- 1.18.7. The wall mount controls in room 1124 and 1125 will control projector on/off, input selection, projector volume control, and will include switch contacts to operate the projection screen controls.
- 1.18.8. The existing two Draper Access Series V motorized projection screens in 1124 and 1125 have the optional motors with low voltage controller. LV controls will be connected to the AV control panel in place of the LV wall switches by the AV contractor. Include single gang blank white cover plates for the LV screen switches.
- 1.18.9. The AV equipment and AV rack from room 1125 and will be reused in Legacy Room 3032 with the following modifications: the Kramer switcher/scaler will be removed from the rack; the video input panel will be modified in the rack; the equipment in the rack will be organized so that all the equipment will fit within the rack frame; a finished wood rack housing will be provided for the Middle Atlantic SRSR-4-24 sliding/rotating rack, wood finish to be determined. Surplus equipment will be handed to City for disposal.
- 1.18.10. The existing speaker cable runs from the ceiling speakers in room 3032 to the paging system amplifiers in room 2018 will be intercepted and routed above the ceiling to the 70V amplifier in the local AV rack in room 3032. The 70V attenuators will remain in the circuit, and the priority page actuation will remain connected and operational.
- 1.18.11. A Cobranet dual channel output extender will be supplied and installed in the AV rack in room 3032, and will be connected to the BSS BLU-80 paging processor in the main Comm Room. The Cobranet output device will be incorporated into the programming of the BSS London BLU-80 and configured to provide analog zone paging audio and building background music for input into the local DSP in room 3032.

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- 1.18.12. The video projector from room 1125 will be re-used in room 3032. The projector will be located at grid line K, with the support structure extension provided by others. A new projector ceiling mount plate and pipe extension will be supplied and installed by the AV contractor. Allow for Unistrut between the structural mounting point and the projector bracket to allow some fore/aft adjustment as the projection distance is at the limit of the lens.
- 1.18.13. The projector will be aligned to hit the 79"x140" image area screen, adjust for level image and correct lens offset to avoid needing electronic keystone correction.
- 1.18.14. A new Draper Access Series E motorized projection screen in 79" x 140" size will be supplied and installed in room 3032 by the AV contractor. The screen will have the optional motor with internal low voltage controller, LV controls will be connected to the Crestron control processor by the AV contractor, and the touch panel will be reprogrammed to include screen controls. There will be no other screen control accessible.
- 1.18.15. The existing Crestron control system processor and 6" touch panel will be reprogrammed by the AV contractor to control the video switching on the projector, the audio DSP, the screen controls.
- 1.18.16. The projector in 3032 will have the analog RGBHV input connected to the interface in the rack and the VGA inputs connected to the wall box input plates. The DVI input will be connected directly to the Blu-Ray DVD player in the rack using DVI extenders. The control of the projector will be through the Crestron control processor and touch panel.
- 1.18.17. The AV contractor will supply a new furniture finish rack cabinet for the existing swivel/slide rack that is being reused in room 3032. The rack enclosure will have to be custom sized and configured to accommodate the rack assembly.
- 1.18.18. The Mezzanine fitness area will have a new multi-zone sound system installed, with a rack located at Fitness reception 3002, and a pair of 70V speakers in each bay, plus speakers for the reception desk and lobby area. There will be a separate amplifier channel for each zone, with a separate LV volume control located in each bay for local adjustment by the users and two controls in the rack for the local zones.
- 1.18.19. The Mezzanine fitness area will have a requirement for a fire alarm system mute interface, using the logic inputs on the local DSP.
- 1.18.20. The new AV equipment rack will be located against the wall in Fitness Reception area 3002 and the cable routed out the side of the rack and through the conduit into the adjacent electrical room and down into the level 2 ceiling raceways. Cable will come up from level 2 into pullboxes and then up to the buttress JB at 600mm AFF and then to a pair of speaker JB's in each bay. The LV potentiometers will follow the same route and run from the buttress mounted JB in Wiremold up to a single gang box at wall switch height.
- 1.18.21. The BSS Soundweb BLU-80 will be connected to the Fitness DSP by Cobranet through the dedicated VLAN on the ROO provided Ethernet network, and will be configured to deliver zone paging and building BGM to the DSP in the fitness area rack location. The BLU-80 is located in equipment room 1011.
- 1.18.22. The BSS London BLU-80 DSP paging processor will be reprogrammed and configured to make use of 4 Cobranet outputs to connect to deliver zone paging and overall building BGM to the DSP in the Mezzanine Fitness rack and the Cobranet extender in the Legacy Room rack. The Crestron controller for the paging system will need to have the programming modified to include the selection of these two new paging zones.

2. PRODUCTS

2.1. GENERAL

- 2.1.1. Provide only new equipment and material approved for the installation and suitable for continuous operation. Where the specifications do not describe a required item, furnish equipment or material consistent with the quality of other specified products, and best suited to the purpose required.
- 2.1.2. All audio equipment, with the exception of microphone inputs, loudspeaker outputs, and consumer (IHF) items in approved usage, is intended to operate at a nominal level of -20 dBm to +4 dBm on balanced floating 600 ohm lines. Provide buildouts, terminations, interstage attenuators and decoupling transformers as required.
- 2.1.3. Consumer items are nominally intended to operate at 200 mV on unbalanced high-impedance lines. Provide buildouts, terminations, interstage attenuators and decoupling transformers as required.
- 2.1.4. All RF CATV equipment is intended to operate at a nominal level of 0 dBmV to +50 dBmV on 50 ohm or 75 ohm lines. Provide terminations and interstage attenuators as required.
- 2.1.5. All composite and component video equipment is nominally intended to operate at 1 V p-p on 75 ohm lines. Provide terminations and interstage and distribution amplifiers as required.

2.2. AUDIO EQUIPMENT AND MATERIALS

2.2.1. Audio Source Equipment

2.2.1.1 CD Player/iPod Dock Combo Quantity (1)

Provide one (1) CD player with an integral iPod dock, for installation in the mezzanine fitness rack in 3002. The CD player will have a +/-12% pitch shift. The unit will also have a front panel headphone jack, with separate volume control. The unit will be rack mountable. Use the analog audio outputs.

Approved: Tascam CD-200i; or approved equal

2.2.1.2 DVD Player Quantity (1)

Provide one (1) DVD player for DVD audio playback, for installation in the mezzanine fitness rack in 3002. The unit will be rack mountable. Use the analog audio outputs.

Approved: Tascam DV-D01U; or approved equal

2.2.1.3 Digital Cable Tuner Quantity (1)

Supply and install one (1) digital cable tuner in the fitness area rack at room 3002. Activation of the accounts will be by the City. Connect the audio outputs to the DSP for background music. Provide rack mount equipment shelf that exposes IR sensor for selection of channels.

Approved: Shaw DCT700; plus Middle Atlantic rack shelf; or equal

2.2.2. Audio Mixers / Processing

2.2.2.1 Digital Audio Processor Mezzanine Fitness Quantity (1)

Install one (1) matrix audio mixer/system processors in fitness mezzanine rack in 3002. The DSP must be equipped with a Cobranet interface module, a minimum of 12 mic/line inputs and 8 line outputs, with open DSP architecture. The matrix outputs shall be used for the speaker zone feeds. Install unit in the A/V Equipment Rack at 3002. Provide for control over Ethernet.

Approved: Biamp AudiaFlex CM with 6x IP-2 and 4x OP-2 modules; or approved equal

2.2.2.2 Voltage Control Box Quantity (2)

Install two (2) voltage control interface boxes compatible with the DSP in item 2.2.2.1 and connect to the device. The VCB will provide for the connection of 7 remote mounted potentiometers for local volume adjust in 5 fitness bays and the reception desk and lobby areas, as well as the fire alarm mute. Provide 7 potentiometers, 5 in the fitness bays connected back to the device in the fitness rack in 3002, and 2 in the rack on the same rack panel as the input connectors.

Approved: Biamp Voltage Control Box; or approved equal

2.2.2.3 Davinci User Interface Quantity (1)

Provide a Davinci Graphic User Interface for the system that will allow a central location to control and monitor all available aspects of sound system zone activation, source select, and volume on a single local computer. The Davinci user interface will reside on a computer to be determined within the building. Coordinate IP address selection with the Richmond Olympic Oval IT department.

2.2.2.4 DSP Control panels Quantity (1)

Provide one (1) control panel, with a program selector knob and a volume control knob. The panels must compatible with the DSP unit in item 2.2.2.1. Mount in a rack panel in the rack in fitness 3002. Connect to the DSP unit using specified 5 wire control cable (section 2.4.3.3). Configure to select available inputs to the entire fitness area and adjust the volume

Approved: Biamp Volume/Select 8 panel; or approved equal

2.2.2.5 Cobranet Output Panels Quantity (2)

Provide one (1) Cobranet output panels in the Legacy Room 3032 rack, with 2x balanced XLRM connectors for line level outputs The output device will fit a double gang box with a Decora plate. The device will be PoE capable and will connect via RJ-45 to the dedicated Cobranet network (provided by ROO) and BSS London BLU-80 paging processor. Program the BSS London to feed the paging only audio and the building BGM to the two outputs.

Approved: Atterotech Outbox X2; or approved equal

2.2.2.6 Fire Alarm Logic Interface

Provide logic programming for the fire alarm interface for the Fitness Mezzanine system to provide muting of the sound system program when the fire alarm system provides an inhibit trigger. The trigger signal will be delivered to demarcation point in the electrical room 3003 adjacent to sound rack. Use the demarcation point terminal strip to test the logic functions by

pulling the logic inputs to ground, and demonstrate the logic functions independent of the fire alarm operation during commissioning.

Approved: Biamp Voltage Control Box programming and configuration

2.2.2.7 2x1 Mixers Rooms 1124/1125 Quantity (2)

Provide two (2) 2x1 line level mixers, one at each projector mounting post in rooms 1124 and 1125. The mixer will mix the audio inputs from the VGA extender and DVI-D extender wall plates. Connect the output to audio 2 input Provide complete with suitable power supply and mounting. Adjust to match floor box audio level.

Approved: RDL ST-MX-2; or approved equal

2.2.3. Power Amplifiers

2.2.3.1 Multi Channel 70V Amplifier Quantity (1)

Provide one (1) eight channel amplifier (or 2x four channel amplifiers) to drive the fitness mezzanine area speaker zones, capable of delivering a minimum of 200 watts per channel into a 70V load with a bandwidth of 20Hz to 20kHz per output. Distortion at rated power into a 70V load shall be less than 0.5% over the rated bandwidth. Mount amplifier(s) in the fitness mezz rack at 3002.

Approved: Crest CM2208; Crown CTS-8200; Lab Gruppen C 20:8X; (2x)QSC CX204V; or approved equal

2.2.3.2 70V Pole Mount Amplifiers Quantity (2)

Provide two (2) compact pole mount single channel amplifiers capable of delivering a minimum of 50 watts into a 70V load with a bandwidth of 20Hz to 20kHz per output. Distortion at rated power into a 70V load shall be less than 0.5% over the rated bandwidth. Mount amplifiers on the projector mount poles in rooms 1124 and 1125, and connect to the variable audio output of the projector. and to existing loudspeakers in the ceiling. Confirm that speaker taps are set at less than 10watts each. Allow for local electrical approvals if not supplied with CSA or C-UL sticker.

Approved: Stewart Audio CVA-50-1 plus AV-POLE bracket; or approved equal

2.2.4. Loudspeakers

2.2.4.1 Loudspeakers Mezzanine Fitness Zones Quantity (14)

Install a total of fourteen (14) surface mount loudspeakers in the fitness mezzanine area. Each speaker shall consist of a 8 inch full range, single point source transducer. The system shall be equipped with a transformer offering 70.7 volt operation with 60, 30, 15, 7.5, 3.75 watt taps available. Frequency response 1 meter on axis with swept sine wave shall be 65 Hz to 20 kHz +/- 3 dB, sensitivity shall be at least 91 dB, for 1 watt, 1 meter with minimal transformer insertion loss accounted for. The enclosure shall include a grill and yoke mount bracket assembly. In each fitness bay, the yoke will be mounted in parallel with the edge of the buttress on the GWB to allow a downtilted, toed-in orientation. The speakers in the circulation area will be mounted to the top of the curved H beams, and tilted down and toed in. Provide seismic restraint to structure. Finish to be white.

Approved: Tannoy Di8DCt plus Yoke mount, or approved equal

2.2.5. Audio Wiring

2.2.5.1. Microphone, Line Level and Foldback

22 AWG stranded shielded twisted pair, polyethylene insulated, 100% foil shield coverage, 22 AWG stranded drain wire, PVC jacket. FT-4 rated. Pull wiring in conduit provided.

Approved: Allied AAOM2222, Belden 8451 or equal

2.2.5.2. 70 Volt Speaker Distribution

Two conductor 18 AWG stranded, PVC insulated, PVC jacket, FT-4 rating.

Approved: Allied AA3182, Belden 8461 or equal

2.2.5.3. 5 Wire Control Cable

5 wire data grade, 95-120 ohm nominal impedance, 16pf/ft capacitance, 65% min velocity of propagation. FT-4 rated. Pull wiring in conduit and raceway provided.

Approved: Belden 1502R; Gepco 18/22AXL; Liberty AXLINK, Liberty CRESNET, or equal

2.2.5.4. Ethernet/Cobranet Cable

Supply and install CAT-6 cabling for the sound system Ethernet control and Cobranet delivery applications. All ANSI/TIA/EIA T568B2 testing criteria will apply for CAT-6 certification of each run.

Approved: Panduit TX6000 Category 6, UTP, 23AWG, 100ohm solid copper, CMR-rated. CMP or LS0H rated cables shall be used where required by code. No manufacturer alternates accepted.

2.2.6. Connectors

2.2.6.1. Do not intermix connector brands for similar connectors.

2.2.6.2. XLR3M Panel and Cable Connectors

pin XLR male connectors, mounted on plates or rack panels.

Approved: Neutrik NC3MD, NC3MX, or equal

2.2.6.3. XLR3F Panel and Cable Connectors

pin XLR female connectors, mounted on plates or rack panels.

Approved: Neutrik NC3MF, NC3FX, or equal

2.3. VIDEO EQUIPMENT AND MATERIALS

2.3.1. Video Equipment

2.3.1.1 VGA Extenders room 1124, 1125, 3032 Quantity (3)

Install three (3) active VGA extenders with audio buffering in the wall plates in rooms 1124 and 1125, and 3032. Provide with suitable power supplies and interconnect cables between the extender and projector VGA inputs. Devices to be Decora compatible in white finish, incorporate in double gang wall plate Caddy Clip with DVI extender transmitters.

Approved: Extron Extender D; or approved equal

2.3.1.2 VGA Interface room 3032 Quantity (1)

Install one (1) VGA interface with audio buffering in the rack location in 3032. Provide with suitable power supplies and interconnect cables between the interface and projector RGBHV inputs. Include rack mount shelf or bracket. Device to be black finish.

Approved: Extron RGB 198; or approved equal

2.3.1.3 DVI Extenders Transmitters (Room 1124 & 1125) Quantity (2)

Install two (2) HDCP compliant active single link DVI extenders with audio buffering in the wall plates in rooms 1124 and 1125. Provide with suitable power supplies and dual Cat5e interconnect cables between the extender input plate and the receiver at the projector mount pole. Finish to be white, include Decora cover plate at each end and Caddy Clip mount for two gang wall plate and combine mounting with item 2.3.1.1.

Approved: Extron DVI 201 A D Tx; or approved equal

2.3.1.4 DVI Extenders Transmitter (Room 3032) Quantity (1)

Install one (1) HDCP compliant active single link DVI extender transmitter with audio buffering in the rack in room 3032 for connection between the DVD player in the rack and the DVI input on the projector. Provide with suitable power supplies and dual Cat5e interconnect cables between the extender transmitter and the receiver at the projector mount pole. Use RS-232 link for projector control from control processor. Include rack mounting shelf.

Approved: Extron DVI 201 Tx; or approved equal

2.3.1.5 DVI Extenders Receiver room 1124, 1125 and 3032 Quantity (3)

Install three (3) HDCP compliant active single link DVI extender receivers in rooms 1124, 1125, and 3032. Provide with suitable power supplies and dual Cat5e interconnect cables between the extender input plate and the receiver at the projector mount pole. Include mounting for receiver at pole or ceiling.

Approved: Extron DVI 201 Rx; or approved equal

2.3.1.6 Video Projectors for Rooms 1124 and 1125 Quantity (2)

Supply and install two (2) video projectors, one each in rooms 1124 and 1125. The projectors will be 3 panel LCD type with a native WXGA (1280x800 pixel) resolution and a minimum output of

3500 ANSI Lumens. The minimum contrast ratio will be 1,000:1. The unit will have 2x XGA inputs on HD-15; HDCP compliant DVI-D and composite video inputs. The unit will be controllable through an RS-232 serial port or IR remote control. Provide complete with standard 2x zoom lens. The lens will allow a projection distance range of 3825mm to 7680mm to fill a 79" high viewing surface. Align and adjust projector to provide optimum height 16:10 image on the projection screen. Connect video projector inputs to the input plates, audio amplifier, DVI receivers and to the control panel, and supply all necessary audio, video and control cable and connectors for termination. .

Approved: Panasonic PT-FW300U; or approved equal

2.3.1.7 Video Projector Installation Quantity (1)

Install one (1) City supplied Panasonic PT-DW5100 video projector in room 3032. Include an allowance for two 500mm long pieces of Unistrut to allow fore/aft position adjustment. Align and adjust projector to provide optimum image on the new projection screen. Connect video projector VGA, DVI and RGBHV inputs to the extenders and interfaces, and supply all necessary video cable and connectors for termination. Connect control system to the projector and program the control system to communicate successfully via RS-232 port with the projector. Notify City of any issue relating to projector performance or function that may involve service or a warranty claim.

2.3.1.8 Projector Brackets Quantity (2)

Supply and install two (2) ceiling mount projector bracket and mount to ceiling structure for meeting room 1124 and Legacy room 3032. Include all necessary mounting hardware, projector specific brackets and support pieces. Include cost of structural engineer's review of shop drawings.

Approved: Chief CMA-110 ceiling plate, Chief RPA mount with suitable SLB projector bracket; 1.5" dia. pipe lengths cut to fit; or approved equal

2.3.1.9 Projection Screen Legacy Room 3032 Quantity (1)

Install one (1) motorized projection screen complete with matte white fibreglass with a 79" x 140" viewing area in Legacy Room 3032. Install screen case with the bottom of the case flush in the T-bar ceiling. Mount the screen to the blocking along the wall using braced angle brackets. The screen controls will be connected to the Crestron C2PE processor. Make good T-bar ceiling after installation. Provide stamped shop drawings for proposed screen support.

Approved: Draper Access E type, with matte white screen and optional internal LV control motor assembly; or approved equal

2.3.2. Video Wiring

2.3.2.1. UTP DVI Extender Cable

Supply and install CAT-5e cabling for the DVI extender applications. All ANSI/TIA/EIA T568B2 testing criteria will apply for CAT-5e certification of each run. UTP, 24AWG, 100ohm solid copper, CMR-rated. CMP or LS0H rated cables shall be used where required by code.

Approved: Panduit TX5500 No manufacturer alternates accepted.

2.3.2.2. Bundled High Resolution RGBHV/XGA

For bundled RGBHV/XGA signals, provide high bandwidth bundled RGBHV 5-coaxial cables. Bandwidth should be a minimum of $-3\text{dB @}140\text{MHz@}100\text{feet}$. The cable should have a combination of foil and braid shield for 100% shield coverage. Centre conductor should be 24AWG bare copper stranded. Nominal diameter of individual coax cable should less than 0.2". Overall cable diameter should be nominal 0.5". Terminate cable with BNC connectors suitable for cable diameter. All Video cable must be FT-4 rated

Approved: Extron M59-5; or approved equivalent

2.3.2.3. Bundled High Resolution RGBHV 15pin HD to 5-BNC Adapter cable

For connection between RGBHV and VGA interfaces, switchers, DA's etc, provide high bandwidth bundled RGBHV 5-coaxial HD-15 to 5-BNC or 5-BNC to 15pin HD adapter cables at the required length. Bandwidth should be a minimum of $-3\text{dB @}140\text{MHz@}100\text{feet}$. The cable should have a combination of foil and braid shield for 100% shield coverage. Centre conductor should be 20AWG bare copper stranded. Nominal diameter of individual coax cable should less than 0.2". Overall cable diameter should be nominal 0.5". Terminate cable with BNC connectors. All Video cable must be FT-4.

Approved: Extron SY 15 HD M-RGBHVF w/ length as required

2.3.2.4. High Resolution RGBHV VGA 15pin HD to VGA 15 pin HD cable

For connection between devices using VGA 15pin HD connectors for the transmission of RGBH/V high resolution video signals, provide high bandwidth bundled RGBHV 5-coaxial HD-15 male to 15pin HD male cables at the required length of 3' up to 100'. Bandwidth should be a minimum of $-3\text{dB @}140\text{MHz@}100\text{feet}$. All Video cable must be FT-4.

Approved: Extron VGA M-MMD/xx w/ length as required

2.3.2.5. High Resolution TMDS HDMI to DVI-D cable

For connection between devices using HDMI and DVI-D connectors for the transmission of TMDS high resolution video signals, provide high bandwidth HDMI Type A male connector to DVI-D single link male connector cables at the required length from 3 to 50 feet. All Video cable must be FT-4.

Approved: Extron HDMI M-DVI-D M-M/xx w/ length as required

2.3.2.6. High Resolution single link DVI-D to DVI-D extension cable

For connection between devices using DVI-D and DVI-D connectors for the transmission of TMDS high resolution video signals, provide high bandwidth DVI-D single link male to DVI-D single link male connector cables at the required length from 6 to 75 feet. All Video cable must be FT-4.

Approved: Extron IN9700/xx w/ length as required

2.3.2.7. High Resolution single link DVI-D to DVI-D patch cable

For connection between devices using DVI-D and DVI-D connectors for the transmission of TMDS high resolution video signals, provide high bandwidth DVI-D single link male to DVI-D single link male connector cables at the required length from 3 to 15 feet. All Video cable must be FT-4.

Approved: Extron IDVD SL/xx w/ length as required

2.3.2.8. High Resolution DVI-A male to VGA 15-pin female adapter cable

For connection between devices using DVI-A and VGA connectors for the transmission of RGBH/V high resolution video signals, provide high bandwidth DVI-D single link male to VGA 15pin HD female adapter cables. All Video cable must be FT-4.

Approved: Extron DVIAM-RGBHVF

2.3.2.9. High Resolution DVI-A female to VGA 15-pin male adapter

For connection between devices using DVI-A and VGA connectors for the transmission of RGBH/V high resolution video signals, provide high bandwidth DVI-A single link female to VGA 15pin HD male adapters. All Video cable must be rated FT-4.

Approved: Extron DVIAF-VGAM

2.3.2.10. High Resolution HDMI female to DVI-D male adapter

For connection between devices using DVI-D and HDMI connectors for the transmission of TMDS high resolution video signals, provide high bandwidth HDMI female to DVI-D single link male adapters. All video cable must be FT-4.

Approved: Extron HDMIF-DVIDM

2.3.3. Connectors

2.3.3.1. 75 ohm BNC Inline Connectors

Terminate coaxial cable with BNC inline cable connectors appropriate for the cable type being terminated. Composite and bundled component video cable will require different sizes of connectors. Follow cable and connector manufacturer's recommendations regarding use of connectors.

Approved: Amphenol, Belden, Kings etc.

2.3.3.2. 75 ohm BNC Right Angle Adapters

Provide right angle adapters at any location where there is insufficient bend radius to use inline cable BNC connectors.

Approved: Amphenol 31-9, Kings KC-99-35, or equal

2.3.3.3. 75 ohm BNC Panel Feed through Connectors

BNC type bulkhead feed through jacks, isolated from ground with fibre or plastic insulating washers, use for all BNC panel applications.

Approved: Canare BCJ-JRU

2.3.3.4. 75 ohm RCA Phono Panel Connectors

RCA type bulkhead jacks, isolated from ground with fibre or plastic insulating washers, use for all RCA panel applications for audio and video. Use red/white and yellow colours consistent with A/V equip standards.

Approved: Canare RJ-RU (solder connections) RJ-BCJRU (BNC rear)

2.4 **CONTROL SYSTEM**

2.4.1 Video Projector Controls

Qty (2)

Supply and install two (2) video projector controllers, one for each of rooms 1124 and 1125. The unit will control the projector through an RS-232 serial port and will control the LV contacts on the motorized screen. The unit will have assignable buttons and will connect directly to the projector through serial control ports. Configure for all three inputs and volume control adjust. Use Caddy Clip style bracket to mount in GWB wall. Finish to be white.

Approved: Crestron MPC-M10; or approved equal

2.4. **HARDWARE**

2.4.1. **Enclosures and Cabinets**

2.4.1.1. Equipment Rack Enclosure (room 3032) Qty (1)

Install one (1) custom furniture finish rack cabinet housing for a sliding rotating equipment racks for the A/V equipment in legacy room 3032. The existing swivel/slide equipment rack is 24U high. There will be a provision for an additional 16U of fixed in place rack mounting space above the swivel/slide rack for rack mount storage shelves and drawers, and the rack mounted 6" touch panel at roughly 1500mm AFF. Rack rail will be fixed to the side panels in the upper 16U portion. The rack storage components for the upper section will be selected and added post tender. Install security covers over all equipment with front panel controls with no media loading or manual tuning requirements. Install rack equipment and panel plates using flat head socket, Allen head machine screws, or Torx screws with plastic washers. Wood finish choice to be confirmed.

Approved: Middle Atlantic/Exact Furniture Custom cabinet with levelers instead of casters, to fit existing SRSR-4-24 rack, plus additional 16U rack space above; or approved equal.

2.4.1.2. Equipment Rack (Fitness Mezzanine Reception room 3002) Qty (1)

Install one (1) furniture finish rack cabinet equipment rack for the A/V equipment in the mezzanine reception area 3002. Coordination of cooling fan locations and side cable entry will need to be confirmed prior to ordering. The rack will be positioned with one side to the wall and cable entry will be near the baseboard, so cable entry will be on one side near the base, and both cooling fans will be mounted on the opposite side. The equipment rack should be a maximum of 20U high. Heavy-duty EIA standard 19 inch spaced steel rack rails for grounding of chassis, and blank panels in all unused rack spaces. Usable depth 19". Provide metal rack mounted AC power strips with front panel power switches. Provide with security covers over all equipment with no media loading or manual tuning requirements. Install rack equipment and panel plates using flat head socket, Allen head machine screws, or Torx screws with plastic washers. Wood finish choice to be confirmed.

Approved: Middle Atlantic/Exact Furniture RE-120 with levelers instead of casters plus Middle Atlantic PD-915R rack mount power strips

2.4.2. **Connector Plates**

2.4.2.1. Rack Mount Audio Connector Panel (fitness mezz 3002) Qty (1)

Provide one (1) 2U rack panel for the system rack with 2x XLR3F microphone inputs; and 2x TRS 3.5mm iPod input phone jack with isolated ground, each passively combined to mono using a Radio Design Labs TX-LC2 per input, plus two potentiometers for the reception/lobby zone adjustments. Connect to the DSP. Provide shop drawing prior to fabrication.

3. EXECUTION

3.1. INSTALLATION

- 3.1.1. Secure all equipment, except portable equipment, in place with a safety factor of at least three (calculate mounting based on object weight x 3). Adequately ventilate all equipment for worst case power dissipation. No item of equipment shall produce residual noise in excess of NC-30 when measured from the centre of the enclosing room.
- 3.1.2. Install all equipment in such a manner as to present no safety hazard to operating personnel. Carry out all installation work in neat and orderly fashion, mounting hardware parallel to, or perpendicular to, building lines. Provide this specification and contract documents on the job site at all times.

3.2. MOUNTING, RIGGING AND SEISMIC RESTRAINT

- 3.2.1. All overhead mounting or rigging installations of loudspeakers components and systems, and video equipment must have received the approval of a Professional Engineer registered in British Columbia, at the shop drawing stage prior to installation. Where the Sound Contractor uses loudspeaker enclosures or systems that are factory equipped with rigging or mounting points, the rigging or mounting hardware and the attachment to the building or support structure must be certified. Component mounting in the enclosures must make use of bolts and threaded inserts or locknuts. Self threading wood or sheet metal screws are not acceptable for driver mounting to the baffle. Loudspeaker mounting clamps that grip the edge of the loudspeaker frame, and are put in compression by a through bolt are not acceptable. All loudspeakers must be mounted by bolts through mounting holes in the frame.
- 3.2.2. Loudspeaker components such as moulded fibreglass horns, cast or injection moulded plastic speaker enclosures or horns, etc. must never be supported by a system using the drilled or moulded holes through the plastic material. All mounting holes or attachment points must have aluminium or steel reinforcement to prevent breakaway or tear-out of the material surrounding the holes.
- 3.2.3. All wooden loudspeaker enclosures that are custom manufactured for the project must be built of plywood, not particle board or medium density fibreboard. All joints between panels (including baffles and backs) must be reinforced with structural steel or aluminium bracing, bolted through the enclosure, using Nyloc nuts, or permanent thread locking compound on the bolts. All rigging or suspension points must pick up these structural members of the enclosure. No glue joint shall be placed in tension when suspending a loudspeaker enclosure. Component mounting in the enclosures must make use of bolts and threaded inserts or locknuts. Self threading wood or sheet metal screws are not acceptable for driver mounting to the baffle. Loudspeaker mounting clamps that grip the edge of the loudspeaker frame, and are put in compression by a through bolt are not acceptable. All loudspeakers must be mounted by bolts through mounting holes in the frame. Especially large or heavy drivers may require the use of an internal safety cable attached to the speaker frame and an internal rigging point.
- 3.2.4. Rigid and fixed mounting systems (brackets, tube and clamp, frames etc.) used for any piece of suspended equipment must have a safety cable attached between the suspended device and the superstructure used to support the mounting system. The size and construction of the safety cable, and attachment points must be suitable to support the weight of the equipment being restrained.
- 3.2.5. Flexible rigging systems (chain and aircraft cable) must be installed by a Certified Rigger. Flexible mounting systems must have suitable seismic restraint sway bracing provided. Seismic restraint systems must be approved by a Professional Engineer registered in British Columbia.

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- 3.2.6. All free standing equipment racks, trolley or caster equipped racks intended for permanent locations, free standing or platform mounted loudspeakers, video projectors, and other equipment with significant mass and freedom of movement must be equipped with a seismic restraint system that can be disconnected for servicing the equipment.

3.3. WIRING

- 3.3.1. Route microphone cables in separate conduit or raceways and maintain separation of all other cables in tray system and equipment racks by level and function: microphone circuits, line level circuits, foldback circuits, loudspeaker circuits, intercom circuits, control circuits and 120 volt AC power circuits. Neatly arrange cables with plastic cable ties. Avoid tight bundling, and twist cable bundles into a spiral configuration before installing cable ties. Allow a minimum of a 1 metre spiral bound slack service loop when entering racks or panels. Exercise care to avoid damage to wiring or equipment.
- 3.3.2. Make all signal connections within systems with rosin-core solder or approved mechanical connectors. Untidy or cold solder joints will be rejected. Use proper crimping tools for mechanical connectors.
- 3.3.3. Do not splice cables except with permission of the Audio-Visual Consultant.
- 3.3.4. All connections using shielded pair audio cable should include cable dressing as follows. The shield, or drain wire should have a clear Teflon, or green PVC, or heatshrink sleeve covering exposed conductor between the connector, or termination and the cable jacket. A heat shrink boot, or Hellerman sleeve should be used on any cable that uses a braided shield or spiral wrap shield where the cable is dressed for termination.
- 3.3.5. All audio circuits, unless otherwise specified, shall be balanced, floating and shielded two wire circuits with the red or white wire *hot* (connected to pin 2 of XLR3 connectors and to the Tip of phone connectors) and the black wire *cold* (connected to pin 3 of XLR3 connectors and to the Ring of phone connectors).
- 3.3.6. Make input connections to power amplifiers with XLR3 connectors or with spade lugs on barrier terminal strips. Do not make input connections with 1/4 inch phone plugs.
- 3.3.7. Use ring lugs or high current locking connectors, such as Neutrik Speakons for connections to enclosed loudspeaker systems.
- 3.3.8. Isolate all BNC video connectors from building ground on all panels, plates and bulkheads.
- 3.3.9. Install video cable in a manner that will prevent sharp bends or kinks. Use right angle BNC connectors where necessary to prevent cable kinking in shallow electrical boxes.

3.4. BUILDOUTS AND TERMINATIONS

- 3.4.1. All equipment in the audio chains MUST be connected to preserve correct signal levels, impedances and polarity throughout the system. Provide block and level diagrams, specific to the equipment being offered, showing all equipment impedances, interstage loss pads, buildouts and terminations proposed to accomplish this. *Include in the shop drawing submission.* Shop drawings without this detail will be rejected.

3.5. GROUNDING AND SHIELDING

- 3.5.1. Isolate all racks containing sound system equipment from the building and electrical grounds. Bond adjacent equipment racks with #4 AWG insulated ground cable. Connect all racks containing sound system equipment to only the dedicated sound system ground point. Conduit and tray systems containing audio, video and control wiring will be permanently connected to the electrical ground.
- 3.5.2. Do the utmost to prevent ground loops of any type.
- 3.5.3. Isolate the shields of all shielded cables from both the conduit system and any other shielded cables. Provide continuous shield from source to input point, with shields lifted at the source and grounded at the input point. Properly serve all unconnected shielding. For microphone cables, provide continuous shield from microphone receptacle to microphone mixer input. Ground only at mixer. Provide separate shield terminal for each circuit in multipin connectors - no common shield terminals will be permitted. Pin 1 on XLR type connectors must not be connected to the connector barrel or shell.

3.6. MARKING

- 3.6.1. Mark all wiring with PVC or neoprene slip-on sleeves, or with tape type markers with a clear heat shrink boot, indicating approved circuit number.
- 3.6.2. Record circuit numbers and wire destinations on as-built drawings and schedules. List spare circuits.

3.7. NAMEPLATES

- 3.7.1. Provide engraved metal or plastic nameplates to identify each and every receptacle. Fill engraving with a contrasting colour as approved on shop drawings. Dymo labels are not acceptable. Decal type labels (Brother) are not acceptable in high traffic or high wear applications.
- 3.7.2. Identify all racks and panels as specifically noted on the drawings.
- 3.7.3. Submit all nomenclature to the Consultant and Audio-Visual Consultant for approval prior to installation.

3.8. CONTROL SYSTEM PROGRAMMING GUIDELINES

- 3.8.1. Control system interface programming should be assumed to require adjustment to suit the user's needs that develop from system use. General user interface design guidelines employed by the computer industry allow for up to six iterations to finalize a layout. Allow adequate time for refinement of control interface layout.
- 3.8.2. Control system layout should follow interface design guidelines of natural and evident function mapping of controls and should provide user feedback of the state of the control system and the system it controls.
- 3.8.2.1. Orient change in level indicators with higher levels being up or to the right, and lower levels being down or to the left.
- 3.8.2.2. Align button elements to fit along straight and parallel lines, and group buttons that control one device in edge-to-edge contact to denote the relationship. Where multiple devices or device groups are included on a single control screen provide adequate white space between button groups to denote separation of function.
- 3.8.2.3. Provide visually balanced control screen layouts that provide good legibility of control buttons and surfaces, and allow good visual flow when reading the screen, with the relationships between control elements clearly evident. Recommended reading for assistance in the optimization of interface design include:
- "The Design of Everyday Things" by Donald Norman
 - "Usability Engineering" by Jakob Nielsen
 - "Designing Visual Interfaces" by Kevin Mullet, Darrell Sano
 - "The Inmates are Running the Asylum" by Alan Cooper
- 3.8.2.4. Provide simple but definitive word descriptions for controls. Avoid use of the same word to describe two different system elements (i.e.: "main control screen" and "projection screen") Only use Iconic button description elements where they are clear and unambiguous.
- 3.8.2.5. When controlling fixed hardware devices, with visible front panels such as VCR's, cassette, CD, laserdisc or DVD players, attempt to replicate the transport control panel layout of the device being controlled.
- 3.8.2.6. Keep related controls together, or duplicate on nested or parallel branch control pages so that it is not necessary to move between pages to control commonly used system elements. (i.e. a volume control for A/V sources on the VCR control page)
- 3.8.2.7. Provide visual feedback of control operation (if available in the product provide audible tactile feedback in the form of electronic "clicks" or "beeps" when controls are activated as well. For controls that normally in a LOW or OFF state, use a uniform and consistent color throughout, and have the colour change state when the control is activated. For system elements that are in an OR state, and are toggled between states, have the activated button change colour and all other buttons return to a common colour.

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- 3.8.2.8. Where the function requested is governed by a timer or the action is not immediate because of some operational latency in the equipment being controlled, a pop-up indicator should tell the user that their command is being implemented and should give some indication of the expected delay.
 - 3.8.2.9. Use neutral colours for backgrounds and buttons. Avoid colour combinations that "strobe" or fight each other. For LOW or OFF states, all background and button colours should be from the same side of the colour palette, normally "cool" colours. When the system element is activated or in HIGH state, the colours should change to "hotter" colours.
 - 3.8.2.10. When there is a conflict between these guidelines and the user feedback, the user's input will take precedence.

3.9. FINISHES

- 3.9.1. Finish all racks, panels, loudspeakers, baffles, grilles and other hardware exposed to the public with colours and finishes approved by the Architect.
- 3.9.2. Provide brushed stainless steel or brushed aluminium covers for individual and ganged outlets unless otherwise directed by the Architect.
- 3.9.3. When directed by the Architect, paint outlet covers to match finishes in the area.
- 3.9.4. Make good, to the City's and Architect's satisfaction, any finishes damaged during the course of construction.

3.10. TESTING

- 3.10.1. Conduct tests to demonstrate that the sound system is properly functional:
 - 3.10.1.1. After installation, measure and document the sum of the harmonic distortion, noise floor and gain for a typical path from microphone level input to amplifier output.
 - 3.10.1.2. Measure and document gain structure through the signal path from input to output for each typical signal level. Repeat with sine wave sweep from 50 Hz to 15kHz to record any additional adjustments required by equalization. Repeat with full bandwidth pink noise signal, or swept test signal to record equalizer wide-band gain.
 - 3.10.1.3. Ensure that system is free of spurious oscillation and RF noise up to 5 MHz.
 - 3.10.1.4. Test polarity of microphones, microphone cables, and signal wiring: pin 1 = *shield*, pin 2 = *hot*, pin 3 = *cold*. Test polarity of connector plate plugs and jacks: sleeve = *shield*, ring = *cold*, tip = *hot*. Test polarity of signal equipment and amplifiers. Test polarity of loudspeaker wiring: red = (+), black = (-). Drive all loudspeakers in polarity, and in absolute polarity. Test absolute polarity of the voice and playback systems, input to output, and ensure that the sum of all signal paths is in polarity. If it is necessary to invert signal polarity at any stage or interconnect point to preserve system polarity, document that polarity change on as-built drawings.
 - 3.10.1.5. With musical program, drive each loudspeaker to rated or maximum sound pressure level without amplifier clipping and eliminate buzzes, rattles or other vibration. Repeat with sinewave sweep from 50 Hz to 8000 Hz at 10 dB below rated loudspeaker output.

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- 3.10.1.6. Ensure that residual noise and hum at rated output are below NC-30 when measured from the centre of the enclosing room.
- 3.10.1.7. Ensure that audio wiring is free from ground loops. Demonstrate, by removal of jumper, that racks and panels are isolated from the electrical conduit ground.
- 3.10.2. Measure, verify, and document proper operation of the composite video system as follows:
- 3.10.2.1. Measure and document the line loss in 75-ohm cable as follows:
- 3.10.2.1.1. Use a TV test signal generator window signal that goes up to peak white at one end of each cable. At the other end of each cable, measure the signal with a waveform monitor. Signal should not exceed a line loss of more than 10 IRE. With the same signal, if burst is less than 35 IRE, then cable equalization is required.
- 3.10.2.2. Measure video distribution amplifier performance, including frequency response, gain and noise levels:
- 3.10.2.2.1. Check frequency response using a video test signal of 100 IRE peak luminance at the input of each device, and with a waveform monitor at the output of each device, the signal should not exceed 4% loss at 4.2MHz.
- 3.10.2.2.2. Check and adjust gain using a video test signal of 1V p-p, 75% colour bars at the input of each device, and with a waveform monitor at the output to each device, adjust for unity gain 0.5dB.
- 3.10.2.2.3. Check noise level using the following method. With no signal at the input of each device, measure noise levels at the output(s) on a waveform monitor. Noise voltage levels shall not exceed -55dB, which is 2.0mV p-p ref. 1.0V p-p.
- 3.10.2.3. Video projector: using appropriate test signals and sources, set the following parameters:
- 3.10.2.3.1. Set physical alignment between projector and screen to ensure that raster is centred on the screen. Ensure that vertical alignment is within the vertical depth of field of the lenses.
- 3.10.2.3.2. Set LCD panel alignment before proceeding with electronic alignment. Ensure that horizontal and vertical focus of raster lines is maintained across height and width of screen
- 3.10.2.3.3. Adjust image quality using greyscale before adjusting colour parameters.
- 3.10.2.3.4. Adjust Brightness and contrast and colour balance using SMPTE test signals and colour bars at the input of the projector.
- 3.10.2.4. Overall Composite Video System Performance
- 3.10.2.4.1. Through the use of TV test signals and a TV waveform monitor, insure that the overall composite video system meets these specifications:
- Frequency response: 0.5dB, 60 to 4.2MHz.
 - Insertion amplitude: 1V p-p (100 IRE).
 - Signal levels: 1V p-p +3 IRE.
 - Chrominance p-to-luminance gain inequality: +5 IRE.

-
- Signal-to-noise ratio: 56dB.
 - Hum: 5% hum to peak modulation.
 - Noise: within 5% of manufacturers specification.

3.10.3. Measure, verify, and document proper operation of the computer video system as follows:

3.10.3.1. Measure and document the line loss in RGBHV cable as follows:

3.10.3.1.1. Use a 81kHz horizontal and 75Hz vertical computer video test signal generator signal that produces peak white levels, connected at one end of each cable, with red, green and blue test signals operating at 0.7V P-P and the H and V sync signals at TTL levels. At the other end of each cable, measure the signal with an oscilloscope of suitable bandwidth. Line loss should not exceed 2dB.

3.10.3.2. Measure RGBHV video distribution amplifier performance, including frequency response, gain and noise levels:

3.10.3.2.1. Check frequency response using a 81kHz horizontal and 75Hz vertical computer video test flat field signal at the input of each device, and with a oscilloscope at each of the red, green, and blue outputs of each device, the signal should not exceed 2dB loss at 150MHz.

3.10.3.2.2. Check and adjust gain using a 81kHz horizontal and 75Hz vertical computer video test signal generator with a 75% colour bars red, green, and blue output level of 0.7V p-p, at the input of each device, and with an oscilloscope at each of the red, green and blue outputs of each device, adjust for unity gain 0.5dB.

3.10.3.2.3. Check noise level using the following method. With no signal at the input of each device, measure noise levels at the output(s) on an oscilloscope. Noise voltage levels shall not exceed -55dB, which is 1.0mV p-p ref. 0.7V p-p.

3.10.4. Forward to the Audio-Visual Consultant a complete report detailing test results obtained above, accompanied by a letter certifying that all audio components meet manufacturer's specifications and that the system is complete and ready for inspection.

3.11. TEST EQUIPMENT

3.11.1. Provide the following audio test equipment on site during check-out:

3.11.1.1. Time domain measurement system (TEF, EASRA, JBL/EAW Smaart) for setting of direct sound equalization.

3.11.1.2. Sound level meter with linear response and 1/2 inch free field microphone.

3.11.1.3. Audio test set with low distortion signal generator, true RMS meter, and facility to measure THD. (Audio Precision, Neutrik, HP, etc.)

3.11.1.4. 5 MHz oscilloscope.

3.11.1.5. Pink noise generator

3.11.1.6. All cables, connectors and adaptors necessary to interface with the sound system.

3.11.2. Provide the following video test equipment on site during check-out:

3.11.2.1. 500 MHz oscilloscope

3.11.2.2. Waveform monitor/Vector scope

3.11.2.3. test pattern/colour bar generator

3.11.2.4. signal level meter

3.11.2.5. Computer video test generator with scan rates up to 115kHz H / 90Hz V

3.11.3. Provide test equipment of professional quality and in good working order. Substandard equipment will be cause for rejection. The Audio-Visual Consultant reserves the right to demand proof of equipment accuracy.

3.12. ADJUSTMENTS

3.12.1. After demonstrating satisfactory system operation to the Audio-Visual Consultant, provide system equalization with all interior finishes and furnishings in place. Measure uncorrected house response of the ceiling loudspeakers at no less than four (4) positions in each room selected by the Audio-Visual Consultant. Adjust equalizer to shape house response for the voice system. Measure and correct prominent ring modes by measuring with the wireless lavalier microphone. Set the parametric equalizer to adjust overall spectrum shape plus prominent ringing of fixed microphones. Measured response after equalization shall fall within the limits defined on Figure # 1 at three positions randomly selected by the Audio-Visual Consultant. With pink noise input, record maximum sound pressure level after equalization.

3.12.2. Forward to the Audio-Visual Consultant a complete report of adjustments.

3.12.3. Schedule final adjustments to take advantage of essentially quiet conditions.

4. Figure #1 Sound System Response Limits
(All sound systems)

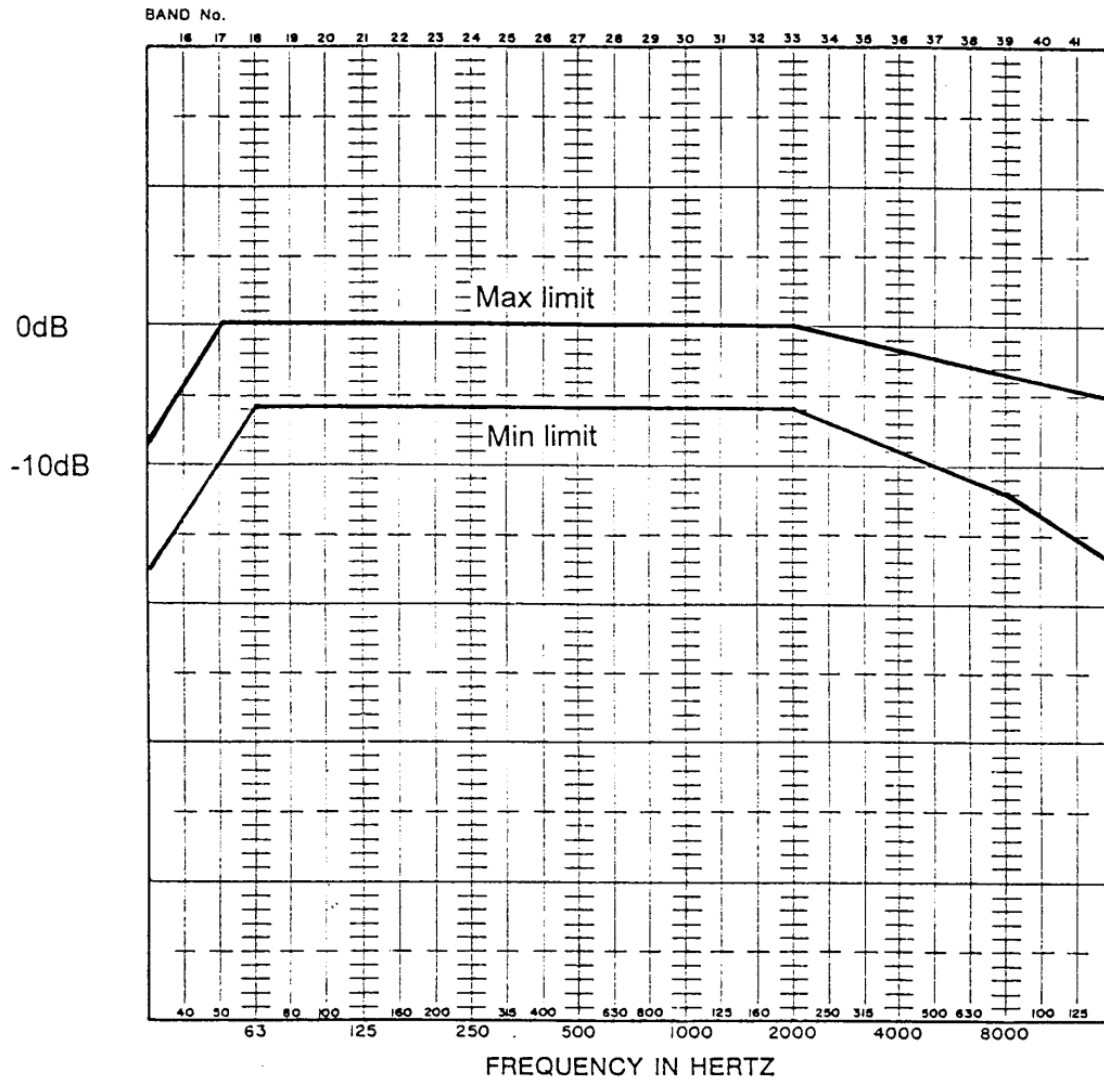


Figure # 2 Meeting Room 1124 and 1125 AV System Configuration

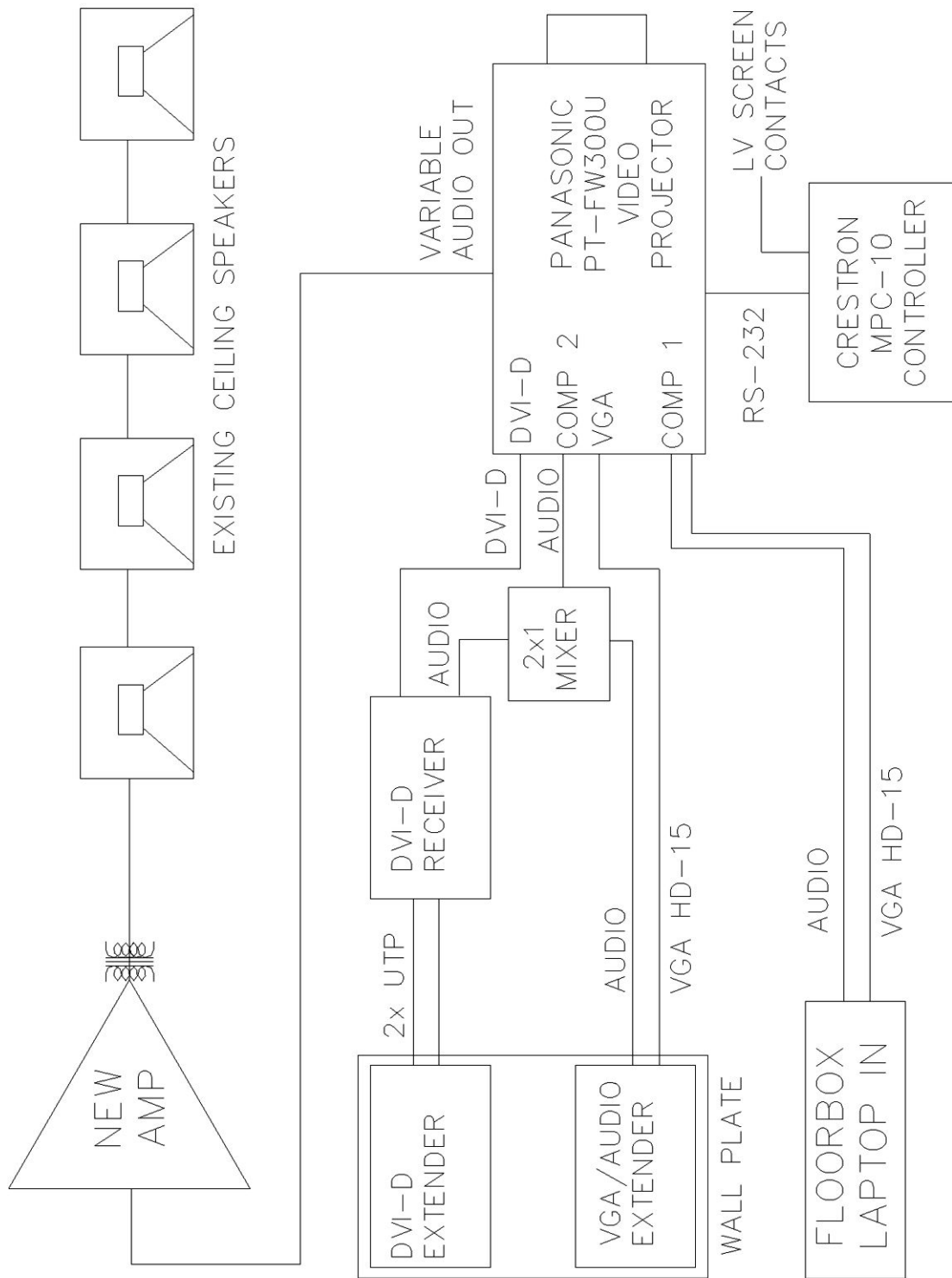
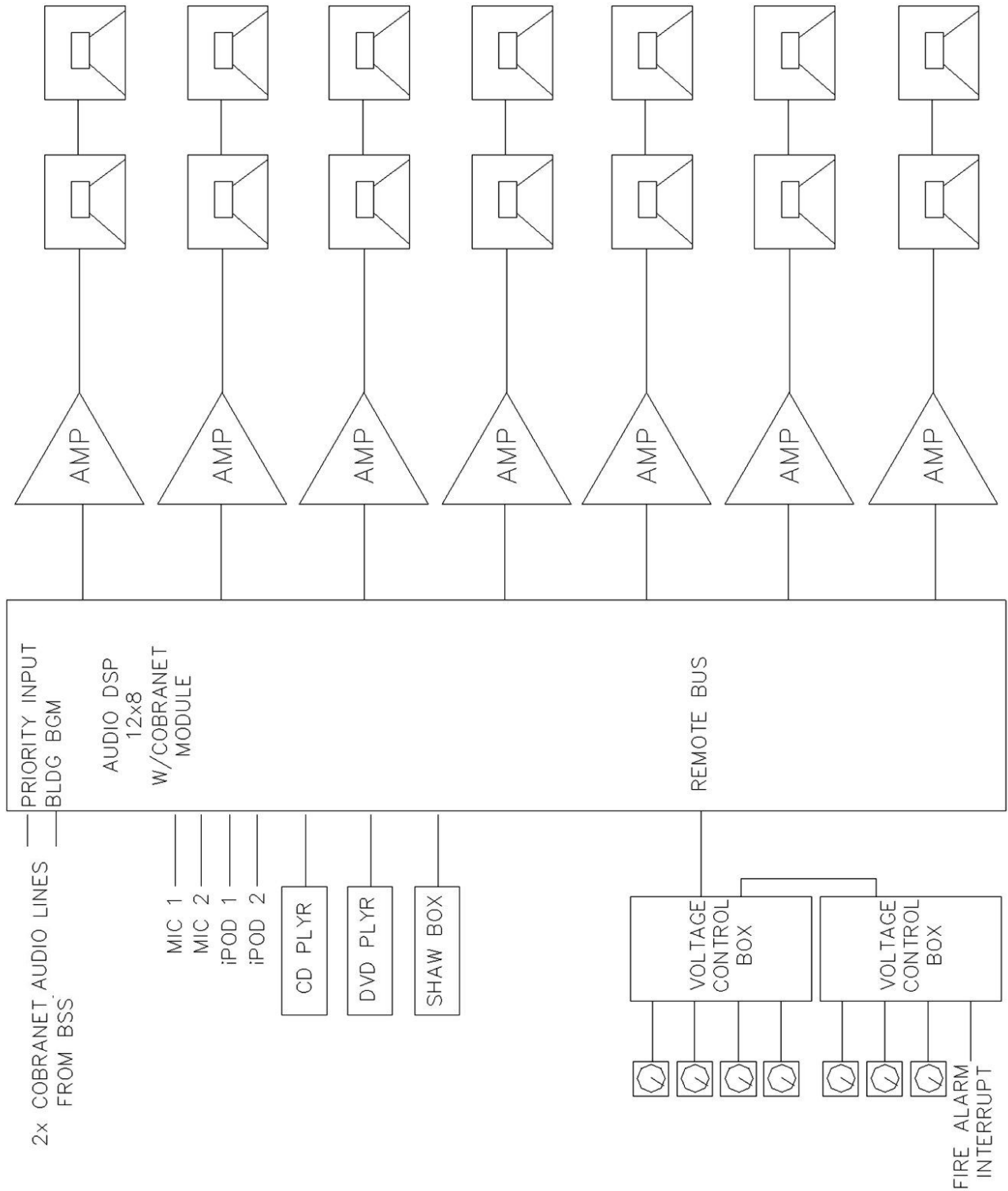


Figure # 4 Fitness Mezzanine Audio System Configuration



PART D – QUOTATION FORM

Quotation Form

Purchasing
City of Richmond
6911 No. 3 Road
Richmond, BC V6Y 2C1

The undersigned Bidder, having carefully read and examined the Instructions to Bidders, General Conditions, Requirements, Quotation Form, Drawings, and having full knowledge of the work required, does hereby offer to provide all necessary materials in strict accordance with the Requirements and to do all therein called for on the terms and conditions and under the provisions therein set forth at the:

LUMP SUM TOTAL QUOTED PRICE OF \$ _____

PAYMENT TERMS _____ EARLY PAYMENT TERMS _____

The above price includes all applicable duties, taxes, and handling charges (excluding HST) incidental to the Work incidental to and forming part of this Quotation and exclusive of HST,.

The undersigned Bidder agrees to complete the whole of the works within _____ working days of acceptance.

Name of Bidder: _____

Address: _____

Telephone No: _____

Name, Signature, and
Title of Signing Officer: _____

Date: _____

E-mail: _____

PART D – QUOTATION FORM

(To be submitted with Quotation)

Undertaking of Liability Insurance

City of Richmond
6911 No. 3 Road
Richmond, BC V6Y 2C1

Dear Sirs:

We, the undersigned (insert insurance company's name) _____ do hereby undertake and agree to insure the Contractor in the amount of \$5,000,000.00 as outlined in the attached "General Conditions of the Contract" and agree to:

- a. Name the City of Richmond, its officers, officials, agents, and employees as additional insured in connection with the work being proposed by the Contractor.
- b. State that such policy applies to each insured in the same manner and to the same extent as if separate policy had been issued to each insured named in the policy.
- c. State that the policy cannot be cancelled, lapsed, or materially changed without at least 30 days written notice of cancellation delivered to the City Clerk of the City of Richmond at 6911 No. 3 Road, Richmond, BC V6Y 2C1.
- d. State that coverage provided by such insurance shall protect the Contractor and the City of Richmond during the performance of the works and services specified in the attached Form of Quotation and specifically that the insurance required by such Quotation shall be consistent with the requirements therein.

if the Contract is awarded to (insert bidder's name) _____

EXCEPTIONS:

Dated at _____, British Columbia, this ____ day of _____, 2009.

BY: _____ TITLE: _____

This form must be signed by the Insurance Company or an authorized Broker on behalf of the Insurance Company.

A SEPARATE FORM MUST BE SIGNED FOR EACH POLICY IF MORE THAN ONE POLICY IS APPLICABLE.

PART D – QUOTATION FORM

List of Drawings

| Drawing No. | Sheet No. | Title |
|--------------------|------------------|---|
| Figure #1 | | Sound System Response Limits |
| Figure # 2 | | Meeting Room 1124 and 1125 AV System Configuration |
| Figure #3 | | Legacy Room 3032 AV System Configuration |
| Figure #4 | | Fitness Mezzanine Audio System Configuration |
| Drawing 1 | | 2010 Mezzanine Fitness System Model |
| Drawing 2 | | 2010 Legacy Room 3032 AV System Model |
| Drawing 3 | | 2010 Meeting Room 1124 and 1125 AV System Model |

PART D – QUOTATION FORM

Environmental Terms and Conditions of Contract

1.0 Environmental Policy Requirements

1.1 The City of Richmond’s Environmental Purchasing Policy

The City of Richmond’s Environmental Purchasing Policy states:

In order to increase the development and awareness of environmentally sound products and services, City of Richmond staff will review their contracts and tender specifications for goods and services, to ensure that wherever possible and economically feasible, specifications are amended to provide for consideration of environmental characteristics. Consideration may be given to those environmental products that are certified by an independent accredited organization.

The City of Richmond as a whole will endeavour to increase its use of products and services that are more responsible to the environment in the way they are made, used, transported, stored and packaged and disposed of. It is recognized that analysis is required in order to ensure that the products are made available at competitive prices, and that the environmental benefits provided by a product or service should not significantly affect the intended use of that product or service.

- 1.1.1 The City of Richmond reserves the right to request information from bidders that will demonstrate compliance to this environmental purchasing policy.
- 1.1.2 Bidders are asked to supply information on environmentally preferable products and services that meet all specifications and performance requirements.
- 1.1.3 Placing the City of Richmond in breach of its environmental policy or environmental laws will result in the termination or suspension of an agreement, at the sole discretion of the City.

1.2 Environmental impacts in the life cycle of a product or service

- 1.2.1 Environmental purchasing involves considering the costs and environmental consequences of a product or service in all stages of its life cycle, including raw materials acquisition, production, manufacturing, packaging, distribution, operation, maintenance, reuse and disposal.
- 1.2.2 Independent certification programs such as Environmental Choice as well as an increasing number of manufacturers conduct life cycle assessments to answer the question, “What is the environmental burden of a product or

PART D – QUOTATION FORM

service through all stages of its life cycle?” The City of Richmond is interested in receiving, wherever available, life cycle information relevant to the products or services being considered.

1.3 Characteristics of environmentally preferable products

1.3.1 Environmentally preferable products and services have characteristics that include but are not limited to the following:

- Reduce waste and make efficient use of resources, including energy
- Are reusable or contain reusable parts
- Are recyclable
- Contain post-consumer recycled materials
- Produce fewer polluting by-products and/or safety hazards during manufacture, use or disposal, and
- Have a long service life and/or can be economically and effectively repaired or upgraded.
- Are certified by an independent accredited organization such as the Environmental Choice program

1.4 Packaging

1.4.1 As with products and services, the City of Richmond will endeavour to consider the environmental characteristics of a product’s packaging.

1.4.2 The City prefers that suppliers minimize the amount of packaging used on products or that durable, long-lasting forms of reusable packaging be used. While packaging containing post-consumer recycled material or recyclable packaging is considered better than wasteful packaging, reduced or reusable packaging is preferred.

1.5 Environmental attributes of company

1.5.1 It is desirable that suppliers to the City of Richmond have an environmental policy statement approved at the executive level and implemented across the company.

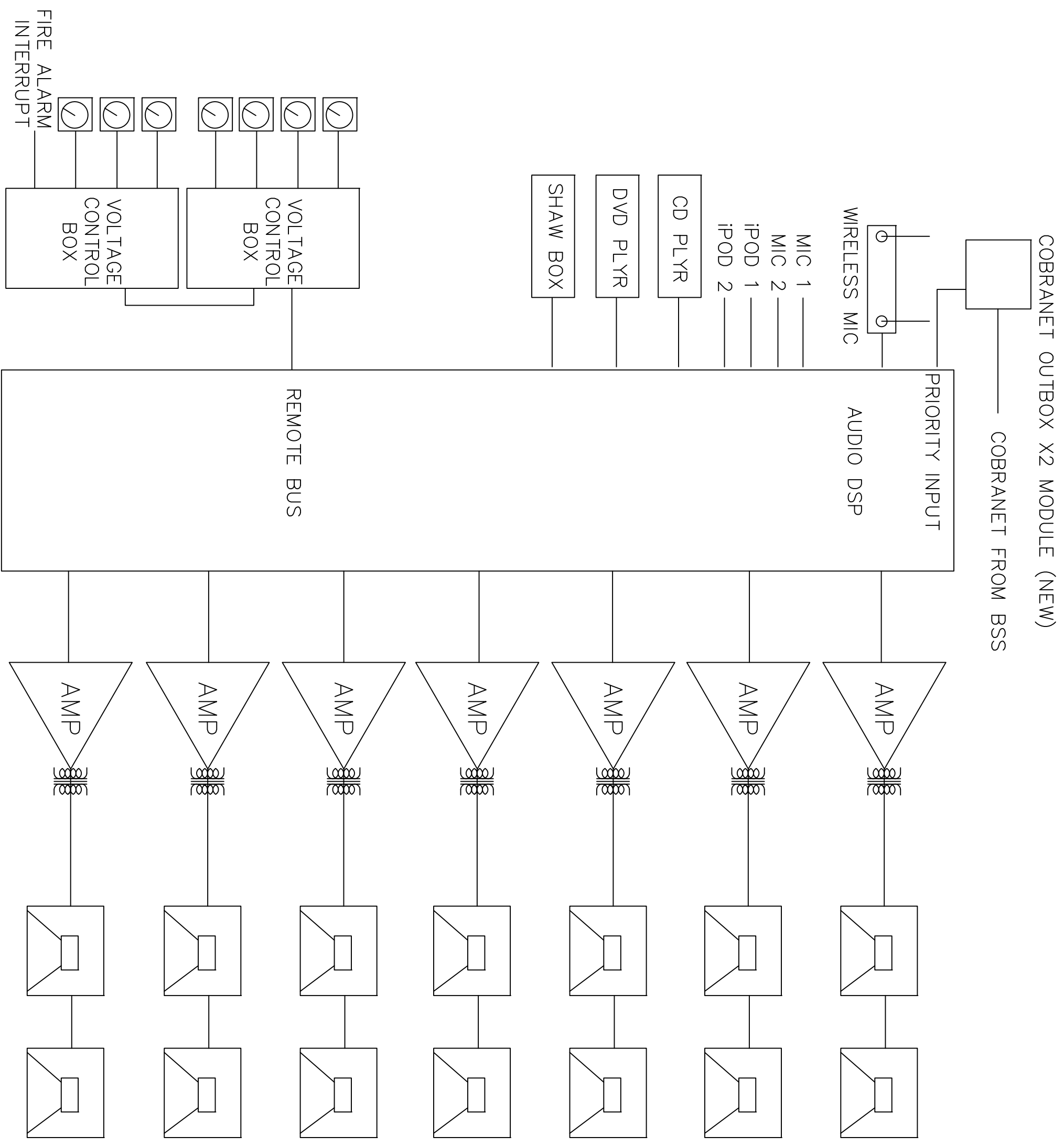
1.5.2 Suppliers who have pursued environmental certification such as ISO 14001 should include this information with their bid. The ISO 14000 Series is a set of international standards for voluntary environmental management for both private and public organizations. It is designed to promote environmental compliance, ensure a commitment to pollution prevention, and foster continual improvement of environmental performance through efficient environmental management.

PART D – QUOTATION FORM

- 1.5.3 The City of Richmond strictly subscribes to an environmental policy that requires all suppliers to be in compliance with all environmental laws and regulations regarding the manufacture, processing, handling, provision, disposal and waste management of goods and services.

1.6 Environmental purchasing resources

- 1.6.1 The City of Richmond Environmental Purchasing Guide is available from the City of Richmond Web site.



COBRANET OUTBOX X2 MODULE (NEW)

COBRANET FROM BSS

