SCOPE OF WORK: URBAN WARFARE SIMULATOR

1.   **Introduction.**   The Urban Warfare Simulator is an advanced virtual reality-based training solution designed to provide immersive and realistic urban combat training to troops. This system will combine cutting-edge VR Technology, realistic Weapon simulations and multiplayer capability to enhance tactical skills in a cost-effective, remote or adaptive environment. Simulator will be a computer-based program designed to train and assess tactical interventions in various environments. It will provide a realistic and interactive platform for law enforcement, military units, security personnel and emergency responders to practice building clearance, hostage rescue and emergency evacuations in diverse scenarios.

2.   **Project Overview.** Urban warfare simulator will be a comprehensive training tool allowing personnel to practice **tactical manoeuvres in different environments with dynamic variables**. It will enhance strategic decision-making, spatial awareness and operational effectiveness for law enforcement, military and emergency responders.

    2.1.   **Purpose.** Train Military Personnel on Urban Warfare & Combat situations in different parts of the country, adapting to demography & different weather and climatic conditions. Apropos of providing a cost-efficient and safe training alternative to live combat situations.

    2.2.   **Key Features.** Simulator will have the following key features:

        2.2.1. Immersive VR environment.

        2.2.2. Wireless multiplayer for up to five participants.

        2.2.3. Detailed training scenarios.

        2.2.4. Realistic weapon handling with haptic feedback.

        2.2.5. Performance analytics and post-session reviews.

    2.3.   **Use Cases.** Urban Warfare Simulator will have the following use cases for training of troops:

        2.3.1. Military tactical training for troops on different scenarios of Urban Warfare operations.

        2.3.2. Use of weapons in Urban warfare operations.

        2.3.3. Practice on varied scenarios and conditions.

3.	**Categories and Environments.** Urban, Rural & Multicultural environment structures to incorporate the following for varied training exposure to troops:

    3.1.	**Urban Environment Structures**.

    3.2.	**Rural Environment Structures**.

    3.3.	**Multicultural Structures.**

4.	Scope of Work can be broadly divided into the following parts: -

    4.1.	Part I -	General Instructions.

    4.2.	Part II -	Aim and System Design.

    4.3.	Part III -	Specific instructions pertaining to the hardware.

    4.4.	Part IV-	Specific instructions pertaining to the software.

    4.5.	Part V-	Misc Aspects

PART I: GENERAL INSTRUCTIONS

5.   All assumptions/parameters that are likely to affect simulator performance/characteristics are to be duly approved by the Simulator Development Division (SDD) before implementation.

6.   Procurement of associated hardware, development software, software tools, and related computer hardware is the responsibility of the contracted firm/vendor. Necessary computer hardware for developing/testing purposes will be utilised only at the SDD location. Remote access to PCs will not be granted. Also, source code will not be shared for development at any location outside of SDD. Additional requirements/ issues/ clarification, if any, should be brought out during the pre-bid meeting.

7.   Any software tool/hardware item(s) used by the contracted firm/vendor, for which SDD has been billed, will be handed over to SDD on final acceptance of the project software.

8.   The contracted firm/vendor will adhere strictly to the mutually agreed-upon time schedule and will be fully responsible for meeting the timelines. Allocation of resources as well as timelines for completion of tasks will be prepared in consultation with the project officer within seven days of supplying the Supply Order.

9.   IPR of the hardware/software items will remain with SDD.

10.   The project team of SDD associated with the development work will also be trained to handle the hardware/software as and when required.

11.   Acceptance of the final product will be through vigorous in-house testing and user trials.

12.   Payment will be done once the final product is accepted, tested, and all deliverables are handed over to SDD.

13.   The contracted firm/vendor should not be blacklisted by any organization of the Government of India. The firm should have handled similar projects and should have at least 12 months of experience in the related field(s).

14.   A brief presentation on the project timeline, as well as a broad idea of various modules, must be given within one week of the placement of the supply order.

PART II: AIM AND SYSTEM DESIGN

15.   **Aim.**   To develop a Virtual reality-based simulator for troops to provide realistic training on Urban Warfare operations. The simulator will provide a realistic and immersive environment for users to practice urban warfare tactics, techniques, and procedures (TTPs) in a variety of scenarios.

16.   **System Design.**   The hardware/software components: -

16.1.   **Simulator Configuration.** The project envisages training of five squad members in virtual reality scenarios on VR headsets, also projected on a screen (Screen of size 10' x 8' combined. The system design should be modular so that it can offer multiple screen configurations.

16.2.   The simulator is envisioned to consist of the following at the trainee end:

16.2.1.   **VR headsets.**   The trainees will be trained by wearing VR headsets to adapt to immersive virtual reality scenarios of urban built-ups.

16.2.2.   **Demilitarised/ Replica/ In Service Weapons.** Weapons will be provided for instrumentation (placing of sensors). 05 x Weapons (Tavor/UZI/M4A1 Carbine & Berreta Pistol/ rifles) will be instrumented as part of the scope of work of this project.

16.2.3.   **Sight.**   Optical sight for all weapons will be developed with a near-realistic reticule pattern in Virtual View.

17.   **Interior Design and Layout Configurations.**

17.1.   **Room Configuration.**   Room design should be close to reality & cover all the aesthetics of the room:

17.1.1.   Room Size Variations: Small (4 Sqm), Medium (10 Sqm) & Large (20 Sqm+).

17.1.2.   Furniture & Object Placement: Tables, Chairs, beds, cupboards & bookshelves.

17.1.3.   Hidden Compartments: Secret doors, false walls, underground tunnels.

17.1.4.   Obstacles & barricades: Locked doors, furniture blockades, debris, storage boxes, etc.

17.1.5.   Lighting Conditions: Well lit, dimly lit & pitch dark for night mode.

17.2. **Entry & Exit Structures.**

17.2.1. Doors: Hinged doors (Left & Right opening), Sliding doors & Revolving doors.

17.2.2. Windows: Sliding, hinged (Up/Down or left/right opening), bulletproof & reinforced.

17.2.3. Roof top access: Open terraces, Sloped roofs, trapdoors, rooftop escape routes.

17.2.4. Basement & Underground Areas: Basement areas.

17.2.5. Multiple story access: Stairs (Straight, spiral, fire escape, attic ladders, elevators & escalators.

18. **Environmental & Tactical elements.**

18.1. Weather Conditions: Ability to introduce Weather conditions in the scenarios- Rain, fog, dust storms & nighttime.

18.2. Sound Simulation: Echo effects in large rooms, muffled sounds in closed spaces.

18.3. Structural weakness: Breakable walls, doors, glass panels.

18.4. Fire & smoke simulation: Smoke-filled rooms, fire hazards & option to introduce fire & smoke in any running scenario.

18.5. Crowd & hostile elements: Civilians, suspects and armed adversaries.

19. **Weapons and equipment Simulation.** The simulator should include a variety of weapons and explosive devices for training and intervention purposes. These will include: -

19.1. TAVOR Rifle: Configurable as per scenario.

19.2. UZI Rifle: Configurable as per scenario.

19.3. M4 A1 Carbine: Configurable as per scenario.

19.4. Berreta pistol: Configurable as per scenario.

19.5. AK-47: Configurable as per scenario.

19.6. Improvised explosive devices (IED & Molotov Cocktails): Fire-based threat simulations.

19.7. Stun Grenade: Diversion method before room entry.

19.8.   Ballistic shield: Protection against enemy fire during room intervention. These weapons will be modelled with realistic physics, haptics and ammunition limitation to provide an immersive and effective training environment.

20.   **Interactive Instructor Station (IIS) (Software Module).**   The   IS application will control the conduct of training in the simulator. The IIS will run over a wireless connection. It will send the exercise data to the weapons at the beginning of the exercise and receive the sensor data from the weapons during the conduct of the exercise. The computer configuration and functionality of IIS is covered in detail in Part III and Part IV of this document.

21.   **CGI System (Software Module).**   The CGI system will create and render the simulated environment, which will be further displayed using the Video Projection System on the screen and also in VR headsets being used by the trainees. The hardware configuration and functionality of CGI are covered in detail in Parts III and IV of this document.

22.   **Video Projection System (VPS).**   01 x High-definition 4K projectors will be used to project CGI graphics on the screens. The projector will be placed approximately 5 metres from the screen.

23.   **Physical Characteristics.**

23.1.   The simulator should be modular in design and constructed with the maximum possible use of COTS components. It should be stable, rugged and able to withstand the wear and tear of daily usage.

23.2.   The system should be operational with outdoor temperature between -5°C and 50°C and up to 95% humidity.

PART III: DETAILED DESIGN INSTRUCTIONS FOR HARDWARE

24.   **Modifications to the Demilitarised/ Replica Weapon.**   The   weapons used by trainees, whether demilitarised/ Replica weapons, will be suitably modified for use with the simulator. No modification carried out on the weapon will be permanent in nature. The sensors used as part of the modification of the rifle/pistols will draw power from a rechargeable battery source provided along with them. The battery source shall provide a combined minimum endurance of three hours (three packs of one hour each). Details of modification, purpose and intended scope of work for each weapon are as mentioned below: -

24.1. **Sensors.**   Suitable sensors to be employed for the operations of the simulator, i.e. firing, tracking & movement of the trainee avatar.

24.1.1.   **Trigger Operation.** The trigger press release by the trainee will be captured and reflected by fire in the simulation.

24.1.2.   **Trainee movement.**   Movement of the avatar will be catered by direction-sensitive push buttons and should be easily accessible to the trainee.

24.1.3.   The data from various sensors fitted in the mockup will be shared with the IIS and CGI computers wirelessly.

24.2 **Power Supply.**   A suitable DC power battery will be provided, which will draw power from rechargeable batteries providing a combined minimum endurance of three hours (three packs of one hour each). Use of standard (non-proprietary) rechargeable batteries is only to be made for the purpose.

25.   **Instructor Station (IIS / CGI Workstation).**

Ser No.	Component	Minimum exact specification
25.1	CPU	**Intel Core i7-14700K** – 20 cores / 28 threads, base 3.4 GHz, turbo 5.6 GHz, 33 MB L3 cache
25.2	GPU	**NVIDIA GeForce RTX 4070** – 12 GB GDDR6X, 192-bit bus, FP32 throughput 29.1 TFLOPS
25.3	RAM	**32 GB DDR5-5600 MHz** (2 × 16 GB); two vacant slots for expansion to 64 GB
25.4	Storage	**2 TB NVMe 4.0 ×4 SSD**; sequential read ≥ 6 500 MB/s, write ≥ 5 000 MB/s

Ser No.	Component	Minimum exact specification
25.5	Networking	2 × 10 GbE (RJ-45), 2 × 2.5 GbE, integrated Wi-Fi 7
25.6	OS	Windows 11 Pro 64-bit **or** Linux kernel ≥ 6.5 (3-year LTS)
25.7	Peripherals	32-inch 3840 × 2160 IPS monitor, programmable back-lit keyboard, optical mouse

26.　　**Reliability/Ruggedness.** The hardware components will be reliable and rugged enough to function without any fault for a minimum duty cycle of 12 hours, involving continuous and rigorous use.

27.　　**List of deliverable Hardware** is as follows:

Ser No.	Item	Qty	Mandatory Baseline Specification (exact values or better)
27.1	VR Headset	5	Quest 3 - Inside-out 6-DOF; per-eye **2064 × 2208** pixels; 90 / 120 Hz; Wi-Fi 6E; Snapdragon XR2-Gen 2 SoC; 3-D spatial audio
27.2	Laser projector	1	3-LCD blue-phosphor laser; **6,400 ANSI lm**; native **1920 × 1200** (WUXGA); dynamic contrast ≥ 600000: 1; lens shift V ± 55 % / H ± 25 %; light-source life ≥ 20 000 h
27.3	Projection screen	1	Rear-projection, 10 ft × 8 ft
27.4	Immersive audio	1	6-channel (5.1) amplifier + speakers, total power ≥ 120 W RMS, freq. 40 Hz – 20 kHz, HDMI-eARC input
27.5	Weapon sensor-kits	5	**As per Para 24 & 25**; 2 spare batteries per kit
27.6	Enterprise router	1	**Quad-band Wi-Fi 7 (802.11be)**; dual 6 GHz 320 MHz; aggregate wireless **30 Gbps**; 1 × 10 GbE WAN; 2 × 10 GbE + 2 × 2.5 GbE LAN; MLO, 4096-QAM

Ser No.	Item	Qty	Mandatory Baseline Specification (exact values or better)
27.7	Online UPS	1	5 kVA double-conversion; output 230 V ± 1 %, THD < 3 %; battery autonomy ≥ 30 min at 80 % load; SNMP card
27.8	Workstation (IIS/CGI)	1	Full build **as per Para 25**

PART IV: SPECIFIC INSTRUCTIONS PERTAINING TO SOFTWARE

System Capacity and Configuration Options

28.   The application shall support up to five concurrent VR users. The installer shall offer three predefined display layouts:

    28.1.   Single-screen – 10 ft × 8 ft projection plus VR headsets.

    28.2.   Dual-screen – 20 ft × 8 ft projection plus VR headsets.

    28.3.   Headset-only – VR headsets without projection.

29.   **Performance, latency, and VR-comfort safeguards**

    29.1   The rendering engine shall deliver at least **90 fps** to every VR headset and **60 fps** to every projected surface while maintaining end-to-end motion-to-photon latency ≤ 20 ms (95th percentile) on the reference workstation defined in Part III.

    29.2   During the **graphics-soak performance test defined in Para 47.5**, the headset frame-time 95th-percentile jitter shall not exceed 5 ms.

    29.3   Locomotion is provided by four directional buttons (forward, back, left, right) and an optional snap-turn button on the replica weapon. When button-driven movement is active, avatar translation speed shall not exceed 1.5 m/s[1], and snap-turn increments shall be 30° or less. A comfort vignette or reduced-FOV tunnel must be available as a user-selectable option to limit cybersickness.

    29.4   Headsets shall support mechanical interpupillary-distance adjustment from **58 mm to 72 mm** and include face pads that accommodate users wearing spectacles.

    29.5   The instructor shall be able to **define a rectangular guardian boundary that encloses the designated standing area plus a 0.5 m buffer on all sides**. When the trainee's head or controllers approach this boundary, the headset must display a visual grid or switch to passthrough video to prompt re-centring.

Weapon and Screen Calibration

30.   The application will provide a user-friendly interface to the firer for carrying out the Calibration in the simulator. The firer can carry out the screen calibration before the start of a training session or in case the video projection system and/or VR headset of the system. The procedure is required to ensure accurate calculation of the location of the firing. A suitable method to achieve this functionality, and thereby accurate firing results, will be developed as part of the application.

Built-In Test Facility (BITE)

31.   The software application will provide the instructor with a tool to see the status and serviceability of the following:

     31.1.   Check the connectivity status of sensors with the computer.

     31.2.   Check the connectivity status of the firers' weapons with the system.

     31.3.   Check the serviceability of the communication link between all components.

Trainee Database and Security

32.   The software will provide the instructor with the facility to manage the addition/ deletion/modification of trainee data in the application. It will provide Role-based access control with three roles: **Instructor**, **Maintainer, and Trainee**. The data fields to be captured in the trainee database will be provided by the project team at the time of development of the software. The data should be stored permanently in the application till deleted by the instructor.

Training Exercises

33.   The instructor will have the option to choose from any of the following types of training exercises: -

     33.1. **Basic & Advanced Marksmanship Training Exercise**.   As part of this module, the instructor will have the option to select from any one of the **10 exercises** forming part of the Urban warfare from a drop-down menu. The database would include the exercise name, location, scoring pattern, number of rounds allotted to the trainee, etc. The parameters of the selected exercise will be sent to the CGI for rendering of the same to the trainee.

     33.2. **Scenario-Based Exercises**.   A database of ready-to-use scenario-based exercises will be built into the simulator. These exercises will be built using the urban structures. A total of 10 exercises will be pre-built as part of this module. The details of the exercises will be provided during the development phase by SDD.

33.3. **User-Defined Parameters for Scenario-Based Exercises**. The user (instructor) should be able to configure the parameters of an exercise before starting an exercise. The parameters include No. of enemies, no of civilians, hostages present or not, behaviour of hostages, light conditions, noise conditions, etc.. The exact set of parameters will be provided by SDD during the development phase.

Firing Detail

34. Based on the number of firers selected for training, the corresponding number of firers (out of the total number of firers selected for training) will be grouped as part of one firing detail. For example, in case there are 2 trainees selected for firing out of 5 trainees, then the application will automatically group the trainees into one firing detail respectively.

Environmental and Weather Controls

35. The application will provide the instructor with a user-friendly dashboard to control the weather/ atmospheric conditions. The following conditions can be set at the beginning of the exercise and also be changed at run time during the conduct of the exercise: -

35.1. Time of day to adjust visibility conditions.

35.2. Day vision & Night vision mode.

35.3. Smoke inside the room.

35.4. Fog/haze with varying density.

35.5. Breakable windows with rain & snow outside.

36. During the exercise runtime, the **instructor panel** will display the following information with respect to each of the firers being trained on the simulator

36.1. Number of bullets fired by the firer and the balance ammunition.

36.2. Dynamic score of each trainee after each bullet fired.

36.3. Every exercise should be auto recorded.

37. At the end of the exercise summary, for each firer will also be displayed on the screen and will contain the following information: -

37.1. Firing score of each trainee.

37.2. Total hits.

37.3. Total number of bullets fired.

Exercise Recording and Replays

38.   The software shall let the instructor begin, pause, resume, or scrub through a synchronised recording of any exercise. Each session must capture every defined camera view, including free-roaming overview cameras and the first-person body-cam feed from each firer. During replay, the instructor can switch among these angles or show them side by side, and can play the footage at normal speed or at user-selectable slow-motion and fast-forward rates. **Recording shall be stored in 1080 p H.264 or better.**

Reports Generation and After-Action Review

39.   The instructor dashboard shall display firing reports at the individual, unit, and subunit levels. It must offer clear, interactive filters for date, scenario, and trainee name. Report layouts will be supplied during development. Each after-action review shall automatically include:

> 39.1.   A full recording of every run or simulation;
>
> 39.2   Shot-hit-kill logs;
>
> 39.3   A movement heat map for each firer/ trainee.

Calculation of Bullet Trajectory

40.   The CGI application shall include a trajectory solver that models the flight of every round fired. Calculations must incorporate gravity, temperature, pressure, and humidity; user-set wind speed and direction; spin drift; Magnus effect; Coriolis force; gun inclination; and cross-wind aerodynamic jump. Aerodynamic drag shall use the G7 reference curve for rifle and carbine ammunition and the G1 curve for pistol ammunition. The trajectory solver module shall also accept a user-supplied Cd-versus-Mach table for rounds with bespoke radar data. The mean impact error shall not exceed 0.5 m at 300 m when compared with reference tables approved by SDD.

Built-up Areas

41.   **Urban.**

> 41.1.   Educational Institutions: Schools, Colleges,   Universities (Single/Multi-Floor).
>
> 41.2.   Commercial Buildings: Shopping Malls, Offices and Hotels.
>
> 41.3.   Transport Hubs: Airport, Railway Stations, Bus Terminals & Metro Stations.
>
> 41.4.   Public Infrastructure: Hospitals, Stadiums, Convention Centers etc.

41.5. Government & Corporate Buildings: High security premises, embassies & Banks.

41.6. Residential buildings: Apartments, high rise complexes & independent houses.

41.7. Religious Places: Famous temples, Churches, Mosque & Gurdwaras.

42. **Rural Scenarios.**

42.1. Traditional Homes: Mud houses, bamboo structures, stone houses, wooden cottages.

42.2. Agricultural & Open Areas: Farms, Open fields, & Livestock shelters.

42.3. Partially Constructed Buildings: Unfinished homes & under-construction site.

42.4. Rural Community Centres, Panchayat building, small schools & village shops.

42.5. Dhoks & Tribal settlements: Temporary shelters, nomadic homes, makeshift structures.

Artificial Intelligence Requirements

43. The simulation shall deliver believable enemy, friendly, and civilian behaviour while meeting these essential performance targets:

43.1. The AI decision loop shall update at **60 Hz**, keeping friendly manoeuvres in step with enemy actions so trainees can practise correct drills and counters.

43.2. Enemies must detect aural cues—such as gunfire, breaking glass, or forced doors—and react within **0.5 s** by searching, taking cover, or engaging.

43.3. All scenarios shall permit forced entry by breaching windows, doors, and interior partitions; the AI must immediately adjust its path-finding to new access points.

43.4. Fire events shall trigger sprinklers that reduce visibility; enemies and hostages must adapt their movement and line-of-sight behaviour accordingly.

43.5. Hostage scenarios shall feature hostages that cower, follow escorts, and move to a designated safe zone once threats are neutralised.

43.6. The engine shall support **up to 30 hostile and 10 civilian agents concurrently** without dropping below the 90 fps headset performance target defined in

PART V: MISC ASPECTS

44.   **Development Methodology.**   The development will be carried out at SDD.

45.   **Stability.**   The complete system, including hardware and software, must run for at least 12 hours of continuous full-load operation with no slowdown or crash.

46.   **Project Support.**   After implementation, the vendor shall provide on-call support for **five years**. Minimum service levels:

46.1.   **Critical fault** – remote response within 24 h, corrective patch or workaround within 72 h.

46.2.   **Minor fault** – response within three working days, resolution within ten working days.

46.3.   **Preventive maintenance** – one remote health-check each quarter and one onsite visit per year.

46.4.   **Software updates** – cumulative patch bundle or version release at least every six months, supplied free of charge during the support period.

47.   **Testing and Trials.**   The project will be deemed complete after successful user trials and handover of all deliverables listed in paragraphs 49–51.

47.1.   Functional testing of each module shall be conducted at SDD, followed by final testing with all hardware and software fully integrated.

47.2.   The developer shall rectify faults and design issues until all **Acceptance-Test-Procedure (ATP)** checkpoints are satisfied.

47.3.   Testing and the project will be closed only when the system meets every requirement in this scope of work and the ATP sign-off sheet is countersigned by SDD.

47.4.   **Simulator-sickness evaluation (SSQ).**   After the final user trial each trainee shall complete the **Simulator Sickness Questionnaire (SSQ)**. The mean total SSQ score shall not exceed **20** (mid-range "mild") and no individual score shall exceed **30**. If these limits are breached, the vendor must investigate root cause and optimise performance or comfort settings before final acceptance.

47.5 **Graphics-soak performance test.** A standard "worst-case" scenario, supplied by the vendor and approved by SDD, shall run for **60 minutes** with all five headsets active, 30 hostile AI and 10 civilian AI, dynamic fog and rain enabled, and full audio. Logged headset data must show:

47.5.1.   Average frame-rate ≥ 90 fps,

47.5.2.   95th-percentile frame-time jitter ≤ 5 ms,

47.5.3.   No dropped frames causing projection-plane reprojection.

47.6.   Any amendments raised during intermediate reviews or final user trials are to be implemented before final acceptance.

48.   **Weight of Weapon Post Modifications.**   To preserve realistic handling, the weight of each modified weapon shall not vary by more than **± 5 %** from its service weight.

49.   **Hardware/Mockup Deliverables.**   The hardware deliverables are given below. **All hardware shall include at least a three-year on-site warranty.**

49.1.   Quantity 05 VR Headset.

49.2.   Quantity 01 4K Projector.

49.3.   01 Workstation.

49.4.   01 Sound system.

49.5.   10 x 8 Screen.

49.6.   05 Weapon kits configurable with developed software.

49.7.   Power backup – UPS.

49.8.   Networking – Router.

50.   **Software Deliverable.**

50.1.   Complete source code of IIS and CGI applications in both hard copy and digital form.

50.2.   A single, digitally signed installer that bundles the IIS and CGI applications with all dependencies and device drivers.

50.3.   An **automated test suite**, build script, and version-pinning manifest so that SDD can reproduce the delivered binaries.

51.   **Technical Documentation.**

51.1. **Software Documentation**.   Flow diagrams, data dictionary, Software Design Documents, etc, will be provided in accordance with the laid down Software Development Life Cycle (SDLC) industry standards and best practice. The essence of documentation should be clear traceability and navigability from requirements to the code and vice versa. In every file, detailed comments regarding variables, constants, functions/methods, their use and purpose would be documented. All hard and soft copies of documentation on testing, code reviews etc, will be handed over to SDD.

51.2. **Hardware Documentation**.

    51.2.1.   Comprehensive technical manual (both hard copy and soft copy).

    51.2.2.   Bill of Materials.   Detailed list of components with generic name, specifications, manufacturer part number, source of supply and cost.

    51.2.3.   Wiring diagrams.

    51.2.4.   CAD designs of any custom-designed components.

    51.2.5.   PCB diagram (in case of any proprietary PCBs) and Gerber files.

51.3. **Operation and Maintenance Documentation**

    51.3.1.   Instructions on setting up of software.

    51.3.2.   Comprehensive user manual (both hard copy and soft copy).

    51.3.3.   Instructions on troubleshooting common problems.

52.   **Payment Mode.**   One-time post-completion of the project.