Notes on Tendering for
Public address (PA) System installed
in Standard Design Secondary/Primary Schools

1. These notes apply to schools which are built by Government at Government expense according to the standard design.

2. As a general rule, the sponsoring body is responsible for the full cost of furniture/equipment. No Government financial assistance is usually involved in the purchase.

3. Notwithstanding (b) above, the sponsoring body is required to invite tenders for processing in accordance with the proper tendering procedure - in a similar manner as if Government financial assistance were involved.

4. Public Address (PA) System is included in the standard Furniture/Equipment list for secondary schools.

5. As with other categories of furniture/equipment, the sponsoring body is responsible for calling for tenders for Public Address (PA) System in Assembly Hall and in Covered Playground.

6. The detailed specifications for secondary schools are at Annex I.

7. The following information should be given to the tenderers at the time of tendering:
   7.1 the number and type of the loudspeakers;
   7.2 the rated input power of the loudspeakers;
   7.3 the rated output power of the mixer-power amplifier; and
   7.4 appropriate floor plans or drawings.

8. For Assembly Hall whose dimensions are within approximate 12.7 metre (width) and 21.6 metre (depth), four 30W column speakers should be installed. The rated output power of the mixer-power amplifier should be 120 W minimum.

9. For covered playgrounds, six 15W horns should be installed. The rated output power of the mixer-power amplifier should be 100W minimum.

10. The Specification does not cover general conditions of contract such as payment terms, time for work completion, etc. which should be specified in the tenders.
11. Specimen Summary of Tender for secondary/primary schools is at Annex II.

12. Specimen Table for secondary/primary schools is at Annex III.
Annex I

Specification for Supply and Installation of
Public Address (PA) System for Standard Design Secondary Schools

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FIG. 3 Details of Recessed Microphone Socket Outline at Stage
1. **Scope**

1.1 This specification lays down the technical specification, functional features and performance characteristics of basic equipment items, quality of installation, materials used and standard of workmanship which are required for the provision of general Public Address systems for standard design Secondary/Primary School.

1.2 This specification should be read in conjunction with any Particular Specification issued by the School. Unless otherwise stated in the Particular Specification, the requirements laid down in this document shall apply to contracts/orders for the supply and installation of all Public Address (PA) system issued by the School.

2. **Related Documents and Specification**

2.1 **Reference to User/Design/Installation Specification**

2.1.1 The latest edition of the Institution of Electrical Engineers’ Regulations for Electrical Installations.

2.1.2 BS 4847 “Method of Measurement of Speed Fluctuations in Sound Recording and Reproducing Equipment”.

2.1.3 BS 5428 “Methods for Specifying and Measuring the Characteristic of Sound System Equipment”.

2.1.4 EIA RS-160 Sound System

2.1.5 EIA RS-490 Standard Test Methods of Measurement for Audio Amplifiers.

2.1.6 EIA RS-27A Acceptance Testing of Dynamic Loudspeakers.

2.2 **Other National or International Standards**

Equipment complying with other national and international standards may be offered. Tenderers shall demonstrate clearly the factors of technical superiority or other aspects as reviewed by these standards.
3. Detailed Design & Performance Specification

3.1 Definition of Terms and Abbreviations

a. ‘PA’ means Public Address

b. ‘BS’ means British Standard

c. ‘EIA’ means Electronic Industries Association of USA

d. ‘r.m.s.’ means ‘root mean square’

3.1.2 Measuring Systems

All units are SI units.

3.1.3 Measuring Criteria

3.1.3.1 Unless otherwise stated, all voltage, power levels, power or voltage ratios for amplifiers are r.m.s. measured at 1 KHz or relative to measurement made at 1 KHz.

3.1.3.2 Frequency response of cassette decks is measured on a record/playback basis at nominal record and playback signal levels. If a -20 db recording level is required for this parameter, it should be clearly stated.

3.1.3.3 Sensitivity of loudspeakers is measured at a distance of 1 metre with a random noise signal of 1 watt.

3.2 System Design

3.2.1 The Public Address (PA) system shall be designed for sound reinforcement during assemblies and speeches and playback of pre-recorded music or announcements.
3.2.2 It shall consist of the following basic components:

1. Microphone complete with floor-stand,

2. Cassette deck,

3. Mixer power amplifier (for Assembly Hall and for Covered Playground)

4. Column speakers (for Assembly Hall) and horn speakers (for Covered Playground),

5. Monitor speaker,

6. Wooden Cabinet for housing items (2), (3), and (5).

3.2.3 The equipment shall be installed in the Assembly Hall or the Covered Playground depending on individual school’s requirement. The exact requirement and the quantity of equipment to be installed will be specified at the time of tendering.

3.2.4 Standard equipment list for PA system in Assembly Hall

A list of standard PA system equipment is as follows:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Quantity</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Mixer Power Amplifier (120W)</td>
<td>1 set</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Column Speaker (30W)</td>
<td>4 sets</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Microphone with floorstand</td>
<td>4 nos.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Cassette Deck</td>
<td>1 set</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Cabinet Wooden</td>
<td>1 set</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Wiring &amp; Installation</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

The proposed equipment installation positions are shown in Fig. 1 attached for reference.
3.2.5 **Standard equipment list for PA system in Covered Playground**

A list of standard PA system equipment is as follows:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Quantity</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Mixer Power Amplifier (100 W)</td>
<td>1 set</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Horn Speaker (15 W)</td>
<td>6 sets</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Microphone with floorstand</td>
<td>2 nos.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Cabinet Wooden</td>
<td>1 set</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Wiring &amp; Installation</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

The proposed equipment installation positions are shown in Fig. 2 attached for reference.

3.2.6 **Standard equipment list for PA system in Male and Female Dressing Room**

A list of standard PA system equipment is as follows:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Quantity</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Ceiling Speakers 4W</td>
<td>2 sets</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Wiring &amp; Installation</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

The proposed equipment installation positions are shown in Fig. 1 attached for reference.

3.2.7 Tenderers are advised to visit the site before they submit their tenders. This would enable them to make accurate assessment of site conditions and quantity of cables required.
3.3 Component Performance Specification

3.3.1 Unidirectional Microphone

3.3.1.1 The microphone shall be of dynamic type provided with built-in blast and pop protection and microphone holder.

3.3.1.2 The microphone shall be provided with a built-in on-off switch and a suitable length of cable. Unless specified in the Particular Specification, the required length of microphone cable to be supplied with the microphone shall be 3 metres.

3.3.1.3 All cables for microphones shall be terminated with Cannon XLR-type connectors.

3.3.1.4 The microphone shall be provided with a tiltable mount and hardware adaptable to the floor stand.

3.3.1.5 The microphone shall satisfy the following minimum performance characteristics :-

   a. on-axis frequency response not to vary by more than +6dB, -10dB over the frequency range 100 to 10,000 Hz, relative to 1 KHz,

   b. sensitivity not to be less 1.0mV/Pa (-77 dB ref. 1V/uBar) at 1 KHz,

   c. distortion to be less than 0.5% at 1 KHz at 30 Pa sound pressure level input,

   d. front-to-back discrimination ratio to be greater than 15 dB for 300 to 5,000 Hz for unidirectional microphones,

   e. balanced, low output impedance in the range 200 to 600 Ohms at 1,000 Hz.

3.3.2 Microphone Floor Stand

3.3.2.1 The floor stand shall comprise a substantially constructed heavy cast black painted base supporting a satin chrome finished column with a self-locking device permitting the inner column to be raised or lowered with one hand within a range of adjustment from 900 to 1600 mm nominal.
3.3.2.2. It shall also have adjustable swivel quick release isolation mount to provide for instant and noseless removal of the microphone from the stand for hand held use.

3.3.3 Mixer-Power Amplifier (for Assembly Hall and Covered Playground)

3.3.3.1. The mixer-power amplifier shall be fully solid-state, and provided with balanced floating outputs of 70 Volts and 100 Volts for loudspeaker connectors.

3.3.3.2. As a minimum requirement, the mixer-power amplifier shall be provided with the following facilities:

   a. power on/off switch,

   b. mains ‘on’ indicator lamp,

   c. Total 6 nos. of Input ports for Assembly Hall and Total 4 nos. of Input ports for Covered Playground

      - 4 nos. of Microphone input (for Assembly Hall) and 2 nos. of Microphone inputs (for Covered Playground)

      - 2 nos. of Auxiliary input (for Cassette player and phono)

   d. input protection against overload and independent mixing volume control for each input,

   e. master volume, bass and treble tone controls,

   f. three-core flexible cord and correctly fused plug for mains supply and earth connection,

   g. AC and DC protection,

   h. Protection circuits at output ports to prevent turn-on surges from reaching speaker and the presence of short, overload or extreme overdrive
i. standard sockets complete with plugs and locking rings for each input and terminals for loudspeaker output,

j. a small cabinet speaker (2 watt) for monitoring purpose.

3.3.3.3 Performance Characteristics Required

a. microphone input sensitivity not to be greater than 0.5 mV for rated output for source impedance of 200 to 600 Ohm balanced,

b. high level input sensitivity not to be greater than 400mV for rated output for source impedance up to 50 Kohm,

c. preamplifier provides at least 60dB signal range from noise to clipping,

d. frequency response not to vary by more than ± 3 dB over the frequency range 50 to 15,000 Hz, at rated output power,

e. total harmonic distortion at rated output not to exceed 2% between 50 and 15,000 Hz, distortion shall not increase at lower power output, and/or less than full load,

f. output regulation to be within 2 dB from no load to full load, the amplifier shall be stable under no load conditions,

g. noise level to be better than 65 dB below rated output with input shorted, over the frequency range 50 to 15,000 Hz, unweighted.
3.3.4 **Loudspeaker**

3.3.4.1 The loudspeaker shall be complete with built-in line matching transformer to match line to loudspeaker impedance,

3.3.4.2 The maximum input voltage of the loudspeaker shall be 100V r.m.s.,

3.3.4.3 Indoor speakers (for Assembly Hall) shall be terminated through 2A 3-pins plugs and sockets complying with BS546. Outdoor speakers (for Covered Playground) shall be terminated through weatherproof type plugs and sockets provided with a push-on cap and cap retaining ring.

3.3.4.4 **Horn Speaker** (for Covered playground installation (Outdoor application))

a. The speaker shall be perfectly weatherproof and shall satisfy the following minimum performance characteristics:

(i) on-axis frequency response not to vary by more than +10dB over the frequency range 250 to 6000Hz,

(ii) output sound pressure level not to be less that 103 dB at input 1W, 1m.

b. The speaker shall be complete with mounting bracket suitable for mounting on any hard surface.

3.3.4.5 **Column speaker** (for Assembly Hall (indoor application))

a. The speaker column shall comprise at least four dynamic cone speaker units arranged column-wise on a baffle board to deliver smooth sound dispersion, with uniform sound pressure. Multiple tapping matching transformers shall be provided.
b. The enclosure shall be acoustically designed to provide a unidirectional wide lateral beam spread of sound with limited cover in the longitudinal direction.

c. The wooden enclosure shall be rigid and complete with high quality front grille cloth, and fiber glass or BAF insulation lining of not less than 20 mm thick covering the interior column; speech coils and magnet air gaps shall be protected against ingress of dust and moisture.

d. The column shall be suitable for mounting on any hard surface and the mounting mechanism shall permit free rotation about the vertical axis and adjustable tilting angle when installed. Mounting brackets shall be supplied.

e. The column shall finished to harmonize with the wall or immediate background.

f. The speaker shall satisfy the following minimum performance characteristics:

   (i) on-axis frequency response not to vary by more than ± 10dB over the frequency range 200 to 10,000 Hz,

   (ii) output sound pressure level not to be less than 95 dB at input 1W, 1m.

3.3.4.6 Ceiling Speakers (for Male and Female Dressing Rooms (indoor application))

a. The speaker shall be suitable for hard ceiling mount or flush mounting to a flase ceiling of any configuration, depending on individual system requirement. It shall be equipped with a multiple tapping transformer to provide easy control of speaker sound volume after speaker installation. Supporting brackets to mount the speaker shall be provided. The whole speaker shall be properly covered to prevent the ingress of foreign materials. A dust proof bag or metal box shall be provided to protect the flase ceiling type speaker.
b. The speaker shall satisfy the following minimum performance characteristics:

(i) on-axis frequency response not to vary by more than 10 dB over the frequency range 200 to 10,000 Hz,

(ii) Sensitivity not be less than 90 dB/W.

(iii) Power handling capacity of 2W.

3.3.5 Cassette Deck

3.3.5.1 The cassette deck shall be provided the following facilities:

a. power on/off switch,

b. microphone and headphone jacks

c. input/output level control and meters,

d. three-digit resettable tape counter,

e. automatic shut-off at tape end in every tape mode

f. convenient auto mute function

g. type function “Normal/chromium dioxide/Metal” selector switch

h. Noise Reduction System

3.3.5.2 The cassette deck shall satisfy the following performance characteristics:

a. frequency response not to vary by more than ±3 dB over the frequency range 50 to 13,000 Hz using ferric oxide tape,

b. signal-to-noise ratio to be better than 55 dB using ferric oxide tape,

c. wow and flutter to be less than 0.05% r.m.s., weighted in accordance with BS 4847,
d. total harmonic distortion to be less than 1.0% using ferric oxide tapes,

e. fast forward and rewind time not to be more than 90 seconds for C-60 tapes,

f. microphone input sensitivity not to be greater than 0.5 mV for rated output for source impedance of 200 to 600 ohm,

g. line input sensitivity not to be greater than 78 mV for source impedance up to 50 Kohm,

h. line output level not to be less than 400 mV for output impedance up to 2 Kohm.

i. tape speed 47.5 mm/sec (1-7/8 inch/second)

3.3.6 Equipment Cabinet

3.3.6.1 The cabinet shall be of compatible size and sufficient strength and rigidity to house the equipment. It shall be completed with locking door and three-pin power sockets.

3.3.6.2 The cabinet shall be made of wood of at least 15mm thick.

3.3.7 Microphone Cable

3.3.7.1 The microphone cable shall be flexible twisted pair of tinned annealed copper conductors, PVC insulation, tinned copper braided shield, and PVC outer sheath. The colour of the sheath shall be either light grey or white.

3.3.7.2 The cable shall satisfy the following minimum characteristics:

a. at least 16 strands per conductor,

b. strand diameter not to be less than 0.15mm,

c. nominal outer diameter not to be greater than 50mm,

d. capacitance between conductors not to be more than 110 pF/m,
e. inner conductor d.c. resistance not to be more than 36 ohm/Km at 20 degree C,
f. insulation thickness not to be less than 0.25 mm.

3.3.8 Loudspeaker Cable

3.3.8.1 The loudspeaker cable shall be flexible pair of tinned, annealed copper conductors, PVC insulated, and white or grey PVC sheath. For surface wiring, the cable shall be a parallel pair. For conduit run, the cable shall be a twisted pair.

3.3.8.2 The cable shall satisfy the following minimum characteristics:
   a. at least 19 strands per conductor,
   b. strand diameter not to be less than 0.21 mm,
   c. nominal outer diameter not to be greater than 8 mm,
   d. insulation thickness not to be less than 0.5mm

3.3.9 Power Supply Cable

3.3.9.1 Power cables shall be three-core PVC insulated, non-armored with copper conductors of not less than 2.5 sq. mm to BS 6004 and BS 6346 and complete with an overall protection sheath of PVC.

3.3.10 Connector & Accessories

3.3.10.1 All audio connectors for wall panels, mixer inputs, microphones etc. shall be Cannon XLR type

3.3.10.2 Each indoor loudspeaker shall be terminated through a 2A three-pin plug and socket complying with BS 546 to facilitate easy removal of the loudspeaker. Locally made plug and socket of equivalent standard is also acceptable. The Contractor shall be responsible for properly mounting the socket base plate onto any existing adaptable box. Outdoor speakers shall be terminated through weatherproof type plugs and sockets provided with a push-on cap and cap retaining ring.
3.3.10.3 A sheet metal box with stainless steel cover shall be required to house one Cannon XLR male or female socket, detailed in Fig. 3 attached.

4. Installation Requirements

4.1 General

4.1.1 All equipment, cabling etc. shall be installed in locations as indicated on the floor plans and drawings provided by the School.

4.1.2 All cables shall be, as far as practicable, run inside conduits or trunkings specially provided for the purpose.

4.1.3 The Contractor shall provide and install all conduits, trunking, raceways and adaptable boxes to supplement the conduits or trunkings provided if required.

4.1.4 Jointing of cables shall be avoided. All cables shall be jointed by properly designed connectors or inside joint boxes.

4.1.5 Surface wirings will only be accepted if specified at the time of tendering.

4.1.6 The Contractor shall make good any work disturbed during installation at his own expense.

4.2 Equipment Fixing and Interconnection

4.2.1 All equipment except portable equipment shall be firmly held in place. Fastenings and supports shall be adequate to support their loads with a safety factor of at least three. If attachment to roof truss members is required to lift equipment into place, attachment shall be made only at permanent lifting eyelets provided in the roof truss. Welding or drilling of the steel roof truss is not permitted; permanent attachment to trussess shall be made by approved clamping arrangements employing neoprene or similar bearing pads to protect the trusses finish.

4.2.2 Interconnection of various items of equipment shall be mechanically and electrically connected by multi-pins connectors or terminals.
4.2.3 Lines shall be run in separate conduits for microphone level circuits (levels below -20 dBm), line level circuits (up to +30 dBm), loudspeaker circuits (above +30 dBm), and power circuits. All other conduits shall be spaced not less than 50 mm from power conduits. Power conduits shall be grounded to the power system ground. Microphone and 600 ohm lines shall be insulated from the conduit and form each other for the entire conduit length. Microphone and 600 ohm line conduits shall be mechanically and electrically connected to receptacle boxes and electrically grounded to the audio system ground point. Lines in conduit shall not be spliced.

4.2.4 Microphone line shields shall be grounded only at the microphone frame. Other shields shall be grounded only at the power amplifier inputs or at the control equipment outputs. Continuity of shields shall be preserved at connecting points. All audio grounds in the sound equipment rack(s) shall be connected to a common point on the rack(s). This point shall be connected to the building ground.

4.2.5 All audio lines, including microphone lines, line-level lines and loudspeaker lines, shall be floating with respect to the ground, either side of audio lines shall be grounded. If the equipment has a single ended input or output, it must be provided with isolation transformers to provide the floating conditions. Muting on microphones shall be done by shorting the microphone output, not by opening the circuit. Cut-off or transfer switches in line-level lines or loudspeaker lines shall be two-pole, switching both sides of the line simultaneously. Outputs of power amplifiers shall not be inter-connected. Loudspeaker lines leaving the equipment rack(s) shall be connected via barrier strip terminals.

4.3 Materials and Workmanship

4.3.1 The works carried out shall be executed in a first class workman-like manner and shall be subjected to the approval of the School.

4.3.2 The School reserves the right to reject any part of the installation not complying with this specification, and the Contractor shall carry out the necessary remedial work of replacement without extra cost or delay.

4.4 Surface Wiring
4.4.1 All cable shall be run in a vertical or horizontal direction. Only cables required to feed a point on a ceiling may be fixed to the ceiling.

4.4.2 When cables pass through walls or columns, a piece of PVC sleeve of adequate size shall be inserted into the wall or column, and the cables shall be drawn therein. Holes so created around the sleeve shall be fitted up with cement and touched up with paint. The colour of the paint shall match with that of the walls or columns.

4.4.3 Rubber grommets or insulated bushes shall be used to protect the cables passing through metal covers of distribution board, box or any other metal work.

4.4.4 Cables shall be run at least 150 mm clear of non-electrical services.

4.4.5 Unless otherwise authorized by the School, cables shall be secured flat to the surface of walls and ceiling by means of buckle clips or cable saddles.

4.4.6 Buckle clips shall be of heavy gauge, heavily tinned brass with countersunk fixing holes, and shall be fixed by means of non-corrosive pins or screws of 15 mm minimum length secured to one plug inserted to a depth of 20 mm minimum. Where the buckle clips are secured to plaster, concrete etc. the plug shall be made from teak dwelling of parallel length. Every fixing hole in the buckle clip will be deemed to require a pin or screw. The heads of the screws or pins shall be level with the surface of the clips so that no damage to the sheath of the cables can occur.

4.4.7 Spacing of the clips shall not exceed 150 mm in horizontal direction and 225 mm in vertical direction.

4.4.8 A clip shall be provided not less than 75 mm and not more than 100 mm from any bend or termination and cables shall be set so that they lie flat against the surface.

4.5 Surface Conduit

4.5.1 Surface conduits shall be fixed by galvanized heavy spacing saddles, and shall run only in a perpendicular or horizontal direction. On straight run 20 mm and 25 mm conduits shall be supported by not less than one saddle every one metre in addition to the support provided by and structure, box or fitting.
4.5.2 For 32 mm and larger conduits, saddles may be placed not more than 1.2 m apart. Angle bends shall in all cases be supported by two saddles as near thereto as possible. Heavy spacing galvanized saddles shall be fixed with brass screws in rawl plugs, or other approved methods.

4.5.3 Conduit bends shall have a radius of four times the outer diameter of the conduit.

4.5.4 A saddle shall be provided not less than 150 mm and not more than 200 mm from any bend or termination.

4.5.5 Steel conduit systems shall be mechanically and electrically continuous throughout, and efficiently earthed.

4.5.6 Chases for conduit in walls shall be either perpendicular or horizontal.

4.5.7 Joints in runs of steel conduit shall be made by means of a coupler into which the ends of both conduits are to be inserted and tightened up.

4.5.8 An adequate number of suitably sized hot-dipped galvanized cast iron draw-in boxes shall be provided in conduit runs to enable cables to be drawn in easily and without damage. Draw-in boxes shall be fitted after every two bends, or after a maximum straight run of 15 m.
**GROUND FLOOR PLAN**

**LEGEND**
- □ 15 x 15 mm adaptable box at ceiling level for mono speaker
- ☐ 100 x 100 mm adaptable box for P.A. equipment
- ☐ 13A 3-pin switched socket outlet
- ☐ 4 x 16A concealed compact
- ☐ 15 x 15 mm adaptable box at 300 mm A.P.L. for microphone

**NOTES**
- All dimensions are in millimeters

**PRELIMINARY**
- 15 SEP 1992
- ELECTRONICS DIVISION, EMSD

**DRAWING**
- PENDING DESIGN FOR PRIMARY AND SECONDARY SCHOOL
- DATED: 15-SEP-92
- SCALE: 1:100
- CHECKED:
- APPROVED:
FLEXIBLE COVER
FOR MICROWAVE
( BY P.A. CONTRACTOR )

STEEL OR WOODEN
COVER

CANNON SOCKET
( BY P.A. CONTRACTOR )

1 x 6FT STEEL CONDUIT

100 x 100 x TO (D)
ADAPTABLE BOX
( TO BS 4562 )

SECTION ' X-X ' 

STEEL OR WOODEN
COVER C/W HINGES

1 x 6FT STEEL
CONDUIT

100 x 100 x TO (D)
ADAPTABLE BOX
( TO BS 4562 )

PLAN

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH RELEVANT LAYOUT DRAWING.

PRELIMINARY
ELECTRONICS DIV., E.M.S.D.

18 MAY 1992

DRAWN BY

C. O. T. LEW

APPROVED

10.5.91

DRAWING NO.

ECL(AS)-10596/6

OFFICE

ELECTRONICS DIVISION

E.P.B.S.
DEPARTMENT
HONG KONG.

GP 507

A4 210 x 297
Annex II

Summary of Tender
(Secondary Schools)

Installation of Public Address (PA) System
for ________________________________________________________________

(I) In Assembly Hall

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Mixer Power Amplifier (120 W)</td>
<td>1 set</td>
<td></td>
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<tr>
<td>(2) Column Speakers (30 W)</td>
<td>4 sets</td>
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<td>(3) Microphone with floorstand</td>
<td>4 nos.</td>
<td></td>
</tr>
<tr>
<td>(4) Cassette Deck</td>
<td>1 set</td>
<td></td>
</tr>
<tr>
<td>(5) Cabinet, Wooden (inclusive of the 2W monitoring speaker)</td>
<td>1 set</td>
<td></td>
</tr>
<tr>
<td>(6) Wiring &amp; Installation</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

(II) In Covered Playground

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Mixer Power Amplifier (100 W)</td>
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</tbody>
</table>

(III) In Male and Female Dressing Room

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Ceiling speaker 4W</td>
<td>2 sets</td>
<td></td>
</tr>
<tr>
<td>(6) Wiring &amp; Installation</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

Total Price (I) + (II) + (III) : HK$ ________

Contractor : ____________________________________________________________
Address : ________________________________________________________________

_________________________________________________________  ______________________________
Signature : _____________________________  Date : ______________________________
Annex (III)

School’s Tender Ref. : ______________________________ Name of School : __________________________
Date of the Issue of Tender : __________________________
Closing Date of Tender : ______________________________
Validity of Tender : Up to ____________________________

TENDER PRICE COMPARISON TABLE FOR PUBLIC ADDRESS SYSTEM
IN STANDARD-DESIGN SECONDARY SCHOOLS
(TO BE COMPLETED IN TRIPLICATE)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Brief Description</th>
<th>Quantity required</th>
<th>List of Suppliers (at least TRN)</th>
<th>Supplier’s Names</th>
<th>Suppliers’ Names</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mixer Power Amplifier (120 W)</td>
<td>1 set</td>
<td>5 (or more) Suppliers selected from the L. &amp; W. List of Suppliers and Specialist Contractors for Materials and Works (Electrical Installation)</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>2</td>
<td>Column Speakers (30 W)</td>
<td>4 sets</td>
<td>School’s nominated Suppliers Outside the approved lists</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>3</td>
<td>Microphone with floorstand</td>
<td>4 Nos.</td>
<td></td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>4</td>
<td>Cassette Deck</td>
<td>1 set</td>
<td></td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>5</td>
<td>Cabinet, Wooden (inclusive of the 2W monitoring speaker)</td>
<td>1 set</td>
<td></td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>6</td>
<td>Wiring &amp; Installation Track &amp; Accessories</td>
<td>-</td>
<td></td>
<td>$</td>
<td>$</td>
</tr>
</tbody>
</table>

(To be completed in triplicate)
<table>
<thead>
<tr>
<th>Item No.</th>
<th>Brief Description</th>
<th>Quantity required</th>
<th>Supplier’s Names</th>
<th>Suppliers’ Names</th>
</tr>
</thead>
<tbody>
<tr>
<td>(II) Items for Covered Playground</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>1</td>
<td>Mixer Power Amplifier (100 W)</td>
<td>1 set</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Horn Speakers (15 W)</td>
<td>6 sets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Microphone with floorstand</td>
<td>2 Nos.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Cabinet, Wooden (inclusive of the 2W monitoring speaker)</td>
<td>1 set</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Wiring &amp; Installation Track &amp; Accessories</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(III) Items for Male and Female Dressing Room</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>1</td>
<td>Ceiling speaker 4W</td>
<td>2 sets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Wiring &amp; Installation</td>
<td>-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>