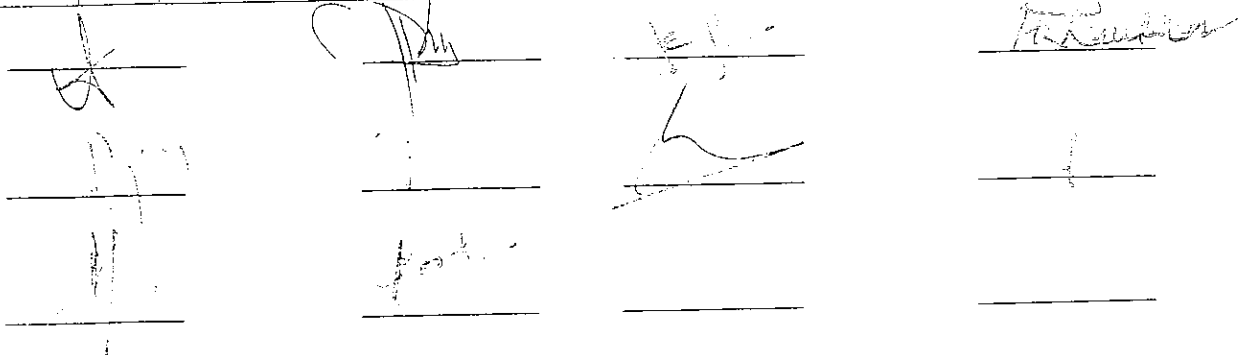


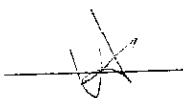
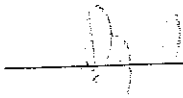
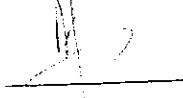
QRs/SPECIFICATIONS OF TWO WHEELED DAY AND NIGHT SURVEILLANCE ROBOT


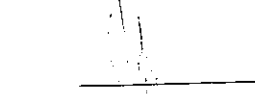
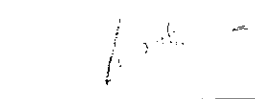
Ser No	Qualitative Requirements	
1.	<u>General</u>	
(a)	Two Wheeled Day and Night Surveillance Robot should be a micro-robot that enables instantaneous video and audio reconnaissance within indoor or outdoor environments. The Robot should be portable enough to be used by a single operator.	
(b)	<u>Wireless Link with Control Unit</u>	
(i)	The Robot should be able to receive Command and Control instructions from Control Unit through a Wireless Link and should be able to move accordingly at the following desired ranges	
(aa)	Line of Sight Range	Essential : 90 mtr Desirable : 150 mtr
(ab)	Non Line of Sight Range	Essential : 25 mtr Desirable : 70 mtr
(ii)	The Robot should be able to transmit audio and video reconnaissance data over the wireless link to Control unit at the following desired ranges:-	
(aa)	Line of Sight Range	Essential : 90 mtr Desirable : 150 mtr
(ab)	Non Line of Sight Range	Essential : 25 mtr Desirable : 70 mtr
(c)	Should be able to be used as a pole camera when used in tandem with an extendable manual / robotic pole to see over walls, through windows and under culverts. Proposed pole attachment should be compact and lightweight for ease of carriage.	
2.	<u>Two Wheeled Robot</u>	
(a)	Weight	750 gms or less
(b)	Should be able to sustain drops on concrete floor	Up to 8 mtr or better
(c)	Should be able to sustain throws on concrete floor	Up to 30 mtr
(d)	Should comply to IP 65 or better	
(e)	<u>Day and Night Camera- For video Surveillance</u>	
(i)	The Camera should have a CCD Sensor capable of producing B & W images. A Colorful display is desirable	
(ii)	Resolution	420 TV lines or higher
(iii)	Field of View of each Camera	50 degrees or higher (Both Azimuth and Elevation)
(iv)	Frame Rate	25 fps or higher

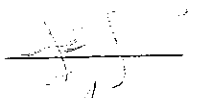
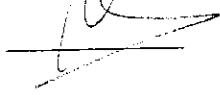



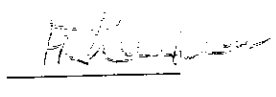


QRs/SPECIFICATIONS OF TWO WHEELED DAY AND NIGHT
SURVEILLANCE ROBOT (Contd....)

Ser No	Qualitative Requirements	
(f)	<u>IR Illumination</u>	Non Visible IR illumination should be provided for darkness which should automatically switch on if ambient light is really low.
(i)	Range of IR Illumination	7.5 Mtr.
(g)	<u>Microphone – For Audio Surveillance.</u> Super sensitive omni directional microphone with pickup range at least of 5 mtr is essential. Pick up range of 15 mtr is desirable.	
(h)	<u>Battery</u>	
(i)	Endurance	60 Minutes or Higher
(ii)	Charge Cycles	500 or Higher
(j)	<u>Speed.</u> Equal or more than one Foot per second	
3.	<u>Control Unit.</u> To receive and display audio and video reconnaissance data picked up by Robot and also to move the Robot.	
(a)	Weight	1.75 Kg or Less
(b)	Video Out and Audio Out Port	Must be there
(c)	Joystick Control	Suitable Joystick to be provided to move the Robot
(d)	Screen	Control Unit to have suitable screen of 3 inches to 3.5 inches to display video being received is essential, desirable 7 inch.
(e)	<u>Battery</u>	
(i)	Endurance	60 minute is essential desirable 180 minutes or Higher
(ii)	Charge Cycles	500 or Higher
4.	<u>Battery Charger.</u> Suitable 110/220 V AC battery Chargers to charge the Robot and Control Unit batteries. Separate chargers required for Control Unit and Robot.	
5.	<u>Portability and Storage.</u> The equipment to be provided in suitable pelican box for ease of carriage. In addition, vendor to provide suitable black bag to allow the equipment to be secured to the Personal Load Carrying Equipment during operations.	

QRs/SPECIFICATIONS OF TWO WHEELED DAY AND NIGHT SURVEILLANCE ROBOT (Contd...)

Ser No	Qualitative Requirements
6.	<u>Maintenance Kit</u> Suitable maintenance kit with recommended accessories to be provided to reduce Mean Time to Repair (MTTR).
7.	<u>Literature</u> . Operating and Technical literature for each discrete components of system should be in English language
8.	<u>Training</u> . Demonstration of one set of complete system with its full accessories should be arranged at buyers premises on NO cost NO commitment basis. In situ training of users for three day on operation, maintenance, fault finding and user level repairs.

[Signature]
Amit K. Gupta
 DCT/TBP

[Signature]
 S. P. Singh
 DCT (B-3), (L&T)

[Signature]
PAWAN K. (X)
 25th Bn (SSB)

[Signature]
 G. A. K. Sharma
 SC TSG, NSG

[Signature]
R. N. Meel
 Lt Col
 G. A. K. Sharma
 SC TSG, NSG

[Signature]
(HARI MOHAN)
 Lt Col
 (Lt Col Amit Singh)

APPROVED / NOT APPROVED

(RC Tayal)
 DG, NSG

TRIAL DIRECTIVES FOR TWO WHEELED DAY AND NIGHT SURVEILLANCE ROBOT

Ser No	Qualitative Requirements	Trial Methodology
1	<p>General</p>	
(a)	<p>Two Wheeled Day and Night Surveillance Robot should be a micro-robot that enables instantaneous video and audio reconnaissance within indoor or outdoor environments. The Robot should be portable enough to be used by a single operator.</p>	<p>To be checked physically by BOO</p>
(b)	<p><u>Wireless Link with Control Unit</u></p>	
(i)	<p>The Robot should be able to receive Command and Control instructions from Control Unit through a Wireless Link and should be able to move accordingly at the following desired ranges</p>	<p>To be checked physically by BOO</p>
(aa)	<p>Line of Sight Range Essential : 90 mtr Desirable : 150 mtr</p>	<p>To be checked physically by BOO</p>
(ab)	<p>Non Line of Sight Range Essential : 25 mtr Desirable : 70 mtr</p>	<p>To be checked physically by BOO</p>
(ii)	<p>The Robot should be able to transmit audio and video reconnaissance data over the wireless link to Control unit at the following desired ranges:-</p>	<p>To be checked physically by BOO</p>
(aa)	<p>Line of Sight Range Essential : 90 mtr Desirable : 150 mtr</p>	<p>To be checked physically by BOO</p>
(ab)	<p>Non Line of Sight Range Essential : 25 mtr Desirable : 70 mtr</p>	<p>To be checked physically by BOO</p>
(c)	<p>Should be able to be used as a pole camera when used in tandem with an extendable manual / robotic pole to see over walls, through windows and under culverts. Proposed pole attachment should be compact and lightweight for ease of carriage.</p>	<p>To be checked physically by BOO</p>


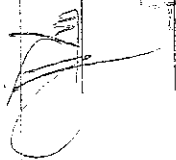
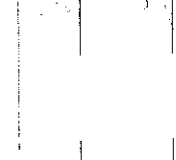
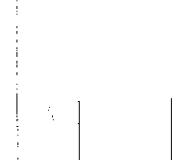
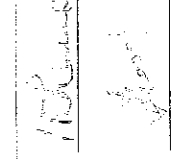
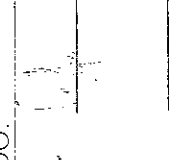

[Handwritten signature]

[Handwritten signature]

[Handwritten text]

TRIAL DIRECTIVES FOR TWO WHEELED DAY AND NIGHT SURVEILLANCE ROBOT (Contd....)

<u>Ser No</u>	<u>Qualitative Requirements</u>	<u>Trial Methodology</u>
2.	Two Wheeled Robot	
(a)	Weight 750 gms or less	To be checked physically by BOO
(b)	Should be able to sustain drops on concrete floor Up to 8 mtr or better	To be checked physically by BOO
(c)	Should be able to sustain throws on concrete floor Up to 30 mtr	To be checked physically by BOO
(d)	Should comply to IP 65 or better	Certification from National / International accredited lab to be checked by BOO.
(e)	Day and Night Camera- For video Surveillance	
(i)	The Camera should have a CCD Sensor capable of producing B & W images. A Colorful display is desirable	Certificate from OEM to be provided. Correctness and authenticity to be verified by BOO.
(ii)	Resolution 420 TV lines or higher	Certificate from OEM to be provided. Correctness and authenticity to be verified by BOO.
(iii)	Field of View of each Camera 50 degree or higher (Both Azimuth and Elevation)	To be checked physically by BOO
(iv)	Frame Rate 25 fps or higher	Certificate from OEM to be provided. Correctness and authenticity to be verified by BOO.

3
TRIAL DIRECTIVES FOR TWO WHEELED DAY AND NIGHT SURVEILLANCE ROBOT (Contd..)

Ser No	Qualitative Requirements	Trial Methodology
(f)	<u>IR Illumination</u> Non Visible IR illumination should be provided for darkness which should automatically switch on if ambient light is really low. Range of IR Illumination 7.5 Mtr	To be checked physically by BOO
(g)	<u>Microphone – For Audio Surveillance</u> Super sensitive omni directional microphone with pickup range at least of 5 mtr is essential. Pick up range of 15 mtr is desirable.	To be checked physically by BOO
(h)	<u>Battery</u> (i) Endurance 60 Minutes or Higher (ii) Charge Cycles 500 or Higher	To be checked physically by BOO
(i)	<u>Speed</u> Equal or more than Feel per second	To be checked physically by BOO
3.	<u>Control Unit</u> To receive and display audio and video reconnaissance data picked up by Robot and also to move the Robot.	To be checked physically by BOO
(a)	<u>Weight</u> 1.75 Kg or Less	To be checked physically by BOO
(b)	<u>Video Out and Audio Out Port</u> Must be there	To be checked physically by BOO
(c)	<u>Joystick Control</u> Suitable Joystick to be provided to move the Robot	To be checked physically by BOO
(d)	<u>Screen</u> Control Unit to have suitable screen of 3 inches to 3.5 inches to display video being received is essential. desirable 7 inch.	To be checked physically by BOO
(e)	<u>Battery</u> (i) Endurance 60 minute is essential desirable 180 minutes or higher (ii) Charge Cycles 500 or Higher	To be checked physically by BOO

