

***TECHNICAL REPORT OF
MECHANICAL PLANTS
FIRE HYDRANT AND HYDROSANITARY***

***TECHNICAL REPORT FOR DETAILED DESIGN
PROJECT***

**"RECONSTRUCTION OF THE BUILDING OF
PUSTEC HEALTH CENTER AND ITS ADAPTATION
FOR THE HOUSING OF THE OFFICES OF PUSTEC
MUNICIPALITY "**

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Introduction

This document describes the main features of mechanical installations of provided for the building of the offices of the Municipality of Pustec and the terms of reference to be considered for drafting of the project implementation.

From the point of view of mechanical installations, we distinguish these area of use of which also have the characteristics of same operation:

1. Kati +0 office and corridors and toilets
3. Kati +1 Office and corridors

Mechanical systems include

- a) Fire protection and evacuation;
- b) system of supply with sanitary water to chilly and warm;
- c) system of the sewerage and used waters
- d) system of drainage of the storm waters.

Below we are describing it in a way detailed each of them

FIRE PROTECTION AND EVACUATION

This material describes the fire protection strategy designed for the facility "RECONSTRUCTION OF THE BUILDING OF PUSTEC HEALTH CENTER AND ITS ADAPTATION FOR THE HOUSING OF PUSTEC MUNICIPAL OFFICES"

The fire protection strategy and any comments or suggestions for the object "RECONSTRUCTION OF THE BUILDING OF THE PUSTEC HEALTH CENTER AND ITS ADAPTATION FOR THE HOUSING OF PUSTEC MUNICIPAL OFFICES" is based on the architecture project presented by the investor.

The strategy is divided into that of passive protection which includes the evacuation of employees from the building and materials and the manner of construction of the building, and that of active protection in the concrete case of extinction with different agents.

SECTION 1 STANDARD The design

Fire Protection and Evacuation System.

The laws, regulations, norms and standards used in this project are presented below:

- ✓ Law No. 152/2015 "On fire protection and rescue service" Regulation on fire protection measures in the design of buildings of any type
- ✓ Decision No. 162. dated 19.4.1965 revised, accepting the administration of technical and graphic documentation of the fire protection project and for rescuing and issuing technical acts
- ✓ EN 13501 Fire classifications of construction products and building elements (all parts).
- ✓ EN 2 Classification of fires. .
- ✓ EN 1838 Lighting applications - Emergency lighting.
- ✓ NFPA 10 Standard for Portable Fire Extinguishers, 2010 edition.

- ✓ EN 3-7 Portable fire extinguishers.Characterisitic, performance requirments and tests.
- ✓ BS B2 Fire Safety-Dealing houses- Volume 1 etc.

SECTION 2 SYSTEMS The FIRE PROTECTION

2.1 Summary

protection from FirE it is conceived AND designed oxen to guarantee SECURITY e life AND of material values we to all building RECALLING specification to pmnzsh and commensurate instance that rISK oxen PRESENT year, materials and the activity that takes place in it.

2.2 Distribution on fire

Referring to the activity, type of combustible materials, area of the apartments, constructive characteristics, etc. the building is classified as LH to fire (low risk) according to European norms EN 12845.

Consequently, the building refers to the definitions of, internal protection, for the premises of this building should be provided minimally by means of fire extinguishing equipment manual type (portable extinguisher).

While external protection for this category is not provided as a necessity.






Also referring to the Italian standards which are widely adapted to our design standards, to determine the degree of risk buildings with office activity are divided into categories based on the height of the building and the number of permanent presence of persons.

Based on this fact, the building in question is a two-storey building that does not exceed the height 12 m and with the presence of persons working in it less than 100 people.






From this it results that the building taken into analysis enters group no. 0 with permanent presence of up to 100 people and according to this type it is not necessary to extinguish with water

Distribution of portable extensions

Means portable oxen WILL to used WILL to be we fit with class e flammability referred to the classification of each environment in particular.

- | | | |
|---------------|---|---|
| Klasa I ose |  | Perdoret per zjarre qe e kane origjinen prej materialeve te ngurte sikurse derrase, leter, plastik, tekstile,etj. |
| Klasa II ose |  | Perdoret per zjarre qe e kane origjinen prej materialeve te jengshem sikurse benzene , benzole , nafte , alkol , vajra etj. |
| Klasa III ose |  | Perdoret per zjarre qe e kane origjinen prej materialeve te gazte sikurse metan , propan , butan GPL etj. |
| Klasa IV ose |  | Perdoret per zjarre qe e kane origjinen prej materialeve metalike sikurse alumin,magnesium, sodium, etc. |
| Klasa V ose |  | Perdoret per pajisje elektrike qe jane nen tension. |

Reconstruction of the Puctec Health Center Building and its adaptation for housing the Pustec Municipality Offices

Zjarri është ndarë në klasa të ndryshme. Fjalët PO apo JO nënkupton përshtatjen e secilës bombol për përdorimin në vecanti të një klase zjarri.	Dioksidi i karbonit (CO2)	Pluhur kimik i thate	Shkume	Kimikate te lengeta	Lengje avulluese
					
Kategori A	I limituar	PO - AB(E) JO - B (E)	PO	PO	PO
Kategoria B	I limituar	PO	PO	JO	I limituar
Kategoria C	JO	PO	JO	JO	I limituar
Kategoria E	PO	PO	JO	JO	PO
Kategoria F	JO	JO - AB(E)	I limituar	PO	JO
		PO - B(E)			



Equipment provided in the project for firefighting are type:

- portable ABC
- with chemical powder dry for materials to combustible to category or
- weight: 6 kg

2-3 Evacuation from the building

Evacuate another part of the fire protection system

Evacuation Concept

The concept of evacuation of persons from the building is designed to ensure that evacuation access roads allow the immediate evacuation of people inside the building.

Leaving the building is divided into 2 main components as follows:

- horizontal departure from the building
- vertical removal from the building

Each definition described below serves this purpose.

Crowding

The population of the building is calculated based on the floor area of each typology, taking into account the fire load per person according to the typology of the environment. The base used is NFPA 500 as shown in Table 2 below:

Table 2: NFPA 5000, fire load per person

USE	Fire load per person (m2 / person)
Apartments	18 .
Business (1) Administrative	4 .
Shops	2 .
Car parking (storage)	46 .
Technical Rooms (mechanical / electrical parts)	27 .

Horizontal Removal from the Building

Horizontal departure from the building means the distance and width of the departure from the respective environment on one floor up to the evacuation rate, a protected environment or the exit from the building.

Departure Distances

Departure distances from the building according to the typology of the respective premises are shown in Table 3.

Table 3: Departure distances

Typology of housing	Manner of departure	NFPA 5000 departure distances		
		One direction (1)	Two directions (2)	Alternative
residential (Apartment)	Inside the Apartment (balcony / terrace included)	N / A	38 m	us
	From the door of apartment at the Floor Exit	15 m	15 m	61 m
Office Premises	Floor Exit	15 m	30 m	91 m
Car Parking	Floor Exit	15 m	15 m	61 m
Shops	Floor Exit	15 m	30 m	76 m
Technical room (fire pumps, electric cabin)	Floor Exit	15 m	15m, 30m if there is no combustible equipment	76 m

(1) A direction is when departure is possible only in one direction to the exit.

(2) Two Directions is when the exit can be achieved through 2 different routes or 2 exits are possible

Width of Access Roads and Exits

All doors on the exit routes are open from the exit direction when serving a number of more than 50 people. When the doors open into the stairwells, the door must be moved to avoid obstructing other evacuation routes.

Number of exits required by ORDER No. 424 and section 11.4.1.1 of NFPA 5000 are as follows:

- 0 - 50 people: 1 exit

- 51 - 500 persons: 2 exits

- 501 - 1000 persons: 3 exits

- More than 1000 persons: 4 exits

The number of exits to buildings in this case should be more than 1 exit.

Outputs are measured according to NFPA 5000 requirements.

Hallway

In accordance with NFPA requirements, corridors serving the exit stairs must have a minimum width of 1.59 m (minimum size per person is 5 mm).

2-4 Signaling cards

A very important element in the fire protection project is the provision of relevant signage that has to do with a number of warning, indicative and action signs which are explained below:

- Warning signs - are the signs that show the prohibition of lighting fires, prohibition of the use of water for extinguishing, etc.
- Indicative signs - such as exit directions through corridors, stairs, placement of hydrants and cylinders, etc.

Signaling cards belonging to the warning and indicative categories are of the following dimensions and material format:

Format Scheme in mm



Dimensioni i Karteles mm				
Distanca	4	6	10	16
Baza	120	160	230	370
Lartesia	120	160	230	370
Emertimi	A	B	C	D



Signaling cards belonging to the operating category are of the following dimensions and material format

SECTION 3 System of supply of sanitary water (chilly + warm)

3.1 Dimensioning

Dimensioning AND design of to all components AND accessories of the system of supply and distribution of water cold & hot HEALTH WILL to be realized we STAGE e implementation project taking into account the following elements:

- Distribution scheme;
- Determining the nominal flow for each device h / sanitary and dimensioning of pipes;
- Dimensioning of pipelines highways and those of recirculation;
- Total flow nominal;
- Design feed;
- Working pressure
- Longitudinal unit losses pressure;
- Max speed of turnover of water;
- Dimensioning of electric boilers.

At this stage it is considered that the public network guarantees the necessary input and pressure for completion e need to years. after to done verification from UK company of Pustec area.

Grid sizing to sanitary water supply to warm and to cold, will refer to the Technical Norm EN 806. for to Definite quantities e NEEDED for water to any DEVICE HEALTH WILL to be used the following table:

TAB. 2
PORTATE NOMINALI PER RUBINETTI D'USO SANITARIO

Apparecchi	acqua fredda [l/s]	acqua calda [l/s]	pressione [m c.a.]
Lavabo	0,10	0,10	5
Bidet	0,10	0,10	5
Vaso a cassetta	0,10	—	5
Vaso con passo rapido	1,50	—	15
Vaso con flussometro	1,50	—	15
Vasca da bagno	0,20	0,20	5
Doccia	0,15	0,15	5
Lavello da cucina	0,20	0,20	5
Lavatrice	0,10	—	5
Lavastoviglie	0,20	—	5
Orinatoio comandato	0,10	—	5
Orinatoio continuo	0,05	—	5
Vuotatoio con cassetta	0,15	—	5

for defined quantity maximum simultaneous (flow e pump) of need for sanitary water WILL to be used chart e FOLLOWING e which determines the flow e project we BASIC of theoretical input of calculated according to:

Σ number / type of appliances sanitary x Σ input for each device / type = total flow

for calculation e diameter to piping WILL to the following formula is used

$$Q = 0.785 \times D^2 \times V \quad D = \sqrt{Q / 0.785 \times V}$$

by :

D is the inside diameter in mm

Q is the flow in lt / sec V is speed desired water in pipes m / sec

Choosing e velocity maximum to APPROVED to water, depending on type and diameter of pipeline, is done according to the following table:

Materiale tubi	φ tubi	impianti tipo A vmax (m/s)
Acciaio zincato	fino a 3/4"	1,1
	1"	1,3
	1 1/4"	1,6
	1 1/2"	1,8
	2"	2,0
	2 1/2"	2,2
	oltre 3"	2,5
Pead PN10 e PN16	fino a DN 25	1,2
	DN 32	1,3
	DN 40	1,6
	DN 50	1,9
	DN 63	2,1
	DN 75	2,3
	oltre DN 90	2,5
Multistrato	fino a DN 26	1,2
	DN 32	1,3
	DN 40	1,6
	DN 50	2,0

4.0 SEWERAGE AND RAIN DRAINAGE DISCHARGE SYSTEM

The new pipes for the sewerage system will be connected to the existing system.

4.1 Normative basis

DCM Nr. 159, dated 1.3.2017 *Design standards in buildings*

EN 12056 *Gravity drainage systems inside buildings - Generale and performance requirements, Sanitary pipeeork, layout and calculation, Roof drainage, layout and calculation, teasteëater lifting plants, Installation and testing, instructions for operation, maintenance and use*

4.2 Dimensioning

The reclamation project, both that of sewage and that of rainwater, refers to the Norm Technical EN 12056 1-6.

The following table will be used to determine the required quantities discharged by each sanitary appliance or water supply point

TAB. 1 PORTATE NOMINALI DI SCARICO	
Apparecchi	portata nominale [l/s]
Lavabo	0,50
Lavabo a canale (3 rubinetti)	0,75
Lavabo a canale (6 rubinetti)	1,00
Bidet	0,50
Vaso a cassetta	2,50
Vaso con passo rapido	2,50
Vaso con flussometro	2,50
Vasca da bagno	1,00
Vasca terapeutica	1,50
Doccia	0,50
Lavello da cucina	1,00
Lavatrice	1,20
Lavastoviglie	1,00
Orinatoio comandato	1,00
Orinatoio continuo	0,50
Vuotatoio con cassetta	2,50
Sifone a pavimento DN 63	1,00
Sifone a pavimento DN 75	1,50
Sifone a pavimento DN 90/110	2,50

for defined quantity maximum of discharge sanitary do to be used chart e FOLLOWING e which determines the flow e project we BASIC to flow THEORY to calculated according to:

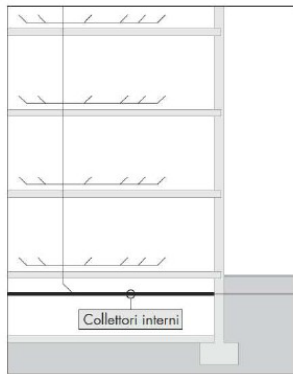
Σ number / type of sanitary appliances x Σ input for each device / type = max amount of discharge

for calculation e diameter of pipelines used tables e FOLLOWING we depending of penance, location that pipeline of discharge (download of internally, collector), position of the pipeline (vertical or horizontal)

- a) diameter of downloads depending on feed and pendulum, inside toilets
- b) diameters e columns vertical to download we depending to flow AND type to ventilation (of columns)
- c) diameters e collectors horizontal to emissions we depending to flow AND pependences, inside of the building

TAB. 8 - COLLETTORI INTERNI
Portate ammesse [l/s] in relazione alla pendenza dei tubi

DN	1,0%	1,5%	2,0%	2,5%	3,0%
63	0,9	1,2	1,4	1,6	1,7
75	1,7	2,0	2,4	2,6	2,9
90	2,5	3,0	3,5	4,0	4,3
110*	4,5	5,5	6,4	7,1	7,8
125	6,5	8,0	9,2	10,3	11,3
160	13,0	16,0	18,5	21,0	23,0
200	23,8	29,2	33,7	37,7	41,4
250	43,2	53,0	61,2	68,5	75,0
315	79,8	97,8	113,0	126,5	138,6

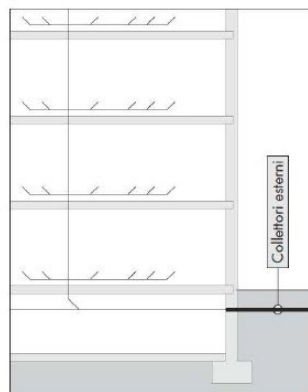


110* Ø minimo collettore con WC

- d) diameters e collectors horizontal to emissions we depending to flow AND pependences, outside the perimeter of the building

TAB. 9 - COLLETTORI ESTERNI
Portate ammesse [l/s] in relazione alla pendenza dei tubi

DN	1,0%	1,5%	2,0%	2,5%	3,0%
75	1,8	2,3	2,6	3,0	3,2
90	2,8	3,4	4,0	4,5	4,9
110*	5,0	6,2	7,2	8,0	8,9
125	7,4	9,0	10,5	11,7	12,9
160	15,0	18,0	21,0	23,5	26,0
200	27,0	33,1	38,1	42,8	47,0
250	49,0	60,1	69,5	77,7	85,2
315	90,6	111,1	128,4	143,6	157,4



110* Ø minimo collettore con WC

The dimensions of the wells are calculated as a function of the flows are determined by the designer in the respective drawings.



Also the dimensions of the collectors that discharge sewage and rainwater are calculated and dimensioned in function of the inflows and their material is selected PE wrinkled on the outer surface and polished on the inner with dimensions ranging from 160-250 mm.

4.3 Rainwater discharge network

An important point when designing a building is the drainage of rainwater, which collects from the roofs or terraces. Rainwater will discharge from the terrace through the piles and will descend vertically through the rain pipes and discharge into the surrounding environment of the building in a free state. Roofs, balconies, terraces and other construction elements, water should be removed with a system consisting of slopes towards open spaces in such a way as not to create a problem for the longevity of the building and at the moment they leave the rain pipes should have made possible their orientation towards the area networks through gutters, wells, pipelines, etc.

For the calculations of the rainwater discharge system should be taken for reference the technical norm EN 12056 3. The determination of the diameter of the discharge pipes should be done considering a discharge intensity equal to 0.04 l / s per square meter of surface.