

# Appendix 1- Technical requirements to the offered products

## 1.1 General requirements to all PC models

Feature	Minimum requirements
Microsoft Windows Pro	All offered PC models must come with the latest Microsoft Windows Pro license
Configuration	<p>Provider shall not change hardware components or change configuration (including BIOS) without prior notice from the Contracting authority</p> <p>If such change requires that the Contracting authority would need to change drivers, the Supplier must inform about that at least 2 months before implementation of the change.</p> <p>The drivers must be made available immediately</p>
BIOS	Changing BIOS info related particular PC model (model range) cannot be changed without replacing the PC model, unless otherwise agreed with the Contracting authority
Network	Offered PC models shall have network cards that support 1 Gbit and PXE (network booting)
Trusted Platform Module	All PCs must come with TPM 2.0

## 1.2 Standard workstation

Feature	Minimum requirements
Cabinet	Place for min. 1 x 3,5" disks
Processor	Intel Core i7 (8. generation) 8700T / 2.4 GHz
Hard Disk	Min. 240 GB SSD disk
	Min. read speed 500 MBps
	Min. write speed 450 MBps
RAM	Minimum 16 GB of RAM with a minimum of 1 available slot for upgrading memory.
	The PC shall support upgrading up to 64 GB of RAM.
Ports	The PC shall have at least the following ports:
	8 pcs of USB, of which at least 4 pcs are USB-3
	Audio-out (headphone) connector
	Audio-in (microphone) connector
	RJ-45 network
	2 display ports
	Adapters are not accepted as substitute solution
Graphics	Offered model shall support minimum 2-screen solution
	The resolution shall support at least 1920x1080, 1920x1200 and 2560x1440
	It shall be possible to install a dedicated video card at additional cost

Memory chips	Memory chips shall not be welded to the motherboard
	It shall be possible to remove and /or change memory chips if necessary
Motherboard interface	Minimum 1 PCIe x16

### 1.3 Enhanced workstation

Feature	Minimum requirements
Cabinet	Place for min. 1 x 3,5" disks
Processor	Intel Core i7 (8. generasjon) 8700T / 2.4 GHz
Hard Disk	Min. 512 GB SSD disk
	Min. read speed 2800 MBps
	Min. write speed 1600 MBps
RAM	Minimum 64 GB of RAM with necessary available slots for upgrading memory
	The PC shall support upgrading up to 256 GB of RAM.
Ports	The PC shall have at least the following ports:
	8 pcs of USB, of which at least 4 pcs are USB-3 or better
	Audio-out (headphone) connector
	Audio-in (microphone) connector
	RJ-45 network
	2 display ports
Graphics	Adapters are not accepted as substitute solution
	Offered model shall support minimum 2 screen solution
	The resolution shall support at least 1920x1080, 1920x1200 and 2560x1440
	Offered model shall come with a video card designed for CAD - for example Quantum GIS – minimum NVIDIA Quadro 2000 or similar
Motherboard interface	Offered model shall support at least 2 full size video cards designed for CAD – for example Quantum GIS
	Minimum 2 PCIe x16
Powersupply	Minimum 500 watt modular power supply
Disk Controller	Offered model shall have disk controller with RAID support
Serial Port	It shall be possible to install serial port

### 1.4 General requirements to all laptop models

Feature	Minimum requirements
Display	Offered models shall have a display with minimum support for 1920x1080 Full HD
	Displays shall have a matte surface or be anti-reflective
	Offered models shall support minimum 2-screen solution. The resolution shall at least support 1920x1080 and 1920x1200
Keyboard	PCs must be supplied with Moldavian/Romanian/English/Russian
Battery	There must be a minimum 3-year battery warranty on production defects

	Laptop batteries shall be available if replacement is required for a minimum of 3 years after purchase
	All models must be delivered with maximum available battery capacity that does not affect the form factor of the machine
Multimedia	All laptops shall have an integrated HD camera and microphone
Bluetooth	All laptops shall have integrated Bluetooth
WLAN	All laptops shall where applicable support wireless standard 802.11a (5GHz)
	Ethernet RJ-45 1Gb (onboard or docking station)
Ports	Minimum of 2 USB 3.0 or faster
	Minimum 1 USB-C Alt Mode or Thunderbolt
	HDMI and / or Display Port
	Audio-out (headphone) connector
	Audio-in (microphone) connector
	Must support PXE

### 1.5 Standard laptop

Feature	Minimum requirements
Display size	Min. 15"
Processor	4C / 8T
Hard Disk	Min. 256 GB SSD disk
	Min. read speed 450 MBps
	Min. write speed 400 MBps
RAM	Minimum 16 GB Dual Rank
	Possibility for upgrading to 32 GB RAM
Graphic card	NVIDIA Quadro T2000 4GB
Weight	Max. 3 kg

### 1.6 Enhanced laptop

Feature	Minimum requirements
Display size	Min. 15"
Processor	Min. 6C / 12T
Hard Disk	Min. 512 GB SSD disk
	Min. read speed 1000 MBps
	Min. write speed 1000 MBps
RAM	Minimum 32 GB
	Possibility for upgrading to 64 GB RAM
Graphics adapter	NVIDIA Quadro T2000 4GB
Weight	Max. 3 kg

### 1.7 Laptop photogrammetric workstation

Feature	Minimum requirements
Display size	Min. 15"
Processor	Min. 6C / 12T

Hard Disk	Min. 1 TB SSD disk
	Min. read speed 1000 MBps
	Min. write speed 1000 MBps
RAM	Minimum 32 GB, Dual Rank
	Possibility for upgrading to 64 GB
Graphics adapter	NVIDIA Quadro T2000 4GB
Weight	Max. 3 kg

### 1.8 Laptop GIS workstation

Feature	Minimum requirements
Display size	Min. 15"
Processor	Min. 6C / 12T
Hard Disk	Min. 1 TB SSD disk
	Min. read speed 1000 MBps
	Min. write speed 1000 MBps
RAM	Minimum 16 GB, Dual Rank
	Possibility for upgrading to 32 GB
Graphics adapter	NVIDIA Quadro T2000 4GB
Weight	Max. 3 kg

### 1.9 Docking station

Feature	Minimum requirements
Compatability	Docking station shall be compatible with the offered laptop model
	- 2 display ports
	- Keyboard connector
	- Mouse connector
	- Audio-out (headphone) connector
	- Audio-in (microphone) connector
	- RJ-45/Ethernet port (network)
	- 3 Universal Serial Bus (USB) 3.0 connectors
	- Powered Universal Serial Bus (USB) connector
	- Power Connector

### 1.10 Monitors

Feature	Minimum requirements
Type	LED-backlit LCD
Standard	Full HD
Resolution	Min. QHD 2560 x 1440 at 60 Hz
Size	Min 27"
Aspect ratio	16:9
Brightness	350 cd/m2
Display position rotation	Height, pivot (rotation), swivel, tilt

Input connections	HDMI, Display port, Mini display port
Compliant standards	Plug and Play, TUV, RoHS

### 1.11 Server

Feature	Minimum requirements
Server rack	Server rack shall be compatible with the offered server, for example 42U 1200 mm
Patch panel	RJ45, category 6, 48 ports
Processor	Min. 8 C / 16 T / 11 M cache
Memory	Min. 16 GB DDR4
RAID/Internal Storage Controllers	C12, RAID 5 for 4 or more HDDs or SSDs (Matching Type/Speed/Capacity)
Storage capacity	Min. 240 GB SSD SATA; Hot-Plug Min. 40 TB for data storage (preferably 5 x 8 TB)
Network Card	4 Ports 1Gb
Operating System	Windows Server® 2019
Switch	CRS326-24G-2S+RM (port: 24G and 2 optical)
Switch	CCR1009-7G-1C-PC ((port: 7G and 1 optical)
UPS	Uninterrupted power supply shall be compatible with the offered server, for example APC Smart-UPS Rack Mounting 2U SMC3000 or similar, 1 unit
Power Supply	Dual, Hot-plug, Redundant Power Supply (1+1), 750W, 1 unit

### 1.12 Plotter printer

Feature	Minimum requirements
Type	Ink
Sheet size	Manual feed - from 330 x 482 to 610 x 1897 mm Input tray – from 210 x 279 to 330 x 482 mm
Roll size	279 to 610 mm rolls
Print resolution	Up to 2400 x 1200 optimized dpi
Ink cartridges	4 (C, M, Y, K)
What is in the box	Printer, printer stand, print-heads, introductory ink cartridges, quick reference guide, setup poster, power cord
Drivers	For Windows
Printing supplies	Set of compatible ink cartridges Paper roll Compatible roll feed spindle

### 1.13 Multifunctional machine – printer, scanner, copier

Feature	Minimum requirements
Type	Ink
Format	A3
Print resolution	2400 x 1200 dpi or better
Ink cartridges	4 (C, M, Y, K)
What is in the box	Machine, print-heads, introductory ink cartridges, quick reference guide, setup poster, power cord
muniDrivers	For Windows

Printing supplies	Set of compatible ink cartridges
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