

PROJECT: Sports and Culture Centre in Obrenovac

SITE: Obrenovac
Cadastral plot 509 CM Rvati

INVESTOR: City of Belgrade, Belgrade

ESTIMATED BILL OF QUANTITIES FOR CIVIL AND SPECIALISTS' WORKS
SPORTS AND CULTURE CENTRE IN OBRENOVAC

PHASE II - SPORTS CENTRE WITH SUPPORT FACILITIES

July 2015

No.	Item Description	UoM	Quantity	Unit Price	Total in RSD
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1. PRELIMINARY WORKS - DEMOLITION

- 1.1.** Removal of existing furniture, belongings and dismantling and removal of billboards, curtains for shading, etc. from all areas, which are to be adapted. Usable furniture and belongings are to be transported and stored in a storage area specified by the investor, which is located up to 15km. Report shall be made on removed and stored belongings, based on which the Contractor shall make handover to the Investor. Collect, remove, load debris to a truck and transport it to the city landfill. The Investor and the Contractor will determine the category of furniture and belongings and define in writing a place for their storage. Calculation per m2 of room area
- | | | |
|--|----|----------|
| | m2 | 2,842.84 |
|--|----|----------|
-
- 1.2.** Careful removal of interior doors, both single and double, along with frame, flashing and all associated parts, threshold, protective strips, etc. Dismantled doors shall be marked, stacked, removed, loaded onto a truck and taken to a landfill designated by the investor within a distance of 15km. Unit price includes dismantling, marking, all transport and stacking in a landfill. Calculation per piece
- | | | |
|-------------|-----|-------|
| single door | pcs | 47.00 |
| double door | pcs | 10.00 |
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- 1.3.** Careful removal of glazed metalworks, along with the frame, flashing and all associated parts, protective strips, etc., larger than 5m2. Dismantled metalwork shall be marked, stacked, removed, loaded onto a truck and transported to a landfill designated by the Employer up to 15km of distance. Unit price includes dismantling, marking, all transport and stacking at a landfill. Calculation per m2
- | | | |
|--|----|---------|
| | m2 | 78.6458 |
|--|----|---------|
-
- 1.4.** Partial stripping of damaged plaster from the interior walls of the ground floor. The Supervision and the Contractor will define areas from which plaster shall be stripped and state it in writing. Strip plaster, clean wall surfaces with steel brushes, dedust and prepare them for re-plastering. After inspecting the site, based on visual inspection, it is estimated that approximately 20% of plastered surfaces is deducted. Collect, remove, load debris to a truck and transport it to the city landfill. Calculation per m2
- | | | |
|-------------|----|----------|
| Sports hall | m2 | 1,220.00 |
|-------------|----|----------|
-
- 1.5.** Demolition of brick walls, masonry in mortar, thickness 12cm

Walls shall be demolished together with ring beams, door lintels and all wall claddings. Usable bricks shall be cleaned from plaster and stacked on a construction site landfill designated by the Investor.

Collect, remove, load debris to a truck and transport it to the city landfill, up to 15km away.

Calculation per m3

m3 6.81

1.6. Removal of wall tiles with mortar.

Ceramic wall tiles on the first floor of the building shall be removed.

Remove tiles with mortar, and the brick surface shall be cleaned with steel brushes and dedusted. Collect, remove, load debris to a truck and transport it to the city landfill.

Calculation per m2

m2 245.09

1.7. Removal of floor tiles, on the first floor of the building, placed in cement mortar.

Tiles and base shall be removed down to healthy structure. Remove, load debris to a truck and transport it to the city landfill.

Calculation per m2

m2 51.45

1.8. Assembly and disassembly of metal tubular scaffolding, for works inside the sports hall, all according to applicable regulations and occupational safety measures.

Scaffolding must be statically stable, anchored to the building and properly grounded. Scaffold boards made of planks or finished floor elements shall be placed at each 2m of height. Planks are placed sidewise on the platform outside.

The entire surface of the scaffold shall be covered with jute or PVC.

Structural engineer shall receive the scaffolding and approves it for use through the log entry. It is used for the duration of the works.

Calculation per m2

m2 2,606.70

1.9. Punching holes in the reinforced concrete walls and floors, for forming a passage to new air-handling unit. Punching should be performed carefully not to disturb the stability of the building. (axis 21, room 19.2 on the first floor of the building)

Punching according to the provided drawing and details of the structural analysis and technical description of statics:

The works shall be carried out gradually in the following stages:

1. chiselling - removal of concrete from the openings in width greater by 20 cm from all sides, so as to form a larger opening. During the works, special attention shall be paid not to damage and break rebars;
2. cutting of rebar in the middle of the opening, so rebar can remain longer;
3. cleaning of the entire opening and the place of work from debris.

Collect, remove, load debris on a truck and transport it to the city landfill.

Unit price includes necessary support of the floor slab with metal struts and beams assembly and disassembly of light mobile scaffolding, which will be used during the works.

Calculation per m3

m3 1.25

- 1.10.** Cutting of concrete tongue by 63.5 cm on the buttresses in the axis 6 (19.1 room on the first floor) for creating a room for new air-handling unit.

Cutting should be performed carefully not to disturb the stability of the building, according to the provided drawing, details of the structural analysis and technical description of statics:

The works shall be carried out gradually in the following stages:

1. chiselling - removal of concrete from the openings in length greater by 25 cm, so that cut part is longer by 25cm;
- 2.

During the works, special attention shall be paid not to damage and break horizontal rebars, and not to remove the vertical rebar;

3. cleaning of the place of work from debris.

Perform the works carefully.

Collect, remove, load debris on a truck and transport it to the city landfill.

Calculation per m3

m3 1.07

- 1.11.** Punching brick wall for passage of air conditioning pipes. Opening dimensions 110x110cm, thickness
Carefully demolish the parts of the wall, not to loosen the wall masses. Collect, remove, load debris on a truck and transport it to the city landfill.

Calculation per m3

m3 0.78

- 1.12.** Careful stripping off the edges of openings in RC slab, which is being closed.

Strip off concrete in the width of 10cm, from all four sides.

Collect, remove, load debris on a truck and transport it to the city landfill.

Calculation per m

m 6.00

2. MASONRY

- 2.1.** Plastering of interior walls with compo mortar in two layers, in the area where the plaster is stripped.
Before plastering, the surface shall be cleaned and sprayed with cement slurry. The first layer, ground, shall be performed with compo mortar, up to 2 cm thick, made of sifted gravel and lime. Apply plaster over the base and cut it for better application of the second layer.

The second layer shall be performed with fine and clean sand, without impurities, silt and organic matter. Float with wetting and smoothing with small floats.

The plastered surface must be flat, without breaks and waves, and the edges must be sharp and straight.

The joint with plaster that is not stripped must be flush and invisible.

Wet plaster to prevent rapid drying.

Unit price includes the necessary material, all transport, construction, and assembly and disassembly of necessary scaffold.

Calculation per m2 m2 1,220.00

- 2.2. Plastering of walls, base for gluing tiles, with compo mortar.

Before plastering, wall surfaces must be cleaned and sprayed with cement slurry. Apply a layer of plaster made with sifted gravel, 0-4mm, and level it. The plastered surfaces must be flat and roughened.

Calculation per m2 m2 245.09

- 2.3. Patching of plastered surfaces, grooves, quoins, etc. to the width of 30cm, by compo mortar in two layers.

Before plastering, wall surfaces shall be wetted and sprayed with cement slurry, apply the first layer, ground, mortar, made with sifted gravel in thickness of about 2cm.

Apply the second layer on dry first layer, made with fine sand, and then thoroughly float it including wetting.

Surfaces must be flat, without breaks and waves, and edges must be sharp. The joints with the existing surfaces must be flush.

Unit price includes the necessary material, all transport, construction, and assembly and disassembly of light mobile scaffold.

Calculation per meter m' 2,368.34

- 2.4. Cladding of the separating wall between the sports hall and cultural center with MULTIPOR panels.

Panels of thermal insulation of aerated concrete type Multipor or corresponding thickness of 10cm (density of panel P=100-115kg/m³) shall be glued to the base (adhesive density 770kg/m³) and leveled.

Install plastic anchors, 1 piece per panel, as well as metal and PVC sections to protect edges and corners.

Over the placed panels, uniformly apply adhesive layer of 2-3 mm and sink the mesh with flap, over the entire surface.

After drying, apply adhesive in a layer 2-3mm thick for leveling the entire surface, and use smoothing trowel.

Wall surface must be flat, without waves or humps and edges must be sharp.

Unit price includes the supply of necessary material, all transport and construction, and assembly and disassembly of light mobile scaffold.

Calculation per m2 of finished cladding. m2 936.54

3. CONCRETE AND REINFORCING WORKS

- 3.1. Repair, curing of damage to cement screed

Repair should be made with polymeric materials.

Surfaces for reparation should be prepared, remove loose material, in all follow the manufacturer's instructions.

Mixture should be applied in layers, by hand or by machine, to the required thickness of approximately 2mm according to materials manufacturer.

Unit price contains the supply of necessary material, construction, all transport, as well as any additional material.

Calculation per m2 m2 1,850.00

3.2. Processing of edges of reinforced-concrete carcass, at the part where opening is made, or where carcass is shortened.

Rebar shall be cut, according to the provided drawing in the design documentation and bent, while excess shall be cut off. Prepare wooden formwork, according to design documentation, and the area shall be grouted with fine-grained concrete.

After concrete is hardened, formwork shall be carefully dismantled to avoid damage to the concrete and concrete shall be cured in line with the regulations.

The works shall be carried out according to the drawing and description from the design documentation and Designer's instructions.

Unit price includes the necessary material, all transport and construction. Supply and installation of reinforcement shall be calculated separately.

Calculation per meter m 10.00

3.3. Making of lintel on the part of air-conditioning pipe penetration through the brick wall.

Rebar shall be placed in the prepared opening, according to the design and structural analysis, then wooden formwork shall be set up and grout it with fine-grained concrete, brand MB30.

Unit price includes the necessary material, construction, making, assembly and stripping of light mobile formwork. Supply and installation of reinforcement shall be calculated separately.

Calculation per m3 m3 0.18

3.4. Closing of the opening in the concrete slab, with concrete MB30.

After grooves are cut on the edge of the opening, new rebar shall be welded to the end of the existing rebar, as stipulated by the design, details and structural analysis.

The bottom part shall be in wooden formwork, supported with metal struts, sides of the opening shall be coated with a mixture for concrete bracing, while opening shall be concreted, MB30.

The upper side shall be floated.

Unit price includes the necessary material, all transport and construction. Supply and installation of reinforcement shall be calculated separately.

Calculation per m3 m3 0.49

3.5. Repair of cracks at the level of RC ring on top of the concrete structure, on beam face, on the cantilevered overhang, axis 48 and A

Repair shall be carried out, in the manner described in the design documentation, as follows:

Cleaning shall be done mechanically and with air compressor blow.

Crack shall be filled with repair cement.

Filling shall be performed according to the principles of grouting, (partially close the crack, place tubing for mixture injection and inject the repair mixture.

Use repair mixture from the product range of "SIKA" or any other product that is used for these purposes, of the same or higher quality.

Unit price includes the necessary supply of materials, development.

Assembly and disassembly of tubular scaffolding, calculated in item 1.8, and therefore is not the subject of this BoQ item.

Calculation per piece of repaired crack. pcs 1.00

3.6. Supply and installation of reinforcement.

Rebars shall be cleaned, cut, bent and installed according to the design and structural analysis. Before concreting, rebars must be inspected and approved in writing by a structural engineer.

Calculation per kg kg 130.60

4. JOINERY

4.1. Fabrication and installation of single and double doors, in ready-made openings.

Door frame made of first class and dry oak, MDF door wing, according to joinery diagrams and details. Skylight is glazed with a single glass 6mm thick.

Between the wing and frame place sealing profile of neoprene rubber.

The doors are provide with adequate hardware, concealed cylinder lock and three keys, three mortise hinges per wing, chosen by the Designer.

Rubber bumper shall be placed on the floor. Transitional strip on the floor, made of stainless steel.

Unit price contains the supply of necessary material, shop fabrication, all transport, on-site installation with all flashings inside and out, and the final product painted in colour and shade by Designer's choice.

Calculation per piece

item IV	single door 100x220	pcs	5.00
item V	single door with skylight 100x310	pcs	1.00
item VI	single door 90/210	pcs	1.00
item VII	single door with skylight 90x300	pcs	2.00
item VIII	single door 80x210	pcs	4.00
item IX	single door with skylight 80x300	pcs	3.00
item X	single door 70x210	pcs	26.00

4.2. Fabrication and installation of panel partition, (folding sliding doors) in ready-made openings.

Frame is made of first class and dry oak, wing is coated with MDF, according to joinery diagrams and details.

Between the wing and frame place sealing profile of neoprene rubber.

The doors are provide with adequate hardware, concealed cylinder lock and three keys, three mortise hinges per wing, chosen by the Designer, and guide rails.

Unit price contains the supply of necessary material, shop fabrication, all transport, on-site installation with all flashings inside and out, and the final product painted in colour and shade by Designer's choice.

Calculation per m2

item XI	dim. 480/235 pieces 2	m2	22.56
item XII	dim. 484/346 pieces 2	m2	30.31
item XIII	dim. 534/346 pieces 1	m2	18.48
item XXIII	dim. 674/346 pieces 2	m2	46.64



5. METAL WORK

5.1. Fabrication and installation of fire doors (doors with a report on fire testing issued by IMS)

Doors made of steel sections, sheet metal. The door wing is a grid of box sections 50x30x1mm, partition sheet plate is 1.5mm thick, placed at both sides, while door frame is of box sections 80x40x1,5mm.

Fire infill 30mm thick, lining, fire panels placed on both sides, metal sheet 1.5mm thick placed on both sides, fire resistant MDF panels 8mm thick placed on both sides, the color chosen by the Designer.

Sealing, double row of sealing rubber on frame and wing, double row of expansion strips on door frame and wing.

Hardware, hinges, safety locks, panic fittings.

Unit price contains the supply of necessary material, shop fabrication, all transport, on-site installation with all flashings inside and out, and the final product painted in colour and shade by Designer's choice.

Calculation per piece

item XV	dim 200/314 double doors F90	pcs	5
item XVI	dim 200/220 double doors F90	pcs	3
item XVII	dim 100/220 single doors F60	pcs	3

5.2. Fabrication and installation of doors, glazed with safety glass 8mm thick.

The doors are made of aluminum profiles, improved with multi-chamber profile system, double sealing system with EPDM rubber, in line with joinery diagram and details.

Install hardware of anodized aluminum, lock and three hinges per leaf, chosen by the designer.

Doors are glazed with safety glass, thickness 8mm, and sealed with permanently elastic EPDM rubber, vulcanized on the corners.

Colour and shade, chosen by the designer.

Unit price includes the necessary material, shop fabrication, all transport, on-site installation with all flashing inside and out.

Calculation per piece

item 57	dim 120/260 single door with skylight	pcs	2.00
item 66	dim 100/314 single door with skylight	pcs	2.00

5.3. Fabrication and installation of solid metal doors.

The doors are made of aluminum profiles, improved with multi-chamber profile system, double sealing system with EPDM rubber, in line with joinery diagram and details.

Leaves are covered with aluminum sheet on both sides.

Install hardware of anodized aluminum, lock and three hinges per leaf, chosen by the designer.

Colour and shade, chosen by the designer.

Unit price includes the necessary material, shop fabrication, all transport, on-site installation with all flashing inside and out.

Calculation per piece

item 74	dim 116/220 single door with skylight	pcs	2.00
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5.4. Fabrication and installation of glass partition with doors, made of Alu profiles, glazed with safety glass 8mm thick.

Partition is made of aluminum profiles, improved with multi-chamber profile system,

Install hardware of anodized aluminum and lock on leaves, chosen by the designer.

Partition and door leaf, which can be opened, are glazed with safety glass, 8mm thick, and sealed with permanently elastic EPDM rubber, vulcanized on corners.

Colour and shade, chosen by the designer.

Unit price includes supply of the necessary material, shop fabrication, all transport, on-site installation with all flashing inside and out, anchors and reinforcement.

Calculation per m2

item 55	dim 1585/260 with double sliding doors, 1pcs	m2	41.21
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item 64	dim 308/275 with single doors, 1 pcs	m2	8.47
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item 67	dim 198/314 with single doors, 2pcs	m2	6.21
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6. TILING WORKS

6.1. Pointing of existing wall tiles, placed adjacent.

Clean the existing joints, wash and point them with white cement or grouts, and then clean them.

Unit price contains the supply of necessary material, all transport and construction.

Calculation per m2	m2	519.90
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6.2. Pointing of existing floor tiles, placed adjacent.

Clean the existing joints, wash and point them with white cement or grouts, and then clean them.

Unit price contains the supply of necessary material, all transport and construction.

Calculation per m2	m2	242.18
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6.3. Replacement of damaged wall tiles.

Replace damaged wall tiles with the same type modeled after the existing ones. Carefully remove damaged tiles with mortar, avoid damage to adjacent tiles, install new tiles and place grout in joints.

Based on the estimate on the spot, it is necessary to replace approximately 15% of wall tiles.

Unit price contains the supply of necessary material, all transport and construction.

Calculation per m2 m2 55.55

6.4. Replacement of damaged floor tiles.

Replace damaged wall tiles with the same ones modeled after the existing ones.

Carefully remove damaged tiles with mortar, avoid damage to adjacent tiles, install new tiles and place grout in joints.

Based on the estimate on the spot, it is necessary to replace approximately 25% of floor tiles.

Unit price contains the supply of necessary material, all transport and construction.

Calculation per m2 m2 36.67

6.5. Placement of wall ceramic tiles, dimensions 20x20cm, on the adhesive, on the first floor, in the rooms where tiles are removed.

I class tiles, domestic production, glue them in butt joint. If necessary, additionally grind the tile edges manually. Tiled surfaces must be flat and vertical. Placed tiles shall be pointed and cleaned with sawdust.

Unit price contains the supply of necessary material, all transport and construction, as well as assembly and disassembly of light movable scaffolding.

Calculation per m2 m2 245.09

6.6. Placement of floor ceramic tiles, dimensions 20x20cm, on cement mortar, on the first floor, where tiles are removed.

I class tiles, placed in cement mortar, in bonding chosen by the Designer. The base shall be previously sprayed with cement slurry. If necessary, additionally grind the tile edges manually. Tiles shall be placed flat and grouted with cement slurry. Placed tiles shall be pointed and cleaned with sawdust.

Unit price contains the supply of necessary material, all transport and construction.

Calculation per m2 m2 51.45

6.7. Placement of the plinth of ceramic tiles, height up to 15cm in corridors.

Ceramic tiles shall be placed on the tile adhesive. The base must be flat and prepared. Placed tiles shall be pointed and plinth cleaned.

Unit price contains the supply of necessary material, all transport and construction.

Calculation per meter. m 338.00



7. DRY WORKS

- 7.1.** Construction of partition wall, thickness of 125mm, made of moist-proof plasterboards. Single metal substructure covered on both sides with double moisture-proof plasterboards.

Any opening and places where equipment should be built in shall have necessary reinforcements and carriers of built-in components.

Placed rock wool must have thermal and mechanical properties prescribed by civil engineering physics study.

Type protective corner shall be installed at any protruding angles. Plate joints are filled, bandaged with tape and point with joint grout.

Joints are filled with gypsum filler by using bandage tape.

During installation of partition walls, joints with floor and ceiling as well as finish of doorjamb and window jambs shall be performed according to details and specification of the manufacturer and with the consent of the designer.

Strictly follow details from the design documents and take measures on the spot.

Unit price contains the supply of necessary material, all transport, construction, assembly and disassembly of light movable scaffolding. Calculation is provided without openings deduction.

Calculation per m2

m2 48.03

7.2. Lining of ventilation pipes with fire GPK panels, fire resistance F=90min.

Construct self-standing metal substructure, around pipes, rock wool shall be placed as insulation, thickness of 70mm, and double coated with plasterboards thickness 2x12.5mm. The total thickness of the lining is approximately 75 mm.

Metal substructure is made of galvanized CW 50 sections, as per design and the manufacturer's instructions. Rock mineral wool thickness 70 mm is placed, and then two layers of plasterboards are installed and fixed. The joints shall be finished with putty and bandage tape.

The lining shall be trowelled with putty, surfaces finished and finally painted in the colour and shade chosen by the designer, with semi-dispersive paint, two coats.

Unit price contains the supply of necessary material, all transport, construction, fabrication, assembly and disassembly of light movable scaffolding.

Calculation per m2

m2 41.08



8. FLOORING WORKS

8.1 Supply, delivery and installation of wooden sports floor, on elastic substructure, according to FIBA standards. PE foil shall be placed on the screed, as a vapor barrier, with overlaps of 10cm. Substructure consists of elastic spacers, scantlings system and associated level gauges, all in accordance with the manufacturer's declaration. Baseboard must be massive, solid wood, pressed beech, minimum thickness of 22mm, factory-finished, lacquered on both sides.

Sports floor - system must have EN 14904 standard and FIBA certificate, which will be documented with the offer.

Unit price includes supply of all necessary materials, all transport and production as well as delivery and installation of 2 pieces of original wooden lids for volleyball. The lid consists of a metal frame (brass) and the wooden cover.

Calculation per m2 m2 1,840.00

- 8.2.** Fabrication and assembly of edge wooden lacquered strip, with performed floor ventilation.
Strips are made of first class dry timber (beech), finally lacquered. The strip is a two-part so that one part is fixed in the parquet and the second part is screwed into the wall. The two parts are independent from one another, and are separated by metal spacers.

Unit price contains the supply of necessary material, all transport and fabrication.

Calculation per meter. m 200.00

- 8.3.** Curing and protection of terrazzo floors (gallery of stands, passes)
Prior to work commencement, carefully inspect the surfaces, and visibly mark the damaged parts. Damage, cracks, should be repaired with putty made of cement and marble flour.
Once the putty is hardened, floor shall be smoothed with grindstones of various fineness, until a smooth and flat surface of equal gloss is obtained.
Repeat the entire process, if holes or grooves appear.
Once the finest grinding is completed, floor shall be washed twice with water with the addition of detergent and then dried.

After drying, the surfaces shall be coated with transparent coating IZOLIT and two coats of silicone water-repellent transparent coating.

Calculation per m2 m2 128.26

- 8.4.** Laying of a homogenous vinyl flooring with non-directional pattern, thickness 2 mm. Colour, shade, pattern chosen by the designer.
Eco-friendly dispersion coating is applied to dry and clean surface. After drying, eco-friendly self-leveling coating is applied in a layer up to 3 mm. After levelling coating is dried, it shall be fine ground, cleaned and vacuumed.
Homogeneous vinyl flooring shall be delivered and laid on this prepared surface with a maximum 2% of humidity, with unidirectional pattern, thickness of 2mm.
Flooring characteristics
Wear class T (according to EN 600 and 660), with PUR protection, fire resistance Bfl S1 (according to EN 13501-1) and weighing up to 2950g/m2, class 34-43 (EN 685), slip-resistant R9, resistant to development of mold and mildew.
Vinyl flooring is cut while dry, glued to the floor by dispersive, eco-friendly adhesive, including welding of joints with electrode, in the same colour as selected flooring.
After welding, joint shall be perfectly flush to the floor.
Floors shall be performed with vertical covings at the joint with wall at height of 15cm.
Unit price includes supply of the necessary material, all transport and fabrication.

Calculation per m2 of the horizontal projection, with constructed coverings 15cm high.

m2 327.79

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9. PAINTING WORKS

9.1. Scraping of old paint from all walls and ceiling of the ground floor and first floor.

The surfaces of walls and ceilings, which are painted, shall be scraped, washed, ground, dedusted, cleaned and impregnated.

Unit price contains the supply of necessary material, all transport and fabrication.

Calculation per m2

m2 5,440.87

9.2. Troweling and painting of walls and ceilings with dispersive, antibacterial washable paint.

Plastered walls shall be dedusted and trowelled with emulsion filler.

After they are prepared, the surfaces shall be ground, cleaned and neutralized. Inspect and point slightly damaged parts and cracks. Impregnate and apply dispersion putty twice.

All surfaces shall be ground, impregnated, while minor damages shall be pointed. Paint them and then correct with tinted dispersion putty, and paint with dispersion paint in two layers. The colour and shade are chosen by the designer.

Unit price contains the supply of necessary material, all transport, as well as fabrication and assembly and disassembly of light movable scaffolding.

Calculation per m2

m2 6,968.53

Sports hall

9.3. Troweling and painting of new plasterboard walls and ceilings, including necessary previous activities, with dispersion, antibacterial washable paint.

Heads of screws or nails shall be red lead coated, surfaces shall be coated with boiled linseed oil and joints pointed with dispersion putty.

After they are prepared, the surfaces shall be ground, cleaned and neutralized. Inspect and point slightly damaged parts and cracks. Impregnate and apply dispersion putty twice.

All surfaces shall be ground, impregnated, while minor damages shall be pointed. Paint them and then correct with tinted dispersion putty, and paint with dispersion paint in two layers. The colour and shade are chosen by the designer.

Unit price contains the supply of necessary material, all transport, as well as fabrication and assembly and disassembly of light movable scaffolding.

Calculation per m2

m2 137.14

9.4. Cleaning and painting of railing of gallery, stairs, and auditorium.

Before painting, clean metal from corrosion with chemical and physical means, and then the surfaces shall be ground and cleaned. Railing shall be impregnated and primed, and then painted twice with paint for metal.

Wooden part of railing shall be stained with Sadolin or similar agent chosen by the designer. Prior to painting, all surfaces shall be sandpapered, until obtaining smooth surface. Paint it twice, respecting the drying period of 24 hours, and then apply the finest sandpaper and paint it for the third time.

Unit price contains the supply of necessary material, all transport, and construction.

Calculation per m2 m2 825.70

9.5. Marking of sport courts,

Mark the courts with lines 5 cm wide according to the rules of competition (basketball, handball, volleyball). For marking, use quick-drying acrylic paint, with high levels of adhesion and durability. Colour of the lines is according to the rules of marking the sport courts.

Calculation per meter. m 350.00

10. FINISHING WORKS

10.1. Cleaning and washing of the site after the completion of all works.

Carry out thorough cleaning of the entire site, dedusting of walls, cleaning and thorough washing of all interior rooms.

Cleaning and washing of windows and doors after completion of works.

Windows and doors shall be carefully cleaned, all surfaces washed with water with the addition of appropriate chemical agents.

Calculation per m² measured net area from the data. m2 3,824.00

SUMMARY

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|-----|--------------------------------|--|
| 1. | PRELIMINARY WORKS - DEMOLITION | |
| 2. | MASONRY | |
| 3. | CONCRETE AND RC WORKS | |
| 4. | JOINERY | |
| 5. | METAL WORK | |
| 6. | TILING WORKS | |
| 7. | DRY WORKS | |
| 8. | FLOORING WORKS | |
| 9. | PAINTING WORKS | |
| 10. | FINISHING WORKS | |

ESTIMATED BILL OF QUANTITIES: INTERNAL
INSTALLATIONS

PHASE II - SPORTS CENTRE WITH SUPPORT FACILITIES

No.	DESCRIPTION	UoM	Quantity	Unit price	Total RSD
I PREVIOUS WORKS					
1.	Careful dismantle of basin fixtures. Dismantle the basin fixtures, clean and hand them over to the investor through kept records. Calculation per piece.	pcs	14.00		
2.	Careful dismantle of WC pan fixtures. Dismantle the WC pan fixtures, clean and hand them over to the investor through kept records. Calculation per piece.	pcs	10.00		
3.	Careful dismantle of squatting closet fixtures. Dismantle the squatting closet fixtures, clean and hand them over to the investor through kept records. Calculation per piece.	pcs	4.00		
4.	Careful dismantle of shower fixtures. Dismantle the shower fixtures, clean and hand them over to the investor through kept records. Calculation per piece.	pcs	2.00		
5.	Careful dismantle of drain fixtures. Dismantle the drains, clean and hand them over to the investor through kept records. Calculation per piece.	pcs	7.00		
6.	Sealing of sewage pipes. Seal the sewage pipes in the floor leading from the disassembled devices. Lump sum calculation.	LS	1		
7.	Dismantling of water supply network. Dismantle the water supply pipes in the walls so they can be replaced with new ones. Dismantled pipes shall be cleaned and handed over to the investor through kept records. Calculation per meter	m1	25.00		
8.	Dismantling of sewage network. Dismantle the sewage pipes in the walls and floors so they can be replaced with new ones. Dismantled pipes shall be packed and transported to the landfill designated by the investor. Calculation per meter	m1	30		
9.	Mechanical cutting of slab on the ground d=12cm. Cutting is performed in strips 1m wide. The item covers all sides of the field to be cut. Calculation per meter.	m1	7.00		
TOTAL I:					

II EARTHWORKS

- 1 Trench digging, rectangular shape, width 0.8 m, maximum depth 1.20 m, disposal of excavated material on one side at a minimum distance of 1.0 m from the edge of the trench.

Calculation per m3 of excavated material in virgin condition, for all necessary labour and materials. The unit price includes possible pumping of groundwater, necessary shoring of trenches deeper than 1.0m, trench protection.

m3 15.60

- 2 Unit price includes the supply, delivery, transport along the trench, pouring into trench, planning and compaction of sand in layers beneath and around the pipe, thickness 30cm. Material to be used is sand type "Dunavac".

Calculation per m3 of installed sand in compacted condition, for all necessary labour and materials.

m3 3.90

3 Trench backfilling with excavated soil

Trench backfilling with excavated soil including compaction in layers of 30 cm, until obtaining natural compaction.

Calculation per m3 of backfilled trench in compacted state, for all labour and material.

Sanitary water supply network

m3 11.70

4 Transport of excess soil from excavation.

Unit price includes the transport of the excavated material to the city landfill.

m3 3.90

5 Base layer for concrete floor slab

Supply of materials, transport and backfilling of gravel in a layer of 10cm as a base for construction of concrete floor slab. Calculation per m2.

m2 13.00

TOTAL II:

III CONCRETE WORKS

- 1 Supply of materials, transport and construction of base for waterproofing, made of lean concrete MB20 d=10cm. Calculation per m2.

m2 13.00

- 2 Supply of materials, transport and casting of concrete slab on the ground d=12cm, concrete MB25. Calculation per m2.

m2 13.00

TOTAL III:

IV INSULATION WORKS

- 1 Supply of materials, transport and construction of horizontal waterproofing on parts of the slab on the ground (after patching) to protect it against moisture and seepage water. It is performed in the layers of bleeding concrete, as follows:
- Cold applied bitulite coating "A"
 - Hot applied bitumen coating 85/25
 - kondor 3 (APP Plastomer Modified-Bitumen Waterproof Membrane)
 - kondor 3 (APP Plastomer Modified-Bitumen Waterproof Membrane) with defined overlappings welded to the previous layer. Special attention is paid to the connection between new and existing waterproofing layer. Insulation shall be raised along the walls to the height of 30cm.
- Calculation per m2, complete item.

m2 16.00

TOTAL IV:

V WATER SUPPLY INSTALLATIONS

1. Supply and installation of polypropylene (plastic) water supply pipes with all the necessary fittings for pipe network. Unit price includes hanging the pipes on wall and structure, chiselling and punching of walls in floor structure, as well as the required scaffolding.

NOTE: pipe diameter in the drawings represents the inner diameter of pipe.

Calculation per meter of finished pipeline.

Ø20, DN 15 mm m 60.00

Ø25, DN 20 mm m 60.00

2. Testing of the newly-designed pipeline on pressure.

Calculation per meter. m1 13.00

3. Disinfection and bacteriological testing of the newly-designed pipeline.

Calculation per meter. m1 13.00

4. Supply and installation of thermal insulation for pipes made of material class A1, A2 or at least B1, which is hardly flammable in accordance with SRPS U.J1.050 or EN 13501-1.

Calculation per meter.

Ø 20-32mm m 120.00

TOTAL V:

VI SEWAGE INSTALLATIONS

1. Supply and installation of PVC sewer pipes with appropriate fittings. The pipes are mounted by hanging, chiselling and punching walls of floor structure or by digging into the walls or floors in a strictly designed decline of 2%. Unit price includes sealing material for pipe joints, and scaffolding.

Calculation per meter of complete pipeline.

Ø 50 mm - PVC m 5.00

Ø 75 mm - PVC m 25.00

Ø 110 mm - PVC m 2.00

2. Supply and installation of floor drains with waterless trap, plastic housing and a chrome grille, horizontal drains with a flange for toilets.

Calculation for completely mounted drain.

Ø 75 mm pcs 6.00

3. Watertightness testing of sewage pipes.

Calculation per meter. m' 30.00

TOTAL VI:

VII SANITARY DEVICES

1. Supply, transport and installation of complete wash basin, I class, white faience. Basin size 50/40 cm, it should be furnished with a standing single lever mixer for cold and hot water, with a short outlet, nickel-plated drain trap Ø32 mm with a rosette, plug and chain. Design and installation of fixing strips or plastic plugs in the wall for fixing the basin, and is included in the unit price.
- | | | |
|--|-----|-------|
| Calculation per piece including labour and material. | pcs | 9.00 |
| - gate built-in valve Ø 15 mm | pcs | 18.00 |
2. Supply, transport and installation of complete wash basin, I class, white faience (with low-mounted water heater). Basin size 50/40 cm, it should be furnished with a standing single lever mixer for cold and hot water, with a short outlet, inlet pipes, nickel-plated drain trap Ø32 mm with a rosette, plug and chain. Design and installation of fixing strips or plastic plugs in the wall for fixing the basin, and is included in the unit price.
- | | | |
|--|-----|------|
| Calculation per piece including labour and material. | pcs | 3.00 |
| - gate built-in valve Ø 15 mm | pcs | 3.00 |
3. Supply, transport and installation of complete wash basin, I class, white faience **for the disabled**. Basin size 64/55 cm, it should be furnished with a standing single lever mixer for cold and hot water, with a short outlet, nickel-plated drain trap Ø32 mm with a rosette, plug and chain. Design and installation of fixing strips or plastic plugs in the wall for fixing the basin, and is included in the unit price. Manufacturer JIKA Laufen group, or equivalent.
- | | | |
|--|-----|------|
| Calculation per piece including labour and material. | pcs | 1.00 |
| - angle valve for cisterns: Ø 15 mm | pcs | 2.00 |
4. Supply, transport and installation of a complete WC pan made of faience, I class. EK valve Ø15 mm with nickel-plated cap shall be placed on water inlet to toilet cistern. Plastic seat is mounted on the toilet pan. Low-mounted toilet cistern shall be installed, fountain type, with plastic flush pipe and other accessories. Unit price includes all connecting and sealing materials.
- | | | |
|---|-----|-------|
| Calculation per completely mounted and tested device. | pcs | 15.00 |
|---|-----|-------|
5. Supply, transport and installation of a complete sanitary ware of toilet **for the disabled**, which consists of: console ceramic WC pan for the disabled, I class, with low noise concealed cistern, buttons made of stainless steel for flush activation, in shape and colour as chosen by the Employer, lifted off the floor min. 6 cm with the seat and cover. Manufacturer INCEA or equivalent. Wall bracket shall be provided for each WC pan.
- | | | |
|--|-----|------|
| Calculation per piece including labour and material. | pcs | 1.00 |
| - angle valve for cisterns: Ø 15 mm | pcs | 1.00 |
6. Supply and installation of shower trays of enamelled steel sheet 90x90 cm with drain fitting.
- | | | |
|---|-----|------|
| Calculation per completely mounted shower tray. | pcs | 1.00 |
|---|-----|------|
7. Supply and installation of electrical low-mounted water heaters under pressure.

Calculation per completely mounted water heater.

V = 10 lit.

pcs 3.00

- gate built-in valve Ø 15 mm

pcs 3.00

TOTAL VII:

VIII SANITARY FITTINGS

1. Supply and installation of wall-mounted lever mixer for hot and cold water with fixed spout, shower and flexible hose for shower trays.

Calculation per piece.	pcs	1.00
- gate built-in valve Ø 15 mm	pcs	2.00

TOTAL VII:

IX SANITARY WARE

1. Supporting ware in bathrooms and toilets, as chosen by the designer, with all the necessary material for fixing:

* paper holder	pcs	16.00
* liquid soap dispenser	pcs	12.00
* toilet brush	pcs	16.00
* mirror dimension 80x100cm, next to wash basin	pcs	12.00
* mirror dimension 60x40cm for the disabled	pcs	1.00
* liquid soap dispenser next to shower	pcs	7.00
towel holder next to shower	pcs	7.00

TOTAL IX:

X OTHER WORKS

1. Flushing of sewer network before and after the intervention.

Calculation per meter.	m'	32.00
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TOTAL X:

S U M M A R Y

- I PREVIOUS WORKS
- II EARTHWORKS
- III CONCRETE WORKS
- IV INSULATION WORKS
- V WATER SUPPLY INSTALLATIONS
- VI SEWAGE INSTALLATIONS
- VII SANITARY DEVICES
- VIII SANITARY FITTINGS
- IX SANITARY WARE
- X OTHER WORKS

TOTAL :

ESTIMATED BILL OF QUANTITIES: ELECTRICAL INSTALLATIONS					
PHASE II - SPORTS HALL WITH SUPPORT FACILITIES					
Item	DESCRIPTION	UoM	Quantity	Unit Price	Total
1	Dismantling				
	Dismantling of the existing electrical equipment including the necessary works and hand over to the Investor				
1.1	- distribution cabinets RO (6 pcs) and related equipment	set	1		
1.2	- relating feeding lines of cabinet, sockets, lighting 3 water heaters	set	1		
1.3	- existing lighting, 78 lamps 4x18 W, 25 pcs 2x26 W, 30 pcs spot lamps, 4 external reflectors, 143 reflectors, 12 pcs. Of evacuation lamps.	set	1		
1.4	- existing outlets and HVAC consumers (54pcs.)	set	1		
2	Equipment in Power Substation and diesel electrical generator - DEA				
2.1	Delivery and installation of NV fuses at the sports hall outlets for consumers:				
	- 200A, Ik=20kA, for ATS (RO-SH) - outlet no.8, 3pcs.	set	1		
	- 200A, Ik=10kA, for RO-KL1 - outlet no.5, 3pcs.	set	1		
3	Distribution cabinets				
	Delivery of new distribution cabinets similar to type Evrotehna, Krajevo, for installation in/on the wall, complete with equipment similar to type Schrack, by single-line diagrams, works and commissioning				
3.1	Supply, delivery and wall-mounting of distribution cabinet RO-1, made from pickled sheet metal, with a door and lock, dimensions 550x800x200, IP 54, with the following accessories: - main switch 0-1, three-pole 80 A, 500V, pieces 1; - single-pole switch 0-1, 10 A, 250 V, pieces 1; - circuit breakers 10 A, type "B", pieces 14; - circuit breakers 16 A, type "B", pieces 21; - circuit breaker 25 A, type "C", pieces 3; - FID switch 25/0,5A, pieces 4	pcs.	1		
3.2	Supply, delivery and wall-mounting of distribution cabinet RO-2, made from pickled sheet metal, with a door and lock, dimensions 550x800x200mm. IP 54, with the following accessories: - main pole 0-1, three-pole 50 A, 500V, pieces 1; - single-pole switch 0-1, 10 A, 250 V, pieces 1; - circuit breakers 10 A, type "B", pieces 14; - circuit breakers 16 A, type "B", pieces 13; - FID switch 25/0,5A, pieces 4.	pcs.	1		
3.3	Supply, delivery and wall-mounting of distribution cabinet RO-SH1, made from pickled sheet metal, dimensions 550x650x200, IP 54, with the following accessories: - main pole 0-1, three-pole 63 A, pieces 1; - circuit breakers 10 A, type "B", pieces 14; - circuit breakers 16 A, type "B", pieces 13;	pcs.	1		
3.4	Supply, delivery and wall-mounting of distribution cabinet RO-KL1, which consists of a network and generator part, made from pickled sheet metal, with a door and lock, dimensions 800x950x200+800x400x200, IP 54 with the following accessories: - switch 0-1, three-pole, 200 A, 500V, with magnetic thermal protection, with shut down coil 240 V, 50 Hz, with two working and two break contacts, with a range of settings 160-200 A , pieces 1; - switch 0-1, three-pole, 63 A, 500V, with magnetic thermal protection, with shut down coil 240 V, 50 Hz, with two working and two break contacts, with a range of settings 40-63 A , pieces 1; - knife-type fuses NV00 160/ 125 A, pieces 3; - knife-type fuses NV00 160/ 40 A, pieces 6; - knife-type fuses NV00 160/ 10 A, pieces 3; - green signal lamps, network indication, pieces 6; - other fine material for wiring.	pcs.	1		
3.5	Supply and installation of distribution cabinet RO-PPK1 fire dampers, of necessary dimensions, including installation of equipment under single-pole diagram: - single-pole cam switch 1-0, 10A, 500V, pieces 1 - single-pole LV circuit breakers of nominal current 6A, pieces 1 - single-pole LV circuit breakers of nominal current 4A, pieces 1 - transformer station 230V AC / 24V AC, 100VA, pieces 1 - auxiliary relay 24V AC, 3xNO/NC, pieces 7 - push button 1xNO/NC, pieces 2 - LED lamps for indication of damper position - open, fi 22mm, 230V, green, pieces 2 - LED lamps for indication of damper position - closed, fi 22mm, 230V, yellow, pieces 2 - LED lamps for indication of fire, fi 22mm, 230V, red, pieces 1 - other supplies (clips, rails, wiring wire, marks, etc.)	pcs.	1		
4	Power lines				
	Delivery of power lines for supplying distribution cabinets, including their laying in the prepared and existing route, making cable terminations on both ends, connecting and commissioning				

Item	DESCRIPTION	UoM	Quantity	Unit Price	Total
4.1	-W5 power line N2XH 4x95mm2 + N2XH-Y 1x50mm2 from LV distribution TS - RO-KL1	m	110		
4.1.1	-W5.1 power line N2XH 5x25mm2 from RO-KL1 to RO-KK1	m	10		
4.1.2	-W5.2 power line N2XH 4x50mm2 + N2XH 1x35mm2 from RO-KL1 to RO-ČIL1	m	20		
4.1.3	-W5.3 power line N2XH 5x6mm2 from RO-KL1 to RO-REK1	m	60		
4.1.4	-W8.3 power line N2XH 5x16mm2 from RO-SH to RO-SH.1	m	25		
4.1.5	-W8.6 power line N2XH 5x6mm2 from RO-SH to RO-KL-1	m	100		
4.1.6	-W7 power line N2XH-Y 5x25mm2 from LV distribution TS to RO-1	m	10		
4.1.7	-W7.1 power line N2XH-Y 5x6mm2 from RO-1 to RO-2	m	55		
4.2	Supply, delivery and laying of lines for supplying lamps and fire dampers. The line is type N2XH 3x1,5mm2	m	1620		
4.3	Supply, delivery and laying of lines for supplying fire dampers. The line is type N2XH 4x1,5mm2	m	20		
4.4	Supply, delivery and laying of line N2XH 3x2,5mm2, for supplying single-phase sockets I RO-PPK1.	m	700		
4.5	Supply, delivery and laying of fireproof line NHXHX Fe180/E90 3x1,5mm2 for supplying panic lighting.	m	150		
4.6	Supply, delivery and laying of control cable JH(St)H 2x2x0,8mm for connection between air-handling unit and control centre, and between the cabinets of automatics for heat substation and pumps, as well as the center for command and control.	m	300		
5	Lamps				
	Delivery of lamps, complete with works on the installation, connection and commissioning				
5.1	Recessed fixed luminaire, housing is made of aluminum coated with epoxy polyester finish powder fine-grained structure, polymerised at 180°C. Applicable to all types of suspended ceilings, type Cent 6W , light bulb GU10, 230V, equivalent to type Buck.	pcs.	16		
5.2	Recessed luminaire, circular, with matte glass, equivalent to type Lara W DO 226 EPP , IP 20, G24q3, with electronic control gear accessories and compact fluorescent light source 26W/840. Lamp ring is white. Equivalent to type Buck-Berng.	pcs.	75		
5.3	Recessed luminaire for suspended ceilings module 600x600 and monolithic suspended ceilings, with shiny, aluminum, double parabolic, DarkLight grid made of MiroSilver aluminum, purity of 99.99%, the limit glare in accordance with EN 12464 (UGR <19), limit Dark limit 65° ≤1000 (cd/m²) in accordance with EN 12464, the optical efficiency of luminaire (Downward Light Output Ratio) 82%, made of 0.6 mm thick sheet steel of increased strength, powder coated with electrostatic application of powder paint, RAL 9003, equivalent to the type of Arco T5 414 DL (Buck) 4xT16 14W /840 G5, IP20, 230V. The luminaire has electronic control gear accessories class A2, is delivered as a transient wired, protective polyethylene foil (self-adhesive), mounting accessories and light source of 14W/840	pcs.	42		
5.4	Recessed luminaire for plasterboard and modular ceilings 600x600, made of white painted steel sheet thickness of 0.6mm, with opal diffuser, which is UV stabilized, structure and thickness of the diffuser provide a uniform and high light distribution and aluminum frame of diffuser, equivalent to the type ARCO 424 DO (Buck) 4xT16 24W/840, G5, IP40, 230V. The luminaire is supplied with electronic equipment class A2, installation accessories and light sources of 24W / 840.	pcs.	9		
5.5	Surface mounted circular luminaire diameter Ø300mm made of impact-resistant (IK08) UV stabilized polycarbonate, halogen free, equivalent to type 1544 Globo (Buck-Disano) 1x100W, E27, IP65, 230V. Luminaire is supplied complete with mounting accessories and light source maximum 100W	pcs.	10		
5.6	Surface mounted luminaire equivalent to type Titan 236W PC , IP65. The luminaire is made of polycarbonate, with electronic control gear accessories, reflector made of white plastic sheet, plastic buckles and fluorescent light source 36W/840, Buck-Berng	pcs.	24		
5.7	Surface-mounted, wall or ceiling luminaire with housing made of extruded aluminum and transparent polycarbonate diffuser, equivalent to type 418 RIGO (Buck-Disano), 1xT16 14W/840, G5, P43, 230V. The luminaire is supplied with electronic equipment class A2, installation accessories and light sources of 14W/840, without switch and convenience outlet	pcs.	4		

Item	DESCRIPTION	UoM	Quantity	Unit Price	Total
5.8	Surface mounted luminaire security lighting with local power supply in non-maintained, made of V2 self-extinguishing polycarbonate with a transparent, polycarbonate diffuser, equivalent to type AESTETICA LED 8SE3-40 (Beghelli) , 230V, IP40, operating autonomy 3h, electronic control gear accessories, with battery, inverter, LED light source and an appropriate label on adhesive foil, code: 16225	pcs.	21		
5.9	Surface mounted projector lamp with its own carrier, rotationally symmetric light beam, housing made of die-cast aluminum, reflector made of polished aluminum purity 99.85%, diffuser of tempered glass thickness 5mm, equivalent to type 1156 FORUM XL INDOOR (Disano) , 1 x HQL-TS 1000W, K12s-36, 230V, IP65, IK08, weight 13kg; - magnetic control gear accessories, ACC, 1176 (Disano), 1000W, 230 V, IP 65 - bulb HQL-TS 1000W/D/S (Osram), 6100 K, Ra>90, K12s-36, 230 V.	pcs.	27		
5.10	Surface mounted projector lamp with its own carrier, rotationally symmetric light beam, housing made of die-cast aluminum, reflector made of polished aluminum purity 99.85%, diffuser of tempered glass thickness 5mm, equivalent to type 1156 FORUM FL (Disano) , 1 x HQL-TS 1000W, K12s-36, 230V, IP65, IK08, weight 13kg; - magnetic control gear accessories, ACC, 1176 (Disano), 1000W, 230 V, IP 65 - bulb HQL-TS 1000W/D/S (Osram), 6100 K, Ra>90, K12s-36, 230 V.	pcs.	9		
5.11	Surface mounted projector lamp with its own carrier, rotationally symmetric light beam, housing made of die-cast aluminum, reflector made of polished aluminum purity 99.85%, diffuser of tempered glass thickness 5mm, equivalent to type 1156 FORUM FM (Disano) , 1 x HQL-TS 1000W, K12s-36, 230V, IP65, IK08, weight 13kg; - magnetic control gear accessories, ACC, 1176 (Disano), 1000W, 230 V, IP 65 - bulb HQL-TS 1000W/D/S (Osram), 6100 K, Ra>90, K12s-36, 230 V.	pcs.	6		
5.12	Supply, delivery and installation of an ordinary switch 250V, 16A, white, similar to type Aling.	pcs.	21		
5.13	Supply, delivery and installation of two-gang switch 250V, 16A, white, similar to type Aling.	pcs.	8		
5.14	Supply, delivery and installation of one-gang switch 250V, 16A, white, similar to type Aling.	pcs.	4		
5.15	Supply, delivery and installation of toggle switch 250V, 16A, white, with signal lamp, similar to type Aling.	pcs.	3		
6	Sockets and HVAC consumers				
	Delivery of sockets, complete with the works on the installation, connection and commissioning				
6.1	Supply, delivery and installation of single phase socket 250V, 16A with protective contact, white, similar to the type Aling.	pcs.	92		
7	Scoreboard system				
	Delivery of installations for scoreboard, including assembly works. Connecting and commissioning is carried out by equipment supplier.				
7.1	-parapet distribution, which consists of the following elements				
	base of double-chamber parapet, approximate dimensions 2x140x55mm. Complete with inner corners of two-component parapet distribution, end "caps" elements for joints covering, "T" elements.	m	95		
7.2	Floor boxes dimensions M14, similar type of OBO Bettermann, with cover for parquet.	pcs.	4		
7.3	Inspection openings dimensions 140x140mm	pcs.	3		
7.4	Cables N2XH 3x2,5mm2 + PPL 3x0,75 + S/FTP cat6	m	400		

Item	DESCRIPTION	UoM	Quantity	Unit Price	Total
7.5	<p>Delivery, installation and commissioning of scoreboard system for several sports that should meet the following requirements:</p> <ul style="list-style-type: none"> -in accordance with FIBA, IHF, FIVB regulations; -dimensions (WxHxL), min. 5000x1500x50mm; -weight up to 150kg; - aluminum housing; - digits 25 cm high, for showing the playing time in 99:59 format or real time, and the results from 0-199; - digits 18cm high, for showing the game period, team fouls or score in sets in volleyball from 0-9; - digits 15 cm high, for showing the number of players from 0-99 and penalty in 9:59 format for two players per team or results in sets in volleyball; -digits 8 cm high, for showing the number of players from 0-99, fouls 0-9 and points 0-99; - players' names: 12 characters per name for 12 players per team; - Team's name: fixed text made of white self-adhesive foil HOME TEAM / VISITING TEAM; - Red LED indicators, 1 for both teams for possession of ball and 3 per team for time outs, diameter min. 2cm; -Activation of all LEDs should be done with current drivers so that brightness does not depend on the input line voltage or DC voltage within the device or cabling inside the device. Brightness cannot be adjusted by changing the pulse width, but by changing the current through the diode. This is necessary to avoid flicker on the video camera. It also dramatically extends the life of the diode; - viewing angle of diodes min. 110 °; - ability to control brightness; - built-in loud siren min. 100dB; - control panel with LCD display and membrane keypad. The panel should have a built-in beeper for confirmation of pressed button. All data should be stored in case of power failure; - 				
	<ul style="list-style-type: none"> -Power supply 220VAC-50Hz; - resistance to temperature changes from -40 C to 60 C; - all panels within the device need to be connected with connectors, so that in case of need, they can be easily replaced. The panels need to be protected by a coating against moisture; - main block of scoreboard with the carrier and the scoreboard protection carrier should be equipped with an electric actuator, which allows you to change the position of the scoreboard. Wireless control of the system, electrical lock; - four hours for a shot in line with the FIBA rules; - carriers of a clock for a shot with protection; - two control consoles of the clock for the shot 24s/14s; - red perimeter lighting of the inner edge of the two basket tables that lights up at the end of the period; - when there is no game, scoreboard system can display real time and temperature in the hall, when measured at a height of 1m in relation to the court; - user manual, user maintenance, technical documentation; - warranty period 2 years. 	set	1		
8	Air-handling units				
	Delivery of air-handling unit installations, chillers and recuperators, complete with electrical cabinets, other electrical equipment and necessary works on the installation. Connection and commissioning is carried out by the supplier of equipment				
	INCLUDED BY UNIT PRICE FOR MECHANICAL INSTALLATIONS except equipotential metal masses, bus bypass, etc.				
	<p>Delivery of material and additional equipotential by tape FeZn 20x3mm, mounted on support on wall at a height of 0.3m from the floor.</p> <p>Galvanic bonding of metal masses to the tape shall be performed by conductor P-F/Y 1x6mm².</p> <p>Unit price includes construction of fixing clips for pipes, drilling of tape, setting of the corresponding plates, screws with nuts and star washers and construction a connection to the housing RO-KL1;</p> <p>Delivery and laying of conductors P/Y 1x16mm² from the existing equipotential bus to the ring for additional equipotential.</p>	set	1		
9	Construction of cable routes				
	Delivery of necessary materials and equipment for making cable routes, complete with works on the installation.				
10.1	Installation of PNK 200mm cabinet through corridors. Complete with brackets, joints, T branches and bends.	m	50		
10.2	Installation of PNK 300mm cabinet through corridors. Complete with brackets, joints, T branches and bends.	m	50		
10.3	Installation of fireproof PNK 100/60mm, similar to type OBO Bettermann	m	50		
10.4	Delivery of material and making of grounding PNK cabinet with conductor P/Y 1x6mm ² fed from the nearest PE bus.	set	1		
10	Other				
12.1	Required testing and commissioning with the issuance of certificates of compliance				
	Testing the continuity of protective conductor and equipotential				

Item	DESCRIPTION	UoM	Quantity	Unit Price	Total
	Measurement of insulation resistance of cables, electrical equipment and devices, individual and entire installations performed.				
	Testing of protection by electrical separation of electrical installation				
	Testing of additional equipotential - testing of functionality of individual devices and equipment.				
	Measuring transitional resistance and grounding				
	After measuring, the Contractor shall make a protocol and provide the investor with all the necessary certificates along with certification of the obtained values.	set	1		
12.2	Sealing of penetration of power lines in the transition from one to another fire zone by fireproof compound.	pcs.	5		
12.3	Development of As-built design	set	1		
12.4	Development of equipotential of metal masses in the toilets by conductor P/Y 1x6mm ² . Including box for equipotential PS-49, as well as cable P/Y 1x6mm ² fed from the nearest PE bus.	pcs.	6		
	TOTAL:				

ESTIMATED BILL OF QUANTITIES: TELECOMMUNICATION AND SIGNAL INSTALLATIONS

PHASE II - SPORTS HALL WITH SUPPORT FACILITIES

ITEM	DESCRIPTION	UoM	QUANTITY	UNIT PRICE	TOTAL
1	COMMUNICATION AND DATA SHARING SYSTEM				
	Passive equipment				
1.1	Wall-mounted cabinet 19" 18U 600x600, FD 2 - perforated front door, removable rear and sides - splice box with cassettes for 24 splices, pigtails, patch panel with 12 SC duplex adapters MULTIMODE - 1 piece - patch panel 25 x RJ-45 cat 3 - 1 pcs. - patch panel 24 x RJ-45 cat 6a - 2 pcs. - Shunting ring - 4 pcs. - fan unit - power strip - delivery, installation, connection	pcs.	1		
1.2	Socket with two modules RJ-45 category 6 with built-in box and mask - delivery, connection, installation	pcs.	13		
1.3	Copper twisted pair cable, FTP LSHF-FR, category 6a, 4x2x0,5 mm. - delivery, laying	m	1,000		
1.4	Optical cable, MM, 50/125, 8 fibres, LSHF-FR. - delivery, laying	m	200		
1.5	Installation cable JH(St)H 20x2x0.8 mm. - delivery, laying	m	150		
1.6	Patch cord - delivery, connection	pcs.	2		
1.7	Patch cord, FTP category 6a - delivery, connection	pcs.	34		
1.8	Attestation of links 6A category with the development of measurement protocol	pcs.	34		
1.9	Attestation of optical links with the development of measurement protocol	pcs.	1		

ITEM	DESCRIPTION	UoM	QUANTITY	UNIT PRICE	TOTAL
Active equipment					
1.10	Layer 2 switch, 48 x 10/100/1000BASE-T PoE similar to type Cisco Catalyst WS-C2960S-48FPS-L - delivery, installation, connection	pcs.	1		
1.11	SFP module, multimode - delivery, installation, connection	pcs.	2		
1.12	Access point for wireless network access - delivery, installation, connection	pcs.	1		
1.13	Uninterruptable power supply similar to type APC SMX1500RMI2U; 1200 W / 1500 VA, input 230V / output 230V , Interface ports: SmartSlot, USB ; Extended runtime model, height 2U - delivery, installation, connection	pcs.	1		
1.14	Testing and commissioning	lump	1		
1.15	Development of As-build design	lump	1		
<hr/>					
TOTAL 1					

ITEM	DESCRIPTION	UoM	QUANTITY	UNIT PRICE	TOTAL
2	TV SIGNAL DISTRIBUTION SYSTEM				
2.1	Distribution amplifier bidirectional similar to type Televes 5383 - delivery, installation, connection	pcs.	2		
2.2	Distributor, two-way - delivery, installation, connection	pcs.	2		
2.3	Distributor, three-way - delivery, installation, connection	pcs.	3		
2.4	Output broadcasting connector - delivery, installation, connection	pcs.	7		
2.5	Coaxial cable RG6 HF - delivery, laying	m	200		
2.6	Coaxial cable RG11 HF - delivery, laying	m	150		
2.7	Testing and commissioning	lump	1		
2.8	Development of As-build design	lump	1		
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	TOTAL 2				

ITEM	DESCRIPTION	UoM	QUANTITY	UNIT PRICE	TOTAL
3	VIDEO SURVEILLANCE SYSTEM				
3.1	IP day/night box camera for indoor mounting, 2MP, 1/3 inch DSP; HD 1080p (max. 12 ips), HD 720p (max. 25 ips); H.264, MPEG-4 & MJPEG triple encoding; Supports WD in resolution 1.3MPx; Mechanical IR filter; Integrated Web Server; Two-way duplex audio G.711; Back-light compensation (BLC); 3 alarm inputs, 1 alarm output, RS485 connector; Multi-user environment; Motion detection and email notification; Automatic Gain Control (AGC) 50 dB; S / N ratio is greater than 50 dB; alarm input; Power supply 24AC or PoE; supported protocols TCP/IP, UDP/IP, DHCP, DNS, HTTP, RTP (RTCP, RTSP), SMTP, NTP, IGMP v3, UPnP; with megapixel 1/3 inch lens with a voltage-controlled aperture (Auto-iris), Variable Focal Length F1,4/ 3-8 mm; Aspheric with slip mount option to adjust the position of auto iris; Multi-coated lenses for the elimination of "ghosts" and reflections caused by backlight; CS mount lenses; Horizontal width of the scene 35.4-92.5° with mounting accessories - delivery, installation, connection	pcs.	4		
3.2	IP day/night box camera in the housing for outdoor installation with heater, 2MP, 1/3 inch DSP; HD 1080p (max. 12 ips), HD 720p (max. 25 ips); H.264, MPEG-4 & MJPEG triple encoding; Supports WD in resolution 1.3MPx; Mechanical IR filter; Integrated Web Server;	pcs.	3		
3.3	Central server and video storage with software for surveillance, archiving and video analysis - delivery, installation, connection	pcs.	1		
3.4	Client computer with software for control of system with professional monitor 22" - delivery, installation, connection	pcs.	1		
3.5	Testing and commissioning	lump	1		
3.6	Development of As-build design	lump	1		
TOTAL 3					

ITEM	DESCRIPTION	UoM	QUANTITY	UNIT PRICE	TOTAL
4	INSTALLATION MATERIAL				
4.1	Halogen-free cable ducts dimensions 16x25mm including forming of penetration through walls made of concrete, gypsum or brick - delivery and installation	m	85		
4.2	Halogen-free cable ducts dimensions 25x40mm including forming of penetration through walls made of concrete, gypsum or brick - delivery and installation	m	80		
4.3	Halogen-free cable ducts dimensions 40x60mm including forming of penetration through walls made of concrete, gypsum or brick - delivery and installation	m	80		
4.4	Halogen-free cable ducts dimensions 75x150mm including forming of penetration through walls made of concrete, gypsum or brick - delivery and installation	m	10		
4.5	Halogen-free installation hose Ø32 including forming of penetration through walls made of concrete, gypsum or brick - delivery and installation	m	100		
4.6	Sealing of penetrations for telecommunication and signal cables between different fire zones with fire-resistant compound - delivery of materials and penetration sealing	lump	1		
4.7	Small installation material	lump	1		
4.8	Development of As-build design	lump	1		
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TOTAL 4					

ITEM	DESCRIPTION	UoM	QUANTITY	UNIT PRICE	TOTAL
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SUMMARY

- 1 COMMUNICATION AND DATA SHARING SYSTEM
- 2 TV SIGNAL DISTRIBUTION SYSTEM
- 3 VIDEO SURVEILLANCE SYSTEM
- 4 INSTALLATION MATERIAL

TOTAL (RSD)

ESTIMATED BILL OF QUANTITIES FOR AUDIO EQUIPMENT

PHASE II - SPORTS HALL WITH SUPPORT FACILITIES

NO	DESCRIPTION - SUPPLY AND INSTALLATION:	UoM	QUANTITY	Unit Price	TOTAL excl. VAT
1.0.	Audio system				
1.1.	The stadium loudspeaker - horn three-band / BI-AMP speaker with a frequency range of 50Hz - 18kHz, ± 3 dB with 1x15"/4" LF speaker, 1x10"/2.5" MF speaker and 1x1" HF speaker, LF Power: 750W AES, 3000W peak, MF + HF: 300W AES, 1200W peak LF sensitivity: 104dB, MF + HF: 104dB, 139dB max peak, impedance 8 Ω , dispersions 70°x 40°, or equivalent technical parameters.	piece	4		
1.2.	System with brackets for hanging speakers	piece	4		
2.0.	Audio control room				
2.1.	Audio mixer - 12 channel console, 6 mic / 12 line inputs analog + effect, 4 XLR mic inputs, three-band equalization per channel with parametric midrange, 60mm fitter, digital effects processor, output for headphone and stereo + mono output with XLR connectors, +48 phantom power for microphones, USB digital input / output, or equivalent technical parameters..	piece	1		
2.2.	Digital Audio Processor with 4 inputs and 8 outputs for analogue and AES / EBU signals. Adjusting the input and output signals, delays, limiting, transitional frequency, graphic and 8-parametric equalize, RS 232 connection and software for lap top control, store and lock and preset, or equivalent technical parameters.	piece	1		
2.3.	Amplifier with "switched mode" power, four-channel power 4x1250W/ 4 Ω , frequency range 20Hz - 25kHz ± 0.5 dB with distortion <0.1%, sensitivity of 23-44dB, noise -110dB. Housing 19", 2U, or equivalent technical parameters..	piece	2		
2.4.	Current distribution with three-phase power connection of 32A, 12 Schuko outlets (3 x 4 per phase) with protective fuse of 16A and a digital meter of voltage on each phase, or equivalent technical parameters.	piece	1		
2.5.	Metal rack 19", 16U dimensions 866x600x800mm, with internal wiring.	piece	1		
3.0.	Sound sources and accessories				
3.1.	Professional table dynamic microphone with switch for publication purposes from the scorer's table on the court, with 48V power supply, frequency range 70Hz - 18kHz, balanced XLR output, impedance 600 Ω , or equivalent technical parameters.	piece	1		
3.2.	UHF diversity wireless microphone set consisting of receiver with 8 frequencies, balanced XLR output, handheld microphone with a dynamic head or equivalent technical parameters.. Addition for installation in 19" rack.	piece	2		
3.3.	Laptop screen 15.6 inches, the minimum configuration: Intel® Core™ i5 processor speed of 1.8 GHz, 4GB RAM, 500GB hard drive, 1GB of graphics memory, Windows 8.1 64-bit operating system with supporting software for stage lighting control.	piece	1		
4.0.	Cables and connectors for audio system installation				
4.1.	Audio multicore cable 28 pair MF-FY FRNC 28x2x0.22 mm ² , halogen-free, package 100 m.	piece	1		
4.2.	Microphone cable NF-M-RF FRNC 2x0.22 mm ² , halogen-free, package 100 m.	piece	1		
4.3.	XLR connector three-pole male, cable.	piece	10		
4.4.	XLR connector three-pole female, cable.	piece	10		
4.5.	Speaker cable LS-FRNC 4 x 4 mm ² , halogen-free, package 100 m.	piece	4		
4.6.	SPEAKON connector four-pole cable.	piece	24		
4.7.	Network F/STP Cat. 6 cable, 4x2xAWG26/7 FTP-C200 FRNC, halogen-free, package 305m.	piece	2		
4.8.	Current cable N2XH 3 x 2.5 mm ² , halogen-free, package 100m.	piece	1		
4.9.	Installation and small supplies.	piece	1		
4.10.	Programming, commissioning and training of users.	piece	1		

ESTIMATED BILL OF QUANTITIES FOR MECHANICAL INSTALLATIONS

PHASE II - SPORTS HALL WITH SUPPORT FACILITIES

II.A. HEATING UNITS AND ACCESSORIES

1.	Dismantling of the existing heating units within sports hall and changing rooms, complete with radiator valves, lockshield valves, air exhaust valves and reductions. After being dismantled, radiators shall be taken to landfill within the facility, for further finishing and rehabilitation	pcs.	101
2.	Dismantling of the existing double radiator pipe connections, including removal to the landfill within the facility.	pcs.	101
3.	Dismantling of the existing bracket and radiator carriers found to be, after heating units dismantling unstable or inadequate, to 50% of total number of heating units	pcs.	160
4.	Flushing of interior of dismantled radiator sections with cold water under pressure, (Karcher or equivalent) until traces of mud and dirt stop exiting from radiator	pcs.	101
5.	Supply and installation of radiator reduction NO32/NO15	pcs.	404
6.	Supply and installation of seal for cast iron radiators NO32	pcs.	404
7.	Hydraulic testing of all flushed radiator sections with cold water under pressure of 5 bar for 5 minutes	pcs.	101

8.	After hydraulic testing, paint shall be removed from all heating units, by sandblasting to metal gloss. After sandblasting, radiator sections shall be painted with anti-corrosive coating in two layers.	m ²	785
9.	Supply and installation of radiator angle valves with thermostatic head in anti-vandal execution, lockable, in chosen position.		
	NO 15	pcs.	101
10.	Supply and installation of radiator angle lockshield valves		
	NO 15	pcs.	101
11.	Supply and installation of radiator manual air exhaust valves		
	NO 15	pcs.	101
12.	Supply and installation of radiator filling and emptying valves		
	NO 15	pcs.	101
13.	Supply and installation of cast iron radiator brackets		
		pcs.	160
14.	Painting and varnishing of radiator units with hot resistant varnish in two layers, colour shade at the Investor's choice.		
		m ²	785
15.	Fabrication and installation of double connection for radiators		
		pcs.	101
16.	Dismantling and installation of radiators for painting purposes.		
		pcs.	101

TOTAL II.A:

II.B. PIPEWORK AND ACCESSORIES

1. Supply and installation of black steel pipes for hot water

NO15	m'	204
NO20	m'	90
NO25	m'	90
NO32	m'	72
NO40	m'	12
NO50	m'	210
NO65	m'	90
NO80	m'	12

2. Binding, welding and other auxiliary supplies, pipe bends, oxygen, acetylene, hangers etc., approx. 50% of previous item. All brackets and hangers to be used should be incombustible, ie. metal, minimum incombustibility class A2 d1,s0

LS		1
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3. Insulation of pipeline sections that pass through floor or under the door, with prefabricated insulation minimum combustibility class B-s1,d0, all packed in roofing paper.

NO32	m'	15
NO50	m'	10
NO65	m'	10

4. Cutting parts of the existing cables, which pass through floor channels

set		1
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5. Fabrication and installation of pipe widening for air exhaust vessels

NO 150x300	pcs.	2
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6. Supply and installation of ball vessels with threaded connection

NO 15	pcs.	2
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7.	Supply and installation of automatic air exhaust valves		
	NO 15	pcs.	4
8.	Cleaning with a steel brush and double red lead coating of entire piping.		
		m ²	120
9.	Painting of visible pipe network by hot resistant varnish in two layers, shade chosen by the Employer		
		m ²	105
10.	Cold test of installation water pressure of 7 bar. for two hours		
	branch K3	set	1
	branch K4	set	1
11.	Hot testing of installations including regulation of piping and heating units MANDATORY		
	branch K3	set	1
	branch K4	set	1

TOTAL II.B:

II.C. AIR-CONDITIONING

1.	Dismantling the existing air handling unit KGS 40 capacity 40000 m ³ / h of air, including hot and cold water piping, accompanying pipe fittings and equipment in the space where air handling unit is installed. It is also necessary to dismantle the parts of air channels to allow removal of air-handling unit. Dismantled elements of air handling units and accessories shall be taken to the landfill within the facility.		
		set	1
2.	Supply and installation of air-handling units		

produced by "WOLF" or equivalent, with glycol heat recovery and factory corresponding elements of glycol run around (circulation pump, expansion vessel, safety valve, air exhaust valve and shut-off and regulating fittings), and command box, for internal installation. Side of operation is at right

Characteristics according to the enclosed wording of Bill of Quantities. Cabling from electrical cabinets to air handling unit. Filling glycol heat exchanger run around with 23% mixture of glycol-water. All assembled, filled and tested

KG TOP 450

according to DIN EN 13053 02/2012

Intake air volume 40000 m³/h

Exhaust air volume 40000 m³/h

external pressure drop

insertion / extraction 550/550 Pa

set 1

3. Fabrication and installation galvanized steel channels, rectangular sections, complete with MEC sections

thickness 1.0 mm kg 1360

4. Supply and installation of carriers, hangers, sealing self-adhesive tapes and small accessories for air ducts approx. 30% of the duct weight
All brackets and hangers to be used should be incombustible, ie. metal, minimum incombustibility class A2 d1,s0

LS 1

5. Supply and installation of prefabricated insulation with vapour barrier thickness 19 mm for insulating rectangular channels for distribution of air, complete with connecting tape
all min. combustibility class B-s1,d0

m² 320

6. Supply and installation of aluminium grilles for air intake with flow regulator, manufactured by "KLIMA OPREMA" Belgrade or equivalent

	type OV 2-L 1025x425	pcs.	20
7.	On the spot check and rehabilitation of existing fixed blinds for intake of external and exhaust of old air		
	dim 1500x1500	pcs.	2
8.	On the spot check and rehabilitation of existing floor grids in the hall under rostrum		
	dim. 1000x500 mm	pcs.	20
9.	Inspection and rehabilitation of existing fire dampers and their placement in required position		
	dim 1300x1300	pcs.	2
10.	Thorough cleaning of the floor, exhaust channel in the sports hall, by hand and cleaning robots for sheet metal ducts. After cleaning, channel cleanliness shall be inspected by taking control samples.		
		m´	70
11.	Supply and installation of thermostatic switches for air handling unit fans, including connecting and commissioning. Thermostatic switch in the push flow of fresh air is adjusted to 55°C, and to 52°C for return flow of old air		
		pcs.	2
12	Supply and installation of equipment for air handling unit auto control, fully connected and commissioned.		
	Any mentioned equipment may be replaced with equivalent one.		
	BA System, BAS 920 electronic controller 8AI, 4DI, 4DO, 4AO		
		pcs.	1
	BA System, BAS 920 DIOM additional module 8DI, 8DO		

Mbus com.	pcs.	1
Weintek, MT8071iE colour, touch-sensitive display	pcs.	1
Siemens, QAM 2110.040 duct temp. sensor Pt100	pcs.	4
Siemens, QAF81.6 frost thermostat	pcs.	1
Siemens, QBM81-3 diff. pressostat	pcs.	1
Danfoss, AMD 510 AS damper actuator on / off	pcs.	2
Danfoss, AMD 520 damper actuator control	pcs.	1
Danfoss, VF3 65 three-way control valve, glycol	pcs.	1
Danfoss, AME 435 motorized drive	pcs.	2
Danfoss, VF3 80 three-way control valve, heater	pcs.	1
Danfoss, ESMT outside temperature sensor	pcs.	1
WORKS fabrication of electrical cabinets	pcs.	1
installation of electrical cabinets setting cable runs and laying cables		

		pcs.	1
	mounting peripheral equipment, connection of equipment, connection of electrical cabinets		
		pcs.	1
	development of application software for the controller and display		
		pcs.	1
	commissioning		
		pcs.	1
	preparation of documentation and user training		
		pcs.	1
13.	Supply and installation of heat pump air-water, produced by "WESPER", or equivalent, type EQPH 204.2, with the characteristics from design documentation and the remote ON / OFF command. The unit has buffer 200 liters, water duty, circulation pump and all the necessary electronics for operation Heat pump works with 100% water and system emptied in winter.		
	The required cooling capacity 172.5 kW		
	Cooling fluid R410A Power: 400 (VAC); 50 (Hz). El. power: 38.06 kW Dimensions: 2180x1160x2286mm		
	Operational weight: 980 kg Fully connected and commissioned		
		set	1
14.	Supply and installation of elastic connections to connect the heat pump with flange		
	NO 80	set	2
15.	Supply and installation of ball valves with threaded connection		
	NO 15	pcs.	2
	NO 20	pcs.	4
	NO 80	pcs.	7

16.	Supply and installation of dirt trap complete with flange connection, NP6			
	NO 80	pcs.	1	
17.	Supply and installation of membrane expansion vessel REFLEX or equivalent			
	NG 80	pcs.	1	
18.	Supply and installation of safety valve			
	NO15/25			
	opening pressure 6bar			
	closing pressure 5.4bar			
		pcs.	1	
19.	Supply and installation of manometer with manometer valve			
	measuring range 0-10 bar	pcs.	1	
20.	Fabrication and installation of pipe widenings for air exhaust vessels			
	NO 50x100	pcs.	1	
21.	Supply and installation of black pipes for connecting cables from cooling aggregate to air handling unit			
	NO15	m'	6	
	NO80	m'	30	
<hr style="border: 1px solid black; width: 150px; margin: 0 auto;"/>				
22.	Binding, welding and other auxiliary supplies, pipe bends, oxygen, acetylene, hangers etc., approx. 50% from previous item All brackets and hangers to be used should be incombustible, ie. metal, minimum combustibility class A2 d1,s0			
		LS	1.00	
23.	Cleaning with a steel brush and double red lead coating of entire piping.			

		m ²	10
24.	Supply and installation of prefabricated insulation 19 mm thick with vapour barrier min. combustibility class B-s1,d0		
		m ²	20
25.	0.5cm mineral wool insulation of piping, coated in Al-sheet metal, pipe shall be first insulated with prefabricated insulation, 20mm thick with vapour barrier, and then coated with mineral wool 5cm thick. min. combustibility class B-s1,d0		
	NO80	m'	10
26.	Commissioning of installations including necessary control measurement and system control - central air-conditioning of sports hall		
		set	1

TOTAL II.C:

II.D. OTHER WORKS

1.	Forming openings through walls and floor structure, including the installation of ribbed PVC pipe framing on distribution piping, at penetration points and making the passage beneath doors		
		set	50
2.	Supply of sealants and sealing of pipelines and channels that pass through the fire wall by sealant of fire resistance 120min.		
		set	1
3.	Preparatory and finishing works, with installation handover.		
		LS	1

TOTAL II.D.:

SUMMARY - PHASE II

II.A. HEATING UNITS AND ACCESSORIES

II.B. PIPEWORK AND ACCESSORIES

II.C. AIR-CONDITIONING

II.D. OTHER WORKS

TOTAL:

GRAND SUMMARY FOR REPAIR AND ADAPTATION WORKS - PHASE II, SPORTS HALL WITH SUPPORTING FACILITIES

NO	Type of works				TOTAL
1	Specialist's works				
2	W&S installations				
3	Electrical installations				
4	Telecommunication and signal installations				
5	Audio system installations in Sports hall				
6	Mechanical installations				
	TOTAL:				