



## NEW WESTMINSTER

TENDER NUMBER: **NWIT-15-25**

PROJECT TITLE: **Council Chambers Audio-Visual Systems**

PROJECT LOCATION: New Westminster City Hall  
511 Royal Avenue  
New Westminster, BC

BID DUE: **3:00 PM (Local Time) on Tuesday, July 14, 2015**

MANDATORY  
BIDDERS MEETING: **9:30 am (Local Time) on Monday, June 29, 2015**  
Council Chambers - New Westminster City Hall  
511 Royal Avenue  
New Westminster, BC

DATE: June 23, 2015

**CITY OF NEW WESTMINSTER**  
**511 Royal Avenue**  
**New Westminster, BC**  
**V3L 1H9**

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**1.0 Scope Of Work**

- 1.1 Provide all materials, equipment, labour, and services necessary to complete the supply, delivery, fabrication, assembly, installation, set-up, commissioning, adjustments, and alignment of the audio visual system as specified in the Tender Documents, General Requirements, Specifications, and Drawings.

**2.0 Owner**

- 2.1 The owner is the City of New Westminster, 511 Royal Avenue, New Westminster, BC, V3L 1H9, herein after referred to as the "City".

**3.0 Submission Of Tender**

- 3.1 Bidders shall submit the Tender on the enclosed Bid Form in a **sealed** envelope, clearly marked **NWIT-15-25 Council Chambers Audio-Visual Systems**

- 3.2 The completed Tender shall be submitted to:

Information Desk  
City of New Westminster  
511 Royal Avenue  
New Westminster, BC, V3L 1H9  
Attention: Purchasing Manager

- 3.3 The City shall receive Tenders at the location specified in 3.2 above, prior to **3:00 PM (Local Time) on Tuesday, July 14, 2015.**

- 3.4 Bidders shall submit the Bid Form with all blank spaces filled in. Alterations, qualifications, or omissions to the Bid Form may render the Bid liable for rejection by the City. The Bidder shall initial any erasures or corrections to the entries on the Bid Form.

- 3.5 The City does not accept facsimile, electronic mail, or other unsealed Bids.

- 3.6 The official time will be that on the clock located at the Information Desk. The City **will not** accept late submissions.

- 3.7 The City will not open this Tender in public.

**4.0 Addenda**

- 4.1 Should addenda to the Bid Documents be required for any reason, it is the City's intention not to issue addenda during a period three (3) days prior to the Bid Closing date and time.

- 4.2 Bidders are responsible for checking the City's website for any addenda or other information relating to this Invitation to Tender.

- 4.3 All Addenda become part of the Contract Documents. Bidders should include adjustment costs in the Bid Price.

4.4 Failure to acknowledge any Addendum may result in the disqualification of the Bidder.

### **5.0 Living Wage Policy**

5.1 Effective January 1, 2011, the City of New Westminster became a “Living Wage Employer”. As such, the City has established a Living Wage Policy that requires all firms that are contracted by the City to provide services on City premises, to pay their employees, who perform said service on City property, a Living Wage as calculated by the Living Wage for Families Campaign. The figure for 2015 for the Lower Mainland is \$20.68, assuming no benefits are provided by the employer.

5.2 In order to determine an employee’s hourly rate with benefits the Living Wage for Families has created a Living Wage Calculator to assist with this determination. Please access the following website to determine your compatibility  
<http://www.livingwageforfamilies.ca/employers/living-wage-calculator/>

5.3 The City includes in all its competitive bid documents a Declaration referencing the City’s expectations with regards to compliance of the Policy. **Completion and submission of the Declaration is required prior to Contract award.**

5.4 In evaluating submissions, the City intends to rely on the Declaration provided by a Respondent and shall have no obligation or duty to investigate the truthfulness of the Declaration.

5.5 Please review the City’s Living Wage Policy for further information  
[http://www.newwestcity.ca/business/living\\_wage\\_employer/living-wage-policy-and-declaration](http://www.newwestcity.ca/business/living_wage_employer/living-wage-policy-and-declaration)

### **6.0 Acceptance Of Bid**

6.1 The City is not obligated to accept the lowest or any tender and may reject all bids.

6.2 The City may waive any non-compliance with the Bid Documents.

6.3 The City may, prior to contract award, negotiate changes to the scope of work with the low bidder or any one or more bidders without having any duty or obligation to advise any other bidders or to allow them to vary their bid prices due to changes to the scope of work.

6.4 Bids shall remain open for acceptance by the City for a period of sixty (60) days from the closing date.

### **7.0 Revision Of Bid**

7.1 A Bid Form already delivered to the City may only be revised in the manner described below and, to qualify, the revision must be actually received by the City at the address given herein prior to the time and date specified for the closing of this Tender.

7.2 Bidders shall submit written Bid Revisions only in a sealed envelope. The Bidder may revise only the Bidder’s entries on the delivered Bid Form.

7.3 The City **will not** accept revisions of Bids by facsimile or email.

### **8.0 Evaluation Of Bids**

8.1 The City will review and evaluate all valid submitted bids. The City will evaluate Bids based on the Offer Price, qualifications, and references.

### **9.0 Knowledge Of Site And Work**

9.1 Bidders shall visit the site of the work and make allowances in their bids for such conditions as in the sole opinion of the bidder are warranted. The City makes no representation or warranty as to the conditions of the site.

### **10.0 Documents Required Of The Successful Tenderer**

10.1 Within seven (7) days of acceptance of the Bid by the City and prior to the work starting, the Contractor shall provide some or all of the following documents and/or requirements to the City:

- a) Certificate of Good Standing from WorkSafe BC;
- b) Proof of Insurance as required under the CCDC Contract General Conditions, the CCDC -41, and the Supplementary General Conditions of this tender;
- c) Names of all Subcontractors and description of the work to be performed by them, or confirmation that no Subcontractor will be involved in this project;
- d) Written assurance of sufficient manpower in your employ to fulfil satisfactorily this Contract;
- e) Proof of a valid City of New Westminister or Inter-Municipal Business License;
- f) A Construction Schedule as required under the CCDC Contract General Conditions;
- g) Performance Security and Labour and Material Payment Security as called for on page 5 of 6 of the Instructions to Bidders.

### **11.0 Permits**

11.1 If requested, the Contractor shall apply and pay for all permits required, by authorities having jurisdiction, to carry out the work. The City will apply for and pay for the building permit.

### **12.0 Pricing Requirements**

12.1 All prices shall be firm and shall include the cost of labour, materials, equipment, permits, transportation, services, fuel charges, and all Federal and Provincial taxes in force as of the date of submission of the offer, except that the Goods and Services Tax (GST) shall be excluded from the price.

### **13.0 Queries**

13.1 The City requests Bidders to advise the City of any errors, conflicts, or omissions in the Bid Documents, prior to Tender closing, so the City may issue an addendum.

13.2 After the Bid is accepted, bidders shall abide by the City's decision in the correction of previously unidentified obvious errors, conflicts, or omissions.

- 13.3 Address all queries or requests for additional information to:  
Heather Rossi, Purchasing Department,  
City of New Westminster,  
E-mail: [nwpurchasing@newwestcity.ca](mailto:nwpurchasing@newwestcity.ca)
- 13.4 The City cautions Bidders that information obtained from any other source is not official and may be inaccurate.
- 13.5 The City accepts no responsibility for any information provided by its employees or agents that is not in writing in accordance with this section.
- 14.0 Mandatory Bidders' Meeting**
- 14.1 The City has arranged a **Mandatory Bidders' Meeting** on **Monday, June 29, 2015** at **9:30 am** at Council Chambers - New Westminster City Hall, 511 Royal Avenue, **New Westminster**.
- 14.2 To be eligible to submit a Bid for this Tender, Bidders must attend the **Mandatory Bidders' Meeting**. Failure to attend the Mandatory Bidders Meetings will result in disqualification of the Bidder.
- 14.3 If requested, the City will provide the company name and phone number of the attendees at the Mandatory Bidders Meeting, by posting an attendance list on the City's website.
- 15.0 Bid Security, Performance Bonding and Guarantees**
- 15.1 All Bidders are required to provide with their Bid, Bid Security in a form acceptable to and payable to the City of New Westminster. The amount of the Bid Security must be equal to ten percent (10%) of the Bid Price (excluding GST), and one of the following types:
- Bid Bond;
  - Certified Cheque;
  - Irrevocable Letter of Credit; or
  - Bank Draft.
- 15.2 If, after Award of Contract, the Bidder refuses to enter into the Contract, the Bid Security (if any) may be forfeited to the City of New Westminster because of its damages, without prejudice to the City's remedies for the Bidder's breach of contract.
- 15.3 **Failure to provide Bid Security (when required) will result in disqualification of the Bidder.**
- 15.4 The Successful Bidder will be required to provide to the City of New Westminster, in a form acceptable to the City, Performance Security in an amount equal to fifty percent (50%) of the Contract Price, and in one of the following types:
- Certified Cheque;
  - Irrevocable Letter of Credit;
  - Bank Draft; or
  - A Performance Bond.

- 15.5 The Successful Bidder will be required to provide to the City of New Westminster, in a form acceptable to the City, Labour and Material Payment Security in an amount equal to fifty percent (50%) of the Contract Price, and in one of the following types:
- a) Certified Cheque;
  - b) Irrevocable Letter of Credit;
  - c) Bank Draft; or
  - d) A Labour and Material Payment Bond, the Bond must be a Broad Form bond protecting all companies with a direct contract with the Principal or any Sub-Contractor of the Principal.

**16.0 Form Of Contract**

- 16.1 Any contract arising from this Invitation to Tender will use the CCDC 2 – 2008 Stipulated Price Contract (not bound in the tender documents) and the Supplementary Conditions included in the Tender Documents.

**17.0 Ownership Of Tenders And Freedom Of Information**

- 17.1 All documents submitted to the City of New Westminster become the property of the City, and as such, the City advises Bidders that parts, or all, of their bids may be subject to the provisions of *British Columbia's Freedom of Information and Privacy Protection Act (FOIPPA)* and *Community Charter*. Bidders who wish to protect particular parts of their bids from disclosure under the FOIPP Act should specifically identify any information or records with their bids that constitute trade secrets and that are supplied in confidence, and the release of which could significantly harm their competitive position. Information that does not meet all three of the foregoing categories may be subject to disclosure to third parties. Please refer to the *Freedom of Information and Protection of Privacy Act* for further information. The City, as owner of the documents submitted, retains the right to copy the documents.

**End of Instructions to Bidder**

**1.0 PROJECT**

Title: **Council Chambers Audio-Visual Systems**

Location: New Westminister City Hall, 511 Royal Avenue, New Westminister, BC

**2.0 BIDDER**

Name: \_\_\_\_\_  
(Hereinafter referred to as the "Bidder")

Address: \_\_\_\_\_  
(including postal code)

Contact Name: \_\_\_\_\_

Telephone No: \_\_\_\_\_

Facsimile No: \_\_\_\_\_

Email Address: \_\_\_\_\_

**3.0 OWNER**

The Owner is the City of New Westminister, 511 Royal Avenue, New Westminister, BC, V3L 1H9, hereinafter referred to as the "City".

**4.0 OFFER**

4.1 The Bidder, having examined the Bid Documents and having gained full knowledge of the scope, character and location of the work and having become familiar with the local conditions, hereby offers to the City to execute the Work for the above named project in accordance with the Bid Documents for the amount of:

\_\_\_\_\_dollars

(\$ \_\_\_\_\_), the contract price, which price shall be subject to adjustments as may be provided in the Tender Documents. The contract price **excludes** the Goods and Services Tax (GST).

4.2 The Bidder should refer to Paragraph 1.9 Quotation Submission of Section 27 00 00 for further details on submission of their Offer.

4.3 The Bidder acknowledges that the City may, prior to contract award, negotiate changes to the scope of work with the low bidder or any one or more bidders without having any duty or obligation to advise any other bidders or to allow them to vary their bid prices due to changes to the scope of work.



**5.0 ADJUSTMENTS TO CONTRACT PRICE**

5.1 The Bidder further offers to carry out any changes to the work authorized by the City and to be compensated as provided in the General Conditions.

**6.0 SCHEDULE**

6.1 The Bidder should refer to Paragraph 3.1 Scheduling and Sequencing of Section 27 00 00 for further details on the Work Schedule.

6.2 The City requires the Work to be substantially complete, a manner acceptable to the City, by October 8, 2015.

6.3 Failure to commence or complete the Work within the time stated may result in cancellation of the contract and completion of the Work by others.

**7.0 ADDENDA**

7.1 Any addenda issued by the City shall become part of the Bid Documents.

7.2 The Contractor acknowledges receipt of the following addenda and confirms that the Bid has been prepared in accordance therewith:

<u>Addendum No.</u>	<u>Dated</u>	<u>No. of Pages</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

**8.0 SUBCONTRACTORS**

8.1 The Contractor confirms that following is a list of all the subcontractors who will be employed for the Work. No other subcontractors will be employed unless prior written approval is received from the City.

<u>Name of Subcontractor</u>	<u>Item of Work</u>
_____	_____
_____	_____
_____	_____
_____	_____

**9.0 BIDDER'S EXPERIENCE**

9.1 The Bidder shall state hereunder experience in similar work that they have successfully completed recently.

<u>Year</u>	<u>Description of Contract</u>	<u>Owner</u>	<u>Value</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

**10.0 REFERENCES Note: Failure to complete this section may result in disqualification.**

10.1 Bidders shall provide sources for three (3) references (companies for whom work of a similar nature was done in the past five (5) years, including the City of New Westminster).

1 Company Name: \_\_\_\_\_

Contact Person: \_\_\_\_\_ Phone: \_\_\_\_\_

Nature of Contract: \_\_\_\_\_

Project Date: \_\_\_\_\_ Approximate Value: \_\_\_\_\_

2 Company Name: \_\_\_\_\_

Contact Person: \_\_\_\_\_ Phone: \_\_\_\_\_

Nature of Contract: \_\_\_\_\_

Project Date: \_\_\_\_\_ Approximate Value: \_\_\_\_\_

3 Company Name: \_\_\_\_\_

Contact Person: \_\_\_\_\_ Phone: \_\_\_\_\_

Nature of Contract: \_\_\_\_\_

Project Date: \_\_\_\_\_ Approximate Value: \_\_\_\_\_

**11.0 ACCEPTANCE**

11.1 Acceptance of this offer by the City will be made by the issuance of a Letter of Award.

**12.0 SIGNATURES**

SIGNED, SEALED, AND DELIVERED by the Contractor:

\_\_\_\_\_  
(Contractor's Name)

\_\_\_\_\_ (Corporate Seal)  
(Legal Signing Authority)

\_\_\_\_\_  
(Print Name and Title)

\_\_\_\_\_  
(Date)

**End of Bid Form**

**1.0 Summary Of Work**

- 1.1 The Contractor shall provide all labour, materials, products, equipment, services, and incidentals required to complete the Contract Work as indicated in the Contract Documents and amendments.

**2.0 Coordination**

- 2.1 The Contractor shall coordinate and direct the execution of the work including directing the subcontractors.

**3.0 Cutting and Patching**

- 3.1 As it is necessary to carry out the Contract Work, areas of cutting, removal, or opening up of existing floors, walls, ceilings, or other existing site or building areas, will be undertaken by another contractor hired by the Owner. The Contractor shall coordinate locations and scope of cutting and/or removal with the Owner's contractor.

**4.0 Submittals**

**4.1 Pre-Construction Submittals**

- .1 The following submittals shall be provided by the Contractor for the City's review within seven (7) business days of award of the Contract:
- a) Construction Schedule;
  - b) Proof of Insurance (see Supplementary Conditions and CCDC2-2008);
  - c) Clearance Letter from WorkSafe BC;
  - d) Proof of a valid City of New Westminister or Inter-Municipal Business License.

**4.2 Shop Drawings & Samples**

- .1 Shall be provided to the City Representative in a timely manner prior to ordering of the material and equipment.

**5.0 Maintenance Manuals**

- 5.1 At the time of application for Substantial Performance, provide the City with maintenance manuals as specified in the Contract Documents.

**6.0 Utilities And Services**

- 6.1 The City shall provide, at no cost to the Contractor for the related work, cold water, and electrical power.
- 6.2 The Contractor may use washrooms as designated by the City.
- 6.3 All other utilities and/or services required by the Contractor shall be the responsibility of the Contractor.

**7.0 Security**

- 7.1 The Contractor shall be responsible for the security of the job site building as related to the Work. Comply with all fire regulations during the period of construction. Leave no portion of existing buildings unlocked after public visiting hours at any time. Coordinate with the City as necessary. Except for designated public entrances, all doors will remain locked at all times.
- 7.2 The Contractor's employees are to wear photo identification (provided by the City) at all times when in the work area inside the building.

**8.0 Access**

- 8.1 Coordinate with City staff prior to commencing work. Parking may be available on site.

**9.0 Dangerous Materials**

- 9.1 No gasoline or other dangerous materials shall be stored on the site.
- 9.2 The Contractor shall separate any dangerous or hazardous materials removed from the site and take to the appropriate recycling or disposal station(s).

**10.0 Site Control And Organization**

- 10.1 The Contractor shall at all times keep the site orderly and, as work allows, generally clean. Remove all trash and debris daily. Sweep clean all floor areas in, and adjacent to, the work area on a daily basis.

**11.0 Site Meetings**

- 11.1 The Contractor shall coordinate and attend regular site meetings at such intervals as may be deemed necessary for the purpose of coordinating and expediting the progress of the work.
- 11.2 An authorized representative of the City will attend these meetings, as and when required. The Contractor agrees to attend in person or send an authorized representative to any such meetings that the City may call. The Contractor's subcontractors shall attend meetings as required to expedite the Work.
- 11.3 The City Representative shall record and distribute the minutes of any such meetings.

**12.0 Pre-Construction Conference**

- 12.1 The City shall advise the Contractor of the time and location of a pre-construction meeting that representatives of the Contractor and his trades shall attend prior to the start of any construction of this contract. The purpose of the meeting is to review site conditions, scheduling and other contractual items.

**13.0 Rectify Damages**

13.1 The Contractor shall make good any damage or spillage to adjacent buildings, areas, grounds, or vehicles at no cost to the City and leave the site in the same state as it was prior to commencement of the contract and to the satisfaction of the City. The Contractor shall perform all work in a manner that ensures the minimum interference with normal use of public spaces and facilities.

**14.0 Rejected Work**

14.1 Defective work whether the result of poor workmanship, use of defective products or damage through carelessness or other act or omission of the Contractor, shall be removed from the site by the Contractor and replaced and/or re-examined promptly in accordance with the Contract Documents, all at the Contractor's expense.

**15.0 Quality Of Work**

15.1 Workmanship shall be of the highest quality. When not specified elsewhere, the Contractor shall perform work in accordance with recognized trade standards and according to product manufacturer's recommendations.

**16.0 Temporary Supports**

16.1 The Contractor shall be responsible for all temporary supports, bracing, or similar structural work as may be required during the carrying out of the Contract Work.

**17.0 Consultation With Owner**

17.1 The Contractor shall contact the City immediately:

- .1 For clarification regarding the Contract Work for information in addition to what is provided in the Contract Documents;
- .2 If any conflicts or inaccuracies are discovered in the Contract Documents;
- .3 If any site conditions become apparent that require revisions to the project design and Contract Documents.
- .4 For coordination and approval of shutdowns of building systems, the City prohibits any shutdown of building systems during normal working hours.

**18.0 Protection Of The Public And Others**

18.1 The Contractor shall take adequate measures to protect the public, City of New Westminister staff, and others on site from injury, damage, or other loss resulting from construction and related activities. Included within the Contractor's work are hoarding, signage, and similar items appropriate for construction conditions and the progress of the job. The City shall have complete jurisdiction over entry of Contractor's workers and vehicle access to site and existing buildings. The Contractor shall make building access arrangements in consultation with applicable staff.

18.2 The Contractor will be required to meet with the City's Representative on site to review and accept responsibilities as identified in the City's Prime Contractor Designation, Risk Assessment, and Pre-Job Meeting forms.

**19.0 Contractor Closeout**

**19.1 Final Accounting**

- .1 Final statement of account - submit to Owner reflecting all adjustments and the following:
  - a) Original Contract Sum;
  - b) Additions and deductions resulting from:
    - i) Change Orders;
    - ii) Unit Prices;
    - iii) Other adjustments;
    - iv) Deductions for uncorrected work;
  - c) Total Contract sum as adjusted;
  - d) Previous payments;
  - e) Sum remaining due.
  
- .2 The City retains the right to obtain proof of payment, in the form of a CCDC 9A-2001 Statutory Declaration, of all sub-trades and material suppliers from the Contractor prior to making final payment.

**19.2 Project Closeout**

- .1 Flush clear all drains affected by the work;
- .2 Clean site of materials and debris created by the Construction;
- .3 Submit written acceptance that utility companies have inspected services to their satisfaction;
- .4 Provide City Representative with all Warranty and Bond Certificates with:
  - a) The proper name and address of the Owner and of the Project;
  - b) The date the warranty commences, which corresponds to the date of Substantial Performance;
  - c) A clear statement of what is being warranted as referenced in the Specifications;
  - d) The signature and seal of the company issuing the warranty, countersigned by the Contractor;
- .5 Attend a final walk-through with the City Representative to identify any final deficiencies;
- .6 Make good all known deficiencies in the work and notify the City Representative of readiness for final inspection only after completion of these items;
- .7 The City Representative will review completion of deficiencies during one review only. Additional reviews required to check un-rectified deficiencies or incomplete work will be back-charged by the Owner on the Contractor's progress payments and paid from those funds.

**20.0 Special Instructions**

- 20.1 The City does not permit smoking in or on the premises at any time.

**21.0 Waste Management**

- 21.1 The Contractor shall remove all waste from the site within forty-eight (48) hours after demolition.
- 21.2 The waste bins shall be located in an area that does not interfere with the normal operations of the building.
- 21.3 The City does not permit the use of existing on site waste receptacles by the Contractor.
- 21.4 Unless otherwise specified, all materials removed become the property of the Contractor, and must be disposed of in conformance with municipal, provincial, federal and WorkSafe BC requirements.
- 21.5 Separate recyclable and toxic waste materials from the waste stream. Deliver to a local waste management facility.

**End of General Requirements**



<b>CITY OF NEW WESTMINSTER</b>	<b>SUPPLEMENTARY GENERAL CONDITIONS CCDC-2 2008</b>
<b>Revised August 1, 2013</b>	<b>Page 1 of 2</b>

The Supplementary Conditions revise the General Conditions in the CCDC 2-2008 Stipulated Price Contract as follows:

**ARTICLE A-5 PAYMENT**

Paragraph 5.3 Interest –

Paragraph 5.3.1 (1) – Delete “.2%..” and substitute “.0%..”

Paragraph 5.3.1 (2) – Delete “.4%..” and substitute “.0%..”

**GENERAL CONDITIONS OF THE STIPULATED PRICE CONTRACT**

**PART 1 GENERAL PROVISIONS**

**GC 1.1 CONTRACT DOCUMENTS,**

1.1.7.1 Between “the Agreement between the *Owner* and the *Contractor*” and “Definitions” –  
Insert “Addenda”

**PART 2 ADMINISTRATION OF THE CONTRACT**

**GC 4.2 CONTINGENCY ALLOWANCE**

Delete in its entirety.

**PART 5 PAYMENT**

**GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER**

Delete in its entirety.

**GC 5.3 PROGRESS PAYMENT**

5.3.2 Delete “10 calendar days” and substitute with “thirty (30) calendar days”

**PART 6 CHANGES IN THE WORK**

**GC 6.2 CHANGE ORDER**

Add

“6.2.3: The allowance for overhead and profit charged by the *Contractor* and subcontractors shall be as follows:

- .1 Cost of materials and labour plus 10% mark-up by the *Contractor* for changes in the work performed by the Contractor.
- .2 Cost of labour and materials plus 10% mark-up by the Contractor on changes in the work performed by the subcontractors.
- .3 Cost of labour and materials plus 10% mark-up by the subcontractors for changes in the work performed by the subcontractors.
- .4 The overhead and profit for changes in the work shall include supervision, administrative costs, small tools, miscellaneous materials, layout, additional bonding costs, and recording of the changes on the record drawings.

CITY OF NEW WESTMINSTER	SUPPLEMENTARY GENERAL CONDITIONS CCDC-2 2008
Revised August 1, 2013	Page 2 of 2

## PART 11 INSURANCE AND CONTRACT SECURITY

### GC 11.1 INSURANCE

**11.1.1.1** *Delete in its entirety and replace with the following:*

- .1 General liability insurance in the name of the *Contractor* and include, or in the case of a single, blanket policy, be endorsed to name, the *Owner*, the *Consultant*, *sub-consultants* and *special consultants* as identified by the *Owner* as insureds but only with respect to liability, other than legal liability arising out of their sole negligence, arising out of the operations of the *Contractor* with regard to the *Work*. General liability insurance shall be maintained from the date of commencement of the *Work* until one year from the date of *Substantial Performance of the Work*. Liability coverage shall be provided for completed operations hazards from the date of *Substantial Performance of the Work*, as set out in the certificate of *Substantial Performance of the Work*, on an ongoing basis for a period of not less than twenty-four months following *Substantial Performance of the Work*.

- .4 In line 1, after “*Owner and the Consultant*” insert “, *sub-consultants and special consultants* as identified by the *Owner*,”

11.1.1.3 Delete in its entirety

11.1.1.5 Delete in its entirety

### GC 11.2 CONTRACT SECURITY

**11.2.2** *Delete in its entirety and replace with the following:*

**11.2.2** If the *Contract Documents* require surety bonds to be provided, such bonds shall be issued by a duly licensed surety company authorized to transact the business of suretyship in the province or territory of the *Place of the Work* and shall be maintained in good standing until the fulfilment of the *Contract*. The form of Performance Bond shall be in accordance with the latest edition of the CCDC approved Performance Bond form. The Labour and Materials Payment Bond shall be a Broad Form bond, protecting all companies with a direct contract with the Principal or any Sub-Contractor of the Principal.

## CCDC 41 – CCDC INSURANCE REQUIREMENTS

Delete paragraphs 3 and 5



## DECLARATION – LIVING WAGE EMPLOYER

I, \_\_\_\_\_ as a duly authorized signing officer of

Company: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_, confirm that all employees and sub-contractors under our contract with the City as outlined below, are paid not less than the “Living Wage” as calculated by the Living Wage for Families Campaign.

I understand that this requirement extends only to those employees and sub-contractors’ employees that perform work while on City premises and property for durations in excess of one continuous hour per occasion.

I understand that the City will conduct audits if and when notification of breach of this compliance is received by the City. I understand that in the event any breach of this declaration is found to be true, the City reserves the right to cancel its contract without penalty at any time once said authentication of the breach is made.

Contract Name: \_\_\_\_\_

Authorized Signatory:

Dated:

\_\_\_\_\_

\_\_\_\_\_





CITY OF NEW WESTMINSTER  
COUNCIL CHAMBERS AV SYSTEMS  
511 Royal Avenue.  
New Westminster, BC

AUDIO VISUAL SYSTEMS

Division 27  
Issued for Tender

**Date: June 19, 2015**

Acumen Engineering  
#650 – 2700 Production Way  
Burnaby, BC, V5A 4X1

# INDEX

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**Part 1 General**

**1.1 DOCUMENTS**

- .1 This section of the Specification forms part of the Contract Documents and is to be read, interpreted, and coordinated with all other parts.

**1.2 GENERAL SUMMARY**

- .1 The Contractor shall provide Division 27 systems as described herein and as indicated on drawings.

**1.3 SCOPE OF WORK**

- .1 Provide all materials, equipment, labour, and services necessary to complete the supply, delivery, fabrication, assembly, installation, commissioning, set-up, adjustment, and alignment of the audio visual system as specified herein and shown on the drawings.
- .2 Provide all incidental or related products or materials necessary to ensure a complete and operating system, including, but not limited to:
  - .1 Interface equipment, level matching equipment and isolation devices required to interconnect the equipment within the system and with other systems;
  - .2 Power supplies, power boosters, relays, AC power strips, enclosure panels and junction boxes required to make the equipment function properly as a system;
  - .3 All mounting brackets or hardware required to integrate the equipment into the surrounding work and structure; all require seismic restraints and engineering thereof;
  - .4 All software, firmware, and programming devices or special programming data cables required to make the system operate and to allow programming of all required programmable functions.
- .3 Provide all incidental or related products or materials necessary to provide a high-level of professional quality finish to equipment racks, enclosures, and cabling. These incidental products or materials include, but are not limited to blank panels, vertical / horizontal lacing bars, cable ties, cable tie mounts, terminal plates/ blocks, 'snake-skin' cable dressing, Velcro straps, grommets, strain-relief, laser-printed cable ID labels, etc.
- .4 Coordinate installation with other trade contractors to facilitate installation work. Extra costs arising from conflicts or delay due to improper contractor's coordination shall be the responsibility of the Contractor. The cost of close coordination with other trade contractors shall be the responsibility of the Contractor.
- .5 Provide all equipment, personnel, and resources necessary to facilitate infrastructure testing and commissioning.
- .6 Provide for related construction requirements such as equipment storage, hoarding, evening, night or weekend work, equipment lifts or scaffolding required to complete the scope of work.
- .7 Provide as-built documents, diagrams, manuals, tests results, warranties, and other documentation as specified.
- .8 Provide infrastructure operation and maintenance training to Owner's AV and/or IT representative.
- .9 Supply, delivery, and installation of seismic restraints in accordance with local building codes and regulations and any additional requirements specified herein. Contractor shall be responsible for all costs associated with obtaining all necessary professional approvals



for all seismic restraints and related shop drawings. Seismic restraints without prior approval by a professional Seismic Engineer shall be rejected by the Consultant and/or the Owners authorized representative.

#### 1.4 RELATED WORK

- .1 All electrical wiring, electrical switch gear, conduit, raceways, and junction boxes will be supplied and installed by others. Hard-wired electrical connections to equipment rack power strips will be made by the Electrical Contractor. Cover plates are to be provided under this section.
- .2 All data cabling and network drops are supplied by others.

#### 1.5 DRAWINGS AND SPECIFICATIONS

- .1 The Contract drawings and specifications form an integral part of the contract documents. Neither the drawings nor the specifications shall be used alone. Work omitted from the drawings but mentioned or reasonably implied in the specifications, or vice versa, shall be considered as properly and sufficiently specified and shall be provided.
- .2 Where conflict exists between drawings and specifications, the Contractor shall make allowance for the more expensive solution.
- .3 This specification part does not necessarily detail the quantities required. Refer to the appended drawings and technology floor plans to determine quantity of all required products and materials.
- .4 System drawings are functional drawings only. They are intended to show the general signal flow through the system and convey the design intent. They are not intended to show every required interconnection or interface/isolation component or device, and are not to be used in lieu of AV Contractor's shop drawings.
- .5 The contract includes for provision of a total number of outlets and/or devices equivalent to the quantity shown or specified. The right is reserved to change outlet / device locations as may be required by the Owner or as may be necessary to place these clear of obstruction. No extra cost will be allowed for such changes unless these changes increase the total amount of material and labour.
- .6 Floor plans are provided as a reference only – critical distances and measurements must be verified by obtaining actual measurements.
- .7 Outlets and or devices may be relocated up to 5 meters from the position shown on contract drawings without cost to the Owner, provided the unit is not installed prior to receiving direction for such relocation.
- .8 Drawings are generally diagrammatic and are intended to indicate the scope and general arrangement of the Work. The Contractor shall not scale the drawings, but rather take field measurements.
- .9 Contractor shall maintain one (1) complete set of white prints to be used exclusively for purposes of recording changes, deviations and revisions from the original contract (pay particular attention to the size and location of conduits, back-boxes etc.). Contractor shall include all costs for transferring manual Record Drawings to electronic AutoCAD® format As-built drawings of Division 27 systems in the bid submission.

#### 1.6 QUALIFICATIONS

- .1 The Contractor must have been regularly engaged in the supply and installation of audio-visual equipment similar to that specified herein for a minimum period of five years.
- .2 All products specified and supplied in this project must be sourced through manufacturers authorized distribution channels. The Contractor must be authorized by the manufacturer or manufacturers approved distribution channels to supply, install, and service products

- specified or approved for use in this project. Upon request, the Contractor shall show proof of a contractual relationship with the manufacturer or manufacturers authorized representative to supply service and /or provide warranty service and shall submit the manufacturer's certification to Consultant and/or the Owners authorized representatives. Verification shall be specific to this job and generic (To Whom It May Concern) letters may not be deemed as acceptable verification. The Contractor shall be responsible for all costs associated with the supply of required equipment through authorized supply channels and shall be fully responsible for all costs related to warranty issues of product.
- .3 The Contractor must have been regularly engaged in service and maintenance of audio-visual equipment and systems similar to that specified herein for a minimum period of five years. The Contractor shall have a service facility with dedicated service staff, and agree to maintain such facility for the duration of the Warranty Period.
  - .4 Preference will be given to bidders who do not use sub-contractors. All work by sub-contractors must be under the supervision of an on staff technician or project manager. If sub-contractors are to be used, list the name of the companies and/or individuals who would perform the work.
  - .5 Contractor and subcontractor(s) shall submit a list of three (3) recent projects of similar scope, complete with references.
  - .6 Contractor shall provide a listing of all such staff members that will be involved in this project including:
    - .1 Job title and brief resume of each team member;
    - .2 A list of projects that each team member has worked on;
    - .3 Copies of all relevant certification and diplomas.
  - .7 All control system programming must be by done by on-staff Crestron factory certified programmers. Provide a listing of all such staff including copies of all relevant certification and diplomas. Include samples of programming from (3) similar scope projects.
  - .8 Preference will be given to bidders who have on staff CTS-I certified technicians.
  - .9 Perform all work using fully competent workers in a neat, thorough, and professional manner, in accordance with Standard Industry Practice and manufacturer's installation instructions. Where these may vary, one from the other, follow the more stringent requirements.
  - .10 Contractor shall designate a full-time, qualified representative to supervise all on-site work, including that of sub-contractors.
  - .11 Comply fully with the following instructions, acts, regulations and codes, and if the requirements of one act, regulation or code are more stringent than similar requirements under another act, regulation or code, then the more stringent requirements are to apply:
    - .1 International Building Code (IBC) and all local building codes in effect at the Place of the Work;
    - .2 National Fire Protection Association (NFPA) and all local fire codes in effect at the Place of the Work;
    - .3 National Electrical Code (NEC) and all local electrical codes in effect at the Place of the Work.

## 1.7 QUOTATION SUBMISSION

- .1 The pricing submission of all bidders shall include the following:
  - .1 Schedule of prices: provide a list of major system components categorized by specification articles and paragraphs, on the Contractor's letterhead, to include:
    - .1 Equipment;
      - .1 model number;
      - .2 name of manufacturer;
      - .3 description;
      - .4 quantity to be furnished;
    - .2 Labour;
      - .1 Labour cost;
    - .3 Programming;
      - .1 Programming cost;
    - .4 Documentation;
      - .1 Cost for O&M Manuals and project record drawings.
  - .2 The primary objectives of the schedule of prices are: To aid the Owner in determining the type and kind of products being bid; verify the general completeness of the submission; and, to aid the Owner in post-bid negotiations if budget paring is required. Provision of this cost breakdown does not relieve the Contractor of its responsibility to provide all products, components, and quantities of equipment required to make the system fully operational and functional, whether included in this schedule or not.
  - .3 For products proposed as alternatives to the pre-accepted products listed in this specification or for each product specification in which no pre-accepted product has been specified in this document:
    - .1 submit manufacturer's specification sheets, functional descriptions, and any other materials to demonstrate that the proposed product meets or exceeds the specifications;
    - .2 on such sheets listing several components or options, clearly identify the items you are proposing by using an arrow, circle, or other obvious notation;
    - .3 clearly indicate all limitations or exceptions to the specification requirements;
    - .4 clearly indicate the specification article, and paragraph for which you are proposing the product;
    - .5 failure to submit in accordance with this paragraph may result in the proposed product being rejected.
  - .4 Description and technical specifications of all significant equipment, wiring, or features discovered by the Bidder to be necessary to the function and operation of the system, but not specified in this document.
  - .5 System enhancements: submit as a separate proposal, any recommendations that will enhance system performance or reduce costs without loss of performance and features. Include the "as- specified" system proposal in your bid. Include a complete description of the recommendations, along with technical specifications and a detailed breakdown of costing. And, include a clear indication

as to whether the recommendations increase, decrease, or do not affect the proposal price.

- .6 A list of spares and consumables to be provided as required under the "EXTRA MATERIALS" article. Indicate quantity and unit replacement value for each at current prices. Indicate expected life of each consumable.
- .7 A description of the Contractor's policy regarding upgrades to the system firmware and software in both the warranty and post-warranty periods.

## 1.8 DEFINITION OF TERMS

- .1 The following abbreviations may be used within this specification document and in the drawings:
  - .1 AES: Audio Engineering Society;
  - .2 ANSI Lumens: American National Standards Institute, ANSI IT7.228-1997 - measurement method for light output of fixed resolution video projection devices;
  - .3 ASTM: American Society For Testing And Materials;
  - .4 BICSI: Building Industry Consulting Service International;
  - .5 CSA: Canadian Standards Association;
  - .6 CTS: Certified Technology Specialist;
  - .7 CTS-D: Certified Technology Specialist - Design;
  - .8 CTS-I: Certified Technology Specialist - Installation;
  - .9 IEEE: Institute of Electrical and Electronic Engineers;
  - .10 INFOCOMM: Professional AV communications industry association;
  - .11 ISO: International Standards Organization;
  - .12 NEMA: National Electrical Manufacturer's Association;
  - .13 NSCA: National Systems Contractor's Association;
  - .14 NTSC: National Television Systems Committee
  - .15 SMPTE: Society of Motion Picture and Television Engineers
  - .16 ULC: Underwriter's Laboratories (UL);
  - .17 RS-232: ANSI/EIA/TIA 232-F-1997 - electrical interface and timing for a particular type of serial data transmission;
  - .18 RS-422: EIA 422-B-1994 - electrical interface and timing for a particular type of differential serial data transmission;
  - .19 RS-485: ANSI/TIA/EIA-485-A-98 - electrical interface and timing for a particular type of differential serial data used in a multi-drop configuration;
  - .20 EIA 19 inch: ANSI/EIA 310-D-1992 - equipment racks and panels;
  - .21 VESA: Video Electronics Standard Organization.
- .2 Standard Industry Practice: Installation techniques and practices for similar installations, as established from time to time by standards and certification organizations such as ANSI, BICSI, EIA, INFOCOMM, and NSCA. This specifically includes compliance with all applicable sections of EIA-568.
- .3 Substantial Performance of the Work: Substantial Performance of the Work has been reached when all adjustments stipulated in the Specifications as being a condition of achieving Substantial Performance of the Work have been made and the entire Work is ready for use or is being used for the purpose intended.

.4 Meaning of terms:

- .1 The word "provide" means to supply, install, commission, align, adjust, and debug;
- .2 The expressions "perform the Work" mean "perform, construct, install, complete, protect, repair, replace, maintain, and test the Work and every part thereof in conformity with the Contract," and variations of these expressions have corresponding meanings;
- .3 Where the words "approved," "accepted," "required," "authorized," or words of similar import are used, such words refer to the approval, acceptance, requirement, or authorization of the Consultant unless expressly stated otherwise;
- .4 The expressions "contract signing" and "award of a contract" mean the date of issue of the purchase order, and variations of these expressions have corresponding meanings;
- .5 Where the words "shown," "indicated," "detailed," "specified," or words of similar import are used, such words refer to the specification and drawings unless expressly stated otherwise;
- .6 The word "including" or "includes," or any variation thereof, when followed by an enumeration of items or things, in every case, are to be read as though the word "including" or "includes," or the variation thereof, was followed by the words "but without restricting the generality of the foregoing" and in no case presume that the items or things enumerated are complete or exhaustive or descriptive of the whole for which the items or things are constituent parts;
- .7 Manufacturer refers to the company that manufactures the components and equipment backed by a warranty against defects. They also provide recommendations on the proper application and installation methodology of their products;
- .8 Words "Tender", "Proposal" and "Bid" used in this contract documents shall mean the same and are interchangeable;
- .9 Words "Tenderer" or "Bidder" or "Proponent" used in these contract documents shall mean the party submitting the proposal or bid or tender response are interchangeable;
- .10 The word "Contractor" shall mean the successful tenderer, bidder or proponent whose proposal is accepted by the Owner that results in them entering a formal contract with the Owner to perform the work;
- .11 Words "Design Professional", "Consultant" and "Engineer" used in this contract documents shall mean the same and are interchangeable;
- .12 Words "Data Outlet" and "Computer Outlet" used in this contract documents shall mean the same and are interchangeable.

Comment [HMR1]: These terms refer to different dates and are not interchangeable.

**1.9 REGULATORY REQUIREMENTS**

- .1 Contractor shall comply with the latest British Columbia Building Code, and Canadian Electrical Code, including all provincial and other amendments, and local by-laws. When multiple codes and/or regulations apply, follow the most stringent provision.
  - .1 Canadian Electrical Code;
  - .2 BC Electrical Safety Act;
  - .3 British Columbia Building Code;
  - .4 British Columbia Fire Code Regulation;
  - .5 Municipal Building Codes and By-Laws;

- .6 Worker's Compensation Act;
- .7 Industry standards TIA, EIA, BICSI.
- .2 Materials shall bear the approval of the Canadian Standards Association (CSA) and/or Underwriters Laboratories® approval Canadian Standards designation (ULC). Approvals other than these must meet and be approved for use and installation by local inspection authorities. Contractor shall be responsible for all costs associated with obtaining local approvals.

## **Part 2 Products**

### **2.1 GENERAL PRODUCT REQUIREMENTS**

- .1 All products and materials must meet or exceed the published specifications of the manufacturer.
- .2 Unless otherwise specified, all products and materials to conform to the specifications and requirements of all authorities having jurisdiction at the Place of Work. These include, but are not limited to, the Underwriter's Laboratories® (CUL), CSA, local and provincial Building Codes, the American Society for Testing Materials (ASTM), and all applicable trade association specifications. Where there is conflict between these requirements, the more stringent requirements apply.
- .3 Unless otherwise specified, products and materials are to be:
  - .1 New, of recent manufacture, and carry full factory warranty: used, reconditioned, previously installed, or repaired equipment or material are not acceptable. When allowed in the specifications, 'B'-stock or demo units are to be clearly identified as such at the time of bidding.
  - .2 The manufacturer's warranty must be valid in Canada. Products purchased from US distributors and warranties that are only valid in the US are not acceptable.
  - .3 Commercial grade (unless otherwise specified);
  - .4 Highly user friendly in operation;
  - .5 Designed to require a low level of maintenance;
  - .6 If operated from AC power;
    - .1 designed to operate from nominal AC power of 120 VAC & 208 VAC @ 60Hz;
    - .2 provide an approved AC cordset equipped with a suitable plug, an approved external power supply, or an approved means for making a hard-wired AC mains connection.
- .4 All switches and knobs are to be rated for high MTBF (mean time before failure) rate.
- .5 Consumables (i.e. lamps, fuse, or batteries) are to be readily available in Canada.
- .6 Provide all AC plug strips (power bars) required to power the supplied equipment.
- .7 Provide user licenses and passwords for all supplied software. These user licenses and passwords are to be registered under the name of the Owner or authorized representative.

### **2.2 PRODUCT ALTERNATES AND/OR SUBSTITUTES**

- .1 Reference Manufacturers and Products:
  - .1 Reference manufacturers and/or products are described herein as a minimum reference performance.

- .2 The Consultant may consider equivalent products only if it is of equal or better performance.
  - .3 During the bidding phase, the bidder shall submit to the designate contact in writing the proposed product equivalent and/or substitutes that meet and/or exceed the published performance specifications for the Consultant's review.
  - .4 Requests for equivalents and/or substitutes that constitute changes to the system design must be accompanied with a device interconnection and system flow chart diagram.
  - .5 After reviewing the submittal, the Consultant will either approve or not approve the proposed alternate product in an Addendum issued by the City to all bidders.
  - .6 Requests for review of alternate products will only be considered if submitted a minimum of five (5) business days (Monday to Friday) (120 hours) before the date of tender close.
  - .7 The Consultant or the Owner has the right to reject any product during the Shop Drawing stage that is found to be sub-standard or inferior in any way to the products specified in the published specifications.
- .2 Pre-Approved Manufacturers and Products:
- .1 Pre-approved manufacturers and products shall be used within the quotation. It is the discretion of the Consultant or the Owner whether equivalent or superior products may be used.
- .3 During the bidding phase, the bidder shall be responsible for ensuring that proposed product alternates and/or substitutes meet and/or exceed the published performance specifications.
- .4 The Owner reserves the right to request samples of equipment and a fully operational demonstration of all equipment being offered. These would be provided at no cost to the Owner.
- .5 If after Award, the Contractor substitutes any product without written permission, he shall be responsible for costs associated with supplying and/or installing products that will meet or exceed the specifications.

### **Part 3 Execution**

#### **3.1 SEQUENCE AND SCHEDULING**

- .1 The following timeline of installation is based on the proposed construction schedule as it is known to date. It is the responsibility of the Contractor to coordinate scheduling of all aspects of the A/V Systems installation with the GC and to confirm the exact date of completion. The expected schedule is as follows:
  - .1 Shop Drawings: Within 10 business days of award of contract.
  - .2 Start of A/V Cable Installation: 6 weeks prior to scheduled construction completion.
  - .3 Start of A/V Equipment and Cable Installation: July 31, 2015.
  - .4 Testing and Commissioning: October 1 – 7, 2015.
  - .5 Substantial Completion: October 8, 2015
  - .6 Owner Training: October 9-16, 2015.
  - .7 Submission of manuals and as-built drawings: within 10 business days of Substantial Completion.

- .2 The Contractor shall accommodate changes in the Base Building schedule if they should occur. If these changes will affect any of the above-mentioned deadlines, the Contractor shall immediately notify the General Contractor, the Architect, and the Consultant in writing.
- .3 Accomplish the majority of the Work during normal working hours, starting in the morning. Confine off-hours work to additional hours required to complete the Work to the agreed upon schedule.
- .4 The Contractor will be granted access to the site from 0700H to 1700H, five days a week. Upon request, the Owner may grant the Contractor additional access as required. Weekend and extended access must be pre-arranged with the Owner's Representative at least two working days in advance. Costs for opening and closing rooms out of standard operating hours will be borne by the Contractor.

### **3.2 PERMITS, FEES, TAXES AND INSPECTIONS**

- .1 Prior to execution of work, the Contractor shall obtain all necessary permits and licenses for compliance with Federal, Provincial and Municipal laws and regulations.
- .2 The Contractor shall be responsible for all permit, inspection, and re-inspection fees.
- .3 The Contractor shall pay for all associated taxes.

### **3.3 PAYMENT FOR SERVICES BY OTHERS**

- .1 Where, in the specifications, Contractor is required to arrange with others to have certain services carried out, or to have certain services performed, he shall allow for these in his tender and pay for any costs involved (e.g. the payment to the Consultant for transfer of manual drawings to electronic CAD format).

### **3.4 CONTRACTOR RESPONSIBILITIES**

- .1 Establishment and verification of dimensions, elevations, grades, boundaries shown on drawings and, reporting of any errors or inconsistencies to the Consultant before starting Work. Starting Work shall imply that the Contractor has verified all items and found them to be correct. Additional costs arising out of any subsequent rectifications shall be borne by the Contractor.
- .2 Co-ordinate work with other trades in an efficient and harmonious manner.
- .3 Take whatever measures are required to protect new and existing Communication equipment from damage due to dust contamination or construction work activity, to the satisfaction of the Consultant.
- .4 The Contractor is responsible for ensuring the infrastructure is not damaged during the installation process (i.e. improperly supported cable bundles).

### **3.5 PROJECT MEETINGS**

- .1 When requested, the Contractor shall attend coordination site meetings with the Project Manager, and/or Owner's Representative.

### **3.6 SHOP DRAWINGS**

- .1 Within ten (10) business days after award of contract, prior to ordering material and/or start of installation, The Contractor shall submit to the Consultant for approval:
  - .1 Printed copies of shop drawings
  - .2 One (1) soft copy of shop drawings (in electronic format)
  - .3 Product samples (if requested)



- .2 Shop drawings submittal shall include (but not be limited to):
  - .1 Equipment/material list in tabular format with following columns:
    - .1 Specification Reference number – indicating applicable section and paragraph number of the Specifications.
    - .2 Manufacturer – product brand
    - .3 Part number – clearly identifying the product (including any accessories, and equipment options).
    - .4 Brief Description of item
    - .5 Notes column – dedicated for Consultant's notes during review.
  - .2 Catalogue cut-sheets shall clearly indicate (using yellow highlighter pen or arrow) product part number, accessories, and options. Submit only information pertinent to the project. Advertising literature and brochures of general nature will be rejected.
  - .3 Single-line schematic drawings clearly showing the interconnection of all equipment including signal type; pictorial drawings are not acceptable.
  - .4 Proposed rack layout drawings;
  - .5 Drawings for custom-fabricated hardware, indicating layout, critical dimensions, finish, and textual legends.
  - .6 Detail drawings for mounting of projectors, displays, loudspeakers and loudspeaker suspensions with all wall, ceiling and/or overhead mount information certified by a Professional Engineer (Structural) registered in the Province of British Columbia. All cost associated with certification are to be included in the contractors bid submission.
  - .7 A description of all changes to the electrical, mechanical, or architectural aspects of the building that the Contractor has determined are necessary to achieve the installation and functional operation of the proposed systems.
  - .8 A description of all proposed deviations from the Specifications.
- .3 For each requested substitute, provide manufacturer's specification sheets and any other descriptive material required to demonstrate that the proposed item meets or exceeds the original specification. On such sheets listing several components or options, clearly identify the items you are proposing by using an arrow, circle, or other obvious notation. Clearly indicate all limitations or exceptions to the specification requirements. Clearly indicate the specification section, part, article, and paragraph for which you are proposing the product as a substitute
- .4 If a submittal is not complete, assume the cost for re-evaluation of subsequent submittals. These costs will be charged at the Consultant's prevailing charge-out rates.
- .5 By submitting shop drawings, product data, and samples, the Contractor signifies that he has carefully reviewed and verified materials, quantities, field measurements, and related field construction criteria. It also signifies the Contractor has checked, coordinated, and verified that all information contained with shop drawings, product data, and samples conforms to the requirements of the Work and of the Contract Documents.
- .6 Consultant's review of shop drawings does not infer any comment on quantities shown on the drawings. Shop drawing review does not relieve the Contractor of the responsibility of receiving required approvals from inspection authorities.
- .7 The Contractor shall not order or perform any portion of the Work requiring submittal and review of shop drawings, product data, or samples until the Consultant has approved the respective submittal.

### **3.7 DELIVERY, STORAGE, AND HANDLING**

- .1 All materials and equipment shall be new. Deliver and store materials in original, unopened packaging. Assume all packing, transportation, and insurance costs.
- .2 All packaging material must be removed from site at the Contractor's expense.
- .3 Ensure that all equipment and materials delivered to the site are received in writing by the Construction Manager or electrical superintendent. Neither the Consultant nor Owner is authorized to sign for receipt of goods.
- .4 Store materials in a safe and secure location, and protect against damage. Coordinate storage requirements with the general contractor, electrical superintendent, or Owner's representative.
- .5 Any equipment that is mounted on the floor, ceiling, and walls during the construction stage shall be protected from dust, dirt, and accidental breakage due to activity by other trades. All other equipment that does not need to be mounted ahead of time shall be mounted during the finishing stage of the Work.

### **3.8 COORDINATION ON SITE**

- .1 Coordinate and cooperate with other trades for timely accomplishment of installation including supply of special materials, rough-in information, and sequencing of work. Pay particular attention to the impact of the work of others that acceptance of an alternative product may create.
- .2 Coordinate and cooperate with other trades for timely accomplishment of system interfacing including supply of special materials, physical connections, testing, and adjusting.
- .3 Coordinate and cooperate with other trades for space needs and other needs to result in assemblies that are well integrated into the surrounding work.
- .4 The Contractor shall advise the Consultant of any specific equipment, materials, or installation that are non-conforming with laws, by-laws or regulations of authorities having jurisdiction.
- .5 Immediately upon discovering any apparent conflict between the Specifications and the drawings, or between two drawings, report the discrepancy to the Consultant for direction before proceeding with the affected work.
- .6 When requested, Contractor shall attend coordination site meetings with the Project Manager, Consulting Engineer, and/or Owner's Representative.
- .7 Coordinate with Owner to avoid disruption of business.

### **3.9 CLOSE-OUT SUBMITTALS**

- .1 There will be a \$5000.00 holdback, which will be released upon submission and approval of all closeout documents.
- .2 The Contractor shall submit to the Consultant for approval two (2) printed copies and two (2) electronic copies on USB flash drives of all Close-Out Submittals in AutoCAD 2012 or newer .DWG files as well as full-size versions in Adobe Acrobat PDF format.
- .3 Project Record Drawings including, but not limited to:
  - .1 Single-line schematic drawings showing signal flow through the system; show different signal types, along with level and impedance variations; indicate actual equipment installed both by a generic description (e.g.: "16-channel audio mixer") and the manufacturer and model (e.g.: "Sonic Arts MX-1601"); indicate input/output terminals using the same terminology and labelling scheme as that appearing on the actual equipment; indicate cable numbers using the same numbering scheme as that used to physically mark the cables; pictorial system

- drawings are not acceptable; drawings must be in black on white without any reliance on colour coding;
- .2 Equipment rack layout drawings;
  - .3 Wire run lists showing all cables identified by the actual designations affixed to each cable. Provide MS Excel compatible spreadsheet file in electronic manual;
  - .4 Pin-out schedules or diagrams for all special-purpose connectors;
  - .5 Layout drawings of custom-fabricated panels or boxes.
- .4 Operations Manual consisting of one or more permanent binders sectioned by tabs and containing:
- .1 Special operational instructions for the system as a whole (e.g.: start-up/shutdown procedures); provide typical procedures to activate each major system function;
  - .2 Copies of manufacturer's operating manuals for each unique piece of installed equipment or software;
  - .3 Brief operating instructions for custom-fabricated equipment;
  - .4 A manufacturer's warranty certificate for each unique piece of equipment; if warranties are required to be registered, supply a warranty registration form for each piece of equipment to be registered; failure to provide warranty registration materials, at a minimum, binds the Contractor to the same terms and conditions as the manufacturer would have had to meet had the warranty been registered; this in no way reduces any other warranty obligations of the Contractor under the Contract.
- .5 Maintenance Manual consisting of one or more permanent binders sectioned by tabs and containing the following separated sections, in order:
- .1 A table of contents;
  - .2 Contractor data consisting of a page listing names, addresses, phone and fax numbers, and any other relevant contact information, for both the Contractor and the Owner;
  - .3 A copy of this specification;
  - .4 A copy of all documents modifying the specification (e.g.: addenda, site memos, relevant correspondence, Change Orders, etc.); bind these in date order from earliest to latest;
  - .5 Overall system schematics; if the originals are large drawings, reduce them to one or more 'A'-size drawings to fit into the binder;
  - .6 Equipment list, broken down by system; for each line item, show the quantity provided, the manufacturer's name, the full model number, and a brief functional description (e.g.: "1x6 Video Distribution Amplifier "); this list should logically follow the overall system flow diagrams when read from left to right, first page to last;
  - .7 A list of consumables (e.g.: lamps, fuses, or batteries) required to keep the system operating over time, along with sources of supply (if not readily available);
  - .8 A recommended maintenance schedule followed by preventative maintenance and user-maintenance procedures, along with details on how to obtain service; include copies of sections from the applicable manufacturer's product manual's maintenance sections, along with any other maintenance procedures recommended by the Contractor; clearly highlight any maintenance procedures required by the manufacturer to keep the manufacturer's warranty in force; include a troubleshooting guide detailing the more common malfunctions;

- .9 Final settings of set-up and alignment controls electronic processors, and power amplifiers; tap connections of 70V components; configuration settings of all mode switches, DIP switches, screw-driver adjustments, and programmable hardware supplied under the Contract, if different from the factory default; configuration settings of all software supplied under the Contract;
- .10 All user IDs, account names, passwords, software license keys, and security codes associated with all equipment or software.
- .11 A table of all networked devices to show network settings and addressing. This includes but is not limited to device name, MAC address, IP address, subnet mask, and gateway. Provide MS Excel-compatible spreadsheet file in electronic manual.
- .12 Schematic drawings of all custom-fabricated equipment; schematic drawings showing all modifications to off-the-shelf equipment.
- .6 Control system programming documentation and source files: provide Crestron / AMX / Extron Code and ancillary programming files in electronic form on a USB drive, along with hard copy documentation of all programming, in accordance with the section 27 41 16 "CONTROL SYSTEM PROGRAMMING" All code must be received in both the compiled and uncompiled format. All modules must not be password protected. All code becomes the property of the Owner. VTP-Pro/ graphic files must also be provided. All programs and code become the property of the Owner.
- .7 DSP system programming documentation and source files: E.g., provide programming code and ancillary programming files in electronic form on a USB drive, along with hard copy documentation of all programming. If any passwords are in place in the DSP programming, these passwords must be provided. All programs and code become the property of the Owner.

### 3.10 TESTING AND COMMISSIONING

- .1 On-site tests to be conducted in the presence of the Consultant and the Owner's Representative(s) who may suspend or discontinue testing at any time if performance is unsatisfactory. Additional testing will be resumed when corrective action has been performed. Any additional costs incurred as a result of failed testing are the responsibility of the Contractor. During commissioning, provide all programming for full functionality to complete the intent of the Audio Visual systems.
- .2 Contractor shall provide all programming for full functionality. During commissioning, allow for coordination and possible modifications of the programming. Contractor must allow for up to (2) return visits for programming and modifications at no additional charge to the Owner.
- .3 Declaration of substantial performance is at the discretion of the Consultant and Owner.

### 3.11 WARRANTY

- .1 Warrant all supplied products, regardless of manufacturer, for a minimum of one year on parts and one year on labour without limitation other than those stated herein. This warranty is to apply to all equipment malfunctions not caused by abuse or misuse by the Owner or their agents. This warranty is to include all equipment modified by the Contractor, as well as, the modifications themselves.
- .2 Warrant all supplied software and firmware, regardless of manufacturer, for a minimum of one year without limitation other than those stated herein. During this period, provide all major updates and upgrades at no cost, whether normally charged for by the manufacturer or not.
- .3 Warrant the installation work for a minimum of one year on parts and one year on labour without limitation other than those stated herein. This warranty is to apply to all malfunctions directly attributable to faulty installation work or materials.

- .4 Warrant all supplied software and firmware, regardless of manufacturer, for a minimum of one year without limitation other than those stated herein. During this period, provide all major updates and upgrades at no cost, whether normally charged for by the manufacturer or not.
- .5 Warrant control system programming for a minimum of one year on labour without limitation other than those stated herein. This warranty shall apply to all bugs, glitches, or other program malfunctions directly attributable to programming errors. This does not include adding features after the final programming changes have been made (i.e.: changes made after the first month or two of full operation). This also does not apply to any programming changes made by third parties or by the Owner.
- .6 Begin the warranty period upon substantial completion of work or first beneficial use of system, whichever occurs first.
- .7 If any manufacturer's existing warranty on any supplied product is less than the terms specified herein, is prorated, or has limitations, extend the manufacturer's warranty to meet the requirements stated herein. Assume all costs associated with such warranty extension.
- .8 In the event that any manufacturers' warranties are for a longer term than specified herein, ensure that all such warranties are fully transferred to the Owner. Transfer of any warranty to the Owner must not, in any manner, diminish the Contractor's responsibilities as stated herein.
- .9 Submit manufacturer's warranty certificates and registration forms as required under the "CLOSE-OUT SUBMITTALS" article.
- .10 Nothing in any of these warranties is to limit any rights or remedies the Owner may otherwise have under the Contract with respect to defects in material and workmanship.

### **3.12 FINAL ACCEPTANCE**

- .1 Final Acceptance shall be granted upon resolution of deficiencies (if any) resulting from the Substantial Performance Review. In addition, the following stipulations must be met.
  - .1 The Contractor shall supply to the Owner and the Consultant a complete report of positive test results for approval and system acceptance.
  - .2 Submit to the Owner and Consultant, certificate stating that system is fully operational; and that meets all standard requirements as instructed in the contract documents and as required.
  - .3 Provide manufacturer's warranty certification or application documents as specified.
- .2 Provide all requirements as specified under the article "Close out Submittals".

### **3.13 SEISMIC RESTRAINT**

- .1 Obtain the approval of a professional engineer for drawings that detail the installation of suspended overhead equipment and seismic restraints. Provide these drawings in the shop drawings and as part of your Closeout Submittal. The cost of this professional service shall be included in the quotation amount.

### **3.14 PROTECTION**

- .1 During the installation phase, protect finished or unfinished work against damage or loss. In the event of such damage or loss, immediately replace or repair such work or equipment at no cost to the Owner.

**3.15 DAMAGE**

- .1 Where existing structure, grade or pavement is required to be removed, altered, or otherwise defaced to facilitate the installation, it will be Contractor's responsibility to arrange for such work.
- .2 Any equipment, structure, pavement, or grade damaged by the execution of this Contract will be repaired to its original condition. Any cost incurred for such work shall be at cost to Contractor.
- .3 Irreparably damaged equipment; structures, walls, surfaces etc. shall be replaced at cost to Contractor.
- .4 If the finish of new equipment, structures, walls, surfaces etc. is damaged by the Contractor, the Contractor, at the discretion of the Consultant, shall either replace or restore the equipment, structures, walls, surfaces etc. to its original condition by re-spraying, refinishing, etc. at no cost to the Owner.
- .5 Openings and cutouts shall not be burned into panels. Oversize openings shall not be patched up with loose plates or oversize washers. Oversized openings will be considered damage to the equipment and are to be treated as specified above.
- .6 The Contractor shall use extreme care when working near existing services and any services disturbed will be replaced at his cost to the satisfaction of the Consultant.

**-END OF SECTION 27 00 00 -**

## 27 41 16 AUDIO VISUAL SYSTEM

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**Part 1            General**

**1.1                SCOPE OF WORK**

1. Supply, fabricate, install, program, test, commission, and document a complete Audio Visual System for the Owner as described herein and on accompanying drawings.
2. Remove and uninstall existing AV systems and cables as required and return to Owner.
3. Rooms and systems shall include:
  1. City Council Chambers
  2. Committee of the whole meetings
  3. Council Chambers AV Production Room
  4. Council Chambers Separate Meeting Room
  5. Basement Server Room
  6. Video Production Suite
4. Provide all audio, video and control cables for video displays, speakers, input plates, touch screens, etc. All low voltage cabling must meet local building and fire codes.
5. Supply, deliver, fabricate, and install every product that is necessary and/or incidental to complete a fully operational system as described in these specifications. These include, but are not limited to all matching transformers, baluns, interfaces, adapters, converters, etc.
6. Supply, deliver, fabricate, and install all construction materials necessary and/or incidental to complete the Work. These include, but are not limited to equipment rack hardware, connectors, interconnects, adapters, brackets, mounts, AC power distribution bars, grommets, cable management hardware (lacing bars, cable ties, cable tie mounts, cable ID labels etc.), enclosures, equipment labels, shrink tubing, etc.
7. Provide close coordination with other trade contractors to facilitate installation Work. Extra costs arising from conflicts or delay due to improper bid shall be the responsibility of the AV Contractor.
8. Provide all equipment, personnel, and resources necessary to facilitate system engineering, installation, testing, documentation, end-user training, and after-sales service/support.

**1.2                SYSTEM DESCRIPTION**

- .1 The following paragraphs are intended solely to provide a functional description of the Audio Visual systems so that the Contractor has an understanding of the functional goals for the systems. Provide all hardware required to make these systems functional as per the description, the system drawings, and these specifications.
- .2 The Council Chambers shall be re-furbished to provide for a digitally compliant HD presentation system to conduct council, committee of the whole sessions as well as be used for day-to-day meetings. In addition, the system shall be designed to provide for multi-room capability as the facility will have a retractable wall installed that will separate the chambers into two separate and distinct functional areas.
- .3 Multi-room capability shall require all AV devices and programming to support room combine and independent room operation for all features of the AV system.
- .4 The Council Chambers video recording and production system shall be upgraded to HD format and shall be digitally compliant. The production recording system shall interface to existing broadcast, video streaming and archiving systems.



- .5 Existing Audio Visual system in the Council Chambers, video production area will be un-installed and replaced as required. AV conduit infrastructure shall be used, and where new or existing equipment is supplied, any existing AV cables shall be removed and new cables will be installed. Wherever AV systems cable infrastructure must be surface mounted due to site conditions the Contractor shall use conduit or appropriate Wiremold/PVC raceway.
- .6 System descriptions and functionality are as listed below.
  - .1 Supply and install a new HD (16:10 aspect ratio) phosphor laser projector and scaling room control receiver complete with anti-vibration ceiling mount system including ceiling flange, extension pole, and bracket/plate.
  - .2 Supply and install a ceiling mount electric 150" diagonal projection screen behind the valance at the front of the room.
  - .3 Supply and install a commercial grade wall mounted HD flat panel display and scaling room control receiver including wall mount and anti-theft security cable in the Council Chambers.
  - .4 New HD flat panel confidence display monitors shall be installed at councillor and city staff desk positions.
  - .5 Councillor and staff monitors shall connect to the AV matrix switch via Contractor supplied and installed HD and HDCP digitally compliant HDMI distribution units in conjunction with a digital room control scaler module.
  - .6 The HDMI distribution amps for the Council Chambers and staff desks shall be located in the local millwork for each desk location.
  - .7 The Contractor shall supply and install 2x1 HDMI switcher boxes in the millwork for each of the councillor stations c/w toggle switch that will allow users to select the display capabilities of the confidence monitors. Users shall select either their personal laptop as a display source or signal from the AV matrix. The selection of source shall be with an illuminated toggle switch (Contractor supplied and installed) that shall be wired so that the LED is illuminated when the switch position is for personal laptop display.
  - .8 The Contractor shall supply and install required patch cables for user laptops to connect to 2 x 1 HDMI switcher.
  - .9 Power for the LED illumination shall be from the 2x1 HDMI switcher power supply and the Contractor shall complete all wiring as required.
  - .10 The Contractor shall supply and install a new HDCP compliant modular digital audio video matrix presentation switcher to be installed into the AV equipment rack located in the server room. All outputs from the matrix shall be scaling type outputs.
  - .11 The Contractor shall integrate the audio output of the AV matrix switch to the facility DSP.
  - .12 The Contractor shall supply and install device UTP transmitters and receivers for interface to the digital audio video matrix for the council desk, staff desks, presentation podium, wall mount meeting room location and the video production suite.
  - .13 The Contractor shall supply and install a wireless video to HDMI Presentation Gateway module in the AV system rack in the server room. The presentation device shall be set up so that it can be used in either the separate meeting room or the Council Chambers or both. The device shall be configured to work on the facility WiFi and the Contractor shall coordinate with Owner forces to integrate.
  - .14 The Contractor shall supply and install a room scaling output receiver at the video production suite location for interface to the video production switcher. This will

- allow video content to be broadcast from the AV matrix switch over the video production/distribution system.
- .15 The Contractor shall interface the output of the production switcher located in the AV closet at the rear of the room to the AV video matrix located in the server room with a scaling UTP transmitter/receiver system with scaling.
  - .16 The Contractor shall supply and install and interface a video feed from the AV matrix switch to the Owner supplied web streaming equipment located in the server room. This will provide a mixed video feed for broadcast. The Contractor will liaise with Owner representatives to complete interface and confirm that web streaming of audio and video is complete and functional.
  - .17 The Contractor shall supply install and integrate a HD compliant picture in picture system for broadcast to flat panel display monitors on councillor and staff desks. PIP generator to be located in AV systems rack.
  - .18 The Contractor shall integrate Owner supplied CATV transmitter to the AV matrix switcher and shall provide for channel selection capability on the touch screen control system.
  - .19 The Contractor shall supply and install a touchscreen control system processor in the AV systems rack.
  - .20 The Contractor shall supply and install a tabletop touch screen control unit at the City Clerk desk position. All aspects of the AV system will be controlled by this touchscreen.
  - .21 The Contractor shall supply and install a tabletop touch screen control unit at the Mayor's desk position.
  - .22 The Contractor shall supply and install a wall-mounted touchscreen near the front entrance.
  - .23 The Contractor shall interface the touch screen control system processor to the existing facility lighting control interface to provide for control of the room lighting control system. Users shall be able to access room lighting scenes from the touch screen control units.
  - .24 The Contractor shall supply and install a new wireless count up, countdown control console and interface to two wall mounted countdown timer clocks.
  - .25 The Contractor shall supply and install 4 wall mounted HD compliant PTZ cameras with wall mounts in the Council Chambers.
  - .26 PTZ cameras shall interface to the production switcher located in the AV closet at the rear of the room. The cameras shall be capable of being controlled by the production switcher or be operated in automatic mode through the control system processor from the touch screens. Automatic mode shall provide the user the ability to record and web stream council meetings without an operator present.
  - .27 The Contractor shall supply and install a new production switcher in a rolling rack to be located in the AV closet at the rear of the room. The AV production switcher rack shall be provided with a minimum 12 foot umbilical cable that will allow the rack to be moved in and out of the closet. The cabling shall be dressed in a production style cable loom system. The production switcher rack shall house the PTZ camera control units and shall have a rack mounted drawer.
  - .28 The Contractor shall interface production switcher and the facility DSP Audio feeds to the existing Shaw video broadcast transmission system.
  - .29 The Contractor shall supply and install a HDMI distribution amp located at the production suite location for signal distribution to web streaming and AV matrix.

- .30 The Contractor shall supply and install a HD/SDI scan converter for interface of output of production switcher to Shaw video record/transmission system.
- .31 The Contractor shall supply and install a touch screen preview monitor for the production system. The touch screen monitor shall interface to the control system processor. The preview monitor shall be mounted to the rolling video production rack with a monitor mount.
- .32 The video production system must interface to the control system processor so that the system can be operated automatically from the touch screen system and provide for video production, recording, and web streaming independently.
- .33 The Contractor shall supply and install (1) new audio system DSP.
- .34 The Contractor shall integrate the DSP with the facility phone system so that teleconference sessions can be conducted using the new microphone/speaker conference system and broadcast over the speakers, as well as web streaming system.
- .35 The Contractor shall interface the DSP output to the production switcher location for interface to Shaw broadcast systems. The Contractor shall provide a local mixer that can provide for a variable balanced audio output as well as a balanced fixed audio output. Contractor shall coordinate with broadcaster to confirm level requirements.
- .36 The Contractor shall supply and install an audio distribution system at the press location in the Council Chambers.
- .37 The Contractor shall supply and install an audio distribution system with a rack mounted breakout panel at the production switcher location for audio distribution to the existing Shaw broadcast and distribution systems.
- .38 The Contractor shall liaise with Shaw personnel to ensure that the new video record and production systems integrate with existing Shaw broadcast and distribution systems.
- .39 The Contractor shall confirm that integration to existing broadcast and web streaming services is complete and all existing functions have been maintained.
- .40 The Contractor shall supply and install new ceiling mounted speakers.
- .41 The Contractor shall supply and install a new amplifier for room speakers.
- .42 Speakers shall be wired in zones so that each zone shall be able to have individual DSP control of level, equalization and dynamic control.
- .43 The Contractor shall supply and install a new PTT (push to talk) tabletop conference system located at council and staff desks, presentation podium, and Chamber of the whole sessions.
- .44 The Contractor shall wire the PTT system so that additional stations can be added to the system during committee of the whole meetings. During these sessions, portable tables shall be moved into position at the presentation podium location.
- .45 The PTT conference system shall be programmed so that individual stations can be turned on or off remotely. This will allow mayor or city clerk to remotely activate individual stations on a global or individual basis.
- .46 The PTT system shall have all functions controlled from the touchscreen control system panels. The panels shall provide for cue lists as well as the ability to have staff positions speak to topics by interjecting into the cue. The staff interjection capability shall not disrupt or displace the cue.

- .47 The PTT system shall be integrated to the facility phone system so that teleconference session can be conducted with and through the PTT system microphones and inherent speakers.
- .48 The Contractor shall integrate and install existing Owner supplied (3) wireless microphones and remote wireless antenna system. Interface to the facility DSP shall include appropriate noise gating so that spurious RF signal activation shall not broadcast over the PA system when the microphone transmitter is powered off and/or the base station remains on or in standby mode.
- .49 The Contractor shall supply and install PZM style archiving microphones into the council desk. The microphones shall interface to the existing Owner supplied DSP and the Contractor shall program this DSP so that it will send a mixed audio feed to the Owner's security digital recording system.
- .50 The Contractor shall supply and install a Presentation Podium Shotgun Microphone at the presentation desk. The facility DSP shall be programmed to provide for presentation capability from this microphone and the touchscreen control system shall have a presentation preset.
- .51 The Contractor shall supply and install a RF based hearing assistance system.
- .52 The Contractor shall supply and install a digital archiving recorder in the production room wall mounted rack. The archiving recorder shall receive its record feed from the AV matrix and all functions of the archiving recorder shall be controlled from the touchscreen control system.
- .53 The archive recorder shall be programmed so that staff will install a USB thumb drive and the recorder shall record council sessions.
- .54 All AV racks shall have rack mounted power bars.
- .55 The Contractor shall supply and install a wall-mounted rack in the AV production closet at the rear of the room.
- .56 The Contractor shall supply and install a floor standing rack in the basement server room for AV equipment.

## **Part 2 Products**

### **2.1 GENERAL PRODUCT SPECIFICATIONS**

- .1 Product features listed in product specifications are not necessarily the minimum requirement. All components in the A/V contractors bid must meet the requirements of specific reference product listed.

### **2.2 VIDEO COMPONENTS**

- .1 Unless otherwise specified, all digital video HDMI, DVI, DisplayPort signal processing, routing and management equipment to have a minimum bandwidth of 6.68 Gbps (1080p DeepColor). All digital video equipment must be compatible with HDMI V1.3 or later and be HDCP compliant.
- .2 All video components will meet local building codes and will be CSA and/or ULC approved with said marking clearly visible. The Contractor will be responsible for replacing all components found not to be CSA or UL-C approved. Or, the Contractor will be responsible for obtaining the CSA or UL-C approvals at no extra cost to the Owner.
- .3 Council Chambers Ceiling Mount Projector:
  - .1 1 Chip DLP;
  - .2 Laser Diode Light Source;

- .3 6500 Lumen Output;
  - .4 Native Resolution: 1920 x 1200;
  - .5 Aspect Ratio: 16:10;
  - .6 Inputs: SDI, HDMI, DVI-D, VGA;
  - .7 Control: Ethernet and RS-232;
  - .8 Provide zoom lens for throw distance shown in drawings;
  - .9 Provide ceiling mount brackets (offset mount may be required) and seismic restraints;
  - .10 Reference Product: Panasonic PT-RZ670 c/w lens (1.7 – 2.4:1) and ceiling mounting system (Anti-vibration mount, extension pipe and projector bracket) or equivalent.
- .4 Council Chambers Recessed Ceiling Mounted Electric Drop-Down Screen:
- .1 150" Diagonal 16:10 Aspect Ratio;
  - .2 Viewable Screen Area 54 9/16" x 87 3/8";
  - .3 Recessed ceiling mount;
  - .4 Matt White Screen Fabric;
  - .5 Plenum Rated screen case;
  - .6 Screen controller built into screen case;
  - .7 Screen Case: White;
  - .8 Coordinate screen black drop as required;
  - .9 Reference Product: Da-Lite Designer Contour Electrol or equivalent.
- .5 Council Chambers 80" LED Monitor:
- .1 80" LCD screen w. LED backlight;
  - .2 Aspect ratio 16:9;
  - .3 Native Resolution: 1920 x 1080;
  - .4 Inputs: VGA, HDMI;
  - .5 Control: RS-232 and Ethernet (with PNZB01);
  - .6 Device must be rated for and carry commercial use warranty;
  - .7 Provide wall mounting brackets c/w security cable system and seismic restraints;
  - .8 Reference Product: Sharp PNE 802 c/w optional PNZB01 or equivalent to be installed with appropriate wall bracket security cable kit and seismic restraints.
- .6 Council Chambers Tabletop Display Monitors:
- .1 Screen image area: 21.5" diagonal;
  - .2 Resolution: 1920 x 1080 (1080p) ;
  - .3 LED Display;
  - .4 Aspect Ratio: 16:9;
  - .5 VESA (100mm) mounting holes;
  - .6 Inputs: HDMI, VGA;
  - .7 Screens to be installed on Council Chambers and staff desk locations;

- .8 Screens to be connected to 2x2 switcher with HDMI cable; and
- .9 Reference Product: Dell S2240L or equivalent.
- .7 32 x 32 Digital Video Matrix Switcher:
  - .1 32 x 32 digital video cardframe that accepts Crestron DigitalMedia (DM) input and output cards;
  - .2 Provide digital video, analog video, and Crestron DM input cards as required and as indicated in the drawings;
  - .3 Provide output card(s) with the following minimum configuration: (8) DM-CAT 8 G, (4) HDMI and stereo analog audio outputs;
  - .4 Cardframe will have a built-in Gigabit Ethernet port and switch;
  - .5 Built-in EDID format management to prevent conflicts arising brought about by assigning an HD source to multiple displays;
  - .6 Built-in Quickswitch HD technology that hastens the HDCP handshaking process between a source and multiple displays; This allows for almost instant switching between protected HD sources and displays;
  - .7 Built-in HDCP key management to allow users to identify the number of HDCP keys a particular HDMI source can handle at a time;
  - .8 Built-in HDMI CEC signal management to prevent unwanted CEC control signals from interfering with the main remote control system;
  - .9 Matrix switcher will support digital video resolutions of up to 1080p DeepColor;
  - .10 Unit to be installed in AV Rack in basement data room.
  - .11 Reference Product : Crestron DM-MD 32 x 32 DigitalMedia Matrix Switcher complete with Model DMC-DVI, DM-8G, DMC-DVI, DMC-SDI, DMC-C, DMC-HD, DMC-VID-RCA-A,DMCO input and output cards or equivalent.
  - .12 Provide security cover for this device.
- .8 Digital Media Receiver / Controller /Scaler:
  - .1 Inputs: DM 8G+ signal transported through Crestron DM cable;
  - .2 Video Outputs: HDMI, DVI;
  - .3 HDCP Compliant;
  - .4 Control Outputs: RS232, Relay and IR control ports;
  - .5 Built in Ethernet to connect to Owner's LAN;
  - .6 Install receivers at displays on rear wall and overflow area
  - .7 Install receivers in council desk millwork, at the projector, at the wall mounted 80" display, at the video production suite location area
  - .8 Reference Product: Crestron DM-RMC-SCALER-C or equivalent.
- .9 Council Chambers Digital Media Transmitter:
  - .1 Inputs: HDMI, VGA with stereo audio, USB
  - .2 Output: Crestron Digital Media 8G+;
  - .3 Chassis: two-gang wall plate;
  - .4 Install transmitters on desks at the Council Chambers desk, staff desk, presentation podium, at 80" wall mounted display location.
  - .5 Reference Product: Crestron DM-TX-200-C-2G

- .10 Production Suite Digital Media Transmitter:
  - .1 Inputs: HDMI, VGA with stereo audio, USB
  - .2 Output: Crestron Digital Media 8G+;
  - .3 Install transmitter at video production suite.
  - .4 Reference Product : Crestron DM-TX-201-C
- .11 HDMI 1 x 2 Distribution Amplifier:
  - .1 Inputs: HDMI;
  - .2 Output: HDMI;
  - .3 Resolution: 1920 x 1080 or 1080p up to 1920 x 1200
  - .4 Built in EDID minder
  - .5 Built in key minder
  - .6 HDCP compliant
  - .7 Chassis: Metal enclosure with rack mount kit ;
  - .8 Install distribution amp in desk millwork;
  - .9 Connect confidence monitors to HDMI distribution amp using Extron HDMI cable.
  - .10 Reference Product: Extron HDMI DA2 or equivalent.
- .12 HDMI 1 x 6 Distribution Amplifier:
  - .1 Inputs: HDMI;
  - .2 Output: HDMI;
  - .3 Resolution: 1920 x 1080 or 1080p up to 1920 x 1200
  - .4 Built in EDID minder
  - .5 Built in key minder
  - .6 HDCP compliant
  - .7 Chassis: Metal enclosure with rack mount kit;
  - .8 Install distribution amp in desk millwork;
  - .9 Connect confidence monitors to HDMI distribution amp using Extron HDMI cable.
  - .10 Reference Product: Extron HDMI DA6 or equivalent.
- .13 2 x 1 HDMI Switcher:
  - .1 Inputs: HDMI
  - .2 Output: HDMI;
  - .3 Resolution: 1920 x 1200 or 1080p
  - .4 HDCP Compliant;
  - .5 EDID Minder;
  - .6 Control: RS-232, IR, Contact Closure;
  - .7 Chassis: Metal enclosure;
  - .8 Install switchers in council desk millwork;
  - .9 Provide HDMI to mini display port for connection of Owner's laptops; and

- .10 Reference Product: Extron SW2 HDMI or equivalent c/w 6' mini display port to HDMI adapter cable (Extron part # 26-679-06) or equivalent.
  
- .14 HD Picture In Picture Generator:
  - .1 Inputs: DVI-D
  - .2 Output: DVI-D;
  - .3 Resolution: 1920 x 1200 or 1080p
  - .4 Control: RS-232
  - .5 Chassis: Metal enclosure; and
  - .6 Reference Product: TVONE 1T-C2-750 or equivalent.
  
- .15 Wireless Video To HDMI Presentation Gateway:
  - .1 Output: HDMI, VGA;
  - .2 Resolution: up to 1920 x 1080 or 1080p
  - .3 Control: Ethernet RJ/45
  - .4 Install device in AV rack in basement server room. Coordinate with facility IT staff to integrate functional capability on the facility Wi Fi.
  - .5 Reference Product: We Present WiPG-1000 or equivalent.
  
- .16 Wall Mount Wide Angle HD PTZ Camera:
  - .1 Image Sensor: ½.8 type Exmor CMOS
  - .2 Output: HDMI, HD-SD;
  - .3 Zoom: 12x optical
  - .4 Control: RS-232
  - .5 Install cameras (2) in Council Chambers and universal CCU controller at production suite location; and
  - .6 Reference Product: Vaddio Roboshot 12 w. wall mount and Quick Connect Universal CCU or equivalent.
  
- .17 Wall Mount Zoom HD PTZ Camera:
  - .1 Image Sensor: ½.8 type Exmor CMOS
  - .2 Output: HDMI, HD-SD;
  - .3 Zoom: 30x optical
  - .4 Control: RS-232
  - .5 Install cameras (2) in Council Chambers and universal CCU controller at production suite location; and
  - .6 Reference Product: Vaddio Roboshot 30 w. wall mount and Quick Connect Universal CCU or equivalent.
  
- .18 Rack Mount Universal Camera Control Interface Unit:
  - .1 Adjustments for: Red, Blue gain, Iris, Chroma, Brightness, OPWB, Gamma Shutter, Image Stabilization, Noise Reduction;
  - .2 Output: HDMI, HD-SDI, SDI;
  - .3 Control: RS-232



- .4 Install CCU controller at production suite rack location; and
- .5 Reference Product: Vaddio Quick Connect universal CCU or equivalent.
  
- .19 Video Production Switcher:
  - .1 Inputs: 5 x HD/SDI, 1 x DVI-I/D
  - .2 Output: HDMI, HD-SDI;
  - .3 Control: RS-232
  - .4 Chassis: Metal enclosure;
  - .5 Install switcher in production suite rack location; and
  - .6 Reference Product: Vaddio Production HD-SDI MV c/w rack mount kit or equivalent.
  
- .20 Video Production Preview Monitor :
  - .1 Inputs: DVI-D
  - .2 Resolution 1080p
  - .3 Screen Image: 22" diagonal
  - .4 Control: RS-232
  - .5 Touch screen type: 5 wire resistive touch
  - .6 Install monitor in production suite rack location c/w monitor mount and security cable; and
  - .7 Reference Product: Vaddio Tele Touch 22" c/w or equivalent.
  
- .21 HD/SD-SDI to SDI/Digital Down Converter:
  - .1 Inputs: HD/SDI
  - .2 Output: 2 x HD SDI, 1x SDI, Composite;
  - .3 Install converter at production suite location; and
  - .4 Reference Product: AJA HD10MD3 or equivalent.

## **2.3 AUDIO COMPONENTS**

- .1 Conference Discussion System:
  - .1 Controls Up To 40 Discussion Stations;
  - .2 Integrated PC w. Pre-Installed Software;
  - .3 Ethernet control;
  - .4 Dual output ports
  - .5 Ability to remotely cue or mute individual discussion stations;
  - .6 Integrate all internal software functions to touch screen control system;
  - .7 Provide for control programming information so that the PTT system can integrate with PTZ camera system so that non operator assisted meetings can be recorded and streamed to the web;
  - .8 Control processor to be installed in AV systems rack, and chairman and delegate stations to be installed in Council Chambers; and

- .9 Reference Product: Sennheiser ADN CU1 with ADN C1 (Chairman Station), and D1 (Delegate Station).
- .2 Wireless Hearing Assistance System:
  - .1 Modulation: Wideband FM;
  - .2 72 MHz or 216 MHz bandwidth;
  - .3 Rack mountable transmitter;
  - .4 Wall mount antenna kit;
  - .5 Portable RF Digital Receivers (4 minimum) w. Ear Speaker
  - .6 Unit to be installed for Council Chambers – wireless antenna to be installed at or near AV production closet door; and
  - .7 Reference Product: Listen LS-03
- .3 Presentation Podium Shotgun Microphone:
  - .1 Dual Section Flexible Gooseneck;
  - .2 XLR Output;
  - .3 Operating Voltage; 12 – 48V phantom power (stand alone): 13.8 V DC;
  - .4 Length 400mm
  - .5 Reference Product: Sennheiser MZH3042 w. ME36 Capsule and MZS31 Shockmount
- .4 Backup Microphone:
  - .1 Hemispherical Polar Pattern;
  - .2 Low frequency roll off;
  - .3 Mounts to standard single gang wall plate;
  - .4 Reference Product: AKG PZM 11 or equivalent.
- .5 Facility DSP Processor w. Telephone Hybrid:
  - .1 12 Analog Inputs;
  - .2 8 Analog Outputs;
  - .3 8 Channels AEC Processing;
  - .4 Ethernet/RS-232 Control;
  - .5 Expandable on AVB;
  - .6 DSP control processor to be installed in AV systems rack; and
  - .7 Reference Product: Biamp Tesira Forte AVB VI
- .6 Ceiling Mount Speakers:
  - .1 Coaxial Speaker;
  - .2 6.5" Cone Driver, 1" Compression Driver
  - .3 Frequency Response: 80Hz – 20 kHz +- 5dB;
  - .4 Sensitivity: 94 dB SPL 1W/1m
  - .5 Nominal Impedance: 8 Ohms;
  - .6 Dispersion: 115° conical
  - .7 Devices to be installed in Council Chambers; and

- .8 Reference Product: Community D6 or equivalent.
- .7 Audio Distribution Amplifier:
  - .1 Stereo Audio w. 8 outputs, Mono Audio w. 16 outputs;
  - .2 Frequency Response: 10Hz – 35 kHz +/- 0.01dB;
  - .3 Input Impedance: 20kΩ balanced or 10kΩ unbalanced
  - .4 Output Impedance: 150Ω balanced,
  - .5 Crosstalk: < -85dB (20Hz to 1 kHz) <-70 dB (1kHz to 20 kHz);
  - .6 Devices to be installed in AV equipment rack in basement server room, Mic level outputs are to be sent to floor box at press station and hearing assistance system; and
  - .7 Reference Product: RDL RU-ADA8D
- .8 Audio Mic/Line Mixer:
  - .1 4 Channel Mic/Line input;
  - .2 Frequency Response: Mic 80 Hz – 30 kHz +/- 1.5dB; Line 20Hz 0 30 kHz +/- 0.25 dB;
  - .3 Output: Mic/Line Switchable,
  - .4 Rack Mountable;
  - .5 Device to be installed in AV equipment rack in production suite;
  - .6 Reference Product: RDL RU-MX4 c/w rack kit or equivalent.
- .9 Archive Unit:
  - .1 Simultaneous record and stream capability;
  - .2 Supports resolution up to 1920 x 1200;
  - .3 HDCP compliant;
  - .4 EDID Minder;
  - .5 Inputs: HDMI, Component HD, Composite;
  - .6 Output: HDMI;
  - .7 USB Storage port;
  - .8 Control: RS-232, Ethernet;
  - .9 Device to be installed in AV equipment rack in production suite; and
  - .10 Reference Product: Extron SMP 351 or equivalent.
- .10 4 Channel Power Amplifier 70V:
  - .1 Fan Cooled;
  - .2 1 RU Height;
  - .3 Amplifier Type: Class D;
  - .4 Independent power supply for each channel;
  - .5 Inputs: Phoenix style screw terminal;
  - .6 Power Outputs: 250W (RMS) 70V per channel;
  - .7 Unit to be installed in AV rack in server room; and
  - .8 Reference Product: TOA DA-250FH

- .11 Balance Line Converter:
  - .1 Mix two signals to mono balanced;
  - .2 Combine stereo into mono with balanced output;
  - .3 Unbalanced to balanced conversion without gain;
  - .4 Unit to be installed in AV rack in server room; and
  - .5 Reference Product: RDL TX-J2 or equivalent.

## 2.4 CONTROL COMPONENTS

- .1 System Control Processor:
  - .1 Cresnet Port
  - .2 10/100 Ethernet
  - .3 Room View Enabled
  - .4 3 Com Ports (RS-232/422/485)
  - .5 8 IR/Serial Ports
  - .6 8 Verisport I/O Ports
  - .7 8 Low Voltage Relay Ports
  - .8 Install processor in AV Rack
  - .9 Processor to integrate to existing Crestron lighting interface control panel so that lighting scenes can be controlled from touchscreen units.
  - .10 Reference Product: Crestron CP3
- .2 Wireless Count Up, Countdown Timer System:
  - .1 Count Up/Down Timer Control System
  - .2 2.4 GHz Wireless
  - .3 Four Digit Display Clocks w. 5" Digits
  - .4 Install control processor at Council Chambers Desk, Clocks (2) on front and back wall
  - .5 Reference product: Alzatex ALZM07A w. TMR218B6BK-RF2 , DSP502B clocks w. RFXM04A and CSA/CUL compliant 12VAC, 20VA transformer
  - .6 Contact: [www.alzatex.com](http://www.alzatex.com)
- .3 10" Wired Tabletop Touchscreen Panel
  - .1 10.1" Touchscreen Display;
  - .2 1280 x 800 resolution;
  - .3 Panels to be tabletop mounted on Council Chambers desk at mayors and city clerk's location
  - .4 Reference Product: Crestron TSW 1050 w. tabletop mount.
- .4 10" Wired Wall Mount Touchscreen Panel
  - .1 10.1" Touchscreen Display;
  - .2 1280 x 800 resolution;
  - .3 Panels to be wall tabletop mounted on Council Chambers desk at mayors and city clerk's location

- .4 Reference Product: Crestron TSW 1052 w. mounting kit.
- .5 1-Button Switch For 2 x 1 Switcher
  - .1 LED Illumination;
  - .2 Mount switch at councillor station. Device illumination to indicate display source. Confirm location of switch with Owner's representative prior to install.
  - .3 Reference Product: Extron AAP 100 w. LED Latching Switch (70-407-11) and blank plate.

## 2.5 MISCELLANEOUS COMPONENTS

- .1 HDMI Cable to 75':
  - .1 Type: High Speed Cable;
  - .2 Supports 1920 x 1200 @ 60Hz and 1080p/60 up to 75 feet without a cable equalizer;
  - .3 Data Rate to 4.95 Gbps;
  - .4 Refresh rate to 60 Hz;
  - .5 Cable to be used for interconnect of HDMI signals in Council Chambers; and
  - .6 Reference Product: Extron HDMI Pro Series
- .2 HDMI Cable to 200':
  - .1 Type: High Speed Cable;
  - .2 Supports 1920 x 1200 @ 60Hz and 1080p/60 up to 200 feet with a cable equalizer (Extron model HDMI 101);
  - .3 Data Rate to 4.95 Gbps;
  - .4 Refresh rate to 60 Hz;
  - .5 Cable to be used for interconnect of HDMI signals in Council Chambers; and
  - .6 Reference Product: Extron HDMI Pro Series
- .3 HDMI to Mini Display Port Cable 6':
  - .1 Type: HDMI to Mini Display Port;
  - .2 Supports 1920 x 1200 @ 60Hz and 1080p/60;
  - .3 Adapter to be used for interconnect of user laptop to HDMI switcher located in council chamber millwork.; and
  - .4 Reference Product: Extron HDMI to Mini Display Port 6' Cable 26-679-06 or equivalent.
- .4 Production Suite AV Audio Output Plates:
  - .1 Black Anodized Aluminium Finish
  - .2 2 x XLR Connectors
  - .3 5 x BNC Connectors
  - .4 1 x USB Female Connector
  - .5 Device to be installed at Video production suite
- .5 Press Feed AV Audio Output Plates:
  - .1 Stainless Steel 2 Gang Plate

- .2 2 x XLRF Connectors
- .3 Devices to be installed in floor box at Press desk in Council Chambers.
  
- .6 Rack Mounted Power Bar.
  - .1 2 Stage Surge Suppression
  - .2 9 Outlets 1 Front, 8 Rear
  - .3 1 RU height
  - .4 LED Power Indication
  - .5 Unit to be installed in AV production suite mobile rack;
  - .6 Reference Product: Middle Atlantic PDC915
- .7 Flat Panel Wall Mount:
  - .1 Maximum Load: 200 lb;
  - .2 Distance From wall 2.63";
  - .3 Units to be used for flat panel displays in rooms; and
  - .4 Units to be installed in Council Chambers
  - .5 Reference Product: Chief LSM1U series c/w security cable for display monitor or equivalent.
- .8 Projector Mount:
  - .1 Maximum Load: 50 lb;
  - .2 Roll 4°, Pitch 25°, Yaw 360°;
  - .3 Units to be installed in Council Chambers
  - .4 Reference Product: Chief RPAU series c/w CMA 345T anti – vibration mount and extension pipe or equivalent.
- .9 AV Production Rolling Rack Preview Monitor Mount:
  - .1 Maximum Load: 45 lb;
  - .2 Tilt: +5°, -15°;
  - .3 Units to be installed in AV production rolling rack c/w mounting plates as required;
  - .4 Reference Product: Chief FTR4100 or equivalent.
- .10 AV Production Suite Wall Mount Rack:
  - .1 Reference Product: Middle Atlantic DWR 12-22 or equivalent.
- .11 AV Production Suite Rolling Rack:
  - .1 Reference Products: Middle Atlantic PTRK 14 c/w rack mounted power bar (PDC 915) and 2 RU drawer (D2) and Vaddio 998-5000-100 or equivalent.
- .12 AV Rack For Basement Server Room:
  - .1 Reference Products: Middle Atlantic ERK 4425 c/w rack mounted power bar (PDT series) or equivalent.

**Part 3 Execution**

**3.1 INSTALLATION GENERAL**

- .1 Coordinate all aspects of installation work and schedules with the Owner or Owner Representative.
- .2 The Contractor shall install all audio visual components.
- .3 Installed equipment shall be easily accessible for cleaning, adjustment, replacement, and routine maintenance, have proper ventilation, and shall provide safety and convenience for the operator.
- .4 All boxes, conduits, cabinets, equipment, and related wiring shall be firmly mounted in place. Mounting shall be plumb and square.
- .5 Care shall be exercised in wiring the systems to avoid damage to cables and equipment. All joints and connections shall be made with rosin core solder or with mechanical connectors. Crimp type connections shall be accomplished with manufacturer recommended ratchet type crimping tools. Cables shall be free of splices between terminations at the specified equipment. Unused conductors, shields, or drain wires shall be dressed under heat shrink tubing, not cut.
- .6 Wires and cables shall be formed into harnesses that are tied and supported in accordance with accepted engineering practice. Care shall be taken to bundle and secure all cables that interconnect electronic devices integral to the exhibit with destinations outside the exhibit. Where applicable, ensure harnessing and bundling of cables accommodates movement of exhibit on casters to provide access to the rear or interior of the exhibit.
- .7 Harnesses cables shall be combed straight. Harnesses with intertwining members are unacceptable. Each cable that breaks out from a harness for termination shall be provided with a service loop. Cables shall be formed in either a vertical or a horizontal relationship to equipment, controls, components, or terminations.
- .8 Terminal blocks or connectors shall be provided for all cables that interface with racks, cabinets, consoles, or equipment modules. All control panel cables shall be terminated on their own terminal strip in the rack, all bussing of the cables shall be done on the controller side of the terminal strip.
- .9 Unless specified by make and model in the design package the use of gender adapters, video or audio connection adapters, and prefabricated, molded, or modular connecting cables are prohibited for use in these systems. The low quality generic cables that are shipped with players are prohibited.
- .10 Follow manufacturers' instructions for installing, operating, configuring, and programming their equipment. Do not perform modifications to equipment that would void its warranty.
- .11 Install and terminate all cables, and interconnect all equipment and components in accordance with approved drawings. Install AV cover plates and faceplates onto all boxes.
- .12 All audio, video, and control system signal cables shall be free from kinks, sharp bends, tears, stress, etc. that could degrade their performance.
- .13 All set-up, programming, and calibration of A/V components to be included by the Contractor.
- .14 Appropriate test equipment and test software to be supplied by the Contractor.
- .15 Install, calibrate and program fully working Audio/Video System, please adhere to all requirements in section 27 00 00.

### **3.2 VIBRATION CONTROL**

- .1 Where projectors, flat panel displays, PTZ cameras, ceiling mounted document cameras and wall or ceiling mounted projection screens are supplied and installed contractors are to mount devices so that environmental vibration shall not affect the projected image.

### **3.3 SETUP OF VIDEO DISTRIBUTION SYSTEMS**

- .1 The following paragraphs represent guidelines for the setup of the video distribution system only. They are intended to reflect the general video distribution philosophy, the design intent, and the minimum overall requirements. The Contractor is expected to provide fully functional system that maximizes performance while maintaining ease of use.
- .2 The philosophy of the video distribution design is to be simplicity of use while providing high quality images to the video displays. For example, when a laptop computer is plugged into a video input, the video image shall automatically fill the screen at a high quality, predetermined resolution. Manual adjustments to the video resolution output of the laptop should be the exception and not the rule.
- .3 **EXTENDED DISPLAY IDENTIFICATION DATA (EDID)**
  1. It is critical that an EDID strategy be predetermined for all digital video sources connected into the video distribution network to ensure that all video sources can be displayed in a high-resolution format that is compatible with each display. The AV Contractor shall devise an EDID plan for all video inputs.
  2. Whenever possible, ensure that the EDID minder on the switching hardware is set for each video source to match the native resolution of the primary video display. The primary display is defined as the central point of focus for most users of the system. If it is not clear which video display is the primary display, contact the Consultant for clarification.
  3. EDID management for laptop table or wall inputs requires special attention to support a wide variety of user devices with a variety of native resolution. The EDID timing table for these inputs shall set to 1280 x 720, progressive, 60 Hz ("720p").
  4. On systems with video outputs to devices with resolution that are not compatible with the primary video display native resolution and/or 720P, provide a scaler on the output of the video distribution unit to allow the native resolution to be displayed on these devices. Some common scenarios where this occurs are small size preview monitors and sending content to videoconferencing codecs.
- .4 **HI-BANDWIDTH DIGITAL CONTENT PROTECTION (HDCP)**
  1. When using video sources like Blu-Rays, Cable Boxes and Satellite Receivers with HDCP encrypted video, ensure that the HDCP encryption remains intact throughout the distribution chain.
  2. All video distribution hardware shall be able to manage the HDCP authentication and key exchange. All video switch hardware shall manage and maintain continuous encryption between sources and outputs to prevent the renegotiation of HDCP when video is switched. Video switch hardware shall also allow a single video source to be displayed to multiple video displays regardless of the number of HDCP keys provided by the source.
  3. If non-HDCP compliant output devices are part of the AV system, the control system and video switch must be programmed to minimize HDCP incompatibilities. Non-HDCP compliant devices may include Videoconference Codecs, IP streaming devices, and broadcast devices. When a user selects an operation mode that involves a non-HDCP compliant output, the HDCP handshake should be disabled for sources that are likely to be routed to the non-



HDCP output. For example, some video devices like Mac PCs will encrypt all video with HDCP when they are connected to HDCP compatible video displays even if the content that is being sent to the display is not HDCP encrypted. In this scenario, when a user begins a videoconference, the HDCP handshake on the Mac PC input shall be disabled otherwise a blank screen will be displayed. Note: HDCP encrypted material will not be viewable on any non-HDCP compliant devices and will not be displayed if the HDCP handshake is disabled.

.5 COLOUR SPACE

1. To maximize the speed of switching between inputs and to ensure that colours are uniform on displays when switching between video and PC sources set "Colour Space" to RGB on the setup menu for all video sources (i.e. Blu-Ray DVD and Cable Boxes).

**3.4 CONTROL SYSTEM GENERAL**

- .1 The control system is integral to the operations of the AV system. The systems will require the capability to operate multiple sources, display devices production record and archiving systems and interface to lighting control systems. Crestron touch panel control systems will be used to control the AV systems.
- .2 The AV Contractor will attend (4) control system programming meetings at the Owner's office. These meetings shall be focused on the Graphical User Interface (GUI) and will be as follows:
  1. A (2) hour meeting to discuss Owner GUI requirements;
  2. Three (2) hour meetings to review suggested touchscreen layouts for the various spaces.
- .3 Prior to each meeting the Contractor shall supply to the consultant a mock-up of the proposed GUI for review.
- .4 The meeting with the Owner shall proceed after the consultant has reviewed and approved the GUI design.
- .5 Any changes from the consultant review must be included and checked by the consultant before meeting with the Owner.
- .6 All mock-ups shall include colour PDF files showing the proposed graphical layout and nomenclature for each touchscreen page for each unique touchscreen.
- .7 All mock-ups shall also include a Windows executable file of the GUI that will allow the Owner and/or its representatives to run a simulation of the panel functionality on the Owner's computer (i.e. created using Simulation Mode in Crestron's Vision Tools software).
- .8 These touchscreen layouts will be reviewed by the Consultant and be accepted or rejected. The consultant will provide comments for revision on rejected screen layouts. All touchscreen layouts require acceptance from the Consultant prior to the installation of the control system programming.
- .9 Prior to installation, the AV Contractor shall present to the Owner or Owner's representative a final mock-up for review, feedback, and approval. The final mock-up shall include PDF copies of GUI touchscreens and a Windows executable file as outlined above.
- .10 After installation, the Owner shall use the system for a period of 60 days to obtain information on system functionality. At the end of the sixty (60) day period, the Owner shall provide the AV Contractor feedback on minor change requirements and the AV Contractor shall provide programming service to affect changes. The Contractor should allocate time and materials for up to 3 return visits to complete Owner changes.

### 3.5 CONTROL SYSTEM PROGRAMMING

- .1 The following paragraphs represent guidelines for the touch panel programming only. They are intended to reflect the general control philosophy, the design intent, and the minimum overall requirements. The Contractor is expected to provide a complete state-of-the-art touch panel interface.
- .2 The philosophy of the touch panel interface design is to be simplicity and intuitiveness – "one button per task." For example, pressing a button marked "PC" may: turn on the video projector; select matrix video switcher input and output, select DSP audio input; and preset volume control.
- .3 Once the set-up requirements for a presentation type have been completed, the panel is to display basic operating controls for the selected presentation device, along with buttons to allow the user to jump directly to another presentation type without needing to back up one or more level.
- .4 The touch panel pages are to be arranged in descending layers of complexity such that a basic user only sees basic functions, and more complex control for advanced users or technical staff is only revealed by drilling down to a deeper level.
- .5 A sleep mode is to turn off the panel illumination after an adjustable period of inactivity (initially set to 5 minutes). Once asleep, touching the panel brings it back to life without changing screens.
- .6 Button nomenclature is to be simple and unambiguous. Except for standard transport controls (i.e. fast forward, rewind, play, pause, etc.) or DVD menu navigation controls, icons are not to be used alone without text. Button highlighting (i.e. to indicate the active state) is to be immediately obvious (e.g. change button background to contrast with the inactive state).
- .7 Power On Screen:
  1. Display the facility logo and a button to access a panel adjustment/set-up page. Touching this screen anywhere other than the set-up button causes the default "Main Control Page" to display.
  2. If a set of maintenance pages is required, the main page is to be accessed from this screen. This access must be password protected.
  3. Reset all devices to a predefined idle state.
- .8 Activity Selection: When an activity is selected such as "Laptop Presentation", the panel should automatically default to a sub-control page, which allows full control of devices. The following controls will always be available on all of the Activity Pages:
  1. Audio Volume Level (Up/Mute/Down);
  2. Return button (return to previous page, when needed);
  3. Manual Control (takes the user to the manual control page to manually operate certain elements of the AV system such as projector, microphone levels, etc.);
  4. All Operating Mode choices (on tabs across the top part of the touch panel);
  5. A Help button (when pressed, the touch panel will send the user to a Help Page that contains the contact information of the resident AV technician).
- .9 Power Off Button: Display a power off button on all system mode screens. When this button is pressed a pop up display should ask if the user is sure they want to turn the system off with a "YES" and "NO" button option. This will ensure that the user can easily turn off all aspects of the system without accidentally shutting off the system and having to wait while the projector goes through its cool down period. When "YES" is selected, all aspects of the AV system should turn off automatically.

- .10 Setup Page: At a minimum, provide the following functions:
  - 1. Timer duration for the screen sleep mode;
  - 2. Audible key click on/off and key click volume (if supported by the screen).

### 3.6 TOUCH PANEL GUI PROGRAMMING GUIDELINES

- .1 Note: This guideline is not a definitive instruction on how to program the remote control system. Its objective to provide a conceptual guideline to the Contractor on how the control system should perform based on Owner feedback. It is the responsibility of the Contractor to take the information provided and combine it with their practical engineering experience to develop a fully functional program that will satisfy the needs of the Owner for a simple and easy to operate AV system. Coordination between Contractor and Consultant is mandatory during the programming stage.
  - .1 Main Control Page: This page will be representative of requirements for the following system modes that the user can select:
    - .1 Source Selection including all Input Plates;
    - .2 Input to Output Selection;
    - .3 Room Lighting; and
    - .4 Mic Setup Page
    - .5 Room Combining Capabilities
    - .6 Independent Room Operation
  - .2 Source Selection: When a video source like the Blu-Ray DVD Player, the HDTV Cable Box, or the Camera is selected, the panel should automatically default to a sub-control page, which allows full control of the selected source. The following controls will always be available on all of the Source Control Page: Audio Volume Level (Up/Mute/Down), return button (return to previous page, when needed), Manual Control (takes the user to the manual control page to manually operate certain elements of the AV system such as projector, microphone levels, etc.), all Operating Mode choices (on tabs across the top part of the touchscreen), and a small logo on the top left corner of the screen (when pressed, the touchscreen will send the user to a Help Page that contains the contact information of the resident AV technician or Owner's support representative). When selecting PC sources or input plate sources, the panel will remain on the Main Control Page.
  - .3 When a source is selected in a room, it will automatically default to the display that is in the room. To provide for client flexibility when source selection page for a device is activated it should also display a button for destination. This will allow the Owner to send any source to any AV display.
  - .4 Mic Setup Page: This page will have the following control functions when this mode is selected:
    - .1 Individual microphone On/Off;
    - .2 Individual microphone level control
  - .5 Room Lighting/Shade Scene Selection: This page will have the following control functions when this mode is selected:
    - .1 Buttons for each room lighting scene control; and
    - .2 Selection buttons for room shade control
- .2 Council Specific GUI and Control System Guidelines: The control system and GUI shall provide, at a minimum the following capabilities and control functionality:

- .1 Multi-room and multi-function capability including Council Sessions, Committee Of The Whole Sessions, and Separate meeting room functionality.
- .2 Cueing capability on both the City Clerk and Mayors Touchscreen - multiple levels of topic based cueing are required. Cueing shall allow for staff stations to speak to an issue without eliminating the existing cue list.
- .3 Audio and video blackout/override from both the mayor and city clerk.
- .4 Individual microphone and PTT conference station activation and override. For ease of operation, microphone and conference locations shall be displayed on a GUI that represents the actual Council Chambers layout.
- .5 Capability to activate operator independent record and web streaming mode. Cameras shall have the capability to geographically locate to mic activation from the PTT system when in this mode.
- .6 Picture in picture integration.
- .7 Control of all aspects of video production switcher and cameras.
- .8 Teleconference capability with dialling and control from touchscreens.
- .9 The operation of the system as an audio presentation system.
- .10 Control of all source devices and inputs from the touchscreen.
- .11 Maintenance page c/w the ability for staff to enter names for discussion stations.

### **3.7 GENERAL TESTING**

- .1 Upon system completion, Contractor shall test the entire system to ensure the system is fully operational. This systems testing shall be completed prior to occupancy date.
- .2 The system shall perform, as a minimum, as specified within these specifications. It is the Contractor's responsibility to correct all systems problems and deficiencies.
- .3 Check and verify every furnished product. Demonstrate the full inventory to be all new equipment, in full compliance with the specification, or as modified by approved submission.
- .4 Check and verify against stray AC voltages on any equipment accessible to a user relative to ground.
- .5 Check and verify that there are no sharp or jagged surfaces accessible to a user.
- .6 Check and verify system serviceability. This includes accessibility to equipment to be easily pulled for repair by one person; neatly dressed cables; bundled in forms described herein; having no excessive pressure on cables at termination points and connectors; utilize service loops; and, have each cable number in agreement with as-built drawings. All switches, knobs, and receptacles shall be logically and permanently labelled as specified herein.

### **3.8 A/V SYSTEM TESTING**

- .1 Ensure the A/V systems are free of artifacts such as hum, noise, or distortion of any level above that specified by the manufacturers of the equipment specified and/or provided. System components and related wiring shall be located to minimize electromagnetic and electrostatic hum, spurious oscillation, wiring length, and shall provide proper ventilation, safety, and convenience for the operator.
- .2 The Contractor shall verify all circuits and extensions for correct connection, continuity, and phasing.

- .3 The Contractor shall make all adjustments and modifications so that all systems are operational. Lifting of ground on AC Plug is not an acceptable fix and is against Electrical Code.
- .4 Each video source shall be tested to each video display. Ensure that video display picture quality is at acceptable standards and is free any distortion including hum bars.
- .5 It is the A/V Contractor's responsibility to fully test and troubleshoot all aspects of the Control System's operations.

### **3.9 TRAINING**

- .1 The Contractor to provide a qualified representative for a minimum (2) two hour sessions of training to the Owner. The exact date of each session shall be coordinated with Owner's schedule and availability:
- .2 One session shall occur immediately after the system has been tested and fully operation.
- .3 The other session shall occur approximately 3-6 weeks after first training session and after all deficiencies have been completed.

**-END OF SECTION 27 41 16-**

## 27 41 80 AUDIO VISUAL CABLES AND CONNECTORS

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**Part 1 General**

**1.1 SCOPE OF WORK**

- .1 Supply, install, and document all required cables for the sound systems described herein and on drawings.
- .2 The scope of work includes, but is not limited to, the following.
  - .1 Supply, deliver, and install every cable type that is necessary and/or incidental to complete a fully operational system as described in these specifications. These include, but are not limited to coaxial, speaker, UTP, RGB and twisted pair shielded cables;
  - .2 Provide close coordination with Owner and other trade contractors to facilitate installation Work. Extra costs arising from conflicts or delay due to improper RFP will be the responsibility of the Contractor;
  - .3 Provide all equipment, personnel, and resources necessary to facilitate system engineering, installation, testing, documentation, end-user training, and after-sales service/support.

**Part 2 Products**

**2.1 GENERAL CABLES**

- .1 All cables will meet local building codes and meet minimum FT4 fire rating and will be CSA and/or ULC approved with said marking clearly visible on outer jacket.
- .2 All cables installed within plenum spaces will meet local building codes and meet minimum FT6 fire rating and will be CSA and/or ULC approved with said marking clearly visible on outer jacket. FT4 rated cables installed within conduits in plenum spaces is acceptable as an alternative to FT6 cables.
- .3 All cables will be clearly labelled at both ends. There will be a corresponding cable list listing all cables. This list will identify cable number, room name or number and destination.
- .4 All cables and cables at the equipment rack head end will be bundled together by type of cable with a minimum excess length of 12-feet; this bundle will be wrapped in plastic for protection. All cables terminating at a wall mounted j-box will have a minimum excess length of 12 inches.
- .5 A/V cables will be categorized as follows;
  - .1 Group 1: Microphone and Line-Level Audio Signal Cables;
  - .2 Group 2: Video Signal and Loudspeaker Cables;
  - .3 Group 3: Digital Audio and Digital Video Cables;
  - .4 Group 4: Data / Control Network Cables and DC Power Cables (Under 100-Volts);
  - .5 Group 5: AC Power Cables.
- .6 Maintain the recommended cable groupings within each equipment rack. Run Group 4 and 5 cables on the right hand side of the equipment rack. Run Group 1, 2 and 3 on the left hand side of the equipment rack. Maximize distance between cable bundles inside the rack. Dress, bundle, and tie all rack cables to appropriate wiring management accessories (lacing bars – vertical/horizontal, strain relief, etc.) for equipment rack use.

- .7 Use grommets or sleeves on all cable pass-through or knock-out holes cut out on plastic or metal panels. Pay particular attention on all cable paths. Ensure that cables do not have direct contact with any sharp or rough edges that can damage them.
- .8 Provide sufficient slack to cable bundles going into equipment racks. Equipment rack will be movable for servicing and maintenance without straining the cable bundles.
- .9 Provide sufficient slack to cable bundles for equipment located in millwork or cabinetry. Sufficient slack should be available to remove the equipment from its shelf and disconnect it from its harness. This rule also applies to equipment on pull-out shelves.
- .10 Prevent cable stress due to over-tightened cable ties, sharp bends, insufficient cable slack, and pulling tension. Excessive cable stress can change the electrical properties of most cables and will affect overall system performance.
- .11 No splices are allowed anywhere between cable ends. All cable runs should be continuous.
- .12 Practice good soldering or crimping techniques when terminating cable with a connector or lug. The Consultant will perform checks on soldered and/or crimped connectors from time to time. Inspect all solders and crimps before finalizing the termination, re-terminate all bad terminations.
- .13 Unused cables will be 'capped and stowed'.
- .14 All exposed conductors at cable ends, e.g. cable shields, will be insulated using heat shrink to prevent accidental short circuits with other cables in the connector or in its surrounding area.
- .15 The Contractor will assume all expenses of replacing any supplied or installed cables rejected by an inspection authority.
- .16 Take all necessary precautions to avoid electromagnetic, electrostatic, and common-mode interference within specified systems or with other existing equipment or equipment furnished and installed by other trades. The Contractor will assume all expenses incurred by furnishing filters and/or isolation devices required to suppress interference problems of any type.
- .17 All AV interconnect cables, whether pre-made or field assembled, will utilize colour coded strain reliefs or colour O-rings or colour shrink tubing to provide a visual reference or guide that will identify the type of AV signal it will pass through.
  - .1 Green – Component Video Signal Y;
  - .2 Blue – Component Video Signal, Pb;
  - .3 Red – Component Video Signal Pr;
  - .4 Black – 15-P HD Computer Video;
  - .5 Red – Computer Colour Component Red;
  - .6 Green – Computer Colour Component Green;
  - .7 Blue – Computer Colour Component Blue;
  - .8 Black – Horizontal Sync Signal;
  - .9 Yellow - Vertical Sync Signal;
  - .10 Red – Right Channel Stereo Audio;
  - .11 White – Left Channel Stereo Audio;
  - .12 Black – Mono Audio.



## 2.2 AUDIO CABLES - GENERAL

- .1 Unbalanced audio signals will not be run through cables greater than 30 feet. Use balanced line transmitter / line receiver units when required.
- .2 When wiring devices within single or multi-ganged equipment racks, two audio devices with high-impedance and unbalanced input and/or outputs can be connected together using two-cable unbalanced lines provided that the cable is shielded. Connect shields to ground at source-end only.
- .3 All audio outputs will match audio inputs. Use appropriate signal transformers such as RANE BB-44, RANE BB-22, RDL TX-1A, TX-LC2, RDL FP-UBC2 to convert unbalanced to balanced lines and vice versa. The Contractor will furnish the required type and quantity of transformers at no additional cost.
- .4 Use appropriate signal transformers such as RDL TX-LM2 and RDL STM-1 to convert microphone-level to line-level signals and vice versa. The Contractor will be responsible for furnishing the required type and quantity of transformer at no additional cost.
- .5 Do not passively split ('Y' connections) unbalanced audio signals. Balanced audio signals can be split once only. Use appropriate active amplifiers to distribute signals to two or more destinations. The Contractor will be responsible for furnishing the required type and quantity of distribution or amplification devices at no additional cost. An exception to this would be the presence of a passive 'loop out' connection from an audio device. In such a case, this passive 'loop out' can be used as a duplicate audio source. However, if the passive 'loop out' signal has to be sent to two or more destinations, an active amplifier will be used to accomplish this task. A device with an active or buffered 'loop out' signal can be used to drive an indefinite chain of devices having a similar active or buffered looping output.

## 2.3 VIDEO CABLES - GENERAL

- .1 Use video cables that have a bandwidth rating of, at least, twice the maximum frequency of the source signal. Inappropriately furnished or sub-standard cables will be rejected by the Consultant.
- .2 Use RG6 cables for all cable runs exceeding 65 feet, otherwise use RG59 cable for all standard video applications
- .3 Use high-quality BNC and RCA type connectors with matching compression crimp tools.
- .4 Use only 75-ohm rated connectors for video / graphics signals.
- .5 Use the correct type of BNC connector specifically for the furnished video cable.
- .6 Avoid the use of adapters whenever possible (e.g. BNC to RCA).
- .7 Do not passively split video signals (e.g. 'Y' connections or passive splitters). Use appropriate active amplifiers to distribute video signals. The Contractor will furnish these distribution amplifiers at no additional cost. An exception to this would be the presence of a 'loop out' connection from a VTR or Video Monitor. In such a case, this 'loop out' can be used as a duplicate video source. However, if the 'loop out' signal has to be sent to two or more destinations, an active amplifier will be used to accomplish this task.
- .8 Digital Video:
  - .1 Unless otherwise specified, all digital video HDMI and DVI cables shall support a minimum bandwidth of 6.68 Gbps (1080p DeepColor).
  - .2 Maximum length of HDMI and DVI cables is 15 meters.

- .3 For lengths greater than 15 meters, repeaters or an active transmitter / receiver based system shall be used. All such devices must be HDCP and EDID compliant.
- .4 All HDMI and DVI cables must be installed in conduit unless FT-4 rated.
- .5 All HDMI and DVI cable shall be pre-terminated; field terminations are not acceptable.

## 2.4 AUDIO / VIDEO / CONTROL CABLE SPECIFICATIONS

- .1 General:
  - .1 All cables shall have a minimum FT-4 rating.
  - .2 All cables will have clear markings showing the manufacturer's name, cable model number/part number, and fire rating. Sequential foot markings are optional but preferred.
- .2 Approvals:
  - .1 Submit samples and cutsheet for each proposed cable that will be used in this project. Obtain an approval from the Consultant prior to ordering and installing the cables.
- .3 Crestron DigitalMedia Cable – Non Plenum:
  - .1 Sole Source: Crestron DM-CBL-8G-NP.
- .4 Crestron DigitalMedia Cable – Plenum:
  - .1 Sole Source: Crestron DM-CBL-8G-P.
- .5 AMX DGX Cable – Non Plenum:
  - .1 Cat6A F/UTP (shielded and bonded);
  - .2 Reference Product: Belden 10GX62F or equivalent.
- .6 AMX DGX Cable – Plenum:
  - .1 Cat6A F/UTP (shielded and bonded);
  - .2 Reference Product: Belden 10GX63F or equivalent.
- .7 HDMI Cable High-speed, FT-4:
  - .1 Reference Product: Liberty Cable E-HDSM-series or equivalent. Non-compliant cables will be rejected.
- .8 Twisted Pair Cable:
  - .1 Each twisted pair within the cable shall be individually shielded;
  - .2 Reference Product: Extron STP201P or equivalent.

## 2.5 INTERCONNECT CABLES, SIGNAL CONNECTORS AND ADAPTERS

- .1 General:
  - .1 Acceptable Manufacturers: Liberty, Kings, Amp, Canare, Amphenol, Extron, Neutrik, Trompeter, ADC, Altinex, Covid.
  - .2 Use the same manufacturer for each type of connector (i.e., panel mount, cable end, adapters, etc.).

- .3 Do not mix and match mating connectors. Use mating connectors of the same manufacture and model series.
- .4 All video connections (BNC or RCA) will be of the compression-fit type. No solder connections will be allowed anywhere along the signal chain except on panel mount BNC or RCA connectors using a willow junction box.
- .5 Ensure that compression fit connectors are matched to the signal cable. Ill-fitting connectors due to mismatched components will be rejected.
- .6 Minimize the use of audio, video, or CATV adapters as much as possible. Proper connectors should be installed at cable ends of interconnecting cables to match the input connectors of equipment. In certain cases, such as a 15-pinHD connector need to be broken out into 5-BNC connectors or vice versa, an adapter cable is a necessary requirement.
- .7 Only pre-made and molded 15-pin HD connectors, adapters and interconnect cables will be allowed. Site assembled 15-pin HD connectors are only allowed if using 15-pin HD connectors made by Positronics or Extron. Pre-approved interconnect cable manufacturers: Extron, Altinex, Covid, Comprehensive Video, CALRAD.
- .2 Unbalanced Audio and Video RCA Panel Mount Connectors:
  - .1 Recessed type connectors with Nickel finish;
  - .2 Colour coding: Yellow for video, Red for audio right channel, and White or Black for audio left channel;
  - .3 Mount connector from rear of wall plate.
  - .4 Reference product: Neutrik D-series or Canare RJ-RU.
- .3 Video RCA Panel Mount Connectors:
  - .1 Recessed type connectors with Nickel finish;
  - .2 Impedance 75-ohms;
  - .3 Mount connector from rear of wall plate.
  - .4 Reference Product: Neutrik D-series or Canare RJ-RU.
- .4 Balanced Audio Panel Mount Connectors:
  - .1 3-pin XLR-type male or female;
  - .2 Finish: Nickel housing with Silver Contacts;
  - .3 With solder terminals.
  - .4 Mount connectors from rear of wall plate.
  - .5 Reference Product: Neutrik D-series.
- .5 Audio/Video/CATV In-Line Connectors (BNC, RCA, F-type):
  - .1 Compression-fit type. No crimp-on or solder connectors allowed;
  - .2 Provide color-coded O-rings for connectors to match the signal type and follow industry-standard colour schemes for different video signal formats;
  - .3 With integral inspection "window" to view actual termination;
  - .4 Reference Product: Liberty ConnecTec Termination System.

- .6 Speaker Connectors, panel-mounted or in-line:
  - .1 Reference Product: Neutrik Speak-On series connectors.

### **Part 3 Execution**

#### **3.1 INSTALLATION GENERAL**

- .1 All cables will be run through conduit or in specifically designated ceiling drops and chase ways. All conduit is part of base building contract and is not part of Contractor's contract.
- .2 Coordinate all aspects of installation scheduling with General Contractor.
- .3 Contractor is responsible for any required permits. Cost of such permits shall be included.

#### **3.2 LABELLING AND IDENTIFICATION**

- .1 All cables and connecting blocks will be clearly, logically and permanently-marked and identified by the following means:
  - 1. Use cable labels similar to the Panduit Polyolefin Self-laminating Labels for Ink-Jet or Laser-Jet printers or any other means acceptable to the Consultant. Cable labels should be machine printed and not handwritten. Other approved labels and labeller machines include Dymo Industrial (not the consumer or business Dymo products), Brady Industrial, or other similar professional labellers.
  - 2. For labelling equipment, use Panduit, Dymo Industrial RhinoPro, Brady Industrial, or other similar professional labellers that use industrial strength labels.
  - 3. Cable labels should be placed approximately 12-cm. from each end of the cable.
  - 4. The following identification standard will be adopted:
    - .1 Audio Speaker Cables: Sxxx (Low Impedance, High Impedance, etc.);
    - .2 Audio Line Cables: Axxx (Balanced or Unbalanced Line and/or Mic Level);
    - .3 Video Line Cables: Vxxx (Video, RGBHV, Digital Media, etc.);
    - .4 Control Line Cables: Cxxx (Proprietary networks, Serial, Logic, etc.);
    - .5 Low-Voltage Power Cables: Pxxx;
    - .6 "xxx" will mean sequential numbering from 001;
    - .7 Include all cable identification numbers on all wiring diagrams and cable schedules.
  - 5. Labelling conventions will be clear and logical; any deviation from the above standard must be submitted in writing to the Consultant. It is up to the discretion of the Consultant to reject or accept the written submission.

**-END OF SECTION 27 41 80-**