UNITED NATIONS DEVELOPMENT PROGRAMME
ALBANIA

TECHNICAL REPORT

Security upgrade of Ministry of Interior (Mol) Main Supply Centre "Mullet"- -Small Arms Light WeaYesns (SALW) and ammunition storage location, Second Phase

DETAILED DESIGN

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- GENERAL DESCRIPTION -

1.1 - INTRODUCTION

Project Background:Under the "SEESAC Project for the Enhancement of SALW Control Security Measures in Albania" funded by the Government of the United States, the Department of State, Bureau of Political-Military Affairs, Office of Weapons Removal and Abatement (PM/WRA), UNDP and SEESAC implements a comprehensive intervention for the Ministry of Interior (MoI) Main Supply Centre "Mullet" - Small Arms Light Weapons (SALW) and ammunition storage location security upgradeby ensuring that the significant amounts of stockpiled SALW and ammunition under the responsibility of the Ministry of Interior of the Republic of Albania are safe, secured, and accounted for.

As such, the project will reduce the risk of uncontrolled proliferation at the local and regional level, as well as the risk of uncontrolled explosions. This project aims to improve the safety and security of weapons and ammunition storages in Albania by providing specific infrastructural assistance in line with international best practices and standards (MOSAIC and IATG). The project will also contribute to enhanced community safety and security, including armed violence reduction and small arms and light weapons (SALW) control.

After the firs phase upgrading the "Mullet" storage through the joint funding from the EU and US in 2018, when the SALW storage building security was upgraded and a restricted perimeter formed, as well as in 2019, through the US funded SEESAC Project for the Enhancement of SALW control security measures in Albania, whereby the ammunition tunnel was refurbished and secured.

In addition to this, further security advancement of the Mullet location will be achieved through the entire perimeter security fencing, and CCTV system and exterior lighting installation, also financed by the US.

1.2 – LOCATION AREA

Mullet Storage Center,subject of this contract, is located nearby of the Mullet village, part of the administrative territory of Tirana municipality, on the way of the old road Tirane –Elbasan and andand approximately 12 km from the center of Tirana.The site for itself is located in a narrow valley between two hills, surrounded by greenery.

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The Municipality of Tirana is one of the 61 municipalities of Albania, is the biggiest city and the capital City of Albania with a population approximately 800,000 inhabitants and with an area 1238 km2. Tirana is the main administrative center and the min stateinstitutions are operating there.

1.3 – PURPOSE OF THE PROJECT

The purpose of the project will be focused on the construction of new outer fencing of the Mullet Storage Center. Along with the construction of the fence will be the installation of the lighting and surveillance system.

1.4 – EXISTING CONDITION

The Storage Center Mullet,resides inside the territory of the former military unit built some years ago, with the objective for armaments storage inside the tunnels. At present, this depot is un institution under the Ministry of Interior and the State Police depernded facilitie.

The center was built before the '90s and partial investments have been made for its rehabilitation.

The storage fence, as part of the construction atthat time, almost do not exsist. The fencing wasbuilt with very thin concrete columns and barbed wire fencing which at the moment are out of order.

Over the years the fence has generally degraded and fallen to the ground and concrete columns in most cases are disbanded due to result of atmospheric factors.

As a conclusion, we must say that the fencing is almost destroyed and significantly it has reduse the security level ofthe facility.

Based on the goals of the Project and with the request of the MoI and the General Directory of the Sate Police, constructing a new secured fence lighting and camera surveillance systems will be a great benefit for the security of this facility..

The following photos showing thecurrent state of the siege.



































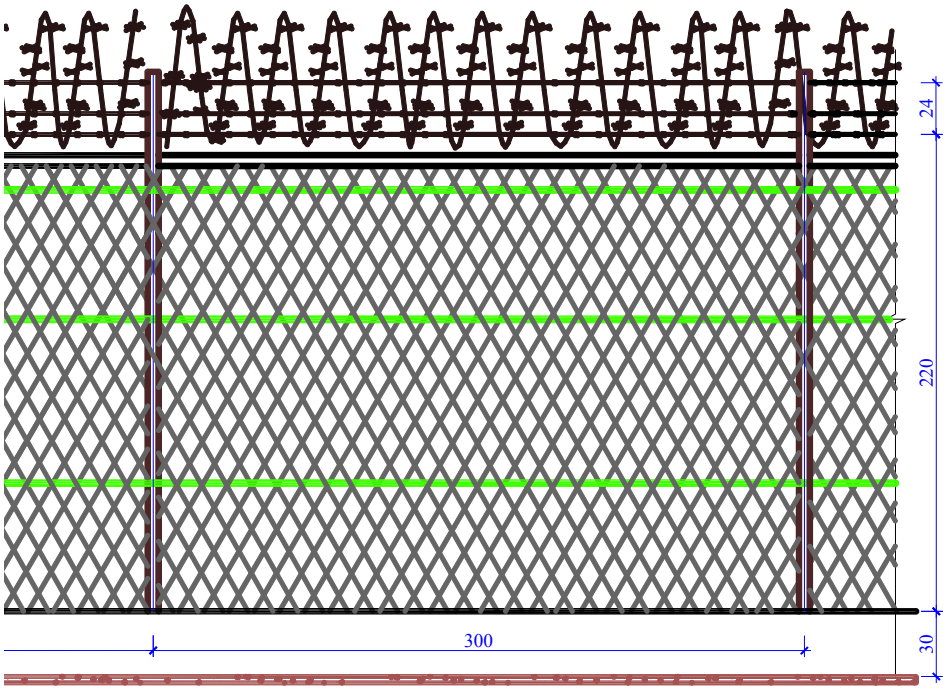
1. –PROJECT SOLUTION

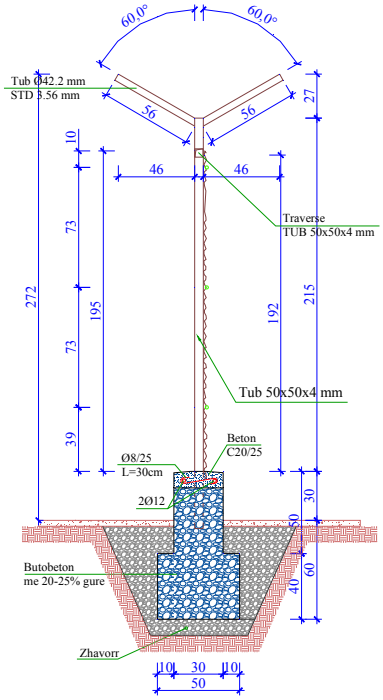
Referring to the investor requirements for the project, the Design Team is focused on the designing of the perimeter fencing, lighting system and the surveillance system.

A description of the relevant solutions provided for the Project is given in details as below.

A. OUTER FENCING

For both alternatives of the technical solution, the outer fence is foreseen to be made with steel hollow square sectionvertical elements,□ section50x50x4mm while the upper part is provide to made with hollow square section 40mm with a "V" shape. The vertical steel columns are embedded in 30cm concrete. The foundation of siege has a height of 30cm above the earth's surface, 3mm diameter rhombus shape gabion wire meshes with 50-60mm rhombus openings and 200cm mesh overall height. The tubes will be closed at the top. Across the grid height are provided 3 rows of 3mm galvanisedwire which is fixed from column to column describing the grid and keeping it taut after the columns. In the bent part of the columns are placed 3 rows of galvanized barbed wire, also between two elements of "V" spiral barbed wire reticulates. It is envisaged that the gabion mesh will be inserted 5 cm into the concrete of the foundation siege. The removalof the existing fencing should be done in parallel with the realization of the new fencing, to ensure the safety of gabion and during the construction phase.





Along the new fencing, reinforcing elements are provided every 18 m, but depending on the terrain this distance may vary. All steel elements will be painted with antirust and two-handed gray oil paint as gabion nets.

Along the fencing due to the fractures of the terrain it is foreseen to build some small retaining walls (1-2m height).

The storageis located inside a gorge and in its lower part, while fencing on the slopes of the hills that surround it. During the rainfall this causes the surface water to pass through the fence to the inside of storage area.

In order to avoid the water coming through the storage area, disturbing its normal operation or to not couse any damage on it, are foreseen to be installed some small culverts.

Their dimensions range is foreseen from Diameter(D) = 250mm to D = 500mm. At the entrance and exit of them, will be set the wire mash.

B. LIGHTING NETWORK

Throughout the surrounding area of the storage, it is required to create a lighted space of not less than 4 m in width inside of fencingwith the entire length of the closure.
To realize this lighting network we have used:

- Placing lighting poles about 8 m high.

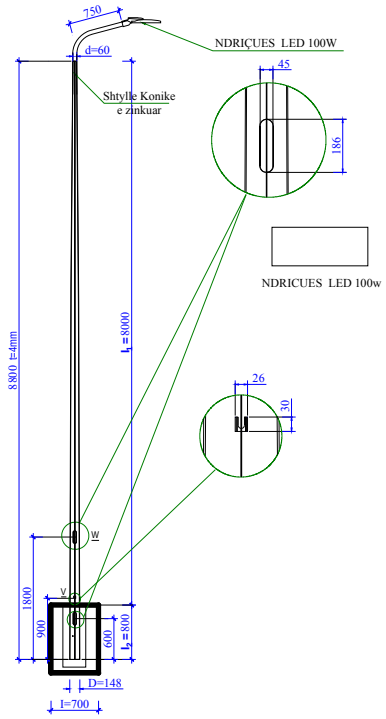
The electricity supply of these luminaires is done through 2 separate lines, dividing the length of the fence into 2 parts.

Turning these lights on and off will become automatically in function of natural lighting, i.e. the moment the twilight starts, the electricity grid will become on and at the dawn of the day the electricity grid will become off. Also, it is provided a manual control of thelighting network in case of need.

Supply cables are calculated so that the line voltage loss does not exceed 3.3% of the nominal supply voltage of this network. This guarantees us that the intensity of the light produced by the luminaries is in almost equal parameters.

The swich board of these lamps is intended to be placed in the low voltage panel of the electrical cabine located inthe territory of the facility.

The lights are placed in polesthat are 8 m height and with 4-5 m distance pulled from the fencing. The distance between the light polesis variable from 20m to 25 m, thiswill be depended from the relief. The illuminator used in this case is 150W LED, which produce a light intensity of 25 500 Lm.The lamp have 100 000 hours/work.In this case illumination is good about 25 - 40 Lux /m2, in function of the environment. With these levels of brightness we provide a good view of the camera system.



(Iluminator according to technical solution)

C. SURVEILLANCE SYSTEM

For the realization of the camera control system, of the entire boundary of the storage fence, it was considered that the whole territory should be under control at any moment. For this reason the cameras are selected;

1- Overview 100m (150m)
2- Rotation Option 0 ° - 360 ° (Pan), 20 ° to 90 ° (Tilt), 180 ° (Autoflip)
3- With the option of viewing at night (0.002 Lux (color), 0.0002 Lux (B/W)
4- With the Yesssibility of detecting movements
5- With the Yesssibility of defining the area needed for control
6- To withstand mechanical shocks

The transmit network of cameras is based on fiber optic cable. Insertion of fiber optic cable is done according to the ring system.Also the equipment of this network are such as to serve this ringsystem.F.O.This ring system means that each node receives and gives signalto the packets that you address for that node.
Since the ring has no end and the data stops in the node, the RING networks haveno needs for limits. Each node serves as a repeater for transmission.
But as we can see from the scheme we have combined two networks, that ring -and with star form.
As we see from the block diagram of the TVCC system, we have chosen a 24-swhich gatesManaged Switch which in addition to communicating with devices such as cameras, NVRs, Joystiks can also be connected to other devices depending on future needs.

This switch also has two SFP Yesrts. In this 2 Yesrts At these two SFP swhich gatesare connected the two optical fibers (watch the scheme). These binoculars go to other devices (nodes) that together implement the ring system.
As we can see from the scheme, we have divided the entire network into 6 nodes (from S1 to S6). In the S1 node as described above, is placed a manageable switch with 24 Yesrts (12 YesEYesrts).In the S2, S3, S4 and S5 nodes we have placed a managed industrial switch with 8Yesrts RJ 45YesE. In this switch we have connected all the cameras that are in the space around this switch (distance not more than 50m).The connection to the cameras is made with FTP cat6 cable using YesEYesrts. In the S6 node, as shown in the drawing, is placed a manageable switch with 16 YesEYesrts.
The Yeswer supply of these joints will also be provided with an FG7OR 3x4mm2 ring cable system.This cable is connected to a frame that is Yeswered by a 2200VA mono phase UPS and has a duration of 30 min.
In each node we will have a mono phase UPS 230V, 1000VA with a holding time of 9 min, as well as a 230V AC / 48V DC feeder that will serve for the Switch's Yeswersupply.We have two types of cameras.

a- Camera Bullet (fixed)
b- Camera PTZ

Bullet cameras, as seen in the scheme, are placed to view certain spaces, while PTZ cameras that are placedin pillars above 6 m, serve to control a 100 m wide area.
The fiber optic system used has an advantage:

- Enables reducing the impactof the atmosphericeffects of emissions on the network.
- Not affected by damage to the fiber network at one point. In this case we continue to receive information from each camera.
- It allows to expand networking with other cameras without changing the basic equipment

All the information of cameras will be registrated in wo NVR. All camera information is recorded in the NVR which has a capacity of up to 24TB, which is sufficient and if there is a need to add additional cameras.This also comes from the capability of the equipment,which in its caracteristics has compressionVideo: H.265, H.264, MJPEG.
The system also provides Joystik equipment that will be operated manually by the PTZ camera operator. Also PTZ cameras can be set to automatically control certain areas of the space they cover.
It foreseen to have one monitor 42" which relates with NVR, which connect through cable HDMI.
When programming the camera signal, it must be considered that at all times the surrounding area of the storage fence will be viewed by theese cameras.
The Fiber-optic cable will have 8 Single Mode fibers.

Annex – A

TECHNICAL SPECIFICATIONS FOR THE SURVEILLANCE SYSTEM AND ITS EQUIPMENTS

Camera with outer IP, 4.0Mpx,IR,Bullet,

Sensor:	1/2.8" inch, 4.0 Megapixel CMOS (color)
Video Compression:	H.265, H.264
Resolution:	4MP (2560×1440),
Images per second:	25 fps, fr registration in full HD and HD,
Multistream:	Yes, to 3 stream
RAM/ROM:	1024MB/128MB
Dynamic range:	Yes, Ultra WDR to140dB.
Sounds reduction:	3D DNR
Balance of light:	BLC, HLC
Lent type:	Motorized, Auto Iris
Lent:	2.7 – 12mm,
Viewing angle:	101˚ – 36˚ Horizontal, 53˚– 20˚ Vertical
IR-cut Filter.	Yes,
Infrared:	To 50m
Smart IR	Yes,
Image Stabilization	Yes,
Minimum Lighting:	0.005 Lux (color), 0 Lux (IR on)
Controli Bit Rate:	CBR/VBR
Video compressionH.265:	14Kbit/sto 6Mbit/s
Video compressionH.264:	24Kbit/s to 10Mbit/s
SupYesrts protocols:	HTTP;HTTPs;TCP;ARP;RTSP;RTP;UDP;FTP; DHCP;DNS;DDNS;PPYESE;IPv4/v6;QoS;UPnP;NTP; Multicast;ICMP;IGMP;SNMP,
Communication:	RJ-45, 100/1000Mbps Base-TEthernet Interface
Web interface:	Access, live view, network configuration
SuYesrton Web Browser:	Internet Explorer, Mozilla, Chrome
Safety:	Yes
SuYesrton ONVIF:	Yes, ONVIF
SuYesrtonAnalitic:	Yes,
Certificate:	CE, EN60950, UL60950-1, FCC Part 15,
Benchmarks:	IP67 for the environment, IK10 for hardness (vandalproof).
Provender:	YesE (802.3at), 12V DC
Yeswer consumption:	less than 13W
Working temperature:	from -40˚C to + 60˚C,

IP camera, rotary, PTZ Dome, 4.0M, IR

Sensor:	1/1.9" inch, 4.0 Megapixel CMOS (color)
Video Compression:	H.264, MJPEG
Resolution:	4MP (2560×1440),
Images per second:	25 fps përregjistrim full HD, 25/50 fps përregjistrim HD
RAM/ROM:	1024MB/64MB
Dynamic range:	Yes, WDR derinë 120dB.
Sounds reduction:	2D/3D DNR
Movement Detection:	Yes, suYesrton
Area of Interest:	Yes, suYesrton
Auto Tracing:	Yes, suYesrton
Analitic/Inteligjence:	Yes, suYesrton (intrusion, missing, face recognition, etj.)
Balance of light:	BLC, HLC, ATW (White Balance)
Lent:	6 – 180mm,
Optical Magnification	30x
Viewing angle:	61.1˚ – 2.1˚ Horizontal,
Rotation anglen	0° - 360° (Pan), -20° - 90° (Tilt), 180° (Autoflip)
Rotation speed	600°/sekondë (Pan), 500°/sekondë (Tilt),
Image Stabilization	Yes,
Lighting minimum:	0.002 Lux (color), 0.0002 Lux (B/W)
Controli Bit Rate:	CBR/VBR
Compression H.264:	448Kbit/s to8Mbit/s
MJEG Compression:	4Mbit/s to 20Mbit/s
SupYesrts protocols:	IPv4/IPv6, HTTP, HTTPS, SSL, TCP/IP, UDP, UPnP, ICMP, IGMP ,SNMP, RTSP, RTP, SMTP, NTP, DHCP, DNS, PPYESE, DDNS, FTP, IP Filter, QoS,
Communication:	RJ-45, 10/100Mbps Base-T Ethernet Interface
Tastierekomandimi PTZ:	Yes, e përshire me ndërfaqe RJ-45 dhe USB
Web interface:	Internet Explorer, Mozilla, Chrome
SuYesrton ONVIF:	Yes, ONVIF
Certificate:	CE, EN55032/ EN50130-4, UL60950-1, FCC Part 15,
Benchmarks:	IP67 përmjedisin, IK10 përfortesinë (vandalproof).
Provender:	24V AC ,YesE (802.3at),
Yeswer consumption:	13W, 20W (heater on)
Working temperature:	from-40˚C to +70˚C,

Video Recorder Network NVR, 32 channels, H.265 / H.264, Ultra 4K

Video Introduction:	32 Channels,
Camera type:	IP camera, different types and brands, MegaPixel
Software:	With central management program and camera control
Analtics:	Yes, intelligent video system (intrusion, missing, face recognition, etc.)
Video Compression:	H.265, H.264, MJPEG
Video Resolution:	3840 × 2160, 1920 × 1080, 1280 × 1024, 1280 × 720, 1024 × 768,1024 × 768, (HD, Full HD, 4K)
Video output:	1xVGA, 2 x HDMI with high resolution Full HD, HD (1920 × 1080, 1280 × 1024, 1280 × 720, 1024 × 768), up to 4K
Frames per second:	25fps for each camera, in HD and HD resolution
Recording Rate:	384Mbps
Bit Rate:	16Kbit / s up to 20Mbit / s, for each channel
Method of registration:	Manual, Alarm, Movement Detection, Schedule
Function:	Playback / Recording / Live / Back-up / Network
Save registration:	HDD, USB, eSATA, Network,
Network:	2 xRJ45 10/100 / 1000M ethernet interface,
SupYesrts protocols:	HTTP, HTTPs, TCP / IP, IPv4 / IPv6, UPnP, RTSP, UDP, SMTP, NTP, DHCP, DNS, IP Filter, PPYesE, DDNS, FTP, Alarm Server, IP Search etc.
RS interface:	1x RS232, 1x RS485
Audio interface:	1Ch input, 1Ch output
USB Interface:	2xUSB2.0, 2xUSB 3.0
Yes e-sata interface, su	Yesrton 1 x eSataYesrt
HDD:	8sataIII Yesrt (each hdd from 4TB to 6TB);
Storage:	12TB, Enterprice HDD level
Raid:	Yes, suYesrton RAID 0/1/5/6/10
Processor:	Intel Dual Core Processor
Mounting on Rack	Yes, 2U, cabinet mountable,
SuYesrton ONVIF:	Yes, ONVIF 2.4
Certificate:	CE, EN55022, EN55024, EN50130-4, EN60950-1 FCC Part15,
Power:	100V - 240V, 50Hz - 60Hz
Operating Conditions:	-10 ° C to + 55 ° C, operating temperature
Storage conditions:	-20 ° C to + 70 ° C, from 0 - 90% relative humidity

Switch Industrial, i menaxhueshem, 8 Yesrta RJ-45, YesE, 2 SPF Gibabit

Technology:	Industrial Switch, manageable, 8xRJ45, YesE, 2xSFP Gibabit
Usage:	In closed environments, with high and low temperatures, for the use of IP cameras, YesE, for the connection of cameras in the network in ToYesiology RING, certified for industrial use
Gigabit Link:	2xSFP with fiber optic, uplink up to 50km
Industrial PoE	8 YesrtaYesE and YesE + IEE 802.af/at
Installation:	In DIN Rail, in closed cabinets as well as in IT cabinets
Management:	Web GUI Interface, diagnosis and analysis through Simple Network Management Protocol (SNMP), Spanning-tree protocol (STP), Link Layer Discovery Protocol (LLDP), Discovery Protocol
Integration:	IP Discovery, DHCP Dynamic Host Configuration Protocol
Safety:	Secure access; Yesra-security
Data Load:	VLAN aware, Internet Group Management Protocol (IGMP) and DHCP snooping to filter unwanted data
Hardware:	DRAM 128MB DDR2, Flash Memory 160MB
Software:	LLDP, CDP aware, MSTP, STP Yesrtfast, ICMP Vlans, static IP, Trust Ingress DSCP, COS, Priority Yesrt, Yesrt- security, IGMP querier, DHCP server SNMP v2 / v3, SNMP traps, syslog, IGMP DCH snooping snooping, BPDU guard, Radius client, Etherchannel, Alarms, YesE capability.
Output power:	130-200W including YesE
Feeder:	AC input 100-240V, 50-60HZ, 48V DC output, 3.15A, suYesrton up to 8 YesrtaYesE or 5 YesrtaYesE + indoors, mounted on din rail in outdoor and indoor cabinets.
Temperature:	Works at temperatures from -40˚C to + 70˚C in cabinets with openings / holes, from -40˚C to + 60˚C in hermetically sealed cabinets, from -40˚C to + 75˚ C in the cabinet where there is ventilation, from -40˚C to + 85˚C storage temperature.
Security Certificate:	CE, EN 60950-1 UL / CSA / IEC / EN 61010-2-201, UL / CSA 60950-1
Environmental Certificate:	ANSI / ISA 12.12.01 (Class1, Div2 A-D), EN 60079-0, IEC 60079-0, UL 60079-0, 15, CAN / CSA C22.2 No. 60079-0, -15,
EMC Certificate:	FCC 47 CFR Part 15 Class A, EN 55022 / CISPR 22 Class A, EN 55016, RoHS compliance, CE Marking, IEC / EN 61000
Benchmarks IEE:	IEEE 802.1D, IEEE 802.1p, IEEE 802.1q VLAN, IEEE 802.1s Multiple SpanningTrees, IEEE 802.1w Rapid SpanningTree, IEEE 802.3ad LACP IEEE 802.3af , IEEE 802.3at
Adaptation RFC	Suporton RFC 768 UDP, RFC 791, RFC 793 TCP, RFC 791 ICMP, RFC 854 Telnet, RFC 2068 HTTP, RFC 2131, 2132 DHCP

SFP: Suporton lloje te ndryshme SFP-je, GLC-FE-

SWITCH 24 Yesrta, YesE, Managable	
Technical specifications	
Type of Equipment	Switch - 24 Yesrts - Managed
Type	Rack-mountable
Yesrta	24 x 10/100/1000 + 2 x 1 Gigabit SFP+
Yeswer Over Ethernet (YesE)	370W
Performanca	Switching capacity : 176 Gbps Forwarding performance (64-byte packet size) : 65.5 Mpps
MAC Address Tabela	8K
Distance Management Protocols	SNMP 1, SNMP 2, RMON 1, RMON 2, RMON 3, RMON 9, Telnet, SNMP 3, SNMP 2c, HTTP, HTTPS, TFTP, SSH
Alegoritmi I Enkriptimit	SSL
Autentikimi	Secure Shell (SSH), RADIUS, TACACS+
Characteristics	Layer 2 switching, auto-sensing per device, dynamic IP address assignment , Yeswer over Ethernet (YesE), auto-negotiation, BOOTP supYesrt, ARP supYesrt, load balancing, VLAN supYesrt, auto-uplink (auto MDI/MDI-X), IGMP snooping, Syslog supYesrt, DiffServsupYesrt, Broadcast Storm Control, IPv6 supYesrt, Multicast Storm Control, Unicast Storm Control, Rapid Spanning Tree Protocol (RSTP) supYesrt, Multiple Spanning Tree Protocol (MSTP) supYesrt, DHCP snooping, Dynamic Trunking Protocol (DTP) supYesrt, Yesrt Aggregation Protocol (PAgP) supYesrt, Access Control List (ACL) supYesrt, Quality of Service (QoS), YesE+, Link Aggregation Control Protocol (LACP), Yesrt Security, MAC Address Notification, Remote Switch Yesrt Analyzer (RSPAN)
Benchmarks	IEEE 802.3, IEEE 802.3u, IEEE 802.3z, IEEE 802.1D, IEEE 802.1Q, IEEE 802.3ab, IEEE 802.1p, IEEE 802.3af, IEEE 802.3x, IEEE 802.3ad (LACP), IEEE 802.1w, IEEE 802.1x, IEEE 802.1s, IEEE 802.3ah, IEEE 802.1ab (LLDP), IEEE 802.3at
RAM	128 MB
Flash memory	64 MB Flash
Status Indicators	Yesrt status, link activity, Yesrt transmission speed, Yesrt duplex mode, Yeswer, system
Expansion / Connection	

100FX/LX/BX/DX

interfaces	24 x 10Base-T/100Base-TX/1000Base-T - RJ-45 - YesE USB : 1 x 4 PIN USB Type A 1 x console - mini-USB Type B - management 1 x console - RJ-45 - management 1 x 10Base-T/100Base-TX - RJ-45 - management 2 x SFP+
Additional Slots (Extension)	1 (total) / 1 (free) x Stacking Module
energy	
Yeswer Device	Yeswer supply - internal
Energjia (Volt)	AC 120/230 V (50/60 Hz)
Different	
Benchmarks	TUV GS, CISPR 22 Class A, GOST, BSMI CNS 13438 Class A, CISPR 24, NOM, VCCI Class A ITE, EN55024, CB, EMC, MIC, IEC 60950-1, EN 60950-1, UL 60950-1 Second Edition, RoHS, CSA C22.2 No. 60950-1, FCC Part 15 B Class A
Application / System Requirements	
Software	LAN Base
Service & Support	Limited lifetime warranty
Service & Support (Details)	Limited warranty - replacement - lifetime - resYesnse time: next business day Limited warranty - Yeswer supply and fans New releases update

Workstation Computer
For program, management and monitoring of the camera and IT system

Type:	Workstation Computer (brand, original brand)
Purpose:	To use and monitor high quality HD cameras
Monitor:	2xLED 24 ", full HD, 1920x1080,
HDMI Cables:	Includes four pieces, for connecting monitors and TVs,
Processor:	Intel Xeon Quad Dore Processor, 2.93GHZ
Memory:	8GB
HDD:	500GB 7200rmp sata III HDD
Graphics:	2xPCI Expres, 2GB dedicated memory, with 2xHDMI output each
Optical:	DVD +/- RW
Network:	10/100 / 1000Mbps
Çerfifikatë:	CE

Monitor / TV 42 "
For computer connection and camera monitoring

Display:	LED
Dimensions	42 "inch
Resolution:	Full HD, 1920x1020p
Frequency:	100Hz,
Contrast:	High, mega
Marres TV	Yes, DVB-T / C
Interfaces:	2xHDMI, 1xVGA,
USB	Yes interface, 2xUSB 2.0
audio	2x10W

Smart UPS 2200VA / 1600W
For camera and IT system equipment in indoor cabinets

Technology:	Smart UPS
Output voltage:	230V AC
Frequency:	50Hz
Output power:	2200VA / 1600W
Input voltage:	180 - 270V AC
Interfaces:	LCD for status, USB for management
Functionality:	online double conversion
Mounted on the rack:	Yes,
Automatic reboot:	Yes
Emergency shutdown button:	Yes

Çerfifikatë: CE

Exterior cabinet

Type:	Closed cabinet, use outdoors
Construction:	Metallic
Dimensions:	800x600x300mm
Open / close key	Yes
Ventilation options:	Yes
Mounting:	In concrete base
Environmental standard	IP66, for protection from atmospheric conditions
Strength	IK10,
Accessories	Included, for mounting equipment on din rail

Interior cabinet:

Type:	Used indoors, IT rooms
Construction:	Metallic,
Dimensions:	800mmx600mm x24U
Accessories	Included, for mounting equipment and rack cables

Optical Fiber, Single Mode, 4 pairs:

Type:	single mode optical fiber, with 4 pairs
Technology:	External use, (outdoor)
Standards:	Reinforced, protected from damage
Certificate:	CE

Patch Panel Fibreoptike 24 Yesrt

Type:	Patch Optical Fiber Panel,
Technology:	Internal use in IT cabinets
Mounting:	In 1U cabinet,
Number Ports	24 Ports
Connector:	SC

Patch Panel FibreOptike 8 Port,

Type:	Patch Optical Fiber Panel,
Technology:	Used in outdoor cabinets
Editing:	Din Rail
Number of Ports	8 Ports
Connector:	SC / LC

SFP

Type:	SFP Gibabit, for switches and optical nefiber transmission / reception,
Usage:	For network connection of core switches and camera switches
Technology:	Single Mode, Long Range,
Capacity:	1Gbps, high transmission and reception capacity
Distance:	Up to 20km
Benchmarks:	IEEE 802.3, Digital Monitoring Diagnostics (DDM),
Vale length	1310nm
Connectors:	SC / LC (according to technology and fiber patch panel)

Report is preparing by:
Eng. YlliKarapici
Eng. HysniRuka
Eng. XhevahirAliu
Eng. YlliBilali

KLODIODA LTD
ADMINISTRATOR

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YLLI KARAPICI

Annex B – Topographic Study

The area that lays the object**"Outer Fencing and Storage Camera Surveillance System, Mullet"**is a valley and green area with some small and medium grown trees

For the project design and for the extraction of a series datas,has been used the topographic maps of the area at scale 1: 25,000, as well as the aerial and satellite photos of the area as well as the direct measurements in the field.

Geodetic Works

Geodetic and topographic works were carried out on the basis of the general and specific technical requirements foreseen by the required terms of references.
The group of topographers organized the work and developed the works based on the experience gained in the previous works of this nature.
Prior to the start of topographic works, were provided the necessary cartographic, geodetic.

To ensure the unique geodetic connection of all projects from the society, will be taken data from the points of the triangulationMilitary Topographic Institute.
The system used by the Republic of Albania is the Gauss Kruger projection with the ellipsoid Krasovsky.

The survey was done in the international system with the UTM projection with the ellipsoid WGS84.
In view of area and pace of development it has, it is more fruitful to use this system.This system can easily determine the geodetic coordinates for each point on the Earth's surface by using GPS.

During field reconnaissance, the polygon points and the level markers were placed in the fixed points on the ground.
The point that was fixed on the ground were provided with coordinates in the UTM projectionellipsoid WGS84 and quotas.

Field fixation of polygonal points well done with nail fixed on concrete blocks.
They are placed in visible and unmovable places.Their identity is fixed with red ink which become distinct from the existing. They are placed in stable locations, nearby the road, have mutual views, providing in this waycontinuation of work from the project idea to the detailed design.

Every point on the ground has a number,coordinates and altitude(look at the servey plan).These data provide easy access to the field.Fixed point of the ground are defined at the plan that is include in the project.

The measurements were performed withGPS TRIMBELL R6, Total Station type Laica 307, Total Station type Trimble M3 and with dini level which provide measurements of angles and distances with the necessary precision for the project.

Leica 307

Topcon GPT 900 ATrimbell R6

Development of Geometric Leveling

To ensure high technical requirements in the surveyed works, it was determined that the altimetric accuracy of the topographic works is high and for this purpose a geometric leveling for the polygonmetry points in all the road sections was developed.
The geometric leveling it's done with dini level Kern Level, with the double technical leveling method, by measuring each pair twice, with two placements of instrument. The difference between the two dislevel obtained at each station was not allowed for more than 3 mm.

Reliving

The survey work will be carried out by three topographic groups coordinated by a topographerwith experience matured in similar projects.
It is reliving the whole area where the object extends, as well as a perimeter line that surrounds it.
In the plan are fully reflected all elements of its component, existing road,curbs, fences, manholes, various objects, a dense number of detail points.
The topographic works performed are based on the full scale of professional preparation, the use of contemporary field field and computer data processing technologies to meet the technical requirements set forth by the projector.
Every point that was taken in the terreinhave three dimensional coordinates, presented in the project.
Processing of topographic material in the office was done with Prost (Sierra Soft) and Autocad Land Development software from where it was obtained three dimensional reliving.
This reliev serves as a basis for drafting the implementation project with the accuracy and quality required in the terms of reference by the investor.
In the graphic material of the project is given the fixation plan and the coordinate table of points placed on the ground.

Job description on the ground.

For the support of the works, firstly were created two strong points which are sufficient for performing detail survey points.
Measurements of these points were performed by the static method, staying at the point for 40 min in the interval of 1 sec providing millimetric precision of point coordinates.

The presence of the receiver at the limited distance provides the highest accuracy of the measurements in the shortest time interval.
So, for points until 1km from the base receiver was used a 10-second interval with measurements per secondwhile for a distance of up to 2 km the interval of 15 seconds.
The main element in measuring 'stop & go' is not to lose the connection of the carrier phase which breaks the final solution.
This can be accomplished by avoiding the entry into the signal shadow zone or the area with high signal reflection.
In this case, the receiver TRIMBLE R6 gives a signal that informs the meter that it must resume the measurement from a measured point in advance, providing the required accuracy.
In the areas with construction density, the Total Station was used because there were trees and high buildings that did not allow the measurement of GPS details.
Attached we have featured Monograph of stations associated with photographs. This makes their finding easier during the detailed design

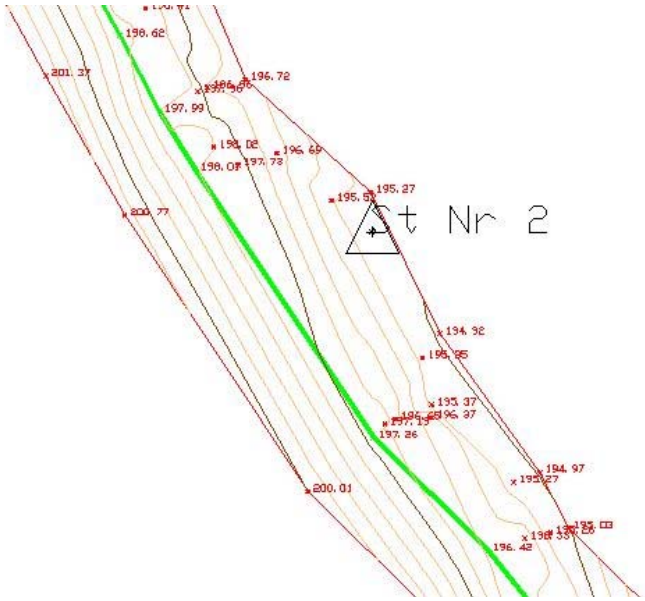
Polygonal Point No.1

Point layout

Polygonal point coordinates		
X	Y	Z
403832.70	4568729.74	158.89

Polygonal Point No.2

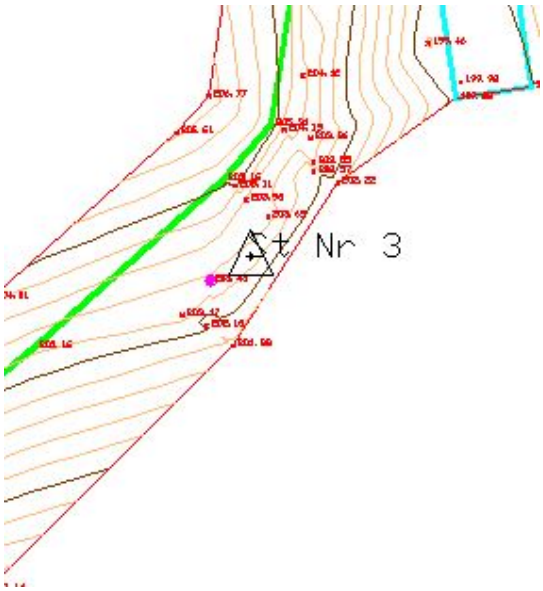
Point layout



Polygonal point coordinates		
X	Y	Z
403714.25	4568907.98	195.26

Polygonal Point No.3

Point layout



Polygonal point coordinates		
X	Y	Z
403665.07	4569020.97	203.69