



# MONTANA FISH, WILDLIFE & PARKS

## ADDENDUM NO. 3

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TO: ALL BIDDERS OF RECORD

PROJECT: Makoshika State Park Basement Fire Sprinklers

FWP PROJECT #: 7136352

DATE: February 21, 2020

FROM: Darcy Yakoweshen, Montana FWP Project Manager

**Acknowledge receipt of this addendum by inserting its number and date in the Proposal Form and on the Bid Envelope. Failure to do so may subject bidder to disqualification.**

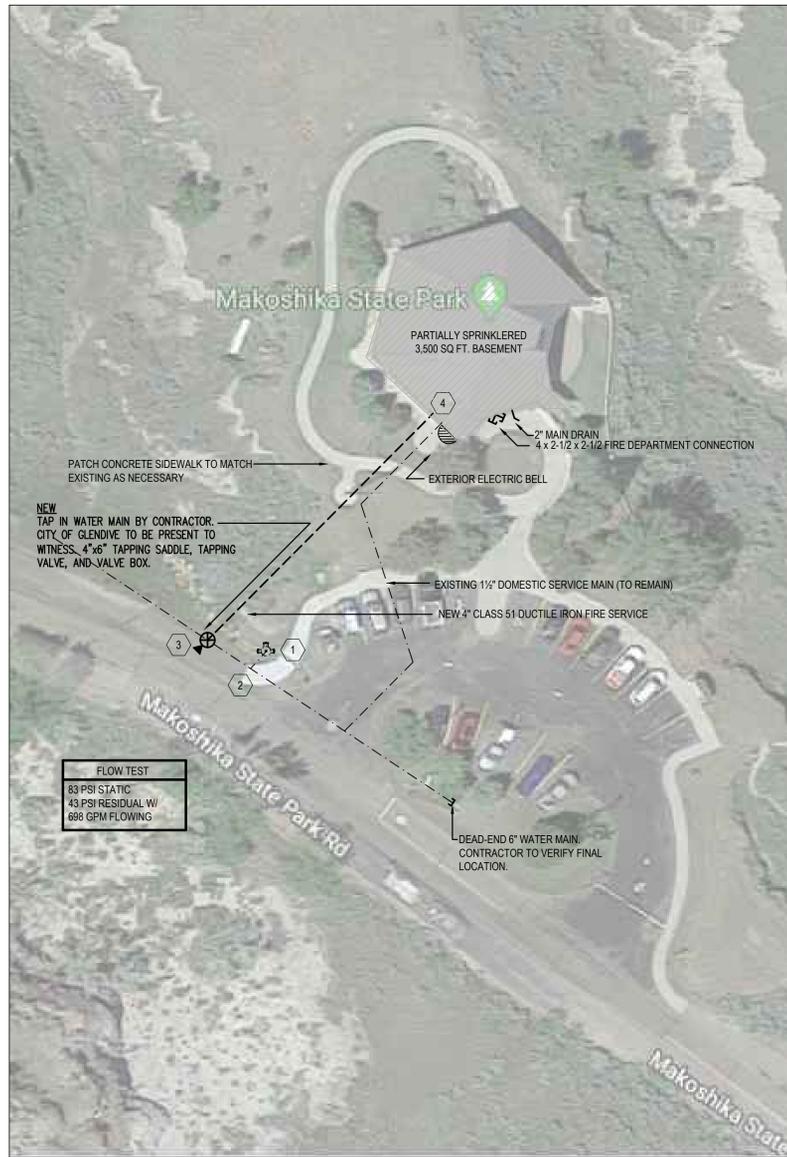
This Addendum forms a part of the Contract Documents. Clarification and/or modifications area as follows:

Fire Sprinkler drawings have been updated with the following changes:

- FDC location has been changed on the first floor. Piping in the basement has been updated to reflect this change.
- Location of the Water Main on the Reference Site Plan has been changed to not be in the street a previously shown.
- Minimum bury depth of 7'-0" has been clarified.
- New 4" Underground Fire service line is to be core-drilled not sleeved.
- Underground Pipe table has been updated to reference Restraint Details and not Thrust Blocks.
- Piping in Storage Room 004 has been adjusted to avoid electrical panels.
- Fire Sprinkler General Notes have been clarified to include painting of the exposed piping on the first floor i.e. the FDC and Main Drain.
- Note has been clarified to match concrete as existing.

**END OF ADDENDUM NO. 3**

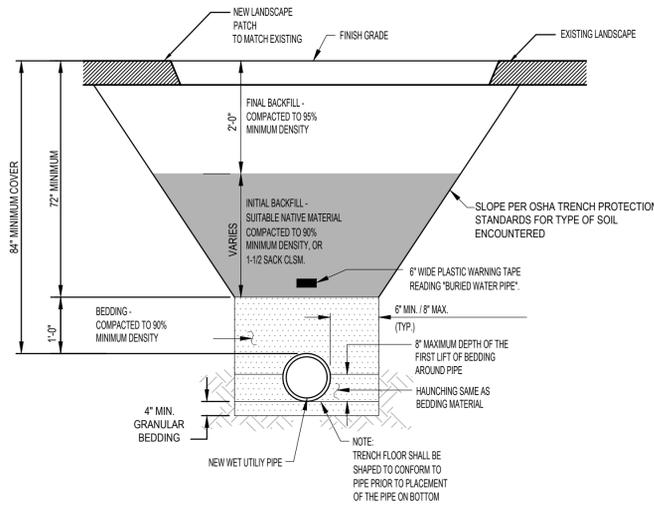




**A FIRE SPRINKLER REFERENCE SITE PLAN**

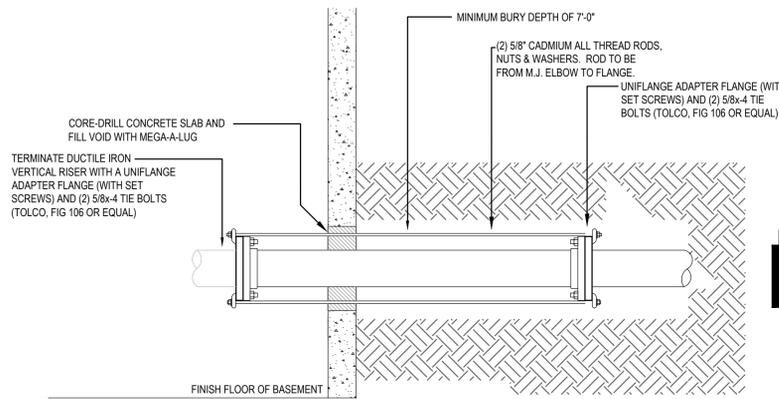
FX1.0 1" = 30'-0"

- CONTRACTOR IS TO UTILIZE THE LOWER BACK DOOR DURING ALL CONSTRUCTION WITHIN THE BUILDING.
- PUBLIC AREAS/HALLWAYS
- ALL PUBLIC AREAS MUST BE CLEARED OF DEBRIS AND STORAGE AT THE END OF EACH DAY DURING CONSTRUCTION. IF STAGING MATERIALS IN PUBLIC AREAS OR HALLWAYS, CONTRACTOR SHALL CLEARLY DELINEATE DAILY STORAGE ZONES WITH SAFETY CAUTION TAPE. AT NO TIME SHALL CONTRACTOR BLOCK EMERGENCY EGRESS PATHWAYS.
- CONTRACTOR SHALL COMPLETE HOUSEKEEPING AT THE END OF EACH DAY IN ALL PUBLIC AREAS. CONTRACTOR SHALL COMPLETE A FINAL CLEAN OF EACH ROOM.



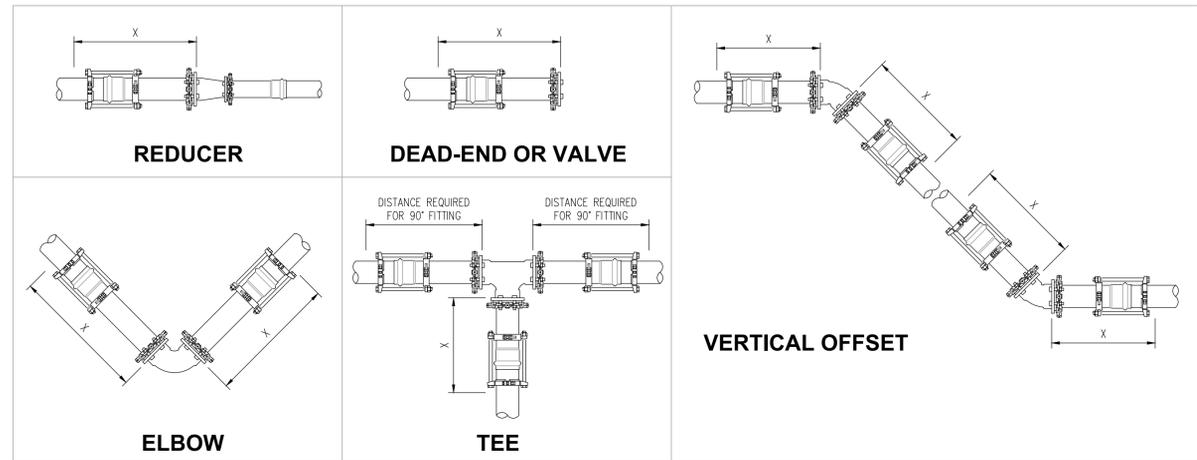
**2 NEW FIRE LINE SECTION**

FX1.0 NO SCALE



**3 NEW 4" UNDERGROUND PIPE TERMINATION AT SLAB**

FX1.0 NO SCALE



PIPE SIZE	MINIMUM LINEAR FEET OF PIPE REQUIRED TO HAVE JOINT RESTRAINT (X)					
	90° ELBOW	45° ELBOW	22.5° ELBOW	11.25° ELBOW	TEE	DEAD-END OR VALVE
4"	19'-0"	8'-0"	4'-0"	2'-0"	19'-0"	16'-0"
6"	27'-0"	11'-0"	6'-0"	3'-0"	27'-0"	22'-0"
8"	35'-0"	15'-0"	7'-0"	4'-0"	35'-0"	29'-0"
12"	50'-0"	21'-0"	10'-0"	5'-0"	50'-0"	41'-0"

- DESIGNED BASED UPON EBAA, MODEL 1100 MJ RESTRAINT AND MODEL 1700 JOIST RESTRAINT HARNESS
- TABLE BASED UPON WORST CASE TYPE 'CL' FINE GRAINED SOIL; TEST PRESSURES OF 250 PSI; MINIMUM 3.5-FT BURY DEPTH; TYPE-3 TRENCH; AND A 1.5:1 SAFETY FACTOR.
- RESTRAINED JOINT SHALL BE USED ON ALL JOINTS FROM ANY MAIN TEE TO ANY FIRE HYDRANT.

**4 DUCTILE IRON JOINT RESTRAINT DETAIL WITH SPLIT SERRATED RESTRAINT HARNESS**

FX1.0 NO SCALE

CALL 1-800-424-5555 BEFORE DIGGING.

UNDERGROUND PIPE		
MATERIALS MAY BE OF DOMESTIC OR IMPORT ORIGIN		
PIPE SIZE	PIPE	FITTINGS
4"	CLASS 51 DUCTILE IRON PIPE	SEE DUCTILE IRON JOINT RESTRAINT DETAILS

**UNDERGROUND LEGEND**

SYMBOL	DESCRIPTION
	OS&Y VALVE
	RISE
	NEW UNDERGROUND FIRE LINE
	EXISTING UNDERGROUND FIRE SERVICE/WATER MAIN
	TAPPING SLEEVE
	THRUST BLOCKING
	CUT IN FIELD
	UNLESS OTHERWISE NOTED
	THREAD ONE END
	THREAD BOTH ENDS
	GROOVE ONE END
	GROOVE BOTH ENDS
	THREAD & GROOVE
	OUTSIDE STEM & YOKE
	WITH
	DOWN
	FINAL GRADE
	ABOVE FINISHED FLOOR

**GENERAL NOTES**

- FIRE PROTECTION SYSTEM SHALL BE DESIGNED, INSTALLED, TESTED, AND FLUSHED IN ACCORDANCE WITH:
  - INTERNATIONAL BUILDING CODE (IBC) - 2012 EDITION WITH LOCALLY ADOPTED MODIFICATIONS
  - NFPA 13 (STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS) - 2010 EDITION
  - NFPA 72 (NATIONAL FIRE ALARM AND SIGNALING CODE) - 2010 EDITION
  - NFPA 24 (STANDARD FOR THE INSTALLATION OF PRIVATE FIRE SERVICE MAINS AND THEIR APPURTENANCES) - 2010 EDITION
- NO INSTALLATION OF ANY PIPING OR EQUIPMENT IS TO BEGIN PRIOR TO APPROVAL OF PLANS BY THE AUTHORITY HAVING JURISDICTION AND THE OWNER'S REPRESENTATIVE.
- ALL PAINTING OF FIRE PROTECTION PIPING AND RELATED COMPONENTS TO BE PERFORMED BY OTHER TRADE DIVISIONS.
- ALL ELECTRICAL WIRING OF FIRE ALARM SYSTEM AND FIRE SPRINKLER ELECTRICAL COMPONENTS TO BE PROVIDED IN THIS CONTRACT. FIRE SPRINKLER SYSTEM SHALL BE SUPERVISED IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE AND NFPA 72 (NATIONAL FIRE ALARM CODE).
- IT IS THE OWNER'S RESPONSIBILITY TO PROVIDE ADEQUATE HEAT TO PREVENT FREEZING THROUGHOUT WET PIPE SPRINKLER SYSTEM AREAS AND IN ENCLOSURES FOR DRY PIPE AND OTHER TYPES OF VALVES CONTROLLING WATER SUPPLIES TO SPRINKLER SYSTEMS.

**COFFMAN ENGINEERS**  
751 Osterman Dr., Suite 104  
Bozeman, MT 59715  
ph 406.562.1936  
www.coffman.com

**PROFESSIONAL ENGINEER**  
JASON ANDERSON  
No. 11806PE

NO.	DATE	DESCRIPTION
1	12-16-2019	REVISED PER RFP COMMENTS
2	02/03/2020	ELEVATOR CHANGE
3	02/20/2020	ADDITIONAL #3

WATER FLOW TEST RESULTS:  
STATIC PRESSURE: 83 PSI  
RESIDUAL PRESSURE: 43 PSI  
GPM FLOWING: 688 GPM  
TEST TAKEN AT: SNIFFER ST  
TEST TAKEN BY: GLENDA ST  
DATE: 09/29/2019

SYSTEM TYPE: NEW WET SYSTEM

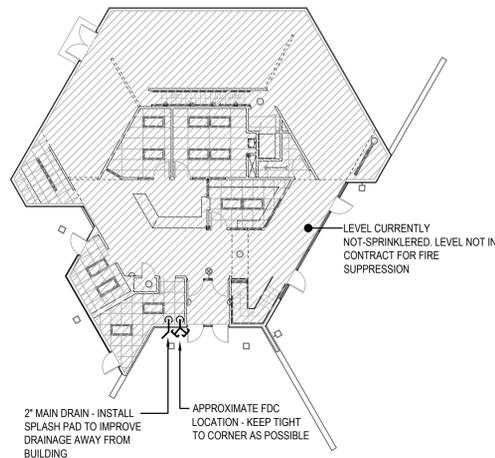
CONTRACT NAME: MAKOSHKA STATE PARK, BASEMENT FIRE ALARM SPRINKLERS  
1301 SNYDER ST, GLENDAVE, MT 59330  
CONTRACT WITH: MONTANA FISH, WILDLIFE & PARKS DESIGN & CONSTRUCTION  
1522 NINTH AVE, HELENA, MT 59620

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

DRAWN BY: B. HOFFMAN  
CHECKED BY: J. ANDERSON  
DATE: 01/09/2020

CONTRACT NO.:  
COFFMAN #: 191665  
SHEET NO.:

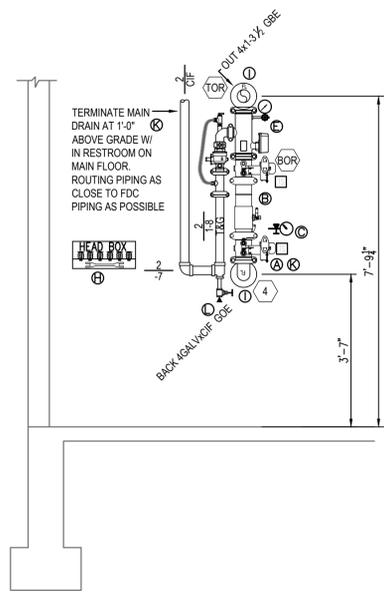
**FX1.0**



**Hydraulically Calculated System**

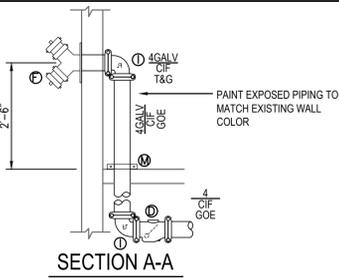
This system as shown on COFFMAN ENGINEERS company print no. FX2.0 dated 11/19/19 for BASEMENT at MAKOSHKASTA contract no. 191665 is designed to discharge at a rate of 0.15 gpm (l/min) per sq ft (m<sup>2</sup>) of floor area over a max area of 928 sq ft (m<sup>2</sup>) when supplied with water at the rate of 516.1 gpm (l/min) at 34.71 psi (bars) at the base of the riser. Hose stream allowance of 250 gpm (l/min) is included in the above.

Occupancy classification: ORDINARY HAZARD 1  
 Commodity classification: N/A  
 Maximum storage height: N/A  
 Installed by: TBD



**RISER LEGEND**

- 4" GROOVED FLANGE - VICTAULIC FIG 744
- 4" DOUBLE CHECK VALVE ASSEMBLY WITH GROOVED BUTTERFLY VALVES AND BUILT-IN TAMPER SWITCHES - AMES, MODEL "COLT" C200BFG
- 1/2x1/4 GALV HEX BUSHING, 1/4x3/8 GALV NIPPLE, 1/4" 3-WAY VALVE, 1/4" WATER GAUGE, 1/4" PLUG - "GAUGE KIT"
- 4" GROOVED CHECK VALVE - VICTAULIC, MODEL 717
- 4" RISER MANIFOLD WITH FLOW SWITCH, BACK AND DRAIN VALVE, PRESSURE GAUGE AND PRESSURE RELIEF VALVE
- TYCO FIRE, MODEL 8M-1 WITH MAIN DRAIN AND TEST ORIFICE. ORDER WITH OPTIONAL 175 PSI PRESSURE RELIEF VALVE. NO ADDITIONAL SIGNAGE TO BE PROVIDED - "INSPECTORS TEST" AND "MAIN DRAIN" WORDING CAST IN BODY
- 4 x 2-1/2 x 2-1/2 EXPOSED "AUTO SPKR" FIRE DEPARTMENT CONNECTION BRASS FINISH - POTTER ROEMER, MODEL 5751 WHICH INCLUDES THE FOLLOWING: EXPOSED INLET CONNECTION WITH NATIONAL STANDARD HOSE THREAD SWIVELS AND DOUBLE CLAMPERS (2) 2 1/2" PLUGS AND CHAINS - ROUND 9-3/4" O.D. BRASS WALL PLATE WITH "AUTO SPKR" LETTERING SECURE TO INTERIOR WALL WITH A 4" GALV SOLID WALL PLATE
- 10" EXTERIOR ELECTRIC BELL - POTTER MBA2410 W/ WEATHERPROOF BACKBOX SPARE HEAD CABINET WITH MINIMUM AS REQUIRED PER NFPA #13 (EXCEPT FOR DRY PENDENTS) - (6) HEAD MODEL WITH WRENCHES
- 4" GROOVED ELL - SHORT TAKEOUT
- 4" GROOVED TEE - SHORT TAKEOUT
- TERMINATE MAIN DRAIN THROUGH WALL WITH A 2" GMI 45" ELL AND 2GALVx-2 TOE. SECURE TO EACH SIDE OF WALL WITH (2) 2" SOLID GALV WALL PLATES. INSTALL SPLASH PAD TO AID IN DRAINAGE AWAY FROM BUILDING.
- 1/4" NIPPLE, 1" BALL VALVE, 1" PLUG WITH "AUXILIARY DRAIN" SIGN AND CHAIN
- 4" RISER CLAMP

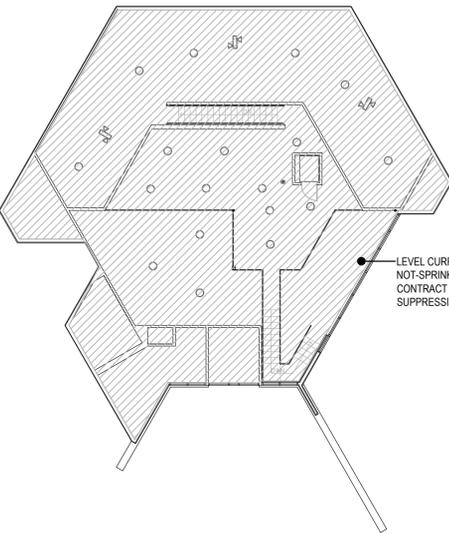


**FIRE SPRINKLER RISER DETAIL**

1  
FX2.0  
1/2" = 1'-0"

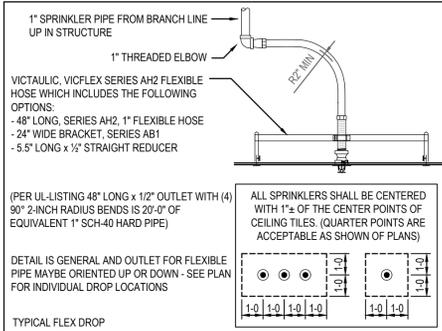
**MAIN FLOOR - FIRE SPRINKLER PLAN**

B  
FX2.0  
1/16" = 1'-0"



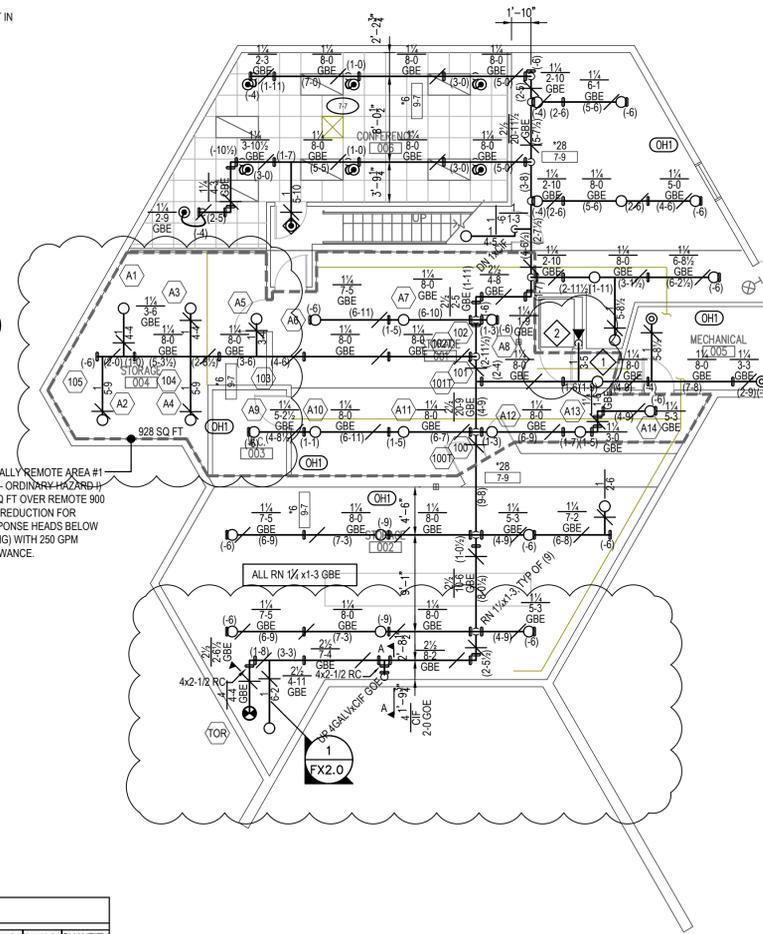
**MEZZANINE LEVEL - FIRE SPRINKLER PLAN**

C  
FX2.0  
1/16" = 1'-0"



**TYPICAL FLEXIBLE DROP**

2  
FX2.0



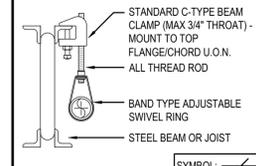
**BASEMENT - FIRE SPRINKLER PLAN**

A  
FX2.0  
1/8" = 1'-0"

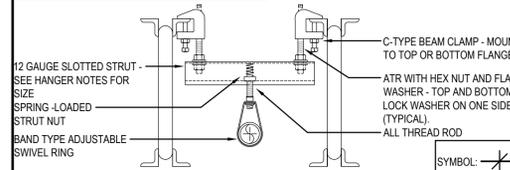
**SPRINKLER HEADS**

MANUFACTURER	MODEL	TYPE	SIN	FINISH	THREAD	K-FACTOR	CANOPY	ESCUTCH	TEMP	WRNCH	SYMBOL	QUANTITY
TYCO	TY-FRB	PEND	TY323	WHITE	1/2"	5.6	RECD	STY15	200°	W7	⊙	7
TYCO	TY-FRB	UP	TY313	BRASS	1/2"	5.6	ON-LINE	-	200°	W6	⊙	32
TYCO	TY-FRB	UP	TY313	BRASS	1/2"	5.6	ON-SPRIG	-	200°	W6	⊙	2
TYCO	TY-FRB	PEND	TY323	WHITE	1/2"	5.6	EXTENDED	STY 401	200°	-	⊙	1
TYCO	TY-FRB	SIDE	TY331	BRASS	1/2"	5.6	N/A	N/A	200°	W7	⊙	1
<b>TOTAL</b>												<b>43</b>

**TYPICAL HANGER AND RESTRAINT DETAILS**



PROVIDE: 3/4" THROAT C-TYPE 3/8" BEAM CLAMP, 3/8x1/2" (1/2" AVERAGE LENGTH FOR LISTING) ATR & PIPE RING.



PROVIDE: (2) 3/4" THROAT C-TYPE 3/8" BEAM CLAMPS & 3/8x6 ATR W/ HEX NUTS & FLAT WASHERS TOP AND BOTTOM & LOCK WASHER ON ONE SIDE, 1.58 x 1.58 x 5.0 LONG 12-GAUGE SLOTTED STRUT TRAPEZE, 3/8" STRUT NUT W/ 3/8x1/2" (1/2" AVERAGE LENGTH FOR LISTING) ATR AND PIPE RING.

**HANGER NOTES**

- ALL-THREAD-ROD SHALL BE CADMIUM-ZINC PLATED OR EQUAL.
- \*SEND ATR IN FULL 10' LENGTHS (I.E. NOT CUT AT FABRICATOR).
- \*SEND STRUT IN FULL 20' LENGTHS (I.E. NOT CUT AT FABRICATOR).

**GENERAL NOTES**

- ALL CEILING HEIGHTS ARE OPEN TO STRUCTURE U.O.N.
- ALL GROOVED COUPLINGS SHALL BE ZERO FLEX/RIGID U.O.N. AND/OR REQUIRED BY CODE.
- ALL HARD PIPE DROPS 1x3-0" T.O.E. U.O.N.
- ALL DOWNS TO FLEX PIPE 1x2-0" U.O.N., TERMINATE W/ 1" THREADED ELL U.O.N.
- ALL SPRINGS 1x0IF U.O.N. UPRIGHT "6" INCHES BELOW DECK.
- SPRINKLER HEADS ARE NOT CENTER LINE OF CEILING TILE. ACTUAL LOCATIONS OF SPRINKLER HEADS WITHIN CEILING TILE MAY VARY DUE TO CONSTRUCTION CONDITIONS.
- ALL PENDENT SPRINKLERS IN SUSPENDED ACOUSTICAL TILE CEILING SHALL BE INSTALLED ON A 48" LONG FLEX DROP. SEE DETAIL 1/FX2.0.
- PROVIDE SPLIT CHROME WALL PLATES AT ALL EXPOSED WALL PENETRATIONS IN FINISHED ROOMS - TOTAL COUNT FOR SHEET: (1) 1 INCH, (7) 1-1/4 INCH, (2) 2-1/2 INCH.
- ALL ROOMS ARE CLASSIFIED AS LIGHT HAZARD OCCUPANCY (0.10 GPM/SQ FT OVER REMOTE AREA - 100 GPM HOSE) PER NFPA 13 UNLESS OTHERWISE NOTED WITH SYMBOLS BELOW. SEE REMOTE AREA NOTES FOR REMOTE AREA MODIFICATIONS AS APPLICABLE.
- (OH) ORDINARY HAZARD GROUP 1 - 0.15 GPM/SQ FT OVER REMOTE AREA - 250 GPM HOSE
- (OH2) ORDINARY HAZARD GROUP 2 - 0.20 GPM/SQ FT OVER REMOTE AREA - 250 GPM HOSE

**PLAN KEY NOTES**

- SPRINKLER UNDER DUCT GREATER THAN 4'-0"
- DN 1x12-0 TOE TO 1x12 SCREWED ELBOW AND 200" SIDEWALL WITH HEAD GUARD LOCATED APPROXIMATELY 12" ABOVE BOTTOM OF ELEVATOR SHAFT (NOT MORE THAN 24" ABOVE BOTTOM DOES NOT REQUIRE THE MAIN LINE POWER SUPPLY TO BE DISCONNECTED PER THE ELEV CODE [ANSI A17.1-2004 PARAGRAPH 2.8.2.4.1]. SECURE TO WALL WITH 1.58x1.58x6.0 LONG SLOTTED UNISTRUT, (2) 3/8x1/2" NUTS AND WASHERS, (2) 3/8x1" HEX NUTS, AND 1" STRUT PIPE & CLAMP.

**FIRE SPRINKLER GENERAL NOTES**

- FIRE PROTECTION SYSTEM SHALL BE DESIGNED, INSTALLED, TESTED, AND FLUSHED IN ACCORDANCE WITH:
  - INTERNATIONAL BUILDING CODE (IBC) - 2012 EDITION WITH LOCALLY ADOPTED MODIFICATIONS
  - NFPA 13 (STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS) - 2010 EDITION
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- ALL PAINTING OF FIRE PROTECTION PIPING AND RELATED COMPONENTS TO BE PERFORMED BY UNDER THIS CONTRACT.
- ALL ELECTRICAL WIRING OF FIRE ALARM SYSTEM AND FIRE SPRINKLER ELECTRICAL COMPONENTS TO BE PROVIDED IN THIS CONTRACT. FIRE SPRINKLER SYSTEM SHALL BE SUPERVISED IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE AND NFPA 72 (NATIONAL FIRE ALARM CODE).
- IT IS THE OWNERS RESPONSIBILITY TO PROVIDE ADEQUATE HEAT TO PREVENT FREEZING THROUGHOUT WET PIPE SPRINKLER SYSTEM AREAS AND IN ENCLOSURES FOR DRY PIPE AND OTHER TYPES OF VALVES CONTROLLING WATER SUPPLIES TO SPRINKLER SYSTEMS.

**FIRE SPRINKLER LEGEND**

SYMBOL	DESCRIPTION
⊙	*ALTERNATE SPRINKLER TEMPERATURES MAY BE NOTED NEXT TO SYMBOL (I.E. INT = INTERMEDIATE; HIGH = HIGH TEMPERATURE)
⊙	STANDARD SPRAY PENDENT SPRINKLER ON - DROP
⊙	STANDARD SPRAY PENDENT SPRINKLER ON - DROP
⊙	STANDARD SPRAY UPRIGHT SPRINKLER ON - LINE
⊙	STANDARD SPRAY UPRIGHT SPRINKLER ON - SPRIG
⊙	FLOW SWITCH
⊙	TAMPER SWITCH
⊙	CHECK VALVE
⊙	BUTTERFLY VALVE (GROOVED OR SCREWED)
⊙	GLOBE VALVE
⊙	HORN/STROBE ASSEMBLY
⊙	FIRE DEPARTMENT CONNECTION
⊙	PIPE CENTERLINE FROM FINISHED FLOOR
⊙	HYDRAULIC NODE POINT
⊙	CEILING HEIGHT
⊙	RISER
⊙	DISTANCE PIPE FROM DECK
⊙	FLANGE
⊙	GROOVED ELBOW UP
⊙	GROOVED ELBOW DOWN
⊙	GROOVED COUPLING
⊙	SCREWED ELBOW DOWN
⊙	SCREWED ELBOW UP
⊙	HANGER SYMBOL #1
⊙	HANGER SYMBOL #2
⊙	HEAD BOX
⊙	TAPPING VALVE
⊙	THRUST BLOCKING PLUG
⊙	NEW SPRINKLER PIPE
⊙	ABOVE FINISHED FLOOR
⊙	ALL THREAD ROD
⊙	A.S. AUTOMATIC SPRINKLER
⊙	CIF OUT IN FIELD
⊙	DN DOWN
⊙	FDC FIRE DEPARTMENT CONNECTION
⊙	FO FINISHED GRADE
⊙	GALV GALVANIZED
⊙	GBE GROOVE BOTH ENDS
⊙	GOE GROOVE ONE END
⊙	GMI GALVANIZED MALLEABLE IRON
⊙	OS&Y OUTSIDE STEM & YOKE
⊙	RN RISER NIPPLE
⊙	TBE THREAD BOTH ENDS
⊙	TOE THREAD ONE END
⊙	T&G THREAD AND GROOVE
⊙	UCN UNLESS OTHERWISE NOTED
⊙	W/ WITH

**SEISMIC CLEARANCE REQUIREMENTS**

PROVIDE CLEARANCE AT ALL PIPING EXTENDING THROUGH WALLS, FLOORS, FOUNDATIONS. NO CLEARANCE REQUIRED AT GYPSUM BOARD OR EQUALLY FRANGIBLE CONSTRUCTION THAT IS NOT REQUIRED TO HAVE A FIRE RESISTANCE RATING.

NOMINAL PIPE SIZE	CORE DRILL HOLE OR PIPE SLEEVE SIZE	AT CONTRACTORS OPTION FLEXIBLE COUPLINGS MAY BE INSTALLED WITHIN 12" OF THE WALL SURFACE ON EACH SIDE OR WITHIN 12" ABOVE FLOOR AND 24" BELOW FLOOR, AND THE CLEARANCES NOTED ARE NOT REQUIRED.
1/4"	1/2"	
1/2"	3/4"	
3/4"	1"	
1"	1 1/4"	
1 1/4"	1 3/4"	
1 1/2"	2"	
2"	2 1/2"	
2 1/2"	3"	
3"	3 1/2"	
3 1/2"	4"	
4"	4 1/2"	
4 1/2"	5"	
5"	5 1/2"	
5 1/2"	6"	
6"	6 1/2"	
6 1/2"	7"	
7"	7 1/2"	
7 1/2"	8"	
8"	8 1/2"	
8 1/2"	9"	
9"	9 1/2"	
9 1/2"	10"	
10"	10 1/2"	
10 1/2"	11"	
11"	11 1/2"	
11 1/2"	12"	
12"	12 1/2"	
12 1/2"	13"	
13"	13 1/2"	
13 1/2"	14"	
14"	14 1/2"	
14 1/2"	15"	
15"	15 1/2"	
15 1/2"	16"	
16"	16 1/2"	
16 1/2"	17"	
17"	17 1/2"	
17 1/2"	18"	
18"	18 1/2"	
18 1/2"	19"	
19"	19 1/2"	
19 1/2"	20"	

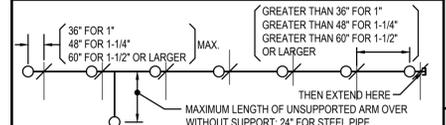
(NOTE THAT AT NON-RATED FRANGIBLE GYPSUM BOARD WALLS NO CLEARANCE IS REQUIRED)

**HANGER SPACING REQUIREMENTS**

NOMINAL PIPE SIZE	STEEL PIPE	MAXIMUM DISTANCE BETWEEN HANGERS (FT-IN.) - N.F.P.A. #13
1/4"	N/A	12-0"
1/2"	N/A	12-0"
3/4"	N/A	12-0"
1"	N/A	12-0"
1 1/4"	N/A	12-0"
1 1/2"	N/A	12-0"
2"	N/A	12-0"
2 1/2"	N/A	12-0"
3"	N/A	12-0"
4"	N/A	12-0"
6"	N/A	12-0"
8"	N/A	12-0"
10"	N/A	12-0"
12"	N/A	12-0"
14"	N/A	12-0"
16"	N/A	12-0"
18"	N/A	12-0"
20"	N/A	12-0"

NOTE: TYPICAL HANGER SYMBOLS AS SHOWN ON PIPING PLAN MAY NOT REFLECT ACTUAL FIELD INSTALLATION. FINAL HANGER INSTALLATION SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF N.F.P.A. #13.

DISTANCE FROM SPRINKLER TO HANGER - N.F.P.A. #13 - MAX PRESSURES ≤ 100 PSI (ALL SPRINKLER TYPES)



**SEISMIC BRACING REQUIREMENTS**

EARTHQUAKE BRACING SHALL CONFORM WITH N.F.P.A. #13 (2010 EDITION), I.B.C. (2012 EDITION), NEHRP, AND ASCE/SEI 7-05 (2007 EDITION) CRITERIA.

DESCRIPTION OF SITE CONDITIONS	
MAPPED SPECTRAL ACCELERATION FOR SHORT PERIODS	S <sub>s</sub> = 0.066
MAPPED SPECTRAL ACCELERATION FOR A 1-SECOND PERIOD	S <sub>1</sub> = 0.028
SITE CLASS	D
SEISMIC OCCUPANCY CATEGORY OF BUILDING	II
MAXIMUM SPECTRAL RESPONSE ACCELERATION AT SHORT PERIODS	S <sub>RS</sub> = 0.07
MAXIMUM SPECTRAL RESPONSE ACCELERATION AT 1-SECOND PERIODS	S <sub>1R</sub> = 0.045
SEISMIC DESIGN CATEGORY BASED ON S <sub>RS</sub>	A
SEISMIC DESIGN CATEGORY BASED ON S <sub>1R</sub>	A
SINCE THE WORST CASE SEISMIC DESIGN CATEGORY FOR EITHER SDS OR SD1 IS 'B' OR LESS THEN THE SPRINKLER SYSTEM IS EXEMPT FROM SEISMIC BRACING PER ASCE 7-05 PARAGRAPH 13.1.4.	

PIPE SIZE	SCHEDULE 40	SCHEDULE 80	SCHEDULE 160
1"	1"	1 1/2"	2"
1 1/2"	1 1/2"	2"	2 1/2"
2"	2"	2 1/2"	3"
2 1/2"	2 1/2"	3"	3 1/2"
3"	3"	3 1/2"	4"
3 1/2"	3 1/2"	4"	4 1/2"
4"	4"	4 1/2"	5"
4 1/2"	4 1/2"	5"	5 1/2"
5"	5"	5 1/2"	6"
5 1/2"	5 1/2"	6"	6 1/2"
6"	6"	6 1/2"	7"
6 1/2"	6 1/2"	7"	7 1/2"
7"	7"	7 1/2"	8"
7 1/2"	7 1/2"	8"	8 1/2"
8"	8"	8 1/2"	9"
8 1/2"	8 1/2"	9"	9 1/2"
9"	9"	9 1/2"	10"
9 1/2"	9 1/2"	10"	10 1/2"
10"	10"	10 1/2"	11"
10 1/2"	10 1/2"	11"	11 1/2"
11"	11"	11 1/2"	12"
11 1/2"	11 1/2"	12"	12 1/2"
12"	12"	12 1/2"	13"
12 1/2"	12 1/2"	13"	13 1/2"
13"	13"	13 1/2"	14"
13 1/2"	13 1/2"	14"	14 1/2"
14"	14"	14 1/2"	15"
14 1/2"	14 1/2"	15"	15 1/2"
15"	15"	15 1/2"	16"
15 1/2"	15 1/2"	16"	16 1/2"
16"	16"	16 1/2"	17"
16 1/2"	16 1/2"	17"	17 1/2"
17"	17"	17 1/2"	18"
17 1/2"	17 1/2"	18"	18 1/2"
18"	18"	18 1/2"	19"
18 1/2"	18 1/2"	19"	19 1/2"
19"	19"	19 1/2"	20"
19 1/2"	19 1/2"	20"	20 1/2"
20"	20"	20 1/2"	21"
20 1/2"	20 1/2"	21"	21 1/2"
21"	21"	21 1/2"	22"
21 1/2"	21 1/2"	22"	22 1/2"
22"	22"	22 1/2"	23"
22 1/2"	22 1/2"	23"	23 1/2"
23"	23"	23 1/2"	24"
23 1/2"	23 1/2"	24"	24 1/2"
24"	24"	24 1/2"	25"
24 1/2"	24 1/2"	25"	25 1/2"
25"	25"	25 1/2"	26"
25 1/2"	25 1/2"	26"	26 1/2"
26"	26"	26 1/2"	27"
26 1/2"	26 1/2"	27"	27 1/2"
27"	27"	27 1/2"	28"
27 1/2"	27 1/2"	28"	28 1/2"
28"	28"	28 1/2"	29"
28 1/2"	28 1/2"	29"	29 1/2"
29"	29"	29 1/2"	30"
29 1/2"	29 1/2"	30"	30 1/2"
30"	30"	30 1/2"	31"
30 1/2"	30 1/2"	31"	31 1/2"
31"	31"	31 1/2"	32"
31 1/2"			

## FIRE ALARM NOTES

1. FIRE ALARM SYSTEM SHALL COMPLY WITH:
  - A) NFPA 70 (NATIONAL ELECTRIC CODE), 2011
  - B) NFPA 72 (FIRE ALARM CODE), 2013
  - C) NFPA 90A, 2009
  - D) IBC, 2012
  - E) ADA/ABA, 2004
2. THE FIRE ALARM SYSTEM SHOWN IS BASED ON HOCHIKI PRODUCTS AND REPRESENTS COMPLETE SHOP DRAWINGS FOR INSTALLATION. SUBSTITUTIONS ARE PERMITTED.
3. COORDINATE THE EXACT DEVICE LOCATIONS WITH ELECTRICAL AND MECHANICAL SYSTEM EQUIPMENT AND BUILDING ARCHITECTURAL FEATURES. INSTALLING CONTRACTOR SHALL CONSULT/CONFIRM ANY NECESSARY DEVIATION OF DEVICE BOX PLACEMENT OR CONDUIT/CIRCUIT ROUTING WITH THE DESIGNER OF RECORD PRIOR TO IMPLEMENTING CHANGES IN THE FIELD.
4. ALL FIRE ALARM CONDUIT SIZES SHALL BE 3/4" MINIMUM UNLESS OTHERWISE NOTED. ALL CONDUIT SHALL BE CONCEALED IN WALL AND CEILING SPACES WHERE FEASIBLE. IN FINISHED AREAS WITHOUT DROP CEILING, INSTALL SURFACE MOUNTED CONDUIT AS NECESSARY. OWNER TO PROVIDE PAINT TO MATCH FOR SURFACE MOUNTED CONDUIT.
5. MINIMUM CIRCUIT PERFORMANCE REQUIREMENTS:
  - IDC - INITIATING DEVICE CIRCUIT SHALL BE CLASS B.
  - NAC - NOTIFICATION APPLICATION CIRCUIT SHALL BE CLASS B.
  - SLC - SIGNALING LINE CIRCUIT SHALL BE CLASS B.
6. "T" TAPPING OF FIRE ALARM NAC CIRCUITS IS PROHIBITED.
7. FIRE ALARM CONTRACTOR SHALL PROVIDE TWO EACH OF DETECTORS, MODULES, RELAYS, AND NOTIFICATION APPLIANCES AS SPARE DEVICES TO THE OWNER. "EXCEPTION: OSID AND PANEL COMPONENTS"
8. PAINT FIRE ALARM JUNCTION BOX COVERS RED. BOTH SIDES OF COVER PLATES SHALL BE PAINTED RED.
9. FIRE ALARM EQUIPMENT CABINETS SHALL HAVE TAGS PERMANENTLY AFFIXED TO THE FACE OF THE ENCLOSURE. LABEL 120VAC CIRCUIT NUMBER SERVING FIRE PANEL. LABEL EACH DEVICE WITH ITS ADDRESS OR NAC DESIGNATOR USING SELF-ADHESIVE LASER PRINTED COMMERCIALY AVAILABLE ID TAGS. MODULES AND SWITCH LABELS SHALL ALSO INCLUDE ASSOCIATED FUNCTION. DO NOT MOUNT SMOKE DETECTORS WITHIN 36" OF AN AIR DIFFUSER OR CEILING FAN.
10. PER 2013 NFPA 72, PARAGRAPHS 10.4.4 & A10.15, SMOKE DETECTORS SHALL BE INSTALLED AT FIRE CONTROL EQUIPMENT IN ACCORDANCE WITH 17.7.3.2.1.
11. ALL FIRE ALARM SYSTEM CONTROL RELAYS SHALL BE LOCATED WITHIN 36" OF THE EQUIPMENT OR CIRCUIT THEY CONTROL.

## ELECTRICAL NOTES

1. THE CONTRACTOR SHALL COMPLY WITH THE CONSTRUCTION PRACTICES AND REQUIREMENTS OF THE REFERENCED EDITION OF THE NATIONAL ELECTRIC CODE (2011 NFPA 70), CURRENT NATIONAL ELECTRICAL SAFETY CODE, AND INSTRUCTIONS OF MANUFACTURERS OF EQUIPMENT AND MATERIALS SUPPLIED FOR THE PROJECT.
2. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL JUNCTION AND PULL BOXES REQUIRED FOR THE INSTALLATION OF ELECTRICAL DEVICES AND EQUIPMENT. WHETHER OR NOT SPECIFICALLY INDICATED ON THE PLANS, SIZING OF THESE BOXES SHALL BE PER THE NATIONAL ELECTRICAL CODE.
3. ALL PENETRATIONS THROUGH FIRE BARRIERS SHALL BE FIRE STOPPED TO MAINTAIN THE INTEGRITY OF THE FIRE BARRIER. FIRE STOPPING MATERIAL SHALL BE U.L. LISTED.
4. THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE OWNER PRIOR TO MAKING ANY PENETRATIONS THROUGH STRUCTURAL MEMBERS.
5. SHOULD PROJECT CONDITIONS REQUIRE REARRANGEMENT OF WORK, THE CONTRACTOR SHALL MARK SUCH CHANGES ON THE AS-BUILT DRAWINGS. IF THESE CHANGES REQUIRE ALTERNATE METHODS TO THOSE SPECIFIED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL SUBMIT DRAWINGS SHOWING THE PROPOSED ALTERNATE METHODS. THE CONTRACTOR SHALL NOT PROCEED UNTIL APPROVAL IS OBTAINED. REARRANGEMENT OF WORK FOR THE PURPOSE OF COORDINATION SHALL NOT BE CONSIDERED AN ITEM FOR EXTRA COST.
6. REPAIR ANY DAMAGE TO EXISTING CONSTRUCTION RESULTING FROM THE INSTALLATION OF ELECTRICAL ITEMS. THE AREAS REPAIRED SHALL MATCH THE ADJACENT SURFACES IN TEXTURE AND COLOR.
7. ALL EXPOSED AND CONCEALED CONDUITS SHALL BE EMT (ELECTRICAL METALLIC TUBING). ALL UNDERGROUND CONDUIT SHALL BE PVC CONDUIT SCHEDULE 40, UNLESS NOTED OTHERWISE. USE FLEXIBLE METAL CONDUIT AND SEAL-TIGHT WHERE APPLICABLE.
8. ALL EQUIPMENT SHALL BE CAPABLE OF FITTING IN THE SPACES LOCATED WHILE MEETING THE MANUFACTURER'S RECOMMENDED ACCESS REQUIREMENTS. REVIEW ALL PLACES WHERE EQUIPMENT IS TO BE INSTALLED PRIOR TO ORDERING OF EQUIPMENT AND NOTIFY THE CONTRACTING OFFICER OF ANY INADEQUATE CLEARANCES OR CONDITIONS THAT WILL PREVENT THE PROPER INSTALLATION, MAINTENANCE, AND OPERATIONS OF THE EQUIPMENT.
9. PROVIDE ACCESS PANELS TO ALL CONCEALED TRANSFORMERS, DEVICES, JUNCTION BOXES AND EQUIPMENT. COORDINATE THE LOCATION OF ACCESS PANELS TO INSURE THAT THE EQUIPMENT CAN BE MAINTAINED ADEQUATELY.
10. ALL 120VAC CIRCUIT BREAKERS SERVING FIRE ALARM EQUIPMENT SHALL BE RED AND LOCKABLE. PROVIDE BREAKER LOCK ON DEVICE(S).
11. ANY PENETRATION OF THE BUILDING VAPOR BARRIER SYSTEM SHALL BE APPROPRIATELY SEALED TO RETAIN THE INTEGRITY OF THE SYSTEM. THIS INCLUDES BUT IS NOT LIMITED TO CONDUITS AND BACKS OF ELECTRICAL BOXES.
12. ALL EQUIPMENT AND CABLE SHALL BE PROPERLY RATED FOR THE CONDITIONS IN WHICH IT IS INSTALLED.
13. ALL EQUIPMENT IN FINISHED AREAS SHALL BE FLUSH OR SEMI-FLUSH MOUNTED TO THE EXTENT SUPPORTED BY THE MANUFACTURER AND ALLOWED BY CODE. ENSURE ADEQUATE CLEARANCES FOR HINGED COVERS/DOORS.

CONTRACTOR IS TO UTILIZE THE LOWER BACK DOOR DURING ALL CONSTRUCTION WITHIN THE BUILDING. PUBLIC AREAS/HALLWAYS ALL PUBLIC AREAS MUST BE CLEARED OF DEBRIS AND STORAGE AT THE END OF EACH DAY DURING CONSTRUCTION. IF STAGING MATERIALS IN PUBLIC AREAS OR HALLWAYS, CONTRACTOR SHALL CLEARLY DELINEATE DAILY STORAGE ZONES WITH SAFETY CAUTION TAPE. AT NO TIME SHALL CONTRACTOR BLOCK EMERGENCY EGRESS PATHWAYS. CONTRACTOR SHALL COMPLETE HOUSEKEEPING AT THE END OF EACH DAY IN ALL PUBLIC AREAS. CONTRACTOR SHALL COMPLETE A FINAL CLEAN OF EACH ROOM.

## MATERIAL KEYNOTES

- FX3 FIRE ALARM COMMUNICATOR PANEL
- 2 ADDRESSABLE SMOKE DETECTOR
- 3 JUNCTION BOX
- 4 WATERFLOW SWITCH
- 5 TAMPER SWITCH
- 7 MANUAL FIRE ALARM / PULL STATION

### GENERAL NOTES

1. FIRE ALARM DESIGN TO EXCLUSIVELY MONITOR WATERFLOW, SUPERVISORY, AND GATE VALE TAMPER CONDITIONS.

### PLAN KEY NOTES

1. NEW HOCHIKI 4555 - 4 ZONE FIRE PANEL W/ BUILT IN PRIMARY GSM CELLULAR COMMUNICATOR OR EQUAL
2. FIELD ROUTE 120 V CONDUIT TO NEW FIRE ALARM PANEL LOCATION AND ELECTRIC BELL
3. 120 V ELECTRIC ALARM BELL
4. SYSTEM SENSOR SMOKE DETECTOR MODEL #H-B (4-WIRE, 23 Ma @ 24V) OR EQUAL

MATERIALS SHOWN ARE OF DOMESTIC OR IMPORT ORIGIN	FITTINGS AND OUTLETS	PIPE	SCHEDULE 40	SCHEDULE 80	SCHEDULE 40	SCHEDULE 80

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**J. ANDERSON**  
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PROFESSIONAL ENGINEER

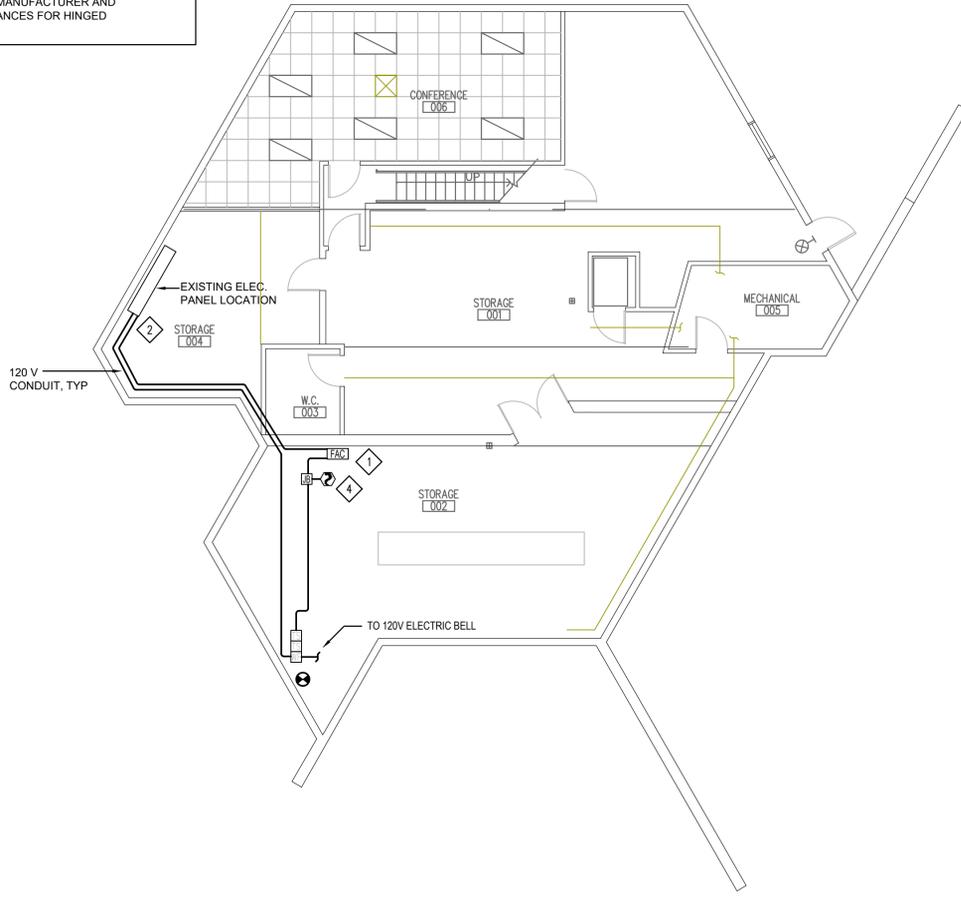
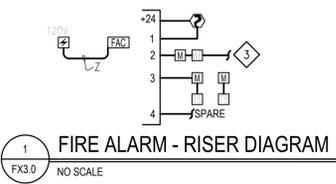
WATER FLOW		APPROVALS & COORDINATION		REVISIONS	
STATIC PRESSURE:	63 PS	DESIGNED BY:	J. ANDERSON	NO.	DATE
RESIDUAL PRESSURE:	43 PS	CHECKED BY:	J. ANDERSON	1	12-16-2019
GPM FLOWING:	688 GPM	DATE:	09/29/2019	2	02/03/2020
TEST TAKEN AT:	SNYDER ST	REVISIONS		3	02/20/2020
TEST TAKEN BY:	GLENDAE FD	DESCRIPTION			
DATE:	09/29/2019	NEW WET SYSTEM			

CONTRACT NAME: MONTANA STATE PARK, BASEMENT FIRE ALARM SPRINKLERS  
1301 SNYDER ST, GLENDALE, MT 59330  
CONTRACT WITH: MONTANA FISH, WILDLIFE & PARKS DESIGN & CONSTRUCTION  
1522 NINTH AVE, HELENA, MT 59620  
DESCRIPTION: BASEMENT - FIRE ALARM PLAN

SCALE: 1/8" = 1'-0"  
DRAWN BY: B. HOFFMAN  
CHECKED BY: J. ANDERSON  
DATE: 01/08/2020  
CONTRACT NO.:  
COFFMAN #: 191665  
SHEET NO.: **FX3.0**

### OPERATIONAL MATRIX

- WATERFLOW SWITCH TO ENGAGE ELECTRIC BELL AND ALARM PANEL
- TAMPER SWITCH TO SUPERVISORY ALARM AT PANEL AND SEND TO SUPERVISORY STATION
- SMOKE DETECTOR TO ALARM PANEL AND NOTIFY RESPONDING STATION



**A BASEMENT - FIRE ALARM PLAN**

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

**GENERAL SYSTEM SPECIFICATIONS**

**PART 1- GENERAL**

**1.1 SCOPE**

A. Furnish and install an automatic sprinkler system to protect the the basement floor only, as shown on the drawings, with accessories as necessary. Connect system to a water supply of sufficient pressure to ensure full and sustained water discharge immediately from sprinkler heads. Water supply shall conform to NFPA water supply requirements. Furnish and install a Fire Alarm system to monitor the automatic sprinkler system in accordance with NFPA #72. Install an underground Fire Service line from the existing 6" city water main in the street as shown on the drawings and in accordance with NFPA #24.

B. All portions of the systems shall be installed in accordance with the drawings, details, and specifications and as required by jurisdictional authorities and codes. The position is taken that the Owner is entitled to a project which meets or exceeds the minimum requirements of nationally recognized fire protection standards. All efforts and installations shall be directed toward this end. Where there is a conflict between the contract drawings and/or specifications, and the requirements of the jurisdictional authorities or codes, the conflict shall be brought to the attention of the Engineer at least ten (10) days prior to bidding or be resolved at no cost to the Owner. If the contractor has not identified conflicts to the Engineer, he shall be responsible for complying with the most restrictive (expensive) methods.

**1.2 REGULATORY AGENCIES**

A. The term jurisdictional authority used in this section of the specification shall include, as applicable, but not be limited to the following:  
 1. Glendive Fire Department  
 2. Glendive Water Department  
 3. State of Montana Building Department  
 4. Insurance Services Office or Insuring Authority having jurisdiction.  
 5. Owner.

B. The design and installation of all systems of fire protection shall conform to all requirements of applicable codes and publications herein defined:  
 1. International Building Code (2012)  
 2. NFPA #13 (2010)  
 3. NFPA #24 (2010)  
 4. NFPA #72 (2010)  
 5. All State and local ordinances  
 6. Underwriters Laboratories

**1.3 SUBMITTALS**

A. General  
 1. These drawings represent complete shop drawings and have already been submitted to the authorities have jurisdiction for approval. The successful Contractor shall provide submittal data as required under other portions of this specification.  
 B. Installer's Qualifications  
 1. All systems of fire protection shall be installed by a licensed (for the location of installation) Fire Protection Contractor, fully experienced in fire protection installation as required and specified herein.  
 2. All installers shall be competent and shall hold an endorsement by the State of Montana. Prior to beginning work, current Contractor's and Installer's license and endorsements shall be on file with the Department of Commerce Professional and Occupational Licensing Bureau, (301 South Park, P.O. Box 200513, Helena, MT 596200513).  
 3. Fire Protection Contractors may be required to provide in writing specific information as to successfully completed projects and references to show cause as to why they should be considered acceptable to the engineer.  
 C. Close-Out  
 1. Record Drawings required per paragraph 1.5 and Operation and Maintenance Manuals required per paragraph 1.6, shall be submitted for approval.

**1.4 JOB CONDITIONS**

A. The Contractor shall investigate the structural, mechanical, electrical, and finished conditions affecting the piping, and shall arrange the equipment accordingly, furnishing required fittings, offsets and accessories. Route fire protection piping to avoid interference with duct work and drain piping. In the event it becomes necessary to make field changes in pipe locations due to building construction, the Contractor shall consult with the Engineer before making any changes. Any such changes required shall be made without added cost to the Owner.  
 B. The Contractor shall determine, and be responsible for, the proper locations and type of inserts for hangers, chases, sleeves, and other openings in the construction required for fire protection work, and shall obtain this information well in advance of the construction progress to avoid delay of the work.  
 C. The drawings indicate approximate locations of sprinkler heads and conceptual routing of piping. Contractor is responsible for final locations and routing. Contractor shall review all contract documents including architectural, structural, mechanical, electrical, etc. for actual contract conditions.  
 D. All fees and permits specifically required for fire protection work, not obtained by others as specified elsewhere shall be applied for and paid for by this Contractor.

**1.5 RECORD DRAWINGS**

A. One approved set of drawings shall be maintained on the job at all times.  
 B. One set of "As-Built" drawings shall be kept on the job at all times. "As-Built" drawings shall be kept current daily. "As-Built" drawings shall be available at all times to Engineer for review and use.  
 C. One reproducible set of "As-Built" drawings shall be provided to the Engineer upon completion of the work.

**1.6 OPERATION AND MAINTENANCE MANUALS**

A. Three (3) sets of operating and maintenance instructions shall be provided the Owner upon completion. Manuals shall include, as a minimum, the following:  
 1. "As-Built" Drawings  
 2. Catalog cut sheets of all materials installed  
 3. Equipment maintenance manuals  
 4. Acceptance Test Certificate for the Automatic Sprinkler System  
 5. Acceptance Test Certificate for the Fire Alarm System  
 6. Certification of Owner Training  
 7. Contractor Guarantee and Warranty  
 8. "As-Built" Auto CAD drawing (dwg) file or equal on CD  
 B. One (1) copy of NFPA #25 (2010) shall be provided to the Owner.

**1.7 TRAINING**

A. The Contractor shall instruct the Owner in the operation of all systems. Instruction shall continue until the Owner is fully satisfied that he understands the operation of his system.  
 B. Contractor shall obtain Owner's dated signature that all training has been accomplished and is acceptable to the Owner.

**1.8 GUARANTEES AND WARRANTIES**

A. The Contractor shall guarantee to the Owner in writing, all equipment and workmanship for a period of one (1) year after the fire protection system has been placed in continuous service and has been accepted by all authorities having jurisdiction.  
 B. The Contractor shall not be held responsible for improper or negligent maintenance by the Owner after operating and maintenance instructions has been given the Owner.

**PART 2- PRODUCTS**

**2.1 SYSTEM EQUIPMENT**

A. Where contract documents indicate specific model number or manufacturer; Contractor may substitute identical equipment approved for fire protection use. Similar equipment may be substituted if Contractor submits revised design, substituted materials, and revised calculations for approval.

**2.2 PIPE AND FITTINGS - UNDERGROUND**

A. All underground pipe, fittings, and valves shall conform to NFPA #13 and NFPA #24 requirements.  
 B. Piping underground shall be Class 52 ductile iron pipe or as required by the local utility company. Straight runs of pipe with no offsets may be rubber joint with bell and spigot. All fittings shall consist of mechanical joint type.  
 C. All buried pipe and fittings shall be installed in a sand bedded trench, 6" under pipe and filled with sand to 12" minimum above pipe.  
 D. Prior to connection to existing water line and covering of piping, block or rod underground piping and fittings for static and surge pressures. Furnish and install concrete thrust blocks and joint ties at each change in direction of all underground piping or with use of mechanical joint restraints in accordance with NFPA #13 and NFPA #24 requirements.  
 E. Prior to connection to existing water line, the Water Authority having jurisdiction shall be contacted so that they can inspect the procedures used.  
 F. All underground pipe shall be tested and flushed in accord with NFPA #13 and NFPA #24 requirements.  
 G. Any disturbance to the existing landscape or sidewalk shall be repaired to match existing conditions.

**PART 3- EXECUTION**

**3.1 INSTALLATION**

A. Where details of installation are not given, the installation shall be made using manufacturer's recommended practices or at the direction of the Engineer.  
 B. Contractor shall complete the all systems ready for operation, in all respects, as soon as possible. When system is complete and ready for continuous operation, activate the system for its intended use. After system has been activated for continuous use, water charges will be paid by the Owner.  
 C. This Contractor shall remove from the building and site, all rubbish and unused materials due to or connected with this installation.  
 D. The surface of all piping shall be cleaned and left ready for painting.

**3.2 TESTING**

A. All testing shall be accomplished in accord with NFPA standards and requirements.  
 B. This Contractor shall call for inspection and complete Contractor's Material and Test Certificates signed by the authority having jurisdiction.  
 C. The entire sprinkler system shall be hydrostatically tested at not less than 200 psig pressure for a period of not less than two (2) hours with no pressure drop in the system.  
 D. The Fire Alarm system shall be test in accordance with NFPA #72.  
 E. The Underground system shall be flushed and test in accordance with NFPA #24.  
 F. All testing shall be witnessed by a representative of the Engineer or Owner.  
 G. Where jurisdictional authority's standards are more stringent than the above test, they shall prevail.  
 H. Furnish copies of Aboveground Test Certificate with close-out documentation.

END OF SECTION

PIPE SIZE	PIPE	FITTINGS AND OUTLETS
1"	SCHEDULE 40	CLASS 52 DUCTILE IRON THREADED FITTINGS (DNF PR INTD)
1 1/2" TO 4"	SCHEDULE 80	WEIGHTED DUCTILE IRON BALL GROOVES (ENGS AND LIMITED DUCTILE IRON GROOVED FITTINGS DNFS RATED(S)SPR TAKE-OUT (E, F, G, H, I, J))
1" TO 2"	SCHEDULE 40	BLACK CLASS 150 CAST IRON THREADED FITTINGS (DPS RATED)

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NO.	DATE	DESCRIPTION
1	10-16-2019	REVISED PER RFP COMMENTS
2	02/03/2020	ELEVATOR CHANGE
3	02/20/2020	ADDITIONAL #3

STATIC PRESSURE:	63 PSF
RESIDUAL PRESSURE:	43 PSF
GPM FLOWING:	699 GPM
TEST TAKEN AT:	SNYDER ST
DATE:	09/29/2019

CONTRACT NAME:	MAKOSHIKA STATE PARK, BASEMENT FIRE ALARM SPRINKLERS
CONTRACT WITH:	MONTANA FISH, WILDLIFE & PARKS DESIGN & CONSTRUCTION
CONTRACTOR:	1301 SNYDER ST, GLENDIVE, MT 59330
DESCRIPTION:	PROJECT SPECIFICATIONS

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

DRAWN BY: B. HOFFMAN  
 CHECKED BY: J. ANDERSON  
 DATE: 01/08/2020

CONTRACT NO.:  
 COFFMAN #: 191665  
 SHEET NO.: **FX4.0**