

DIRECTORATE CULTURAL AFFAIRS ARCHAEOLOGICAL & MUSEUMS, PUNJAB

**Tender Document for
Immersive Experience
At Baba Banda Bahadur Memorial Chapparchiri,
Mohali, Chandigarh**

**CLIENT:
DIRECTOR CULTURAL AFFAIRS ARCHAEOLOGICAL & MUSEUMS
PLOT NO 3, SECTOR -38-A,
CHANDIGARH
PUNJAB**

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**Tender Document for
Immersive Experience
at Baba Banda Bahadur Memorial Chapparchiri,
Mohali, Chandigarh**

PART I - TECHNICAL BID

<u>Cost of Tender Document:</u>	<u>Rs 2000.00</u>
<u>Date of Pre Bid Meeting</u>	<u>19.07.2011 at 11.30AM</u>
<u>Due Date of Submission:</u>	<u>26.07.2011 upto 1500 hrs</u>
<u>Due Date of Opening (Technical Bid):</u>	<u>26.07.2011 at 1530 hrs</u>

For this purpose the client intends to invite competitive bids as per details mentioned in the Bill of quantities and as per the designs, technical details, drawings and photographs.

Tender is called for executing the job on a turn key basis.

Interested firms/agency should be from the Entertainment World having experience in similar works of installation of Rich Media shows of immersive quality with large format high brightness projections and willing to undertake the work including system integration including allied works etc. should submit the offer in two-bid system containing the documents/information as under:

INSTRUCTIONS TO THE APPLICANTS

- 1 Completion time : 90 days from the 7th day of issuance of Letter of Intent or from the date of handing over of the clear site whichever is later.
- 2 The applicants are invited to submit their "Technical Proposal" i.e. details, stipulating to the eligibility criteria" and "Financial Proposal" in separate sealed covers for the requisite services.
- 3 The applicants must acquaint themselves to the nature of job, environment and factors / parameters prescribed.
- 4 The word "Client" shall refer to **Director Cultural Affairs Archaeology & Museums Punjab** and its successors, authorized agents and representatives at all times. In this document the words "Client" and **Director Cultural Affairs Archaeology & Museums Punjab has been** used interchangeably.
- 5 The cost of preparing the proposal, including visits to the site and to the client, are not reimbursable as a direct cost of the Assignment; and the client is not bound to accept any such proposals even if submitted. **Director Cultural Affairs Archaeology & Museums Punjab** shall not be responsible or in any way liable for such costs / expenses, regardless of the conduct or outcome of the bidding process. For a clear idea as regards to the area/site the bidder can visit the proposed site in Mohali.
- 6 The client is not bound to accept any proposal and reserves the right to annul the selection process at any time, without incurring any liability to the applicants.

7 CLARIFICATION & AMENDMENTS TO RFP DOCUMENTS

- a) At any time (seven days prior to the due date of receipt of bids) the Client may for any reason, whether at its own initiative or in response to a clarification requested by a prospective bidders through email or written request, modify the RFP document by issuing an Addendum. The client may at its discretion extend the deadline for the submission of proposal.
- b. The Addendum will be sent in writing to all the interested applicants. Such an Addendum shall become part of the RFP document.
- c. Clarification can be sought from the client within 7 days at the client address.

8 SIMILAR PROJECTS& ELIGIBILITY CRITERIA

- I. The respondents must have a commendable reputation at creating large scale high brightness permanent projection installs at sites of historical and cultural relevance. Enclose proof of having executed at least 5 such installs in the last three years on a turnkey basis on themes of culture and history for governments, cultural bodies and ministries .
- II. Respondents will need to be able to demonstrate a wide-ranging CV of unique creative and technical solutions for bespoke edge blending dynamic images of multiple layers and multiple media servers. Enclose work orders etc. as proof of the same.
- III. A proven track record of producing large scale indoor or outdoor permanent projection installs, including the supply and installation of multiple high power video projectors with their associated media servers and ancillary equipment for cultural and historical themes. Large scale is defined as being at least 5 video projectors of each having brightness 20,000 lumens or more.
 - i. (Video footage& documentary proof of the events claimed is a compulsory part of this process)
- IV. The responding bidder will need to show the following inhouse skill sets:
 - i. Projection Installation Design
 - ii. Intelligent Illumination Design
 - iii. Installation Sound Design
 - iv. Projection dynamic image content design at 4 times HD or above.
 - v. Large Format visual Design
 - vi. Creative Direction, Script writing etc.
- V. Past Experience and ability to create three sixty degrees into three sixty degrees immersive experiences with HBLF projections, effects, sound, intelligent illumination, programming, installation and integration of hipotizer media servers. International collaborations shall be considered an added advantage. (enclose photographs/video of past works as proof)
- VI. A proven track record of providing projection and intelligent illumination installations on a turnkey basis for promotion of tourism, culture & history on monuments of world heritage , Heritage cities, cultural parks, etc. with historical themes. Turnkey is defined as the creation of concepts, creation of rich media content, creation of programming, supply and installation of equipment, system integration & commissioning and carrying out training of operational staff, and hand over to the client . The respondents should enclose proof of having executed at least 5 such installs in the past 3 years on a turnkey basis.
- VII. The Bidder must submit a list of the similar works executed along with satisfactory proof like work orders, certificates of appreciation from clients. A complete portfolio of the prospective bidder should also be enclosed with the technical proposal.

Documents to be enclosed along with:

- a) attested copy of PAN
- b) attested copy of registration
- c) Duly certified balance sheets of last 2years by a CA.
- d) self certificate that the firm has not been debarred by any central/state govt. organization and have not entered into any dispute in the court of law/arbitration. If there was any please provide details.
- e) Affidavit on a stamp paper of Rupees hundred stating ' In case any ambiguity is noticed in the documents submitted the department may take take action as deemed fit under law'.

- f) Thematic layout drawings of the concept with markings, scheme of installation and a brief script of the story line.
- g) Company Profile with credentials.
- h) A Demand Draft of Rupees 2000/- towards the cost of this tender favouring Director, Cultural Affairs, Archaeology and Museums, Punjab.
- i) A duly signed copy of this tender as a token of acceptance of the terms and conditions.

8.0 **SUBMISSION OF BIDS**

8.1 **Technical Bid**

The technical bid and its evaluation will be based on the eligibility criteria as mentioned above and with due regard to the similar works undertaken in the past for Organizations as available, CV of the Technical personnel's, Portfolio of the Company, in-house personnel's like audio expert, projection expert, video expert, and their number of years of experience will be taken into consideration.

Apart from the above mentioned documents the following are a pre-requisite to be submitted

8.2 **FINANCIAL BID**

The Financial bid is to be given as per the Bill of Quantities enclosed and as per the makes recommended

The Financial Proposal should be a fixed "**Lump Sum Amount**" in INR (Indian National Rupees) as cost of the creativity, content generation (in all the format as required) and cost of equipment as per Bill of Quantities.

The lump sum amount shall be submitted for -All services / submissions as per "Scope of Services for the creative works " as defined in respective clause (The client reserves the right to make any changes in the design at any stage).

The amount shall be inclusive of all taxes including service tax, duties, fees, levies and other charges imposed under the applicable law, on the consultant, the sub-consultants, and their personnel. The Bidder shall submit the financial proposal unconditionally.

8.3 **SUBMISSION**

8.3.1 The proposal shall be submitted in two separate sealed envelopes and put together in one single outer sealed envelope scribed Immersive Experience at the Memorial of Baba Banda Singh Bahadur at Village Chaparchiri, District Mohali, Punjab. The parts shall include Part 1 – Technical Proposal and Part -2 Financial Proposal. The proposal shall be valid for a period of 90 days from the date of receipt of bid as indicated above.

8.3.2 The client shall have the option to seek further validity of offer by another 30 days.

8.3.3 The envelope shall clearly mention the Technical Proposal and Financial Proposal of the project.

- 8.3.4 The original proposal shall be prepared in indelible ink. It shall contain no interlineations or overwriting, except as necessary to correct any errors made by the applicant itself. Any such corrections must be initiated by the person or persons who sign(s) the proposals.
- 8.3.5 An authorized representative of the firm shall initial all pages of the proposal. The representative's authorization in original / notarized should be confirmed by a New Power of Attorney accompanying the Proposal.
- 8.3.6 The tender document including this Tender Notice shall be submitted duly signed & stamped and in the bound form in token of acceptance of the same.
- 8.3.7 *Complete proposal must be delivered on or before _____ by 3.00 PM to be opened on the same day at 3.30 PM at the following address: -*

The Director Cultural Affairs, Archaeology & Museums Punjab Plot No. -3, Sector -38-A, Chandigarh, Punjab.

Envelope II Price Bid shall contain the price bid on prescribed Performa.

The envelope shall be super scribed as price bid, name of work, name of agency etc and the due date.

Both the envelopes shall be enclosed in one Master Envelope super-scribed with name of work, Name of the Agency and due date.

9. Process of Evaluation:

- i. After the technical proposal is evaluated, The Director, Cultural Affairs Archaeology & Museums Punjab shall notify to those bidders whose proposals were considered non responsive to the RFP and also the bidders who have scored required 70 marks in the technical evaluation. Financial Proposal of the non responsive bidder shall be returned unopened after completing the selection process. The Director Cultural Affairs Archaeology & Museum shall notify the bidder selected by the above process indicating the date and time for opening the financial proposal. The financial proposal shall be opened on the next day in presence of the bidder's representative who may choose to attend. The quoted amount shall be read and recorded. Applicants scoring 70 or more marks in the Technical Evaluation shall be prequalified and short listed for Financial Evaluation. However, if the number of such prequalified applicants is less than two, the Department in its sole discretion may prequalify the applicants whose technical score is even less than 70 points, provided that in such an eventuality, the minimum score of the applicant shall not be less than 60.
- ii. The formula for determining the financial score shall be as under: -
- a. $SF = 100 \times PL / P$
 - b. Where SF is the financial score, PL the lowest price quoted by a bidder and P the price of the proposal under consideration.

- C. The proposals shall be ranked according to their combined technical score (St) and financial score (Sf) scoring with the weights as under: -

Weightage for the Technical Proposal : 0.7

Weightage for the Financial Proposal : 0.3

i. i.e. Final Score = $St \times 0.7 + Sf \times 0.3$

- ii. The Bidder achieving highest combined technical and financial score shall be marked as L1 and shall be qualifying for issuance of letter of Intent, if all the other conditions are fulfilled entering in to the agreement with the Client.

10 Other Terms and conditions

- I. All equipment supplied and installed and workmanship of the work done shall be guaranteed for 6 months from the date of completion. During the defect liability period of 6 months reckoned from the date of completion, defects if any, that are noticed shall be immediately rectified and ensure smooth operation of system, failing which the firm shall be liable for action as deemed fit by the client.
 - II. All software, proprietary of script, design and content shall exclusively be right of CLIENT & shall not be utilized at all anywhere else.
 - III. The agency/contractor should give their charges separately towards operation of the show for two years and comprehensive annual maintenance contract including the cost of spares to be undertaken after the expiry of the defect liability period.
 - IV. Statutory variation shall be paid extra/recovered on production of documentary evidence.
 - V. Completion period- **90 days** and shall be reckoned from the 7th day of issuance of written order to commence the work or from the date of handing over the site whichever is later.
 - VI. The time allowed for carrying out the work as mentioned in the order shall be strictly observed by the contractor. If the work is delayed, the agency shall pay as liquidated damages an amount equal to 1% of the accepted quotation for every week or part of the week for the work remain unfinished or not supplied after the expiry of the delivery period.
 - VII. The client will provide storage space to the contractor for storage of equipment etc. However, safety and security of the space and equipment shall be the responsibility of the contractor.
- VIII. **Payment terms**
- a) 10% of the contract value on signing the agreement.
 - b) 10% of the contract value after submission of layout drawings of projection installation design, image design, sound design, execution plan to Client/consultant for their approval.
 - c) 20% of the contract value on submission of storyboard of content to be generated.
 - d) 20% of the contract value on submission of audio track in one language duly mixed with SFX.
 - e) 15% of the contract amount on submission of audio track in second language duly mixed with SFX.
 - f) 15% of the contract value towards the equipment delivered.
 - g) 10% of the contract value against pro-rata installation, integration testing, commissioning.
 - h) 5% of the contract amount after handover of the show.
- IX. A tenderer shall submit the tender which satisfies each and every condition laid down in this notice, failing which the tender will be liable to be rejected.

- X. Client does not bind themselves to accept the lowest or any tender or to give any reasons for their decision.
- XI. This notice of tender shall form part of the Contract documents.
- XII. Submission of a tender by a tenderer implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions.

DIRECTORATE CULTURAL AFFAIRS ARCHAEOLOGY& MUSEUMS, PUNJAB

**TECHNICAL SPECIFICATIONS
OF EQUIPMENT, SOFTWARE
&
CONNECTED
ELECTRICAL WORKS
FOR
IMMERSIVE EXPERIENCE AT
Baba Banda Bahadur Memorial Chapparchiri,
Mohali, Chandigarh**

SUBHEAD A

Floor standing cabin/Rack

Rack shall be designed and engineered specifically for easy assembly and rapid equipment integration at site on the use of aluminum extrusions profiles for the four vertical pillars, which shall be connected solidly to two welded steel end-frames to take load upto 500 kg. All other parts shall be of formed sheet steel of approved shade.

The rack shall conform to DIN 41494 with Steel Doors - plain, vented at bottom, fully perforated and dual perforated lockable Glass Doors - with optional vented side trims for front-to-back air flow of powder coated shades having minimum depth 600mm and height 1800mm spacious to accommodate to 36U complete with castors (4 nos.) with foot-operated breaks fan housing units with 4 fans one U cable merger AC main channel with 10 points of 5x 15 amp Socket Strip IEC Sockets fitted with earthing kit and necessary mounting hardware.

Stationary transmitter

Stationary transmitter with 18 selectable frequencies in the frequency range of 863 - 865 MHz. Rugged metal housing, suitable for 19" rack mounting. OLED display to indicate channel, AF level, frequency and channel lock function, automatic screen saver mode. On/off switch, channel selector buttons and channel lock function, headphone connection (1/4" stereo jack) for monitoring (MIC signal can be turned off). Separate level controls for microphone, AUX and headphone. Connections for antenna, MP3 or CD player, line or microphone. Selectable RF transmitting power. Strain relief for power adapter cable. Supplied with power adapter, rod antenna, 19" mounting kit incl. connecting cables for antenna connection on the front.

TECHNICAL SPECIFICATIONS

Oscillation type PLL synthesized control OSC
Carrier frequency 863.150 - 864.850 MHz
Adjustable frequencies. 18 pre-programmed, switchable frequencies
Type of emission FM
Max. modulation 45 kHz with level limiting
RF carrier power. Hi: 20 ±2 dBm / Lo: 6 ±2 dBm
Comander system Comander and ALC
T.H.D. < 1%
SINAD > 40 dB at f = 1 kHz,
Mic In = -30 dBv, Hi level
Modulation 15.6 ±1 kHz bei f = 1 kHz,
Mic In = -40 dBv
Dynamic range. 80 dB
Preemphasis. 50 µs
Tone frequency 38 kHz
Power requirement DC adaptor 12 - 15 V, 500 mA
Input / output MIC (balanced / unbalanced),
AUX, Phone
Controls volume Power, Aux / Vol., Mic / Vol., Phone / Vol.
Frequency response 70 Hz - 13 kHz with RP8
Operating range Hi: 120 m / Low: 50 m with RP8
(open field)
OLED display Frequency, Audio level, Lock

Receiver

Beltpack transmitter in a compact, ergonomic design to connect different clip-on or neckworn microphones with 4-pin XLR connector. 18 selectable frequencies in the frequency range of 863 - 865 MHz. On/off switch and button for microphone mute function. Adjustable gain to meet the ambient sound level. OLED display to indicate transmitting channel, battery status, operating mode, frequency and channel lock function. LED to display operation or charging status. Connecting cable of the microphone is used as antenna. Aux-In connection for audio source such as MP3 player, mini stereo jack (3.5mm). Channel selector buttons and channel lock function to avoid accidental channel shifting. Removable belt clip and strap for high wearing comfort. Charging contacts integrated in the housing. Soft-touch surface. Integrated intelligent charging technology with Alkaline detection, temperature monitoring and auto-off function. Supplied with two rechargeable NiMH batteries, type LR 6, AA, mignon with a capacity of 2050 mAh.

TECHNICAL SPECIFICATIONS

Oscillation type	PLL synthesised control QSC
Carrier frequency	863.150 - 864.850 MHz
Adjustable frequencies	18 pre-programmed, switchable frequencies
Type of emission	FM
DC current	175 ±10 mA at 2.4 V
RF carrier power	10 ±2 dBm
Max. modulation	45 kHz with level limiting
Microphone modulation output	Hi level: 14 ±1 kHz at Mic.
Input	-40 dBv, f = 1 kHz
Mid level:	10.8 ±1 kHz
Low level:	8 ±1 kHz
AUX modulation output	13.6 ±1 kHz at Input -10 dBv, f = 1 kHz
Comander system	Comander and ALC
Frequency response	70 Hz - 13 kHz with RP8
SINAD	> 40 dB at f = 1 kHz,
Mic In	= -30 dBv, Hi level
T.H.D.	< 1%
Tone output frequency	38 kHz
Tone output modulation	2.5 ± 0.5 kHz
Battery (rechargeable)	1.2 V (Ni-MH 2100 mAh) x 2 AA type,
Operating time	12 hours
Microphone connector	Mic In: Mini XLR 4-pin
Aux In:	3.5 mm mini jack socket for mono or stereo
Operating range	100 m with RP8 (open field)
Operating temperature	-10 °C - 60 °C
OLED display	Battery, Channel, Frequency, Mute, Lock
LED display	On = blue
Mute	= red flash 1 Hz
Charging	= blue slow flashing 0.5 Hz
Full/trickle charging	= steady blue
Error	= red fast flashing 7 Hz

Charger and storing case

Charger and storing case with 20 charging compartments for beltpack receivers/transmitters and one handheld microphone. Compartment for accessories in the cover with a zipper and Velcro strips for storing headphones. Telescopic dampers safely hold the cover when opened. Plastic case made of an impact-resistant housing, rugged aluminium frame, casters and handle for practical trolley function, carrying handle and lockable snap locks. Automatic rechargeable battery/standard battery recognition. With power on LED. Each charging compartment with individual display of the charging or error status via the operating control LED of the transmitter/receiver.

TECHNICAL SPECIFICATIONS.

AC input. 100 - 240 V, 50/60 Hz
Fuse 1 A, 250 V
Connection. AC input and AC output socket
Switching power supply input 100 - 240 V AC, 50/60 Hz
Switching power supply output. 5 V DC, 12 A
Max. charging time. approx. 5 hours
Ambient temperature
(26 °C / 55%) 56 °C [132.8 °F]
Charging compartments 20 for beltpack
transmitter/receiver, 1 for handheld transmitter

HEAD PHONES

TECHNICAL SPECIFICATIONS

Transducer type	Dynamic
Operating principle	Open
Frequency response	40 - 20,000 Hz
Nominal impedance	2 x 32 Ω
Nominal SPL	104 dB
Power handling capacity	100 mW
Connection	Stereo jack plug 3.5 mm .

Digital Signal Processor (DSP)

The Signal Processor equipment shall operate in Digital Audio Platform and shall have multi channel configuration. Although both the input and output shall be analog with built in internal 12 bit A/D and D/A converters at sampling rate of 48KHz, the internal signal processing shall be digital. Electronically balanced input and electronically balanced output (12 nos. each) shall be provided on plug in barrier strip connectors. Inputs shall be individually programmable to accept variable line level/Mic level signals from the hard disk recorders. Output shall normally provide line level signals.

The hardware configuration shall include six 60 Mhz 32 bit floating point DSP, an 80 MHz 32 bit power PC Processor 32 MB ramp and 8 MB flash ROM. Software shall be provided for creating/connecting DSP system components with each hardware unit. Available system components shall include but not limited to various forms of mixers equalizers, filters, crossovers, dynamic/gain controls, routers, delays, level controls, level meters and tone generators. Ethernet communications shall be utilized for software control,

configuration and DSP sharing. After initial programming, systems may be controlled either using TCP/IP or RS 232 serial communications.

The DSP shall conform to the following detailed specifications:

Frequency Response	20 Hz to 20 KHz (+0 / -0.4 dB)
THD (line level)	< 0.006%
Equivalent input noise	- 125 dBu
Maximum gain (input channel)	66 dB
Cross talk (channel to channel) line level	< -85 dB
Output impedance	200 Ohms
Input impedance	8 K Ohms
Maximum output	+ 24 dBu
Control Interface	Serial RS 232 and TCP-IP
Maximum input	+ 24 dBu
Sampling rate	48 KHz
A/D and D/A converters	24 bit
Mounting	Rack mountable
Software	Software / firmware shall be of latest version

applicable at the time of
commissioning and
Shall be programmable from a PC
using TCP IP / RS 232 interface

Hard Disc Recorder

Hard disc recorder 24 track at 24 bit, 44.1 KHz having 1 Caddy equipped with 40 GB HD and one additional Caddy as spare having 24 analog input and 24 analog output (1/4 " TRS), 24 channel digital I/O via three numbers of ADAT optical inputs and three ADAT optical output complete with hard disc duly loaded with show audio as per following details & specifications:

- 24-track, 24-bit digital audio recording (12 tracks at 96kHz)
- 24 analog inputs (1/4" TRS)
- 24 analog outputs (1/4" TRS)
- 24-channel ADAT Optical I/O
- Dual recording bays , removable IDE computer drives
- Instant random access to audio using ADAT/FST™ (File Streaming Technology).
- Internal editing capabilities include cut, copy, paste, and track-move with undo.
- Ethernet port enables computer connection
- MIDI I/O, MTC out
- ADAT Sync in/out
- Word Clock in

MEDIA

- Caddy 1: 40GB HD
- Caddy 2: empty

TRACK COUNT

- 24 tracks at 24-bit, 44.1 or 48
- 12 tracks at 88.2 or 96 kHz with optional EC2 upgrade

CONNECTIONS

- Analog: 24 24-bit inputs, 24 24-bit outputs (1/4" TRS, +4dBu)
- Digital: 24-channel I/O via 3 ADAT Optical inputs and 3 ADAT Optical outputs

- Other: MIDI in/out. Alesis Sync in/out (DB-9). Word Clock input (BNC, 75). Footswitch jack for punch in/out (1/4"). LRC input for traditional wired remote (1/4"). 10 Base-T Ethernet (RJ-45)

AUDIO SPECS

- Frequency response: 20Hz–20kHz +0/–1dB
- Dynamic range: 103dB A/D, >103dB D/A (A-weighted)
- Distortion: <0.003% THD+N. Input levels: nominal +4dBu, maximum +19dBu
- Pitch control: +100 cents/–200 cents, min-max 30–50kHz (30–100kHz with version 2.0)

POWER & DIMENSIONS.

- Power: 230V AC, 50 HZ

SUBHEAD B

High Resolution DLP Projectors

The projector shall be of high image quality with ultra bright 12,000 ANSI lumens with 1600-2000:1 contrast ratio, uniform brightness & colour suitable on networking with wired LAN system, web browser control. It should be fitted with lens- centered design having vertical/horizontal lens shift, flexible angle setting, easy lens replacement mechanism with suitable mechanical lens shutter. It shall be fitted with direct power of feature, quiet operation, dust proof design, easy replacement of dust filter, anti theft feature including security chain opening, remote etc. as required complete with following specifications:

Specifications

Image	<ul style="list-style-type: none">• 12,000 ANSI lumens (+/- 10%)• 90% brightness uniformity across the screen
Contrast	<ul style="list-style-type: none">• 1600-2000:1 full field
Display Technology and Resolution	<ul style="list-style-type: none">• 3-chip 0.95" DLP®• True SXGA+ 1400 x 1050 resolution
Input Signal Compatibility	<ul style="list-style-type: none">• VGA through to QXGA (2048 x 1536)• Supports standard HDTV formats up to 1080p• Multi-standard video decoder• Horizontal and vertical scaling, all inputs
Scan Rates	<ul style="list-style-type: none">• Horizontal - 15 kHz to 120 kHz• Vertical - 23.97 Hz to 150 Hz
Inputs, Control and Networking	<ul style="list-style-type: none">• RGBHV/YPbPr via 5 BNC• DVI-I - digital/analog RGB/YPbPr (HDCP)• One composite video, one S-Video• Two option slots for analog/digital modules• 3 RS-232 ports and 1 RS-422 port• On-board connectivity (RJ45)• Built-in backlit keypad and IR remote Control
Graphical User Interface	<ul style="list-style-type: none">• Auto set-up, power-up feature• Menus in five languages• On-screen help• 50 channel memories• Optional image warping• Built-in edge-blending• Comprehensive Color Adjustment (CCA™)
Lens Mount	<ul style="list-style-type: none">• Motorized horizontal and vertical offset• Tool-free lens insertion system• Tilt adjustment
Lamp	<ul style="list-style-type: none">• 2.0kW Xenon Bubble lamp• 1000 hours (typical) lifetime
Light Output Control (LITELOC™)	<ul style="list-style-type: none">• "Auto Brightness" (Intensity), "Lamp Conserve" (Power), "Max Brightness" modes

Power Requirements

- Built-in light shutter
- 200 VAC to 240 VAC +/- 10% @ 50/60 Hz
- Power consumption: 3000W maximum
- Thermal dissipation: 10,236 BTU/hr
- Operating current: 15A @ 200V

Ceiling Mount Truss

- To provide provides strong support from ceiling for mounting 3 chip DLP Projectors, truss shall be having micrometer adjustments and quick disconnect save installation and maintenance time. Micrometer adjustments shall give the precision for quickly achieve registration. The quick disconnect feature shall allow to remove the projector for maintenance and replace it on the mount without losing registration. Truss shall be heavy-duty design steel mad with Right/left, fore/aft adjustments.

Minimum Specifications

Roll ± 5 degrees , Pitch ± 20 degrees , Yaw 360 degrees

Media Server:

Hippotizer HD

Key Features

- Leading video playback and real-time rendering
- 2 FX engines per layer, 100+ effects per engine
- Frame accurate synchronisation across multiple servers
- Fully networkable using Hipponet Ethernet protocol allowing connection to multiple servers
- Media Manager with live media updating
- Unlimited universes of PixelMapper for LED fixtures
- Keystone and ScreenWarp for non-linear projection surfaces
- Pan mode and advanced soft edge blending
- Up to 16 layers with dual, pan, clone and single modes available
- 4 layers of full HD resolution (1920 x 1080)
- Powerful timeline function with presets allowing complex changes to shows in minutes
- Remote management, upload and configuration via HippoNet
- External control from DMX/MIDI/TCP-IP/RS232
- Automation component for use with moving staging

Technical Specification

Case Type: 4U 19" Rackmount

Environmental Tolerances:

Ambient Operating Temp Range: 5 - 35 C (40 - 95 F)

Humidity: 5% - 95% (non condensing)

Voltage: 108 - 240v 50-60Hz Auto Switching

Power Consumption: 10 amps

Media Drives: 2

Total Media Storage Space: 300GB

Max Output Resolution: 2560 x 1600 (3200 x 1200 in pan mode)

Max Playback Resolution: 1920 x 1080

Outputs:

VGA / RGBHV, DVI, Composite Video, S-Video, RS232*, Ethernet control, DMX over Ethernet, HippoNet and Audio (using 3rd party sound device)

Inputs:

VGA / RGBHV*, SDI*, Composite Video, S-Video, RS232, Midi*, MX512*, DMX over Ethernet, HD-SDI*, DVI upto 1920 x 1200

Supported Media Formats:

Quicktime, MPEG1, MPEG2, AVI, Windows Media, MPEG4, DIVX, DV, MP3, JPEG, BMP, TIFF, TGA

Maximum Media Size: **1920 x 1080**

Number of Media Layers: **Up to 16 layers, 8 per output**

GrassHopper

Key Features

- Full HD playback with unrestricted output resolution
- Compatible with most industry standard output extenders
- Wide range of input options including HD-SDI, DVI
- Class leading video playback and real-time rendering
- 8 Media layers (+8 mask layers)
- PixelMapper with unrestricted number of output universes
- 2U rack mount case
- Optional patch panel for professional connections
- 2 FX engines per layer - 100+ effects per FX engine
- Frame accurate synchronisation across multiple servers
- Media Manager with live media updating
- ScreenThief for Ethernet video capture
- Keystone and ScreenWarp for non-linear projection surfaces
- Soft-edge blending
- Timeline for stand-alone operation
- External control via DMX / MIDI / TCP-IP/ OSC / RS232
- High performance 3D show visualisation integration via CITP and HMap2
- Map to the most complex LED setups using the award winning videoMapper
- Create stunning multi-screen shows as UberPan controller driving up to 8 outputs
- Use LiveMask to create complex masks in real - time to project onto complex scenery or buildings

Technical Specification

Environmental Tolerances:

Operating Temp. Range: 5-35°C (40-95°F)
Humidity: 5% - 95% (non condensing)
Case Type: 2U 19" Rackmount
Voltage: 107 - 240v 50-60Hz Auto Switching
Power Consumption: 2.5A
Media Drives: 2
Total Media Storage Space: Over 25h HD / 75h SD content

Inputs and Outputs

Outputs: Single unrestricted video output using
VGA / RGBHV, DVIControl outputs using
RS232, Ethernet control, DMX over
Ethernet and HippoNet

Compatible Output Splitters: Matrox Dual Head2Go and ripleHead2Go,
EMSiVU4, Datapath x 4

Max Output Resolution (using output extenders):

4 outputs @ 1024 x 768
4 outputs @ 1280 x 720
3 outputs @ 1280 x 1024
2 outputs @ 1920 x 1080

Video Inputs: 1 x HD-SDI, 1 x DVI/VGA, 2 x DVI/VGA,
(single card can be fitted) ScreenThief
Ethernet Capture

Audio, Control & Patching

Audio: Audio playback on separate layers,
Volume and balance control, Multi-
channel audio playback and Master
volume control

Control: RS232, Midi*, DMX over Ethernet and
TCP/IP, OSC and DMX512*

Patching: Basic patching of DMX, RS232 and Midi.
Midi 'Learn' patch, Diagnostics

Media

Supported Media Formats: Quicktime, MPEG1, MPEG2, AVI, DIVX,
Windows Media, MPEG4, DV, PNG, JPEG,
BMP, TIFF, TGA, Image sequences
Maximum Media Size and Playback Resolution:
1920 x 1080

Maximum Number of Media Layers:8 (+ 8 x mask layers)

Media Management:

Remote media upload, Automatic media conversion, Drag & drop media upload and mapping, live media update, media thumbnails, 256 media groups, 256 clips per group, network sync, show backup

Media Playback:

Inter-frame blending for super slow motion, Inpoint and Outpoint adjustments, Playmodes (loop forward, loop backwards, once forwards, once backwards, ping pong, random, pause, rewind on Level 0), Sync to Hipnotizer, Sync to Timeline, Alpha channel support, Media generators (rain, snow, clouds, starfields etc), Text Engine and Audio mix playback mode

Media Manipulation:

Geometry control, Colour control (basic & advanced), 16 Mix Modes, 18 Digital effects engines, Up to 9 effects parameters per layer, Effects / Transitions editor, Transitions

Show Programming:

Unlimited Groups, Presets, Tracks and Timelines, Timeline copy and paste, Fadecurve editing, Timeline Logic, Cue Controller, Control non Hippotizer devices from Timeline, SMPTE and MTC synchronisation, Fast drag & drop playlist per layer

17" Rack LCD Console with Integrated 8 Port Analog KVM Switch Rack LCD Consoles

The Rack LCD Console with Integrated KVM Switch shall combine the functionality of Rack LCD Console and Analog KVM switches in one convenient package U space in the rack environment, eliminating cable clutter. Shall **include** C13-C14 power cord, Documentation CD, Firmware upgrade cable, Installation guide, NEMA 5-15 power cord, PS2 KVM cable, Single user rack mount kit, USB KVM cable

Nominal Input Voltage	240V
Input Frequency	50 Hz
Input Connections	IEC-320 C14
Cord Length	1.8 meters
Supported Hardware	
Panel Size	17
Display Size	337.9 (H) X 270.3 (V) mm
Display Colors	16
Trackball Type	PS/2 Touchpad,USB mouse
Rack Height	1U

Green hippo RACK MOUNT PC 2U

Intel i5 based PC, 3Gb Ram, 500Gb Drive enclosed in a 2U shock resistant casing with all necessary features as required.

24-Port Gigabit Switch:

Specifications

Ports	Twenty-four 10/100/1000 RJ-45 ports and 2 shared Mini-GBIC slots
Cabling type	Category 5 Ethernet or better
LEDs	System, Link/Activity, Gigabit
Performance	
Switching capacity	48 Gbps, nonblocking
Number of VLANs	256 – static
Web user interface	Built-in web user interface for easy browser-based configuration (HTTP/HTTPS)
SNMP	SNMP versions 1, 2, and 3 with support for traps
SNMP MIBs	RFC1213 MIB-2, RFC2863 interface MIB, RFC2665 Ether-like MIB, RFC1493 bridge MIB, RFC2674 extended bridge MIB (P-bridge, Q-bridge), RFC2819 RMON MIB (groups 1,2,3,9only), RFC2737 entity MIB, RFC 2618 RADIUS client MIB
Firmware upgrade	<ul style="list-style-type: none"> • Web browser upgrade (HTTP) • Trivial File Transfer Protocol (TFTP) upgrade
Other management	RFC854 Telnet (menu-driven configuration) <ul style="list-style-type: none"> • SSH and Telnet management • Telnet client • SSL security for web user interface • Switch audit log

- Dynamic Host Configuration Protocol (DHCP) client
 - BOOTP
 - Simple Network Time Protocol (SNTP)
 - Xmodem upgrade
 - Cable diagnostics
 - Ping
 - Traceroute
- Minimum Requirements
- Category 5 Ethernet network cable
 - TCP/IP installed on each computer within the network
 - Network adapter installed in each computer
 - Network operating system (Windows, Linux, Mac OS X)

Top of Form

386007

Bottom of Form

Transmitter DVI+Aud/Cat.5

DVI-D+Audio CAT.5 Extender to provide the transmission of DVI-D signals at resolutions up to 1920x1200 and 1080p, plus either S/PDIF or analog stereo audio, over Cat.5/5E or Cat.6 cable up to 100 meters (325 feet), Transmitter shall provide EDID capability and shall be fully compatible with all DVI 1.0 signals and seamlessly integrates the selected audio signal into the signal path.

Features:

- 1T-CT-521 Transmitter with EDID feature
- DVI-D Version 1.0 Compliant
- Resolutions to 1920x1200, 1080p @ 60Hz
- Maximum Distance depends upon Receiver:
1T-CT-524 up to 100 meters (325 feet)
1T-CT-528 up to 250 meters (800 feet)
- S/PDIF or Analog Audio Transmission
- Gain and EQ Adjustments
- Locking power supply for security

Receiver

Key Features

1

DVI-D Version 1.0 Compliant

Resolutions to 1920x1200, 1080p @ 60Hz

Maximum Distance depends upon Receiver

S/PDIF or Analog Audio Transmission

Gain and EQ Adjustments

Shall provide 100 mtsEDI

Video I/O 1x via DVI-I Connector

Audio I/O 1x Coax
1x 3.5mm Stereo Audio

Maximum Resolution Up to 1920x1200, 1080p/60

Video Bandwidth 1.65Gbps

Show control computer & associated software and hardware with accessories:

Rack mounted show control computer of complete with in-built hardware interfaces for time synchronization and DMX control window XP Professional operating system and Artist show control software duly programmed as per existing cue of sound and light as per following details:

Show control computer complete with inbuilt interfaces for DMX and Midi ports. The PC shall be a two unit rack mount PC with integrated DMX and midi output. Super quiet and compact machine shall be configured to run Showcad Artist smoothly and reliably. It shall comprises on Pentium Dual Core Processor 2.8 G HZ or above with minimum 2 GB RAM, 512 MB Cache, 120 GB HDD, Hard Disk Controller, CD Rom 17" LCD TFT Monitor DVD ROM, USB 2 interface, key board, optical mouse of licensed loaded window XP Professional, LAN Audio Jack, VGA port, Line in - Line out and Mic in; 1 five pin DMX output port, 1 five pin DIN midi output port.

The above computer shall be fully loaded with Showcad artist software package with 512 channel license as required for controlling lights and other requirements compatible with 512 DMX output channel on USB DMX interface. The above shall be complete with miditime code synchronous software video player for playing and synchronizing on video formats on quicktime support. The license with the documentation shall be in the name of end user

Main Panel/Distribution

Distribution Equipment like Electrical Distribution board, field junction boxes and luminaries / speaker junction boxes etc. – shall be designed as per the final scheme adopted for the show – for the control as well as the distribution of power / controls to various equipments in the field / control room.

These shall be indoor (IP 43) / outdoors type (IP 55), as applicable, and shall be painted in accordance with other equipment within the same area of mounting or painted to suit the ambience.

The components inside these distribution equipments shall be of reputed make and the quantities shall be such that there is at least 10% redundancy on the main equipment.

Outgoing terminals of the main distribution board shall be of heavy duty while the incoming / outgoing terminals of all other distribution equipments shall be screw less terminals of high standard.

Field junction / Distribution Boxes/ Luminaries/ Speaker Junction shall be IP 55 made out of 2 mm thick MS sheet powder coated with screw less clip-on terminals/ or else specified and double compression glands complete as required or as specified.

Cubical panel shall be fabricated out from CRCA sheet with required bracings and supports, gasket with foam rubber to make the panel dust and vermin proof, together with degreasing and applying two coats of red oxide and two coats and stove enamel paint. The panel shall include all required hardwares, moulded insulators and separators including cutting and making space in compartmental formation. The thickness of steel sheets shall be 16 SWG and IP 44 protected. It shall be complete as per the nomenclature mentioned in bill of quantities and as required at site.

Suitable nos. of Earth Pits as per BOQ shall be provided for the Audio & Electrical circuits, near the control room. All cables laid shall have a continuous run of earth wire of suitable cross sectional area as indicated in the BOQ.

UPS

The UPS shall be of 60 kVA rating, upgradable to 80 KVA, 3Ph consisting of integral battery backup of 30 minutes with 100% capacity rectifier charger & inverter. The UPS shall be provided with protection against sags, surges, outages, waveform distortions, frequency variations, line noise, spikes (switching transients) - sine waveform output. The batteries shall be maintenance free and shall be provided with life cycle guarantee commitments with provision that these batteries are hot-swappable, user replaceable type.

The unit shall comply with BS and Indian Electrical standards that apply to UPS power.

The following specifications for size of UPS are indicative and the unit should be sized to meet the final power requirements.

Technical Specifications

Rating	80 kVA
Capacity	80/72 (kVA/KW)
Input	Dual input Hardwired
Output connections	Hardwired
Nominal Input Voltage	415 V 50 Hz
Input Voltage Range	-15% +10% from nominal on full load
Input Power factor	0.99
Input current distortion	≤3% THDi typical at linear load condition
Nominal output voltage	415 V
Output voltage regulation	± 1 % ± 5% dynamic at 10% to 90% Load change < ms recovery time
Parallel ability	upto 8 Units for capacity /redundancy
Efficiency	94%
LCD Display	Graphical LCD with blue backlight
LED	4 status indicators
Standard communication ports:	(2 or 4) x XSlot, 1 x relay contact, 1 x emergency power-off input, 2 x environmental inputs

Bill of Quantities for Equipment for Immersive Experience at Baba Banda Bahadur Memorial Chapparchiri, Mohali

**Part A
(Price bid to be submitted in Envelope II)**

Content Generation

SN	ITEM	Fee including Tax (in Rs.)
1	Total Lump Sum Cost including Script Writing, recording in all 3 languages including SFX, VFX, Music, generation of synchronized rich media content with sound track including parts of 35mm film, animation, multi layering etc ready for transfer onto hardware.	
2	Cost of multiple media server splitting, mapping and programming of projection content with onsite testing, alignment & integration	
3.	Cost of designing, cueing and programming DMX based intelligent effects and system integration.	
	Total Cost Lump sum	<hr/>

(Rs. In words.....)

Date:

Sign and Seal of the Agency

Part B Equipment:

Sl No	Item Description	Unit	Qty	Rate (In figures & Words)	Amount
	Subhead: Audio				
1	Supply installation and fixing Audio / Dimmer Rack - 19 " - 36 U Rack, 600 mm wide, height approx 1800 mm with Aluminum frame and 800 mm depth, top bottom side panel and rear door of CRCA. Sheet size 1 mm, front door with Aluminum section and acrylic/glass sheets, make as approved by Consultant with minimum specifications as specified in the tender.	Nos	1		
2	Supply installation testing commissioning of 863/865 MHz stationary transmitter as per specifications or equivalent make as approved by the consultant.	Nos	3		
3	Supply installation testing commissioning of 863/865 MHz receiver as per specifications or equivalent make as approved by the consultant .	Nos	100		
4	Supply, installation testing commissioning of Charger and storing case with 20 charging compartments for beltpack receivers/transmitters and one handheld microphone with Compartment for accessories in the cover with a zipper and Velcro strips for storing headphones. make as approved by the consultant	Nos	5		
5	Supply installation testing and commissioning of headphone as per specifications or eqvt make as approved by consultant	Nos	100		
6	Supply installation testing and commissioning of Digital Signal Processor – with 12 analogue input & 12 analogue output , make as approved by Consultant with minimum specifications as specified in the tender	Nos	1		
7	Supply installation testing and commissioning of hard disc recorder complete with hard disc duly loaded with show audio in 3 languages in the main harddisk drive as well as in the spare drive mounted on the spare caddy , as per specifications or eqvt as approved by consultant as required.	Nos	1		
	Total Subhead Audio				

	SUBHEAD : High Brightness Large Format Visuals				
	Supply installation testing and commissioning of following:				
1	Supply installation testing and commissioning of DLP Projector of 12,000 Lumens 2.0 KW Xenon Bubble Lamp having resolution of 1400x1050 + True SXGA, 3 chip and variable contrast ration of 1600:2000:1 FULL Field , ANSI 450:1 min complete with 1.2:1 short through SXGA lens as per specifications or equivalent subject to approval by Consultant with minimum specifications as specified in the tender	Nos	5		
2	Supply installation testing and commissioning of ceiling Truss Mount Kits for 12000 lumens Projector as per specifications or equivalent subject to approval by Consultant; with minimum specifications as specified in the tender	Nos	5		
3	Costumised moulded Hanging bracket Structure to be attached to the running truss made of MS / Extruded Aluminum suitable to standby the hanging weight of projector (not less than 65 kg) as specified in drawing and sketches	Nos	5		
4	Truss made of aluminum section heavy duty as per drawing complete with section bars and powder coating , each section shall not be more than 4 mtrs with two brackets each truss and total truss required are 18nos in total.	Nos	1		
5	Supply, laying and termination of DVI D copper cables 0.9 m with ends duly terminated as per requirement as approved by consultant	Nos	12		
6	Supply installation testing and commissioning of Green hippo HIPOTIZER HD Media Servers Rack mounted high resolution media server housed in shock resistant tourable rack case or eqvt as approved by consultant as required.	Nos	2		
7	Supply installation testing and commissioning of Green hippo HIPOTIZER grass hopper Media Servers Rack mounted high resolution media server housed in shock resistant durable rack case or eqvt as approved by consultant as required.	Nos	1		
8	Supply installation testing and commissioning of Apc AP5808 17" Rack LCD Console With Integrated 8 Port Analog Kvm Switch or eqvt as approved by consultant as required.	Nos	1		
9	Supply installation testing and commissioning of Green hippo RACK MOUNT PC 2U Intel i5 based PC, 3Gb Ram, 500Gb Drive enclosed in a 2U shock resistant casing or eqvt as approved by consultant as	Nos	1		

	required.				
10	Supply installation testing and commissioning of Zookeeper TM management software and License for above, Remote management and monitoring software including tools for programming shows via timelines, triggering events for real-time clocks and reading external timing signals such as SMPTE and MTC. Fully Hipponet compatible for the remote setup of Hippotizer Media servers or eqvt as approved by consultant as required.	Nos	1		
11	Supply installation testing and commissioning of Small Business 24 port Gigabit switch and 2 x Mini GBIC fiber uplinks or eqvt as approved by consultant as required	Nos	1		
12	Supply installation testing and commissioning of 20U rack enclosure to house the video control equipment or eqvt as approved by consultant as required.	Nos	1		
13	Supply installation testing and commissioning of TRANSMITTER DVI Extender Transmitter Using Cat5 Cable - Extends To 100m or eqvt as approved by consultant as required.	Nos	4		
14	Supply installation testing and commissioning of 140 mtrsCat5e twistedunshielded pair cable as approved by consultant as required.	Nos	2		
15	Supply installation testing and commissioning of Tvone 1T-CT524 RECEIVER DVI Extender Receiver Using Cat5 Cable - Extends To 100m or eqvt as approved by consultant as required.	Nos	4		
16	Supply of 6-pin Fire wire Cable 1.8 mtrs or eqvt as approved by consultant as required.	Nos	4		
17	Personal Computer with interfaces as per the technical specs for desk mounted system or rack mountable PC with flat screen 17" TFT monitor complete with keyboard mouse etc. of Show cad /HP/DELL/ACER Make or equivalent, subject to approval by Consultant with minimum specifications as specified in the tender	Nos	1		
18	Show Control software, as per ShowCad complete with necessary software and hardware interface, licenses as required complete as per specifications and approval of Consultant as required.	Nos	1		
	TOTAL SUBHEAD : HBLFV				

Subhead: Cabling & Earthing

1

S/I/T/C of cubical panel fabricated out from 16 SWG CRCA sheet with required bracings and supports, gasketed with foam rubber to make the panel dust and vermin proof, together with degreasing and applying two coats of red oxide and two coats and stove enamel paint. The panel shall include all required hardware's, moulded insulators and separators including cutting and making space in compartmental formation. Main Distribution Boards –IP 44.

400 A MCCB 35 KA 3 Pole – 1 No.

Rotary operating mechanism – 1 No.

Digital volt meter – 1 No.

VSS – 1 No.

Digital Ammeter – 1 No.

ASS 1 No.

CTS/5A class 1.5KVA – 3 No.

LED indicator light – 3 Nos.

Outgoing 250 A TPN MCCB 35KA –1 No.

32A four pole 10 KA - 3 nos

2 A SPMCB – 6 No.

Copper bus bars, inter connection with copper wires, glands and thimbles etc. complete In all respects

Nos

1

2

S/I/T/C of cubical panel UPS DB fabricated out from CRCA sheet with required bracings and supports, gasketed with foam rubber to make the panel dust and vermin proof, together with degreasing and applying two coats of red oxide and two coats and stove enamel paint. The panel shall include all required hardware's, moulded insulators and separators including cutting and making space in compartmental formation. The thickness of steel sheets, shall be 16 SWG. Main Distribution Boards –IP 44.

250 A MCCB 35 KA 3 Pole

32A Double pole 10 KA

6-15 Amp SPMCB

2 A SPMCB

Distribution Boards complete with Copper bus bars, inter connection with copper wires, glands

and thimbles etc. complete In all respects

Nos

1

3

Supply installation testing and commissioning of 80 KVA, true on-line UPS 3 Ph 3 Ph double Conversion with all safeties and protection and suitable capacity sealed maintenance free 12 V batteries, with a 10-15 mins backup time on full load with MS open MS Battery rack and Nyvin cable of as approved with minimum specifications as specified in the tender

Nos

1

4

Supply and laying of one number cable of following sizes direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc. / on surface / in pipe / conduit as required.

4a

Three and half Core x 150 mm² PVC insulated, PVC sheathed, armoured, and stranded Aluminum conductor cable 1100V grade, of ISI Marked, as required.

Mtrs

50

4b

4C x 50 mm² PVC insulated, PVC sheathed, armoured, and stranded copper conductor cable 1100V grade, of ISI Marked as required.

Mtrs

25

4c

2C x 2.5 mm² PVC insulated, PVC sheathed, armoured, and stranded copper conductor cable 1100V grade, of ISI Marked as required.

Mtrs

500

5

Earthing with Copper earth plate 600 mmx600x3mm thick including all accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. complete with charcoal and salt as required , BIS specifications.

Sets

4

6

P/F 25 mmx5mm copper strip on surface/recess for connections etc. as required.

Mtrs

50

7

P/F 25 mmx5mm copper strip in 40 mm dia. GI pipe from earth electrode as required.

Mtrs

20

8

P/F 6 SWG GI Wire on surface/recess/in ground for loop earthing along with existing cable as required.

Mtrs

1500

9

Supplying and making end termination with brass compression gland and copper lugs for PVC insulated PVC sheathed Aluminum/ copper conductor armored cable of 1.1.KV grade of following sizes as required:

9a

4 core x 50 Sq. mm Stranded copper Conductor

Sets

4

9b

3 and 1/2 core 150 sq. mm Stranded aluminum conductor

Sets

2

Total for SUBHEAD CABLING

Total of Subhead Audio

Total of Subhead VIDEO

Total of Subhead Cabling

Rs

Rs

Rs

Grand Total

Rs

Signature of the Contractor with SEAL

	Comprehensive Annual Maintenance Charges (with Spares) After Defect liability Period				
					Rs Per Year
				In words and figures	In words and figures
	1st Year				
	2nd Year				
	3rd Year				
	4th Year				
	5th Year				

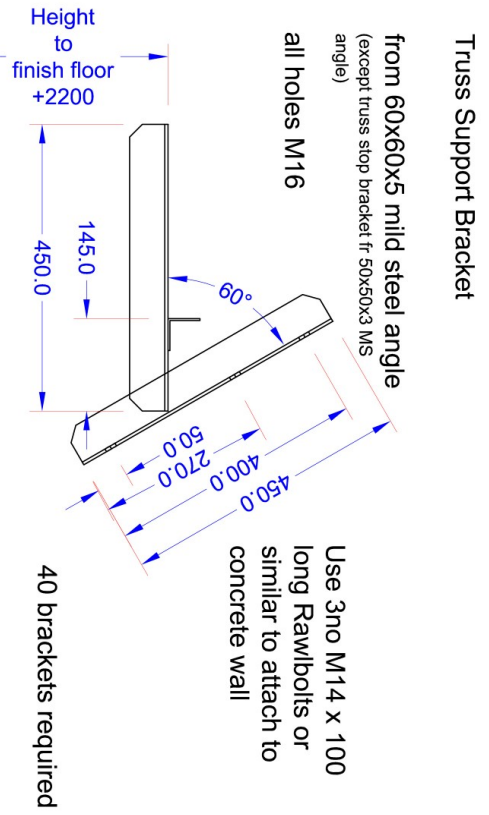
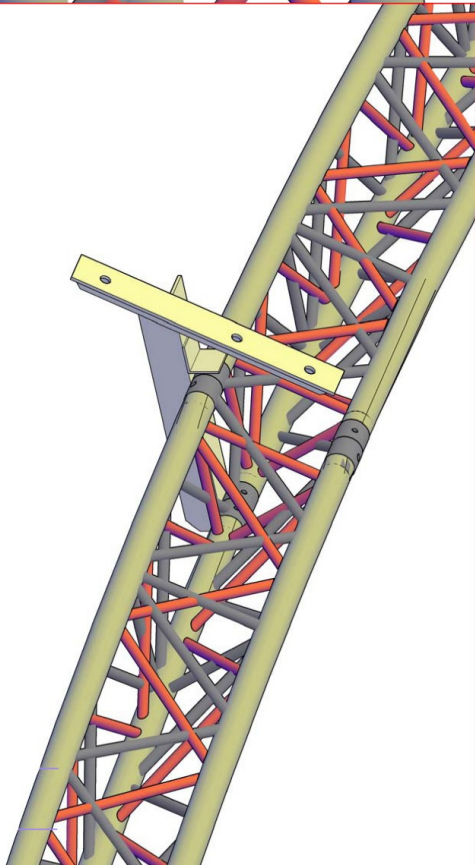
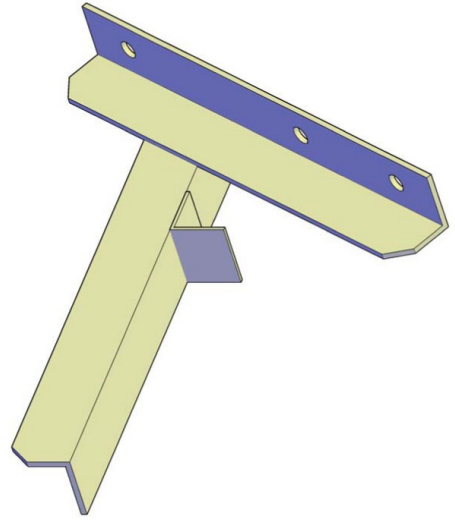
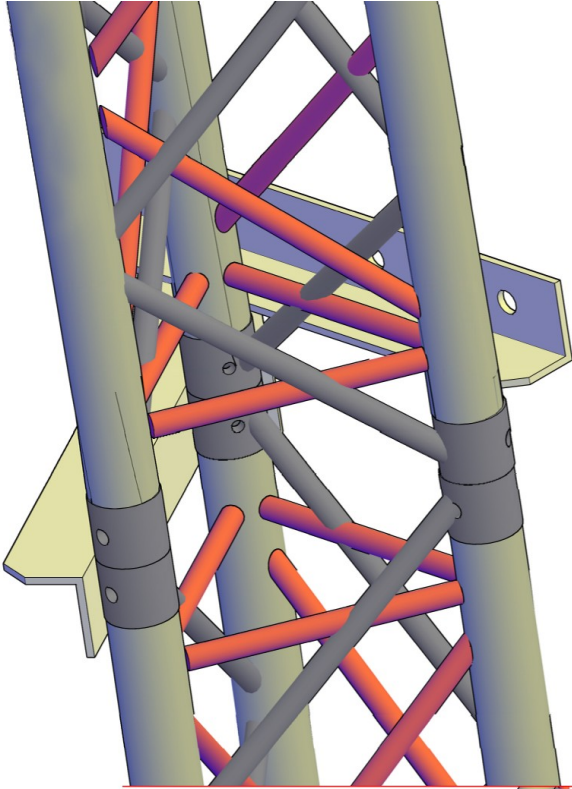
Signature of the Contractor with SEAL

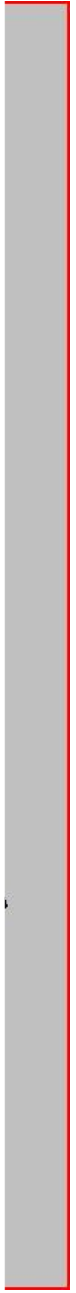
	Operation Charges (without Spares) After handing over the show				
					Rs Per Year
				In words and figures	In words and figures
	1st Year				
	2nd Year				
	3rd Year				
	4th Year				
	5th Year				

Signature of the Contractor with SEAL

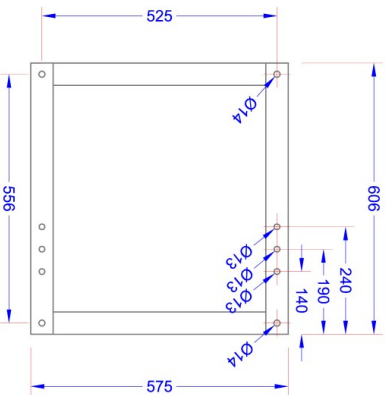


3 Support Bracket Diagram



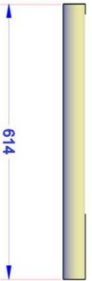


ector Hanging Bracket - Detail



From 50x50x3 Hollow
Section (RHS) Mild Steel

5 Projectors frames required
Also
20no M12 threaded stud x 200mm
long



Also required per projector frame:
from 48.3 x 3.2 CHS (Circular
Hollow Section)



10no TS7100 Swivel
clamps (parallel couplers)

The Doughty Parallel Coupler provides a firm fixing between two parallel bars.

Manufactured from high tensile Aluminium Extrusion, Swivel (157100) and 90 degree fixed (157102) versions are available.

Available in Black or Polished Aluminium

SWL: 750 Kg

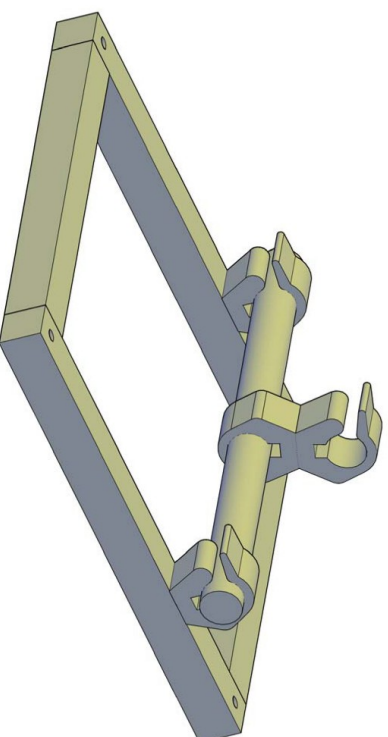
Tube Diameters: 48 to 51mm

Width: 50mm

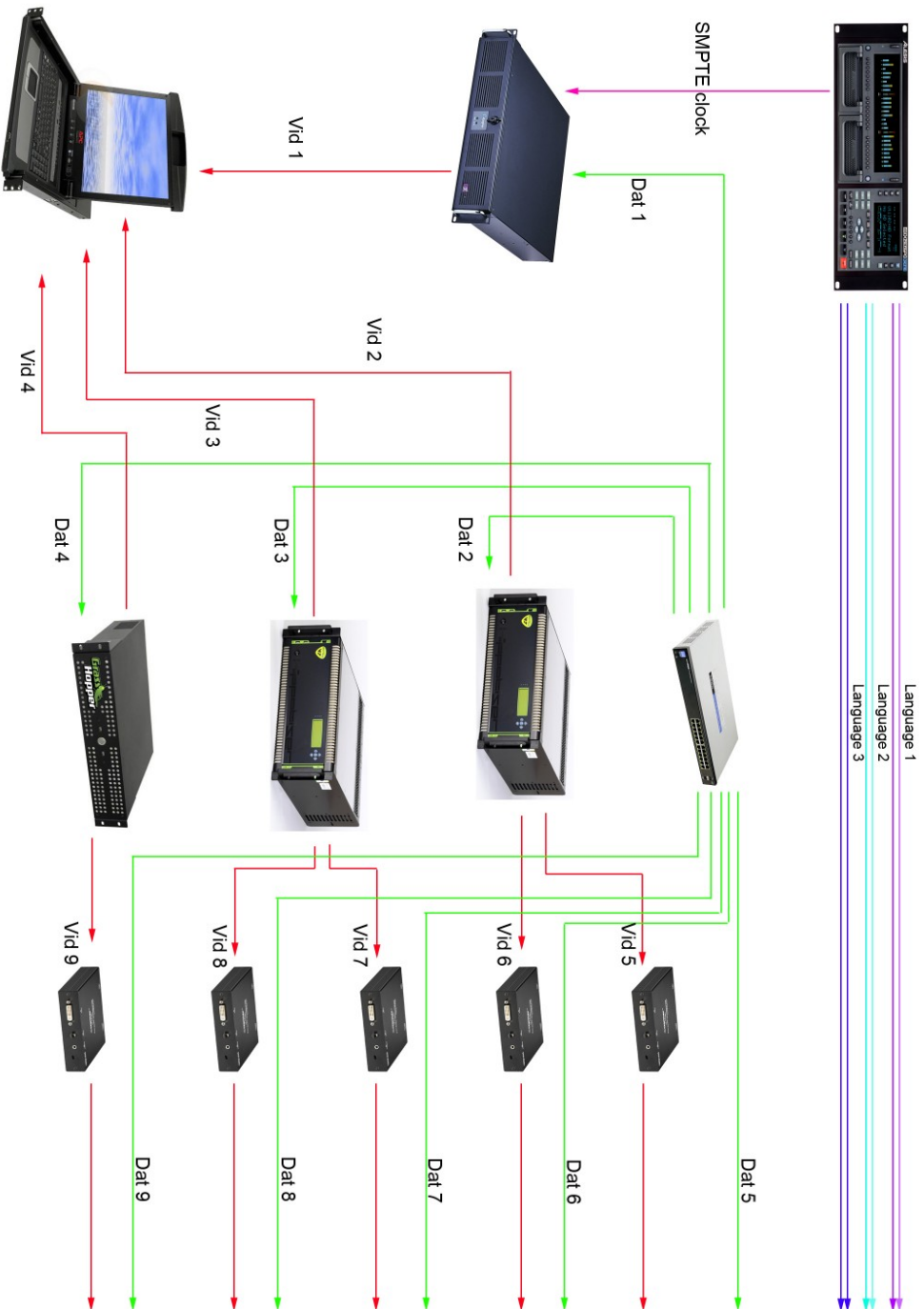
Tube Centres: 110mm

Weight: 1.33 Kg

Boxed Quantity: 6



Control Room - Video & Sound



Unit Diagrams
Control Room Circuit Diagram



