FIRE ALARM SYSTEM LEGEND

FACU	FIRE ALARM CONTROL UNIT
FPC	FIRE PUMP CONTROLLER
JPC	JOCKEY PUMP CONTROLLER
BATT	SECONDARY POWER SUPPLY (BATTERY)
SS	SURGE SUPPRESSOR (PROVIDED BY DIVISION 26) (TRANSIENT VOLTAGE SURGE SUPPRESSOR)
FAC	FIRE ALARM COMMUNICATOR
FAA	FIRE ALARM ANNUNCIATOR
ESFO	EMERGENCY FUEL SHUT OFF PANEL
S P	SMOKE DETECTOR P = PHOTOELECTRIC
AIM	ADDRESSABLE INPUT MONITOR MODULE
AOM	ADDRESSABLE OUTPUT CONTROL MODULE
	GROUND
WF	WATER FLOW DETECTOR / SWITCH (PROVIDED BY DIVISION 21)
VS	VALVE SUPERVISORY SWITCH (PROVIDED BY DIVISION 21)
	HORN / STROBE COMBINATION

SYMBOL IDENTIFICATION LEGEND

EXISTING

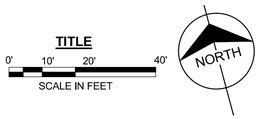
NEW

DEMOLISH

ABBREVIATIONS

AHJ	AUTHORITY HAVING JURISDICTION
EFSO	EMERGENCY FUEL SHUT OFF
FA	FIRE ALARM
FACU	FIRE ALARM CONTROL UNIT
FM	FM GLOBAL
FT	FOOT/FEET
HCTS	HYDRANT CART TEST STAND
IDC	INITIATING DEVICE CIRCUIT
NAC	NOTIFICATION APPLIANCE CIRCUIT
NEC	NATIONAL ELECTRICAL CODE
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
PDC	POWER DISTRIBUTION CENTER
SLC	SIGNALING LINE CIRCUIT
TYP	TYPICAL
UL	UNDERWRITERS LABORATORY
VS	TAMPER SWITCH
WF	WATER FLOW SWITCH
WP	WEATHER-PROOF

PLAN TITLE



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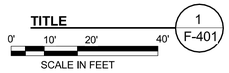

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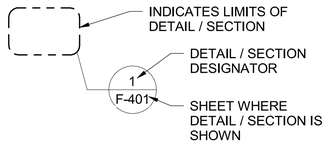

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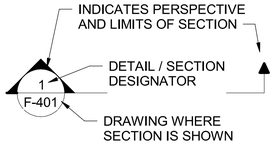


GENERAL NOTES

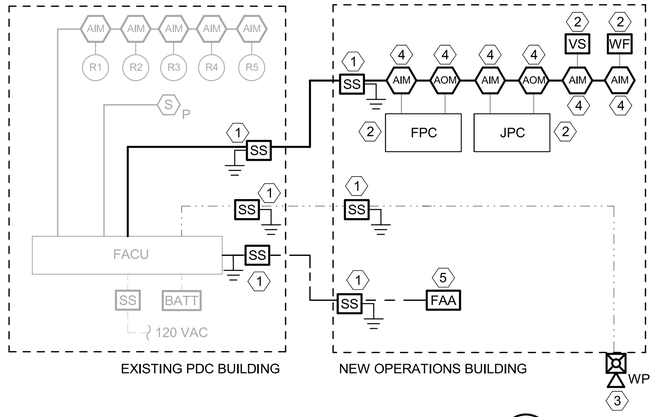
1. PROVIDE AN ADDRESSABLE FIRE ALARM SYSTEM EXPANSION TO COMMUNICATE WITH THE EXISTING EFSO SYSTEM. UTILIZE UNDERGROUND CONDUIT PROVIDED BY DIVISION 26 (SEE SHEETS E-103 AND E-104B) FROM THE PDC BUILDING TO THE OPERATIONS BUILDING TO ROUTE REQUIRED CONDUCTORS SUCH AS SLC'S AND IDC'S. CONNECT TO FOAM ROOM FIRE ALARM COMPONENTS AND THE FAA.
2. COORDINATE ALL REQUIRED SYSTEMS TO THE SATISFACTION OF THE ENGINEER AND AHJ. ANY DEFICIENCIES, INCONSISTENCIES, OR POORLY COORDINATED INSTALLATIONS SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.
3. THE FIRE ALARM DRAWINGS ARE SCHEMATIC IN NATURE AND SHOW A MINIMAL QUANTITY OF DEVICES. DETERMINE THE FINAL QUANTITY AND LOCATION OF ALL DEVICES IN ACCORDANCE WITH THE SPECIFICATIONS, CONTRACT DRAWINGS, AND MANUFACTURER'S WRITTEN RECOMMENDATIONS TO BE COMPLIANT WITH ALL APPLICABLE CODES AND STANDARDS. PROVIDE ADDITIONAL DEVICES WHEN REQUIRED FOR A FULLY FUNCTIONING FIRE ALARM SYSTEM AS REQUIRED BY NFPA 72.
4. CONCEAL ALL CONDUITS IN WALLS OR ABOVE CEILINGS UNLESS OTHERWISE INDICATED. EXCEPTION: CONDUIT IS ALLOWED TO BE SURFACE MOUNTED ON WALLS AND CEILINGS IN UNFINISHED AREAS (E.G. MECHANICAL ROOM, ELECTRICAL PDC). DO NOT TRAPEZE CONDUIT ACROSS AN OPEN SPACE.
5. PROVIDE CONDUIT IN ACCORDANCE WITH THE REQUIREMENTS OF THE ELECTRICAL SPECIFICATIONS, UNLESS OTHERWISE NOTED. SUPPORT CONDUIT IN ACCORDANCE WITH THE NEC (E.G. MAXIMUM 10 FT SUPPORT INTERVALS AND 3 FT FROM A TERMINATION). TENSION ONLY HANGERS ARE NOT PERMITTED.
6. COLOR COORDINATE ALL CONDUCTORS THROUGH THE SYSTEM IN RELATION TO DEVICES THEY FEED SUCH AS SLC - BLACK/RED. PROVIDE ADDRESSABLE SLC CIRCUITS WITH SHIELDED CONDUCTORS, WHERE THE SHIELDING IS GROUNDED AT ONE END. PROVIDE ALL CIRCUITS WITH LABELING AT THE POINT OF TERMINATION SUCH AS SLC 1.
7. DO NOT USE FIRE ALARM EQUIPMENT PANELS AS RACEWAY FOR ROUTING POWER WIRING OR LOW VOLTAGE WIRING. ONLY ROUTE WIRING TERMINATING WITHIN THE PANEL INTO THE PANEL. PROVIDE 1/4 INCH SEPARATION BETWEEN POWER-LIMITED FIRE ALARM CIRCUITS AND POWER CIRCUITS.
8. INSTALL SURGE SUPPRESSORS TO PROTECT ALL POWER SUPPLY CIRCUITS TO THE FACU AND ALL FIRE ALARM CIRCUITS LEAVING OR ENTERING THE BUILDING. MOUNT SURGE SUPPRESSORS IN A SEPARATE ENCLOSURE, UNLESS IT IS UL LISTED AND FACTORY INSTALLED IN THE CONTROL UNIT. ALLOW 3 FT OF CONDUCTOR LENGTH BETWEEN SURGE SUPPRESSOR AND THE PROTECTED EQUIPMENT.
9. INSTALL FIRE ALARM BATTERIES IN THE ENCLOSURE OF THE DEVICE/UNIT IT SUPPORTS (E.G. FACU ENCLOSURE) OR IN AN INDEPENDENT DEDICATED ENCLOSURE.

FIRE ALARM CONTROL UNIT (FACU) FUNCTIONAL MATRIX

	NOTIFICATION			
	NOTIFICATION TO FIRE ALARM ANNUNCIATOR BY CONDITION	COMMON TROUBLE SIGNAL TO COMMUNICATION CENTER	COMMON SUPERVISORY CONDITION TO COMMUNICATION CENTER	COMMON ALARM CONDITION TO COMMUNICATION CENTER
ALARM SIGNALS				
OPERATIONS EFSO ACTIVATION - R1	X			X
HCTS/EAST EXIT EFSO ACTIVATION - R2	X			X
OFFLOAD EFSO ACTIVATION - R3	X			X
TANK/PUMP PAD AREA EFSO ACTIVATION - R4	X			X
FACU TO AIR SIDE ACTIVATION MAIN 1660 EFSO ACTIVATION - R5	X			X
FIRE PUMP RUNNING	X			X
FLOW SWITCH - WET PIPE SYSTEM	X			X
TROUBLE SIGNALS				
AC POWER FAILURE	X	X		
LOW BATTERY	X	X		
OPEN CIRCUIT FAULT	X	X		
GROUND FAULT	X	X		
COMPONENT COMMON TROUBLE	X	X		
FIRE ALARM ANNUNCIATOR TROUBLE SIGNAL	X	X		
SUPERVISORY SIGNALS				
COMPONENT COMMON SUPERVISORY	X		X	
FIRE PUMP POWER / PHASE FAILURE	X		X	
FIRE PUMP PHASE REVERSAL	X		X	
FIRE PUMP CONTROLLER SUPERVISORY	X		X	
FIRE PUMP CONTROLLER MAIN SWITCH OFF OR MANUAL	X		X	
FIRE PUMP CONTROLLER / ENGINE TROUBLE	X		X	
TAMPER SWITCH - GENERAL VALVE SUPERVISORY	X		X	

FIRE ALARM KEY NOTES (#)

1. QUANTITY AND LOCATION BY CONTRACTOR'S DESIGN TO MEET DESIGN CRITERIA.
2. REFER TO FIRE SUPPRESSION DRAWINGS FOR QUANTITY AND/OR LOCATIONS FOR DEVICE(S).
3. EXTERIOR WP HORN STROBE OVER FDC.
4. PROVIDE ADDRESSABLE INPUT AND/OR OUTPUT MODULE(S) AS REQUIRED TO ACHIEVE THE FUNCTIONALITY INDICATED IN THE FIRE ALARM MATRIX.
5. REFER TO FIRE ALARM PLANS FOR QUANTITY AND/OR LOCATIONS OF DEVICE(S).



FIRE ALARM ONE-LINE DIAGRAM
NTS
1
FA001

CIRCUIT LEGEND

- SIGNALING LINE CIRCUIT (CLASS B)
- INITIATING DEVICE CIRCUITS (CLASS B)
- POWER CIRCUIT
- DATA CIRCUIT
- NOTIFICATION APPLIANCE CIRCUIT

ESFO CIRCUITS

R1	OPERATIONS ESFO CIRCUIT
R2	HCTS/EAST EXIT CIRCUIT
R3	OFFLOAD ESFO CIRCUIT
R4	TANK/PUMP PAD AREA CIRCUIT
R5	FACU TO AIR SIDE ACTIVATION MAIN TERMINAL ROOM 1660

REGISTERED PROFESSIONAL ENGINEER
94771PE
Dec 21, 2023
OREGON
MAY 14, 2019
WILLIAM ALLAN CLAY
EXPIRES: Dec 31, 2025

no.	date	by	ckd	description
A	12-21-23	RJL	KLK	ISSUED FOR PERMIT

ISSUED FOR PERMIT ONLY

BURNS McDONNELL
9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
Burns & McDonnell Engineering Co, Inc.

date	detailed
12/21/23	S.PERUMAL
designed	checked
K. KURTENBACH	R. HINSON

PDX FUEL COMPANY L.L.C

PORTLAND INTERNATIONAL AIRPORT
5000 NE MARINE DR.
PORTLAND, OREGON 97218

PDX FACILITY IMPROVEMENTS

FIRE ALARM NOTES, LEGEND AND ABBREVIATIONS

project	contract
153929	

drawing **FA001** rev. **A**

file

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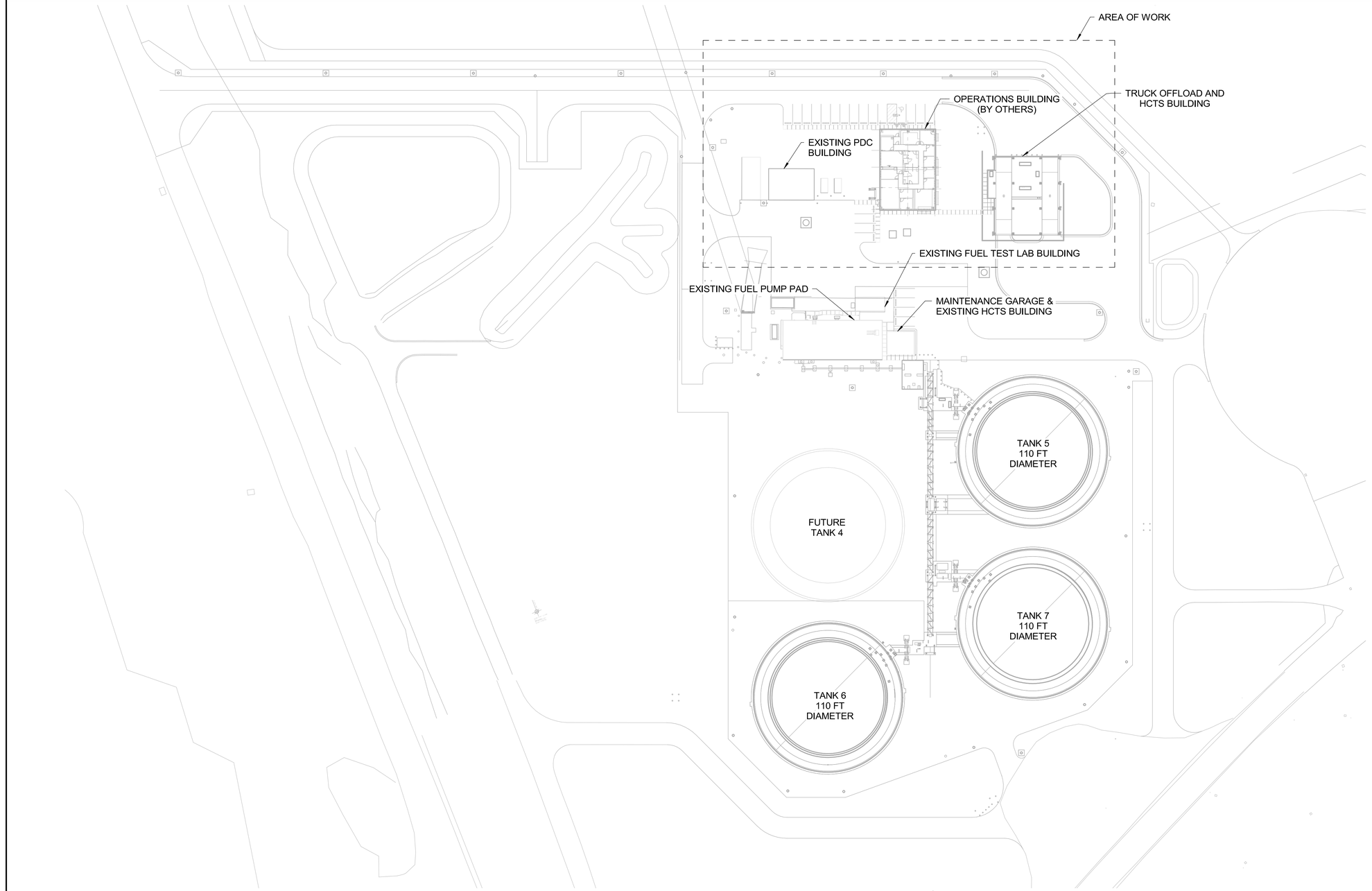


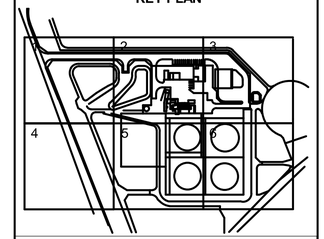
FIRE ALARM OVERALL SITE PLAN

0 25' 50' 100'

NORTH

no.	date	by	ckd	description
A	12-21-23	RJL	KLK	ISSUED FOR PERMIT

KEY PLAN



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KANSAS CITY, MO 64114
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12/21/23	S.PERUMAL
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PORTLAND INTERNATIONAL AIRPORT
5000 NE MARINE DR.
PORTLAND, OREGON 97218

PDX FACILITY IMPROVEMENTS
FIRE ALARM OVERALL SITE PLAN

project	contract
153929	

drawing **FA101** rev. **A**

file

REGISTERED PROFESSIONAL ENGINEER
94771PE
OREGON
MAY 14, 2019
WILLIAM ALLAN CLAY
EXPIRES: Dec 31, 2025

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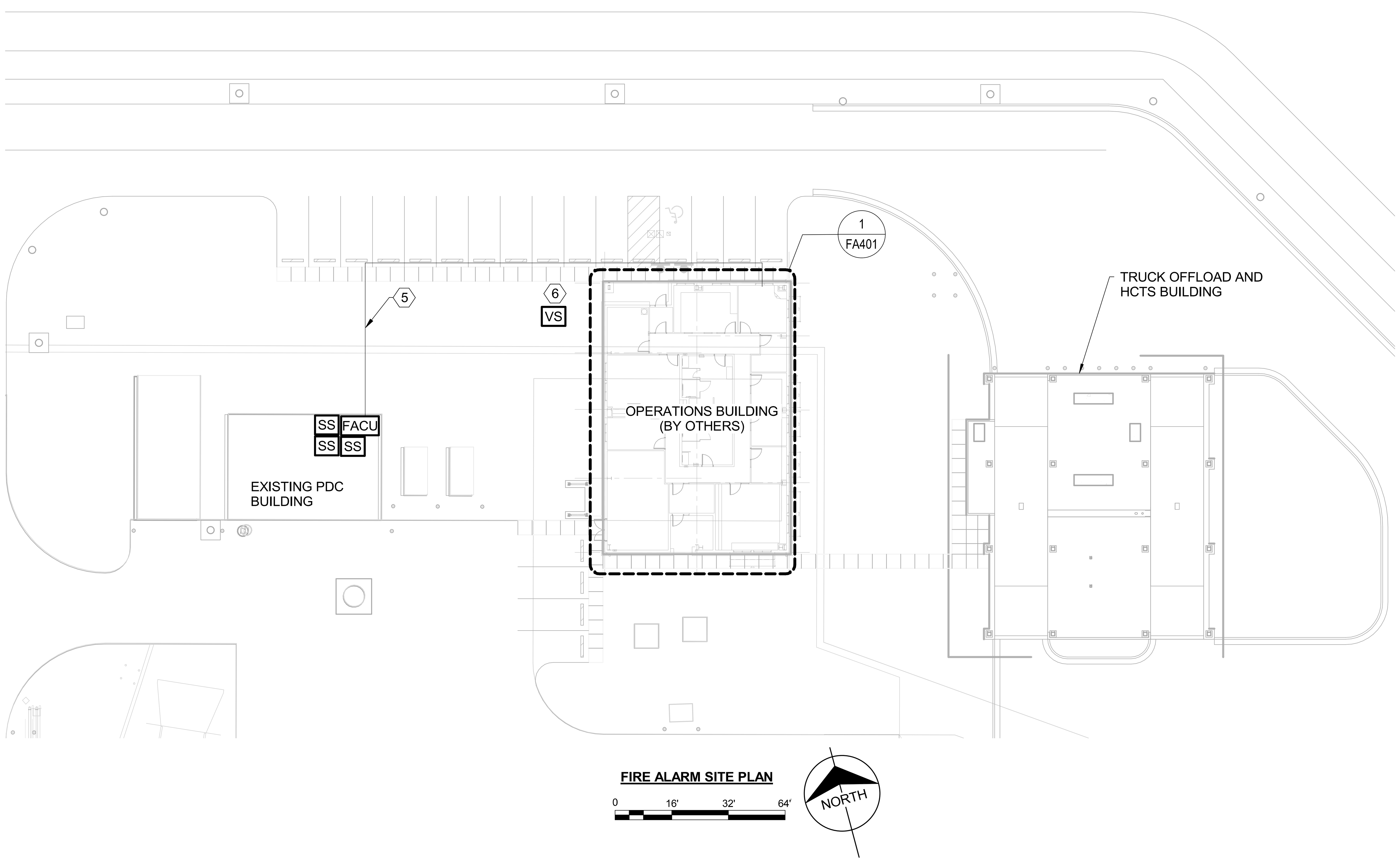
GENERAL SHEET NOTES

1. REFER TO FA001 FOR GENERAL NOTES, DESIGN CRITERIA, FUNCTIONAL MATRIX, FIRE ALARM ONE-LINE DIAGRAM, ABBREVIATIONS AND SYMBOLS.
2. REFER TO ELECTRICAL DRAWINGS E-101, E-102, E-103, AND E-104B FOR CONDUIT ROUTING BETWEEN BUILDINGS.
3. FIRE ALARM CONTRACTOR RESPONSIBLE FOR ABOVE GRADE CONDUIT ROUTING.

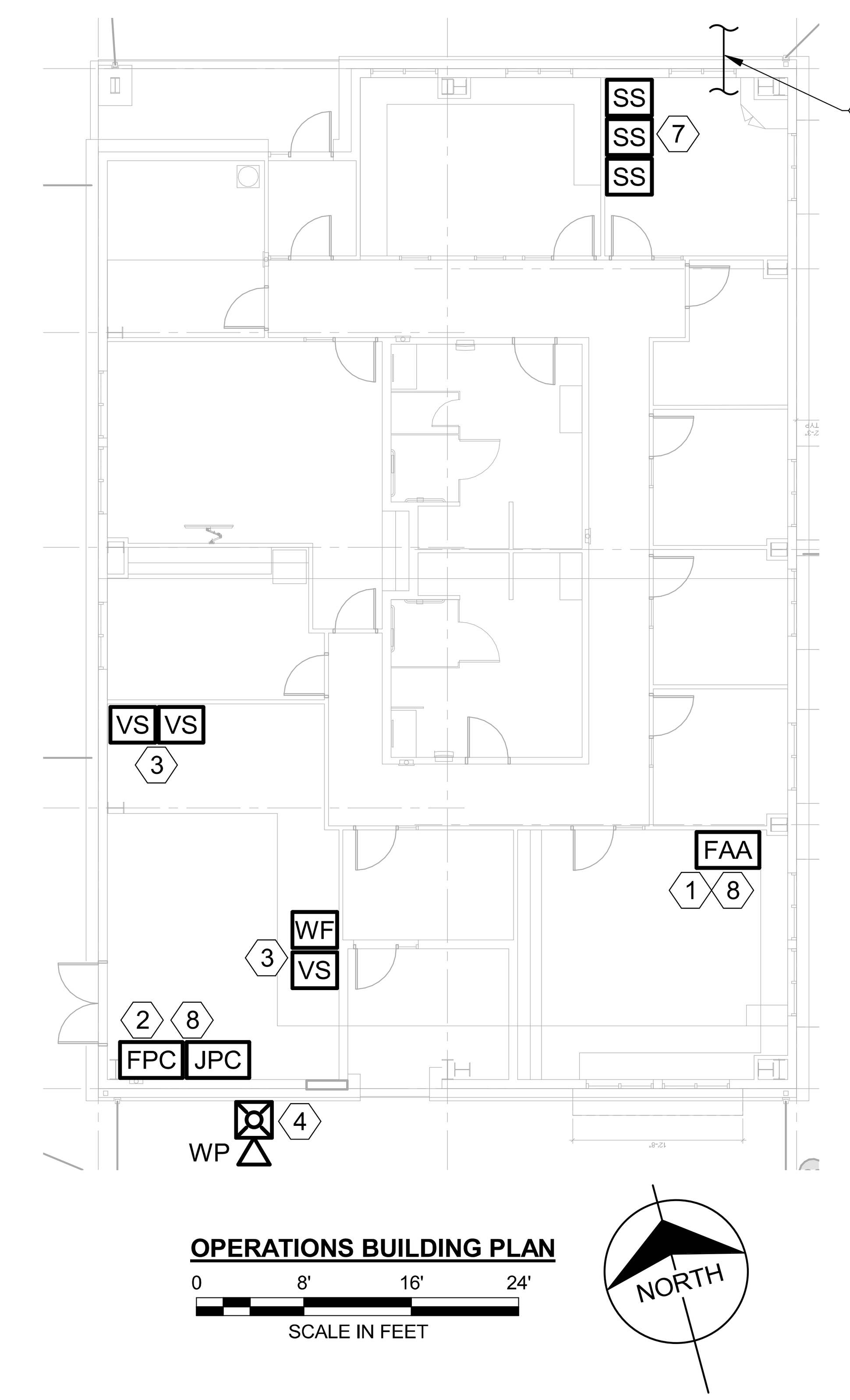
KEY NOTES (X)

1. PROVIDE FIRE ALARM ANNUNCIATOR IN OPERATIONS BUILDING. COORDINATE LOCATION WITH OWNER.
2. PROVIDE MONITORING OF FIRE PUMP AND JOCKEY PUMP CONTROLLERS.
3. PROVIDE MONITORING OF VALVE TAMPER SWITCH AND WATER FLOW SWITCH.
4. PROVIDE HORN STROBE OVER FDC.
5. UNDERGROUND CONDUIT FROM PDC TO OPERATIONS BUILDING PROVIDED BY ELECTRICAL.
6. PROVIDE TAMPER SWITCH FOR PIV ON WATER FIRE WATER SUPPLY.
7. PROVIDE SURGE SUPPRESSORS ADJACENT TO WHERE THE CIRCUIT PENETRATES THE BUILDING.
8. CONDUIT ROUTE THROUGH BUILDING PROVIDED BY OTHERS.



FIRE ALARM SITE PLAN

0 16' 32' 64'



OPERATIONS BUILDING PLAN

0 8' 16' 24'

SCALE IN FEET

no.	date	by	ckd	description
A	12-21-23	RJL	KLK	ISSUED FOR PERMIT

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BURNS McDONNELL

9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
Burns & McDonnell Engineering Co, Inc.

date 12/21/23	detailed S.PERUMAL
designed K. KURTENBACH	checked R. HINSON

PDX FUEL COMPANY L.L.C

PORTLAND INTERNATIONAL AIRPORT
5000 NE MARINE DR.
PORTLAND, OREGON 97218

PDX FACILITY IMPROVEMENTS
FIRE ALARM FLOOR PLAN

project 153929	contract
drawing **FA401**	rev. **A**

file

REGISTERED PROFESSIONAL ENGINEER
94771PE
Dec 21, 2023
OREGON
MAY 14, 2019
WILLIAM ALLAN CLAY
EXPIRES: Dec 31, 2025

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FIRE SUPPRESSION LEGEND

- PRESSURE REGULATING VALVE
- PRESSURE RELIEF VALVE
- OUTSIDE SCREW AND YOKE VALVE (OS&Y) VALVE
- INDICATING BUTTERFLY VALVE POST INDICATING VALVE (PROVIDED BY DIV 33)
- BACKFLOW PREVENTER RPZ TYPE
- CHECK VALVE
- MANUAL BALL VALVE
- LOW POINT DRAIN
- HYDRAULICALLY ACTUATED BALL VALVE
- Y STRAINER
- TEST HEADER
- FIRE DEPARTMENT CONNECTION
- PIPE CAP
- REDUCER
- PROPORTIONER
- OSCILLATING FOAM MONITOR
- FOAM CHAMBER
- RISER LOCATION
- FP — FIRE PUMP
- JP — JOCKEY PUMP
- FPC — FIRE PUMP CONTROLLER
- JPC — JOCKEY PUMP CONTROLLER
- AUTOMATIC AIR RELEASE VALVE
- FIRE HYDRANT (PROVIDED BY DIV 33)
- SEISMIC SEPARATION ASSEMBLY WITH LOW POINT DRAIN (DETAIL 4/FX502)
- FLOW METER
- HOSE CONNECTION
- BLIND FLANGE
- FLEXIBLE COUPLING

FIRE SUPPRESSION SYSTEM

- WET SYSTEM

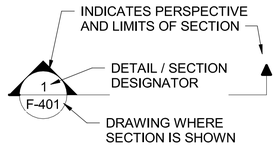
PIPING SYMBOLS

- FIRE WATER LINE PIPING ABOVE GROUND
- –FW—FW– FIRE WATER UNDERGROUND
- —AG FP— ABOVE GROUND FOAM SOLUTION PIPING
- —UG FP— UNDERGROUND FOAM SOLUTION PIPING
- —FC—FC— FOAM CONCENTRATE PIPING
- ELBOW UP OR DOWN
- TEE UP OR DOWN

CONSTRUCTION INTERFACE

- DEMOLITION
- EXISTING
- NEW
- EXISTING
- EXISTING
- NEW
- DEMOLISH

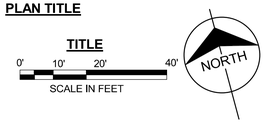
SECTION CUT SYMBOL



FIRE SUPPRESSION ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AFFF	AQUEOUS FILM FORMING FOAM
AHJ	AUTHORITY HAVING JURISDICTION
APPROX	APPROXIMATELY
AS	AUTOMATIC SPRINKLER
CA	CLEAN AGENT
DI	DUCTILE IRON
FL	FIRE LINE
FF	FLAT-FACE
FP	FIRE PUMP
FM	FM GLOBAL
GS	GALVANIZED STEEL
HSCP	HORIZONTAL, SPLIT-CASE
HDPE	HIGH DENSITY POLYETHYLENE
IPS	IRON PIPE SIZE
JP	JOCKEY PUMP
(M)	MECHANICALLY SUPERVISED
MSC	MULTI-STAGE CENTRIFUGAL
NC	NORMALLY CLOSED
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NO	NORMALLY OPEN
PRV	PRESSURE REGULATING VALVE
RF	RAISED FACE
RN	RISER NIPPLE
RPZ	REDUCED PRESSURE ZONE
(S)	ELECTRICALLY SUPERVISED
SPR	SPRINKLER PIPE
SQ FT	SQUARE FOOT
UL	UNDERWRITERS LABORATORY
UNO	UNLESS NOTED OTHERWISE

PLAN TITLE



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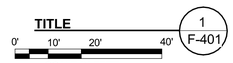
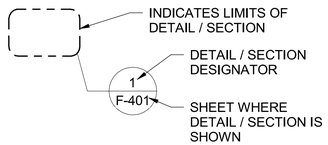


DETAIL / ENLARGED CALLOUT SYMBOL



FIRE SUPPRESSION DESIGN CRITERIA

1. SERVE THE FIRE SUPPRESSION SYSTEM FROM THE NEW DEDICATED FIRE WATER LOOP. PERFORM A HYDRANT FLOW TEST AT THE HYDRANTS INDICATED BELOW, AND INCORPORATE THIS TEST INTO THE HYDRAULIC CALCULATIONS. HYDRANT FLOW TESTING SHALL BE IN ACCORDANCE WITH NFPA 291, AND THE RESULTS OF THE TESTING SHALL BE SUBMITTED AS INDICATED IN NFPA 291 FIGURE 4.11.2. SEE HYDRANT MAP IN DETAIL 5/FX502.

FOR INFORMATION ONLY: FLOW TEST HYDRANT #12336
STATIC TEST HYDRANT #12335
INFORMATION PROVIDED FROM THE LOCAL FIRE DEPARTMENT

DATE	03/28/2019
TIME	5:00 AM
STATIC	100 PSI
RESIDUAL	78 PSI
FLOW	1320 GPM

2. INCLUDE A 10% OR 5 PSI SAFETY FACTOR IN THE HYDRAULIC CALCULATIONS, WHICHEVER IS GREATER FOR THE FOLLOWING SYSTEMS:
   - A. EACH MANUAL FOAM-WATER SYSTEM FOR FUEL TANKS 5, 6, AND 7 (3).
   - B. WET-PIPE SPRINKLER SYSTEM IN THE FOAM ROOM (1).
   - C. MONITOR PROVIDING COVERAGE FOR THE PUMP PAD (1).
   - D. EACH FIRE DEPARTMENT CONNECTION FOR FUEL TANKS 5, 6, 7 AND PUMP PAD MONITOR (4) LOCATED PLAN NORTHWEST OF THE FUEL TANKS, GIVEN THAT THE DIESEL PUMP IS NOT AVAILABLE TO PROVIDE THE DEMAND.
   - E. EACH FIRE DEPARTMENT CONNECTION FOR FUEL TANKS 5, 6, 7 AND PUMP PAD MONITOR (4) LOCATED PLAN SOUTHEAST OF THE FUEL TANKS, GIVEN THAT THE DIESEL PUMP IS NOT AVAILABLE TO PROVIDE THE DEMAND.
3. THE FIRE SUPPRESSION SYSTEM SHALL BE DESIGNED AND INSTALLED BY A LICENSED / CERTIFIED COMPANY WHERE EMPLOYEES ARE LICENSED / CERTIFIED TO INSTALL FIRE PROTECTION EQUIPMENT IN OREGON.
4. ALL COMPONENTS AND ASSEMBLIES USED IN THIS FIRE PROTECTION SYSTEM MUST BE SPECIFICALLY UL LISTED OR FM APPROVED FOR THEIR INTENDED USE.
5. FOAM SUPPRESSION FOAM CHAMBER SYSTEMS SHALL BE SEISMICALLY RESILIENT. ALL TRANSITIONS INDICATED ON FX401 BETWEEN BELOW AND ABOVE GRADE SHALL INCLUDE A SEISMIC SEPARATION ASSEMBLY. ALL SEISMIC ASSEMBLIES SHALL BE EQUIPPED WITH A LOW POINT DRAIN.
6. PIPE TYPES FOR FIRE SUPPRESSION SYSTEMS SHALL BE AS FOLLOWS (SEE SPECIFICATIONS FOR FURTHER INFORMATION):
   - A. AG FOAM SOLUTION PIPE SHALL BE SCHEDULE 40 GALVANIZED STEEL.
   - B. UG FOAM SOLUTION SHALL BE FM APPROVED IPS CLASS 200 HDPE. (SEE SPECIFICATION 33 12 16)
   - C. PIPE USED TO DAYLIGHT BETWEEN UG HDPE AND AG GS SHALL BE DUCTILE IRON.
   - D. AG FIRE SPRINKLER PIPE SHALL BE SCHEDULE 40 BLACK STEEL.
   - E. FOAM CONCENTRATE PIPE SHALL BE BRASS OR STAINLESS STEEL.
   - F. UNDERGROUND FIRE WATER PIPE IS DI AND APPURTENANCES ARE COVERED BY CIVIL SPECIFICATIONS AND DRAWINGS.
7. PROVIDE HIGH POINT VENTS ON FIRE SUPPRESSION SYSTEM AS REQUIRED FOR HYDROSTATIC COMMISSIONING TESTING.

FIRE SUPPRESSION GENERAL NOTES

1. PROVIDE FIXED, FULL SURFACE COVERAGE OF THREE JET-A FUEL TANKS AND ONE OSCILLATING MONITOR PROTECTING THE PUMP PAD WITH FLUORINE-FREE FOAM IN ACCORDANCE WITH NFPA 11 AND THE TABLES BELOW.
2. PROVIDE SPRINKLER COVERAGE OF THE DIESEL PUMP ROOM IN THE OPERATIONS BUILDING IN ACCORDANCE WITH NFPA 13 AND NFPA 20. SEE TABLE 3 BELOW.
3. AT A MINIMUM PROVIDE COMPONENTS AS INDICATED ON THESE DRAWINGS. PROVIDE ADDITIONAL COMPONENTS AND MODIFICATIONS AS REQUIRED TO PROVIDE A FULLY FUNCTIONING FIRE SUPPRESSION SYSTEM.
4. PROVIDE A FULLY COORDINATED SYSTEM. REVIEW COORDINATION CONFLICTS WITH ARCHITECT AND ENGINEER PRIOR TO PIPING FABRICATION AND INSTALLATION. CORRECT ANY DEFICIENCIES, INCONSISTENCIES, OR POORLY COORDINATED INSTALLATIONS AT NO ADDITIONAL COST.
5. FINAL DESIGN REQUIREMENTS (DEVICE AND PIPE QUANTITY, SIZE, AND LOCATIONS) ARE THE SOLE RESPONSIBILITY OF THE FIRE SUPPRESSION CONTRACTOR. DRAWINGS INDICATE MINIMUM REQUIREMENTS; VERIFY AND COORDINATE FINAL DESIGN REQUIREMENTS WITH THESE CONSTRUCTION DOCUMENTS, SPECIFICATIONS, REFERENCE DOCUMENTS, APPLICABLE CODES, AND FACILITY USER REQUIREMENTS.
6. ALL DRAIN PENETRATIONS THROUGH EXTERIOR WALL SHALL BE NO GREATER THAN 2'-0" ABOVE FINISHED GRADE.
7. PROVIDE FIRE PROTECTION PIPE HANGERS AND SUPPORTS WITHIN THE BUILDING PER THE NFPA 13. SUPPORTS THORUGHOUT THE SITE FOR FOAM SOLUTION SUPPLY PIPE PROVIDED BY STRUCTURAL.
8. ALL VALVES INCLUDING CONTROL VALVES AND TRIM VALVES SHALL BE WITHIN 6'-0" AFF UNO.
9. PROVIDE SEISMIC PROTECTION FOR ALL FIRE SUPPRESSION WATER AND FOAM / WATER PIPING AS PART OF THIS PROJECT. INSTALL SEISMIC PROTECTION IN ACCORDANCE WITH NFPA 13. SHORT PERIOD RESPONSE FACTOR Ss 0.848 PER STRUCTURAL SHEET S-001.
10. PRIOR TO DEMOLITION, DISCUSS WITH OWNER FOR AGREED UPON AREA FOR STAGING OF PFAS CONTAMINATED MATERIALS AND STAGE ALL DEMOLISHED MATERIALS IN THIS AREA. PROVIDE DISPOSAL PLAN IN ACCORDANCE WITH OWNER REQUIREMENTS FOR PFAS CONTAMINATED MATERIALS FOR OWNER APPROVAL. ANY PIPE DEMOLISHED SHALL BE PLACED AT OWNER APPROVED LAYDOWN AREA FOR DISPOSAL. DISPOSAL OF PFAS CONTAMINATED MATERIAL WILL BE UNDER THE RESPONSIBILITY OF THE CONTRACTOR.
11. ALL VALVES CONTROLLING THE WATER SUPPLY AND THE SPRINKLER SYSTEM SHALL BE ELECTRONICALLY SUPERVISED. ALL FOAM SOLUTION AND FOAM CONCENTRATE SUPPLY VALVES SHALL BE MECHANICALLY SUPERVISED.
12. ALL VALVES ARE NORMALLY OPEN UNO.
13. PROVIDE FINAL TESTING PLAN FOR OWNER AND CONTRACTOR APPROVAL. PROVIDE A CAPTURE PLAN FOR ALL FOAM SOLUTION MATERIALS CREATED DURING TESTING.
14. COMPLETION OF PORTIONS OF THIS SCOPE MUST BE DONE INCREMENTALLY TO MINIMIZE DISRUPTION TO THE EXISTING FACILITY. SEE FX402 FOR EXTENTS OF THESE PIPE ROUTING PHASES.
15. ALL SECTIONS OF EACH FOAM SYSTEM BETWEEN EACH VALVE OUTSIDE THE FOAM ROOM SHALL BE PROVIDED WITH LOW POINT DRAINS AS INDICATED IN ACCORDANCE WITH NFPA 13 TO BE COMPLETELY DRAINABLE.
16. ANTICIPATED FIRE FLOW FOR THE SITE IS 1500 GPM FOR 2 HOURS.

TABLE 4 - FIRE PUMP SCHEDULE

MARK	PUMP TYPE	DRIVE TYPE	SERVICE TYPE	FLOW RATE (GPM)	BOOST HEAD (PSI)	ELECTRICAL DATA		NOTES
						HP	V/PH/HZ	
FP-1	HSCP	DIESEL	FIRE PUMP	1000	85	65	-	PRIMARY PUMP
JP-1	MSC	ELECTRIC	JOCKEY PUMP	10	100	1.5	460/3/60	

TABLE 1 - FIRE PROTECTION FOAM CHAMBERS DESIGN CRITERIA

HAZARD CLASSIFICATION	SYSTEM TYPE	DENSITY GPM/SQ FT	TANK DIAMETER (FT)	DURATION (MINUTES)	HOSE DEMAND GPM	DISCHARGE DEVICE	PRESSURE (PSI)	ADDITIONAL CODE REFERENCE
JET-A FUEL TANK 5,6, & 7	MANUAL	0.10	110	30*	100	TYPE II FOAM CHAMBER	51	NFPA 11 5.2.5.2.2

* INCLUDE DISCHARGE AND FILL TIME FOR NORMALLY DRY SYSTEM IN FOAM CONCENTRATE SUPPLY CALCULATION.

TABLE 2 - FIRE PROTECTION FOAM MONITOR SYSTEM DESIGN CRITERIA

HAZARD CLASSIFICATION	SYSTEM TYPE	DENSITY GPM/SQ FT	REMOTE AREA SQ FT	DURATION (MINUTES)	MONITOR TYPE	OSCILLATION RANGE (DEGREES)	FLOW (GPM)	NOZZLE INLET PRESSURE (PSI)	RANGE (FT)*	ADDITIONAL CODE REFERENCE
DIKED PUMP PAD	MANUAL	MINIMUM 0.16	1,800	20	OSCILLATING	120	MINIMUM 288 CAPABLE 500***	80	MINIMUM 55	NFPA 11 5.7.3.2

* MINIMUM NARROW FOG SPRAY PATTERN AT 15 DEGREE LOFT CENTERLINE ABOVE HORIZONTAL.
** PER AHJ REQUEST, PROVIDE MONITOR CAPABLE OF PRODUCING 500 GPM.
*** UPON COMPLETION OF INSTALLATION, ACTUAL MONITOR LOFT ANGLE, SPRAY PATTERN, AND SET FLOW RATE WILL BE DETERMINED BY TESTING WITH FIRE PUMP DISCHARGE FIRE WATER TO PROVIDE COVERAGE WHILE MINIMIZING THROW OUTSIDE CURBED FUEL PUMP CONTAINMENT.

TABLE 3 - OPS BUILDING FIRE PUMP ROOM FIRE PROTECTION SPRINKLER SYSTEM DESIGN CRITERIA

MARK	HAZARD CLASSIFICATION	SYSTEM TYPE	DENSITY (GPM/SQ FT)	REMOTE AREA (SQ FT)	MAXIMUM AREA PER HEAD (SQ FT)	HOSE DEMAND (GPM)	SPRINKLER CHARACTERISTICS			NOTES
							TEMP RATING (°F)	TYPE / FINISH (EXPOSED)	MINIMUM K-FACTOR	
	EH-2	WET	0.3	ENTIRE FOAM ROOM	100	500	ORDINARY	STANDARD RESPONSE BRASS UPRIGHT	5.6	1,2

NOTE 1: HOSE DEMAND SUPPLIED FROM BASE HYDRANT SYSTEM NOT FROM BUILDING FIRE PUMP.
NOTE 2: PUMP ROOM HAS BEEN PROVIDED WITH A 2-HR FIRE WALL AS PART OF BUILDING DESIGN COMPLETED UNDER A SEPARATE PROJECT.

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PDX FACILITY IMPROVEMENTS
FIRE SUPPRESSION NOTES, LEGEND AND ABBREVIATIONS

project	contract
153929	

drawing rev.

FX001 — A

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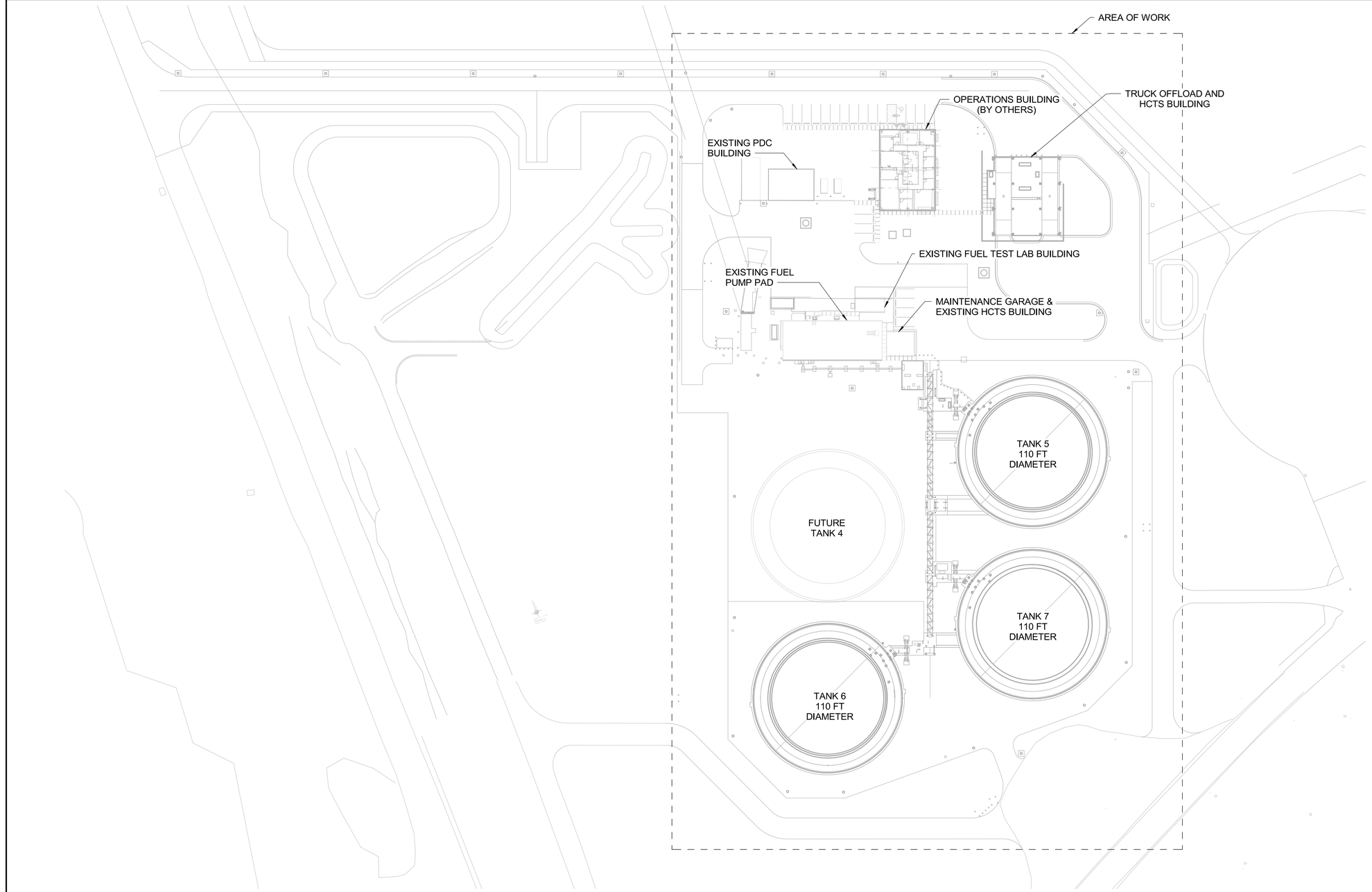


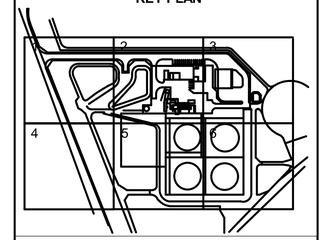
FIRE SUPRESSION OVERALL SITE PLAN

0 25' 50' 100'

NORTH

no.	date	by	ckd	description
A	12-21-23	RJL	KLK	ISSUED FOR PERMIT

KEY PLAN



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FIRE SUPPRESSION OVERALL SITE PLAN

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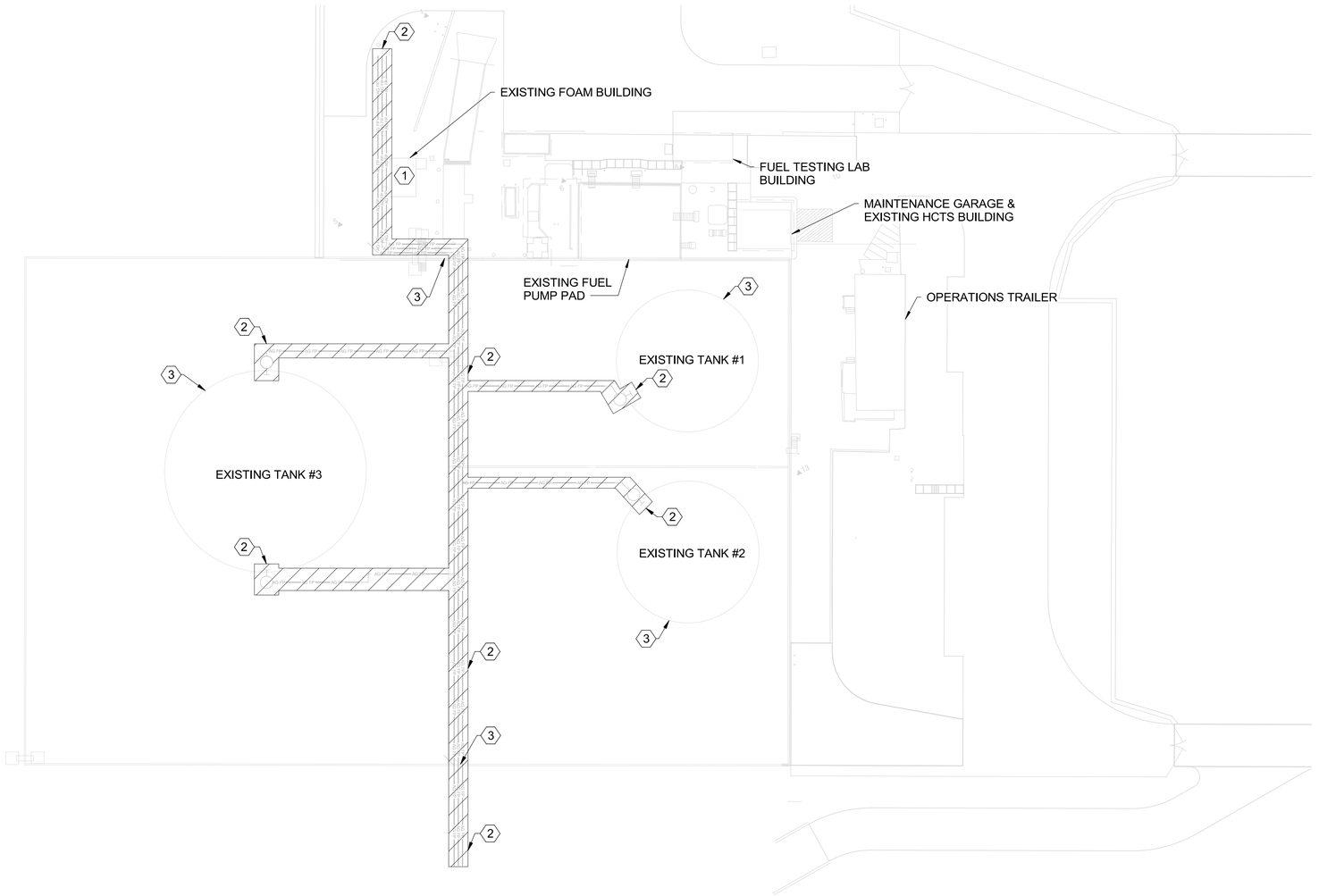
GENERAL SHEET NOTES

1. REFER TO FX001 FOR GENERAL NOTES, DESIGN CRITERIA, ABBREVIATIONS AND SYMBOLS.

KEY NOTES (X)

1. DEMOLISH ALL EQUIPMENT AND PIPING WITHIN THE EXISTING FIRE FOAM BUILDING. ALL AFFF, COMPONENTS, AND PIPING SHALL BE SET ASIDE FOR PROPER DISPOSAL.
2. DEMOLISH FOAM CHAMBER, ASSOCIATED PIPING, FDC, AND VALVES. SET ASIDE FOR PROPER DISPOSAL.
3. EXISTING DIKE WALLS AND TANKS DEMOLISHED BY OTHERS.



FIRE SUPPRESSION DEMOLITION PLAN

0 16' 32' 64'

NORTH

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PDX FACILITY IMPROVEMENTS
FIRE SUPPRESSION DEMOLITION PLAN

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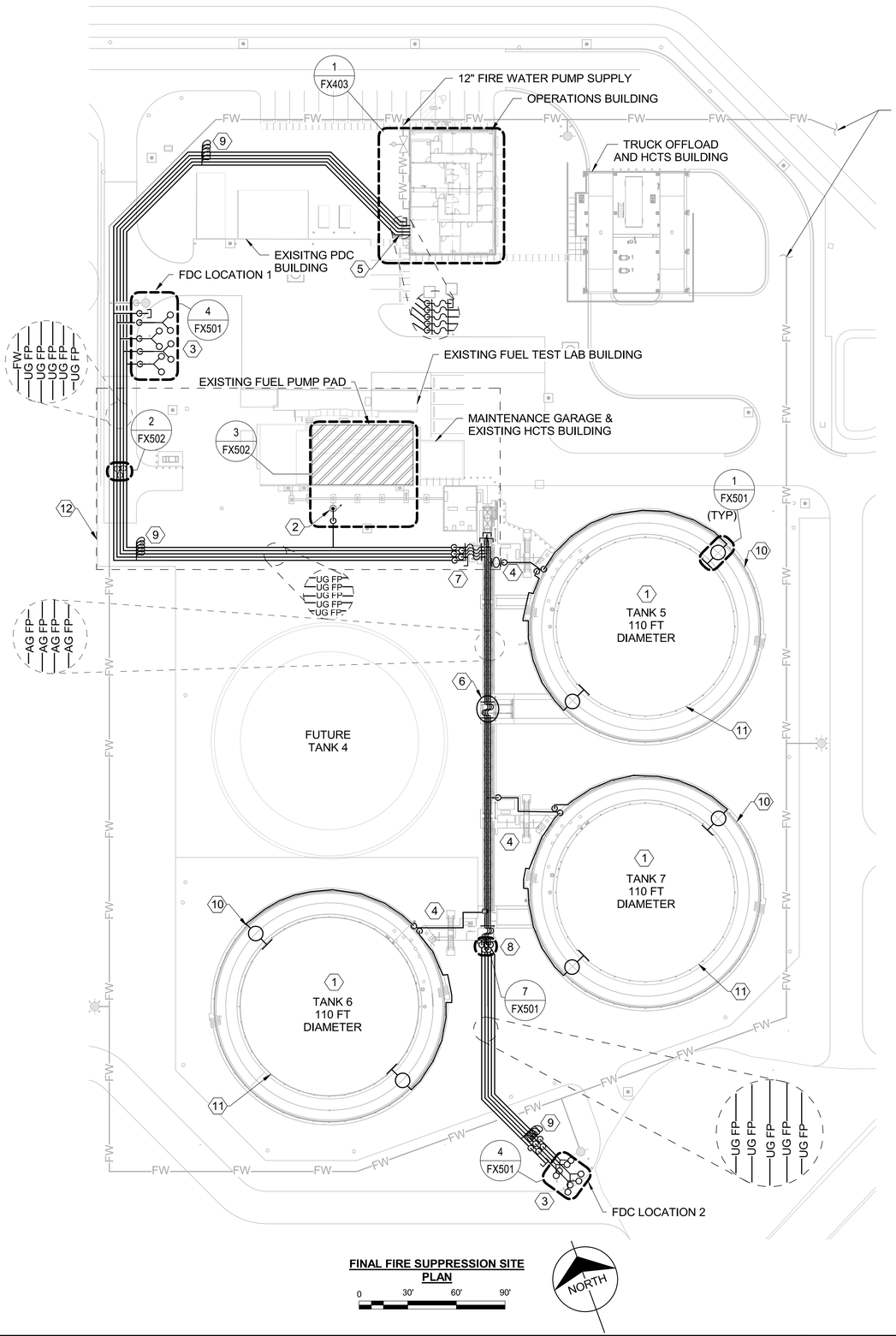

FINAL FIRE SUPPRESSION SITE PLAN

GENERAL SHEET NOTES

1. REFER TO FX001 FOR GENERAL NOTES, DESIGN CRITERIA, ABBREVIATIONS AND SYMBOLS.
2. SEE CIVIL UTILITY DRAWINGS FOR EXACT UNDERGROUND PIPE ROUTES AND BACKFILLING REQUIREMENTS.

KEY NOTES (X)

1. PROVIDE TWO FOAM CHAMBERS ON EACH FUEL TANK IN ACCORDANCE WITH NFPA 11.
2. PROVIDE OSCILLATING FOAM/WATER MONITOR AT PUMP PAD. SEE DETAIL 6/FX501. ORIENT AND PROVIDE COVERAGE AS SHOWN IN 3/FX502.
3. PROVIDE PIPE AND COMPONENTS FOR FIRE DEPARTMENT CONNECTIONS IN THIS LOCATION.
4. SUPPORT PIPES AT A MAXIMUM OF 15' ON CENTER IN ACCORDANCE WITH NFPA 13.
5. PROVIDE SEISMIC SEPARATION ASSEMBLY FOR ALL ABOVE GRADE FOAM SUPPRESSION PIPE PENETRATIONS AT THIS LOCATION. TO ACCOMMODATE 6" OF LATERAL MOVEMENT AND 10" OF VERTICAL SETTLEMENT.
6. PROVIDE SEISMIC SEPARATION ASSEMBLY FOR ABOVEGROUND PIPE AT THIS LOCATION TO ACCOMMODATE 1.5" OF LATERAL MOVEMENT AND 10" OF VERTICAL SETTLEMENT.
7. PROVIDE SEISMIC SEPARATION ASSEMBLY FOR ABOVE GRADE FOAM SUPPRESSION PIPE PENETRATIONS AT THIS LOCATION TO ACCOMMODATE 14" OF LATERAL MOVEMENT AND 10" OF VERTICAL SETTLEMENT.
8. PROVIDE SEISMIC SEPARATION ASSEMBLY FOR ABOVE GRADE FOAM SUPPRESSION PIPE PENETRATIONS AT THIS LOCATION TO ACCOMMODATE 27" OF LATERAL MOVEMENT AND 10" OF VERTICAL SETTLEMENT.
9. PROVIDE LOW POINT DRAINS IN ACCORDANCE WITH DETAIL 3/FX501.
10. SECONDARY DIKE AREA SHELL 142 FT DIAMETER AND 24 FT TALL.
11. STORAGE TANK SHELL
12. SEE PHASING PLANS ON FX402 FOR THIS AREA OF PIPING FOR MODIFICATIONS NECESSARY TO MINIMIZE OUTAGES TO EXISTING OPERATIONS.

LEGEND

MONITOR AREA OF COVERAGE

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PDX FACILITY IMPROVEMENTS
FIRE SUPPRESSION PLAN

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FX401 — A

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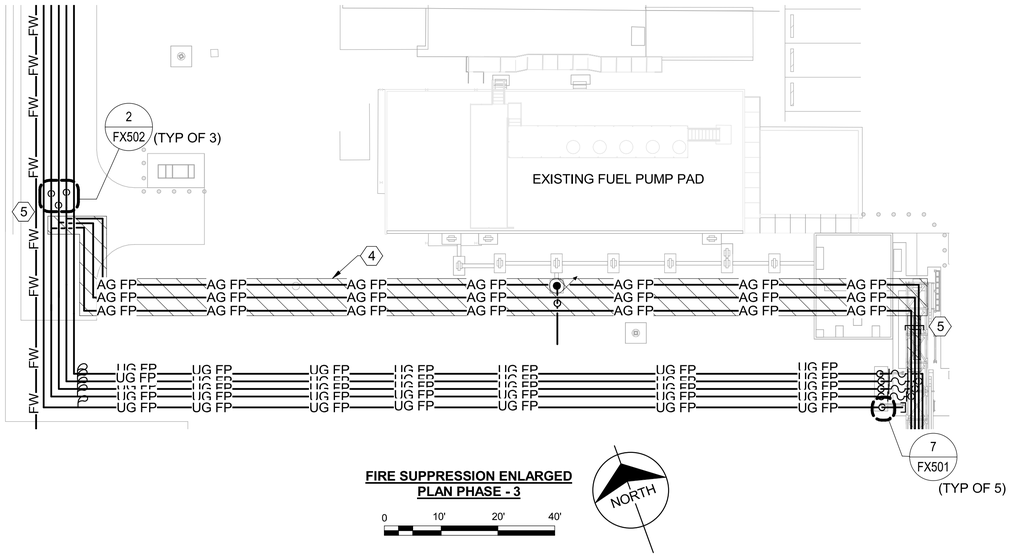
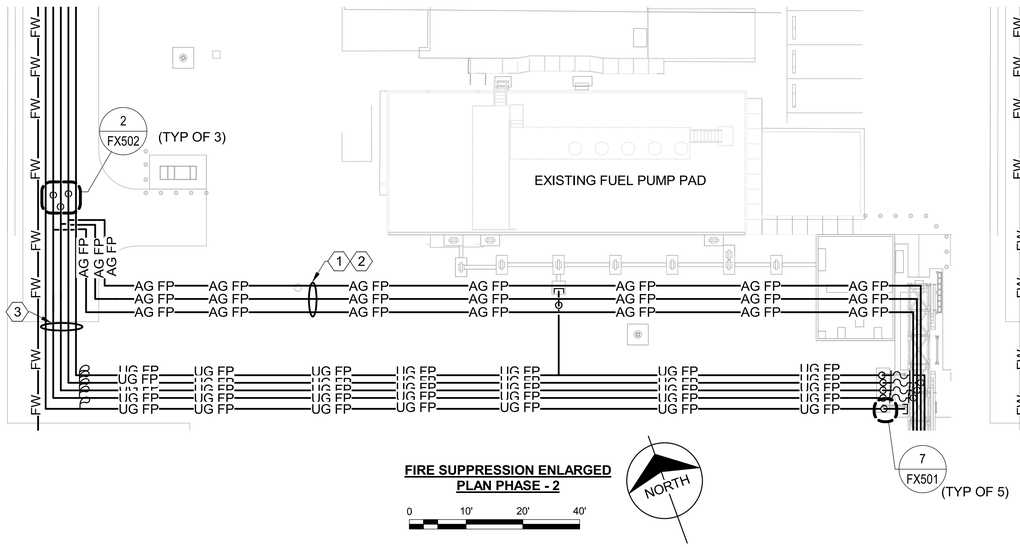
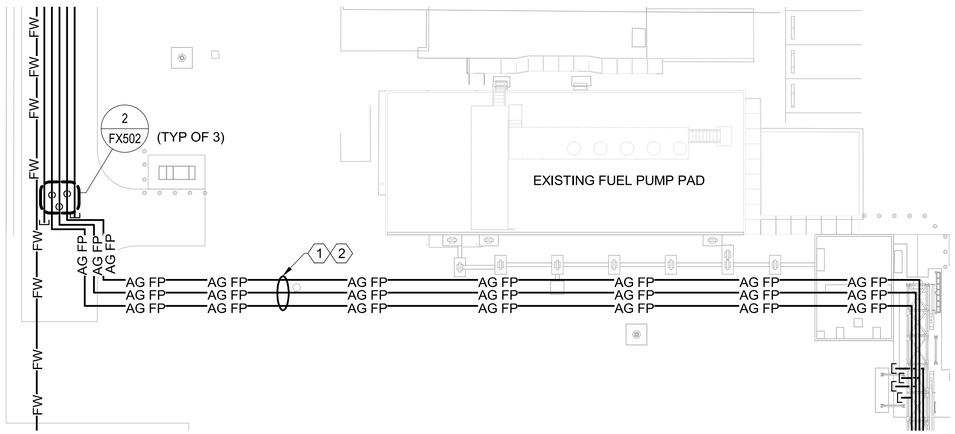


FIRE SUPPRESSION ENLARGED PLAN PHASE - 3



FIRE SUPPRESSION ENLARGED PLAN PHASE - 2



FIRE SUPPRESSION ENLARGED PLAN PHASE -1

GENERAL SHEET NOTES

1. REFER TO FX001 FOR GENERAL NOTES, DESIGN CRITERIA, ABBREVIATIONS AND SYMBOLS.
2. SEE CIVIL UTILITY DRAWINGS FOR EXACT UNDERGROUND PIPE ROUTES AND BACKFILLING REQUIREMENTS.

KEY NOTES (X)

1. PROVIDE TEMPORARY ABOVEGROUND FOAM CHAMBER SUPPLY PIPES THROUGH DIKE AREA TO SUPPLY TANKS 5, 6, AND 7.
2. PROVIDE TEMPORARY SUPPORTS EVERY 15' IN ACCORDANCE WITH NFPA 13.
3. PROVIDE UNDERGROUND FOAM/WATER SUPPLY PIPE THROUGH DEMOLISHED TANK DIKE AREA.
4. AFTER COMMISSIONING AND CONNECTION OF UNDERGROUND PIPE, DEMOLISH TEMPORARY ABOVEGROUND PIPE THROUGH DEMOLISHED TANK DIKE AREA.
5. PROVIDE BLIND FLANGES AT ABOVEGROUND PIPE CONNECTION.
6. PROVIDE LOW POINT DRAINS IN ACCORDANCE WITH DETAIL 3/FX501.

LEGEND

DEMOLITION OF EQUIPMENT

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FIRE SUPPRESSION PHASING PLAN

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GENERAL SHEET NOTES

1. REFER TO FX001 FOR GENERAL NOTES, DESIGN CRITERIA, ABBREVIATIONS AND SYMBOLS.

KEY NOTES (X)

1. RISER TO FEED FIRE PUMP ROOM SPRINKLERS.

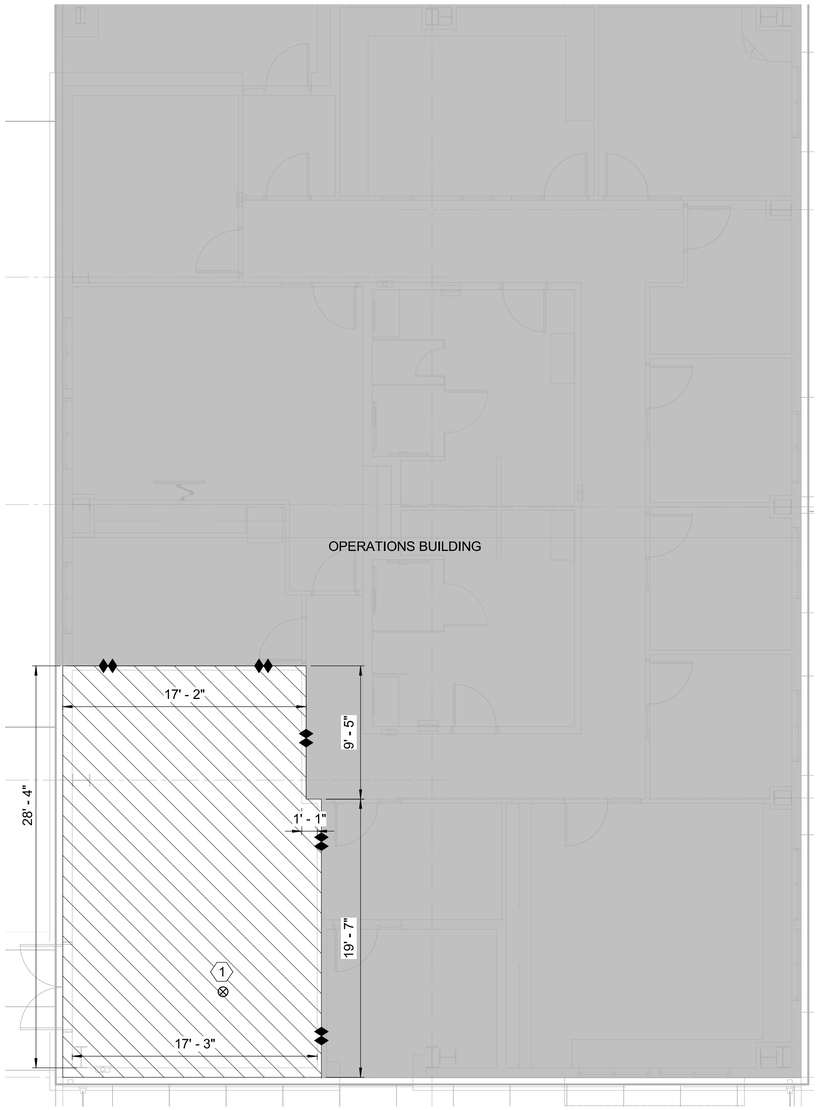
LEGEND

EXTRA HAZARD

NOT SPRINKLERED

FIRE RESISTIVE CONSTRUCTION

2 HR FIRE BARRIER



FIRE SUPPRESSION SPRINKLER PLAN

0 4' 8' 12'

NORTH

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PDX FACILITY IMPROVEMENTS
FIRE SUPPRESSION SPRINKLER PLAN

project	contract
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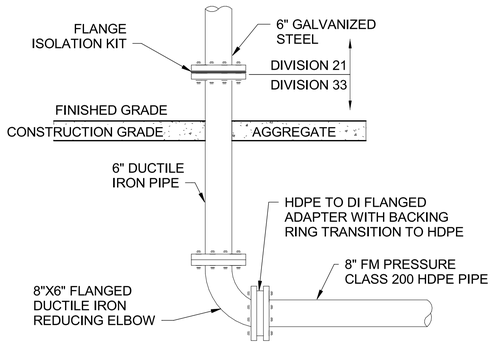
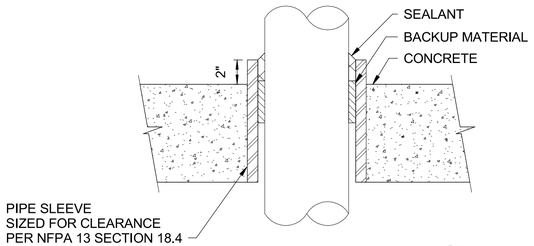
GENERAL SHEET NOTES

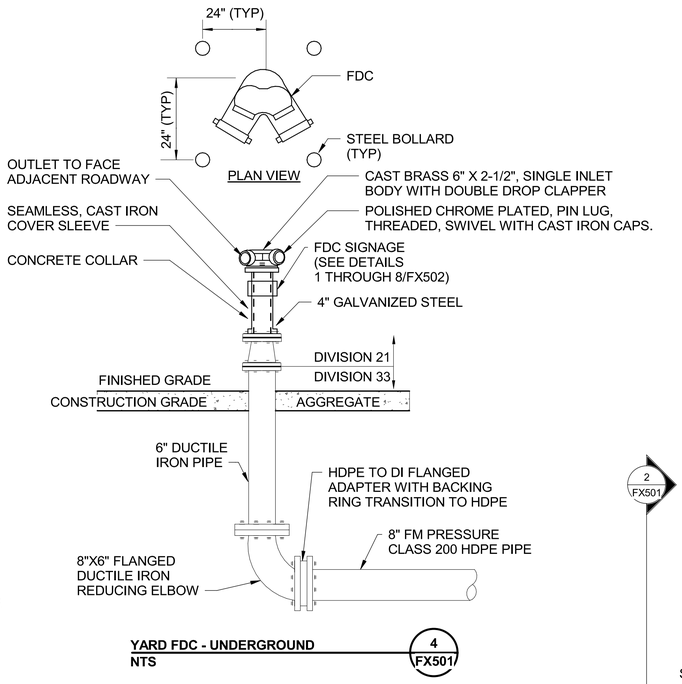
1. REFER TO FX001 FOR GENERAL NOTES, DESIGN CRITERIA, ABBREVIATIONS AND SYMBOLS.



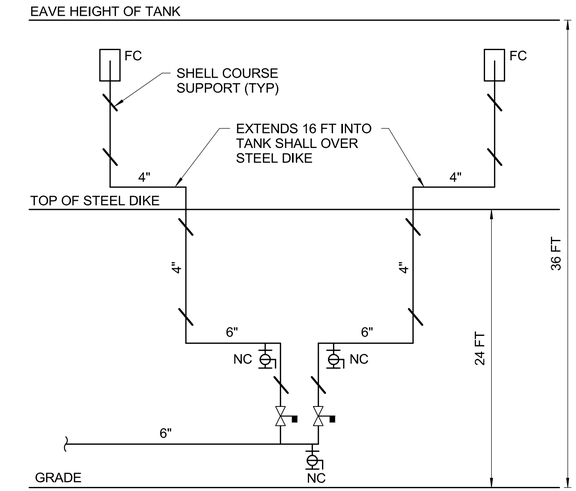
UNDERGROUND FOAM/WATER TO ABOVE GROUND TRANSITION DETAIL - 1 7 FX501
NTS



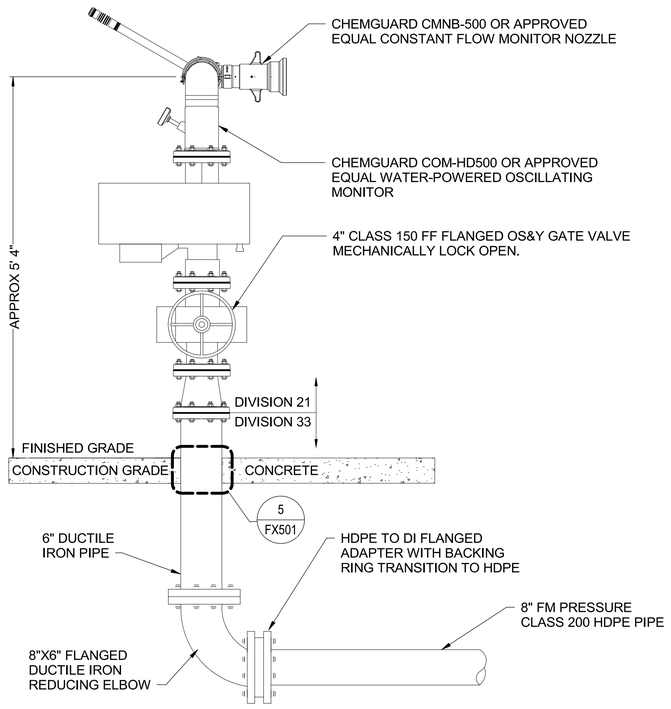
GRADE PENETRATION DETAIL 5 FX501
NTS



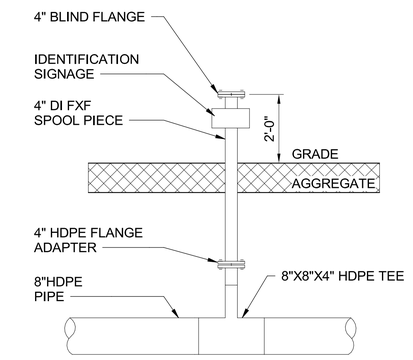
YARD FDC - UNDERGROUND 4 FX501
NTS



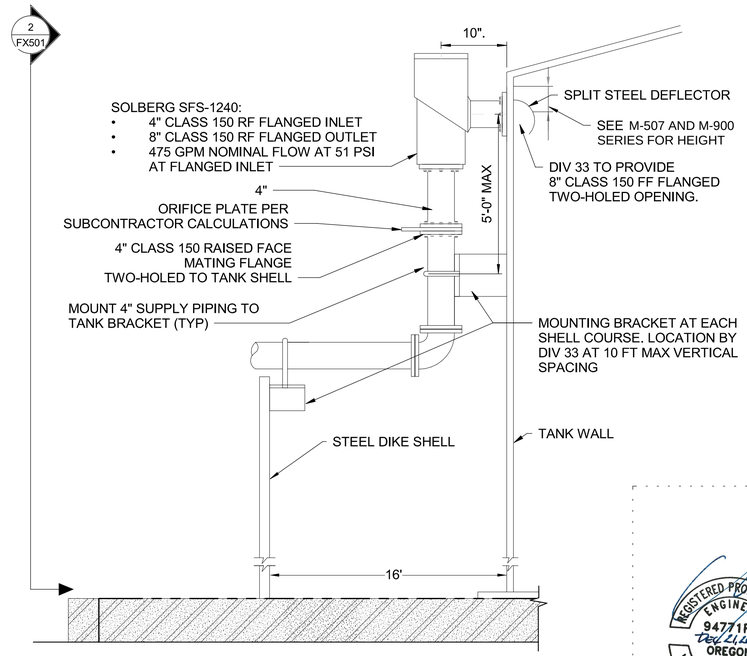
TYPICAL FOAM CHAMBER RISER WITH PIPE CONNECTION ONE-LINE 2 FX501
NTS



FOAM/WATER MONITOR DETAIL 6 FX501
NTS



LOW POINT MANUAL SUMP DRAIN 3 FX501
NTS



TYPICAL FOAM CHAMBER RISER WITH PIPE CONNECTION DETAIL - 1 1 FX501
NTS

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FIRE SUPPRESSION DETAILS - 1

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153929	

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FX501 — A

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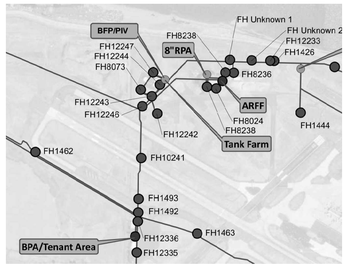


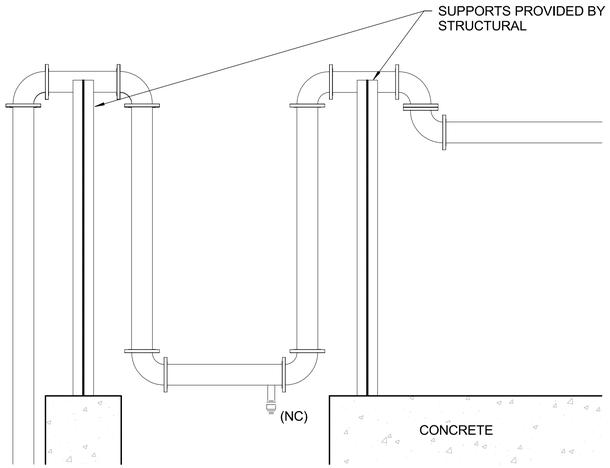
HYDRANT MAP — 5
NTS — FX502

GENERAL SHEET NOTES

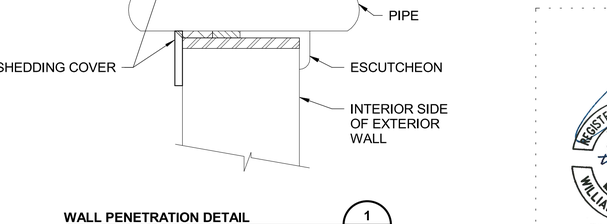
1. REFER TO FX001 FOR GENERAL NOTES, DESIGN CRITERIA, ABBREVIATIONS AND SYMBOLS.

KEY NOTES ⟨X⟩

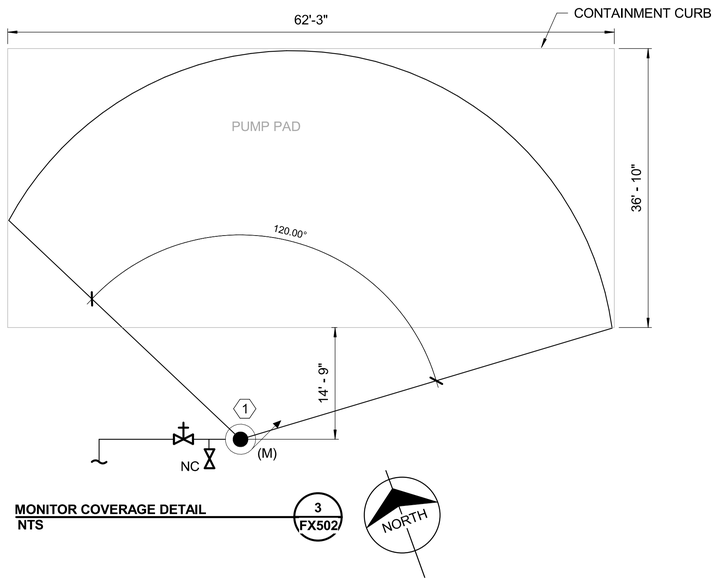
1. SEE TABLE 2/FX001 FOR MONITOR DESIGN PARAMETERS.



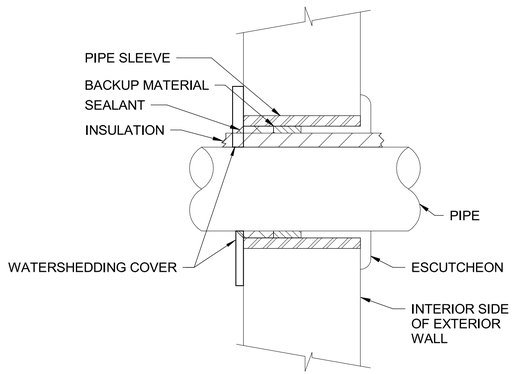
SEISMIC ASSEMBLY DETAIL — 4
NTS — FX502



UNDERGROUND FOAM/WATER TO ABOVE GROUND TRANSITION DETAIL - 2 — 2
NTS — FX502



MONITOR COVERAGE DETAIL — 3
NTS — FX502



WALL PENETRATION DETAIL — 1
NTS — FX502

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FIRE SUPPRESSION DETAILS - 2

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FOAM SUPPRESSION SYSTEM ACTIVATION PROCEDURE

1. OPEN FOAM SUPPLY VALVE FOR ASSOCIATED INCIDENT TANK OR PAD.
2. NOTE THE TIME OF ACTIVATION, FILL TIME OF ACTIVATING SYSTEM, AND REQUIRED SYSTEM DISCHARGE DURATION FOR MANUAL SYSTEM SHUTOFF WHEN DIRECTED BY PFD.

   NOTE: FIRE PUMP AND FOAM CONCENTRATE SUPPLY WILL AUTOMATICALLY INITIATE UPON PRESSURE DROP.

FOAM SUPRESSION SYSTEM PROCEDURE — 15 / FX503
NTS

TEST HEADER VALVE
(NC)

TEST HEADER VALVE IDENTIFICATION SIGNAGE — 14 / FX503
NTS

(2)
WATER ONLY FIRE DEPARTMENT CONNECTION FOAM EQUIPMENT BUILDING

PROVIDE
?,??? GPM @ ??? PSI

WATER ONLY FIRE DEPARTMENT CONNECTION IDENTIFICATION SIGNAGE — 13 / FX503
NTS

FOAM SOLUTION WATER SUPPLY VALVE FOR PUMP PAD MONITOR (NC)

FOAM SUPPLY VALVE IDENTIFICATION SIGNAGE — 12 / FX503
NTS

FOAM SOLUTION WATER SUPPLY VALVE FOR TANK 7 (NC)

FOAM SUPPLY VALVE IDENTIFICATION SIGNAGE — 11 / FX503
NTS

FOAM SOLUTION WATER SUPPLY VALVE FOR TANK 6 (NC)

FOAM SUPPLY VALVE IDENTIFICATION SIGNAGE — 10 / FX503
NTS

FOAM SOLUTION WATER SUPPLY VALVE FOR TANK 5 (NC)

FOAM SUPPLY VALVE IDENTIFICATION SIGNAGE — 9 / FX503
NTS

(1)
FOAM SOLUTION ONLY NORTH FIRE DEPARTMENT CONNECTION FOR PUMP PAD MONITOR

FD TO PROVIDE
?,??? GPM @ ??? PSI
FOR ?? MINUTES

FOAM/WATER FIRE DEPARTMENT CONNECTION IDENTIFICATION SIGNAGE FOR TANK CONNECTIONS — 8 / FX503
NTS

(1)
FOAM SOLUTION ONLY NORTH FIRE DEPARTMENT CONNECTION FOR TANK 7

FD TO PROVIDE
?,??? GPM @ ??? PSI
FOR ?? MINUTES

FOAM/WATER FIRE DEPARTMENT CONNECTION IDENTIFICATION SIGNAGE FOR TANK CONNECTIONS — 7 / FX503
NTS

(1)
FOAM SOLUTION ONLY NORTH FIRE DEPARTMENT CONNECTION FOR TANK 6

FD TO PROVIDE
?,??? GPM @ ??? PSI
FOR ?? MINUTES

FOAM/WATER FIRE DEPARTMENT CONNECTION IDENTIFICATION SIGNAGE FOR TANK CONNECTIONS — 6 / FX503
NTS

(1)
FOAM SOLUTION ONLY NORTH FIRE DEPARTMENT CONNECTION FOR TANK 5

FD TO PROVIDE
?,??? GPM @ ??? PSI
FOR ?? MINUTES

FOAM/WATER FIRE DEPARTMENT CONNECTION IDENTIFICATION SIGNAGE FOR TANK CONNECTIONS — 5 / FX503
NTS

(1)
FOAM SOLUTION ONLY SOUTH FIRE DEPARTMENT CONNECTION FOR PUMP PAD MONITOR

FD TO PROVIDE
?,??? GPM @ ??? PSI
FOR ?? MINUTES

FOAM/WATER FIRE DEPARTMENT CONNECTION IDENTIFICATION SIGNAGE FOR TANK CONNECTIONS — 4 / FX503
NTS

(1)
FOAM SOLUTION ONLY SOUTH FIRE DEPARTMENT CONNECTION FOR TANK 7

FD TO PROVIDE
?,??? GPM @ ??? PSI
FOR ?? MINUTES

FOAM/WATER FIRE DEPARTMENT CONNECTION IDENTIFICATION SIGNAGE FOR TANK CONNECTIONS — 3 / FX503
NTS

(1)
FOAM SOLUTION ONLY SOUTH FIRE DEPARTMENT CONNECTION FOR TANK 6

FD TO PROVIDE
?,??? GPM @ ??? PSI
FOR ?? MINUTES

FOAM/WATER FIRE DEPARTMENT CONNECTION IDENTIFICATION SIGNAGE FOR TANK CONNECTIONS — 2 / FX503
NTS

(1)
FOAM SOLUTION ONLY SOUTH FIRE DEPARTMENT CONNECTION FOR TANK 5

FD TO PROVIDE
?,??? GPM @ ??? PSI
FOR ?? MINUTES

FOAM/WATER FIRE DEPARTMENT CONNECTION IDENTIFICATION SIGNAGE FOR TANK CONNECTIONS — 1 / FX503
NTS

GENERAL SHEET NOTES

1. REFER TO FX001 FOR GENERAL NOTES, DESIGN CRITERIA, ABBREVIATIONS AND SYMBOLS.
2. PRELIMINARY CALCULATIONS FOR MOST DEMANDING FDCS PROVIDED WITH CALCULATION PACKAGE.

KEY NOTES (X)

1. PROVIDE REQUIRED FLOW, PRESSURE, AND FILL AND DURATION TIME FOR THE DEMAND AT EACH FDC CONNECTION FOR EACH TANK OR MONITOR PER THE SUBCONTRACTOR HYDRAULIC CALCULATIONS.
2. PROVIDE REQUIRED FLOW AND PRESSURE DEMAND FOR THE HIGHEST DEMAND OF ANY TANK OR MONITOR WITH FIRE PUMP OUT OF SERVICE PER THE SUBCONTRACTOR HYDRAULIC CALCULATIONS.

no.	date	by	ckd	description
A	12-21-23	RJL	KLK	ISSUED FOR PERMIT

ISSUED FOR PERMIT ONLY

BURNS McDONNELL
9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
Burns & McDonnell Engineering Co, Inc.

date	detailed
12/21/23	S.PERUMAL
designed	checked
K. KURTENBACH	R. HINSON

PDX FUEL COMPANY L.L.C

PORTLAND INTERNATIONAL AIRPORT
5000 NE MARINE DR.
PORTLAND, OREGON 97218

PDX FACILITY IMPROVEMENTS
FIRE SUPPRESSION DETAILS - 3

project	contract
153929	

drawing FX503 — rev. A

file

REGISTERED PROFESSIONAL ENGINEER
94771PE
Dec 21, 2023
OREGON
MAY 14, 2019
WILLIAM ALLAN CLAY
EXPIRES: Dec 31, 2025

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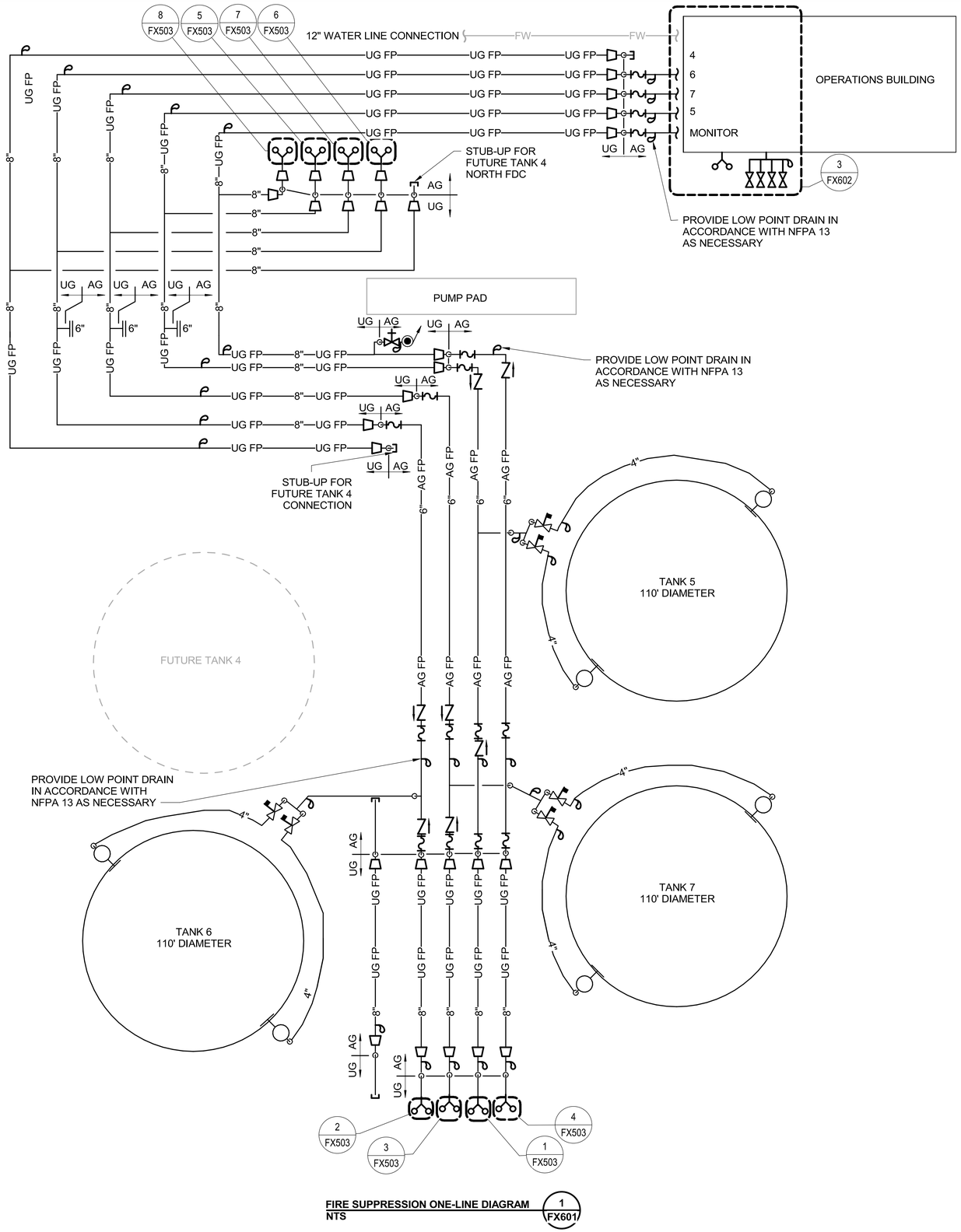

FIRE SUPPRESSION ONE-LINE DIAGRAM (1 / FX601)
NTS

GENERAL SHEET NOTES

1. REFER TO FX001 FOR GENERAL NOTES, DESIGN CRITERIA, ABBREVIATIONS AND SYMBOLS.

PIPE TYPE LEGEND

–FW—FW–	FIRE WATER UNDERGROUND (DI)
—AG FP—	ABOVE GROUND FOAM SOLUTION PIPING (GS)
—UG FP—	UNDERGROUND FOAM SOLUTION PIPING (HDPE)

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ISSUED FOR PERMIT ONLY

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PORTLAND, OREGON 97218

PDX FACILITY IMPROVEMENTS
FIRE SUPPRESSION RISER DIAGRAM

project 153929	contract

drawing **FX601 — A** rev.

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94771PE
Dec 21, 2023
OREGON
MAY 14, 2019
WILLIAM ALLAN CLAY
EXPIRES: Dec 31, 2025

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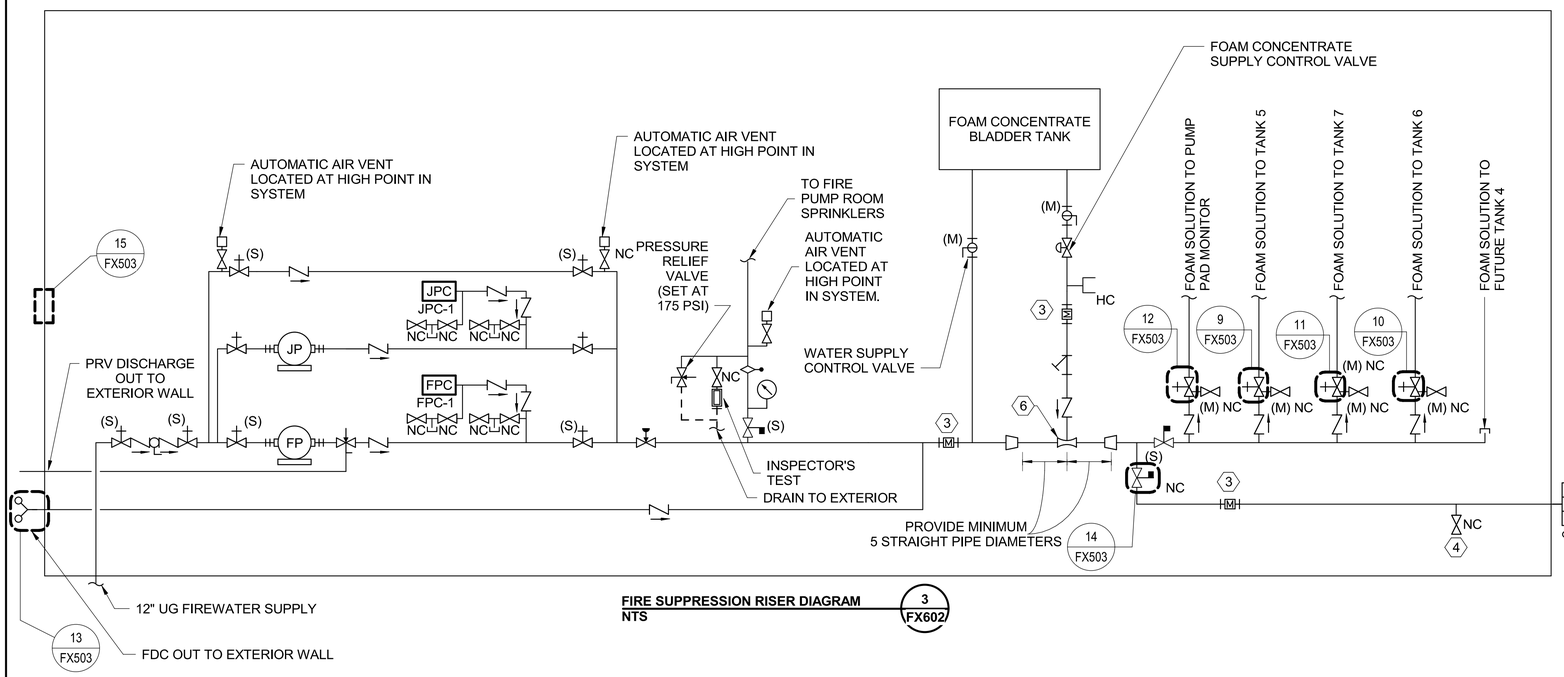


FIRE SUPPRESSION RISER DIAGRAM 3 / FX602
NTS

GENERAL SHEET NOTES

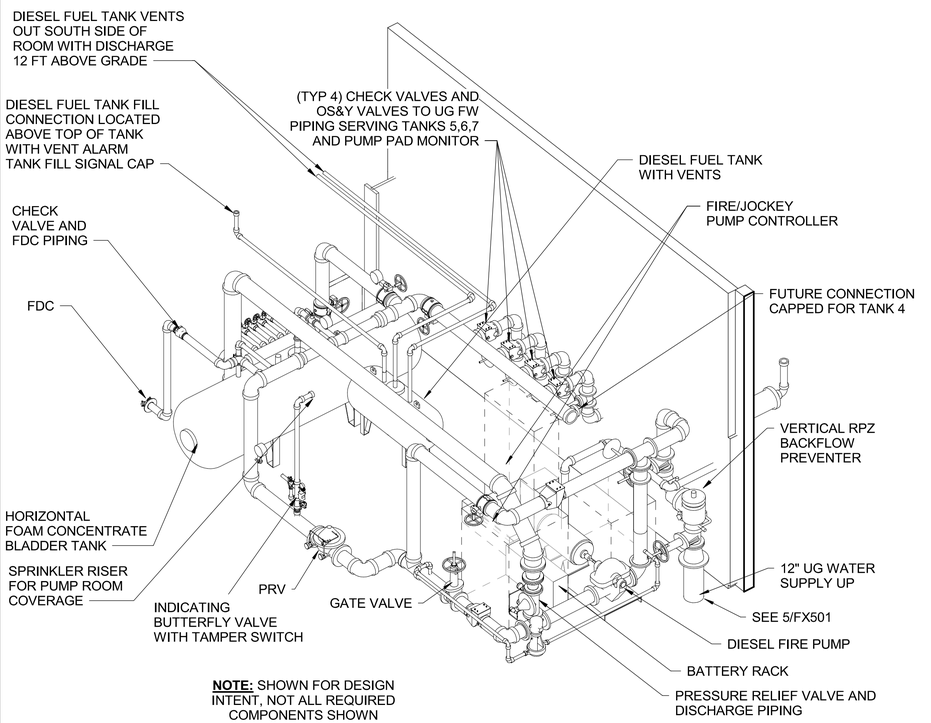
1. REFER TO FX001 FOR GENERAL NOTES, DESIGN CRITERIA, ABBREVIATIONS AND SYMBOLS.
2. PROVIDE CHAIN OPERATORS FOR ALL CONTROL VALVES GREATER THAN 6' AFF.
3. SIZES SHOWN ARE PRELIMINARY.

KEY NOTES (X)

1. PROVIDE EXTRA HAZARD COVERAGE OF FOAM ROOM PER NFPA 20 - 4.13.1.3. THE REST OF THE BUILDING WILL NOT BE SPRINKLERED AND A 2-HOUR FIRE WALL WILL BE PROVIDED IN ACCORDANCE WITH NFPA 20 TABLE 4.13.1.1.2.
2. TEST HEADER UTILIZED AS SUPPLEMENTAL FOAM HOSE STREAM PER NFPA 11 5.9.2.
3. PROVIDE FLOW METERS AND HOSE CONNECTION TO PROVIDE WATER ONLY YEARLY TESTING FOR FOAM PROPORTIONING SYSTEM.
4. PROVIDE CONNECTION FOR FOAM SOLUTION SAMPLE DURING PROPORTIONER COMMISSIONING TESTING.
5. PROVIDE 1100 GALLON FOAM BLADDER TANK.
6. PROVIDE 6" VARIABLE RANGE PROPORTIONER.

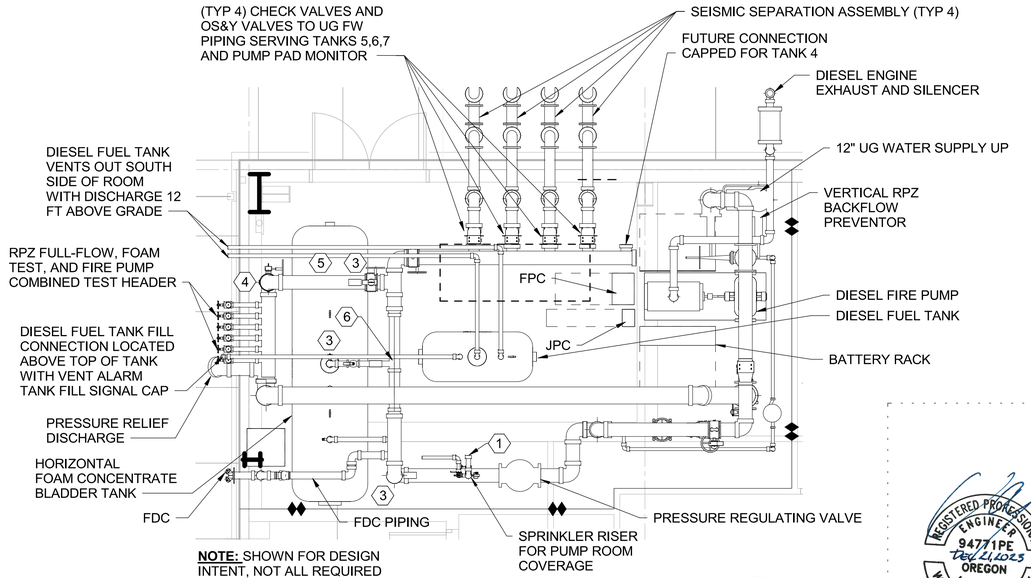
FIRE RESISTIVE CONSTRUCTION

2 HR FIRE BARRIER



NOTE: SHOWN FOR DESIGN INTENT, NOT ALL REQUIRED COMPONENTS SHOWN

FIRE PUMP ROOM 1 / FX602
NTS



NOTE: SHOWN FOR DESIGN INTENT, NOT ALL REQUIRED COMPONENTS SHOWN.

FIRE SUPPRESSION PLAN - PUMP ROOM 4 / FX602
NTS

NORTH

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PDX FACILITY IMPROVEMENTS
FIRE SUPPRESSION RISER DIAGRAM DETAILS

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FX602 — A

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EXPIRES: Dec 31, 2025

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