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VICENTE BORRAS TORRES
1.1. INTRODUCTION

The site is situated in Södra Vägen with Klyvaregatan, near the Nissan River (Halmstad, SWEDEN). The site has a regular shape with an almost flat surface.
1.2. ACTUAL BUILDING

Företagshuset Matador

The actual building is a factory called “Matador”. It’s an old building but not old enough to preserve it.

The building has two floors (around 8 meters of height). The façade from the river side is made with yellow metal plates giving an industrial looking to the building. From the Södra Vägen the façade is made with yellow bricks giving a very simple looking. The building was made just to make the function of factory.
INTRODUCTION
1.3. SURROUNDING

The surroundings of the area are most of them residential buildings. In the north of the place, in the Klyvaregatan street there is a nautical related building.

Map of the area

This building (1) is called Marinstugan.

It's only 1 floor height and everything is wooden made.

In the west of the place, in the södra vägen street the area is full of small residential houses.

This buildings are all only 1 floor height made with wood (2) (3) and brick (4) construction.
INTRODUCTION
1.4. DESCRIPTION PROJECT

The build destination is a cultural and sport centre, the build have two different parts, and these parts is separated in two parts more.

The sport centre has a swimming-pool and one sport part. The sport parts have a gym, and rooms dedicated for practice the diffents sports.

The cultural centre have one restaurant in the first floor, in the second floor are rooms for study, in the third floor there are one room for expositions, and in the fourth floor is dedicated for the direction build.

The build have a swimming pool in one part of the build, the other part of the build is the sport and cultural centre, in the cultural part there are one restaurant, meeting zone and, classes-rooms.

All the build is communicated in the centre of the firs floor, where is the information about the sport and cultural centre.
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2.1. CONDITIONS OF THE AREA.

2.1.1. Demolitions.

The lot where it is tried to build the cultural and sport center, at the moment is built with industrial ships, with which the works of construction will begin with the demolition of the old building, the demolition of the building will be made with average manual mechanics and, including transport al next garbage dump but.

2.1.2. Drained of earth

A time that the vegetal earth lot this free one, began drained of earth del to pave from the comers to be able to synchronize the tasks of excavation with the structure tasks, beginning by the retaining walls, the walls will be made alternated the zones of work with those of excavation to never let to the zone of the river unprotected Nissan to avoid a earth collapse by the pressure del water.

Finished the part of excavation the part of laying of foundations of the swimming pool and the laying of foundations of the part of the building will be made.

All the originating land of the excavation will be transported al authorized garbage dump with trucks.
2.2. FOUNDATIONS AND GROUND SLABS

2.2.1. Surfaces. Run and slabs.

The wells, ditches and raft will fill up with prepared reinforced concrete HA-30/B/25/IIIa+H with 300 kg/cm² of characteristic resistance. This concrete will be prepared for marine ambience and freezing (IIIa-H). This concrete will be elaborated, transported and put in work according to the instruction. First layer of about 100mm of thickness will be spilled with cleaning concrete in the base of the laying of foundations, on which the corresponding reinforcements will be based coming next to the filling of the rest taking care about reinforcements do not move and that has the necessary coverings. The raft will be made with a base of ballasts and compacted artificial skittles of 200 mm of thickness with mechanic methods (preferably roller) at 99% of the normal proctor. It will be demanded in work that the materials like cement, plasters or stucco that are used have quality mark. The steel for reinforced concrete will have quality seal and will be from only one manufacturer.

2.2.2. Semi basement Walls

The semi-basement wall will be laid the raft together with the rest of the structure. For making the shaft of the wall the formwork will be made previously. This formwork will be made with two faces when it’s possible excavation with natural slope and only one face will be made when this is not possible. The concrete will be 30/B/20/IIIa+H of 300 kg/cm² of characteristic resistance. It will come to its waterproofing and drainage in case of the phreatic level is of a level superior to its base (at first is underneath).

2.2.3. Ground slabs

Ground slab will be executed with concrete of 150 kg/cm² of characteristic resistance, and with 15cm of thickness reinforced with electro-welded mesh of 15x15 cm. ø 5-5mm B-500-T in garage ramp and the surrounding zone the same with a base of ballasts and artificial skittles of 200 mm of thickness, on which the ground slabs will be executed.

Expansion joints will not be necessary since the longest measure will be less than 50m.

A waterproof lamina will be placed (plastic polyethylene) on ballasts to avoid the humidity ascent. In addition, to obtain greater grip and protection in the ramp it will be made small scraped of the material.
2.3. SALUBRITY INSTALLATIONS

2.3.1. Canalizations.

The aerial canalizations will be made of PVC type of the hot series of URAPLAST or similar in diameters and lengths according to project planes.

2.3.2. Curb box.

It will be placed inside the parcel two curb boxes for dirty waters and another one for clean waters. In addition it will be placed registry curb box and to undertake to the municipal sewage system. They will be constructed with it makes of massive brick of 1/2 foot of thickness on cast in-situ concrete wall-plate HM-20, burnished with cement mortar 1:3 by the interior, with wall of laminated profile HL 50,5 mm and covers concrete, with the dimensions indicated in planes of Project.

2.3.3. Drain spouts.

All the drain spouts of water evacuation are pluvial or residual and all the water-drainages of sanitary apparatuses and sinks, will be made with PVC pipe hot series of URAPLAST or similar, of diameter and lengths specified in project.

All the joints, elbows, etc., will go with their corresponding meetings of union and special pieces. One will consider that in all the water-drainages of sanitary apparatuses and sinks will have to settle with their corresponding individual siphon.

2.3.4. Smoke ventilation and gases

The evacuation of vapours and gases will be made through conduits of forced ventilation, type "shunt", formed by double pieces prefabricated of fibrocement, or ceramics, received with plaster paste type YG Metallic grid and layer of heat insulation in the passages of forged and always according to the practical standards of Construction. The ventilation in kitchens will be made by means of flexible lamina tube of aluminium and polyester, mounted on steel thread spiral with non-flammable tube of rigid PVC of 150mm will arrange in addition an extractor to smoke and gases, with centrifugal ventilator, of double aspiration and with single-phase incorporated electrical motor, mounted with vibration-proof systems and elastic connection in the mouth, with a power of 1000 evacuation of m3/h. It will be demanded that the extractors have official certificate of operation.
2.4. STRUCTURE

2.4.1. Reinforced concrete structure.

The structure del building this composing in two parts, the part that composes the building with cellar and the part of the conditionned swimming pool, the structure del building is made up of parking underground and a building I publish that it has different heights and different parts, this part del building was made with HA-30/B/20/IIIa+H concrete, that is resistant to marine atmospheres. The concrete will adapt to the concrete instruction EHE, according to Spanish norm, and a seal of quality to the providing company of the concrete will be demanded to him.

The structural part of the swimming pool will be composed by pillars of concrete of different heights to create the curve that describes the cover, these pillars will be reinforced and braced by the large windows that will serve as paramento of the conditionned swimming pool.

The base of the conditionned swimming pool will be composed by concrete of high HA-35/B/16/IIIa+H resistance, that like the rest of the structure will have to pass the controls of warm that are stipulated in the chapter of quality control that is described in the project.
2.5. PARTITIONS

2.5.1. Outer closings.

The Facade will be composed by a solution made with 13mm of plaster, 135mm of isolation Isover UNI-Skiva and another 50 mm of isolation slice. 22 mm steel panels for sleepers will be put in a vertical way. After this the external finish will be made with wooden solution of 22mm of thickness.

2.5.2. Inner Partition.

Inner partitions will be made in general with prefabricated panels of 70mm of thickness, the plasterboard will be of 14 mm thickness and put between the 80 mm isolation. The partition will be mounted through horizontal base screed and vertical every 70 cm.
2.6. WALL COATING

2.6.1. Tiled.

Tiled of restaurant and baths tile or stoneware enamelled, of approximate format 25x35cm., resistant to cleaning products, received with cement mortar with lime or plasticized additive and sand of metering 2:1:10, even with decorative border or serigraphy, pieces to mitre in edges, mixed with grout of white cement and final cleaning, executed according to the regulations.

2.6.2. Rendering coat.

The vertical outer coatings will be made with steel. This solution will be fixed to the facade with aluminium profiles directly attached to the ISOVER solution.

2.6.3. Parget and plastered.

All the walls and ceilings of interior, with the exception of restaurant and baths will have with an equipped and later paste plastering with plaster type YG, having mastered angles and corners. One includes the formation of corners, trimmings of hollows, closings with skirting boards, lifeguards and positioning of scaffolds and proportional part of fibre glass mesh for encounter with structure, according to the regulation.

2.6.4. Paintings.

In metallic carpentry one will paint with two hands of synthetic enamel or to epoxy on iron or oxide steel, previous scratched by means of metallic brush, manual cleaning of the surface, hand of anticorrosive primer or when wass-primer (iron and galvanized, respectively), and two finishes with epoxy two components, according to regulation.

For the wood carpentry a coating with nitrocellulose lacquer applied to pistol will be made. In the vertical inner coatings of plaster or cement it will be painted with plastic painting dripped "fine drop", washable of 1st quality, previous sandpapering of small adhesions and imperfections, hand of seal primer for plaster or cement, priming coat with plastic painting, diluted and finish with two coats of plastic paint, according to regulation. In the horizontal inner coatings quality will be painted with smooth plastic painting, also washable of first quality.
2.7. FLOOR AND STAIRS COATING

2.7.1 Stairs steps.

All the stairs, as much in tracks as counter fingerprints, will be made with the dimensions specified in project drawings, will be wooden made with special pieces, steps broken or compensated, expensive stoneware floor tiles of meetings with cement grout coloured with the same tonality of the floor tiles.

2.7.2 Pavements.

a) Entrance to the building.

Will be made with hardening covering for continuous concrete pavement with hard-plastic painting with hardening polyurethane with the humidity, applied in two or more layers until reaching a maximum thickness of 2 mm, previous scratch of the superficial grout.

b) Deportive zone:

Will be made with floating wooden pavement made with 1st quality press layers, put with the direction fibres perpendicular in plates of 2400x200x15mm with a surface of wearing down of 4mm

c) Parking.

These zones will be made with a light concrete floor with a thickness of 100mm extended on insulating polyethylene profile and sand layer of size 100mm regulated and cured according to regulations.

d) Bathrooms and kitchen

It will be made with joints made with mud floor tile cooked of 300x300mm taken with mortar tail of high benefits and rejoined with joint mortar, according to guide of ceramic ceiling.
2.8. ROOF COATING

1.8.1. Continuous.
The coating of ceiling with equipped and plastered of plaster paste type YG of 15 mm of thickness. It will be made, according to the previously mentioned specifications for vertical coatings and horizontal interiors. The continuous roof coating will be placed in all the stores of the building.

2.8.2. False ceilings.

In the baths, Kitchen, corridors, deport area, meeting room, and classroom and restaurant will be made with a false ceiling with stucco plates, of dimensions 1000x600mm sustained with esparto and paste of stucco E35 type, with perimeter section of 80x200mm and executed with stucco moulding according to the regulation.
2.9. CARPENTRY

2.9.1. Carpentry.

As much the windows as the glass doors will be made with profiles of lacquer aluminium in colour and seal of quality. The stairs railing will be made with profiles with metallic hollows, posts and tubes each 12 cm and banister rails of tubular ø 40mm the access door to the parking will be of the tilted type of horizontal axis of 3,10x2,20 m.+ grid 3,10x0,30 m., with galvanized steel wall, made beating system with metallic frame, mesh ant insects in superior grid, actionable from outside and chain for drive from the interior.

2.9.2. Wood carpentry.

All the doors of step will be of have or rivet, blind people or glass, formed by a folding leaf of 203x72,5 or 62,5x3,5 cm. of clump, board soul DM and plated leaves to the two corresponding faces, pre wall of pine with claws of galvanized in his steel fixation to receive the partitions.

There will be three different models of wooden doors in the building –D2, D3, D4- All of them will be blind with mouldings to vanish made pine of Sweden, claws of galvanized steel fixation and lock chromed.

2.9.3. Metallic carpentry.

All the windows of the building will be metallic made with aluminium profiles hard anodizing of 15 microns, with quality seal, natural colour, without guide. The standard size for the windows in the façade will be 1000mm wide and 800mm height.

The door from access to the swimming pool will be 6000x2125mm, made with panels of steel plate galvanized and stuffed of injected polyurethane foam, forming panels of 40mm of thickness, laqued with acrylic painting with lock of interchangeable cylinder.

The Parking door will be 5000x2500mm with beating system; the door is not opened if some obstacle in its zone of sweeping exist, with system of waming to the user, device that it prevents to even catch the hand in the fold or the loading base, with double photocell of security, traffic light for waming, hydraulic operation with two speeds, starts and closes slow.
2.10. PLUMBING INSTALLATION

2.10.1. Hot and cold water.

All the network of attack and cold water distribution will be made with electrolytic copper pipe with meetings welded, in dimensions and diameters according to plane of project, installed, verified and measured according to regulation.

2.10.2. Plumbing fixtures.

The sanitary apparatuses will be of vitrified porcelain with white colour. They will count on faucets of ceramic discs chromed shining, monocontrol with airflow and individual siphon of water-drainage. The sink will be of stainless steel of total dimensions 1200x600 mm. The faucets will be single grain conventional of ceramic discs chromed with outer mixer, revolving and airflow sewer. The faucets of all the apparatuses will be accredited. An electrical thermo will settle, with 500 l of capacity an instantaneous heater of sanitary hot water.
2.11. ELECTRICAL INSTALLATION

2.11.1. Inner lightning.

The electrical system will be made interlocked, with copper conductor of double protected plastic isolation with flexible tube of P.V.C., verified and measured, according to the construction regulations and Electro-technic Regulation of Low Tension. It will have a general box of protection and magneto thermal switches in each circuit. The mechanisms, boxes, etc., will be of the series Niessen Stylo or similar. The building will be prepared with telephony and antenna TV, A.M. and FM.

2.11.2. Grounding outlet.

Annealing will settle with naked copper conductor buried, of section and lengths according to the project, with corresponding curb boxes of mattock and connection of covered copper steel electrode, executed according to regulation.
2.12. GLASS


The glass in windows will be 4/6/4, made with double insulating glass, made up of colourless glass 4 mm, in the interior, dehydrated air chamber of 6 mm sealed, and colourless glass 4 mm in the outside, with double sealed of butyl and poly sulphur, executed according regulation. In all the glassed wood carpentry, this one will be made with printed glass of 4 mm, of colour, placed with putty.

The glazing for the swimming pool will be made with insulating double glass, made up of security glass 4+4mm in the interior, dehydrated air chamber of 12mm, sealed perimetraly and outer glass tempered of 10mm of tone silver, reflecting, and solar control by means of the treatment of one of its faces by cathodic pulverization in emptiness.

The glazing for the façade will be made with insulating double glass, made up of security glass 4+4mm in the interior, dehydrated air chamber of 12mm, sealed perimetraly and outer glass laminated of 6+6+6 mm of tone silver, reflecting, and solar control by means of the treatment of one of its faces by cathodic pulverization in emptiness.
2.13. ROOF

2.13.1. Roofs.
Cover to execute will be del type nonpissable Q.A.N.-9, composed by: Resistant support, (forged), steam barrier, slope formation, with thermal-acoustic insulator, waterproofing, woven nonweave of protection and gravel layer of rio of 3 cm of thickness.
2.14. PROTECTION INSTALLATIONS

2.14.1. Protection installation against fire.

All the building will have installed a system against fires, including portable extinguishers; a system of detection of smoke; two fire equipped mouths of 25 mm, pulsers normal murals in all the building and lighting installations of emergency and signaling according to gráfado in the planes even the fire detectors.

The building also will have a centralized system of alarms that will be connected to the pertinent power station of alarms that is in charge of the security and monitoring of the building.
2.15. SPECIAL INSTALLATIONS

2.15.1. Telecommunication installation.

One has anticipated the installation of megafonía and sound equipment. The installation of an inner wire net, and an installation of a computer science servant for the connection of the computers to Internet, will consist, as much of the infrastructure (tubes, registries), like of the network itself (cables and elements of connection) adapted to the effective norm.
2.16. HEALTH AND SAFETY

All related to material of security and the prevention of labor risks, health is reflected in the security study that is enclosed in the project, in the study describes to passage to step the phases of execution and the dangers related in each phase, the study proposes all the pertinent measures that there are to take to avoid the possible accidents which negligences or bad uses of the materials can be produced by, or machinery, that are in the enclosure of the work.

The security plan will be effective throughout the period of time that lasts the construction of the building, and will be updated in case of modifications or alterations of the project.
2.17. QUALITY CONTROL

All the related one to the control of quality of the materials, is reflected in the control of quality that is enclosed in the project, in the quality study are reflected the parts of the construction that they have to be put under a control to guarantee the final quality of the building.
2.18. SWIMMING POOL

All the facilities of the conditioned swimming pool, will follow norms NTE (Technological norms of construction) where details all the indispensable diameters of the pipes, the hydraulic calculations, the sizes of loops compensation glasses, the safety measures in public swimming pools and the boilers necessary to warm up the water to an opportune temperature.
HEALTH AND SAFETY
3. MEMORY

1.1. DESCRIPTIVE MEMORY. ANTECEDENTS.

1.1.1 Object of the Study of Security and Health.
1.1.2 General performances.
1.1.3 Conditions of the surroundings.
1.1.4 Indicated general characteristics of the work in the execution project.
1.1.5 Identification of the author or authors of the Study of Security and Health.
1.1.6 Next welfare center.

1.2. PLANNING OF WORK.

1.3. FACILITIES OF HYGIENE AND WELL-BEING.

1.4. COLLECTIVE PROTECTIONS TO USE BY PHASES OF WORK DURING THE CONSTRUCTIVE PROCESS.

Phase 1: Previous performances.
Phase 2: Drained.
Phase 3: Execution of the laying of foundations.
Phase 4: Execution of the structure.
Phase 5: Execution of the facades.
Phase 6: Finished.

1.5. INSTRUCTIONS OF SECURITY FOR THE CIRCULATION OF PEOPLE BY THE WORK AND USE OF PROVISIONAL AUXILAR ELECTRIC OF WORK.

1.6. IDENTIFICATION OF RISKS AND PREVENTIVE MEASURES TO ADOPT IN THE DIFFERENT WORK ACTIVITIES.

Earthwork.
Laying of foundations.
Pillars.
Presolera.
Formwork and aligerantes elements of forged.
Iron (put in work).
Concrete of forged.
Tabiquería of cellars.
Conduits of ventilation.
Execution of tabiquería of boxes of stairs.
Execution of tabiquería in ground floor.
Pavement of terrazzo.
Polished of terrazzo.
Execution of the main façade.
Execution of the later façade.
Heat insulation.
Execution of tabiquería in plants houses.
Installation of plumbing.
Electrical system and of telecommunications.
Tiled.
Installation of elevators.
Gas Installation.
Air conditioner.
Stoneware Pavement and rasilla.
Smooth Talla (nondetachable).
Definitive Wall-plate.
Plastering of house.
Waterproofing of covers.
Painting.

1.7. Identification of risks and preventive measures to adopt in different intervening auxiliary means in the work.

Ladder.
Ladders Platform of unloading of materials.
Hung Scaffolds.
Scaffolds of Borriquetas.
Tubular Metallic Scaffolds.
Props.
Turret of concrete.

1.8. Identification of risks and preventive measures to adopt with the different machinery and tool to use in work.

Shovel shipper of wheels hydraulic.
Backhoe of wheels.
Dump truck.
Dumper.
Mixed excavator on wheels.
Crane tower.
Vibrator of needle.
Truck of concrete.
Pumping polisher (400 V).
Electrical Soldering iron.
Circular mountain range of table.

1.9. Kinds of the materials and elements.

1.10. INSTRUCTIONS FOR THE POSITING, RETIRED MAINTENANCE AND OF COLLECTIVE PROTECTIONS.

Instructions for the positioning of railings of protection. Instructions for the retirement of railings of protection.

1.11. WORKS THAT IMPLY SPECIAL RISKS.

1.12. CONDITIONS OF SECURITY AND HEALTH IN THE FORESEEABLE LATER WORKS (MAINTENANCE).

1.12.1. Works in closings and facades.
1.12.2. Works in flat covers.
1.12.3. Works in facilities of cleaning.
1.12.4. Works in facilities of plumbing.
1.12.5. Works in audio-visual facilities.

1.13. MEASURES IN CASE OF EMERGENCY.

1.14. IT IS PRESENT AT OF THE PREVENTIVE RESOURCES OF CONTRACTOR.

2. PLIEGO DE CONDICIONES

2.1. NORMATIVA DE APLICACIÓN

2.2. CONDICIONES TÉCNICAS DE LOS MEDIOS DE PROTECCIÓN

2.2.1. Protección personal.
2.2.2. Protecciones colectivas.

2.3. CONDICIONES TÉCNICAS DE LA MAQUINARIA

2.4. CONDICIONES TÉCNICAS DE LA INSTALACIÓN ELÉCTRICA PROVISIONAL DE OBRA

2.5. CONDICIONES TÉCNICAS DE LOS SERVICIOS DE HIGIENE Y BIENESTAR

2.6. ORGANIZACIÓN DE LA SEGURIDAD

2.6.1. Recursos preventivos.
2.6.2. Seguros de responsabilidad civil y todo riesgo en obra.
2.6.3. Formación e información.
2.6.4. Vigilancia de la salud.

2.7. OBLIGACIONES DE LAS PARTES IMPLICADAS

2.7.1. Del promotor.
2.7.3. Del coordinador de seguridad y salud durante la ejecución de la obra.
2.7.4. De los recursos preventivos.
2.7.5. De los servicios de prevención de las empresas.
2.7.6. De la comisión de seguridad.

2.8. NORMAS PARA LA CERTIFICACIÓN DE ELEMENTOS DE SEGURIDAD

2.9. PROCEDIMIENTOS PARA EL CONTROL DEL ACCESO DE PERSONAS A OBRA

2.10. PLAN DE SEGURIDAD Y SALUD

3. BUDGET

3.1. INDIVIDUAL PROTECTIONS

3.2. COLLECTIVE PROTECTIONS

3.3. SIGNALING

3.4. INSTALACIONES DE HIGIENE Y BENEFICIO

3.5. PREVENTIVE MEDICINE

3.6. MEETING COORDINATION

3.7. ORDERED OF PREVENTION

3.8. SUMMARY OF THE BUDGET
1. MEMORY

1.1. DESCRIPTIVE MEMORY. ANTECEDENTS.

1.1.1 Object of the Study of Security and Health.

The present Study of Security and Health establishes, during the construction of the work, the forecasts with respect to prevention of risks and occupational accidents, as well as the sanitary services common to the workers.

It will serve to give to basic directives to the companies contractors to carry out his obligations in the field of the prevention of professional risks facilitating his development under the control of the Coordinator in the matter of Security and Health during the execution of the work, in agreement with Real Decree 1627 of 24 of October of 1997 that establishes the Minimum Dispositions in the matter of security and Health.

1.1.2 General performances.

The lot on which it is going away to execute the work is located between the streets Dragvägen 26-28 and Södravägen 29 of Klyvaregatan (Halmstad).

Promote sama the company FINAL PROYECT A.S.

The project of the work has been made by D. Vicente Borras Torres. with situated professional office in the street Östra Str anden, Norra Badvägen 17, Halmstad.

1.1.3 Conditions of the surroundings.

The lot on which it is going away to execute the work has form of irregular polyhedron, so and as it is observed in the location plane that is enclosed, a surface approximated of 3540.912 m² and sensibly horizontal orography.

The copretty lot with the river Nissan that has abundant volume, reason why must have special well-taken care of when making bataches medianeros to he himself.

The streets that surround it totally are urbanized, reason why it is equipped with all the necessary services.

The streets that include/understand the lot find journeyed by people and vehicles of all type, reason why it will have to consider, as much at the time of protecting to the viandantes and vehicles of possible
loosenings of the work, like at the time of making the excavation by bataches by the circulation of the heavy traffic.

The electrical energy will be provided by the electrical company and the attack will be made in Low Tension 3 380/220 xs V, being 36 the anticipated power to install of Kw.

The water provision is predicted by means of a derivation of the potable water formation communications net, being pending of confirmation on the part of the providing company the connection point.

One so anticipates a rolled access and another peatonal to the work and as grafia in planes not 2.1. to 2.6. and 3 of the present Study.

Since the work is in a zone where great rains in just a short time can be produced, it will be due to consider at the time of evaluating the risks during the execution of the excavation and the laying of foundations.

1.1.4 Indicated general characteristics of the work in the execution project.

Since to the accomplishment of the present study of security it is only had the basic project of the architect and in the same one they do not indicate the constructive characteristics of the building, it only can assume how one is going away to execute the work and on those conjectures to the present make study of security and health.

The reasons for which it is lacked the execution project are the following ones:

1. - For the concession of the work license the city council demands the presentation of the basic project and the study of security and health, but not of the execution project.

2. - The execution project is being made and it will not appear until the city council grants the license without putting no repairs.

However, an advance of the mentioned constructive memory has been asked for to the architect, being able to be subject to some change not to comprise of an execution project visa.

The laying of foundations will be made by means of retaining walls by bataches and isolated in pillars and run shoes in wall.

The structure is of flat reinforced concrete with forged unidirectional of joists "in situ" and concrete curved parts of the stem (like aligerante element).
The facade closing will be of caravista brick and the passable flat cover.

The facilities include/understand plumbing, electricity, conditioned air, elevators and gas city.

1.1.5. Identification of the authors or authors of the Study of Security and Health.

The author of the present Study of Security and Health is Vicente Borras Torres Technical Architect.

1.1.6. Next welfare center.

The next welfare center is the ambulatory one of Halmstad hospital situated in the street Rehostia Puta number 25 of the mentioned population.

Its telephone number is 0704611111

In the planes the route is detailed to follow from the work in case of being necessary. The flat mentioned one, as well as the one of each contractor will have to be located in a visible place and accessible wing totality of the workers of the work.
1.2. PLANNING OF WORK
1.3. FACILITIES OF HYGIENE AND WELL-BEING.

Based on the maximum number of workers who can be found in phase of work, one will be certain the necessary surface and elements for these facilities. For the calculation of all it the sum of the maximum number of workers will have to consider so who will be able to agree in the work, being considered that this number will be a maximum of 35 workers, and as it is possible to be observed in planning previously exposed. Since the promotional company has the contiguous premises, so as nº 4 of the present study is indicated in the plane, will arrange next to same a sufficient number of prefabricated houses that they fulfill the following minimum requirements:

*Showers  (3)
*Turkish Plates  (3)
*Washbasins (3)
*Mirrors  (2)

Complemented by necessary the auxiliary organizational elements: Towel rails, soap dish, radiators, heater, etc.

It must be had hot water and fries in showers and washbasins.

The clothes will be provided with seats and individual ticket offices, with key, to keep the clothes and the footwear.

The surface of these services will be satisfied with the premises previously mentioned, since the same one surpasses the 52.5 m2. In the plane nº4 is reflected the premises.

The dining room will be located in the same way that the clothes, in the contiguous local mentioned one, so as nº 4 of the present study is observed in the plane. The necessary elements (tables, banks, sink...) will have to be contributed at the beginning of the work.

The facilities in perfect state of cleaning and conservation will stay. For it, it is pointed out in the budget of the present Study a game referring to cleaning of hygiene facilities and well-being.

In the work office one will settle a medicine kit of first aid with the minimum content indicated by the effective legislation, and a multipurpose dry dust extinguisher of effectiveness 13A.
1.4. COLLECTIVE PROTECTIONS TO USE BY PHASES OF WORK DURING THE CONSTRUCTIVE PROCESS.

Next it is tried to make a route of the collective protections place in the work following the logical process of execution of the works. Although the present study of security and health has been made with the basic project and not with the project of execution for the indicated reasons previously, and since in this basic project a constructive memory does not exist that it defines how they are going away to make the material works nor what are going to be used, procedures logical of the possible works settle down to execute. However, in the security plan it will have to define how they are going away to really carry out the works, being followed the instructions indicated in the execution project, which will have to be approved by the coordinator of security designated for the execution of the work. In addition, in the security plan, the own procedures of work of the contractor will be due to introduce, since at this moment any company for the execution of the work has not been contracted.

The form to define the collective protections, according to the risks that are run in each case, will consist the present of one first determination of the intervening works in the different phases defined in study, to happen later to relate how it is going away to come to make the works, connecting it with general the collective protections to use during its execution. More ahead the particular risks will be defined that run when making each work.

All the described actions next will have to be watched and to be verified by the preventive resources.

**Phase 1: Previous performances:**

Before the beginning of any work, it will be come to place fence of protection that prevents the access to the work to any person other people's to the same one, locating in him a peatonal access and another one for the access of vehicles. The fence one will have to be strong, stable, fixed and blind, having to have a minimum of 2 ms of height. In the planes us 2.1. to 2.6. and 3 its situation is detailed and in nº 18 its composition is defined.

In each one of the mentioned accesses, posters of signaling in which it appears, like minimum will have to be placed, the following legend (or similars):

1. "It is prohibited the access to all person other people's to the work".
2. "The use of helmet and footwear of protection for the circulation by the work is obligatory".

3. "During the circulation by the work it respects the signalings of circulation, as well as the indications of the preventive resources"

In addition, it will have to be placed in visible place in each one of the entrances, a copy of the norms or instructions for the circulation of people by the work.

**Phase 2: Drained:**

a) Intervening works:

In this phase the works will be carried out of drained of cellar and execution of bataches (even ferrallado, encofrado and homigonado of shoes and walls).

b) Procedure of work and collective protections associated:

Once finished the fence one, it will be able to give to beginning the excavation. After conversations maintained with the author of the execution project the necessary procedures of work for the execution of the excavation have been advanced, with the purpose of being able to determine a safe form to make it. Next this procedure is enumerated and the collective protections to consider:

The drained one will be made in six phases, so and as it indicates in the plans us 2.1 to the 2.6., although this phase includes/understands only the three first (the other three are contemplated in the phase of laying of foundations).

In first stage (flat 2.1.), the excavation of the well of the crane will be made tower, coming after which to its installation. Since in the edge of the mentioned well one occurs to the nonavoidable risk of fall at different level produced by the vertical interval of relief between the level of the land and the one of bottom of the excavation, the same one with a railing of protection located to a meter of distance of the excavation will have to be protected so and as nº 2.1. (situation) and nº 14 is indicated in the planes (detail).

In the same way which in the previous case, since in the edge of the drained one (facades) it occurs to the nonavoidable risk of fall at different level produced by the vertical interval of relief between the level of the land and the one of drained bottom of, before beginning the works, the same one with a railing of protection located to a meter
of distance of the excavation will have to be protected so and as nº 2.2. (situation) and nº 14 is indicated in the planes (detail).

During this phase it will be come to form a thorough approach ramp of excavation that has a wide minimum of 5'5 milliliter (4'5 milliliter for access of vehicles and 1 milliliter for personnel access while the stairs cannot be placed - to see plane nº 2.3.). The mentioned incline will be equipped with railings of protection as a signaler so and as grafía in the corresponding plane, so that one of them limits the exclusive zone for access of people and the other serves to control the nonavoidable risk of fall of vehicles at different level by the slope from the incline.

Once finished the drained one, the execution of bataches will begin (phase third), following the directives marked by the facultative direction (flat nº 2.3.). As much the length as the number and order of bataches will come indicated in the project of execution or, otherwise, by the instructions of the work director, serving the described ones in the present study to solely be able to determine the safety measures and collective protections, having to be revision object when it is had the mentioned project of execution. The encofrado one of the retaining walls must have an suitable railing as well as servicing platform, of protection.

In all the cases the necessary slopes will be left according to is observed the behavior of the land.

After it, it will be come to place the stairs of thorough access of excavation and to make wells of the shoes (flat 2.4.).

Once finalized wells, it will be come to change of site the mentioned stairs and the approach ramp rolled thorough of excavation, with the purpose of being able to make bataches and shoes that have been where was the previous incline (flat nº 2.5.).

Last it will be come to the retirement of the incline.

In all the cases the necessary slopes will be left according to is observed the behavior of the land.

**Phase 3: Execution of the laying of foundations:**

a) Intervening works:

In this phase the works of reframing will be carried out, excavation, wrought iron, formwork, concrete and unfomwork of wells and ditches of laying of foundations, retired of the thorough approach ramp of stuffed laying of foundations and and well compaction on elevator pit
b) Procedure of work and collective protections associated:

After finalizing bataches, or even being able to get to put in them, it will be come to place the stairs of thorough access of excavation and to make wells of the shoes and ditches of stays (flat 2.4.). Once excavated wells and ditches, they will be protected with railing located to a meter of the edge (to see in plane 2.4. the propose protection type), which will not take off until the shoe has not been homigonada. In case to deal with shoes near pit of elevator that must lower to the inferior level of the same one, protections not will have to clear until the well until the level of drained bottom has not been filled up of (with the material which it defines the execution project), being eliminated therefore the risk of fall to different level. In order to accede to the bottom of well excavation at the time of making any work (like for example verification of levels of excavation and concrete, refraiming, armed, etc.), a ladder will be used, limiting and protecting the zone by which it is due to accede.

Once concrete the delays of the starting of the stairs from access to cellar, it will be come to place a protector so and as nº 16 is indicated in the plane.

In agreement they are executed elevator pits (filling and compaction), will have to be placed such around a railing that it prevents that the workers can run the risk of fall at different level. In addition a horizontal protection formed by materialized planks of 5 cm of minimum thickness will have to be placed so that covers the hollows totally, and as 2º is indicated in the planes of excavation and collective protections of cellar (flat us 2.4. to 2.6. and 5.1.).

Once finalized wells, it will be come to change of site the stairs of peatonal access and the approach ramp rolled thorough of excavation, with the purpose of being able to make bataches and shoes that have been where was the previous incline (flat nº 2.5.). The precaution will at any moment consider leaving the slopes necessary. In the zone where was the incline, railing of protection in the edge of the drained one will be placed, with the purpose of controlling the nonavoidable risk of fall at different level. In addition, throughout the incline, a railing of protection in the edge as a signaler will be placed, with the purpose of controlling the nonavoidable risk of fall of vehicles at different level by the slope from the incline. A poster at the beginning of the incline will also be placed that it indicates totally that it is of exclusive use for machinery, being prohibited the circulation of people by the same one.
Last it will be come to the retirement of the incline, so and as it is described in plane 2.6..

**Phase 4: Execution of the structure:**

a) Intervening works:

In this phase the works of reframing, armed will be carried out, formwork, and concreted unformwork of forged, prewall-plate of concrete, partition wall, ground floors, boxes of dividing stairs and elevator and of houses, refraiments of partitions. (even accomplishment of the first line of the fog rooms), enfoscados pillars and or plastered of quarters of accountants, positioning of ventilation conduits, positioning of bajantes, positioning and polishing (1ª happened) of terazo and installation of accountants and individual water posts.

b) Procedure of work and collective protections associated:

The phase of structure defined in planning of the present study with the execution of the pillars of the cellar will begin (reframing, armed, encofrado, hormigonado and desencofrado of such). Later it will be come to the accomplishment of the prewall-plate of concrete. When executing it it will have to consider that does not have to take off, under no concept, the plank protection placed in pits of elevator like security as opposed to the risk of fall at different level. It must also consider that will possibly exist overlaps of phases of work between the one of lying of foundations and the one of structure.

Once thrown the prewall-plate, the encofrado one of the forged ones will begin. The effective protection of the risk of fall of the workers from forging in execution at the inferior level will be made by means of the use of encofrados continuous. At the moment of the hormigonado one of the forged ones, the cases of the protection railings will have to be placed, in order that such can be placed and as it is indicated in the corresponding planes of the present study.

In order to protect of the risk of fall at different existing level in the elevator hollows during the execution of the encofrados ones and until the forged one has been hormigonado, encofrado will go in excess this, leaving totally covered the hollow. Once hormigonado, and always before conducting the recovered operation of of the encofrado one, will be placed a railing of protection (shrunk in the cases mentioned in the previous paragraph), and a horizontal protection formed by materialized planks of 5 cm of minimum thickness that covers the hollows totally, so and as it is indicated in the corresponding planes. Previously described also it is valid for any other hollow of similar
dimensions (for example those of natural ventilation of the cellars). In
the case of the small hollows of forged lazy for the passage of facilities
or small ventilations (for example those of enclosures of independence
of protected stairs), they will have to be protected, before recovering
boards of the encofrado one, with planks of 5 cm of minimum thickness
nailed to the forged one with steel faults.

In the case of the hollows of the stairs, protection railing will have to be
placed simultaneously that is encofrando (according to detail plane nº
14). Once hormigonado the forged one the railing of protection
absorbed in the corresponding cases will be placed, eliminating later
(and always before recovering boards) the railing of the encofrado
one.

The shanks of the stairs, since they cannot be concrete before the
superior forged one, will have to be step with wood planks so that the
workers can accede at any moment to the plants by a safe place. This
decision is taken since not always it is possible to be acceded to the
forged one in construction by means of ladders. Once concrete, the
corresponding railing of protection will have to be placed so and as it is
indicated in the corresponding planes.

Once executed forged 1º the consequent collective protections in the
formwork ones will have to be placed (protection railings).

As much in forged 2º as in the following ones the specified thing for the
protection of hollows of all type and shanks of stairs will be due to
consider previously.

From the plant forged one first (forged 2º) the protection networks will
have to be placed so so that always prote'ge' has left all the perimeter
like minimum to a height of 1'00 millimeter, and as it is detailed in the
corresponding section. Before it, in agreement it is come to ruin the
encofrado one of the mentioned plant will settle railings of protection in
the edge of the same one, maintaining them, like minimum, until the
protection networks are placed.

The protection networks will serve so much to protect to the people of
the risk of fall in height, like avoiding the fall of wood or encofrados
metalists to the emptiness during the operations of desencofrado. It will
not be come to the desencofrado one if they are not in good condition
the safety nets.

To the installation of the protection networks and its later hoistings, it will
be had, whenever it can, collective protections (protection railings), in
all the affected plants that avoid the risk of fall at different level which
the workers run who conduct this operation. In case that it is not possible
will equip to all the affected workers with moored lap belts strongpoints with the structure (p.e. pillars), preventing the passage to the rest of workers to the zone that is left by means of railings or signalers unprotected. They will have to be placed, with the greater possible brevity, the railings indicated in the corresponding planes. At the moment at which it has been placed the totality of the mentioned railings and has subjected the networks on the other hand inferior, will be able with no need to allow the passage to the plants affected to the set of workers of the work of which prote'ge's with lap belt go. This operation will have to be watched and to be supervised by the preventive resources, having to paralyze the works in case of finding some deficiency, communicating it to it immediately to the security coordinator so that it can give the necessary instructions for his suitable correction.

Concluded the execution of the forged one of first plant, the indicated marqueses of protection in the plane of ground floor of the present will settle study to protect the accesses to work of the workers as well as of possible falls of objects to the passers-by.

Once uniformwork said forged, it will be come to execute tabiquería of the cellars and the ground floor. In order to serve the necessary material, an entrance will be prepared that is left prote'ge'e with marquee and that allows the entrance of a fork-lift truck or to dumper. In no case the collective protections of the elevators will be due to clear.

During the positioning and the polished one of terrazo, they will have to remain placed the railings of protection with all his elements.

**Phase 5: Execution of the facades:**

a) Intervening works:

In this phase the works of facade closings will be carried out (reframings and execution), enfoados of inner facades, isolation of cameras (with polyurethane foam), tabiquería inner, positioning of ventilation conduits (completion), positioning of bajantes (completion), positioning and polished (1ª happened) of terrazo (completion), plumbing installation (posts, individual copper of houses, water-drainages), electrical system (tube in posts and houses), cavés in corridors and fog rooms (except detachable ceilings), enfoados maestreados and tiled of fog rooms, plasterings of houses, cover slope formation, waterproofing and paved of general covers and fog rooms.

b) Procedure of work and collective protections associated:
The facade will be made with hung scaffold such and as it defines in the sections of procedures of work by intervening offices and average aids. For the execution of the same one, before retiring the protection railings, the zone will have to be limited that is going to be unprotected by means of a danger signaler (railing or similar), being able to accede to the mentioned zone provided solely with lap belt. At the moment at which a railing of 90 cm of height will be able to take off the mentioned signaling. In case that they are left zones of the facade with an inferior protection to 90 cm. of height, like for example in railings of balconies where later a railing of closing or in windows with preframe is going to be placed whose inferior part does not surpass mentioned the 90 cm., will be obligatory to place, before retiring the signaling, a protection that will have to remain until the positioning of the definitive elements. In the case of the railings of balconies, its access by means of the positioning of a railing by the outside of the access door to the same one will have to be prevented. In the case of the windows a tight prop against the jambs as a banister rails and to a minimum altitude of 90 cm will be placed strongly.

In agreement are fence tabicando the closings of the cover of casetones, it will be replaced the railing absorbed in the concrete placed in the phase of structure, by other than one screws to the railings of such, in order that it serves as protection against the fall of people at different level by the lateral one from the mentioned cover, at the time of making diverse works (slope formation, spill of the cellular concrete, layer of compression, waterproofing, paved of the cover, cleaning of the same one, maintenance...).

Phase 6: Finished:

a) Intervening works:

In this phase the works of plumbing installation will be carried out (posts, copper of houses, individual water-drainages), electrical system (tube in posts and houses), carves in corridors and fog rooms (except detachable), enfosados ceilings maestreados and tiled of fog rooms and plasterings of houses, slopes of covers, waterproofings, positioning of paved of covers, stoneware positioning in fog rooms, peldañead of stairs, installation of gas, positioning of metallic carpentry, assembly of kitchen furniture, positioning of metallic carpentry (iron and aluminum), acristalamiento, painting (common houses, cellars and), wood carpentry, polished (2ª happened) and abrillantado of terrazo, vestibules (finished of marble and wood, paved < positioning and polished >, mirrors...), assembly of toilet, assembly of electrical mechanisms of houses, assembly of collective antennas... and the rest of completions of the building.
b) Procedure of work and collective protections associated:

In the phase of finished the risk of fall at different level by the lateral ones exists as much from the stairs like by the hollows lazy in facade for the entrance of materials and to clean the rest of the floor.

The risk of the stairs will be controlled with the railing of protection placed during the phase of structure. However, at the time of peldañear them, one will be due to be retiring by being able to place the marble. In order to avoid that there are accidents, the transit by them will have to be prevented, directing by means of posters as it will be the alternative way to follow (other stairs). This point is very important that vigile/n el/los recurso/s preventivo/s, having to verify that nobody circulates around stairs sections that are unprotected. In the same way that takes off the sections to place, once placed it will be recovered the railing as is possible to be above, no allowing that circulates nobody around the mentioned section until it has been left prote'ge'.

It will happen the same later, when between yesaire plastering them. In the same way which in previous, in agreement the case it is retired railings to plaster sections, it will be condemned the step and redirecting the transit of people towards other stairs, being obligation of preventive resources to watch that this measurement is effective and is made correctly. Since the definitive railing will not be placed until totally the stairs have not been plastered, in agreement is finishing to sections yesaire, it will be recovered the retired railing, moment at which will be able to return to be allowed the transit by the section.

Like in both previous cases, at the time of placing the definitive railing, first the one of work must retire reason why it will have to prevent the transit by her until it has been totally placed. The preventive resources must be to watch the execution of these works, as well as the effectiveness of the adopted measurement.

With respect to the hollow left in facade for the transit of materials (entered and desescombo), it will have left prote'ge' by the positioning of the platform of unloading of materials and the tube of to clean everything, as well as with the closings of railing necessary to finish covering the hollow. The front railing of the platform will only retire for the introduction of the material, having to remain closed at any other moment.

At the time of making the closing of the hollow, as it is open once cleared the platforms, it will have to be protected with railing. In agreement it is closed, and only when the scaffold has arrived at the
corresponding plant, the railing will be able to be retired.
1.5. INSTRUCTIONS OF SECURITY FOR THE CIRCULATION OF PEOPLE BY THE WORK AND USE OF PROVISIONAL AUXILIARY ELECTRIC OF WORK.

It is tried to describe in this chapter a series of norms (preventive measure, articles of individual protection...) necessary to be able to accede and to circulate around the work of safe form. These norms will have to fulfill them all people which they accede to the work, independently of the work which they are going to make in the same one (workers, providers, technical attendances...), having to be exposed in the work, perfectly visible as much in the entrance to the same one, like in clothes and panel of announcements.

The preventive resources or in its defect the legal representatives of each company that makes some work in the work, must to give a copy of the present norms to all its working presents in the work (including independent, subcontracted companies or providing). Of this delivery a copy of the registry of the same one to the security coordinator will have to be left certainty written by means of company/signature of the worker, giving.

The mentioned registry, is one of the adopted measures to control the access to work demanded by R.D. 1627/97.

NORMS OF ACCESS and CIRCULATION BY WORK:

- No entry in the work without before to it not to have warned it to preventive resources; debe/n to know how it to make an effective control of access to work, by its good and the one of the rest of the workers.

- Everybody who between in the work will have to go provided with footwear of security with metallic group and helmet of protection. Both protections will have to be in correct state. In case of making some work with tools or materials that can fall, the footwear must also have metallic toe with the purpose of controlling the nonavoidable risk of fall of objects in manipulation. Remember that the mentioned protections have a lapsing, last which do not guarantee their effectiveness.

- It never must walk over rubbish (a fault could undergo a twist, a slip, a fall, nail...).

- It never must step on a plank or piece of wood that is lazy in the ground. It could have some nail let by forgetfulness or be cleaning it then and to nail it to it.

- In case of seeing a danger signaling that cuts the step it must avoid crossing it. This signaling is indicating a zone of access
restricted or prohibited. If recurso/s has necessity to cross it consúltele to el/los preventivo/s, they will indicate to him which is the correct form to do it.

- Case does of the existing indicating posters by the work.

- It does not clear, under no concept, a collective protection without before it to have consulted and wamed to el/los recursos/s preventivo/s, because deberán to take necessary the preventive measures before leaving the zone unprotected. Only under the supervision of the mentioned preventive resources it is possible to be retired a protection and/or to be worked without her.

- If it finds some protection in badly been or badly placed, adviértalo immediately to the preventive resourses.

- It circulates without haste. It does not have to be running by the work because it could suffer an accident.

- In case of being obstacles (scaffolds of borquetas mounted or elevated servicing platforms, with workers working on them), esquívelos changing of way. Although it gives a roundup, he is preferable to that it suffers or it causes an accident by you overlap with the made work.

- If it must make use of some picture of the electrical aid, hágalo using the pins adapted for its connection. If pregúnteselo to el/ellos el/los has some doubt recurso/s preventivo/s they will remove to him from doubts.

- If any other doubt arises to him during its transit by the work, does not improvise, notices and asks the preventive resources that is one of its functions.

**NORMS OF USE OF PROVISIONAL WORK AID ELECTRICO:**

- The connections to provisional electrical work pictures will be made with standardized pins armored (protected against indirect bondings) and with look. Totally it is prohibited to directly connect bare cables to the pictures without the use of the corresponding pins.

- Each taking of current will provide electrical energy to a single apparatus, machine or machine-tool.

- The tension always will be in the pin “female”, never in the "male", to avoid the direct electrical contacts.

- The current takings will go provided with cut switches to
omnipolar that it allows to leave them without tension when they do not have to be used.

- With respect to the hose use extensions the following thing will consider:

1. - If they are for short periods of time, will be able to take tended by the ground, but brought closer to the vertical parameters.

2. - If they are going to remain a long period of time they will have to take hung by ceiling to a minimum altitude of 2 ms until the workplace.

3. - In case of being necessary to join them, watertight standardized connections will be used antihumidity or termorectáctiles insulating covers, with minimum protection against water spurts.

- Totally it is prohibited to manipulate the electrical pictures. In case that it observes some anomaly in one of them, adviértalo immediately to el/los recurso/s preventivo/s of the work; they will warn the corresponding technician so that she comes to his repair.
1.6. IDENTIFICATION OF RISKS AND PREVENTIVE MEASURES TO ADOPT IN THE DIFFERENT WORK ACTIVITIES

In this section, a relation of the works that foreseeably will take part in the execution of the project, as well as of the adoption of necessary the preventive measures for its accomplishment tries to be made. However, it is possible to remember that the present study of security and health has been made with the basic project and not with the project of execution for the indicated reasons previously, reason why in this basic project does not exist a constructive memory that it defines how they are going away to make the material works nor what are going to be used.

On each point the own risks are identified existing type by the execution of each work, as well as the preventive measures and protections to adopt to control and to reduce these risks. In the security plan it will have to define how they are going away to really carry out the works, being followed the instructions indicated in the execution project, which will have to be approved by the coordinator of security designated for the execution of the work. In addition, in the security plan, the own procedures of work of the contractor will be due to introduce more concretely, since it has at this moment not been contracted any company for the execution of the work, identifying the own specific risks, as well as the preventive measures and technical protections that they try to adopt to control them and to reduce them.

For the definition of each work, the indicated form has been adopted next:

a) Definition of the work: it consists of an enunciation of the works that will take part in each one of the activities.

b) Average aids to use: they determine themselves as they are the average aids who anticipate themselves to use. The identification of the risks of each one of them, as well as the preventive measures and technical protections to adopt, will come indicated in the section corresponding to average aids, reason why it will have to be taken care of the mentioned thing in such.

c) Material to use: they indicate themselves what material will be used in the execution of the works. Just as in the previous point, he will have to be taken care of, in each case, to the stipulated thing in the section of materials of the present study.

d) Work Machinery and tools: one mentions in this point the necessary machinery and tools for the total execution of each work that takes part in the activity. Just as in the previous points, the
Identification of the risks of each type of machinery or tool, as well as the preventive measures and technical protections to adopt will come indicated in the section corresponding to average aids, reason why it will have to be taken care of the mentioned thing in such.

e) Identification of risks: a relation of the own risks of the work will be contributed to make, without including the pertaining ones to the use of average aids, machinery or materials, since they are already defined in the corresponding sections. Within this epígrafe it is defined, for each risk, the following thing:

1-> Collective protections: in case of using particular collective protections for the accomplishment of the works that are not indicated in the section of "Collective protections to use during the constructive process" of the present study of security, they are indicated in this point, opposite case are not mentioned.

2-> Individual protections: it is indicated what particular individual protections it will be necessary to use for each one of the intervening activities in each procedure of work. They do not include necessary for the use of the average aids, machinery nor material, since or they are defined in the corresponding sections.

3-> Preventive norms: the intrinsic preventive norms to the accomplishment of the works are mentioned, as well as (if it comes) the procedures of safe work. They do not include necessary for the use of the average aids, machinery nor material, since or they are defined in the corresponding sections.

Earthwork:

a) Definition of the work:

This section includes/understands the works of drained of cellars, execution of bataches (only earthwork) and excavation of wells and ditches of shoes and stays by means of average mechanics, as well as the reframing of lines of excavation and wells, the verification of plomos of excavation and the refining by hand of earth. The accomplishment of these works will be carried out so and as it indicates in the section 1.4. phases 2 and 3 of the present study of security.

b) Average aids to use:

For the accomplishment of the works that include/understand the earthwork, supported ladders will be used on the land.
c) Material to use:

The necessary materials for the execution of these works, will be:

1-> Plaster (to mark the reframings).
2-> Small used steel pieces like aid in the marked one of the reframings.

d) Work Machinery and tools:

The machinery to use in the mentioned works will be:

1- Shovel shipper of wheels.
2- Hydraulic backhoe of wheels.
3- Dump truck.
4- Dumper.
5- Mixed excavator on wheels.
6- Mini excavator.

The tools to use will be:

1- Regulate metalists for the verification of plomos.
2- Shopping baskets for the refining of earth (small manual tool).
4- Flowerpot.
5- Shovels, tips and legonas for the refining of earth.
6- Optical level and strip, to remove levels from excavation.
7- Tachymeter.

e) Identification of risks:

During the accomplishment of the work of earthwork, the following inherent particular risks to the own works are identified:

**Earth collapse on people.** This risk consists of the possibility that a collapse of earth sloped or batache takes place on the workers who are working in the proximities. Among other causes, the mentioned ones will have to consider very next:

- During and after to have produced rains or a breakage of a pipe of water conduction.
- Earth under sidewalks badly compacted or loose sands or gravel by the passage of facilities by the same ones.
- Circulation of vehicles by the neighborhoods.
- By ascent of the phreatic level.

Collective protections: it will have to stay signaled the zone that is susceptible to run this risk, so that they only can accede to same the workers who need to work in the zone. For it a railing of protection or similar will be used. In the case of wells or deep ditches where some work is due to make (for example in wells of the shoes of elevator pits), a timbering of the same one will have to be made. In the case of bataches, a propping as a timbering will be made so and as it is indicated in the plane of corresponding detail.

Preventive measures:

i. El/los recurso/s preventivo/s deberá/n at any moment to watch the state of earth, warning of any anomaly observed the one in charge of the work, the head of work and the coordinator of security in the phase of execution, and ordering to the rest of workers the paralysis of the works and the retirement of the precarious zone.

II. In case of the breakage of a pipe of canalization of water or rains that can have produced damages in the land, el/los recurso/s preventivos/s vigilará/n that does not accede any worker to the affected zone (land slopes, cuts in bataches, etc.), hoping that the facultative direction and the coordinator of security in phase of execution issue the necessary orders for the correct safe solution of the problems.

III. In case of water accumulation in bataches, laying of foundations bottoms, next to slopes (by the superior or inferior part), etc., el/los recurso/s preventivos/s will have to supervise the bailing of the same one, with the purpose of avoiding collapses.

IV. The front of advance and lateral slopes of drained and bataches, as well as the timbering existing, will be reviewed by el/los recurso/s preventivos/s before resuming the tasks interrupted by any cause, with the purpose of detecting the alterations of the land that denote loosening risk, having to warn immediately to the coordinator of security in case of locating to some anomaly, leaving certainty in writing of it.

v. In case that some vehicle must approach the coronation on the brink of madness, el/los recurso/s preventivos/s will have to control that he does not remain a worker under the zone of influence, as well as that the land does not undergo any variation.

VI. saw In case that it is necessary the circulation by the neighborhoods of some type of machinery (machinery of excavation,
concrete trucks, dumpers, etc.), these will have to circulate to a minimum of 3 ms of distance of the coronation in the case of light vehicles or 4 ms in the case of heavy vehicles, having to be perfectly signalized with subject tape to supports or similar. The preventive resources must to verify at any moment that this signaling is in perfect state.

VII. Will not have to gather together material in the edges of the coronation of the slopes or bataches.

**Super-effort:**

Next reference to a possible cause becomes of sobreefforts produced during the execution of the works:

- Transport of reframing apparatuses (tachymeter, level).
- Fine of earth with shovels, tips, etc. on shopping baskets, as well as their transport and drained.
- Inadequate Positions at the time of making the reframings.

**Preventive measures:**

It will be taken care of had in the ergonomics section of the preventive plans of la/s empresa/s that take part in the works. It will have to be verified that this point appears in the plan of corresponding security.

**Fall of people at different level by the edge from the excavation and the slopes.**

This risk consists of the possibility that the workers can fall by the edge of the excavation or the access to the bottom of the same one.

**Collective protections:** it will be taken care of the arranged thing in the section of collective protections, in concrete in the mentioned thing in the phase of execution of the drained one.

**Individual protections:** in case of having to make some work in the edge of the excavation or the slopes and that to the accomplishment of the same one a collective protection cannot be arranged, the worker it will have to make use of a lap belt antifallen moored to a strongpoint supervised by the preventive resources.

**Preventive measures**:

i. The preventive resources must at any moment to verify the state of the collective protections, being in charge of which they are replaced in case of detecting some anomaly, leaving certainty written
of it, and prohibiting to the rest of workers the access to the zone until it is corrected.

II All the personnel who must accede to the work will have received the information corresponding to the circulation by the same one in phase of drained and laying of foundations. The preventive resources must to put record of it.

III. It is prohibited totally to remain in an excavation front that is not adjusted nor protected by means of railing.

IV. In order to accede to the bottom of bataches, ladders will be used that fulfill the established thing in the corresponding section of average aids of the present study of security. The preventive resources must to verify that the access such is being made of this form, being warned any worker who makes it incorrectly of how he must do it. All the workers who must accede to bataches must have received formation of security necessary to make the mentioned access correctly.

V. In moment which it can (that is to say, at the moment in that the first section of retaining wall has been hormigonado), it will settle the drained stairs of thorough access of that indicates in the planes nº 2.3. to the 2.6.. The preventive resources must to verify and to verify that this stairs are placed such and as is indicated in the plane of corresponding detail.

**Foundations:**

a) Definition of the work:

This section includes understands the works of concrete spill of cleaning, ferrallado, encofrado (in its case) and hormigonado of the shoes and stays, even worn of ferralla. In case of considering it necessary the facultative direction, also the compaction of the bottoms of foundations by means of average mechanics will be included in this activity.

b) Average aids to use:

For the accomplishment of the works of laying of foundations, ladders supported on the land and planks and boards will be used to create footbridges at the time of hormigonar (to see detail plane). At the time of hormigonar, in case of not doing it by means of pumping, a cupola will be used.

c) Material to use:
The necessary materials for the execution of these works, will be:

1. Concrete.
2. Elaborated iron.

d) Work Machinery and tools:

The machinery to use in the mentioned works will be:

1. Crane tower.
2. Vibrator of needle.
3. Circular mountain range of cut, for the accomplishment of pillars, formwork and footbridges.
4. Radial, to cut lazy auxiliary irons in the laying of foundations for formwork of the retaining walls or the any other work that arises.
5. Truck concrete mixer.
7. Vibrating tray, in case it is necessary the accomplishment of the compaction of foundations bottom.

The tools to use will be:

1. Lead (small manual tool).
2. Level (small manual tool).
3. Flowerpot (small manual tool).
5. Leg of goat (small manual tool).
7. Shovels, tips and legonas for the accomplishment of formwork.
8. Optical level and strip, to remove levels from foundations.
9. Tachymeter, for the reframing of the pillars.

e) Identification of risks:

During the execution of the laying of foundations, the following inherent particular risks to the own work is identified:

**Super-effort**

Next reference to a possible cause becomes of sobreefforts produced during the execution of the works:
- Spill of the concrete.
- Transport and positioning of ferralla.
- Transport of reframing apparatuses (tachymeter, level).
- Inadequate Positions at the time of making the reframings.

**Preventive measures:** it will be taken care of the arranged thing in the ergonomics section.

**Earth collapse on people.** This risk consists of the possibility that a collapse of territories of bataches can take place or the wells of foundations on the workers.

**Collective protections:** it will be taken care of the arranged thing in the section of collective protections, in concrete in the mentioned thing in the phase of execution of the drained one.

**Preventive measures:**

i. All the personnel who must accede to the work will have received the information corresponding to the circulation by the same one in phase of drained and laying of foundations. The preventive resources to put record of it.

ii. Batache will be signalized at every moment that remains open without hormigonar, being function of the One in charge of Work and the preventives resources exist in work to be kind of which nobody approaches too much the same.

iii. The preventive resources must to watch the performances of the workers who are working as much in bataches as inside foundations wells (in special in those of the elevator pit), verifying that do not take place any anomaly in the state of the land, in special at the moment of introduction of ferralla and of the vibrated spill and of the concrete in shoes.

iv. Materials will not be gathered together nor will on the brink of madness allow to the passage of vehicles laying of foundations wells. The preventive resources must to watch that this is thus.

v. It must be tried to introduce ferralla totally elaborated inside the shoes not to conduct the operations of tied in his interior.

**Fall of people at different level** at the time of concrete foundations wells.
**Collective protections:** For the operations of concrete and vibrated from positions on the foundations movable servicing platforms will settle down that allow the workers to make their work surely. This platform will have to be sufficiently resistant (the material of which must be formed will be like minimum planks in good state of 5 cm of thickness) and wide (like minimum 1 millimeter), arranged perpendicularly to the axis of the zone of shoe to fill.

**Pillars:**

a) Definition of the work:

The work consists of the execution of the structural pillars of the work, being made as it follows:

In the first place it will be come to the reframing from such, continuing with the positioning of the armor with the help of the crane tower, after which it will be come to plumb and to tie the armed one to the delays. Once placed the separators, it will be come to the application of the desmoldeante in the encofrado one and to its installation. Later the pillar will be hormigonará from a hormigonado tower of, by means of spill with tumbler. In agreement they are hormigonando the pillars, they will collapse, helping of wood wedges and a goat leg. When it has hardened the concrete, it will be come to the desencofrado one of the pillar, cleaning and gathering together the encofrado material of for its later use.

In any case it will be taken care of the specifications indicated on the part of the manufacturer and/or provider of each one of the intervening elements in the constructive process (chapter I SAW, art. 41 of Law 31/1995 of P.R.L).

b) Average aids to use:

For the accomplishment of the mentioned works, the following auxiliary means will be used:

1- Ladders.
2- Scaffolds of borriquetas.
3- Concrete tower of.
4- Cupola.

c) Material to use:

The necessary materials for the execution of these works will be:
d) Work Machinery and tools:

The machinery to use in the mentioned works will be:

1- Crane tower.
2- Vibrator of needle.
3- Circular mountain range of cut.
4- Radial, to cut lazy auxiliary irons in the laying of foundations for encofrado of the retaining walls or the any other work that arises.
5- Truck concrete mixer.

The tools to use will be:

1- Lead (small manual tool).
2- Level (small manual tool).
3- Hammer (small manual tool).
4- Pliers (small manual tool).
5- Leg of goat (small manual tool).
6- Grifa (small manual tool).
7- Cats (small manual tool).
8- Shovels, tips and legonas for the accomplishment of encofrados and encamillados.
9- Tachymeter, for the reframing of the pillars.

e) Identification of risks:

**Super-effort:** next reference to a possible cause becomes of sobreefforts produced during the execution of the works:

- Spill of the concrete.
- Transport and positioning of iron.
- Transport of reframing apparatuses (tachymeter, level).
- Inadequate positions at the time of making the reframings.

**Preventive measures:** all the workers will have received formation on ergonomics, in special referring to the works previously enumerated.

**Fall of people at the same level:**

**Preventive measures:** The storing of the plates of fromwork will be
made on foot of each pillar. The preventive resources will watch that it exists the suitable cleaning and necessary order in the work.

**Fall of people at different level:**

**Preventive measures:**

i. At the time of hormigonar the pillars, it will be always remained on the servicing platform, totally being prohibited apoyarse on plates of encofrado. In addition, the chain of closing of the access of the “turret or hormigonado tower of” will remain moored, closing the set whenever on the platform some worker exists.

ii. Totally he is prohibited to climb up the formwork ones of the pillars or to remain in balance on the same.

iii. All these measures will be watched over the preventive resources. IV. The concrete one and vibrating of the concretes of pillars, concrete will be made from “tower of”.

**Inadequate illumination:**

**Preventive measures:** in case that it was necessary to hormigonar at night, the positioning of sufficient centers will be had predicted that they allow to perfectly seen or the zones of work and the operations make.

**Cuts with objects**, in concrete with the iron straps lazy in the formwork ones of the pillars being able to concrete them:

**Preventive measures:** to the latiguillos and separators in the pillars already executed and unformword will be cut to avoid the risk of cuts and prinks to the passage of the workers near them.

**Traditional character:**

a) Definition of the work:

The work will consist of the execution of the prewall-plate of the cellar 2º, being carried out as it is described next:

In the first place, it will be come to the cleaning of the zone to execute so much of rubbish as of material and auxiliary means that can have by the zone. In case that zones of the land exist that have been loose or little compact after the execution of the excavation, the laying of foundations or the pillars of structure, it will have to be compacted with average mechanics (compactadores trays or rollers). After this operation concrete will be come to remove the levels from, placing planks like reference and aid to the work, cutting the planks that are necessary for the correct leveling. Once removed the levels, it will be
come to spill the concrete (provided from plant), by means of tumbler, vibrating the surface with strip, reviewing the same one with talocha. In order to distribute the concrete correctly, rakes and shovels will be used. In agreement they are fence finishing off the tracks will retire support planks, leaving empty the space that is to fill up it with sand later. The cured one of the concrete will be made by means of irrigation with water. Once hardened, if it had been left some plank absorbed in the concrete, this one will take off with the help of a goat leg.

b) Average aids to use:

For the accomplishment of the mentioned works, planks and boards will be used to create footbridge concrete one. At the time of concrete a cupola will be used.

c) Material to use:

The necessary materials for the execution of these works will be:

1- Concrete.
2- Nails.

d) Work Machinery and tools:

The machinery to use in the mentioned works will be:

1- Crane tower.
2- Vibrating Tray.
3- Circular mountain range of cut, for the cut of planks, tacos and wedges at the time of removing the leveling, as cue well as in the formation of footbridges.
4- Truck concrete mixer.

The tools to use will be:

1- Level (small manual tool).
2- Flowerpot (small manual tool).
3- Leg of goat (small manual tool).
4- Shovels, tips and legonas for the accomplishment of formwork.
5- Optical level and strip, to remove levels on planks.

e) Identification of risks:

**Super-Effort**: next reference to a possible cause becomes of sobreefforts produced during the execution of the works:
- Cleaning and compaction of the land.
- Positioning of leveling planks.
- Transport of leveling apparatuses.
- Spill of the concrete.
- Distribution of the concrete by means of rakes and shovels.
- Inadequate Positions at the time of making the reframings.
- Retired of fresh and hardened concrete planks.
- Vibrated of the concrete with vibrating strip.
- Finished of the concrete.

**Preventive measures:** all the workers will have received formation on ergonomics, in special referring to the works previously enumerated.

Forged formwork and lightenes elements of:

a) Definition of the work:

The work consists of the accomplishment of the encofrado one of the forged ones, as much below the level ± 0,00 like over her. Since substantial differences with respect to the collective protections exist to use in both cases, in the identifying landmark of risks it will have to indicate his differences.

In any case, the own execution of the works will not vary and will be made of the following way:

In the first place it will be come to the reframing of the reference levels of the pillars. In the same way those singular elements will be reframed all to consider (stairs, beams of hang, etc.). After this operation, it will be come to have the encofrado one according to the instructions of assembly given by the manufacturer and/or provider the encofrado one (chapter I SAW of the L.P.R.L.). Once arranged, it will be come to reframe the situation of the used concrete blocks like aligerante element, as well as to the positioning of such.

Once the forged one has turned the time necessary of hardening of the concrete, will be come to its unfoomwork, piling up the material and removing it by the edge from the forged one.

b) Average aids to use:

For the accomplishment of the mentioned works, the following auxiliary means will be used:

1. Ladders.
2. Scaffolds of boriquetas.
3- Tubular scaffold with wheels (for the assembly of the formwork one by the inferior part).

c) Material to use:

The necessary materials for the execution of these works will be:

1- Elements of the encofrado one.
2- Props.
3- Boards, planks and tables.
4- Steel faults and nails.
5- Wire.
6- Concrete blocks.
7- Palets.
8- Expanded polystyrene.

d) Work Machinery and tools:

The machinery to use in the mentioned works will be:

1- Crane tower (including all its auxiliary organizational elements).
2- Circular mountain range of cut.
3- Caladora mountain range.

The tools to use will be:

1- Lead (small manual tool).
2- Level (small manual tool).
3- Hammer (small manual tool).
4- Pliers (small manual tool).
5- Leg of goat (small manual tool).
6- Cats (small manual tool).

e) Identification of risks:

During the execution of the encofrados ones in general, the following inherent particular risks to the own work are identified:

**Super-effort:** next reference to a possible cause becomes of sobreefforts produced during the execution of the works:

- Load and positioning of the components of the formwork one (even boards, planks and tables).
- Inadequate Positions at the time of making the refarmings.
**Preventive measures:** all the workers will have received formation on ergonomics, in special referring to the works previously enumerated.

**Fall of people at different level** at the time of executing the formwork one of the plants:

Individual protections: the workers who are going to place the elements of the encofrados ones from the superior plane will use subject retráctiles lap belts to strongpoints of the structure (p. ej. pillars). These belts will be of the Alsina mark or similar

**Preventive measures:**

i. Until the encofrada plant is not established completely and with the protections pertinent of edge placed, all the workers who work or circulate around the same one will have to go previously provided with the mentioned individual protection. It is especially important that this phase of work is watched and verified by the preventive resourses.

II. The preventive resources will notice of the risk of fall different level from the personnel who must walk on wooden framework.

III. It is recommended to avoid being above by the excessively warped boards, that will have to be rejected immediately before their putting.

IV. It is recommended to walk simultaneously supporting the feet in two boards, that is to say, on the meetings.

V. The ascent and reduction of the personnel to the encofrados ones will take place through prescribed ladders.

**Fall of objects on people**, when making the workings of desencofrado or by badly piled up of the wood:

**Preventive measures:**

i. The loosening of boards will be executed by means of metallic nail, conducting the operation from a zone already unfomwork.

**Order and cleaning:**

**Preventive measures:**
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i. Concluded the unformwork one, the boards for their transport will be piled up ordenadamente on emplintadas trays, subject with ropes tied with sailor knots (networks, canvases, etc.).

II. Finished the unformwork one, it will be come to a sweeping of the plant to retire the rubbish and behavior to his spill by means of tubes (or emplintada trays).

III. One will take pains the order and the cleaning during the execution of the works.

IV. Once concluded a determined edge, it will be cleaned eliminating all the leftover material, which will be piled up, in a place known for his later one retired.

Blows and cuts by immovable objects:

Collective protections: cubridores of wood will settle on the delays of ferralla of stairs slabs.

Footsteps on sharp objects and rubbish:

Preventive measures:

i. The existing nails or ends in the used wood will be extracted.

II. The loose or uprooted nails will be eliminated by means of a piled up sweeping and in place known for their later one retired.

Derived risks to work outdoors:

Preventive measures:

1-The works will be suspended if it rains.

Inadequate illumination:

Preventive measures: in case that it was necessary to hormigonar at night, the positioning of sufficient centers will be had predicted that they allow to perfectly see or the zones of work and the operations make.

Iron (put in work):
a) Definition of the work:

The work consists of the positioning of ferralla on the encofrado one. For its accomplishment the following thing will consider:

In the first place it will be come to the reframing from the beams, bands and nerves on the encofrado one. After this operation and always after to have placed the concrete blocks (will be come to place ferralla of the beams in the first place, followed of the bands to end the nerves and stairs. After it it will be come to the footwear of the mentioned elements with separators. Later the negatives of the nerves will be placed. Finally mallazo will be arranged.

b) Average aids to use:

For the accomplishment of the mentioned works the use of any average aid is not anticipated.

c) Material to use:

The necessary materials for the execution of these works will be:

1- Elaborated
2- Iron.
3- Mallazo.
4- Separators.
5- Wire.

d) Work Machinery and tools:

The machinery to use in the mentioned works will be:

1- Crane tower.

The tools to use will be:

1- Pliers (small manual tool).
2- Grifa (small manual tool).
3- Leg of goat (small manual tool).
4- Shears of hand (small manual tool).

e) Identification of risks:
During the positioning of ferralla, the following inherent particular risks to the own works are identified:

**Super-effort**: next reference to a possible cause becomes of sobreefforts produced during the execution of the works:

- Load and disposition of ferralla in work.
- Grifado of bars.
- Inadequate Positions at the time of making the reframings.

**Preventive measures**: all the workers will have received formation on ergonomics, in special referring to the works previously enumerated.

Cuts and hurt in hands and feet by handling of round of steel.

**Preventive measures**: all the workers will have received formation and information on how making their work of safe form.

**Crushings during the operations of loads and unloading of packages of ferralla**.

**Preventive measures**:

i. The aerial transport of packages of armors by means of crane will be executed suspending the load of two separated points by means of slings.

ii. The maneuvers of location "in situ" of ferralla mounted will be guided by means of a team of three men; two, will guide by means of ropes in two-way traffic the piece to locate, following the instructions of third that will manually come to carry out the corrections of plumbed.

**Falls at the same level, slips and twists when walking on the armors**.

**Preventive measures**: "ways of three planks of width" will settle (60 cm. like minimum) that allow the circulation on forged in phase of armed of negatives (or tended of mallazos of distribution).

**Falls at different level**.

**Preventive measures**: any work in the perimetral zone
without before being is prohibited correctly installed the networks or railings of protection.

Blows by fall or uncontrolled turn of the suspended load.

Preventive measures: it is prohibited On guard vertical the aerial transport of armors of pillars. They will be transported suspended of two points by means of slings until arriving next to the station, depositing itself in the ground. The vertical transport for the exact location "in situ" will be only allowed.

Order and cleaning:

Preventive measures:

i. Iron mounted (pillars, grills, etc.) it will be stored to this end in the designated places. II. The wastes or cuts of iron and steel, will take shelter gathering together in the place determined for their later load and transport to the garbage dump.

Concrete of forged:

a) Definition of the work:

The work consists of the hormigonado one of the forged ones by means of truck of concrete pumping. For its accomplishment the following thing will consider:

In the first place it will be come to place the gauges that serve as reference to reach the height of the compression layer, after which it will go to water the zone to hormigonar, verifying that is not any broken block or in bad conditions. Later it will be come to hormigonar, vibrating beams, bands and nerves with needle vibrator and the layer of compression with vibrating rule. Finally the finished one of the forged one with talocha will be reviewed. Once finished each section it will be come to change the gauges the following one, conducting again the same operations.

b) Average aids to use:

For the accomplishment of the mentioned works the use of any average aid is not anticipated. It is only possible that it is necessary the use of a cupola to hormigonar some point of the forged one where to the pump it is impossible to him to arrive.

c) Material to use:
The necessary materials for the execution of these works will be:

1- Concrete.
2- Water.

d) Work Machinery and tools:

The machinery to use in the mentioned works will be:

1- Crane tower (in case of being necessary its support not to get the pump at the set from the forged one to pump).
2- Truck of concrete pumping.
3- Vibrator of needle
4- Vibrating Tray.

The tools to use will be:

1- Talochas (small manual tool).

e) Identification of risks:

During the spill of the concrete, the following risks are identified inherent individuals to the own work:

**Super-effort:**

**Preventive measures:** all the workers will have received formation on ergonomics, in special referring to the works previously enumerated.

**Fall of people at the same level.**

**Collective protections:**

i. Movable platforms of a minimum of 60 cm will settle down of wide (3 joined planks to each other), from that they execute the works of vibrated of the concrete.

II. Belt roads will settle down on the surfaces to hormigonar formed by lines of 3 planks of minimum total width of 60 cm.

**Preventive measures:** it is prohibited to journey being above directly on the curved parts of the stem (ceramics or of concrete), in prevention of falls.

Fall of people y/u objects at different level.
Preventive measures:

i. Of the bucket (or tumbler) ends of guide for aid to their correct position of spill will hang. It is prohibited to guide it or to receive it directly, in prevention of falls by pendular movement of the bucket.

II. The preventive resources revise the good state of the hollows in the forged one, reinstalando the "covers" that lack and nailing the releases, daily.

Fall of objects to the emptiness.

Preventive measures: the good state of the visors of protection against fall of objects will be reviewed daily, being solved the deteriorations.

Formworks collapse, breakage or reventón of.

Preventive measures:

i. Before the beginning of the concrete spill, preventive resources will verify that the positioning of the formwork one is according to indicated in the project of execution and the recommendations of the manufacturer, in accident prevention by reventones or I spill.

II. The preventive resources will watch good behavior of the encofrados ones during the spill of the concrete, having paralyzed them at the moment that detects failures. The spill will not be started again until restoring decreased stability.

III. It is prohibited to concentrate concrete loads in a single point. The spill will be made extending the concrete with smoothness without abrupt unloadings, and in ample surfaces.

Footsteps on transit surfaces.

Preventive measures: accesses easy and safe will be arranged to arrive at the work places.

The derived ones from works on humid or wet grounds.

Preventive measures: the workers will wear footwear of nonskid security, with the purpose of avoiding slides in wet surfaces.

Entrapment:
Preventive measures: the opening of the bucket for spill will be executed exclusively driving the existing handle for it, with the hands protected with impermeable gloves.

Septum of cellars:

a) Definition of the work:

This section includes/understands the works of execution of tabiquería of the cellars, including assembly and disassembling of scaffolds, reframing of tabiquería, mortar provision (on the part of the laborers to the officials) and plumed of the metallic doors (RF and emplanchadas).

The works of assembly and disassembling of tubular metallic scaffolds, come indicated in the section corresponding to these average aids.

The work of mortar provision comes described in the section of works of pawn.

b) Average aids to use:

For the execution of tabiquería in cellars, scaffolds of borriquetas will be used and, only in forged special cases where the vertical clearance between is excessive, tubular metallic scaffolds.

c) Material to use:

The necessary materials for the execution of these works, will be:

1- Perforated brick of 9 x 12 x 24.
2- Great hollow brick (table of 16 x 33) of different sizes.
3- Cement mortar.
4- Metallic carpentry.
5- Plaster (for falcado of plomos).

d) Work Machinery and tools:

The use of any work machinery is not anticipated.

The tools to use will be:

1- Regulate metalists (as much fixed as with wharves).
2- Trowel (small manual tool).
3- Small boilers (small manual tool).
4- Lead (small manual tool).
5- Level (small manual tool).
6- Flowerpot.
7- Escapre (chisel).
8- Portable illumination.

e) Identification of risks:

**Falls of people at the same level.**

*Preventive measures:* the rubbish and rubble will be evacuated daily by means of mounted tubes of spill to the effect, to avoid the risk of slips and falls, being located those according to instructions of the facultative direction.

**Fall of objects on the people.**

*Preventive measures:* it is prohibited to work next to the paramentos just raised before passed 24 hours. If a strong wind regime exists affecting them, can collapse on the personnel.

**Blows against objects.**

*Preventive measures:* the zones of work will be cleaned of rubbish (brick rubble) periodically, to avoid the unnecessary accumulations.

**Super-effort**

*Preventive measures:* all the workers will have received formation on ergonomics, in special referring to the works previously enumerated.

**Lack of illumination.**

*Preventive measures:* all the zones in which there are to work will be sufficiently illuminated.

**Conduits of ventilation:**

a) Definition of the work:

The work consists of the execution of the ventilation conduits type shunt, including the provision to plant as much of the blocks that conform the conduits as of the material of it takes hold (mortar or plaster), the accomplishment of the cut of the corresponding block where the ventilation grid is going to be placed, the formation of scaffolds of borriquetas, kneaded of the material of takes hold, positioning of you regulate for the plumbed one of the blocks, positioning of the blocks,
stuffed of leftover hollows in forged and sealed of the meetings with plaster.

The work of provisions of materials comes described in the section of works of pawn.

b) Average aids to use:

1- Scaffolds of borriquetas (for the positioning of the blocks).
2- Platform of unloading of materials (provision to plants of blocks, mortar, plaster, machinery and necessary tool, etc.).
3- “Chinese” cars (for the provision of mortar).

c) Material to use:

The necessary materials for the execution of these works will be:

1- Blocks of ventilation conduits.
2- Cement mortar.
3- Plaster.
4- Micro-concrete for the filling of hollows in forged.

d) Work Machinery and tools:

1- Crane tower (material provision).
2- Fork-lift truck (for the load and unloading of palletized blocks).
3- Radial.

The tools to use will be:

1- Regulate metalists (as much fixed as with wharves).
2- Trowel (small manual tool).
4- Level (small manual tool).
5- Flowerpot.
6- Escapre (chisel).
7- Portable illumination.

e) Identification of risks:

**Fall of people at the same level.**

**Preventive measures:** the rubbish and rubble will be evacuated.
daily by means of mounted tubes of spill to the effect, to avoid the risk of slips and falls, being located those according to instructions of the facultative direction.

**Fall of people at different level.**

**Preventive measures:**

i. The introduction of materials in the plants with the aid of the crane tower will be made by means of flown platforms. Its distribution will decide at its moment the facultative direction. In spite of it they will be due to use, whenever it is possible, and the freight elevators located in the facades.

II. It is prohibited to balance the loads suspended for its installation in the plants, in prevention of the risk of fall to emptiness.

III. The blocks palletized transported with crane, will be governed by means of ends moored to the base of the elevation platform, never directly with the hands, in prevention of falls to the emptiness by pendulum of the load.

IV. The use of bomiquetas in balconies, forged terraces is prohibited and edges of if before con fallen to the emptiness formed by right feet has not come itself to install possible a solid protection and horizontal solid crosspieces.

**Fall of objects on the people.**

**Preventive measures:**

i. The palletized blocks will be hoisted to the plants without breaking the iron straps (or envelope of P.V.C.) with that it provides the manufacturer to it, to avoid the risks by spill of the load.

II. The loose blocks will be hoisted ordenadamente piled up inside platforms to hoist emplintadas, watching that cannot fall the pieces by collapse during transport. III. It is prohibited to directly send rubble by the openings of facades, or inner hollows.

**Blows against objects.**

**Preventive measures:** the zones of work will be cleaned of rubbish periodically, to avoid the unnecessary accumulations.

**Super-effort:**

**Preventive measures:** all the workers will have received formation on ergonomics, in special referring to the works previously enumerated.
Entrapment by elevation means and transport.

Preventive measures: the blocks palletized transported with crane, will be governed by means or means moored to the base of the elevation platform, never directly with the hands, in prevention of blows or atrapamiento by pendulum of the load.

Lack of illumination.

Preventive measures: all the zones in which there are to work will be sufficiently illuminated.

Execution of septum of boxes of stairs:

a) Definition of the work:

This section includes understands the works of execution of tabiquería of the boxes of stairs, including assembly and disassembly of scaffolds of borriquetas, reframing of tabiquería, mortar provision (on the part of the laborers to the officials) and plumbed of the metallic doors (RF-60) and the marks of entrance of houses.

The work of mortar provision comes described in the section of works of pawn.

b) Average aids to use:

1- Scaffolds of borriquetas.
2- Platform of unloading of materials.

c) Material to use:

The necessary materials for the execution of these works will be:

1- Perforated brick of 9 x 12 x 25.
2- Hollow brick of 4 and 7 x 16 x 33.
3- Hollow brick of 2 and 3 x 12 x 25.
4- Rasilla of 1 x 12 x 25.
5- Cement mortar.
6- Wood marks.
7- Doors RF-60.
8- Plaster (for falcados and superior subjection of partitions).

d) Work Machinery and tools:
The tools to use will be:

1- Regulate metalists (as much fixed as with wharves).
2- Wharves (for the plumbed one of marks).
3- Trowel (small manual tool).
4- Small boilers (small manual tool).
5- Lead (small manual tool).
6- Level (small manual tool).
7- Flowerpot.
8- Escapre (chisel).
9- Portable illumination.

E) Identification of risks:

**Fall of people at the same level.**

**Preventive measures:** the rubbish and rubble will be evacuated daily by means of mounted tubes of spill to the effect, to avoid the risk of slips and falls, being located those according to instructions of the facultative direction.

**Fall of people at different level.**

**Preventive measures:**

i. The introduction of materials in the plants with the aid of the crane tower will be made by means of flown platforms. Its distribution will decide at its moment the facultative direction. In spite of it they will be due to use, whenever it is possible, and the freight elevators located in the facades.

II. It is prohibited to balance the loads suspended for its installation in the plants, in prevention of the risk of fall to emptiness.

III. The ceramics palletized transported with crane, will be governed by means of ends moored to the base of the elevation platform, never directly with the hands, in prevention of falls to the emptiness by pendulum of the load.

IV. The use of borriquetas in balconies, forged terraces is prohibited and edges of if before con fallen to the emptiness formed by right feet has not come itself to install possible a solid protection and horizontal solid crosspieces.
Fall of objects on the people.

**Preventive measures:**

i. The ceramic material will be hoisted to the plants without breaking the iron straps (or envelope of P.V.C.) with that it provides the manufacturer to it, to avoid the risks by spill of the load.

II. The loose brick will be hoisted ordenadamente piled up inside platforms to hoist emplintadas, watching that cannot fall the pieces by collapse during transport.

III. It is prohibited to directly send rubble by the openings of facades, or inner hollows.

IV. It is prohibited to work next to the paramentos just raised before passed 24 hours. If a strong wind regime exists affecting them, can collapse on the personnel.

Blows against objects.

**Preventive measures:** the zones of work will be cleaned of rubbish (brick rubble) periodically, to avoid the unnecessary accumulations.

Super-effort:

**Preventive measures:** all the workers will have received formation on ergonomics, in special referring to the works previously enumerated.

Entrapments by elevation means and transport.

**Preventive measures:** the ceramics palletized transported with crane, will be governed by means of ends moored to the base of the elevation platform, never directly with the hands, in prevention of blows or atrapamiento by pendulum of the load.

Lack of illumination.

**Preventive measures:** all the zones in which there are to work will be sufficiently illuminated.

Order and cleaning.

**Preventive measures:** it is prohibited to concentrate the brick loads on bays. The storing of palets will be made next to each pillar to avoid the overloads of the structure in the places of smaller resistance.
Execution of septum in ground floor:

a) Definition of the work:

This section includes the works of execution of tabiquería of ordinary in ground floor, including/understanding the accomplishment of vestibules, I close, false ventilations and, It includes the assembly and disassembling of scaffolds, reframing of tabiquería, mortar provision (on the part of the laborers to the officials) and falcado of the guides and supports of the scrollable closings and doors of garage.

The work of mortar provision comes described in the section of works of pawn.

b) Average aids to use:

1- Tubular scaffolds (all type).
2- Scaffolds of borriquetas.

c) Material to use:

The necessary materials for the execution of these works will be:

1- Perforated brick of 9 xs 12 xs 25.
2- Hollow brick of 16 xs 33 (all the measures).
3- Hollow brick of 2 and 3 xs 12 xs 25.
4- Rasilla of 1 x 12 xs 25.
5- Cement mortar.
6- Guides and claws of scrollable closings.
7- Plaster (for falcado of you regulate and guides).

d) Work Machinery and tools:

The machinery to use will be:

1- Fork-lift truck (to serve the material).

The tools to use will be:

1- Regulate metalists (as much fixed as with wharves).
2- Wharves (for the plumbed one of marks).
3- Trowel (small manual tool).
4- Small boilers (small manual tool).
5- Lead (small manual tool).
6- Level (small manual tool).
e) Identification of risks:

**Fall of people at the same level.**

*Preventive measures:* the rubbish and rubble will be evacuated daily by means of mounted tubes of spill to the effect, to avoid the risk of slips and falls, being located those according to instructions of the facultative direction.

**Fall of people at different level.**

*Preventive measures:*

i. The introduction of materials in the plants with the aid of the crane tower will be made by means of flown platforms. Its distribution will decide at its moment the facultative direction. In spite of it they will be due to use, whenever it is possible, and the freight elevators located in the facades.

II. It is prohibited to balance the loads suspended for its installation in the plants, in prevention of the risk of fall to emptiness.

III. The ceramics palletized transported with crane, will be governed by means of ends moored to the base of the elevation platform, never directly with the hands, in prevention of falls to the emptiness by pendulum of the load.

IV. The use of borriquetas in balconies, forged terraces is prohibited and edges of if before con fallen to the emptiness formed by right feet has not come itself to install possible a solid protection and horizontal solid crosspieces.

**Fall of objects on the people.**

*Preventive measures:* it is prohibited to work next to the paramentos just raised before passed 24 hours. If a strong wind regime exists affecting them, can collapse on the personnel.

**Blows against objects.**
**Preventive measures:** the zones of work will be cleaned of rubbish (brick rubble) periodically, to avoid the unnecessary accumulations.

**Super-effort:**

**Preventive measures:** all the workers will have received formation on ergonomics, in special referring to the works previously enumerated.

**Entrapment by elevation means and transport.**

**Preventive measures:** the ceramics palletized transported with crane, will be governed by means of ends moored to the base of the elevation platform, never directly with the hands, in prevention of blows or atrapamiento by pendulum of the load.

**Lack of illumination.**

**Preventive measures:** all the zones in which there are to work will be sufficiently illuminated.

**Order and cleaning.**

**Preventive measures:** it is prohibited to concentrate the brick loads on bays. The storing of palets, will be made next to each pillar to avoid the overloads of the structure in the places of smaller resistance.

**Pavement of terrazzo:**

a) Definition of the work:

The work consists of the positioning of the pavement of terrazo. The succession of the works to make will be the following one:

Before the beginning of the works terrazo will be distributed as much in plant palletized as the acoustic lamina. The works with the laying of mentioned lamina, using for their union will begin sticky tape. Once arranged the lamina, the reference line will remove from the floor tiles and the laying of the mortar will be made of takes hold, which will be served and spilled by means of “Chinese” cars. Later dusting will be made cement on previous mortar to the distribution of the floor tile on the same one. Once distributed the floor tile, it will be struck for his correct one takes hold verifying the level. On the following day it will be come to the filling of meetings, thus being finalized the work.
The work of provisions of materials comes described in the section of works of pawn.

b) Average aids to use:

1. Platform of unloading of materials (provision to plants of palets of terrazo, mortar, acoustic lamina, machinery and necessary tool, etc.).
2. "Chinese" cars (for the provision of mortar).

c) Material to use:

The necessary materials for the execution of these works will be:

1. Acoustic lamina.
2. Floor tiles of terrazo.
3. Bastard mortar.
4. Return to gather material of (colored cement).

d) Work Machinery and tools:

1. Crane tower (material provision).
2. Fork-lift truck (for the load and it unloads of terrazo palletized).
3. Radial.

The tools to use will be:

1. Regulate metalists.
2. Trowel (small manual tool).
4. Level (small manual tool).
5. Rubber mace (small manual tool).
8. Trowel (small manual tool).
9. Cutting of terrazo.

e) Identification of risks:

**Fall of people at the same level.**

**Preventive measures:**

i. The edges will clean of "cuts" and "paste wastes".
ii. The tools ordered and not by the ground will be arranged.
Cuts in the feet by footsteps on rubble and materials with sharp edges.

Preventive measures: the edges will be cleaned of "cuts" of terrazo.

Super-effort:

Preventive measures:

I. The works will be made in such a way that it is not in the same position during long time.
II. All the workers will have received formation on ergonomics, in special referring to the works previously enumerated.

Crushing and contusions by storings badly placed or in the transport and positioning of the pieces, or by the tools.

Preventive measures:

i. The floor tiles in storing, never will be arranged so that they prevent the crossing sites, to avoid accidents by slip.
II. The tools ordered and not by the ground will be arranged.

Electrocution.

Preventive measures:

i. The illumination by means of portable insulating handle "and grid of protection of the 24 light bulb will take control of" lampholders watertight with and fed V.

II. The male-female prohibits itself conexionado of electrical cables to the pictures of feeding without the use of the pins, in prevention of the electrical risk.

Lack of illumination.

Preventive measures:

i. All the zones in which there are to work will be sufficiently illuminated.
II. The zones of work will have a minimum illumination of 100 lux to a height on the ground around 2 m. Suitable artificial illumination in case will be placed of lacking natural light.

**Derivatives risks to make the work outdoors.**

**Preventive measures:** with extreme environmental temperatures the works will be suspended.

**Polished of terrazzo:**

a) Definition of the work:

The work consists of the polished one, polishing and to give brightness of the pavement of terrazzo and marble. The succession of the works to make will be the following one:

The works will be made in three phases:

1ª. Polished. It consists of the accomplishment of the first polished after the positioning of terrazzo or marble. For its execution water is used that, when mixing itself with the dust of terrazzo polished forms a paste that must take shelter and be deposited in suitable containers. Once polished, rejunta with cement again colored.

2ª. Polished. It consists of the accomplishment of the borders and second happened of polished, to make after to have painted the house. In second happened it happens like in the polished one, using water also. For the borders a radial one is used on terrazzo in dry.

3ª. Vitrified. It is the last phase of the polished one to make when the house has already been finished. They are used for to give brightness it liquid special of and sawdust. In case of appearing some small coquera, it is covered with putty and brightness with a radial one occurs him.

The work of provisions of materials comes described in the section of works of pawn.

b) Average aids to use:

1- Platform of unloading of materials (to receive in plant the machinery served by the crane tower during the phases as polished and polished).

2- Elevator (to serve to plant the machinery during a brillantado phase as and, in its case, of polished).
c) Material to use:

The necessary materials for the execution of these works, will be:

1. Water.
2. Return to gather material of (colored cement).
3. Liquids of to give brightness.

d) Work Machinery and tools:

1. Crane tower (to serve to plant the machinery during the phases as polished and polished).
2. Polisher (400 V).

The tools to use will be:

2. In order to gather the liquid of polished.
3. Trowel (small manual tool).
4. Portable illumination.

e) Identification of risks:

Super-effort:

Preventive measures:

i. The works will be made in such a way that it is not in the same position during long time.

II. All the workers will have received formation on ergonomics, in special referring to the works previously enumerated.

Electrocution.

Preventive measures:

i. The illumination by means of portable insulating handle "and grid of protection of the 24 light bulb will take control of" lampholders watertight with and fed V.

II. The male-female prohibits itself conexionado of electrical cables to the pictures of feeding without the use of the pins, in prevention of the electrical risk.
a) Definition of the work:

This section includes understands the works of execution of the brick factory caravista, including assembly and disassembling of hung scaffolds, reframing and plumbed of facades, cut of the brick, provision of mortar (on the part of the laborers to the officials) and plumbed of prewalls of aluminum, as well as enfoscado of the camera and the ceilings of the balconies and the galleries.

The works of assembly and disassembling of hung and metallic scaffolds tubular, come indicated in the section corresponding to these average aids.

The work of mortar provision comes described in the section of works of peonaje, and the one of enfoscado of trasdós, in the section of enfoscados.

b) Average aids to use:

For the execution of the facade in high plants, scaffolds hung anchored to the forged one and, only in the case of the closings of the zones left for the provision of the materials to the work, hung scaffolds will be used offset.

For the execution of the facade in ground floor, tubular metallic scaffolds will be used.

For the enfoscado one as much of after two of the factory like of the ceiling of the balconies and galleries, scaffolds of borriquetas will be used.

c) Material to use:

The necessary materials for the execution of these works will be:

1- Side-face brick.
2- Cement mortar.
3- Aluminum carpentry.
4- Plaster (for falcado of lead).

d) Work Machinery and tools:

The machinery to use in the mentioned works will be:

1- Circular mountain range of table.
The tools to use will be:

1. Regulate metalists (as much fixed as with wharves).
2. Trowel (small manual tool).
4. Lead (small manual tool).
5. Level (small manual tool).
6. Flowerpot.
7. Escapre (chisel).
8. Portable illumination.

e) Identification of risks:

During the accomplishment of the work of main execution of facade, the following inherent particular risks to the own work are identified:

**Fall of people at different level at the time of removing the plomos from facade.** This risk consists of the possibility of falling from the edge of the forged ones at inferior levels at the time of verifying the plomos of forged and the fixation of such for the later execution of the facade. With the purpose of controlling it the following thing will consider:

**Collective protections:** whenever it can they will maintain placed the railings of protection to forged edge of.

**Individual protections:** in case of being necessary to retire the protection railings or that are ineffective for the accomplishment from the mentioned work (p. ej. In case the worker between the strips must show itself that conform the railing to be able to remove the plomos), el/los operario/s that make the operation must have moored lap belt to a strongpoint of the structure.

**Preventive measures:** in case of being necessary to retire the protection railings the Retired of railings of protection "including in the section of instructions will be due to follow for positioning and retired procedure" of collective protections of the present study of security.

**Super-Effort:**

**Preventive measures:**

i. The works will be made in such a way that it is not in the same position during long time.
All the workers will have received formation on ergonomics, in special referring to the works previously enumerated.

**Execution of the later facade:**

* a) Definition of the work:

This section includes/understands the works of execution of the brick factory perforated, including assembly and disassembling of hung scaffolds, reframing and plumbed of facades, creation of thresholds, mortar provision (on the part of the laborers to the officials) and plumbed of prewalls of aluminum, as well as the enfoscado one as much of trasdós as of the soffit of the factory.

The works of assembly and disassembling of hung and metallic scaffolds tubular, come indicated in the section corresponding to these average aids.

The work of mortar provision comes described in the section of works of peonaje, and the one of enfoscado of trasdós, in the section of enfoscados.

* b) Average aids to use:

For the execution of the facade in high plants, hung scaffolds will be used anchored.

For the execution of the facade in plant first, tubular scaffolds of bomiquetas and metalists will be used.

For the enfoscado one as much of trasdós of the factory like of the ceiling of the balconies and galleries, scaffolds of bomiquetas will be used.

* c) Material to use:

The necessary materials for the execution of these works, will be:

1. Perforated brick.
2. Cement mortar.
3. Aluminum carpentry.
4. Plaster (for falcado of lead).

* d) Work Machinery and tools:

The tools to use will be:
1- Regulate metalists (as much fixed as with wharves).
2- Trowel (small manual tool).
3- Small boilers (small manual tool).
4- Lead (small manual tool).
5- Level (small manual tool).
6- Flowerpot.
7- Escapre (chisel).
8- Portable illumination.

e) Identification of risks:

During the accomplishment of the work of main execution of facade, the following inherent particular risks to the own work are identified:

**Fall of people at different level at the time of removing the plomos from facade.** This risk consists of the possibility of falling from the edge of the forged ones at inferior levels at the time of verifying the plomos of forged and the fixation of such for the later execution of the facade. With the purpose of controlling it the following thing will consider:

**Collective protections:** whenever it can they will maintain placed the railings of protection to forged edge of.

**Individual protections:** in case of being necessary to retire the protection railings or that are ineffective for the accomplishment from the mentioned work (p. ej. In case the worker between the strips must show itself that conform the railing to be able to remove the plomos), el/los operario/s that make the operation must have moored lap belt to a strongpoint of the structure.

**Preventive measures:** in case of being necessary to retire the protection railings the Retired of railings of protection “including in the section of instructions will be due to follow for positioning and retired procedure” of collective protections of the present study of security.

**Super-effort:**

**Preventive measures:**

i. The works will be made in such a way that it is not in the same position during long time.

II All the workers will have received formation on ergonomics, in special referring to the works previously enumerated.
Heat insulation:

a) Definition of the work:

The heat insulation will be made with polyurethane foam projected with machine. The work will be made after to have enfoscado the soffit of the factory of caravista brick (main facades) or of perforated brick (later facades).

In the first place it will be come to the covered one of hollows of facades to protect the carpentry and the facades. Once covered, it will be come to the projected one and extending from the foam on the closings. The works with the retirement of the protections and his will finalize desescombo.

The application of the polyurethane foam is made on facades and walls by means of projection of the product (it mixes formed by the mixture of poliol and isocianato) to obtain heat insulation. The projected one is made by means of a hose that goes connected to the machine and, as well, to the product deposits that, by means of a pump, inhale the same one and make the mixture.

The workers also make the cleaning of the pistols to project with Dissolvent, they change hoses, and, in general, they make the cleaning and daily maintenance of the machine to project.

b) Average aids to use:

1. Platform of unloading of materials (provision to plants of protection material and machinery).

c) Material to use:

The necessary materials for the execution of these works, will be:

1. Polyurethane (it mixes of poliol and isocianato).
2. Plastics of protection.
3. Tape to sprint.

d) Work Machinery and tools:

The machinery to use in the mentioned works will be:

1. Crane tower. It will be used to serve to plant the material as much as protection as the necessary machinery for the accomplishment as the works.
2- Machinery for the manufacture of the polyurethane foam.

The tools to use will be:

1- Blade.

e) Identification of risks:

Falls at different level.

Collective protections: when one works on a platform (for example scaffold) to more than two meters of height the corresponding collective protection will be placed (railings).

Individual protections: in the same case that the previous one, besides to place the collective protection, the workers will have to go provided with moored lap belt to a strongpoint.

Preventive measures:

i. The average used aids to make the works in height (stairs, platforms, scaffolds, etc.) they will have to be accredited and to reunite the conditions of security adapted to guarantee the protection of the workers, in agreement with the effective legislation.

II. In general, the servicing platforms will stay free of materials and tools to avoid possible falls of the workers. III A procedure of safe work for each one of the applications will settle down to execute. This procedure will contemplate the preventive measures of individual or collective character. IV. El/los recurso/s preventivo/s, will have to watch that the as much individual protections as collective they are being used.

Fall of people at the same level.

Preventive measures:

i. One will stay cleared the zone of work trying not to invade it with cables, material, toolboxes, etc. that can give rise to slips and falls of the workers.

II Any product spill will be eliminated periodically that has taken place during the work day to avoid slides and falls.

Fall of objects in manipulation:

Individual protections:
i. Footwear of security with reinforced toe will be due to use.

ii. It is recommended, when they must manipulate heavy loads, the use of gloves to facilitate the adhesion to the same ones and to avoid that they slip and they fall.

**Preventive measures**: the workers must have formation on the correct manual manipulation of loads.

**Execution of tabiquería in plants houses:**

a) Definition of the work:

This section includes/understands the works of execution of tabiquería in houses, including medianeras, inner partitions, cameras and falseos, using for it hollow brick of different formats. The reframing of the same one is included, mortar provision (on the part of the laborers to the officials) and plumbed of prewalls of wood, as well as the formation of scaffolds of borriquetas.

The work of mortar provision comes described in the section of works of pawn.

b) Average aids to use:

1- Scaffolds of borriquetas.
2- Platform of unloading of materials.

c) Material to use:

The necessary materials for the execution of these works will be:

1- Hollow brick of 4, 7 and 9 x 16 x 33.
2- Hollow brick of 2 and 3 x 12 x 25.
3- Rasilla of 1 x 12 x 25.
4- Cement mortar.
5- Premarcos of wood.
6- Plaster (for falcado of you regulate and superior subjection of partitions).

d) Work Machinery and tools:

The machinery to use will be:

1- Electrical compressing hammer (to make the holes of the marks in terrazo).
The tools to use will be:

1- Regulate metalists (as much fixed as with wharves).
2- Wharves (for the plumbed one of marks).
3- Trowel (small manual tool).
4- Small boilers (small manual tool).
5- Lead (small manual tool).
6- Level (small manual tool).
7- Flowerpot.
8- Escapre (chisel).
9- Portable illumination.

e) Identification of risks:

**Fall of people at the same level.**

Preventive measures: the rubbish and rubble will be evacuated daily by means of mounted tubes of spill to the effect, to avoid the risk of slips and falls, being located those according to instructions of the facultative direction.

Preventive measures:

i. The introduction of materials in the plants with the aid of the crane tower will be made by means of flown platforms. Its distribution will decide at its moment the facultative direction. In spite of it they will be due to use, whenever it is possible, and the freight elevators located in the facades.

II. It is prohibited to balance the loads suspended for its installation in the plants, in prevention of the risk of fall to emptiness.

III. The ceramics palletized transported with crane, will be governed by means of ends moored to the base of the elevation platform, never directly with the hands, in prevention of falls to the emptiness by pendulum of the load.

IV. The use of borquetas in balconies, forged terraces is prohibited and edges of if before it has not been come to install one solid protection against possible falls to the emptiness formed by right feet and horizontal solid crosspieces.

**Fall of objects on the people.**

Preventive measures:
i. The ceramic material will be hoisted to the plants without breaking the iron straps (or envelope of P.V.C.) with that it provides the manufacturer to it, to avoid the risks by spill of the load.

II. The loose brick will be hoisted ordenadamente piled up inside platforms to hoist emplintadas, watching that cannot fall the pieces by collapse during transport.

III. It is prohibited to directly send rubble by the openings of facades, or inner hollows.

IV. It is prohibited to work next to the paramentos just raised before passed 24 hours. If a strong wind regime exists affecting them, can collapse on the personnel.

**Blows against objects.**

*Preventive measures:* the zones of work will be cleaned of rubbish (brick rubble) periodically, to avoid the unnecessary accumulations.

**Super-Effect**

*Preventive measures:* all the workers will have received formation on ergonomics, in special referring to the works previously enumerated.

**Electrocution.**

**Entrapments by elevation means and transport.**

*Preventive measures:* the ceramics palletized transported with crane, will be governed by means of ends moored to the base of the elevation platform, never directly with the hands, in prevention of blows or atrapamiento by pendulum of the load.

**Lack of illumination.**

*Preventive measures:* all the zones in which there are to work will be sufficiently illuminated.

**Order and cleaning.**

*Preventive measures:* it is prohibited to concentrate the brick loads on
bays. The storing of palets will be made next to each pillar to avoid the overloads of the structure in the places of smaller resistance.

**Installation of plumbing:**

a) Definition of the work:

The plumbing installation includes/understands the following works:

a.1.) Installation of centralizations.
a.2.) Positioning of bajantes of pvc.
a.3.) Installation of copper pipes.
a.4.) Installation of pvc in houses.
a.5.) Installation of iron pipes.
a.6.) Installation of collectors.
a.7.) Positioning of toilets, heaters and sinks.

Although the different works can be made in different phases, and will correspond to the facultative direction the power to fix the times of the same ones, I consider that the form logical to undertake them (since in the execution project any other is not indicated), is the following one:

In the first place it will be come to place the bajantes of pvc in agreement go being placed the ventilation conduits. At the same time, the work with the installation of the centralizations will be synchronized.

In agreement it is executed tabiquería of closings of stairs will settle copper in his phase of posts. The installation of copper in houses will employ to beginning after the execution of tabiquería general of houses, consisting, in the first place, in the marked one of the regatas as much of copper as of pvc for, once done, to come to the mentioned installation.

After the installation of copper it will be come to the positioning from PVC interlocked in houses. The connection of the bathtubs and plates of shower will be made after the falcado one of the same ones. The connection of the sanitary elements to the bajantes by means of pipe of PVC will be made when the house to hook already is plated. The connection of cazoletas of covers to the pipes of pvc will be made when the cover slopes have finished, finishing off conforms them is finished the asphalt fabric.

As soon as are pearlite plasterings the cellars, will be come to the installation of the iron pipes from the attack to the centralizations, groups of pressure and BIAS BINDING, as well as from the group of pressure to the centralizations.
The execution of the collectors in ground floor and its connection in cellars to the formation communications net will once give beginning placed the pavement of covers.

The positioning of sanitary, heating elements sinks and faucets will give beginning when the wood carpentry has been placed.

The works of assembly and disassembling of hung and metallic scaffolds tubular, come indicated in the section corresponding to these average aids.

b) Average aids to use:

- Tubular metallic scaffold. It will be used, always with wheels, in the phases of installation of: posts of copper in ground floor, iron in cellar and collectors of pvc.
- Forged scaffold hung anchored to. It will be used for the installation of the bajantes in inner facades.
- Scaffold of borriquetas. It will practically be used in the accomplishment of all the works of plumbing installation.
- Ladders. Ladders in precise cases will be able to be used where a scaffold of borriquetas cannot be mounted.
- Platform of unloading of materials (provision to material plants).

c) Material to use:

The necessary materials for the execution of these works will be:

- Copper pipe (and accessories).
- Iron pipe (and accessories).
- Pipe of PVC (and accessories).
- Material of butane welds for copper.
- Glue of PVC.
- Putty and esparto for unions of iron pipes.
- Toilets, sink, heaters and screws.

d) Work Machinery and tools:

The machinery to use in the mentioned works will be:

- Crane tower. It will be used to unload the material (pipes of iron and receive) and to serve it to plant.
- Fold machine of pipes.
- Butane soldering iron.
- Tester of pressure and watertightness of pipes and welds.
-Drill.

The tools to use will be:

- Screwdrivers.
- Cutting of copper.
- Flowerpot.
- Escapre (chisel).
- Portable illumination.

e) Identification of risks:

**Falls at the same level.**

**Preventive measures:** rubble and cuts will stay clean of the work places. They will clean as to advance, piling up itself the rubbish for his spill by the tubes, to avoid the risk of footsteps on objects.

**Entrapment between heavy pieces.**

**Preventive measures:** the tubes for the conductions will be gathered together in the possible most horizontal surface on wood sleepers, in a receiver delimited by several right feet that they prevent that by any cause the conduits slide or roll.

**Footsteps on sharp or material objects.**

**Preventive measures:** rubble and cuts will stay clean of the work places. They will clean as to advance, piling up itself the rubbish for his spill by the tubes, to avoid the risk of footsteps on objects.

**Bums.**

**Preventive measures:**

i. It is prohibited to leave the ignited burners and blowpipes.

II. The electrical illumination by means of portable will take place by means of “watertight mechanisms of security” with insulating handle and grid of protection of the light bulb.

**Super-Effort**

**Preventive measures:** all the workers will have received formation on ergonomics, in special referring to the works previously enumerated.
Lack of illumination.

**Preventive measures:** the illumination of the plumbing edges will be of a minimum of 100 lux measured to a height on the level of the pavement, around the 2 ms.

**Electrical system and of telecommunications:**

a) Definition of the work:

The electrical system and of telecommunications includes/understands the following works:

a.1.) Installation of centralizations.

a.2.) Installation of attacks of individual electrical telecommunications and.

a.3.) Installation of tube and boxes in houses and stairs.

a.4.) Copper thread installation in houses and stairs.

a.5.) Thread installation copper in attacks.

a.6.) Positioning of mechanisms in houses and stairs (including video doormen).

a.7.) Positioning of illumination in stairs, lobbies and vestibules.

a.8.) Installation of antennas.

a.9.) General installation of cellars for parking of vehicles (including tube, thread, screens, mechanisms, emergencies, registries of telecommunications, etc.).

a.10.) Provisional work electrical system.

Although the different works can be made in different phases, and will correspond to the facultative direction the power to fix the times of the same ones, I consider that the form logical to undertake them (since in the execution project any other is not indicated), is the following one:

In the first place it will be come to mark the regatas of the houses, for, once made, to begin with the installation of tube and boxes in houses and stairs, being able to synchronize it with the installation of the tube of the general attacks of electrical individual telecommunications and.

In agreement they are plastered the houses will be come to pass the thread of copper in the same ones. In the same way, when they are plastered the stairs, it will be come to pass the thread (as much electrical as of telecommunications) in illumination and attacks.

Simultaneously, and whenever the cellars are plasterings, it will give to beginning the installation of such, consisting the works to make in them
of the following thing: first the tacos of all the facilities will be marked and placed, happening, after to have painted the affected zones, to install the rigid tube of the illumination and detection of smoke. Later the screens, emergencies, detectors, pulsers will be placed, etc. Once finished the previous thing, or simultaneously, it will be come to the installation of the rigid tube of the facilities of telecommunications, and later to the positioning of incoming logs.

After the installation of the copper thread and after to have painted and to have placed the wood carpentry it will be come to the positioning from the mechanisms, outer lights and video doormen in houses in the first place and stairs later. In order to leave the houses totally installed the household-electric ones will be placed (top, bell and furnace).

As soon as they are enfoscados and hopeless casetones, will be come to the positioning of the ground antennas.

Provisional the work electrical system deserves a specific mention by different considerations (it is "an alive" installation during the execution of the work, are made works under tension, etc.). For that reason specific risks are included in the end (in addition to the common ones to the rest of electrical systems), relative to their assembly, maintenance and disassembling.

The mentioned provisional installation will begin in the beginning of works and will finalize when concluding the building, after registering the electricity of the common services of the building.

The works of assembly and disassembling of tubular metallic scaffolds, come indicated in the section corresponding to these average aids.

b) Average aids to use:

- Tubular metallic scaffold. It will be used, always with wheels, in the phases of installation of: cellars, distribution of attacks in ground floor and antennas in covers.
- Scaffold of boriquetas. It will be possible to be used in the accomplishment of all the works of electrical system and telecommunications.
- Ladders of scissors. Like the scaffolds of boriquetas will be able to be used ladders in most of the works making.
- Platform of unloading of materials (provision to material plants).

c) Material to use:

The necessary materials for the execution of these works will be:
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- Corrugated tube.
- Thread of covered copper and TV.
- Discovered copper thread (general takings of earth and enclosures of telecommunications).
- Mechanisms.
- Lights.
- Household-electric.
- Antennas.
- Registries of telecommunications.
- Modules of accountants.

d) Work Machinery and tools:

The machinery to use in the mentioned works will be:

- Drill.
- Hot air soldering iron (to warm up and to double rigid pipes).

The tools to use will be:

- Pliers
- Screwdrivers
- Hammer
- Escapre (chisel).
- Portable illumination.

e.1.) Identification of common risks:

Fall of people at the same level.

Preventive measures: one will not be due to enter a zone of work, unless this is clean perfectly of rubbish, to avoid the risks of footsteps or tropezones.

Fall of people at different level.

Preventive measures:

i. It is prohibited in general in this work, the use of scaffold or ladders on borriquetas, in places with fall risk from height, if before the suitable protections of security have not settled.

II. The works will not begin on the covers until to have concluded the petos of perimetral closing, to avoid the fall risk from heights.
III. The "strongpoints" of security of which will settle down to moor the cables to which to hook the lap belt, to avoid the fall risk from height.

IV. The operations of assembly of components, will take place in level zero. The composition of elements in height is prohibited, if it is not strictly essential with the purpose of not harnessing the already existing risks.

**Super-effort**

**Preventive measures:** all the workers will have received formation on ergonomics, in special referring to the works previously enumerated.

**Electrocution or burns** (by the bad protection of electrical pictures, incorrect maneuvers in the lines, by use of tools without isolation, bypass of the protection mechanisms (circuit breakers differentials, etc.), by conexionados direct without pins male-female...).

**Preventive measures:**

i. The illumination by means of portable will take place using "watertight lampholders with insulating handle", and grid of protection of the light bulb, fed 24 volts.

II. The tests of operation of the electrical system will be announced to all the personnel of the work before being initiated, to avoid accidents.

III. Before making enter load the electrical system a revision in depth will become of the connections of mechanisms, protections and joints of the direct or indirect electrical pictures general, in agreement with the Electrotechnic Regulation of Low Tension.

IV. Before making enter the cells of transformation in good condition it will be come to verify the real existence in the room, of the sidewalk of maneuvers, poles of maneuver, dry chemical dust extinguishers and medicine kit, and that the workers are dresses with articles of personal protection. Once verified these points, it will be come to issue the entrance order in good condition.

V. It is specifically prohibited to install next storm cloud antennas, at sight. I saw. The tools to use by the electricians installers will be protected with standardized insulating material against the contract ones with electrical energy vii. The conexionado one of cables to the pictures of electrical work provision is prohibited, without the use of the pins male-female.
Lack of illumination.

**Preventive measures:** the illumination in the the 100 edges will not be inferior to lux, measured to 2 m.s of the ground.

2) Identification of specific risks of provisional the work electrical system:

**General preventive measures:**

i. The personnel in charge of the assembly, maintenance and disassembling of the installation will be electrician and, preferably, he will have the corresponding professional membership card. It is prohibited that any other worker manipulates the mentioned installation.

II. All the electrical machinery will be reviewed periodically, and in special, at the moment at which a failure is detected, moment in which will be declared it "out of service" by means of electrical disconnection and hangs of the corresponding label in the control board.

III. The electrical machinery will be reviewed by specialist personnel in each type of machine, never by the usuary workers of the same one.

**Electrocution:**

**Preventive measures:** totally it is prohibited the assembly, retired revision or of the installation under current. Before initiating one of the mentioned works the feeding of the mains will become disconnected, installing in the connection place a visible signboard, in which it is ***refixed mng: "NOT TO CONNECT, MEN WORKING IN THE NETWORK". The preventive resources will be outstanding the fulfillment of this measurement.

**Tiled:**

a) Definition of the work:

This section includes/understands the works of positioning of the plated one in fog rooms, using for tiled it of different formats (which will come defined in the execution project and will have to be reflected in the plan of security of the corresponding contractor), cement mortar, mortar tail and material of stuffed of meeting. One includes the provision of all the materials (on the part of the laborers to the officials)
and made level of first line, as well as the formation of scaffolds of borriquetas.

Previous to the positioning of the plated one enfoscado of the partitions will be made maestreado to tile. Said enfoscado it comes indicated in the corresponding section.

b) Average aids to use:
   - Scaffolds of borriquetas.
   - Platform of unloading of materials (provision to material plants and necessary tool).
   - "Chinese" cars (for the provision of the material).

  c) Material to use:
     - Cement mortar (for the maestreado enfoscado one).
     - Mortar tail (to tile).
     - Plated (formats according to execution project).
     - Material of stuffed of meeting (white or similar cement).
     - Plastic separators for the formation of meetings.

  d) Work Machinery and tools:
   The machinery to use will be:
     - Crane tower (material provision).
     - Radial.

   The tools to use will be:
     - Cutting of ceramic material.
     - Regulate fixed metalists.
     - Trowel (small manual tool).
     - Small boilers (small manual tool).
     - Glue Machine.
     - Can.
     - Lead (small manual tool).
     - Level (small manual tool).
     - Flowerpot.
     - Escapre (chisel).
     - Trowel indented for the positioning of plated with mortar the tail.
     - Portable illumination.

e) Identification of risks:
Falls at the same level.

Preventive measures:

i. The edges will clean of "cuts" and "paste wastes".
ii. The boxes of plaqueta in storing, never will be arranged so that they prevent the crossing sites, to avoid accidents by slip.

Cuts in the feet by footsteps on rubble and materials with sharp edges.

Preventive measures: daily the edges will be cleaned so that it never works in places with rubbish.

Strange bodies in the eyes.

Individual protections: with the purpose of controlling the risk, the workers will go provided with glasses antiprojections.

Super-effort

Preventive measures: all the workers will have received formation on ergonomics, in special referring to the works previously enumerated.

Electrocution:

Preventive measures:

i. The illumination by means of portable insulating handle "and grid of protection of the 24 light bulb will take control of" lampholders watertight with and fed V.
ii. The male-female prohibits itself conexionado of electrical cables to the pictures of feeding without the use of the pins, in prevention of the electrical risk.

Lack of illumination.

Preventive measures: the illumination in the the 100 edges will not be inferior to lux, measured to 2 m.s of the ground.

Installation of elevators:

a) Definition of the work:

The works consist of the installation of the work elevators in different
phases. Initially the noticeable one of the holes of the slab will be made in phase of structure, once has encofrado the same one.

The works themselves will begin with the positioning of guides, wharves, skeleton of the cabin, motors and doors. The works will be interrupted for, once finalized the previous thing is come, on the part of masonry officials to end on the inside as much as by outside tabiqueria that defines the box of elevators. After it, it will be come to finish the cabin and to leave in operation the elevator, for want of placing the coatings.

Once finalized the work, it will be come to finish off the decoration of the elevators, to regulate them and to leave prepared them for want of his connection and definitive beginning.

b) Average aids to use:

-Platform of unloading of materials.

c) Material to use:

The necessary materials for the execution of these works will be:

-Metallic guides.
-Motors, doors and cabins of elevators.
-Steel cables.
-Screws, bridles, etc.
-Material for electrical weld.

d) Work Machinery and tools:

-Crane tower (to unload the material and to provide it to the corresponding plant).
-The own elevator during its installation.

The tools to use will be:

-Regulate metalists.
-Lead (small manual tool).
-Level (small manual tool).
-Flowerpot.
-Escapre (chisel).
-Small tool in general (monkey wrenches, screwdrivers, etc.).

e) Identification of risks:
Falls to the emptiness by the hollow of the elevator.

Collective protections:

i. The movable servicing platform will be surrounded perimetralmente by railings by 1'00 m. of height, formed of bar banister rail, and rodapié, equipped with coined system with in case of abrupt reduction.

II Before coming "to tend the plomos" for the reframing of guides and cables of the cabin, it will be verified that all the hollows are closed with solid provisional railings, of 1'00 m. of height, formed by banister rails, intermediate strip and rodapié. III The assembly platform will be protected by a resistant visor anti-impact.

Individual protections:

i. The works within the elevator hollow will be made with lap belt moored to a strongpoint in the superior large stone bench.

II. The installation of the walls of the doors of passage of the plants, will execute subjects with lap belts to safe strongpoints ready to such necessity.

Preventive measures:

i. It will not be come to make hangs of the cable of the "lifting carracks" of the provisional platform of assembly, until to have exhausted the necessary time for the hardening of the strongpoint of security that is to support the set, under the superior large stone bench.

II Before initiating the works, the platform with the maximum weight will be loaded that must support, mayorado in a 40% of security. This "test of load" will be executed to a height of 30 cm. on the bottom of the hollow of the elevator. Concluded satisfactorily, the works will begin on platform.

III The concrete slab of the superior large stone bench of the hollow of elevators will be designed with the orifices precise to be able to make without risk through them, the tasks of plumbed of the guides.

IV The doors will be hung immediately that the wall is received and ready for it, coming to shoot a latch of safety clip, or to install coining that prevents its fortuitous opening and the accidents of fall by the hollow of the elevator.
Falls of objects.

**Preventive measures:** it is prohibited during the development of all the work, to throw rubbish by the hollows destined to the installation of the elevators to avoid the accidents by blows.

Entrapment between heavy pieces.

**Preventive measures:** the work clothes will not be comfortable, so that an enlistment of same with pulleys or the counterbalances cannot be produced.

Electrical contacts.

**Preventive measures:**

i. The electrical illumination by means of portable, will take place using "watertight lampholders of security with insulating handle" equipped with protective grid with the light bulb, fed 24 volts.

II The provisional installation of water takings is prohibited next to the nuclei of elevators, to avoid the run-offs with interference in the works of the installers and consequent involution of risks.

Super-effort:

**Preventive measures:** all the workers will have received formation on ergonomics, in special referring to the works previously enumerated.

Lack of illumination.

**Preventive measures:** the illumination of the hollow of the elevator will settle in all its development. The level of illumination in the edge will be of 200 lux.

Footsteps on materials.

**Preventive measures:** daily the edges will be cleaned so that it never works in places with rubbish.

Gas installation:

a) Definition of the work:

This section as much includes/understands the works of gas installation in houses including the inner installation of the house like the outside. It
also includes the assembly and disassembling of offset and metallic hung scaffolds tubular, reframings several (posts, houses, etc.), welded of pipes and covers of iron, soldier of copper pipes, unloads and piled up of heavy equipment (iron pipes as much as of copper), positioning of top, etc.

The works of assembly and disassembling of hung and metallic scaffolds tubular, come indicated in the section corresponding to these average aids.

Since the phases of inner and outer installation, as well as of verification and connection and the one positioning top they entail very diverse risks, I include/understand that they must separate differentiating them as follows next:

a.1.) Inner installation of houses. It consists of the installation of copper in houses.

a.2.) Outer installation of houses. It includes iron posts and copper slopes.

a.3.) Installation of attacks contained by cellar and ground floor.

a.4.) Positioning of top, connections and verifications:

b) Average aids to use:

- Hung scaffold offset. It will be used for the outer installation.
- Tubular metallic scaffold. It will be used, always with wheels, in the phase of installation of attacks in cellar and ground floor.
- Platform of unloading of materials (provision to material plants).

c) Material to use:

The necessary materials for the execution of these works, will be:

- Copper pipe (and accessories).
- Iron pipe (and accessories).
- Household-electric (top).
- Material of weld (electrical and of butane).

d) Work Machinery and tools:

The machinery to use in the mentioned works will be:
- Fold machine of pipes.
- Electrical soldering iron.
- Butane soldering iron.
- Tester of pressure and watertightness of pipes and welds.
- Drill.

The tools to use will be:

- Screwdrivers.
- Level (small manual tool).
- Flowerpot.
- Escapre (chisel).
- Portable illumination.

e) Identification of risks:

**Falls to the same one and different level.**

**Collective protections:** the hollows in patinillos, patios or zones specifically prepared for installation of vertical conduits will have to be protected.

**Individual protections:** the worker must as much go prote'ge' with lap belt to the hour of plumbed and the presentation like in the definitive installation.

**Preventive measures:** one will maintain the order and cleaning in the zones of work.

**Falls of objects.**

**Preventive measures:** the iron straps of the packages like load handles will not be used.

**Fire and explosions.**

**Preventive measures:**

i. The places of storage of gas bottles perfectly will be ventilated.

Il It will be prohibited to smoke in the proximities and, also, it will be had a suitable extinguisher (dry dust).

Ill One will not knit with exposed bottles to the sun.
IV. The used bottles and gas cylinders will On guard be used vertical the being.

V. It is necessary to maintain the monitoring of the pressure gauges, racoes and hoses. I saw the possible flights in hoses with soapy water will be verified, never with a flame.

VII. Will never allow the even acetylene use to weld to tubes or copper element, because in the reaction acetiluro takes place ad receives, that is explosive.

**Blows with objects.**

**Preventive measures:** the transport of straight sections of tubes to shoulders of the worker will be made backwards inclining the load, so that the front part surpasses meters at least both to avoid striking other workers.

**Lack of illumination.**

**Preventive measures:** the zones of work will stay illuminated, between 200 - 300 lux.

**Air conditioner:**

a) Definition of the work:

This section includes/understands the works of air conditioner in houses including the installation of refrigerating lines (within houses and in as much vertical distributions as of cover), installation of conduits, mouths of conduits, positioning of condensadoras and evaporating machines, connections and positioning of thermostats, and beginning of the equipment.

The works with the reframing of the inner machines will begin on the ceiling of the bathroom 2º, as well as of the passages of the conduits by the partitions. Later they will employ to beginning of lying of refrigerating lines. Once the installation of electrical tube on the part of the electrician has finished, will be placed the conduits. The following work to make will be the one of positioning of inner machines (even connection of water-drainages). In agreement are being plastered the houses, they will be made the mouths of the conduits. Later the outer machines will be placed, to finalize with the positioning of the thermostats, connections of machines and tests on watch.
b) Average aids to use:
- Ladders (refrigerating installation of conduits, lines, machines (even connections), mouths).
- Platform of unloading of materials (provision to plants of machines and conduits).

b) Material to use:
The necessary materials for the execution of these works will be:
- Copper pipe (and accessories).
- Machinery (condensadora and evaporating).
- Material of weld (of butane).
- Small material (screws, nails, etc.).
- Tubes of PVC for water-drainages.
- Aluminum tape.
- Metric rod of 6.
- Cue.
- Preframe of grids.
- Grids.

c) Work Machinery and tools:
The machinery to use in the mentioned works will be:
- Crane tower.
- Fork-lift truck (for the load and unloading of machines).
- Butane soldering iron.
- Tester of pressure and watertightness of pipes and welds.
- Drill.

The tools to use will be:
- Screwdrivers.
- Level (small manual tool).
- Special blades of cut.
- Stapler.
- Plate scissors.
- Flowerpot.
- Escaper (chisel).
- Portable illumination.

e) Identification of risks:

Fall at the same level.
**Preventive measures:** the conduit sections will be evacuated as rapidly as possible of the factory of assembly for their conformation in their definitive location, and to avoid accidents in the factory, by saturation of objects.

**Fall at different level.**

**Preventive measures:**

i. The grids will mount from stairs of scissors equipped with nonskid shoes and cadenilla limitor of opening, to eliminate the fall risk.

II The conduits to locate in considerable heights, will settle from tubular scaffolds with servicing platforms of a minimum of 60 cm. in width, surrounded by solid railings of 90 cm. of height, formed by banister rails, intermediate strip and baseboard.

**Entrapment (between gears, transmissions, etc., during the operations of completion or assembly).**

**Preventive measures:**

i. Before the beginning of the start up, the protections of the movable parts will settle, to avoid the risk of atrapamientos.

II To forbid specifically the manipulation of assimilable movable parts of any motor or without before to have come itself to the total disconnection of the mains of feeding, to avoid accidentess by entrapment.

**Footstep on objects.**

**Preventive measures:**

i. The leftover cuts, will be retired as take place to a place determined, for their later collection and spilled by the tubes and to avoid the risk of footsteps on objects.

II. Forbiding to give in in the ground, blades, sharp, grapadoras and riveting to avoid accidentess by footsteps on objects.

**Cuts by plate handling.**

**Preventive measures:** during the cut with shears the plates will
remain supported on the subject banks and, to avoid accidents by undesirable movements, in special of the trimmed leaves.

**Cuts by use of the fiber glass.**

**Preventive measures:** the fiber glass plates will be cut on the bank by means of blade. At any moment it will be attended the cutter to avoid risks by deviations and errors.

**Super-effort:**

**Preventive measures:** all the workers will have received formation on ergonomics, in special referring to the works previously enumerated.

**Lack of illumination.**

**Preventive measures:** the illumination in the the 100 edges will not be inferior to lux, measured to 2 m.s of the ground.

**Projections of objects.**

**Preventive measures:** the movable parts of a machine will not be connected nor will put into operation, without before to have separated from them tools that are being used, to avoid the risk of projection of objects or fragments.

**Electrocution.**

**Preventive measures:** during the tests, when the electrical energy of feeding must be cut momentarily, a signboard of precaution with the legend will settle in the picture: "NOT TO CONNECT, MEN WORKING IN THE NETWORK".

**Stoneware pavement and rasilla:**

a) Definition of the work:

The work consists as much of the positioning of the stoneware pavement in fog rooms as in balconies, as well as of rasilla of covers. The succession of the works to make will be the following one:

Stoneware pavement: before the beginning of the works the stoneware in boxes of 1 will be distributed in plant m2, taking it to the positioning place. Also it will be provided, in his case, the acoustic lamina. The works with the laying of mentioned lamina, using for their union will begin sticky tape. Once arranged the lamina, increasing of 12 mm will
be made barren concrete. After it the laying of the mortar will be made of takes hold, which will be served and spilled by means of “Chinese” cars. Later dusting will be made cement on previous mortar to the distribution of the stoneware floor tile on the same one, which will be made placing crosspieces of separation of meetings. Once distributed the floor tile, it will be struck for his correct one takes hold verifying the level. On the following day it will be come to the rejuntado one of the meetings with material of special filling, thus being finalized the work.

Rasilla of covers: in the first place all the materials will be provided to the cover (rasilla and cement palatizados and sand). Later it will be come to the manufacture of mortar from takes hold and his laying, after which dusting will be made cement on previous mortar to the distribution of rasilla. In order to finalize the meetings with appropriate material of filling will be to return to gather.

The work of provisions of materials comes described in the section of works pawn.

b) Average aids to use:

- Platform of unloading of materials (provision to plants of palets of stoneware, mortar, acoustic lamina, machinery and necessary tool, etc.).
- "Chinese" cars (for the provision of mortar).

c) Material to use:

The necessary materials for the execution of these works, will be:
- Acoustic lamina (stoneware pavements).
- Stoneware floor tiles.
- Rasilla of 25 xs 12 xs 1.
- Barren concrete of 12 mm.
- Cement. Bastard mortar (stoneware pavements).
- Returning to gather of material. (colored cement).
- Crosspieces of PVC.
- Sand.

d) Work Machinery and tools:

The machinery to use in the mentioned works will be:
- Crane tower (material provision).
- Fork-lift truck (for the palletized load and it unloads of rasilla and the stoneware).
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-Radial.

The tools to use will be:

-Regulate metalists.
- Trowel (small manual tool).
- Small boilers (small manual tool).
- Level (small manual tool).
- Rubber mace (small manual tool).
- Flowerpot (small manual tool).
- Escapre (chisel - small manual tool).
- Trowel (small manual tool).
- Cutting of ceramic material.
- Table (for the made level one of rasilla).

e) Identification of risks:

Fall of people at the same level.

Preventive measures:

i. The edges will clean of "cuts" and "paste wastes".

ii. The tools ordered and not by the ground will be arranged.

Cuts in the feet by footsteps on rubble and materials with sharp edges.

Preventive measures: the edges will be cleaned of "cuts" of terrazzo.

Super-effort:

Preventive measures:

i. The works will be made in such a way that it is not in the same position during long time.

ii. All the workers will have received formation on ergonomics, in special referring to the works previously enumerated.

Crushing and contusions by storings badly placed or in the transport and positioning of the pieces, or by the tools.

Preventive measures:
i. The floor tiles in storing will never be arranged so that they prevent the crossing sites, to avoid accidents by slip.

II. The tools ordered and not by the ground will be arranged.

Electrocution.

Preventive measures:

i. The illumination by means of portable insulating handle "and grid of protection of the 24 light bulb will take control of" lampholders watertight with and fed V.

II. The male-female prohibits itsconexionado of electrical cables to the pictures of feeding without the use of the pins, in prevention of the electrical risk.

Lack of illumination.

Preventive measures:

i. All the zones in which there are to work will be sufficiently illuminated.

II. The zones of work will have a minimum illumination of 100 lux to a height on the ground around 2 m.s.

III. Suitable artificial illumination in case will be placed of lacking natural light.

Derivates risks to make the work outdoors.

Preventive measures: with extreme environmental temperatures the works will be suspended.

Smooth stature (nondetachable):

a) Definition of the work:

This section as much includes/understands the works of positioning of the smooth stature in houses in corridors as in fog rooms (it cooks and main bath), in distributors and stairs, falseos of cellars and ground floors, in vestibules, centralizations and any other type. One includes the possibility of making dark (in vestibules and distributors), and the positioning of molding in houses. It is including the formation of servicing platforms with tubular scaffolds of boriquetas, as well as scaffolds (with and without wheels). Also it is including the formation of the ventilation
of the kitchens with a closed drawer and the positioning of the corresponding grid in the plate.

b) Average aids to use:

- Scaffolds of borriquetas.
- Tubular scaffold (with or without wheels).
- Platform of unloading of materials (provision to plants of machines and conduits).

c) Material to use:

The necessary materials for the execution of these works, will be:

- Stucco plates.
- Ensacada dust stucco.
- Packing.
- Dark molding and of stucco.
- Grids of ventilation (for kitchens).

d) Work Machinery and tools:

The machinery to use in the mentioned works will be:

- Crane tower.
- Fork-lift truck (for the load and unloading of material).

The tools to use will be:

- Regulate.
- Shopping baskets.
- Trowel (small manual tool).
- Level (small manual tool).
- Flowerpot.
- Escapre (chisel).
- Portable illumination.

e) Identification of risks:

Falls at the same level.

Preventive measures: the storings of coats or stucco plates, will be arranged so that they do not prevent the crossing sites, to avoid the accidents by slip.

Falls at different level.
**Collective protections:** before the installation and later use of scaffolds of borriquetas next to hollows, a protection railing will have to be placed that surpasses in 1 millimeter the height of the servicing platform, so that it covers the risk with fall in height. The preventive resources will have to verify and to watch the effectiveness of this measurement in all the cases.

**Preventive measures:** the scaffolds for the installation of false ceilings on inclines will have the horizontal and bordered surface of work of prescribed railings. The support in definitive steps is allowed and borriquetas whenever this is immobilized and the planks anchor, coin, etc.

**Strange bodies in the eyes.**

**Individual protections:** for accidents by particle projection on the eyes, protection glasses will be used antiprojections.

**Lack of illumination.**

**Preventive measures:** the illumination in the the 100 edges will not be inferior to lux, measured to 2 m.s of the ground.

**Electrocution.**

**Preventive measures:**

i. The illumination by means of portable, will take control of "watertight lampholders with insulating handle" and "grid" of protection of light bulb. The electrical energy will feed them 24 V.

II. The male-female prohibits itself conexionado of electrical cables to the pictures of feeding without the use of the pins.

**Super-effort:**

**Preventive measures:**

i. All the workers will have received formation on ergonomics, in special referring to the works previously enumerated.

II. The transport of coats and stucco plates will be made preferably on hand wheelbarrow, in avoidance of super-efforts.

**Definitive wall-plate:**

a) Definition of the work:
The work will consist of the execution of the definitive wall-plate of the cellar 2º, being carried out as it is described next:

In the first place, it will be come to the cleaning of the zone to execute so much of rubbish as of material and auxiliary means that can have by the zone. After this operation, hormigonado will be come to remove the levels from, placing for it you regulate metalists worn with bricks. Once removed the levels, it will be come to spill the concrete (provided from plant), by means of dumper, vibrating the surface with strip, reviewing the same one with talocha. In order to distribute the concrete correctly, rakes and shovels will be used. In agreement they are fence finishing off the tracks will retire you regulate and support bricks by hand, filling up, with shovels, the space that is. The cured one of the concrete will be made by means of irrigation with water. In case that it was necessary to adjust some cut left of hormigonados previous, a compressing hammer will be used.

b) Average aids to use:

The use of any average aid for the accomplishment of the mentioned works is not anticipated.

c) Material to use:

The necessary materials for the execution of these works, will be:

- Concrete.
- Bricks.

d) Work Machinery and tools:

The machinery to use in the mentioned works will be:

- Vibrating Tray.
- Truck concrete mixer.
- Dumper.
- Compressing hammer (in case of being necessary to prick concrete).

The tools to use will be:

- Level (small manual tool).
- Hammer (small manual tool).
- Leg of goat (small manual tool).
- Shovels, legonas and rakes (for the distribution of the concrete).
-Optical level and strip, to remove levels on you regulate.

e) Identification of risks:

During the execution of the wall-plate, the following inherent particular risks to the own work are identified:

**Super-effort**: next reference to a possible cause becomes of sobreefforts produced during the execution of the works:

- Positioning of you regulate them of leveling.
- Transport of leveling apparatuses.
- Distribution of the concrete by means of rakes and shovels.
- Inadequate Positions at the time of making the framings.
- Retired of you regulate in fresh and hard concrete.
- Vibrated of the concrete with vibrating strip.
- "Talochado" of the concrete.

**Preventive measures**:

i. The works will be made in such a way that it is not in the same position during long time.

II. All the workers will have received formation on ergonomics, in special referring to the works previously enumerated.

**Plastering of houses**:

a) Definition of the work:

This section includes/understands the works of plaster plastering inside houses. It is including the formation of servicing platforms totally materialized with scaffolds of borriquetas and planks.

The accomplishment of the work will begin with the formation of teachers in comers and comers of the house. Later it will be come to the formation of the servicing platform, which, since I have said previously must totally be materialized. After this operation one will begin to plaster, initially the ceiling happening later to the partitions. Once a height is reached after which the use of the servicing platform is not necessary, it will dismount to finish off the plastering of the inferior part of the partition until arriving at baseboard.

b) Average aids to use:

- Scaffolds of borriquetas.
- Platform of unloading of materials (provision to plants of machines and conduits).
c) Material to use:

The necessary materials for the execution of these works, will be:

- Stucco plates.
- Ensacada dust stucco.
- Packing.
- Dark molding and of stucco.
- Grids of ventilation (for kitchens).

d) Work Machinery and tools:

The machinery to use in the mentioned works will be:

- Crane tower.
- Fork-lift truck (for the load and unloading of material).

The tools to use will be:

- Regulate.
- Shopping baskets.
- Trowel (small manual tool).
- Level (small manual tool).
- Flowerpot.
- Escapre (chisel).
- Portable illumination.

e) Identification of risks:

**Falls at the same level.**

*Preventive measures:* at any moment cleanings and ordered the support and transit surfaces will stay to make the works of plasterings to avoid the accidents by slide.

**Strange bodies in the eyes.**

*Individual protections:* for accidents by particle projection on the eyes, protection glasses will be used antiprojections.

**Super-effort:**

*Preventive measures:*

i. All the workers will have received formation on ergonomics, in special referring to the works previously enumerated.
The transport of coats of binders or barren will be made preferably on hand wheelbarrow, to avoid sobreefforts.

**Lack of illumination.**

**Preventive measures:** the illumination in the the 100 edges will not be inferior to lux, measured to 2 m.s of the ground.

**Electrocution.**

**Preventive measures:**

i. The illumination by means of portable, will take control of "watertight lampholders with insulating handle" and "grid" of protection of light bulb. The electrical energy will feed them 24 V.

ii. The male-female prohibits itself conexiónado of electrical cables to the pictures of feeding without the use of the pins.

**Waterproofing of covers:**

a) Definition of the work:

The waterproofing of covers includes/understands the following works in different phases:

- Formation of steam barrier.
- Stuffed of meetings of pavement of covers with polyurethane putty.

The works will begin with the formation of the steam barrier, which will be made as is finished the facade railings. In case of entering with part of the facade without finishing, it will have to be taken care of mentioned in the section phase 5 (execution of the facades) of point 1.4. "Collective protections to use during the constructive process". The work will consist of the extended one of an asphalt emulsion by the forged one of cover in two layers. The emulsion comes provided in boats of 25 kg and it extends with brush.

Once finished slopes on the steam barrier, it will be come to the positioning of the asphalt fabric on the same ones. In the first place a separating fiber glass fabric is placed, on which the asphalt fabric extends and welds, so that it is left loose respect to slopes.

The last performance of these works, consists of the positioning of the
filling of meetings of expansion of the ceramic pavement of the covers, with polyurethane putty.

b) Average aids to use:

- Ladder.

c) Material to use:

The necessary materials for the execution of these works, will be:

- Asphalt emulsion in cans of 25 kg.
- Asphalt fabric.
- Separating fiber glass lamina.
- Polyurethane putty.

d) Work Machinery and tools:

The machinery to use in the mentioned works will be:

- Crane tower.
- Fork-lift truck (for the load and unloading of material).
- Butane soldering iron.

The tools to use will be:

- Catalana (small manual tool).
- Shopping baskets.
- Brooms.

e) Identification of risks:

Fall of people at different level.

Individual protections: in case of being necessary to work without the collective protection corresponding and without the risk of fall at different level has disappeared, the workers they will go provided with moored lap belt to strongpoint.

Fall of people at the same level.

Preventive measures:

i. At any moment one will stay clean and free of obstacles that make difficult to the circulation or the works, the cover that is executed.
The plastics, cardboard, paper and iron straps, coming from the diverse ones packed, will take shelter immediately that the packages have been opened, pair their later elimination.

Super-effort:

Preventive measures: all the workers will have received formation on ergonomics, in special referring to the works previously enumerated.

Burns (sealed, waterproofings in hot).

Individual protections: the workers who make the works of asphalt fabric positioning will go provided with leather gloves.

Painting:

a) Definition of the work:

The execution of the painting includes/understands the following works in different phases:

- Quarters of accountants in ground floor; consisting of painting, in an early phase (when still the structure is being executed), the quarters of accountants of the electrical systems and plumbing, with plastic painting.

- Houses and stairs. For the accomplishment of this work, in the first place aluminum windows and doors will be protected. Once prote'ge', the damaged walls will be masillarán, sandpapering once has dried. Later, it will be come to throw the fine drop in ceilings (except of the fog rooms) and walls. On the following day, or when it has dried, the fat drop in walls will be thrown, coming to his "chafado". After it, it will be come to the painted one of the ceilings with white plastic painting with compressor (two hands). Once dry, the walls with plastic painting of color will be painted to define in the phase of execution with rollers (two hands). Later, it will be come to paint the encounter of the wall with the ceiling with brush (until covering completely). In order to finalize the works the protections placed in aluminum will retire and it will come to rascado and the cleaning from rodapiés and borders.

- Cellars. In the first place ceilings, walls and pillars with two hands of white weather will be painted so that it is possible to be made the own facilities of the cellar (electricity, plumbing, gas, etc.). Once the cellars with slurry have been painted, to the pillars levels in and wall will remove to paint the red ray (located approx. to 90 cm) and the inferior gray. After it stuck paper will be placed and the mentioned colors will
be painted, retiring immediately the paper. Finally, it will be come to the painted one of the numbers of the parking seats.

- Works in covers. The works consist of the accomplishment of the painting of casetones and railings of cover with stony painting. Before the beginning of the works it will be come to protect the existing carpentry with paper, which will retire when the work finishes.

- Later Facade. The later facade will be painted from hung scaffold offset. The painting to use will be stony. Before the beginning of the works it will be come to protect the existing carpentry with paper, which will retire when the work finishes.

- Material metalists. All the metallic materials are included in this point to paint in the work. In concrete these materials they are: railings of stairs and railings, metallic (stairs, vestibules and cellars), grids of ventilation (cellars, ground floor and covered) doors, water facilities, fires and gas (as much in cellars as in patios of lights and covers, front doors to vestibules and registries of stairs and C.G.P..

- Ceilings of galleries and eaves. They will be painted from the balconies with stony painting. Before beginning the works of painted, it will be come to protect the caravista brick (in its case), clearing this protection once made the work.

- Vestibules. East point to the painting of the ceilings of the vestibules talks about, as much in the interior as in the outside.

b) Average aids to use:

- Scaffolds of borriquetas.
- Tubular scaffold (with or without wheels).
- Ladders.

c) Material to use:

The necessary materials for the execution of these works, will be:

- Plastic painting.
- Painting to the weather.
- Stony painting.
- Metallic enamel.
- Paper of protection.
- Turpentine spirit.
- Material of plaster repair (type "aguaplast").

d) Work Machinery and tools:
The machinery to use in the mentioned works will be:

- Compressed air pistol with compressor.

The tools to use will be:

- Rollers.
- Brushes.
- Spatula.

e) Identification of risks:

**Fall of people at different level.**

**Collective protections:** The use of the ladders in the balconies is prohibited, without to have put previously the means of collective protection (superior railings, networks, etc.), to avoid the risks of falls to the emptiness.

**Individual protections:** In case of being necessary to work without the collective protection corresponding and without the risk of fall at different level has disappeared, the workers they will go provided with moored lap belt to strongpoint.

**Preventive measures:** Moored cables of security to the strongpoints of the work will tend, of which to moor the fastener of the lap belt in the situations of fall risk from height.

**The derivatives of the works made in injurious atmospheres (poisonings).**

**Preventive measures:**

i. The paintings, (the varnishes, dissolvents, etc.), will be stored in ventilated places affluent.

ii. It is prohibited to store paintings susceptible to emanate inflammable steam with the incompletely closed containers bad or, to avoid accidents by toxic or explosive atmosphere generation.

iii. The injurious atmosphere formation will be always avoided staying ventilated the premises that are being painted (open windows and doors).

**The derivatives of the breakage of hoses of the compressors.**

**Preventive measures:** Daily all the hoses of the compressors will be reviewed, replacing all those that are in badly been.
Poisoning.

Preventive measures:

i. It is prohibited to smoke or to eat in the stays in which it is painted with paintings that contain organic dissolvents or toxic pigments.

II. One will warn the personnel in charge to handle organic dissolvents (or toxic pigments) of the necessity of a deep personal hygiene (hands and face) before making any type of ingestion.

Super-effort:

Preventive measures: all the workers will have received formation on ergonomics, in special referring to the works previously enumerated.

Explosion or fire.

Preventive measures: a dry chemical dust extinguisher will settle next to the access door to the painting warehouse.

Lack of illumination.

Preventive measures: the illumination in the the 100 edges will not be inferior to lux, measured to 2 m.s of the ground.

Electrocution.

Preventive measures:

i. The illumination by means of portable, will take control of "watertight lampholders with insulating handle" and "grid" of protection of light bulb. The electrical energy will feed them 24 V.

II The male-female prohibits itself conexiando of electrical cables to the pictures of provision of energy without the use of the pins.
1.7. IDENTIFICATION OF RISK AND PREVENTIVE MEASURES TO ADOPT IN DIFFERENT INTERVENING AUXILIARY MEANS IN THE WORK.

In this section, a relation of the average aids who foreseeably will take part in the execution of the project, as well as of surely necessary procedures of work for its use is mentioned. However, it is possible to remember that the present study of security and health has been made with the basic project and not with the project of execution for the indicated reasons previously, reason why in this basic project does not exist a constructive memory that it defines how they are going away to make the works nor what average aids are going to be used.

In each point the own risks type by the use of each average aid and, in their case, by the assembly, maintenance and disassembling of such are identified existing. Also the preventive measures and protections are indicated to adopt to control and to reduce these risks. In el/los plan/es of security will have to be defined what average aids are going away to use, identifying the own risks and indicating the preventive measures to adopt, considering at any moment the stipulated thing by the manufacturer. All it will have to be approved by the coordinator of security designated for the execution of the work. The company contractor will have to include in the security plan the stipulated thing in the own preventive plan referring to the average aids to use in the work.

For the definition of each average aid, the indicated form has been adopted next:

a) Description of the average aid: type is described of the average aid to use, considering that each contractor will have to define more concretely in his plan of security how it will be this means.

b) Work Machinery and tools: one mentions in this point the necessary machinery and tools for the assembly, maintenance and disassembling of the average aid. Just as in the previous points, the identification of the risks of each type of machinery or tool, as well as the preventive measures and technical protections to adopt will come indicated in the corresponding section, reason why it will have to be taken care of the mentioned thing in such.

c) Identification of risks: a relation of the own risks is contributed, avoidable as as much nonavoidable, of the use of the average aid, including, in its case, the corresponding ones to the assembly, maintenance and disassembling of the same one. Within this epígrafe it is defined, for each risk, which I indicate next:

Collective protections: in case of using particular collective protections for the use of the average aid that are not indicated in the section of
"Collective protections to use during the constructive process" of the present study of security, they are indicated in this point, opposite case are not mentioned.

Individual protections: they are indicated what particular individual protections it will be necessary to use for the correct use of the average aid.

Preventive norms: the preventive norms for the use of the average aids are mentioned necessary.

d) Verifications to make before the use of the average aid (if it comes).

Ladders

a) Description of the average aid:

The ladders, are an average aid used in a great amount of works during the execution of the work. It is a portable apparatus that consists at intervals of two convergent parallel pieces or slightly united by crosspieces and that serves to raise or to lower a person from a level to another one.

It is predicted that they can be used in work all type of existing ladders, which are:

- simple Stairs of a section: nonautosoprtada and nonadjustable stairs portable in length, composed of two stringers.

- double Stairs of scissors: the union of the sections is made by means of a metallic device of joint that allows its fold.

- tensile Stairs: it is stairs composed of two simple ones superposed and whose length varies by displacements relative of a section on another one. They can be mechanical (cable) or manual.

- transformable Stairs: he is a tensile one of two or three sections (mixed of one tensile double and).

- mixed Stairs with lozenge: the union of the sections is made by means of a metallic device of joint that allows its fold.

With respect to the materials of which they are compound, I anticipate that they will be possible to be used of wood, steel or aluminum.

b) Necessary Machinery and tools:
The tools to use will be:

- Flowerpot or hammer (for the possible superior and inferior subjection of the stairs).

**c) Identification of risks:**

The following preventive measures will be common to all the mentioned risks next:

The contractor will have to inform and to form all his workers (as much own as subcontracted), on the suitable use of ladders.

The preventive resources will have to verify so much that is being used the average aid so and as it is mentioned in the indicated points next, as well as that its state is the correct one. Also it will take care of the arranged thing in the plans of corresponding security and prevention. It will have to be in charge of which any anomaly is rectified that finds to the respect? The usuary company of the average aid, will have to ask for to the manufacturer or provider, so and as it indicates article 41 of the Law of Prevention of Labor Risks, the necessary information for the correct and safe use of the same one, having to give it to each one of the workers who are going to use it.

**Fall in height due to a side slip of the head of the stairs (precarious support, stairs badly located, wind, lateral displacement of the user, etc).** It is an avoidable risk. With the purpose of controlling it the following thing will consider:

**Preventive measures:** with the purpose of avoiding the side slip, the stairs will subject superior, tying it correctly in its head (for example, during the encofrado phase of, with faults nailed in the same one and wire fences to tie).

**Fall in height due to a sliding of the foot of the stairs (lack of nonskid shoes, ground that yield or in slope, little inclination, superior support on wall, etc).** It is an avoidable risk. With the purpose of controlling it the following thing will consider:

**Preventive measures:**

i. All the stairs of which they are used in the work, must have shoes antisliding. The preventive resources will order to repair or to retire all those ladders that do not have the mentioned shoes.
II. The inclination of the stairs will have so to be the correct one and as it indicates the manufacturer in the security information that must give.

III. Firmly they will be moored in its end superior to the object or structures to which they give access. The preventive resources will have to watch that this point is fulfilled at any moment.

**Fall in height due to a imbalance raising loads or when inclining laterally towards the sides to carry out a work.** It is an avoidable risk. With the purpose of controlling it the following thing will consider:

**Preventive measures:**

i. All the workers who are going to use the ladders, must have information and formation on use of same for the transport of loads or the accomplishment of works on the same ones, facilitated by the contractor through the service of prevention.

II. He prohibits himself to by hand transport weights (or to shoulder), equal or superior to 25 kg on the ladders.

**Fall in height due the breakage of a step or post (old, bad repaired, existence of knots...).** It is an avoidable risk. With the purpose of controlling it the following thing will consider:

**Preventive measures:**

i. All the stairs of the work will be inspected before their use (and at least once to the day) by the preventive resources rejecting those that are not in good state.

II. The homemade repair of the mentioned stairs will not be allowed.

III. The stairs will have the stringers of a single piece and without deformations or dents are observed that can decrease their security.

IV. The steps (crosspieces) of wood will be assembled.

V. The wood stairs will be protected of the inclemency by means of transparent varnishes, so that they do not hide the possible defects.

VI. The metallic stairs will not be suplementadas with welded unions. In addition, they will be protected with painting antioxidation that preserves them of the aggressions of the inclemency.

VII. The wood stairs must under protection of store in places the atmospheric agents and so that they facilitate the inspection.
Fall in height due to the accomplishment of an abrupt gesture of the worker (object difficult to raise, electrical unloading, attempt to gather an object who falls, pinchazo with a nail that excels, etc.). It is an avoidable risk. With the purpose of controlling it the following thing will consider:

**Preventive measures:**

I. All the workers who are going to use the ladders, must have information and formation on use of same for the transport of loads or the accomplishment of works on the same ones, facilitated by the contractor in charge of as they make the works.

II The stairs will stay cleanings. III In case of being of wood, it will be verified before using the one that does not have any salient nail.

Fall in height due to the breakage of the cord of union between both flat of stairs of double or transformable scissors or to an incorrect use of the same ones. It is an avoidable risk. With the purpose of controlling it the following thing will consider:

**Preventive measures:**

i. All the stairs of scissors will have one cadenilla or similar that limits its Maxima opening.

II Totally it is prohibited to make a homemade repair of the limitor mentioned ones.

III The scissors stairs must be used since they have been designed, not as if was simple stairs.

IV The stairs of use scissors On guard, will be mounted with the stringers On guard of Maxima opening in order not to decrease their stability.

V. The scissors stairs never will be used as a borriquetas to sustain the servicing platforms.

VI The scissors stairs will not be used, if the position necessary on them to make a certain work, forces to locate the feet in 3 last steps.

vii. The scissors stairs will be used always mounted on horizontal pavements.

The entrapment between objects of some member produced when pushing out of position the ironworks of assembly of the heads of stairs of transformable scissors or or when unfolding tensile stairs. It is an
avoidable risk. With the purpose of controlling it the following thing will consider:

**Preventive measures:** the scissors stairs must have in their superior joint tops of opening security.

The entrapment between objects of some member when taking place the breakage of the tow rope in stairs tensile, prudent badly tied, as much in the fold as in the unfolded one. It is an avoidable risk. With the purpose of controlling it the following thing will consider:

**Preventive measures:** The preventive resources will daily review before the beginning of the works and all the stairs of scissors of the work, rejecting or taking care of which those are repaired that is in badly been.

Fall of objects on other people during diverse works and the personnel of aid or that circumstantially has happened underneath or next to the stairs.

**Preventive measures:** in case of being necessary to work on stairs.

Direct or indirect electrical contacts when using metallic stairs for works of electricity or next to electrical conductions.

**Preventive measures:**

i. The stairs will be provided with insulating shoes.

II. In no case it will have to be in contact with the enemy the stairs with connected electrical cables (in inferior support, tied to the structure of the stairs...).

**Fall in height due to badly a use of the stairs.**

**Preventive measures:**

i. The stairs will have will exceed in 1 mililiter the height to save.

II. They will settle of such form, that its inferior support you gave of the vertical projection of the superior one, 1/4 of the length of the stringer between supports.

III. The base of the ladders never must lean on places or little firm objects that can decrease their stability.
IV. The access of workers, through the ladders, will be made one by one. In no case they will be able to accede simultaneously to same the two or more workers.

V. The ascent and reduction and work must take place frontally, that is to say, watching directly towards the steps that are being used.

Fall in height due to being making a work on the stairs. In principle manual stairs do not have to be used to work, but in case of being necessary and whenever it is not possible to use a servicing platform the protections and preventive measures will be due to adopt that follow next:

Individual protections:

i. In case that the feet of the worker you are to more than 2 ms of the ground, a lap belt must be used anchored to a solid and resistant point. The preventive resources will have to verify their effectiveness, paralyzing the works before any anomaly and putting it in knowledge of the contractor, the service of prevention and the coordinator of security so that they can give a solution.

Preventive measures:

i. In order to make the work correctly, the stairs must be located so that it is possible to be acceded easily to the point of operation without having to stretch or to hang themselves. In case of not arriving with facility, the situation of the stairs will be due to vary returning to verify the elements of security of the same one.

Electrocution.

Preventive measures:

i. In no case stairs to a distance of less will work or transport than 5 milliliter, as much in horizontal as in vertical, of a line of discharge or average tension. It must be put special well-taken care of with the transport of stairs in the neighborhoods of electrical lines, having to always respect the minimum separation distances. However, in this work, any line is not observed nor is had certainty of its existence.

II. The stairs must be used to work of the form that have been conceived, reason why never will be able to be used on guard
horizontal to serve as bridges, footbridges or platforms. In addition, they
do not have either to be used to serve as supports scaffolding.

**Fall of objects on people.**

**Preventive measures:**

i. The stairs do not have to be stored on guard inclined, since they could slide and fall on a person.

ii. They must be stored horizontal, on guard subject by fixed supports, leaned to walls.

d) Verifications to make before the use of the stairs.

**The preventive resources** will have to inspect the state of the following elements:

1. Steps: firmness, aspect nondeteriorated, original subjection (not replaced by wires, cords.. or any other invention), etc.

2. Systems of subjection and support: shoes, cadenillas, lozenges.. or any other element that guarantee the stability of the stairs.

3. Other auxiliary organizational elements: as for example prudent and enlistments of tensile stairs.

Before any anomaly of described or the others, the stairs will be due to retire of circulation, informing into it, the preventive resources, to the totality of the users of the same one. This will have definitively to be repaired by specialized personnel or to be retired.

**Platform of unloading of materials**

a) Description of the average aid:

The platform of unloading of materials is an auxiliary organizational element used to make the auxiliary distribution of materials, means and machinery by work.

This formed by one structures metallic folding that subjects by means of props to forge. It is provided with protection railings that in no case can be annulled.

b) necessary Machinery and tools (even other average aids):
For his assembly, disassembling and maintenance, it will be necessary to use:

- Crane tower.
- Props.
- Flowerpot.

c) Identification of risks:

The following preventive measures will be common to all the mentioned risks next:

_The contractor will have to inform and to form_ all his workers (as much own as subcontracted), on the suitable use of the average aid?

_The preventive resources_ will have to verify so much that is being used the average aid so and as it is mentioned in the indicated points next, as well as that its state is the correct one. Also it will take care of the arranged thing in the plans of corresponding security and prevention. It will have to be in charge of which any anomaly is rectified that finds to the respect.

_The proprietary company_ of the average aid, will have to ask for to the manufacturer or provider, so and as it indicates article 41 of the Law of Prevention of Labor Risks, the necessary information for the correct and safe use of the same one, having to give it to each one of the workers who are going to use it.

Fall of objects on people due to the circulation or accomplishment of any work under the vertical of the platform and its zone of influence.

With the purpose of controlling risk will consider the following thing:

**Collective protections:**

i. A signaling in the vertical of the platform will have to be placed that notices and prevents the passage by the same one to any person. This protection will be placed at least to 1.5 m of the vertical mentioned one with the purpose of limiting a possible zone of influence.

II The preventive resources must to verify that the mentioned signaling is at any moment in perfect state.

III the platforms must have in all their edge baseboard with the purpose of avoiding the sliding of objects by the same one.

**Preventive measures:** posters under the vertical will be placed in which it is noticed of the existing danger, indicating to itself the
prohibition of circulating and as much making any work by the vertical mentioned one as by the zone of influence. The preventive resources to verify that the mentioned warning is not deteriorated nor disappears, replacing it so many times as it is necessary. In addition, must to warn to all person whom vea/n to accede to the zone signalized of the incorrect thing of its action.

Fall of people at different level by the edge from the platforms. With the purpose of controlling the risk the following thing will consider:

Collective protections: all the platform must have lateral fixed railings of protection in its and folding ones in the front. The preventive resources must to verify that the mentioned protection is used correctly, noticing it in case in opposition to the affected people (workers, contractor, service of prevention, delegates of prevention, coordinator of security, etc.).

Individual protections: in case of having to accede to the platform without the collective protection is placed, the worker that is going to make the work will go provided with a moored antacid lap belt to a strongpoint.

Preventive measures: posters in each one of the platforms with the instructions of use of the same ones will be placed (to the present see corresponding section in security study). The preventive resources must to verify that the posters remain in their site and are legible, replacing them in opposite case.

Fall of the platform by an erroneous assembly.

Preventive measures: the platforms must be properly propped up by means of props be accustomed to-ceiling, so and as it indicates the manufacturer in the assembly planes. The preventive resources will have to verify the correct state of the proppings.

Hung Scaffolds

a) Description of the average aid:

The hung scaffolds are suspended auxiliary constructions of cables, that vertically move by the facades by means of a elevating mechanism and driven reduction manually. In this work they will be used for the accomplishment of numerous works in height as they are those of closings of facades of buildings, revoked, etc.

The main elements that constitute one of the types of hung scaffold more extended are:
**Platform:** Structure formed by a galvanized plate ground nonskid on which the load and the people are located.

**Derrick:** Element located in the intermediate cover or forged of the building, in which the cable enlists of which it suspends the platform. One is made up of pen, tail and small horse.

**Equipment of elevation:** It is an apparatus that anchored to the platform takes the mechanism that fixes it and moves through the cable; it takes another connected mechanism, which acts on a second cable that makes the functions of security cable.

**Cable:** Auxiliary organizational element that anchored in the derrick, serves so that the platform in vertical sense moves. A second cable exists that makes the functions of security as it has already been indicated.

The scaffolds have different lengths and permissible fully factored loads based on the necessities from the work to make from such. In any case it will have to be taken care of the information facilitated on the part of the manufacturing or providing company on the conditions of assembly, use and maintenance of the scaffolds.

The hung scaffolds to use in this work, will be of two types:

1) Scaffolds hung anchored to forge.
2) Hung Scaffolds offset.

They will serve to make different works in facades. In each one of the cases it is possible to emphasize three different phases:

- Assembly of the scaffold.
- Use of the scaffold.
- Disassembling of the scaffold.

In both types of scaffold the phase of use of the scaffold will be the same one, reason why for the identification of risks, I will only indicate the existing differences in the assembly and disassembling.

From the take effect of R.D. 2177/2004, the scaffolds will have to fulfill the following requirements:

**Previous documentation to the assembly:**

Unless the scaffolds are mounted according to a generally recognized configuration type, they must have a **note of calculation or calculation**
of resistance and stability elaborated by person with qualifying university formation for this activity. This person will have to be somebody named by the usuary contractor of the scaffold (for example service of prevention, own technician...).

Plan of assembly, use and disassembling, elaborated by person with qualifying university formation for this activity, which will have to be named on the part of the usuary contractor of means (for example service of prevention, own technician...). For the scaffolds that have noticeable EC, plan it will be able to be replaced by the specific instructions of the manufacturer, supplier or provider whenever their assembly and use do not separate from these prescriptions.

Requirements for the assembly, disassembling or substantial modification:

It must have a technical manual on the part of a person who arranges a qualifying university formation to this activity, which will have to be named on the part of the usuary contractor of means (for example service of prevention, own technician... they).en case of scaffolds with noticeable EC and when the operations are made according to the specific instructions of the manufacturer, provider or supplier, they could also be directed by people with a experience of more than two years, certified by the industrialist in this matter and that count on formation of prevencionista of basic level (for example preventive resource, service of prevention...).

These operations will have to be made by workers who have received a suitable formation and specific that allows them to face the specific risks and for it they will have to include/understand:

a) The bread of assembly, disassembling and transformation.

b) The security during these operations.

c) The measures of prevention of risks of fall of people or objects.

d) The safety measures in case of change of the meteorological conditions that could negatively affect the security of the scaffolds.

e) The permissible conditions of load.

f) Any other risk derived from the operations of assembly, disassembling and transformation.

Inspection:
- Before its **start-up**.
- After it’s putting in good condition: **periodically**.
- After any modification, **period of nonuse, exhibition outdoors, shaken seismic or any other circumstance that had been able to affect its resistance or stability**.
- All these inspection will become on the part of people with university or qualifying formation, named on the part of the usuary contractor (for example service of prevention, own technician...). In scaffolds with noticeable EC mounted according to the specific instructions of the manufacturer, provider or supplier, you inspection could also be carried out by people who have a experience of more than two years, certified by the industrialist in this matter and that counts on formation of prevencionista of basic level (for example preventive resource, service of prevention...).

b) Necessary Machinery and tools:

The machinery to use in the works of assembly, maintenance and disassembling of the hung scaffolds will be:

- Crane tower.
- Electrical hammer (only in the case of anchored scaffolds).

The tools to use will be:

- Monkey wrench (small manual tool).

c) Identification of risks:

The following preventive measures will be common to all the mentioned risks next:

**The contractor will have to inform and to form** all his workers (as much own as subcontracted), on the suitable use of the average aid.

**The preventive resources** will have to verify so much that is being used the average aid so and as it is mentioned in the indicated points next, as well as that its state is the correct one. Also it will take care of the arranged thing in the plans of corresponding security and prevention. It will have to be in charge of which any anomaly is rectified that finds to the respect.

The usuary company of the average aid, will have to solicit to manufacturer or provider, so and as indicates article 41 of the Law of Prevention of Labor Risks, the necessary information for the correct and
Safe use of the same one, having to give it to each one of the workers who are going to use it.

I. During the phase of assembly of the hung scaffolds the following risks for types of scaffold are identified both:

**Fall of people at different level at the time of placing the derricks and cables in the cover.** This nonavoidable risk consists of the possibility of falling from the edge of the forged ones at inferior levels at the time of placing the derricks and cables that sustain the servicing platforms. With the purpose of controlling it the following thing will consider:

**Collective protections:** whenever it can stay placed the railings of protection to forged edge of, with which the risk would be avoided.

**Individual protections:** in case of being necessary to retire the protection railings or that are ineffective for the accomplishment from the mentioned work (p. ej. In case some of the strips must retire the worker that conform the railing to be able to accede to the hook of hangs at the time of placing the cable of the scaffold), el/los operario/s that make the operation must have moored lap belt to a strongpoint of the structure.

**Preventive measures:** in case of being necessary to retire the protection railings the Retired of railings of protection "including in the section of instructions will be due to follow for positioning and retired procedure" of collective protections of the present study of security.

**Fall of heavy objects on people and entrapment between objects at the time of distributing the servicing platforms in the inferior level.** This nonavoidable risk, consists of the possibility that some servicing platform falls when they are being distributed in the inferior level (it acierates, it plants 1ª, etc.) on some worker, or who this or some member his is caught between the platform and the ground. This can happen by a defect of subjection of the platform to the slings, by the passage of workers under the zone of distribution of the platforms, not to be cleans the zone of distribution of platforms, etc. With the purpose of controlling it the following thing will consider:

**Collective protections:** it will have to be limited perfectly zone where they are going away to distribute the platforms, so that they only can accede to same the workers who must conduct some operation.

**Preventive measures:** the gruísta will have at any moment to pay attention as much to the load that takes like a the zone where it tries to leave it. It will have to review the state of the slings as well as its correct
use. In any case, this work will have to be watched over the preventive resources.

**Fall of objects on people.** This nonavoidable risk, consists of the possibility that tools or cables of subjecton fall accidentally from the forged one superior to the workers who are in inferior levels. With the purpose of controlling it the following thing will consider:

**Collective protections:** the zone will have to perfectly remain annotated where the platforms are distributed, so that they only can accede to same the workers who must conduct some operation.

**Preventive measures:** The subjection cables will subject with cords to fixed elements of the level where the derricks are, loosen solely when they have enlisted to the derricks.

I.a. During the phase of assembly of the hung scaffolds offset, in addition the following risks are identified:

**Muscular upheaval at the time of filling up the drawers of counterbalance.** This avoidable risk, consists of the possibility of taking place a muscular injury at the time of placing the counterbalance of the scaffolds. With the purpose of controlling it the following thing will consider:

**Preventive measures:** the counterbalance to use one will be concrete blocks of 25 kg of weight at the most each. In addition, they will be taken care of the nomes of prevention relative to ergonomics given by the company. One will inquire and form to the workers on the correct form to move heavy loads.

II General risks (formation and use of scaffolds):

**Fall of people at different level.**

**Individual protections:**

i. All person who is going to raise a platform of hung scaffold will have to put itsef, before raising, lap belt type harness moored to a security cord. The prudent mentioned one will have to be subject to a independent strongpoint of the lifting structure of scaffolds (for example independent derricks, pillars...).

II. The preventive resources to watch that this measurement is carried out correctly.

**Preventive measures:**
i. Before the first use of the scaffold, a test of load with verification of all the elements will have to be made that guarantees the stability of the system. El/los recurso/s preventivo/s deberán to watch that it is made and to write down the data of the same one, ordering the necessary changes in case that the result was not satisfactory.

II. The separation between derricks will not surpass three meters.

III. The scaffold to strongpoints of the work will be braced to avoid accidental displacements.

IV. It was not loaded excessively of materials nor will deposit these on the platforms of violent way.

V. The concentration of people in reduced sections will be avoided.

VI. The materials deposited on the platforms will allow to the workers the free circulation by the same ones.

vii. El/los recurso/s preventivo/s deberán to verify the state of cables assiduously, commanding to replace them if they observe frayed or pinzamientos.

viii. the movements of elevation or reduction of the scaffold will take control of smoothness and without accusing the unevennesses of the different platforms from a same scaffold.

ix. All the elements of the scaffold will be the described ones by the manufacturer. In case of lacking some, it will be replaced by an original piece.

x. They will be placed properly assured to each scaffold the precise stairs for the access to each scaffolding and in easy and safe form for the workers who use them. They will be always one-piece, prohibiting the stairs with subject bars with nails.

Fall of objects on people.

Preventive measures:

i. The materials deposited on the platforms will not exceed the height of the socle to avoid the fortuitous fall.

Scaffolds of Borriquetas
a) Description of the average aid:

They are formed by a horizontal board of 60 cm. in minimum width, placed on two supports in form of "inverted V".

b) Necessary Machinery and tools:

The machinery to use in the works of assembly, maintenance and disassembling of the hung scaffolds will be:

-Crane tower.

In principle the use of any specific tool is not anticipated.

c) Identification of risks:

The following preventive measures will be common to all the mentioned risks next:

The contractor will have to inform and to form all his workers (as much own as subcontracted), on the suitable use of the average aid.

The preventive resources will have to verify so much that is being used the average aid so and as it is mentioned in the indicated points next, as well as that its state is the correct one. Also it will take care of the arranged thing in the plans of corresponding security and prevention. It will have to be in charge of which any anomaly is rectified that finds on the matter. The scaffolds will daily inspect by preventive resources, before the beginning of the works, to prevent failures or lack with safety measures.

The usuary company of the average aid, will have to ask for to the manufacturer or provider, so and as it indicates article 41 of the Law of Prevention of Labor Risks, the necessary information for the correct and safe use of the same one, having to give it to each one of the workers who are going to use it.

Fall of people at different level.

Collective protections:

i. For the use of boriquetas in balconies (terraces or tribunes), a provisional closing, formed by "right feet" coined to ground will settle and ceiling, to which planks will be moored forming a solid railing of 1'00 m. of height, measures from the work surface on
borriquetas. The railing will consist of banister rails, intermediate strip and rodapié. II The servicing platforms, in case of exceeding 2ml of height, will have complete perimetrales railings of 100 cm. of height, formed by banister rails, sweeps or intermediate strip and baseboard.

**Preventive measures:**

i. Borriquetas always will mount perfectly made level, to avoid the risks of working on inclined surfaces.

II. Borriquetas of wood, will be healthy, perfectly glued and without oscillations, deformations and breakage, to eliminate the risks by failure, spontaneous breakage and sway.

III. The servicing platforms will anchor perfectly to borriquetas, in undesirable avoidance of balance and other movements.

IV. The servicing platforms will not excel by the lateral ones of borriquetas more than 40 cm. to avoid the risk of upsets by tilting.

V. Borriquetas will not be separated "to axes" to each other more than 2.5 m.s to avoid the great arrows, undesirable for the servicing platforms, since they increase the risks when swaying.

VI. The scaffolds will form on a two minimum of borriquetas. It is prohibited specifically, the substitution of these, (or some of them), by "cans", "batteries of assimilable materials" and, to avoid unstable situations.

VII. On the scaffolds on borriquetas, will only stay the material strictly necessary and distributed uniformly by the servicing platform to avoid the overloads that decrease the resistance of planks.

VIII. Borriquetas metallic of system of opening of closing or scissors, will be equipped with cadenillas limitor of the Maxima opening, such, that they guarantee its perfect stability.

IX. The servicing platforms on borriquetas, will to each other have a minimum width of 60 cm (3 joined planks), and the thickness of the plank will be like minimum of 7 cm.

X. Borriquetas metallic to sustain platforms of work located to 2 either the more meters of height, will be braced to each other, by means of "crossings of San Andrés", to avoid the oscillating movements, that make the set uncertain.
XI. It is prohibited to form simple scaffolds on borriquetas metallic whose servicing platforms must be located to 6 either the more meters of height.

XII. Is prohibited to work on stairs or hover platforms in borriquetas, supported as well on another scaffold of borriquetas.

XIII. The scaffolds always will be braced to avoid the undesirable movements that can make lose the balance to the workers.

XIV. Before raising a platform scaffolding will have to review all its structure to avoid the unstable situations.

XV. The vertical sections (right modules or feet) of the scaffolds, will lean on planks of distribution of loads.

XVI. The right feet of the scaffolds in the zones of inclined land, will suplementarán by means of tacos or portions of plank, joined to each other and received the distribution sleeper. XVII. The servicing platforms will have a minimum of 60 cm. in width and firmly will be anchored to the supports of such form that are avoided the movements by sliding or upset.

XVIII. It is prohibited to directly make mortars (or similars) on the platforms of the scaffolds.

XIX. The elements that denote some technical failure or bad behavior will disassemble immediately for their repair (or substitution).

XX. Previous the medical examinations for the admission of the personnel who must work on the scaffolds of this work, will try to detect those organic upheavals (vertigo, epilepsy, upheavals cardiac, etc.), that can suffer and cause accidents to the worker. The results of the recognitions will appear to the Coordinator of Security and Health in work execution before their entrance in the same one.

Falls at the same level.

Preventive measures:

i. The servicing platforms will allow to the circulation and necessary intercommunication for the accomplishment of works.

II It will be prohibited to leave in the platforms on the scaffolds, materials or tools. They can fall on the people or make them encounter and fall when walking on them.
The derivatives of the use of planks and wood of small section or in badly been (breakage, failures, cimbreos).

**Preventive measures:**

i. The wood to use will be healthy, neither without naked defects nor at sight, to avoid the risks by breakage of the planks that form a work surface.

II the planks that form the servicing platforms will be without visible defects, with good aspect and without knots that decrease their resistance. They will be clean, of such form, that the defects by use can be appraised.

**Tubular Metallic Scaffolds**

a) Description of the average aid:

The tubular metallic scaffolds are supported auxiliary constructions in the ground that are used for the sustenation of the different located servicing platforms from different heights; they fulfill, according to the cases, functions on watch, load and protection. In this work they will be used for the accomplishment of numerous works as those of closings of facades in ground floors are and first, tabiquería in different plants, plumbing, electricity, revoked, etc., so and as it is indicated in the corresponding sections.

The risks will have to be identified according to the following phases:

- Assembly of the scaffold.
- Use of the scaffold.
- Disassembling of the scaffold.

Like in the case of the hung scaffolds, in case that the scaffold has more than six meters, they have horizontal elements that they save superior flights and distances between supports of more than eight meters, or are installed in the outside on roofs, cupolas, tile roofs or superior structures whose distance between the level of support of the scaffold and the level of the land or the ground exceeds 24 meters of height, will have to be fulfilled the following requirements in order to fulfill R.D. 2177/2004:

**Previous documentation to the assembly:**

-Unless the scaffolds are mounted according to a generally recognized configuration type, they must have a note of calculation or
calculation of resistance and stability elaborated by person with qualifying university formation for this activity. This person will have to be somebody named by the usuary contractor of the scaffold (for example service of prevention, own technician...).

-Plan of assembly, use and disassembling, elaborated by person with qualifying university formation for this activity, which will have to be named on the part of the usary contractor of means (for example service of prevention, own technician...). For the scaffolds that have noticeable EC, plan it will be able to be replaced by the specific instructions of the manufacturer, supplier or provider whenever their assembly and use do not separate from these prescriptions.

Requirements for the assembly, disassembling or substantial modification:

It must have a technical manual on the part of a person who arranges a qualifying university formation to this activity, which will have to be named on the part of the usary contractor of means (for example service of prevention, own technician... they). en case of scaffolds with noticeable EC and when the operations are made according to the specific instructions of the manufacturer, provider or supplier, they could also be directed by people with a experience of more than two years, certified by the industrialist in this matter and that count on formation of prevencionista of basic level (for example preventive resource, service of prevention...).

These operations will have to be made by workers who have received a suitable formation and specific that allows them to face the specific risks and for it they will have to include/understand:

- g) The bread of assembly, disassembling and transformation.
- h) The security during these operations.
- i) The measures of prevention of risks of fall of people or objects.
- j) The safety measures in case of change of the meteorological conditions that could negatively affect the security of the scaffolds.
- k) The permissible conditions of load.
- l) Any other risk derived from the operations of assembly, disassembling and transformation.

Inspection:

- Before its start-up.
- After it’s putting in good condition: periodically.
- After any modification, period of nonuse, exhibition outdoors, shaken seismic or any other circumstance that had been able to affect its resistance or stability.

- All these inspection will become on the part of people with university or qualifying formation, named on the part of the usary contractor (for example service of prevention, own technician...). In scaffolds with noticeable EC mounted according to the specific instructions of the manufacturer, provider or supplier, you inspection could also be carried out by people who have a experience of more than two years, certified by the industrialist in this matter and that counts on formation of prevencionista of basic level (for example preventive resource, service of prevention...).

b) necessary Machinery and tools:

The machinery and tool to use in the works of assembly, maintenance and disassembling of the tubular metallic scaffolds will be:

- Crane tower.
- Small tool of hand (hammers, screwdrivers, monkey wrenches, etc.).

c) Identification of risks:

The following preventive measures will be common to all the mentioned risks next:

The contractor will have to inform and to form all his workers (as much own as subcontracted), on the suitable use of the average aid.

The preventive resources will have to verify so much that is being used the average aid so and as it is mentioned in the indicated points next, as well as that their state he is the correct one. Also it will take care of the arranged thing in the plans of corresponding security and prevention. It will have to be in charge of which any anomaly is rectified that finds to the respect.

The usary company of the average aid, will have to ask for to the manufacturer or provider, so and as it indicates article 41 of the Law of Prevention of Labor Risks, the necessary information for the correct and safe use of the same one, having to give it to each one of the workers who are going to use it.

I. During the phase of assembly of the scaffolds the following risks are identified:

Fall of people at different level.
Individual protections:

i. All person in charge of the assembly will have to put itself, before raising, a lap belt type harness moored to a security cord. The prudent mentioned one will have to be subject to a independent strongpoint of the lifting structure of the scaffolds.

II. The preventive resources must to watch that this measurement is carried out correctly.

Preventive measures:

i. A new level will not begin without before to have concluded the departure level with all the elements of stability (crossings of San Andrés, and bracings).

II The security reached in the level to begin with already consolidated will be so, that it will offer the necessary guarantees like being able to moor to him the fastener of the lap belt.

III the servicing platforms will consolidate immediately after their formation, by means of the clips of subjection against the corresponding tiltings or bracings.

IV The unions between tubes will take place by means of the "knots" or "metallic bases", or by means of the jaws and pins anticipated, according to the commercialized models.

V. The servicing platforms, will be immobilized by means of the clips and pinsnailed to planks.

Super-effort:

Preventive measures: all the workers will have received formation on ergonomics, in special referring to the works previously enumerated.

Fall of objects.

Preventive measures:

i. The bars, tubular modules and planks, will be hoisted by means of tied ropes of hemp with "sailor knots" (or by means of standardized slings).

II General risks (formation and use of scaffolds).

Fall of people at different level.
Collective protections:

i. The servicing platforms will have mounted on the vertical of rodapié later a solid railing of 1'00 m. of height, formed by banister rails, intermediate strip and rodapié.

II The vertical communication of the tubular scaffold will be resolute by means of the use of prefabricated stairs (auxiliary organizational element of the own scaffold).

III It is prohibited to work on platforms ready on the coronation of tubular scaffolds, if they have before not surrounded with solid railings that surpass 1'00 m. of height on the mentioned servicing platform, formed by banister rails, sweeps intermediate and baseboard.

Preventive measures:

i. The servicing platforms will have a minimum of 60 cm. in width.

II The modules of foundation of the tubular scaffolds, will be equipped with the nivelables bases on endless screws (leveling small spindles), with the purpose of guaranteeing a greater stability of the set.

III The modules of base of the tubular scaffolds, will lean on planks of distribution of loads in the zones of direct support on the land.

IV Totally it is prohibited to support the tubular scaffolds on supplements formed by cans, batteries of diverse materials, "diverse" and assimilable wood turrets.

v. The platforms of support of the endless screws (leveling small spindles), of base of the tubular scaffolds had on distribution planks, will nail to these with steel nails, sunk thoroughly and without doubling.

VI All the components of the scaffolds will have to stay in good state of conservation rejecting itself those that present/display defects, blows or defendant oxidation.

vii. The tubular scaffolds on modules with lateral stairway, will mount with this one towards the outer face, that is to say, towards the face in which it does not work.

viii. Totally is prohibited the use of scaffolds on borriquetas (small borriquetas), supported on the servicing platforms of the tubular scaffolds.
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ix. The tubular scaffolds will mount to an equal or inferior distance to 30 cm. of the vertical paramento in which it works.

x. The tubular scaffolds will be braced to the vertical paramentos, anchoring them solidly to the "strongpoints of security" anticipated in facades or paramentos.

xi. It is prohibited to directly make "pastes" on the servicing platforms in prevention of slippery surfaces that can make fall to the workers.

xii. The materials will be distributed uniformly on the servicing platforms in accident prevention by unnecessary overloads.

Fall of objects.

Collective protections:

i. The servicing platforms will limit advantage, lateral later and, by rodapié of 20 cm.

II. The modules of base of special design for the pedestrian crossing, will complement with wooden frameworks and safe visors at "level of ceiling" in prevention of blows to third.

Preventive measures: the loads will be hoisted until the servicing platforms by means of pulleys mounted on subject tubular gifts by means of a minimum of two bridles to the tubular scaffold.

Super-effort

Preventive measures:

i. The materials will be distributed uniformly on a plank located to average height in the later part of the servicing platform, without their existence to merit the useful surface to me of the platform.

II. All the workers will have received formation on ergonomics, in special referring to the works previously enumerated.

Props

b) necessary Machinery and tools:

The machinery and tool to use in the works to make with props will be:
-Crane tower.
- Small tool of hand (hammers...).

c) Identification of risks:

**Fall from height of the props during the maneuvers of high transport.**

**Preventive measures:**

i. The props will ordenadamente gather together by horizontal layers of an only prop in height and bottom the one that wishes, with the only reservation of which each layer is had immediate perpendicular form to the inferior one.

II The props will be hoisted (or they will descend) to the plants in uniform packages on trays, flejados to avoid unnecessary spills.

III The props will be hoisted (or they will descend) to the plants in packages flejados by both extreme; the set, will be suspended by means of equipment of slings of the hook of the crane tower.

**Entrapment of fingers (extension and retraction).**

**Preventive measures:** the props of type by telescope will be transported to arm or shoulder with the pins and jaws installed On guard of inmovilidad of the capacity of extension or retraction of the props.

**Fall of elements shrouds of the prop on the feet.**

**Individual protections:** the workers who manipulate props, will have to go provided with footwear of security with metallic toe.

**Breakage of the prop by fatigue of the material.**

**Preventive measures:**

i. The distribution of the load on the propped up surfaces will be made uniformly distributed. One specifically prohibits in this work the precise overloads.

II The props will have the length adapted for the mission to make.

**Breakage of the prop by badly been (internal and/or external corrosion...).**
Preventive measures:

i. The props will be in perfect conditions of maintenance (oxide absence, painted, with all its components, etc.).

II. The endless screws will have lubrications in prevention of unnecessary efforts. III. They will lack deformations in the Fuste (dents or torcimientos).

Sliding of the prop by lack of acuñamiento or clavazón.

Preventive measures:

i. The sleeping planks of support of the props that must work inclined with respect to the vertical will be the ones that will be coined. The props, always will support of perpendicular form to the face of the plank. II. The props will nail to the sleeper and sopanda, to obtain a greater stability. III. The props will be equipped in their ends of the plates for support and clavazón.

Collapse of encofrados because of the disposition of props.

Preventive measures: the disposition of the props in the encofrado one will be made as much according to the calculation made by the architect in the execution project and having in account the recommendations of use of the manufacturer of the props like of the one of the encofrados ones.

Collapse of the storings of props.

Preventive measures:

i. The stability of the turrets of storing of props, will make sure by means of sinks it of "right feet" of lateral limitation.

II. It is prohibited specifically after desencofrado the irregular accumulation of the props.

Super-effort

Preventive measures:

i. It is prohibited specifically in this work, the load to shoulder of more than two props by a single man in prevention of sobreefforts.

II. All the workers will have received formation on ergonomics, in special referring to the works previously enumerated.

Towef of concrete:
a) Description of the average aid:

This average aid, is a small auxiliary platform that usually is used like aid to guide the bucket or bucket of the crane during the operations of hormigonado of pillars or elements of certain singularity.

b) Necessary Machinery and tools:

The machinery and tool to use in the works of assembly, maintenance and disassembling of the tubular metallic scaffolds will be:

- Crane tower.
- Small tool of hand (hammers, screwdrivers, monkey wrenches, etc.).

c) Identification of risks:

Falls of people at different level.

Collective protections:

i. The platform will have a railing of 1'00 m. of height formed by bar banister rails, sweeps intermediate and rodapié of table of 15 cm. of height.

Il The access to the platform will be closed by means of a chain or sweeps whenever they remain people on her.

Preventive measures:

i. The platforms will present/display minimum dimensions of 1'10 by 1'10 m. (the necessary minimum for the stay of two men).

Il The ascent and reduction of the platform will be made through stairs.

Ill The transport of people or objects is prohibited on the platforms of the "tower of hormigonado" during its shifts of position, in prevention of the fall risk.

Super-effort by transport and new location.

Preventive measures:

i. The "concrete tower of" will be located to come to the filling of the pillars in corner, with the face of work located perpendicularly to the internal diagonal of the pillar, with the purpose of obtaining the most favorable and safer position.
II. All the workers will have received formation on ergonomics, in special referring to the works previously enumerated.
1.8. IDENTIFICATION OF RISKS AND PREVENTIVE MEASURES TO ADOPT WITH THE DIFFERENT MACHINERY AND TOOLS TO USE IN THE WORK

In this section, a relation of the machinery and tool is mentioned that foreseeably will be used in the execution of the project, as well as of surely necessary procedures of work for its use. However, it is possible to remember that the present study of security and health has been made with the basic project and not with the project of execution for the indicated reasons previously, reason why in this basic project does not exist a constructive memory that it defines how they are going away to make the works neither what machinery nor tool is going to be used.

In each point the own risks are identified existing type by the use of each type of machinery and tool and, in their case, by the assembly and disassembling of the same one. Also the preventive measures and protections are indicated to adapt to control and to reduce these risks.

In the security plan it will have to be defined what machinery and tool are going away to use, identifying the own risks and indicating the preventive measures to adopt, considering at any moment the stipulated thing by the manufacturer. All it will have to be approved by the coordinator of security designated for the execution of the work. The company contractor will have to include in the plan of security stipulated in the own preventive plan referring to the machinery and the tool to use in the work.

For the definition of each machinery or tool, the indicated form has been adopted next:

a) Description of the machinery or tool: to the machinery or tool is described type to use, considering that each contractor will have to more concretely define it in his plan of security.

b) Identification of risks: one contributes to a relation of the own risks of the use of the machinery and tool. Within this epígrafe it is defined, for each risk, the following thing:

Collective protections: in case of using particular collective protections for the accomplishment of the works that are not indicated in the section of “Collective protections to use during the constructive process” of the present study of security, they are indicated in this point, opposite case do not mention.

Individual protections: it is indicated what particular individual protections it will be necessary to use for the correct use of the average aid.
Preventive measures: the preventive norms for the use of the machinery and tool are mentioned necessary.

c) Verifications to make before the use of the machinery or tool (if it comes).

**Shovel shipper of wheels**

a) Description of the machinery:

The use of shovels mounted on tractor is necessary machines in the work, since they are apt for diverse works, but specially for earthwork.

The shovel shipper, is to say the compound power shovel of a tractor on caterpillars or tires equipped of a spoon whose movement of elevation is obtained by means of two articulated arms, will make diverse functions.

The specific function of the shovels shippers in this work is the load, transports to short distance and unloading of materials.

They will be possible to be used some of these three types:

a) With spoon equipped with heave.

b) With spoon that unloads backwards.

c) With spoon equipped with horizontal and vertical combined movements.

Some of these shovels shippers has tumbling, but they are only usable in very soft lands or earth previously puffed up.

b) Identification of risks:

**Upsetting.**

**Preventive measures:**

i. It is prohibited that the conductors leave the machine with the motor to work.

   II the machines to use in this work, will be equipped with lights and horn of backward movement.

   III It is prohibited to take the motor without before making sure that there is nobody in the operational area of the shovel.
IV The brakes of the shutdown machine do not have to be freed. On guard, if before the tacos of immobilization in the wheels have not been installed.

v. It must be circulated at a suitable speed.

VI. The machine with the motor working does not have to give in.

**Upset of the machine.**

**Preventive measures:**

i. The spoon during the earth transports will remain lowest possible to be able to move, with the Maxima stability.

ii. The circulation on unequal lands will take place at slow speed.

iii. The spoon, during the earth transports, will remain lowest possible to be able to move, with the Maxima stability.

**Entrapment**

**Preventive measures:**

i. Adjustments "with the machine do not have to be made" in movement or with the motor in operation, it can suffer injuries.

ii. It does not have to work with the machine in failure situation or semidamages. It must be repaired first and soon to reinitiate the work.

iii. In order to avoid injuries, in case of failure or maintenance, the spoon must lean in the ground, stop the motor, put the hand brake and block the machine before coming to conduct the necessary operations on watch.

**Fall of people from the machine.**

**Preventive measures:**

i. It is prohibited to transport people inside the spoon.

ii. In order to raise or to lower of the machine the steps must be used and handles ready to such function, will avoid injuries by fall.

iii. It is prohibited to rise using the rims, covers, chains and mudguard.
IV It must rise and lower of the machinery of frontal form, taking hold with both hands.

**Vibrations.**

*Individual protections* with the purpose of controlling the risk, the conductors will go provided with vibration-proof elastic belt.

**Twists.**

*Preventive measures:* It does not have to never skip directly to the ground, unless it is by imminent danger.

**Own noise and of set.**

*Individual protections* with the purpose of controlling the risk, the conductors will go provided with auditory protectors. In the same way, the workers who must work in the neighborhoods of the machine (always outside the operational range of the same one), will have to use the auditory protective mentioned ones.

*Preventive measures:* annual or as mark the service of prevention, the conductor and all that that remain habitual in the zone of influence of the source of noise (machine), must watch the evolution of his capacity auditory, with the purpose of control that not exist loss of the same.

**Fire.**

*Preventive measures:* The machines to use in this work, will be equipped with an extinguisher, stamped and with the revisions the day.

**Hydraulic backhoe of wheels**

b) Identification of risks:

**Upsetting.**

*Preventive measures:*

i. It is prohibited that the conductors leave the machine with the motor to work.

II It is prohibited that the conductors leave the shovel with the hoisted spoon and without supporting in the ground.
III The ascents or reductions in load of the machine will always take place using short marches to avoid that the tires lose takes hold with the firm one and slipping the machine descontroladamente.

IV The machines to use in this work, will be equipped with lights and horn of backward movement.

**Upset of the machine.**

**Preventive measures:**

i. The internal belt roads of the work, will be taken care of to avoid blandones and excessive embarramientos that decrease the security of the circulation of the machinery.

II The backhoe will have to go provided with the protection of cabin antiupset or porch of security.

III The spoon, during the earth transports, will remain lowest possible to be able to move with the Maxima stability.

IV The circulation on unequal lands will take place at slow speed.

**Burns.**

**Individual protections:** in order to avoid it leather gloves will be used at the time of conducting operations of maintenance.

**Preventive measures:** whenever it can, it will be avoided to conduct operations of maintenance with the machine just stopped. It will have to be made once has cooled off.

**Entrapment**

**Preventive measures:**

i. It is prohibited to remain (or to work) in the surroundings of the operational range of the arm of a machine for the earthwork.

II It is prohibited to take the motor without before making sure that there is nobody in the operational area of the shovel.

III It will be limited to an equal distance to the one of the maximum reach of the excavating arm, the surroundings of the machine. The accomplishment of works or the permanence of people is prohibited in the zone.
Fall of people from the machine.

Preventive measures:

i. It is prohibited to transport people inside the spoon.
ii. It is prohibited to hoist people to accede to precise works using the spoon.

Blows.

Preventive measures: it is prohibited to make works inside trenches or ditches, in the zone of reach of the arm of retro.

Own noise and of set.

Individual protections: with the purpose of controlling the risk, the conductors will go provided with auditory protectors. In the same way, the workers who must work in the neighborhoods of the machine (always outside the operational range of the same one), will have to use the auditory protective mentioned ones.

Preventive measures: annual or as mark the service of prevention, the conductor and all that that remain habitual in the zone of influence of the source of noise (machine), must watch the evolution of his capacity auditory, with the purpose of control that not exist loss of the same.

Vibrations.

Individual protections: with the purpose of controlling the risk, the conductors will go provided with vibration-proof elastic belt.

Fall of heavy objects on people.

Preventive measures: it is prohibited in this work to use the backhoe like a crane, for the introduction of pieces, pipes, etc., inside the ditches.

Earth collapse on people.

Preventive measures: the conductors will make sure that danger for the workers does not exist who are inside wells or ditches next to the excavation place.

Fire.
Preventive measures: The machines to use in this work, will be equipped with an extinguisher, stamped and with the revisions the day.

Preventive performance standards for the machinists.

- To raise or to lower of the machine, it uses the steps and handles ready to such function, it will avoid injuries by fall.

- It does not rise using the rims, covers, chains and mudguard, will avoid accidents by fall.

- It raises and it lowers of the machinery of frontal form taking hold with both hands; he is safer.

- It never jumps directly to the ground, if it is not by imminent danger for you.

- It does not try to make “adjustments” with the machine in movement or with the motor in operation, it can suffer injuries.

- It does not allow that people nonauthorized accede to the machine, they can cause accidents or be injured.

- It does not work with the machine in failure situation or semidamages. Repárela first, soon backslides the work.

- To avoid injuries, it supports in the ground the spoon, stops the motor, it puts the hand brake and it blocks the machine; next it conducts the operations on watch that need.

- It on guard does not release the brakes of the shutdown machine, if before it has not installed the tacos of immobilization in the wheels.

- The pressure of the tires Watches, works with the inflation to the pressure recommended by the manufacturer of the machine.

**Dump truck**

b) Identification of risks:

**Upsetting of people (entered, exit, etc.).**

Preventive measures:

i. The entrances and exits to the work will be made with precaution helped by the signals of a member of the work.
II If by any circumstance braking and footwear with tops had to stop in the incline the vehicle will have left.

III The trucks will have automatic acoustic warning device of reverse gear, as well as of intermittent of warning of turn.

IV Before starting the engine, or before leaving the cabin, making sure that it has installed the hand brake.

v. When stopping the truck must be put tacos of immobilization in the wheels.

**Shocks against other vehicle.**

**Upset of the truck.**

**Protections:** the trucks must have cabin antiupset and antiimpact.

**Preventive measures:**

i. The box will be lowered immediately after carried out the unloading and before undertaking the march. It is specifically prohibited to load the trucks over the fully factored load marked by the manufacturer, to prevent the risks with overload.

**Fall (when raising or lowering of the box).**

**Preventive measures:**

i. In order to raise and to lower of the truck to use the steps and the handles ready in the vehicle.

II It does not have to rise the machine using the rims, wheels or other projections.

**Entrapment (opening or closes of the box...).**

**Preventive measures:**

i. The conductor will remain outside the cabin during the load.

II Adjustments with the motor in march do not have to become, since entrapment can take place.

**Burns.**
**HEALTH AND SAFETY**

**Individual protections**: in order to avoid it leather gloves will be used at the time of conducting operations of maintenance.

**Preventive measures**:

i. Whenever it can, it will be avoided to conduct operations of maintenance with the machine just stopped. It will have to be made once has cooled off.

II. If the motor is warmed up, not to raise in hot the cover of the radiator, burns can be suffered. III The oil of the motor and the hydraulic system must change in cold.

**Electrocution**.

**Preventive measures**:

i. If it is had to manipulate the electrical system, to disconnect the machine and to remove the ignition key.

II The truck does not have to be taken without to have lowered the box, since electrical lines can be touched.

III In case of touching an electrical line by accident, to leave the cabin and to jump more far possible avoiding to touch to earth and the truck at the same time. To also avoid, that nobody touch earth and truck at the same time, is much danger of electrocution.

**Fire and/or explosion**.

**Individual protections**: the liquids of the battery give off inflammable gases, if they are had to manipulate, to do it with gloves.

**Preventive measures**:

i. The machines to use in this work, will be equipped with an extinguisher, stamped and with the revisions the day.

II It does not have to keep fuel nor rags lubricated in the truck, since fire.

III. It does not have to be smoked nor to approach fire when the motor or the battery is being manipulated.

IV. If it is necessary to take the truck with the battery of another vehicle, to watch the sparks, since the gases of the battery are inflammable and could explode.
**Dumper**

a) Description of the machinery:

Dumper is a vehicle that habitually usually is used by different workers, but for which it is due to directly be in favor authorized of responsible personnel for his use. In addition, the conductor, will have to fulfill the settled down norms of circulation in the enclosure of the work and, in general, he will rely on the Highway Code.

b) Identification of risks:

**Upset of the machine during the spill.**

**Preventive measures:**

i. In the earth spill, or another material, next to ditches and slopes a top will have to be placed that on the brink of madness prevents the advance of dumper beyond a prudencial distance unevenness, considering the natural angle of the slope. If the unloading is lateral, this top will extend in the end next to the circulation sense.

**Upset of the machine in transit.**

**Preventive measures:**

i. With the loaded vehicle the inclines of backs to the march must lower, and avoiding frenazos slowly abrupt.

Il It will be prohibited to circulate around slopes or inclines superior to 20% in humid lands and 30% in dry lands.

Ili In the inclines around which they circulate these vehicles will exist at least a free space of 70 cm. on the most salient parts of such.

IV The load will be reviewed before initiating the march observing its correct disposition and that does not cause imbalance in the stability of dumper.

**Upsetting of people.**

**Preventive measures:**

i. When it is left parked the vehicle stops the motor and the hand brake will be driven. If it is in slope, in addition the wheels will wear.

II. The loads will be appropriate to the type of dump available and they will never make difficult the vision of the conductor.
Ill It is prohibited specifically in this work, to lead dumpers at speeds superior to 20 km per hour.

**Shock by lack of visibility or incorrect transport.**

**Preventive measures:**

i. To establish comfortable and free routes of circulation of obstacles being signalized the danger areas.

Il The loads will be appropriate to the type of dump available and they will never make difficult the vision of the conductor.

Ill In forecast of accidents, the transport of pieces is prohibited (props, planks and similars) that excels laterally of the cupola of dumper.

**Fall of transported people.**

**Preventive measures:**

i. The conductor of dumper does not have to allow the transport of passengers on the same one.

**Blows with the starting handle.**

**Preventive measures:**

i. In the start up, the crank must be taken placing the thumb of the same side that the other fingers.

Il The crank will have the suitable length to avoid to strike parts next to her.

**Mixed excavator on wheels**

  c) Identification of risks:

**Upsetting.**

**Preventive measures:**

i. It is prohibited that the conductors leave the machine with the motor to work.
II It is prohibited that the conductors leave the shovel with the hoisted spoon and without supporting in the ground.

III The ascents or reductions in load of the machine will always take place using short marches to avoid that the tires lose takes hold with the firm one and slipping the machine descontroladamente.

IV The machines to use in this work, will be equipped with lights and horn of backward movement.

**Upset of the machine.**

**Preventive measures:**

i. The internal belt roads of the work, will be taken care of to avoid blandones and excessive embarramientos that decrease the security of the circulation of the machinery.

II The backhoe will have to go provided with the protection of cabin antiupset or porch of security.

III The spoon, during the earth transports, will remain lowest possible to be able to move with the Maxima stability.

IV The circulation on unequal lands will take place at slow speed.

**Burns.**

**Individual protections:** in order to avoid it leather gloves will be used at the time of conducting operations of maintenance.

**Preventive measures:** whenever it can, it will be avoided to conduct operations of maintenance with the machine just stopped. It will have to be made once has cooled off.

**Entrapment**

**Preventive measures:**

i. It is prohibited to remain (or to work) in the surroundings of the operational range of the arm of a machine for the earthwork.

II It is prohibited to take the motor without before making sure that there is nobody in the operational area of the shovel.
III It will be limited to an equal distance to the one of the maximum reach of the excavating arm, the surroundings of the machine. The accomplishment of works or the permanence of people is prohibited in the zone.

**Fall of people from the machine.**

**Preventive measures:**

i. It is prohibited to transport people inside the spoon.

II It is prohibited to hoist people to accede to precise works using the spoon.

**Blows.**

**Preventive measures:** it is prohibited to make works inside trenches or ditches, in the zone of reach of the arm of retro.

**Own noise and of set.**

**Individual protections:** with the purpose of controlling the risk, the conductors will go provided with auditory protectors. In the same way, the workers who must work in the neighborhoods of the machine (always outside the operational range of the same one), will have to use the auditory protective mentioned ones.

**Preventive measures:** annual or as mark the service of prevention, the conductor and all that that remain habitual in the zone of influence of the source of noise (machine), must watch the evolution of his capacity auditory, with the purpose of control that not exist loss of the same.

**Vibrations.**

**Individual protections:** with the purpose of controlling the risk, the conductors will go provided with vibration-proof elastic belt.

**Fall of heavy objects on people.**

**Preventive measures:** it is prohibited in this work to use the backhoe like a crane, for the introduction of pieces, pipes, etc., inside the ditches.

**Earth collapse on people.**

**Preventive measures:** the conductors will make sure that danger
for the workers does not exist who are inside wells or ditches next to the excavation place.

**Fire.**

**Preventive measures:** The machines to use in this work, will be equipped with an extinguisher, stamped and with the revisions the day.

Preventive performance standards for the machinists:

- To raise or to lower of the machine, it uses the steps and handles ready to such function, it will avoid injuries by fall.

- It does not rise using the rims, covers, chains and mudguard, will avoid accidents by fall.

- It raises and it lowers of the machinery of frontal form taking hold with both hands; he is safer.

- It never jumps directly to the ground, if it is not by imminent danger for you.

- It does not try to make "adjustments" with the machine in movement or with the motor in operation, it can suffer injuries.

- It does not allow that people nonauthorized accede to the machine, they can cause accidents or be injured.

- It does not work with the machine in failure situation or semidamages. Repárela first, soon backslides the work.

- To avoid injuries, it supports in the ground the spoon, stops the motor, it puts the hand brake and it blocks the machine; next conduct the operations on watch that need.

- It on guard does not release the brakes of the shutdown machine, if before it has not installed the tacos of immobilization in the wheels.

- The pressure of the tires Watches, works with the inflation to the pressure recommended by the manufacturer of the machine.

**Crane tower**

a) Description of the machinery:
The crane tower, will be located in the place indicated in the plane nº 3 of the present Study of Security and Health. In addition, milliter will go interlocked in concrete shoe according to calculation indicated in the corresponding project will have an arm of 40.

The installer of the crane will emit certificate of beginning of the same one in which he is guaranteed his correct assembly and operation.

This work equipment must have - EC marks or to fulfill the specific legislation that is to him of application and settles, uses and maintains in agreement with the instructions of the equipment provided by the manufacturer.

The cransman must have the corresponding membership card that qualifies them to be able to use it.

The use of this equipment will take place in agreement with the manual of the manufacturer. In case of not having manual saying, it will have to be taken care of the instructions elaborated in the document of adjustment of the equipment to RD 1215/1997 written up by competent personnel.

The crane will have to have the corresponding book of maintenance and to be carried out so and as it marks the effective legislation.

b) Identification of risks:

**Falls at different level.**

**Individual protections:** the cransman of this work always will wear a lap belt class C that will moor to the solid and safe point.

**Preventive measures:**

i. In no case no person will be able to rise the structure of the crane who does not have rating for it. Mounters, installers will only be able to raise... following the plan of assembly, maintenance and disassembling of the crane, as well as its safety measures including in the same one.

II. The suspension or aerial transport of people by means of the hook of crane-tower.

III is prohibited. It is prohibited specifically to prevent the risk with falls of the grúista, that works seated in the edges of the forged ones or encaramando itself on the structure of the crane.
Super-effort

Preventive measures:

i. In the works to arealizar with crane, at no moment will have manually to be forced the load for its displacement; it will have to be the crane the one that makes the effort.

II. All the workers will have received formation on ergonomics, in special referring to the works previously enumerated.

Contact with the electrical energy.

Preventive measures:

i. The crane tower will be connected to earth.

II. In the presence of storm, the works with the crane will become paralyzed tower, leaving themselves out of service in vane until passed the risk of electrical aggression.

III. The wiring of power supply of the crane tower will be made burying it to a minimum of 40 cm. of depth; the route always will remain signalized. The passages of zone with transit of vehicles will be protected by means of a covering with planks leveled in the pavement.

Upset or fall of the crane.

Preventive measures:

i. It is prohibited to load the bucket of hormigonado over the permissible fully factored load of the crane that sustains it.

II. The crane tower to mount in this work, will be equipped with a signboard in visible place, to which the permissible fully factored load in end pays attention clearly.

III. The works with the crane will become paralyzed tower, by security criteria, when the workings must be made under 60 wind regime equal or superior to Km./h.

IV. The crane tower will be equipped with limitor mechanisms of load (for the hook) and of displacement of load (for the pen), in prevention of the upset risk.
v. It will be arranged in work of a weight defective with the fully factored load in end of the crane so that its state can at any time be verified.

VI. The crane tower to install in this work, will mount specifically following all the maneuvers that the manufacturer gives, without omitting nor changing the average recommended aids or of security.

**Spill or collapses of the load during the transport.**

*Preventive measures:*

i. The transport of armors by means of slings connected and provided with hooks with safety catches will be made.

II. The hoisting of boards will take place by means of emplintadas trays in whose interior the boards ordered and subject by means of iron straps or cords will be arranged.

III. The hoisting of armors will be executed suspending to the load of two points such, that the load remains stable.

IV. The hoisting of curved parts of the stern, will take place without breaking the packages in which they are provided of factory, transporting them on an emplintada tray.

v. The hoisting of loose curved parts of the stern will take place on emplintadas trays. The curved parts of the stern will be loaded ordenadamente and they will be moored to avoid its fall during the elevation or transports.

VI. The transport of the elements of the encofrado one by means of slings connected and provided with hooks with safety catches will be made.

VII. The lift wires of loads that present/display a 10% of broken threads, will be replaced immediately, giving to account of it (el/los recurso/s preventivo/s) to the Coordinator of Security and Health during the work execution.

viii. It will be equipped with standardized steel hooks equipped with safety catch.

**Blows by the load to the people or the things during its aerial transport.**

*Preventive measures:*
i. It will be tried not to strike with hormigonado bucket of encofrados nor the timbering.

II. The permanence of workers in the zones is prohibited of beaten of loads during the operations of hoisting of planks, sopandas, props and ferralla; also, it will be come during the elevation from nerves, armors, pillars, curved parts of the stem, etc.

III It is prohibited specifically in this work, to leave in suspension of the hook of the crane the tables of mountain range during the periods of inactivity.

IV. The circulation under suspended loads will be prohibited.

v. When finalizing any period of work (tomorrow, late, weekend), they will be made in the crane tower the following maneuvers:

1º Izar the free hook of loads to top next to the mast.

2º To let the pen on guard "vane".

3º Putting the controls to zero.

4º To open the disconnecting switch of the electrical control of the machine (to disconnect the electrical energy). This maneuver implies the previous disconnection of the electrical provision of the crane in the general picture of the work.

Preventive norms for the operators with crane tower.

- You must stay in a zone of the construction that offers the Maxima to him security, comfort and visibility; it will avoid accidents.

- If it must work on the brink of madness forged or of cuts of the land, it requests that they install strongpoints to him to which to moor the lap belt. These points must be other people's to the crane, otherwise if the crane falls, you will fall you with her.

- It does not work encaramado on the structure of the crane, is not safe.

- At any moment it must have the at sight load to avoid accidents; in case of being outside its field of vision, it asks for the collaboration of a person who guides to him. It does not run
unnecessary risks.

- It avoids to pass suspended loads over the edges with men being worked. If it must make maneuvers on the edges, warns so that they are evacuated.

- It does not try to make "adjustments" in the button seller or the electrical picture of the crane. Warn of the anomalies the Service of Prevention so that they are repaired.

- It does not allow that people nonauthorized accede to the button seller, the electrical picture or the structures of the crane. They can be accidental or to be origin of accidents.

- It does not work with the crane in situation of failure or semifailure. Communicate to the Service of Prevention the anomalies so that they are repaired and leave out of service the crane.

- It totally eliminates of its work diet the spirits, will handle the crane surely.

- If it must manipulate by any cause the electrical system, that cerciórese first of is cut in the general picture, and is hung of the switch or similar a signboard with the following legend: "NOT TO CONNECT, MEN WORKING IN THE CRANE"

- It does not try to hoist loads that by some cause are adhered to the ground. It can make fall the crane.

- It does not try "to drag" loads by means of inclined tensions of the cable. It can make fall the crane.

- It does not try to balance the load to facilitate his unloading in the plants. It puts in risk the fall to his companions who receive it.

- Putting or does not eliminate, the mechanisms of electrical security of the crane.

- When it interrupts by any cause his work, the hook elevates to the Maxima possible height. Put possible the car porter next to the tower; leave the pen in vane and you disconnect the electrical energy.

- It does not leave suspended to objects of the hook of the crane during the nights or week ends. Those objects that are desired are robbed, must be protected in the warehouses, not be hung of the hook.
- It does not elevate flejad as loads bad, can be given off on his companion during the transport and cause injuries.

- It does not allow the use of broken or defective slings to hang the loads of the hook of the crane. It will avoid accidents.

- The breakage of the safety catch of the hook communicates immediately to the Service of Prevention, for its immediate repair and leaves in the meantime the crane out of service; it will avoid accidents.

- It does not try to hoist loads whose weight is equal or superior to the limited one by the manufacturer for the crane model that you use, you can to make fall it.

- It does not exceed the limitation of load anticipated for the displacements of the portor car on the pen, can make collapse the crane.

- Not to hoist any load, without to have assured that the jams are installed chassis-route. Always consider that this action increases the security of crane.

**Vibrator of needle**

b) Identification of risks:

**Falls from height during its handling.**

**Preventive measures:**

i. The operations of vibrated will be always made on stable positions.

Il The feeder of the vibrator will have to be prote'ge', mainly if it runs by zones of passage of the workers, in order that it does not produce slips.

**Falls at different level from the vibrator.**

**Preventive measures:** the motor of the vibrator will be left supported on a stable smooth surface, with the purpose of avoiding that it can fall on somebody.

**Splashes of grout in eyes and skin.**
**Individual protections:** the workers who use the vibrator will have to go provided with glasses antiprojections.

**Electrocution.**

**Preventive measures:**

i. The electrical vibrators will be connected to earth.

ii. The state of the electrical vibrator will be reviewed before each hormigonado and after its use.

iii. The vibrators will have to be prote'ge's electrically by means of double isolation.

iv. The direct-manual sweeps, will take place previous disconnection of the mains of the vibrator, for forecast of the electrical risk and of atrapamientos. v. The pulsers will be protected to avoid that it falls to them material used in the hormigonado one or water.

**Truck of concrete pumping**

b) Identification of risks:

**Upset by proximity to slopes.**

**Preventive measures:** the pump near any slope will not be placed so that it does not lose his stability and it causes the upset of the machine.

**Upset by mechanical failure, for example of the pneumatic cats.**

**Preventive measures:** the safeties of the pumping equipment will be always in perfect conditions of operation.

**Projection of objects to burst the pipe, or when run aground being momentarily.**

**Preventive measures:**

i. The pump of hormigonado nothing else will be able to be used for the concrete pumping according to - the cone of Abrams-recommended by the manufacturer based on the haul distance.
II. Before initiating the daily concrete provision, the inner wearing down of the pipe with a measurer of thicknesses will be verified, since the explosions of the pipes are causes of important accidents.

III. If it is had to pump to great distance, before providing concrete, they will prove the conduits under safety pressure.

IV. Once concrete, must perfectly clean all the set in accident prevention by obstruction.

Fall of people from the machine.

**Preventive measures:** the arm of elevation of the hose will not be able to be used to hoist people, although it is for a work of precise character.

Entrapment of people.

**Preventive measures:**

i. The preventive resources will check that the wheels of the pump are blocked and with perfectly installed the pneumatic or hydraulic looks.

II. Before draining the concrete in the hopper, they must make sure that it has the placed grate.

III. Before initiating the provision, it must make sure that the handle unions have the immobilized pins.

IV. To never touch directly with the hands the hopper or the oscillating tube yes the machine is to work.

v. If they are had to make works in the hopper or the oscillating tube, in the first place the drive motor will be stopped, soon the pressure of the storage cell through the faucet will be bled and finally the works will be able to be done that make lack.

Electrocution.

**Preventive measures:**

i. If the motor of the pump is electrical, before opening the general picture of controls, making sure that it is disconnected.

II. The mechanisms of electrical protection do not have to be modified.
Super-effort

Preventive measures:

i. At the time of manipulating the hose, it will be avoided to deliver attacks unnecessary, having to make all the force the machine.

II. All the workers will have received formation on ergonomics, in special referring to the works previously enumerated.

Polisher (400 V).

b) Identification of risks:

Electrocution (in the electrical ones).

Preventive measures:

i. Daily the state of the isolation of cables will be verified.

II. The connection to the electrical pictures will be made with pins male-female, never with bare cables directly.

Fire by short circuit

Preventive measures:

i. It must be verified that the tool to use is in good conditions of use.

Fall in height

Preventive measures:

i. When developing works with risk of height fall, always assure the position work, since, in case of loss of balance by uncontrolled reaction of the machine, the effects can be multiplied.

Entrapment

Protections:

i. One will equip the polisher with a means switch, so that the machinery works being pressed the switch constantly.
II The personnel in charge of the handling of the polisher will have to be expert in its use, having to have received formation for it.

III The protections of the machine must be always used.

IV In the case of working on pieces of small size or in unstable balance, the piece will make sure to work, so that it does not undergo unexpected movements during the operation.

**Electrical soldering iron.**

b) Identification of risks:

**Contacts with electrical energy in works under rain.** With the purpose of controlling it the following thing will consider:

**Preventive measures:** the preventive resources will must to outdoors stop the works of weld in case that it is raining. The workers, who are going to use the mentioned machinery, will have the formation and sufficient information on the risks relative to their work.

**Contacts with electrical energy by deficiency of electrical isolation in the portaelectrodos or the wiring or others.** With the purpose of controlling it the following thing will consider:

**Preventive measures:**

i. The preventive resources must to verify the state of the machinery before being used. The workers who are going to use it, will warn preventive resources of any deterioration produced in the isolation of the machinery.

II The clamp in the ground or on perfilería does not have to be left directly. It will be deposited on portapinzas to avoid accidents.

III The group will not be used without it takes installed the protector of clemas. It will avoid the electrocution risk.

IV It must be verified that the group correctly is connected to earth before initiating the weld.

v. The land taking of the housing of the group will never be annulled to weld because “the circuit breaker jumps” differential. The worker will have to warn preventive resources so that the failure is reviewed. He will wait himself to that the group is repaired or will be used another one.
VI. The weld group will become disconnected totally whenever a pause becomes of consideration (lunch or food, or displacement to another place).

vii. Will have to be verified, before connecting them to the group, that the electrical hoses are joined by means of watertight connections of inclemency. The protected direct connections with insulating tape will be avoided.

viii. Electrical hoses with the seriously broken or deteriorated external protection do not have to be used. In that case it will be asked for that they are changed. If it were necessary to join hoses, will protect the joint by means of "termometrátiles forillos".

ix. The worker who makes use of the soldering iron will have to make sure that the portaelectrodos clamps and the tips of connection are well isolated.

**Damages in the eyes due to the radiations of the voltaic arc.** This risk as much runs the workers who use the soldering iron like all that that he can circulate around the environs of the work place. It is a nonavoidable risk. With the purpose of controlling it the following thing will consider:

**Collective protections:** with the purpose of avoiding that the workers other people's to the work to weld can suffer damages, the preventive resources will delimit the zone of work.

**Individual protections:** for the accomplishment of the works of electrical weld it will have to be used as protection yelmo to weld or screen of hand.

**Preventive measures:** The preventive resources must to inform to the global one into the workers who are not due to circulate around the same one. All the workers who are going to use the soldering iron will have accreditation that to confir to me that they have received the information and necessary formation for the use of the same one.

**Damages in the eyes due to esquir them generous.** The risk consists of the possibility of being given off to esquir them when itching the fillet weld. It is a nonavoidable risk. With the purpose of controlling it the following thing will consider:

**Individual protections:** in order to control the risk, in the accomplishment of the works of electrical weld it will have to be used as protection yelmo to weld or screen of hand.
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Preventive measures:

i. The preventive resources must inform to the global one into the workers who are not due to circulate around the same one. All the workers who are going to use the soldering iron will have accreditation that to confirm to me that they have received the information and necessary formation for the use of the same one.

II The electrode adapted for the cord will be chosen to execute.

Burns in the hands and to third. The risk consists of the possibility of taking place burns to touch pieces recently welded. It is an avoidable risk. With the purpose of controlling it the following thing will consider:

Individual protections: in order to control the risk, in the accomplishment of the works of electrical weld it will have to be used leather gloves like protection of the hands, as well as bracelets and mandiles of leather.

Preventive measures:

i. All the workers will have to be informed into the mentioned avoidable risk, letting them know that they do not have to touch the pieces recently welded, because they can be to high temperatures that could produce burns to him.

II Before beginning to weld, he will have to verify itself that there are no people in the surroundings of the vertical of his position of work. He will avoid fortuitous burns to them.

Poisoning or asphyxia. It is an avoidable risk. With the purpose of controlling it the following thing will consider:

Preventive measures:

i. The preventive resources must inform to the global one into the workers who are not due to circulate around the same one. All the workers who are going to use the soldering iron will have accreditation that to confirm to me that they have received the information and necessary formation for the use of the same one. II He must always knit in ventilated affluent place, will avoid poisonings and asphyxia.
Falls at the same level.

Preventive measures:

i. Resources will have to be asked for to prevent information on as it is the place more adapted to tend the wiring of the group, to avoid slips and falls.

Circular mountain range of Table

a) Description of the machinery:

The circular mountain range of cut is a light and simple machine, composed of a fixed table with a groove in the board that allows the passage of the disc of mountain range, a motor and an axis carry-tool.

It will have to be used only by personnel enabled for his use. To this end it will have to give to personal saying the instructions of use and security indicated by the manufacturer or provider (art. 41 of Law 31/1995 of P.R.L.), as well as the card of security including in the plan of security of el/los contratista/s that are going to use it. Of this delivery certainty will be left, being left the same one in being able of el/los recurso/s in writing preventivo/s, so that they can verify at any time that is enabled or it does not stop the use of the same one.

In the same way the person or people responsible for the maintenance of the machinery will come themselves with, so that they only can make it who have the instructions of security indicated by the manufacturer or provider (art. 41 of Law 31/1995 of P.R.L.).

The machines, in any case, must be equipped with the following elements of protection:

- Housing of covering of the disc.
- Knife splitter of the cut.
- Pusher of the piece to cut and guides.
- Housing of communications security by pulleys.
- Interrupting of watertight.
- earth Taking.

b) Identification of risks:

In all the cases it will have to be taken care of the saying in the section of order and cleaning of the present study.

Contacts with electrical energy. This risk consists of the possibility of undergoing an electrocution when contacting with one hose in badly
been, by the use of inadequate or nonexistent attachment plugs, or by the deficiency of land taking of the machine. With the purpose of controlling it the following thing will consider:

**Preventive measures:**

i. The preventive resources must to verify the good state of electrical cables of connection of the machines (own and extensions), commanding to repair those that are not in optimal conditions.

II. As much the extensions as the cable of connection of the machines will have to be antihumidity.

III. The connections to make between cables and the electrical picture of distribution will have to be made with watertight pins.

IV. It is prohibited to locate the circular mountain range on the encharcados places.

**Falls of people at the same level.** This risk consists of the possibility of undergoing a fall by slip with rest of cut material. With the purpose of controlling it the following thing will consider:

**Preventive measures:** The preventive resources must to verify that free from products coming from the cuts the borders of the tables stays. This material will sweep and will be piled up for its load on emplintadas trays or spill by tubes.

Preventive norms to give to the workers who use the tables of mountain range:

The following norms will have to give each contractor to them all to their workers (including the independent subcontracted ones and).

- Before putting the machine in good condition it verifies that it is not annulled the Earth return, in affirmative case, warns to preventive resources.

- It verifies that the electrical switch is watertight, in case of not being it, to prevent warns the resources.

- The pusher Uses to handle the wood; consider that of not doing it it can lose the fingers of his hands. Distrust of his skill. This machine is dangerous.
- It does not retire the protection of the cut disc. Study the form with no need to cut to observe the "trisca". The pusher will take the piece where you wish and the speed that you need. If the wood "does not happen", the knife splitter badly is mounted. Request that they adjust it.

- If the machine, unexpectedly stops, retire of her and warns el/los recurso/s preventivo/s so that it is repaired. It tries to make neither adjustments nor repairs.

- The state of the disc Verifies, replacing those that are fisurados or lack some tooth.

- To avoid damages in the eyes, it solicits always provides with security glasses antiprojection of particles and úselas to him, when it must cut.

- It extracts previously all the nails or sunk metallic parts in the wood that wishes to cut. The disc can fracture or leave goodbye the wood uncontrolled form, causing serious accidents.

In the cut of pieces ceramics:

- It observes that the disc for ceramic cut is not fisurado. Of being thus, preventivo/s asks for to el/los recurso/s that changes by another new one.

- The cut Carries out outdoors if possible (or in the premises very ventilated), and always protected with a mask of replaceable mechanical smoke filter.

- The cut to leeward Carries out. The wind will move away of you pernicious particles.

- Gravy the ceramic material, before cutting, will avoid great amount of dust.
1.9. TIPOLOGÍA OF THE MATERIALS AND ELEMENTS

In the present chapter, it is tried to identify what material can contribute chemical or physical risks, indicating what preventive measures will have to be taken to control them.

However, always the recommendations of security will have to consider given by the manufacturers or providers of the materials (art. 41 of the L.P.R.L.).

Cement and its derivatives (concrete, mortar...):

a) Chemical risks:

The cement is a very aggressive material that can produce dermatosis to its contact. In order to avoid this risk, the workers who work with him or their derivatives, they will have to be provided at any moment with gloves of leather and monkey of work that they protect to them of the mentioned contact.

As preventive measure to consider, the workers will not have to eat or to drink during the manipulation of the product in pure state, having to take a good personal hygiene.

b) Physical Risks:

Since during his application (either it is in mortar form, or is in concrete form) it is easy (nonavoidable risk) that jumps some drop or to esquir it to the eyes directly, will have to consider and to protect itself with some type of eye shield (for example glasses).

At the time of spilling the concrete, one will go away provided with impermeable boots of security, those have group and steel toe.

As the cement is a very fine material (almost dust), the workers who are going it to use like raw material for the mortar obtaining u concretes and can be exposed to an inhalation of the same one, will have to go provided with protection mask.

Polyurethane foam:

a) Chemical risks:

The polyurethane foam is a very aggressive material, which can produce serious damages in contact with the skin. In order to avoid this risk, the workers who work with him or their derivatives, they will have to be provided at any moment with long gloves of rubber, monkey of
work, eye shields (glasses antiprojections) and mask with adapted filter, that they protect to them of the mentioned contact.

As preventive measure to consider, the workers will not have to eat or to drink during the manipulation of the product in pure state, having to take a good personal hygiene.

In order to avoid damages in workers who are making other works, a zone of security will be limited; being obligation of preventive el/los recurso/s to watch that nobody skips it. In addition, a poster will be placed signaler who informs to all the workers of the existing danger.

b) Physical Risks:

Since for his application (either it is in mortar form, or is in concrete form) it is easy (nonavoidable risk) that jumps some drop or to esquir it to the eyes directly, will have to consider and to protect itself with some type of eye shield (for example glasses).

c) Other risks:

The polyurethane foam is a very inflammable material, reason why totally it is prohibited to as much smoke or to ignite any fire during his application as in the neighborhoods of the applied or gathered together material. The preventive resources will have to watch that this is being made of this fom, being warned that entire worker who disobey the norms. In addition, a poster will have to be placed signaler who informs as much too all the workers of the existing danger in warehouses as instead of work.

Since a fire still having taken the necessary measures can take place so that it does not happen (an accident), a portable extinguisher in the work place will have to exist, having to have the workers in charge of the manipulation of the product sufficient formation on the correct use of means of fire extinguishing available.

**Plastic painting:**

b) Physical Risks:

The plastic painting is a liquid material that in its application can produce ocular damages or nasal graves. These risks depend on the application form. In case of being applied with average mechanics (compressed air pistol...), it will have to be used eye shields (protection glasses) and of nasal graves (protection mask). In case of being applied with manual means (roller, brushes...), it will only be necessary the use of eye shields.
Next, it is tried to fix minimum safety measures for the correct positioning, maintenance and retired of the different collective protections to place in the work.

**Instructions for the positioning of protection railings**

For the positioning of the railing of protection to forged edge of, in case that ej does not exist any other type of collective protection (p. then. Networks of perimetral protection or tubular metallic scaffold), will have to be observed the following instructions:

1. The preventive resources of the company contractor which it must make the work (according to appears in the contract and the plan of security), informarán to the rest of concurrent companies in the work center, as well as to the own workers who are going away to come to place the railings in the corresponding forged one. Deberán to also verify that the zone is properly annotated so that the access to all the personnel is prevented who is not going to make no work in this place. Also will check at any moment the operations that follow, in order that they are made with the suitable diligences.

2. The employes which they are going to be in charge of the positioning of the railing, or any other worker that must enter the limited zone to conduct any operation, irán provisto/s of lap belt moored to a strongpoint that it prevents that they can fall by the edge that is going to be unprotected.

3. The protection railing will be placed, so and as futuro/s is indicated in the details of the present study of security or with the modifications indicated in plan of security (approved by the coordinator of security in phase of execution) so that prote'ge' correctly has left the risk of fall at different level by forged edge from.

4. The preventive resources of the company contractor which it must make the work (according to appears in the contract and el/los plan/ es of security), will verify the effectiveness of the adopted preventive measure, verifying that is adapted to the stipulated thing in the security plan. Made this verification, one will take off the protection placed like impediment of access to the zone of risk, indicating, own preventive resources to the rest of companies and workers, who can be acceded to the zone.
Instructions for the retirement of protection railings

In case of being necessary the retirement of the railing of protection for the accomplishment of some work will be due to follow the following procedure:

1. The preventive resources will inform to the rest of concurrent companies in the work center, as well as to the own workers of the retirement of the protection.

2. Next the zone will be limited that is going to be unprotected, preventing the access to all those workers who are going to make no work in the mentioned zone.

3. El/los operario/s which they are going to be in charge of the retirement of the railing, irá/n provisto/s of lap belt moored to a strongpoint that it prevents that they can fall by the edge that is going to be unprotected.

4. The railing of protection, leaving piled up it and ordered will retire correctly so that it cannot represent a risk of fall by slip or disorder.

5. The employees that need to accede to the annotated and unprotected zone irá/n provisto/s of lap belt moored to a strongpoint that prevents the fall them by the edge of the forged one.
1.11. WORKS THAT IMPLY SPECIAL RISKS

In this work we occur to the special risks 1, 2 and 10 including in annexed the II of R.D. 1627/97 of 24 of October.

As preventive measures in the case of point 1 (risks of falls in height and sepultamiento by earth collapse) are the present observed indicated in study of security and the health, in the following points:

- Collective protections to use by phases of work during the constructive process.

- Identification of risks and preventive measures to adopt in the different work activities, in the phases of laying of foundations, earthwork, pillar, encofrados and forged aligerantes element of, ferralla (put in work), execution of tabiquería of boxes of stairs and houses, main and later execution of facades, installation of elevators, carves smooth, enfoscados, plastered of houses and painting.

- Identification of risks and preventive measures to adopt with the different machinery and to use in the work, concrete referring to the ladders, the hung platforms of unloading of materials, scaffolds, tubular scaffolds of bomquetas, metallic scaffolds and hormigonado tower of.

- Identification of risks and preventive measures to adopt with the different intervening auxiliary means in the work, concrete referring to the ladders, the hung platforms of unloading of materials, scaffolds, tubular scaffolds of bomquetas, metallic scaffolds and hormigonado tower of.

- Identification of risks and preventive measures to adopt with the different machinery and tool to use in the work, concrete referring to shovel the shipper, mixed backhoe on wheels, dump truck, to dumper, mixed excavator on wheels and mini excavator.

- Instructions for the positioning, retired maintenance and of collective protections.

For point 2 (works with injurious substances such as cement, varnishes, paintings, etc...), the saying in present study will consider, in the following point:

- Tipología of the materials and elements.

In the case of point 10 (manipulation of heavy objects), it will be taken care of the arranged thing in study the present, in the following points:

- Identification of risks and preventive measures to adopt in the different work activities, the phases of laying of foundations, pillars, encofrados and aligerantes elements of forged and ferralla (put in work).
- Identification of risks and preventive measures to adopt in different intervening auxiliary means in the work, concrete the referring thing to the assembly, maintenance and disassembling of such, thus like the use of the platforms of unloading of materials and the cupolas.

- Identification of risks and preventive measures to adopt with the different machinery and tool to use in the work, concrete referring to the use of the crane the tower.
- Instructions for the positioning, retired maintenance and of collective protections.
Next a series of possible works of maintenance and its corresponding safety measures are mentioned considering the saying in the project of execution of the architect. However, they are left subjects to the later revision on the part of competent technician at the time of making these works. The inclusion in this study of the safety measures to adopt in the foreseeable later works, does not justify the nonaccomplishment of the later study or basic study at the time of the accomplishment of the works, as long as it is necessary his writing so and as it comes reflected in R.D. 1627/1997, of 24 of October.

Independently it will be taken care of also the indicated thing in the plan of prevention of each operating company.

1.12.1. Works in closings and facades:

For the works of cleaning of facades, tubular metallic scaffolds will be used considering the safety measures and personal protections mentioned in this study, referring them, in the corresponding sections.

Next the personal risks, protections and safety measures are mentioned according to the work to make:

1.12.1.1. Cleaning and repair of facades:

It will be taken care of the saying in study of security in the sections of execution of enfoscados facades the present and.

1.12.1.2. To paint and to review the enfosrado one of facades:

In this case the saying in the painting sections will be observed, execution of enfosados facades.

1.12.2. Works in flat covers:

In case of being necessary some repair, this will have to be studied and to be valued by competent technician, considering, in any case, the referring thing in this study to covers.

1.12.3. Works in cleaning facilities:

As much at the time of the cleaning as of necessary them inspection it will have to consider mentioned in the section corresponding to the
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mentioned facilities of this study of security and health.

1.12.4. Works in plumbing facilities:

As much at the time of the cleaning of the arqueta as of necessary them inspection and possible repairs in facilities must consider the mentioned thing in the section of plumbing facilities.

1.12.5. Works in audio-visual facilities:

In the verifications and repairs to make of the antennas, the mentioned thing in the section of electricity facilities will consider as well as what follows next:

Falls at different level.

Individual protections: the workers will have to go provided with moored lap belt to a strongpoint.

Preventive measures:

i. The "strongpoints" of security of which will settle down to moor the cables to which to hook the lap belt, to avoid the fall risk from height.

II. The zone of work will stay free of obstacles and objects to eliminate the fall risk from height.

III. The operations of assembly of components, will take place in level zero. The composition of elements in height is prohibited, if it is not strictly essential with the purpose of not hamessing the already existing risks.

IV. All the operations will have to be watched over a preventive resource, designated of prevention or by the service of prevention of the company that the maintenance or repair makes.

Fall of objects on people.

Preventive measures: it is prohibited to spill rubbish and cuts, directly by the facade. The rubbish will take shelter and they will pile up by hand for his later spill to a container, to avoid accidents by fall of objects.

Electrocution.

Preventive measures: it is specifically prohibited to make the works with next storm cloud antennas, at sight.
1.12.6. Works in the installation of elevators:

For the accomplishment of the works of cleaning and maintenance of the elevators the specified thing in study with respect to the installation of elevators will have to consider the present.
1.13. MEASURES IN CASE OF EMERGENCY.

1.13.1. General measures and planning.

The industrialist will have to reflect in the Plan of Security and Health the possible situations of emergency and to settle down the measures in the matter of first aid, the present fights against fires and evacuation of the workers, taking care of the forecasts fixed to Study of Security and Health and designating for it to the personnel in charge to put in practice these measures. This personnel must have the advisable formation, to be sufficiently numerous and to have the suitable material, considering the size and the specific risks of the work.

The right of the workers to the paralysis of its activity, recognized by the effective legislation, which will be applied to are in charge of the emergency measures. It will have to make sure the suitable administration first aid and/or the suitable and fast transport of the worker to a center of medical aid for the assumptions in which the produced damage therefore requires it.

The industrialist will have to organize the necessary relations with the external services to the company that can make activities in the matter of first aid, medical aid of urgency, rescue, and fights against fires and evacuation of people. In the Plan of Security and Health the planning of the measures of emergency adopted for the work, specifying itself of detailed form will have to settle down the forecasts considered in relation to the aspects previously reviewed. In visible affluent place of the work they will have to appear the indications written on the measures that will be to be taken by the workers in cases of emergency.

1.13.2. ROUTES OF EVACUATION AND EXITS OF EMERGENCY

In case of danger, all the places of work will have to be able quickly to be evacuated and in the conditions of Maxima security for the workers. The number, distribution and dimensions of the routes and exits of emergency that will be to arrange themselves will determine based on: use, equipment, dimensions, configuration of the works, phase of execution in which are the works and maximum number of people who can be present. The routes of evacuation and exits of emergency will have to remain expeditious and to end more directly possible at a zone of security. They will have to be signalized according to the effective norm. This signaling will have to be lasting and to pay attention to suitable and perfectly visible places.

The routes and exits will not have to be obstructed by obstacles of any type, so that they can at any time be used without ties. In case of failure of the system of lighting system and when he is mandatory, the routes
and exits of emergency that require illumination they will have to be equipped with lights of security of sufficient intensity.

1.13.3. PREVENTION AND FIRE EXTINGUISHING

a) General dispositions

They will be observed, in addition to the prescriptions that settle down the present in Study, the effective norms and dispositions on the matter. In the works with specific fire risk they will be fulfilled, in addition, the prescriptions imposed by the Regulations and general or special practical standards, as well as the preceptuadas ones by corresponding municipal ordinances.

A sufficient number of appropriate devices of fight against fires and based on the characteristics of the work will be due to anticipate in work, dimensions and uses of the premises and equipment that contains, physical and chemical characteristics of the material substances that are presents and maximum number of personnel who can be in the places and the premises of work.

b) Measures of prevention and extinction

Besides to observe the previous dispositions, the prevention will be adopted that are indicated next, combining their use, in their case, with the general protection next than they can serve public against fires.

**Portable extinguishers:** In the proximity of the jobs with greater placed fire risk and in visible site and readily accessible, portable or movable extinguishers will be aranged on wheels, of physical or chemical foam, mixes of both or dry dusts, anhídrido carbonic or water, according to agrees to the possible determining cause of the fire to extinguish. In concrete it will be necessary to place an extinguisher next to the crane tower, another one next to the C.G.P. and another one within clothes. Cuando are used different types from extinguishers will be labeled with indicating posters of the place and fire class in which they must be used. The extinguishers will be reviewed periodically and loaded, according to the manufacturers, immediately after using them. This task will be made by companies authorized.

**Prohibitions:** In the dependencies and places of work with high fire risk it will final be prohibited to smoke or to introduce matches, burners or equipment of ignition. This prohibition will indicate with visible posters to the entrance and in the free spaces of such places or dependencies. It will be prohibited also to the personnel to introduce or
to use equipment of nonauthorized work by the company and that can cause sparks by contact or proximity to inflammable substances.

c) Other performances

The entrepreneur must to anticipate, in agreement with fixed to the Study of Security and the Health in its case and following the norms of the providing companies, the performances to carry out for possible cases of gas flights, breakage of water canalizations, floods, collapses and collapses, establishing in the Plan of Security and Health the forecasts and norms to follow for such cases of emergency.
Given to the characteristics of construction sites and the anticipated risks, in fulfillment of article 4.3 of Law 54/2003 of 12 of December, of reform of the normative frame of the prevention of labor risks, by means of which 32 is gotten up article bis, Presence of the preventive resources, to the Law of Prevention of Labor Risks, each contractor will have to assign the presence of its preventive resources in the work.

To this end in the Plan of Security and Health, the contractor will have to define the preventive resources assigned to the work, that must have the qualification sufficient and to have means necessary to watch the fulfillment of the measures including in this Plan, being verified his effectiveness.

In the present study, an estimation of exclusive dedication of preventive resources has been made, that must be analyzed by el/los contratista/s to the hour, to not only make the security plan, but also during the execution of the works, having to put sufficient means human to obtain that the security plan is effective and reaches the predicted level of protection.

In Halmstad, ________________

The technical architect.
2. SPECIFICATIONS OF CONDITIONS

2.1. IMPLEMENTATION OF LEGISLATION

GENERAL

Law 31/1,995, of 8 of November, Prevention of Labor Risks.

Title II (Chapters of I to XII): General conditions of the centers of work and the mechanisms and measures of protection of the General Decree of Security and Hygiene in the Work. (O.M. of 9 of March of 1971)

Chapter XVI: Security and Hygiene; sections 1ª, 2ª and 3ª of the Decree of Work of the Construction, Glass and Ceramics. (O.M. of 28 of August of 1.970)

Real Decree 1627/97 of 24 of October of 1997 by that the Minimum Dispositions of Security and Health in Construction sites settle down.

LAW 54/2003, of 12 of December, reform of the normative frame of the prevention of labor risks.

R.D. 171/2004, of 30 of January, by that article 24 of Law 31/1995 is developed, of 8 of November, Prevention of Labor Risks, in the matter of coordination of enterprise activities.

Municipal Ordinance.

SIGNALING

R.D. 485/97, of 14 of April.

Minimum dispositions in the matter of signaling of security and health in the work.

INDIVIDUAL PROTECTIVE EQUIPMENT

R.D. 1.407/1.992 modifier with R.D. 159/1.995, on conditions for the commercialization and it frees intracommunitarian circulation of the protective equipment individual-EPI.

R.D. 773/1.997 of 30 of May, on minimum dispositions of security and health relative to the use by workers of individual protective equipment.

TEAM WORKS
HEALTH AND SAFETY

REAL DECREE 2177/2004, of 12 of November, by that it is modified with Real Decree 1215/1997, of 18 of July, by that the minimum dispositions of security and health for the use by the workers of the work parties settle down, in the matter of temporary works in height.

MACHINES’ SECURITY


Order of 23/05/1977 modified by Order of 7/03/1981. Regulation of magazine platforms for works.

Order of 28/06/1988 reason why is approved Technical training Complementary MIE-AEM2 of the Regulation of Apparatuses of Elevación and Manutención, referring to cranes detachable towers for works.

ACUSTIC CONDITIONS

R.D. 1.316/1989, of the Mº de Relaciones with Cortes and of the Secretariat of the Government. 27/10/1989. Protection of the workers as opposed to the risks derived from the exhibition to the noise during the work.


OTHER DISPOSITIONS OF APPLICATION

R.D. 487/1.997. Minimum dispositions of security and health relative to the manual manipulation of loads that involve risks, in individual dorsolumbaires, for the workers.

Electrotechnic regulation of low Tension and Retrainings.

Order of 20/09/1.986: Book model of Incidences corresponding to the works in which it is obligatory a Study of Security and Greets the work.

Order of 6/05/1.988: Requirements and data of the communications of previous opening or renewal of activities of companies and centers of work.

2.2. SPECIFICATIONSES OF PROTECTION MEANS

All the articles of personal protection or elements of collective protection, will have fixed a period of life utility, rejecting itself to their term.

When by the circumstances of the work a faster deterioration in a determined article or equipment takes place, this one will recover, independently of the predicted duration or date of delivery.

All article or protective equipment that has undergone a treatment limit, that is to say, maximum for which it was conceived (for example, by an accident), will be rejected and replaced to the moment.

Those articles that by their use have acquired more comforts or tolerances of the admitted ones by the manufacturer, will be replaced immediately.

The use of an article or protective equipment never will represent a risk in itself.

2.2.1. PERSONAL PROTECTION.

All element of personal protection will have mark EC whenever it exists in the market.

In those cases in that mentioned mark EC does not exist, they will be of quality adapted to its respective benefits.

The preventive one in charge of the Service of Prevention and resources will have in each one of the work works the use suitable articles of protection.
The work personnel will have to be instructed on the use of each one of the articles of individual protection that are provided to him. In the tactical mission of the lap belt, he will be mandatory that the Coordinator of Security and Health during the work execution provides to the worker the point of anchorage or in its defect the concrete instructions for the previous installation of he himself.

2.2.2. PROTECCIONES COLECTIVAS

2.2.2.1. Vallas de cierre.

The protection of all the enclosure of the work will be made by means of independent fences of limitation and protection.

These fences will be located in the limit of the parcel as it is indicated in the planes and among others they will reunite the following conditions:

* They will have 2 meters of height.

* They will have access door to vehicles of 4 meters in width and independent door of personnel access.

* The fence will be made with feet of wood and mallazo electrosoldado metalist.

* This will have to stay until the conclusion of the work or its substitution by the definitive fence one.

2.2.2.2. Visor de protección de la acceso al trabajo.

The protection of the existing risk in the accesses of the workers to the work will be made by means of the use of protection visors.

The use of the protection visor is justified in article 190 of the Labor Decree of the Construction, Glass and Ceramics.

The visors will be formed by a tubular metallic structure like sustentante element of planks and boards of sufficient width for the access of the personnel extending towards the outside of the facade 2.00 M.s and signalizing itself properly.

The supports of the visor in the ground will be made on perfectly made level wood sleepers.
The boards that form the protection visor will have to form a perfectly dumbfounded surface.

2.2.2.3. **Encofrados continuous.**

The effective protection of the risk of fall of the workers from forging in execution to the inferior forged one will be made by means of the use of encofrados continuous.

The use of this method of work is justified on the basis of which the use of other systems like the use of inferior servicing platforms, superior footbridges or the use of the lap belt on the basis of the had thing in 193 articles 192 and the Labor Decree of the Construction, is obviously nonviable.

The construction company will have by means of the Plan of Security, to justify the election of a certain type of encofrado continuous between the existing commercial supply.

2.2.2.4. **Perimetrales networks.**

The protection of the risk of fall to the emptiness by the perimetral edge of the forged one in the works of structure and desencofrado, will become by means of the use of perimetrales networks with metallic derricks.

The obligation of its use is derived from the had thing in the Labor Decree the Construction, Glass and Ceramics in its 193 articles 192 and.

The networks will have to be of polyamide or polyester forming rhombic mesh of 100 mm. at the most.

The perimetral cord of security will be like minimum of 10 mm. and the network modules will be tied to each other with cord of polyamide or polyester like minimum of 3 mm.

The network will arrange, united to the perimetral cord and of he himself diameter of that, of auxiliary cords of sufficient length to his tied to pillars or fixed elements of the structure.

The metallic supports will be constituted by tubes of rectangular form of 70 xs 100 mm, anchored to the forged one by means of anchored special pieces to the forged one at the time of being hormigonado, with pins.

The networks will settle exceeding in a the memos a meter the work surface, having to rise as the work gains altitude.
2.2.2.5. Boards.

The protection of the risks of fall to the emptiness by the existing hollows in the forged one will be made by means of the wood board positioning.

These hollows talk about to which they are made in work for the passage of elevators, freight elevator and small hollows for conduits of facilities.

The use of this means of protection justifies in article 21 of the General Decree of Security and Hygiene in the Work.

The wood boards must have the suitable resistance and will be formed by a plank mincemeat wood of 7 xs 20 cm. subjects inferiorly by means of three cross-sectional planks, as it is indicated in the Planes.

2.2.2.6. Railings.

The protection of the risk of fall to the emptiness by the perimetral edge in the hormigonadas plants or and the encofrado one of plant first, by the openings in facade or the free side of the access stairs will be made by means of the positioning of railings.

The obligatory nature of its use is derived from had in the General Decree Security and the Hygiene in the Work in its articles 17, 21 and 22 and the Labor Decree of the Construction, Glass and Ceramics in its article 187.

In the General Decree of Security and Hygiene in the Work in their article 23 the conditions are indicated that will have to fulfill the railings to use in work. Among others:

* The railings, plinths and rodapiés will be of rigid and resistant materials.

* The height of the railing will be of 1' 00 M.s on the level of the forged one and it will be formed by banister rails, intermediate strip and rodapié of 20 cm. of height.

They will be able to resist a load of 150 kg. by linear meter.

The disposition and subjection of the same one to the forged one will be made according to the arranged thing in Planes.
2.2.2.7. Platforms of reception of materials in plant

The risks derived from the reception of materials palletized in work by means of the single crane-tower can be suppressed by means of the use of flown receiving platforms.

Its justification is in articles 277 and 281 of the Labor Decree of the Construction, Glass and Ceramics.

The flown platforms that are constructed in work will have to be solid and safe, properly propped up by means of props be accustomed to ceiling, as it is indicated in the planes.

The platforms will have to be metallic and to arrange in their perimeter of railing that will be practicable in a section of the same one to allow the access of the load to the platform.
2.3. SPECIFICATIONS OF THE MACHINERY

The machines with fixed work location, such as cranes tower and concrete mixer will be the installed ones by personnel competent and properly authorized.

The maintenance and repair of these machines it will be, also, in charge of so personal, which will always follow the instructions indicated by the manufacturer of the machines.

The operations of installation and maintenance will have to be registered documentarily in pertinent record books of each machine. Of previously not existing these books for those machines used in other works, before its use, they will have to be reviewed with depth by competent personnel, assigning the mentioned record book to them of incidences.

Special attention will require installation of cranes tower, whose assembly will be made by personnel authorized, who will emit the corresponding certificate of “beginning of the application crane” having been to them the Order of 28 of 1,988 June of or Technical training Complementary MIE-AEM 2 of the Regulation of magazine platforms, referring to cranes tower for works.

The machines with variable location, such as to circulate, vibrator, weld, etc. they will have to be reviewed by expert personnel before its work use, being in charge of the Service of Prevention the accomplishment of the maintenance of the machines according to the instructions provided by the manufacturer.

The personnel in charge of the use of the machines used in work will have to be properly authorized for it, providing to it him the concrete instructions of use.
2.4. SPECIFICATIONS OF THE ELECTRICAL SYSTEM

Provisional the work electrical system will be made following the indicated guidelines in the corresponding sections of the Descriptive Memory and of the Planes, having to be made by authorized company and being of application indicated in the effective Electrotechnic Regulation of Low Tension and Norm ITUNITES 21.027.

All the lines will be formed by single-pole cables with isolated copper conductors and with rubber or policloruro of vinyl, for a nominal tension of 1,000 volts.

All the cables that present/display superficial defects or others not particularly visible, will be rejected.

The protection conductors will be of electrolytic copper and will present/display he himself isolation that the active conductors. They will settle by the same canalizations that these. Their minimum sections will settle down in agreement with table V of Instruction MIBT. 017, based on the sections of the conductors of phase of the installation.

The constituted tubes of P.V.C. or polyethylene, will have to support without deformation some, a temperature of 60º C.

The conductors of the installation will identify themselves by the colors of their isolation, that is to say:

* Blue clear:

For the neutral conductor.

* Green yellow:

For the protection and grounding wire.

* Brown/Black/Gray:

For the active conductors or of phase.

In the pictures, main as as much secondary, those command sets, protection and maneuver will be arranged all to the protection against sobreintensities (overloads and it cuts circuits) and against direct bondings and indirect, as much in the circuits of lighting system like of force.

These devices will settle in the origins of the circuits as well as in the points in which the permissible intensity diminishes, to change to the
section, conditions of installation, systems of execution or type of used conductors.

The apparatuses to install are the following ones:

* A general switch automatic magnetotérmico of cut to omnipolar that he allows his manual drive, for each service.

* Protective devices against overloads and short circuits. These devices are interrupting automatic magnetotérmicos, of cut to omnipolar, with thermal curve of cut. The capacity of cut of these switches will be inferior to the intensity of short circuits that can appear in the point of its installation. The protective devices against overloads and short circuits of the inner circuits will have the poles that correspond to the number of phases of the circuit which they protect and their characteristics of interruption will be in agreement with the permissible maximum intensities in the conductors of the circuit which they protect.

* Protective devices against indirect bondings that to the salary decided on system of class B, are the interrupting sensible differentials to the intensity of defect. These devices will be complemented with the union to a same land taking of all the accessible metallic masses. The interrupting differentials settle between the general switch of each service and the protective devices against overloads and short circuits, in order that they are protected by these devices.

In the switches of the different pictures, indicating plates of the circuits will be placed to that they belong, as well as control mechanisms and protection for each one of the main lines of distribution and the direct feeding to the receivers.

Considerations to consider with cables:

- The distribution from the general picture of work to the secondary pictures (or of plant), will take place by means of buried canalizations in case it is necessary to cross the routes of circulation of vehicles and suspended in the fence of the work until arriving at the crossing point.

- In case of taking place tended of cables and hoses, this one will be made to a minimum altitude of 2 M.s in the peatonales places and of 5 M.s in those of vehicles, measured on the level of the pavement.

- The laying of cables to cross work avenues, as already it has been indicated previously, will take place buried. The “passage of the cable” by means of a permanent plank covering will be signalized that will intend protecting by means of distribution of loads, and to indicate the existence of the “electrical step” to the vehicles. The depth of the minimum ditch,
will be between 40 and 50 cm.; the cable will go in addition protected inside a rigid tube, either of fibrocemento, or of curvedable rigid plastic in hot.

- In case of having to carry out joints between hoses one will consider:
  
a) They will always be high. It is prohibited to maintain them in the ground.

  b) The provisional joints between hoses, will execute by means of watertight standardized connections antihumidity.

  c) The definitive joints will be executed using boxes of standardized joints watertight of security.

- The interconnection of the secondary pictures in ground floor, will take place by means of buried canalizations, or by means of hoses, in which case they will be hung to a height on the pavement around the 2 ms, to avoid accidents by aggression to hoses by use level with the ground.

- The layout of hoses of electrical provision will not agree with the one of provisional water provision to the plants.

Considerations to consider with the switches:

- They will adjust specifically, to the specified ones in the Electrotechnic Regulation of Low Tension.

- The switches will settle inside standardized boxes, provided with front door with security lock.

- The boxes of switches will have adhered on their door a standardized signal of “danger, electricity”.

- The boxes of switches will be hung, either of the vertical paramentos, or of “stable right feet”.

Considerations to consider with the electrical pictures:

- They will be metalists of type for the inclemency, with door and lock of security (with key), according to norm UNE-20324.

- In spite of being of type for the inclemency, they will be protected of the rainwater by means of effective visors like additional protection.
HEALTH AND SAFETY

- The metallic electrical pictures will have the connected housing to earth.

- They will have adhered on the door a standardized signal of “danger, electricity”.
- Received board slopes will be hung of wood to the vertical parameters or, on “firm right feet”.

- Takings of current for connections standardized armored for inclemency Will have, in number determined according to the made calculation. (Recommendable Level of protection IP. 447).

- The electrical pictures will be equipped with electrical look of opening. Considerations to consider with the energy takings:

  - The current takings will go provided with cut switches to omnipolar that it allows to leave them without tension when they do not have to be used.

  - The takings of current of the pictures will take place of the switchboards, by means of pins standardized armored (protected against direct bondings) and whenever it is possible, with look.

  - The current takings will not be accessible without the use of special equipment or will be including low cover or closets that provide a similar degree of inaccesibilidad. Considerations to consider with the protection of the circuits:

  - The automatic switches will be installed in all the lines of current taking of the switchboards, as well as in those of feeding to the machines, apparatuses and machine-tool of electrical operation, so and as it is reflected in the single-wire scheme.

  - The circuit breakers differentials will settle in agreement with the following sensitivities:

    300 mA. - (according to R.E.B.T.) - Feeding to the machinery.

    30 mA. - (according to R.E.B.T.) - Feeding to the machinery like improvement of the security level.

    30 mA. - For the electrical systems of nonportable lighting system.

  - The portable lighting system will be fed 24 v. by means of transforming of security, preferably with separation of circuits.

Considerations to consider with the earth takings:
- The earth formation communications net will have to adjust to the specifications detailed in the effective Electrotechnic Regulation for Low Tension.

- The earth taking in one first stage will take place through a goad or plate to locate next to the general picture, from which it will be distributed to the totality of the receivers of the installation. When definitive land the general taking of the building is made, she will be this one the one that is used for the protection of provisional the work electrical system.

- The thread of earth taking, always will be protected with yellow and green tubular powder in colors. It is specifically prohibited to use it for other uses. Conductor or naked copper cable of 95 mm will be able solely to be used horizontally of section like minimum in the buried sections and that will be considered like artifical electrode of the installation.

- The earth takings will be located in the land of such form, that their operation and effectiveness are the required one by the installation.

Considerations to consider with lighting installation:

- The masses of the fixed receivers of lighting system, will be connected to the earth formation communications net by means of the corresponding conductor of protection. The portable apparatuses of lighting system, except the used ones with small tensions, will be of type protected against the water spurts (recommendable Level of protection IP.447).

- The lighting system of the work, will fulfill the specifications established in Decrees of Work of the Construction, Glass and Ceramics and General of Security and Hygiene in the Work.

- The illumination of the edges will be by means of projectors located on “firm right feet”.

- The electrical energy that must be provided to the portable lamps for the illumination of encharcados edges, (or humid), will use through a transformer of current with separation of circuits that reduces it to 24 volts.

- The illumination of the edges will be located to a height around the 2 M.s, measured from the surface of support of the workers in the job.

- The illumination of the edges, whenever it is possible, will take place crossed with the purpose of diminishing shades.
- The zones of passage of the work will be permanently illuminated avoiding dark corners. General considerations:

- The electrical pictures of distribution, will be always located in places readily accessible.

- The electrical pictures will not settle in the development of the approach ramps to the bottom of the excavation (the machinery or trucks can be taken by and to cause accidents).

- The electrical pictures of inclemency, by additional protection will be covered with visors against rain.

- The provisional posts of which to hang electrical hoses they will not be located to less of 2 M.s (like general norm), of the edge of the excavation, highway and assimilable.

- The electrical provision to the bottom of an excavation will be executed by a place that is not the approach ramp, for vehicles or the personnel, (never next to ladders).

- The electrical pictures, in good condition, will remain closed with the locks of triangle security, (or of key) in good condition.

- The use of rudimentary fuses is not allowed (pieces of wiring, threads, etc.). It is necessary to use “suitable standardized fusible cartridges” to each case, according to is specified in planes.
2.5. SPECIFICATIONS OF THE SERVICES OF HYGIENE AND WELL-BEING

Considering that the anticipated maximum number of workers of 30, the facilities of hygiene and well-being will have to reunite the following conditions:

CLOTHES:

In order to cover the necessities will be had a total surface of 45 m².

The vertical clearance to ceiling will be of 2.30 meters like minimum.

The grounds, walls and ceilings will be smooth and impermeable, allowing the necessary cleaning. Also they will have independent and direct ventilation.

The clothes will be provided with an individual ticket office with key for each worker and seats.

A plank will be qualified containing the labor calendar, General Decree of Security and Hygiene in the Work, Labor Decree of the Construction, Glass and Ceramics and informative notes of routine garrison duty that the

Technical manual of the work provides.

TOILETS:

It will altogether be had houses with the following sanitary elements:

* 3 showers.
* 3 Turkish plates.
* 3 washbasins.
* 2 mirrors.

Completing itself with necessary the auxiliary organizational elements: Toalleros, jaboneras, etc.

It will have hot water in showers and washbasins.

The grounds, ceilings and walls will be smooth and impermeable, allowing the necessary cleaning; also they will have independent and direct ventilation.
The vertical clearance of ground to ceiling will not have to be inferior to 2.30 meters, having each one of the toilets a surface of 1 x 1.20 meters.

DINING ROOM:

It will have (structurally and as far as habitability) the same characteristics that the clothes (45 m2, height of 2.30 free ms like minimum,...).

In addition it will have banks and sufficient tables to 30 people, as well as a sink.

MEDICINE KITS:

It will be had a clearly visible poster in which all the telephones of urgency of the next hospitable centers are indicated; doctors, ambulances, firemen, police, etc.

In all the centers of work it will be had a medicine kit with the average ones to carry out the first aids in case of accident.

The medicine kits will be in charge of enabled people designated by the company.

Its content will be reviewed monthly and the used thing will recover immediately.

The minimum content will be: Oxygenated water, alcohol of 96º, iodine dye, mercurocromo, ammonia, hydrophilic cotton, sterile gauze, sterilized rubber bandage, sticking plaster, antispasmodics, bell crank, bags for water and ice, gloves, syringe, boiler and clinical thermometer.
2.6. ORGANIZATION OF THE SECURITY.

2.6.1. PREVENTIVE RESOURCES

The industrialist will have to name necessary the preventive resources in the work giving fulfillment to indicated in article 32 bis and the additional disposition fourteenth of the Law of Prevention of Labor Risks, including in the extension made in Law 54/2003.

To this end in the Plan of Security and Health, the contractor will have to define the preventive resources assigned to the work, that must have the qualification sufficient and to have means necessary to watch the fulfillment of the measures including in this Plan, being verified his effectiveness.

The named workers must have the necessary capacity, have of the time and sufficient means precise and to be in number, considering the size of the company, as well as the risks to that the workers and their distribution in the same one are exposed.

2.6.2. INSURANCES OF CIVIL RESPONSIBILITY AND ALL RISK IN WORK

The contractor must have cover of civil responsibility in the exercise of his industrial activity, covering the inherent risk to his activity like constructor by the damages to third people from whom civil responsibility to its position can be extracontractual, by facts been born of fault or negligence; imputable to he himself or the people of whom it must respond. It is understood that this civil responsibility must be extended to the field of the supervisory civil responsibility.

The contractor comes forced the hiring from an Insurance, in the modality of all risk to the construction, during the implementation time of the work with extension to a period of maintenance of a year, counted as of the date of definitive completion of the work.

2.6.3. FORMATION AND INFORMATION.

All the personnel who makes its assignment in all the phases of the work, will have to make a course of Security and Health in the Construction, in which the general norms will be indicated to them on Security and Health that in the execution of this work are going away to adopt.

This formation will have to be distributed by technicians of prevention of intermediate or superior level (specialization in security), recommending
its complementation by institutions such as the Cabinets of Security and Hygiene in the Work, Mutual of Accidents, etc.

On the part of the Direction of the company in collaboration with the Coordinator of Security and Health in work execution, he will guard himself so that the personnel is instructed on the particular norms that the execution of each task or for the use of each machine stops, are required.

The company will give to each worker the necessary information of security referring to its job.

2.6.4. MONITORING OF THE HEALTH.

When entering the construction company all worker will have to be put under the practice of an agreed medical examination to his job, which will be repeated with the regularity that recommends the service of prevention of each company.
2.7. OBLIGATIONS OF THE IMPLIED PARTS

2.7.1. OF THE PROMOTER

The property, comes forced to include the present Study of Security and Health, as attached document of the Work Project.

Also, it will pay to the Company Constructora, previous certification of the Coordinator of Security and Health during the work execution, the games including in the Budget of the Study of Security and Health.

The promoter will see fulfilled his to have of information to the contractors, indicated in the R.D. 171/2004, by means of the delivery of the corresponding part of the security study.

The promoter will fulfill his to have to give instructions to the present contractors in the work, through which of the coordinator of security to such. These instructions will be given to the preventive resources for a greater agility and work reception.

2.7.2. OF COMPANY CONSTRATISTA

The Contratista Company comes forced to fulfill the directives contained in the Study of Security and Health, through Plan of Security and Health, coherent with previous and the systems of execution and the procedures of work that the same one is going to use. The Plan of Security and Health, will count on the approval of the Coordinator of Security and Health during the work execution, and will be previous in the beginning of the work.

The company contractor will have to give to the part corresponding of its plan of security to all the companies and independent workers whom they subcontract.

It will have to watch the fulfillment of the norm of prevention of labor risks on the part of the subcontracted companies or independent workers, having to ask for accreditation in writing of such, always before beginning the works, that have made the evaluation of risks and planning of the preventive activity and have perform one's duty in the matter of information and formation of the workers who are going to serve their in the work.

Finally, the Contratista Company, will shared in common fulfill the stipulations preventive of the Study and the Plan of Security and Health, responding of the damages that are derived from the infraction of he himself on the other hand or of the possible subcontractors and employees.
2.7.3. OF THE COORDINATOR OF SECURITY AND HEALTH DURING THE EXECUTION OF THE WORK

To the Coordinator of Security and Health during the work execution it will correspond the control and supervision to him of the execution of the Plans de Seguridad and Salud, having authorized previously any modification of this one and putting record written in Libro de Incidencias.

Periodically, according to the agreed thing, the pertinent certifications of the Budget of Security, putting in knowledge of the Property and the competent organisms will be made, the breach, on the part of the Contratista Company, of the safety measures contained in the Study of Security and Health.

To mention to companies and preventive resources to the coordination meetings.

It will have to fulfill the functions indicated in article 9 of the R.D. 1627/1997. In addition, it will have to give the contractors, the instructions that the R.D marks. 171/2004.

2.7.4. OF THE PREVENTIVE RESOURCES

To watch the fulfillment of the measures including in the plan of security and health in the work and to verify the effectiveness of these, verifying all it in writing.

To give to the security coordinator the lists of control of the plan.

To warn the coordinator of security of any variation of the security plan so that this it can give the necessary instructions.

To receive and to make fulfill all the instructions that of the security coordinator.

To attend the meetings of coordination organized by the coordinator.

2.7.5. OF THE SERVICES OF PREVENTION OF THE COMPANIES

The services of prevention will have to be able to provide to the company the advising and support that needs based on the existing types of risk in her and with respect to:

a) The design, application and coordination of the plans and programs of preventive performance.
b) The evaluation of the risk factors that can affect to the security and the health of the workers in the terms anticipated in article 16 of this Law.

c) The determination of the priorities in the adoption of the suitable preventive measures and the monitoring of its effectiveness.

d) The information and formation of the workers.

e) The benefit of first aid and plans of emergency.

f) The monitoring of the health of the workers in relation to the risks derived from the work.

The service of prevention will have interdisciplinary character, having its average being appropriate to act its as. For it, the formation, specialty, qualification, dedication and number of components of these services as well as their technical resources, will have sufficient and to be adapted to the preventive activities to develop, based on the following circumstances:

1) Size of the company

2) Types of risk that can be exposed the workers

3) Distribution of risks in the company

**2.7.6. OF THE SECURITY COMMISSION**

Operation of the security commission:

Functions of the President:

To show the representation of the organ.

To decide the call the sessions and the fixation of the daily routine.

To preside over the sessions, to moderate the development of the debates and to suspend them by just causes.

Functions of the Secretary:

To carry out the independent call of the sessions by order of the President who will go to all the contractors and workers who are working in the mentioned work.

To write up and to authorize acts of the coordination commission.
Expedition of certifications with the visa of the President.

The call of the sessions will be made with a minimum of 48 hours of advance and will contain the daily routine, having been able to anticipate one second call. The commission of Coordination of Security will meet monthly and whenever it asks for some of the represented parts.

The acts will be approved when finalizing the session.

The attendance to the meetings will be obligatory for all the companies that are working in center, with the purpose of giving fulfillment to the norm previously mentioned.
2.8. NORMS FOR THE CERTIFICATION OF SECURITY ELEMENTS

Next to the execution certification the valuation of the games will extend that, in material of Security, had been made in the work; the valuation will become according to this Study and in agreement with the prices contracted by the property. This valuation will be approved by the Facultative Direction and without this requirement it could not be paid by the Property.

The installment of the certifications exposed in the previous paragraph will become as is stipulated in the work contract.

In case of executing in work nonpredicted units in the present budget, total will be defined and correctly the same ones and the corresponding price will be adjudged to them coming itself for its installment, so and as it is indicated in the previous sections.

In case of considering a revision of prices, the Contractor will communicate this proposal to the Property in writing, having obtained the previous approval of the Facultative Direction.
2.9. PROCEDURES FOR THE CONTROL OF THE ACCESS OF PEOPLE TO WORK

With the purpose of fulfilling the R.D. 1627/97 will be due to establish preventive measures to control the access of people to the work.

For it the procedures settle down that follow next:

As first element to consider, will have to be placed closing the work the indicated fence one in the present study of security, so that it prevents the passage to all person other people's to the work.

The promoter will have to demand to all his contractors the delivery of the documentation of all the workers who are going to enter the work (including the one of independent subcontractors and workers), in order to be able to verify that they have received the formation, information and monitoring of the necessary health for his job.

El/los recurso/s preventivo/s must have in work a listing with the people who can enter the work, so that they can take an own and subcontracted personnel administration that between in the same one, preventing the entrance to all person who is not authorized.

In addition, daily, they will take a data of control of companies of the personnel before the beginning of the Works.

El/los recurso/s preventivo/s will give to all the workers who enter the work a copy of the necessary documentation for the correct circulation by work.

Posters will be placed of no entry to all person other people's to the work in doors.

A nocturnal monitoring will be contracted that it controls that no person other people's to the work between in the same one.
2.10. PLAN OF SECURITY AND HEALTH

The Contractor is forced to write up a Plan of Security and Health, being adapted this Study to his means and methods of execution.

This Plan of Security and Health will have to count on the express approval of the Coordinator of security and health in execution of the work, to that will appear before the initiation of the works.

A copy of the Plan will have to give to the Service of Prevention and Companies subcontractors.

In Halmstad, ____________________

The technical architect.
3. BUDGET

3.1. INDIVIDUAL PROTECTIONS

3.1.1. One game of hurl of rubber anti-humidity with reinforced toe.

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<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earthwork</td>
<td>3.00</td>
</tr>
<tr>
<td>Laying of foundations</td>
<td>5.00</td>
</tr>
<tr>
<td>Structure</td>
<td>8.00</td>
</tr>
<tr>
<td>Masonry</td>
<td>5.00</td>
</tr>
<tr>
<td>Polisher</td>
<td>2.00</td>
</tr>
<tr>
<td>Waterproofing</td>
<td>2.00</td>
</tr>
<tr>
<td>Preventive Resource</td>
<td>1.00</td>
</tr>
</tbody>
</table>

TOTAL  26.00 x 13,00 € = 338,00 €

3.1.2. One game of hurl of security with reinforcement.

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earthwork</td>
<td>3.00</td>
</tr>
<tr>
<td>Laying of foundations</td>
<td>5.00</td>
</tr>
<tr>
<td>Structure</td>
<td>10.00</td>
</tr>
<tr>
<td>Masonry</td>
<td>40.00</td>
</tr>
<tr>
<td>Isolation facades</td>
<td>2.00</td>
</tr>
<tr>
<td>Polisher</td>
<td>2.00</td>
</tr>
<tr>
<td>Plumbing</td>
<td>4.00</td>
</tr>
<tr>
<td>Electricity</td>
<td>6.00</td>
</tr>
<tr>
<td>Gas Installation</td>
<td>2.00</td>
</tr>
<tr>
<td>Conditioned air</td>
<td>6.00</td>
</tr>
<tr>
<td>Wood Carpentry</td>
<td>4.00</td>
</tr>
<tr>
<td>Furniture of kitchen</td>
<td>2.00</td>
</tr>
<tr>
<td>Waterproofing</td>
<td>4.00</td>
</tr>
<tr>
<td>Elevators</td>
<td>3.00</td>
</tr>
<tr>
<td>Glasswork</td>
<td>3.00</td>
</tr>
<tr>
<td>Painting</td>
<td>6.00</td>
</tr>
<tr>
<td>Talla</td>
<td>2.00</td>
</tr>
<tr>
<td>Locksmith shop</td>
<td>2.00</td>
</tr>
<tr>
<td>Aluminium Carpentry</td>
<td>2.00</td>
</tr>
<tr>
<td>Preventive Resource</td>
<td>2.00</td>
</tr>
</tbody>
</table>

TOTAL  110.00 x 12,50 € = 1.375,00 €
3.1.3. One game of hurl insulators for works in low tension.

<table>
<thead>
<tr>
<th>Service</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>2.00</td>
</tr>
<tr>
<td>Elevators</td>
<td>3.00</td>
</tr>
</tbody>
</table>

**TOTAL** 5.00 x 15,00 € = 75,00 €

3.1.4. One game of so large leather gloves short.

<table>
<thead>
<tr>
<th>Service</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earthwork</td>
<td>3.00</td>
</tr>
<tr>
<td>Laying of foundations</td>
<td>15.00</td>
</tr>
<tr>
<td>Structure</td>
<td>40.00</td>
</tr>
<tr>
<td>Masonry</td>
<td>80.00</td>
</tr>
<tr>
<td>Plumbing</td>
<td>4.00</td>
</tr>
<tr>
<td>Electricity</td>
<td>6.00</td>
</tr>
<tr>
<td>Gas Installation</td>
<td>4.00</td>
</tr>
<tr>
<td>Conditioned air</td>
<td>12.00</td>
</tr>
<tr>
<td>Wood Carpentry</td>
<td>8.00</td>
</tr>
<tr>
<td>Furniture of kitchen</td>
<td>4.00</td>
</tr>
<tr>
<td>Waterproofing</td>
<td>6.00</td>
</tr>
<tr>
<td>Elevators</td>
<td>3.00</td>
</tr>
<tr>
<td>Glasswork</td>
<td>6.00</td>
</tr>
<tr>
<td>Talla</td>
<td>2.00</td>
</tr>
<tr>
<td>Locksmith shop</td>
<td>4.00</td>
</tr>
<tr>
<td>Aluminium Carpentry</td>
<td>6.00</td>
</tr>
<tr>
<td>Preventive Resource</td>
<td>4.00</td>
</tr>
</tbody>
</table>

**TOTAL** 207.00 x 3,00 € = 621,00 €

3.1.5. One game long gloves of PVC.

<table>
<thead>
<tr>
<th>Service</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laying of foundations</td>
<td>5.00</td>
</tr>
<tr>
<td>Structure</td>
<td>10.00</td>
</tr>
<tr>
<td>Masonry</td>
<td>30.00</td>
</tr>
<tr>
<td>Plumbing</td>
<td>2.00</td>
</tr>
<tr>
<td>Waterproofing</td>
<td>2.00</td>
</tr>
</tbody>
</table>

**TOTAL** 49.00 x 1,50 € = 73,50 €

3.1.6. One game of gloves for works of weld.

<table>
<thead>
<tr>
<th>Service</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plumbing</td>
<td>4.00</td>
</tr>
<tr>
<td>Gas Installation</td>
<td>3.00</td>
</tr>
<tr>
<td>Conditioned air</td>
<td>2.00</td>
</tr>
<tr>
<td>Elevators</td>
<td>2.00</td>
</tr>
<tr>
<td>Locksmith shop</td>
<td>2.00</td>
</tr>
</tbody>
</table>

**TOTAL** 13.00 x 4,50 € = 58,50 €
3.1.7. One game of dielectric gloves for protection of electrical contact in low tension.

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>2.00</td>
</tr>
<tr>
<td>Elevators</td>
<td>2.00</td>
</tr>
</tbody>
</table>

**TOTAL** 4.00 x 10.80 € = 43.20 €

3.1.8. One helmet of security with harness of adaptation in resistant material to the metallic impact, accredited.

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earthwork</td>
<td>3.00</td>
</tr>
<tr>
<td>Laying of foundations</td>
<td>5.00</td>
</tr>
<tr>
<td>Structure</td>
<td>5.00</td>
</tr>
<tr>
<td>Masonry</td>
<td>30.00</td>
</tr>
<tr>
<td>Isolation facades</td>
<td>2.00</td>
</tr>
<tr>
<td>Polisher</td>
<td>2.00</td>
</tr>
<tr>
<td>Plumbing</td>
<td>4.00</td>
</tr>
<tr>
<td>Electricity</td>
<td>6.00</td>
</tr>
<tr>
<td>Gas Installation</td>
<td>3.00</td>
</tr>
<tr>
<td>Conditioned air</td>
<td>6.00</td>
</tr>
<tr>
<td>Wood Carpentry</td>
<td>4.00</td>
</tr>
<tr>
<td>Furniture of kitchen</td>
<td>2.00</td>
</tr>
<tr>
<td>Waterproofing</td>
<td>4.00</td>
</tr>
<tr>
<td>Elevators</td>
<td>3.00</td>
</tr>
<tr>
<td>Glasswork</td>
<td>3.00</td>
</tr>
<tr>
<td>Painting</td>
<td>6.00</td>
</tr>
<tr>
<td>Talla</td>
<td>2.00</td>
</tr>
<tr>
<td>Locksmith shop</td>
<td>2.00</td>
</tr>
<tr>
<td>Aluminium Carpentry</td>
<td>3.00</td>
</tr>
<tr>
<td>Preventive Resource</td>
<td>3.00</td>
</tr>
</tbody>
</table>

**TOTAL** 98.00 x 6.0 € = 637.00 €

3.1.9. One accredited Protective goggles with colorless crystals.

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laying of foundations</td>
<td>5.00</td>
</tr>
<tr>
<td>Structure</td>
<td>10.00</td>
</tr>
<tr>
<td>Masonry</td>
<td>15.00</td>
</tr>
<tr>
<td>Isolation facades</td>
<td>2.00</td>
</tr>
<tr>
<td>Polisher</td>
<td>2.00</td>
</tr>
<tr>
<td>Plumbing</td>
<td>4.00</td>
</tr>
<tr>
<td>Conditioned air</td>
<td>4.00</td>
</tr>
<tr>
<td>Wood Carpentry</td>
<td>4.00</td>
</tr>
<tr>
<td>Furniture of kitchen</td>
<td>2.00</td>
</tr>
<tr>
<td>Waterproofing</td>
<td>4.00</td>
</tr>
<tr>
<td>Painting</td>
<td>6.00</td>
</tr>
</tbody>
</table>
HEALTH AND SAFETY

Talla 2.00
Aluminium Carpentry 3.00

TOTAL 63.00 x 2,50 € = 157,50 €

3.1.10. One protective goggles for works of weld.

Gas Installation 3.00
Elevators 2.00
Locksmith shop 2.00

TOTAL 7.00 x 4,00 € = 28,00 €

3.1.11. One auricular ears protectors.

Earthwork 3.00
Laying of foundations 5.00
Structure 10.00
Masonry 10.00
Polisher 2.00
Wood Carpentry 4.00
Furniture of kitchen 2.00
Waterproofing 2.00
Elevators 2.00
Painting 4.00
Locksmith shop 2.00

TOTAL 46.00 x 9,30 € = 427,80 €

3.1.12. You Mask for acclimate dusty, a filter.

Earthwork 3.00
Laying of foundations 10.00
Structure 20.00
Masonry 50.00
Polisher 4.00
Wood Carpentry 12.00
Furniture of kitchen 4.00
Waterproofing 8.00
Painting 15.00
Talla 6.00

TOTAL 132.00 x 1,60 € = 211,20 €
3.1.13. One mask with chemical filter for toxic atmospheres by organic dissolvents.

<table>
<thead>
<tr>
<th></th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isolation facades</td>
<td>10.00</td>
</tr>
<tr>
<td>Waterproofing</td>
<td>15.00</td>
</tr>
<tr>
<td>Painting</td>
<td>25.00</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>50.00 x 2.50 € = 125.00 €</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th></th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure</td>
<td>4.00</td>
</tr>
<tr>
<td>Masonry</td>
<td>5.00</td>
</tr>
<tr>
<td>Aluminium Carpentry</td>
<td>2.00</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>11.00 x 30,00 € = 330.00 €</td>
</tr>
</tbody>
</table>

3.1.15. One lap belt of suspension with a mooring point.

<table>
<thead>
<tr>
<th></th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masonry</td>
<td>12.00</td>
</tr>
<tr>
<td>Plumbing</td>
<td>2.00</td>
</tr>
<tr>
<td>Electricity</td>
<td>2.00</td>
</tr>
<tr>
<td>Gas Installation</td>
<td>1.00</td>
</tr>
<tr>
<td>Elevators</td>
<td>2.00</td>
</tr>
<tr>
<td>Painting</td>
<td>2.00</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>21.00 x 42,00 € = 882.00 €</td>
</tr>
</tbody>
</table>

3.1.16. Prudent of nylon security, with blockade and locking mechanism, amortizable in four uses.

<table>
<thead>
<tr>
<th></th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masonry</td>
<td>10.00</td>
</tr>
<tr>
<td>Plumbing</td>
<td>2.00</td>
</tr>
<tr>
<td>Electricity</td>
<td>2.00</td>
</tr>
<tr>
<td>Gas Installation</td>
<td>1.00</td>
</tr>
<tr>
<td>Elevators</td>
<td>2.00</td>
</tr>
<tr>
<td>Painting</td>
<td>2.00</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>19.00 x 72,00 € = 1.368.00 €</td>
</tr>
</tbody>
</table>

3.1.17. One screen for electrical fiber weld vulcanized of 1'35 mm, with colorless acetate viewfinder.

<table>
<thead>
<tr>
<th></th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas installation</td>
<td>1.00</td>
</tr>
<tr>
<td>Elevators</td>
<td>2.00</td>
</tr>
<tr>
<td>Locksmith shop</td>
<td>2.00</td>
</tr>
</tbody>
</table>
TOTAL  5.00 x 54,00 € = 270,00 €

3.1.18. One mandil of leather for works of weld or with glasses.

- Gas installation 1.00
- Waterproofing 2.00
- Elevators 2.00
- Glasswork 3.00
- Locksmith shop 2.00

TOTAL  10.00 x 32,00 € = 320,00 €

3.1.19. One monkey of work of a piece, slight and flexible weave.

- Earthwork 3.00
- Laying of foundations 5.00
- Structure 10.00
- Masonry 30.00
- Isolation facades 2.00
- Polisher 2.00
- Plumbing 4.00
- Electricity 6.00
- Gas installation 3.00
- Conditioned air 6.00
- Wood Carpentry 4.00
- Furniture of kitchen 2.00
- Waterproofing 4.00
- Elevators 3.00
- Glasswork 3.00
- Painting 7.00
- Talla 2.00
- Locksmith shop 2.00
- Aluminium Carpentry 3.00
- Preventive Resource 3.00

TOTAL  104.00 x 15,00 € = 1.560,00 €

3.1.20. One game of leggines for works of weld and glasswork.

- Plumbing 2.00
- Gas Installation 3.00
- Conditioned air 3.00
- Waterproofing 4.00
- Elevators 3.00
- Glasswork 3.00

TOTAL  9.00 x 36,00 € = 324,00 €
3.1.21. One game of muñequeras of leather for works of weld.

<table>
<thead>
<tr>
<th>Service</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plumbing</td>
<td>2.00</td>
</tr>
<tr>
<td>Gas Installation</td>
<td>3.00</td>
</tr>
<tr>
<td>Conditioned air</td>
<td>3.00</td>
</tr>
<tr>
<td>Waterproofing</td>
<td>4.00</td>
</tr>
<tr>
<td>Elevators</td>
<td>3.00</td>
</tr>
<tr>
<td>Glasswork</td>
<td>3.00</td>
</tr>
<tr>
<td>Locksmith shop</td>
<td>2.00</td>
</tr>
</tbody>
</table>

**TOTAL** 20.00 x 9.30 € = 186.00 €

3.1.22. One protective cap against painting for the hair.

<table>
<thead>
<tr>
<th>Service</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Painting</td>
<td>7.00</td>
</tr>
</tbody>
</table>

**TOTAL** 7.00 x 2.20 € = 15.40 €

3.1.23. One suit impermeable for rainy weather or works under water or similar.

<table>
<thead>
<tr>
<th>Service</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earthwork</td>
<td>3.00</td>
</tr>
<tr>
<td>Laying of foundations</td>
<td>5.00</td>
</tr>
<tr>
<td>Structure</td>
<td>5.00</td>
</tr>
<tr>
<td>Masonry</td>
<td>15.00</td>
</tr>
<tr>
<td>Polisher</td>
<td>2.00</td>
</tr>
<tr>
<td>Waterproofing</td>
<td>4.00</td>
</tr>
<tr>
<td>Painting</td>
<td>6.00</td>
</tr>
<tr>
<td>Preventive Resource</td>
<td>2.00</td>
</tr>
</tbody>
</table>

**TOTAL** 42.00 x 22.00 € = 924.00 €

3.1.24. One belt of retractable security.

<table>
<thead>
<tr>
<th>Service</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure</td>
<td>2.00</td>
</tr>
</tbody>
</table>

**TOTAL** 2.00 x 600.00 € = 1.200.00 €

**TOTAL chapter**: 11.330.10 €
3.2. COLLECTIVE PROTECTIONS.

3.2.1. M. Protection with mesh of plastic and props used like signaling to prevent the step.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground floor</td>
<td>83.50</td>
</tr>
<tr>
<td>Planta 1ª</td>
<td>44.50</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>128.00 x 3,50 € = 448,00 €</strong></td>
</tr>
</tbody>
</table>

3.2.2. Extinguishing you of dry dust B.C.E. of 6 kg (effectiveness 55 B) loaded.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3.00 x 73,00 € = 219,00 €</td>
</tr>
</tbody>
</table>

3.2.3. M2. Marquee of protection of 1.5 m.s composed by metallic props (15 uses would amortizablesen) of 4 m.s, wood platform and plinth (amortizable in five uses), even assembly and disassembling (six modules).

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground floor</td>
<td>9.40</td>
</tr>
<tr>
<td>Planta 1ª</td>
<td>7.80</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>17.20 x 10,20 € = 175,44 €</strong></td>
</tr>
</tbody>
</table>

3.2.4. One metallic Door of a leaf for peatonal entrance, ironworks to even hang and security. Amortizable in two uses, totally placed.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.0 x 70,00 € = 70,00 €</td>
</tr>
</tbody>
</table>

3.2.5. M. Railing of protection for in excess openings composed by metallic guardacuerpos each 2'25 m (amortizable in 8 uses), tables of Galician pine of 0'20 x 0'025 m. superior part would colocadasen, rodapié y intermediate part (amortizable in five uses), even positioning, maintenance and disassembling.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Excavation</td>
<td>100.00</td>
</tr>
<tr>
<td>Floor Low Cellar</td>
<td>40.00</td>
</tr>
<tr>
<td>Floor</td>
<td>95.50</td>
</tr>
<tr>
<td>Floor 1ª</td>
<td>198.50</td>
</tr>
<tr>
<td>Floor 2ª</td>
<td>257.00</td>
</tr>
<tr>
<td>Floor 3ª</td>
<td>333.00</td>
</tr>
<tr>
<td>Floor Casetones</td>
<td>212.50</td>
</tr>
<tr>
<td>Floor Covered</td>
<td>78.00</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1314.50 x 6,20 € = 8.149,90 €</strong></td>
</tr>
</tbody>
</table>
3.2.6. M. Vertical network in modules of 10 xs 5 m.s, made up of supports jaw, derricks (amortizable in twenty uses), and network provided with seal AENOR (amortizable in three uses or a year, which before happens), even positioning, hoisting by plant and disassembling.

\[
\text{TOTAL} \quad 170.00 \times 50.00 \, \text{€} = 8.500.00 \, \text{€}
\]

3.2.7. M2. Horizontal protection composed by network of 5 10 xs m2 provided with seal AENOR (they amortizableen three uses or a year, which before happens), tied cord of perimetal and I hook contracted in the concrete, even positioning, maintenance and disassembling.

Floor 2ª: 100.00
Floor 3ª: 100.00
Floor Casetones: 100.00

\[
\text{TOTAL} \quad 300.00 \times 4.00 \, \text{€} = 1.200.00 \, \text{€}
\]

3.2.8. M2. Protection of hollow to cover by means of plank of wild, amortizable pine in five uses, even positioning and disassembling.

Floor Cellar:
- Hollows of Low elevator 9.00

Floor:
- Hollows of elevator 9.00
- Ventilations 13.00
- Hollow facilities 1.00

Floor 1ª:
- Hollows of elevator 9.00
- Hollow facilities 24.35

Floor 2ª:
- Hollows of elevator 9.00
- Hollow facilities 21.85

Floor 3ª:
- Hollows of elevator 9.00
- Hollow facilities 21.85

Floor Casetones:
- Hollows of elevator 9.00
HEALTH AND SAFETY

Hollow facilities 15.35

TOTAL 151.40 x 15.00 € = 2.271.00 €

TOTAL chapter: 21.033.34 €
3.3. SIGNALING

3.3.1. One no entry Señalización de to all person other people's to the work and several of obligatory use of EPÍs and others.

TOTAL $10.00 \times 6.00 \text{ €} = 60.00 \text{ €}$

3.3.2. You Fence type city council placed like signaling of amortizable way of pedestrians in five uses, even transport positioning and disassembling.

TOTAL $14.00 \times 10.00 \text{ €} = 140.00 \text{ €}$

3.3.3. You circular Signal of security of 60 cm. of diameter, amortizable in three uses, totally placed (Prohibition and Oblig. Sense).

TOTAL $4.00 \times 25.00 \text{ €} = 100.00 \text{ €}$

3.3.4. You manual Signal of Stop and Ceda the Passage to two faces.

TOTAL $2.00 \times 20.00 \text{ €} = 40.00 \text{ €}$

TOTAL chapter: 340.00 €
### 3.4. INSTALACIONES OF HYGIENE AND WELL-BEING

#### 3.4.1. One Rent of house of 190 xs 410 xs 230 cm, of 7'8 m² of surface, with window of 84 xs 70 cm of aluminum hard anodizing with grate and cristalina of 6 mm, therms of 50 ls, two Turkish plates, two plates of shower and washbasin with three faucets, everything of fiber glass, ground waterproof plywood with nonskid layer, inner wood doors in the compartments of Turkish plate and curtain in shower, polybutylene pipes, amortizable in five uses, totally placed.

| TOTAL | 20.00 x 200,00 € = 4,000,00 € |

#### 3.4.2. One monthly Rent of house of 1'90x3'00x2'3 m

| TOTAL | 20.00 x 120,00 € = 2,400,00 € |

#### 3.4.3. Electrical radiating you of 1,000 amortizable W in do

| TOTAL | 3.00 x 20,00 € = 60,00 € |

#### 3.4.4. You individual metallic ticket office with key for clothes.

| TOTAL | 35.00 x 12,00 € = 420,00 € |

#### 3.4.5. You Furnace microwaves to warm up meals of 18 liters, revolving plate and clock programmer, amortizable in two uses.

| TOTAL | 1.00 x 90,00 € = 90,00 € |

#### 3.4.6. You Pull of wood with capacity for ten people, amortizable in four uses, totally placed.

| TOTAL | 4.00 x 50,00 € = 200,00 € |

#### 3.4.7. You Mirror for clothes and toilets builds.

| TOTAL | 3.00 x 13,00 € = 39,00 € |

#### 3.4.8. You Adjustment plant low for use like clothes and dining room.

| TOTAL | 1.00 x 1.500,00 € = 1.500,00 € |

#### 3.4.9. H. Cleaning and conservation of the hygiene facilities and well-being.
TOTAL 160.00 x 12.00 € = 1.920.00 €

TOTAL chapter: 10.629,00 €
3.5. PREVENTIVE MEDICINE

3.5.1. You Medicine kit of urgency with obligatory minimum contents.

- Earthwork: 1.00
- Laying of foundations: 1.00
- Structure: 2.00
- Masonry: 3.00
- Isolation facades: 1.00
- Polisher: 1.00
- Plumbing: 1.00
- Electricity: 1.00
- Gas Installation: 1.00
- Conditioned air: 1.00
- Wood Carpentry: 1.00
- Furniture of kitchen: 1.00
- Waterproofing: 1.00
- Elevators: 1.00
- Glasswork: 1.00
- Painting: 1.00
- Talla: 1.00
- Locksmith shop: 1.00
- Aluminium Carpentry: 1.00

**TOTAL** 22.00 x 30.00 € = **660.00 €**

**TOTAL chapter: 660.00 €**
3.6. MEETINGS COORDINATION

3.6.1. You Meeting of coordinación en work of a duration of two hours, considering an average attendance of 15 people.

\[
\text{TOTAL} \quad 10.00 \times 450.00 \, \text{€} = 4500.00 \, \text{€}
\]

TOTAL chapter: 4500.00 €
3.7. ORDERED OF PREVENTION

3.7.1. H. Recurso preventivo on the functions that Law 54/2003 of 13 of December marks, with a minimum formation in security equivalent to the basic level of construction, necessary for the correct accomplishment of its assignment (hours considered according to planning).

\[
\text{TOTAL} \quad 3520.00 \times 15.00 \, \text{€} = 52.800.00 \, \text{€}
\]

TOTAL chapter: 52.800.00 €
### 3.8. SUMMARY OF THE BUDGET

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Individual Protections</td>
<td>11,330,10€</td>
</tr>
<tr>
<td>II</td>
<td>Collective Protections</td>
<td>21,033,34€</td>
</tr>
<tr>
<td>III</td>
<td>Signaling</td>
<td>340,00€</td>
</tr>
<tr>
<td>IV</td>
<td>Facilities of Hygiene and Well-Being</td>
<td>10,629,00€</td>
</tr>
<tr>
<td>V</td>
<td>Preventive Medicine</td>
<td>660,00€</td>
</tr>
<tr>
<td>VI</td>
<td>SAW Meetings of Coordination</td>
<td>4,500,00€</td>
</tr>
<tr>
<td>VII</td>
<td>Preventive Resources</td>
<td>52,800,00€</td>
</tr>
</tbody>
</table>

**Estimated Total 101,292.44 €**

In Halmstad, ________________

The technical architect.
QUALITY CONTROL

Author: Vicente Borrás Torres
Tutor in Halmstad: Ake Spangberg
Tutor in Spain: Vicente Monzó Hurtado
4. MEMORY

4.1. ANTECEDENTS

4.2. PRESCRIPTIONS OF CONTROL OF MATERIALS

4.2.1. Materials accredited with mark, seal or certificate of certificate.

4.2.2. Test of materials.

4.3. PRESCRIPTIONS OF THE EXECUTION CONTROL

4.3.1. Risk factors.

4.3.2. Controls of execution to carry out.

4.3.3. Test on watch.

4.4. CONDITIONS OF ACCEPTANCE AND REJECTION

4.5. PROGRAMMING OF THE QUALITY CONTROL

4.5.1. Programming of the control of materials.

4.5.2. Programming of the execution control.

4.5.3. Programming of tests on watch.

4.6 APPLICATION NORM

4.6.1. Application norm.

4.2. BUDGET

4.2.1. TESTS OF MATERIALS

4.1.1. Steel.

4.1.2. Concrete.

4.1.3. Floor tiles.

4.2. TESTS ON WATCH

4.3. BUDGET SUMMARY
4.3. SHEET OF CONDITIONS

4.1. SPECIFICATIONS

4.1.1. Of general character.

4.1.2. Conditions of provision and identification.

4.1.3. Taking of samples.

4.1.4. Test accomplishment.

4.1.5. Test back.

4.1.6. Decisions derived from the control process.

4.2. ECONOMIC CONDITIONS

4.3. FACULTATIVE AND LEGAL CONDITIONS
4.1 MEMORY

4.1 ANTECEDENTS

The present Quality Control Plan is written up by the Technical Architect Vicente Borrás Torres, by order of FINAL PROYECT A.S. It is going to made up a Social Center, Sport Center, Restaurant, and a Swimming pool, with three high floors in the part of the Social and Sport center, and the swimming pool in on part of the building. That project is located in the streets of Södravagen with Klyrevagatan in Halmstad (Sweden).

The definition of the necessary works is object of this Study that they guarantee the quality specified in the project of execution written up by the Architect Vicente Borras Torres and according to Decree 107/1991 of the Consell de Valencian Generalitat and Order of 30 of September of 1991 of the Conseller de Public Obras, Urbanism and Transports.

Data of the Construction:

- Number of Buildings: 1.
- Total Surface constructed: 2920.00 m².
- Budget of material execution: xxxxxxxx euros.
- Implemation time: 17 months.

4.2 PRESCRIPTIONS OF CONTROL OF MATERIALS

4.2.1. Materials accredited with mark, seal or certificate of certificate.

* Certificate in accordance with the prescribed requirements: common cements with additional characteristics, white cements or special cement.

* Noticeable EC:
  - Common cements.
  - Barren for concrete.
  - Fiber glass products.
  - Expanded polystyrenes.
  - Ceramic bricks.
  - Plasters and stucco.
  - Concrete blocks.
  - Bituminous products.
  - Sanitary apparatuses: toilets and bathtubs.
4.2.2. Test of materials.

According to the application norm the accomplishment of the test for receives of the following materials is:

**CONCRETE**

The concretes to use will be made in power station and the tests will be the corresponding ones to the statistical control fixed to the project.

**Tests of control**

**Statistical Level**

According to the execution project statistical control of the laying of foundations-wall concrete will be made and porticos-forged and the tests to make they are according to article 88,4 of instruction EHE:

- Determination of the consistency by Cone of Abrams.
- Resistance to compression.

Divided the work in lots, according to art. 88,4 of EHE, in each one of them it will determine the kneaded resistance and consistency of 2. In each kneaded 4 test tubes will be tried to compression and its consistency will be obtained like average of two seats of Cone of Abrams.

The lots will be inferior to the minor of the following limits according to the table 88.4.a of the EHE:

- **FOUNDATIONS (Massive)**
  - 100 m3.
  - 1 concrete week of.

- **STRUCTURES WITH ELEMENTS EXCLUSIVELY SUBMISSIVE FLEXION**
  - 100 m3.
  - 2 weeks of concrete.
  - 1,000 m2. of constructed surface.
  - 2 plants.

- **STRUCTURES THAT HAVE COMPRESSED ELEMENTS**
  - 100 m3.
  - 2 weeks of concrete.
  - 500 m2. Of constructed surface.
QUALITY CONTROL

- 2 plants.

STEEL

For the steel to use, the level of control fixed to the execution project is normal. The following tests will be made, according to articles 90.3.1 and 90.3.2 of EHE:

- By each 20 T., or if the steel shows a recognized symbol or a CC-EHE by each 40 T., or fraction corresponding to a same provider, designation and series:
  *
  * Equivalent average section, in two test tubes
    (NORM UNITES 36068 or 36099)
  *
  * Characteristic geometric of Doubled and unfolded the corrugated one in two test tubes
    (NORM UNITES 36068 or 36099)
  *
  * In two test tubes
    (NORM UNITES 36068 or 36099)

- By each diameter, type of steel and provider, at least in two occasions during the accomplishment of the work, or if the steel shows a recognized symbol or a CC-EHE at least in an occasion by each series, type of steel and provider, it will be justified:
  *
  * Elastic test of traction, limit, load and extension of breakage.    (NORM UNITES 7474)

CEMENT FLOOR TILES

The execution project anticipates the use of more than 4,000 floor tiles of terrazzo. According to LC-91 it will be made by each 10,000 units or fraction the test of:

* Wearing down by friction
  (NORM UNITES 127005)
4.3. PRESCRIPTIONS OF THE EXECUTION CONTROL

4.3.1. Risk factors.

According to the data that appear in Project of Execution, the risk factors which they determine the justification of the execution control, according to LC-91 are:

<table>
<thead>
<tr>
<th>RESTRICTION OF THE NORMATIVE (LC/91)</th>
<th>DATA PROJECT</th>
<th>LEVEL FACTOR</th>
<th>RISK FACTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DIMENSION</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nº viviendas</td>
<td>≤ 6</td>
<td>≤ 12</td>
<td>&gt;12</td>
</tr>
<tr>
<td><strong>ESTRUCTURAL</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Span between</td>
<td>≤ 6 m</td>
<td>&gt; 6 m</td>
<td>NO CONTEM.</td>
</tr>
<tr>
<td>Relation in bean and slabs</td>
<td>≥ 1/22</td>
<td>&lt; 1/22</td>
<td>NO CONTEM.</td>
</tr>
<tr>
<td>Nº dof slabs</td>
<td>≤ 5</td>
<td>&gt; 5</td>
<td>NO CONTEM.</td>
</tr>
<tr>
<td><strong>SÍSMIC</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sismic zone</td>
<td>-Low.</td>
<td>-Medium</td>
<td>-High.</td>
</tr>
<tr>
<td></td>
<td>-Zone IV y V</td>
<td>-Zone VI y VII</td>
<td>-Zone VIII y IX</td>
</tr>
<tr>
<td><strong>GEOTÉCNIC</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foundation</td>
<td>Superficial</td>
<td>Profunda</td>
<td>Superficial</td>
</tr>
<tr>
<td>Water level</td>
<td>&gt; 3m</td>
<td>Superficial</td>
<td>NO CONTEM.</td>
</tr>
<tr>
<td>Aggressive terrain</td>
<td>NO</td>
<td>Si o el agua</td>
<td>NO CONTEM.</td>
</tr>
<tr>
<td>Collapse</td>
<td>NO CONTEM.</td>
<td>yes</td>
<td></td>
</tr>
<tr>
<td>Swelling</td>
<td>NO CONTEM.</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>High variability</td>
<td>NO CONTEM.</td>
<td>yes</td>
<td></td>
</tr>
<tr>
<td><strong>ATMOSFÉRICA AGRESIÓN</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proximity</td>
<td>despicable</td>
<td>-Marine atmo</td>
<td>NO CONTEM.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Industry zone</td>
<td></td>
</tr>
<tr>
<td><strong>CLIMATE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check on map</td>
<td>-Comarcas costeras.</td>
<td>-Comarcas interiores.</td>
<td>NO CONTEM.</td>
</tr>
<tr>
<td></td>
<td>-Zona W</td>
<td>-Zona X e Y</td>
<td></td>
</tr>
<tr>
<td>wind</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Situation</td>
<td>Normal</td>
<td>Expuesta</td>
<td>NO CONTEM.</td>
</tr>
<tr>
<td>Building highs</td>
<td>≤ 30 m</td>
<td>≥ 30 m</td>
<td>NO CONTEM.</td>
</tr>
</tbody>
</table>
QUALITY CONTROL

Dimensional. Factor of risk: D=1
   Nº of houses more than 0

Structural. Factor of risk: E=2
   Light between pillars......smaller or equal than just as 6 meters
   Relation light/canto...........bigger or equal just as 1/22
   Nº of forceded: greater than 5

Seismic. Factor of risk: S=1
   Seismic Zone: Zones IV and V (Under)

Geotécnic. Factor of risk: G=1
   Superficial Laying of foundations by shoes or settles in excess
   Phreatic Level: deep (> 3 meters))
   Aggressiveness of the land: nonaggressive.

Environmental aggressiveness. Factor of risk: A=1
   Environmental Aggressiveness: Despicable

Climatic. Factor of risk: C=1
   Lines up: Coast (Zone W)

Wind. Factor of risk: V=1
   Situation: Normal Heights of the building: minor or just as 30 meters

4.3.2. Controls of execution to carry out.

According to the book of control and the concrete instruction EHE, for the indicated factors of risk in section 1.3.1 of the present study, the justification of the following controls of execution is forced:

SUPERFICIAL LAYING OF FOUNDATIONS

By each 500 m² will justify the following verifications of the following phases of execution:

   REFRAMING OF AXES, 2 verifications.
   EXCAVATION Of the LAND, 2 verifications.
   PREVIOUS OPERATIONS to EJEC, 2 verifications.
   POSITIONING OF ARMORS, 2 verifications.
   WORK PUTTING Of the CONCRETE, 2 verifications.
   COMPACTION Of the CONCRETE, 2 verifications.
   CONCRETE MEETINGS, 2 verifications.
   CURED Of the CONCRETE, 2 verifications.
CONCRETE STRUCTURES

SUPPORTS

By each 500 m² and without exceeding two plants, the following verifications of the following phases of execution will be justified:

REFRAMING, 2 verifications.
POSITIONING ARMORS SUPPORTS, 2 verifications.
ENCOFRADO, 2 verifications.
VERT. And COMPAC. CONCRETE, 2 verifications.
CURED CONCRETE, 2 verifications.
DESENCOFRADO, 2 verifications.
FINAL VERIFICATION, 2 verifications.

WALLS

By each 500 m² and without exceeding two plants, the following verifications of the following phases of execution will be justified:

REFRAMING, 2 verifications.
POSITIONING ARMORS, 2 verifications.
ENCOFRADO, 2 verifications.
VERT. And COMPAC. CONCRETE, 2 verifications.
CURED CONCRETE, 2 verifications.
DESENCOFRADO, 2 verifications.
FINAL VERIFICATION, 2 verifications.

BEAMS AND FORGED

By each 500 m² and without exceeding two plants, will justify the following verifications of the following phases of execution:

LEVELS and REFRAMING, 2 verifications.
ENCOFRADO BEAMS and FORGED, 2 verifications.
POSITIONING PIECES OF FORGED, 2 verifications.
POSITIONING ARMORS, BEAMS and FORGED, 2 verifications.
VERT. And COMPACT, CONCRETE, 2 verifications.
CURED CONCRETE, BEAMS and FORGED, 2 verifications.
DESENCOFRADO BEAMS and FORGED, 2 verifications.

OUTER CLOSINGS

FACTORIES OF VISTA FACE
By each 400 m² will justify the following verifications of the following phases of execution:

**EXECUTION Of the CLOSING.2 verifications.**

At least in one of the first units of inspection that are executed, it will also be verified:

- **REFRAMING.1 verification.**
- **HEAT INSULATION.1 verification.**
- **FINAL VERIFICATION.1 verification.**

**FACTORIES TO HAVE**

By each 600 m² will justify the following verifications of the following phases of execution:

- **EXECUTION Of the CLOSING.2 verifications.**

At least in one of the first units of inspection that are executed, it will also be verified:

- **REFRAMING.1 verification.**
- **HEAT INSULATION.1 verification.**
- **FINAL VERIFICATION.1 verification.**

**OUTER CARPINTERIA**

By each 50 Units will justify the following verifications of the following phases of execution:

- **FIXATION OF the WINDOWS.2 verifications.**
- **SEALED and to PRECAUTIONS.2 verifications.**

At least in one of the first units of inspection that are executed, it will also be verified:

- **PREPARATION Of HOLLOW.1 verification.**

**FLAT COVERS**

By each 400 m² will justify the following verifications of the following phases of execution:

- **EXECUTION OF WATERPROOFING.4 verifications.**
- **SINGULAR ELEMENTS.4 verifications.**
At least in one of the first units of inspection that are executed, it will also be verified:

- SUPPORT and PREPARATION.1 WATERPROOFING verification.
- HEAT INSULATION.1 verification.
- COVERED COMPLETION.1 verification.

**WALLS**

By each flat the following verifications of the following phases of execution will be justified:

- EXECUTION.2 verifications.

At least in one of the first units of inspection that are executed, it will also be verified:

- REFRAMING.1 verification.
- FINAL VERIFICATION.1 verification.

**GROUND COATINGS**

**INNER CEMENT FLOOR TILES IN ZONES DEPRIVED**

By each 4 Houses will justify the following verifications of the following phases of execution:

- VERIFICATION of the SUPPORT.2 verifications.
- EXECUTION.2 verifications.
- FINAL VERIFICATION.2 verifications.

**OUTER FLOOR TILES OF CERAMICAS**

By each 200 m² will justify the following verifications of the following phases of execution:

- VERIFICATION Of the SUPPORT.2 verifications.
- EXECUTION.2 verifications.
- FINAL VERIFICATION.2 verifications.

**FLOOR TILES OF INNER CERAMICA IN ZONES DEPRIVED**

By each 4 Houses will justify the following verifications of the following phases of execution:

- VERIFICATION Of the SUPPORT.2 verifications.
EXECUTION. 2 verifications.
FINAL VERIFICATION. 2 verifications.

CLEANING INSTALLATION

HORIZONTAL NETWORK

By each Branch the following verifications of the following phases of execution will be justified:

REGISTRY and ARQUETAS: 1 verification.
BURIED CONDUCTIONS: 1 verification.

At least in one of the first units of inspection that are executed, it will also be verified:

SUSPENDED CONDUCTIONS: 1 verification.

VENTILATION PLANT

VERTICAL CONDUCTIONS

By each Conduit will justify the following verifications of the following phases of execution:

DISPOSITION. 1 verification.
ASPIRDOR ESTATICO: 1 verification.

At least in one of the first units of inspection that are executed, it will also be verified:

PLUMBED. 1 verification.
SUSTENATION. 1 verification.
HEAT INSULATION. 1 verification.
4.3.3. Test on watch.

According to the book of control LC-91, for the indicated factors of risk in section 1.3.1 of the present study, the justification of the accomplishment of tests on watch for the acceptance of the following parts of work is obligatory:

* OUTER CLOSINGS

** YOU MAKE OF VISTA FACE
*** RUN-OFF

The test will be made jointly with the one of run-off in outer carpentry.

* OUTER CARPINTERIA

*** RUN-OFF

By means of a diffuser of shower, connected to a hose, will project water in rain form on the received carpentry of crystal. The test will stay during eight hours.

* FLAT COVERS

*** WATERTIGHTNESS

Once covered all the water-drainages, will spill water until a level of 5 cm. below the highest point of the delivery, without surpassing the 15 cm. in no point, during 24 hours. If the flood is not possible, continuous irrigation during 48 hours.

* FONTANERIA INSTALLATION

** FORMATION COMMUNICATIONS NET OF THE BUILDING
*** TEST HIDRAULICA

Making the test at level of the road with a pressure of 20 Kg./cm2. All the installation will fill of water maintaining opened the terminal faucets until the security is had of which the purge has been complete and it is not left anything of air. Then the faucets that have served as purge and the one of the power supply will be closed. Next using the pump, previously connected Kg/cm2 will be put to him into operation until reaching a pressure of 20. Once obtained, the key of passage of the pump will be closed and it will be come to recognize all the installation to make sure that loss does not exist.
Next the pressure will be diminished until arriving at the on watch one, with a minimum of 6 Kg./cm², and this pressure will stay during fifteen minutes. One will occur by good the installation if during this time the reading of the pressure gauge has remained constant. The alluded to pressures talk about level of the road.

* FONTANERIA INSTALLATION

  ** PARTICULAR INSTALLATION OF FONTANERIA
  *** TEST HIDRAULICA

Will be made the test described in the previous section, before embedding the conductions.

* CLEANING INSTALLATION

  ** HORIZONTAL NETWORK
  *** WATERTIGHTNESS SUSPENDED CONDUCTIONS

Will be verified that to full conduit, appreciable losses in 24 hours do not exist.

* CLEANING INSTALLATION

  ** DESAGUES NETWORK
  *** OPERATION OF WATER DRAINAGES

Synchronizing the operation of 20% of the apparatuses and the flat evacuation of cover.

4.4. CONDITIONS OF ACCEPTANCE AND REJECTION

The conditions of acceptance or rejection of the materials, phases of execution and tests on watch, will be the determined ones in the Annex of the Memory of the Project of execution.

4.5. PROGRAMMING OF THE QUALITY CONTROL

4.5.1. Programming of the control of materials.

CONCRETE

  It is predicted to use concrete made in prepared concrete power station. The power station does not have quality seal so it will have documentarily to credit the control of quality of the components of the concrete according to EHE article 81.
Control of the depth of penetration of the water

Programs the control of following water penetration: Concrete of porch-forged. The prepared concrete power station will contribute to the beginning of the work previously, the following documentation:
- Composition of the meterings of the concrete that is going away to use in the work. Identification of the raw materials of the concrete that is going away to use in the work.
- Copy of the report with the results of the test of determination of the depth of penetration of water under pressure, according to UNITES 83309:90, carried out by an official laboratory or officially credited, at the most 6 ahead months.
- Raw materials and meterings used for the manufacture of the test tubes used for the previous tests.

MASSIVE (SHOES)

A: HA-25/P/40/Ila
- Volume 100 m³ 21,96 2 lots
- Time 1 week 2 week 2 lots

B: HA-25/B/40/Ila
- Volume 100 m³ 412,58 4 lots
- Time 1 week 3 week 3 lots

STRUCTURES THAT HAVE ELEMENTS TO COMPRESSION PILLARS.

C: HA-25/P/20
- Volume 100 m³ 196,51 m³ 2 lots
- Time 2 weeks, 2 weeks 2 lots
- Surface 500m² 1467 m² 3 lots
- I number plants 2 plants. 6 plants 3 lots

SLABS

D: HA-25/B/20/Ila
- Volume 100 m³ 2769 m³ 27 lots
- Time 2 weeks, 36 weeks 17 lots
- Surface 500 m³ 8523 m² 21 lots
- I number plants 2 plants. 3 plant 2 lots

As it is concrete structure is classified within this section and not like elements that work to flexion. Time: It is considered < 2 weeks due to the little surface. I number plants: 1 is considered plants due to the little surface.

Total lots concrete:
- TYPE A: 1 LOT x 2 kneaded x 5 test tubes = 10 test tubes
- TYPE B: 2 LOTS x 2 kneaded x 5 test tubes = 20 test tubes
- TYPE C: 6 LOTS x 2 kneaded x 5 test tubes = 60 test tubes
- TYPE D: 1 LOTS x 2 kneaded x 5 test tubes = 30 test tubes

STEEL
SUMMARY LAYING OF FOUNDATIONS: B 500 S Tn DIAMETER Tn SERIES IN FINE SERIES Ø 6 0,045 0,253 Ø 8 0,082 Ø 10 0,126 Ø 12 0,632 AVERAGE 3,57 Ø 16 2,091 Ø 20 0,849 Ø 25 1,518 THICKNESS 1,518

SUMMARY PILLARS: B 500 S Tn DIAMETER FINE Tn SERIES IN SERIES Ø 6 3,1523 3,1523 Ø 12 0,8057 AVERAGE 2,6354 Ø 16 1,2251 Ø 20 0,6046

SUMMARY FORGED: B 500 S Tn DIAMETER/forged Tn IN Nº SERIES FORGED FINE Tn SERIES Ø 6 1,1532 1,1836 6 7,101 Ø 8 0,0304 Ø 12 0,9039 1,2236 AVERAGE 7,342 Ø 16 0,289 Ø 20 0,0307

Total lots of steel: To the being everything of the same type and manufacturer:

FINE SERIES: 0.253 + 3,1523 + 7,101 = 10,50 Tn (1 LOT 40 Tn) 1
LOT AVERAGE SERIES: 3.57 + 2,6354 + 7,342 = 13,15 Tn (1 LOT 40Tn) 1 LOT
HEAVY SERIES: 1.518 = 1,52 Tn (1 LOT 40 Tn) 1 LOT

CEMENT FLOOR TILES

When surpassing the 4,000 floor tiles, the accomplishment of the test is obligatory.

TYPE TOTAL AMOUNT NORM TO MAKE 25082 TERRAZO 25082 1LOTE/10000 u 1 LOT

STONEWARE FLOOR TILES

TYPE TOTAL AMOUNT NORM TO MAKE STONEWARE 22712 22710 1LOTE/10000u 1 LOT

4.5.2. Programming of the execution control.

For the accomplishment of the indicated controls of execution in section 1.3.2 of the present memory, the inspection units will be determined that next are related. Instead of making lots we will enter inspection units making constructive divisions.

SUPERFICIAL LAYING OF FOUNDATIONS.

Work units: 270 m².
Unit of inspection: 500 m².
We will make: 1 unidad of inspection.

CONCRETE STRUCTURE. IN SUPPORTS.

Work units: 1,438 m².
Unit of inspection: 500m².
We will make: 6 units of inspection. One each plant.

IN FORGED BEAMS.
QUALITY CONTROL

Work units: 1,438 m².
Unit of inspection: 500m2
We will make: 6 units of inspection. One each plant.

OUTER CARPENTRY.

Work units: 79 units. Unit of inspection: 2
Units of inspection, inferior to 50 units of outer carpentry.
We will make: One by door or window.

BLINDS AND CLOSINGS.

Work Units: 52 units Unit of inspection: 2
Units of inspection, inferior to 50 units of blinds by inspection unit.
We will make: one by blind.

DEFENSES AND RAILINGS.

Work units: 36,8m Unit of inspection: 2
Units of inspection, inferior to 50 meters of outer carpentry by inspection unit.
We will make: One by each defense or railing.

FLAT COVERS

Work Units: 224,94 m². Unit of inspection: 1
Unit of inspection, inferior to 400 m².
We will make: Two units of inspection to be two different elements.

WALLS.

Work units: 3 plants (the plant of roof like having casetón more is included).
Unit of inspection: 3 units of inspection, at the rate of one by plant.
We will make: Two units of inspection to be two different elements (roof and casetón).

INNER CARPENTRY.

Work units: 119 units.
Unit of inspection: 3 units of inspection, inferior each unit of inspection to 50 units of outer carpentry.
We will make: one by door.

COATINGS OF PARAMENTS AND CEILINGS:

Work units: 738,23 m² and 9 houses.
Unit of inspection: interiors, each 4 houses.
We will make: a unit of inspection by plant, 5 units of inspection.

EQUIPPED And PLASTERED.

Work units: 4,364,5 m² and 9 houses.
Unit of inspection: interiors, each 4 houses.
We will make: a unit of inspection by plant, 5 units of inspection.

APPEASED OF STONE.

Work units: 14.12 m² in exteriors. Work units: 42.15 m² in interiors.
Unit of inspection: each 200 m² and in interiors each 4 houses.
We will make: a unit of inspection in each case (inner and outer).

CEILINGS OF PLATES.

Work Units: 290.4 m² in vestibules.
Unit of inspection: common zones the inspection units will be each 100 m² n
According to the established thing in the norm is due to make 3 units of inspection.
We will make: a unit of inspection by plant, 5 units of inspection.

PAINTINGS.

Work units: 1670.6 m² outer.
Work units: 4654.9 m² in interiors.
Unit of inspection: each 300 m² in exteriors and interiors each 4 houses.
According to the norm we would make 6 units of inspection in exteriors and 3 units of inspection in interiors.
We will make: 6 units of inspection, exteriors 6 but in interiors one each plant

TILED

Work units: in 13 exteriors m²
Work Units: 826.6 m²
Unit of inspection: each 200 exteriors m² and in interiors each 4 houses.
We will make: a unit reinspección in exteriors and 6 in interiors one by plant although the LC-91 prescribes 1 by each 4 houses.

GROUND COATINGS CEMENT FLOOR TILES.

Work units: 726 m²
Unit of inspection: According to the LC-91 a unit will become of inspection in each 200 zones common m² and interiors each 4 houses.
We will make: 5 in zones common one by landing and 6 in houses, one by plant.

FLOOR TILES CERAMICS.

Work units: 1052.5 m² in inner zones.
Unit of inspection: according to the LC-91 each unit of inspection will be each 4 houses.
We will make: 6 units of inspection, each plant.

PLUMBING INSTALLATION CONTROL OF GENERAL EXECUTION OF THE UNDERTAKEN BUILDING.
Tube feeding and group of pressure Battery of accountants
Unit of inspection: according to the LC-91 one by element.

CONTROL OF INDIVIDUAL EXECUTION OF THE BUILDING.

Posts Derivations Heating Faucets and apparatuses
Unit of inspection: LC-91 establishes one each 4 houses.
We will make: 6 units of inspection, one by plant.

CLEANING INSTALLATION

Horizontal Network. Buried conductions Well and arquetas suspended conductions.
Unit of inspection: LC-91 establishes one each branch.
We will make: an inspection unit.

NETWORK OF WATER DRAINAGES.

Unit of inspection: LC-91 establishes one each water drainages.
We will make: 3 units of inspection.

GENERAL ELECTRICAL SYSTEM OF THE BUILDING DISTRIBUTING BOX AND LINES QUARTER OF ACCOUNTANTS INDIVIDUAL DERIVATIONS CANALIZATIONS EARTHING

Unit of inspection: LC-91 establishes one each element.
We will make: 13 units of inspection

INTERIOR OF THE BUILDING SWITCHBOARD INSTALLATION HOUSE BOXES DERIVATION MECHANISMS

Unit of inspection: LC-91 establishes one each 4 houses.
We will make: one by plant, 6 units of inspection.

VENTILATION PLANT vertical Conductions.
Unit of inspection: each conduit vertical.
We will make: two because we have two conduits.

INDIVIDUAL CONNECTIONS

Unit of inspection: LC-91 establishes an inspection each 4 houses.
We will make: one by plant, 6 units of inspection.

4.5.3. Programming of tests on watch.

The location of the indicated tests on watch in section 1.3.3 of the present memory, will be determined during the execution. The number of the same ones will be able to see increased if it were considered advisable by the facultative direction.
QUALITY CONTROL

STRUCTURES OF CONCRETE, SUPPORTS:

Unit of inspection: a test on watch.
We will make: a test on watch by each plant.

STRUCTURES OF CONCRETE, FORGED BEAMS:

Unit of inspection: a test on watch.
We will make: a test on watch by each plant.

YOU MAKE VISTA FACE:

Unit of inspection: 1 test of run-off by facade.
We will make: 1

OUTER CARPENTRY:

Unit of inspection: 1 test of run-off by facade.
We will make: 1

BLINDS And I CLOSE:

Unit of inspection: test of operation by type in 20% of them according to the LC-91
We will make: We verified each blind.

DEFENSES AND RAILINGS:

Unit of inspection: test of disposition and fixation, finished protection and
We will make: we will verify all the railings

FLAT COVER:

Unit of inspection: 1 test of watertightness.
We will make: two, one by cover.

SWIMMING POOL COVER:

Unit of inspection: 1 test of watertightness.
We will make: two, one by cover.

INNER CARPENTRY:

Unit of inspection: a test of operation by house according to the LC-91
We will make: one by element.

COATINGS OF PARAMENTOS AND CEILINGS:
QUALITY CONTROL

Unit of inspection: it will be made a test of run-off and superficial hardness by plant.
We will make: 6 units altogether by each element (enfoscados, equipping, plastered, appeased, paintings, tiled).

INSTALLATION OF PLUMBING, FORMATION COMMUNICATIONS NET OF THE BUILDING:

Unit of inspection: hydraulic testing of plumbing of conductions.
We will make: 1 test.

INDIVIDUAL NETWORK OF THE BUILDING:

Unit of inspection: hydraulic testing of plumbing of conductions and the test of operation.
We will make: 1 test.

INSTALLATION OF CLEANING IN HORIZONTAL NETWORK:

Unit of inspection: test of watertightness one by each branch.
We will make: 6 tests of watertightness.

IN NETWORK OF WATER-DRAINAGES:

Unit of inspection: it will make tests of operation in water-drainages, 1 verification by each water drainages.
We will make: 3 verifications one by water drainages.

ELECTRICAL SYSTEM AND EARTHING; GENERAL OF THE BUILDING:

Unit of inspection: test of resistance to the isolation and earthing.
We will make: 1 verification.

INSTALLATION IN HOUSES:

Unit of inspection: test of operation.
We will make: 1 verification.

VENTILATION PLANT:

Unit of inspection: In vertical conductions a test of operation by Vertical conduit will be made.
We will make: 3 verifications.
4.6 APPLICATION NORM

4.6.1. Application norm.

For the Control of Quality, object of the present Study, is of application the Norm that next is related.

DISPOSITIONS OF QUALITY CONTROL.


Order of 30 of September of 1,991, Book of Control of Quality in Works of Construction of Houses is approved.

Order of 28 of November of 1,991, that modifies the Order of 30/09/91.

Instruction 1 of the Main directorate of Architecture and House.

BASIC STANDARDS AND OF FORCED OBSERVANCE.

CTE: Technical code of the Construction

EHE: Structural Concrete instruction.

EFHE: Instruction for the forged project and the made execution of unidirectional of structural concrete with prefabricated elements.

RC-03 Instruction for the Cement Reception

DISPOSITIONS OF NORMALIZATION AND HOMOLOGATION.

NBE QB 90: Covers with bituminous materials.

NBE CT79: Thermal conditions in the buildings.

NBE CPI 96: Conditions of protection against fires in the buildings.

NBE CA 88: Acoustic conditions in the buildings.

NBE AE 88: Actions in the construction.

NBE FL 90: Resistant walls of brick factory.

Basic norms for the inner facilities of water provision.
EF-96: Instruction for the unidirectional forged project and the execution of reinforced concrete or prestressed.

RB-90: Sheet of general technical prescriptions for the reception of construction site concrete blocks.

RY-85: General sheet of conditions for the reception of plasters and stucco in construction sites.

RL-88: General sheet of conditions for the reception of ceramic bricks in construction sites.

NTE: the section of control of the different technological norms, will be of application when the book of control or the project of execution does not determine the quality control to carry out, being able the technical architect of facultative direction to adopt different controls that they guarantee a quality level equal or superior to the reached one according to NTE.

In Halmstad, _________________

The technical architect.
### 4.2. BUDGET

#### 4.2.1. TESTS OF MATERIALS

##### 4.2.1.1. Steel.

4.2.1.1.1 Test of the average section equivalent in steel bars corrugated in a test tube.

**Bars of B500SD**

- 5 Determinations x 50 euros = 250 euros.
  
  Total test.......................... 250 euros.

4.2.1.1.2 Determination of the geometric characteristics of a steel bar corrugated.

**Bars of B500SD**

- 5 Determinations x 50 euros = 250 euros.
  
  Total test.......................... 250 euros.

4.2.1.1.3 Test of double-unfolded of a test tube of steel bars corrugated made.

**Bars of B500SD**

- 5 Determinations x 50 euros = 250 euros.
  
  Total test.......................... 250 euros.

4.2.1.1.4 Test of traction, elastic limit, critical load and extension in breakage in a steel test tube.

**Bars of B500SD**

- 5 Determinations x 50 euros = 250 euros.
  
  Total test.......................... 250 euros.

Total test STEEL .......................... 1000 euros.
4.2.1.2. **Concrete.**

2.1.2.1 Taking of fresh concrete samples, including sampling of the concrete, measurement of the cone seat, manufacture of up to four cylindrical test tubes of 15 xs 30 cm. cured, faced and tough.

**Reinforcement Wall**

5 lots x 2 kneaded (2 test tube/Kneaded) = 20 test tubes.

20 Determinations x 60 euros = 1200 euros.

Total test............................. 1200 euros.

**Structure**

5 lots x 2 Kneaded (2 test tube/Kneaded) = 20 test tubes.

20 Determinations x 60 euros = 1200 euros.

Total test............................. 1200 euros.

Total tests CONCRETE......................... 2400 euros.

4.2.1.3. **Floor tiles.**

4.2.1.3.1 Determination of the wearing down by friction

**Terrazo** (dimensions: 40x40x3 cm).

2 Determination x 250 euros = 500 euros.

Total test............................. 500 euros.

Total tests FLOOR TILES..................... 500 euros.
4.2.2. TESTS ON WATCH

4.2.2.1 Test of run-off in facades trying jointly the closing of factory and the carpentry in the most unfavorable cloth

1 Determinations x 340 euros = 340 euros.
Total test.............................. 340 euros.

4.2.2.2 Test of water tightness on flat covers, verifying the water-drainages of the cover and drain spout.

2 Determinations x 350 euros = 700 euros.
Total test.............................. 700 euros.

4.2.2.3 Hydraulic testing in the general installation of the building, verifying undertaken, tube of feeding and group of pressure.

1 Determinations x 300 euros = 300 euros.
Total test.............................. 300 euros.

4.2.2.4 Unit of hydraulic testing in each zone.

10 Determinations x 50 euros = 500 euros.
Total test.............................. 500 euros.

4.2.2.5 Test of water tightness in the horizontal formation communications net of cleaning (suspended conductions)

2 Determinations x 90 euros = 180 euros.
Total test.............................. 180 euros.

4.2.2.6 Test of operation of the drain spout of the building.

3 Determinations x 70 euros = 210 euros.
Total test.............................. 210 euros.
4.2.2.7 Unit of hydraulic testing in swimming pool.

1 Determinations x 500 euros = 500 euros.

Total test.............................. 500 euros.

Total tests ON WATCH......................... 2700 euros.
4.2.3. BUDGET SUMMARY

4.2.1. TESTS OF MATERIALS 3900 euros.
4.2.2. TESTS ON WATCH 2730 euros.

ESTIMATED TOTAL OF QUALITY CONTROL : 6630 euros.

In Halmstad, ______________________

The technical architect.

NOTE: In all the tasks are including: displacement of personnel and work equipment of the laboratory, for the taking and collection of samples, as well as for the accomplishment of tests on watch.
4.3. SHEET OF CONDITIONS

4.3.1. SPECIFICATIONS

4.3.1.1. Of general character.

The provision, the identification, the control of reception of the materials, the tests, and, in their case, the tests on watch, will be made in agreement with the specified norm in the dispositions of obligatory character:

- General sheet of conditions for the ceramic brick reception in construction sites, RL-88.
- General sheet of conditions for the reception of plasters and stucco in construction sites, RY-85.
- Sheet of general technical prescriptions for the reception of concrete blocks in construction sites, RB-90.
- Instruction for the cement reception, RC-03.
- Structural concrete instruction, EHE
- Instruction for the forged project and the made execution of unidirectional of structural concrete with prefabricated elements (EFHE)
- Basic norms of the construction, NBE.

When a material does not have obligatory norm, these aspects, will be made preferably in agreement with the norms unites, or in their defect by the NTE or according to the instructions that, at its moment, the facultative direction indicates.

4.3.1.2. Conditions of provision and identification.

The contractor will give to the Direction Work the acreditativos documents that guarantee the quality of the materials:

1. Documents of administrative exigencies for the commercialization:
   - Declaration of conformity of the manufacturer (marked to EC or homologation).
   - Certificate of conformance of the product (by notified organism or others), if it comes.
2. Accreditations Documents certified product (voluntary marks of quality).
   - Certificate of the product (by organism certifier: AENOR, AIDICO, others.)
3. Other documents:
   - Leaves of provision and certificates of provision (providing).
   - Forged: Authorization of Use and certificate of guarantee according to EHEF.
   - Steel: Certificate of adhesion (organism authorized certifier).
The materials will be provided in average suitable (those that are possible, palletized, to facilitate the workings of load and unloading without risks) and identified, in addition the unit to transports will come documented with the “leaves of provision”.

**Particular conditions of reception**

**Cements**

Transport facilities suitable of and storage will be provided in standardized coats of 25 or 50 kg or in bulk in that guarantee their conservation. Each game will provide accompanied of letters patent and annexed documentation, that will contain the following data at least:

1. Name and direction of the providing company.
2. Date of provision.
3. Identification of the factory that has produced the cement.
4. Identification of the center sender (factory, point of expedition, center of distribution).
5. Identification of the vehicle that transports it.
6. Amount that is provided.
7. Denomination and designation of the cement and trade name.
8. Password of the certificate in accordance with the prescribed requirements or number of certificate corresponding to mark of equivalent quality.
9. Name and direction of the buyer and destiny.
10. Reference of the order.

In the letters patent or annexed documentation the use restrictions will be indicated, in their case, and the characteristics of the provided cement in which they will have to appear the nature and the nominal proportion in mass of all the components, as well as the indication of which said proportion, of anyone of the components of the cement does not exceed, in but or less, 5% in the provided game. This possible variation, within the permissible limits, will not be able to suppose in any case a change of the type of cement.

**Barren for concrete**

Each load of barren will go accompanied of a leaf of provision, that will be at any moment to disposition of the work direction, and in that appear like minimum the following data: - name of the provider.

- Nº of series of the provision leaf
- Name of the quarry
- Date of delivery
- Name of the petitioner
- Type of barren
- Provided amount of barren
- Designation of the barren one
- Identification of the provision place

**Plasters and stucco**

In coats with closing of type valve, or in bulk in suitable facilities that guarantee their conservation. In each coat, or the letters patent if the product is provided in bulk, they will have to appear the following data: name of the manufacturer or trade name of the product, designation of the product, according to sheet RY-85 and symbol of quality, in its case.

**Bricks**

Packed not hermetically so that the unloading is facilitated. In the letters patent and, in its case, in the packed one, they will have to appear, like minimum, the following data:

- Manufacturer and, in its case, trade name.
- Brick type and class, designated according to sheet RL-88.
- Resistance to compression in kp/cm².
- Basic sizes (rope, tizón and thickness) in centimeters.

In addition, it will have to appear seal INCE when the corresponding material has it granted.

**Packed blocks of concrete**

Not hermetically and with the suitable age so that they can be satisfied the specifications with control. In the letters patent and, in its case, the packed one they will have to appear, like minimum, the following data: - name of the manufacturer and possibly its mark or the name of the agent who commercializes the product, both legally established in the European economic community.

- Designation of the block according to the established thing in sheet RB-90.
- Any symbol of quality will have, in addition, to appear that the material has granted, under the conditions that impose their concession.

**Concrete**
In the case of using prepared concrete of power station the provision will be made in suitable facilities. Each concrete load will go accompanied of a leaf of provision that will be at any moment to disposition of the work direction and in which they appear, like minimum, the following data:

1. Name of the power station of concrete manufacture.
2. Serial number of the provision leaf.
3. Date of delivery.
4. Name of the petitioner and the person in charge of the reception.

a) When it is designated by properties: designation according to EHE, cement content (Kg./m3) with a tolerance of +-15kg, relation water / cement with a tolerance of +-0,02. When it is designated by metering: cement content by cubic meter of concrete, relation agua/cemento with a +-0,02 tolerance, type of atmosphere according to EHE.
b) Type, class and marks of the cement.
c) Consistency.
d) So large maximum of the barren one.
e) Type of additive, according to unite-in 934-2:98, if there is it, and in opposite case express indication that it does not contain it.
f) Origin and amount of addition (ash-gray silica steering wheels or smoke), if there is it, and in opposite case express indication that it does not contain it.

6. Specific designation of the place of the provision (name and place).
7. Amount of concrete that composes the load, in m3 of fresh concrete.
8. Identification of the truck concrete mixer and the person that comes to
9. Unloading hour limit from use for the concrete.

In case of using concrete made in work it will exist, to disposition of the direction of the work, a book where it will appear:

- The nominal metering or meterings to use in work, as well as any correction made during the process, with its corresponding justification.
- Relation of suppliers of raw materials for the elaboration of the Concrete.
- Description of the equipment used in the elaboration of the Concrete.
- Reference to the calibrated document of of the balance of metering of the cement.
- Registry of the number of kneaded employees in each lot, dates of hormigonado and results of the made tests, in its case.

Steel for reinforcement
All the steel that is used in the work will present/display the marks corresponding to its identification. For the steel that have a recognized symbol or a CC-EHE each game will credit that it is in possession of same and the specific certificate of adhesion in the case of bars or the wires, and will go accompanied of the certificate of guarantee of the manufacturer. For the steel that do not have a recognized symbol or a CC-EHE each game will go accompanied of the results of the tests corresponding to the composition chemical, characteristic mechanical and geometric, conducted by an credited organism of certification and/or test or by organism of the public administration. in the case of bars or corrugated wires, in addition the specific certificate to adhesion will be accompanied.

Forged of concrete with prefabricated elements All the resistant pieces, alveolar joists or slabs, that are received in work, they will take a mark that allows the identification of the manufacturer, type of element, date of manufacture and length. Each system of forged to use will come accompanied from:

- Card of technical characteristics in which it appears the sealed one of the "authorization of use" granted by the Ministry of Public Works and the Economy.
- Documentary justification signed by physical person of the internal control of manufacture, contributed by the manufacturer, who will contain the results of the internal control of the concrete of the last month and he results of the internal control of the finished product (sharp flexion and) of last the 6 months this justification can be replaced by acreditativo certificate of which the element has recognized symbol, in its case.
- Copy of the registries of verification of the control of coverings and position of separators, carried out by the manufacturer and corresponding to the provided game to work
- In its case, according to sections 14.2.1 and 14.3, certified of guarantee of the manufacturer, signed by physical person, according to attached 5 and 6
- Documentary certification of the manufacturer of the pieces of entrevigado on the fulfillment of the load to breakage
- If the pieces of entrevigado are ceramics: documentary certification of the manufacturer on the fulfillment of the value of expansion by humidity
- If the pieces of entrevigado are not concrete ceramics nor: documentary guarantee of the manufacturer of which the behavior of reaction to the fire reaches, at least, m1

Case of materials with quality certificate
when work is received in a material with some certificate of guarantee, because shows a symbol or mark of quality (AENOR, AITIM, CIETSID, etc.), or certificate CC-EHE, or is accredited by the MINER, or as in the case of forged it has use authorization, or it must some accompanied by an assayer’s certificate as it is obligatory in steel, or in accordance with prescribed requirements like the cement, the constructor will give to the facultative direction certificate documents to build consequently.

4.3.1.3. Taking of samples.

The taking of samples will be mandatory in all the materials whose reception by means of tests settles down in the programming of control, and in that, during the march of the work, it considers the direction facultative. Also it will be taken, even though are not mandatory tests of reception, shows preventive of the cement, that will be conserved in work. It will be made at random by the facultative direction, which will be able to delegate in personnel of the credited laboratory, being able to be present the constructor or person delegated by this one. The sampling procedure will be made in agreement with the norm of each product and in sufficient amount for the accomplishment of the tests and against tests for it by each game of material, or lot, will take three equal samples: One will be sent to the laboratory for the accomplishment of the tests anticipated in the programming of control. The two rest will conserve in work for the accomplishment of the con tests if outside necessary. These samples will be conserved in work during at least 100 days if it is perishable materials (conglomerates), or until the definitive reception of the made constructive units with each one of the materials. In the case of not having to make tests, it will be enough with taking these two last samples.

Taking of cement samples, plasters or stucco

When it is package product will at random take three coats from the first one, second and third of all the material that constitutes a lot. From each coat equal amounts of product will be obtained that will be obtained that will be the different samples. Each sample will be formed by 8 kilograms that will be packaged in suitable containers with double cover, one to pressure and another one to spiral, that will be sealed so that they offer guarantees. Inside each package it will be had a label with all the data of identification of the sample and the corresponding lot. The same identification will be arranged in the outside of the package.

Taking of brick samples
The brick samples will be taken at random between the components of a lot. Each sample will be formed by 24 bricks that will be packed for their easy storage.

Taking of samples of concrete blocks

The blocks that will form the samples will take at random between the constituents of the lot, in number sufficient to make the anticipated tests in the programming of the control.

Takings of samples of barren

When it is necessary to gather samples of the barren ones, these will be taken from the pile of barren gathered together in work, from three portions of each unit of storing: one of the superior part, another meeting to the base and third in an intermediate point, introducing a board in the pile exactly upon the place where one is going away to remove the sample, in order that the material is not mixed that is in the superior part.

Taking of concrete samples

The sample taking will be made in suitable containers, constructed of impermeable and inatacable material by the cement. The sample will when coming out obtain from the concrete mixer or truck concrete mixer, happening the container through the unloading current, or causing that current happiness happens through the container, during the precise time that it allows to obtain the volume of necessary sample. Care will be had of which the speed of unloading is not as small as to produce the segregation of the concrete. The samples are taken in the interval of spill between ¼ and 3/4 from the unloading.

In the exceptional assumption that the samples did not take shelter in this interval it will have to be pointed out the interval from which the sample in documents comes on the matter (act of taking of samples and results of the tests). if one is to verify the kneaded uniformity of a same one, the samples are taken approximately to 1/4 and 3/4 from the unloading. In case of not being possible when coming out to take samples from the concrete mixer or the truck concrete mixer, these will unload completely, taking the sample at random, of five points different from the formed pile. The volume of the sample will be superior to the necessary amount for the accomplishment of the tests, it will be homogeneizará and it will go to the execution of the tests not having had to pass more than 15 minutes between the taking of sample and its use.
Taking of steel samples for reinforcement

If the steel is provided in work in bars for its assembly on work foot, 6 test tubes will be taken from 70 cm. in length, of each diameter, manufacturer and lot; that they will be packed and they identified. If the steel mounts in factory, the taking of samples will be able to be made of anyone of the following ways: In work taking the bars at random.

In the own factory of assembly on the steel storings corresponding to the work.

Identification of the samples

All the samples will be identified being pointed out the following points:
1. Denomination of the product.
2. Name of the manufacturer or trade name.
3. Date of arrival to work.
4. Denomination of the game or lot that corresponds the sample.
5. Name of the work.
6. Number of units or amount, in mass or volume that constitutes the sample.
7. It will be pointed out if it shows seal, has homologation or it accompanies some assayer's certificate to him.

Conservation of the samples

All the samples will be conserved with inalterabilidad guarantees:

Under cover, prote’ge'es of the humidity of the ground, safe from the inclemency and most isolated of nobody I mistreat. These measures will be adopted specially in the case of conglomerantes and very specially in the concrete samples, that necessarily will have to conserve in work at least 24 hours. The constructor will have to contribute average the suitable ones that guarantees the conservation in the indicated terms and it will be in charge of his safekeeping.

4.3.1.4. Test accomplishment

All the tests necessary to judge the quality of the materials, as well as the tests on watch, will be due to make by an credited laboratory in the corresponding areas, in agreement with the following dispositions: Decree 186/2001 of 27 of November, the Consell of the Valencian Generalitat. Order of 6 of February of 2002, of the Conseller of public works, urbanism and transports, by which the regulating dispositions of the technical areas of the accreditation of research laboratories for the control of quality of te construction are approved. The laboratory will facilitate to the director of the control acts of the results of the tests or
made tests and will precise inform into the incidences or anomalies to him that take place, as much in the taking and conservation of the samples like in the accomplishment of tests and tests on watch, and that they can affect the interpretation of the results. Despite certain tests or tests on watch, and to criterion of the facultative direction, they could be made by she herself. the number of tests by each material or tests on watch will be anticipated in the programming of the control and like minimum the prescribed ones like obligatory by the LC/91. Despite the constructor it will be able, to his coast, to increase the number of predicted tests.

4.3.1.5. Test back.

When during the control process anomalous results are obtained that imply rejection of the game or corresponding lot, the constructor will have right to make against tests to his coast, by means of the samples conserved in work. For it, he will come himself as he follows:

The two samples will be sent to two laboratories different from the contracted one by the promoter, previously accepted by the facultative direction. if one of both results were unsatisfactory the material will be rejected, if both results were satisfactory will accept the game.

4.3.1.6. Decisions derived from the control process.

In case of non statistical control or not to the one hundred percent, whose results are non in agreement, and before the rejection of the material, the facultative direction will be able to happen to make a statistical control or to the one hundred percent, with the samples conserved in work. The acceptance of a material or its rejection on the part of the facultative direction as well as the decisions made like demolition, reinforcement or repair, will have to be accepted by the promoter or constructor. Before the non satisfactory results of control, and before taking the decision from acceptance or rejection, the facultative direction will be able to make the tests of information or tests on watch that it considers opportune.

4.3.2. Economic Conditions

Previously the cost of the programming of the control of the quality will be in charge of the promoter whom it will contract with an credited laboratory, accepted by the facultative direction, in the corresponding areas. The laboratory will have to send copies of acts of tests to the promoter, to the architect and the technical architect.

When by results that imply rejection must make test and was negative, the cost of these tests and the possible economic consequences that
they derive here will repel the contractor. Also when they are necessary tests of information or complementary tests of services.

They will be in charge of the contractor the average materials, auxiliary humans and necessary means for the conservation of samples or the accomplishment of tests “in situ”, like complementary tests on watch.

If during the control process some material were rejected, and divides or everything of this material it was placed in work, the cost of the demolitions, reinforcements, repairs or of the adopted measures, in its case, by the Facultative Direction it will be the responsibility of the contractor without damage from which this one derives responsibilities to the manufacturer of the product at issue.

4.3.3. FACULTATIVE AND LEGAL CONDITIONS

It is obligation and responsibility of the promoter-proprietor the accomplishment by its account of the tests and tests relative to materials and executed work units that are predicted in the project of execution of works, the study of control of quality and book of control, or that determines in the course of the construction by part facultative direction. To this end, it will have to contract to the tests and tests required with laboratories credited according to Decree 173/89 of 24 of November of the Consell of the Valencian Generalitat, or accreditation granted by another Public Administration and registered in the corresponding Registry according to Decree 1,230/89 of the 13 of October and Order FOM/2060/2002.

It is obligation of the contractor to anticipate, - in conjunction with the property of works and in the times established for execution of the same ones -, the terms and means for the sampling and reception of materials, and in their case, of the mandatory tests and tests according to the directions of the project of execution, study of control, book of control or that settle down by orders of the facultative direction, facilitating the work to develop with existing means in the work. Also it will have to facilitate the director of control copies of documents of reception of materials.

The rejection of materials or work units submissive quality control, could not be justificatory cause of delay or breach of terms been suitable for the execution of the different chapters from work, nor from increase in the costs that happen by new materials or work games that there are to recover.

The integral technicians of the facultative direction will be responsible in the scope of their respective competition of the quality control of works, without damage of which, those tests and tests that are not carried out
by causes that are not to them imputable, will be exclusive responsibility of the promoter and/or contractor that with its conduct has given rise to the omission of the diligence due.

The direction of the Control of Quality that develops to the technical architect or foreman will brief through forms of the control book.

The Director Work comes forced to put documentary record through Book of rules, and in its case writing up the corresponding modified Project, of any variation that are introduced in the Project of Execution of works, having had to make delivery to the Property, contractor and Technical Architect of works of the documentation who justifies the introduced modifications, being exonerated of all responsibility the Technical Architect to whom - in its due time knowledge of the operated changes did not occur him in order to adapt such to its professional assignment.

In all not anticipated here, one will be to the had thing by the Decree 107/91 of of June of the Consell of Valencian the 10 Generalitat and Order of the 30 of September of 1,991 the Conseller de public works, urbanism and transports, and other complementary legal dispositions.

In Halmstad, ________________

The technical architect.
GANTT
COST ESTIMATING

Author:
Vicente Borás Torres

Tutor in Halmstad:
Ake Spangberg

Tutor in Spain:
Vicente Monzó Hurtado
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CHAPTER 18 PLUMBING FIXTURES
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<tr>
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<th>QUANTITY</th>
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<tbody>
<tr>
<td><strong>CHAPTER 01 EARTHWORK</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>m² Grubbing and scanning with mechanic methods, according to regulation.</td>
<td>15.00</td>
<td>80.00</td>
<td>1.200.00</td>
</tr>
<tr>
<td>m³ Excavation to open sky made below the implantation level, in average</td>
<td>2.100.00</td>
<td>2.00</td>
<td>12.600.00</td>
</tr>
<tr>
<td>lands, with mechanic methods, shovel shipper, even manual aid in the</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>difficult zones, cleaning and extraction of remains without including load</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>on transport, according to regulation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>m³ Land transport of density mediates 1,50 t/m³, with dump truck of fully</td>
<td>2.100.00</td>
<td>2.00</td>
<td>12.600.00</td>
</tr>
<tr>
<td>factored load 12 t., to a distance of 20 km, with speed average of 40 km/h.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>considering times of load, going, unloading and returned even load with</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>backhoe.</td>
<td></td>
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</tr>
</tbody>
</table>

**TOTAL CHAPTER 01**                                                      |          |       | **25.200.00** |
<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>PRICE</th>
<th>AMOUNT</th>
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</thead>
<tbody>
<tr>
<td><strong>CHAPTER 02 FOUNDATION AND STRUCTURE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>m Reinforced concrete strip footing, with a quantity of steel of 6.32 kg,</td>
<td>250.00</td>
<td>50.00</td>
<td>12.500.00</td>
</tr>
<tr>
<td>type B400 S, for a permissible tension of the land of 5 kp/cm², 0.75 m.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>wide, and 0.30 m. of song, with 3 cm. of covering of the main armor, even</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>elaboration, separating of concrete, work putting and vibrated, according</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>to regulation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>m³ Reinforced concrete of 25 N/mm², with an average quantity of 25 kg/m³ of</td>
<td>250.00</td>
<td>100.00</td>
<td>25.000.00</td>
</tr>
<tr>
<td>steel B400 S, soft consistency and so large barren maximum of 40 mm, in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>retaining walls, transported and put in work, even formwork to a face,</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>according to regulation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>m³ Reinforced concrete made in work, of soft consistency and large</td>
<td>2.100.00</td>
<td>150.00</td>
<td>315.000.00</td>
</tr>
<tr>
<td>maximum of barren 40, in slab of 50 cm. of song, with an average quantity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of 40.5 kg of B400S steel, even cuts, separators, tied, vibrated and cured</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>wire of of the concrete.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>m² Concrete cleaning layer prepared, of soft consistency, large maximum</td>
<td>2.100.00</td>
<td>20.00</td>
<td>42.000.00</td>
</tr>
<tr>
<td>of barren 40 and 10 cm. of thickness, in the base of the laying of</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>foundations, transported and put in work, according to regulation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>m Reinforced concrete support of 25 N/mm² made in work, with an average</td>
<td>100.00</td>
<td>40.00</td>
<td>4.000.00</td>
</tr>
<tr>
<td>quantity of 95 kg of B400S weldable steel, of section 25x25 cm, for a</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>minor height of 3.5, even wooden formwork and cured, according to</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>regulation.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>TOTAL CHAPTER 02</strong></td>
<td></td>
<td></td>
<td><strong>398.500,00</strong></td>
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</tbody>
</table>
## CHAPTER 03 ROOF AND DAMPPROOFING

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>PRICE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>m² Roof nonpassable, invested with protection of gravel and 0.2 mm polyethylene film of simply sly thickness for formation of steam barrier of low benefits, formed by clay layer expanded stabilized with cement grout of thickness between 20 and 300 mm, ended a layer 3 mm of mortar cement (1:6) float finish, waterproofing by means of membrane monocaustrates constituted by a layer of 1.2 mm vinyl plasticized of thickness, armed with fiber glass, nonadhrida to the support, separator of simply sly polyester felt of 300 gr/m² arranged on the layer, and separator formed by floating polyester felt of 100 gr/m² arranged on waterproofing with simple overlap, heat insulation formed by rigid extruded XPS-III polystyrene panels of 100 mm of thickness and K=0.028 W/m²° with skin and songs to average wood, separator formed by 300 polyester felt of gr/m² arranged floating with simple overlap on the heat insulation and over the protection in vertical elements and gravel layer crushed silica of size 18/25 mm free of fine extended in a minimum layer of 50 mm., even previous cleaning of the support, reframing, formation of bibs, special drains and other elements with trajectory bands and decreases. Measurement in horizontal projection.</td>
<td>840.00</td>
<td>200.00</td>
<td>168.000.00</td>
</tr>
<tr>
<td>m² Nonpassable cover made with panels rib of 0.6x40-42 mm of wood like element has supported forming pending included/understood between 1 &lt;= ρ &lt;= 5%, agglomerate rigid rock wool panels with heat set resins and had with oxiasphalt, of 60 mm of thickness and 150 kg/m³ of density, fixed mechanically, it castrates separator with fiber glass felt of 100 gr/m², waterproofing with solution monocaustrates not adhered, type PN-1, with lamina type LBM-40-FV of bitumen modified with elastomer SBS, 40 gr/dm² total mass, with armor constituted by fiber glass felt, placed without adhering to the support and united by means of blowpipe, it castrates separator with geotextil polyester felt of 100 gr/m² and layer of heavy protection, even reframing, special formation of bibs, drains and other elements, according to regulations.</td>
<td>700.00</td>
<td>250.00</td>
<td>175.000.00</td>
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</tbody>
</table>

**TOTAL CHAPTER 03** 343.000,00
### CHAPTER 04 PARTITIONS

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>PRICE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>700.00 m² Partition made up of a galvanized structure of 70 mm, with channels like horizontal element and posts like vertical element, with a separation between axes of 60 cm., and plate of cardboard plaster and 12.5 mm of thickness, ready to paint, even reframing, preparation, cuts and positioning of the plates and structures support, plumbed leveling and, formation of preframes, execution of angles and passage of facilities, finished of meetings, proportional part of decreases, breakage, accessories of fixation and cleaning.</td>
<td>700.00</td>
<td>60.00</td>
<td>42,000.00</td>
</tr>
<tr>
<td>800.00 m² Closing of facade ISOVER made with plaster panels of 13 mm of thickness in the inner wall, with laminates waterproof and 40 glass wool of Kg/m³ and thickness 195 mm, finished in the outer wall with vertical arranged wood profiles, even reframing, decreases, butt straps, accessories of fixation and watertightness.</td>
<td>800.00</td>
<td>70.00</td>
<td>56,000.00</td>
</tr>
<tr>
<td>800.00 m² Coating of facade with wood profiles composed by fiber of cellulose impregnated in termphenolic resins and protected natural wood surface with coating, smooth unions, of 2440x1220 mm, subjects by means of ends nailed to wooden profiles of section 80x40 mm, separated to each other 400 mm, seizures with plaster paste, according to regulation.</td>
<td>800.00</td>
<td>60.00</td>
<td>48,000.00</td>
</tr>
</tbody>
</table>

**TOTAL CHAPTER 04** **146,000.00**
<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>PRICE</th>
<th>AMOUNT</th>
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</thead>
<tbody>
<tr>
<td><strong>CHAPTER 05 COATINGS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>m² Hardening covering for continuous concrete pavement, with hard plastic</td>
<td>600.00</td>
<td>40.00</td>
<td>24.000.00</td>
</tr>
<tr>
<td>painting with endurecible polyurethane with the humidity, applied in two</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>or more layers until reaching a maximum thickness of 2 mm, previous scratch of</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>the superficial grout by means of metallic brushes and cleaning of the</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>surface, according to regulation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>m² Floor profile of wood with section 70x10 mm, nailed on wood knuckles of</td>
<td>650.00</td>
<td>10.00</td>
<td>6.500.00</td>
</tr>
<tr>
<td>pine of 60x60x30 mm, according to regulation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>m² Floating wooden pavement made with three 1st quality press layers,</td>
<td>15.00</td>
<td>80.00</td>
<td>1.200.00</td>
</tr>
<tr>
<td>put with the direction fibers perpendicular, in plates of 2400x200x15 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with a surface of wearing down of 4 mm, with drawing of 1 licks, varnished</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with application of ultra-violet rayses and discharges temperatures, placed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>on polyethylene profile to cushion noises.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>m² Light concrete floor made with concrete HM 15/B/20/IIa with a thickness</td>
<td>1200.00</td>
<td>150.00</td>
<td>180.000.00</td>
</tr>
<tr>
<td>of 100 mm. extended on insulating polyethylene profile and sand layer of</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>size 0/5 of 10 cm. of thickness with regulated and cured completion by</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>means of irrigation according to regulations.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>m² False ceiling made with smooth stucco plates of 100x60 cm., sustained</td>
<td>700.00</td>
<td>33.00</td>
<td>23.100.00</td>
</tr>
<tr>
<td>with metallic profiles, according to regulation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DESCRIPTION</td>
<td>QUANTITY</td>
<td>PRICE</td>
<td>AMOUNT</td>
</tr>
<tr>
<td>-------------</td>
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<td>--------</td>
</tr>
<tr>
<td>m2 Tiled with meeting made with tile of 200x300 mm., white color, taken with mortartail conventional and rejointed with joints mortar, even courteous and cleaning, according to Guide of Ceramic Ceiling.</td>
<td>15.00</td>
<td>80.00</td>
<td>1.200.00</td>
</tr>
<tr>
<td>m2 Tiled with meeting made with tile of 200x250 mm., white color, taken with mortar tail conventional and rejointed with joints mortar, even courteous and cleaning, according to Guide of Ceramic Ceiling.</td>
<td>130.00</td>
<td>50.00</td>
<td>6.500.00</td>
</tr>
<tr>
<td>m2 Pavement with joints made with mud floor tile cooked of 300x300 mm., taken with mortar tail of high benefits and rejointed with joint mortar, even courteous and cleaning, according to Guide of Ceramic Ceiling.</td>
<td>90.00</td>
<td>40.00</td>
<td>3.600.00</td>
</tr>
</tbody>
</table>

**TOTAL CHAPTER 05**  
246.100,00
## Chapter 06 Carpentry

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Price</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blind door of step with moldings to varnish, formed by a leaf of 2030x825x35 mm., makes solid, of pine of Sweden, wall of pine of 68x58 mm, claws of galvanized steel fixation, astragal of 70x10 mm, in pine of Sweden, latoned hinges of 80 mm, and lock chromed, received and even plumbed of the wall, fit of the leaf, fixation of ironworks and made level, small material and fits end according to regulation.</td>
<td>24.00</td>
<td>250.00</td>
<td>6.000.00</td>
</tr>
<tr>
<td>Door of step, blinds, with moldings, to varnish, formed by two folding leaves of 2030x825x35 mm., massive of pine of Sweden, wall of pine of 68x47 mm, claws of galvanized steel fixation, astragal of 70x10 mm of pine of Sweden, latoned hinges of 80 mm and lock chromed, fit of the leaves, fixation of ironworks and made level and fits end, according to regulation.</td>
<td>8.00</td>
<td>600.00</td>
<td>4.800.00</td>
</tr>
<tr>
<td>Door of step, blinds, with moldings, to varnish, formed by two folding leaves of 2030x625x35 mm., massive of pine of Sweden, wall of pine of 68x47 mm, claws of galvanized steel fixation, astragal of 70x10 mm of pine of Sweden, latoned hinges of 80 mm and lock chromed, fit of the leaves, fixation of ironworks and made level and fits end, according to regulation.</td>
<td>5.00</td>
<td>380.00</td>
<td>1.900.00</td>
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</table>

**Total Chapter 06**  
12.700,00
## MEASUREMENTS AND BUDGET

### CHAPTER 07 METALLIC CARPENTRY

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>PRICE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Window of a folding leaf of vertical axis of 1000 mm wide and 800 mm of height, without incorporated guides of blind, made with aluminium profiles hard anodizing of 15 microns, with seal of quality Ewaa-Euras, natural colour, inserted hinges and cremona to receive glass, even cuts, preparation and unions of profiles, fixation of boltless, sideburns and ironworks of hang and security, positioning on prewall, sealed of the unions and cleaning, according to regulation.</td>
<td></td>
<td>80.00</td>
<td>70.00</td>
</tr>
<tr>
<td>Fixed window of 1000 mm. wide and 800 mm. of height, made with aluminium profiles hard anodizing of 15 microns, with seal of Ewaa-Euras quality, natural colour, without guide, to receive glass, even cuts, to preparation and unions of profiles, fixation of boltless and sideburns, positioning on prewall, sealed of the unions and cleaning, according to regulation.</td>
<td></td>
<td>120.00</td>
<td>60.00</td>
</tr>
<tr>
<td>Fixed window of 500 mm. wide and 800 mm. of height, made with aluminium profiles hard anodizing of 15 microns, with seal of Ewaa-Euras quality, natural colour, without guide, to receive glass, even cuts, to preparation and unions of profiles, fixation of boltless and sideburns, positioning on prowl, sealed of the unions and cleaning, according to regulation.</td>
<td></td>
<td>18.00</td>
<td>90.00</td>
</tr>
<tr>
<td>Sectional door from access to garage of 6000x2125 mm, made with panels of steel plate galvanized and stuffed of injected polyurethane foam, forming a panel of 40 mm of thickness, laqued with acrylic painting, closings of PVC in lateral and the inferior part to give watertightness him, even wall, guide, ironworks and hinges of zinc smelting, with lock of interchangeable cylinder.</td>
<td></td>
<td>1.00</td>
<td>3.000.00</td>
</tr>
<tr>
<td>DESCRIPTION</td>
<td>QUANTITY</td>
<td>PRICE</td>
<td>AMOUNT</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------------------------------</td>
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<td>--------</td>
</tr>
<tr>
<td>Garage door, for continuous use, of 5000 mm of wide and 2500 mm height with beating system, the door is not opened if some obstacle in its zone of sweeping exists, with system of warning to the user, device that it prevents to even catch the hand in the fold or the loading base, with double photocell of security, traffic light for warning of the functions of closed door, open door and beginning of the cycle of closing, hydraulic operation with two speeds, starts and closes slow, the operator will be installed invisibly inside the frame of the door, allowing the automatic opening of the leaf, still in case of lack of current, by means of battery, closes time-lag with codified card reader.</td>
<td>1.00</td>
<td>4.600.00</td>
<td>4.600.00</td>
</tr>
<tr>
<td>Fixed window of 1000 mm. wide and 1200 mm. of height, made with aluminium profiles hard anodizing of 15 microns, with seal of Ewaa-Euras quality, natural colour, without guide, to receive glass, even cuts, to preparation and unions of profiles, fixation of boltless and sidebums, positioning on prewall, sealed of the unions and cleaning, according to regulation.</td>
<td>50.00</td>
<td>120.00</td>
<td>6.000.00</td>
</tr>
<tr>
<td>Door made with two glass leaves tempered of 4500x312 mm., colourless of 10 mm of thickness, even ironworks and positioning.</td>
<td>3.00</td>
<td>1.500.00</td>
<td>4.500.00</td>
</tr>
<tr>
<td>Folding door fire-resistant with 1 leaf of 900x2000 mm., RF-120, formed by wall of profile laminated Z shaped, leaf of steel plate of 1 mm of thickness, with claws of fixation, rock wool isolation of double layer, reinforce of the interior of the leaf with flat metallic profile, reinforcements of the lateral wall with pivots, thermo expansive trimming in the lateral wall that seals to the meetings between wall and leaf, hinges reinforced with discs tempering antiwears away and adjustable wharf for automatic locking of the leaf, artifice handle, with soul of steel and covering of plastic material, reversible antifire special lock with key or cylinder, with finished of cured epoxy dust to the furnace, in beige colour. Even plumbed, positioning and elimination of rest.</td>
<td>2.00</td>
<td>400.00</td>
<td>800.00</td>
</tr>
<tr>
<td>Door of passage with two folding leaves of 700x2050 mm., formed by two steel plates galvanized assembled to each other and stuffed of foam of polyurethane, plate frame steel galvanized of 1,2 mm of thickness, hinges and lock inserted with crank, even plumbed, positioning and elimination of rest.</td>
<td>2.00</td>
<td>200.00</td>
<td>400.00</td>
</tr>
<tr>
<td>DESCRIPTION</td>
<td>QUANTITY</td>
<td>PRICE</td>
<td>AMOUNT</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
<td>----------</td>
<td>--------</td>
<td>---------</td>
</tr>
<tr>
<td>Door of passage with a folding leaf of 800x2050 mm., formed by two steel plates galvanized assembled to each other and stuffed offoam of polyurethane, plate frame steel galvanized of 1,2 mm of thickness, hinges and lock inserted with crank, even plumbed, positioning and elimination of rest.</td>
<td>3.00</td>
<td>200.00</td>
<td>600.00</td>
</tr>
</tbody>
</table>

**TOTAL CHAPTER 07** 34,320,00
<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>PRICE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Furniture of kitchen, with board body white colour with 16 mm of thickness, made up of low furniture to embed furnance, base of sink with two doors, a closet bases of 600 mm, with a door, one of 1000 mm, with two door, another one of 250 mm, with a door and drawer, hanging closet, three hanging closets of 600, 250 and 1000 mm, each one, finished in plastic laminate with closing by hinges, guide al metallic bearings in drawers and gunnes of doors, socle and comice in heel and the imported granite large stone bench with 30 mm of thickness.</td>
<td>3.00</td>
<td>1.200.00</td>
<td>3.600.00</td>
</tr>
<tr>
<td>Dishwasher with 7 programs, dimensions 820x600x600 mm, 12 services, finish of stainless steel, sound insulation pilot of operation.</td>
<td>2.00</td>
<td>2.000.00</td>
<td>4.000.00</td>
</tr>
<tr>
<td>Refrigerating-freezer, 2 motors, of dimensions 1800x700x600 mm 420 Is. Of total capacity, freezer of 144 Is. Automatic defrost and reversible doors.</td>
<td>3.00</td>
<td>1.000.00</td>
<td>3.000.00</td>
</tr>
<tr>
<td>Electric Kitchen, high quality 5 fires, top of stainless steel, thermostat, light in the furnance and burners with automatic ignition, door of the chafing dishes panelable, door with double crystal, dimensions 850x900x550 mm.</td>
<td>3.00</td>
<td>1.000.00</td>
<td>3.000.00</td>
</tr>
<tr>
<td>Electrical oven of independent installation, series luxury, radiation, for a capacity of 54 ls. With autocleaning security thermostat, reversible catalytic walls programmer folding march-stop, double grill, illuminated controls and cable of connection.</td>
<td>3.00</td>
<td>1.000.00</td>
<td>3.000.00</td>
</tr>
<tr>
<td>Sink to fit of non-magnetic stainless steel of 18/10, chromium nickel, shining surface, with soundproof totally inserted and without welds, of dimensions 135x49 mm, 2 sines, drain-grid and cork, faucets monocontrol, standard quality, including positioning and installed and verified aid of mansonry, according to regulation.</td>
<td>1.00</td>
<td>2.000.00</td>
<td>2.000.00</td>
</tr>
<tr>
<td>DESCRIPTION</td>
<td>QUANTITY</td>
<td>PRICE</td>
<td>AMOUNT</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------</td>
<td>----------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>Smoke extractor bell of 90 cm. wide, three speed, volume of m3/h.,</td>
<td>2.00</td>
<td>300.00</td>
<td>600.00</td>
</tr>
<tr>
<td>metallic grids antiflames, retaining grease filter, switch of independent</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>light and connection, evacuation to the interior or the outside, placed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and connected to the network.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL CHAPTER 08**  19.200,00
### CHAPTER 09 ELECTRICAL INSTALLATION

- **Point of light of stairs**, installed with 1,50 copper cable mm² of section, embedded and isolated with, flexible tube of PVC of 13 mm of diameter, even mechanisms of first quality, interlocked, according to regulations.
  
<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>PRICE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,50 copper cable mm² of section, embedded and isolated under flexible tube</td>
<td>15.00</td>
<td>50.00</td>
<td>750.00</td>
</tr>
<tr>
<td>of 13 mm of diameter, even mechanisms of first quality, interlocked.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **General box of protection** with double isolation, with bases of 250-250-400 fuse amperes, with positioning in interior, for underground attacks, provided with metallic tips for the distributing line of 50-240 mm of entrance-exit in phases, made with autoextinguible material autoventilated, according to recommendation.

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>PRICE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>250-250-400 fuse amperes, with positioning in interior, for underground</td>
<td>1.00</td>
<td>1000.00</td>
<td>1000.00</td>
</tr>
<tr>
<td>attacks, provided with metallic tips for the distributing line of 50-240 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of entrance-exit in phases, made with autoextinguible material</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>autoventilated, according to recommendation.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Point of light for garage** formed by incandescent lamp of 100 W., formed
  by copper cable of 1,5 mm² of section, under rigid tube of diameter 13 mm,
  boxes of derivation, driving mechanisms and protection.

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>PRICE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incandescent lamp of 100 W., formed by copper cable of 1,5 mm² of section,</td>
<td>80.00</td>
<td>150.00</td>
<td>12.000.00</td>
</tr>
<tr>
<td>under rigid tube of diameter 13 mm, boxes of derivation, driving mechanisms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and protection.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Point of pit light elevator**, installed with socle lampholders, a lamp of
  60 w., line of 2x1 mm² and 750 v. low, rigid tube of 13 mm of diameter.

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>PRICE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socle lampholders, a lamp of 60 w., line of 2x1 mm² and 750 v. low, rigid</td>
<td>10.00</td>
<td>150.00</td>
<td>15.000.00</td>
</tr>
<tr>
<td>tube of 13 mm of diameter.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Base of plug embedded of 10/16 A. /220, with earthing**, installed with
  copper cable of 1,5 mm² of section, embedded and isolated under flexible
  tube of diameter 13 mm, even mechanisms of first quality and proportional
  part of boxes of derivation and masonry aids, according to regulation.

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>PRICE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/16 A. /220, with earthing, installed with copper cable of 1,5 mm² of</td>
<td>100.00</td>
<td>150.00</td>
<td>15.000.00</td>
</tr>
<tr>
<td>section, embedded and isolated under flexible tube of diameter 13 mm, even</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mechanisms of first quality and proportional part of boxes of derivation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and masonry aids, according to regulation.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Three-phase circuit**, with earth taking, installed with copper cable of
  1,5 mm² of section, mounted under tube of PVC embedded of 13 mm of diameter,
  according to regulations, measured the length executed from the general
  picture of distribution to the registry box.

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>PRICE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three-phase circuit, with earth taking, installed with copper cable of 1,5</td>
<td>800.00</td>
<td>50.00</td>
<td>4.000.00</td>
</tr>
<tr>
<td>mm² of section, mounted under tube of PVC embedded of 13 mm of diameter,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>according to regulations, measured the length executed from the general</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>picture of distribution to the registry box.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DESCRIPTION</td>
<td>QUANTITY</td>
<td>PRICE</td>
<td>AMOUNT</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------</td>
<td>----------</td>
<td>--------</td>
<td>---------</td>
</tr>
<tr>
<td>General distribution frame with elevated degree of electrification, with</td>
<td>1.00</td>
<td>600.00</td>
<td>600.00</td>
</tr>
<tr>
<td>box of double isolation and control mechanism, manoeuvres and protection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>demanded in the Electrotechnic Regulation for Low Tension.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exchanged, installed point of light with 1,50 copper cable mm2 of section,</td>
<td>80.00</td>
<td>70.00</td>
<td>5.600.00</td>
</tr>
<tr>
<td>embedded and isolated with, flexible tube of PVC of 13 mm of diameter, even</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mechanisms of first quality, interlocked, according to regulations.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Point of simple light, installed with 1,50 copper cable mm2 of section,</td>
<td>400.00</td>
<td>40.00</td>
<td>16.000.00</td>
</tr>
<tr>
<td>embedded and isolated with, flexible tube of PVC of 13 mm of diameter, even</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mechanisms of first quality, interlocked, according to regulations.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Copper mattock of earthing formed by diameter coppers telexes trade covered</td>
<td>10.00</td>
<td>40.00</td>
<td>400.00</td>
</tr>
<tr>
<td>14 mm and length 200 cm., even sunk and connections, according to regulation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conduction of earthling buried to a minimum depth of 800 mm., installed</td>
<td>100.00</td>
<td>20.00</td>
<td>2.000.00</td>
</tr>
<tr>
<td>with annealed naked copper conductor of 35 mm2 of section, even excavation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and filling, according to regulation, measurement from the curb box of</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>connection to the last goad.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL CHAPTER 09** 108.350,00
### CHAPTER 10 PLUMBING INSTALLATION

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>PRICE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group of pressure of 35 m.c.a., made up of two electrical pumps in parallel of 4 HP of total power, boiler of galvanized steel 500 ls., retention valves and floodgate, reference instruments and electrical frame, steel canalization galvanized of 50 mm, special pieces, connections even small material and masonry aids, according to regulation.</td>
<td>1.00</td>
<td>8.000.00</td>
<td>8.000.00</td>
</tr>
<tr>
<td>Hourly service counters, with dial of five numbers, totalize and pulsar, housing of steel, connected and verified.</td>
<td>1.00</td>
<td>40.00</td>
<td>40.00</td>
</tr>
<tr>
<td>Shutoff valve of 3/4 &quot; (index blue or red), of high quality, accredited, installed and verified, according to regulations.</td>
<td>2.00</td>
<td>40.00</td>
<td>80.00</td>
</tr>
<tr>
<td>Canalization made with copper tube stretched of 28 mm of outer diameter, including an increase on the price of the tube of 30% for unions and accessories, hides in all its route, verified, according to regulation.</td>
<td>300.00</td>
<td>40.00</td>
<td>12000.00</td>
</tr>
<tr>
<td>Water attack from the general net of distribution with diameter 50-250 mm, to a maximum distance of 5m, with tube of fibrocement and key of manual floodgate in curb box of 400x400 mm., with cover of smelting, accessory of connection and assembly, even installed, verified, according to regulation.</td>
<td>1.00</td>
<td>1000.00</td>
<td>1000.00</td>
</tr>
<tr>
<td>Deposit of production and accumulation of Sanitary Hot water, with capacity of 3000ls., 10 atm</td>
<td>2.00</td>
<td>4000.00</td>
<td>8000.00</td>
</tr>
</tbody>
</table>

**TOTAL CHAPTER 10** 29.120,00
CHAPTER 11 PLUMBING INSTALLATION

**U** Connection in general conductions of PVE, 250 mm of diameter, composed by collarín, machón double, key of sphere, male sleeve of thread, fifteen meters of low polyethylene tube givesidad of 50 mm of diameter and 10 atmospheres of pressure and key of undertaken entrance individual, inclusive arqueta of registry of 40 x 40 cm of brick perforated of 24x11, 5x9 cm, wall-plate of 5 cm of HM - 20 with orifice drain, excavation of ditch and rights and permissions for the connection. Without repave ment position. Totally installed, connected and in perfect state of operation.

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>PRICE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>U</td>
<td>1.00</td>
<td>1.800.00</td>
<td>1.800.00</td>
</tr>
</tbody>
</table>

**U** Battery of division polypropylene accountants copolymer random PP - R, branched off collector c / toma lateral flag or (superior or inferior) of three row / s, for 12 houses, composed by body, tube and bridle of feeding of 75 mm of diameter, forecast of space for assembly of 12 accountants of cold water of 15mm, 12 valves of entrance and exit of DN 15 mm with retention accessory, blind sewer of reserve, billets of connection, supports, elements of attachment and frames of classification of accountants. Nominal pressure 20 bar and temperature 95 Maxima on watch ° C. Totally installed, connected and in correct state of operation.

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>PRICE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>U</td>
<td>3.00</td>
<td>2.000.00</td>
<td>6.000.00</td>
</tr>
</tbody>
</table>

**U** Battery of division polypropylene accountants copolymer random PP - R, branched off collector c / toma central (superior or inferior) of two row / s, for 16 houses, composed by body, tube and bridle of feeding of 75 mm of diameter, installation of 16 cold water meters of 15mm, 16 valves of entrance and exit of DN 15 mm with accessory of retention, blind sewer of reserve, billets of connection, supports, elements of attachment and frames of classification of accountants. Pressure nominal 20 bar and temperature 95 Maxima on watch ° C. Totally installed, connected and in Corrector been of operation.

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>PRICE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>U</td>
<td>3.00</td>
<td>2.500.00</td>
<td>7.500.00</td>
</tr>
<tr>
<td>DESCRIPTION</td>
<td>QUANTITY</td>
<td>PRICE</td>
<td>AMOUNT</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------</td>
<td>----------</td>
<td>--------</td>
<td>---------</td>
</tr>
<tr>
<td>Stainless steel storage cell with coil, 1,000 l of capacity, for water</td>
<td>2.00</td>
<td>10.000</td>
<td>22.000</td>
</tr>
<tr>
<td>installation hot sanitary you of up to 8 bar to 90 °C, complete control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>panel that includes thermometer, thermostat of regulation and switch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>winter / summer, safety valve with pressure gauge, automatic purgador in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>feeding or superior part (according to type, horizontal or vertical),</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>valves of cut (entered, exit, drained.&gt;&gt;), protected power supply, valve</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of retention, fixations and supports. For assembly On guard vertical.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrifiable by means of electrical resistance in the secondary one.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With equipment of cathode protection for aggressive waters. Totally</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>installed, connected and in correct state of operation, even tests.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post of water feeding made with polyethylene tube cross-linking, diameter</td>
<td>200.00</td>
<td>40.00</td>
<td>8.000</td>
</tr>
<tr>
<td>32 mm, DES of accountant to passing key, even claws of subjection, aids</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of masonry and with an increase of the price of the tube of 30% for unions,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>special accessories and pieces. Totally insured and verified.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Installation of plumbing for a complete bath, equipped with washbasin,</td>
<td>3.00</td>
<td>2.000</td>
<td>6.000</td>
</tr>
<tr>
<td>toilet, bidet and bathtub, made with polyethylene pipes cross-linking for</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>the cold water networks and it warms up and with pipes of PVC diameter 40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mm for the network of water-drainages, prepared for individual siphon in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>each apparatus, even with p. p. of bajante of PVC of 125 mm and manguetón</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>for connection to the toilet. Without faucets, apparatuses sanitary nor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>masonry aids. The water takings closed with keys of I square or plugs (</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>according to it comes) and the water-drainages with plugs. Totally</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>finished.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL CHAPTER 11** 51.300,00
### CHAPTER 12 TELECOMMUNICATION INFRASTRUCTURES

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>PRICE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registry closet for telephony of 300x600 mm. embedded, even masonry positioning, connection and aids, according to regulation.</td>
<td>2.00</td>
<td>100.00</td>
<td>2000.00</td>
</tr>
<tr>
<td>Access point for telephony from the point of taking to the closet of connection made according to regulations even masonry connections and aids.</td>
<td>7.00</td>
<td>2000.00</td>
<td>1400.00</td>
</tr>
<tr>
<td>Distribution canalization of telephony formed by two rigid tubes of PVC of diameter 32 mm separated to each other 20 mm. and thread guides even positioning, aids of masonry and proportional part of connections and boxes of step, constructed according to regulations. Measurement the length between faces of closets.</td>
<td>200.00</td>
<td>10.00</td>
<td>2000.00</td>
</tr>
</tbody>
</table>

**TOTAL CHAPTER 12**  

<table>
<thead>
<tr>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>5400.00</td>
</tr>
</tbody>
</table>


**CHAPTER 13 VENTILATION AND AIR CONDITIONING**

**m** Conduit made with flexible tube of stainless steel (AISI-316), 0.1 mm of thickness and 200 mm of diameter, for evacuation of smoke or gases and forced conduction of air, clips of even tightens.

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Price</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conduit made with flexible tube of stainless steel (AISI-316), 0.1 mm of thickness and 200 mm of diameter, for evacuation of smoke or gases and forced conduction of air, clips of even tightens.</td>
<td>10.00</td>
<td>50.00</td>
<td>500.00</td>
</tr>
</tbody>
</table>

**u** Extractor of detachable smoke, with centrifugal ventilator, up to 600 m³/h of volume, single-phase motor of 230 v., 50 Hertz, with thermal protector incorporated, housing and scroll of electrowelded steel plate, placed and connected.

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Price</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extractor of detachable smoke, with centrifugal ventilator, up to 600 m³/h of volume, single-phase motor of 230 v., 50 Hertz, with thermal protector incorporated, housing and scroll of electrowelded steel plate, placed and connected.</td>
<td>2.00</td>
<td>100.00</td>
<td>200.00</td>
</tr>
</tbody>
</table>

**m** Rectangular conduit for ventilation and preparation of the air of 200x300 mm., formed by volcanic rock rigid wool panels, had externally by a profile with aluminium and aluminium by the interior, of 25 mm of thickness, 95 density kg/m³, thermal conductivity to 20°C of 0.030 w/m°C, reaction to the fire, even formation, assembly, cuts to unions and positioning.

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Price</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rectangular conduit for ventilation and preparation of the air of 200x300 mm., formed by volcanic rock rigid wool panels, had externally by a profile with aluminium and aluminium by the interior, of 25 mm of thickness, 95 density kg/m³, thermal conductivity to 20°C of 0.030 w/m°C, reaction to the fire, even formation, assembly, cuts to unions and positioning.</td>
<td>420.00</td>
<td>50.00</td>
<td>21.000.00</td>
</tr>
</tbody>
</table>

**m** Rectangular conduit for ventilation and preparation of the air of 400x600 mm., formed by volcanic rock rigid wool panels, had externally by a profile with aluminium and aluminium by the interior, of 25 mm of thickness, 95 density kg/m³, thermal conductivity to 20°C of 0.030 w/m°C, reaction to the fire, even formation, assembly, cuts to unions and positioning.

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Price</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rectangular conduit for ventilation and preparation of the air of 400x600 mm., formed by volcanic rock rigid wool panels, had externally by a profile with aluminium and aluminium by the interior, of 25 mm of thickness, 95 density kg/m³, thermal conductivity to 20°C of 0.030 w/m°C, reaction to the fire, even formation, assembly, cuts to unions and positioning.</td>
<td>30.00</td>
<td>100.00</td>
<td>3.000.00</td>
</tr>
</tbody>
</table>

**u** Conditioning divided system, heat pump, air-air, outer unit, a compressor and 60000 w. inner unit with 66000 w. heat capacity, even circuit breakers, fuses, wirings between units, thermostats and regulation, loaded lines or similar and valves, until maximum distance of 20 m, distribution by conduits, even beginning.

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Price</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditioning divided system, heat pump, air-air, outer unit, a compressor and 60000 w. inner unit with 66000 w. heat capacity, even circuit breakers, fuses, wirings between units, thermostats and regulation, loaded lines or similar and valves, until maximum distance of 20 m, distribution by conduits, even beginning.</td>
<td>4.00</td>
<td>15.000.00</td>
<td>60.000.00</td>
</tr>
</tbody>
</table>

**u** Electrical conditioned air picture, in metallic plate of 3 mm of thickness, properly treated in epoxi-cured to the furnace, with door is transparent containing in its interior the material, properly connected.

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Price</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical conditioned air picture, in metallic plate of 3 mm of thickness, properly treated in epoxi-cured to the furnace, with door is transparent containing in its interior the material, properly connected.</td>
<td>2.00</td>
<td>1.000.00</td>
<td>2.000.00</td>
</tr>
<tr>
<td>DESCRIPTION</td>
<td>QUANTITY</td>
<td>PRICE</td>
<td>AMOUNT</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------</td>
<td>----------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td><strong>Bell mural for extraction of smoke and vapors, in kitchens of hostelería,</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 ms. of length, with fire-resistant regulator of volume and, composed of three metallic moduli to two faces, with ple num, metallic filters of 2,5 cm. of thickness, trays recoge grasa and conduit of connection to box of ventilator. Medium range on the verge of evacuation connection 3 ms., centrifugal ventilator of double aspiration with incorporated motor of 2500 m³ / h. and 25 mm. c. a., with isolated metallic box, conexionado, even beginning.</td>
<td>2.00</td>
<td>100.00</td>
<td>200.00</td>
</tr>
<tr>
<td><strong>Conduit made with flexible tube, constituted by a covered of PVC and reinforced textile lamina by a thread of steel in spiral, 82 mm. of diameter, for a Maxima pressure of 200 mm. c. a. for air conditioning facilities, ventilation and extraction of smoke. Including an increase on the price of the tube of 40% for unions and accessories.</strong></td>
<td>2.00</td>
<td>200.00</td>
<td>400.00</td>
</tr>
<tr>
<td><strong>Tubular helical extractor with helice of 7120 material thermoplastic and of great volume m³ / h., of motor trifásico, extraflat and compact with assembly of helice and inner rotor motor, protection IP 65, finished in steel plate with painting to poliester and cm. of diameter, to install section of with in the last ducto of evacuation of smoke and vapors, for facilities of a single point in hostelería or even 10/12 individual points in buildings of plants, temperature of work 150 °, without including wiring.</strong></td>
<td>2.00</td>
<td>1.000.00</td>
<td>2.000.00</td>
</tr>
</tbody>
</table>

**TOTAL CHAPTER 13** 89.300.00
### CHAPTER 14 PLUMBING FIXTURES

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>PRICE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wash basin with pedestal, of dimensions 700x560 mm., standard quality of porcelain vitrified white colour, shining, mixer chromed time-lag faucets with air flow, including positioning and aids of masonry, according to regulations.</td>
<td>10.00</td>
<td>500.00</td>
<td>5.000.00</td>
</tr>
<tr>
<td>Toilet of low tank, porcelain vitrified, dimensions 650x450 mm., economic quality, white colour, even seat and cover of similar colour, game of mechanisms including, masonry positioning and aid, according to regulations.</td>
<td>10.00</td>
<td>350.00</td>
<td>3.500.00</td>
</tr>
<tr>
<td>Cold and warm water installation in toilet with washbasin, skilful toilet and shower, made with polypropylene pipe, even unions, elbows and accessories.</td>
<td>2.00</td>
<td>500.00</td>
<td>1.000.00</td>
</tr>
<tr>
<td>Cold water installation and warms up in kitchen with sink, laundry, heater and takes for washing machine, made with polypropylene pipe, even unions, elbows and accessories.</td>
<td>10.00</td>
<td>250.00</td>
<td>2.500.00</td>
</tr>
</tbody>
</table>

**TOTAL CHAPTER 14**                                                                                                           | **12,000.00**

---
<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>PRICE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CHAPTER 15 FIRE PROTECTION INSTALLATION</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>u Extinguisher of built-in pressure dry dust 6 kg, ABC.</td>
<td>10.00</td>
<td>70.00</td>
<td>700.00</td>
</tr>
<tr>
<td>m Metallic emergency stairs with straight sections with four pillars, frontal to the building, wide of passage of 1200 mm, with steel A-42b, pillars of 140x140x5 mm, horizontal structure of support and shanks UPN-140, steps of steel plate A-37 printed with 3 mm, with outer cage with continuous steel tubes of 40x20 mm and inner railing of 1,10m of height, overload of 400 use of kg/m2, fire protection, ended painting of antirust primer, fixation in the base to perimeter of expansion and anchored to the structure of the building.</td>
<td>30.00</td>
<td>2000.00</td>
<td>60.000.00</td>
</tr>
<tr>
<td>u Alarm power station for signaling and control, detection fires, provided with a power supply with exit of 27v stabilized tension, automatic loader for batteries, with acoustic alarm signals and damages, pilots of power station in good condition of failure in curl of siren and detection and alarm for 5 zones, expandable up to 8 zones, according to regulation.</td>
<td>1.00</td>
<td>1.000.00</td>
<td>1.000.00</td>
</tr>
<tr>
<td>u Point of light of inner emergency, polystyrene body brown dark, diffusing prismatic, fusible incorporated, interrupting manual and at a distance permanent 2x3.6 W 60 lumina 12 m2 of surface, duration 1 hour, dimensions 240x125x85 mm.</td>
<td>20.00</td>
<td>150.00</td>
<td>3.000.00</td>
</tr>
<tr>
<td>u Fire detector, thermostatic, with optical socle indicator.</td>
<td>40.00</td>
<td>100.00</td>
<td>4.000.00</td>
</tr>
</tbody>
</table>

**TOTAL CHAPTER 15** 68.700,00
## CHAPTER 16 GLASS WALLS

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>PRICE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>The glass in windows will be 4/6/4, made with double insulating glass, made up of colourless glass 4 mm, in the interior, dehydrated air chamber of 6 mm sealed, and colourless glass 4 mm in the outside, with double sealed of butyl and poly sulphur, executed according regulation. In all the glassed wood carpentry, this one will be made with printed glass of 4 mm, of colour, placed with putty.</td>
<td>800.00</td>
<td>200.00</td>
<td>160.000.00</td>
</tr>
<tr>
<td>The glazing for the swimming pool will be made with insulating double glass, made up of security glass 4+4mm in the interior, dehydrated air chamber of 12mm, sealed perimetraly and outer glass tempered of 10mm of tone silver, reflecting, and solar control by means of the treatment of one of its faces by cathodic pulverization in emptiness.</td>
<td>80.00</td>
<td>250.00</td>
<td>20.000.00</td>
</tr>
<tr>
<td>The glazing for the façade will be made with insulating double glass, made up of security glass 4+4mm in the interior, dehydrated air chamber of 12mm, sealed perimetraly and outer glass laminated of 6+6+6 mm of tone silver, reflecting, and solar control by means of the treatment of one of its faces by cathodic pulverization in emptiness.</td>
<td>90.00</td>
<td>100.00</td>
<td>9.000.00</td>
</tr>
</tbody>
</table>

**TOTAL CHAPTER 16** 189.000,00
## CHAPTER 17 PAINTS

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Price</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coating with smooth plastic painting finished, applied on vertical inner</td>
<td>2.500.00</td>
<td>10.00</td>
<td>25.000.00</td>
</tr>
<tr>
<td>walls of plaster or cement, previous sandpapering of small adhesions and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>imperfections, printing coat with very fine diluted plastic painting, plastified of lack and finishes, according to regulation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coating with smooth plastic painting finished, applied on horizontal inner</td>
<td>1.500.00</td>
<td>10.00</td>
<td>15.000.00</td>
</tr>
<tr>
<td>walls of plaster or cement, previous sandpapering of small adhesions and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>imperfections, printing coat with very fine diluted plastic painting, plastified of lack and finishes, according to regulation</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL CHAPTER 17**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th>40.000.00</th>
</tr>
</thead>
</table>

309
<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>PRICE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydraulic elevator for load of 600 kg (8 people), with automatic doors in</td>
<td>1.00</td>
<td>30.000.00</td>
<td>30.000.00</td>
</tr>
<tr>
<td>cabin, speed 0.63 m/sg., 2 shutdowns, wide of the hollow 1800 mm and depth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1800 mm, cabin of 1000x1450 mm, with panels of melamine or plastic laminate,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>illuminated with fluorescent and diffusing element of grid, pavement of</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>nonskid rubber, aluminium banister rails hard anodizing, mouth finished in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>stainless steel, with button seller of floor pulsers, alarms and illuminated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of emergency and digital positional indicator on shining stainless steel plate,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>automatic outer doors with simple collective maneuver, even masonry aids.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
<td>----------</td>
<td>-----------</td>
<td>----------</td>
</tr>
<tr>
<td>Hydraulic elevator for load of 600 kg (8 people), with automatic doors in</td>
<td>1.00</td>
<td>25.000.00</td>
<td>25.000.00</td>
</tr>
<tr>
<td>cabin, speed 0.63 m/sg., 3 shutdowns, wide of the hollow 1800 mm and depth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1800 mm, cabin of 1000x1450 mm, with panels of melamine or plastic laminate,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>illuminated with fluorescent and diffusing element of grid, pavement of non-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>skid rubber, aluminium banister rails hard anodizing, mouth finished in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>stainless steel, with button seller of floor pulsers, alarms and illuminated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of emergency and digital positional indicator on shining stainless steel plate,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>automatic outer doors with simple collective maneuver, even masonry aids.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
<td>----------</td>
<td>-----------</td>
<td>----------</td>
</tr>
<tr>
<td>Electrical freight elevator of 1000 kg, manual speed 0.50 m/sg., metallic</td>
<td>1.00</td>
<td>40.000.00</td>
<td>40.000.00</td>
</tr>
<tr>
<td>doors, 4 shutdowns, total route 9 m, simple maneuver by pulsers, even masonry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>aids.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL CHAPTER 18** | **95.000,00**
<table>
<thead>
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<th>DESCRIPTION</th>
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<th>PRICE</th>
<th>AMOUNT</th>
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<tr>
<td>TOTAL CHAPTER 01</td>
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<td>25.200,00</td>
<td></td>
</tr>
<tr>
<td>TOTAL CHAPTER 02</td>
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</tr>
<tr>
<td>TOTAL CHAPTER 03</td>
<td></td>
<td>343.000,00</td>
<td></td>
</tr>
<tr>
<td>TOTAL CHAPTER 04</td>
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<td>146.000,00</td>
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</tr>
<tr>
<td>TOTAL CHAPTER 05</td>
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</tr>
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<td>TOTAL CHAPTER 06</td>
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</tr>
<tr>
<td>TOTAL CHAPTER 07</td>
<td></td>
<td>34.320,00</td>
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</tr>
<tr>
<td>TOTAL CHAPTER 08</td>
<td></td>
<td>19.200,00</td>
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</tr>
<tr>
<td>TOTAL CHAPTER 09</td>
<td></td>
<td>108.350,00</td>
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</tr>
<tr>
<td>TOTAL CHAPTER 10</td>
<td></td>
<td>29.120,00</td>
<td></td>
</tr>
<tr>
<td>TOTAL CHAPTER 11</td>
<td></td>
<td>51.300,00</td>
<td></td>
</tr>
<tr>
<td>TOTAL CHAPTER 12</td>
<td></td>
<td>5.400,00</td>
<td></td>
</tr>
<tr>
<td>TOTAL CHAPTER 13</td>
<td></td>
<td>89.300,00</td>
<td></td>
</tr>
<tr>
<td>TOTAL CHAPTER 14</td>
<td></td>
<td>12.000,00</td>
<td></td>
</tr>
<tr>
<td>TOTAL CHAPTER 15</td>
<td></td>
<td>68.700,00</td>
<td></td>
</tr>
<tr>
<td>TOTAL CHAPTER 16</td>
<td></td>
<td>189.000,00</td>
<td></td>
</tr>
<tr>
<td>TOTAL CHAPTER 17</td>
<td></td>
<td>40.000,00</td>
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</tr>
<tr>
<td>TOTAL CHAPTER 18</td>
<td></td>
<td>95.000,00</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL CHAPTERS 1.809.190€
BUILDING THERMAL CONDITIONS
7. INDEX

7.1. ROOF

7.2. FACADE

7.3. THERMICAL STUDY

7.4. CONDENSATIONS AND MOISITURES STUDY
7.1. ROOF

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>THICKNESS (m)</th>
<th>CONDUCTIVITY (kcal/h m °C)</th>
<th>RESISTANCE (h m² °C /kcal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface coefficient (1/hi)</td>
<td></td>
<td></td>
<td>0,110</td>
</tr>
<tr>
<td>Gypsum plaster</td>
<td>0,020</td>
<td>0,26</td>
<td>0,077</td>
</tr>
<tr>
<td>Semi resistant slab</td>
<td>0,100</td>
<td>0,50</td>
<td>0,310</td>
</tr>
<tr>
<td>Waterproof film</td>
<td>0,020</td>
<td>0,12</td>
<td>0,167</td>
</tr>
<tr>
<td>Insulation</td>
<td>0,200</td>
<td>0,04</td>
<td>5,000</td>
</tr>
<tr>
<td>Geotex sheet</td>
<td>0,003</td>
<td>0,04</td>
<td>0,079</td>
</tr>
<tr>
<td>Bituminous sheet</td>
<td>0,005</td>
<td>1,04</td>
<td>0,005</td>
</tr>
<tr>
<td>Geotex sheet</td>
<td>0,003</td>
<td>0,04</td>
<td>0,079</td>
</tr>
<tr>
<td>Gravel layer</td>
<td>0,050</td>
<td>0,42</td>
<td>0,119</td>
</tr>
<tr>
<td>Surface coefficient (1/he)</td>
<td></td>
<td></td>
<td>0,060</td>
</tr>
</tbody>
</table>

\[ \sum R = \frac{1}{K} = 6,005 \]

\[ K = 0,1665 \quad \text{kcal/h m}^2 \text{ °C} \]
### 7.2. FACADE

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>THICKNESS (m)</th>
<th>CONDUCTIVITY (kcal/h m °C)</th>
<th>RESISTENCE (h m² °C/kcal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface coefficient (1/hi)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gypsum plaster</td>
<td>0.150</td>
<td>0.26</td>
<td>0.577</td>
</tr>
<tr>
<td>Insulation (Isover)</td>
<td>0.100</td>
<td>0.04</td>
<td>2.632</td>
</tr>
<tr>
<td>Insulation (Poliestirenum)</td>
<td>0.100</td>
<td>0.03</td>
<td>3.333</td>
</tr>
<tr>
<td>Water proof</td>
<td>0.003</td>
<td>0.04</td>
<td>0.066</td>
</tr>
<tr>
<td>Stone</td>
<td>0.025</td>
<td>0.50</td>
<td>0.050</td>
</tr>
<tr>
<td>Surface coefficient (1/he)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[
\sum R = 1/K = 6.788 \\
K = 0.14731 \quad \text{kcal/h m}^2 \text{ °C}
\]
7.3. THERMICAL STUDY

This Table Express the values of K specified for the different constructive elements of the building.

That full fit the requirements demanded in the articles 4th and 5th Spanish basic regulation NBE-CT-79.

Thermal conditions in buildings.

<table>
<thead>
<tr>
<th>Constructive element</th>
<th>Superf. S m²</th>
<th>Coeficiente K kcal/h m² ºC/Wm² ºC</th>
<th>S . K kcal/h ºC/WºC</th>
<th>Coef. correct. n</th>
<th>n . Σ s . K Kcal/h ºC/WºC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Apartado E</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walls in contact with exterior</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exteriors verticals openings doors, windows</td>
<td>windos 350,26 2,000 700,520</td>
<td>955,520</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>doors 150,00 1,700 255,000</td>
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<td>1</td>
<td>175,000</td>
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<td>175,000</td>
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<tr>
<td>Slabs over exteriors places</td>
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<tr>
<td><strong>Apartado N</strong></td>
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<tr>
<td>Walls separated with other buildings or not calefacted locals</td>
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<tr>
<td>Verticals walls separated with not calefacted locals or continuos walls</td>
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<tr>
<td>Slabs over closed spaces not calefacted of h &gt; 1 m</td>
<td>250,00 0,509 127,250</td>
<td>0,5 63,625</td>
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<tr>
<td>Openings doors windos Puerta 2 20,00 1,700 34,000</td>
<td>17,000</td>
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<td><strong>Apartado Q</strong></td>
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<tr>
<td>Roof walls</td>
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<tr>
<td>Openings, lucernary skylight Lucernario</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Roofs Atico</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Piched roof with less than 60º with the horizontal Cubierta 500,00 0,670 335,000</td>
<td>0,8 268,000</td>
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VICENTE BORRAS TORRES
### THERMICAL STUDY

#### Apartado S

<table>
<thead>
<tr>
<th>Tipo</th>
<th>Ss</th>
<th>Ks</th>
<th>SsKs</th>
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<td>Walls separated with the terrain</td>
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<tr>
<td>Slabs over ventilated spaces</td>
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<td></td>
<td></td>
<td>0,000</td>
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<tr>
<td>h ≤1 m</td>
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<td></td>
<td></td>
<td>0,000</td>
<td></td>
</tr>
<tr>
<td>Walls buried or semiburied</td>
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<table>
<thead>
<tr>
<th>total area S</th>
<th>1.130,50</th>
<th>1</th>
<th>Σ Total</th>
<th>1.479,15</th>
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Factor shape f en m⁻¹ = 0,37

<table>
<thead>
<tr>
<th>Total volumen V</th>
<th>3.076,50</th>
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<th>3</th>
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<table>
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<tr>
<th>Exigencia de la Norma (Art. 4.º)</th>
<th>Cumplimiento de la exigencia de la Norma</th>
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<tr>
<td>Kind of energy shape</td>
<td>K₀</td>
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<tr>
<td>factor I</td>
<td>B</td>
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K₀ del edificio = 1,308 < 1,310
7.4. CONDENSATIONS AND MOISITURES STUDY
<table>
<thead>
<tr>
<th>CONCEPT</th>
<th>L</th>
<th>λ</th>
<th>Rₜ</th>
<th>rᵥ</th>
<th>Rᵥ</th>
<th>POINT</th>
<th>ΔT°</th>
<th>T° POINT</th>
<th>ΔPᵥ</th>
<th>Pᵥ</th>
<th>T° Moisture</th>
<th>OBSERVATIONS</th>
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</thead>
<tbody>
<tr>
<td>Surface coefficient (1/hi)</td>
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<td></td>
<td>A</td>
<td>0.071</td>
<td>18,000</td>
<td>0.000</td>
<td>15,480</td>
<td>13,50</td>
<td>Not condensation</td>
</tr>
<tr>
<td>Stone</td>
<td>0.025</td>
<td>1,200</td>
<td>0.021</td>
<td>100</td>
<td>2.5</td>
<td>B</td>
<td>0.011</td>
<td>17,918</td>
<td>0.088</td>
<td>15,392</td>
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<td>Water proof</td>
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<td>C</td>
<td>0.000</td>
<td>17,918</td>
<td>3.515</td>
<td>11,878</td>
<td>13,00</td>
<td>Not condensation</td>
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<tr>
<td>Insulation (Isover)</td>
<td>0.100</td>
<td>0.003</td>
<td>30,303</td>
<td>10.5</td>
<td>1.05</td>
<td>D</td>
<td>16.435</td>
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<td>0.037</td>
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<tr>
<td>Insulation (Isover)</td>
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<td>0.003</td>
<td>30,303</td>
<td>10.5</td>
<td>100</td>
<td>E</td>
<td>16.435</td>
<td></td>
<td>3.515</td>
<td>8,326</td>
<td>-15.00</td>
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<tr>
<td>Gypsum plaster</td>
<td>0.020</td>
<td>1,000</td>
<td>0.020</td>
<td>60</td>
<td>1.2</td>
<td>F</td>
<td>0.011</td>
<td>14,951</td>
<td>0.042</td>
<td>8,284</td>
<td>-15.34</td>
<td>Not condensation</td>
</tr>
<tr>
<td>Surface coefficient (1/hi)</td>
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<td></td>
<td></td>
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<td>0.038</td>
<td></td>
<td>0.000</td>
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Σ Rₜ = 60,847  Σ Rᵥ = 204,750

Ti = 18,0 °C  Hri = 75%  Psi = 20.64 mbar  Pvi = 15,480 mbar
Te = -15.0 °C  Hre = 95%  Pse = 8,72 mbar  Pve = 8,284 mbar
<table>
<thead>
<tr>
<th>CONCEPT</th>
<th>L</th>
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<th>RT</th>
<th>rv</th>
<th>RV</th>
<th>POINT</th>
<th>ΔTº</th>
<th>ΔPv</th>
<th>Pº</th>
<th>Tº moisture</th>
<th>OBSERVATIONS</th>
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<tbody>
<tr>
<td>Surface coeficient (1/hi)</td>
<td>0,110</td>
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<tr>
<td>Gypsum plaster</td>
<td>0,020</td>
<td>0,260</td>
<td>0,077</td>
<td>60</td>
<td>1,2</td>
<td>A 18,000</td>
<td>0,000</td>
<td>15,480</td>
<td>13,5</td>
<td>Not condensation</td>
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<tr>
<td>Semi-resistant slab (30 cm)</td>
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<td>0,310</td>
<td>100</td>
<td>10</td>
<td></td>
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<td>13,25</td>
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<tr>
<td>Waterproof film</td>
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<td>0,000</td>
<td>10</td>
<td></td>
<td>C 18,000</td>
<td>0,000</td>
<td>15,480</td>
<td>11,9</td>
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<td>Insulation and slope formation</td>
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<td>0,150</td>
<td>0,667</td>
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<td>5</td>
<td>D 18,000</td>
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<tr>
<td>Regularization mortar</td>
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<td>100</td>
<td>3</td>
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<td>0,000</td>
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<td>9,7</td>
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<tr>
<td>Geotex sheet</td>
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<td>0,001</td>
<td>3,000</td>
<td>0</td>
<td>0</td>
<td>F 18,000</td>
<td>0,000</td>
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<td>9,3</td>
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<td>Bituminous sheet</td>
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<td>0,160</td>
<td>0,031</td>
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\[ \Sigma R_T = 7,399 \quad \Sigma R_v = 60,200 \]
C O N S T R U C T I O N S
D R A W I N G S
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<td>FLIP-10p</td>
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**Diagram:**

[Diagram of steel elements and wood panels with dimensions and labels.]