

Technical Description of Preparatory Works



Project: NMMC, Armenia, Yerevan
13 Armenakyan Str, Nork Marash



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Contents

1 Preliminary notes	3
2 Technical Description of civil works	5
2.1 Scope of renovation and preparatory works.....	5
2.1.1 Main technical indicators.....	5
2.1.2 Description of dismantling works	5
2.1.3 Description of renovation works.....	6
2.2 Rooms Finishing table	7
2.3 Standard definitions	8
2.3.1 Floor Types.....	8
2.3.2 Wall Types.....	8
2.3.3 Ceiling Types.....	9
2.3.4 Door Types.....	9
2.3.5 Window Types	10
2.4 Floor plans.....	11
2.4.1 Block B Level 1 (not to scale)	11
2.4.2 Block E Level 0 (not to scale)	12
3 Technical description of M&E works.....	13
3.1 General Notes:	13
3.2 Heating, Ventilation, Air Conditioning (HVAC)	13
3.3 Water supply and sewage	13
3.4 Medical gas supply	14
3.5 Firefighting system – not included (responsibility of the client).....	14
3.6 Electrical systems	14
3.7 Indoor lighting system.....	15
3.8 Extra Low Voltage systems.....	15
3.9 Schematics of M&E Installations.....	16

1 Preliminary notes

The hospital renovation project is located in Yerevan, the capital of Armenia. The project encloses the adaptation within existing NMMC building Nr.1 blocks B and E areas, the settlement for arrangement of Angiography, CT, X-Ray functions with auxiliary and technical rooms. The size of the renovated area is roughly 420 square meters.

Within the borderlines of the indicated areas on the drawings, to be provided the following:

- interior demolition works
- partition walls (non-load bearing)
- flooring
- internal doors and windows
- new plastering, finishing and painting
- external façade repairs
- M &E Installations
- pre-installation works for Medical Equipment

This building description (& the later required Project Documentation & price indication Smeta) are limited to the indicated renovation areas.

The draft below shows the principal scheme of the NMMC building Nr.1 blocks. Only parts of Block B level 1 and Block E level 0 are affected by renovation measures.

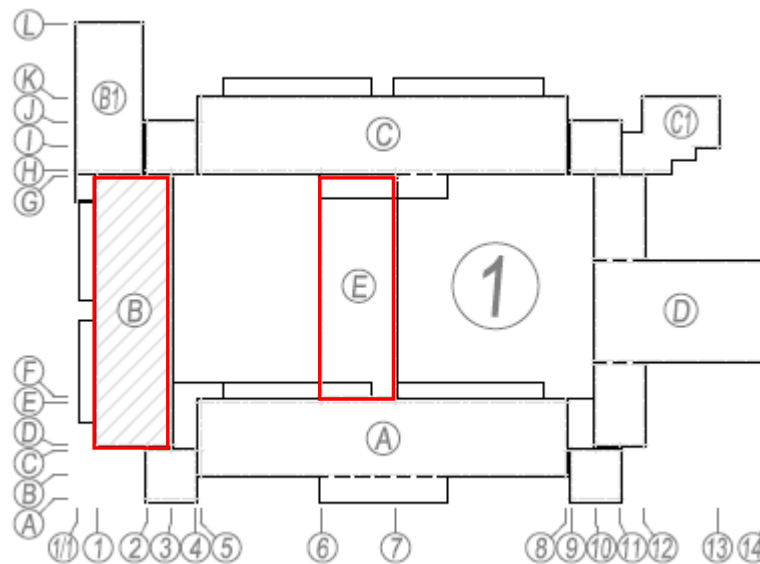


Figure 1 Scheme of NMMC building Nr. 1 blocks

The list of rooms to be renovated and the room measurements are shown in table 1:

NMMC-1 Block B and E Room data					Remarks
Block/ Room No	Function / Room	Area m ²	Peri- m	Height m	
1B	CT /				
101	Corridor	42,70	41,70	2,70	part of corridor
103	Staff room	19,10	19,75	2,70	w/ annexe extent
105	Corridor	4,40	8,85	2,70	
108	Staff room	15,50	17,00	2,70	w/ annexe extent
109	Control Room	18,25	18,60	2,70	
110	CT Room	38,00	25,25	2,70	
111	Tech room	12,75	16,00	2,85	annexe
	Subtotal:	150,7	147,2		
1B	Angiography /				
112	Sluice	13,45	14,85	2,70	
113	Angiography Room	46,60	29,35	2,70	
114	Control Room	14,65	15,40	2,70	
115	Tech room	12,70	16,00	2,85	annexe
116	AHU Room	13,20	16,45	3,15	annexe
117	Corridor	32,40	34,20	2,70	
118	Corridor	8,25	11,50	2,70	part of corridor
119	Store	7,40	11,55	2,70	
120	Store	6,20	10,30	2,70	
	Subtotal:	154,9	159,6		
1E	X-Ray /				
001	Corridor	25,00	24,80	2,70	part of corridor
012	Patient change	4,35	8,45	2,85	
013	Anteroom	3,90	8,10	2,85	
014	Control Room	11,20	13,40	2,90	
015	X-ray room	44,30	27,70	3,00	
1C/016	Corridor	5,25	10,25	2,70	
1C/017	Development Room	14,95	15,80	2,70	
019"	pocket	5,20	10,60	2,00	outside hole
	Subtotal:	114,2	119,1		
	Total:	419,7	425,9		
basic renovation area:		~ 240			

Table 1 List of Rooms with gross areas

General Note: Technical descriptions of works contained in this document as well as the drawings, specifications, and options described herein are subject to modification as technically required in the course of detailed design elaboration.

2 Technical Description of civil works

2.1 Scope of renovation and preparatory works

2.1.1 Main technical indicators

2.1.1.1 Block B main technical indicators:

- basic renovation area ~170 m², with adjoining premises is ~305 m² (areas as indicated in the drawings)
- storey to be altered: existing ground floor, level 1
- ceiling height: 2,35 – 2,7 m

Works include no alteration of load bearing structure and no alteration of existing fire rating!

Alterations required due to adaptation of existing space for arrangement of Angiography room, CT room, Control rooms, technical rooms and stores as indicated in the drawings.

2.1.1.2 Block E main technical indicators:

- basic renovation area ~70 m², with adjoining premises is ~115 m² (areas as indicated in the drawings).
- Storey to be altered: Existing semi-basement, level 0
- Ceiling height: 2,7 – 3,00 m

Works include no alteration of load bearing structure and no alteration of existing fire rating!

No alteration of different floor levels in the area to be renovated.

Alterations required due to adaptation of existing space for arrangement of X-Ray room, control room, ante-room and patient change room.

2.1.2 Description of dismantling works

Within the borderlines of the indicated areas on the drawings, the following dismantling works in the building shall be provided (bearing structures of the building shall remain):

- dismantling of windows, inside doors, false ceilings as per drawings;
- dismantling of existing internal walls and partitions as per drawings;
- removal of non-bearing external walls and/or access wall openings for installation of medical equipment as per drawings;
- removal of plaster from surfaces of columns and beams;
- removal or repair of plaster from surfaces of internal walls and from an internal surface of external walls;
- removal or repair of existing finishing due to poor state from surfaces of walls and ceiling;
- dismantling of floor coverings (to surface of structural slabs of covering); *

** Note: Block B only, for floor Type A&B*

Slot cuttings shall be provided for evaluation of properties of existing subfloor structure (assumed backfill material underneath the existing floor).

- *In the case of non-bearing properties as regards the weight of the fix medical equipment, the removal and transport of inadequate filling to waste disposal site and backfill with lean reinforced concrete.*
- *In the case of bearing properties, the filling shall remain and partial openings finished properly with lean concrete.*

In both cases the employer shall give the final approval of works execution and approval of payment for the selected procedure.

2.1.3 Description of renovation works

Within the borderlines of the indicated areas on the drawings, the following renovation works in the areas of building shall be provided (bearing structures of the building shall remain):

- execution of internal walls and partitions as per drawings - from piece materials (pumecrete plate and/or block) and from gypsum plaster-board (in damp areas – moisture resistant gypsum plasterboard) on metal framework;
- erection of annexe technical rooms and extent of staff rooms on terrace space beneath balcony as per drawings;
- plastering of annexe's external walls with stone (tuff) tiles veneer (socle with basalt tiles);
- new or repair screed coating of the floor claddings;
- execution of pre-installation works (foundation, provision for floor duct, etc.,) for fix Medical Equipment according to the technical tasks of the manufacturers;
- new or repair plastering of the surface of internal walls and of an internal surface of external walls;
- new or repair plastering of the surfaces of internal walls with x-ray protection barite layer (thickness – according to lead equivalent calculations) in X-ray treatment rooms;
- installation of internal and external doors and windows;
- implementation of partial false ceiling and encasing of M&E installations for the specified areas (to define in the course of design) - from gypsum plaster-board on metal framework;
- revetment of floor surfaces with ceramic tiles;
- preparation of floor surfaces and covering with homogeneous vinyl floor covering according to implementation directives of the manufacturer;
- new or repair finishing of the surface of internal walls and ceilings with further colouring by water emulsion structures;

Note: The types of finishing to be provided as indicated in the Rooms Finishing table.

2.1.3.1 Internal Finishing

Internal finishing shall be executed according to the functional purpose of rooms and taking into account requirements of existing sanitary norms and regulations.

In colour scale light tone shall prevail (colour yet to be defined in the course of design).

Materials for finishing of walls, floors, ceilings in the respective rooms have to be resistant for damp cleaning (allowing use of disinfecting solutions).

2.1.3.2 External finishing

External finishing shall be foreseen for partial minor repair due to poor state for the adjoining external zones (to define in the course of design) with further colouring by facade paints, if required including thermal insulation.

External surface of annexe walls is foreseen as plastering with stone (tuff) tiles veneer (socle with basalt tiles and curbing) and rainwater protected with coping shed.

2.1.3.3 Requirements to the construction and finishing materials

The construction and finishing materials delivered by the Contractor, have to meet the requirements imposed to them in Armenia on fire safety, wear resistance and allocation of toxic substances, and also requirements for reliability and durability, simplicity in operation, moisture resistance and possibility of carrying out repair work. All delivered materials must have the quality certificate with technical characteristics and the hygienic certificate allowing application in medical institutions.

2.2 Rooms Finishing table

Finishing variations of rooms as per the Standard definitions A,B,C,D (explained in para. 2.3)

Block B and E Rooms		Standard Definitions				
Block/ Room No	Function / Room	Finishing Standard Definition				
		Floor <i>Type</i>	Wall <i>Type</i>	Ceiling <i>Type</i>	Door& <i>Type</i>	Window <i>Type</i>
1B	CT /					
101	Corridor			A	C	
103	Staff room	D	D	A		B
105	Corridor					
108	Staff room	D	D	A		B
109	Control Room	A	B	B	A	A
110	CT Room	A	B+C	B	B	
111	Tech room	D	D	B		
1B	Angiography /					
112	Sluice	A	A+B	B	C	
113	Angiography Room	B	B+C	B	B	
114	Control Room	A	A+B	B	A	A
115	Tech room	D	D	B	A	
116	AHU Room	D	D	B	D	
117	Corridor	C	A+B	A		
118	Corridor			A		
119	Store	A		A		
120	Store			A		
1E	X-Ray /					
001	Corridor			A		
012	Patient change	C	B	A	A	
013	Anteroom	C		A	A	
014	Control Room	C	B	A		A
015	X-ray room	C+C	B	B	B	
1C/016	Corridor			A		
1C/017	Development Room			A		
019"	pocket			B	D	B

Table 2 Rooms Finishing table

2.3 Standard definitions

2.3.1 Floor Types

2.3.1.1 Floor construction; Type A

- Existing slab (level of structure laid open)
- Reinforced concrete floor (if substructure is non-bearing)*
- Lean concrete filling
- Surface preparation after dismantling works in order to compensate unevenness
- Homogeneous vinyl floor covering (standard) or equivalent

2.3.1.2 Floor construction Type B (in Angiography room)

- Existing slab (level of structure laid open)
- Reinforced concrete floor (if substructure is non-bearing)*
- Lean concrete filling
- Surface preparation after dismantling works in order to compensate unevenness
- Homogeneous vinyl floor covering (conductive, antistatic) or equivalent

** Note: Floor Type A&B*

Slot cuttings shall be provided for evaluation of properties of existing subfloor structure (assumed backfill material underneath the existing floor). In the case of non-bearing properties as regards the weight of the fix medical equipment, the removal inadequate filling and backfill with lean reinforced concrete.

2.3.1.3 Floor construction Type C

- Existing slab (level of structure laid open)
- Surface preparation after dismantling works in order to compensate unevenness
- Ceramic Tiling ~30x30 cm with anti-slip surface
- addition C: additional concrete base foundation in the area of X-Ray unit for load transfer.

2.3.1.4 Floor construction Type D

- Strip foundation terrace external wall
- Filling (thickness to design)
- Reinforced concrete floor (thickness to design)
- Levelling screed
- Ceramic Tiling ~30x30 cm with anti-slip surface

2.3.2 Wall Types

2.3.2.1 Wall construction; Type A

- 2 x 12,5 mm gypsum plasterboard double sided.
- Galvanized profile (75 mm size, 1 mm thickness) structure.
- 50 cm wide OSB plates, for fixing wall mounted equipment
- 4.0 cm insulating material
- Flexible ceiling connection, according to implementation directives of the manufacturer
- Finishing of wall and colouring by water emulsion structures

2.3.2.2 Wall construction Type B

- 12,5 cm pumecrete plate wall; x-ray protection barite layer (thickness – according to lead equivalent calculations) in X-ray treatment rooms.
- Finishing of walls and colouring by water emulsion structures steady against detergents. In rooms with wash-basin a trimming with glazed ceramic tiles around wash-basin.

2.3.2.3 Wall construction Type C

- 15 cm pumecrete block wall; additional x-ray protection barite layer (thickness – according to lead equivalent calculations) in X-ray treatment rooms.
- Finishing of walls and colouring by water emulsion structures steady against detergents in treatment rooms. In all other rooms to provide painting by water emulsion structures. In rooms with wash-basin a trimming with glazed ceramic tiles around wash-basin.

2.3.2.4 Wall construction Type D

- 15 cm pumecrete block wall; additional external walls plaster with stone (tuff) tiles veneer.
- Finishing of walls and colouring by water emulsion structures.

2.3.3 Ceiling Types

2.3.3.1 Ceiling Type A

- Finishing of ceiling and colouring by water emulsion structures
- No suspended ceiling structure

2.3.3.2 Ceiling Type B

- Partial false ceiling and encasing of M&E installations for the specified areas (to define in the course of design) in X-ray treatment rooms - from gypsum plaster-board on metal framework according to implementation directives of the manufacturer.
- Finishing of ceiling and colouring of ceilings by water emulsion structures steady against detergents.
- Installation of the required M&E fittings

2.3.4 Door Types

2.3.4.1 Internal revolving door Type A

- Standard Doors in rooms of general hospital purpose.
Standard Doors in technical rooms depending on category of the room.
- steel frame as an “encirclement frame” (non-threshold, except tech rooms)
 - with norm fold; material thickness 1.0 mm;
 - primed and painted surface;
- installation of door frames according to implementation directives of the manufacturer
- All doors lockable.

2.3.4.2 Internal revolving door Type B

- X-ray protective doors in X-ray treatment rooms. To determine thickness of lead at design.
- steel frame as an “encirclement frame”
 - with norm fold; material thickness 1.0 mm;
 - primed and painted surface;
 - x-ray protection inlay in X-ray treatment rooms;
- Installation of door frames according to implementation directives of the manufacturer;
- all doors lockable.

2.3.4.3 Internal corridor revolving door Type C

- Corridors standard doors, aluminium shapes, glazed.
- aluminium shapes
- installation of door frames according to implementation directives of the manufacturer
- all doors lockable

2.3.4.4 External revolving door Type D

- External standard doors, aluminium shapes with thermo-bridge.
- aluminium shapes with thermo-bridge frame
- installation of door frames according to implementation directives of the manufacturer
- all doors lockable

2.3.5 Window Types

2.3.5.1 Control room windows Type A

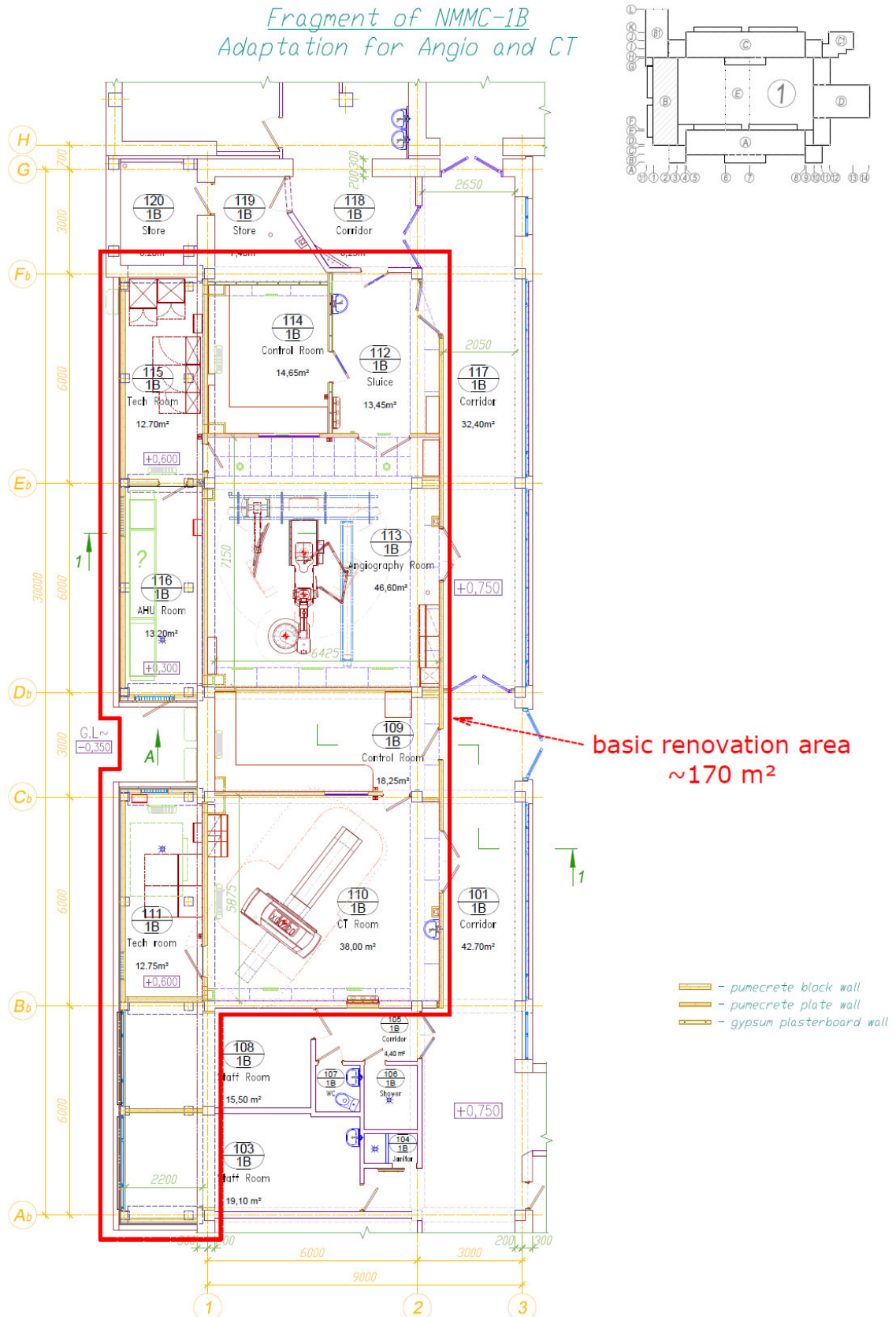
- shaped profiles with radiation protection
- window glass with radiation protection

2.3.5.2 External windows Type B

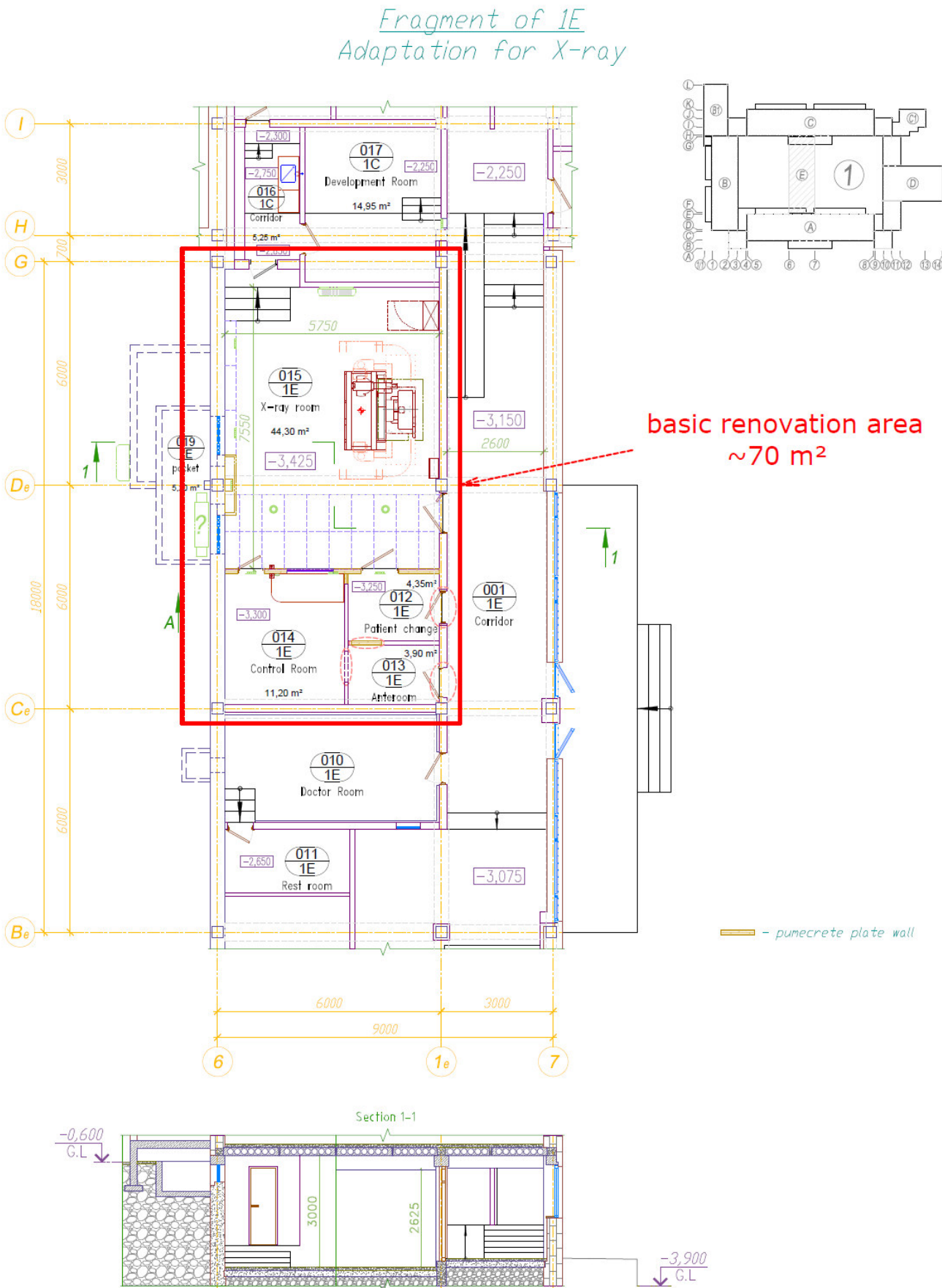
- aluminium shapes with thermo-bridge (design to be define)
- double-glazed windows

2.4 Floor plans

2.4.1 Block B Level 1 (not to scale)



2.4.2 Block E Level 0 (not to scale)



3 Technical description of M&E works

3.1 General Notes:

Within the borderlines of the indicated areas on the drawings, the following Mechanical and Electrical (M&E) works shall be provided in the renovation areas of building blocks B and E:

- The existing old HVAC and electrical equipment (old split units, ducts, lighting fixtures, etc.) have to be dismantled and removed by the Client.
- The new design shall be done according to the local norms and regulations.
- Installation of the following new M&E systems

3.2 Heating, Ventilation, Air Conditioning (HVAC)

Heating: The existing radiator heating system in the block B will not be affected.

Two radiators shall be shifted to a new position in the staff rooms of block B, cause of changes in the room layouts.

Angiography, CT and X-ray areas shall be temperature controlled by the A/C system. In rooms for AHU and technical rooms additionally electrical radiators shall be installed.

In X-ray room, the existing electrical water pipe heaters shall be replaced by modern electrical panel heaters.

Ventilation: Angiography, CT and X-ray shall have one Air Handling Unit (AHU) each, for supply and exhaust air.

Angiography room: The air exchange shall be about 10 times per hour for air intake (exchange for air exhaust to be defined in the course of design). Supply air to room shall be filtered with HEPA-filters (as required by the special room class, filtering steps G4+F7+F9+H13). The AHU requires a recuperator for heating and cooling of the air.

CT and X-ray rooms: The air exchange shall be about 3 times per hour for air intake and 4 times per hour for air exhaust. The units require recuperator for the heating of the air.

Additional exhaust ventilation for Development room of X-ray area shall be provided.

Air conditioning and cooling system: Angiography, CT and X-ray

Angiography room: Cooling / heating shall be foreseen by AHU's cooler/heater system and/or by duct air recool/reheater (to be defined in the course of design). Room air specified (design) temperature shall be 21°C (permissible temp. 21 ÷ 24°C).

CT and X-ray rooms: Cooling / heating shall be foreseen by AHU's cooler/heater system or additional heaters and slit units (to be defined in the course of design). Room air specified (design) temperature shall be 21°C (permissible temp. 21 ÷ 26°C).

Angiography and CT control rooms: Cooling / heating shall be foreseen by split units.

Technical rooms: Cooling / heating shall be foreseen by heaters and slit units (to be defined in the course of design) and shall be according to the requirements of technical tasks of the fix Medical Equipment.

CT unit: Separate cooling system shall be provided, according to the requirements of technical task of CT-unit.

3.3 Water supply and sewage

Block B:

In the sluice in front of the Angiography Room and the CT Room, new wash basins shall be foreseen.

Two existing sewage risers, one in angiography and one in CT area, will need to be relocated. The risers shall be rerouted through the above floor (of ICU) outwards to the corridor area and down to ground level and below the floor out of the building to the existing sewage canalization.

In technical rooms of air handling units, a drain with floor trap shall be foreseen for condensate water. The drain shall be led out of the building.

Three external downpipes of rainwater canalization for the indicated on the drawing area shall be replaced due to poor state. The rainwater canalization in this area shall be inspected and repaired, if required.

Block E:

The drain connections shall be foreseen for AHU and split-unit condensate water.

In the corridor behind X-ray Room, connections to the existing sewage and water supply shall be foreseen for sink-unit.

No other activities for water supply and sewage are foreseen for Block E.

3.4 Medical gas supply

In the Angiography room and in the CT room each shall be foreseen one supply point for medical gases. One supply point consists of one oxygen (O₂), one vacuum (Vac) and one compressed air (CA5) outlet. These supply points will be integrated in the existing medical gas system of the hospital. The existing old outlets will be removed and relocated. Outlets are according to NIST standard (non-interchangeable screw thread).

For the X-ray area medical gas supply is not foreseen.

3.5 Firefighting system – not included (responsibility of the client)

Firefighting systems will be not affected during the execution of works and left as responsibility of client (hospital).

3.6 Electrical systems

Power supply: For the power supply of the newly refurbished zones, the existing provision of power supply of the hospital will be used and adjusted to the new requirements (to be defined in the course of design).

For each Angiography and CT area, one new electrical switchboard for sockets and lighting and one new electrical switchboard for the AHU shall be foreseen.

For X-ray area, one combined switchboard is preliminary foreseen for sockets and lighting and for AHU.

The existing power supply cables are foreseen to be used for the switchboards. Cables in bad condition shall be renewed. The existing distribution board (DB) in the yard between block B and E is foreseen as the central connection point for the main (normal) power supply for all switchboards.

Angiography and CT area besides normal supply (NS) sockets shall be provided with emergency supply (ES) sockets. The existing connection box (in the courtyard between block B and E) that supplied from existing emergency diesel generator (64 kW) is foreseen as connection point for the emergency power supply cables to the electrical switchboards for sockets and lighting.

For X-ray area and for all AHUs emergency power supply is not foreseen.

Note: It is in the responsibility of the client (the hospital) that the a.m. areas will be supplied by the normal and emergency (diesel generator with automatic switch in case of power failure) power supply. Any changes required in the main and emergency power supply system up to a.m. connection points must be provided by the client.

Sockets shall be installed according to the requirements of medical technology (to be defined in the course of design). Materials for sockets shall be according to hygienic standards in hospitals.

Power supply also includes power supply cables for medical equipment. Cables shall be installed in cable trays rigid or flexible pipes.

For each Angiography and CT units power supply, one new switchboard in technical rooms shall be foreseen. The supply cables are foreseen to be renewed and directly connected from switchboards to the main distribution board (MDB) of the building 1 (MDB room located next to block C and C1).

For X-ray unit power supply, one new switchboard in X-ray room shall be foreseen. The existing supply cable that supplied from existing DB in the courtyard between block B and E is preliminary foreseen to be used.

Uninterruptible Power Supply (UPS):

The Angiography, CT and X-ray Unit are foreseen to be protected with UPS, in accordance with the requirements of the manufactures of this equipment.

For the X-ray and CT units, only the control system of units shall be protected with UPS that system will be shut down automatically.

For Angiography Unit, complete system of unit shall be protected with UPS, for a period of at least 10 min. during a primary power failure, in order to guarantee that procedure will not be interrupted. Within this period, the electrical power supply should be switched over to the existing diesel generators of the hospital.

Some other medical equipment can have local UPS or need to be protected with UPS.

Earthing and grounding:

In general, all grounding connections (to be defined in the course of design) shall be connected to the existing grounding system of the hospital.

For Angiography room shall be executed an antistatic flooring and proper grounding shall be foreseen.

Few additional potential equalizer (PE) pin-sockets shall be foreseen in Angiography room.

The Lightning Protection System of the building will not be affected during the execution of works and left as responsibility of client (hospital).

3.7 Indoor lighting system

Luminous intensity shall be calculated according to the requirements of the rooms (to be defined in the course of design). For Angiography and CT rooms, at least one of the lights shall be connected to emergency supply circuit. For Angiography, CT and X-ray rooms, high efficient lighting fixtures shall be used. For other rooms energy saving lighting fixtures shall be foreseen according to the functional purpose of rooms. Material for lighting fixtures and switches shall be according to hygienic standards in hospitals.

3.8 Extra Low Voltage systems

IT-System:

For angiography, CT and X-ray area shall be foreseen RJ-45 sockets for local area network. Cables shall be according to Cat 5e standard. Quantity of sockets is according to the requirements of medical technology (to be defined in the course of design). All cables shall be connected to 2 defined connection points next to the area of the renovation. One connection point with local hub is foreseen next to CT area, and one connection point next to X-ray area (see schematic drawing). The further cable connection from the connection point to the existing server room (on level 2 between block A and D) is not included in this scope of works (has to be executed by the client). The Angiography, CT and X-ray systems will be prepared (at the IT connection points) for remote control service access through the manufacturer, according to the manufacturer's instructions.

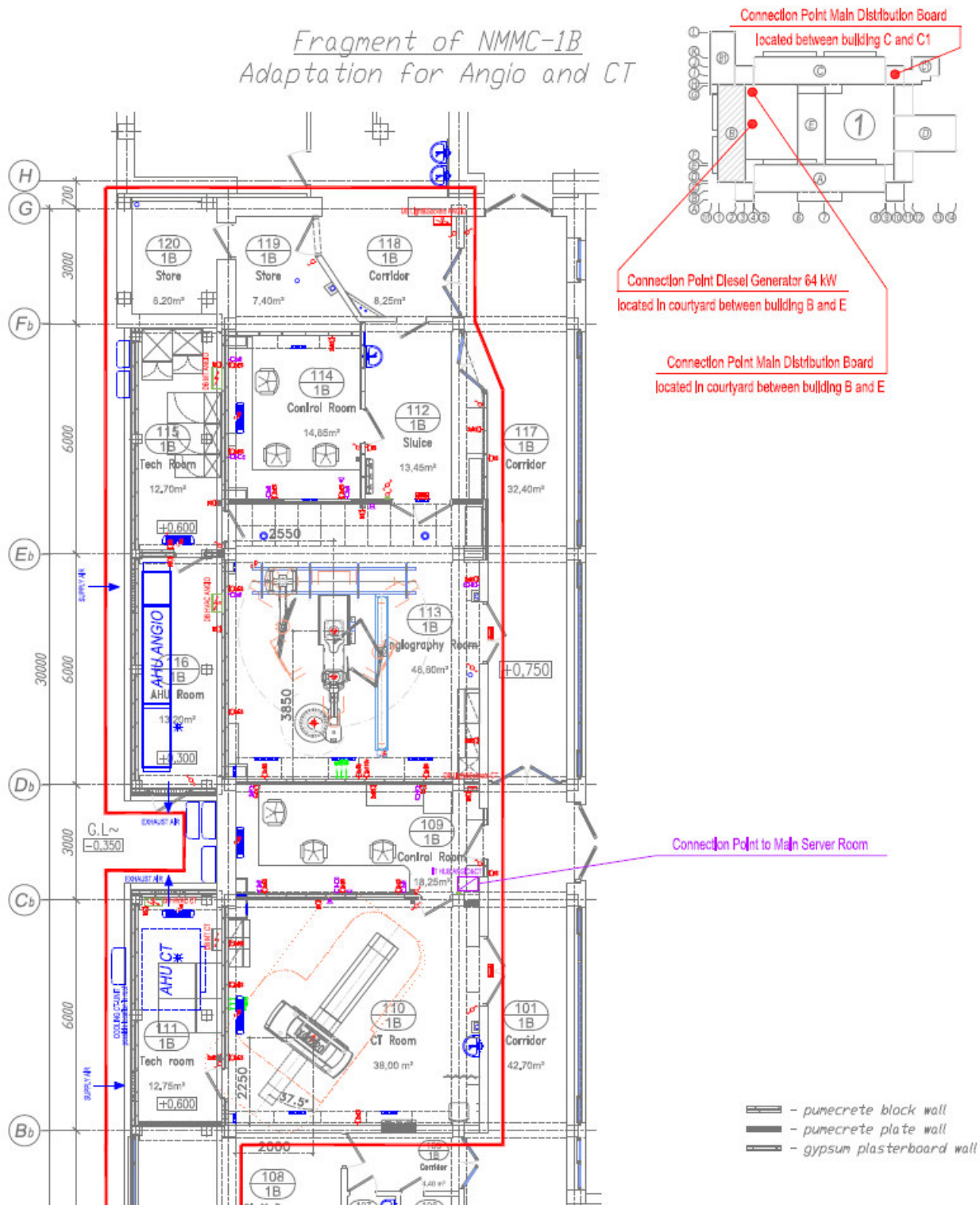
Telephone:

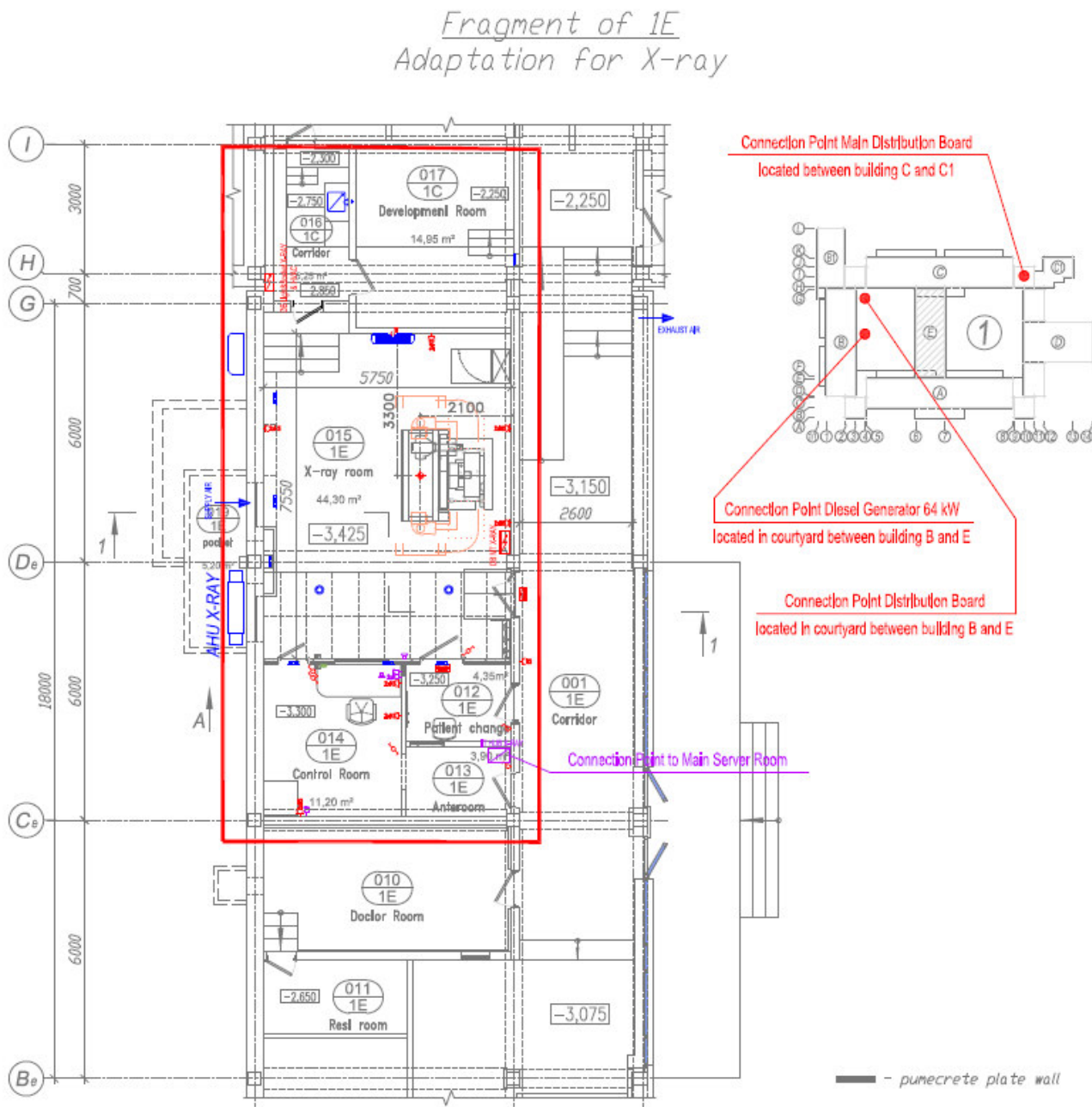
The existing sockets of the 2-wire telephone system in the rooms shall be adjusted and relocated to new positions according to the requirements of medical technology.

Intercom:

For all 3 areas shall be installed an intercom system for acoustic communication between the patient and the medical staff. It is foreseen 2-way communication with microphone and loudspeakers.

3.9 Schematics of M&E Installations





End of Document