

PREPARING WORK
GROUND WORK
REMOVAL/DEMOLISH WORK

General description

Preparing work include construction site setup, temporary storage setup, single container installing as office space, temporary water, waste water drain and power connection, all in reference with currently valid construction work.

Unit price due the temporary/permanent removal of some parts of the existng structure shall include temporary storage of the parts or removal of the debris (incl. unloading) to the local authorized depot.

I Unit price shall include tepmorary protection of the existng structure in purpose to avoid any damage due the construction work. Weather protection of the temporary open existng structure shall be included as well.

Unit price for the ground work (escavation work) shall include temporary protection of the trees, walls, floors etc.

Due the escavation work class of soil shall be determined (if required) and decision must be notified in construction book and work diary and signed by supervisor and execution company. The class of soil shall be determined based on construction norms valid in BiH.

If the underground water comes to the surface during the escavation work the company shall have ready waste water (mud) pump to remove waste water out of digging location. The company shall propose unit price for single mud pump per working hour.

No.	ITEM DESCRIPTION	UNIT	QTY	COMMENTS ON COMPLIANCE (Please confirm compliance with technical specifications or indicate deviations)
1	Construction site preparing work, temporary material and tools storage setup, temporary water, waste water and power supply setup, temporary office setup (chef of construction site and supervisor). One set of main design must be available on construction site at all time.	LS	1.00	
2	Longitudinal trench axle marking with wooden poles, including the trench bottom relatively level marking. Based on points measured on distance 30 m each, total length of marking 3035 m (120 markers)	LS	1.00	
3	Asphalt cutting (thickness 10 cm) with mechancial saw. No power available on site, need generator support or petrol engineed machine. 660x2 = 1320	m	1,320.00	
4	Permanent removal of the asphalt (road pass removal) to the local authorized depot (max. distance 10 km). 330 m2 x 0.1 = 33.0 m3	m3	33.00	
5	Mechanical trench digging, soil class VI including the soil storage 3.0 m far from trench. 0.8x0.5x2975.0 m	m ³	1,190.00	
6	Hand (manual) trench digging where is required (locations with no access to the civil engines-genset pad), soil claa V/VI including soil temporary storage 3.0 m far from trench. 0,75x0,75x0,80x53 = 23.85 m3	m ³	23.85	
7	Purchase, transport and installing of the sand (for MDPE pipes bed), granulation 0-4 mm, consumption 0.16 m3/m of trench length. 0.8x0.2x2975,0 m	m ³	476.00	
8	Purchase, transport and installing asphalt (trench road cross), type BNS 22, thickness 10 cm in standard width of repair 0.4 m. 660x0.5 = 330 m2	m2	330.00	
9	Purchase, transport and installing final layer of the gravel, size 0-16 mm, including planning and compactiong to the pressure resistance 6 Mpa. Approx. thickness of the layer 10 cm. 1.2x1.2x0.2x53 = 15.26 m3	m3	15.26	
10	Purchase, transport and installing final layer of the gravel, size -32 mm, including planning and compactiong to the pressure resistance 6 Mpa. Approx. thickness of the layer 25 cm. 1.2x1.2x0.1 = 6.2 m3	m3	6.20	
11	Soil for permanent removal transport and unloading to the local authorized depot max. 10 km distance (location shall approce supervisor). 0.40x0,50x2975 m = 595 m3	m ³	595.00	

**REINFORCED
 CONCRETE WORK**

General description

All reinforced concrete work shall be executed reference the main design and currently valid BiH standards (Official gazete No. 11/87). The test concrete blocks must be tested by location and by the type of concrete with written approval from supervisor.

Each construction element must be labeled with type of concrete and other required characteristics of concrete required in main design. Concrete probe blocks shall be tested in authorized institute for this type of testing. For concrete category B.I. (workshop concrete producing) the testing shall be executed in workshop location.

In a case of positive test results the investor shall pay the cost. In a case of non satisfactory results the testing shall be on contractor cost.

All reinforced concrete work must be executed in details reference with main design.

Contractor must proof (in written form) the concrete quality, aggregate quality and water quality.

Water used in concrete fabrication must be clean with no organic or anorganic elements in. The water cement factor must be fully respected.

Prior to concrete installing the contractor must check frame format regarding the dimensional and stability issue.

Reinforcement shall be fixed that it is not possible to be moved from designed position. Reinforcement must be surrounded with concrete all around with no visible parts of reinforcement.

II

If concrete work must be stopped by any reason the further concrete work must be in ref. with technical regulations about this issue.

External concrete surface must be flat, clean with no visible air bags, cracks to prevent concrete deterioration in conditions when it is installed.

If there is some air bags shown up the contractor shall not close it with no approval by supervisor.

In a case of the concrete extended transport time (potential concrete segregation) the contractor shall set additional concrete mixing to rich liquid and uniform concrete mass.

After concrete installing the contractor shall protect concrete from hot temperature, sun with proposed adding water to the surface (7 days at least). Same procedure shall be executed in a case of low temperature (eventual additive required) especially top surface. This will not produce additional cost to the investor.

The contractor shall not use in same concrete partition two types of cement in any case.

Price include real unit m3 of installed concrete or regarding the element unit price if it is specified in bill of quantity.

Prior to concrete installing the frame shall be washed with water two times.

Formating shall be removed in reference with currently valid standard and with approval of supervisor.

Formating shall be separate cost. In a case of workshop formating the formating shall not be subject of separate item (price).

Price include labor, material with loose, tools, equipment, transport, scaffolding and any other tax eventually required by local authorities.

No.	ITEM DESCRIPTION	UNIT	QTY	COMMENTS ON COMPLIANCE (Please confirm compliance with technical specifications or indicate deviations)
1	Workshop producing of manhole all in reference with detailed drawing. Type of concrete is MB30. The concrete shall be vibrated with nozzle min. DN 30 mm Price shall be reference the completely manhole construction including the street light additional foundation (see attached drawing), steel cover (Q=100 kN), lock, hinges, stairs etc.	SET	53.00	
2	Loose concrete slab construction with poor concrete MB15 with no reinforcement. Loose slab shall be constructed on top of the compacted gravel pad (min. gravel thickness 20 cm) to the compacting level 4 MPa. 53 x 1.20x1.20x0.20 = 15.26 m3	m ³	15.26	
3	Stand alone steel pole foundation (movable camera street lights) construction with concrete MB30. reinforcement included. Cross section of foundation is 1.0 x 0.7x0.7 m each. 1.0x0.7x0.7x30 set	m ³	14.70	
4	Stand alone cadastral survey reinforced concrete poles (standard H-0.6 m) - markers all along the trench axle. Price include pole numeration. 120 sets	SET	120.00	

**REINFORCEMENT
 WORK**

General description

- III** Reinforcement must be clean with no corrosion or grease presented. Reinforcement shall be settled in reference with detailed drawing.
- All back support reinforcement (flat steel wire DN 5 mm) shall be fixed with preheated steel wire DN 1.4 mm.
- Price include distancers (to prevent reinforcement exposing to the outside of concrete wall) and left over reinforcement.
- In a case of local market missing proposed reinforcement the contractor shall propose new calculation to the supervisor/designer and require written approval for installing. Price shall not be changed in this case.
- Price include unit price per kg of reinforcement. Formating is not included in price (included in concrete work).

No.	ITEM DESCRIPTION	UNIT	QTY	COMMENTS ON COMPLIANCE (Please confirm compliance with technical specifications or indicate deviations)
1	Provision, transport and installing flat round reinforcement steel class GA-240/360, cleaning, cutting, formating and installing (simple structure).	kg	750.00	
2	Provision, transport and installing round rebar reinforcement steel DN 12 mm, class RA-450/500, cleaning, cutting, fomrating and installing (simple structure).	kg	750.00	
3	Provision, transport and installing reinforcement steel mesh type Q185, class MA-500/600, formating, cutting, cleaning and installing (unit price include distance pieces). Q185-600x220-36 pcs.	kg	2480.00	

**METAL WORKSHOP
 WORK**

General description

- IV** Metal workshop work must be done in professional manner with qualified staff all in reference with proposed details.
- Welding joints must be done in professional manner, with standrad electrical welding method.
- Welded ends must be flat with no sharp edges. All connections must be cleaned and checked.
- After workshop work metal parts must be cleaned and protected with two coats of corrosive protection. After metal parts are installed it must be painted in two coats of paint/varnish.

No.	ITEM DESCRIPTION	UNIT	QTY	COMMENTS ON COMPLIANCE (Please confirm compliance with technical specifications or indicate deviations)
1	Provision, transport and construction and installing of the standalone (PTZ) camera poles in reference with detailed drawing (same as for fixed cameras). The steel pole shall be protected with steel galvanisation + two coats of paint/varnish in green color. Price include all screws, boltsm washers and anchors. L=500 cm, 100X100X5MM	pcs	4	
2	Provision, transport, construction and installing of the extrenal camera steel poles all in reference with drawing (manhole details). The steel poles shall be protected with steel galvanization + two coats of paint/varnish in green color. Price include all screws, bolts, washers and anchors. L=400 cm, 100X100X5MM	pcs	22	
3	Provision, transport, construction and installing of the frame for the synoptic map (wall installing) what include the metal frame (steel boxed pipe 40x40x2.6 mm) size 250x150 cm, plexy glass 5 mm thickness (transparent), white PVC support 3 mm thickness (LED elements set up described in hardware bill of qty). switch cabinet support in reference with detailed drawing. The frame shall be protected with two coats of corrosive protection paint + two coats of paint/varnish in green color. Price include all screws, boltsm washers and anchors. Synoptic map shall be drawn on heavy coated HP plotter paper in scale 1:1000-syrvey drawing).	SET	1	
4	Provision, transport, construction and installing of the switch cabinet support in reference with detailed drawing (manhole details). The support shall be protected with steel galvanization and protection paint + two coats of paint/varnish in green color. Price include all screws, boltsm washers and anchors.	EA	22	

DUCTING WORK

General description

- V** Ducting work is standard optic cable/power cable ducts installing. Dust pipe proposed is MDPE pipe DN 110 mm. Ducts shall be installed in one length from manhole to the next manhole. Pipe end shall be sealed on concrete entrance with SIKA seal. Ducts shall be installed in the sand bed (under and over the pipe) and signed with red warning tape 10 cm width.

No.	ITEM DESCRIPTION	UNIT	QTY	COMMENTS ON COMPLIANCE (Please confirm compliance with technical specifications or indicate deviations)
1	Purchase, transport and installing the MDPE pipes (nominal size DN 100 mm) in a sand bed. Price include pipe end sealing with SIKA sealing material.	m	5,010	
2	Purchase, transport and installing the MDPE pipes (nominal size DN 75 mm). Price include MDPE pipe set ups and sealing to the manhole. 462 m	m	462	
3	Purchase, transport and installing the MDPE pipes protection of exposed part (wall exposed) with steel pipe DN 76.1 x 2.9 mm, L=120 cm each. Price include and two steel anshors. Price include steel pipe painting with 2 layer of corrosive paint and two layers of the oil paint color on supervisor approval. 17 x 1.20 m	set	22	
4	Purchase, trasport and installing warning tape red in color 10 cm width.	m	5,010	

B1 CABLE CABINETS

I Technical characteristic of all equipment must satisfied technical description in Appendix
 Technical Description and Single line diagram

No.	ITEM DESCRIPTION	UNIT	QTY	COMMENTS ON COMPLIANCE (Please confirm compliance with technical specifications or indicate deviations)
1	<p>MAIN DISTRIBUTION BOARD INSTALLING Purchase, transport and installing: The new power panel board is designed as a surface-mounting, steel profile and twice pickled steel sheet 2 mm thick, corrosion protected method of electrostatic powder coating, RAL 7003, fully equipped with the single pole scheme. Approximate dimensions (600x600x2000) mm (width x depth x height).</p> <ul style="list-style-type: none"> • degree of mechanical protection IP43 • Introduction of cables from below • Space for installation of the UPS • 30% reserve space for mounting equipment • All equipment used must be new, first-class quality, the product of one of reputable manufacturers. • All new equipment must be marked. On the board will be labels and warnings, and inside single line diagram. <p>- The supply part consists the automatic transfer switch 63A network- generator; 4-phase surge arresters 10kA, voltmeter's switch with voltmeter;, at the door of the cabinet are installed signal lamps for the voltage presence - Outgoing part consists of network-generator part and UPS-part. In outgoing:</p> <ul style="list-style-type: none"> • contactor 10A, 2 pcs • Automatic fuse 25A, 10kA, 3-pole, 1 pcs • Automatic fuse 25A, 10kA, 4-pole, 1 pcs • Automatic fuse 16A, 10kA, 2 pcs • Automatic fuse 6A, 10kA, 5 pcs • Automatic fuse 4A, 10kA, 4 pcs • Included all necessary installation material, associated works (trade and construction), connection of cables, wired and tested 	LS	1	
2	<p>CABLE CABINET KO Purchase, transport and installing: Cable cabinet KO made of polycarbonate, the mechanical protection IP54, outdoor mounting, dimension (400x350x200)mm.</p> <p>Equipped with:</p> <ul style="list-style-type: none"> - three-pole fuse- switch 160A, 1 pcs - fuse NV00C 10A, 1 kom - null busbar - terminal block 16A for outdoor lighting - Automatic fuse, 2A, 6kA, 1pcs - Included all necessary installation material, associated works, connection of cables, wired and tested 	LS	22	
3	Testing and putting into operation	LS	22	

B2 CABLES

Technical characteristic of all equipment must satisfied technical description in Appendix Technical Description

II It will be used cables type PP00 (NYY). The cables will be installed in the earth cable trench in PVC pipes. On all cables, at their beginning and end it is necessary to set the appropriate tags.

Included all necessary installation material, associated works, connection of cables, tested

No.	ITEM DESCRIPTION	UNIT	QTY	COMMENTS ON COMPLIANCE (Please confirm compliance with technical specifications or indicate deviations)
1	Purchase, transport and installing in cable trench in the the pipe cable PP00 4x25mm2 Included all necessary installation material	M	1750	
2	Purchase, transport and installing in cable trench in the the pipe cable PP00 4x4mm2 Included all necessary installation material	M	1750	
3	Purchase, transport and installing cable joints Cu 6-25mm2, all completely	LS	44	
4	Purchase, transport and installing cable lugs Cu 6-25mm2	LS	140	
5	Purchase, transport and installing in cable trench FeZn tapes, PVC shield, warning tape, all completely per m of the trench	M	1750	
6	Purchase, transport and installing perforated cable shelf dimensions (150x80) mm. Includes all necessary mounting and the fixing materials	M	20	
7	Testing and putting into operation	LS	1	

C1) PASSIVE EQUIPMENT

No.	ITEM DESCRIPTION	UNIT	QTY	COMMENTS ON COMPLIANCE (Please confirm compliance with technical specifications or indicate deviations)
1.	Supply and laying of fiber optical cable 9/125mm, 4 fibers with rodent protection for outdoor installation. Cable is laid into pipe in excavated trench.	m	5050	
2	<p>Upgrade of the existing main standalone 19" communication cabinet, dimensions 42U, (HxWxD) 2200x800x800mm, housing is powder-painted, made of steel sheet with min. 1.5 mm thickness, transparent front door with a lock, horizontal and vertical cable guides, sides that are removable, with the possibility of removing the rear. The following equipment is to be mounted in the cabinet:</p> <ul style="list-style-type: none"> - 1 pc., fan unit with min. 3 fans 35W (flow rate 160m³ / h per fan) and thermostat (+5 to +55 C), with a switch to turn on and off. - 1 pcs., 230VAC power socket unit, with surge protection, switch, 7 sockets (at angle 30 degrees) and standard cable length of 1.5 m. - 1pc. copper earthing bar for installation in 19" cabinet - 4 set vertical cable organizer made of steel U profiles, - 2 pcs cable management panel 19" with 5 plastic rings, suitable for conducting optical fiber cables - 2 pcs. 19" shelf depth min. 460mm to accommodate active equipment. Simplified installation with "click" system. Minimum shelf payload 80kg. - 1 pcs. 19" full patch panel series TOOLLES LINE with 24 modular shielded RJ45 connectors, 10GB / s, production Schrack or eq. - 2 pc. 19" fiber optic panel with 12 ports, depth 240mm (depth adjustable), height 1U equipped with 12 duplex SC adapters, OM2 category, a set of "pigtailed" with ceramic ferrule, and cover and the accompanying splice box and cable arrangement box - 6 pcs duplex fiber optic patch cable 2m, OM2 category, terminated at both one end with SC connectors and LC connectors on other side. - 5 pcs FTP patch cable RJ45 8/8, length 1,5 m, Cat6a 	set	1	
3	Delivery and installation of optical fiber endings SC (pigtail) and connecting to cable endings. The price includes all the necessary materials for ending cables.	set	244	
4	Work on the welding of optical fibers	set	244	
5	Supply and laying of cable SFTP Cat6a into PVC pipe	m	2650	
6	Supply and connection of metal male RJ45 Cat6a connector on both ends of SFTP cable	pcs	92	
7	Functional testing of a structured network with a device for testing communication networks and the creation of appropriate test protocol with a detailed specification of measurements for each connection. All copper and optical connections must be tested and included in protocol.	ls.	1	
8	Unspecified material	ls.	1	

C2) ACTIVE EQUIPMENT

No.	ITEM DESCRIPTION	UNIT	QTY	COMMENTS ON COMPLIANCE (Please confirm compliance with technical specifications or indicate deviations)
9	<p>Delivery of polyester wall mounting enclosure dimensions (HxWxD)1200mmx1000mmx350mm, IP46 including mounting accessories. Cable glands are mounted from bottom side. Front door is equipped with lock. Following equipment is installed inside cabinet:</p> <ul style="list-style-type: none"> - 2 pcs ventilation unit with termostat - 1 set including filters - 1 pc resistance heater 55W with termostat - 1 pc fluo light with end switch - 1 pc Rotary switch single pole, DIN mounting, 16A - 8 pc Miniature single pole circuit breaker 6A, C - 1pc surge protection 2 poles, 20kA, 230VAC - 1 pc. 19" fiber optic panel with 12 ports, equipped with 12 duplex SC adapters, OM2 category, a set of "pigtaills" with ceramic ferul, and cover and the accompanying splice box and cable arrangement box. - industrial type for wall mounting - 4 pcs duplex fiber optic patch cable 2m, OM2 category, terminated at one end with SC connectors and LC connectors on other side. <p>All complete including wiring and test protocol</p>	set	24	
10	<p>Delivery and install of active equipment for computer network</p> <p>Managed L2 switch with IP cammeras support - SEE TERMS OF REFERENCE</p> <p>Interfaces Gigabit Ethernet</p> <p>Ports 8 x 10/100/1000 + 4 x combo Gigabit SFP</p> <p>Power Over Ethernet (PoE): PoE+</p> <p>PoE Budget:123.2W (8x IEEE 802.3AF CLASS2/ 8xIEEE 802.3AF CLASS3/4x IEEE 802.3AT CLASS4</p> <p>Performance: Bandwidth : 35.7 Mpps</p> <p>Switching capacity : 24 Gbps</p> <p>MAC Address Table Size: 8K entries</p> <p>Jumbo Frame Support: 9216 bytes</p> <p>Remote Management Protocol: HTTP, RMON 1, RMON 2, RMON 3, RMON 9, SNMP 1, SNMP 2, Telnet</p> <p>Encryption Algorithm: SSL</p> <p>Authentication Method: RADIUS, Secure Shell (SSH), TACACS</p> <p>Compliant Standards: IEEE 802.1D, IEEE 802.1p, IEEE 802.1w, IEEE 802.1x, IEEE 802.3, IEEE 802.3ab, IEEE 802.3ad (LACP), IEEE 802.3u, IEEE 802.3x</p> <p>RAM: 128 MB</p> <p>Min Operating Temperature -0⁰C (-30oC) - non working temp.</p> <p>Max Operating Temperature +40⁰C (+70 oC) -non working temp.</p> <p>Humidity Range Operating:5..90%</p> <p>Features: Broadcast Storm Control, auto-uplink (auto MDI/MDI-X), flow control, layer 2 switching, port mirroring, DHCP support, Link Aggregation Control Protocol (LACP), Quality of Service (QoS), RADIUS support, Trivial File Transfer Protocol (TFTP) support, VLAN support, Weighted Round Robin (WRR) queuing, auto-negotiation</p> <p>4x SFP Trancievers SMF, 1000Mbps, 10 km, 1310 nm, LC</p> <p>Complete set</p>	set	24	
11	Commissioning and testing of active equipment	ls.	1	

STORAGE BULDING - SH

I Technical characteristic of all equipment must satisfied technical description in Appendix Technical Description

No.	ITEM DESCRIPTION	UNIT	QTY	COMMENTS ON COMPLIANCE (Please confirm compliance with technical specifications or indicate deviations)
1	5Mpix Outdoor Fixed IP Camera with IR and analytics:	LS	2	
2	Alarm Control Panel DIRECT SOFTWARE CONTROL	LS	1	
3	Ethernet communication module	LS	1	
4	Fire safety barrier	LS	2	
5	Manual call point for hazardous areas - EX class IID	LS	2	
6	Optical smoke detector for hazardous areas with base detector - EX class IIC T5	LS	2	
7	Outside siren wit agu. Bat 12V/2,4Ah - FITED TO THE BELONGS CAMERA POLE	LS	1	
8	UPS - Type 2 (600 KVA)	LS	2	
9	Installation of the connection box and makeing all the required connections in it. All with work and cables. - MONITORING ROOM	LS	1	
10	All survilence system elements installing, system testing, functional testing and set up, connecting of elements, camera parameter set up, Final written report required.	LS	1	
11	Testing and putting into operation	LS	1	
12	All above items are for one storage. There are 22 storages in total	SET	22	

PTZ

II Technical characteristic of all equipment must satisfied technical description in Appendix Technical Description

No.	ITEM DESCRIPTION	UNIT	QTY	COMMENTS ON COMPLIANCE (Please confirm compliance with technical specifications or indicate deviations)
1	2MP Outdoor PTZ 30x IP Camera with IR and analytics:	LS	4	
2	Installing, Testing and putting into operation	LS	4	

MONITORING CENTRE

III Technical characteristic of all equipment must satisfied technical description in Appendix Technical Description

No.	ITEM DESCRIPTION	UNIT	QTY	COMMENTS ON COMPLIANCE (Please confirm compliance with technical specifications or indicate deviations)
1	NVR Video recorder - SEE TECHNICAL DESCRIPTION	LS	1	
2	Video monitoring workstation	LS	1	
3	42" LCD/LED monitor	LS	3	
4	24" LCD/LED monitor	LS	1	
5	Single line IP alarm receiver	LS	1	
6	UPS - Type 2 (6000 KVA smart line)	LS	1	
7	Ethernet switch -Type 2	LS	1	
8	Keyboard for control of PTZ	LS	1	
9	IP Input/output module for configuration of hardware synoptic map	LS	1	
10	Alarm monitoring software programming - SEE TECHNICAL DESCRIPTION	LS	1	
11	Video monitoring and recording software	LS	1	
12	Connection all items inside the racks, beetwin the racks and outside of the racks	LS	1	
13	Alarm monitoring software programming	LS	1	
14	Video monitoring and recording software programming	LS	1	
15	Testing and putting all the system into operation, Training of the personel	LS	1	