GUAM POWER AUTHORITY
ATURIDÅT ILEKTRESEDÅT GUÅHAN
P.O.BOX 2977 • HAGÅTÑA, GUAM U.S.A. 96932-2977

April 22, 2025

AMENDMENT NO.: V

TO

INVITATION FOR BID NO.: GPA-027-25

FOR

GLORIA B. NELSON PUBLIC SERVICE BUILDING FIRE PROTECTION SERVICE AND MAINTENANCE CONTRACT

Prospective Bidders are hereby notified of the following responses to the inquiries received from Bidder No.: 1 dated April 4, 2025:

INCLUSIONS:

- Attachment C: Plan and Hydraulic Calc – Wet Piping
- Attachment D: GPA-GWA Multi-Purpose Facility Fire Pump Inspection
- Attachment E: Fire Suppression 2D
- Attachment F: GPA GWA Gloria B

QUESTION:
1. Fire Sprinkler System Documentation:

   - Please provide copies of the As-built drawings and original Acceptance Testing Certifications for the fire sprinkler system, including the fire pump system. (Note: Attachment A of the bid documents appears to pertain to the Fire Alarm System, not the Fire Sprinkler System.)

ANSWER:
Refer to Attachments C, D and F of *INCLUSIONS* above.

QUESTION:
2. FM-200 Clean Agent Suppression System Documentation:

   - Please provide copies of the As-built drawings, Operation and Maintenance manuals, and System Acceptance Testing Certification for the FM-200 Clean Agent Suppression System.

ANSWER:
Refer to Attachment E of *INCLUSIONS* above.

QUESTION:

3. FM-200 System Component Availability:

   - Given that Viking no longer manufactures the installed FM-200 Clean Agent System, how will the government address potential future component replacement and system maintenance?

ANSWER:

Any changes to an existing system shall be submitted in writing for further review.

QUESTION:

4. FM-200 Cylinder Hydrostatic Testing:

   - As the FM-200 cylinders are beyond their 10-year hydrostatic testing requirement, please clarify the government's plan for addressing this issue.

ANSWER:

Testing, maintenance, parts, certification and inspection are part of the fire protection maintenance contract. Any FM-200 equipment (cylinders included) that require testing or replacement, that is part of the maintenance contract.

QUESTION:

5. FM-200 Cylinder Bracketing (UPS Room):

   - The UPS Room features two FM-200 cylinder feeds, but only one cylinder bracket is present. Is the provision and installation of additional bracketing, to ensure code compliance, within the scope of this contract?

ANSWER:

The installation of an additional cylinder bracket is in line with the terms of the maintenance contract.

QUESTION:

6. UPS Room Expansion Drawings:

   - Please provide copies of the design/As-built drawings reflecting the expansion of the UPS Room, to ensure accurate assessment of the system configuration.

ANSWER:

Refer to Attachment E of *INCLUSIONS* above.

QUESTION:

7. Server Room Riser Pipe Bracketing:

   - The riser pipes in the Server Room, downstream of the rubber discharge hose, lack bracketing. Given the 725 PSI cylinder discharge pressure, is the provision and installation of adequate bracketing for these riser pipes within the scope of this contract?

ANSWER:

All work relating to maintenance, repair, inspection, and certification are included in the fire alarm/suppression protection system maintenance contract.

QUESTION:

8. IFB GPA-027-25, Page 6, Descriptions E & F:

- Please clarify whether the existing Fire Sprinkler System incorporates a Pre-Action/Dry Pipe System. Provision of the As-built drawings would greatly assist in this clarification.

ANSWER:

a. Yes. FM-200 dry-pipe sprinkler system inspection and testing is part of the maintenance contract.
b. Refer to Attachments C, D and F of *INCLUSIONS* above.

QUESTION:

9. Amendment No. 3, Description F.9:

- Amendment No. 3, Description F.9, stipulates that system parameters must be "within acceptable levels." Please clarify the specific acceptable levels, as manufacturer requirements typically specify a minimum standard, not a range.

ANSWER:

Within acceptable levels, implies "readings must meet manufacturer recommended standards".

All other Terms and Conditions in the bid package shall remain unchanged and in full force.

JOHN M. BENAVENTE, P.E.
General Manager

ATTACHMENT C: Plan and Hydraulic Calc -Wet Piping

GPA/GWA MULTIPURPOSE FACILITY
FIRE SPRINKLER PLANS

FIRE SPRINKLER NOTES:

PROVIDE A COMPLETE AUTOMATIC FIRE SPRINKLER SYSTEM THROUGHOUT ENTIRE SPACE. THE SYSTEM SHALL BE AS SHOWN ON THESE DRWGS. AND INSTALLED IN ACCORDANCE WITH NFPA 13 BY A LICENSED FIRE PROTECTION CONTRACTOR. SEISMICALLY BRACE MAINS.

THESE FIRE SPRINKLER PLANS ARE SUBMITTED FOR CONDITIONAL APPROVAL OF THE FIRE AND BUILDING DEPARTMENTS.

CONTRACTOR SHALL PROVIDE ALL NECESSARY OFFSETS AT DUCTWORK AND BEAMS TO PROVIDE PROPER LOCATIONS PER NFPA 13. ALL WORK AND MATERIALS SHALL COMPLY WITH NFPA 13.

PIPING: BLACK STEEL WITH CAST IRON THREAD FITTINGS FOR FIRE PROTECTION. PROVIDE PIPE SUPPORTS AND HANGERS. LIGHT HAZARD AREA MAY BE PIPED WITH PLASTIC CPVC FOR FIRE PROTECTION.

HEADS: PROVIDE NEW HEADS AS SHOWN. PENDENTS TO BE CHROME QUICK RESPONSE WITH CHROME ESTCH. PLATE. UPRIGHT HEADS TO BE QUICK RESPONCE BRASS. SEE FIRE SPRINKLER PLAN FOR LOCATION AND QUANTITIES.

HYDRAULICALLY TEST THE SYSTEM, SUBMIT (3) SIGNED AND DATED CERTIFICATES SIMILAR TO NFPA FORM AND REQUEST FIRE DEPARTMENT INSPECTION AND TEST AT LEAST 15 DAYS PRIOR TO THE DATE FOR FORMAL INSPECTION.

PORTABLE FIRE EXTINGUISHER: PROVIDE A LISTED MULTI-PURPOSE DRY CHEMICAL PORTABLE EXTINGUISHER WITH A MINIMUM RATE 2-A:10-B:C. PROVIDE EACH EXTINGUISHER IN SURFACE CABINET. SEE ARCHITECTUAL DRAWING FOR EXACT LOCATIONS.

PROVIDE 18 SPARE SPRINKLER HEADS IN METAL CABINET PER ~~UFC~~ IFC LOCATE SPARE HEAD CABINET IN PUMP ROOM. PROVIDE HYDRAULIC INFORMATION SHEET NEXT TO SPARE HEAD CABINET.

CONTRACTOR TO MODIFY COORDINATE WITH OTHER TRADES AND OFFSET PIPING AS REQUIRED TO AVOID CONFLICTS.

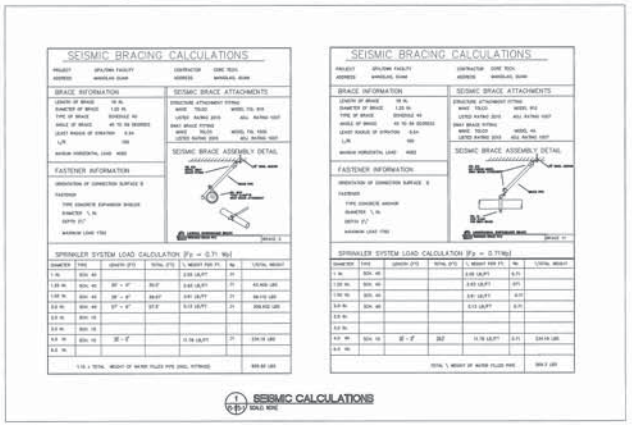
CONTRACTOR TO INSURE ALL CONCEALED STORAGE SPACES ARE COVERED.

IT SHALL BE THIS CONTRACTOR'S RESPONSIBILITY TO SEE THAT FIRE ALARM DEVICES ARE CONNECTED TO THE FIRE ALARM PANEL. THIS CONTRACTOR TO VERIFY THAT FLOW SW. CONN. TO FA PANEL ARE MADE.

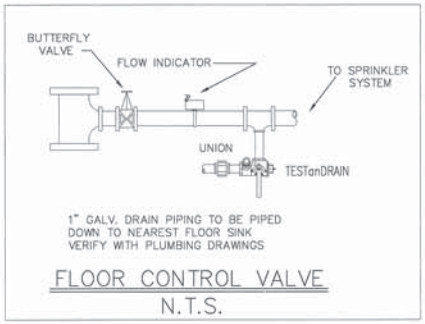
OCCUPANCY CLASSIFICATION

LIGHT HAZARD: OFFICES, CORRIDORS, LOUNGE, CONFERENCE ROOMS, 0.10 GPM/FT. SQ.

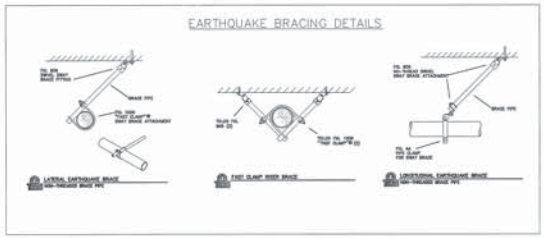
ORDINARY HAZARD: MECHANICAL ROOMS, 0.15 GPM/FT SQ..



1 SEISMIC CALCULATIONS



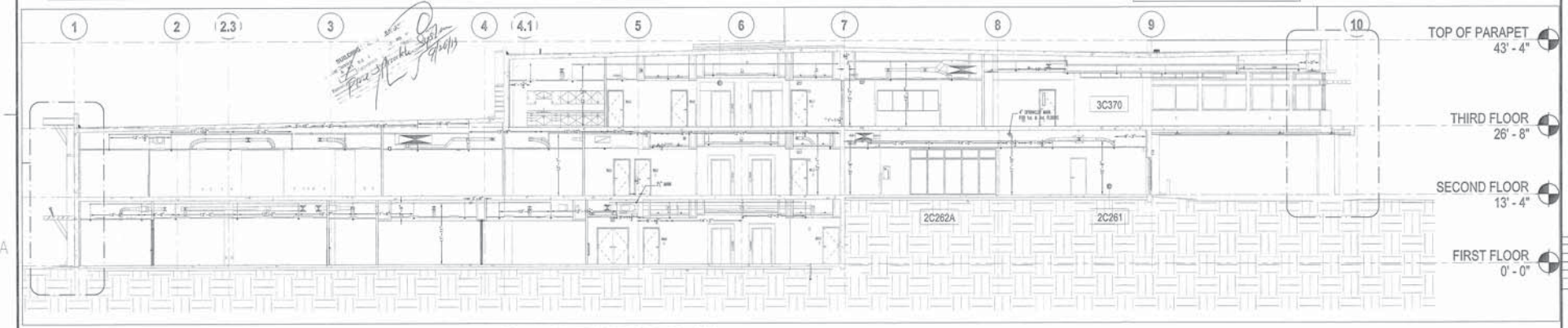
FLOOR CONTROL VALVE
N.T.S.



B120000159
GPA ENGINEERING + GWA PLAN REVIEW
APPROVED
DISAPPROVED
SIGNATURE
DATE 4/26/13
Kimmy

GUAM FIRE DEPARTMENT FIRE PREVENTION BUREAU PLAN REVIEW NO. 13-0193
APPROVED DATE 4/26/13
DISAPPROVED
REMARKS: Please see GFD 13-273
FIRE INSPECTOR

REFER TO B120000914 GWA CONTROL # 163-12



1 ELEVATION PLAN
Scale: 1/8 = 1' - 0"

Falcon Fire Protection LLC
PO BOX 326326
HAGATNA, GUAM 96932
Tel: 671-483-4539
jamie@falconfire.com License CLB08-2017

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GUAM MARIANAS ISLANDS

AUGUST, 2013
GPA/GWA Multipurpose Facility
MANGILAO, GUAM

FIRE SUPPRESSION SHOP DRAWINGS

FS-1

Falcon Fire
Protection LLC
PO BOX 326328
HAGATNA, GUAM 96932
Tel 671-483-6539
email: JonnifalconfireGmail.com License CL2308-0577

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FIRE SUPPRESSION SHOP DRAWINGS

FS-2

Sprinkler Head Schedule

Symbol	Quantity	Thread or K-Factor	Description	Note
●	40	1/2"	VERTICAL PENDENT 155 DEG F 286	
▼	4	1/2"	HORIZONTAL SIDEWALL 155 DEG F 286	
	5.6			

1 FIRST FLR. SPRINKLER PLAN
Scale: 1/8" = 1'-0"

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PO BOX 326328
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Tel 671-483-6539
email: johnfalconfire@ghpo.com License CLB08-0317

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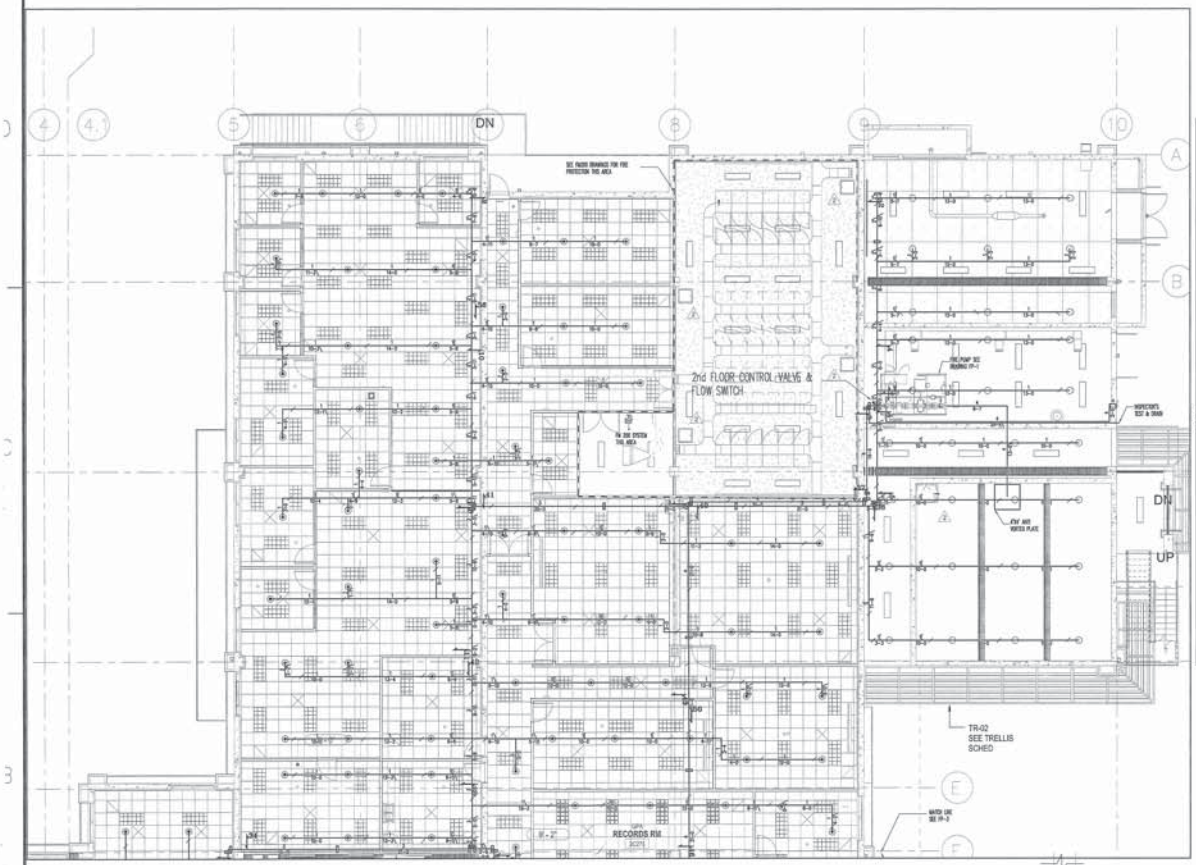
FIRE SUPPRESSION SHOP DRAWINGS

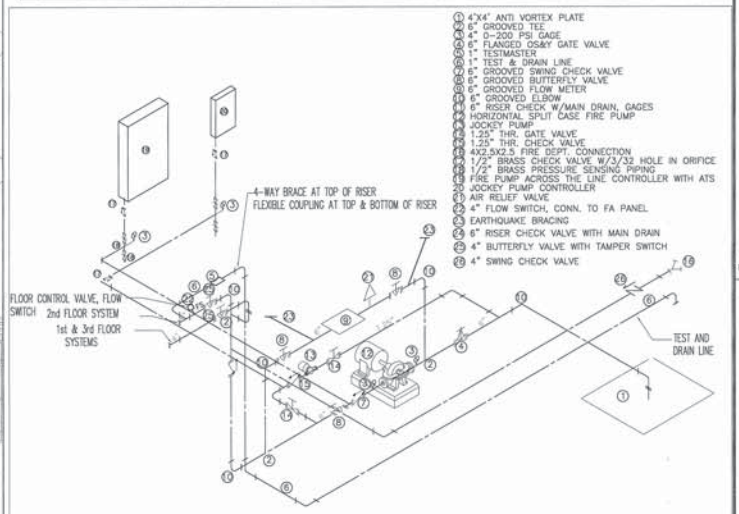
FS-3

FIRE PUMP SCHEDULE

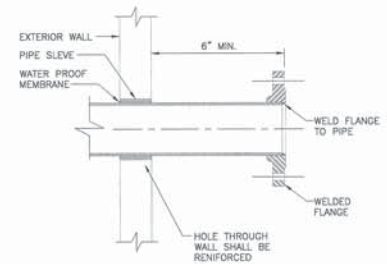
UNIT NO.	USE	TYPE	DRIVE	RATED FLOW GPM	RATED PRESSURE PSI	RPM	USABLE HORSEPOWER	VOLTAGE- VOLTS	PHASE	HERTZ	REMARKS
FP	FIRE PUMP	HORIZONTAL SPLITCASE	ELECTRIC	500	80	3550	40	480/208	3	60	THE NEW FIRE PUMP SHALL BE PROGRAMMED TO START WHENEVER THE SYSTEM PRESSURE FALLS TO 60 PSI. THE FIRE PUMP CONTROLLER SHALL BE SET TO MANUAL OFF.
JP	JOCKEY PUMP	VERTICLE MULTISTAGE	ELECTRIC	5	100	3580	1	480/208	1	60	THE JOCKEY PUMP SHALL BE PROGRAMED TO START AT 80 PSI AND TO OFF AT 110 PSI. SYSTEM PRESSURE SHALL BE SET AT 110 PSI. THE FIRE ALARM CONTRACTOR SHALL CONNECT TO THE FIRE PUMP CONTROLLER FOR PUMP RUNNING, PHASE REVERSAL AND LOSS OF POWER THIS CONTRACTOR SHALL VERIFY CONNECTION.



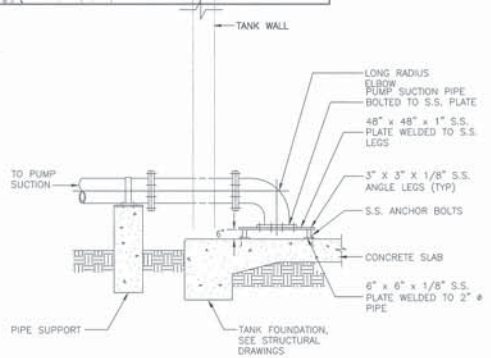
1 SECOND FLR. SPRINKLER PLAN
Scale: 1/8" = 1'-0"



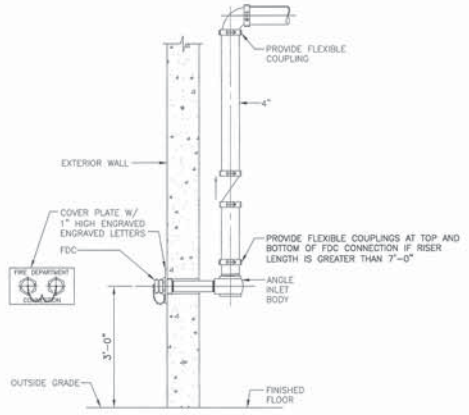
1. 4"X4" ANTI VORTEX PLATE
2. 6" GROOVED TEE
3. 4" 0-200 PSI GAGE
4. 6" FLANGED OS&Y GATE VALVE
5. 1" TESTMASTER
6. 1" TEST & DRAIN LINE
7. 6" GROOVED SWING CHECK VALVE
8. 6" GROOVED BUTTERFLY VALVE
9. 6" GROOVED FLOW METER
10. 6" GROOVED ELBOW
11. 6" RISER CHECK W/MAIN DRAIN, GAGES
12. HORIZONTAL SPLIT CASE FIRE PUMP
13. JOCKEY PUMP
14. 1.25" THR. GATE VALVE
15. 1.25" THR. CHECK VALVE
16. 4X2.5X2.5 FIRE DEPT. CONNECTION
17. 1/2" BRASS CHECK VALVE W/3/32 HOLE IN ORIFICE
18. 1/2" BRASS PRESSURE SENSING PIPING
19. FIRE PUMP ACROSS THE LINE CONTROLLER WITH ATS
20. JOCKEY PUMP CONTROLLER
21. AIR RELIEF VALVE
22. 4" FLOW SWITCH, CONN. TO FA PANEL
23. EARTHQUAKE BRACING
24. 6" RISER CHECK VALVE WITH MAIN DRAIN
25. 4" BUTTERFLY VALVE WITH TAMPER SWITCH
26. 4" SWING CHECK VALVE



4 FP-4 TYPICAL TANK PIPE PENETRATION DETAIL
NTS



3 FP-4 PUMP SUCTION AND VORTEX PLATE DETAIL
NTS



2 FP-4 FIRE DEPARTMENT CONNECTION DETAIL
NTS

Falcon Fire Protection LLC
P.O. Box 326326
Agana, Guam 96932
Tel 671-483-8539
email: johnfalconfire@yahoo.com License GLB08-2577

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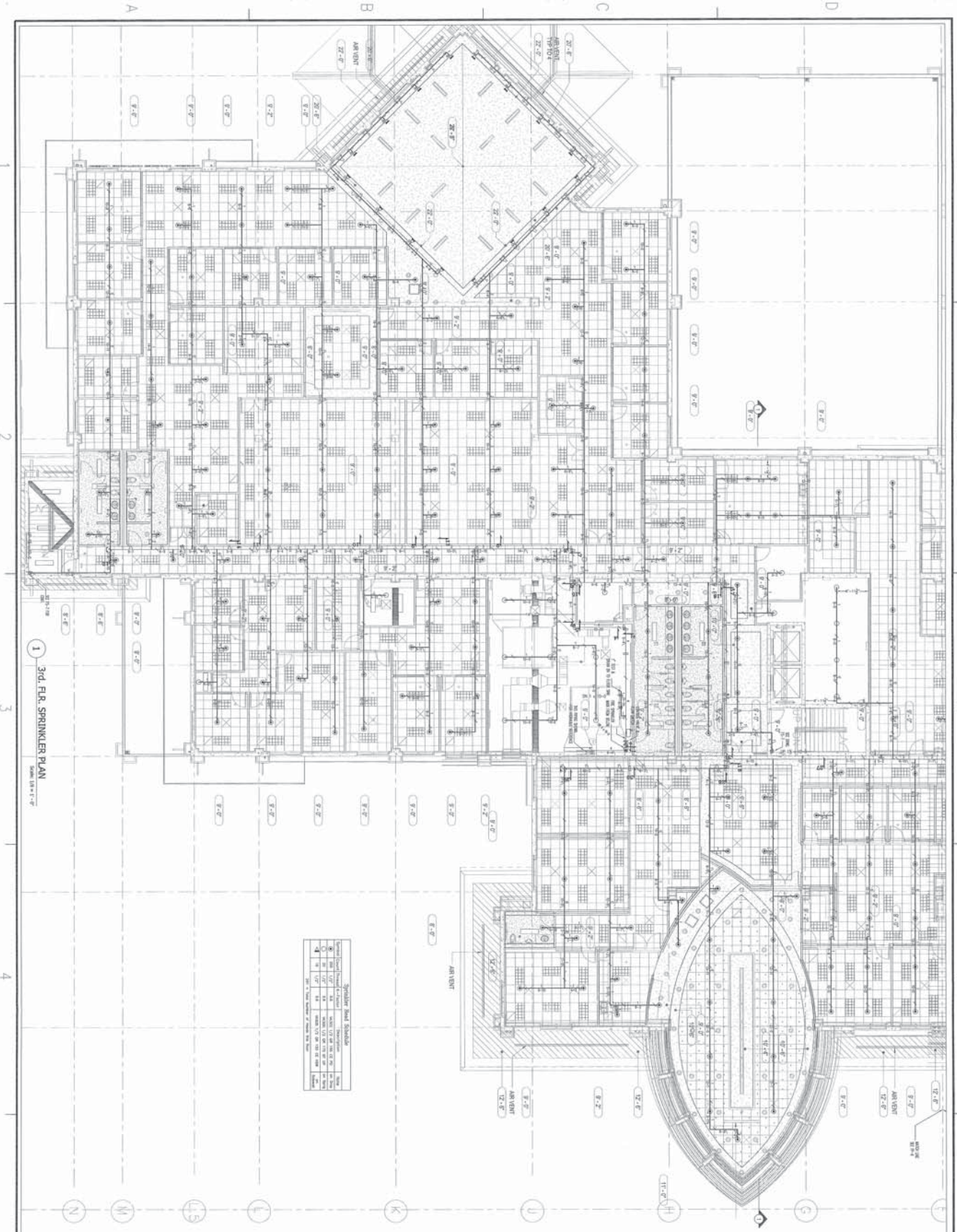
FIRE SUPRESSION SHOP DRAWINGS

FS-4



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FIRE SUPRESSION SHOP DRAWINGS

FS-5

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HAGATNA, GUAM 96932
Tel 671-483-6539
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1 3rd. FLR. SPRINKLER PLAN

GUAM MARIANAS ISLANDS

AUGUST, 2013
GPA/GWA Multipurpose Facility
MANGILAO, GUAM

FIRE SUPRESSION SHOP DRAWINGS

FS-6

Falcon Fire Protection LLC
PO BOX 326326
HAGATNA, GUAM 96932
Tel 671-483-6539
email: johnfalconfire@yahoo.com License CL808-0377

Falcon Fire
Protection LLC
PO BOX 326326
HAGATNA, GUAM 96932
Tel 671-483-6539

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AUGUST, 2013
GPA/GWA Multipurpose Facility
MANGILAO, GUAM

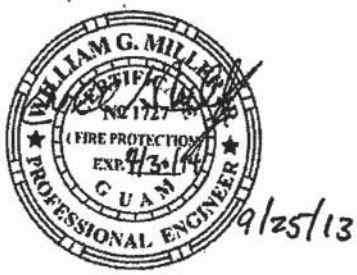
FIRE SUPPRESSION SHOP DRAWINGS

FS-7

1 ROOF, SPRINKLER PLAN

HYDRAULIC CALCULATIONS SUMMARY SHEET

DATE	5-Aug-13
LOCATION	GPA/GWA FACILITY MANGILAO, GUAM
OWNER	GOVERNMENT OF GUAM
REMOTE AREA	THRID FLOOR
HAZARD CLASSIFICATION	LIGHT HAZARD
APPROVING AGENCY	GUAM FIRE DEPT.
SYSTEM DESIGN REQUIREMENTS	
1. DESIGN AREA OF APPLICATION	MOST REMOTE 1500 FT. SQ.
2. MINIMUM RATE OF WATER APPLICATION	0.1 GPM PER SQ. FT
3. AREA PER SPRINKLER	VARIES
4, IN RACK DEMAND	0
TOTAL WATER REQUIRED AT BASE OF RISER INCLUDES 0 GPM HOSE ALLOWANCE PRIVATE WATER SOURCE	257.8 GPM @ 54.25 PSI



9/25/13

. . . Fire Protection by Computer Design

Gary Lansing, PE
Barrigada, Guam
Honolulu, Hawaii
gla96913@hotmail.com
671-734-6641

Job Name	:	GPA GWA MULTIPURPOSE FACILITY
Building	:	
Location	:	
System	:	
Contract	:	
Data File	:	FP-4 AREA 1.wxf

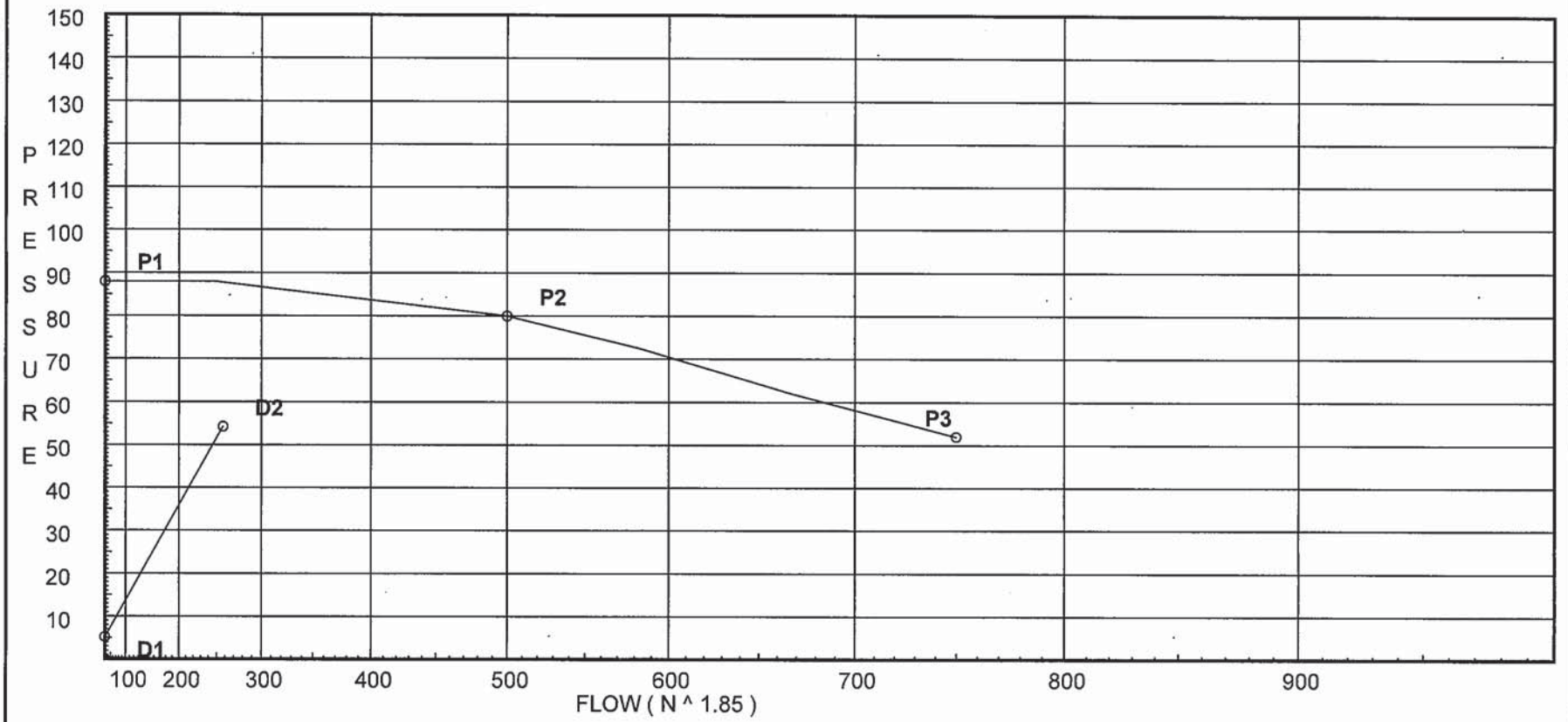
Computer Programs by Hydratec Inc. Route 111 Windham N.H. USA 03087

Water Supply Curve (C)

Gary Lansing, PE
GPA GWA MULTIPURPOSE FACILITY

Date

Pump Data:		Demand:	
P1 - Pump Churn Pressure	: 88	D1 - Elevation	: 5.197
P2 - Pump Rated Pressure	: 80	D2 - System Flow	: 257.759
P2 - Pump Rated Flow	: 500	D2 - System Pressure	: 54.252
P3 - Pump Pressure @ Max Flow	: 52	Hose (Demand)	:
P3 - Pump Max Flow	: 750	D3 - System Demand	: 257.759
		Safety Margin	: 33.559



Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
B	NFPA 13 Butterfly Valve	0	0	0	0	0	6	7	10	0	12	9	10	12	19	21	0	0	0	0	0
E	NFPA 13 90' Standard Elbow	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																			
S	NFPA 13 Swing Check	0	0	5	7	9	11	14	16	19	22	27	32	45	55	65					
T	NFPA 13 90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121

Units Summary

Diameter Units	Inches
Length Units	Feet
Flow Units	US Gallons per Minute
Pressure Units	Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

Pressure / Flow Summary - STANDARD

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
DP01	11.0	5.6	7.0	na	14.82	0.1	110	7.0
EQ01	12.0		6.64	na				
1	13.0	5.6	7.0	na	14.82	0.1	110	7.0
EQ02	12.0		7.51	na				
DP03	11.0	5.6	7.0	na	14.82	0.1	110	7.0
EQ03	12.0		7.02	na				
DP04	11.0	5.6	7.0	na	14.82	0.1	110	7.0
EQ04	12.0		7.02	na				
2	12.0	K = K @ EQ01	6.64	na	14.82			
3	12.0		7.74	na				
4	12.0		11.75	na				
5	12.0	K = K @ EQ03	12.68	na	19.92			
6	12.0		16.65	na				
7	12.0		18.52	na				
8	12.0		18.56	na				
9	12.0		21.09	na				
10	12.0		21.6	na				
11	12.0		22.63	na				
12	12.0		26.39	na				
13	12.0		37.68	na				
14	12.0		37.69	na				
15	-16.0		50.73	na				
PUMP	0.0		54.25	na				
16	12.0	K = K @ EQ01	7.01	na	15.22			
17	12.0	K = K @ EQ02	11.26	na	18.15			
18	12.0	K = K @ EQ01	6.97	na	15.18			
19	12.0		7.78	na				
20	12.0		12.14	na				
21	12.0		12.51	na				
22	12.0		15.23	na				
23	12.0		20.72	na				
24	12.0		20.72	na				
25	12.0	K = K @ EQ01	7.47	na	15.71			
26	12.0	K = K @ EQ01	10.7	na	18.8			
27	12.0	K = K @ EQ01	11.47	na	19.47			
28	12.0	K = K @ EQ01	10.72	na	18.83			
29	12.0	K = K @ EQ04	12.28	na	19.6			
30	12.0	K = K @ EQ03	14.78	na	21.51			
31	12.0	K = K @ EQ01	10.83	na	18.92			
32	12.0	K = K @ EQ04	12.11	na	19.46			
33	12.0	K = K @ EQ03	15.69	na	22.16			

The maximum velocity is 15.17 and it occurs in the pipe between nodes 11 and 12

Final Calculations - Hazen-Williams

Hyd. Ref. Point	Qa Qt	Dia: "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
DP01	14.82	1.049		0.0	1.000	7.000		K Factor = 5.60
to		120.0		0.0	0.0	-0.433		
EQ01	14.82	0.0750		0.0	1.000	0.075		Vel = 5.50
	0.0							
	14.82					6.642		K Factor = 5.75
1	14.82	1.049		0.0	1.000	7.000		K Factor = 5.60
to		120.0		0.0	0.0	0.433		
EQ02	14.82	0.0750		0.0	1.000	0.075		Vel = 5.50
	0.0							
	14.82					7.508		K Factor = 5.41
DP03	14.82	1.049	1T	5.0	1.000	7.000		K Factor = 5.60
to		120.0		0.0	5.000	-0.433		
EQ03	14.82	0.0747		0.0	6.000	0.448		Vel = 5.50
	0.0							
	14.82					7.015		K Factor = 5.60
DP04	14.82	1.049	1T	5.0	1.000	7.000		K Factor = 5.60
to		120.0		0.0	5.000	-0.433		
EQ04	14.82	0.0747		0.0	6.000	0.448		Vel = 5.50
	0.0							
	14.82					7.015		K Factor = 5.60
2	14.82	1.049	1E	2.0	7.660	6.642		K Factor @ node EQ01
to		120.0	1T	5.0	7.000	0.0		
3	14.82	0.0747		0.0	14.660	1.095		Vel = 5.50
3	15.22	1.049	1T	5.0	9.540	7.737		
to		120.0		0.0	5.000	0.0		
4	30.04	0.2761		0.0	14.540	4.015		Vel = 11.15
4	18.15	1.38		0.0	5.350	11.752		
to		120.0		0.0	0.0	0.0		
5	48.19	0.1742		0.0	5.350	0.932		Vel = 10.34
5	19.92	1.38		0.0	12.000	12.684		K Factor @ node EQ03
to		120.0		0.0	0.0	0.0		
6	68.11	0.3302		0.0	12.000	3.963		Vel = 14.61
6	0.0	1.61		0.0	12.000	16.647		
to		120.0		0.0	0.0	0.0		
7	68.11	0.1559		0.0	12.000	1.871		Vel = 10.73
7	0.0	2.067		0.0	1.000	18.518		
to		120.0		0.0	0.0	0.0		
8	68.11	0.0460		0.0	1.000	0.046		Vel = 6.51
8	0.0	1.61	1T	8.0	8.220	18.564		
to		120.0		0.0	8.000	0.0		
9	68.11	0.1559		0.0	16.220	2.528		Vel = 10.73
9	69.16	2.635		0.0	9.720	21.092		
to		120.0		0.0	0.0	0.0		
10	137.27	0.0517		0.0	9.720	0.503		Vel = 8.08
10	59.94	2.635		0.0	10.250	21.595		
to		120.0		0.0	0.0	0.0		
11	197.21	0.1012		0.0	10.250	1.037		Vel = 11.60

Final Calculations - Hazen-Williams

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
11	60.55	2.635	1T	16.474	6.140	22.632		
to		120.0		0.0	16.474	0.0		
12	257.76	0.1660		0.0	22.614	3.755		Vel = 15.17
12	0.0	3.26	1T	20.159	162.210	26.387		
to		120.0	1E	9.408	29.567	0.0		
13	257.76	0.0589		0.0	191.777	11.294		Vel = 9.91
13	0.0	4.26		0.0	0.630	37.681		
to		120.0		0.0	0.0	0.0		
14	257.76	0.0159		0.0	0.630	0.010		Vel = 5.80
14	0.0	3.26		0.0	15.430	37.691		
to		120.0		0.0	0.0	12.127		
15	257.76	0.0588		0.0	15.430	0.908		Vel = 9.91
15	0.0	4.26	2T	52.668	250.000	50.726		
to		120.0	9E	118.504	215.940	-3.930		* Fixed loss = 3
PUMP	257.76	0.0160	1B	15.8	465.940	7.456		Vel = 5.80
			1Fsp	0.0				
			1S	28.968				
	0.0							
	257.76					54.252		K Factor = 35.00
System Demand Pressure						54.252		
Safety Margin						33.559		
Continuation Pressure						87.811		
16	15.22	1.049	2E	4.0	5.250	7.010		K Factor @ node EQ01
to		120.0		0.0	4.000	0.0		
3	15.22	0.0786		0.0	9.250	0.727		Vel = 5.65
	0.0							
	15.22					7.737		K Factor = 5.47
17	18.15	1.049	1E	2.0	2.500	11.263		K Factor @ node EQ02
to		120.0		0.0	2.000	0.0		
4	18.15	0.1087		0.0	4.500	0.489		Vel = 6.74
	0.0							
	18.15					11.752		K Factor = 5.29
18	15.18	1.049	1E	2.0	8.340	6.972		K Factor @ node EQ01
to		120.0		0.0	2.000	0.0		
19	15.18	0.0781		0.0	10.340	0.808		Vel = 5.64
19	15.71	1.049	1T	5.0	9.990	7.780		
to		120.0		0.0	5.000	0.0		
20	30.89	0.2909		0.0	14.990	4.360		Vel = 11.47
20	18.81	1.38		0.0	2.000	12.140		
to		120.0		0.0	0.0	0.0		
21	49.7	0.1845		0.0	2.000	0.369		Vel = 10.66
21	19.47	1.38		0.0	8.010	12.509		
to		120.0		0.0	0.0	0.0		
22	69.17	0.3398		0.0	8.010	2.722		Vel = 14.84
22	0.0	1.61	1T	8.0	26.230	15.231		
to		120.0		0.0	8.000	0.0		
23	69.17	0.1604		0.0	34.230	5.490		Vel = 10.90

Final Calculations - Hazen-Williams

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
23	0.0	4.26		0.0	0.450	20.721		
to		120.0		0.0	0.0	0.0		
24	69.17	0.0022		0.0	0.450	0.001		Vel = 1.56
24	0.0	2.635		0.0	25.430	20.722		
to		120.0		0.0	0.0	0.0		
9	69.17	0.0145		0.0	25.430	0.370		Vel = 4.07
	0.0							
	69.17					21.092		K Factor = 15.06
25	15.71	1.049	1E	2.0	1.750	7.468		K Factor @ node EQ01
to		120.0		0.0	2.000	0.0		
19	15.71	0.0832		0.0	3.750	0.312		Vel = 5.83
	0.0							
	15.71					7.780		K Factor = 5.63
26	18.80	1.049	1E	2.0	5.420	10.698		K Factor @ node EQ01
to		120.0	1T	5.0	7.000	0.0		
20	18.8	0.1161		0.0	12.420	1.442		Vel = 6.98
	0.0							
	18.80					12.140		K Factor = 5.40
27	19.47	1.049	1E	2.0	1.390	11.470		K Factor @ node EQ01
to		120.0	1T	5.0	7.000	0.0		
21	19.47	0.1238		0.0	8.390	1.039		Vel = 7.23
	0.0							
	19.47					12.509		K Factor = 5.50
28	18.83	1.049	1E	2.0	11.370	10.724		K Factor @ node EQ01
to		120.0		0.0	2.000	0.0		
29	18.83	0.1164		0.0	13.370	1.556		Vel = 6.99
29	19.60	1.049		0.0	5.750	12.280		K Factor @ node EQ04
to		120.0		0.0	0.0	0.0		
30	38.43	0.4357		0.0	5.750	2.505		Vel = 14.27
30	21.51	1.38	1T	6.0	20.120	14.785		K Factor @ node EQ03
to		120.0		0.0	6.000	0.0		
10	59.94	0.2607		0.0	26.120	6.810		Vel = 12.86
	0.0							
	59.94					21.595		K Factor = 12.90
31	18.92	1.049	1E	2.0	8.870	10.831		K Factor @ node EQ01
to		120.0		0.0	2.000	0.0		
32	18.92	0.1175		0.0	10.870	1.277		Vel = 7.02
32	19.47	1.049		0.0	8.250	12.108		K Factor @ node EQ04
to		120.0		0.0	0.0	0.0		
33	38.39	0.4347		0.0	8.250	3.586		Vel = 14.25
33	22.16	1.38	1T	6.0	20.120	15.694		K Factor @ node EQ03
to		120.0		0.0	6.000	0.0		
11	60.55	0.2656		0.0	26.120	6.938		Vel = 12.99
	0.0							
	60.55					22.632		K Factor = 12.73

Final Calculations - Hazen-Williams

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*******	Notes	******

Attachment D: GPA-GWA Multi-Purpose Facility Fire Pump Inspection

Falcon Fire Protection LLC

P.O. Box 326326 Hagatna, GU 96932
Tel: (671) 482-6539 · Fax: (671) 969-3401
CLB08-0377 C19 & C20

FIRE PUMP - STANDARD TEST REPORT

DATE OF TEST: 10/14/14 NAME OF BUILDING OR SITE: GPA-GWA Multi-Purpose Facility

ADDRESS OF BUILDING OR SITE: Route 15 Mangilao, GU

TYPE OF TEST: X Regulation 4 X FD Witness, if any : FD assignment

TESTER: name Russell Powell company **Consolidated Fire Protection, LLC.** Cert. of Fitness # see name

FIRE PUMP INFORMATION

FIRE PUMP NUMBER (USE SEPARATE FORM FOR EACH FIRE PUMP): 1 PUMP S/N: 13-068092-01-01/OK5880

MANUFACTURER OF FIRE PUMP: AC Fire Pump Systems

RATING OF FIRE PUMP: 500 GPM at 80 PSI (Note: If pressure is given in feet, convert to PSI by multiplying by 0.4341)

TYPE OF DRIVER : Electric: X ☐ Diesel ☐

A. If electrically-driven, does a generator supply standby/emergency power? YES X NO ☐

If yes, how many gallons of diesel or other approved fuel is available? 100 (an 8-hour supply for the generator operating at full capacity is required)

B. If diesel driven, how many gallons of diesel fuel is available? _____ (an 8-hour supply is required; the horsepower of the engine is equal in number of gallons required for an 8-hour supply)

PRESSURE RELIEF VALVE SETTING, if applicable N/A PSI

CONTROLLER:

AUTO START SETTING: 60 PSI; AUTO STOP SETTING: Manual PSI

OVERRUN TIME SETTING, if applicable: N/A minutes; MANUFACTURER OF CONTROLLER: Eaton

JOCKEY PUMP CONTROLLER: AUTO START SETTING: 70 PSI; AUTO STOP SETTING: 80 PSI

WATER SUPPLY INFORMATION:

CAPACITY OF ON-SITE TANK, if applicable: 60,000 gallons; LOCATION OF TANK: Next to Fire Pump Room

IF SUPPLIED DIRECTLY BY STREET MAIN, PRESSURE AT INLET: Maximum: N/A PSI; Minimum: N/A PSI

PERFORMANCE TEST

1. AUTOMATIC START(S) OF FIRE PUMP (For Reg. 4 the auto start is to be performed from highest, most remote point prior to any other test procedures): LOCATION OF TEST FLOW(S): Inspectors Test/Test Loop W/ Meter

   NUMBER OF STARTS 6 RESULTS SATISFACTORY X ☐ RESULTS UNSATISFACTORY ☐

2. MANUAL START(S) OF FIRE PUMP: NUMBER OF STARTS 6

   RESULTS SATISFACTORY X ☐ RESULTS UNSATISFACTORY ☐

3. FLOW TEST USING TEST OUTLETS: If electric driver, was test on normal power ☐ standby power ☐

	Req'd Flow (GPM)	# of test outlets	Nozzle Orifice size	Req'd pitot reading	Suction pressure (PSIG)	Discharge pressure	*Second pressure gauge*	RPM's if available	Net Pump pressure	Previous test pressure
0% of rated capacity	0	Flow Meter	N/A	N/A	0	98	N/A	3564	98	N/A
50% of rated capacity	250	Flow Meter	N/A	N/A	0	92	N/A	3662	92	N/A
100% of rated capacity	500	Flow Meter	N/A	N/A	0	85	N/A	3660	85	N/A
150% of rated capacity	750	Flow Meter	N/A	N/A	0	65	N/A	3554	65	N/A
___ % of rated capacity										
___ % of rated capacity										

Falcon Fire Protection, LLC

* SECOND PRESSURE GAUGE LOCATED _____, The second pressure gauge is to be located in the fire pump room in the same pressure zone as the pump being tested, but as remote as practical from fire pump discharge and flow turbulence (such as at the controller). Caution: Beware of trapped pressure!

ACCEPTANCE TEST: DOES THE FIRE PUMP EQUAL OR EXCEED THE CERTIFIED CURVE AT ALL POINTS? YES [X] NO [ ]

AT 150% OF RATED CAPACITY, IS NET PUMP PRESSURE AT LEAST 65% OF RATED PRESSURE? YES [X] NO [ ]

REG. 4 ONLY: IF PREVIOUS PUMP TESTS RESULTS ARE AVAILABLE, IS THE NET PUMP PRESSURE WITHIN 10% OF THE PREVIOUS RESULTS AT EACH POINT TESTED? YES [ ] NO [ ]

IF NOT, SPECIFY: N/A New Pump

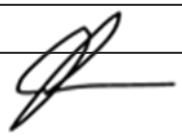
IS FIRE PUMP STATUS INFORMATION CORRECTLY INDICATED IN THE FIRE CONTROL ROOM, if applicable? YES [X] NO [ ]

IF NOT, SPECIFY:

OVERALL EVALUATION: IS THE FIRE PUMP IN PROPER OPERATING CONDITION? YES [X] NO [ ]

IF NOT, SPECIFY:

COMMENTS:

SIGNATURE OF TESTER 

SIGNATURE OF FD WITNESS, if any

Attachment E: Fire Suppression 2D

public works
Government of Guam

BUILDING SAFETY IS NO ACCIDENT

BUILDING PERMITS & INSPECTION SECTION
APPLICATION FOR PERMIT & PLAN REVIEW

IMPORTANT: Applicant must complete all items in sections I, II, III, IV

Application Number: _____

Permit Number: B130009.91

I. LOCATION OF BUILDING

Location Rt 15 (No) Marglao (Street) Zoning District PF

Between _____ (Cross Street) and _____ (Cross Street)

Subdivision _____ Lot # 5412-R-2 Block _____ Lot Size _____

II. TYPE AND COST OF BUILDING

A. Type of Building

B — Group Occupancy; II B — Type of Construction; Concrete — Foundation

- ☐ New Building
- ☐ Foundation Only
- ☐ Shell Only
- ☐ Fence Wall
- ☐ Retaining Wall
- ☐ Other _____
- ☐ Add
- ☐ Alter
- ☐ Repair
- ☐ Demolished
- ☐ Reconstructed
- ☐ Relocated

Dimension of Building: _____

B. Ownership

- ☐ Private (individual, corporation, non-profit institution, etc.)
- ☒ Public (Federal, State, or Local Government)

C. COST

Cost of Improvements	
electrical	
plumbing	
heating, air conditioning	
other (elevator, etc.) FM-200	138500.00
TOTAL COST OF IMPROVEMENT	$ 138500.00

Nonresidential - Describe in detail proposed use of buildings, e.g., food processing plant, machine shop, laundry building at hospital, elementary school, secondary school, college, parochial school, parking garage for department store, rental office building, office building at industrial plant. If use of existing building is being changed, enter proposed use.

Multi purpose facility
Fire Supression System

D. PROPOSED USE - (For "Wrecking" most recent use)

Residential
- ☐ One family
- ☐ Two or more families — Enter No. of Units → _____
- ☐ Transient hotel, motel, or dormitory — Enter No. of Units → _____
- ☐ Garage
- ☐ Carport
- ☐ Other *(specify)* _____

Non-Residential
- ☐ Amusement, Recreational
- ☐ Church, other religious
- ☐ Industrial
- ☐ Parking garage
- ☐ Service station, repair garage
- ☐ Hospital, institutional
- ☐ Office, bank, professional
- ☐ Public utility
- ☐ School, library, other educational
- ☐ Stores, mercantile
- ☐ Tanks, towers
- ☒ Other *(specify)* Multi Purpose

III. SELECTED CHARACTERISTICS OF BUILDING

for new buildings and additions, complete Parts E – K, for wrecking, complete only Part I, for all others skip to IV.

E. Principal Type of Frame
- ☒ Masonry (wall bearing)
- ☐ Wood frame
- ☐ Structural steel
- ☐ Reinforced concrete
- ☐ Other *(specify)* _____

F. Type of Sewage Disposal
- ☒ Public Sewer
- ☐ Private (septic tank, etc.)

G. Type of Mechanical
- ☐ Yes ☐ No Central Air Conditioning
- ☐ Yes ☐ No Will there be an elevator?

H. Type of Water Supply
- ☒ Public Supply
- ☐ Private (well, cistern)

I. Dimensions
- ☒ Number of stories 4
- Total square feet of floor area, all floors, based on exterior dimensions 17700
- Total land area, sq. ft. 11

J. Number of Off-street Parking Spaces
- Enclosed _____
- Outdoors _____

K. Residential Buildings Only
- Number of bedrooms _____
- Number of Bathrooms: Full _____ Partial _____

IV. IDENTIFICATION Guam Power Authority

	Print Name / Signature	~~Mailing Address~~ - Number, street, city, and state	ZIP Code	Telephone
1. Owner or Lessee	GPA	P.O. Box 2977		475-1472
	Falcon Fire		96932	
2. Contractor	Falcon Fire	P.O. Box 326326		483-6539
	License # CLB-08-0377	Hagatna, GU 96932	96932	John
3. Architect or Engineer SEAL NO.	B. H. Miller 1727	P.O. Box 352 Hagatna, GU	96932	483-8125

Has the plan for project been approved by TLUC or TSPC? If so, attach copy of approval and conditions placed on project.
The owner of this building and the undersigned agree to conform to all applicable laws of this jurisdiction.

Owner/Lessor _____ Current Address _____ Application Date _____

public works
Government of Guam

BUILDING SAFETY IS NO ACCIDENT

BUILDING PERMITS & INSPECTION SECTION
APPLICATION FOR PERMIT & PLAN REVIEW

Application Number:
Permit Number: B13000949

TO BE FILLED OUT BY BUILDING PERMIT STAFF ONLY

V. PLAN REVIEW RECORD

Plans Review Required	Date Plans Started	Date Plans Approved	Comments
Architectural			
Structural			
Mechanical/Plumbing			
Flood Control			
Electrical			
HPCC			
Hydraulics/Civil			
Highway Encroachment			
Rights of Way			
Traffic Engineering			

VI. ZONING PLAN EXAMINATION RECORD TO BE DONE BY DLM

District: Mangilao Public Facility (PF) GPA/GWA
Use: Fire Suppression System
Front Yard:
Side Yard: Side Yard
Rear Yard:

Ownership Of Property:
If not owner, is there a lease or authorization to the property?
Did this project receive TLUC approval? What are the conditions

VII. COMMENTS BY OTHER AGENCIES (Route as indicated)

Agency	Date	Signature	Does your Agency recommend approval? If so, seal your response
Land Management, Zone	12/02/13		
Contractor's License Board	12/02/13		LIC VALID 01/30/2014
Public Health			
E.P.A.			
Public Utility Agency			
Guam Power Authority			
Fire Prevention Bureau	1/13/2014		APPROVED LTR
(PEALS BOARD)	12/02/2013		Valid Registration
Parks & Rec.			

Permission is hereby given to the above work according to conditions hereon and according to approved plans and specifications pertaining thereto, subject to compliance with the Uniform Building Code and Government Code of Guam.

VIII. VALIDATION

Building Permit Number _____ Approved Valuation: _____
Building Permit Issued _____, 19____ Plan Checking fee _____ Rec'd _____
Approved By: _____ Building Permit fee _____
Title: _____ Date: _____ Total _____

INSTALLATION/CONSTRUCTION NOTES:

MECHANICAL NOTES:

1. PIPING MATERIALS MUST CONFORM TO THE REQUIREMENT AS OUTLINED IN NFPA 2001, SECTION 4.2.1, CURRENT EDITION. BLACK PIPE MUST BE USED.
2. PIPE FITTINGS MUST CONFORM TO THE REQUIREMENTS AS OUTLINED IN NFPA 2001, SECTION 4.2.3 CURRENT EDITION. MALLEABLE IRON FITTINGS MUST BE 300LB. CLASS CONFORMING TO ASTM SPECIFICATION A-197 150LB. CLASS AND ORDINARY CAST IRON FITTINGS ARE NOT TO BE USED. WGS GROOVED PIPE FITTINGS MAY BE USED AS WELL AS THREADED, WELDED, OR FLANGED, AS LONG AS THEY CONFORM TO THE ABOVE REQUIREMENTS. HOWEVER, HOLE-CUT FITTINGS OR SIMILAR, MAY NOT BE USED.
3. ALL REDUCTIONS SHALL BE MADE USING REDUCERS OR REDUCING FITTINGS – BUSHINGS ARE NOT PERMITTED.
4. ALL PIPE AND NOZZLE DROPS MUST BE BRACED TO WALLS, COLUMNS, OR CEILINGS USING STEEL HANGERS WITH A MINIMUM OF 3/8" ALL-THREAD ROD PLACED PER NFPA CODE. BRACED NO MORE THAN 5'-0" APART. ROD PIPE SUPPORTS ARE REQUIRED TO SUPPORT "LIVE LOAD" OF THE PIPE SYSTEM DURING DISCHARGE. RIGID BRACING IS REQUIRED AT EACH DIRECTIONAL CHANGE, FITTING, TEE AND NOZZLE.
5. EACH PIPE SECTION SHALL BE CLEANED INTERNALLY BEFORE INSTALLATION WITH A NON-FLAMMABLE CLEANER IN ACCORDANCE WITH NFPA 2001, LATEST EDITION.
6. ALL PENETRATIONS MUST BE SEALED BY INSTALLING CONTRACTOR.
7. LUBRICATE GASKETS ON ALL COUPLINGS USING NON-PETROLEUM BASED LUBRICANTS.
8. FLOW CALCULATIONS SHALL BE BASED ON PIPING BEING INSTALLED EXACTLY AS DIAGRAMED ON DRAWINGS. ALL FIELD PIPING CHANGES SHALL BE APPROVED BY MANUFACTURER PRIOR TO FABRICATION AND INSTALLATION.
9. TEFLON TAPE OR JOINT COMPOUND SHALL BE USED ON ALL THREADED JOINTS.
10. ALL "THRU TEES" MUST BE RUN IN A HORIZONTAL PLANE.
11. THE PIPING SYSTEM SHOULD BE SECURELY SUPPORTED WITH DUE ALLOWANCE FOR AGENT THRUST FORCES SEISMIC ACTIVITY, THERMAL EXPANSION, AND CONTRACTION, AND SHOULD NOT BE SUBJECTED TO MECHANICAL, CHEMICAL VIBRATION, OR OTHER DAMAGE ASME B31.1 SHOULD BE CONSULTED FOR GUIDANCE. THE FSSA PIPE DESIGN HANDBOOK PROVIDES GUIDANCE ON HOW TO APPLY ASME B31.1. THE MAXIMUM HORIZONTAL SPACING FOR SCREWED, WELDED OR GROOVED PIPE ARE AS INDICATED ON THE FOLLOWING TABLE:

DETECTION/ALARM NOTES:

1. NOT BASED UPON ADA COMPLIANCE. IF ADA COMPLIANCE IS REQUIRED ADJUST ACCORDINGLY.
2. BATTERY CALCULATIONS RESULT IN A REQUIRED AMP HOUR OF 3.67 AH, A BATTERY WITH A HIGHER AH RATING WILL NEED TO BE USED. IF DEVICES USED ARE OTHER THAN THE DEVICES USE FOR THE BATTERY CALCULATIONS, NEW BATTERY CALCULATIONS WILL NEED TO BE PERFORMED TO VERIFY CURRENT BATTERIES WILL STILL BE SUFFICIENT TO MEET THE SECONDARY POWER REQUIREMENTS OF NFPA 72.
3. VERIFY THROUGH LOCAL CODES OR ANY OTHER THAT MAY BE APPLICABLE THE PROPER LOCATION OF CONDUIT CONNECTIONS INTO THE RELEASE CONTROL PANEL.
4. LAYOUT IS BASED UPON TWO WIRE DETECTION. IF FOUR WIRE DETECTION IS REQUIRED LAYOUT WILL NEED TO BE REWISE TO REFLECT THE CHANGES.
5. OPTIONAL DEVICES MAY BE REQUIRED WITH PANEL.
6. PROVIDE EXTERNAL JUNCTION BOX FOR DETECTORS AND NOTIFICATION APPLIANCES AS REQUIRE FOR DEVICES BEING USED.
7. HORNS TO PRODUCE A DECIBEL LEVEL OF 70 DECIBELS THROUGHOUT THE AREA THEY ARE PROTECTING FOR A BUSINESS OCCUPANCY AS PER NFPA 72, 2010 SECTION 18.4.3, WHICH REQUIRES THE DECIBEL LEVEL TO BE 15 DECIBELS ABOVE THE AVERAGE AMBIENT SOUND LEVEL OF THE OCCUPANCY WHICH IT IS PROTECTING AND IN ACCORDANCE WITH TABLE A.18.4.3 WHICH SHOWS BUSINESS OCCUPANCIES AS HAVING AN AVERAGE AMBIENT SOUND LEVEL OF 55 DECIBELS.
8. WALL MOUNTED STROBES TO BE SPACED IN ACCORDANCE WITH NFPA 72 2010, TABLE 18.5.4.3(a).
9. NOTIFICATIONS/RELEASE CIRCUITS OF THE VFR-400 RELEASE CONTROL PANEL ARE RATED TO A MAXIMUM OF 1 AMP EACH, AND 2.5 AMPS FOR ALL 4 CIRCUITS.
10. VERIFY REQUIRED FINAL LOCATION OF PANEL (AS PER NFPA 72 THE RELEASE PANEL SHALL BE INSTALLED WHERE IT IS PROTECTED FROM DAMAGE CAUSED BY ACTIVATION OF THE SUPPRESSION SYSTEM(S) THEY CONTROL).

ELECTRICAL LAYOUT:

1. NOT BASE UPON ADA COMPLIANCE. IF ADA COMPLIANCE IS REQUIRED ADJUST ACCORDINGLY.
2. BATTERY CALCULATIONS WILL NEED TO BE PERFORMED TO VERIFY CURRENT BATTERIES WILL STILL BE SUFFICIENT TO MEET THE SECONDARY POWER REQUIREMENTS OF NFPA 72.
3. VERIFY THROUGH LOCAL CODES OR ANY OTHER THAT MAY BE APPLICABLE, THE PROPER LOCATION OF CONDUIT CONNECTIONS INTO THE RELEASE CONTROL PANEL.
4. LAYOUT IS BASED UPON TWO WIRE DIRECTION. IF FOUR WIRE DETECTION IS REQUIRED, LAYOUT WILL NEED TO BE REVISED TO REFLECT THE CHANGES.
5. OPTIONAL DEVICES MAY BE REQUIRED WITH PANEL TO MAKE IT POSSIBLE TO SHUT-DOWN ALL THE NECESSARY EQUIPMENT FOR THE PROJECT. PRIOR TO PURCHASING THE PANEL SHOWN, PLEASE CONTACT VIKING TECHNICAL SERVICES AT 1-877-384-5464 TO DETERMINE WHETHER OR NOT THE PANEL SHOWN ON THE DRAWING IS CAPABLE OF SHUTTING DOWN ALL THE REQUIRED EQUIPMENT, AND IF SO, WHAT OPTIONAL DEVICES MAY BE REQUIRED TO DO SO.
6. DETECTORS AND NOTIFICATION APPLIANCES MAY REQUIRE AN EXTERNAL JUNCTION BOX DEPENDANT UPON WHICH DEVICES ARE BEING USED.
7. HORN TO PRODUCE A DECIBEL LEVEL OF 70 DECIBELS THROUGHOUT THE AREA THEY ARE PROTECTING FOR A BUSINESS OCCUPANCY AS PER NFPA 72, 2010 SECTION 18.4.3, WHICH REQUIRES THE DECIBEL LEVEL TO BE 15 DECIBELS ABOVE THE AVERAGE AMBIENT SOUND LEVEL OF THE OCCUPANCY WHICH IT IS PROTECTING, AND IN ACCORDANCE WITH TABLE A.18.4.3 WHICH SHOWS BUSINESS OCCUPANCIES AS HAVING AN AVERAGE AMBIENT SOUND LEVEL OF 55 DECIBELS.
8. WALL MOUNTED STROBES TO BE SPACED IN ACCORDANCE WITH NFPA 72 2010, TABLE 18.5.4.3.1(a).

1. FLOOR SURFACE
   - A. SINCE THE DENSITY OF THE CLEAN AGENT IS GREATER THAN AIR, SEALING OF FLOOR PENETRATIONS IS CRUCIAL SO THAT THE AGENT DOES NOT DISPERSE THROUGH THOSE OPENINGS.
   - B. IF THERE ARE ANY FLOOR DRAINS LOCATED IN THE ENCLOSURE THEY SHALL HAVE TRAPS IN THEM THAT ARE FILLED WITH WATER OR ANOTHER COMPATIBLE LIQUID AT ALL TIMES.
   - C. BOTTOM OF THE DOORS SHOULD HAVE DOOR SWEEPS OR DROP SEALS. IF BOTTOM OF THE DOOR IS CUT TOO HIGH OFF THE FLOOR FOR DOOR SWEEPS OR DROP SEALS, OR IF THE FLOOR SURFACE IS UNEVEN A THRESHOLD SHOULD BE INSTALLED.
   - D. IF AN UNDER FLOOR SPACE IS BEING USED, AND CONTINUES OUT OF THE PROTECTED ENCLOSURE, AIRTIGHT FIRE RATED PARTITIONS SHOULD BE INSTALLED UNDER THE FLOOR DIRECTLY UNDER ABOVE-FLOOR BORDER PARTITIONS. SUCH PARTITIONS SHOULD BE CAULKED ON THE TOP AND BOTTOM.
   - E. IF A REMOVABLE FLOOR TILE EXTENDS UNDER A DOORWAY, OVER SUCH A PARTITION IT SHOULD EITHER BE
     1. PERMANENTLY SEALED IN PLACE
     2. INSTALLED WITH A FLEXIBLE SEAL BETWEEN IT AND THE WALL BELOW.
     3. DISCONTINUED AT THE DOORWAY WITH PERMANENT AIR TIGHT LEDGE CREATED UP TO WHICH FLOOR TILES ABUT.
   - F. IF ADJOINING ROOMS SHARE THE SAME UNDER FLOOR AIR HANDLERS, THEN THE PARTITIONS SHOULD HAVE DAMPERS INSTALLED OF THE SAME TYPE AS REQUIRED FOR THE DUCTWORK.
2. CEILING
   - A. THE SUSPENDED CEILING OF THE ENCLOSURE SHOULD BE OF A 2 x 2 ACOUSTIC GRID CONSTRUCTION (PF), TAPED AND PAINTED WITH ACCESS PANELS IF REQUIRED.
   - B. WHERE DISCHARGE NOZZLES ARE INSTALLED THE CEILING TILES SHOULD BE CLIPPED FOR A 10 FT. RADIUS AROUND THEM.
   - C. ALL CEILING TILES SHOULD HAVE A WEIGHT OF AT LEAST 5 POUNDS PER SQUARE FOOT.
   - D. LIGHTWEIGHT VINYL COATED ACOUSTICAL TILES SHOULD NOT BE USED UNLESS THEY ARE CLIPPED THROUGH OUT THE PROTECTED AREA (PF).
   - E. PIPE CHASES AND CABLE TRAYS SHOULD BE SEALED AROUND BOTH THE OUTSIDE AND INSIDE AT A POINT WHERE THEY PASS THROUGH THE CEILING OF THE PROTECTED ZONE.
3. VENT CALCULATIONS
   - A. VENT CALCULATIONS ARE BASED UPON FSSA PRG-01 SECOND EDITION, JANUARY 2010. VENT SIZE BASED UPON LIMITING THE MAXIMUM NEGATIVE PRESSURE TO 5 PSF AND MAXIMUM POSITIVE PRESSURE TO 5 PSF.
4. WALL SURFACES
   - A. THE PERIMETER WALLS OF THE PROTECTED ENCLOSURE SHOULD EXTEND FROM THE STRUCTURAL FLOOR TO THE STRUCTURAL FLOOR ABOVE, OR THE ROOF/SOLID SLAB CEILING LEVEL.
   - B. ALL HOLES, CRACKS, OR PENETRATIONS LEADING INTO OR OUT OF THE ENCLOSURE SHOULD BE SEALED.
   - C. PIPE CHASES AND CABLE TRAYS SHOULD BE SEALED AROUND BOTH THE OUTSIDE AND INSIDE AT A POINT WHERE THEY PASS THROUGH THE WALL OF THE PROTECTED ZONE.
   - D. ALL WALLS SHOULD BE CAULKED AROUND THE INSIDE PERIMETER OF THE ROOM WHERE THE WALLS REST ON THE FLOOR SLAB AND WHERE THE WALLS INTERSECT THE CEILING SLAB OR ROOF ABOVE.
   - E. POROUS BLOCK WALLS SHOULD BE SEALED SLAB-TO-SLAB TO PREVENT GAS FROM PASSING THROUGH THE BLOCK. MULTIPLE COATS OF PAINT MAY BE REQUIRED.
5. HVAC
   - A. BUILDING AIR HANDLING UNIT DUCTWORK, SHOULD HAVE GASKETED LOW LEAK AGENT/SMOKE TYPE DAMPERS WITH FLEXIBLE SEALS THAT WILL CLOSE UPON ACTIVATION OF THE PRE-DISCHARGE TIMER IN THE PANEL.
   - B. DAMPERS SHOULD BE MOTOR-OPERATED OR SPRING-LOADED
   - C. DAMPERS SHOULD BE INSTALLED AS CLOSE AS POSSIBLE TO THE DUCTS POINT OF ENTRY INTO THE ROOM.
   - D. DUCT JOINTS SHOULD BE SEALED BETWEEN THE DAMPER AND THE DUCT ENTRY POINT.
   - E. THE GAP BETWEEN THE DAMPER FRAME AND THE DUCT WALL SHOULD BE SEALED.
   - F. INTERNAL INSPECTION OF THE DAMPER SHOULD BE MADE ACCESSIBLE BY A MINIMUM 6" SQUARE ACCESS PANEL.
6. MISC
   - A. WINDOWS SHOULD HAVE SOLID WEATHER – STRIPPING AROUND ALL JOINTS. GLASS TO FRAME AND FRAME TO WALL JOINTS SHOULD BE SEALED.
   - B. IF A PURGE SYSTEM IS INSTALLED THE FAN START – UP SHALL BE TIED INTO THE RELEASING PANEL IN A WAY THAT WILL NOT ALLOW FOR THE FAN TO OPERATE FOR A MINIMUM OF 10 MINUTES AFTER SYSTEM DISCHARGE.
   - C. IF ANY AIR CONDITION UNITS ARE LOCATED IN THE ENCLOSURE IT IS RECOMMENDED THAT THEY ARE SHUT DOWN UPON DISCHARGE.
   - D. IF REQUIRED BY THE AHJ AN EPO SWITCH CAN BE USED TO POWER DOWN THE EQUIPMENT IN THE DATA CENTER.
     1. IF AN EPO SWITCH IS INTERCONNECTED TO THE RELEASE PANEL THE SYSTEM WILL NEED TO BE FITTED WITH AN EPO BYPASS SWITCH TO FACILITATE REQUIRED PERODIC SYSTEM INSPECTIONS.
   - E. RELEASE CONTROL PANEL MUST BE PROVIDED WITH A DEDICATED CIRCUIT USING A 20 AMP FUSE.

SYMBOL LEGEND / ABBREVIATIONS

FSCP	FIRE SYSTEM CONTROL PANEL- CLEAN AGENT
MA	DUAL ACTION MANUAL PULL STATION
MA	ABORT SWITCH
SD	SMOKE DETECTOR – PHOTOELECTRIC
H/S	HORN / STROBE
	ELECTRIC BELL
S	STROBE
RCOS	MAINTENANCE BY-PASS SWITCH
EOL Ω	END OF LINE RESISTOR
	DISCHARGE NOZZLE, 360°
	DISCHARGE NOZZLE, 180°
	EXTINGUISHING AGENT CONTAINER
CA	CLEAN AGENT
DN	DOWN
EPO	EMERGENCY POWER OFF
FSSA	FIRE SUPRESSION SYSTEM ASSOCIATION
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION

PIPING SUPPORTS & ROD SIZES		
PIPE SIZE (INCHES)	DISTANCE BETWEEN SUPPORTS (FEET)	ROD DIAMETER (INCHES)
1/4, 1/2, 3/4, 1, 1-1/4	7	3/8
1-1/2	9	3/8
2	10	3/8
2-1/2	11	1/2
3	12	1/2
4	14	5/8

GUAM FIRE DEPARTMENT
FIRE PREVENTION BUREAU
PLAN REVIEW NO. 2-12 DATE: 12-14
☑ APPROVED
☐ DISAPPROVED
REMARKS: Acceptance Testing to be Conducted
FIRE INSPECTOR

TYPICAL SEQUENCE OF OPERATION USING VIKING VFR-400 RELEASE CONTROL PANEL:

1. ACTIVATION OF THE FIRST DETECTOR, WITHIN THE SYSTEM SHALL:
   - A) LIGHT THE COMMON ALARM LED ON THE CONTROL PANEL
   - B) ACTIVATE THE ALARM CONNECTED TO THE FIRST ALARM OUTPUT IN SIDE THE HAZARD AREA.
2. ACTIVATION OF A SECOND DETECTOR ON THE SYSTEM SHALL:
   - A) ILLUMINATE THE LED FOR THE PRE-DISCHARGE TIMER ON THE .CONTROL PANEL, LED WILL BEGIN FLASHING.
   - B) ACTIVATE HORN AND/OR STROBE DEVICE CONNECTED TO THE SECOND ALARM OUTPUT INSIDE THE HAZARD AREA.
   - C) SHUTDOWN AIR-CONDITIONING AND VENTILATION SYSTEM SERVING PROTECTED AREA, ACTIVATE DOOR CLOSERS IN THE PROTECTED AREA AND SEND SIGNAL TO FIRE ALARM SYSTEM VIA FACP.
3. AFTER THE PRE-DISCHARGE TIMER HAS BEEN EXHAUSTED, THE CLEAN AGENT (FM-200) WILL BE RELEASED TO DISCHARGE THROUGH THE NOZZLE(S) AND THE FOLLOWING WILL OCCUR:
   - A) PRE-DISCHARGE LED ON THE PANEL WILL CHANGE FROM FLASHING TO STEADY ON TO REPRESENT SYSTEM ACTIVATION.
   - B) POWER TO ALL HIGH VOLTAGE EQUIPMENT WILL BE SHUTDOWN.
   - C) VISUAL DEVICE OUTSIDE OF THE HAZARD AREA IN WHICH THE AGENT IS BEING RELEASED WILL BE ACTIVATED.

*NOTE: IF ABORT SWITCH IS ACTIVATED, PRE-DISCHARGE TIMER WILL CONTINUE TO COUNTDOWN UNTIL IT REACHES 10 SECONDS AND THEN STOP. RELEASING THE ABORT SWITCH WILL CONTINUE THE COUNTDOWN TO 0, ACTIVATING THE SWITCH AGAIN WILL RESET THE TIMER TO 10 SECONDS AND HOLD UNTIL IT RELEASED AGAIN.

WARNING: ACTIVATION OF THE MANUAL RELEASE DEVISE AT EACH EXIT WILL BY-PASS THE AUTOMATIC DETECTION AND IMMEDIATELY START THE PRE-DISCHARGE TIMER. THE MANUAL RELEASE ZONE CANNOT BE ABORTED OR BY-PASS.

**NOTE:
1. THE SEQUENCE OF OPERATIONS PROVIDED IS FOR REFERENCE ONLY, AND MAY CHANGE BASED UPON REQUIREMENTS FOR A SPECIFIC PROJECT IN ACCORDANCE WITH DRAWINGS AND/OR SPECIFICATION THAT ARE PROVIDED FOR THE PROJECT.

2. THIS SYSTEM MUST BE DESIGNED BY QUALIFIED DESIGN PROFESSIONALS IN CONJUNCTION WITH INSURING BODIES. THE USER IS RESPONSIBLE FOR THE DESIGN AND CONFIGURATION OF THE SYSTEM, ITS APPROPRIATENESS FOR THE USE INTENDED AND ITS COMPLIANCE WITH ALL CODES, STANDARDS AND IN COMPLIANCE WITH AHJ REQUIREMENTS. THE VIKING CORPORATIONS DOES NOT DESIGN SYSTEMS FOR SPECIFIC INSTALLATIONS AND MAKES NO REPRESENTATION OR WARRANTY CONCERNING WHETHER ANY SPECIFIC SYSTEM INSTALLATION WILL BE SUFFICIENT FOR THE INTENDED USED OR WILL COMPLY WITH ANY STANDARD, CODE OR ORDINANCE.

Falcon Fire Protection LLC
PO BOX 225336
HAGATNA, GUAM 96932
TEL: 671-687-3473
email: jonathan.crisostomo@yahoo.com
Lic#: GLB-2011-0077

ENGINEERING SERVICES, LLC
MECHANICAL & FIRE PROTECTION CONSULTING
DESIGNING & CONSTRUCTION OVERSIGHT SPECIALISTS
P.O. Box 283 Hagatna, Guam 96932
M ..... 646-607 /969-5006
F 646-4084
E-Mail ..... engr@kg.net.gu

WILLIAM C. MILLER JR.
No. 9512
REGISTERED PROFESSIONAL ENGINEER
03.20.14
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION

SHEET CONTENTS:
GENERAL INSTALLATION/CONSTRUCTION NOTES, SYMBOLS, LEGENDS AND ABBREVIATIONS AND SYSTEM SPECIFICATIONS

GUAM MARIANAS ISLANDS
GPA - GWA
MULTI-PURPOSE FACILITY
HAGATNA, GUAM
FIRE SUPRESSION SHOP DRAWINGS

DESIGN:	WGM
DRAWN:	EHM
CHECKED:	WGM
SUPV:	WGM
SCALE:	AS SHOWN
DATE:	01/02/14

FS-1

INSTALLATION/CONSTRUCTION NOTES:

MECHANICAL NOTES:

1. PIPING MATERIALS MUST CONFORM TO THE REQUIREMENT AS OUTLINED IN NFPA 2001, SECTION 4.2.1, CURRENT EDITION. BLACK PIPE MUST BE USED.
2. PIPE FITTINGS MUST CONFORM TO THE REQUIREMENTS AS OUTLINED IN NFPA 2001, SECTION 4.2.3 CURRENT EDITION. MALLEABLE IRON FITTINGS MUST BE 300LB. CLASS CONFORMING TO ASTM SPECIFICATION A-197 150LB. CLASS AND ORDINARY CAST IRON FITTINGS ARE NOT TO BE USED. VGS GROOVED PIPE FITTINGS MAY BE USED AS WELL AS THREADED, WELDED, OR FLANGED, AS LONG AS THEY CONFORM TO THE ABOVE REQUIREMENTS. HOWEVER, HOLE-CUT FITTINGS OR SIMILAR, MAY NOT BE USED.
3. ALL REDUCTIONS SHALL BE MADE USING REDUCERS OR REDUCING FITTINGS – BUSHINGS ARE NOT PERMITTED.
4. ALL PIPE AND NOZZLE DROPS MUST BE BRACED TO WALLS, COLUMNS, OR CEILINGS USING STEEL HANGERS WITH A MINIMUM OF 3/8" ALL-THREAD ROD PLACED PER NFPA CODE, BRACED NO MORE THAN 5'-0" APART. RIGID PIPE SUPPORTS ARE REQUIRED TO SUPPORT "LIVE LOAD" OF THE PIPE SYSTEM DURING DISCHARGE, RIGID BRACING IS REQUIRED AT EACH DIRECTIONAL CHANGE, FITTING, TEE AND NOZZLE.
5. EACH PIPE SECTION SHALL BE CLEANED INTERNALLY BEFORE INSTALLATION WITH A NON-FLAMMABLE CLEANER IN ACCORDANCE WITH NFPA 2001, LATEST EDITION.
6. ALL PENETRATIONS MUST BE SEALED BY INSTALLING CONTRACTOR.
7. LUBRICATE GASKETS ON ALL COUPLINGS USING NON-PETROLEUM BASED LUBRICANTS.
8. FLOW CALCULATIONS SHALL BE BASED ON PIPING BEING INSTALLED EXACTLY AS DIAGRAMED ON DRAWINGS. ALL FIELD PIPING CHANGES SHALL BE APPROVED BY MANUFACTURER PRIOR TO FABRICATION AND INSTALLATION.
9. TEFLON TAPE OR JOINT COMPOUND SHALL BE USED ON ALL THREADED JOINTS.
10. ALL "THRU TEES" MUST BE RUN IN A HORIZONTAL PLANE.
11. THE PIPING SYSTEM SHOULD BE SECURELY SUPPORTED WITH DUE ALLOWANCE FOR AGENT THRUST FORCES SEISMIC ACTIVITY, THERMAL EXPANSION, AND CONTRACTION, AND SHOULD NOT BE SUBJECTED TO MECHANICAL, CHEMICAL, VIBRATION, OR OTHER DAMAGE ASME B31.1 SHOULD BE CONSULTED FOR GUIDANCE. THE FSSA PIPE DESIGN HANDBOOK PROVIDES GUIDANCE ON HOW TO APPLY ASME B31.1. THE MAXIMUM HORIZONTAL SPACING FOR SCREWED, WELDED OR GROOVED PIPE ARE AS INDICATED ON THE FOLLOWING TABLE:

DETECTION/ALARM NOTES:

1. NOT BASED UPON ADA COMPLIANCE, IF ADA COMPLIANCE IS REQUIRED ADJUST ACCORDINGLY.
2. BATTERY CALCULATIONS RESULT IN A REQUIRED AMP HOUR OF 3.67 AH, A BATTERY WITH A HIGHER AH RATING WILL NEED TO BE USED. IF DEVICES USED ARE OTHER THAN THE DEVICES USE FOR THE BATTERY CALCULATIONS, NEW BATTERY CALCULATIONS WILL NEED TO BE PERFORMED TO VERIFY CURRENT BATTERIES WILL STILL BE SUFFICIENT TO MEET THE SECONDARY POWER REQUIREMENTS OF NFPA 72.
3. VERIFY THROUGH LOCAL CODES OR ANY OTHER THAT MAY BE APPLICABLE THE PROPER LOCATION OF CONDUIT CONNECTIONS INTO THE RELEASE CONTROL PANEL.
4. LAYOUT IS BASED UPON TWO WIRE DETECTION. IF FOUR WIRE DETECTION IS REQUIRED LAYOUT WILL NEED TO BE REWISE TO REFLECT THE CHANGES.
5. OPTIONAL DEVICES MAY BE REQUIRED WITH PANEL.
6. PROVIDE EXTERNAL JUNCTION BOX FOR DETECTORS AND NOTIFICATION APPLIANCES AS REQUIRE FOR DEVICES BEING USED.
7. HORNS TO PRODUCE A DECIBEL LEVEL OF 70 DECIBELS THROUGHOUT THE AREA THEY ARE PROTECTING FOR A BUSINESS OCCUPANCY AS PER NFPA 72, 2010 SECTION 18.4.3, WHICH REQUIRES THE DECIBEL LEVEL TO BE 15 DECIBELS ABOVE THE AVERAGE AMBIENT SOUND LEVEL OF THE OCCUPANCY WHICH IT IS PROTECTING AND IN ACCORDANCE WITH TABLE A.18.4.3 WHICH SHOWS BUSINESS OCCUPANCIES AS HAVING AN AVERAGE AMBIENT SOUND LEVEL OF 55 DECIBELS.
8. WALL MOUNTED STROBES TO BE SPACED IN ACCORDANCE WITH NFPA 72 2010, TABLE 18.5.4.3(e).
9. NOTIFICATIONS/RELEASE CIRCUITS OF THE WR-400 RELEASE CONTROL PANEL ARE RATED TO A MAXIMUM OF 1 AMP EACH, AND 2.5 AMPS FOR ALL 4 CIRCUITS.
10. VERIFY REQUIRED FINAL LOCATION OF PANEL (AS PER NFPA 72 THE RELEASE PANEL SHALL BE INSTALLED WHERE IT IS PROTECTED FROM DAMAGE CAUSED BY ACTIVATION OF THE SUPPRESSION SYSTEM(S) THEY CONTROL).

ELECTRICAL LAYOUT:

1. NOT BASE UPON ADA COMPLIANCE. IF ADA COMPLIANCE IS REQUIRED ADJUST ACCORDINGLY.
2. BATTERY CALCULATIONS WILL NEED TO BE PERFORMED TO VERIFY CURRENT BATTERIES WILL STILL BE SUFFICIENT TO MEET THE SECONDARY POWER REQUIREMENTS OF NFPA 72.
3. VERIFY THROUGH LOCAL CODES OR ANY OTHER THAT MAY BE APPLICABLE, THE PROPER LOCATION OF CONDUIT CONNECTIONS INTO THE RELEASE CONTROL PANEL.
4. LAYOUT IS BASED UPON TWO WIRE DIRECTION. IF FOUR WIRE DETECTION IS REQUIRED, LAYOUT WILL NEED TO BE REVISED TO REFLECT THE CHANGES.
5. OPTIONAL DEVICES MAY BE REQUIRED WITH PANEL TO MAKE IT POSSIBLE TO SHUT-DOWN ALL THE NECESSARY EQUIPMENT FOR THE PROJECT. PRIOR TO PURCHASING THE PANEL SHOWN, PLEASE CONTACT VIKING TECHNICAL SERVICES AT 1-877-384-5464 TO DETERMINE WHETHER OR NOT THE PANEL SHOWN ON THE DRAWING IS CAPABLE OF SHUTTING DOWN ALL THE REQUIRED EQUIPMENT, AND IF SO, WHAT OPTIONAL DEVICES MAY BE REQUIRED TO DO SO.
6. DETECTORS AND NOTIFICATION APPLIANCES MAY REQUIRE AN EXTERNAL JUNCTION BOX DEPENDANT UPON WHICH DEVICES ARE BEING USED.
7. HORN TO PRODUCE A DECIBEL LEVEL OF 70 DECIBELS THROUGHOUT THE AREA THEY ARE PROTECTING FOR A BUSINESS OCCUPANCY AS PER NFPA 72, 2010 SECTION 18.4.3, WHICH REQUIRES THE DECIBEL LEVEL TO BE 15 DECIBELS ABOVE THE AVERAGE AMBIENT SOUND LEVEL OF THE OCCUPANCY WHICH IT IS PROTECTING, AND IN ACCORDANCE WITH TABLE A.18.4.3 WHICH SHOWS BUSINESS OCCUPANCIES AS HAVING AN AVERAGE AMBIENT SOUND LEVEL OF 55 DECIBELS.
8. WALL MOUNTED STROBES TO BE SPACED IN ACCORDANCE WITH NFPA 72 2010, TABLE 18.5.4.3.1(e).

1. FLOOR SURFACE

A. SINCE THE DENSITY OF THE CLEAN AGENT IS GREATER THAN AIR, SEALING OF FLOOR PENETRATIONS IS CRUCIAL SO THAT THE AGENT DOES NOT DISPERSE THROUGH THOSE OPENINGS.
B. IF THERE ARE ANY FLOOR DRAINS LOCATED IN THE ENCLOSURE THEY SHALL HAVE TRAPS IN THEM THAT ARE FILLED WITH WATER OR ANOTHER COMPATIBLE LIQUID AT ALL TIMES.
C. BOTTOM OF THE DOORS SHOULD HAVE DOOR SWEEPS OR DROP SEALS. IF BOTTOM OF THE DOOR IS CUT TOO HIGH OFF THE FLOOR FOR DOOR SWEEPS OR DROP SEALS, OR IF THE FLOOR SURFACE IS UNEVEN A THRESHOLD SHOULD BE INSTALLED.
D. IF AN UNDER FLOOR SPACE IS BEING USED, AND CONTINUES OUT OF THE PROTECTED ENCLOSURE, AIRTIGHT FIRE RATED PARTITIONS SHOULD BE INSTALLED UNDER THE FLOOR DIRECTLY UNDER ABOVE-FLOOR BORDER PARTITIONS. SUCH PARTITIONS SHOULD BE CAULKED ON THE TOP AND BOTTOM.
E. IF A REMOVABLE FLOOR TILE EXTENDS UNDER A DOORWAY, OVER SUCH A PARTITION IT SHOULD EITHER BE:
   1. PERMANENTLY SEALED IN PLACE
   2. INSTALLED WITH A FLEXIBLE SEAL BETWEEN IT AND THE WALL BELOW.
   3. DISCONTINUED AT THE DOORWAY WITH PERMANENT AIR TIGHT LEDGE CREATED UP TO WHICH FLOOR TILES ABUT.
F. IF ADJOINING ROOMS SHARE THE SAME UNDER FLOOR AIR HANDLERS, THEN THE PARTITIONS SHOULD HAVE DAMPERS INSTALLED OF THE SAME TYPE AS REQUIRED FOR THE DUCTWORK.

2. CEILING

A. THE SUSPENDED CEILING OF THE ENCLOSURE SHOULD BE OF A 2 x 2 ACOUSTIC GRID CONSTRUCTION (PF), TAPED AND PAINTED WITH ACCESS PANELS IF REQUIRED.
B. WHERE DISCHARGE NOZZLES ARE INSTALLED THE CEILING TILES SHOULD BE CUPPED FOR A 10 FT. RADIUS AROUND THEM.
C. ALL CEILING TILES SHOULD HAVE A WEIGHT OF AT LEAST 5 POUNDS PER SQUARE FOOT.
D. LIGHTWEIGHT VINYL COATED ACOUSTICAL TILES SHOULD NOT BE USED UNLESS THEY ARE CUPPED THROUGH OUT THE PROTECTED AREA (PF).
E. PIPE CHASES AND CABLE TRAYS SHOULD BE SEALED AROUND BOTH THE OUTSIDE AND INSIDE AT A POINT WHERE THEY PASS THROUGH THE CEILING OF THE PROTECTED ZONE.

3. VENT CALCULATIONS

A. VENT CALCULATIONS ARE BASED UPON FSSA PRO-01 SECOND EDITION, JANUARY 2010. VENT SIZE BASED UPON LIMITING THE MAXIMUM NEGATIVE PRESSURE TO 5 PSF AND MAXIMUM POSITIVE PRESSURE TO 5 PSF.

4. WALL SURFACES

A. THE PERIMETER WALLS OF THE PROTECTED ENCLOSURE SHOULD EXTEND FROM THE STRUCTURAL FLOOR TO THE STRUCTURAL FLOOR ABOVE, OR THE ROOF/SOLID SLAB CEILING LEVEL.
B. ALL HOLES, CRACKS, OR PENETRATIONS LEADING INTO OR OUT OF THE ENCLOSURE SHOULD BE SEALED.
C. PIPE CHASES AND CABLE TRAYS SHOULD BE SEALED AROUND BOTH THE OUTSIDE AND INSIDE AT A POINT WHERE THEY PASS THROUGH THE WALL OF THE PROTECTED ZONE.
D. ALL WALLS SHOULD BE CAULKED AROUND THE INSIDE PERIMETER OF THE ROOM WHERE THE WALLS REST ON THE FLOOR SLAB AND WHERE THE WALLS INTERSECT THE CEILING SLAB OR ROOF ABOVE.
E. POROUS BLOCK WALLS SHOULD BE SEALED SLAB-TO-SLAB TO PREVENT GAS FROM PASSING THROUGH THE BLOCK. MULTIPLE COATS OF PAINT MAY BE REQUIRED.

5. HVAC

A. BUILDING AIR HANDLING UNIT DUCTWORK, SHOULD HAVE GASKETED LOW LEAK AGENT/SMOKE TYPE DAMPERS WITH FLEXIBLE SEALS THAT WILL CLOSE UPON ACTIVATION OF THE PRE-DISCHARGE TIMER IN THE PANEL.
B. DAMPERS SHOULD BE MOTOR-OPERATED OR SPRING-LOADED.
C. DAMPERS SHOULD BE INSTALLED AS CLOSE AS POSSIBLE TO THE DUCTS POINT OF ENTRY INTO THE ROOM.
D. DUCT JOINTS SHOULD BE SEALED BETWEEN THE DAMPER AND THE DUCT ENTRY POINT.
E. THE GAP BETWEEN THE DAMPER FRAME AND THE DUCT WALL SHOULD BE SEALED.
F. INTERNAL INSPECTION OF THE DAMPER SHOULD BE MADE ACCESSIBLE BY A MINIMUM 6" SQUARE ACCESS PANEL.

6. MISC

A. WINDOWS SHOULD HAVE SOLID WEATHER – STRIPPING AROUND ALL JOINTS. GLASS TO FRAME AND FRAME TO WALL JOINTS SHOULD BE SEALED.
B. IF A PURGE SYSTEM IS INSTALLED THE FAN START – UP SHALL BE TIED INTO THE RELEASING PANEL IN A WAY THAT WILL NOT ALLOW FOR THE FAN TO OPERATE FOR A MINIMUM OF 10 MINUTES AFTER SYSTEM DISCHARGE.
C. IF ANY AIR CONDITION UNITS ARE LOCATED IN THE ENCLOSURE IT IS RECOMMENDED THAT THEY ARE SHUT DOWN UPON DISCHARGE.
D. IF REQUIRED BY THE AHJ AN EPO SWITCH CAN BE USED TO POWER DOWN THE EQUIPMENT IN THE DATA CENTER.
   1. IF AN EPO SWITCH IS INTERCONNECTED TO THE RELEASE PANEL THE SYSTEM WILL NEED TO BE FITTED WITH AN EPO BYPASS SWITCH TO FACILITATE REQUIRED PERIODIC SYSTEM INSPECTIONS.
E. RELEASE CONTROL PANEL MUST BE PROVIDED WITH A DEDICATED CIRCUIT USING A 20 AMP FUSE.

SYMBOL LEGEND / ABBREVIATIONS

FSCP CA	FIRE SYSTEM CONTROL PANEL- CLEAN AGENT
CA	DUAL ACTION MANUAL PULL STATION
CA	ABORT SWITCH
P	SMOKE DETECTOR – PHOTOELECTRIC
H CA	HORN / STROBE
	ELECTRIC BELL
CA	STROBE
MSMS	MAINTENANCE BY-PASS SWITCH
EOL	END OF LINE RESISTOR
	DISCHARGE NOZZLE, 360°
	DISCHARGE NOZZLE, 180°
	EXTINGUISHING AGENT CONTAINER
CA	CLEAN AGENT
DN	DOWN
EPO	EMERGENCY POWER OFF
FSSA	FIRE SUPRESSION SYSTEM ASSOCIATION
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION

PIPING SUPPORTS & ROD SIZES

PIPE SIZE (INCHES)	DISTANCE BETWEEN SUPPORTS (FEET)	ROD DIAMETER (INCHES)
1/4, 1/2, 3/4, 1, 1-1/4	7	3/8
1-1/2	9	3/8
2	10	3/8
2-1/2	11	1/2
3	12	1/2
4	14	5/8

Falcon Fire Protection, LLC
P.O. Box 326326
Harmon, Guam 96932
Tel: (671) 653-3939
email: jointfalconfire@yahoo.com License G.B.L. No. 2077

ENGINEERING SERVICES, LLC
MECHANICAL & FIRE PROTECTION ENGINEERING
BUILDING ACCESSIBILITY CONSULTANTS
P.O. Box 283 Hagatña, Guam 96932
Tel: (671) 646-1214/1588 • Fax: (671) 646-1215
E-Mail: engr@guamnet

I, WILLIAM C. WITTE JR., HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION

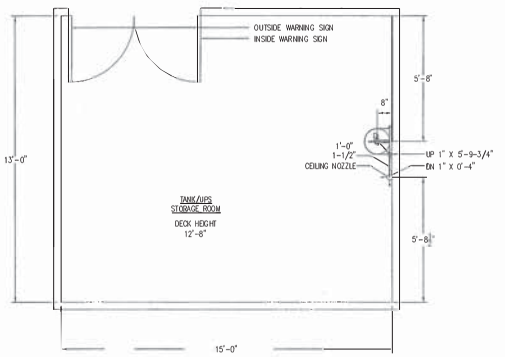
SHEET CONTENTS:

GENERAL
INSTALLATION/CONSTRUCTION NOTES, SYMBOLS, LEGENDS AND ABBREVIATIONS AND SYSTEM SPECIFICATIONS

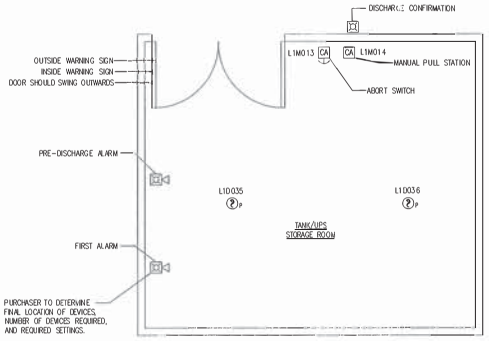
GUAM MARIANAS ISLANDS
GPA - GWA
MULTI-PURPOSE FACILITY
HAGATNA, GUAM
FIRE SUPPRESSION SHOP DRAWINGS

DESIGN	WCM
DRAWN	EMM
CHECKED	WCM
SUPV.	WCM
SCALE	AS SHOWN
DATE:	11/27/13

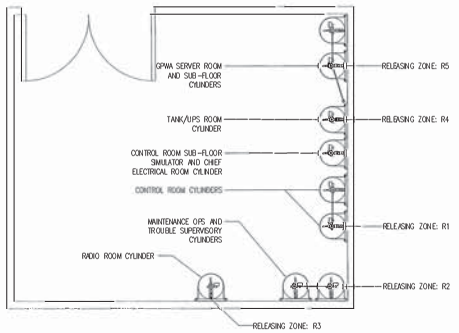
FS-1



1 FS-2 TANKS/UPS ROOM PIPING PLAN
SCALE: 3/8" = 1'-0" ZONE R4

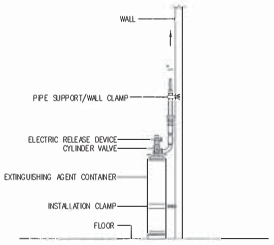


2 FS-2 TANKS/UPS ROOM DETECTION/ALARM PLAN
SCALE: 3/8" = 1'-0" ZONE R4

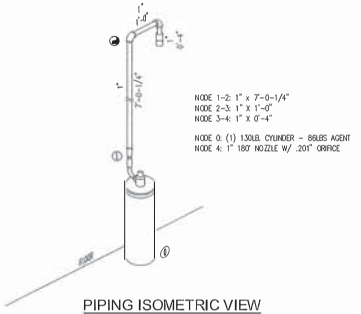


2 FS-2 TANKS/UPS ROOM CYLINDER TANKS PLAN
SCALE: 3/8" = 1'-0" ALL ZONES

AGENT BEING USED:	MIX-200
DESIGN CONCENTRATION:	7.1 %
OCCUPANCY:	NORMALLY OCCUPIED
CONTAINER VOLUME:	(1) 130 LB.
STORAGE PRESSURE:	360 PSI
FILLING QUANTITY:	86LBS @ 70° F
NOZZLE SIZE:	(1) 1 IN
ORIFICE CONFIGURATION:	(1) 180°
ORIFICE AREA:	(1) 0.201 IN



CLEAN AGENT RISER DETAIL
NOT TO SCALE



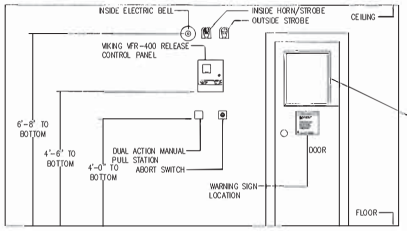
PIPING ISOMETRIC VIEW
NOT TO SCALE

BATTERY CALCULATIONS					
		STANDBY		ALARM	
MODULE/DEVICE	QUANTITY	mA PER UNIT	TOTAL mA	mA PER UNIT	TOTAL mA
VFR-400	1	121	121	274	274
PS-24 SMOKE	6	.045	.27	150	900
SB-46 BASE	6	0	0	46	276
SH-1224 (HORN)	2	0	0	87	174
SL-1224 (STROBE)	2	0	0	177	354
ELECTRIC RELEASE	1	0	0	500	500
		REQUIRED AH (85% EFFICIENCY FACTOR)			3.57

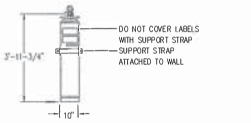
SH-1224 (HORN) BASED UPON 2400HZ NON-TEMPORAL @ 24 VDC (HIGH)

SL-1224 (STROBE) & SL-1224 BASED UPON 950 @ 24 VDC

THE CURRENT RATINGS THESE DEVICES ARE BASED UPON REFLECT THE MAXIMUM SETTINGS AT WHICH THE BATTERY CALCULATIONS WERE PERFORMED AND DO NOT REPRESENT THE ACTUAL SETTINGS FOR THE DEVICES REQUIRED FOR THIS PROJECT PURCHASER TO VERIFY ACTUAL REQUIRED SETTINGS OF DEVICES AND THAT THEY DO NOT EXCEED THE SETTINGS USED FOR THE BATTERY CLACULATIONS



ELEVATION EXAMPLE COMPONENT LOCATIONS
NOT TO SCALE



130 LB. AGENT CYLINDER INSTALLATION
NOT TO SCALE

THIS ROOM PROTECTED BY
FM200 FIRE SUPPRESSION
SYSTEM (TANK/UPS ROOM)

SECOND FLOOR

Falcon Fire Protection LLC
P.O. BOX 326326 96932
TEL: 671-483-4553
email: johnfalconfire@yahoo.com License GLB09-0077

ENGINEERING SERVICES, LLC
ENGINEERING & ARCHITECTURAL CONSULTING
ENGINEERING & CONSTRUCTION MANAGEMENT SERVICES
P.O. Box 393 Hagatna GUAM 96932
Tel 646-6074/75/76/77/78
Fax 646-6064
e-mail ..... engr@gte.net

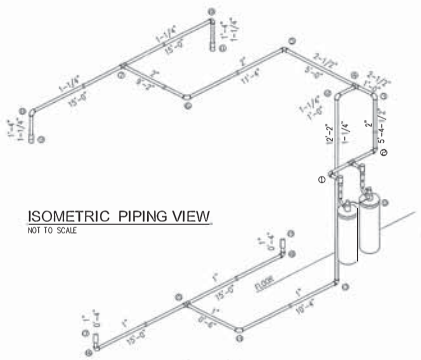
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION

SHEET CONTENTS:
TANKS/UPS ROOM PIPING PLAN, ALARM AND DETECTION PLAN, PIPING ISOMETRICS AND MISCELLANEOUS INSTALLATION DETAILS

GUAM MARIANAS ISLANDS
GPA - GWA
MULTI-PURPOSE FACILITY
HAGATNA, GUAM
FIRE SUPPRESSION SHOP DRAWINGS

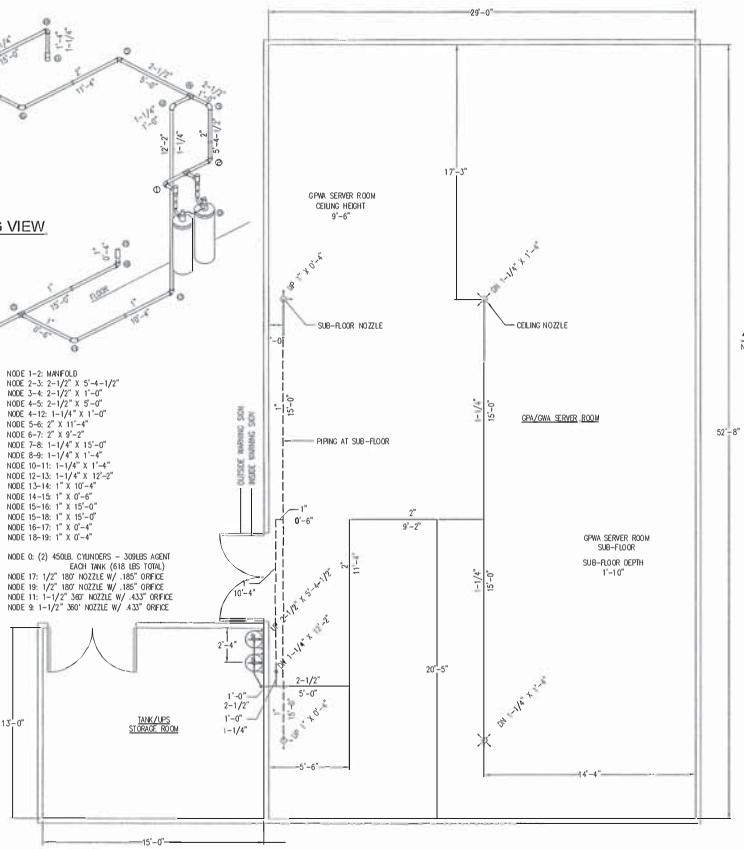
DESIGN:	WGM
DRAWN:	EMM
CHECKED:	WGM
SUPV.:	WGM
SCALE:	AS SHOWN
DATE:	11/27/13

FS-2

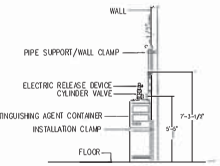


NODE 1-2: MANIFOLD
NODE 2-3: 2-1/2" X 5'-4-1/2"
NODE 3-4: 2-1/2" X 1'-0"
NODE 4-5: 2-1/2" X 5'-0"
NODE 4-12: 1-1/4" X 1'-0"
NODE 5-6: 2" X 11'-4"
NODE 6-7: 2" X 9'-2"
NODE 7-8: 1-1/4" X 15'-0"
NODE 8-9: 1-1/4" X 1'-4"
NODE 10-11: 1-1/4" X 1'-4"
NODE 12-13: 1-1/4" X 12'-2"
NODE 13-14: 1" X 10'-4"
NODE 14-15: 1" X 0'-6"
NODE 15-16: 1" X 15'-0"
NODE 15-18: 1" X 15'-0"
NODE 16-17: 1" X 0'-4"
NODE 18-19: 1" X 0'-4"

NODE 0: (2) 450LB. CYLINDERS - 309LBS AGENT EACH TANK (618 LBS TOTAL)
NODE 17: 1/2" 180° NOZZLE W/ .185" ORIFICE
NODE 19: 1/2" 180° NOZZLE W/ .185" ORIFICE
NODE 11: 1-1/2" 360° NOZZLE W/ .433" ORIFICE
NODE 9: 1-1/2" 360° NOZZLE W/ .433" ORIFICE



1 FS-3 GPA SERVER ROOM PIPING PLAN
SCALE: 1/4" = 1'-0" ZONE R5

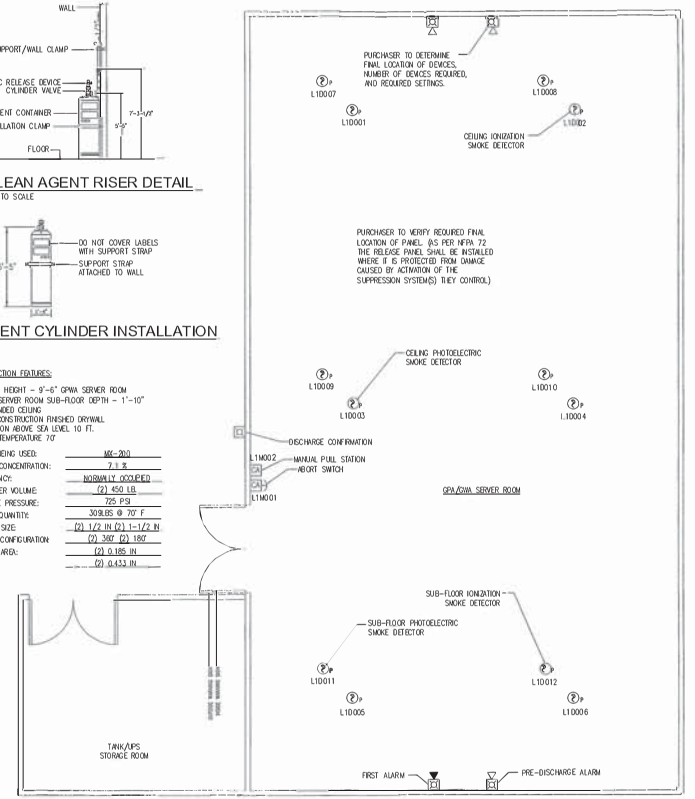


CLEAN AGENT RISER DETAIL
NOT TO SCALE

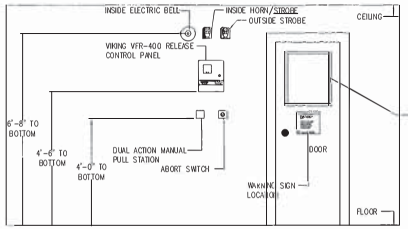
450 LB. AGENT CYLINDER INSTALLATION
NOT TO SCALE

CONSTRUCTION FEATURES:
- CEILING HEIGHT - 9'-6" GPWA SERVER ROOM
- GPWA SERVER ROOM SUB-FLOOR DEPTH - 1'-10"
- SUSPENDED CEILING
- WALL CONSTRUCTION FINISHED DRYWALL
- ELEVATION ABOVE SEA LEVEL 10 FT.
- ROOM TEMPERATURE 70°

AGENT BEING USED:	MX-200
DESIGN CONCENTRATION:	7.1 %
OCCUPANCY:	NORMALLY OCCUPIED
CONTAINER VOLUME:	(2) 450 LB.
STORAGE PRESSURE:	725 PSI
FILLING QUANTITY:	309LBS @ 70° F
NOZZLE SIZE:	(2) 1/2 IN (2) 1-1/2 IN
ORIFICE CONFIGURATION:	(2) 360° (2) 180°
ORIFICE AREA:	(2) 0.185 IN (2) 0.433 IN



2 FS-3 GPA SERVER ROOM DETECTION ALARM PLAN
SCALE: 1/4" = 1'-0" ZONE R5



ELEVATION EXAMPLE COMPONENT LOCATIONS
NOT TO SCALE

Falcon Fire Protection LLC
PO Box 336326
Greenville, NC 89932
Tel (671) 483-6539
email: johnfalconfire@yahoo.com License GLB08-3577

ENGINEERING SERVICE LLC
MECHANICAL & FIRE PROTECTION SYSTEMS ENGINEERING CONSTRUCTION PLANS SERVICES
PO Box 128 Hagatna, Guam 96932
Tel: 646-8033/646-1626
Fax: 646-8036
e-mail: mgwilliams.pe@gmail.com

WILLIAM G. MILLER JR. CERTIFIED No. 19727 PROFESSIONAL ENGINEER
11.27.13
U.S.A.

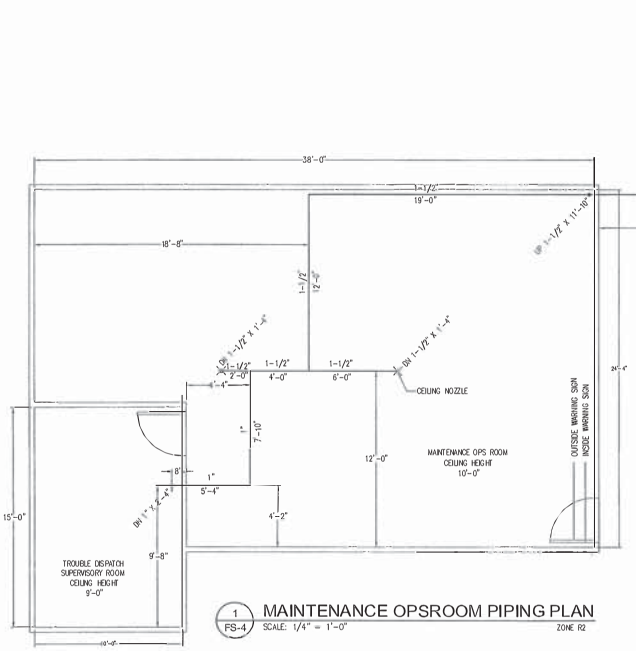
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION

SHEET CONTENTS:
GPA/GWA ROOM PIPING PLAN, ALARM AND DETECTION PLAN, PIPING ISOMETRICS AND MISCELLANEOUS INSTALLATION DETAILS

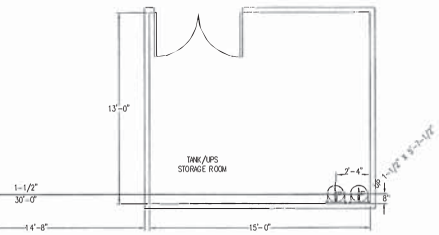
GUAM (AGANA) NAS ISLANDS
GPA - GWA
MULTI-PURPOSE FACILITY
HAGATNA, GUAM
FIRE SUPPRESSION SHOP DRAWINGS

DESIGN:	WGM
DRAWN:	EMM
CHECKED:	WGM
SUPV.:	WGM
SCALE:	AS SHOWN
DATE:	11/27/13

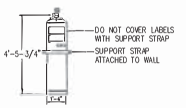
FS-3



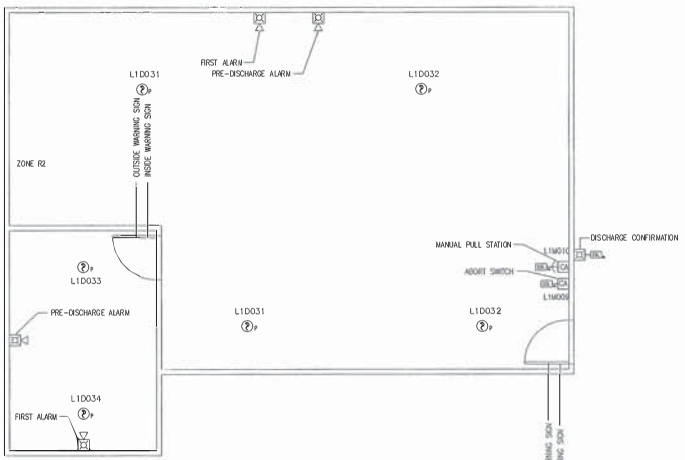
1 FS-4 MAINTENANCE OPSROOM PIPING PLAN
SCALE: 1/4" = 1'-0" ZONE R2



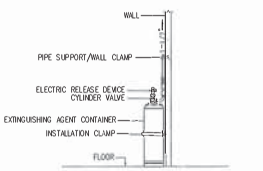
AGENT BEING USED:	MK-30A
DESIGN CONCENTRATION:	7.1 %
OCCUPANCY:	NORMALLY OCCUPIED
CONTAINER VOLUME:	(2) 350 LB
STORAGE PRESSURE:	725 PSI
FILLING QUANTITY:	348LBS @ 70° F
NOZZLE SIZE:	(1) 1/2 IN (2) 1-1/2 IN
ORIFICE CONFIGURATION:	(2) 360° (1) 180°
ORIFICE AREA:	(1) 0.299 IN
	(1) 0.291 IN
	(1) 0.165 IN



350 LB. AGENT CYLINDER INSTALLATION
NOT TO SCALE



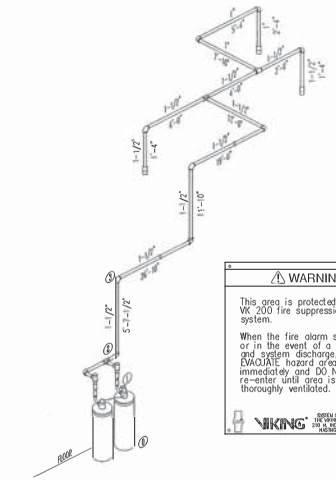
2 FS-4 MAINTENANCE OPS ROOM DETECTION/ALARM PLAN
SCALE: 1/4" = 1'-0" ZONE R2



CLEAN AGENT RISER DETAIL
NOT TO SCALE

NODE 1-2: MANIFOLD
NODE 2-3: 1-1/2" X 26'-10"
NODE 3-4: 1-1/2" X 11'-10"
NODE 4-5: 1-1/2" X 19'-0"
NODE 5-6: 1-1/2" X 12'-0"
NODE 6-7: 1-1/2" X 6'-0"
NODE 7-8: 1-1/2" X 1'-4"
NODE 9-10: 1-1/2" X 2'-0"
NODE 9-12: 1" X 7'-10"
NODE 10-11: 1-1/2" X 1'-4"
NODE 12-13: 1" X 5'-4"
NODE 13-14: 1" X 2'-4"

NODE 0: (2) 350LB. CYLINDER – 174LBS AGENT EACH TANK (348 LBS TOTAL)
NODE 8: 1-/2" 360° NOZZLE W/ .299" ORIFICE
NODE 11: 1-1/2" 360° NOZZLE W/ .291" ORIFICE
NODE 14: 1/2" 180° NOZZLE W/ .165" ORIFICE



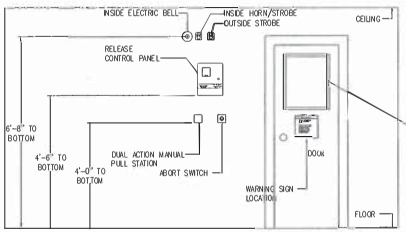
ISOMETRIC PIPING VIEW
NOT TO SCALE

⚠ WARNING

This area is protected by a VK 200 fire suppression system.

When the fire alarm sounds, or in the event of a FIRE and system discharge, EVACUATE hazard area immediately and DO NOT re-enter until area is thoroughly ventilated.

VIKING



ELEVATION EXAMPLE COMPONENT LOCATIONS
NOT TO SCALE

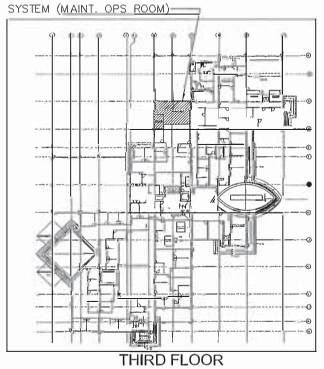
⚠ WARNING

This area is protected by a VK 200 fire suppression system.

In the event of a fire and system discharge, CAUTION must be taken to avoid exposure to products of combustion. DO NOT enter without an approved self-contained breathing apparatus or until area is thoroughly ventilated.

VIKING

THIS ROOM PROTECTED BY FM200 FIRE SUPPRESSION SYSTEM (MAINT. OPS ROOM)



THIRD FLOOR

Falcon Fire Protection LLC
PO Box 326326
Hagatna, Guam 96932
Tel 671-483-6539
email: jpmfalconfire@yahoo.com License GLB08-0177

ENGINEERING SERVICE LLC
MECHANICAL & FIRE PROTECTION CONSULTING
ENGINEERING CONSTRUCTION MANAGEMENT
P.O. Box 283 Hagatna, Guam 96932
Tel 671-565-9646 Fax 671-565-9646 cell 483-4264
e-mail wgc@ga.net

WILLIAM G. MILLER JR. CERTIFIED PROFESSIONAL ENGINEER No. 10177 11.27.13

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION

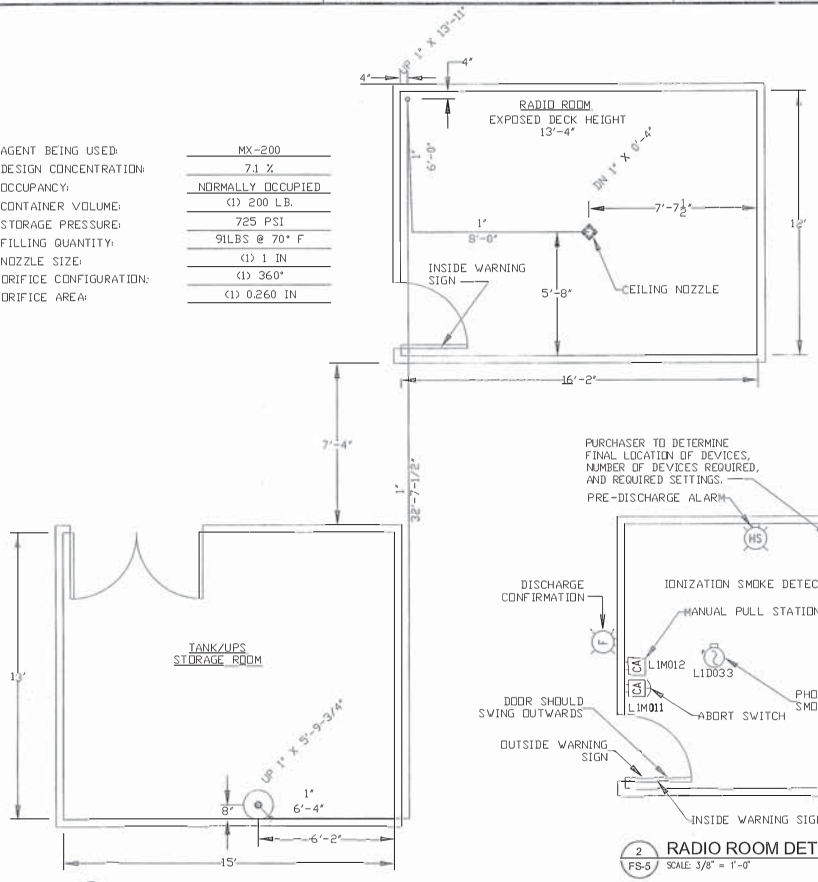
SHEET CONTENTS:
MAINTENANCE OPS ROOM PIPING PLAN, ALARM AND DETECTION PLAN, PIPING ISOMETRICS AND MISCELLANEOUS INSTALLATION DETAILS

GUAM MARIANAS ISLANDS
GPA - GWA
MULTI-PURPOSE FACILITY
HAGATNA, GUAM
FIRE SUPPRESSION SHOP DRAWINGS

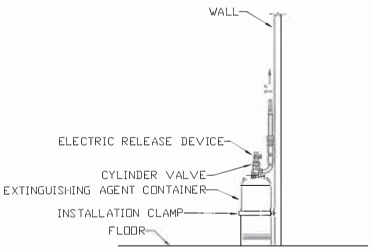
DESIGN:	WGM
DRAWN:	EMM
CHECKED:	WGM
SUPV:	WGM
SCALE:	AS SHOWN
DATE:	11/27/13

FS-4

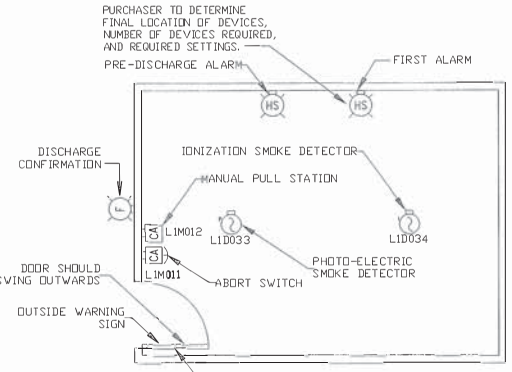
AGENT BEING USED:	MX-200
DESIGN CONCENTRATION:	7.1 %
OCCUPANCY:	NORMALLY OCCUPIED
CONTAINER VOLUME:	(1) 200 LB.
STORAGE PRESSURE:	725 PSI
FILLING QUANTITY:	91LBS @ 70° F
NOZZLE SIZE:	(1) 1 IN
ORIFICE CONFIGURATION:	(1) 360°
ORIFICE AREA:	(1) 0.260 IN



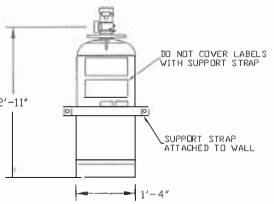
1 FS-5 RADIO ROOM PIPING PLAN
SCALE: 3/8" = 1'-0" ZONE R3



CLEAN AGENT RISER DETAIL
NOT TO SCALE



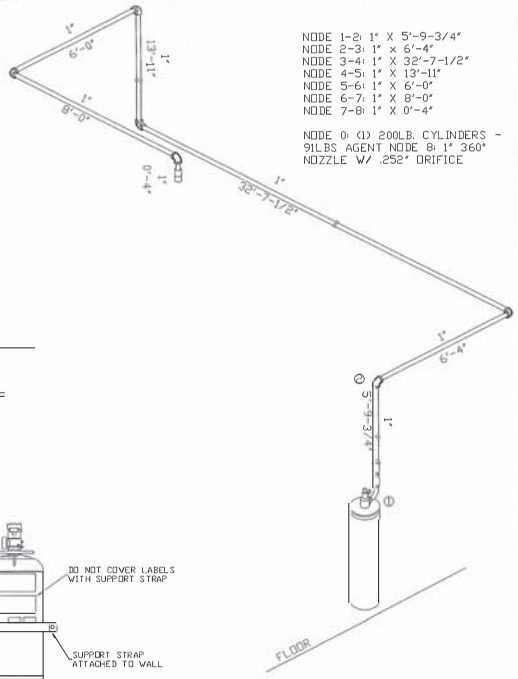
2 FS-5 RADIO ROOM DETECTION/ALARM PLAN
SCALE: 3/8" = 1'-0" ZONE R3



200 LB. AGENT CYLINDER INSTALLATION
NOT TO SCALE

NODE 1-2: 1" X 5'-9-3/4"
NODE 2-3: 1" x 6'-4"
NODE 3-4: 1" X 32'-7-1/2"
NODE 4-5: 1" X 13'-11"
NODE 5-6: 1" X 6'-0"
NODE 6-7: 1" X 8'-0"
NODE 7-8: 1" X 0'-4"

NODE 0: (1) 200LB. CYLINDERS - 91LBS AGENT NODE 8: 1" 360° NOZZLE W/ .252" ORIFICE



PIPING ISOMETRIC VIEW
NOT TO SCALE

BATTERY CALCULATIONS					
		STANDBY		ALARM	
MODULE/DEVICE	QUANTITY	mA PER UNIT	TOTAL mA	mA PER UNIT	TOTAL mA
VIR-400	1	121	121	274	274
PS-24 SMOKE	6	.045	.27	150	900
SH-46 BASE	6	0	0	46	276
SH-1224 (HORN)	2	0	0	87	174
SL-1224 (STROBE)	2	0	0	177	354
ELECTRIC RELEASE	1	0	0	500	500
		REQUIRED AH (85% EFFICIENCY FACTOR)			3.57

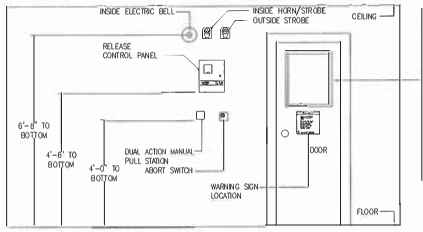
SH-1224 (HORN) BASED UPON 2400HZ NON-TEMPORAL @ 24 VDC (HIGH)
SL-1224 (STROBE) & SL-1224 BASED UPON 95CD @ 24 VDC
THE CURRENT RATINGS THESE DEVICES ARE BASED UPON REFLECT THE MAXIMUM SETTINGS AT WHICH THE BATTERY CALCULATIONS WERE PERFORMED AND DO NOT REPRESENT THE ACTUAL SETTINGS FOR THE DEVICES REQUIRED FOR THIS PROJECT PURCHASER TO VERIFY ACTUAL REQUIRED SETTINGS OF DEVICES AND THAT THEY DO NOT EXCEED THE SETTINGS USED FOR THE BATTERY CLACULATIONS

⚠ WARNING

This area is protected by a VK 200 fire suppression system.

When the fire alarm sounds, or in the event of a FIRE and system discharge, EVACUATE hazard area immediately and DO NOT re-enter until area is thoroughly ventilated.

VIKING SYSTEM MANUFACTURER THE VIKING CORPORATION 2100 N. RESERVE PARK DR. HASTINGS, MI 49058



ELEVATION EXAMPLE COMPONENT LOCATIONS
NOT TO SCALE

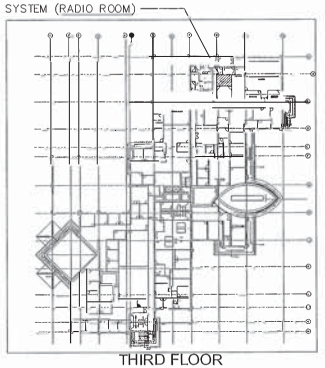
⚠ WARNING

This area is protected by a VK 200 fire suppression system.

In the event of a fire and system discharge, CAUTION must be taken to avoid exposure to products of combustion. DO NOT enter without an approved self-contained breathing apparatus or until area is thoroughly ventilated.

VIKING SYSTEM MANUFACTURER THE VIKING CORPORATION 2100 N. RESERVE PARK DR. HASTINGS, MI 49058

THIS ROOM PROTECTED BY FM200 FIRE SUPPRESSION SYSTEM (RADIO ROOM)



THIRD FLOOR

Falcon Fire Protection LLC
PO BOX 326326
HAGATNA, GUAM 96932
TEL: (671) 483-8539
email: jimfalconfire@yahoo.com License CLB08-0577

ENGINEERING SERVICES, LLC
ENGINEERING & ENVIRONMENTAL PLANNING
P.O. Box 283 Hagatna, GUAM 96932
TEL: 646-8570/63-9156
FAX: 646-6304
E-Mail: ...@...net

RILEY G. MILLER JR.
No. 11,273
REGISTERED PROFESSIONAL ENGINEER
GUAM

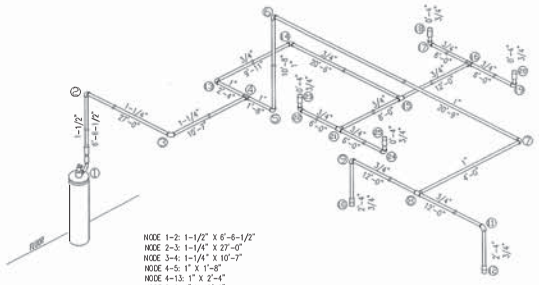
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION

SHEET CONTENTS:
RADIO ROOM PIPING PLAN, ALARM AND DETECTION PLAN, PIPING ISOMETRIC AND MISCELLANEOUS INSTALLATION DETAILS

GUAM MARIANAS ISLANDS
GPA - GWA
MULTI-PURPOSE FACILITY
HAGATNA, GUAM
FIRE SUPPRESSION SHOP DRAWINGS

DESIGN:	WJM
DRAWN:	EMM
CHECKED:	WJM
SUPV.:	WJM
SCALE:	AS SHOWN
DATE:	11/27/13

FS-5



NODE 1-2: 1-1/2" X 6'-6-1/2"
NODE 2-3: 1-1/4" X 27'-0"
NODE 3-4: 1-1/4" X 10'-7"
NODE 4-5: 1" X 1'-8"
NODE 4-13: 1" X 2'-4"
NODE 5-6: 1" X 10'-8"
NODE 6-7: 1" X 20'-9"
NODE 7-8: 1" X 4'-0"
NODE 8-9: 3/4" X 12'-0"
NODE 8-11: 3/4" X 12'-0"
NODE 9-10: 3/4" X 2'-4"
NODE 11-12: 3/4" X 2'-4"
NODE 13-14: 3/4" X 9'-10"
NODE 14-15: 3/4" X 20'-6"
NODE 15-16: 3/4" X 12'-0"
NODE 15-21: 3/4" X 8'-0"
NODE 16-17: 3/4" X 6'-0"
NODE 17-18: 3/4" X 0'-4"
NODE 19-20: 3/4" X 0'-4"
NODE 21-22: 3/4" X 6'-0"
NODE 21-24: 3/4" X 6'-0"
NODE 22-23: 3/4" X 0'-4"
NODE 24-25: 3/4" X 0'-4"

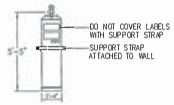
NODE 0: 450LB. CYLINDER – 208LBS AGENT
NODE 25: 1/2" 360° NOZZLE W/ .150" ORIFICE
NODE 23: 1/2" 360° NOZZLE W/ .150" ORIFICE
NODE 20: 1/2" 360° NOZZLE W/ .154" ORIFICE
NODE 18: 1/2" 360° NOZZLE W/ .154" ORIFICE
NODE 10: 1" 360° NOZZLE W/ .283" ORIFICE
NODE 12: 1" 360° NOZZLE W/ .244" ORIFICE

ISOMETRIC PIPING VIEW
NOT TO SCALE

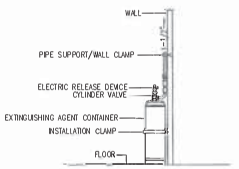
CONTROL RM SUB-FLOOR / SIMULATOR & CHIEF ROOM PIPING PLAN
SCALE: 1/4" = 1'-0"
1 / FS-6A
ZONE R1

CONSTRUCTION FEATURES:
- CEILING HEIGHT – 9'-0" SIMULATOR/ CHIEF ELEC.
- CONTROL ROOM SUB-FLOOR DEPTH – 1'-0"
- SUSPENDED CEILING
- WALL CONSTRUCTION FINISHED DRYWALL
- ELEVATION ABOVE SEA LEVEL 10 FT.
- ROOM TEMPERATURE 70°

AGENT BEING USED:	NX-200
DESIGN CONCENTRATION:	7.1 %
OCCUPANCY:	NORMALLY OCCUPIED
CONTAINER VOLUME	(1) 450 LB.
STORAGE PRESSURE:	725 PSI
FILLING QUANTITY:	208LBS @ 70° F
NOZZLE SIZE:	(4) 1/2 IN (2) 1 IN
ORIFICE CONFIGURATION:	360°
ORIFICE AREA	(2) 0.150 IN
	(2) 0.154 IN
	(1) 0.283 IN
	(1) 0.244 IN

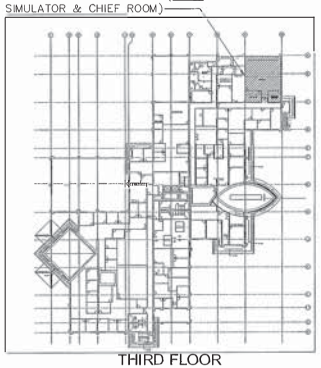


450 LB. AGENT CYLINDER INSTALLATION
NOT TO SCALE



CLEAN AGENT RISER DETAIL
NOT TO SCALE

THIS ROOM PROTECTED BY FM200 FIRE SUPPRESSION SYSTEM (CTRL. SIMULATOR & CHIEF ROOM)



THIRD FLOOR

Falcon Fire Protection LLC
P.O. BOX 326326
PAGO PAGO, AS 96932
Tel 671-483-6539
email: jonfalconfire@yahoo.com License GLB08-0377

ENGINEERING SERVICES, LLC
P.O. Box 30 Hagatna, GUAM 96932
Tel 646-8020/46-9696
Fax 646-9704
e-mail ..... engr@pticnet.net

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION

SHEET CONTENTS:

CONTROL ROOM SUB-FLOOR, SIMULATOR, CHIEF ELECTRICAL DISPATCH ROOM PIPING PLAN, PIPING ISOMETRICS AND MISCELLANEOUS INSTALLATION DETAILS

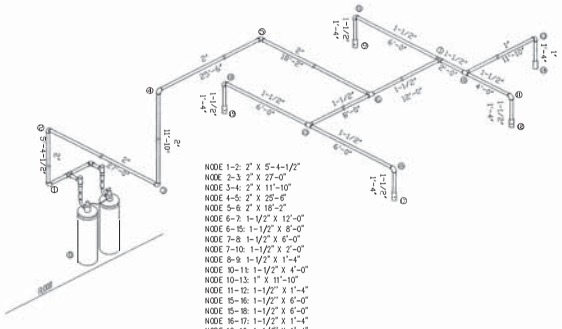
GUAM MARIANAS ISLANDS

GPA - GWA
MULTI-PURPOSE FACILITY
HAGATNA, GUAM

FIRE SUPPRESSION SHOP DRAWINGS

DESIGN:	WDM
DRAWN:	EMM
CHECKED:	WDM
SUPV.	WDM
SCALE:	AS SHOWN
DATE	11/27/13

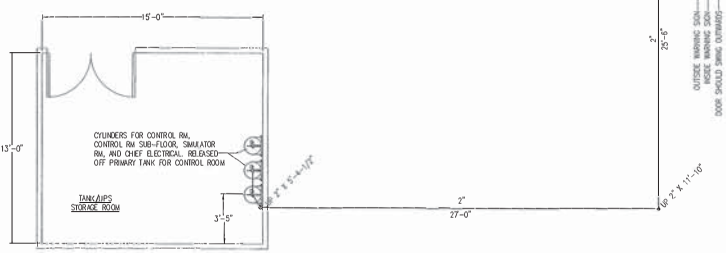
FS-6A

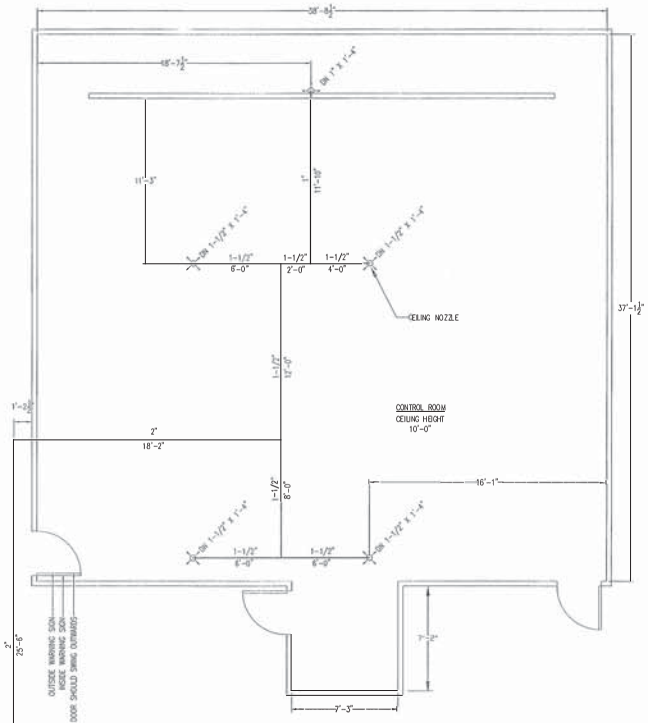


NODE 1-2: 2" X 5'-4-1/2"
NODE 2-3: 2" X 27'-0"
NODE 3-4: 2" X 11'-10"
NODE 4-5: 2" X 25'-6"
NODE 5-6: 2" X 18'-2"
NODE 6-7: 1-1/2" X 12'-0"
NODE 6-15: 1-1/2" X 8'-0"
NODE 7-8: 1-1/2" X 6'-0"
NODE 7-10: 1-1/2" X 2'-0"
NODE 8-9: 1-1/2" X 1'-4"
NODE 10-11: 1-1/2" X 4'-0"
NODE 10-13: 1" X 11'-10"
NODE 11-12: 1-1/2" X 1'-4"
NODE 15-16: 1-1/2" X 6'-0"
NODE 15-18: 1-1/2" X 6'-0"
NODE 16-17: 1-1/2" X 1'-4"
NODE 18-19: 1-1/2" X 1'-4"

NODE 0 (2) 450LB. CYLINDERS - 266LBS AGENT EACH CYLINDER (532LBS TOTAL)
NODE 14: 1/2" 180° NOZZLE W/ .189" ORIFICE
NODE 17: 1-1/2" 360° NOZZLE W/ .299" ORIFICE
NODE 19: 1-1/2" 360° NOZZLE W/ .299" ORIFICE
NODE 9: 1-1/2" 360° NOZZLE W/ .299" ORIFICE
NODE 12: 1-1/2" 360° NOZZLE W/ .283" ORIFICE

ISOMETRIC VIEW
NTS



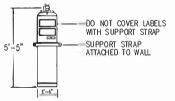


1 FS-6B CONTROL ROOM PIPING PLAN
SCALE: 1/4" = 1'-0" ZONE R1

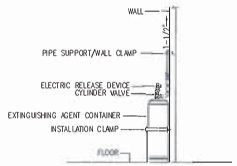
CONSTRUCTION FEATURES:

- CEILING HEIGHT = 10'-0"
- SUSPENDED CEILING
- WALL CONSTRUCTION FINISHED DRYWALL
- ELEVATION ABOVE SEA LEVEL 10 FT.
- ROOM TEMPERATURE 70°

AGENT BEING USED:	NK-200
DESIGN CONCENTRATION:	7.1 %
OCCUPANCY:	NORMALLY OCCUPIED
CONTAINER VOLUME:	(1) 450 LB.
STORAGE PRESSURE:	725 PSI
FILLING QUANTITY:	532LBS @ 70° F
NOZZLE SIZE:	(4) 1-1/2 IN (1) 1/2 IN
ORIFICE CONFIGURATION:	(4) 360° (1) 180°
ORIFICE AREA:	(3) 0.299 IN
	(1) 0.283 IN
	(1) 0.189 IN

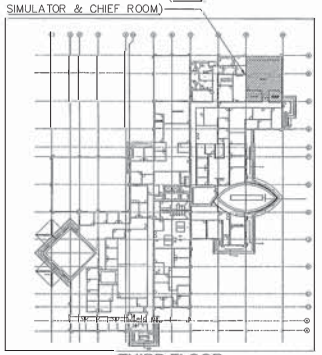


450 LB. AGENT CYLINDER INSTALLATION
NTS



CLEAN AGENT RISER DETAIL
NTS

THIS ROOM PROTECTED BY FM200 FIRE SUPPRESSION SYSTEM (CTRL, SIMULATOR & CHIEF ROOM)



THIRD FLOOR

Falcon Fire Protection LLC
PO Box 326326
Tel: 671-483-0553
email: johnfalconfire@yahoo.com License CL2006-0577

ENGINEERING SERVICE S.L.L.C
PO Box 283 Hagatna, Guam 96932
Tel: 671-646-6104 Fax: 671-646-6104
e-mail: ...@pticom.net

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION

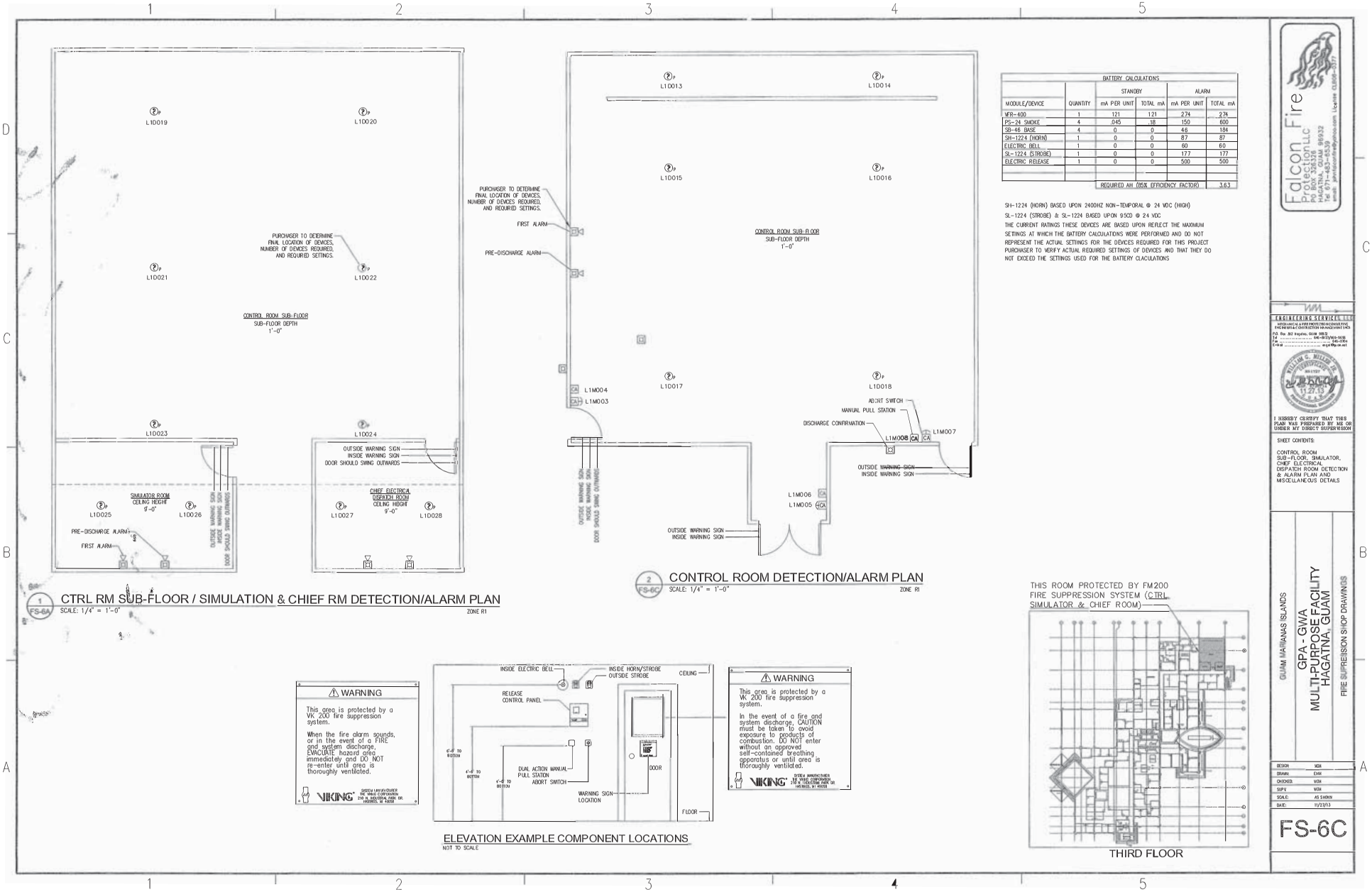
SHEET CONTENTS:

CONTROL ROOM PIPING PLAN, PIPING ISOMETRICS AND MISCELLANEOUS INSTALLATION DETAILS

GUAM MARIANAS ISLANDS
GPA - GWA
MULTI-PURPOSE FACILITY
HAGATNA, GUAM
FIRE SUPPRESSION SHOP DRAWINGS

DESIGN:	MDH
DRAWN:	EMH
CHECKED:	MDH
SUPV:	MDH
SCALE:	AS SHOWN
DATE:	11/27/13

FS-6B



BATTERY CALCULATIONS

MODULE/DEVICE	QUANTITY	STANDBY mA PER UNIT	STANDBY TOTAL mA	ALARM mA PER UNIT	ALARM TOTAL mA
MFR-400	1	121	121	274	274
PS-24 SMOKE	4	.045	.18	150	600
SB-46 BASE	4	0	0	46	184
SH-1224 (HORN)	1	0	0	87	87
ELECTRIC BELL	1	0	0	60	60
SL-1224 (STROBE)	1	0	0	177	177
ELECTRIC RELEASE	1	0	0	500	500
			REQUIRED AH (85% EFFICIENCY FACTOR)		3.63

SH-1224 (HORN) BASED UPON 2400HZ NON-TEMPORAL @ 24 VDC (HIGH)

SL-1224 (STROBE) & SL-1224 BASED UPON 950Ω @ 24 VDC

THE CURRENT RATINGS THESE DEVICES ARE BASED UPON REFLECT THE MAXIMUM SETTINGS AT WHICH THE BATTERY CALCULATIONS WERE PERFORMED AND DO NOT REPRESENT THE ACTUAL SETTINGS FOR THE DEVICES REQUIRED FOR THIS PROJECT PURCHASER TO VERIFY ACTUAL REQUIRED SETTINGS OF DEVICES AND THAT THEY DO NOT EXCEED THE SETTINGS USED FOR THE BATTERY CLACULATIONS

Falcon Fire Protection LLC
P.O. Box 326328 PMB 98932
Tel 671-483-8539

ENGINEERING SERVICES, LLC
MECHANICAL & FIRE PROTECTION CONSULTING, ENGINEERING & CONSTRUCTION MANAGEMENT SVCS
P.O. Box 307 Hagatna, Guam 96932
Tel 646-8127/969-9638
Fax 646-0764
E-Mail wgs@ite.net

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION

SHEET CONTENTS:

CONTROL ROOM SUB-FLOOR, SIMULATOR, CHIEF ELECTRICAL DISPATCH ROOM DETECTION & ALARM PLAN AND MISCELLANEOUS DETAILS

GUAM MARIANAS ISLANDS

GPA - GWA

MULTI-PURPOSE FACILITY

HAGATNA, GUAM

FIRE SUPPRESION SHOP DRAWINGS

DESIGN	MDM
DRAWN	EMM
CHECKED	MDM
SUPV	MDM
SCALE:	AS SHOWN
DATE:	11/27/13

FS-6C

Attachment F: GPA GWA Gloria B

Phoenix Pacific
The Fire and Life Safety Experts

CERTIFICATE OF COMPLETION

Name of Protected Property: **GPA / GWA Gloria B. Nelson Combined Utilities Facility**
Mailing Address: **P.O. Box 2977**
Agana, Guam 96932-2977

Representative of Protected Property: **Jerald Guzman**
Authority Having Jurisdiction: **GUAM FIRE DEPARTMENT (ONE STOP)**
Address/Contact Number(s): **(671) 646-3102**

1. Type(s) of System or Service:

X NFPA 72, Chapter 3-Local
If Alarm is transmitted to location(s) off premise, list where received:

N/A NFPA 72, Chapter 3 -Emergency Voice/Alarm Service
Quantity of voice/alarm channels: N/A Single: N/A Multiple: N/A

N/A NFPA 72, Chapter 4 –Auxiliary
Indicate type of connection:
Local energy: N/A Shunt: N/A **Parallel telephone:** N/A
Location and telephone number for receipt of signals:

N/A NFPA 72, Chapter 4-Remote Station
Alarm: N/A
Supervisory: N/A

N/A NFPA 72, Chapter 4-Proprietary
If alarms are re-transmitted to public fire service communications center or others, indicate location and telephone number of the organization receiving alarm:
N/A
Indicate how alarm is re-transmitted:
N/A

N/A NFPA 72, Chapter 4-Central Station
The Prime Contractor:
N/A
Central Station Location:
N/A
Means of transmission of signals from the protected premise to the central station:
N/A McCulloh N/A Multiplex N/A One-Way Radio
N/A Digital Alarm Communicator N/A **Two-Way Radio** N/A Others
Means of transmission of alarms to the public fire service communications center:
Type(s) of System or Service:

1. **MANUAL DIALING 911**
System Location: **Mangilao, Guam**

Phoenix Pacific
The Fire and Life Safety Experts

	Organization	Representative (Name/Number)
Installer:	**Existing System**	
Supplier:	Phoenix Pacific (Guam), Inc.	Sharoll Mobel – 646-6461
Service Organization:	Phoenix Pacific (Guam), Inc.	Vince Castro – 646-6461

Location of Record (As-Built) Drawings:

Location of Owner's Manuals:

Location of Test Reports:
Phoenix Pacific (Guam), Inc.

A contract, dated 10/21/2021 **, for test and inspection in accordance with NFPA standard(s)** No.**(s)** 72 dated 10/21/2021 , is in effect.

2. Certification of System Installation:
Fill out after installation is complete and wiring checked for open, shorts, ground faults and improper branching, but prior to conducting operational acceptance tests.)
This system has been installed in accordance with the NFPA standards as listed below, and was **Inspected by** **Existing System** On _____ includes the devices listed below and has been in service since _____ .

X NFPA 72, Chapters 1 3 4 5 6 7 (circle all that apply)
X NFPA 70, National Electrical Code, Article 760
X Manufacturer's Instructions
Other (specify): _____

Signed: **Existing System** Date: October 21, 2021
Organization: _____

3. Certification of System Operation:
All operational features and functions of this system were tested by Alvin Hernandez
On 10/21/2021 **and found to be operating properly in accordance with the requirements of:**

X NFPA 72, Chapters 1 3 4 5 6 7 (circle all that apply)
X NFPA 70, National Electrical Code, Article 760
X Manufacturer's Instructions
Other specify: _____

Signed: **Alvin Hernandez Tech Rep. NICET # 146107** Date: October 21, 2021
Organization: **Phoenix Pacific (Guam), Inc.**

4. Alarm Initiating Devices and Circuits (Use blanks to indicate quantity of devices).
MANUAL
a) **17** **Manual Stations** X **Non-coded, Activating** _____ Transmitters _____ Coded
b) -0- Combination Manual Fire Alarm and Guard's Tour Coded Stations
AUTOMATIC

Coverage 100% Complete: 100% Partial: N/A

a)	**70**	**Smoke Detectors**	-0-	Ion	**70**	**Photo**		
b)	**5**	**Duct Detectors**	-0-	Ion	**5**	**Photo**		
c)	0	**Heat Detectors**	-0-	FT	-0-	RR	_____ FT/RR	_____ RC

Phoenix Pacific
The Fire and Life Safety Experts

d) -0- **Sprinkler Water Flow Switches** ____ **Non-coded, activating** ____ **Transmitters** ____ **Coded**
e) ____ Other (list): Water Flow/Tamper Switch
f) ____ Other (list): ____

5. Supervisory Signal Initiating Devices and Circuits (Use blanks to indicate quantity of devices.)

GUARD'S TOUR

a) -0- Coded Stations
Non-Coded Stations
b) -0- Activating ____ Transmitters
c) -0- **Compulsory Guard Tour System Comprised of** ____ **Transmitter Stations and** Intermediate Stations.

SPRINKLER SYSTEM **NOT PROVIDED BY PHOENIX PACIFIC (GUAM), INC.**

a) -0- Coded Valve Supervisory Signaling Attachments
Valve Supervisory Switches Activating ____ Transmitters.
b) -0- Building Temperature Points
c) -0- Site Water Temperature Points
d) -0- Site Water Supply Level Points

ELECTRIC FIRE PUMP:

e) -0- Fire Pump Power
f) 0 Fire Pump Running
g) -0- Phase Reversal

ELECTRICA-DRIVEN FIRE PUMP:

h) -0- Selector in Auto Position
i) -0- Engine or Control Panel Trouble
j) -0- Fire Pump Running

ENGINE DRIVEN GENERATOR:

k) -0- Selector In Auto Position
l) -0- Control Panel Trouble
m) -0- Transfer Switches
n) -0- Engine Running

Other Supervisory Function (s) (specify):

6. Alarm Notification Appliances and Circuits
Quantity of indicating appliance circuits connected to the system: -0-

Types and quantities of alarm indicating appliances installed:

a) -0- Bells -0- Inch -0- Speakers
b) -0- Horns
c) -0- Chimes
d) -0- Other: ____
e) **142** **Visual Signals** Type: **15/75Cd Wall Mount Horn/Strobe**
30 **with audible** **112** **without audible**
f) **-1-** **Local Annunciator**

7. Signaling Line Circuits:
Quantity and Style (See NFPA 72, Table 3-6.1) of signaling line circuits connected to system:
Quantity: N/A Style: N/A

Phoenix Pacific
The Fire and Life Safety Experts

8. System Power Supplies: Inside Electrical Room
Quantity and Style (See NFPA 72, Table 3-6.1) of signaling line circuits connected to system:

a) **Primary (Main):** **110VAC** Nominal Voltage: **110VAC** Current Rating: _____
Over-current Protection: Type: **FUSE** Current Rating: **6A** Location: **Int.**

b) Secondary (Standby):
02 **Storage battery:** Amp-Hour Rating: **18 AH**
Calculated capacity to drive system, in hours: X 24 _____ 60
-0- Engine-driven generator dedicated to fire alarm system
Location of fuel storage: _____

c) Emergency or Standby System used as backup to Primary Power Supply, instead of using a Secondary Power Supply:
-0- Emergency System described in NFPA 70, Article 700
-0- Legally Required Standby System described in NFPA 70, Article 701
-0- Optional Standby System described in NFPA 70, Article 702, which also meets the Performance requirements of Article 700 or 701.

9. System Software
a) Operation System Software Revision Level(s): **IO500**
b) Application Software Revision Level(s): **REV. 4.11**
c) Revision Completed by (Name): **EDWARDS**
Revision Completed by (Firm): **EDWARDS**

** COMMENTS:

By: **Phoenix Pacific (Guam), Inc.** October 21, 2021
Central Station or Alarm Service Company — Date

Vince Castro, NICET # 124020 **Lead System Technician**
Name — Title

Under completion of the system(s) satisfactory test(s) witnessed (if required by the authority having jurisdiction):

By: _____ _____
Representative of the authority having jurisdiction — Date

_____ _____
Name — Title