B. P. Koirala Memorial Cancer Hospital
Bharatpur, Chitwan

Invitation of Quotation/Proposals for LINAC
Notice Published: September 23, 2025

B. P. Koirala Memorial Cancer Hospital invites detailed financial proposals with breakdown for the procurement of a Linear Accelerator (LINAC) Turn Key with the following details . This invitation is extended to capable and interested firms/companies, who must submit a comprehensive quotation, including a detailed Bill of Quantities (BoQ) and full specifications, along with all requisite legal and company documents, including a manufacturer's authorization.

Supply, Delivery, Installation and Commissioning of Linear Accelerator system (Turn Key)

S.N	Technical Specification
A.	AN OVERVIEW TO SPECIFICATIONS:-
	i. A digital Medical Linear Accelerator, Energy 6MV WFF/FFF capable of deliver 3DCRT, IMRT,VMAT with on board kvCBCT Imager.
	ii. Proposed Machine (brand name) global lunched year must be 2015 or newer. Please specify
	iii. Proposed Machine (brand name) must be USFDA and CE certified.
B.	BASIC EQUIPMENT:-
1.	Energy:- Photon: 6 MV WFF/FFF
2.	Photon Beams Quality: As per BJR 11/17/25 .please specify
3.	Photon Dose rate:- The X-ray dose rate shall be variable in steps and shall be upto 500MU/min or more for 6 MV WFF/FFF
4.	RF Source:- Magnetron / Klystron, please specify
5.	Waveguide Type :- Standing / Travelling wave please specify
6.	Electron Gun:- Sealed / Unsealed
7.	Treatment Modes:- TSD / TAD
8.	Field Size:-
	i. Maximum: 28x28 cm^2 or more ii. Minimum: 1 x 1cm^2 or less.
9.	Beam Flatness/dynamic beam flatness:- ± 3% for FS 10x10 cm^2
10.	Beam Symmetry:- ±2 % for 10x10 cm^2
11.	Gantry :-
	a. Rotation ±180° (360° total)
	b. Read out - Digital
	c. Accuracy dig-readout ±0.5°
	d. Control - Hand pendent and control-console
	e. Target - Axis Distance: 100 ± 0.2 cm
	f. ODI Accuracy ± 0.1 cm (Except Ring gantry Linear Accelerator)

S.N	Technical Specification
12.	Collimator:-
	a. Rotation: ± 90° about mid position/rotation range
	b. Control: Hand pendent and control- console
	c. Readout accuracy: ± 0.5°
	d. Collimator Rotation Isocentre ≤ 2 mm dia. Sphere
13.	Multi-leaf collimator (MLC):-
	a. No. of Leaves : at least 114 or above
	b. Leaf resolution: Central MLC leaves resolution must be ≤ 5mm at isocenter.
	c. Independent drives for each leaves.
14.	Treatment Couch:- 3DOF or more
15.	Wedges:- Motorized/Dynamic/Virtual Wedge (Not applicable to ring gantry Linac)
16.	Treatment delivery Capabilities:-3DCRT, IMRT,VMAT
17.	System shall have all safety interlocks, last person out switch, Door interlock, Emergency switches, Anti-collision sensor/system, Radiation beam ON/OFF indicator in bunker entrance
18.	Portal Imaging & Accessories:-MV imaging
19.	Portal dosimetry system or Equivalent system for pre-treatment IMRT/VMAT plan verification and QA (hardware and software). Must be a helical detector grid with more than twelve hundreds diode detectors, Tissue equivalent inserts must supply and system should compatible to supplied Linac.
20.	Treatment Planning System:-
	a) The treatment planning system: Two workstations (WS)
	b) Physician's contouring work station: 3WS with deformable image registration and auto fusion.
	c) Record & Verify System : 2WS
	d) TPS: The TPS should be of the latest version of optimization and planning algorithm & able to network with CT simulator, MRI/ PET and diagnostic CT system etc.
	e) Latest advanced hardware for Calculation and non-calculation workstation, minimum 23" LED/LCD monitor for workstations .
21.	Server (backup/restore):- fully integrated servers for data management and image management with sufficient back up capabilities.
22.	DICOM RT Data Import & Export Software should be supplied.
23.	Accessories:-
	a. CCTV / Camera four nos. two wide angle & two remote control with remote zoom & focus facility b. Laser alignment system – Green Color (4 nos.) / Inbuilt Inbore Laser alignment system (system color) c. An intercom (patient communication) system must be upplied.
	d. Compatible to proposed machine, Must supply a QA system for beam/machine parameter check.
	e. Last person out switch
C.	GENERAL SPECIFICATION
1.	General:-

S.N	Technical Specification
	Linear Accelerator must have the latest technology and should be fully computer controlled with the latest state of art digital control system.
2.	It shall be brand new machine. Machine manufacture date should not be more than two years older from date of installation. Company shall provide certificate of trouble free operation of proposed machine for two years from existing multiple users.
3.	The supplier/bidder/company should provide one certified Service Engineer permanently stationed for entire warranty period and must provide the necessary service/ maintenance tools.
4.	All the equipment/ accessories quoted and supplied should be of latest model. (Proof should be enclosed in the form of press release/advertisement/certification by concerned bodies/commitment in company letter head, etc.). If it is not latest, bid will not be qualified from evaluation.
5.	Company should give the undertaking for supply of spares till machine life.
6.	Company should be responsible for installation, technical support to hospital responsible physicist in machine acceptance tests, commissioning (if required).
7.	Software updating should be provided free of cost for warranty and CMC period.
8.	Installation and acceptance test performance support will be company's responsibility with no additional cost (free of cost).
9.	Warranty/Guarantee:-
	i. From the date of machine handover to hospital of Linear accelerator systems including, software, TPS shall have comprehensive warranty/guarantee for 5 years against manufacturing defects of materials and workmanship. This also applies to the supplied and installed supportive system such as chiller, UPS, Battery and HVAC system.
	ii. Uptime of at least 95% . This time will be calculated 3 hours after reporting to engineer/ company by phone or emails till engineers hand over the machine for treatment. In case of failure the compensation warranty period will be extended by 1:3 day ratio.
10.	Comprehensive Maintenance Contract (CMC):-
	a. After expiry of warranty/ guarantee period of 5 years, CMC charges must be quoted for next 5 years on yearly basis (from 6th year to 10^{th} year) after expiry of warranty for entire linear accelerator system along with TPS and including supportive systems such as UPS, Battery, Chiller and HVAC.
	b. The quoted CMC charges will be taken into consideration at the time of evaluation (Financial) of the bid.
	c. CMC charge, if taken as % of bid cost, should not include the cost of BoQ ,i.e- cost of civil, electrical work, dismantling cost, Training cost etc
11.	Any items, if required for proper functioning and running of the machine that is not quoted or mentioned in specification/ BoQ should be included and provided by vendor. Vendor should include the cost of those items in price bid. Inclusion of such items will be responsibility of vendor.
12.	In case the local representative (agency/supplier) of manufacturer changes, it shall be responsibility of manufacturing company to run machine till its full life. Manufacturer must submit declaration for this.

S.N	Technical Specification
13.	Networking and configuration with existing Brachyrherapy machines (Make:Bebig), CTSimulator (Make:Philips, Brilliant Big bore) and/or proposed to be procured CTsimulator, equipment should be done by vendors at their own cost. No additional payment will be made to vendor for this work.
14.	The company should be responsible for installation and maintenance of the machine, software, accessories and networking which will help directly and indirectly in proper functioning of the machine.
D.	Accessories to be Supplied
1.	Chiller / Water Cooling system:-
	i. Supply, installation and maintenance of adequate Chiller system is responsibility of Company / bidder. Chiller space will be provided by hospital
	ii. Adequate Air condition for Linac room, console, and server as per machine and TPS as room requirements should supply.
	iii. Relative Humidity : Approx.50-55 RH or as per machine requirements
	iv. Air Changes –more than 8 air changes per hour.
2.	On-Line UPS to run entire system minimum 30min (standby) must be supplied. The installation and maintenance should be done by bidder.
3	a) Machine must fit in the Bunker of dimension as per attached drawings.
	b) Radiation beam centre must be in the midline ±60cm of the existing primary wall length (gantry-target direction)
	c) Must have adequate clearance with walls for all couch movements as per offered machine standard.
	d) Additional modifications including all complete work (civil electrical plumbing etc) as required to install the Linac shall be the bidder's responsibility.
	e) All Internal decoration and furnishing of bunker, control console, TPS, server room (flooring, painting, , networking, wiring, room lights, false walls and ceiling) shall be the responsibility of bidder.
	f) Dismantle of existing 600CD machine including base frame shall be the responsibility of bidder.
	g) Pit preparation and base frame installation if required as per quoted model, shall be the responsibility of bidder.
	h) Modification of existing internal dimensions of bunker shall not be permitted. For radiation safety requirement, if required, outer wall retrofit is allowed.
	i) Existing bunker door replacement/repair shall be bidder's responsibility.
	j) For site/ bunker details bidder may visit the site.
4	Dosimetry(BeamScan) kit for Machine commissioning
	a) Kit (Part number: T41043.1.270)
	b) BeamDose software (Reference number: S080053
	c) One day on-site hardware and software application training

S.N	Technical Specification
5	**Training Manufacturing site/ company training center**
	1. Two Radiation Oncologists and two Medical Physicists: Training on TPS workflow (basic, tools, contouring, planning, verification) for one week
	2. Training for 2 radiotherapy technologist for one week
	3. Medical Physicist (i) TPS, data administration, Record &verification: one week and (ii) Machine commissioning: one week
	4. Training for a biomedical engineer in company training center for one week
	5. Onsite Basic operation of Linear Accelerator: one week training to Radiation Technologist and Medial Physicist
	All the financial liabilities shall be borne by the bidder including transportation, lodging, and accommodation. Training schedules should be matched and approved by hospital.

Bill of Quantity

I	**Training Manufacturing site/ company training center**		
	1. Two Radiation Oncologists and two Medical Physicists: Training on TPS workflow (basic, tools, contouring, planning, verification) for one week		
	2. Training for 2 radiotherapy technologist for one week		
	3. Medical Physicist (i) TPS, data administration, Record &verification: one week and (ii) Machine commissioning: one week		
	4. Training for a biomedical engineer in company training center for one week		
	5. Onsite Basic operation of Linear Accelerator: one week training to Radiation Technologist and Medial Physicist		

II	**Description**	**Unit**	**Qty**	**Remark**

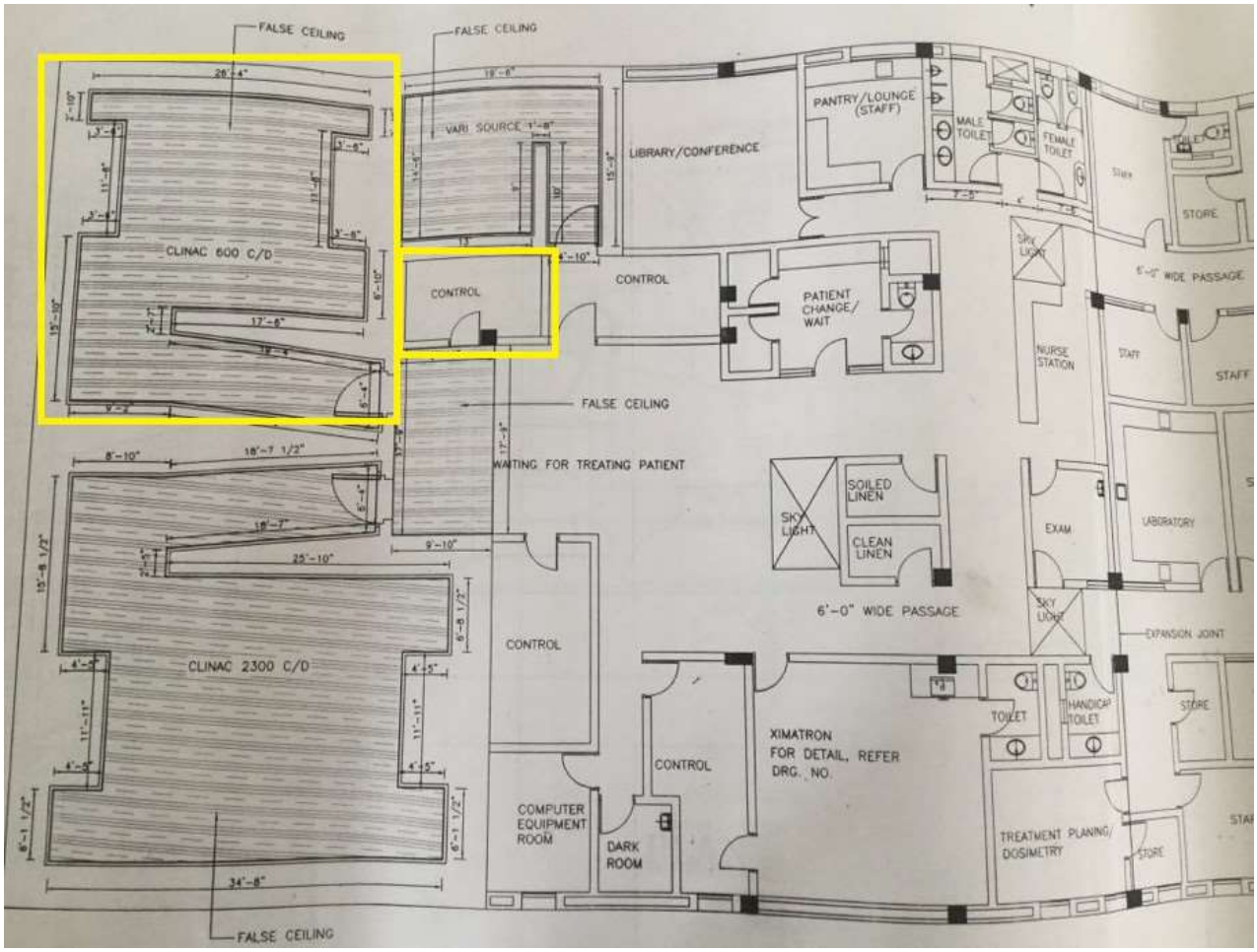
A	**CIVIL STRUCTURAL WORKS AND INTERIOR**			
A1	Dismantling Works inside Bunker,Console Room and TPS room including machine, PCC, flooring, false ceiling,walls, Furnitures,etc to any depth/width, disposal of debris, cleaning & making the surface free from dust and debris as per instruction. (Measurement on floor area)	sqm	650	
A2	Supply and install 3 mm thick homogeneous anti-static vinyl flooring with 0.3 mm wear layer, surface resistivity 10^6–10^9 Ω, smooth non-slip finish, light neutral color, seamless welded joints with conductive adhesive, grounded to building ESD system, including 150 mm matching skirting, installed over self leveling compound, moisture-free concrete subfloor, resistant to rolling loads, disinfectants, fully compliant with IEC 61340-5-1 and ASTM F150 standards	Sqm	650	
A3	Wall finishing with medical-grade emulsion paint with minimum two coats of washable paint over primer and putty (location: bunker, console room, TPS room)	Sqm	3000	
A4	Supply and install 600×600 mm mineral fiber ceiling/wall tiles, 15–20 mm thick, fire-resistant Class B1, with smooth light-colored finish, high sound absorption (NRC ≥ 0.6), moisture-resistant, dust-proof, ESD-safe, laid on powder-coated GI T-grid framework with adjustable hangers, perimeter channels, and access panels, allowing integration with lighting, HVAC diffusers, and electrical services, ensuring easy maintenance and compliance with hospital safety standards	Sqm	300	
A5	Radiation Bunker Door servicing/replacement with interlock provision as per requirement of OEM.	Nos	1	
B	**FURNITURE WORKS**			
B1	Supplying and applying medical graded vinyl wall cladding in bunker corners	Sqm	50	
B2	Supply and installation of ergonomic workstation tables (width 2'8") with 25–30 mm solid hardwood top finished with durable laminate, solid hardwood frame and legs, edge-banded, lockable 2–3 drawer units with solid wood fronts and smooth sliding mechanisms, cable management provisions(modular design) as per instruction (measurement shall be made in as Length* height) as per instruction.	sqm	19	

B3	Wall-mounted storage cupboards with width (1'6") made up of minimum 19mm thick premium plywood or solid wood body and shelves, lockable doors, anti-tip design with laminated finish within LINAC room; to store: Dosimetry & QA Items, LINAC accessories. (measurement shall be made as Length* height) as per instruction.	sqm	6	
B4	Wooden Tables for Workstations with overhead cabinets of width 2' (19mm premium laminated plywood) (measurement shall be made as Length* height) as per instruction.	sqm	10	
B5	Ergonomic office Revolving chairs with adjustable height, backrest and handrest, 360° swivel, high-density foam seat and backrest as per instruction.	nos	10	
B6	Supply and install metal visitor chair with a durable powder-coated steel frame, ergonomic backrest and seat with a minimum width of 18–20 inches, arranged in rows or clusters, suitable for high-traffic hospital waiting areas as per instruction	nos	40	
C	**ELECTRICAL WORKS**			
C1	Main Power Supply & Distribution – 3-phase, 400V, 50Hz with MCBs, isolators, busbar, panel board, and earthing	LS	1	For LINAC machine & associated systems
C2	UPS & Backup Power – Online UPS for critical equipment including battery bank and installation	LS	1	30 min backup depending on requirement
C3	Emergency Generator Connection – Cabling, ATS, and connection to hospital DG set	LS	1	For uninterrupted LINAC operation
C4	Room Lighting & Power Points – LED lighting, switches, sockets for consoles, TPS, and auxiliary equipment rooms	LS	1	Adequate illumination & power for staff workstations
C5	Dedicated Circuits for LINAC Ancillaries – Cooling pumps, chiller, HVAC system, computer consoles, motorized patient table, safety interlocks	LS	1	As per OEM recommendation
C6	Earthing & Lightning Protection – Earthing pits, bonding of all metallic structures, lightning arrestor	LS	1	As per requirements Critical for sensitive electronic equipment

C7	Cable Trays & Conduits – For power, data, and control cables including trays, conduits, and supports	LS	1	Neat installation for safety & maintenance
C8	Fire Alarm & Safety Integration – Smoke detectors, emergency lights, and integration with hospital fire alarm system	LS	1	Mandatory for safety compliance
C9	Testing & Commissioning – Electrical testing, insulation resistance test, earth continuity, functional testing of all circuits	LS	1	As per hospital & OEM standards
D	**HVAC WORKS**			
D1	**Ductable A/C units along with Low side works and high side works for complete installation & commissioning of AC** Supply , installation ,testing & commissioning of aircooled ductable split air conditioner with ceiling suspended IDU and all standard fitting,GSS sheet metal duct(insulation using resin bounded glass wool with 7 micron aluminium foil) for air distribution 22/24 G, IDU SS drain pan as per specification complete with suitable capacity drive motor , aircooled condensor with all accessories ,hermetically sealed scroll compressor, electronic microprocessor pendant controller with digital display, first charge refrigerant gas, vibration isolator pads, structural support for fixing IDU/ODU, safety devices including thermal protector, pressure release valve ,overload relay single phase preventer etc, power wiring and control cabling(indoor to outdoor), thermostat wiring, high-low pressure cut out suitable for 3 phase 440V supply etc complete as required) for Bunker 5.5 TR working and 5.5 TR as standby, for console room , 2 TPS rooms , server room and UPS room as required Make: Daikin, Hitachi, Blue Star, Voltas	TR	11+ Adequate number for proper functioning of the entire system	
D3	Supply and install industrial-grade dehumidifier, floor-standing or wall-mounted type, with automatic humidity control (maintaining 45–55% RH), capacity as per room volume and load, washable air filters, digital display, continuous drainage connection, low-noise operation (<50 dB), corrosion-resistant body, energy-efficient compressor with auto-defrost, and complete with power connection, installation, testing, and commissioning as per hospital and OEM standards.	LS	2	

E	**PLUMBING WORKS**			
E1	Supply, installation, testing, and commissioning of complete plumbing works including incoming water supply connection with valves and backflow prevention, internal cold/hot water distribution, drainage and sewer connections with traps and floor drains, condensate drains for HVAC/chiller, sanitary fixtures (basins, sinks, hose bibs), neutralization pit (if required), pipe supports, insulation, storm water provision, corrosion protection, coordination with civil/electrical works, and all accessories, fittings, testing, disinfection, documentation, and handover as per hospital standards	LS	1	
F	**FIRE & SAFETY**			
F1	Fire Alarm System with smoke detectors as per standards	LS	1	
F2	Fire extinguishers (CO_2 / clean agent) in bunker & console as per standards	Nos	3	
F3	Emergency lighting & exit signage in bunker & console as per standards	LS	1	

600CD Bunker



Interested firm/company can submit their detail proposal with breakdown of the equipment with related goods/Services/Wokr to the hospital and make administration directly or via email: bpkmchhospital@gmail.com/ directorbpkmch@gmail.com/bpkmchprocurement@gmail.com within 7 days.