



الشركة بورسعيدية للأعمال الهندسية والإنشاءات البحرية



PORT SAID FOR ENGINEERING WORKS & NAVAL CONSTRUCTIONS CO.
إحدى شركات هيئة قناة السويس S. C. A

كراسة الشروط والمواصفات الخاصة بالمناقصة العامة

رقم ١٧ - ٢٠٢٣/٢٠٢٤

جلسة يوم الأحد الموافق ٢٠٢٣/١٢/٣

أولاً : موضوع المناقصة :

- إنشاء وتركيب نظام مكافحة حريق كامل من إنذار وإطفاء لمصنع تصنيع الاعمال الحديدية بمساحة ٧٠٠٠ م^٢ بالقطعة ٩٢ و ٩٣ المنطقة الصناعية بالعاشر من رمضان .

ثانياً : المواصفات الفنية وجدول الكميات : طبقاً للكراسة المرفقة .

ثالثاً : الشروط العامة :

- تقدم العطاءات بإسم السيد المحاسب/ رئيس القطاع التجارى بنظام المظروف الواحد (فنى + مالى) على أن يسدد تأمين إبتدائى قدره ٢% من قيمة العطاء المقدم يسدد نقدى أو بالدفع الالكترونى او بشيك مصرفى مقبول الدفع او خطاب ضمان بنكى غير مشروط يزداد إلى ٥% فى حالة الترسية .
- يتم تقديم المظروف مصحوباً بإيصال سداد بمبلغ وقدره ٢٥٠٠ جنيه مصرى قيمة كراسة الشروط والمواصفات الفنية التى يمكن الحصول عليها من موقع الشركة الموقع أدناه .
- يكتب على المظروف من الخارج موضوع المناقصة ورقمها وتاريخ الجلسة بخط واضح .
- تقدم العطاءات فى موعد غايته الساعة الثانية عشر ظهراً يوم الأحد الموافق ٢٠٢٣/١٢/٣ بمقر الشركة ببورفؤاد .
- لن يلتفت إلى العطاءات المتضمنة شروط مخالفة لما جاء بكراسة الشروط او التى ترد بعد الموعد المحدد لجلسة إستلام المظاريف .
- يكون العطاء سارى لمدة شهر من تاريخ فتح المظاريف .
- يرفق بالمظروف صورة من : البطاقة الضريبية - شهادة التسجيل بضريبة القيمة المضافة - السجل التجارى سارى - شهادة التسجيل بمنظومة الفاتورة الالكترونية - شهادة الاتحاد المصرى لمقاولى التشييد والبناء سارية - سابقة الخبرة مدعومة بالمستندات فى مجال الاعمال المطلوبة ولن يلتفت إلى العطاء الغير المصحوب به هذه المستندات .
- تقديم برنامج زمنى محدد طبقاً لمدة التنفيذ .
- يتم تحديد ضريبة القيمة المضافة فى بند منفصل .
- نظراً لأهمية الاعمال فإن غرامة التأخير وفقاً للاحه ١% عن كل إسبوع بحد أقصى ١٠% مع حق شركتنا فى فرض كافة الغرامات الموقعه على شركتنا من قبل هيئة التنمية الصناعية فى حال تأخير المقاول .

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إحدى شركات هيئة قناة السويس S. C. A

- مدة تنفيذ الأعمال ٣ شهور من تاريخ إستلام الموقع .
- الأستلام الابتدائي بموجب محضر استلام موقع من مهندس الشركة والاستشاري والمقاول بعد موافقة إدارة الحماية المدنية على الاعمال المنفذة .
- معاينة الموقع معاينة نافية للجهالة .
- الألتزام بما ورد بالموصفات الفنية والألتزام بموافقة الحماية المدنية .
- جميع المهمات التي يتم توريدها مطابقة لموافقة الحماية المدنية والموصفات الفنية .
- للشركة الحق في قبول او رفض اي عطاء أو إلغاء المناقصة أو تأجيل ميعاد فتح المظاريف دون إبداء أى أسباب .
- تخضع المناقصة للائحة الشركة المالية .

وتفضلوا بقبول فائق الاحترام ،،،

رئيس القطاع التجارى
محاسب

عمرو سيد محمد سعيد

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المواصفات الفنية وجداول الكميات

مصنع تصنيع الاعمال الحديدية
بالمنطقة الصناعية (A6) بمدينة العاشر من رمضان.

استشاري مكافحة الحريق

الأستاذ الدكتور / محمد محبوب بسيوني

قسم هندسة القوى الميكانيكية - كلية الهندسة - جامعة طنطا

٠١٢٠٣٥٤٨٢١٥-٠١٠٠٥٨٥٢٣٣٥
MEP TECH

أغسطس ٢٠٢٣

Engineering Consulting and Contracting

أ.م. محمد محبوب بسيوني
مهندس استشاري مكافحة الحريق
رقم الترخيص: ٣٨/١٣٩٦ رقم الاستشاري: ٣/١٦٤٧
رقم السجل: ٥٩٩٢٤٩٥٦
١١٠٠٥٨٥٢٣٣٥

١- المواصفات الفنية

MEP TECH

Engineering Consulting and Contracting

ذو الكرم بيجو ميپ تك
مهندس استشاري معكافئ للمهندس
رقم الترخيص: ٢٨١٦٣٩٦ رقم التسجيل: ٢٨١٦٣٩٦
رقم الهاتف: ٥١٩١٢٤٩٥٦
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1.2 DEFINITIONS

- A. Where used in this document and accompanying drawings, the following words are defined as listed:
1. "Provide" to furnish, install and connect up complete and ready for safe and regular operation of particular work referred to.
 2. "Install" to erect, mount and connect complete with related accessories.
 3. "Furnish" or "Supply" to purchase, procure, acquire and deliver complete with related accessories.
 4. "Work" labor, materials, equipment, apparatus, controls, accessories and other items required for proper and complete installation.
 5. "Concealed" embedded in masonry or other construction, installed in furred spaces, within double partitions or hung ceilings, in trenches, in crawl spaces or in enclosures.
 6. "Exposed" not installed underground or "concealed" as defined above.
 7. "Indicated," "shown" or "noted" as indicated, shown or noted in the contract documents.
 8. "Similar" or "equal" in materials, weight, size, design and efficiency of specified product.
 9. "Reviewed," "satisfactory," "accepted," or "directed" as reviewed, satisfactory, accepted or directed by or to Engineer.
 10. "Architect," "Engineer," "Project Manager," "Owner," the party or parties responsible for interpreting, accepting and otherwise ruling on the performance under "The Contract."
 11. "This Contract", "The Contract" the agreement covering the work to be performed by "The Contractor."
 12. "The Specifications," "This Section, Part, Division of the Specifications" the documents specifying the work to be performed by "The Contractor."
 13. "Other," "Other Contractor", persons, parties, or trades responsible for work of the project other than "the Contractor".
 14. "Project Manager" or "Construction Manager" is defined as the Owner's authorized representative.

1.3 CODES and STANDARDS

The design, manufacture, testing, and commissioning of various components of the firefighting System shall comply with all currently applicable statutes, regulations, and safety codes in the locality where the equipment will be installed.

Unless otherwise specified, the Fire Alarm System and the components shall conform to the latest applicable relevant NFPA codes and Egyptian Standards:

- a) Egyptian civil defense authority.
- b) Egyptian code for fire protection system.
- c) NFPA 1: Fire Prevention Code.
- d) NFPA 10: Standard for Portable Fire Extinguishers.
- e) NFPA 11: Standard for Low-, Medium-, and High-Expansion Foam
- f) NFPA 12: Standard on Carbon Dioxide Extinguishing Systems
- g) NFPA 13: Standard for the Installation of Sprinkler Systems
- h) NFPA 14: Standard for the Installation of Standpipe and Hose system.
- i) NFPA 15: Standard for Water Spray Fixed Systems for Fire Protection
- j) NFPA 16: Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems
- k) NFPA 20: Standard for the Installation of Stationary Pumps for Fire Protection.
- l) NFPA 22: Standard for Water Tanks for Private Fire Protection.
- m) NFPA 24: Standard for the Installation of Private Fire Service Mains and their Appurtenances

- n) NFPA 30: Flammable and Combustible Liquids Code.
- o) NFPA 72: National Fire Alarm Code
- p) NFPA 101: Life Safety Code.
- q) NFPA 820: Standard for Fire Protection in Wastewater Treatment and Collection Facilities

1.4 ORGANIZATION OF THE WORK

- A. Implement the work called for under this contract simultaneously with the work of other Trades in a manner such as not to delay the overall progress of the project. Be prepared to furnish promptly to other Trades involved at the project all information and measurements relating to the work which they may require. Cooperate with them in order to secure the harmony necessary in the interest of the project as a whole.
- B. Put work in place as fast as possible to meet all construction schedules.
- C. Keep a competent superintendent in charge of the work. Replace such superintendent if unsatisfactory to the Project Manager.
- D. Maintain a complete file of Contract and shop drawings at the Site available for inspection by the Engineer and Project Manager.
- E. Provide every facility to permit inspection or observation of the work by the Engineer during the course of construction.
- F. Be responsible for work until its completion and final acceptance; replace any of the same which may be damaged, lost or stolen, without additional cost to the Owner.

1.5 ACCEPTANCE OF THE WORK

- A. Make all workmanship, equipment and materials supplied under this contract acceptable to the Engineer, who has the power to reject any items, which in their judgment are not in full accordance with the Drawings and Specifications.

1.6 SCOPE OF WORK

M

- A. The Specifications and the accompanying drawings are intended to secure the provisions of all material, labor, equipment, and services necessary to install complete, tested, and ready for operation the FIRE PROTECTION Systems in accordance with the Specifications and Drawings. Provide all systems complete with necessary appurtenances and minor auxiliaries, including offsets to clear interferences and supports, which are not shown but are needed to make each system complete in every respect. Provide all work described in the Specifications and not shown on the Drawings, or vice versa, in complete working order. If mention has been omitted of any item of work or material, necessary for completion of the system, then such items must be and are hereby included.

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رقم الاستشارة: ٣/١٦٤٢

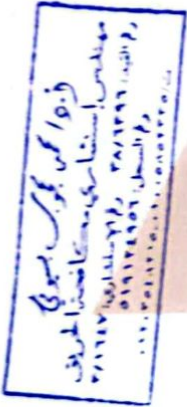
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1.7 EXAMINATION OF EXISTING CONDITIONS

- A. Before submitting a proposal, the Contractor is responsible for visiting the site of the work and becoming thoroughly familiar with all conditions and limitations. The submission of a proposal will be construed as evidence that such an examination has been made, and later claims for labor, equipment or materials required for difficulties encountered which could have been foreseen had such an examination been made will not be recognized.
- B. Verify all grades, elevations, dimensions, and clearances at the site.
- C. Verify existing conditions and bring any discrepancies to the Engineer's attention in writing prior to proposal submission.

1.8 SHOP DRAWINGS AND OTHER INFORMATION REQUIRED

- A. Prior to purchasing equipment or materials, submit a list of proposed manufacturers to the Engineer for approval.
- B. Shop drawings, which are submitted out of sequence or without supplemental information necessary for proper evaluation of the submission are subject to delays in processing.
- C. Shop drawings must bear the General Contractor's stamp certifying:
 1. That he has checked the submitted subcontractor's shop drawings.
 2. That the submitted shop drawing is fully coordinated with all interfacing trades and with other trades where interference may occur.
 3. That the submitted shop drawings are in conformance with the contract documents, except for the following substitutions and/or changes.
- D. Prior to assembling or installing the work, submit the following for review:
 1. Catalog information and factory assembly drawings, as required for a complete explanation and description of all items of equipment.
 2. Field installation drawings, as required to explain fully all procedures involved in erecting, mounting and connecting all items of equipment.
- E. Materials installed or work performed without acceptance of materials is done at the risk of the Contractor, and the cost of removal of such material or work, which is judged unsatisfactory for any reason, is at the expense of the Contractor.
- F. Documents will not be accepted for review unless:
 1. Number of copies and type of paper complies with the requirements of contract "General conditions".
 2. Complete information pertaining to appurtenances and accessories is included.
 3. Submitted as a package where documents pertain to related items.
 4. Properly marked with service or function identification as related to the project, where they consist of catalog sheets displaying other items, which are not applicable.
 5. Properly marked with external connection identification as related to the project where they consist of standard factory assembly or field installation drawings.
- G. Shop drawings and other submissions, which are submitted for review, will be returned with a Shop Drawing stamp indicating actions based on reviews that are made and Contractor's responses that may be necessary. Actions noted regarding "REVIEW" and "RESPONSE" portions of the shop drawing stamp are defined as explained in project General Requirements (Sec.1.1), and Contract General & Special Conditions.



1.9 AS-BUILT DRAWINGS

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- A. Before commencing work, procure complete set of reproducible transparencies of Contract Drawings.
- B. Neatly revise to conform to Record Drawings.
- C. Conspicuously indicate major deviations in Mechanical Equipment Rooms by specific reference to shop drawings of these rooms and provide an accurate and complete record of the work as installed.
- D. Upon completion of work, submit signed and certified reproducible transparencies as As-Built and referenced Shop Drawings, along with marked up prints of Record Drawings, to the Engineer for acceptance.
- E. Submit complete copy on computer diskette, with complete list of contents.

1.10 COORDINATION OF WORK WITH OTHER TRADES

- A. Coordinate the work of this division with the work of all other Contracts and the utility company and so arrange that there will be no delay in the proper installation and completion of any part or parts of each respective work wherein it may be interrelated with that of this Contract so that generally all construction work can proceed without delaying the completion of the project.
- B. Examine contract drawings and specifications for all other trades relating to this project, verify all governing conditions at the site, and become fully informed as to the extent and character of the work required and its relation to other work in the building. No consideration will be granted for any alleged misunderstanding of the materials to be furnished for work to be done.
- C. Scaled and figured dimensions with respect to the items are approximate only; sizes of equipment have been taken from typical equipment items of the class indicated. Before proceeding with work, carefully check all dimensions and sizes and assume full responsibility for the fitting-in of equipment and materials to the building and to meet architectural and structural conditions.
- D. Coordinate work with other disciplines. Confer with other contractors whose work might affect this installation; and arrange all parts of this work and equipment in proper relation to the work and equipment of others, with the building construction and with architectural finish so that this work will harmonize in service, appearance, and function.
- E. Install exposed piping to provide the maximum amount of headroom coordinated with the Architectural drawings above the finished floor. Install piping concealed in areas where hung ceilings or other furred spaces are indicated.
- F. Refer to the Architectural Drawings for ceiling heights, locations and types of hung ceilings and furred spaces.
- G. Furnish to the Trade Contractors for general construction, detailed advance information regarding all requirements related to work under other Divisions and/or Sections. Furnish sizes, accurate data, and locations of any and all pads, pits, chases, sleeves, and slots through floor slabs, walls, foundations, ceilings, roof, and other special openings required for work under this Division.

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1.11 DELIVERY AND RECEIVING

- A. Owner-furnished equipment will be delivered, crated or otherwise packaged to the site delivery point selected by the Project Manager. The Contractor is responsible for accepting delivery of all Owner-furnished items, which are under his trade jurisdiction and place them in their final location.
- B. Where items cannot be immediately placed in their final position, the Contractor is responsible for storing and protecting all Owner-furnished items until the time of their final installation. The contractor is responsible for the care and protection of the items until acceptance by the Owner.
- C. Coordinate delivery of Utility Company furnished equipment with the delivery policy of that company.

1.12 PROTECTION, MAINTENANCE AND PRODUCT HANDLING OF FIRE PROTECTION EQUIPMENT

- A. Deliver and store FIRE PROTECTION equipment/piping at the site properly packed and crated until finally installed. Store materials in spaces as designated by the General Contractor. Investigate each space through which equipment must be moved. If necessary, have equipment shipped from manufacturer in crated sections

of size suitable for moving through restricted spaces.

- B. Adequately protect uninstalled and installed equipment and materials against loss or stealing, damage caused by water, paint, fire, plaster, moisture, acids, fumes, dust or other environmental conditions, or physical damage, during delivery, storage, installation and shutdown conditions. Replace any damaged or stolen material without extra cost to the Owner Except the equipment that has been handed over to the owner or tenants.
- C. Provide effective protection for all material and equipment against damage that may be caused by environmental conditions. Do no work when conditions of temperature in area or moisture on materials or substrates are not in accordance with material manufacturer's recommended conditions for installation.
- D. Maintain all equipment and systems installed, until issuance of the certificate of practical completion. The operation of the equipment by the Owner does not constitute an acceptance of the work. Work will be accepted only after the Contractor has adjusted his equipment, demonstrated that it fulfills the requirements of the Drawings and Specifications, and has furnished all required certificates.
- E. Provide effective protection against damage for all materials and equipment during shipment, and storage at the Project Site. Cover all stored equipment to exclude dust and moisture. Place stored equipment on pallets or racks with appropriate weather cover.
- F. After piping and equipment are installed, cover openings to prevent entrance of water and foreign materials. Close openings with temporary metal or plastic caps.
- G. Protect all rough and finished floors and other finished surfaces from damage, which may be caused by construction materials and methods. Protect floors with tarpaulins, drip pans and oil-proof floor covering. Protect finished surfaces from welding and cutting splatters with baffles and splatter blankets. Protect finished surfaces from paint droppings, adhesive and other marring agents with drop cloths. Protect other surfaces with appropriate protective measures.
- H. Deliver materials to Project Site in manufacturer's original unopened containers with manufacturer's name and product identification clearly marked thereon.
- I. After completion of project, clean the exterior surfaces of equipment furnished in this Division including concrete residue, to the Engineer's satisfaction.



1.13 EQUIPMENT AND MATERIALS

- A. Provide Equipment and Materials required for installation under the specifications, new and without blemish or defect. Provide equipment and materials, which will meet with the acceptance of authorities having jurisdiction over the work. Where such acceptance is contingent upon having the products listed or labeled by Underwriters Laboratories Inc., or other test laboratory, provide products so listed or labeled. Where no specific indication as to the type or quality of material or equipment is indicated, furnish a first class standard article.
- B. Wherever a manufacturer of a product is specified and the terms "other approved" or "approved equal" or "equal" or "similar to" are used, the substituted item must conform in all respects to the specified item, and meet the Engineer's approval. Consideration will not be given to claims that the substituted item meets the performance requirements with lesser construction. Performance as delineated in schedules and in the Specifications indicates minimum performance. In many cases, equipment is oversized to allow for pick-up loads, dating and future loads which cannot be delineated under the minimum performance.
- C. Provide all equipment, piping, valves, etc. of one type (such as pumps) produced by one manufacturer.
- D. Substituted equipment where permitted and accepted must conform to space requirements. Replace at Contractor's expense any substituted equipment that

PIPING AND FITTING MATERIALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- Drawings and general provisions of contract, including general and special conditions, apply to work of this section.
- General provisions for fire protection works applies to work of this Section.
- The requirements of this section apply to equipment specified elsewhere in the specification.

1.2 DESCRIPTION OF WORK

- Work includes providing all labor, supervision, materials, equipment, accessories, services and tests necessary to complete and make ready for operation by the Owner, all piping, fittings and jointing materials for fire protection systems in accordance with Drawings and Specifications.

1.3 QUALITY ASSURANCE

- Manufacturers: firms regularly engaged in manufacture of piping, fittings, and jointing materials of types and capacities required, whose products have been in satisfactory use in similar service for not less than 3 years. Provide products produced by a manufacturer listed as an Acceptable Manufacturer.
- Cast, stamp or roll manufacturer's name on each pipe length, and cast stamp or roll manufacturer's symbol and pressure rating on each fitting.
- Standard Compliance: Comply with requirements of applicable local codes, NFPA 13,14, ASTM, or approved equal and as follows:

Material	Authority
Black Steel Pipe	ASTM A53-Grade "A" schedule 40.
Ductile Iron Pressure Pipe	AWWA C151
Malleable Iron Screwed Fittings-150 lb. Class	ASME B16.3
Malleable Iron Screwed Fittings - 300 lbs. Class	ASME B16.3
Fittings Cast Iron Screwed Fitting	ASME B16.4
Wrought steel schedule 40 welding fittings	ASME B36.10M
Cast Iron Flanged Fittings and Flanges, Standard Weight	ASME B16.1
Ductile Iron Fittings	AWWA C110
High Density Polyethylene (HDPE) Pipe	TUV 8074, TUV8075

1.4 SUBMITTALS

- Product Data: submit manufacturer's data including printed technical literature, installation, instructions, and catalog cuts for each type of pipe and pipe fitting.
- Submit piping schedule showing manufacture, pipe or tube weight, fitting type, and joint type for each piping system.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Steel Pipe

Refer to the attached manufacturer's list

B. HDPE Pipe

Refer to the attached manufacturer's list

2.2 PIPING MATERIALS

A. Black Steel Pipe

1. Pipe: Schedule 40 steel pipe and ASTM A-53.
2. Fittings:
 - a. Standard malleable iron steam pattern fittings with flat band; ANSI B16.3 and B16.9.
 - b. Standard weight steel threaded, weld, flanged or grooved.
3. Joints:
 - a. Red or White lead and oil or other approved compound or Teflon tape on male threads.
 - b. Electric welding using welding rod class 7018 or equivalent.

B. HDPE Pipe

1. Pipe:
 - a. High Density Polyethylene (HDPE) pipe shall comply with TUV 8074 and TUV 8075.
 - b. HDPE pipe and accessories 2" diameter and larger, shall be 160 psi at 73.4°F meeting the requirements of Standard Dimension Ration (SDR) 17 as MINIMUM STRENGTH.
 - c. HDPE pipe and accessories 2" and less in diameter, shall be 160 psi at 73.4°F meeting the requirements of Standard Dimension Ration (SDR) 9 as MINIMUM STRENGTH.

2. Fittings:

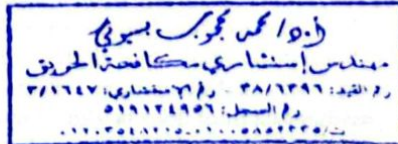
- a. All molded fittings and fabricated fittings shall be fully pressure rated to match the pipe SDR pressure rating to which they are made. All fittings shall be molded or fabricated by the manufacturer. No Contractor fabricated fittings shall be used unless approved by the Engineer. Standard weight steel threaded, weld, flanged or grooved.
- b. All fittings shall be installed using butt-fused fittings, thermo-fused fittings/couplings, or flanged adapters and must be approved by the Engineer. NO size on size wet taps shall be permitted.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General

1. Install pipes and pipe fittings as indicated on the plans and elsewhere in the specifications, in accordance with recognized industry practices which will achieve permanently leak-proof piping



systems, capable of performing each indicated service without piping failure. Install each run with minimum joints and couplings, but with adequate and accessible unions for disassembly and maintenance/replacement of valves and equipment. Align piping accurately at connections, within 1/16" misalignment tolerance.

2. Coordinate as necessary to interface installation of piping, fittings, and jointing with other work
3. Locate piping runs except as otherwise indicated, vertically and horizontally (pitched to drain) and avoid diagonal runs wherever possible. Orient horizontal runs parallel with walls and column lines. Locate runs as shown or described by diagrams, details and notations or, if not otherwise indicated, run piping in shortest route which does not obstruct usable space or block access for servicing building and its equipment. Hold piping close to walls, overhead construction, columns and other structural and permanent-enclosure elements of buildings.
4. Do not run piping through electric rooms, electric spaces, electric closets, or other electrical or electronic equipment spaces unless unavoidable, and specifically indicated on the plans, in which case, install drip pan below and 12" beyond foot print of such piping. Spill drip pan drain on floor of adjacent space where flow will be noticed. Do not spill to a receptacle.
5. Clean exterior surfaces of installed piping system of superfluous materials and prepare for application of specified coatings (if any). During construction, properly cap all lines and equipment nozzles so as to prevent the entrance of sand, dirt, etc. Each system of piping to be flushed prior to testing for the purpose of removing grit, dirt, sand, etc., from the piping for as long as time as is required to thoroughly clean the system.
6. Except for concrete, corrugated metal, hub-and-spigot, clay, and similar units of pipe, provide factory-applied plastic end-caps on each length of pipe and tube. Maintain end-caps through shipping, storage and handling as required to prevent pipe-end damage and eliminate dirt and moisture from inside of pipe and tube. Where possible, store pipe and tube inside and protected from weather. Where necessary to store outside, elevate above grade and enclose with durable, waterproof wrapping. Cap, plug or otherwise close ends of installed piping when not being worked on to prevent the entrance of debris.
7. In erecting pipe, friction wrenches and risers shall be used exclusively, any pipe cut, dented or otherwise damaged shall be replaced.
8. All fittings, unions and connections at pumps, tanks or other major equipment 2-1/2 inches and over in size shall be assembled with flanged joints and approved gaskets.

B. Joints

1. Threaded pipe: In accordance with ANSI B2.1; cut threads full and clean using sharp dies. Ream threaded ends to remove burrs and restore full inside diameter. Apply pipe joint compound, or pipe joint tape (Teflon) where recommended by pipe/fitting manufacturer, on male threads only at each joint and tighten joint to leave not more than 3 threads exposed.
2. Nipples: Any piece of pipe 8 inch in length and less shall be considered a nipple. All nipples with unthreaded portion 1-1/2 inch

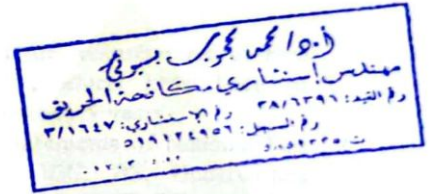
and less shall be extra heavy. All other nipples shall be of weight corresponding to fitting connected. Only shoulder nipples shall be used, close nipples will not be acceptable.

3. Solder: In accordance with recognized industry practice. Cut tube ends squarely, ream to full inside diameter, and clean outside of tube ends and inside of fittings. Apply solder flux to joint areas of both tubes and fittings. Insert tube full depth into fitting, and solder in manner which will draw solder full depth and circumference of joint. Wipe excess solder from joint before it hardens.
4. Weld: pipe joints in accordance with ASME Code for Pressure Piping, B31, and in accordance with recognized industry practice and as follows:
 - a. Weld pipe joints only when ambient temperature is above 0°F (-18°C) where possible.
 - b. Bevel pipe ends at a 37.5° angle where possible, smooth rough cuts, and clean to remove slag, metal particles and dirt.
 - c. Use pipe clamps or tack-weld joints with 1" long welds; 4 welds for pipe sizes to 10", 8 welds for pipe sizes 12" to 20".
 - d. Build up welds with stringer-bead pass, followed by hot pass, followed by cover or filler pass. Eliminate valleys at center and edges of each weld. Weld by procedures which will ensure elimination of unsound or unfused metal, cracks, oxidation, blow-holes and non-metallic inclusions.
 - e. Do not weld-out piping system imperfections by tack-welding procedures; refabricate to comply with requirements.
 - f. At Installer's option, install forged branch-connection fittings wherever branch pipe is indicated; or install regular "T" fitting.
5. Flanged: Match flanges within piping system, and at connections with valves and equipment. Clean flange faces and install gaskets. Tighten bolts to provide uniform compression of gaskets.

3.2 INSPECTIONS AND TESTS

- A. Examine conditions under which piping is to be installed. Notify Construction Manager and Architect in writing of
- B. conditions detrimental to proper completion of the work. Do not proceed with work until unsatisfactory conditions have been corrected.
- C. After installation, and prior to testing, insulating or painting inspect piping in accordance with procedures of ASME B31. Inspect each run of each system for completion of joints, supports and accessory items.
- D. Do not put any systems in operation until they have been tested, inspected, and approved by all authorities having jurisdiction. During the progress of the installation, notify the Owner's representative and the authorities, at least 48 hours prior to such test or inspection. Set up and prepare all tests in advance of scheduled test time. Perform all tests in the presence of a plumbing official.
- E. Submit to Owner signed copies of all test reports and approvals and maintain copy of same at site until acceptance of the work.
- F. During the progress of the work, pressure test the various piping systems including mains, risers, branches and fixture roughing as directed or as required to permit insulation, general construction and built-in rough work to proceed.

- G. Provide all apparatus and temporary work for tests. Take all due precautions to prevent damage to the building or its contents as a result of such test. Pay for all such damage to the building or work of other trades caused by such test. After testing, remove all water to prevent freeze-up.
- H. After testing, remove and/or repair joints as required and retest. No caulking of pipe joints to remedy leaks will be permitted except where lead and oakum joints are used.
- I. Fire Standpipe System: test in full accord with NFPA Code requirements but in no case less than 12 bar hydrostatic pressure for a period not less than two hours.
- J. All HDPE water mains shall be disinfected prior to pressure testing as per ASPA specification.



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FIRE STANDPIPE AND HOSE SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and special Conditions, apply to work of this section.
- B. General Provisions for fire protection Works, applies to work of this Section.

1.2 DESCRIPTION OF WORK

- A. Work Includes: Providing all labor, material, equipment and service necessary to complete and make ready for operation by the Owner, complete automatic Fire & Jockey packaged pump systems in Accordance with drawings and specifications.

1.3 QUALITY ASSURANCE

- A. Manufacturers: Firms regularly engaged in the manufacturer of Fire pump package Systems required, whose products have been in satisfactory use in similar service for not less than 5 years.
- B. Standards Compliance: Comply with the requirements of National Fire Protection Association (NFPA), VDE/DIN, IEC, BS, Underwriters Laboratories Inc. (UL), and Factory Mutual (FM), Local Building and Fire Department rules and regulations.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's catalog data and brochures of equipment, and certification by manufacturers indicating conformance to specific requirements and tests.
- B. Shop Drawings: Submit materials, performance data, pump curves.
Calculation: Submit hydraulic calculations.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

Refer to the attached Manufacture's list

2.2 FIRE HOSE REEL STATION

- A. A single fire cabinet 80x80x30 cm (W*H*L) including a single door. The cabinet door hinges allowing it to swing up to 180°. The thickness of the cabinet material (Epoxy painted black steel) is not less than 1.5mm. The cabinet includes the following items:
 1. 2.5" cast brass angle valve, all polished.
 2. 2.5" cadmium plated steel escutcheon.
 3. 2.5" pressure restricting DSIC. Where required polished brass.
 4. 2.5" fire department hose and nozzle following fire brigade requirements and installed in cabinet.
- B. A single fire cabinet 80x80x30 cm (W*H*L) including a single door. The cabinet door hinges allowing it to swing up to 180°. The thickness

of the cabinet material (Epoxy painted black steel) is not less than 1.5mm.
The cabinet includes the following items:

1. 2.5" cast brass angle valve, all polished.
2. 1" Hose, reel, nozzle and valve installed in cabinet.

2.2 FIRE EXTINGUISHERS

A. Foam (Aqua-jet type)

1. CYLINDER Alloy steel.
2. EXTINGUISHING AGENT Water foam AFFF.
3. PROPELLANT Dehumidified air or N2.
4. VALVE CPF M. 30x1.5, brass body, with anti-corrosion treatment.
5. USE A B F fire rating (solid materials, flammable liquids, cooking oils).
6. BRACKET Wall-mounted for valve, in standard equipment.

B. Dry Chemical (ABC - Multi-Purpose)

1. Heavy duty steel cylinder with red enamel finish replaceable molded valve stem seals, metal valve and siphon tube, with wall bracket UL rating 4A, 60 BC.

C. Carbon Dioxide

1. Heavy duty aluminum cylinder with red enamel finish with wall bracket, UL rating 5BC.

D. Firesearch CO2 extinguishing system

1. Direct pressure operated system.
2. Suitable for fighting flammable liquids and electric fires.
3. Brass valve complete with overpressure safety valve, and pressure regulator.
4. Shell Material: Seamless steel cylinder

PART 3 - EXECUTION

3.1 INSPECTION

- #### A.
- Examine conditions under which the fire standpipes are to be installed. Notify Architect in writing of conditions detrimental to proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- #### A.
- Install fire hose reel station and accessories as indicated in accordance with manufacturer's written instructions, requirements of applicable Standards, and with recognized industry practices to ensure that installation complies with requirements and serves intended function.
- #### B.
- Coordinate as necessary to interface installation of fire standpipe work with other work.

C. Fire Extinguishers

1. Provide fire extinguishers in sizes and quantities so as to ensure the required protection throughout the entire building.
2. Refer to the National Fire Protection Association Pamphlet Number 10, Portable Fire Extinguisher, for design requirements. In general, all public spaces and corridors shall be provided with a 6 kg (13 lbs.) dry chemical multi- purpose fire extinguisher. Location a maximum of 25M (82 feet) from the furthest point of

FIXED WATER SPRINKLERS SYSTEMS

PART 1 -GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and special Conditions, apply to work of this section.
- B. General Provisions for fire protection Works, applies to work of this Section.

1.2 DESCRIPTION OF WORK

A. Work Includes:

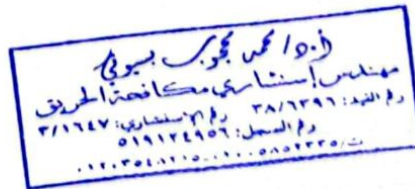
Providing all labor, material, equipment and service necessary to complete and make ready for operation by the Owner, complete automatic fixed water spray systems in Accordance with drawings and specifications.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's catalog data and brochures of equipment, and certification by manufacturers indicating conformance to specific requirements and tests.
- B. Shop Drawings: Submit materials.

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FIRE PUMPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and special Conditions, apply to work of this section.
- B. General Provisions for fire protection Works applies to work of this Section.

1.2 DESCRIPTION OF WORK

- A. Work Includes: Providing all labor, material, equipment and service necessary to complete and make ready for operation by the Owner, complete automatic Fire & Jockey packaged pump systems in Accordance with drawings and specifications.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's catalog data and brochures of equipment, and certification by manufacturers indicating conformance to specific requirements and tests.
- B. Shop Drawings: Submit materials, performance data, pump curves.
- C. Certification
 1. A certified characteristic curve showing the pump performance based upon the results of the factory test.
 2. A plot of engine speed vs. pump capacity over the entire range from shut off beyond 150% of design capacity.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

Refer to the attached manufacture's list.

2.2 AUTOMATIC FIRE PUMPS

- A. Pump: A 750 GPM horizontal split case or end suction, bronze fitted, centrifugal fire pump listed by Underwriters Laboratories and/or approved by Factory Mutual; meeting all the requirements of the National Fire Protection Association Pamphlet #20, standard for the installation of centrifugal fire pumps and acceptable to the authorities having jurisdiction; where installation procedures conflict between NFPA recommendations and the approving authorities, the authority's requirements take precedence.
- B. Pump rating: Total dynamic head (TDH) and electrical characteristics, refer to schedule on drawings.
- C. Suction conditions: 0 pounds per square inch pressure with pump to deliver not less than 150% of rated capacity at a pressure not less than 65% rated head; shut-off pressure not to exceed 120% of the rated pressure.
- D. Include the following accessories for each fire pump:
 1. Eccentric suction reducer
 2. Discharge tee

3. Main relief valve
 4. Test header
 5. Casing relief valve
 6. Overflow cone, enclosed type
 7. Suction and discharge gauges
 8. Coupling guard
 9. Automatic air release valve
- E. Mount the pump and driver on a common baseplate of either cast iron or fabricated steel and direct connect through a flexible coupling protected by a suitable guard.
- F. Provide name and capacity plate with pump.
- G. Electric pump driver: Horizontal foot-mounted ball bearing induction motor, 3 phase, 50 hertz with open drip-proof NEMA enclosure; motor locked rotor current not to exceed the values stated in NFPA #20.

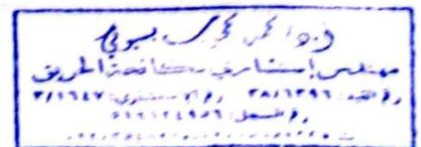
2.3 AUTOMATIC FIRE PUMP CONTROL PANELS

- A. Fire pump controller: Factory assembled, wired and tested unit conforming to all requirements of NFPA Pamphlets #20, Centrifugal Fire Pumps and #70, National Electrical Code with controller Underwriters listed and Factory Mutual approved.
- B. Controller: Combined manual and automatic type designed for wye-delta starting. (Closed transition type.) Housed in a NEMA type 3R rain-tight and weatherproof wall mounted enclosure.
- C. All controller components, including circuit breakers and contacts, to be front mounted, front wired, and front accessible for maintenance; circuit breaker interrupting capacity.
- D. Include the following accessories:
1. Automatic transfer switch
 2. Isolation switch
 3. Circuit breaker
 4. Minimum run timer
 5. Power available lamp
 6. Remote contacts for pump running and power available
 7. Start - stop pushbuttons
 8. Emergency run button
 9. Load shedding
 10. Low suction pressure alarm with remote contacts
- E. Control
1. Starting
 - a. Automatic pressure switch
 - b. Supervisory power failure
 2. Stopping
 - a. Manual

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2.4 DIESEL ENGINE DRIVE

- A. Diesel Engine: conform to NFPA 1247, arranged for automatic operation and include over speed/over crank switch and drive, two contractor switches, low oil pressure and high water temperature warning switches, and fuel shut-off solenoid, with wiring terminating in junction box.
- B. Include following engine accessories:
1. Stub shaft
 2. Oil bath air cleaner
 3. Water cooled exhaust manifold



2.5 JOCKEY PUMPS - VERTICAL

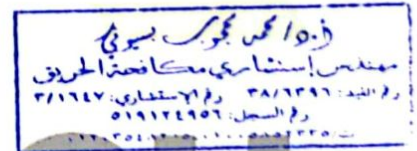
- A. Pumps: A 50 GPM multi-staged vertical having bronze impellers which are pinned for positive driving to stainless steel impeller shafts.
- B. For pump rating, total dynamic head and electrical characteristics, refer to schedule on drawings.
- C. Equip pump with close grained cast iron diffusers with bronze casing rings and with bronze sleeve-type base bearings.
- D. Pump base and motor adapter: cast iron with complete mechanical shaft seals and standard NEMA open drip-proof motors with drip canopies.

2.6 JOCKEY PUMPS CONTROL PANELS

- A. Factory assembled, wired and tested jockey pump controller, UL listed and of the same manufacturer as the main fire pump controller with a full voltage magnetic starter, fusible disconnect switch, "HAND-OFF-AUTOMATIC" selector switch, "START" pushbutton and a pressure switch.
- B. Include the following accessories:
 1. Fused disconnect switch
 2. Across-the-line starter
 3. Hand-off-automatic selector switch mounted on cabinet
 4. Running period timer
 5. Pressure switch with adjustable cut-in and cut-out pressure
 6. Overload heaters
 7. Control circuit transformer
- C. Assemble, wire and test controllers at the factory prior to shipment.

2.7 ALARM DEVICES

- A. Alarming for pump equipment to be wired to the Fire Alarm Panel furnished and installed under another section of the work. Panel to have the following functions:
 1. Fire pump running
 2. Fire main low pressure
 3. Fire pump loss line power
 4. Phase Reversal



PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine conditions under which the packaged fire pump systems are to be installed. Notify consultant in writing of conditions detrimental to proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

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3.2 INSTALLATION

- A. Install packaged fire pump systems and accessories as indicated in accordance with manufacturer's written instructions, requirements of applicable Standards, and with recognized industry practices to ensure that installation complies with requirements and serves intended function.
- B. Coordinate as necessary to interface installation of packaged fire pump systems work with other work.
- C. Provide access space around pumps for service. Provide no less than minimum as recommended by manufacturer.
- D. Decrease from line size with long radius reducing elbows or reducers.

1. 5 DELIVERY, STORAGE, AND HANDLING

A. Preparation For Transport: Prepare valves for shipping as follows:

1. Ensure valves are dry and internally protected against rust and corrosion.
2. Protect valve ends against damage to threads, flange faces, and weld-end preps.
3. Set valves in best position for handling. Set globe and gate valves closed to prevent rattling; set ball and plug valves open to minimize exposure of functional surfaces; set butterfly valves closed or slightly open; and block swing check valves in either closed or open position.

B. Storage: Use the following precautions during storage:

1. Do not remove valve end protectors unless necessary for inspection; then reinstall for storage.
2. Protect valves from weather. Store valves indoors. Maintain valve temperature higher than the ambient dew point temperature. If outdoor storage is necessary, support valves off the ground or pavement in watertight enclosures.

C. Handling: Use a sling to handle valves whose size requires handling by crane or lift. Rig valves to avoid damage to exposed valve parts. Do not use handwheels and stems as lifting or rigging points.

2.1 ACCEPTABLE MANUFACTURERS

Refer to the attached manufacture's list

2. 2 VALVE FEATURES, GENERAL

A. Valve Design: Rising stem or rising outside screw and yoke stems.

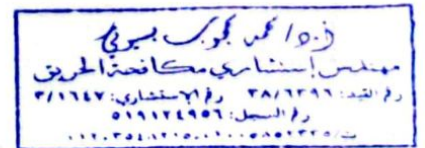
1. Nonrising stem valves may be used where headroom prevents full extension of rising stems.

B. Pressure and Temperature Ratings: As scheduled and required to suit system pressures and temperatures.

C. Sizes: Same size as upstream pipe, unless otherwise indicated.

D. Operators: Provide the following special operator features:

1. Handwheels, fastened to valve stem, for valves other than quarter turn.
2. Lever handles, on quarter-turn valves 150 mm and smaller, except for plug valves. Provide plug valves with square heads; provide one wrench for every 10 plug valves.
3. Chain-wheel operators, for valves 65 mm and larger, installed 1.8 m or higher above finished floor elevation. Extend chains to an elevation of 1.5 m above finished floor elevation.
4. Gear drive operators, on quarter-turn valves 200 mm and larger.



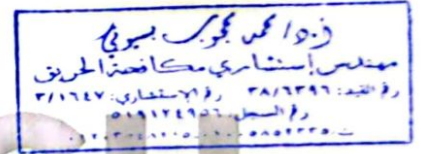
PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine valve interior through the end ports for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks used to prevent disc movement during shipping and handling.
- B. Actuate valve through an open-close and close-open cycle. Examine functionally significant features, such as guides and seats made accessible by such actuation. Following examination, return the valve closure member to the shipping position.
- C. Examine threads on both the valve and the mating pipe for form (i.e., out-of-round or local indentation) and cleanliness.
- D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Check gasket material for proper size, material composition suitable for service, and freedom from defects and damage.
- E. Prior to valve installation, examine the piping for cleanliness, freedom from foreign materials, and proper alignment.
- F. Replace defective valves with new valves.

3.2 VALVE ENDS SELECTION

- A. Select valves with the following ends or types of pipe/tube connections:
1. Copper Tube Size, 50 mm and Smaller: Solder ends, except provide threaded ends for heating hot water and low-pressure steam service.
 2. Steel Pipe Sizes, 50 mm and Smaller: threaded.
 3. Steel Pipe Sizes 65 mm and Larger flanged.



3.3 VALVE INSTALLATIONS

- A. General Application: Use gate, ball, and butterfly valves for shut-off duty; globe, ball, and butterfly for throttling duty. Refer to piping system specification sections for specific valve applications and arrangements.
- B. Locate valves for easy access and provide separate support where necessary.
- C. Install valves and unions for each fixture and item of equipment arranged to allow equipment removal without system shutdown. Unions are not required on flanged devices.
- D. Install three-valve bypass around each pressure reducing valve using throttling-type valves.
- E. Provide manual drain valves at all low points of water piping systems whether shown on the Drawings or not. Drain valves to be gate, ball, or globe valves.
- F. Provide manual or automatic air vents at all high points of water piping systems whether shown on drawings or not. Manual vent valves to be of the gate or globe type.

INSTRUMENTS AND GAUGES

1.1 Pressure and Altitude Gauges

Generally, valued pressure gauges shall be installed at the following location

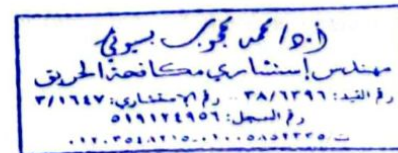
- At each pump discharge and suction, both installed at the height,
 - On system pressurization equipment,
 - On each side of pressure reducing valve sets,
 - On closed expansion vessels,
- Gauges installed on fire protection water piping system shall be provided with gauge cock of straight pattern, ground plug type with lever handle.
 - The pressure gauge range shall be chosen in such a way that the indicator will be situated near a middle position during normal operating conditions. The gauge shall have an adjustable pointer.
 - Gauges shall be burden tube type to BS 1780, 100mm diameter, except those installed in plant rooms which shall be 150mm diameter. gauges shall have enameled mild steel case with chrome bezel, substantial glass face, and phosphor bronze bourdon tube. dial face shall be white with black scale graduation and numbering
 - Gauges shall have overall accuracy of one per cent (1%) of scale range.
 - Gauge shop drawing and gauge shall be approved by the engineer and gauges shall all be of the same manufacture.
 - Gauges shall comply with the following schedule:

1.5	2.5	3.0	4.5	10	(bar)	Pressures
0-3	0-5	0-6	0-10	0-20	(bar)	Gauge range
0.5	1	1	1	2	(bar)	Figure intervals
100	100	100	100	500	(mbar)	Intermediate

1.2 AUTOMATIC AIR VENTS

- Automatic air vents shall only be installed where particularly indicated on the drawings. Vents shall have a float and integral valve plug with seat to discharge chamber. The discharge chamber shall have a tapped port for drain line extension.
- An isolating globe valve shall be installed between the main and the air vent and both shall be pressure rated for the system. Drain lines shall be extended to the nearest open drain.

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- c) Any other internationally recognized body acceptable to Employer/ Engineer. Approval certificates shall be furnished along with the bid.

1.6 General Requirements

- The design construction and operational features of all types of detectors shall be in accordance with relevant standards (The main fire alarm panel must be placed in the security room next to the main gate). The fire alarm system shall be generally as per the schematic diagram and the location of detectors, manual call points, etc., shall be generally as shown in the layout drawings.
- Manual call points where the addressing capability is not an integral part, a separate Addressable interface unit shall be provided.

a) Addressable Fire Alarm Control Panel.

- The panels should be of free-standing floor/wall-mounting consoles as required and made from 16 SWG CRCA sheet steel with dust, damp, and vermin proof construction with neoprene gaskets. The panels shall be designed for IP-54 protection. The panels shall be painted in even baked enamel paint after suitable primer treatment. The panel shall be covered with a glass door with lock and key. The panel shall have a separate external junction box mounted on top of the panel for terminating the cables/conduits. This external junction box shall have suitable size of knockouts for cable/conduit connections. Suitable terminal blocks shall be provided for termination of external cables/wires. The panel shall essentially consist of:
 - a) Fire Alarm System,
 - b) Fault Alarm System and complete with all equipment necessary for the reception, control, monitoring, recording, and relaying of signals originating from the trigger devices and for the activation of fire alarm sounders. The panel shall identify open circuit, short circuit, earth fault, removal or failure of detectors, components or connection failure as a fault and shall provide a fault warning and indication.
- The panel shall be suitable for input supply of 240 Volts +/- 10% A.C. single phase, 50 Hz and 24 V D.C. standby battery supply, in the event of mains failure. The batteries shall be provided in the panel. The standby power shall be provided by means of batteries of sufficient ampere-hour capacity.
- The change over from A.C. main supply to stand by power shall be fully automatic in either direction and shall be instantaneous, uninterrupted. The panel shall provide necessary stabilized D.C. voltage to the individual loop circuits as well as to the internal circuits.

The control panels shall also incorporate the following salient features: -

Fire alarm control panel shall function as a communications interface between Central processing unit and sensors and controlled devices. Control panel shall be intelligent each with its own microprocessor and memory.

- Fire alarm control panel shall have main processor board necessary loop modules for detector loops, alarm output modules for external hooter/lamp, control output modules for various control functions through relay contacts and communication module for interacting with CPU.
- Fire alarm control panel shall have facility to process the input signals and also have facility to control all the input data received from Addressable type detectors/Addressable interface unit located in various loops at different locations and from different field devices/switches.
- Addressable Detectors/manual call point and required field devices in the various areas shall be connected to fire alarm panels by Class A or Class B wiring to the loop module. However, the number of such sensors per loop shall not be more than 125.
- Fire alarm control panel shall have number of electronic filters to ignore false alarm and increase sensitivity to real fires for sensors. The sensitivity of each Addressable detector should be automatically raised if detectors are gradually polluted due to dust and other

particles entering inside the detector. If detectors are more polluted, the control panel shall give warning that the detector needs service. The electronic filters shall recognize the unwanted alarm from detectors due to electrical spikes; pipe smokes etc. and raise the sensitivity limit accordingly.

- The fire alarm control panel shall have optional printer facility to print out the alarm/trouble occurrences with suitable firefighting measures.

Control panel shall also have the following features.

- Logging an alarm, time.
- Status checks of disabled alarm addresses before they are restored.
- Storing of alarms and the possibility of internal organization of alarms.
- Fire control panel shall have facility to brief user guide menu to enable the operator for proper use of various menu functions.
- User's menu structure for carrying various events shall be provided in the fire alarm control panel.
- The fire alarm control panel display shall have facility of brief user guide menu to enable the operator for proper use of various menu functions.
- The control panel shall have facility to set date and time and display the same.
- Each Addressable detector, interface units can be disabled from panel for maintenance purpose and restore the same whenever required.
- The status check of each detector, interface units for alarm, pre-warning, trouble, disabling shall be possible from control panel.
- The control panel shall have memory storage for last 126 events and an alarm counter for number of alarms occurred after the control panel is installed.
- The fire alarm control panel shall have mains on, disable, fault, pre-warning, more alarm (for two or more alarms) LED's and flashing fire signs on front panel.
- Fire alarm control panel shall have the sounder silence, reset, more alarm, push buttons and also push buttons for user menu structures.
- Power supply to the fire alarm control panel shall be 240V, 50 Hz, 1 Ph AC supply & 24V DC battery backup.

b) Addressable Push Button type manual call points.

- Each manual call point unit shall comprise of a push button of approved make with minimum 1 N.O. + 1 N.C. contacts. The push button shall not be shrouded and the same shall be projecting out from the surface of the enclosure. This whole assembly of push button shall again be enclosed in an external cast aluminum enclosure with all side covered except from the front side. The front side shall be sealed with breakable glass cover using neoprene or equivalent gasket. The glass cover shall be fixed in such a way that the actuating push button is kept depressed (with 'N.C.' contact closed and 'N.O.' contact opened) so long as the glass cover is intact. In case of fire, when glass cover is broken to give fire warning, the push button shall be released due to spring action hence giving remote fire alarm through the 'NO' contact which has now changed over.

The enclosure shall be completely dust, damp, weather and vermin proof with IP 65 protection.

- The complete unit shall be suitable for wall/column mounting with necessary surface/recess mounting accessories as required.
- The complete unit and the push button shall be painted 'Signal Red' (Shade No. 537 as per IS: 5). the internal surface shall be painted with 'White' Color.
- Clear inscription reading (in English) and in specified vernacular language "FIRE ALARM - IN CASE OF FIRE, BREAK GLASS" shall be provided for each manual call point unit, either on the enclosure or on a separate metal plate mounted behind the glass cover. In addition to this, a "RED" Lamp response indicator is provided which will light up on the actuation of the Manual call point to help to locate the Manual Call Point station that is operated



Each manual call point unit shall be provided with the following accessories: -

- An iron hammer of sufficient weight, which could be used to break the glass cover. The iron hammer shall be suspended on a hook fixed to the enclosure by means of a non-corrodible iron chain of sufficient length and ply to facilitate easy breaking of the glass cover.
- The enclosure shall have provision for conduit entries/ cable glands at 2 places of 2 core 1.5 Sq mm PVC armored cable.
- An identification number (on a number plate) shall be provided for which each push button station will be same as the number given to the fire alarm indicating point on the remote fire alarm indicating panel. The details of numbering scheme will be intimated later.

c) Addressable Electronic sounder.

- These should be wall/ceiling mounted, electronic speakers with solid state circuitry with 2-tone system (viz. alert and evacuation working on 24V D.C). The sound should be distinct and against background noise with an audible range of at least 30 Meters in an interior of office etc. These speakers shall be suitable for fire alarm signal.

d) Addressable type Smoke detectors

- Plug in type Addressable Photo electric-light scattering based Smoke detectors with detector mounting base & required accessories: Optical Smoke detectors shall respond quickly to optically dense smoke (light white smoke), It's sensitivity shall be set through the Fire Alarm Control Panel and Sensitivity may be automatically adjusted by the panel on a time-of-day basis. Using software in the FACP, detectors shall automatically compensate for dust accumulation and other slow environmental changes that may affect their performance.

e) Addressable type Heat detectors

- Plug in type Addressable Heat Detector with detector mounting base & required accessories: The Thermal (heat) detector shall be rate of rise temperature type. It shall use thermistor and microprocessor technology to provide an alarm when the rate of rise in temperature exceeds 10°C/minute (typical) or if the temperature exceeds a threshold of around 68°C.

f) Cables and wiring (including EMT conduit).

1) Type:

- A 2*1.5mm² multi standard copper wiring shall be with plain annealed copper conductor, PVC insulated, PVC sheathed construction. The conductors of cable shall be solid circular type.
- All wiring shall be run inside EMT conduit made from mild strip galvanized steel to insure corrosion resistance.

2) Rating

- The wires shall be rated for 1100 Volts.

3) Core Identification

- Cores shall be provided with the standard color scheme of PVC insulation conforming to relevant standards.

4) Circuit Ratings

- The current rating shall be based on the following conditions:
 - c) Maximum conductor temperature : 70 Degree C.

- d) Ambient Air Temperature : 45 Degree C.
e) Ground Temperature : 30 Degree C.
f) Depth of Lying : 750 mm

5) Storing, Laying, Jointing and Terminations

1. Storing:

- On receipt of cables/wires at site, the cables shall be inspected and stored in a safe location.

2. Laying

Cables/Wires shall be laid as per the specifications given below: -

- Cable Laid Indoors

Cable shall be laid in indoors wherever specified. Suitable clamps, hooks and saddles shall be used for securing the cables in position. Spacing between the cables shall not be less than 200 mm center to center. All concealed wiring shall be inside 25 mm HGMS conduit of reputed make.

3. Jointing and Terminations

Cable jointing shall be done as per the recommendation of the cable manufacturer. Jointing shall be done by qualified cable jointers. Each termination shall be carried out using brass compression glands and cables sockets. Hydraulic crimping tool shall be used for making the end terminations. Cable gland shall be earthed by using suitable size G.I. wire/tape.

Junction boxes shall be constructed of code gauge sheet galvanized steel with lockable covers, keyed to the fire alarm panel or C346A for municipal terminations, and painted red. Boxes shall be secured in position independently of conduits entering them. Boxes shall be installed so they are accessible. All terminations shall be made on screw terminals and labeled to the satisfaction of the Coordinator of Alarms, URI.

Instruction Manual and Drawings:

- Manufacturer shall supply three sets of instruction manual detailing all the circuit diagrams, component, specifications, operational instructions, routine and periodical test methods and Frequencies.

رئيس استشاري مكاتبة الحرف
مهندس استشاري مكاتبة الحرف
رئيس القسم: ٥٨١٧٩٥٦
رقم التليفون: ٣٨١٢٢٤٦
رقم الفاكس: ٥٨١٧٩٥٦
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زواي كمي بكونك بصوتك

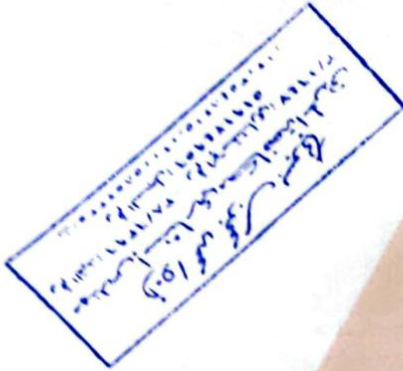
MEP TECH

Vendor List

ITEM	PRODUCT	MANUFACTURER	ORIGIN
1	FIRE PUMPS	PATTERSON	USA
		SKS	ITALY
		WATEX	UAE
		OMEX	USA
		FAIR GUARD	USA
		ARMSTRONG	USA
		MARSH	USA
		NAFFCO	UAE
		STANDART	TURKEY
		PEERLESS	USA
		KSP	GERMANY
		SFFECO	UAE

مهندسين استشاريين مكافئين لخبرتهم
رقم الترخيص: ٣٨١٢٤٩٦ - رقم الاستشارة: ٢١١٦٤٧
رقم السجل: ٥٨١٢٤٩٥٦

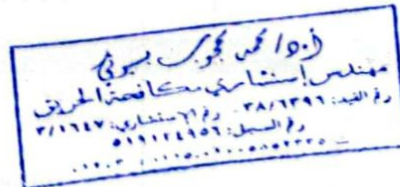
		MAS	TURKEY
		BRISTOL	UAE
		EBITT	TURKEY, HUNGARY, UAE
		OR EQUIVALENT	
2	FIRE HOSE CABINET	BAVARIA	EGYPT
		CROKER	USA
		POTTER ROEMER	USA
		NAFFCO	UAE
		SFFECO	UAE
		SRI	MALAYSIA
		MASRY GROUP	EGYPT
		WATANIA	EGYPT
		ANGUS FIRE	UK
		NOHA	ARGENTINA
		EZULA	CANADA
		RAPIDROP	UK
		OR EQUIVALENT	
		3	Water spray Nozzles or sprinklers
HDS	INDIA		
VIKING	USA		
RAPIDROP	UK		
OR EQUIVALENT			
4	VALVES	KENNEDY	USA
		NIBCO	USA
		MULLER	USA
		FIRE WALL	USA
		WEFLO	UK
		TYCO	USA
		POTTER ROEMER	USA
		SHIELD	UK,UAE
		SRI	MALAYSIA
		RAPIDROP	UK
		EZULA	CANADA
		GALA	USA
		OR EQUIVALENT	
		5	AUTOMATIC AIR VENT
CLA-VAL	ITALY		
VALMATIC	USA		
WATTS	USA		
6	FIRE EXTINGUISHERS	OR EQUIVALENT	
		BAVARIA	EGYPT
		METEORY	EGYPT
		NAFFCO	UAE
		SFFECO	UAE
		BRISTOL	UAE
7	SEAMLESS BLACK STEEL PIPES	INTERPIPE	UKRAINE
		JASCO	KSA
		MECH	CHINA
		SHIELD	UK
		U.S PIPE	UAE
		NAYLOR PIPE	USA




٢- جداول الكميات

MEP TECH

Engineering Consulting and Contracting



جداول الكميات - BILL OF QUANTITIES					
PROJECT NAME: مصنع تصنيع الاعمال الحديدية					
LOCATION: بمدينة العاشر من (A6) بالمنطقة الصناعية					
رمضان					
Ref.	DESCRIPTION	Unit	Quantity	Unit Price LE	Amount LE
FIRE FIGHTING					
General note:					
The contractor is responsible for the quality of all BOQ works and it is mandatory for him to catch out the civil defense compliance certificate.					
1	FIRE WATER PUMPS Supplying, installing, testing and commissioning fire pump set as follows: Electric Fire Pump: • Horizontal split case or End suction fire electric pump , 750GPM, 9 BAR. • Electric motor . • Control Panel . • Accessories: Two Gate valves – Check valve – Suction and delivery pressure gauge – Casing relief valve – Flexible joints. Diesel Fire Pump: • Horizontal split case or End suction fire diesel pump , 750GPM, 9 BAR. • Diesel engine , including batteries, fuel system and direct reading fuel gauge. • Control Panel . • Accessories: Gate valves – Check valve – Suction and delivery pressure gauge – Pressure relief valve – Air vent – Flexible joints. Jockey Pump: • Vertical multi-stage pump , 50 GPM, 9.5 BAR. • Electric motor. • Control Panel . Including suitable electric cables & civil work for pump set concrete base and metal canopy.	LS	1		
2	Drainage Submersible Pumps: Supplying, installing, and commissioning of submersible drainage pump from Grundfos or equivalent for pump room and water tank drainage, vertical centrifugal end suction type, electrical float type control for automatic operation, c/w all hookup valves, check valves, isolating valves.				

فدوا محمد بركات محمد
مهندس استشاري مقاولات الحرف
رقم ترخيص: ٢٨١٣٣٦٦
رقم سجل: ١١١٢٤١٥٦
١١١٢٤١٥٦

MEP TECH
Engineering Consulting and Contracting

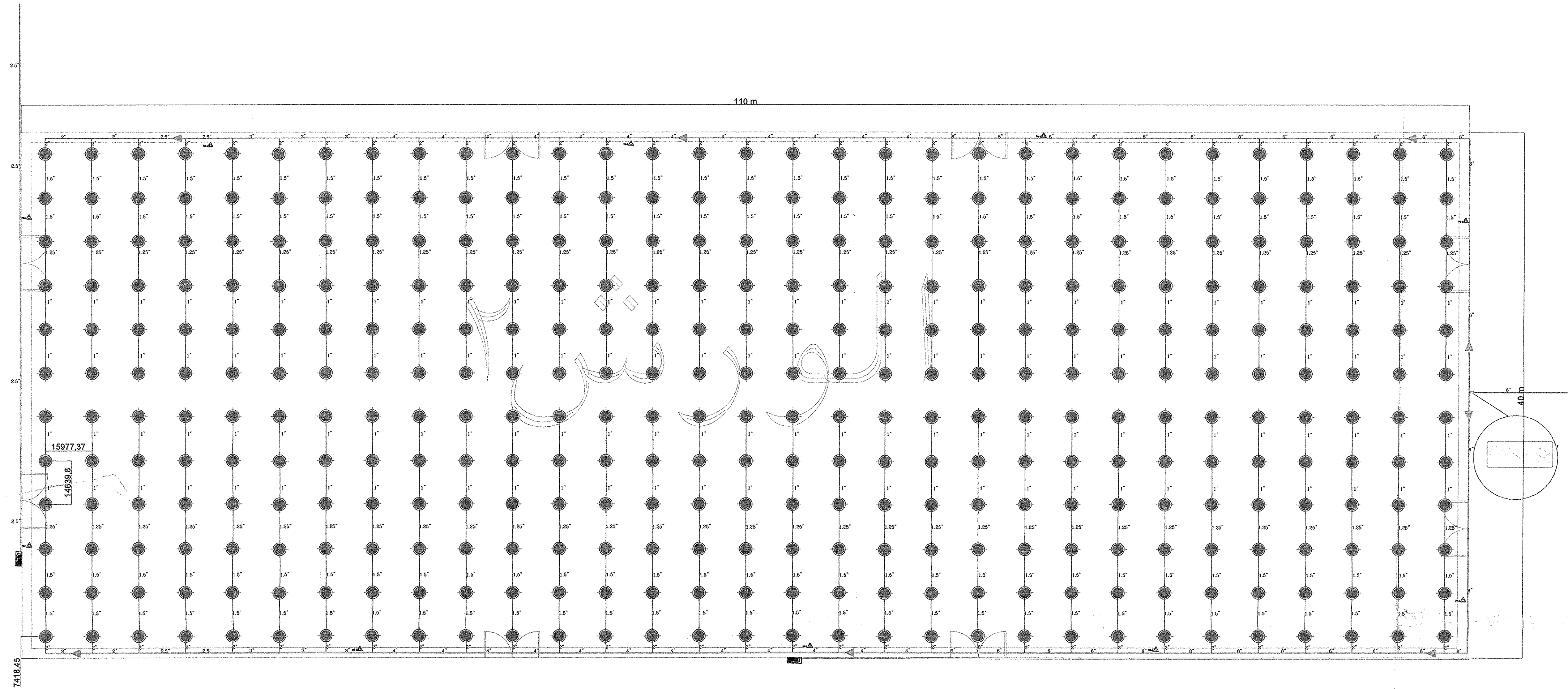
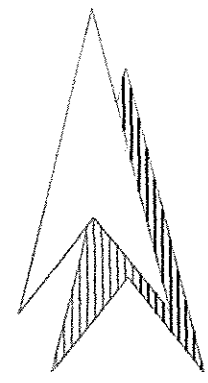
	discharge line to the nearest drain point, driving electrical motors, power and control panel, electrical wiring cables, cable trays, all fittings and accessories required for proper system operation.				
2.1	submersible pump Q=20m ³ /h - H=15m	No.	2		
3	FIRE WATER PIPES (ABOVE GROUND)				
	Supply, installing, testing and commissioning of underground and above ground seamless black steel or ERW fire protection piping system, including pipes, valves, fittings, supports, hangers, sleeves, inner painting (primer and 2 coating painting) and all required couplings and adapters all as per A.S.T.M. A-53 schedule 40 all as specified and as shown in drawings, NFPA.				
3.1	1" nominal diameter.	m	1980		
3.2	1.25" nominal diameter.	m	924		
3.3	1.5" nominal diameter.	m	1470		
3.4	2" nominal diameter.	m	438		
3.5	2.5" nominal diameter.	m	648		
3.6	3" nominal diameter.	m	150		
3.7	4" nominal diameter.	m	474		
3.8	6" nominal diameter.	m	1632		
4	FIRE WATER PIPES (UNDERGROUND)				
	Supplying, installing, connecting, excavation, backfilling with compact layers and testing of High-Density Polyethylene (HDPE) pipes for whole underground fire water piping system. All fittings must be made from HDPE material and the valves must be compatible with the HDPE pipes and fittings. All HDPE pipes, valves and fittings must be PN 16. Including cutting, welding, fixing by suitable supports and all accessories, etc., as per drawings, NFPA.				
4.1	2.5" nominal diameter.	m	162		
4.2	4" nominal diameter.	m	108		
4.2	6" nominal diameter.	m	396		

ذو احمد محمد بسيوني
مهندس استشاري مقاولات الحريق
رقم الترخيص: ٣٨١٦٣٩٦ - رقم الاستشارة: ٧١١٤٧
رقم الهاتف: ٠١٩١٢٤٩٥٦
رقم الجوال: ٠١٠٠٠٠٠٠٠٠٠٠٠

5	AIR VENTS				
5.1	Supply, installing, test and commissioning 1 in' diameter automatic air vent (UL & FM) and all accessories as per drawings and according to NFPA.	No	2		
6	DRAINS				
6.1	Supply, installing, test and commissioning 2 in' diameter drain valve (UL & FM) and all accessories as per drawings and according to NFPA.	No.	5		
6.2	Supply, installing, testing and commissioning of galvanized steel nominal diameter of 2" for firefighting drain with all accessories as per drawings and according to NFPA	m	60		
7	GATE VALVE & Check Valve				
	Supply installation, testing and commissioning of OS & Y Gate UL Listed / FM Approved. The valve shall be with companion flanges, Brass stem, hand wheel, PTFE gasket including fully open /close indicator through potential free contact.				
7.1	OS & Y Gate Valve 6"	No.	5		
8	Control & Monitoring Zone				
	Supply installation, testing and commissioning of Control & Monitoring Zone OS & Y Gate check valve, tamper switch, flow switch and all accessories				
8.1	Control & Monitoring Zone 6"	No.	4		
9	SIAMESE CONNECTION				
9.1	Supply, installing, test and commissioning of of a Siamese connection (firefighters' connection) to be used by local firefighting vehicles, diameter 4" * 2.5" * 2.5" complete with a swing check valve and OS&Y gate valve of UL FM approved type.	No.	2		
10	FIRE HOSE CABINET				
10.1	Supply, installing, test and commissioning of fire hose cabinet not less than 1.5mm thickness including 30 m rubber hose reel 1 in. diameter, 2.5 in. diameter landing valve, 30 m textile hose with multi-purpose ejector, 2.5 in. diameter ball valve for maintenance, supports and all accessories as per drawings and according to NFPA.	No.	32		

فواكس
مهندسين استشاريين
والقانونيين
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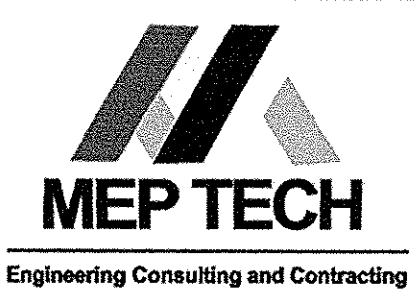
الشمال



SYMBOL	DESCRIPTION
FIRE FIGHTING	
FP	SUPPLY WATER MAIN PIPE above ground
FP	SUPPLY WATER MAIN PIPE under ground HDPE
FHC	FIRE HOSE CABINAT 2.5"
FHC	FIRE HOSE CABINAT 1" & 2.5"
FE-01	6kg POWDER FIRE EXTINGUISHER
	45R FIRE EXTINGUISHER
	6kg CO2 FIRE EXTINGUISHER
Z.C.V	zone control valve
	WATER DIRECTION
	GATE WAVE
	UPRIGHT SPRINKLER

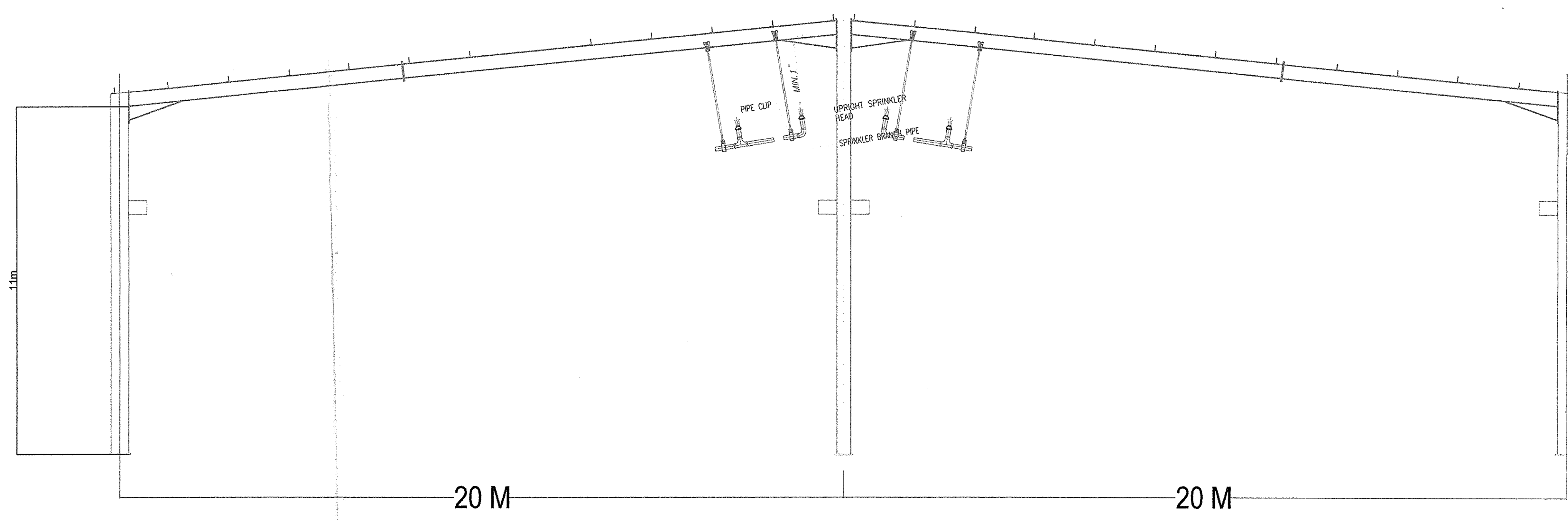
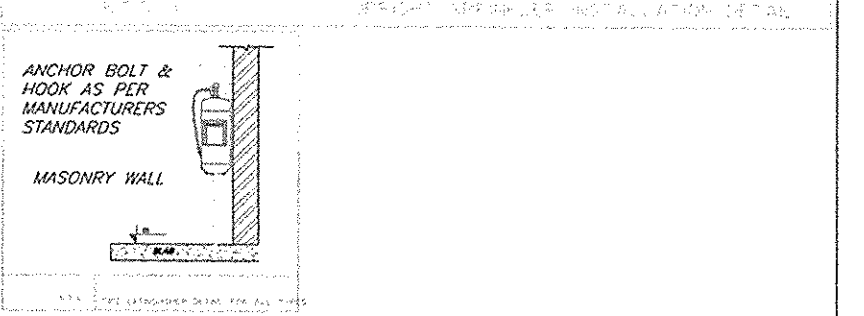
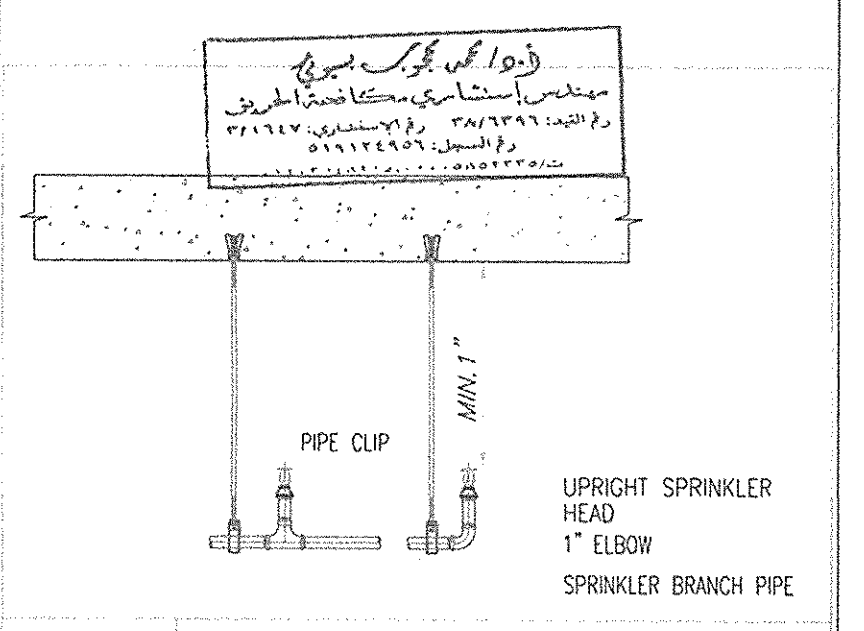
المشروع
مصنع تصنيع المعادن بالمنطقة الصناعية
بمدينة العاشر من رمضان
قطعة رقم ٩٢-٩٢

المالك
الشركة الجورسيديية للاعمال الهندسية
والانشاءات البحرية



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SCALE	DESIGNED BY	A.R.G	DATE	Rev.
	DRAWING BY	A.R.G		
	APPROVED		DRAWING NAME	
			مكافحة حريق الورش	



20 M

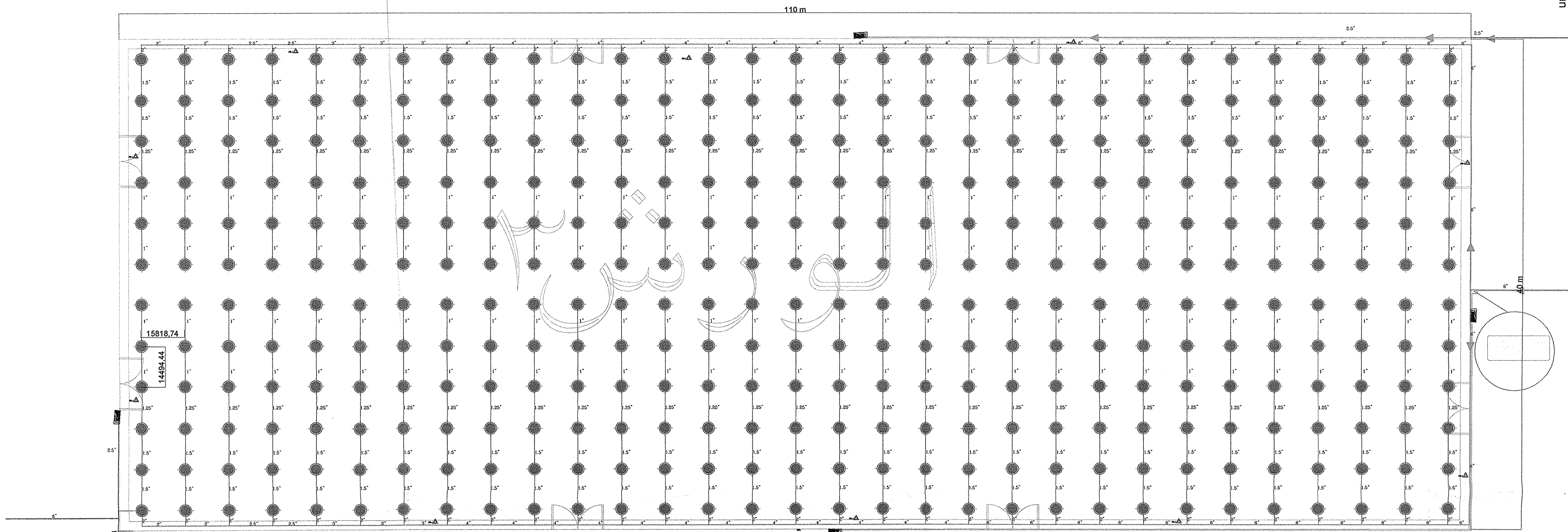
20 M

1m

7418.45



under ground



SYMBOL	DESCRIPTION
FIRE FIGHTING	
FP	SUPPLY WATER MAIN PIPE above ground
FP	SUPPLY WATER MAIN PIPE under ground HDPE
FHC	FIRE HOSE CABINAT 2.5"
FHC	FIRE HOSE CABINAT 1" & 2.5"
FE-01	8kg POWDER FIRE EXTINGUISHER
	45H FOAM FIRE EXTINGUISHER
	6kg CO2 FIRE EXTINGUISHER
Z.C.V	zone control valve
	WATER DIRECTION
	GATE VALVE
	UPRIGHT SPRINKLER

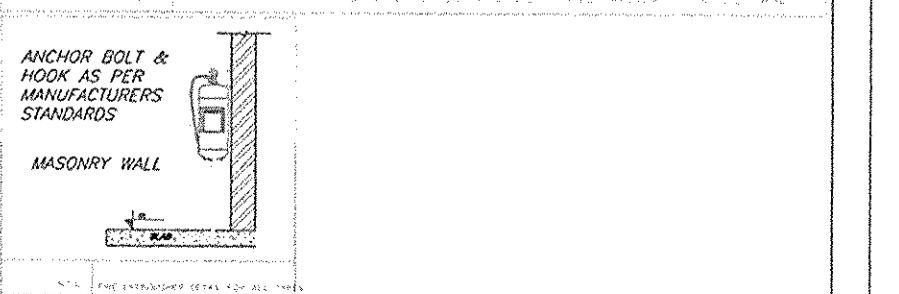
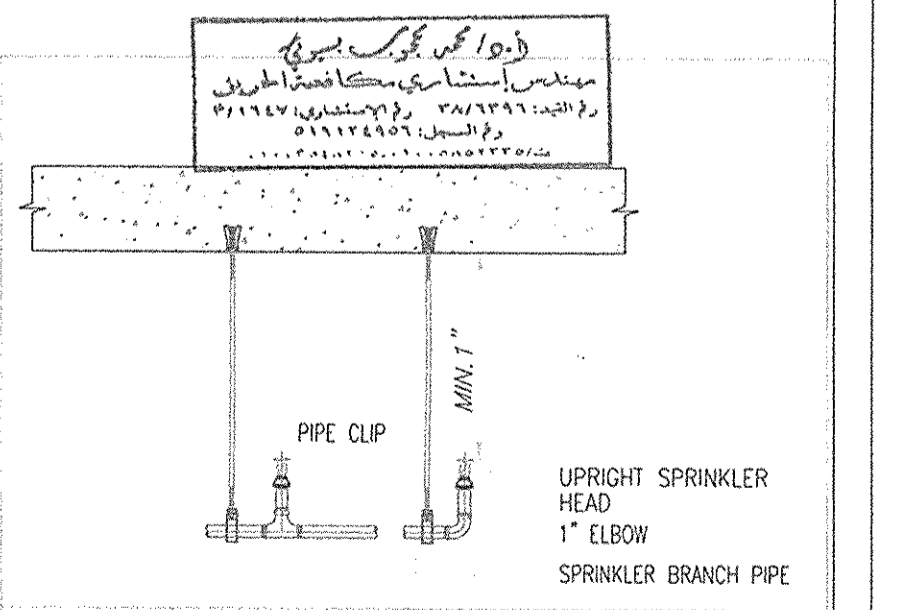
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بمدينة العاشر من رمضان
قطعة رقم ٩٢-٩٢

المالك
الشركة اليورسيديت للاعمال الهندسية
والانشاءات البحرية

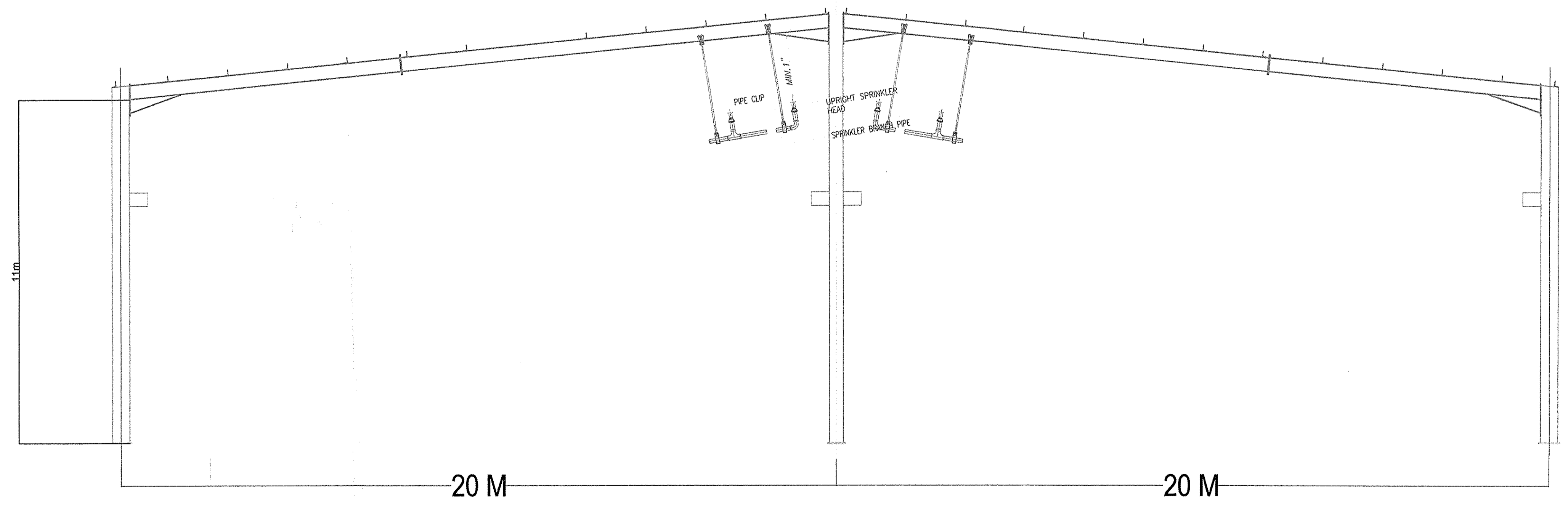


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	APPROVED		DRAWING NAME	
			مكافحة حريق الرشاش	

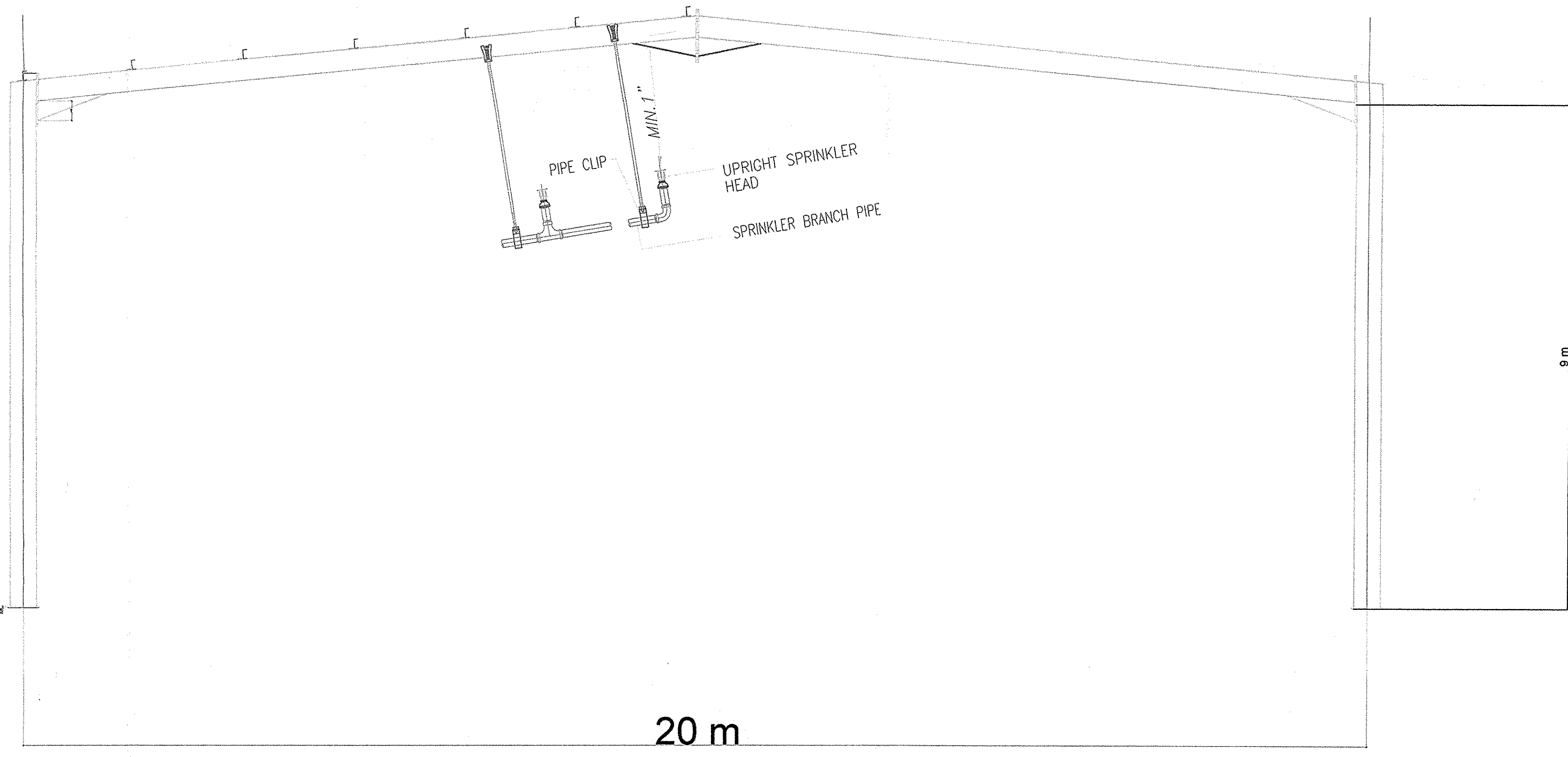
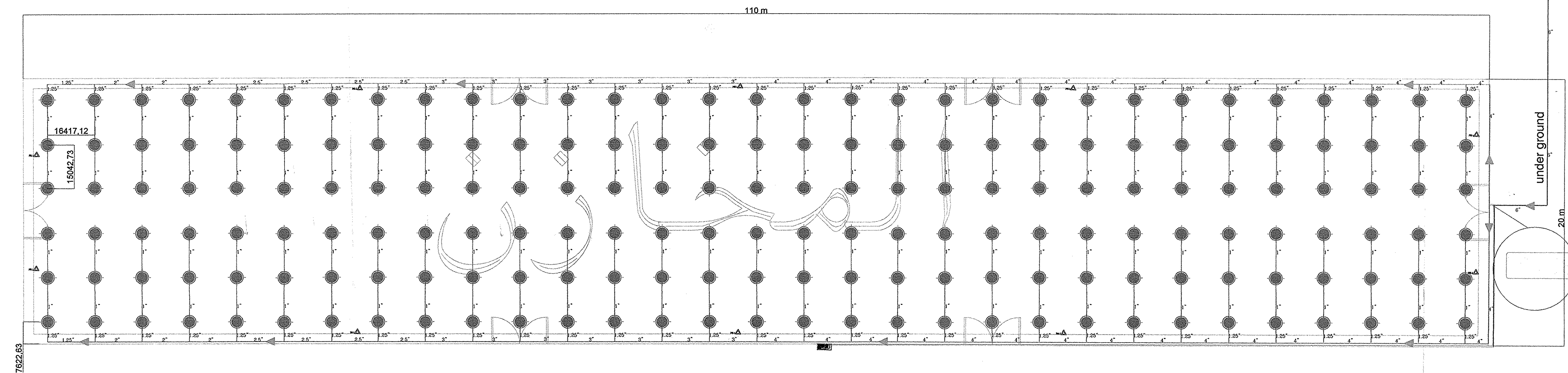
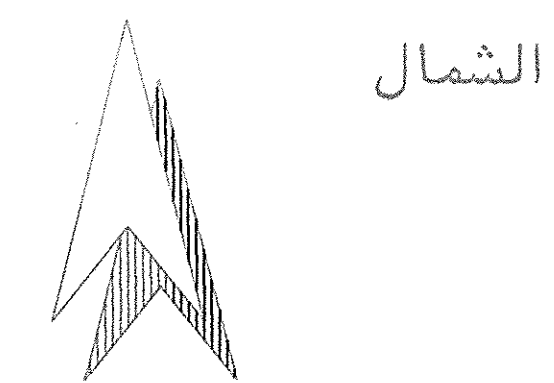


under ground



20 M

20 M



SYMBOL	DESCRIPTION
FIRE FIGHTING	
FP	SUPPLY WATER MAIN PIPE above ground
FP	SUPPLY WATER MAIN PIPE under ground HDPE
FHC	FIRE HOSE CABINAT 2.5"
FHC	FIRE HOSE CABINAT 1" 2.5"
FE-01	6kg POWDER FIRE EXTINGUISHER
	45H FOAM FIRE EXTINGUISHER
	6kg CO2 FIRE EXTINGUISHER
Z.C.V	zone control valve
	WATER DIRECTION
	GATE VALVE
	UPRIGHT SPRINKLER

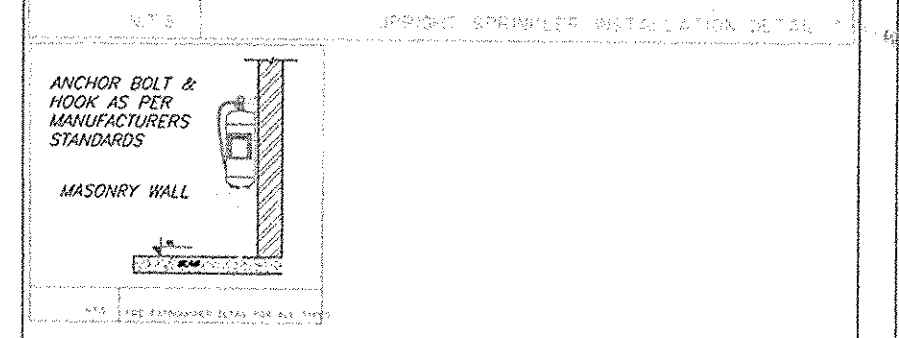
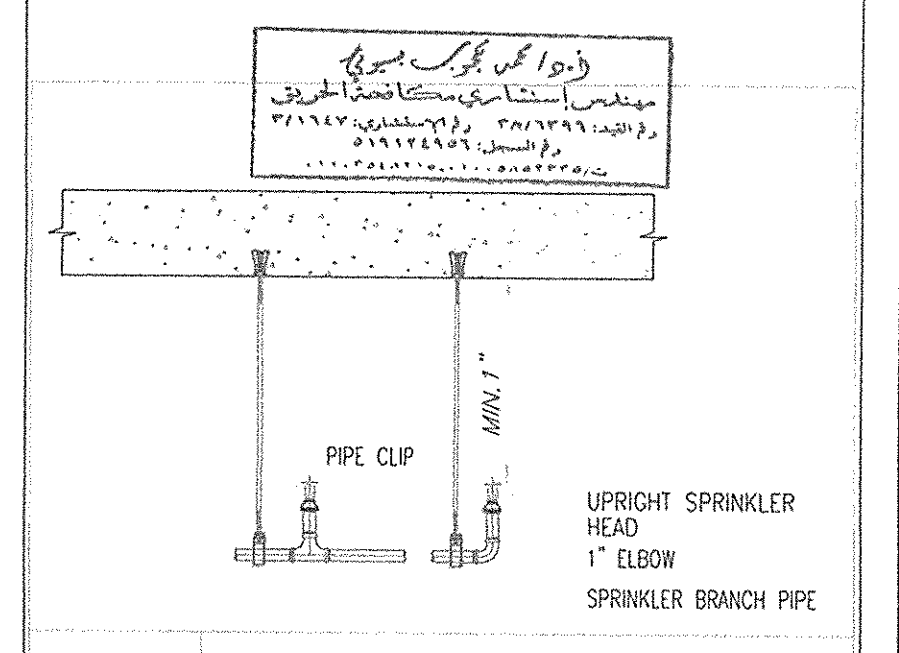
المشروع
مصنع تصنيع المعادن بالمنطقة الصناعية
بمدينة العاشر من رمضان
قطعة رقم ٩٢-٩٣

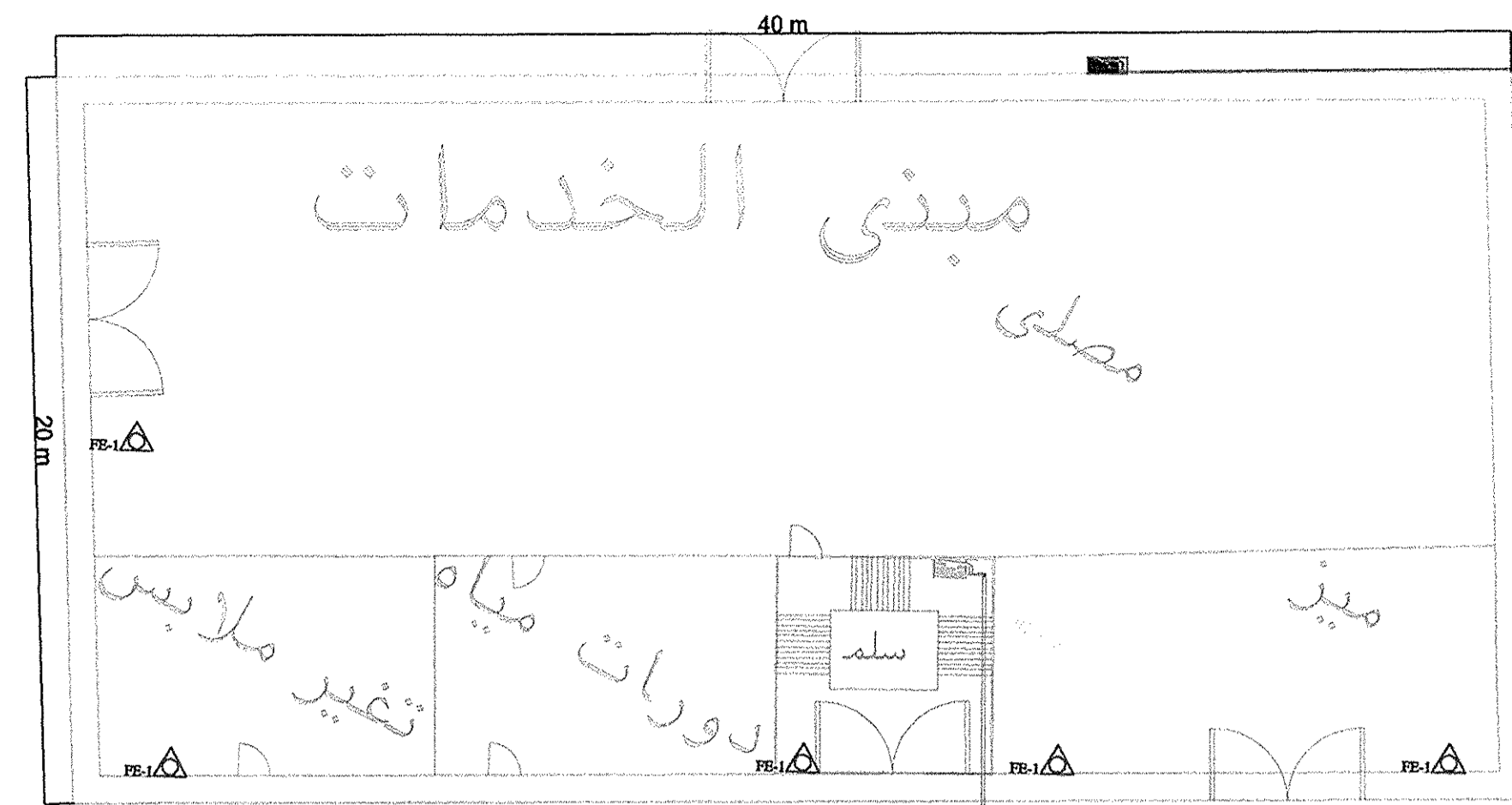
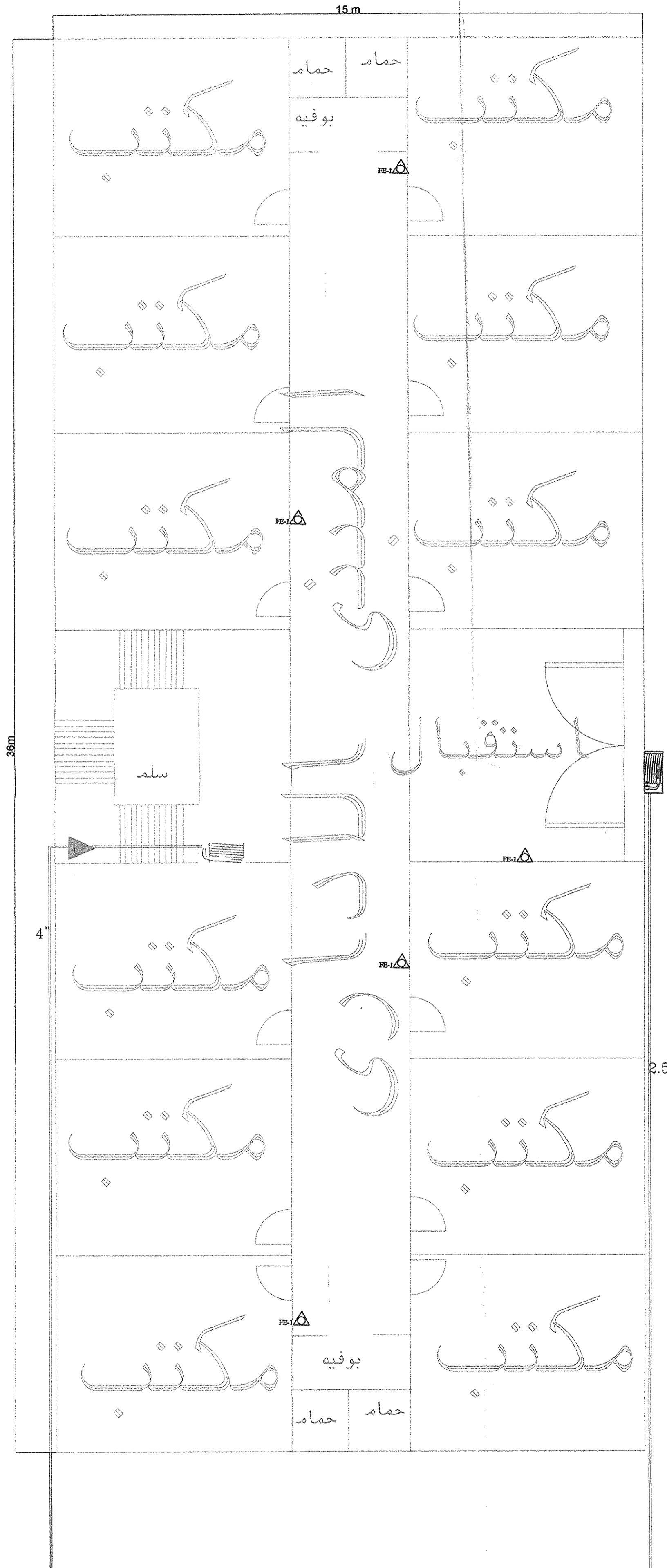
المالك
الشركة البورسعيدية للاعمال الهندسية
والانشاءات البحرية

MEP TECH
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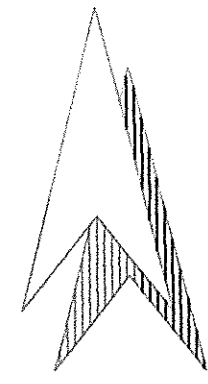
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	APPROVED		DRAWING NAME	
			مكافحة حريق المخازن	





الشمال



SYMBOL	DESCRIPTION
FIRE FIGHTING	
FP	SUPPLY WATER MAIN PIPE above ground
FP	SUPPLY WATER MAIN PIPE under ground HDPE
FHC	FIRE HOSE CABINET 2.5"
FHC	FIRE HOSE CABINET 1" & 2.5"
FE-01	6kg POWDER FIRE EXTINGUISHER
	45kl FOAM FIRE EXTINGUISHER
	6kg CO2 FIRE EXTINGUISHER
Z.C.V	zone control valve
	WATER DIRECTION
	GATE WAVE
	UPRIGHT SPRINKLER

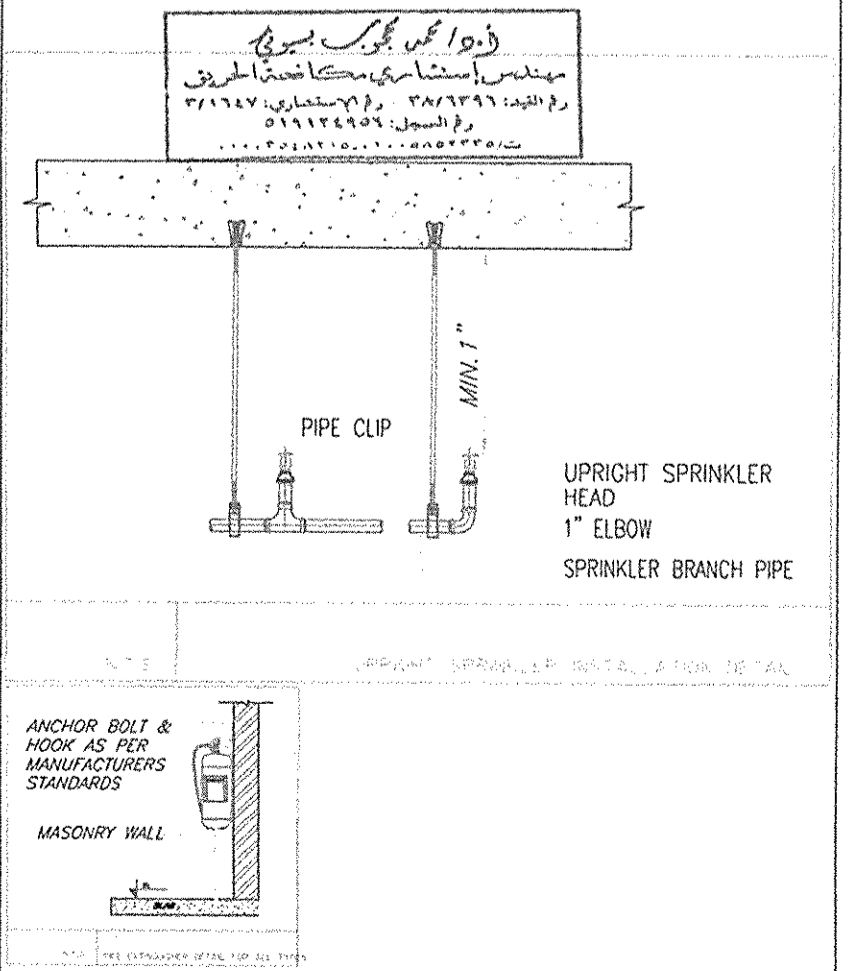
المشروع
مصنع تصنيع المعادن بالمنطقة الصناعية
بمدينة العاشر من رمضان
قطعة رقم ٩٢-٩٣

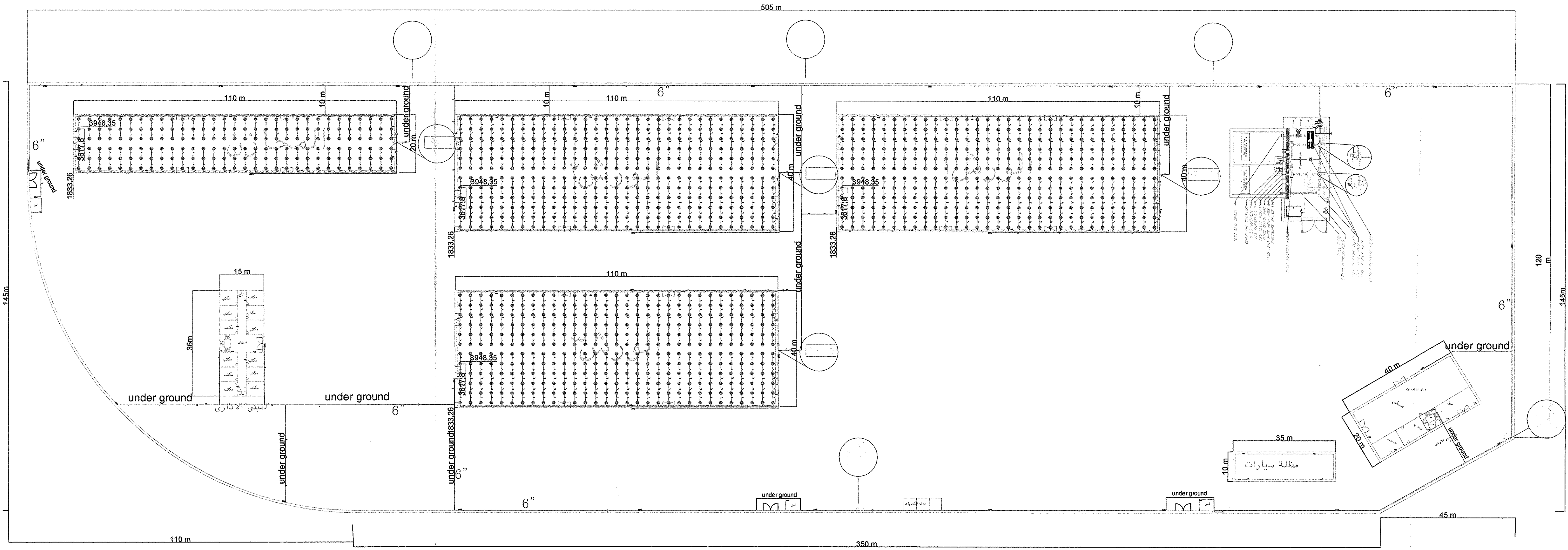
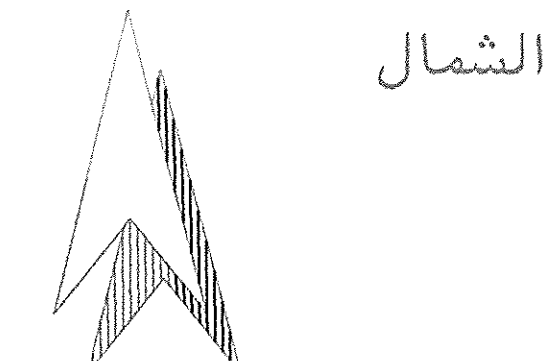
المالك
الشركة البورسعيدية للاعمال الهندسية
والانشاءات البحرية



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info@mepotech-eg.com

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	APPROVED		DRAWING NAME	
			مكافحة حريق المبنى الادارى ومبنى الخدمات	

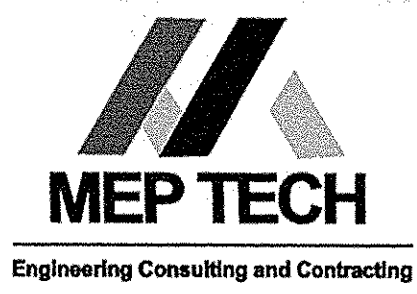




SYMBOL	DESCRIPTION
FIRE FIGHTING	
FP	SUPPLY WATER MAIN PIPE above ground
FP	SUPPLY WATER MAIN PIPE under ground HDPE
FHC	FIRE HOSE CABINAT 2.5"
FHC	FIRE HOSE CABINAT 1" & 2.5"
FE-01	6kg POWDER FIRE EXTINGUISHER
	45lit FOAM FIRE EXTINGUISHER
	6kg CO2 FIRE EXTINGUISHER
Z.C.V	zone control valve
	WATER DIRECTION
	GATE WAVE
	UPRIGHT SPRINKLER

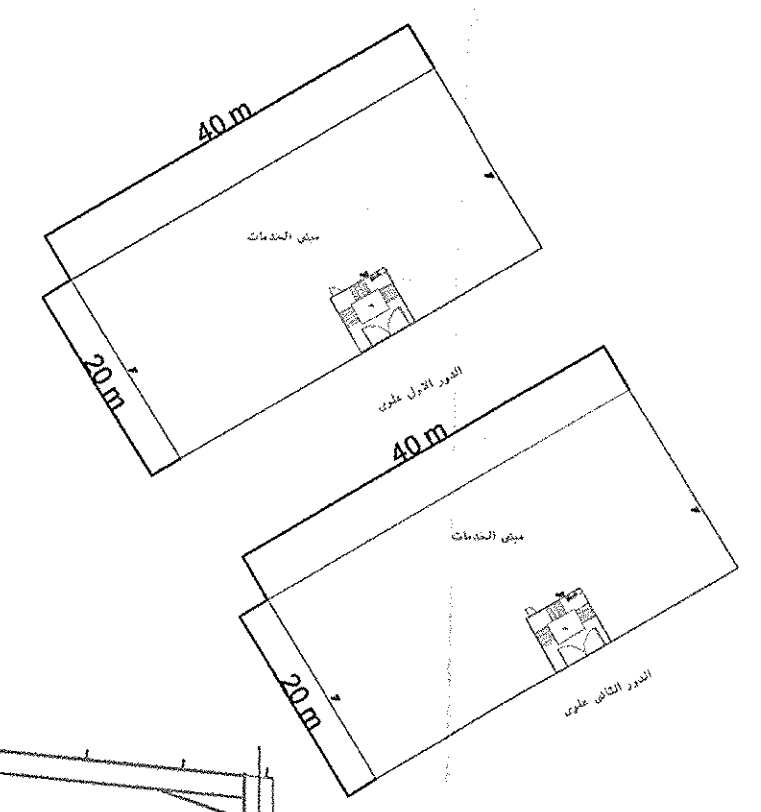
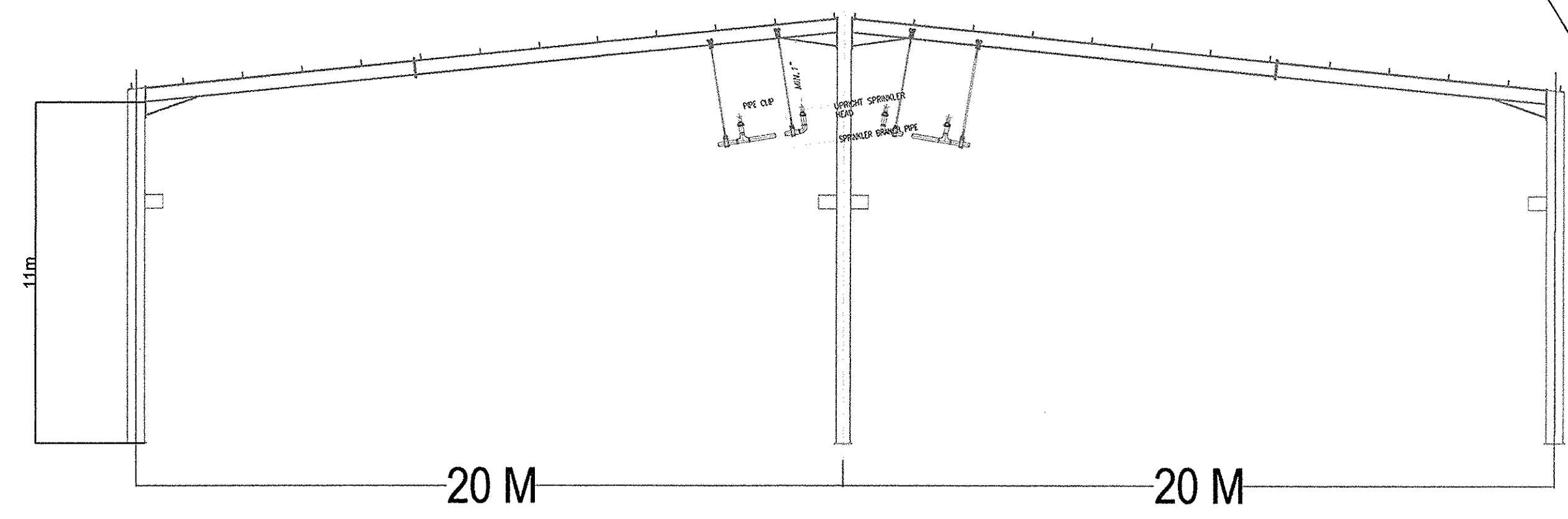
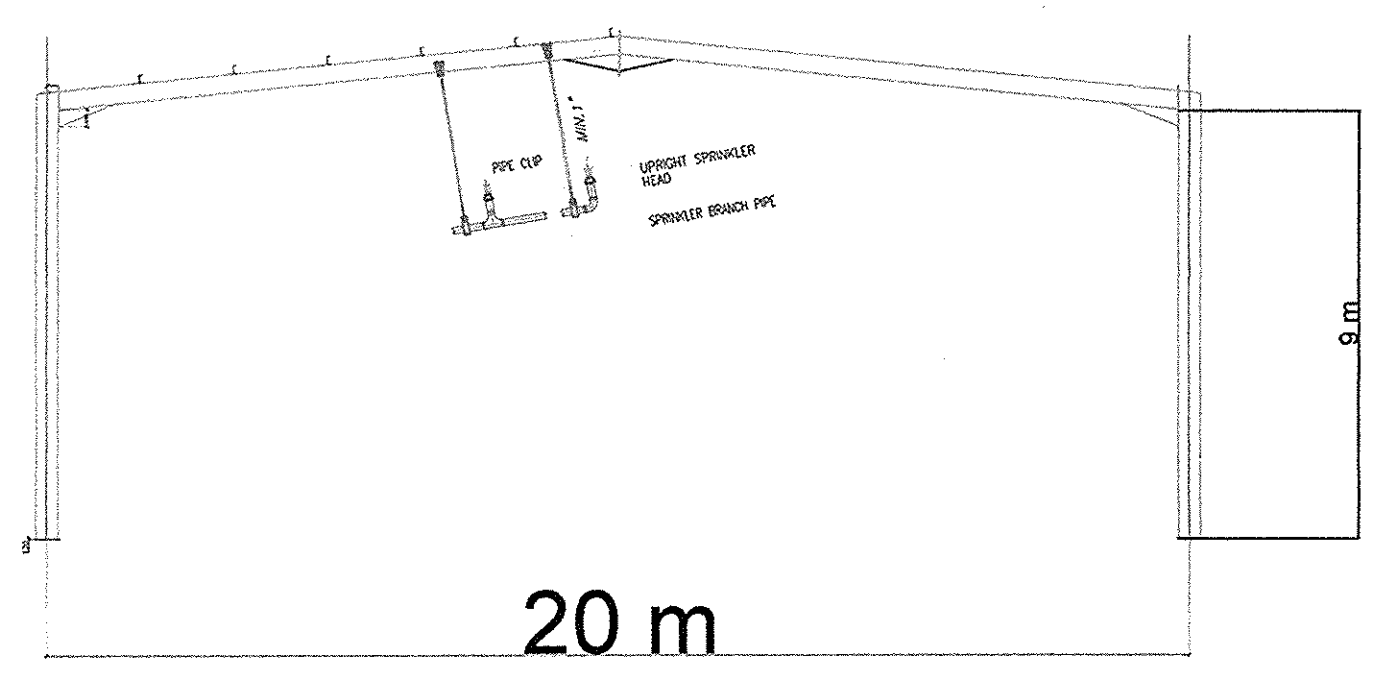
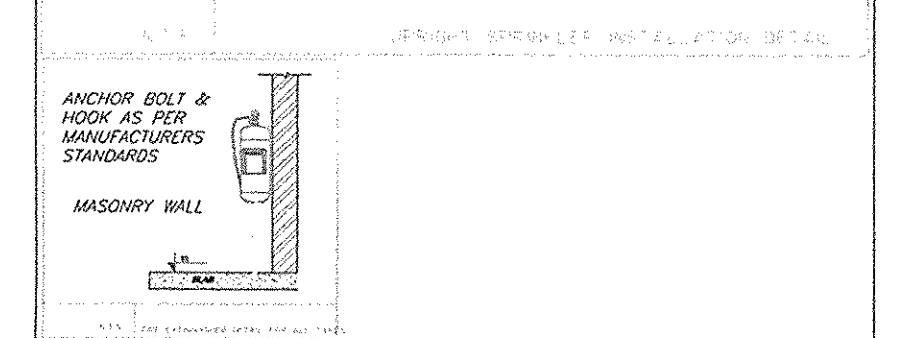
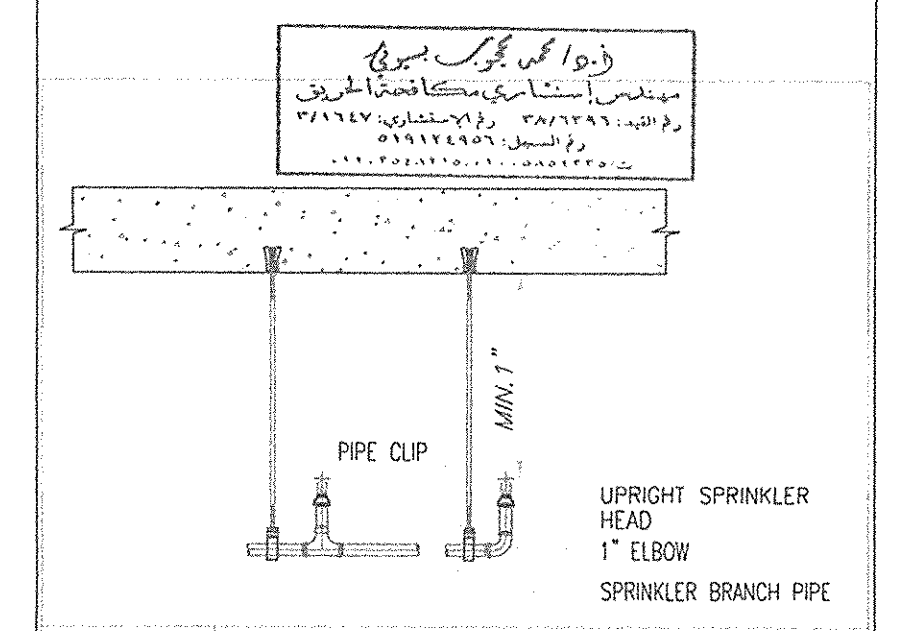
المشروع
مصنع تصنيع المعادن بالمنطقة الصناعية
بمدينة العاشر من رمضان
قطعة رقم ٩٢-٩٣

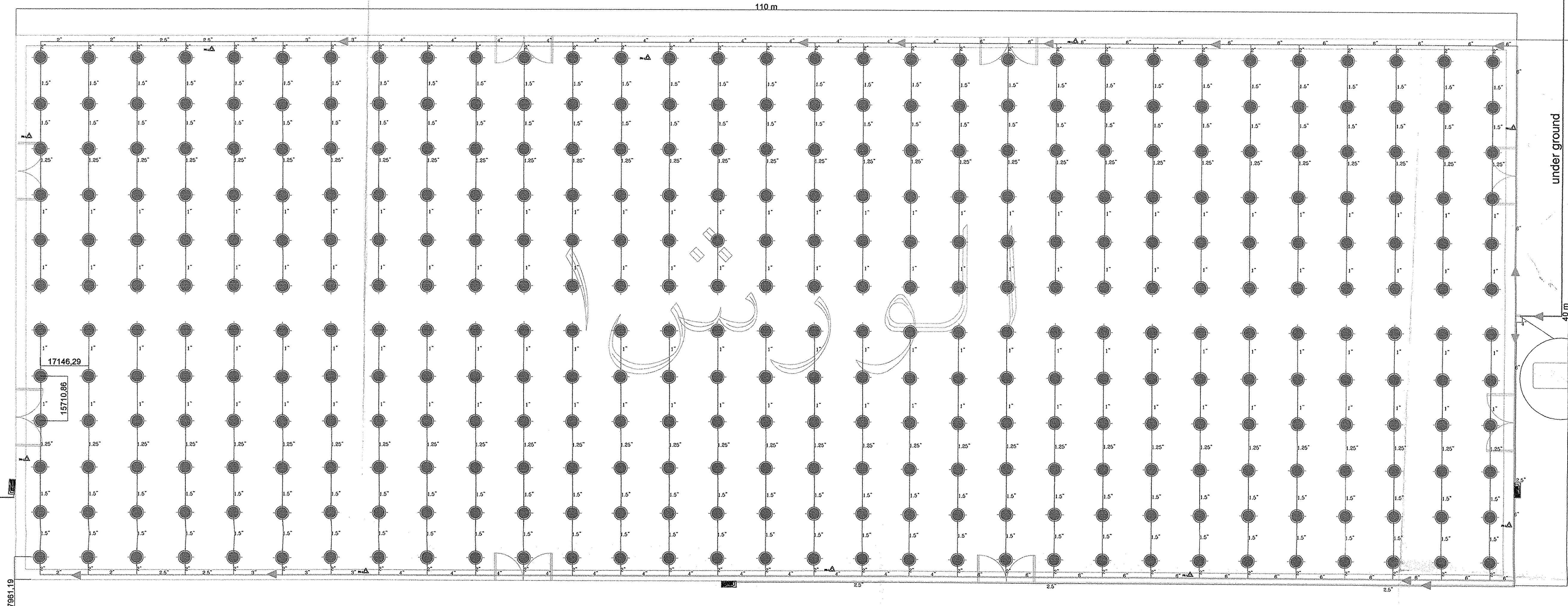
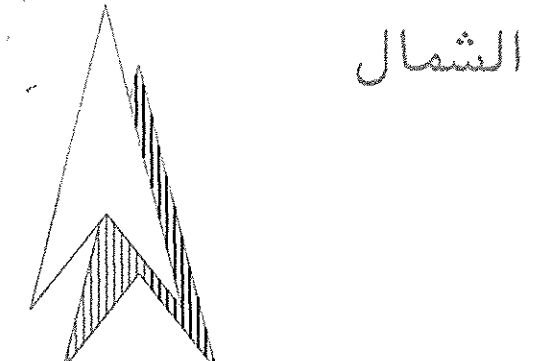
المالك
الشركة اليوسعيدية للاعمال الهندسية
والانشاءات البحرية



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	APPROVED		DRAWING NAME	
			تكافة حريق الموقع العام	





SYMBOL	DESCRIPTION
FIRE FIGHTING	
FP	SUPPLY WATER MAIN PIPE above ground
FP	SUPPLY WATER MAIN PIPE under ground HDPE
FHC	FIRE HOSE CABINAT 2.5"
FHC	FIRE HOSE CABINAT 1" & 2.5"
FE-01	6kg POWDER FIRE EXTINGUISHER
	45lit FOAM FIRE EXTINGUISHER
	6kg CO2 FIRE EXTINGUISHER
Z.C.V	zone control valve
	WATER DIRECTION
	GATE VALVE
	UPRIGHT SPRINKLER

المشروع
مصنع تصنيع المعادن بالمنطقة الصناعية
بمدينة العاشر من رمضان
قطعة رقم ٩٢-٩٢

المالك
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