SECTION 15320 - CLEAN AGENT FIRE PROTECTION WORK

PART 1 GENERAL

1 SCOPE

A. THIS SPECIFICATION OUTLINES THE REQUIREMENTS FOR SINGLE PROTECTION ZONE CLEAN AGENT TOTAL FLOODING FIRE GASEOUS SUPPRESSION SYSTEM WITH AUTOMATIC DETECTION AND CONTROL FOR THE COMMUNICATIONS AND PROJECTION ROOMS UP TO THE CEILING LEVEL INCLUDING THE UNDERFLOOR CAVITY AND THE VOLUME OF THE HVAC SYSTEMS. ALL PROJECT SPECIFICATION SECTIONS OF DIVISION 1. THE WORK DESCRIBED HEREIN INCLUDES ALL ENGINEERING, LABOR, MATERIALS, EQUIPMENT, AND SERVICES REQUIRED TO COMPLETE AND TEST THE SUPPRESSION SYSTEM.

1. THE AGENT TANK SHALL BE LOCATED IN THE MECHANCIAL ROOM WHERE SHOWN ON THE PLANS.
2. THE RELEASE PANEL SHALL BE LOCATED WHERE SHOWN ON DRAWINGS.
3. THE RELEASE PANEL SHALL ALSO FUNCTION AS THE DETECTION, RELEASE, AND SUPERVISION FOR THE ASSOCIATED PRE-ACTION SPRINKLER SYSTEM.
4. ALL THE FIRE ALARM WORK FOR THE CLEAN AGENT SYSTEM AND PRE-ACTION SPRINKLER SYSTEM IS DEFINED IN THIS PROJECT AS PART OF THE CLEAN AGENT WORK SCOPE.
5. THE FINISHED TANK SUPPORT AND DISTRIBUTION PIPING SYSTEM.

II APPLICABLE STANDARDS AND PUBLICATIONS

A. THE DESIGN, EQUIPMENT, INSTALLATION, TESTING, AND MAINTENANCE OF THE CLEAN AGENT SUPPRESSION SYSTEM SHALL BE IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS SET FORTH IN THE LATEST EDITION OF THE FOLLOWING CODES AND STANDARDS:

1. NFPA NO. 2001 - CLEAN AGENT FIRE EXTINGUISHING SYSTEMS
2. NFPA NO. 70 - NATIONAL ELECTRICAL CODE
3. NFPA NO. 72 - NATIONAL FIRE ALARM CODE
4. NFPA NO. 75 - PROTECTION OF INFORMATION TECHNOLOGY EQUIPMENT
5. UL LISTINGS
6. REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION (AHJ)

III REQUIRMENTS:

A. THE CLEAN AGENT GASEOUS SUPPRESSION SYSTEM INSTALLATION SHALL BE IN ACCORDANCE WITH THE DRAWINGS, SPECIFICATIONS, AND APPLICABLE STANDARDS.

B. CLEAN AGENT TYPE SHALL BE DUPONT HFC-125 OR HFC-227ea

C. CLEAN AGENT MUST BE UL LISTED AND FM APPROVED

IV QUALITY ASSURANCE:

A. MANUFACTURER:

1. THE MANUFACTURER OF THE CLEAN AGENT SUPPRESSION SYSTEM HARDWARE AND DETECTION COMPONENTS SHALL HAVE A MINIMUM OF 10 YEARS EXPERIENCE IN THE DESIGN AND MANUFACTURE OF SIMILAR TYPES OF SUPPRESSION SYSTEMS AND WHO CAN REFER TO SIMILAR INSTALLATIONS PROVIDING SATISFACTORY SERVICE.
2. THE NAME OF THE MANUFACTURER, PART NUMBERS AND SERIAL NUMBERS SHALL APPEAR ON ALL MAJOR COMPONENTS.
3. ALL DEVICES, COMPONENTS AND EQUIPMENT SHALL BE NEW AND STANDARD PRODUCTS OF THE MANUFACTURER'S LATEST DESIGN, SUITABLE TO PERFORM THE FUNCTIONS INTENDED.
4. ALL DEVICES AND EQUIPMENT SHALL BE UL LISTED AND/OR FM APPROVED.
5. ALL CLEAN AGENT EQUIPMENT, DETECTION, AND CONTROL PANEL SHALL BE PROVIDED BY A SINGLE FIRE SUPPRESSION MANUFACTURER. DIFFERENT MANUFACTURERS FOR THE CLEAN AGENT AND DETECTION AND CONTROL SHALL NOT BE ACCEPTABLE.

B. INSTALLER:

1. THE CLEAN AGENT INSTALLING CONTRACTOR SHALL BE TRAINED BY THE MANUFACTURER TO DESIGN, INSTALL, TEST, AND MAINTAIN CLEAN AGENT FIRE SUPPRESSION SYSTEMS. DISTRIBUTOR AND DESIGN CERTIFICATES SHALL BE PROVIDED TO THE OWNER.
2. THE CLEAN AGENT INSTALLING CONTRACTOR SHALL EMPLOY A NICET CERTIFIED SPECIAL HAZARD DESIGNER, LEVEL III OR ABOVE, WHO WILL BE RESPONSIBLE FOR THIS PROJECT.
3. THE CLEAN AGENT INSTALLING CONTRACTOR SHALL BE AN EXPERIENCED FIRM REGULARLY ENGAGED IN THE INSTALLATION OF AUTOMATIC CLEAN AGENT, OR SIMILAR, FIRE SUPPRESSION SYSTEMS IN ACCORDANCE WITH NFPA STANDARDS.
4. THE CLEAN AGENT INSTALLING CONTRACTOR MUST HAVE A MINIMUM 5 YEARS EXPERIENCE IN THE DESIGN, INSTALLATION AND TESTING OF CLEAN AGENT, OR SIMILAR, FIRE SUPPRESSION SYSTEMS. A LIST OF SYSTEMS OF A SIMILAR NATURE AND SCOPE SHALL BE PROVIDED ON REQUEST.
5. THE CLEAN AGENT INSTALLING CONTRACTOR SHALL SHOW EVIDENCE THAT HIS COMPANY CARRIES A MINIMUM $2,000,000.00 LIABILITY AND COMPLETED OPERATIONS INSURANCE POLICY. THESE LIMITS SHALL SUPERSEDE LIMITS REQUIRED IN THE "GENERAL CONDITIONS" OF THE SPECIFICATIONS.
6. THE CLEAN AGENT INSTALLING CONTRACTOR SHALL HAVE CLEAN AGENT RECHARGING STATION. THE CLEAN AGENT INSTALLING CONTRACTOR SHALL PROVIDE PROOF OF HIS ABILLITY TO RECHARGE THE LARGEST CLEAN AGENT SYSTEM WITHIN 60 HOURS AFTER A DISCHARGE. INCLUDE THE AMOUNT OF CLEAN AGENT BULK STORAGE AVAILABLE.
7. THE CLEAN AGENT INSTALLING CONTRACTOR SHALL BE AN AUTHORIZED STOCKING DISTRIBUTOR OF THE CLEAN AGENT SYSTEM MANUFACTURER SO THAT IMMEDIATE REPLACEMENT PARTS ARE AVAILABLE FROM INVENTORY.
8. THE CLEAN AGENT INSTALLING CONTRACTOR SHALL SHOW PROOF OF EMERGENCY SERVICE AVAILABLE ON A 24 HOUR, 7 DAYS A WEEK BASIS; SERVICE PERSONNEL SHALL BE AVAILABLE FOR EMERGENCY SERVICE RESPONSE AT ALL TIMES.

C. SUBMITTALS:

1. THE CLEAN AGENT INSTALLING CONTRACTOR SHALL SUBMIT THE FOLLOWING DESIGN INFORMATION AND DRAWINGS FOR APPROVAL PRIOR TO STARTING WORK ON THIS PROJECT.
   a. FIELD INSTALLATION LAYOUT DRAWINGS HAVING A SCALE OF NOT LESS THAN 1/8"=1 FT 0 INCH DETAILING THE LOCATION OF ALL AGENT STORAGE TANKS, PIPE RUNS INCLUDING PIPE SIZES AND LENGTHS, CONTROL PANEL, DETECTORS, MANUAL PULL STATIONS, ABORT STATIONS, AUDIBLE AND VISUAL ALARMS, ETC.
   b. AUXILIARY DETAILS AND INFORMATION SUCH AS MAINTENANCE PANELS, DOOR HOLDERS, SPECIAL SEALING REQUIREMENTS AND EQUIPMENT SHUTDOWNS.
   c. SEPARATE LAYOUTS OR DRAWINGS SHALL BE PROVIDED FOR EACH ROOM AND SUBFLOOR AND FOR MECHANICAL AND ELECTRICAL WORK.
   d. A SEPARATE LAYOUT OR DRAWING SHALL SHOW ISOMETRIC DETAILS OF AGENT STORAGE CONTAINERS, MOUNTING DETAILS, AND AND PROPOSED PIPE RUNS AND SIZES.
   e. ELECTRICAL LAYOUT DRAWINGS SHALL SHOW THE LOCATION OF ALL DEVICES AND INCLUDE POINT-TO-POINT CONDUIT RUNS.
   f. PROVIDE AN INTERNAL CONTROL PANEL WIRING DIAGRAM, WHICH SHALL INCLUDE POWER SUPPLY REQUIREMENTS AND FIELD WIRING TERMINATION POINTS.
   g. COMPLETE HYDRAULIC FLOW CALCULATIONS, FROM A UL LISTED COMPUTER PROGRAM, SHALL BE PROVIDED FOR ALL ENGINEERED CLEAN AGENT SYSTEMS. CALCULATION SHEETS MUST INCLUDE THE MANUFACTURER'S NAME AND UL LISTING FOR VERIFICATION. THE INDIVIDUAL SECTIONS OF PIPE AND EACH FITTING TO BE USED, S SHOWN ON THE ISOMETRICS, MUST BE IDENTIFIED ND INCLUDED IN THE CALCULATION. TOTAL AGENT DISCHARGE TIME MUST BE SHOWN AND DETAILED BY ZONE.
   h. DETECTOR AIR SAMPLING LAYOUT DRAWINGS SHALL SHOW THE LOCATION OF ALL DETECTORS, PIPING LAYOUT AND SAMPLING POINT LOCATIONS. COMPLETE HYDRAULIC FLOW CALCULATIONS, FROM A UL LISTED COMPUTER PROGRAM, SHALL BE PROVIDED FOR EACH AIR SAMPLING SYSTEM.
   i. PROVIDE CALCULATIONS FOR THE BATTERY STANDBY POWER SUPPLY TAKING INTO CONSIDERATION THE POWER REQUIREMENTS OF ALL ALARMS, INITIATING DEVICES, AND AUXILIARY COMPONENTS UNDER FULL LOAD.
   j. A COMPLETE SEQUENCE OF OPERATION SHALL BE SUBMITTED DETAILING ALL ALARM DEVICES, SHUTDOWN FUNCTIONS, REMOTE SIGNALING, DAMPER OPERATION, TIME DELAY, AND AGENT DISCHARGE FOR EACH ZONE OR SYSTEM.

V. SYSTEM DESCRIPTION AND OPERATION

A. THE SYSTEM SHALL BE A TOTAL FLOODING CLEAN AGENT EXTINGUISHING SYSTEM USING COMPONENTS MANUFACTURED BY:

FIKE PROTECTION SYSTEMS
704 SOUTH 10TH STREET
BLUE SPRINGS, MO 64015

OR APPROVED EQUAL.

B. THE SYSTEM SHALL PROVIDE THE CLEAN AGENT MIMIMUM DESIGN CONCENTRATION ESTABLISHED BY NFPA 2001 FOR CLASS-A HAZARDS, IN ALL AREAS AND/OR PROTECTED SPACES AT THE MINIMUM ANTICIPATED TERMPERATURE WITH THE PROTECTED AREA.

C. THE SYSTEM SHALL BE COMPLETE IN ALL WAYS. IT SHALL INCLUDE ALL MECHANICAL AND ELECTRICAL INSTALLATION, ALL DETECTION AND CONTROL EQUIPMENT, AGENT STORAGE CONTAINERS, CLEAN AGENT, NOZZLES, PIPE AND FITTINGS, MANUAL RELEASE, AND ABORT STATIONS, AUDIBLE AND VISUAL ALARM DEVICES, AUXILIARY DEVICES AND CONTROLS, SHUTDOWNS, ALARM INTERFACE, CAUTION/ADVISORY SIGNS, FUNCTIONAL CHECK OUT AND TESTING, TRAINING AND ALL OTHER OPERATIONS NECESSARY FOR A FUNCTIONAL, UL LISTED AND/OR FM APPROVED, CLEAN AGENT SUPPRESSION SYSTEM.

D. PROVIDE TWO (2) INSPECTIONS DURING THE FIRST YEAR OF SERVICE. INSPECTIONS SHALL BE MADE AT 6 MONTH INTERVALS COMMENCING WHEN THE SYSTEM IS FIRST PLACED INTO NORMAL SERVICE.

E. CONTRACTOR SHALL BE RESPONSIBLE FOR SEALING AND SECURING THE PROTECTED SPACES AGAINST AGENT LOSS AND/OR LEAKAGE DURING THE 10 MINUTE "HOLD" TIME. ALL PENETRATIONS SHALL BE FIRE STOPPED TO A MINIMUM 1-HOUR FIRE RATING.

F. A FULL TIME FIRE STOPPING FIRM EMPLOYING AN INDIVIDUAL CERTIFIED AS A DRI (DESIGNATED RESPONSIBLE INDIVIDUAL) BY FACTORY MUTUAL ACCORDING TO FM 4991, "APPROVAL OF FIRESTOP CONTRACTORS", OR BY UNDERWRITER LABORTORIES "QUALIFIED FIRESTOP CONTRACTOR PROGRAM" SHALL BE PROVIDED BY THE CLEAN AGENT CONTRACTOR.

1. INSTALLATION RESPONSIBILITY:
   a. ASSIGN INSTALLATION OF THROUGH-PENETRATION FIRESTOP SYSTEMS ON THE PROJECT TO A SINGLE QUALIFIED INSTALLER.
2. SOURCE LIMITATIONS:
   a. OBTAIN FIRESTOP PRODUCTS, FOR EACH TYPE OF PENETRATION AND CONSTRUCTION CONDITION INDICATED, FROM A SINGLE MANUFACTURER THROUGH ONE DISTRIBUTION SOURCE. EXCEPTIONS MAYBE MADE FOR PROPRIETARY PRODUCTS T THE REQUEST OF THE DRI.
3. IDENTIFICATION:
   a. LABEL AND DOCUMENT ALL PENETRATIONS AS REQUIRED BY THE FCIA MANUAL OF PRACTICE, APPENDIX D (12/29/2005, REVISION NO. 2).
   b. PRESENT CLOSEOUT DOCUMENTS, AS OUTLINED IN THE FCIA MANUAL OF PRECTICE SECTION 5.7, TO THE OWNER'S REPRESENTATIVE AT THE COMPLETION OF THE PROJECT.

G. THE CLEAN AGENT SYSTEMS SHALL BE ACTUATED BY VESDA AIR SAMPLING POINTS INSTALLED AT A MAXIMUM SPACING OF 250 SQ. FT. PER SAMPLING POINT. THE CLEAN AGENT AND PREACTION SPRINKLER SYSTEM SHALL BE ACTUATED BY THE VESDA FIRE 2 ALARM LEVEL.

H. ALL INITIATING AND INDICATING CIRCUITS SHALL BE WIRED IN ACCORDANCE WITH NFPA-72. ALL WIRING SHALL BE IN CONDUIT.

I. AUTOMATIC OPERATION OF EACH CLEAN AGENT AND PREACTION SPRINKLER PROTECTED AREA SHALL BE AS FOLLOWS:

1. PREALARM 1 - VESDA ALARM LEVEL "ALERT" SHALL SOUND LOCAL AUDIBLE AND VISUAL ALARM ON THE DISPLAY MODULE.
2. VESDA ALARM LEVEL "ACTION" SHALL SOUND LOCAL AUDIBLE AND VISUAL ALARM ON THE DISPLAY MODULE.
3. ALARM - VESDA ALARM LEVEL "FIRE 1"
   a. ACTIVATE ALARM LED "FIRE 1" ON THE VESDA DISPLAY
   b. ACTIVATE RELEASING PANEL "ALARM" LED AND DISPLAY REAL TIME SMOKE OBS/SQ. FT. ON DISPLAY
   c. ENERGIZE ALARM HORN / STROBES IN THE PROTECTED AREAS (HORN SOUNDS SLOW PULSE)
   d. TRANSMIT SIGNAL TO THE BUILDING FIRE ALARM
   e. SHUT DOWN AIR HANDLING UNITS IN THE PROTECTED AREAS.
   f. CLOSE FIRE / SMOKE DAMPER IN PROJECTION ROOM (103).
4. PRE-DISCHARGE - VESDA ALARM LEVEL "FIRE 2"
   a. ACTIVATE ALARM LED "FIRE 2" ON THE VESDA DISPLAY
   b. ACTIVATE RELEASING PANEL "PRE-DISCHARGE" LED AND DISPLAY REAL TIME SMOKE OBS/SQ. FT. ON DISPLAY
   c. ENERGIZE ALARM HORN / STROBES IN THE PROTECTED AREAS (HORN SOUNDS FAST PULSE)
   d. START TIME-DELAY SEQUENCE (NOT TO EXCEED 60 SECONDS)
   e. SYSTEM ABORT SEQUENCE IS ENABLED AT THIS TIME
   f. TRANSMIT SIGNAL TO THE BUILDING FIRE ALARM
5. DISCHARGE - TIME DELAY EXPIRES
   a. ACTIVATE DISCHARGE LED ON RELEASING PANEL
   b. ACTIVATE RELEASING PANEL CUSTOM DISPLAY
   c. ENERGIZE ALARM HORN / STROBES IN THE PROTECTED AREAS (HORN SOUNDS STEADY)
   d. CLEAN AGENT DISCHARGES INTO THE PROTECTED AREAS (IN LESS THAN 10 SECONDES)
   e. TRANSMIT DISCHARGE SIGNAL TO THE BUILDING FIRE ALARM
   f. ALARM PRESSURE SWITCH IS ACTIVATED SHUTTING DOWN POWER TO COMPUTER EQUIPMENT (U.P.S. EPO)
   g. DISCHARGE STROBE OUTSIDE DOOR ACTIVATES.
6. THE SYSTEM SHALL BE CAPABLE OF BEING ACTUATED BY MANUAL DISCHARGE DEVICES LOCATED AT EACH HAZARD EXIT. OPERATION OF A MANUAL DEVICE SHALL DUPLICATE THE PRE-DISCHARGE SEQUENCE DESCRIPTION ABOVE EXCEPT THAT THE TIME-DELAY AND ABORT FUNCTIONS SHALL BE BY-PASSED. THE MANUAL DISCHARGE STATION SHALL BE OF THE ELECTRICAL ACTUATION TYPE AND SHALL BE SUPERVISED.

PART 2 PRODUCTS

1 MATERIALS AND EQUIPMENT

A. THE CLEAN AGENT SYSTEM MATERIAL AND EQUIPMENT SHALL BE STANDARD PRODUCTS OF THE MANUFACTURER'S LATEST DESIGN AND SUITABLE TO PERFORM THE FUNCTIONS INTENDED. WHEN ONE OR MORE PIECES OF EQUIPMENT MUST PERFORM THE SAME FUNCTIONS, THEY SHALL BE DUPLICATES PRODUCED BY ONE MANUFACTURER. ALL DEVICES AND EQUIPMENT SHALL BE UL AND FM APPROVED.

1. CLEAN AGENT STORAGE AND DISTRIBUTION: EACH SYSTEM SHALL HAVE ITS OWN SUPPLY OF CLEAN AGENT.
   a. THE SYSTEM DESIGN SHALL BE CENTRAL STORAGE.
   b. SYSTEMS SHALL BE DESIGNED IN ACCORDANCE WITH THE MANUFACTURER'S GUIDELINE.
   c. AGENT SUPPLY SHALL BE LOCATED WITHIN THE ADJACENT MECHANICAL ROOM.
   d. THE CLEAN AGENT SHALL BE STORED IN FLOOR-MOUTED CYLINDRICAL CONTAINERS. CONTAINERS SHALL BE SUPER-PRESSURIZED WITH DRY NITROGEN, TO AN OPERATING PRESSURE OF 360 DEGREES PSIG, AT 70 DEG. F. CONTAINERS SHALL BE OF HIGH-STRENGTH ALLOY STEEL CONSTRUCTION THAT COMPLIES WITH THE DEPARTMENT OF TRANSPORTATION REGULATIONS FOR REFILLABLE PRESSURE VESSELS AND CONFORM TO NFPA 2001.
   e. CONTAINERS SHALL BE ACTUATED BY PARALLEL-WIRED INITIATORS OR SOLENOIDS LOCATED AT EACH AGENT CONTAINER.
   f. EACH CONTAINER SHALL HAVE A PRESSURE GAUGE AND LOW-PRESSURE SWITCH TO PROVIDE VISUAL AND ELECTRICAL SUPERVISION OF THE CONTAINER PRESSURE. THE LOW PRESSURE SWITCH SHALL BE WIRED TO AN ADDRESSABLE MONITOR MODULE TO PROVIDE AN AUDIBLE AND VISUAL "SUPERVISORY" ALARM IN THE EVENT THE CONTAINER PRESSURE DROPS BELOW 288 PSI. THE PRESSURE GAUGE SHALL BE COLOR CODED TO PROVIDE AN EASY, VISUAL INDICATION OF CONTAINER PRESSURE.
   g. EACH CONTAINER SHALL HAVE A PRESSURE RELIEF PROVISION THAT AUTOMATICALLY OPERATES WHEN THE INTERNAL TEMPERATURE EXCEEDS 150 DEG. F.
   h. EACH CONTAINER SHALL BE FITTED WITH A LIQUID LEVEL INDICATING DEVICE. IT SHALL BE POSSIBLE TO DETERMINE THE CONTAINER AGENT QUANTITY WITHOUT REMOVING THE CONTAINER FROM ITS MOUNTING BRACKET, DISCONNECTING THE DISTRIBUTION PIPING, OR REMOVING THE CLEAN AGENT SYSTEM FROM SERVICE.
   i. ENGINEERED DISCHARGED NOZZLES SHALL BE PROVIDED, WITHIN THE MANUFACTURER'S GUIDELINES, TO DISTRIBUTE THE CLEAN AGENT THROUGHOUT THE PROTECTED SPACES. THE NOZZLES SHALL BE DESIGNED TO PROVIDE PROPER AGENT QUANTITY AND DISTRIBUTION. EACH SIZE NOZZLE SHALL BE AVAILABLE IN 180 AND 360 DEGREE DISTRIBUTION PATTERNS.
   j. CEILING NOZZLES SHALL BE INSTALLED WITH THE MANUFACTURER'S STANDARD NOZZLE DEFLECTOR AS DETAILED ON THE PLANS. TOTAL DISCHARGE RATES SHALL NOT EXCEED 20 LBS/SEC.
   k. DISTRIBUTION PIPING AND FITTINGS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANURACTURER'S REQUIREMENTS, NFPA 2001 AND APPROVED PIPING STANDARDS AND GUIDELINES. ALL DISTRIBUTION PIPING SHALL BE INSTALLED BY QUALIFIED INDIVIDUALS USING GOOD, ACCEPTED PRACTICES AND QUALITY WORKMANSHIP PROCEDURES. ALL PIPING SHALL BE ADEQUATELY SUPPORTED AND ANCHORED AT ALL DIRECTIONAL CHANGES AND NOZZLE LOCATIONS.
   - ALL PIPING SHALL BE REAMED, BLOWN CLEAN AND SWABBED WITH SUITABLE SOLVENTS TO REMOVE BURRS, MILL VARNISH AND CUTTING OILS BEFORE ASSEMBLY.
   - ALL MALE PIPE THREADS SHALL BE SEALED WITH TEFLON TAPE PIPE SEALANT APPLIED IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS AND GOOD PIPING PRACTICES.
   - ALL PIPING SHALL BE PRESSURE TESTED IN ACCORDANCE WITH NFPA 2001.
   - CLEAN AGENT INSTALLING CONTRACTOR SHALL PROVIDE STEEL SUPPORT SYSTEMS NECESSARY TO MOUNT AND BRACE THE STORAGE TANKS. A FIRE RESISTANT 8 FT x 4 FT x 3/4" SHEET OF PLYWOOD SHALL BE INSTALLED AS ADDITIONAL SUPPORT AS PER PLANS. PLYWOOD SHALL BE PAINTED WITH A MINIMUM 2 COATS OF WHITE PAINT.

PART 2 PRODUCTS

1 MATERIALS AND EQUIPMENT

A. CONTROL PANEL

1. THE CLEAN AGENT / PRE-ACTION PANEL AND ITS COMPONENTS SHALL BE UL LISTED (REV. 9 COMPLIANT) AND FM APPROVDED FOR USE AS A LOCAL FIRE ALARM SYSTEM WITH RELEASING DEVICE SERVICE.
2. THE CONTROL SYSTEM SHALL PERORM ALL FUNCTIONS NECESSARY TO OPERATE THE SYSTEM DETECTION, ACTUATION AND AUXILIARY FUNCTIONS, AS OUTLINED.
3. THE CLEAN AGENT SYSTEM SHALL BE CAPABLE OF PROVIDING BATTERY STANDBY POWER TO PROVIDE A MINIMUM 24 HOUR EMERGENCY POWER. A TROUBLE SIGNAL WILL BE INITIATED IF BATTERY IS DISCONNECTED OR IF BATTERY IS IN AN ABNORMALLY LOW CHARGE STATE.
4. THE CONTROL SYSTEM SHALL BE MICROPROCESSOR BASED WITH HARDWARE AND SOFTWARE INTEGRATION DESIGNED TO GUARANTEE RELIABILITY.
5. THE CONTROL SYSTEM SHALL PROVIDE THE FOLLOWING CAPABILITIES AND FUNCTIONS:
   a. TWO (2) SIGNAL LINE CIRCUITS, STYLE 4/6 (CLASS A/B). COMMUNICATIONS TO UP TO 254 ADDRESSABLE DEVICES PER CIRCUIT. ADDRESSABLE DEVICES DESCRIBED BELOW.
   b. TWO (2) CLASS B (STYLE Y), INDICATING APPLICANCE CIRCUITS RATED FOR 2.0 AMPS @24 VDC.
   c. TWO AUXILIARY POWER SUPPLY CIRCUITS RATED 2A @24 VDC.
   d. ONE RESETTABLE AUXILIARY POWER SUPPLY CIRCUIT RATED 2A @ 24 VDC.
   e. THREE (3) FORM "C" RELAYS, RATED 2 AMPS @30VDC. THESE RELAYS PROVIDE ALARM, TROUBLE, AND SUPERVISORY ANNUNCIATION.
   f. AUXILIARY RELAY MODULE PROVIDING 4 PROGRAMMABLE CONTACTS RATED 2A @30 VDC. PANEL SHALL SUPPORT TWO MODULES.
   g. TEN (10) STATUS LEDS PLUS ALPHA-NUMERIC DISPLAY FOR TROUBLESHOOTING: AC POWER; ALARM; TROUBLE; SUPERVISORY; SILENCE; PRE-DISCHARGE; RELEASE; RELEASE DISABLED; ABORT AND GROUND FAULT.
   h. PROGRAMMABLE PRE-DISCHARGE AND DISCHARGE TIMERS.
   i. SIX (6) OPTIONAL ABORT TYPES
   j. 32-CHARACTER BACKLIT LCD DISPLAY

B. DETECTORS:

1. AUTOMATIC DETECTORS SHALL BE ADDRESSABLE SPOT TYPE SMOKE AND VESDA AIR SAMPLING.
2. ALL ADDRESSABLE SPOT DETECTORS & BASES AND ADDRESSABLE MODULES SHALL BE PROVIDED WITH ISOLATOR OPTION WHICH OPERATE PEER-TO-PEER.
3. THE SENSORS SHALL BE SPACED AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND THE GUIDELINES OF NFPA 72.
4. AIR SAMPLING VESDA SCANNER DETECTOR (FOUR ZONE) SHALL BE INSTALLED IN THE PROJECTION AND COMMUNICATIONS ROOM. A SEPARATE DEDICATED AIR SAMPLING DETECTOR SHALL BE INSTALLED IN THE AREA BENEATH THE RAISED FLOOR. EACH VESDA DETECTOR SHALL BE MONITORED INDEPENDENTLY BY A HIGH LEVEL INTERFACE MODULE (HLI) MODULE LOCATED IN THE CONTROL PANEL.
5. SPOT SENSORS (HEATS) FOR THE MECHANICAL ROOM SHALL BE PROVIDED TO ACTIVATE THE PRE-ACTION SPRINKLER SYSTEM.

C. ADDRESSABLE DEVICES:

THE CONTROL PANEL SHALL BE CAPABLE OF COMMUNICATING TO UP TO 254 DEVICES PER SLC CIRCUIT

1. VESDA HIGH LEVEL INTERFACE (HLI) SHALL BE INSTALLED IN THE CONTROL PANEL PROVIDING A NETWORK CONNECTION TO EACH VESDA AIR SAMPLING DETECTOR.
2. RELEASING CONTROL MODULE (RCM)
   a. CAPABLE OF SUPPORTING UP TO 2.0A @24VDC RELEASING CURRENT.
   b. THE RCM SHALL BE CAPABLE OF OPERATING IN ONE OF TWO MODES; CONNECTION TO A SINGLE COMPATIBLE SOLENOID (PRE-ACTION) OR CONNECTION TO AGENT RELEASE MODULES (ARM).
3. SUPERVISED CONTROL MODULE (SCM)
   a. THE SCM SHALL BE CAPABLE OF SUPPLYING UP TO 2.0 A @24VDC OUTPUT CURRENT FOR CONNECTION TO COMPATIBLE BELLS, HORNS, STROBES, ETC.
4. RELAY MODULE (RM)
   a. THE RM SHALL BE FUNCTION PROGRAMMABLE BY THE CONTROL PANEL. EACH CONTACT SHALL BE CAPABLE OF SWITCHING UP TO 2A @30VDC.
5. THE MM SHALL MONITOR NORMALLY OPEN OR NORMALLY CLOSED CONTACTS AND SHALL BE PROGRAMMED FOR A VARIETY OF INPUT TYPES.
6. INTELLIGENT MANUAL RELEASE STATION
   a. THE INTELLIGENT PULL STATION SHALL BE AN INTELLIGENT INPUT MODULE THAT IS ACTIVATED THROUGH DUAL-ACTION, PUSHING IN AND PULLING DOWN AS INSTRUCTED TO PROVIDE A MEANS OF MANUALLY DISCHARGING THE AUTOMATIC FIRE EXTINGUISHING SYSTEM.
   b. THE FRONT SHALL BE MARKED "CLEAN AGENT RELEASE".
   c. THE MANUAL RELEASE SHALL BE LOCATED AT EACH EXIT FROM THE PROTECTED HAZARD AND SHALL HAVE AN ADVISORY SIGN PROVIDED AT EACH LOCATION.
   d. THE MANUAL ACTUATIONS SHALL BY-PASS THE TIME DELAY AND ABORT FUNCTIONS, SHALL CAUSE THE SYSTEM TO DISCHARGE AND SHALL CAUSE ALL RELEASE AND SHUTDOWN DEVICES TO OPERATE IN THE SAME MANNER AS IF THE SYSTEM HAD OPERATED AUTOMATICALLY.

D. ABORT STATION

1. THE ABORT STATION SHALL BE THE "DEAD MAN" TYPE AND SHALL BE LOCATED NEXT TO EACH MANUAL RELEASE SWITCH.
2. "LOCKING" OR "KEYED" ABORT STATIONS SHALL NOT BE PERMITTED.
3. EACH ABORT STATION SHALL BE PROVIDED WITH A MINI-MONITOR MODULE AND CONNECTED TO THE ADDRESSABLE SLC LOOP.
4. THE ABORT STATION SHALL BE SUPERVISED AND SHALL INDICATE TROUBLE CONDITION AT THE RELEASE PANEL IF DEPRESSED.

E. REMOTE LCD DISPLAY

1. PROVIDES INFORMATION ABOUT THE HOST CONTROL UNIT IN A REMOTE LOCATION WITH A 32-CHARACTER DISPLAY.
2. IT RECEIVES THE INTELLIGENT DATA STREAM FROM THE RS485 OUTPUT OF THE CONTROL PANEL.
3. PROVIDES CAPABILITY TO OPERATE UP TO 8 PROGRAMMABLE BUTTONS (RESET, SILENCE, ETC.)
4. IT SHALL HAVE AN INTERNAL PIEZO.

ENGINEERED DESIGNED FACILITIES
149 WELDON PARKWAY, SUITE 111, MARYLAND HEIGHTS, MO 63043
PHONE 314-569-2548 · FAX 314-569-2549

MODOT - DISTRICT 4 HEADQUARTERS
LEE'S SUMMIT, MO
COMMUNICATIONS ROOM

SPECIFICATIONS

ENGINEER'S SEAL

REV	DATE	DESCRIPTION	BY	APPRD	CHKD
X2	07/02/09	GENERAL REVISIONS. FOR REVIEW ONLY.	KGH	WHC	DDK
X1	06/30/09	PRELIMINARY DRAWING. FOR BIDS ONLY.	KGH	WHC	DDK

DESIGNED K G HETLAGE DATE 07/02/09
DRAWN K G HETLAGE DATE 07/02/09
CHECKED SCALE N/A
SHEET NO. SP-1
REV X2

D. AUDIBLE AND VISUAL ALARMS: ALARM SIGNAL DEVICES SHALL OPERATE FROM THE CLEAN AGENT CONTROL PANEL.
   1. HORN/STROBE UNITS SHALL BE PROVIDED AND INSTALLED WITH THE MINIMUM ADA AND NFPA REQUIRMENTS. STROBES SHOULD BE OF THE SELECTABLE TYPE.
   2. A DISCHARGE STROBE DEVICE SHALL BE INSTALLED OUTSIDE, AND ABOVE, EACH EXIT DOOR FROM THE PROTECTED SPACE. PROVIDE AN ADVISORY SIGN AT EACH LIGHT LOCATION.
   3. A DISCHARGE STROBE DEVICE SHALL BE INSTALLED OUTSIDE, AND ABOVE, EACH EXIT DOOR FROM THE PROTECTED SPACE. PROVIDE AN ADVISORY SIGN AT EACH LIGHT LOCATION.
E. CAUTION AND ADVISORY SIGNS
   PROVIDE SIGNS, AS REQUIRED, TO COMPLY WITH NFPA-2001 AND THE RECOMMENDATIONS OF THE CLEAN AGENT EQUIPMENT SUPPLIER.
   1. ENTRANCE WARNING SIGN: (1) REQUIRED AT EACH ENTRANCE TO A PROTECTED SPACE
   2. MANUAL DISCHARGE SIGN: (1) AT EACH MANUAL DISCHARGE STATION.
   3. SYSTEM ABORT SIGN: (1) AT EACH MANUAL DISCHARGE STATION.
   4. FLASHING LIGHT SIGN: (1) REQUIRED AT EACH FLASHING LIGHT OVER EACH EXIT FROM A PROTECTED SPACE.
      EXIT WARNING SIGN: (1) REQUIRED AT EACH EXIT TO A PROTECTED SPACE.
F. SYSTEM AND CONTROL WIRING: ALL REQUIRED CLEAN AGENT SYSTEM POWER, CONTROL AND SIGNAL WIRING SHALL BE FURNISHED AND INSTALLED BY THE CLEAN AGENT SYSTEM CONTRACTOR.
   1. ALL WIRING ABOVE CEILING AND EXPOSED IN ROOMS SHALL BE INSTALLED IN ELECTRICAL METALLIC TUBING (EMT) OR CONDUIT.
   2. ALL SYSTEM COMPONENTS SHALL BE SECURELY SUPPORTED INDEPENDENT OF THE WIRING. RUNS OF CONDUIT AND WIRING SHALL BE STRAIGHT, NEATLY ARRANGED, PROPERLY SUPPORTED, INSTALLED PARALLEL AND PERPENDICULAR TO WALLS AND PARTITIONS.
   3. THE SIZES OF CONDUCTORS SHALL BE THOSE SPECIFIED BY THE MANUFACTURER. COLOR CODES SHALL BE USED. ALL WIRES SHALL BE TAGGED AT ALL JUNCTION POINTS AND SHALL BE FREE FROM GROUNDS AND CROSSES BETWEEN CONDUCTORS. FINAL CONNECTIONS BETWEEN EQUIPMENT AND SYSTEM WIRING SHALL BE MADE UNDER THE DIRECT SUPERVISION OF A FACTORY-TRAINED REPRESENTATIVE.
   4. ALL WIRING SHALL BE INSTALLED BY QUALIFIED INDIVIDUALS, IN A NEAT AND WORKMANLIKE MANNER, TO CONFORM TO THE NATIONAL ELECTRICAL CODE, ARTICLE 725 FOR CLASS 1 SIGNAL SYSTEMS, EXCEPT AS OTHERWISE PERMITTED FOR LIMITED ENERGY CIRCUITS, AS DESCRIBED IN NFPA-72 CURRENT EDITION. WIRING INSTALLATION SHALL MEET ALL STATE AND LOCAL CODES.
   5. THE COMPLETE SYSTEM ELECTRICAL INSTALLATION AND ALL AUXILLARY COMPONENTS SHALL BE GROUNDED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.

PART 3 EXECUTION

1. SYSTEM INSPECTION AND CHECKOUT
   A. AFTER THE SYSTEM INSTALLATION HAS BEEN COMPLETED, THE ENTIRE SYSTEM SHALL BE CHECKED OUT, INSPECTED AND FUNCTIONALLY TESTED BY QUALIFIED, TRAINED PERSONNEL, IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDED PROCEDURES AND NFPA STANDARDS.
   B. ALL CONTAINERS AND DISTRIBUTION PIPING SHALL BE CHECKED FOR PROPER MOUNTING AND INSTALLATION.
   C. ALL ELECTRICAL WIRING SHALL TEST FOR PROPER CONNECTION, CONTINUITY AND RESISTANCE TO GROUND.
   D. THE COMPLETE SYSTEM SHALL BE FUNCTIONALLY TESTED, IN THE PRESENCE OF THE OWNER AND/OR HIS REPRESENTATIVE, AND ALL FUNCTIONS, INCLUDING SYSTEM AND EQUIPMENT INTERLOCKS, MUST BE OPERATIONAL AT LEAST 5 DAYS PRIOR TO THE FINAL ACCEPTANCE TESTS.
      1. EACH DETECTOR SHALL BE TESTED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDED PROCEDURES, AND TEST VALUES RECORDED.
      2. ALL SYSTEM AND EQUIPMENT INTERLOCKS, AUDIBLE AND VISUAL DEVICES, EQUIPMENT SHUTDOWNS, LOCAL AND REMOTE ETC. SHALL FUNCTION AS REQUIRED AND DESIGNED.
      3. EACH CONTROL PANEL CIRCUIT SHALL BE TESTED FOR TROUBLE BY INDUCING A TROUBLE CONDITION INTO THE SYSTEM.
      4. PANEL TROUBLE AND ALARM AT BUILDING MAIN FIRE ALARM PANEL SHALL BE TESTED.
11. TRAINING REQUIREMENTS
   A. PRIOR TO FINAL ACCEPTANCE, THE CLEAN AGENT INSTALLING CONTRACTOR SHALL PROVIDE OPERATIONAL TRAINING TO THE OWNER'S PERSONNEL. EACH TRAINING SESSION SHALL INCLUDE SYSTEM CONTROL PANEL OPERATION, MANUAL AND ABORT FUNCTIONS, TROUBLE PROCEDURES, AUXILLARY FUNCTIONS AND EMERGENCY PROCEDURES.
III. OPERATION AND MAINTENANCE
   A. PRIOR TO FINAL ACCEPTANCE, THE CLEAN AGENT INSTALLING CONTRACTOR SHALL PROVIDE COMPLETE OPERATION AND MAINTENANCE INSTRUCTION MANUALS, THREE (3) COPIES FOR EACH SYSTEM, TO THE OWNER. ALL ASPECTS OF SYSTEM OPERATION AND MAINENANCE SHALL BE DETAILED, INCLUDING PIPING ISOMETRICS, WIRING DIAGRAMS OF ALL CIRCUITS, WRITTEN DESCRIPTION OF THE SYSTEM DESIGN AND SEQUENCE OF OPERATION, DRAWINGS ILLUSTRATING CONTROL LOGIC AND EQUIPMENT USED IN THE SYSTEM. CHECKLISTS AND PROCEDURES FOR EMERGENCY SITUATIONS, TROUBLESHOOTING TECHNIQUES AND MAINTENANCE OPERATIONS AND PROCEDURES SHALL BE INCLUDED IN THE MANUAL.
IV. AS-BUILT DRAWINGS
   A. UPON COMPLETION OF EACH SYSTEM, THE CLEAN AGENT INSTALLING CONTRACTOR SHALL PROVIDE THREE (3) COPIES OF SYSTEM AS-BUILT DRAWINGS TO THE OWNER. THE DRAWINGS SHALL SHOW ACTUAL INSTALLATION DETAILS INCLUDING ALL EQUIPMENT LOCATIONS, I.E. CONTROL PANELS, AGENT CONTAINERS, DETECTORS, AND THEIR ADDRESSES, ALARMS, MANUALS AND ABORTS, ETC., AS WELL AS PIPING AND CONDUIT ROUTING DETAILS. SHOW ALL ROOM OR FACILITIES MODIFICATIONS, INCLUDING DOOR AND/OR DAMPER INSTALLATION COMPLETED. ONE CD DISK SHALL BE PROVIDED WITH THE 'AS-BUILT' DRAWINGS AND SYSTEM MANUAL IN ELECTRONIC FORMAT.

V. ACCEPTANCE TESTS
   A. AT THE TIME 'AS-BUILT' DRAWINGS AND MAINTENANCE/OPERATIONS MANUALS ARE SUBMITTED, THE INSTALLING CONTRACTOR SHALL SUBMIT A 'TEST PLAN' DESCRIBING PROCEDURES TO BE USED TO TEST THE CONTROL SYSTEM. THE TEST PLAN SHALL INCLUDE A STEP-BY-STEP DESCRIPTION OF ALL TESTS TO BE PERFORMED AND SHALL INDICATE THE TYPE AND LOCATION OF TEST APPARATUS TO BE EMPLOYED. THE TESTS SHALL DEMONSTRATE THAT THE OPERATIONAL AND INSTALLATION REQUIREMENTS OF THIS SPECIFICATION HAVE BEEN MET. ALL TESTS SHALL BE CONDUCTED IN THE PRESENCE OF THE OWNER AND SHALL NOT BE CONDUCTED UNTIL THE TEST PLAN HAS BEEN APPROVED.
   B. THE TESTS SHALL DEMONSTRATE THAT THE ENTIRE CONTROL SYSTEM FUNCTIONS AS DESIGNED AND INTENDED. ALL CIRCUITS SHALL BE TESTED: AUTOMATIC ACTUATION, MANUAL ACTUATION, HVAC, AUDIBLE AND VISUAL ALARM DEVICES, MANUAL OVERRIDE ABORT FUNCTIONS AND AGENT CONTAINER PRESSURE SUPERVISION. SUPERVISION OF ALL PANEL CIRCUITS, INCLUDING AC POWER AND BATTERY POWER SUPPLIES, SHALL BE TESTED AND QUALIFIED.
   C. A PRESSURIZATION TEST SHALL BE CONDUCTED, IN EACH PROTECTED SPACE, TO DETERMINE THE PRESENCE OF OPENINGS, WHICH WOULD AFFECT THE CLEAN AGENT SYSTEM CONCENTRATION LEVELS. ALL TESTING SHALL BE COMPLETED BY A FACTORY CERTIFIED LEVEL II TESTER AND IN ACCORDANCE WITH NFPA-2002
   D. IF PRESSURIZATION TESTING INDICATES THAT OPENINGS EXIST WHICH WOULD RESULT IN LEAKAGE AND/OR LOSS OF THE CLEAN AGENT EXTINGUISHING AGENT, THE SEALING CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE PROPER SEALING ALL PROTECTED SPACES AGAINST AGENT LOSS OR LEAKAGE. THE SEALING CONTRACTOR SHALL BE RESPONSIBLE FOR THE PRESSURIZATION TEST SUCCESS. IF THE FIRST PRESSURIZATION TEST IS NOT SUCCESSFUL, IN ACCORDANCE WITH THESE SPECIFICATIONS, THE CONTRACTOR SHALL DETERMINE, AND CORRECT, THE CAUSE OF THE TEST FAILURE. THE CONTRACTOR SHALL CONDUCT ADDITIONAL PRESURIZATION TESTS, AT NO ADDITIONAL COST TO THE OWNER, UNTIL A SUCCESSFUL TEST IS OBTAINED. COPIES OF SUCCESSFUL TEST RESULTS SHALL BE SUBMITTED TO THE OWNER FOR RECORD.
   E. UPON ACCEPTANCE BY THE OWNER, THE COMPLETED CLEAN AGENT SYSTEM SHALL BE PLACED IN NORMAL SERVICE.
VI. CLEAN AGENT SYSTEM INSPECTIONS
   A. THE CLEAN AGENT INSTALLING CONTRACTOR SHALL PROVIDE TWO (2) INSPECTIONS OF EACH CLEAN AGENT SYSTEM, INSTALLED UNDER THIS CONTRACT, DURING THE ONE-YEAR WARRANTY PERIOD. THE FIRST INSPECTION SHALL BE AT 6 MONTH INTERVAL, AND THE SECOND INSPECTION AT THE 12 MONTH INTERVAL, AFTER SYSTEM ACCEPTANCE. INSPECTIONS SHALL BE CONDUCTED IN ACCORDANCE WITH THE MANUFACTURER'S GUIDELINES AND SHALL COMPLY WITH THE RECOMMENDATIONS OF NFPA-2001.
   B. DOCUMENTS CERTIFYING SATISFACTORY SYSTEMS OPERATION SHALL BE SUBMITTED TO THE OWNER UPON COMPLETION OF EACH INSPECTION.
VII. WARRANTY
   A. ALL SYSTEM COMPONENTS FURNISHED, AND INSTALLED UNDER THIS CONTRACT, SHALL BE GUARANTEED AGAINST DEFECTS IN DESIGN, MATERIALS AND WORKMANSHIP FOR A FULL WARRANTY PERIOD WHICH IS STANDARD WITH THE MANUFACTURER, BUT IN NO CASE LESS THAN ONE YEAR FROM THE DATE OF SYSTEM ACCEPTANCE.
   B. THE CLEAN AGENT CONTRACTOR SHALL PROVIDE A 5 YEAR WARRANTY AGAINST DEFECTS IN MATERIALS PROVIDED THE OWNER MAINTAINS A SERVICE AGREEMENT DURING THE WARRANTY PERIOD.
VIII. MGE UPS INTER-CONNECTION
   A. THE CONTRACTOR SHALL PROVIDE AN MGE FIELD ENGINEERING TECHNICIAN TO COORDINATE WITH THE INSTALLING ELECTRICIAN TO CONNECT THE FIRE INTERLOCK CIRCUITS. ALL COST FOR THIS TECHNICIAN IS PART OF THIS CONTRACT.

SECTION 15300 - PRE-ACTION SPRINKLER SYSTEM

PART 1 GENERAL

1 SCOPE
   A. THE CONTRACTOR SHALL DESIGN, INSTALL, AND TEST ONE (1) NEW PRE-ACTION SYSTEM TO PROTECT THE CLEAN AGENT AREAS CONSISTING OF THE COMMUNICATIONS, AND MECHANICAL ROOMS.
   B. CONTRACTOR SHALL REMOVE EXISTING WET PIPE SPRINKLER BRANCH LINES AND SPRINKLERS LOCATED IN THE THE CLEAN AGENT PROTECTED AREAS. LINES SHALL BE REMOVED AND CAPPED OUTSIDE THE CLEAN AGENT AREAS.
   C. NEW PRE-ACTION VALVE AND TRIM SHALL BE INSTALLED IN THE MECHANICAL ROOM.

II APPLICABLE STANDARDS AND PUBLICATIONS
   A. THE DESIGN, EQUIPMENT, INSTALLATION, TESTING, AND MAINENANCE OF THE PRE-ACTION SPRINKLER SYSTEM SHALL BE IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS SET FORTH IN THE LATEST EDITION OF THE FOLLOWING CODES AND STANDARDS:
      1. NFPA-75 - PROTECTION OF INFORMATION TECHNOLOGY EQUIPMENT
      2. NFPA-13 INSTALLATION OF SPRINKLER SYSTEMS
      3. NFPA-70 NATIONAL ELECTRICAL CODE
      4. NFPA-72 NATIONAL FIRE ALARM CODE
      5. NFPA-26 RECOMMENDED PRACTICE FOR THE SUPERVISION OF VALVES CONTROLLING WATER SUPPLIES FOR FIRE PROTECTION

III GENERAL FIRE PROTECTION REQUIRMENTS
   A. FIRE PROTECTION WORK SHALL BE PERFORMED BY A QUALIFIED FIRE PROTECTION CONTRACTOR. THIS SECTION SHALL GOVERN THE INSTALLATION OF ALL FIRE PROTECTION SPECIALTIES. CONTRACTOR SHALL BE RESPONSIBLE FOR INCLUDING THE COST OF ALL LABOR, ACCESSORIES, TOOLS, EQUIPMENT AND MATERIAL REQUIRED TO INSTALL THE FIRE PROTECTION SYSTEMS SHOWN ON THE DRAWINGS AND AS SPECIFIED, AS WELL AS THE COST FOR PERMITS, PLAN REVIEWS, INSPECTIONS AND TESTING.
   B. ALL WORK AND MATERIAL SHALL MEET THE APPROVAL OF THE LOCAL FIRE DEPARTMENT AND LOCAL AUTHORITIES HAVING JURISDICTION.
   C. AUTOMATIC SPRINKLER SYSTEMS ARE TO BE HYDRAULICALLY CALCULATED AS SPECIFIED HEREIN. LOCATIONS AND QUANTITY OF SPRINKLERS HAVE BEEN COORDINATED WITH THE PROJECT DRAWINGS AND WITH THE VARIOUS DISCIPLINES INVOLVED. LOCATIONS AND QUANTITY OF MAINS, SPRINKLERS, BRANCH LINES, AND ACCESSORIES ARE INDICATED FOR GENERAL GUIDANCE AND INDICATION OF OVERALL SYSTEM CONCEPTS. FINAL LOCATIONS AND QUANTITY OF PIPING AND/OR SPRINKLERS ON SHOP DRAWING MAY VARY FROM LOCATIONS AND QUANTITY SHOWN ON THE CONTRACT DRAWINGS PROVIDED SPRINKLER LOCATIONS AND QUATITY ARE COORDINATED WITH THE VARIOUS DISCIPLINES, SPECIFIED DISCHARGE DENSITY IS ACHIEVED, AND PIPING INSTALLATION DOES NOT INTERFERE WITH OTHER SERVICES AND SYSTEMS. CONTRACTOR SHALL DETERMINE PIPE SIZING BASED ON HYDRAULIC CALCULATIONS, BUT NO MAINS SHALL BE SMALLER IN SIZE AS THAT SHOWN ON THE PLANS.
   D. FITTINGS FOR OFFSETS, RAISE, DROPS AND ARM OVER WILL BE INCLUDED IN BID WITH NO EXTRA COST TO OWNER AFTER CONTRACT IS AWARDED.

IV SCOPE OF WORK
   A. FURNISH AND INSTALL FIRE SUPPRESSION SYSTEM AS SHOWN ON CONTRACT DRAWINGS AND AS SPECIFIED HEREIN. WORK SHALL INCLUDE THE FOLLOWING MAJOR ITEMS:
      1. PRE-ACTION SPRINKLER SYSTEM
      2. MODIFICATIONS TO EXISTING SPRINKLER SYSTEM

V SYSTEM PERFORMANCE REQUIRMENTS
   A. DESIGN SPRINKLER PIPING ACCORDING TO THE FOLLOWING AND OBTAIN APPROVAL FROM AUTHORITIES HAVING JURISDICTION:
      1. INCLUDE 20 PERCENT MARGIN OF SAFETY FOR AVAILABLE WATER FLOW AND PRESSURE.
      2. INCLUDE LOSSES THROUGH WATER SERVICE PIPING, VALVES, AND BACKFLOW PREVENTERS.
      3. SPRINKLER OCCUPANCY HAZARD CLASSIFICATIONS: AS FOLLOWS:
         - LIGHT HAZARD
      4. MINIMUM DENSITY FOR AUTOMATIC-SPRINKLER PIPING DESIGN: AS FOLLOWS:
         - LIGHT-HAZARD OCCUPANCY: 0.10 GPM OVER 1500 SQ. FT. AREA.
      5. MAXIMUM PROTECTION AREA PER SPRINKLER: AS FOLLOWS:
         - PROJECTION AND COMMUNICATION ROOMS: 225 SQ. FT.
         - OTHER AREAS: ACCORDING TO NFPA 13 RECOMMENDATIONS, UNLESS OTHERWISE INDICATED.
   B. COMPONENTS AND INSTALLATION: CAPABLE OF PRODUCING PIPING SYSTEMS WITH 175 PSIG MINIMUM WORKING-PRESSURE RATING, UNLESS OTHERWISE INDICATED.

VI SUBSTITUTIONS
   A. NO SUBSTITUTIONS WILL BE ALLOWED EXCEPT AS SPECIFIED IN SECTION 15010-BASIC MECHANICAL REQUIREMENTS.

VII SHOP DRAWINGS AND SUBMITTAL REQUIREMENTS
   A. SHOP DRAWINGS FOR FIRE PROTECTION WORK SHALL BE SUBMITTED IN ACCORDANCE WITH THE REQUIRMENTS DESCRIBED IN SECTION 15010-BASIC MECHANICAL REQUIRMENTS.
   B. DRAWINGS AND SPECIFICATIONS ARE PROVIDED FOR ESTABLISHING THE SCOPE OF THE SYSTEM AND ARE NOT INTENDED TO SHOW ALL DETAILS AND COMPONENTS. CONTRACTOR SHALL BE REQUIRED TO PREPARE DETAILED DRAWINGS AND TO FURNISH MATERIALS AND EQUIPMENT SHOP DRAWINGS AND MANUFACTURER'S CATALOG CUTS FOR SUBMISSION TO THE ENFORCING AUTHORITIES AND TO THE ARCHITECT/ENGINEER PRIOR TO COMMENCING WORK OR ORDERING MATERIAL. SHOP DRAWINGS BEING SUBMITTED FOR APPROVAL SHALL BEAR THE SEAL OF THE CONTRACTOR'S ENGINEER RESPONSIBLE FOR DESIGN. THE SEAL OF THE ENGINEER RESPONSIBLE FOR CONTRACT DOCUMENTS SHALL NOT APPEAR ON CONTRACTOR'S SHOP DRAWINGS. THREE (3) COPIES OF THE INSTALLATION DRAWINGS BEARING THE STAMP OF APPROVAL OF THE ENFORCING AUTHORITIES SHALL BE SUBMITTED TO THE ARCHITECT/ENGINEER FOR RECORD PUPOSES.

PART 2 - PRODUCTS

I. REQUIREMENTS OF PIPE, MATERIAL AND DEVICES
   A. ALL PIPING SHALL MAINTAIN PROPER CLEARANCE FROM STRUCTURAL, ELECTRICAL AND MECHANICAL ITEMS AND SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE NFPA REQUIRMENTS.
   B. ALL MATERIAL, EQUIPMENT, VALVES, AND DEVICES SHALL BE UL LISTED IN THE FIRE PROTECTION EQUIPMENT LIST.
   C. PIPING MATERIALS FOR SPRINKLER SYSTEMS:
      1. PIPING SHALL BE STEEL OR COPPER MEETING THE STANDARDS LISTED IN NFPA 13 FOR ABOVE GROUND PIPE AND TUBE. ALL STEEL PIPING SHALL BE UL LISTED OR FM APPROVED FOR FIRE PROTECTION USE. USE THE FOLLOWING STEEL PIPE IN THE APPLICATIONS PERMITTED BY NFPA 13 AND STATED HEREIN:
         - SCHEDULE 40, STANDARD WEIGHT
         - THREADABLE FIRE PROTECTION STEEL PIPE WITH A WALL THICKNESS GREATER THAN SCHEDULE 10.
         - SCHEDULE 10 - ROLL GROOVE OR SHOP WELDED ONLY.

         ALL PIPING SHALL BE LISTED FOR A MINIMUM OF 300 PSI CONTINUOUS USE AND SHALL HAVE AN INSTALLED UL CORROSION RESISTANCE RATIO (CRR) OF 1.0 OR GREATER.
      2. FITTINGS AND JOINTS SHALL MEET ASTM AND ANSI STANDARDS AND SHALL BE COMPATIBLE WITH THE PIPING USED. THREADED OR CUT GROOVE FITTINGS AND JOINTS ARE NOT PERMITTED ON SCHEDULE 10 PIPING. CUT GROOVE FITTINGS AND JOINTS ARE NOT PERMITTED ON LIGHT-WALL PIPING. THREADED FITTINGS AND JOINTS MAY BE USED ON LIGHT-WALL PIPING PROVIDED THREADS ARE CHECKED WITH ANSI/ASME B1.20.1 THREAD GAUGE. ROLL GROOVE FITTINGS MAY BE USED ON LIGHT-WALL PIPE.
      3. ALL FITTINGS AND JOINTS SHALL BE UL LISTED, RATED FOR 175 PSI WORKING PRESSURE UNLESS SYSTEM PRESSURE EXCEEDS 175 PSI.
      4. PRE-ACTION SYSTEM PIPING SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH FM STANDARDS AND DRY SYSTEM GROOVED FITTINGS SHALL USE END SEAL TYPE GASKETS.
      5. FLEXIBLE SPRINKLER FITTINGS SHALL BE UL LISTED AND FM APPROVED. FITTINGS SHALL BE PROVIDED WITH MANUFACTURER'S ACCESSORY MOUNTING DEVICES. MANUFACTURER SHALL BE FLEXHEAD INDUSTRIES OR VICTAULIC.
   D. FIRE PROTECTION VALVES: ALL VALVES ARE RATED FOR A MINIMUM WORKING PRESSURE OF 175 PSI UNLESS NOTED ON DRAWINGS TO BE 250 PSI WORKING PRESSURE OR WHERE SYSTEM PRESSURE EXCEEDS 175 PSI.
      1. GATE VALVES SHALL BE FLANGED, SCREWED, OR GROOVE-END OS&Y TYPE.
      2. BUTTERFLY VALVES SHALL BE FLANGED, GROOVE-END OR FULL-LUG TYPE. VALVES SHALL HAVE MANUAL GEAR OPERATORS WITH POSITION INDICATORS AND TAMPER SWITCH ADAPTORS. WAFER-TYPE BUTTERFLY VALVES ARE NOT ACCEPTABLE FOR FIRE PROTECTION SERVICES.
      3. SWING-TYPE CHECK VALVES SHALL BE FLANGED, SCREWED, OR GROOVED-END TYPE.
      4. DRAIN VALVES SHALL BE GLOBE VALVE TYPE WITH CAPPED MALE THREAD END, SIZES AS LISTED ON THE DRAWINGS OR AS REQUIRED.
      5. INSPECTOR'S TEST/DRAIN VALVE SHALL BE MANUFACTURED BY AGF MANUFACTURING. VALVE SHALL BE MODEL 1000.
   E. PIPE SUPPORTS
      1. ALL PIPE HANGERS AND SUPPORTS SHALL COMPLY WITH THE REQUIREMENTS OF THESE SPECIFICATIONS AND NFPA STANDARDS.
      2. ALL PIPE HANGERS SHALL BE SUPPORTED FROM APPROVED INSERTS OR BEAM OR JOIST CLAMPS, AS APPLICABLE.
      3. HANGER RODS CONSTRUCTED OF ALL-THREAD RODS SHALL BE PLATED.
      4. FIRE PROTECTION SYSTEMS SHALL MEET ALL APPLICABLE REQUIREMENTS FOR SEISMIC DESIGN LISTED IN NFPA.
   F. PRESSURE GAUGES:
      1. FURNISH AND INSTALL PRESSURE GAUGES WHERE REQUIRED.
      2. FOR EACH GAUGE, FURNISH AND INSTALL GAUGE SHUTOFF VALVE AND PROVISION FOR DRAINING GAUGE.
      3. PRESSURE GAUGES SHALL HAVE GRADE B ACCURACY, AS DEFINED BY ASME B40.1 AND DIN STANDARDS. GAUGE MOVEMENT SHALL BE BRASS OR BRONZE BOURDON TUBE TYPE. GAURE SHALL HAVE 3-1/2" STEEL CASE. GAUGE SHALL BE LISTED TO HAVE NO LESS THAN TWICE THE NORMAL OPERATING PRESSURE.
   G. SPRINKLERS SHALL BE UL LISTED QUICK RESPONSE TYPE AS MANUFACTURED BY VIKING SPRINKLER COMPANY:
      1. IN AREAS WHERE THERE ARE NO CEILINGS, SPRINKLERS SHALL HAVE A ROUGH BRASS FINISH.
      2. IN AREAS WHERE THEIR ARE CEILINGS, SPRINKLERS SHALL BE CONCEALED TYPE AS INDICATED ON DRAWINGS. CONCEALED SPRINKLERS SHALL HAVE A ROUGH BRASS FINISH WITH FACTORY PAINTED WHITE FLAT COVER PLATES AND FURNISHED IN ADJUSTABLE MODELS.
      3. ALL SPRINKLERS SHALL BE ORDINARY TEMPERATURE RATED, 155 DEG. F. MINIMUM UNLESS OTHERWISE NOTED. SPRINKLERS WITH PROPER TEMPERATURE RATINGS SHALL BE PROVIDED FOR AREAS OF HIGH AMBIENT TEMPERATURE, SUCH AS BOILER ROOMS, EQUIPMENT ROOMS, ETC.
      4. SPRINKLER GUARDS SHALL BE INSTALLED AS SHOWN ON DRAWINGS AND IN BOILER ROOMS, EQUIPMENT ROOMS, ELEVATOR MACHINE ROOMS, ELECTRIC CLOSETS, SWITCHGEAR ROOMS, TRANSFORMER VAULTS, AND WHERE SPRINKLERS ARE 7 FT. OR LESS FROM THE FLOOR.
      5. SIMILAR SPRINKLERS BY CENTRAL SPRINKLER CORPORATION, RELIABLE AUTOMATIC SPRINKLER COMPANY, GEM SPRINKLER COMPANY OR EQUAL MAY BE SUBMITTED FOR APPROVAL.
      6. ALL SPRINKLERS FOR PRE-ACTION SYSTEMS SHALL BE INSTALLED WITH VERTICAL ARM OVERS WHERE THE SPRINKLER DROP FIRST RISES UPWARD BEFORE TURNING DOWN TO THE CEILING.
   H. SPRINKLER CABINET SHALL BE INSTALLED WHERE DIRECTED BY OWNER NEAR THE PRE-ACTION VALVE. CABINET SHALL CONTAIN THREE (3) EXTRA NEW SPRINKLERS AND WRENCH. INCLUDE, IN PROPORTION TO NUMBERS INSTALLED, ALL TEMPERATURE RATINGS AND TYPES.
   I. PRESSURE OPERATED ALARM SWITCHES SHALL BE MANUFACTURED BY POTTER ELECTRIC COMPANY. CONTRACTOR SHALL SET THE RETARD DEVICE TIME DELAY AS REQUIRED DURING PRELIMINARY FIRE ALARM TESTING. SWITCHES SHALL HAVE TWO (2) SETS OF CONTACTS.
   J. SHUTOFF SUPERVISION SHALL BE MANUFACTURED BY POTTER ELECTRIC COMPANY. DEVICES SHALL BE MODEL OSYS-U OR OSYS-B

PREACTION SYSTEM

II. PREACTION VALVE ASSEMBLY SHALL BE MANUFACTURED BY THE VIKING SPRINKLER COMPANY WITH ELECTRICAL DETECTION AND INITIATION PROVIDED BY THE CLEAN AGENT SYSTEM, A RISER TYPE AIR MAINTENANCE COMPRESSOR, NEOPRENE AND CORK VIBRATION PADS, COMPLETE WITH A MANUAL STARTER, AUTOMATIC PRESSURE SWITCH, PRESSURE RELIEF VALVE, AUTOMATIC AIR MAINTENANCE DEVICE, LOW AIR PRESSURE ALARM, AND AUXILLARY DRY CONTACTS FOR FIRE ALARM SYSTEM INTERFACE. THE PREACTION SYSTEM IS TO BE INSTALLED WITH A SUPERVISED DOWN STREAM CONTROL VALVE TO ALLOW TRIP TESTING WITHOUT FLOODING THE SYSTEM. SIZE OF VALVE TO BE DETERMINED BY CONTRACTOR'S HYDRAULIC CALCULATIONS. SIMILAR ASSEMBLIES BY CENTERAL SPRINKLER CORPORATION, RELIABLE AUTOMATIC, VICTAULIC, OR GEM SPRINKLER COMPANY MAY BE SUBMITTED FOR APPROVAL. ELECTRICAL POWER FOR THE AIR COMPRESSOR IS SHOWN WITHIN THE ELECTRICAL SCOPE OF WORK.

PART 3 - EXECUTION

I. PREPARATION
   A. PERFORM FIRE HYDRANT FLOW TESTING ACCORDING TO NFPA. USE RESULTS FOR SYSTEM DESIGN CALCULATIONS.
   B. REPORT TEST RESULTS PROMPTLY AND IN WRITING.
   C. SLOPE PREACTION PIPING BACK TO THE PREACTION VALVE.
   D. SLOPE PREACTION PIPING BACK TO THE PREACTION VALVE.

II. PIPING APPLICATIONS
   A. DO NOT USE WELDED JOINTS WITH GALVANIZED STEEL PIPE
   B. SEAMED DRY AND PREACTION SYSTEM PIPING SHALL BE INSTALLED SEAM SIDE UP.

III. VALVE APPLICATIONS
   A. WHERE SPECIFIC VALVE TYPES ARE NOT INDICATED, THE FOLLOWING REQUIRMENTS APPLY:
      1. FIRE PROTECTION SERVICE VALVES: UL LISTED AND FM APPROVED FOR APPLICATIONS WHERE REQUIRED BY NFPA 13 AND NFPA 14.
         - SHUTOFF DUTY: USE GATE VALVES
      2. GENERAL DUTY VALVES: FOR APPLICATIONS WHERE UL LISTED AND FM APPROVED VALVES ARE NOT REQUIRED BY NFPA 13 AND NFPA 14.
         - SHUTOFF DUTY: USE GATE, BALL, OR BUTTERFLY VALVES.
         - THROTTLING DUTY: USE GLOBE, BALL, OR BUTTERFLY VALVES.

IV. JOINT CONSTRUCTION
   A. STEEL PIPING, GROOVED JOINTS: USE SCHEDULE 40 STEEL PIPE WITH ROLL-GROOVED ONLY ENDS AND SCHEDULE 30 OR THINNER STEEL PIPE WITH ROLL-GROOVED ENDS; STEEL, GROOVED-END FITTINGS; AND STEEL, KEYED COUPLINGS. ASSEMBLE JOINTS WITH COUPLINGS, GASKETS, LUBRICANT, AND BOLTS ACCORDING TO COUPLING MANUFACTURER'S WRITTEN INSTRUCTIONS. USE GASKETS LISTED FOR DRY-PIPE SERVICE FOR DRY PIPING. APPLY COLD ZRC GALVANIZING COMPOUND TO ALL GALVANIZED PIPE SECTIONS DAMAGED OR CUT BY JOINTING PROCESSES, SUCH AS EXPOSED PIPE THREADS.

REV	DATE	DESCRIPTION	BY	APPRD	CHKD
X2	07/02/09	GENERAL REVISIONS, FOR REVIEW ONLY.	KGH	WHC	DDK
X1	06/30/09	PRELIMINARY DRAWING, FOR BIDS ONLY.	KGH	WHC	DDK

ENGINEER'S SEAL

ENGINEERED DESIGNED FACILITIES
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MODOT - DISTRICT 4 HEADQUARTERS
LEE'S SUMMIT, MO
COMMUNICATIONS ROOM

SPECIFICATIONS

DESIGNED	K.G HETLAGE
DRAWN	K.G HETLAGE
CHECKED	
DATE	07/02/09
DATE	07/02/09
SCALE	N/A
SHEET NO.	SP-2
REV	X2

JOINT CONSTRUCTION (CONT'D)

B. DISSIMILAR PIPING MATERIAL JOINTS: CONSTRUCT JOINTS USING ADAPTERS OR COUPLINGS COMPATIBLE WITH BOTH PIPING MATERIALS. USE DIELECTRIC FITTINGS IF BOTH PIPING MATERIALS ARE METAL.

V. 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.

B. WHERE POSSIBLE, THE BOTTOM OF ALL BRANCH PIPING SHALL BE ABOVE THE TOP OF LIGHT FIXTURES INSTALLED WITHIN LAY-IN CEILINGS.

C. USE APPROVED 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 AND SMALLER. UNIONS ARE NOT PERMITTED ON FLANGED DEVICES OR IN PIPING INSTALLATIONS USING GROOVED JOINTS.

E. INSTALL "INSPECTOR'S TEST CONNECTIONS" IN SPRINKLER PIPING, COMPLETE WITH SHUTOFF VALVE, SIZED AND LOCATED ACCORDING TO NFPA 13.

F. INSTALL SPRINKLER PIPING WITH DRAINS FOR COMPLETE SYSTEM DRAINAGE.

G. INSTALL SPRINKLER ZONE CONTROL VALVES, TEST ASSEMBLIES, AND DRAIN RISERS ADJACENT TO STANDPIPES WHEN SPRINKLER PIPING IS CONNECTED TO STANDPIPES.

H. HANGERS AND SUPPORT: COMPLY WITH NFPA 13 FOR HANGER MATERIALS. INSTALL ACCORDING TO NFPA 13 FOR SPRINKLER PIPING.

I. EARTHQUAKE PROTECTION: INSTALL PIPING TO PROTECT FROM EARTHQUAKE DAMAGE.

J. INSTALL PIPING WITH GROOVED JOINTS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS. CONSTRUCT RIGID PIPING JOINTS, UNLESS OTHERWISE INDICATED.

K. INSTALL PRESSURE GAUGES ON RISER OR FEED MAIN, AT EACH SPRINKLER TEST CONNECTION, AND AT TOP OF EACH STANDPIPE. INCLUDE PRESSURE GAUGES WITH CONNECTION NOT LESS THAN NPS 1/4" AND WITH SOFT METAL SEATED GLOBE VALVE, ARRANGED FOR DRAINAGE PIPE BETWEEN GAUGE AND VALVE. INSTALL GAUGES TO PERMIT, REMOVAL, AND INSTALL WHERE THEY WILL NOT BE SUBJECT TO FREEZING.

L. INSTALL PRESSURE GAUGES AT ALL PRESSURE SWITCHES USED IN DRY SYSTEMS, PREACTION SYSTEMS, PRESSURE MAINTENANCE PUMP CONTROLLERS, AND FIRE PUMP CONTROLLERS. GAUGES INSTALLED SHALL BE VISIBLE FROM THE VIEWPOINT REQUIRED TO OBSERVE AND ADJUST THE PRESSURE SWITCHES.

VI. CLEANING

A. CLEAN DIRT AND DEBRIS FROM SPRINKLERS.

B. REMOVE AND REPLACE SPRINKLERS HAVING PAINT OTHER THAN FACTORY FINISH.

VII. SIGNS AND IDENTIFICATION

A. FURNISH AND INSTALL ALL NAME TAGS, NAMEPLATES, MARKERS, PLAQUES, ETC., REQUIRED FOR IDENTIFICATION OF FIRE PROTECTION SYSTEM COMPONENTS IN ACCORDANCE WITH THE CURRENT APPLICABLE NFPA STANDARDS.

1. FURNISH PIPING MARKERS FOR ALL FIRE PROTECTION MAINS PIPING (I.E. NOT BRANCH LINES) AND ALSO FOR FIRE FIRE PROTECTION PIPING, INCLUDING BRANCH LINES AND DRAIN PIPING, THAT PASS THROUGH A SPACE WITHOUT ANY VISIBLE CLUE AS TO ITS FUNCTION.
2. FURNISH VALVE NAME TAGS IN ACCORDANCE WITH NFPA SPECIFICATION FOR ALL CONTROL, DRAIN, TEST, BY-PASS AND DRUM DRIP VALVES. VALVE NAME TAGS SHALL INDICATE VALVE FUNCTION AND SYSTEM NAME.
3. FURNISH NAMEPLATES FOR ALL FIRE PROTECTION EQUIPMENT SUCH AS PUMPS, AIR COMPRESSORS, CONTROLLER PANELS, STORAGE TANKS, RELEASE PANELS, ETC.
4. FURNISH HYDRAULIC DESIGN PLAQUES FOR ALL FIRE PROTECTION SYSTEMS IN ACCORDANCE WITH NFPA STANDARDS.

VIII. SYSTEM ACCEPTANCE

A. THE INSTALLING CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SECTIONS OF NFPA 13 AND 14 SYSTEM ACCEPTANCE STANDARDS AND ALSO THOSE OF LOCAL AUTHORITIES HAVING JURISDICTION. THE ACCEPTANCE STANDARDS INCLUDE, BUT ARE NOT LIMITED TO:

1. FLUSHING OF PIPING.
2. HYDROSTATIC TESTS.
3. SYSTEM OPERATIONAL TESTS.
4. INSTRUCTIONS TO OWNER (MANUALS AND NFPA 25 PUBLICATION).
5. HYDRAULIC DESIGN INFORMATION.
6. COMPLETE AND SIGNED "MATERIAL AND TEST CERTIFICATES".

B. AUTHORITIES HAVING JURISDICTION AND THE OWNER'S REPRESENTATIVE SHALL BE NOTIFIED IN ADVANCE OF ALL TESTS. TESTS SHALL BE CONDUCTED IN THE PRESENCE OF THE OWNER AND REPESENTATIVES OF THE GOVERNING AUTHORITIES.

C. AT NO TIME SHALL THE COMPUTER ROOM BE WITHOUT PROTECTION. THE CLEAN AGENT MUST BE ON-LINE PRIOR TO REMOVING WET SPRINKLER BRANCH LINES AND INSTALLING NEW SPRINKLER SYSTEM.

ENGINEERED DESIGNED FACILITIES
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MODOT - DISTRICT 4 HEADQUARTERS
LEE'S SUMMIT, MO
COMMUNICATIONS ROOM

SPECIFICATIONS

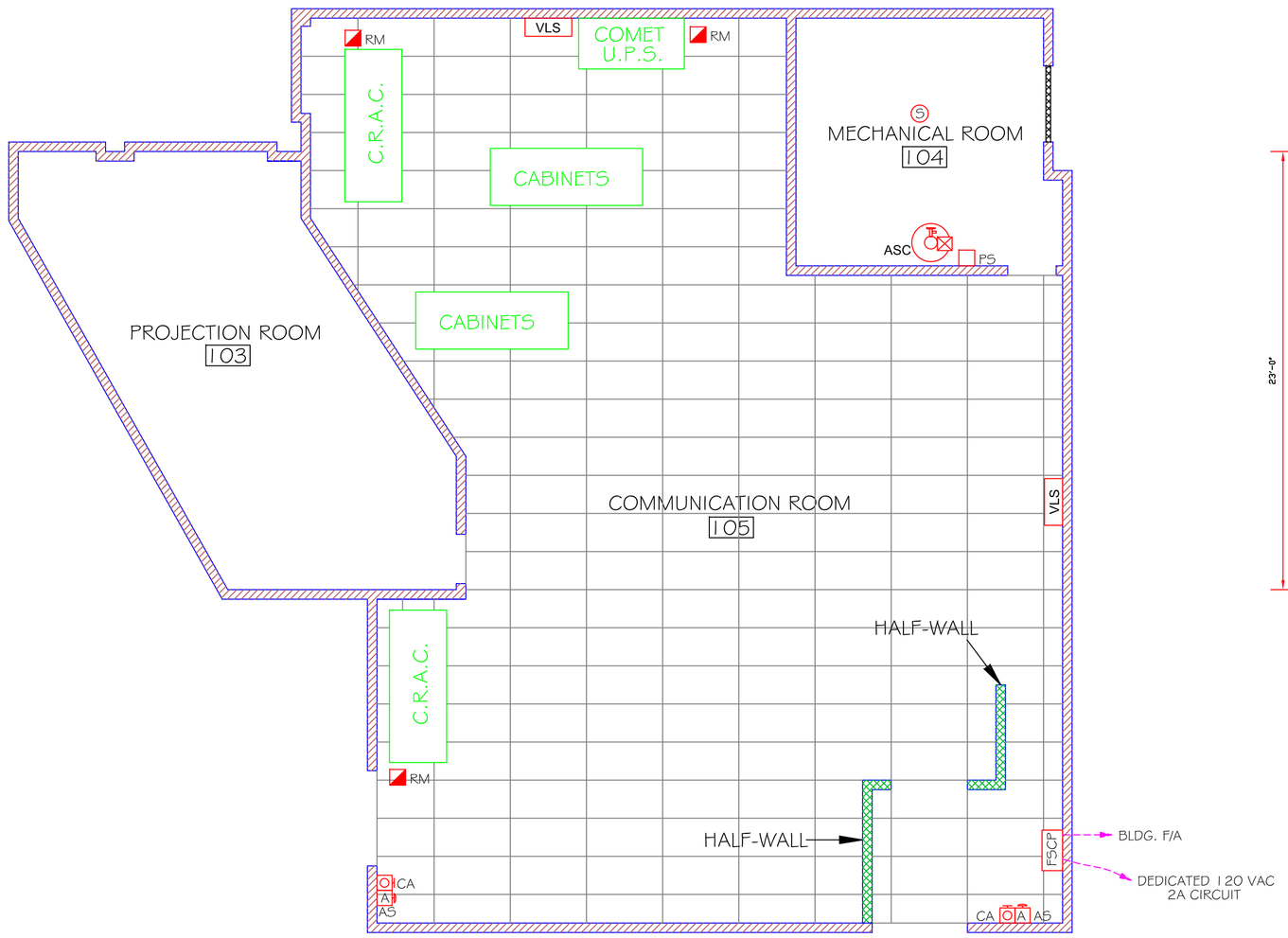
ENGINEER'S SEAL

REV	DATE	DESCRIPTION	BY	APPRD	CHKD
X2	07/02/09	GENERAL REVISIONS, FOR REVIEW ONLY.	KGH	WHC	DDK
X1	06/30/09	PRELIMINARY DRAWING, FOR BIDS ONLY.	KGH	WHC	DDK

DESIGNED K.G HETLAGE DATE 07/02/09
DRAWN K.G HETLAGE DATE 07/02/09
CHECKED SCALE N/A

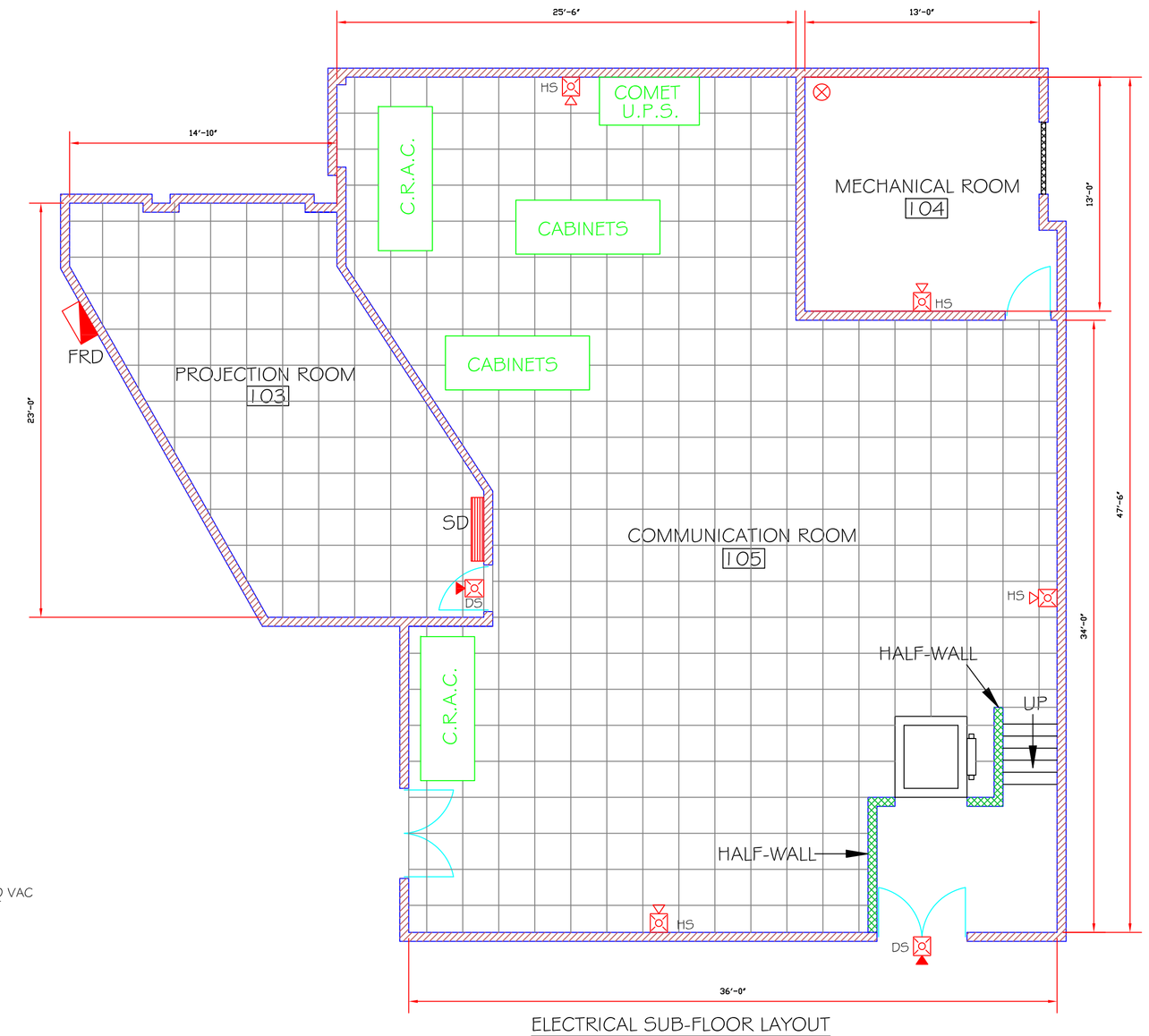
SHEETNO. SP-3

REV X2



ELECTRICAL CEILING LAYOUT

SCALE: 3/16"=1'-0" CLG HT 11'-4" U.N.O.

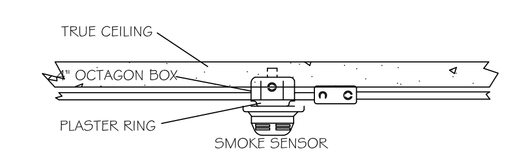


ELECTRICAL SUB-FLOOR LAYOUT

SCALE: 3/16"=1'-0" S/F HT 1'-6" U.N.O.

SYMBOLS LIST

SYMBOL	PC NO.	QTY	DESCRIPTION
FSCP	1	1-EA	FIRE SUPPRESSION CONTROL PANEL
VLS	2	3-EA	VESDA LASER SCANNER DETECTOR
S P	3	1-EA	ANALOG SENSOR, PHOTOELECTRIC
CA	4	2-EA	MANUAL PULL STATION
AS	5	2-EA	ABORT SWITCH
RM	6	3-EA	RELAY MODULE
HS	7	5-EA	WALL MOUNTED HORN STROBE
DS	8	2-EA	WALL MOUNTED STROBE
ASC	9	1-EA	FIRE SUPPRESSION AGENT STORAGE CONTAINER
PS	10	1-EA	ALARM PRESSURE SWITCH
FRD	11	1-EA	FIRE REMOTE DISPLAY UNIT
SD	12	1-EA	CLASS-1 LOW-LEAKAGE FIRE/SMOKE DAMPER



A / FP-1 SMOKE DETECTOR CEILING MOUNTING DETAIL

ENGINEER'S SEAL

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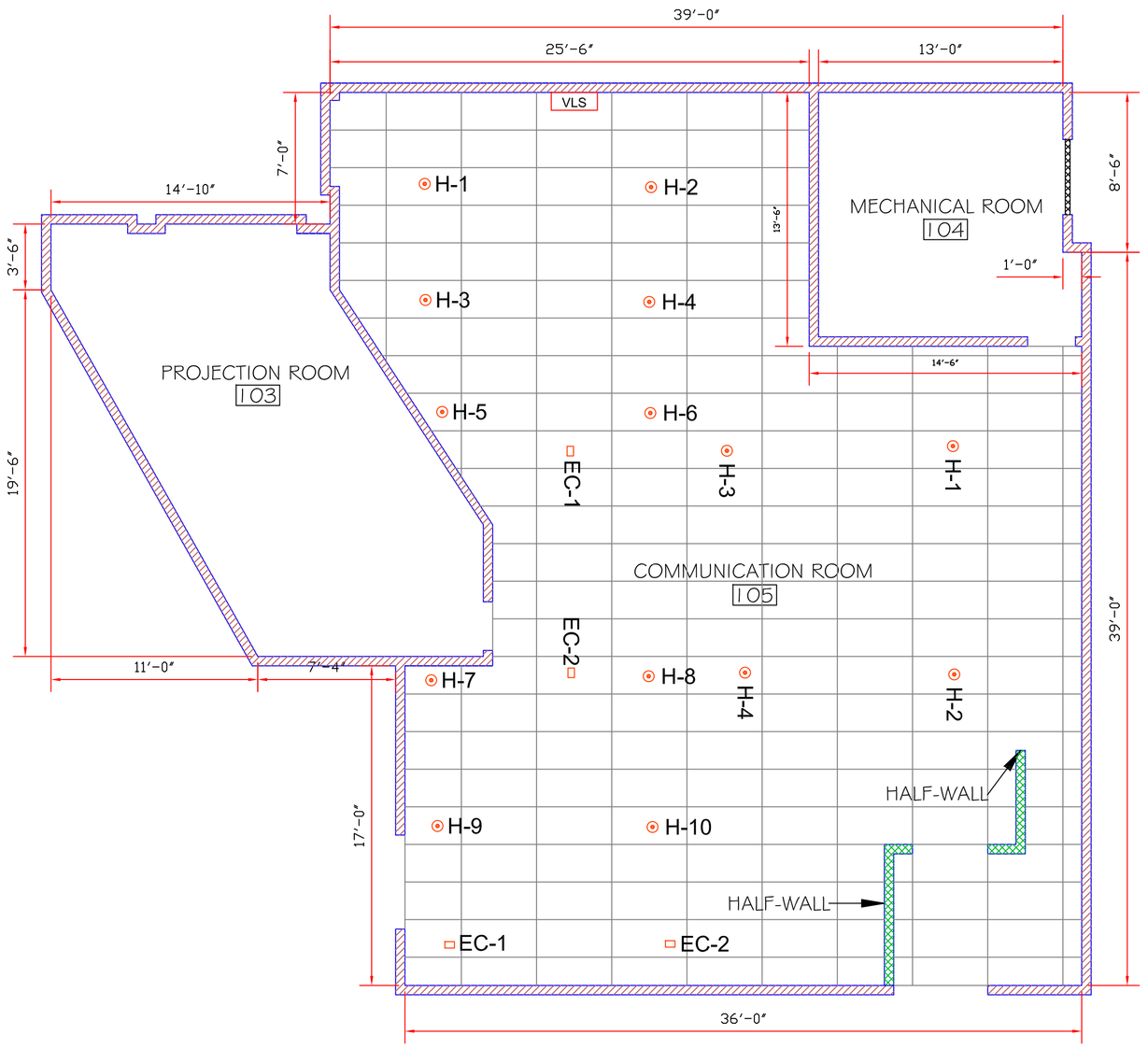
ELECTRICAL LAYOUT

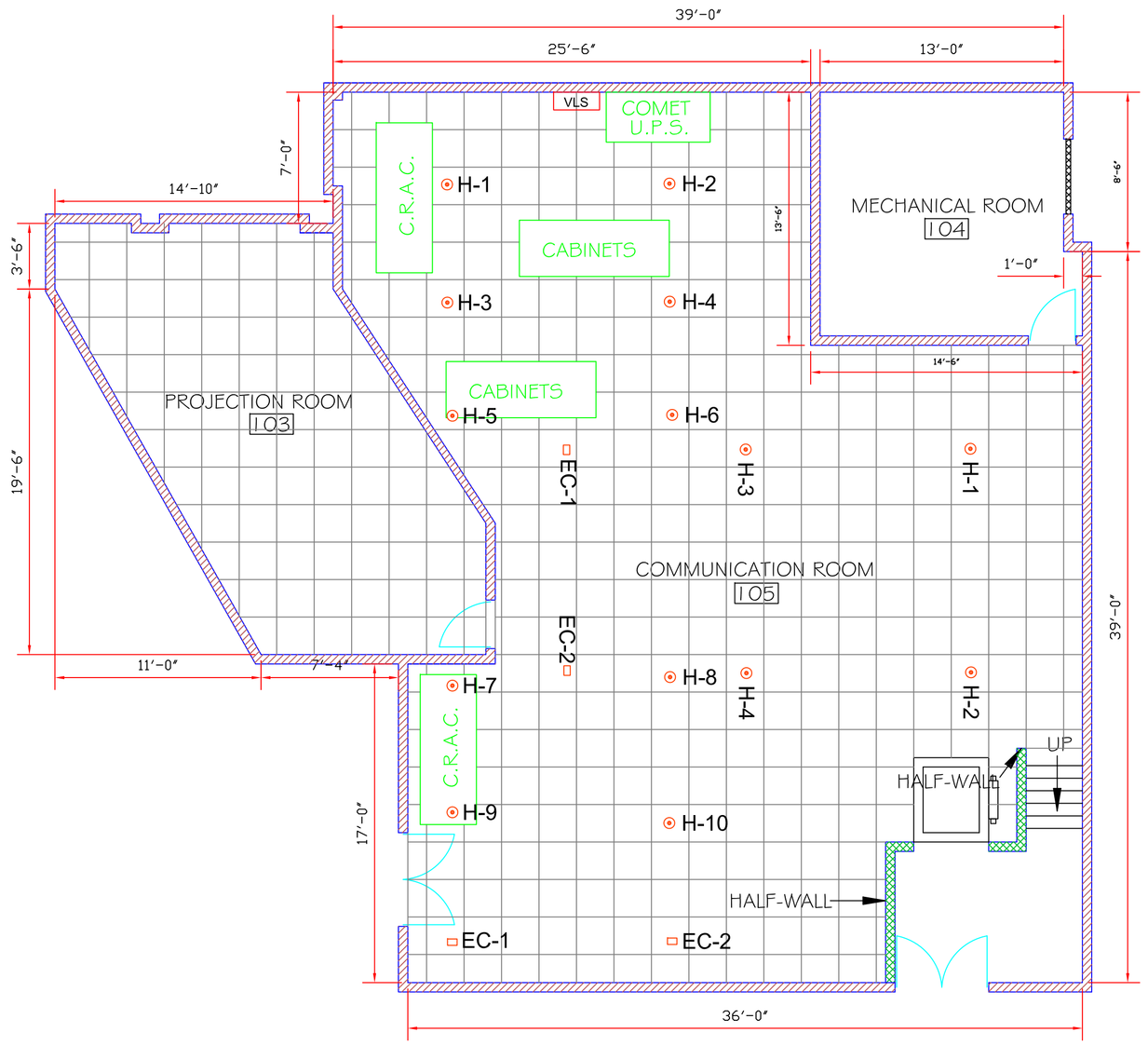
DESIGNED	K.G HETLAGE	DATE	07/02/09
DRAWN	K.G HETLAGE	DATE	07/02/09
CHECKED		SCALE	AS NOTED

SHEETNO. FP-1 REV X2



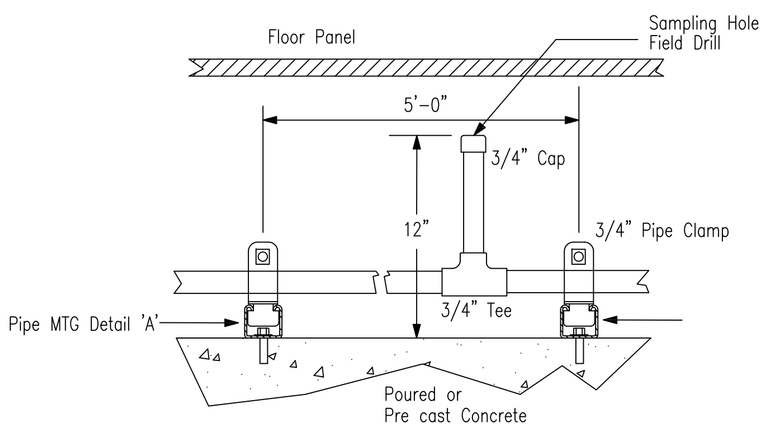
AIR-SAMPLING CEILING LAYOUT

SCALE: 3/16"= 1'-0" CLG HT 11'-4" U.N.O.



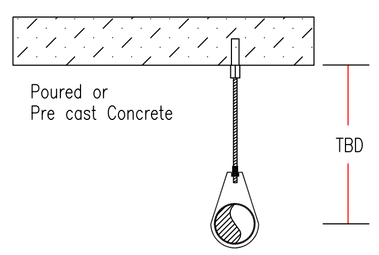
AIR-SAMPLING SUB-FLOOR LAYOUT

SCALE: 3/16"= 1'-0" S/F HT 1'-6" U.N.O.



1 FP2 **SUB-FLOOR SAMPLING PIPE DETAIL**

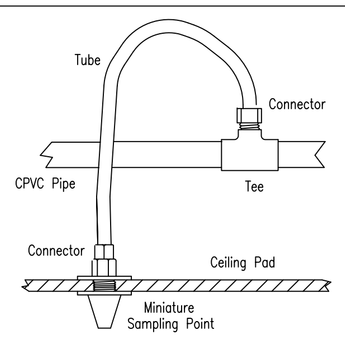
NOT TO SCALE



1 -- Wedge Anchor with Coupling (1/4" = 3/4" Pipe)
1 -- All Thread Rod
1 -- Adjustable Hanger Ring

2 FP2 **CEILING SAMPLING PIPE HANGER**

NOT TO SCALE



3 FP2 **CEILING CAPILLARY SAMPLING DETAIL**

NOT TO SCALE

ENGINEERS SEAL

REV	DATE	DESCRIPTION	BY	APPRD	CHKD
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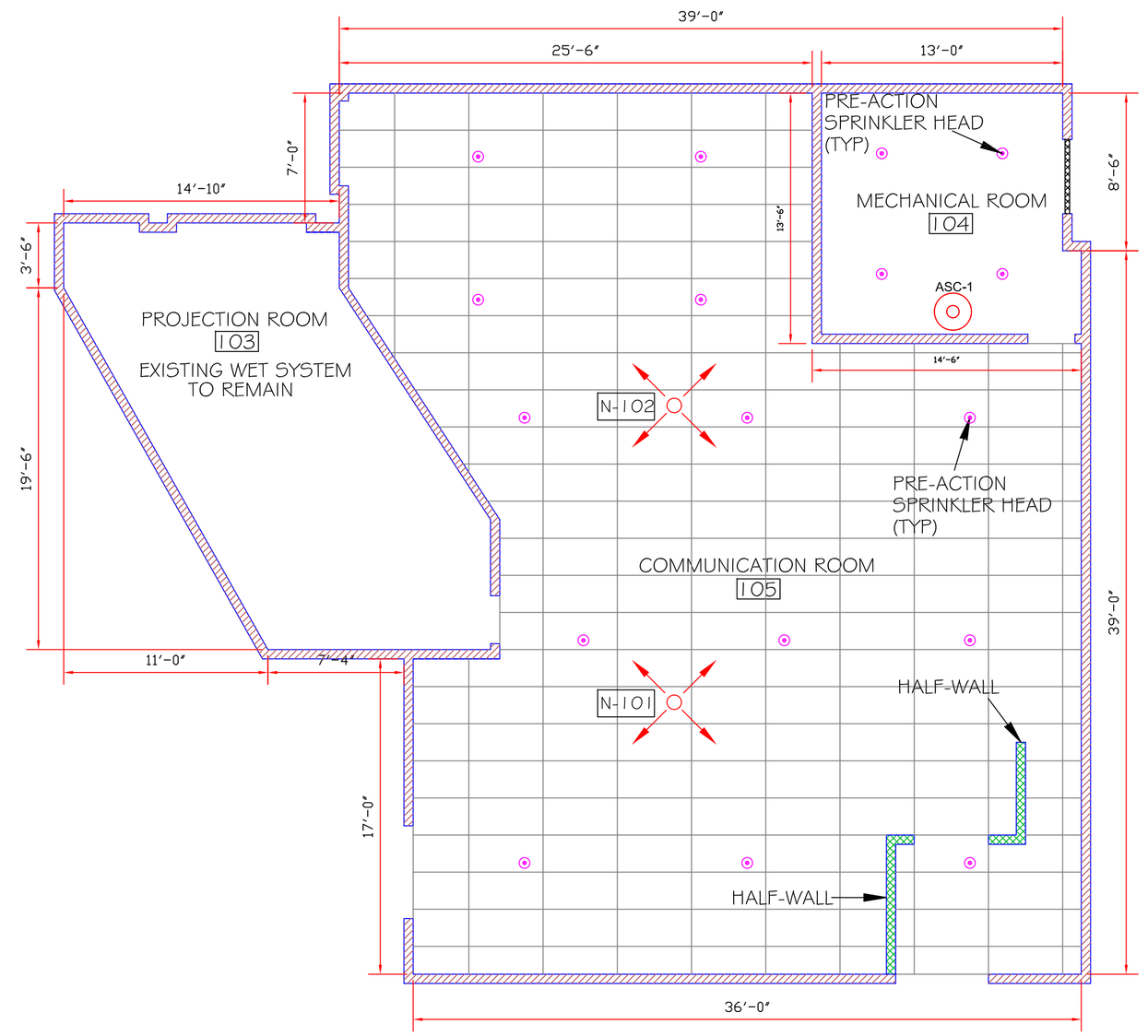
AIR-SAMPLING LAYOUT

DESIGNED	K G HETLAGE	DATE	07/02/09
DRAWN	K G HETLAGE	DATE	07/02/09
CHECKED		SCALE	AS NOTED

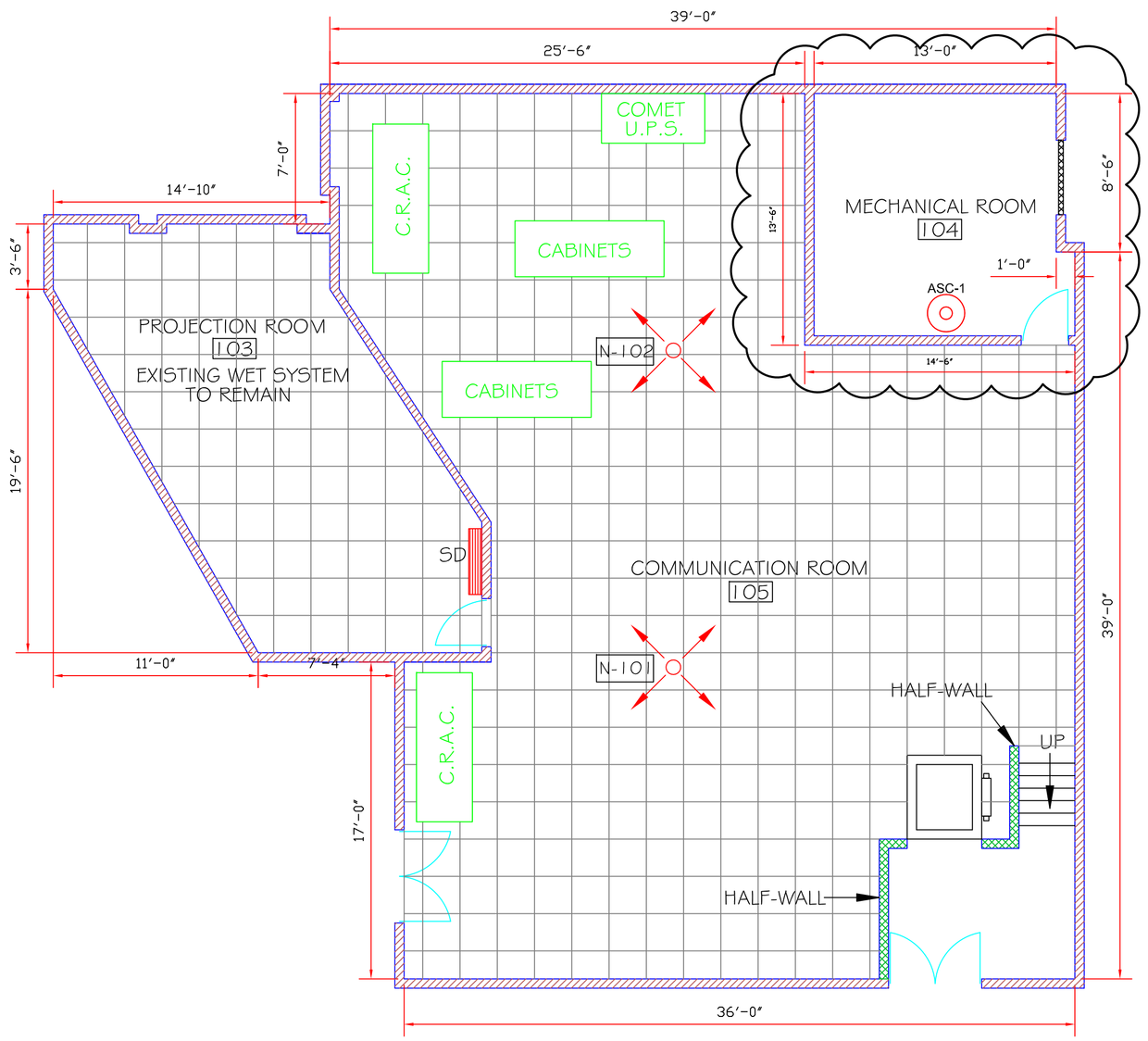
SHEET NO. FP-2

REV X2



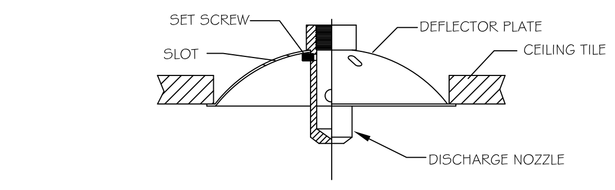
CLEAN-AGENT/PRE-ACTION CEILING LAYOUT

SCALE: 3/16"= 1'-0" CLG HT 11'-4" U.N.O.

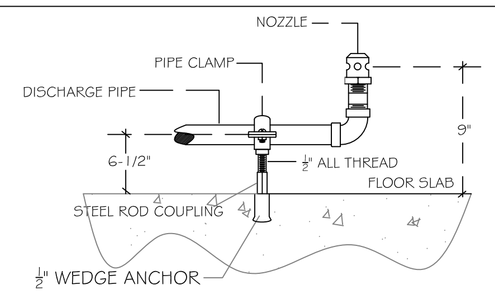


CLEAN-AGENT SUB-FLOOR LAYOUT

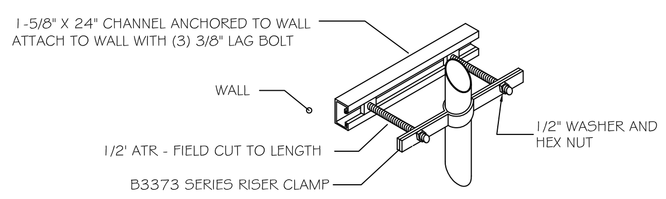
SCALE: 3/16"= 1'-0" S/F HT 1'-6" U.N.O.



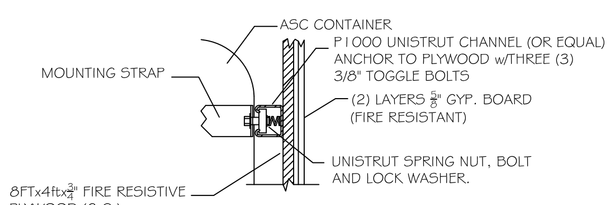
C FP-3 CEILING NOZZLE MOUNTING DETAIL



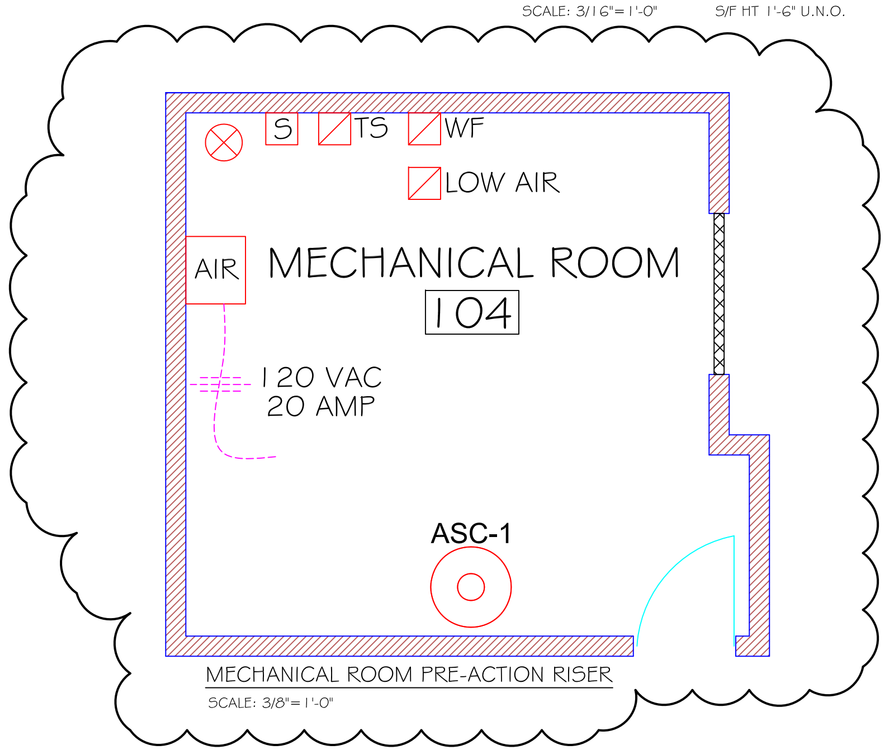
D FP-3 SUB-FLOOR NOZZLE MTG. DETAIL



A FP-3 AGENT CONTAINER VERTICAL RISER DETAIL



B FP-3 AGENT CONTAINER MTG DETAIL



MECHANICAL ROOM PRE-ACTION RISER

SCALE: 3/8"= 1'-0"

PRE-ACTION SYMBOLS LIST		
SYMBOL	PC NO.	DESCRIPTION
◉	1	PRE-ACTION SPRINKLER HEAD
S	2	SOLENOID, PRE-ACTION
TS	3	TAMPER SWITCH
WF	4	ALARM (FLOW) PRESSURE SWITCH
LP	5	LOW SUPERVISORY AIR
AIR	6	AIR COMPRESSOR

ENGINEERS SEAL

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CLEAN AGENT/PRE-ACTION LAYOUT

DESIGNED	K G HETLAGE	DATE	07/02/09
DRAWN	K G HETLAGE	DATE	07/02/09
CHECKED		SCALE	AS NOTED

SHEETNO. FP-3 REV X2