CITY OF EL PASO, TEXAS
AGENDA ITEM DEPARTMENT HEAD'S SUMMARY FORM

DEPARTMENT: Engineering Department

AGENDA DATE: December 2, 2008

CONTACT PERSON/PHONE: R. Alan Shubert, ext. 4423

DISTRICT(S) AFFECTED: 2

SUBJECT:

That the City expend additional available funding in the amount of SIXTY THOUSAND NINE HUNDRED NINE AND 80/100 ($60,909.80) to VISTACON, INC. to fund additional labor and materials for Contract Number 2008-056, EPIA Terminal Modifications and Additional Public Concessions.

BACKGROUND / DISCUSSION:

The scope of the change order includes the addition of a dry pipe fire suppression system to cover the ground floor under each of the new terminal areas. It was determine that this system is needed to comply with the Fire Code as these areas need to have the flexibility to be used for storage as part of the airport operation.

PRIOR COUNCIL ACTION:

City Council previously awarded a construction contract to Vistacon for the construction of the project.

AMOUNT AND SOURCE OF FUNDING:

Airport Enterprise Fund PAP0037, 62620028, 41077, 508027

BOARD / COMMISSION ACTION:

N/A

**********REQUIRED AUTHORIZATION**********

LEGAL: (if required) _____ **FINANCE:** (if required) _____

DEPARTMENT HEAD: _____

(Example: if RCA is initiated by Purchasing, client department should sign also)

Information copy to appropriate Deputy City Manager

APPROVED FOR AGENDA:

CITY MANAGER: _____ **DATE:** _____

RESOLUTION

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF EL PASO:

That the City expend additional available funding in the amount of SIXTY THOUSAND NINE HUNDRED NINE AND 80/100 ($60,909.80) to VISTACON, INC. to fund additional labor and materials for Contract Number 2008-056, EPIA Terminal Modifications and Additional Public Concessions.

ADOPTED this the _____ day of _____, 2008.

THE CITY OF EL PASO

_____
John F. Cook, Mayor

ATTEST:

_____
Richarda Duffy Momsen
City Clerk

APPROVED AS TO FORM:

Mark Shoesmith
Assistant City Attorney

APPROVED AS TO CONTENT:

R. Alan Shubert, P.E.
City Engineer

CITY OF EL PASO ENGINEERING DEPARTMENT
CONTRACT CHANGE ORDER

DATE: 11/4/2008

CHANGE ORDER NO.: 13

☑ SCOPE CHANGE ☐ CONSTRUCTION CHANGE

PROJECT: EPIA TERMINAL MODIFICATIONS & ADDITIONAL PUBLIC CONCESSIONS

BID NO.: 2008-056

TO (Contractor): VISTACON, INC.

DEPT. ID#: 62620028
PROJ/GRANT/USER: PAP0037
FUND: 41077
ACCOUNT: 508027
PO NO. : 2008002810

M.L. 11-4-08

You are directed to make the following changes to this Contract:

Justification:

EPIA wishes to add a dry pipe fire suppression system to each of the new terminal areas.

This action incrases the contract amount by $60,909.80. Vistacon has requested a total of 51 work days for all fire sprinkler design and installation. Of that, 21 days are for design and theh pipe installation in IB. The remaining 30 days spread over the other four areas is 7.5 days per area.

The sprinkler pipe installation will not be on the Critical Path of any other area including IC. The Vistacon schedule indicates the completion of the FW pipe in Area IC in November 21, 2008 and Area IC completing February 25, 2008, therefore there is no need for additional days. Likewise:
*** Vistacon's schedule indicates the FW pipe in Area IIA is not on the Critical Path and is being installed from July 6-July 10, 2009. The scheduled area completion of October 9, 2009. (SEE ATTACHMENT FOR THE REST OF THE JUSTIFICATION FOR THIS CHANGE ORDER)...**

CHANGE ORDER AMOUNT : 60,909.80

Original Contract Sum			9,645,000.00	
Net Change by previous Change Orders			21,949.56	
Net Change by previous Construction Quantity Notices			0.00	
Contract Sum prior to this Change Order			9,666,949.56	
Contract Sum will be	**(increased)** (decreased) (unchanged)	**By this Change Order**	**60,909.80**	
New Contract Sum, including this Change Order			9,727,859.36	
Total Net Value of Change Orders To Date			82,859.36	
Total Net Value of Construction Quantity Notices to Date			0.00	
Contract Time will be	**(increased)** (decreased) (unchanged)	**BY (21) DAYS***	Original Contract Days:	490
			Days by Previous and Current Change Order:	56
*** Subject to the terms of the Contract, GENERAL CONDITIONS, SECTION 2.5**			**Total Days:**	**546**

Net Change Order and Construction Quantity Notice Percentage (Not to exceed 25%) **0.86%**

CONTRACTOR	COEP USER DEPARTMENT	CITY OF EL PASO
VISTACON, INC.	AIRPORT DEPARTMENT	CITY COUNCIL ACTION REQUIRED: [ ] No [✓] Yes Date Approved
By Basilio Silva BASILIO A SILVA JR. P.E. Type or Print Name 11-06-08 Date	By Patricia T. Abeln, AAE for Type or Print Name 11-11-08 Date	By JR R. Alan Shubert, P.E. City Engineer 11/20/08 Date

REQUEST FOR CHANGE ORDER No. 13

TO: Victoria Ruiz DATE: October 29, 2008

FROM: Don Bishop

RE: Project: EPIA Terminal Expansion
Bid No: 2008 – 056

Change Order No: 13

Please Indicate Type: Construction ☐ Scope X

Please Indicate Action to PO: Increase ☒ Decrease ☐ No Change ☐

Change in Contract Time: 21 Days

Change Order Amount:

Unforeseen Condition:	$
Value Engineering:	$
Error/Omission:	$
User Request:	$60,909.80
Total	$60,909.80

Justification:
EPIA wishes to add a dry pipe fire suppression system to each of the new terminal areas.

This action *increases* the contract amount by $60,909.80. Vistacon has requested a total of 51 work days for all fire sprinkler design and installation. Of that, 21 days are for design and the pipe installation in IB. The remaining 30 days spread over the other four areas is 7.5 days per area.

The sprinkler pipe installation will not be on the Critical Path of any other area including IC. The Vistacon schedule indicates the completion of the FW pipe November 21, 2008 and the Area IC completing February 25, 2008 therefore there are no need for additional days. Likewise:

- Vistacon's schedule indicates the FW pipe in Area IIA is not on the Critcal Path and is being installed from July 6 to July10, 2009. The scheduled area completion of October 9, 2009.
- FW pipe installation for Area IIB is from August 11 to August 17, 2009 with an area completion of October 9, 2009.

In summary the FW pipe installation will only impact Area IB since it falls in the middle of the Work in the remaining areas and is not shown as a critical item on the Vistacon schedule. Therefore time should only allowed in Area IB at 21 working days as indicated in their letter.

CHANGE ORDER REQUEST NO. 13

Project Name : **EPIA Terminal Expansion**
Contractor : **Vistacon**
Bid No : **2008-056**

Allowed days:

1. **Area IB – 21 work days design (total) and installation**
2. **Area IC – 0 work days installation**
3. **Area IIA – 0 work days installation**
4. **Area IIB – 0 work days installation**

Attachments:

- Vistacon Letter of October 24, 2008 – Amended Pricing With Electrical
- Vistacon Letter of October 10, 2008 – Original Pricing
- Proposal Request 06 – Dated October 9, 2008
- A&A Fire Systems Quote of October 10, 2008
- S&S Systems Quote of October 24, 2008
- Millennium Electric quote of October 20, 2008

ITEM 1:

DESCRIPTION: **Add a dry pipe fire suppression system under each of the new areas of the terminal expansion.**

PROBLEM: **None**

SOLUTION: **Add a dry pipe fire suppression system under each of the new areas of the terminal expansion.**

COST: **$60,909.80**

CHANGE ORDER TYPE: **User request**

#0006 R

Dry Pipe System

MOORE NORDELL KROEGER ARCHITECTS

PROPOSAL REQUEST

PROJECT: 6004-EPIA Passenger Terminal Modifications

PROPOSAL REQUEST #: 0006

OWNER: City of El Paso
Two Civic Center Plaza
El Paso TX 79901

DATE: 09-Oct-08 *

CONTRACT DATED:

TO: (Contractor): Paragon

ATTN: Don Bishop

CONTRACT FOR:

Please submit an itemized quotation for changes in the Contract Sum and/or Time incidental to proposed modifications to the Contract Documents described herein.

THIS IS NOT A CHANGE ORDER NOR A DIRECTION TO PROCEED WITH THE WORK DESCRIBED HEREIN.

DESCRIPTION:

At the design phase of the project, the El Paso Fire Department did not require fire sprinklers to be installed at the first level soffit. As the project has progressed the Fire Department is now leaning towards the fact that no fire sprinklers under the concourse might be a safety issue. Therefore, EPIA has opted to have the sprinklers under the concourse as indicated on the attached.
PR6.1 - Dry Pipe Fire Suppression Sprinklers Specification
PR6.2 - New Fire Riser Schematic SK6-FP102
PR6.3 - Dry Pipe Suppression SK4-FP102
PR6.4 - Legend SK3-FP102
PR6.5 - Dry Pipe Fire Suppression System SK5-FP102
PR6.6- Fire Protection Plan - Lower Level SK1-E401
RP6.7- Fire Protection Plan - Lower Level SK2-E401
PR6.8 - First Floor Plan Special System SK!-E402
***** 10/16/2008 added the folling information:

* "Contractor shall submit alternate price to serve the dry pipe system from three fire riser rooms instead of five. Dry pipe system between column lines E19 and E24 on the north and south sides shall be served from one riser room instead of the two shown on SK4-FP102 and SK2-E401. Dry pipe system between column lines E33 and E42 on the north and south sides shall be served from one riser room instead of the two shown on SK5-FP102 and SK1-E402. Alternate price shall delete all associated valves, compressors, piping, flow and tamper switches, fire alarm modules and electric circuits related to two deleted riser rooms as indicated in the referenced sketches."

ATTACHMENTS: PR6.1, PR6.2, PR6.3, PR6.4, PR6.5, PR6.6 PR6.7 & PR6.8

ARCHITECT: **Moore Nordell Kroeger Architects, Inc.**

BY: Rodney Kroeger

REGISTERED ARCHITECT * RODNEY MARTIN KROEGER * 13660 * STATE OF TEXAS

10-16-2008

* Revised 10.16.08

7170 Westwind Dr., Ste. 105, El Paso, TX 79912-1726
(915)587-8023 FAX(915)587-0985

VISTACON INC.
GENERAL CONTRACTORS

BASILIO A. SILVA, JR., P.E.
PRESIDENT

ELSA SILVA
VICE PRESIDENT

October 24, 2008

Mr. Don Bishop
Paragon Project Resources
8411 Lockheed Dr. Ste 7
El Paso, Texas 79925

Re: El Paso International Airport Terminal Modifications

Dear Mr. Bishop,

Below you will find the revised cost for Proposal Request #0006, additional fire sprinkler system as requested by your office. This is the original Proposal Request #0006 but this one includes the special systems and electrical scope of work. Please advise.

A&A Fire Systems		
(See Attached Breakdown)		$50,712.80
Sound & Signal Systems		$3,526.00
Millennium Electrical		$2,827.00
Vistacon Inc.		
Remove & Reinstall metal lath @ Area IB (2 plasterers 16hrs)		$744.00
Penetration & Patch @ area IB Riser Room		$200.00
	Subtotal	$58,009.80
	5% Overhead	$2,900.00
	TOTAL	$60,909.80

Time Requested- Area IB	21 Days
Design & Fabrication (14 Days)	
Installation Time (7 Days)	
Areas IC, IIA, IIB, IIC	30 Days
Total time requested upon Approval of proposal requested.	51 DAYS

Sincerely,

Jaime Reyes
Project Coordinator

1161 Kessler, El Paso, TX 79907
(915) 592-0321 • Fax (915) 591-0064
vistacon@vista-con.com

9811 Carnegie Avenue
El Paso, Texas 79925
(915) 590-8300
Fax (915) 590-8315
Texas License SCR 0909
NM License 94771

A&A FIRE SYSTEMS

CHANGE ORDER REQUEST #4

October 10, 2008

VistaCon, Inc.
1151 Kessler
El Paso, Texas 79907

RE: EPIA Terminal Modifications and Additions
6701 Convair
El Paso, Texas
Dry Pipe Sprinkler System

Gentlemen:

To install new dry pipe systems in the areas indicated on the Proposal Request #0006 from Moore Nordell, Kroeger, Architects dated 10/9/2008 for the above referenced project, we quote the amount of **$50,212.80 (Fifty Thousand, Two Hundred Twelve Dollars and 80/100)** based on the following breakdown:

Area Indicated at Column Lines E33-E42 between C and F:

Phase IC

• Design	$997.00
• Material	$7,715.00
• Labor (80 hours)	$2,161.00
• Fabrication	$1,122.00
• Equipment	$1,255.00
Total	$13,250.00
10% overhead/profit	$1,325.00
Total Change Request this area	**$14,575.00**

Area Indicated at Column Lines E33-E42 between G and H:

Jolin @ A+ Fire Systems .com

• Design	$825.00
• Material	$7,715.00
• Labor (80 hours)	$2,161.00
• Fabrication	$1,122.00
• Equipment	$1,255.00
Total	$13,078.00
10% overhead/profit	$1,307.80
Total Change Request this area	**$14,385.80**

Area Indicated at Column Lines E11-E16:

• Design	$730.00
• Material	$5,669.00
• Labor (60 hours)	$1,585.00
• Fabrication	$825.00
• Equipment	$923.00
Total	$9,732.00
10% overhead/profit	$973.20
Total Change Request this area	**$10,705.20**

Area Indicated at Column Lines E19-E24 between E and F:

• Design	$500.00
• Material	$3,940.00
• Labor (40 hours)	$1,080.00
• Fabrication	$573.00
• Equipment	$641.00
Total	$6,734.00
10% overhead/profit	$673.40
Total Change Request this area	**$7,407.40**

Area Indicated at Column Lines E19-E24 between G and H:

• Design	$500.00
• Material	$3,940.00
• Labor (40 hours)	$1,080.00
• Fabrication	$573.00
• Equipment	$641.00
Total	$6,734.00
10% overhead/profit	$673.40
Total Change Request this area	**$7,407.40**

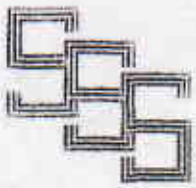
Credit for Area Indicated at Column Lines E06-E10:

• Material	$2,800.00
• Labor (40 hours)	$1,080.00
Total	$3,880.00
10% overhead/profit	$388.00
Total Credit this area	**<$4,268.00>**

This proposal excludes any required electrical and fire alarm connections.

Sincerely:

John M. Arpin SET
Vice President



Sound & Signal Systems of Texas
3621 Mattox
El Paso, TX 79925

Project Number 1322C1
10/24/2008 Page: 1 *** * Proposal * ***
915-772-9893

VISTACON INC
Hector Corral
1161 Kessler Dr.
El Paso, TX 79907

C22011 915-592-0321 Fax: 915-591-0064

Project Title..: EPIA Term. Mod.& Add. Pub.Concessio

Dry System Change Order per Rick Mc Swain

Notifier-FMM1	12	Addressable Monitor Module with FlashScan	64.00	768.00
VALCOM-611602	2	16 AWG 2/C SOL O/S FPLP	385.00	770.00
VALCOM-601402	1	14 AWG 2/C SOL FPLP		408.00
	12	Labor for devices	40.00	480.00
	15	Labor for wire	40.00	600.00
	1	Permit Modification		500.00

This * * Proposal * * is Valid for 60 Days.

$3,526.00

Electrical Contractors, Inc.
3669 Mark Jason Drive
El Paso, Texas 79938

Estimate

#31787

ISSUED TO:

Vistacon, Inc.
1181 Kessler Drive
El Paso, Texas 79907

REGARDING:

EPIA-Terminal Modifications
6701 Convair Road
El Paso, Texas 79925

DATE: October 20, 2008

CUSTOMER #:

Estimate Expires	Reference	Start Date	Completion Date	Rep
Expires 60 Days				

We submit the following specifications:

#	DESCRIPTION	Qty	Unit	Cost	Amount
	Proposal Request No. 0006				
1	1/2" flex	40	LF	0.45	18.00
2	1/2" flex connectors	15	Each	0.50	7.50
3	4square boxes and blank covers	5	Each	10.00	50.00
4	1/2" flex 90s	5	Each	4.50	22.50
5	1/2" emt	340	LF	0.60	204.00
6	1/2" couplings	35	Each	0.35	12.25
7	1/2" connectors	19	Each	0.55	10.45
8	4square boxes with blank covers	12	Each	10.00	120.00
9	#10 thhn	1,050	LF	0.65	682.50
10	Journeyman Labor	40	Hours	25.00	1,000.00
11	Apprentice Labor	40	Hours	17.50	700.00
				Total:	2,827.20

TERMS & CONDITIONS All product to be new and all work is to be done in a workman like manner, according to standard practices. Any deviation or alteration from the above specifications will require approval of all parties. As per plans and specs

Submitted by 10.20.08 Date

Accepted by Date

ACCEPTANCE: The above Terms, Conditions and Descriptions are satisfactory and are hereby accepted.

SECTION 13935 - DRY-PIPE FIRE-SUPPRESSION SPRINKLERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Pipes, fittings, and specialties.
2. Fire-protection valves.
3. Fire-department connections.
4. Sprinkler specialty pipe fittings.
5. Sprinklers.
6. Alarm devices.
7. Manual control stations.
8. Control panels.
9. Pressure gages.

B. Related Sections:

1. Division 13 Section "Digital, Addressable Fire-Alarm System" for alarm devices not specified in this Section.
2. Division 13 Section "Wet-Pipe Fire-Suppression Sprinklers" for wet-pipe sprinkler piping.
3. Division 13 Section "Fire-Suppression Standpipes" for standpipe piping.

1.3 DEFINITIONS

A. Standard-Pressure Sprinkler Piping: Dry-pipe sprinkler system piping designed to operate at working pressure 175 psig (1200 kPa) maximum.

1.4 SYSTEM DESCRIPTIONS

A. Dry-Pipe Sprinkler System: Automatic sprinklers are attached to piping containing compressed air. Opening of sprinklers releases compressed air and permits water pressure to open dry-pipe valve. Water then flows into piping and discharges from sprinklers that are open.

1.5 PERFORMANCE REQUIREMENTS

A. Standard-Pressure Piping System Component: Listed for 175-psig (1200-kPa) minimum working pressure.

B. Delegated Design: Design sprinkler system(s), including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

C. Sprinkler system design shall be approved by authorities having jurisdiction.

1. Margin of Safety for Available Water Flow and Pressure: 10 percent, including losses through water-service piping, valves, and backflow preventers.
2. Sprinkler Occupancy Hazard Classifications:

   a. Airport Baggage Handling: Ordinary Hazard, Group 2.

3. Minimum Density for Automatic-Sprinkler Piping Design:

   a. Ordinary-Hazard, Group 2 Occupancy: 0.20 gpm over 1500-sq. ft. (8.1 mm/min. over 139-sq. m) area.
   b. Special Occupancy Hazard: As determined by authorities having jurisdiction.

4. Maximum Protection Area per Sprinkler: Per UL listing.
5. Maximum Protection Area per Sprinkler:

   a. Office Spaces: 120 sq. ft. (11.1 sq. m).
   b. Storage Areas: 130 sq. ft. (12.1 sq. m).
   c. Mechanical Equipment Rooms: 130 sq. ft. (12.1 sq. m).
   d. Electrical Equipment Rooms: 130 sq. ft. (12.1 sq. m).
   e. Other Areas: According to NFPA 13 recommendations unless otherwise indicated.

6. Total Combined Hose-Stream Demand Requirement: According to NFPA 13 unless otherwise indicated:

   a. Extra-Hazard Occupancies: 500 gpm (31.5 L/s) for 90 to 120 minutes.

1.6 SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

B. Shop Drawings: For dry-pipe sprinkler systems. Include plans, elevations, sections, details, and attachments to other work.

1. Wiring Diagrams: For power, signal, and control wiring.

C. Delegated-Design Submittal: For sprinkler systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer or certified designer is responsible for their preparation.

D. Coordination Drawings: Sprinkler systems, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Domestic water piping.
2. Compressed air piping.
3. HVAC hydronic piping.
4. Items penetrating finished ceiling including the following:

   a. Lighting fixtures.
   b. Air outlets and inlets.

5. Structural beams, joist, and columns.

E. Qualification Data: For qualified Installer and professional engineer or certified designer.

F. Approved Sprinkler Piping Drawings: Working plans, prepared according to NFPA 13, that have been approved by authorities having jurisdiction, including hydraulic calculations if applicable.

G. Fire-hydrant flow test report.

H. Field Test Reports and Certificates: Indicate and interpret test results for compliance with *performance requirements* and as described in NFPA 13. Include "Contractor's Material and Test Certificate for Aboveground Piping."

I. Field quality-control reports.

J. Operation and Maintenance Data: For sprinkler specialties to include in emergency, operation, and maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications:

1. Installer's responsibilities include designing, fabricating, and installing sprinkler systems and providing professional engineering services needed to assume engineering responsibility. Base calculations on results of fire-hydrant flow test.

   a. Engineering Responsibility: Preparation of working plans, calculations, and field test reports by a qualified professional engineer or certified designer.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. NFPA Standards: Sprinkler system equipment, specialties, accessories, installation, and testing shall comply with the following:

1. NFPA 13, "Installation of Sprinkler Systems."
2. NFPA 24, "Installation of Private Fire Service Mains and Their Appurtenances."

1.8 PROJECT CONDITIONS

A. Interruption of Existing Sprinkler Service: Do not interrupt sprinkler service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary sprinkler service according to requirements indicated:

1. Notify Architect, Construction Manager, and Owner no fewer than two days in advance of proposed interruption of sprinkler service.
2. Do not proceed with interruption of sprinkler service without Architect's and Owner's written permission.

1.9 COORDINATION

A. Coordinate layout and installation of sprinklers with other construction that penetrates ceilings, including light fixtures, HVAC equipment, and partition assemblies.

1.10 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Sprinkler Cabinets: Finished, wall-mounted, steel cabinet with hinged cover, and with space for minimum of six spare sprinklers plus sprinkler wrench. Include number of sprinklers required by NFPA 13 and sprinkler wrench. Include separate cabinet with sprinklers and wrench for each type of sprinkler used on Project.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, and fitting materials, and joining methods for specific services, service locations, and pipe sizes.

2.2 STEEL PIPE AND FITTINGS

A. Standard Weight, Galvanized-Steel Pipe: ASTM A 53/A 53M, Type E, Grade B. Pipe ends may be factory or field formed to match joining method.

B. Schedule 30, Galvanized-Steel Pipe: ASTM A 135; ASTM A 795/A 795M, Type E; or ASME B36.10M, wrought steel; with wall thickness not less than Schedule 30 and not more than Schedule 40. Pipe ends may be factory or field formed to match joining method.

C. Thinwall Galvanized-Steel Pipe: ASTM A 135 or ASTM A 795/A 795M, threadable, with wall thickness less than Schedule 30 and equal to or greater than Schedule 10. Pipe ends may be factory or field formed to match joining method.

D. Galvanized-Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M, standard-weight, seamless steel pipe with threaded ends.

E. Galvanized, Steel Couplings: ASTM A 865, threaded.

F. Galvanized, Gray-Iron Threaded Fittings: ASME B16.4, Class 125, standard pattern.

G. Malleable- or Ductile-Iron Unions: UL 860.

H. Cast-Iron Flanges: ASME B16.1, Class 125.

I. Plain-End-Pipe Fittings: UL 213, ductile-iron body with retainer lugs that require one-quarter turn or screwed retainer pin to secure pipe in fitting.

J. Grooved-Joint, Steel-Pipe Appurtenances:

1. Pressure Rating: 175 psig (1200 kPa) minimum.
2. Galvanized, Grooved-End Fittings for Steel Piping: ASTM A 47/A 47M, malleable-iron casting or ASTM A 536, ductile-iron casting; with dimensions matching steel pipe.
3. Grooved-End-Pipe Couplings for Steel Piping: AWWA C606 and UL 213, rigid pattern, unless otherwise indicated, for steel-pipe dimensions. Include ferrous housing sections, EPDM-rubber gasket, and bolts and nuts.

2.3 PIPING JOINING MATERIALS

A. Pipe-Flange Gasket Materials: AWWA C110, rubber, flat face, 1/8 inch (3.2 mm) thick or ASME B16.21, nonmetallic and asbestos free.

1. Class 125, Cast-Iron and Class 150, Bronze Flat-Face Flanges: Full-face gaskets.
2. Class 250, Cast-Iron and Class 300, Raised-Face Flanges: Ring-type gaskets.

B. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.

2.4 LISTED FIRE-PROTECTION VALVES

A. General Requirements:

1. Valves shall be UL listed or FM approved.
2. Minimum Pressure Rating for Standard-Pressure Piping: 175 psig (1200 kPa).

B. Ball Valves:

1. Standard: UL 1091 except with ball instead of disc.
2. Valves NPS 1-1/2 (DN 40) and Smaller: Bronze body with threaded ends.
3. Valves NPS 2 and NPS 2-1/2 (DN 50 and DN 65): Bronze body with threaded ends or ductile-iron body with grooved ends.
4. Valves NPS 3 (DN 80): Ductile-iron body with grooved ends.

C. Bronze Butterfly Valves:

1. Standard: UL 1091.
2. Pressure Rating: 175 psig (1200 kPa).
3. Body Material: Bronze.
4. End Connections: Threaded.

D. Iron Butterfly Valves:

1. Standard: UL 1091.
2. Pressure Rating: 175 psig (1200 kPa).
3. Body Material: Cast or ductile iron.
4. Style: Lug or wafer.
5. End Connections: Grooved.

E. Check Valves:

1. Standard: UL 312
2. Pressure Rating: 250 psig (1725 kPa) minimum.
3. Type: Swing check.
4. Body Material: Cast iron.
5. End Connections: Flanged or grooved.

F. Bronze OS&Y Gate Valves:

1. Standard: UL 262.
2. Pressure Rating: 175 psig (1200 kPa).
3. Body Material: Bronze.
4. End Connections: Threaded.

G. Iron OS&Y Gate Valves:

1. Standard: UL 262.
2. Pressure Rating: 250 psig (1725 kPa) minimum.
3. Body Material: Cast or ductile iron.
4. End Connections: Flanged or grooved.

H. Indicating-Type Butterfly Valves:

1. Standard: UL 1091.
2. Pressure Rating: 175 psig (1200 kPa) minimum.
3. Valves NPS 2 (DN 50) and Smaller:

    a. Valve Type: Ball or butterfly.
    b. Body Material: Bronze.
    c. End Connections: Threaded.

4. Valves NPS 2-1/2 (DN 65) and Larger:

    a. Valve Type: Butterfly.
    b. Body Material: Cast or ductile iron.
    c. End Connections: Flanged, grooved, or wafer.

5. Valve Operation: Integral electrical, 115-V ac, prewired, single-circuit, supervisory switch indicating device.

I. NRS Gate Valves:

1. Standard: UL 262.
2. Pressure Rating: 250 psig (1725 kPa) minimum.
3. Body Material: Cast iron with indicator post flange.
4. Stem: Nonrising.
5. End Connections: Flanged or grooved.

J. Indicator Posts:

1. Standard: UL 789.
2. Type: Horizontal for wall mounting.
3. Body Material: Cast iron with extension rod and locking device.
4. Operation: Hand wheel.

2.5 TRIM AND DRAIN VALVES

A. *General Requirements:*

1. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
2. Pressure Rating: 175 psig (1200 kPa) minimum.

B. Angle Valves:

C. Ball Valves:

D. Globe Valves:

E. Plug Valves:

2.6 SPECIALTY VALVES

A. General Requirements:

1. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
2. Pressure Rating:

   a. Standard-Pressure Piping Specialty Valves: 175 psig (1200 kPa) minimum.
   b. High-Pressure Piping Specialty Valves: 250 psig (1725 kPa) minimum.

3. Body Material: Cast or ductile iron.
4. Size: Same as connected piping.
5. *End Connections: Flanged or grooved.*

B. Dry-Pipe Valves:

1. Standard: UL 260
2. Design: Differential-pressure type.
3. Include UL 1486, quick-opening devices, trim sets for air supply, drain, priming level, alarm connections, ball drip valves, pressure gages, priming chamber attachment, and fill-line attachment.

4. Air Compressor:

   a. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
   b. Motor Horsepower: Fractional.
   c. Power: 120-V ac, 60 Hz, single phase.

C. Automatic (Ball Drip) Drain Valves:

1. Standard: UL 1726.
2. Pressure Rating: 175 psig (1200 kPa) minimum.
3. Type: Automatic draining, ball check.
4. Size: NPS 3/4 (DN 20).
5. End Connections: Threaded.

2.7 *FIRE-DEPARTMENT CONNECTIONS*

A. Exposed-Type, Fire-Department Connection:

1. Standard: UL 405.
2. Type: Exposed, projecting, for wall mounting.
3. Pressure Rating: 175 psig (1200 kPa) minimum.
4. Body Material: Corrosion-resistant metal.
5. Inlets: Brass with threads according to NFPA 1963 and matching local fire-department sizes and threads. Include extension pipe nipples, brass lugged swivel connections, and check devices or clappers.
6. *Caps: Brass, lugged type, with gasket and chain.*
7. Escutcheon Plate: Round, brass, wall type.
8. Outlet: Back, with pipe threads.
9. Number of Inlets: Two.
10. Escutcheon Plate Marking: Similar to "AUTO SPKR & STANDPIPE."
11. Finish: Polished chrome plated Rough chrome plated.
12. Outlet Size: NPS 4 (DN 100) NPS 5 (DN 125) NPS 6 (DN 150).

2.8 SPRINKLER SPECIALTY PIPE FITTINGS

A. General Requirements for Dry-Pipe-System Fittings: UL listed for dry-pipe service.

B. Branch Outlet Fittings:

1. Standard: UL 213.
2. Pressure Rating: 175 psig (1200 kPa) minimum.
3. Body Material: Ductile-iron housing with EPDM seals and bolts and nuts.

4. Type: Mechanical-T and -cross fittings.
5. Configurations: Snap-on and strapless, ductile-iron housing with branch outlets.
6. Size: Of dimension to fit onto sprinkler main and with outlet connections as required to match connected branch piping.
7. Branch Outlets: Grooved, plain-end pipe, or threaded.

C. Flow Detection and Test Assemblies:

1. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
2. Pressure Rating: 175 psig (1200 kPa) minimum.
3. Body Material: Cast- or ductile-iron housing with orifice, sight glass, and integral test valve.
4. Size: Same as connected piping.
5. Inlet and Outlet: Threaded.

D. Branch Line Testers:

1. Standard: UL 199.
2. Pressure Rating: 175 psig (1200 kPa) minimum.
3. Body Material: Brass.
4. Size: Same as connected piping.
5. Inlet: Threaded.
6. Drain Outlet: Threaded and capped.
7. Branch Outlet: Threaded, for sprinkler.

E. Sprinkler Inspector's Test Fittings:

1. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
2. Pressure Rating: 175 psig (1200 kPa) minimum.
3. Body Material: Cast- or ductile-iron housing with sight glass.
4. Size: Same as connected piping.
5. Inlet and Outlet: Threaded.

F. Adjustable Drop Nipples:

1. Standard: UL 1474.
2. Pressure Rating: 250 psig (1725 kPa) minimum.
3. Body Material: Steel pipe with EPDM O-ring seals.
4. Size: Same as connected piping.
5. Length: Adjustable.
6. Inlet and Outlet: Threaded.

2.9 SPRINKLERS

A. General Requirements:

1. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.

2. Pressure Rating for Residential Sprinklers: 175 psig (1200 kPa) maximum.
3. Pressure Rating for Automatic Sprinklers: 175 psig (1200 kPa) minimum.
4. Pressure Rating for High-Pressure Automatic Sprinklers: 250 psig (1725 kPa) minimum.

B. Automatic Sprinklers with Heat-Responsive Element:

1. Nonresidential Applications: UL 199.
2. Characteristics: Nominal 1/2-inch (12.7-mm) orifice with discharge coefficient K of 5.6, and for "Ordinary" temperature classification rating unless otherwise indicated or *required by application.*

C. Sprinkler Finishes:

1. Chrome plated.
2. Painted.

D. Special Coatings:

1. Corrosion-resistant paint.

E. Sprinkler Escutcheons: Materials, types, and finishes for the following sprinkler mounting applications. *Escutcheons for concealed, flush, and recessed-type sprinklers are specified with* sprinklers.

1. Ceiling Mounting: Chrome-plated steel, one piece, or flat Chrome-plated steel, two piece, with 1-inch (25-mm) vertical adjustment.
2. Sidewall Mounting: Chrome-plated steel, one piece, flat.

F. Sprinkler Guards:

1. Standard: UL 199.
2. Type: Wire cage with fastening device for attaching to sprinkler.

2.10 ALARM DEVICES

A. Alarm-device types shall match piping and equipment connections.

B. Water-Motor-Operated Alarm:

1. Standard: UL 753.
2. Type: Mechanically operated, with Pelton wheel.
3. Alarm Gong: Cast aluminum with red-enamel factory finish.
4. Size: 10-inch (250-mm) diameter.
5. Components: Shaft length, bearings, and sleeve to suit wall construction.
6. Inlet: NPS 3/4 (DN 20).
7. Outlet: NPS 1 (DN 25) drain connection.

C. Electrically Operated Alarm Bell:

1. Standard: UL 464.

2. Type: Vibrating, metal alarm bell.
3. Size: 6-inch (150-mm) minimum diameter.
4. Finish: Red-enamel factory finish, suitable for outdoor use.

D. Pressure Switches:

1. Standard: UL 346.
2. Type: Electrically supervised water-flow switch with retard feature.
3. Components: Single-pole, double-throw switch with normally closed contacts.
4. Design Operation: Rising pressure signals water flow.

E. Valve Supervisory Switches:

1. Standard: UL 346.
2. Type: Electrically supervised.
3. Components: Single-pole, double-throw switch with normally closed contacts.
4. Design: Signals that controlled valve is in other than fully open position.

F. Indicator-Post Supervisory Switches:

1. Standard: UL 346.
2. Type: Electrically supervised.
3. Components: Single-pole, double-throw switch with normally closed contacts.
4. Design: Signals that controlled indicator-post valve is in other than fully open position.

2.11 CONTROL PANELS

A. Description: Single-area, two-area, or single-area cross-zoned type control panel as indicated, including NEMA ICS 6, Type 1 enclosure, detector, alarm, and solenoid-valve circuitry for operation of deluge valves. Panels contain power supply; battery charger; standby batteries; field-wiring terminal strip; electrically supervised solenoid valves and polarized fire-alarm bell; lamp test facility; single-pole, double-throw auxiliary alarm contacts; and rectifier.

1. Panels: UL listed and FM Global approved when used with thermal detectors and Class A detector circuit wiring. Electrical characteristics are 120-V ac, 60 Hz, with 24-V dc rechargeable batteries.
2. Manual Control Stations: Electric operation, metal enclosure, labeled "MANUAL CONTROL STATION" with operating instructions and cover held closed by breakable strut to prevent accidental opening.

2.12 PRESSURE GAGES

A. Standard: UL 393.

B. Dial Size: 3-1/2- to 4-1/2-inch (90- to 115-mm) diameter.

C. Pressure Gage Range: 0 to 300 psig (0 to 2070 kPa).

D. Water System Piping Gage: Include "WATER" or "AIR/WATER" label on dial face.

E. Air System Piping Gage: Include retard feature and "AIR" or "AIR/WATER" label on dial face.

2.13 ESCUTCHEONS

A. General: Manufactured ceiling, floor, and wall escutcheons and floor plates.

B. One-Piece, Cast-Brass Escutcheons: Polished chrome-plated finish with set-screws.

C. One-Piece, Deep-Pattern Escutcheons: Deep-drawn, box-shaped brass with chrome-plated finish.

D. One-Piece, Stamped-Steel Escutcheons: Chrome-plated finish with set-screw or spring clips.

E. Split-Casting, Cast-Brass Escutcheons: Polished chrome-plated finish with concealed hinge and set-screw.

F. Split-Plate, Stamped-Steel Escutcheons: Chrome-plated finish with concealed hinge, set-screw or spring clips.

G. One-Piece Floor Plates: Cast-iron flange with holes for fasteners.

H. Split-Casting Floor Plates: Cast brass with concealed hinge.

2.14 SLEEVES

A. Cast-Iron Wall Pipe Sleeves: Cast or fabricated of cast iron and equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.

B. Galvanized-Steel-Sheet Sleeves: 0.0239-inch (0.6-mm) minimum thickness; round tube closed with welded longitudinal joint.

C. Galvanized-Steel-Pipe Sleeves: ASTM A 53/A 53M, Type E, standard weight, zinc coated, plain ends.

2.15 SLEEVE SEALS

A. Description: Modular sealing element unit, designed for field assembly, to fill annular space between pipe and sleeve.

1. Sealing Elements: EPDM-rubber or NBR interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
2. Pressure Plates: Carbon steel or Stainless steel.
3. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating or Stainless steel of length required to secure pressure plates to sealing elements.

2.16 GROUT

A. Standard: ASTM C 1107, Grade B, posthardening and volume adjusting, dry, hydraulic-cement grout.

B. Characteristics: Nonshrink, and recommended for interior and exterior applications.

C. Design Mix: 5000-psi (34-MPa), 28-day compressive strength.

D. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.1 PREPARATION

A. Perform fire-hydrant flow test according to NFPA 13 and NFPA 291. Use results for system design calculations required in "Quality Assurance" Article.

B. Report test results promptly and in writing.

3.2 SERVICE-ENTRANCE PIPING

A. Connect sprinkler piping to water-service piping of size and in location indicated for service entrance to building.

B. Install shutoff valve, backflow preventer, pressure gage, drain, and other accessories indicated at connection to water-service piping.

3.3 PIPING INSTALLATION

A. Locations and Arrangements: Drawing plans, schematics, and diagrams indicate general location and arrangement of piping. Install piping as indicated, as far as practical.

1. Deviations from approved working plans for piping require written approval from authorities having jurisdiction. File written approval with Architect before deviating from approved working plans.

B. Piping Standard: Comply with requirements in NFPA 13 for installation of sprinkler piping.

C. Use listed fittings to make changes in direction, branch takeoffs from mains, and reductions in pipe sizes.

D. Install unions adjacent to each valve in pipes NPS 2 (DN 50) and smaller.

E. Install flanges, flange adapters, or couplings for grooved-end piping on valves, apparatus, and equipment having NPS 2-1/2 (DN 65) and larger end connections.

F. Install "Inspector's Test Connections" in sprinkler system piping, complete with shutoff valve, and sized and located according to NFPA 13.

G. Install sprinkler piping with drains for complete system drainage.

H. Install sprinkler control valves, test assemblies, and drain risers adjacent to standpipes when sprinkler piping is connected to standpipes.

I. Install automatic (ball drip) drain valves to drain piping between fire-department connections and check valves. Drain to floor drain or to outside building.

J. Connect compressed-air supply to dry-pipe sprinkler piping.

K. Install alarm devices in piping systems.

L. Install hangers and supports for sprinkler system piping according to NFPA 13. Comply with requirements in NFPA 13 for hanger materials.

M. Install pressure gages on riser or feed main, at each sprinkler test connection, and at top of each standpipe. Include pressure gages with connection not less than NPS 1/4 (DN 8) and with soft metal seated globe valve, arranged for draining pipe between gage and valve. Install gages to permit removal, and install where they will not be subject to freezing.

N. Drain dry-pipe sprinkler piping.

O. Pressurize and check dry-pipe sprinkler system piping and air compressors.

3.4 JOINT CONSTRUCTION

A. Install couplings, flanges, flanged fittings, unions, nipples, and transition and special fittings that have finish and pressure ratings same as or higher than system's pressure rating for aboveground applications unless otherwise indicated.

B. Install unions adjacent to each valve in pipes NPS 2 (DN 50) and smaller.

C. Install flanges, flange adapters, or couplings for grooved-end piping on valves, apparatus, and equipment having NPS 2-1/2 (DN 65) and larger end connections.

D. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

E. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.

F. Flanged Joints: Select appropriate gasket material in size, type, and thickness suitable for water service. Join flanges with gasket and bolts according to ASME B31.9.

G. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

1. Apply appropriate tape or thread compound to external pipe threads.

2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.

H. Twist-Locked Joints: Insert plain end of steel pipe into plain-end-pipe fitting. Rotate retainer lugs one-quarter turn or tighten retainer pin.

I. Steel-Piping, Cut-Grooved Joints: Cut square-edge groove in end of pipe according to AWWA C606. Assemble coupling with housing, gasket, lubricant, and bolts. Join steel pipe and grooved-end fittings according to AWWA C606 for steel-pipe joints.

J. Dissimilar-Material Piping Joints: Make joints using adapters compatible with materials of both piping systems.

3.5 VALVE AND SPECIALTIES INSTALLATION

A. Install listed fire-protection valves, trim and drain valves, specialty valves and trim, controls, and specialties according to NFPA 13 and authorities having jurisdiction.

B. Install listed fire-protection shutoff valves supervised open, located to control sources of water supply except from fire-department connections. Install permanent identification signs indicating portion of system controlled by each valve.

C. Install check valve in each water-supply connection. Install backflow preventers instead of check valves in potable-water-supply sources.

D. Specialty Valves:

1. General Requirements: Install in vertical position for proper direction of flow, in main supply to system.
2. Dry-Pipe Valves: Install trim sets for air supply, drain, priming level, alarm connections, ball drip valves, pressure gages, priming chamber attachment, and fill-line attachment.

a. Install air compressor and compressed-air supply piping.

3.6 SPRINKLER INSTALLATION

A. Install sprinklers in suspended ceilings in center of narrow dimension of acoustical ceiling panels.

B. Install dry-type sprinklers with water supply from heated space. Do not install pendent or sidewall, wet-type sprinklers in areas subject to freezing.

3.7 FIRE-DEPARTMENT CONNECTION INSTALLATION

A. Install wall-type, fire-department connections.

B. Install automatic (ball drip) drain valve at each check valve for fire-department connection.

3.8 ESCUTCHEON INSTALLATION

A. Install escutcheons for penetrations of walls, ceilings, and floors.

B. Escutcheons for New Piping:

1. Piping with Fitting or Sleeve Protruding from Wall: One piece, deep pattern.
2. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One piece, cast brass with polished chrome-plated finish or stamped steel with set-screw or spring clips.
3. Bare Piping at Ceiling Penetrations in Finished Spaces: One piece or split casting, cast brass with polished chrome-plated finish or One piece or split plate, stamped steel with set-screw.
4. Bare Piping in Unfinished Service Spaces: One piece, cast brass with polished chrome-plated finish or stamped steel with set-screw or spring clips.
5. Bare Piping in Equipment Rooms: One piece, stamped steel with set-screw or spring clips.
6. Bare Piping at Floor Penetrations in Equipment Rooms: One-piece floor plate.

3.9 SLEEVE INSTALLATION

A. General Requirements: Install sleeves for pipes and tubes passing through penetrations in floors, partitions, roofs, and walls.

B. Sleeves are not required for core-drilled holes.

C. Permanent sleeves are not required for holes formed by removable PE sleeves.

D. Cut sleeves to length for mounting flush with both surfaces unless otherwise indicated.

E. Install sleeves in new partitions, slabs, and walls as they are built.

F. For interior wall penetrations, seal annular space between sleeve and pipe using joint sealants appropriate for size, depth, and location of joint. Comply with requirements for joint sealants in Division 7 Section "Joint Sealants".

G. For exterior wall penetrations above grade, seal annular space between sleeve and pipe using joint sealants appropriate for size, depth, and location of joint. Comply with requirements for joint sealants in Division 7 Section "Joint Sealants".

H. For exterior wall penetrations below grade, seal annular space between sleeve and pipe using sleeve seals.

I. Seal space outside of sleeves in concrete slabs and walls with grout.

J. Install sleeves that are large enough to provide 1/4-inch (6.4-mm) annular clear space between sleeve and pipe unless otherwise indicated.

K. Install sleeve materials according to the following applications:

1. Sleeves for Piping Passing through Concrete Floor Slabs: Galvanized-steel pipe.

2. Sleeves for Piping Passing through Concrete Floor Slabs of Mechanical Equipment Areas or Other Wet Areas: Galvanized-steel pipe.

   a. Extend sleeves 2 inches (50 mm) above finished floor level.
   b. For pipes penetrating floors with membrane waterproofing, extend cast-iron sleeve fittings below floor slab as required to secure clamping ring if ring is specified. Secure flashing between clamping flanges. Install section of cast-iron soil pipe to extend sleeve to 2 inches (50 mm) above finished floor level. Comply with requirements for flashing in Division 7.

3. Sleeves for Piping Passing through Gypsum-Board Partitions:

   a. Galvanized-steel-pipe sleeves for pipes smaller than NPS 6 (DN 150).
   b. Galvanized-steel-sheet sleeves for pipes NPS 6 (DN 150) and larger.
   c. Exception: Sleeves are not required for water-supply tubes and waste pipes for individual plumbing fixtures if escutcheons will cover openings.

4. Sleeves for Piping Passing through Concrete Roof Slabs: Galvanized-steel pipe.
5. Sleeves for Piping Passing through Exterior Concrete Walls:

   a. Galvanized-steel-pipe sleeves for pipes smaller than NPS 6 (DN 150).
   b. Cast-iron wall pipe sleeves for pipes NPS 6 (DN 150) and larger.
   c. Install sleeves that are large enough to provide 1-inch (25-mm) annular clear space between sleeve and pipe when sleeve seals are used.

6. Sleeves for Piping Passing through Interior Concrete Walls:

   a. Galvanized-steel pipe sleeves for pipes smaller than NPS 6 (DN 150).
   b. Galvanized-steel-sheet sleeves for pipes NPS 6 (DN 150) and larger.

L. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Comply with requirements in Division 7 Section "Through-Penetration Firestop Systems" for firestop materials and installations.

3.10 SLEEVE SEAL INSTALLATION

A. Install sleeve seals in sleeves in exterior concrete walls at water-service piping entries into building.

B. Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble sleeve seal components and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.11 IDENTIFICATION

A. Install labeling and pipe markers on equipment and piping according to requirements in NFPA 13.

B. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Division 16 Section "Electrical Identification."

3.12 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. Leak Test: After installation, charge systems and test for leaks. Repair leaks and retest until no leaks exist.
2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
3. Flush, test, and inspect sprinkler systems according to NFPA 13, "Systems Acceptance" Chapter.
4. Energize circuits to electrical equipment and devices.
5. Start and run air compressors.
6. Coordinate with fire-alarm tests. Operate as required.
7. Verify that equipment hose threads are same as local fire-department equipment.

C. Sprinkler piping system will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

3.13 CLEANING

A. Clean dirt and debris from sprinklers.

B. Remove and replace sprinklers with paint other than factory finish.

3.14 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain specialty valves.

3.15 PIPING SCHEDULE

A. Piping between Fire-Department Connections and Check Valves: Galvanized, standard-weight steel pipe with threaded ends; cast-iron threaded fittings; and threaded or grooved ends; grooved-end fittings; grooved-end-pipe couplings; and grooved joints.

B. Sprinkler specialty fittings may be used, downstream of control vales, instead of specified fittings.

C. Standard-pressure, dry-pipe sprinkler system, NPS 2 (DN 50) and smaller ,shall be one of the following:

1. Schedule 30, galvanized-steel pipe with threaded ends; galvanized, gray-iron threaded fittings; and threaded joints.
2. Schedule 30 or thinwall, galvanized-steel pipe with plain ends; plain-end-pipe fittings; and twist-locked joints.
3. Schedule 30, galvanized-steel pipe with cut-grooved ends; galvanized, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.

D. Standard-pressure, dry-pipe sprinkler system, NPS 2-1/2 to NPS 4 (DN 65 to DN 100), shall be one of the following:

1. Schedule 30, galvanized-steel pipe with threaded ends; galvanized, gray-iron threaded fittings; and threaded joints.
2. Schedule 30, galvanized-steel pipe with cut-grooved ends; galvanized, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.

E. Standard-pressure, dry-pipe sprinkler system, NPS 5 and NPS 6 (DN 125 and DN 150), shall be one of the following:

1. Schedule 30, galvanized-steel pipe with threaded ends; galvanized, gray-iron threaded fittings; and threaded joints.
2. Schedule 30, galvanized-steel pipe with cut-grooved ends; galvanized, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.

3.16 SPRINKLER SCHEDULE

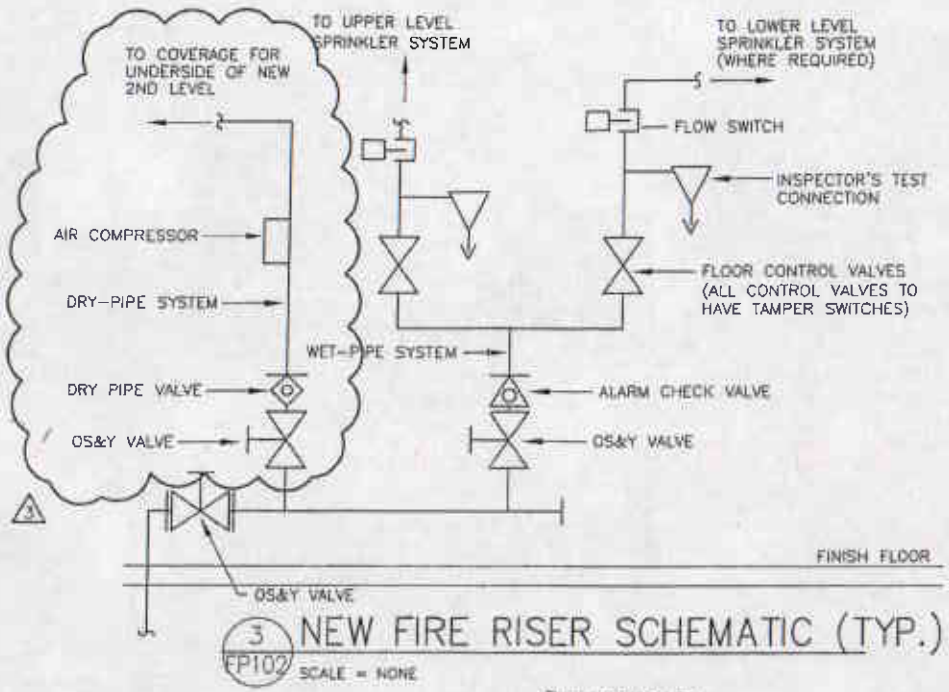
A. Use sprinkler types in subparagraphs below for the following applications:

1. Rooms without Ceilings: Upright sprinklers.
2. Rooms with Suspended Ceilings: Dry pendent sprinklers, Dry recessed sprinklers, or Dry flush sprinklers.
3. Wall Mounting: Dry sidewall sprinklers.
4. Spaces Subject to Freezing: Upright, dry pendent sprinklers; and dry sidewall sprinklers as required.
5. Special Applications: Extended-coverage and quick-response sprinklers where indicated.

B. Provide sprinkler types in subparagraphs below with finishes indicated.

1. Concealed Sprinklers: Rough brass, with factory-painted white cover plate.
2. Flush Sprinklers: Bright chrome, with painted white escutcheon.
3. Recessed Sprinklers: Bright chrome, with bright chrome escutcheon.
4. Upright, Pendent, and Sidewall Sprinklers: Chrome plated in finished spaces exposed to view; rough bronze in unfinished spaces not exposed to view; wax coated where exposed to acids, chemicals, or other corrosive fumes.

END OF SECTION 13935



3 FP102 NEW FIRE RISER SCHEMATIC (TYP.)

SCALE = NONE

Paragon

Received

Bath ENGINEERING
4110 RIO BRAVO SUITE 102
EL PASO, TX 79902
TEL: 915-534-9110

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AARON MEDINA 95799 LICENSED PROFESSIONAL ENGINEER

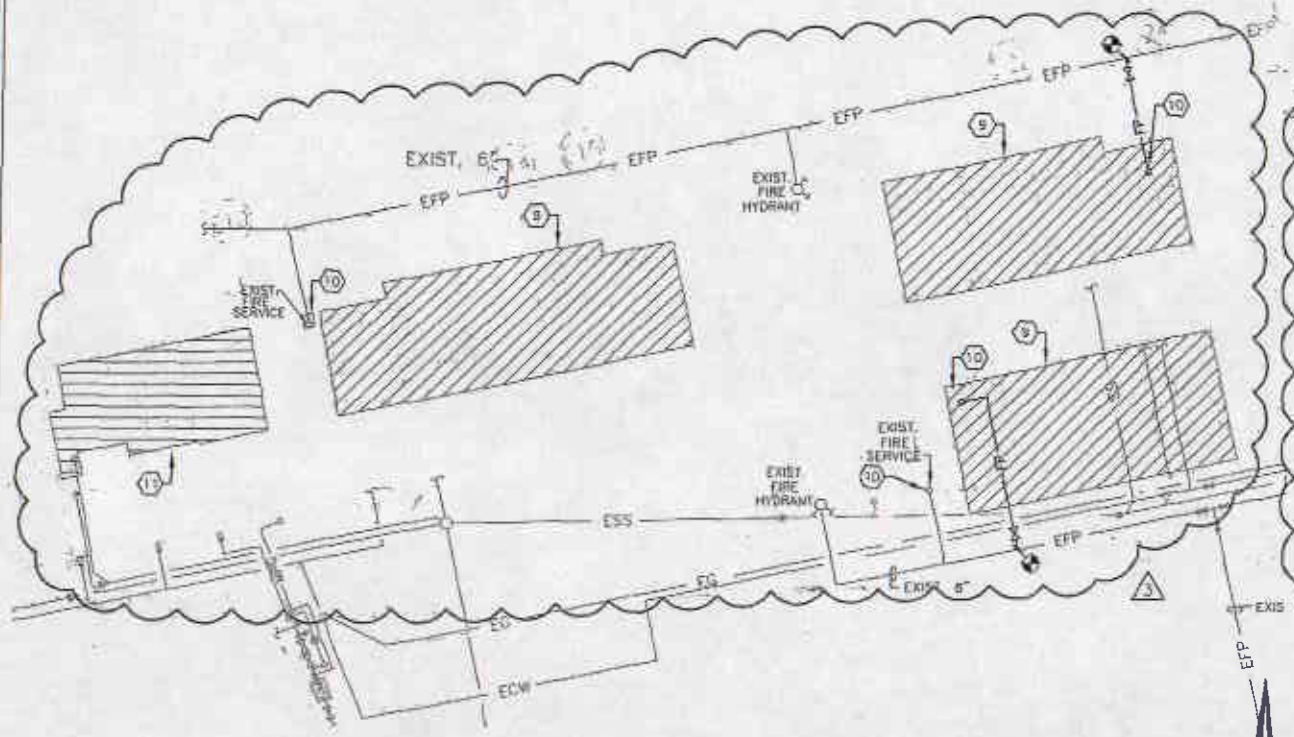
MOORE NERDELL KRAEGER

FIRE PROTECTION REMODEL - LOWER LEVEL

EL PASO INTERNATIONAL AIRPORT
Terminal Modification and Additional Public/Concessions

AS SHOWN	10/09/08
FP102	0604
PS-06	
SK6-FP102	

pg 1. 2



KEYED NOTES: (APPLIES TO ALL)

(9) HATCHED AREA SHALL HAVE A DRY-PIPE FIRE SUPPRESSION SYSTEM. DRY PIPE SYSTEM SHALL PROVIDE COVERAGE FOR THE UNDERSIDE OF THE NEW UPPER LEVEL ADDITION WHERE EXPOSED. CONTRACTOR SHALL COORDINATE WITH ARCHITECT AND STRUCTURAL TO DETERMINE ROUTING OF SYSTEM PIPING WITHIN SOFFIT.

(10) CONTRACTOR SHALL DETERMINE BEST SUITABLE LOCATION TO TAP DRY-PIPE SYSTEM INTO NEW OR EXISTING WET PIPE RISERS OR EXISTING DRY PIPE SYSTEM. FIELD VERIFY EXACT LOCATION OF EXISTING AND NEW FIRE RISERS AND EXISTING DRY PIPE SYSTEM. COORDINATE INSTALLATION OF RISERS WITH OTHER DISCIPLINES.

(11) HATCHED AREA SHALL NO LONGER BE PART OF THE CONTRACT. WORK CONSISTED OF RELOCATING EXISTING SPRINKLERS AND PIPING TO MATCH NEW COVERAGE AREA AND CEILING GRID. CREDIT SHOULD BE GIVEN TO THE OWNER ON THIS WORK.

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AARON MEDINA 95799 LICENSED PROFESSIONAL ENGINEER

MOORE NERDELL KREEGER

01 / FP102 DRY-PIPE FIRE SUPPRESSION SYSTEM

1"=30'-0"

0 15' 30' 60

FIRE PROTECTION REMODEL PLAN – LOWER LEVEL

EL PASO INTERNATIONAL AIRPORT
Terminal Modification and Additional Public/Concessions

AS SHOWN	10/09/06
FP102	0604
PR-06	
SK4-FP102	

pg 1 of 2

GENERAL NOTES: (APPLIES TO ALL SHEETS)

1. WORK ASSOCIATED WITH THE FIRE PROTECTION TRADE DEFINED ON DRAWINGS AND SPECIFICATIONS PROVIDE THE REQUIREMENTS FOR THE FIRE PROTECTION SYSTEM. THE DRAWINGS ARE CONCEPT DRAWINGS WHICH ARE INTENDED TO INDICATE INFORMATION ONLY TO DEMONSTRATE POTENTIAL SYSTEM ARRANGEMENT. DRAWINGS DO NOT INDICATE ALL INFORMATION NECESSARY FOR THE INSTALLATION OF THE FIRE PROTECTION SYSTEM, BUT IT IS INTENDED AS A REFERENCE GUIDE FOR THE CONTRACTOR FOR THE PURPOSE OF DESIGNING THE SYSTEM AND CONSTRUCTING A BID.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COMPLETE DESIGN AND CONSTRUCTION OF THE FIRE PROTECTION SYSTEM AS REQUIRED BY THE CONTRACT DOCUMENTS.
3. THESE DRAWINGS ARE DIAGRAMMATIC SHOWING THE GENERAL AREAS WHERE WORK IS TO BE PERFORMED. CONTRACTOR IS TO ADAPT THE WORK TO ACTUAL CONDITIONS. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS DEFINING THE PROPOSED DESIGN BEFORE COMMENCING ANY WORK.
4. WORK ASSOCIATED WITH THE FIRE PROTECTION TRADE DEFINED ON DRAWINGS AND SPECIFICATIONS PROVIDE THE REQUIREMENTS FOR THE UPGRADE AND/OR EXTENSION OF THE EXISTING FIRE PROTECTION SYSTEM.
5. ALL NEW FIRE PROTECTION SYSTEMS SHALL BE IN COMPLIANCE WITH NFPA 13 , 14, AND LATEST EDITION OF THE FIRE CODE, FIRE MARSHALS OFFICE, AND LOCAL AMENDMENTS.
6. AREA INDICATED BY HATCH AREA STATING DRY-PIPE FIRE SUPPRESSION SYSTEM SHALL BE CLASSIFIED AS ORDINARY HAZARD, GROUP 2 OCCUPANCY, AS DEFINED IN NFPA 13. FOR THE PURPOSE OF THE SPRINKLER DESIGN, MINIMUM REQUIREMENTS SHALL BE CALCULATED WITH A 0.20 DENSITY (GPM/SQ. FT.) OVER 1,500 SQ. FT. COVERAGE AREA OF SPRINKLER SYSTEM OPERATION.
7. ALL NEW SPRINKLER WORK SHALL BE HYDRAULICALLY CALCULATED AND SUBMITTED FOR APPROVAL PRIOR TO FABRICATION AND INSTALLATION.
8. CONTRACTOR SHALL INSTALL INCLUDING, BUT NOT LIMITED TO VALVES, TRIM, RELEASING PANEL AND AIR COMPRESSOR. ALL OTHER COMPONENTS SUCH AS THE NOTIFICATION DEVICES, INITIATING DEVICES, POWER TO FIRE ALARM SHALL BE PROVIDED BY OTHERS AND SHALL BE INTERCONNECTED TO THE RELEASING AND BUILDING FIRE ALARM PANELS.
9. ALL ELECTRICAL, ALARM, DETECTION, AND CONTROL WIRING AND INTERCONNECTING WIRING FOR THE DRY-PIPE FIRE PROTECTION SYSTEM SHALL BE COORDINATED WITH FIRE ALARM AND ELECTRICAL CONTRACTOR. ALL ALARM, ELECTRICAL, AND CONTROL CONNECTIONS SHALL BE INSTALLED IN ACCORDANCE WITH NFPA 72 LATEST EDITIONS, FIRE MARSHALS OFFICE, AND LOCAL AMENDMENTS.
10. CONTRACTOR SHALL BRING ANY DISCREPANCIES OR CONFLICTING DATA TO THE ATTENTION OF ARCHITECT PRIOR TO COMMENCEMENT OF WORK.
11. ALL HANGERS AND SUPPORTS SHALL COMPLY WITH NFPA 13. COORDINATE SUPPORT OF DRY-PIPE SYSTEM WITH STRUCTURAL.

GENERAL NOTES: (APPLIES TO ALL SHEETS)

11. A FLOW TEST REPORT AT THE SITE IS REQUIRED WITHIN 30 DAYS OF SHOP DRAWING SUBMITTALS. FLOW TEST INFORMATION SHALL BE OBTAINED FROM THE EL PASO FIRE MARSHAL WATER DIVISION. FIRE HYDRANT RESIDUAL PRESSURE, PITOT PRESSURE AND FLOW FOR THE TWO ADJACENT FIRE HYDRANTS MUST BE INDICATED ON SHOP DRAWINGS.
12. AT NO TIME SHALL ANY FIRE PROTECTION SYSTEM BE LEFT INOPERABLE DURING NON-WORKING HOURS.
13. COORDINATE ALL SYSTEM SHUTDOWNS WITH THE LOCAL FIRE DEPARTMENT AND EPIA SECURITY OPERATIONS.
14. LAYOUT AND INSTALLATION OF FIRE PROTECTION SYSTEM SHALL BE COORDINATED WITH ALL DISCIPLINES. WHERE DISCREPANCIES OCCUR, FIRE PROTECTION CONTRACTOR SHALL OFFSET TO PROVIDE CLEARANCE FOR DUCTWORK, HYDRONIC, LIGHTING, ELECTRICAL CONDUIT, CABLE TRAY LAYOUT, STRUCTURAL, ETC.
15. SYSTEM COMPONENTS INSTALLED OUTSIDE, OR IN PRESENCE OF A CORROSIVE ATMOSPHERE, SHALL BE CONSTRUCTED OF MATERIALS THAT WILL RESIST CORROSION OR BE SUITABLY PROTECTED FOR CORROSION.
16. ALL SIZES SHOWN FOR FIRE PROTECTION PIPE AND FITTINGS ARE APPROXIMATE, ACTUAL SIZES SHALL BE DETERMINED BY FIRE PROTECTION CONTRACTOR.
17. FIRE PROTECTION CONTRACTOR SHALL DETERMINE THE BEST POSSIBLE LOCATION TO TAP NEW DRY PIPE SYSTEM TO EXISTING DRY OR WET PIPE SYSTEM OR NEW WET SYSTEM. CONTRACTOR SHALL VERIFY CAPACITY OF EXISTING DRY PIPE SYSTEM TO DETERMINE IF EXISTING CAN BE EXTENDED TO THE NEW SYSTEM. CONTRACTOR SHALL FIELD VERIFY LOCATION OF EXISTING AND NEW RISERS PRIOR TO DESIGN OF DRY PIPE SYSTEM.

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AARON MEDINA
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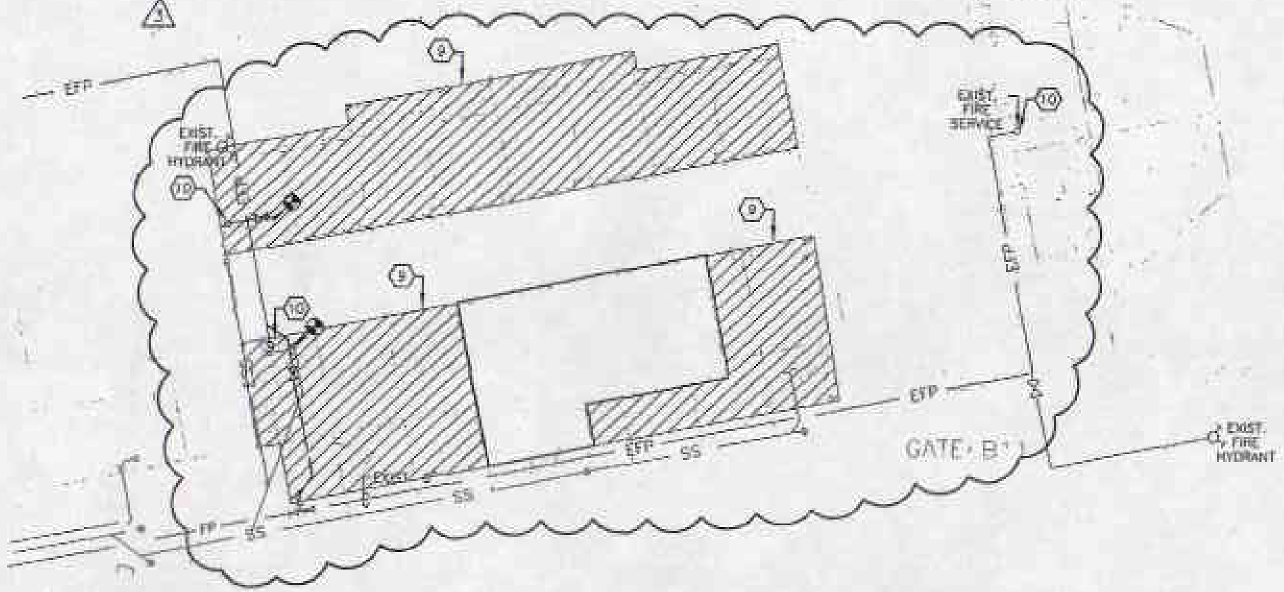
MOORE NERDELL KRREGER

FIRE PROTECTION REMODEL PLAN – LOWER LEVEL

EL PASO INTERNATIONAL AIRPORT
Terminal Modification and Additional Public/Concessions

SCALE: AS SHOWN	DATE: 10/09/08
REFERENCE SHEET: FP102	PROJECT NUMBER: 0804
DRAWING TYPE: PR-00	
SHEET NUMBER: SK3-FP102	

PR 6.5



01 FP102 DRY-PIPE FIRE SUPPRESSION SYSTEM

1"=30'-0"

0 15' 30' 60

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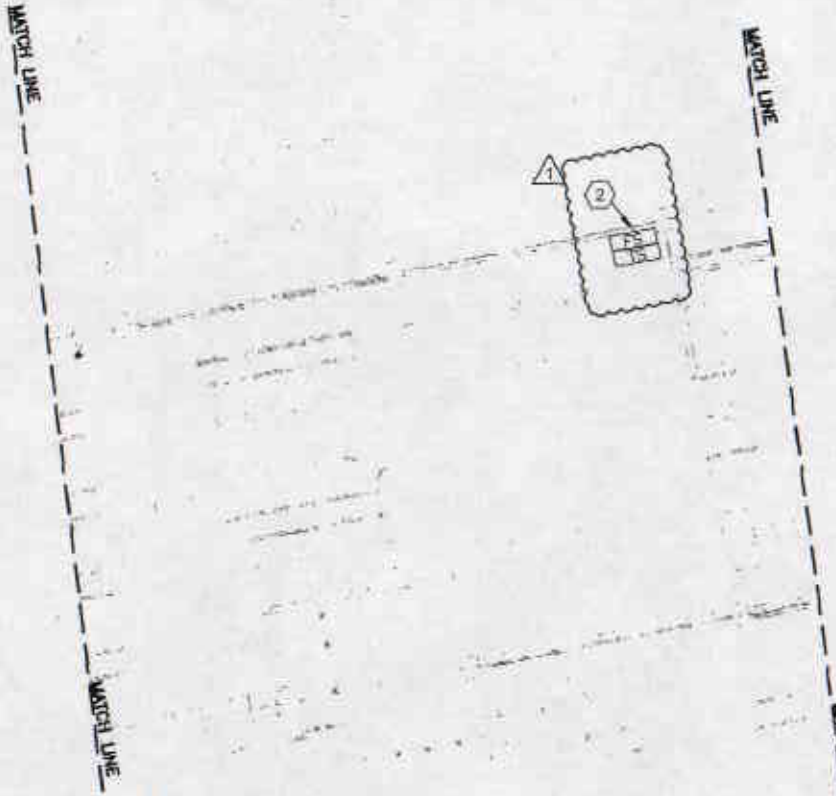
STATE OF TEXAS AARON MEDINA 95799 LICENSED PROFESSIONAL ENGINEER

MOORE NORDELL KROEGER

FIRE PROTECTION REMODEL PLAN – LOWER LEVEL

El Paso INTERNATIONAL AIRPORT
Terminal Modification and
Additional Public/Concessions

AS SHOWN	10/09/08
FP102	0604
PR-08	
SK5-FP102	



PARTIAL FIRST FLOOR - SPECIAL SYSTEM PLAN

01 / E401

1" = 8'-0"

0 4' 8' 16'

TRUE NORTH PLAN NORTH

PARTIAL GENERAL NOTES

1 5. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL NECESSARY ROUGH-IN FOR THE DRY-PIPE SYSTEM.

PARTIAL KEYED NOTES

1 (2) DRY-PIPE FIRE SUPPRESSION SYSTEM CONTROL PANEL PROVIDE AND INSTALLED BY FIRE PROTECTION CONTRACTOR. FIRE ALARM SHALL INTERFACE CONTROL PANEL WITH BUILDING FIRE ALARM SYSTEM. PROVIDE INTERCONNECTION CONDUIT , AND WIRING TO VALVE, COMPRESSOR, AND ALL ASSOCIATED DEVICES PER DRY-PIPE SUPPRESSION SYSTEM DRAWINGS. PROVIDE 120V EMERGENCY POWER TO CONTROL PANEL AND COMPRESSOR FROM NEAREST EMERGENCY PANEL WITH SPARE 20A/1P CIRCUIT BREAKERS. FURNISH AND INSTALL NEW 120V, 20A/1P CIRCUIT BREAKER IF SPARES ARE NOT AVAILABLE. USE 2#10, 1#10G IN 1/2"C.

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STATE OF TEXAS
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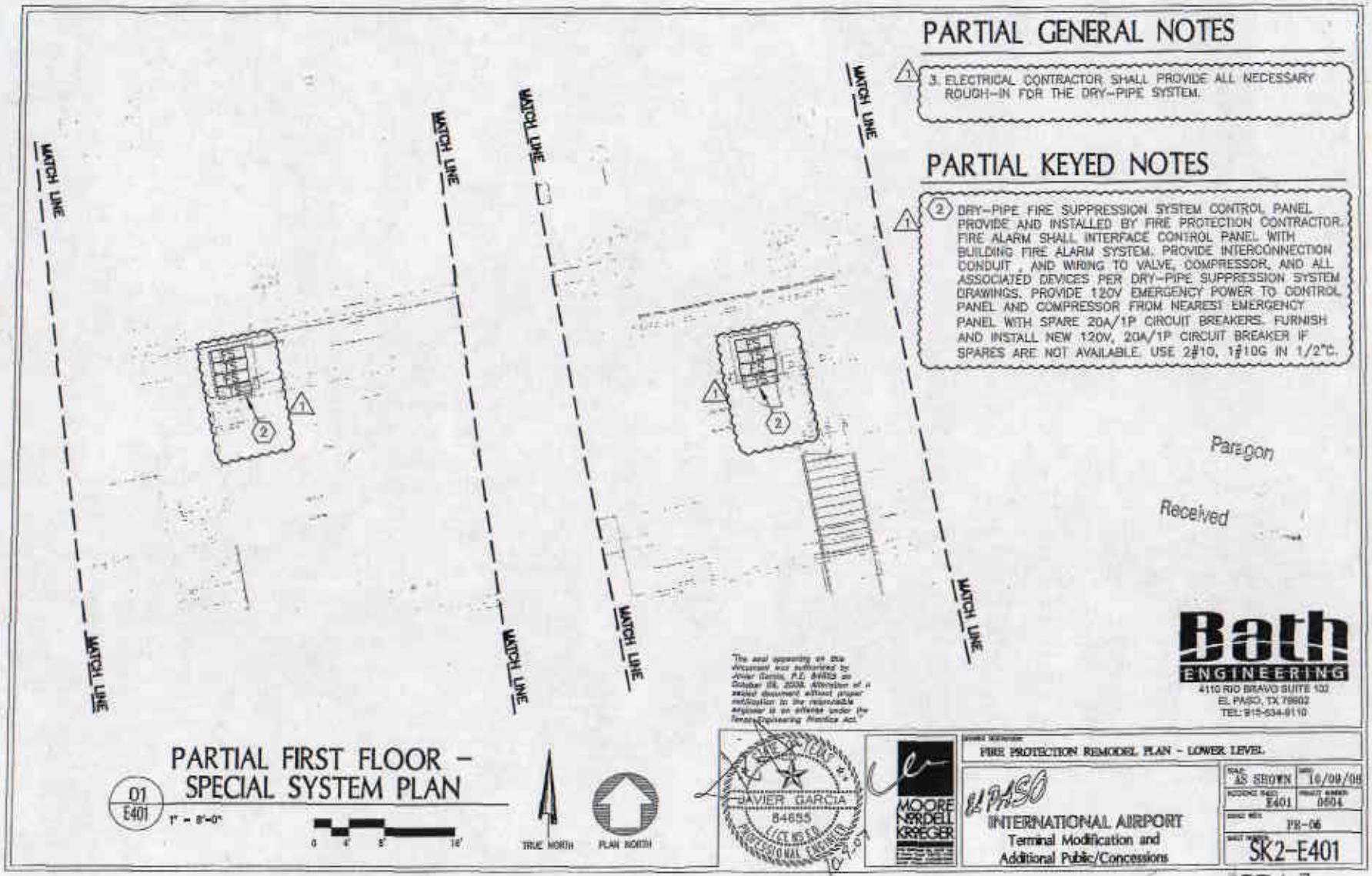
FIRE PROTECTION REMODEL PLAN - LOWER LEVEL

EL PASO INTERNATIONAL AIRPORT
Terminal Modification and Additional Public/Concessions

AS SHOWN	10/09/08
E401	0604
PR-06	
SK1-E401	



PARTIAL GENERAL NOTES

1. 3. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL NECESSARY ROUGH-IN FOR THE DRY-PIPE SYSTEM.

PARTIAL KEYED NOTES

2. DRY-PIPE FIRE SUPPRESSION SYSTEM CONTROL PANEL PROVIDE AND INSTALLED BY FIRE PROTECTION CONTRACTOR. FIRE ALARM SHALL INTERFACE CONTROL PANEL WITH BUILDING FIRE ALARM SYSTEM. PROVIDE INTERCONNECTION CONDUIT , AND WIRING TO VALVE, COMPRESSOR, AND ALL ASSOCIATED DEVICES PER DRY-PIPE SUPPRESSION SYSTEM DRAWINGS. PROVIDE 120V EMERGENCY POWER TO CONTROL PANEL AND COMPRESSOR FROM NEAREST EMERGENCY PANEL WITH SPARE 20A/1P CIRCUIT BREAKERS. FURNISH AND INSTALL NEW 120V, 20A/1P CIRCUIT BREAKER IF SPARES ARE NOT AVAILABLE. USE 2#10, 1#10G IN 1/2"C.

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01 / E401

PARTIAL FIRST FLOOR - SPECIAL SYSTEM PLAN

1" = 8'-0"

0 4' 8' 16'

TRUE NORTH

PLAN NORTH

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10-7-08

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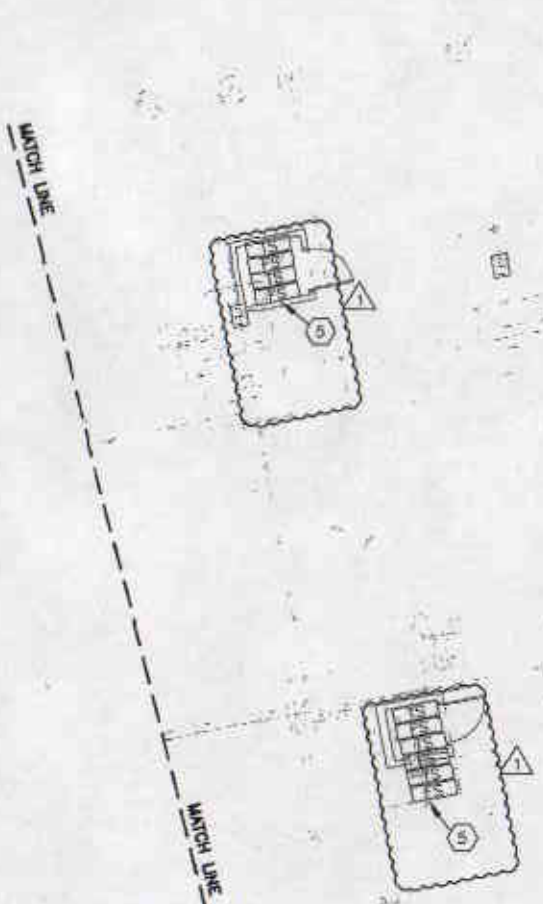
FIRE PROTECTION REMODEL PLAN - LOWER LEVEL

El Paso INTERNATIONAL AIRPORT
Terminal Modification and Additional Public/Concessions

SCALE: AS SHOWN	DATE: 10/08/08
SEQUENCE NUMBER: E401	PROJECT NUMBER: 0804
ISSUE SET: PR-06	
SHEET NUMBER: SK2-E401	



PARTIAL GENERAL NOTES

1 4. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL NECESSARY ROUGH-IN FOR THE DRY-PIPE SYSTEM.

PARTIAL KEYED NOTES

1 (5) DRY-PIPE FIRE SUPPRESSION SYSTEM CONTROL PANEL PROVIDE AND INSTALLED BY FIRE PROTECTION CONTRACTOR. FIRE ALARM SHALL INTERFACE CONTROL PANEL WITH BUILDING FIRE ALARM SYSTEM. PROVIDE INTERCONNECTION CONDUIT , AND WIRING TO VALVE, COMPRESSOR, AND ALL ASSOCIATED DEVICES PER DRY-PIPE SUPPRESSION SYSTEM DRAWINGS. PROVIDE 120V EMERGENCY POWER TO CONTROL PANEL AND COMPRESSOR FROM NEAREST EMERGENCY PANEL WITH SPARE 20A/1P CIRCUIT BREAKERS. FURNISH AND INSTALL NEW 120V, 20A/1P CIRCUIT BREAKER IF SPARES ARE NOT AVAILABLE. USE 2#10, 1#10G IN 1/2"C.

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PARTIAL FIRST FLOOR - SPECIAL SYSTEM PLAN

01 / E402

1" = 8'-0"

0 4' 8' 16'

TRUE NORTH

PLAN NORTH

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STATE OF TEXAS
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MOORE NEIDELL KREEGER

FIRST FLOOR SPECIAL SYSTEM PLAN

EL PASO INTERNATIONAL AIRPORT
Terminal Modification and Additional Public/Concessions

SCALE	DATE
AS SHOWN	10/09/08
REFERENCE SHEET: E402	PROJECT NUMBER: 0604
ISSUE NO.: PR-05	
SHEET NUMBER: SK1-E402	