

GENERAL LOCATION OF CONTRACT

# THE STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION

U.S. CUSTOMARY  
UNITS



## CONSTRUCTION PLANS FOR: DELAWARE TRANSIT CORPORATION, LOWER BEECH STREET BUILDINGS 15 & 16 FIRE PUMP

CONTRACT NUMBER: T202053105  
FEDERAL AID PROJECT NUMBER: N/A

COUNTY: NEW CASTLE

DESIGN DESIGNATION		
FUNCTIONAL CLASS:	D.H.V. PROJECTED: N/A	YEAR: N/A
TYPE OF CONSTRUCTION: SITE	DESIGN SPEED: N/A	
A.A.D.T. CURRENT: N/A	YEAR: N/A	TRUCKS: N/A
A.A.D.T. PROJECTED: N/A	YEAR: N/A	DIRECTION OF DISTRIBUTION: N/A
INDEX OF SHEETS		
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2	F-001 FIRE PROTECTION LEGEND, ABBREVIATIONS, AND NOTES	
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11	E-100 ELECTRICAL PARTIAL SITE PLAN	
12	E-501 SINGLE LINE DIAGRAM FOR NEW FIRE PUMP	

TOTAL SHEETS: 36

### APPROVED DESIGN EXCEPTIONS

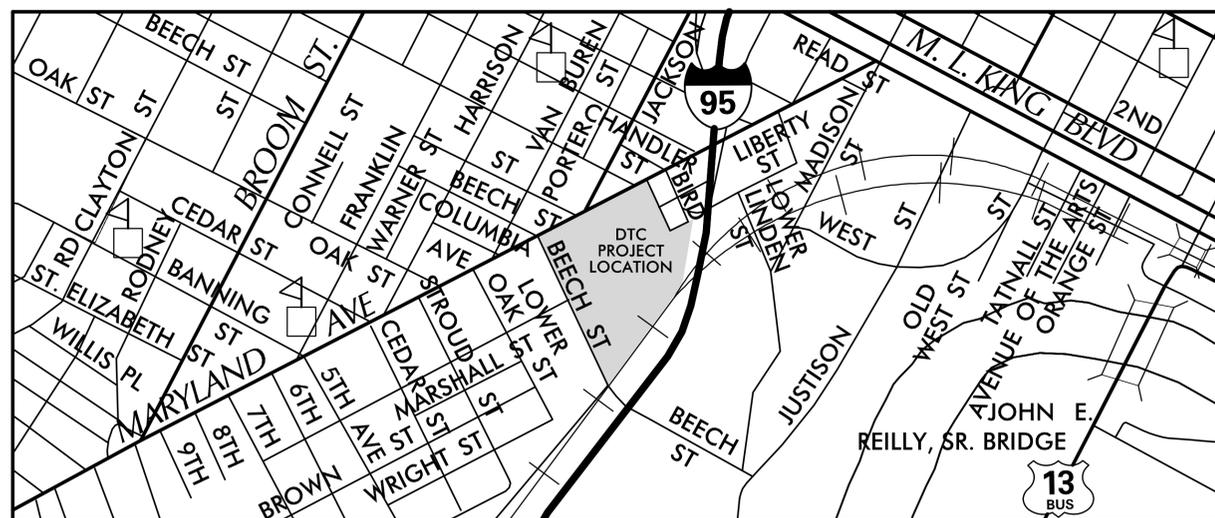
DESIGN PARAMETER	REQUIRED	PROVIDED	DATE

### ADDENDA & REVISIONS

DESCRIPTION	NAME & DATE

### ASSOCIATED CONTRACTS

CONTRACT NO.	CONTRACT NAME



LOCATION MAP  
NOT TO SCALE

PREPARED BY  
THE CONSULTING FIRM OF



Whitman, Reardon & Associates, LLP  
Three Mill Road, Suite 309, Wilmington, Delaware 19806



SEAL

*Frederick P. Hunsicker*

10/30/14

RECOMMENDED

DATE

RECOMMENDED

SQUAD MANAGER, CONSTRUCTION

DATE

GROUP ENGINEER, CONSTRUCTION

DATE

ASSISTANT DIRECTOR, TRANSPORTATION SOLUTIONS  
(CONSTRUCTION)

DATE

RECOMMENDED

STORMWATER ENGINEER

DATE

SEAL

RECOMMENDED

SQUAD MANAGER, TRANSPORTATION SOLUTIONS  
(PROJECT DEVELOPMENT OR BRIDGE DESIGN)

DATE

SEAL

RECOMMENDED

BRIDGE DESIGN ENGINEER

DATE

SEAL

RECOMMENDED

GROUP ENGINEER, PROJECT DEVELOPMENT

DATE

SEAL

RECOMMENDED

ASSISTANT DIRECTOR,  
TRANSPORTATION SOLUTIONS

DATE

APPROVED

CHIEF ENGINEER

DATE

SEAL

## ABBREVIATIONS

ABV	ABOVE	MAINT	MAINTENANCE
AFF	ABOVE FINISHED FLOOR	MAX	MAXIMUM
ADD	ADDENDUM	MECH	MECHANICAL
ADJ	ADJACENT	MEMB	MEMBRANE
ADJT	ADJUSTABLE	MID	MIDDLE
ALT	ALTERNATE	MIN	MINIMUM
ANCH	ANCHOR, ANCHORAGE	MISC	MISCELLANEOUS
∠	ANGLE		
APPD	APPROVED	NAC	NOTIFICATION APPLIANCE CIRCUIT
AD	AREA DRAIN/ACCESS DOOR	NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
		NOM	NOMINAL
BSMT	BASEMENT	NIC	NOT IN CONTRACT
BM	BENCH MARK	NTS	NOT TO SCALE
BEL	BELOW	NO	NUMBER
BRG	BEARING		
BET	BETWEEN	O/A	OUTSIDE AIR
BIT	BITUMINOUS	OC	ON CENTER
BLEND	BLENDING	OPP	OPPOSITE
BS	BOTH SIDES	OPH	OPPOSITE HAND
BOT	BOTTOM	OA	OVERALL (DIM)
BN	BULLNOSE	OH	OVERHEAD
		OH1	ORDINARY HAZARD, GROUP 1
		OH2	ORDINARY HAZARD, GROUP 2
		OPG	OPENING
CI	CAST IRON	PTD	PAINTED
CLG	CEILING		
CH	CEILING HEIGHT	R	RISER
∅	CENTER LINE	REF	REFERENCE
C TO C	CENTER TO CENTER	RELOC	RELOCATE
CLASS 1	HIGH RACK STORAGE AREA	REM	REMOVE
CLO	CLOSET	REQD	REQUIRED
CLOS	CLOSURE	RET	RETURN
COL	COLUMN	REV	REVISION
CONST	CONSTRUCTION	RM	ROOM
CONT	CONTINUE, CONTINUOUS, CONTINUATION	RX	REMOVE EXISTING
CONTR	CONTRACTOR	SCH	SCHEDULE
CJT	CONTROL JOINT	SLC	SIGNALING LINE CIRCUIT
COORD	COORDINATE, COORDINATED	SLR	SEALER
CORR	CORRIDOR	SL	SIMILAR
		SL	SLAB
DPR	DAMPER	SPEC	SPECIFICATION
DP	DAMPPOOFING	STL	STEEL
DEG	DEGREE	STIF	STIFFENER
DEPT	DEPARTMENT	SUP	SUPPORT
DTL	DETAIL	SURF	SURFACE
DIAG	DIAGRAM, DIAGONAL	SYM	SYMMETRICAL
DIAM, DIA	DIAMETER		
DIM	DIMENSION	TYP	TYPICAL
DIST	DISTANCE		
DN	DOWN	UNO	UNLESS NOTED OTHERWISE
DNS	DOWNSPOUT	UL	UNDERWRITERS LABORATORIES
D	DRAIN		
DRB	DRAIN BOARD	V	VALVE
		VAC	VOICE ALARM COMMUNICATIONS CIRCUIT
EA	EACH	VB	VAPOR BARRIER
EQ	EQUAL	VENT	VENTILATE
EXG	EXISTING	VP	VENT PIPE
EXP	EXPANSION	VIF	VERIFY IN FIELD
EH1	EXTRA HAZARD, GROUP 1	VERT	VERTICAL
EH2	EXTRA HAZARD, GROUP 2		
EB	EXPANSION BOLT		
EJ	EXPANSION JOINT	W	WIDTH
EX	EXISTING		
F	FAHRENHEIT		
FA	FIRE ALARM		
FE	FIRE EXTINGUISHER OR FREIGHT ELEVATOR		
FHV	FIRE HOSE VALVE		
FEC	FIRE EXTINGUISHER CABINET		
FH & E	FIRE HOSE & EXTINGUISHER		
FEC	FIRE HOSE CABINET		
FPRG	FIREPROOFING		
FSP	FIRE STANDPIPE		
FXD	FIXED		
GA	GAUGE, GAGE		
GALV	GALVANIZED		
GP	GALVANIZED PIPE		
GOV DOC	GOVERNMENT DOCUMENTS		
GD	GRADE, GRADING		
GWB	GYPSPUM DRYWALL		
GRD ROD	GROUND ROD		
GYP	GYPSPUM		
HT	HEIGHT OR HIGH		
HP	HIGH POINT		
HORZ	HORIZONTAL		
HYD	HYDRAULIC		
HVLS	HIGH VELOCITY LOW SPEED		
IN (")	INCH		
INCL	INCLUDE		
INFO	INFORMATION		
IT	INFORMATION TECHNOLOGY		
LG	LENGTH, LONG		
LH	LIGHT HAZARD		
LP	LOW POINT		
LB	POUND		

## LEGEND - FIRE PROTECTION

	NEW PIPING OR EQUIPMENT TO BE INSTALLED
	EXISTING PIPING OR EQUIPMENT TO REMAIN
	EXISTING PIPING OR EQUIPMENT TO BE DEMOLISHED
	SYSTEM SUPPLY MAIN
	UNDERGROUND FIRE SERVICE MAIN
	WET-PIPE SPRINKLER PIPING
	STANDPIPE SUPPLY MAIN
	DRAIN PIPING
	PIPE CAP
	PIPE CONTINUATION
	TAMPER SWITCH
	FLOW SWITCH
	SPRINKLER SYSTEM RISER
	ZONE CONTROL ASSEMBLY
	OS&Y GATE VALVE
	CHECK VALVE
	DOUBLE CHECK BACKFLOW PREVENTOR
	POST INDICATOR VALVE
	FIRE DEPARTMENT CONNECTION
	PUMP TEST HEADER
	VALVE IN VERTICAL PIPING
	UNDERGROUND CONDUIT
	FIRE ALARM CONTROL PANEL
	DIGITAL ALARM COMMUNICATOR TRANSMITTER
	ADDRESSABLE MONITOR MODULE
	ADDRESSABLE RELAY MODULE
	SURGE SUPPRESSION DEVICE
	ROOM TEMPERATURE SENSOR
	TERMINAL CABINET
	JUNCTION BOX
	CONNECT NEW TO EXISTING
	EXTENT OF DEMOLITION

## FIRE PROTECTION NOTES:

- SCOPE OF WORK - THE SCOPE OF WORK SHALL BE TO PROVIDE A FIRE PUMP SYSTEM AND FIRE SERVICE DISTRIBUTION MAINS TO SERVE THE EXISTING FIRE PROTECTION SYSTEMS LOCATED AT THE DELAWARE TRANSIT CORPORATION COMPLEX IN WILMINGTON, DELAWARE. THE INSTALLING CONTRACTOR SHALL PROVIDE ALL PIPING, PUMP EQUIPMENT, CONTROLLERS, SPRINKLERS, VALVES, ETC. AS NECESSARY FOR A COMPLETE AND OPERATIONAL FIRE PROTECTION SYSTEM. FIRE PUMP SYSTEM AND FIRE SERVICE EQUIPMENT SHALL COMPLY WITH THE REQUIREMENTS OF NFPA 13, STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS, 2013 EDITION, NFPA 20, STANDARD FOR THE INSTALLATION OF STATIONARY PUMPS FOR FIRE PROTECTION, 2013 EDITION, NFPA 24, STANDARD FOR THE INSTALLATION OF PRIVATE FIRE SERVICE MAINS AND THEIR APPURTENANCES, 2013 EDITION, AND DELAWARE STATE FIRE PREVENTION REGULATIONS, AND PROJECT SPECIFICATIONS.
- SHOP DRAWINGS SHALL BE PREPARED BY THE CONTRACTOR AND MUST BE APPROVED BY THE CITY OF WILLMINGTON OFFICE OF THE FIRE MARSHAL PRIOR TO INSTALLATION.
- ALL PIPE AND FITTINGS TO BE INSTALLED IN ACCORDANCE WITH NFPA 13, 2013 EDITION, AND NFPA 24, 2013 EDITION.
- CONTRACTOR SHALL COORDINATE WITH THE CITY OF WILLMINGTON OFFICE OF THE FIRE MARSHAL FOR ALL APPROVALS, INSPECTIONS, AND CERTIFICATIONS OF ALL FIRE PROTECTION AND FIRE ALARM SYSTEMS.
- ALL WORK INCLUDING INSTALLATION AND TESTING SHALL BE DONE IN ACCORDANCE WITH NFPA 13, NFPA 20 AND NFPA 24. HYDROSTATIC TEST AND FLUSHING TEST TO BE COMPLETED AND DOCUMENTED BY CONTRACTOR IN THE PRESENCE OF REPRESENTATIVES FROM THE CITY OF WILLMINGTON OFFICE OF THE FIRE MARSHAL OR OTHER AUTHORIZED GOVERNMENT REPRESENTATIVE.
- ALL NECESSARY CONNECTIONS TO FIRE ALARM SYSTEM SHALL BE MADE AND COORDINATED WITH THE DESIGNATED FIRE ALARM REPRESENTATIVES. SYSTEM ACCEPTANCE TESTS SHALL BE PERFORMED IN THE PRESENCE OF REPRESENTATIVES FROM THE CITY OF WILLMINGTON OFFICE OF THE FIRE MARSHAL.
- ALL WRITTEN DIMENSIONS ON DRAWINGS SHALL TAKE PRECEDENCE OVER SCALED DIMENSIONS.
- ALL PIPING ON WET SYSTEMS LESS THAN AND INCLUDING 2" DIAMETER SHALL BE SCHEDULE 40 BLACK STEEL.
- ALL PIPING ON WET SYSTEMS OF 2 1/2" DIAMETER AND LARGER SHALL BE SCHEDULE 10 BLACK STEEL. ALL FITTINGS FOR SCHEDULE 10 PIPING SHALL BE GROOVED COUPLINGS.
- INSTALL PIPE HANGERS AS REQUIRED PER NFPA 13. SEISMIC BRACING IS NOT REQUIRED.
- FIRE SPRINKLER PIPING SHALL BE PAINTED RED.
- CONTRACTOR SHALL FIELD VERIFY ALL WORK BEFORE PROCEEDING.
- PENETRATION OF FIRE-RATED ASSEMBLIES SHALL BE SEALED BY THE INSTALLING CONTRACTOR WITH A U.L. CERTIFIED THROUGH-PENETRATION SYSTEM APPROPRIATE FOR THE RATING OF THE WALL PENETRATED.
- ALL MATERIALS SHALL BE LISTED BY UNDERWRITER'S LABORATORIES, INC. (U.L.) FOR USE ON COMMERCIAL FIRE SPRINKLER SYSTEMS.
- ALL SPRINKLER PIPING, INCLUDING INSPECTOR'S TEST CONNECTION, SHALL BE CAPABLE OF BEING DRAINED BACK TO THE SYSTEM RISER, DISCHARGED TO THE OUTSIDE, OR TO AN APPROVED AUXILIARY DRAIN. PROVIDE SIGNS AT ALL DRAIN VALVES.
- SPRINKLER MAINS AND BRANCH LINES SHALL BE INSTALLED AS HIGH AS POSSIBLE AND A MINIMUM OF 12-INCHES ABOVE THE FINISHED CEILING.
- CONTRACTOR SHALL HAVE A FIRE FLOW TEST CONDUCTED FOR SYSTEM DESIGN PURPOSES WITHIN 12 MONTHS OF WORKING PLAN SUBMITTAL.

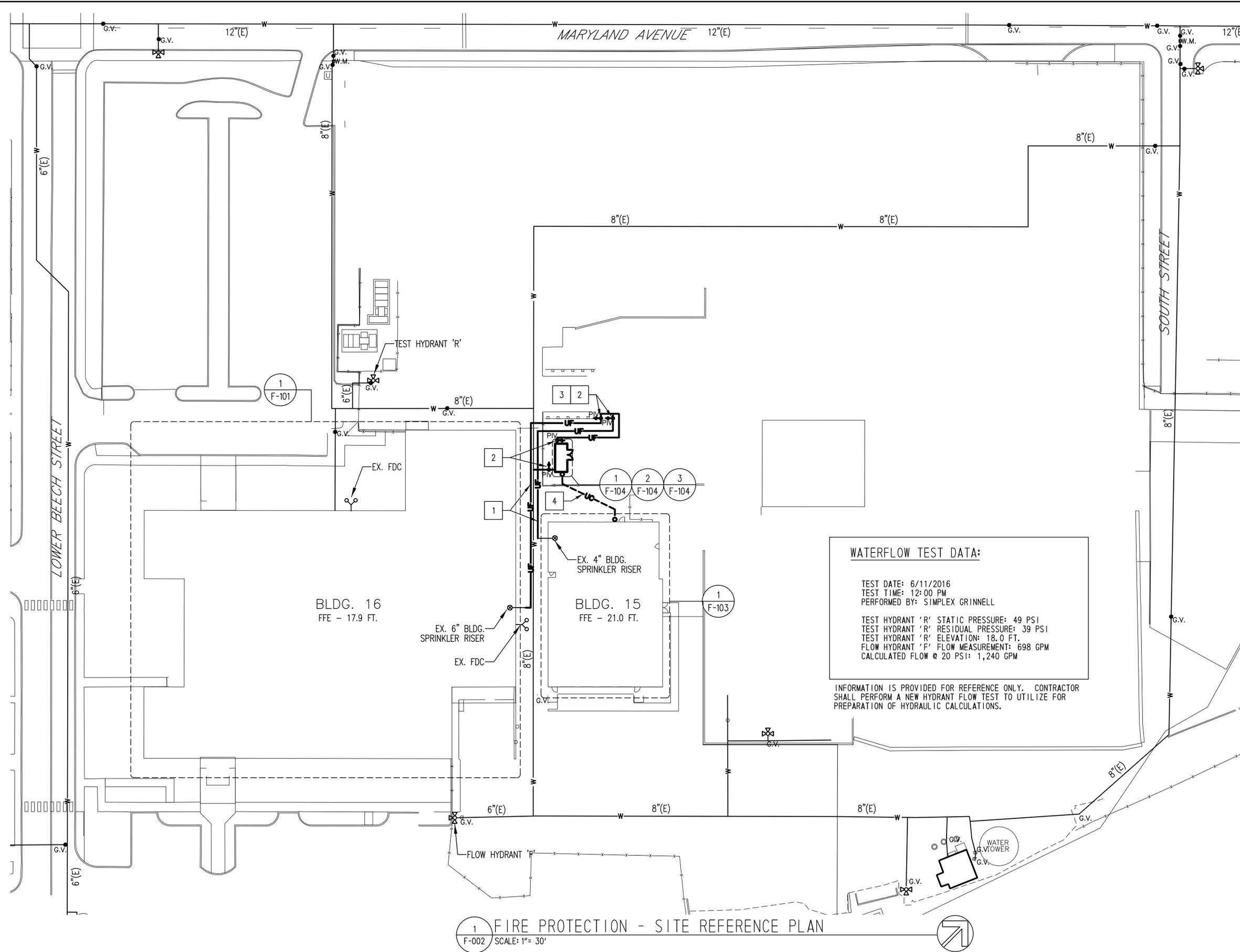
## FIRE ALARM NOTES:

- SCOPE OF WORK - THE SCOPE OF WORK SHALL BE TO MODIFY THE EXISTING ADDRESSABLE FIRE ALARM SYSTEMS SERVING BUILDINGS 15 AND 16 AT THE DELAWARE TRANSIT CORPORATION COMPLEX IN WILMINGTON, DELAWARE. THE INSTALLING CONTRACTOR SHALL PROVIDE ALL PANEL MODULES, INITIATING DEVICES, ADDRESSABLE INPUT DEVICES, POWER SUPPLIES, WIRING, RACEWAY, BOXES, SYSTEM PROGRAMMING, ETC. AS NECESSARY FOR A COMPLETE AND OPERATIONAL FIRE ALARM SYSTEM. ALL WORK SHALL COMPLY WITH THE REQUIREMENTS OF NFPA 72, NATIONAL FIRE ALARM AND SIGNALING CODE, 2013 EDITION, NEC, NATIONAL ELECTRIC CODE (NFPA 70), 2011 EDITION, NFPA 13, STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS, 2013 EDITION, AND DELAWARE STATE FIRE PREVENTION REGULATIONS, AND PROJECT SPECIFICATIONS.
- SCOPE OF WORK INCLUDES THE COMPLETE DEMOLITION OF THE FIRE ALARM SYSTEM SERVING EXISTING FIRE PUMP BUILDING SCHEDULED FOR DEMOLITION.
- SHOP DRAWINGS SHALL BE PREPARED BY THE CONTRACTOR AND MUST BE APPROVED BY THE CITY OF WILLMINGTON OFFICE OF THE FIRE MARSHAL PRIOR TO INSTALLATION.
- ALL NEW EQUIPMENT SHALL BE COMPATIBLE WITH EXISTING ADDRESSABLE FIRE ALARM SYSTEMS (GE EDWARDS).
- CONTRACTOR SHALL COORDINATE WITH THE CITY OF WILLMINGTON OFFICE OF THE FIRE MARSHAL FOR ALL APPROVALS, INSPECTIONS, AND CERTIFICATIONS OF ALL FIRE PROTECTION AND FIRE ALARM SYSTEMS.
- ALL WORK INCLUDING INSTALLATION AND TESTING SHALL BE DONE IN ACCORDANCE WITH NFPA 72. COMPLETE TESTING OF NEW DEVICES AND CIRCUITS, AND OPERATIONAL TESTING OF UP TO 10-PERCENT OF EXISTING DEVICES ON EXISTING CIRCUITS TO BE COMPLETED AND DOCUMENTED BY CONTRACTOR IN THE PRESENCE OF REPRESENTATIVES FROM THE CITY OF WILLMINGTON OFFICE OF THE FIRE MARSHAL OR OTHER AUTHORIZED GOVERNMENT REPRESENTATIVE.
- ALL WRITTEN DIMENSIONS ON DRAWINGS SHALL TAKE PRECEDENCE OVER SCALED DIMENSIONS.
- CONTRACTOR SHALL FIELD VERIFY ALL WORK BEFORE PROCEEDING.
- PENETRATION OF FIRE-RATED ASSEMBLIES SHALL BE SEALED BY THE INSTALLING CONTRACTOR WITH A U.L. CERTIFIED THROUGH-PENETRATION SYSTEM APPROPRIATE FOR THE RATING OF THE WALL PENETRATED.

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ADDENDUMS / REVISIONS	

CONTRACT T202053105 DOT1602	BRIDGE NO.	<b>NA</b>	
COUNTY NEW CASTLE	DESIGNED BY:	DCB	
	CHECKED BY:	EPH	



**DRAWING NOTES:**

1. REFER TO SHEET F-001 FOR LEGEND, NOTES AND ABBREVIATIONS.
2. REFER TO CIVIL DRAWINGS FOR UNDERGROUND UTILITIES. UNDERGROUND PIPING AND FIRE RACEWAY SHOWN ON THIS PLAN FOR REFERENCE ONLY.

**CONSTRUCTION KEY NOTES:**

1. PROVIDE NEW 6" UNDERGROUND SPRINKLER MAIN CONNECTED TO FIRE PUMP SYSTEM DISCHARGE PIPING.
2. PROVIDE POST-INDICATOR VALVE WITH LOCK AND CHAIN.
3. POST SIGNAGE AT PIV VALVES TO IDENTIFY BUILDING SERVED BY EACH SERVICE VALVE.
4. EXTEND NEW FIRE ALARM SLC CIRCUIT IN UNDERGROUND 1" PVC CONDUIT.

**WORK SEQUENCE NOTES:**

1. EXISTING FIRE SPRINKLER SYSTEM SHALL BE MAINTAINED OPERATIONAL TO THE MAXIMUM EXTENT POSSIBLE DURING SYSTEM MODIFICATION WORK. ALL EXTENDED SYSTEM OUTAGES SHALL REQUIRE A FIRE-WATCH SERVICE AS APPROVED BY THE AHJ. THE CONTRACTOR IS RESPONSIBLE FOR FIRE-WATCH SERVICE.
2. MAINTAIN EXISTING SPRINKLER SYSTEMS, INCLUDING EXISTING FIRE SUPPRESSION TANK AND FIRE PUMP, OPERATIONAL WHILE NEW FIRE PUMP SYSTEM AND FIRE SERVICE MAINS ARE INSTALLED. CONTRACTOR SHALL ENSURE NEW FIRE PUMP SYSTEM AND FIRE SERVICE MAINS ARE OPERATIONAL AND ACCEPTANCE TESTED PRIOR TO ANY OUTAGES TO THE EXISTING FIRE SUPPRESSION SYSTEM.
3. UPON APPROVAL OF THE NEW FIRE PUMP SYSTEM AND UNDERGROUND FIRE MAINS, CONTRACTOR SHALL REQUEST AN OUTAGE ON EXISTING FIRE PUMP SYSTEM AND FIRE SUPPRESSION TANK. UPON RECEIVING APPROVAL OF THE OUTAGE, THE CONTRACTOR SHALL ISOLATE AND SHUTDOWN EXISTING PUMP AND TANK SYSTEM AND MAKE NEW SERVICE CONNECTIONS TO THE EXISTING BUILDING SPRINKLER SERVICE LINES.

**WATERFLOW TEST DATA:**

TEST DATE: 6/11/2016  
 TEST TIME: 12:00 PM  
 PERFORMED BY: SIMPLEX GRINNELL

TEST HYDRANT 'R' STATIC PRESSURE: 49 PSI  
 TEST HYDRANT 'R' RESIDUAL PRESSURE: 39 PSI  
 TEST HYDRANT 'R' ELEVATION: 18.0 FT.  
 FLOW HYDRANT 'F' FLOW MEASUREMENT: 698 GPM  
 CALCULATED FLOW @ 20 PSI: 1,240 GPM

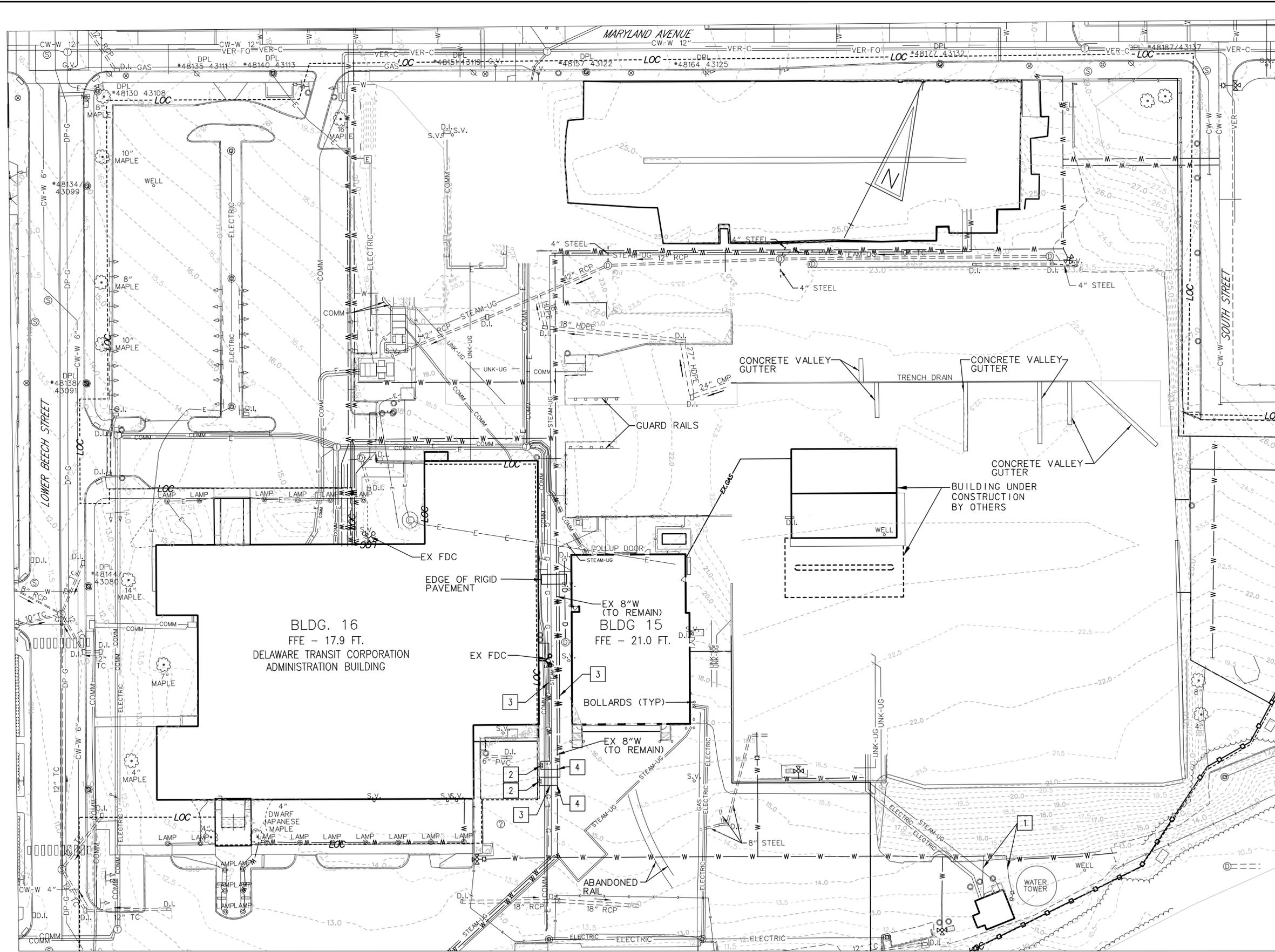
INFORMATION IS PROVIDED FOR REFERENCE ONLY. CONTRACTOR SHALL PERFORM A NEW HYDRANT FLOW TEST TO UTILIZE FOR PREPARATION OF HYDRAULIC CALCULATIONS.

1 FIRE PROTECTION - SITE REFERENCE PLAN  
 F-002 SCALE: 1" = 30'

NO 90581-017A.CADD\CP01-90181017F-002.dgn  
 3/2/2016 8:56:16 AM

ADDENDUMS / REVISIONS	

CONTRACT T202053105 DOT1602	BRIDGE NO. N/A
COUNTY NEW CASTLE	DESIGNED BY: DCB
	CHECKED BY: EPH



- DRAWING NOTES:**
- REFER TO SHEET F-001 FOR NOTES AND ABBREVIATIONS.
  - THE AREA IN WHICH NEW UNDERGROUND PIPING IS TO BE INSTALLED IS CONGESTED WITH MANY BURIED UTILITIES. AN EXISTING VAULT IN THE DRIVEWAY MAY BE ACCESSED TO ASSIST IN LOCATING EXISTING UTILITIES.
  - CONTRACTOR SHALL TAKE CARE TO AVOID DAMAGE TO UTILITIES TO REMAIN. MECHANIZED EXCAVATION SHALL BE LIMITED TO A MAXIMUM DEPTH OF (4) FEET AFTER WHICH HAND DIGGING SHALL BE REQUIRED. CONTRACTOR SHALL REPAIR DAMAGE TO EXISTING UTILITIES AT NO ADDITIONAL COST TO THE OWNER.
  - CONTRACTOR SHALL SAWCUT AND REMOVE EXISTING CONCRETE PAD / PAVING TO THE EXTENTS REQUIRED FOR THE INSTALLATION OF FIRE PUMP EQUIPMENT PAD AND NEW UNDERGROUND PIPING, VALVES, AND CONDUITS.
  - CONTRACTOR SHALL SAWCUT AND REMOVE EXISTING ASPHALT PAVING IN THE DRIVEWAY TO THE EXTENTS REQUIRED FOR INSTALLATION OF NEW UNDERGROUND PIPING AND DISCONNECTION OF EXISTING PIPING AND VALVES.

- DEMOLITION KEY NOTES:**
- DISCONNECT WATER SERVICE LINES ABANDONED IN PLACE.
  - WATER VALVES TO BE REMOVED. INSTALL CAP ON REMAINING PIPE ENDS.
  - EXISTING WATER SUPPLY LINES TO BE ABANDONED IN PLACE.
  - DISCONNECT WATER LINE AT TEE FITTING AND INSTALL CAP.

**NOTE:**  
EXISTING UTILITIES SHOWN HAVE BEEN TAKEN FROM THE BEST INFORMATION AVAILABLE. CONTRACTOR SHALL TEST PIT AS NECESSARY TO VERIFY DEPTH AND LOCATION TO HIS OWN SATISFACTION PRIOR TO STARTING ANY WORK.

- LEGEND:**
- LOD — LIMIT OF DEMOLITION
  - - - LOC - - - LIMIT OF CONSTRUCTION
  - - - 22.5 - - - CONTOUR
  - ⊙ - - - - - STORM DRAIN
  - W — W — WATER LINE
  - ⊠ WATER VALVE
  - WELL
  - ⊠ FIRE HYDRANT
  - STEAM-UG — UNDERGROUND STEAMLINE
  - ELECTRIC — ELECTRIC LINE
  - GAS — GAS LINE
  - CW-S 10" — SEWER LINE
  - CURB & GUTTER

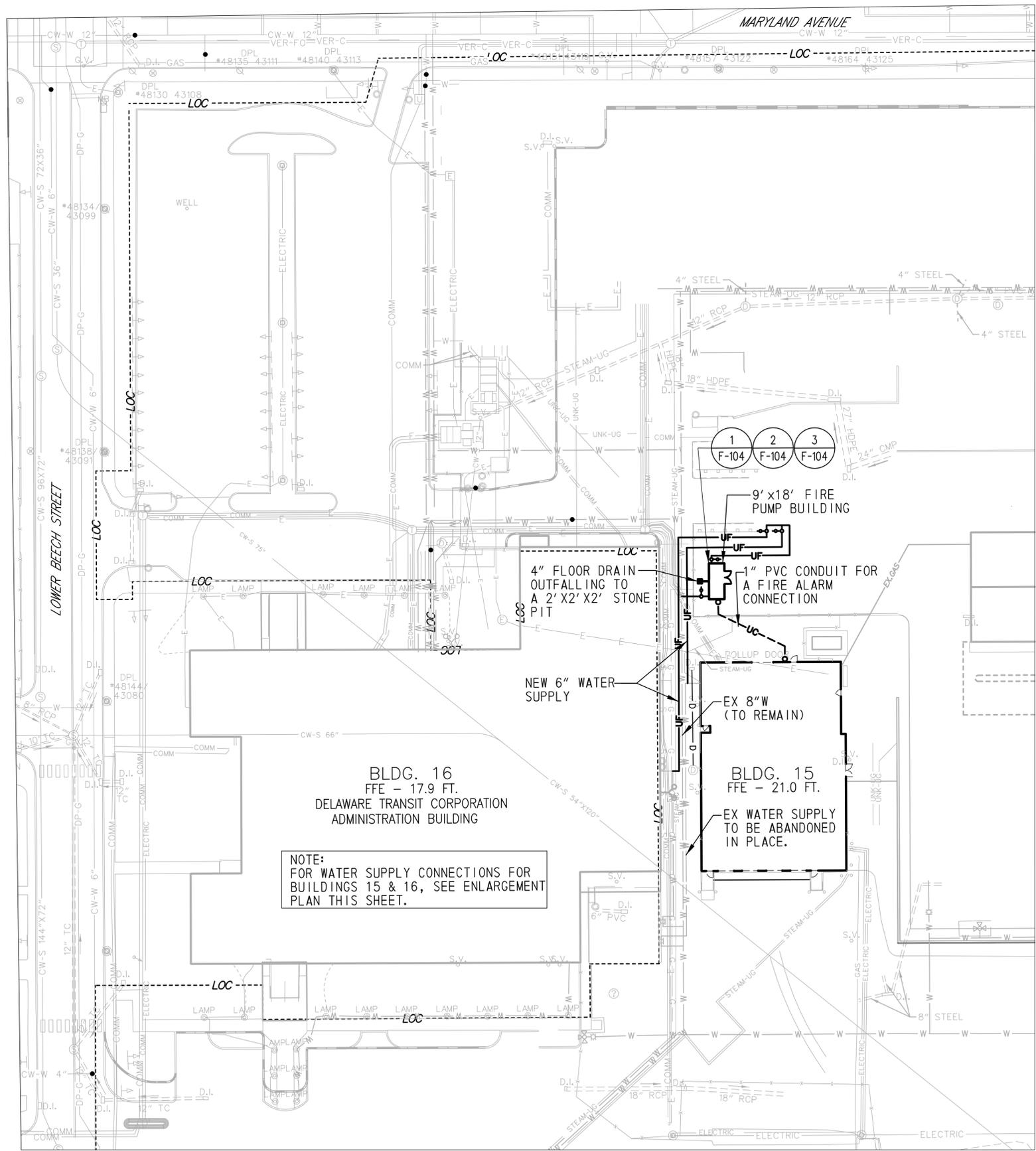
1 FIRE PROTECTION - EXISTING CONDITIONS / DEMO PLAN  
F-003 SCALE: 1" = 30'

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ADDENDUMS / REVISIONS	

CONTRACT T202053105 DOT1602	BRIDGE NO. 	<b>N/A</b>
COUNTY NEW CASTLE	DESIGNED BY: DJL	
	CHECKED BY: AUO	

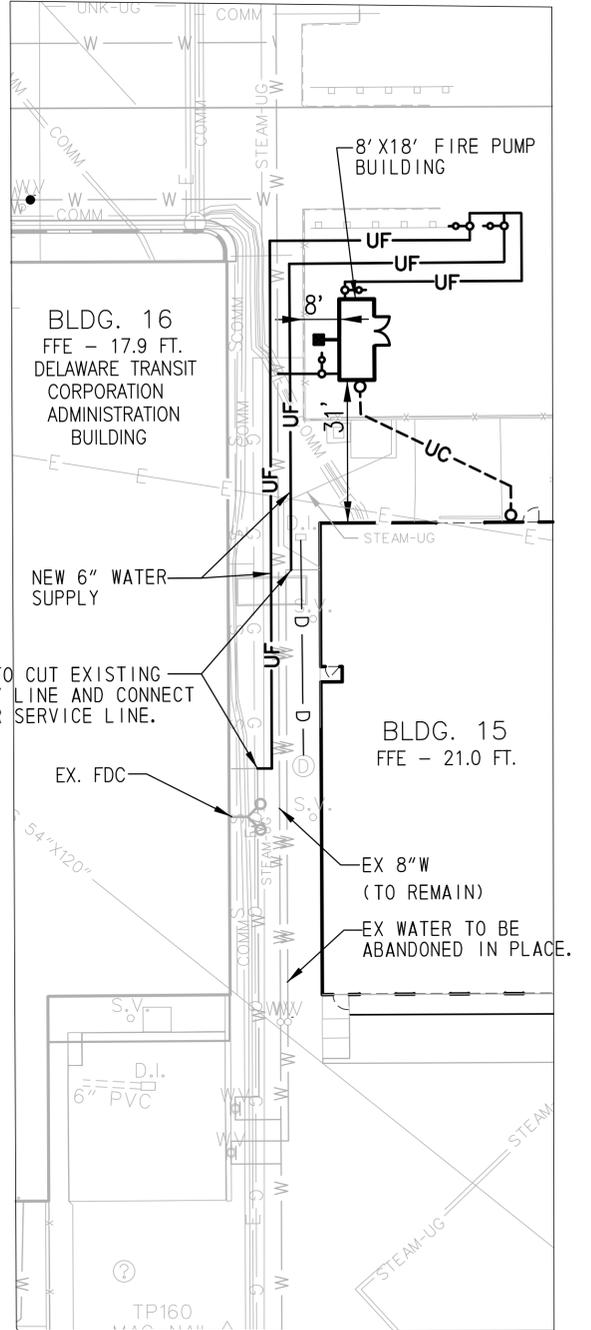
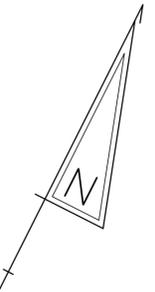
<b>F-003</b>
SHEET NO. 04
TOTAL SHTS. 12



**DRAWING NOTES:**

1. REFER TO SHEET F-001 FOR LEGEND, NOTES AND ABBREVIATIONS.
2. SEE SHEET F-003 FOR LOCATION OF EXISTING WATER LINES TO BE DISCONNECTED AND ABANDONED IN PLACE.
3. BACKFILL UTILITY TRENCHES WITH CLEAN, DRY SAND TO MATCH EXISTING SUBSURFACE MATERIALS.
4. PATCH CONCRETE AND ASPHALT PADS / DRIVEWAYS WITH NEW CONCRETE AND ASPHALT TO MATCH EXISTING ADJACENT CONSTRUCTION.

**NOTE:**  
EXISTING UTILITIES SHOWN HAVE BEEN TAKEN FROM THE BEST INFORMATION AVAILABLE. CONTRACTOR SHALL TEST PIT AS NECESSARY TO VERIFY DEPTH AND LOCATION TO HIS OWN SATISFACTION PRIOR TO STARTING ANY WORK.



**NOTE:**  
CONTRACTOR TO CUT EXISTING WATER SUPPLY LINE AND CONNECT NEW 6\"/>

**WATER SUPPLY BUILDING CONNECTION ENLARGEMENT PLAN**

SCALE: 1" = 20'

**1 FIRE PROTECTION - SITE / UTILITY PLAN**  
F-004 SCALE: 1" = 30'

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ADDENDUMS / REVISIONS	

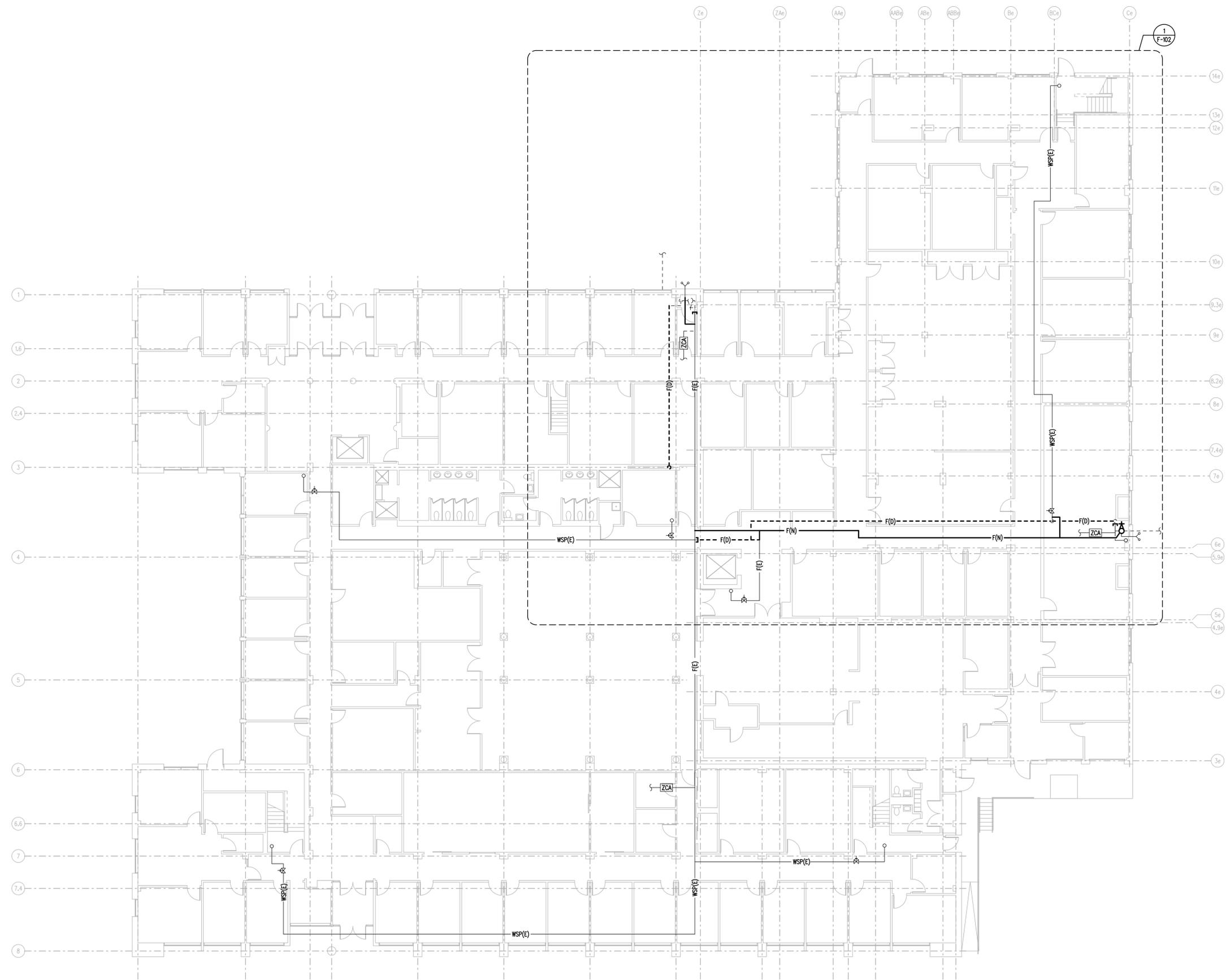
**DELAWARE TRANSIT CORPORATION**  
**LOWER BEECH STREET**  
**BUILDINGS 15 & 16 FIRE PUMP**

CONTRACT T202053105 DOT1602	BRIDGE NO. <b>N/A</b>
COUNTY NEW CASTLE	DESIGNED BY: DJL
	CHECKED BY: AUO

**FIRE PROTECTION**  
**SITE / UTILITY PLAN**

<b>F-004</b>
SHEET NO. 05
TOTAL SHTS. 12

- DRAWING NOTES:**
- REFER TO SHEET F-001 FOR LEGEND, NOTES AND ABBREVIATIONS.
  - DRAWING IS DIAGRAMMATIC AND REFLECTS DESIGN INTENT ONLY. CONTRACTOR IS RESPONSIBLE FOR FINAL PIPE ROUTING, AND SIZING SYSTEM COMPONENTS BASED ON CALCULATIONS.
  - BUILDING SPRINKLER SYSTEM OUTAGES SHALL BE MINIMIZED TO THE MAXIMUM EXTENT POSSIBLE. THE CONTRACTOR SHALL PHASE MODIFICATION WORK TO LIMIT OUTAGES TO NO GREATER THAN 4-HOURS DURING PERIODS OF OCCUPANCY. OUTAGES LASTER LONGER THAN 4-HOURS SHALL REQUIRE A FIRE-WATCH. COORDINATE ALL OUTAGES WITH FACILITY MANAGEMENT.



1 BLDG. 16 OVERALL FIRST FLOOR PLAN - FIRE PROTECTION  
 F-101 SCALE: 1/8"=1'-0"

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ADDENDUMS / REVISIONS	

**DELAWARE TRANSIT CORPORATION**  
 LOWER BEECH STREET  
 BUILDINGS 15 & 16 FIRE PUMP

CONTRACT T202053105 DOT1602	BRIDGE NO. <b>N/A</b>
COUNTY NEW CASTLE	DESIGNED BY: DCB
	CHECKED BY: EPH

**BLDG. 16 OVERALL  
 FIRST FLOOR PLAN  
 FIRE PROTECTION**

<b>F-101</b>
SHEET NO. 06
TOTAL SHTS. 12

**DRAWING NOTES:**

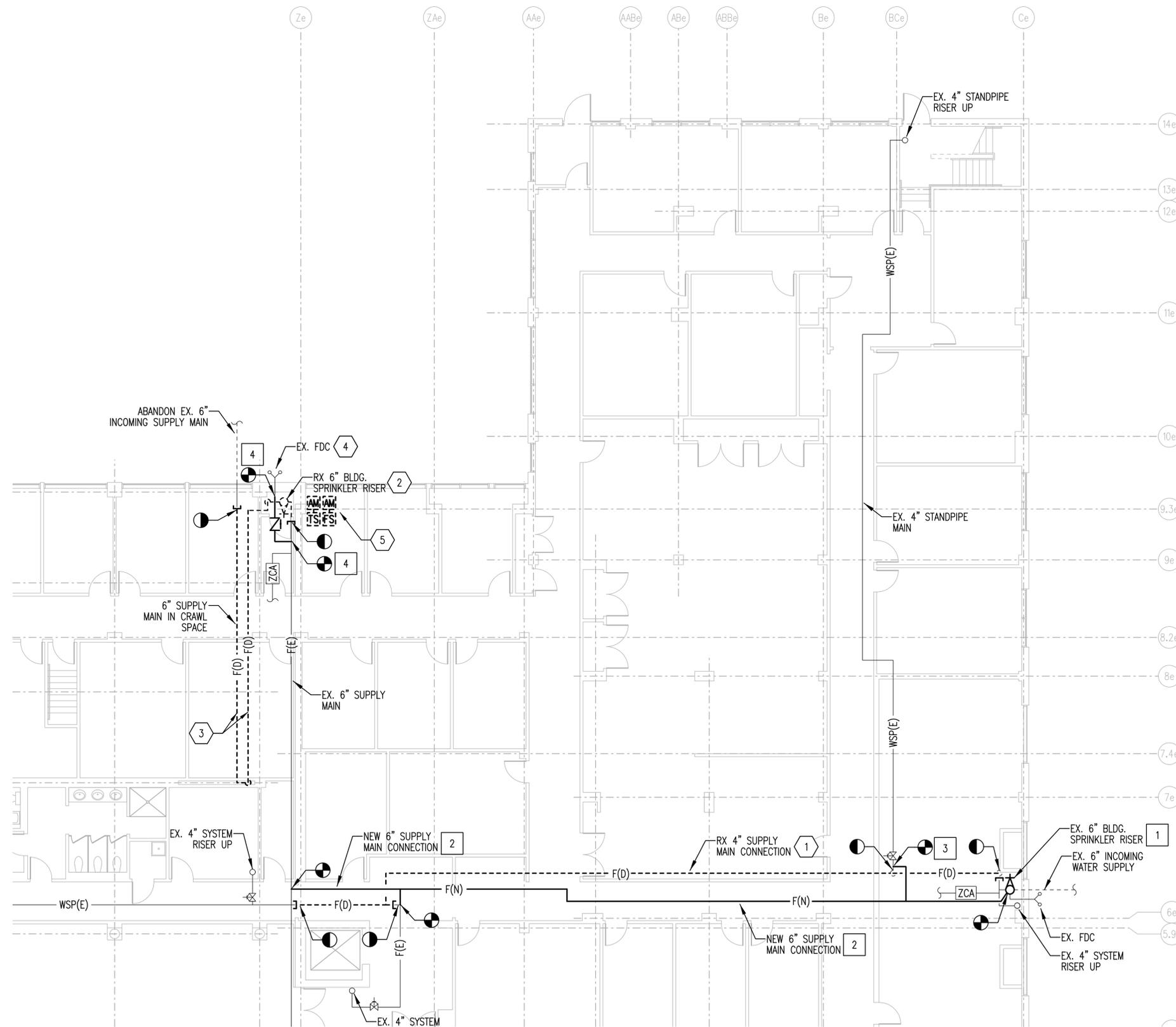
1. REFER TO SHEET F-001 FOR LEGEND, NOTES AND ABBREVIATIONS.
2. DRAWING IS DIAGRAMMATIC AND REFLECTS DESIGN INTENT ONLY. CONTRACTOR IS RESPONSIBLE FOR FINAL PIPE ROUTING, AND SIZING SYSTEM COMPONENTS BASED ON CALCULATIONS.
3. BUILDING FIRE PROTECTION SYSTEM OUTAGES SHALL BE MINIMIZED TO THE MAXIMUM EXTENT POSSIBLE. THE CONTRACTOR SHALL PHASE MODIFICATION WORK TO LIMIT OUTAGES TO NO GREATER THAN 4-HOURS DURING PERIODS OF OCCUPANCY. OUTAGES LASTER LONGER THAN 4-HOURS SHALL REQUIRE A FIRE-WATCH. COORDINATE ALL OUTAGES WITH FACILITY MANAGEMENT.

**DEMOLITION KEY NOTES:**

- 1 DEMOLISH EX. 4" SUPPLY MAIN CONNECTION.
- 2 DEMOLISH EX. 6" SPRINKLER RISER INCLUDING ALARM CHECK VALVE, CONTROL VALVE, DRAIN VALVE AND ASSOCIATED TRIM.
- 3 DEMOLISH EX. 6" SUPPLY MAIN BACK TO CRAWL SPACE AND PROVIDE CAP.
- 4 EXISTING FDC TO REMAIN.
- 5 DEMOLISH EX. SPRINKLER MONITORING DEVICES, ASSOCIATED FIRE ALARM INPUT MODULES, AND ALL ASSOCIATED WIRING AND RACEWAY BACK TO PREVIOUS DEVICE ON CIRCUIT.

**CONSTRUCTION KEY NOTES:**

- 1 UPGRADE SIZE OF SYSTEM RISER DOWNSTREAM OF EX. 6" ALARM CHECK VALVE. RE-CONNECT EX. FDC MAIN TO NEW 6" RISER MAIN.
- 2 PROVIDE NEW 6" SUPPLY MAIN TO FEED NORTH SYSTEM ZONES.
- 3 EXTEND NEW 4" MAIN TO RE-FEED EX. 4" STANDPIPE FEED MAIN.
- 4 EXTEND NEW 4" MAIN TO RE-FEED FDC CONNECTION. PROVIDE NEW CHECK VALVE WITH AUTO-BALL DRIP DEVICE.



1 BLDG. 16 PARTIAL FIRST FLOOR PLAN - FIRE PROTECTION  
 F-102 SCALE: 1/8"=1'-0"

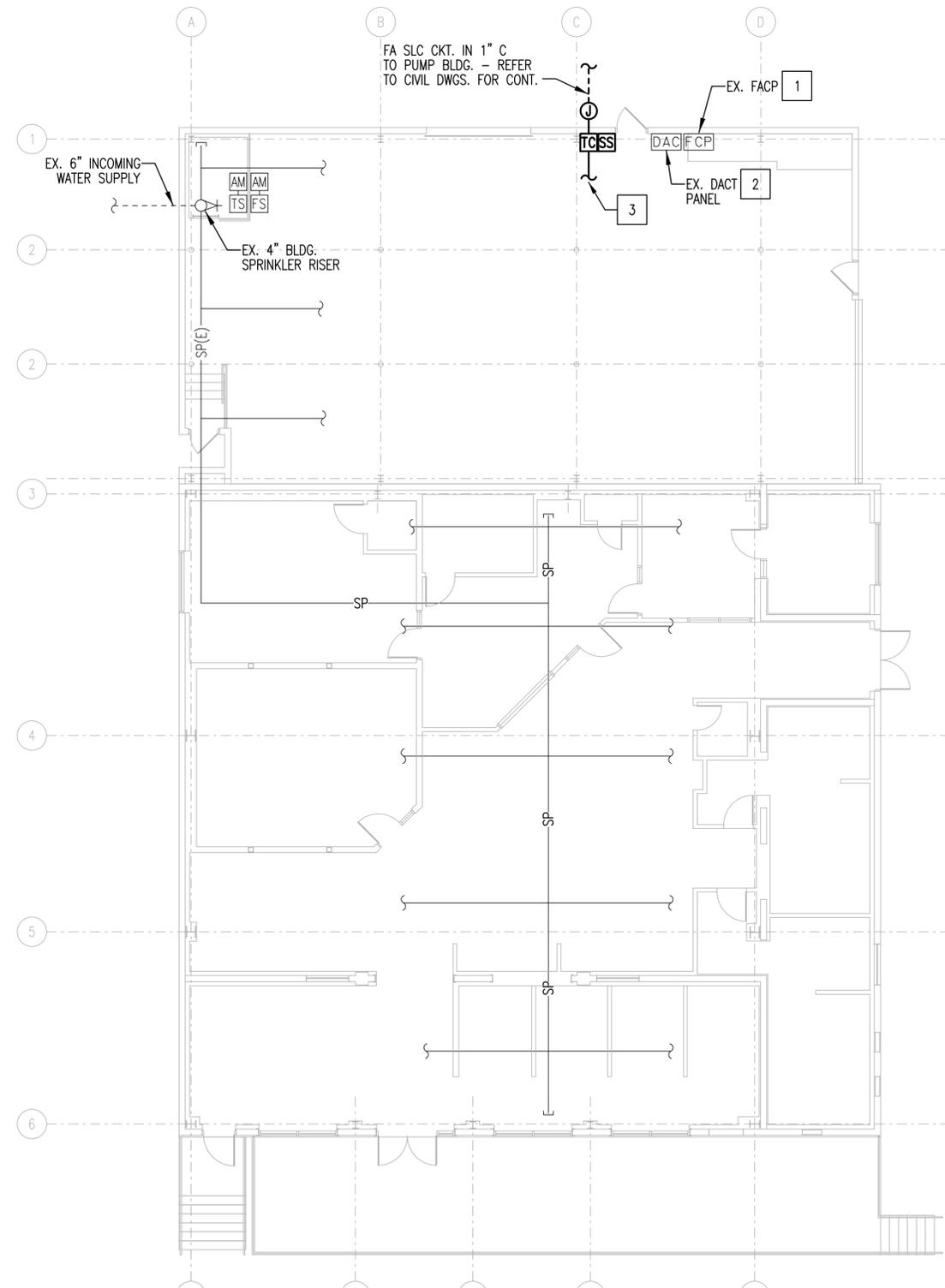
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**DRAWING NOTES:**

1. REFER TO SHEET F-001 FOR LEGEND, NOTES AND ABBREVIATIONS.
2. DRAWING IS DIAGRAMMATIC AND REFLECTS DESIGN INTENT ONLY. CONTRACTOR IS RESPONSIBLE FOR DETERMINING FINAL EQUIPMENT OR DEVICE LOCATION.
3. BUILDING FIRE PROTECTION SYSTEM OUTAGES SHALL BE MINIMIZED TO THE MAXIMUM EXTENT POSSIBLE. THE CONTRACTOR SHALL PHASE MODIFICATION WORK TO LIMIT OUTAGES TO NO GREATER THAN 4-HOURS DURING PERIODS OF OCCUPANCY. OUTAGES LASTER LONGER THAN 4-HOURS SHALL REQUIRE A FIRE-WATCH. COORDINATE ALL OUTAGES WITH FACILITY MANAGEMENT.
4. EXISTING SPRINKLER SYSTEM IS TO REMAIN AND IS SHOWN FOR REFERENCE ONLY.

**CONSTRUCTION KEY NOTES:**

- 1 EXISTING FIRE ALARM CONTROL PANEL (MANUFACTURER: EDWARDS EST, MODEL #1064) SERVING BUILDING 15 TO REMAIN.
- 2 EXISTING DACT PANEL (MANUFACTURER: SILENT KNIGHT, MODEL #5104) TO REMAIN.
- 3 EXTEND SLC CIRCUIT TO NEW PUMP BLDG. PROVIDE NEW TERMINAL CABINET AND SURGE SUPPRESSOR DEVICE TO PROTECT SLC CIRCUIT. MOUNT IN A 8"x8" MIN. CABINET NEAR POINT OF PENETRATION INSIDE BUILDING.



1 BLDG. 15 FLOOR PLAN - FIRE PROTECTION  
 F-103 SCALE: 1/8"=1'-0"

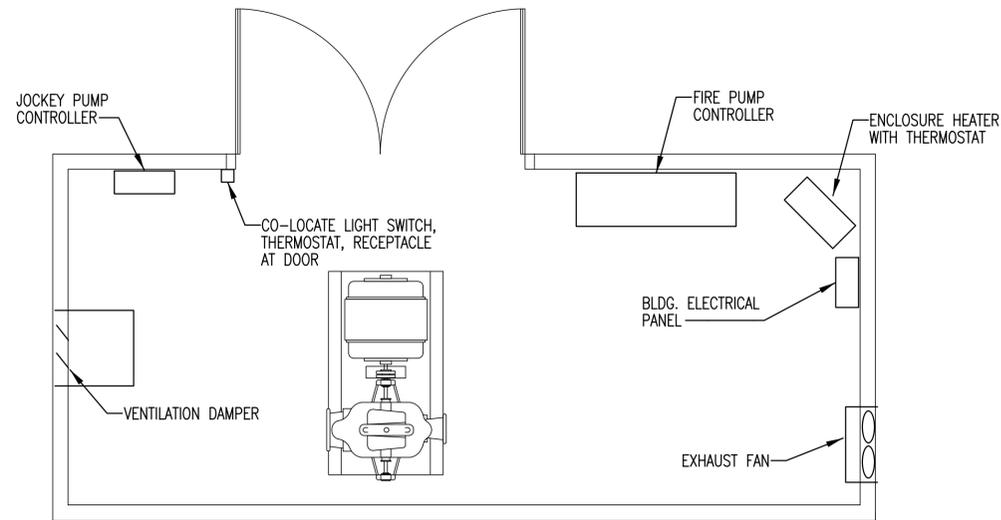
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**DRAWING NOTES:**

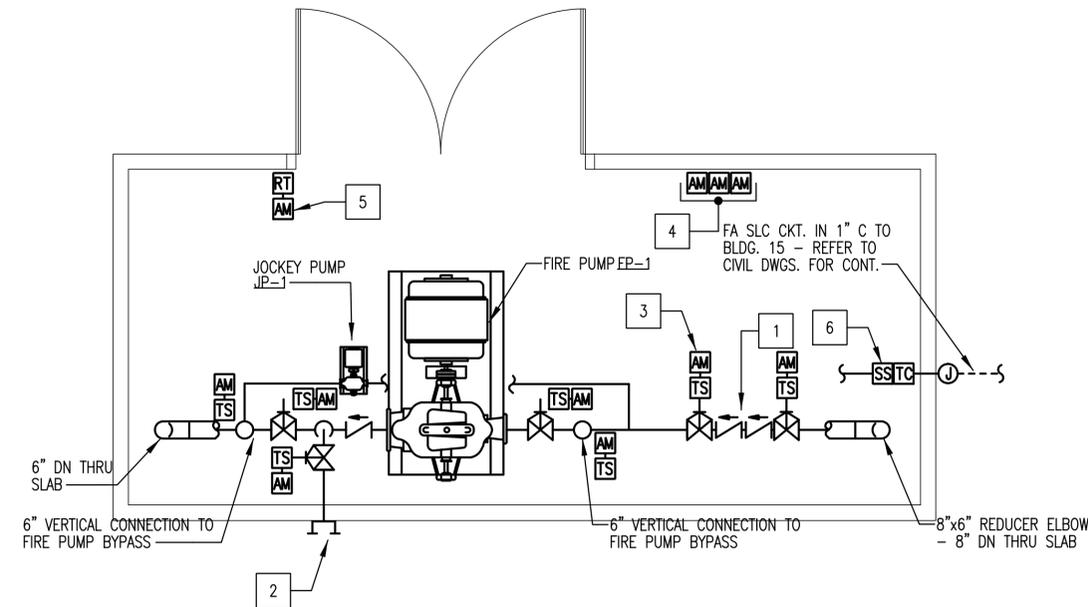
1. REFER TO SHEET F-001 FOR LEGEND, NOTES AND ABBREVIATIONS.
2. DRAWING IS DIAGRAMMATIC AND REFLECTS DESIGN INTENT ONLY. CONTRACTOR IS RESPONSIBLE FOR PROVIDING A COORDINATED EQUIPMENT LAYOUT, FINAL PIPE ROUTING, AND SIZING SYSTEM COMPONENTS BASED ON CALCULATIONS.
3. ENCLOSURE SHALL BE CONSTRUCTED WITH 2-HOUR FIRE RESISTANCE RATED WALLS AND CEILING.

**CONSTRUCTION KEY NOTES:**

- 1 6" UL LISTED DOUBLE CHECK BACKFLOW PREVENTOR ASSEMBLY.
- 2 PUMP TEST HEADER WITH REQUIRED TEST VALVES PER NFPA 20.
- 3 PROVIDE ADDRESSABLE INPUT MODULE AND INTERFACE WITH SPRINKLER VALVE TAMPER SWITCH.
- 4 PROVIDE ADDRESSABLE INPUT MODULES AND INTERFACE WITH PUMP CONTROLLER TO MONITOR FIRE PUMP FOR PUMP RUNNING, LOSS OF PHASE, AND PHASE REVERSAL CONDITIONS.
- 5 PROVIDE ADDRESSABLE INPUT MODULE TO MONITOR ROOM TEMPERATURE SENSOR.
- 6 PROVIDE SURGE SUPPRESSION DEVICE CONNECTED TO SLC FIRE ALARM CIRCUIT. MOUNT IN 8"x8" MIN. ELECTRICAL BOX NEAR POINT OF PENETRATION INSIDE BUILDING.



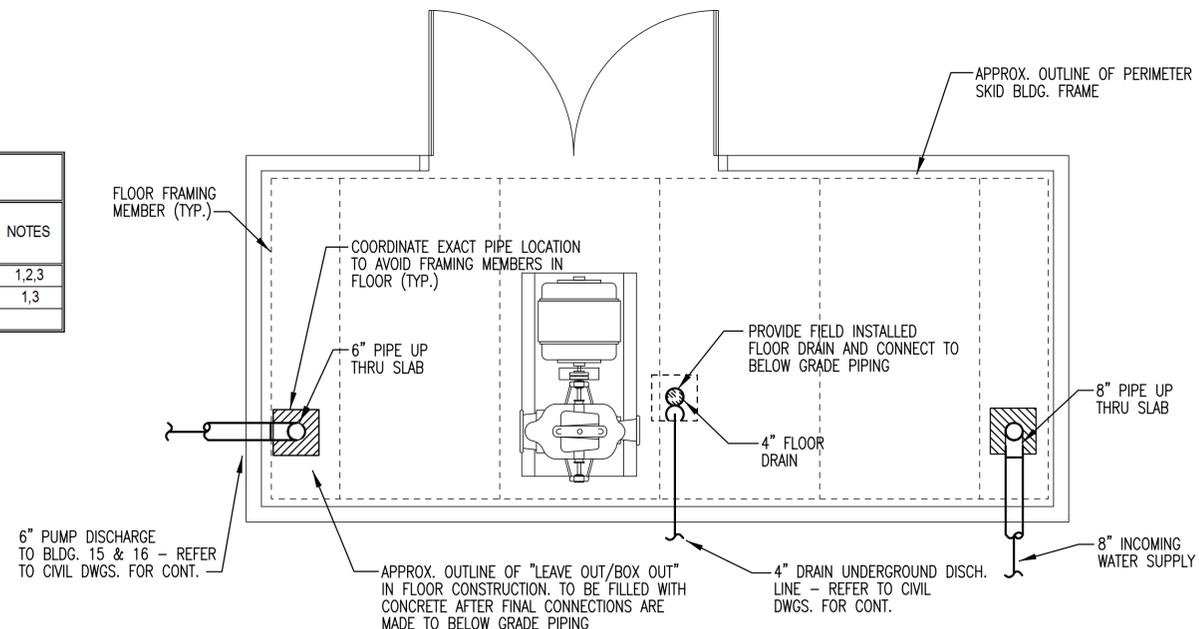
2 PRE-PACKAGED PUMP BLDG. - EQUIPMENT PLAN  
F-104 SCALE: 1/2"=1'-0"



1 PRE-PACKAGED PUMP BLDG. - FIRE PROTECTION PLAN  
F-104 SCALE: 1/2"=1'-0"

PUMP SCHEDULE								
UNIT ID	UNIT TYPE	LOCATION	CAPACITY		ELECTRICAL DATA		BASIS OF DESIGN	NOTES
			GPM	PRESSURE (PSI)	HP	VOLTS/PH		
FP-1	HORIZONTAL SPLIT-CASE	FIRE PUMP BUILDING	500	110	60	480/3	PEERLESS #3AEF9	1,2,3
JP-1	VERTICAL IN-LINE	FIRE PUMP BUILDING	10	120	2	480/3	GRUNDFOS #CR 3-10	1,3

- NOTES:
1. RATINGS ARE PRELIMINARY AND SHALL BE CONFIRMED BY CONTRACTOR. CONTRACTOR SHALL SUBMIT CALCULATIONS TO VERIFY FINAL PUMP SIZE.
  2. FIRE PUMP WITH REDUCED VOLTAGE, SOFT-START TYPE CONTROLLER. PROVIDE ATS FOR SECONDARY POWER FEED.
  3. FIRE PUMP SYSTEM SHALL BE A PRE-PACKAGED, SKID-MOUNTED FIRE PUMP SYSTEM.



3 PRE-PACKAGED PUMP BLDG. - BELOW FIN. FLOOR PLAN  
F-104 SCALE: 1/2"=1'-0"

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# GENERAL STRUCTURAL NOTES:

## GENERAL:

- COORDINATE ALL ACTIVITIES, INCLUDING THOSE OF THE SUBCONTRACTORS, WITH THE OWNER.
- NOT ALL OPENINGS IN THE STRUCTURAL WORK ARE SHOWN. REVIEW ALL DRAWINGS FROM OTHER DISCIPLINES AND COORDINATE ALL OPENINGS AND EMBEDDED ITEMS SUCH AS SLEEVES, ANCHORS, CONDUITS, ETC. THAT WILL BE INCORPORATED INTO THE STRUCTURAL WORK.
- COORDINATE SIZE OF FIRE PUMP BUILDING FOUNDATION WITH THE APPROVED SHOP DRAWINGS.
- REFER TO CIVIL SHEETS FOR FIRE PUMP BUILDING LOCATION AND TOP OF SLAB ELEVATION.
- EQUIPMENT WEIGHTS INDICATED ON DRAWINGS ARE BASED ON BASIS-OF-DESIGN PRODUCTS. CONTACT THE ENGINEER IF ACTUAL EQUIPMENT WEIGHTS EXCEED THOSE SHOWN.
- DESIGN OF THE FIRE PUMP BUILDING IS DELEGATED TO THE CONTRACTOR'S ENGINEER. DESIGN MUST BE IN ACCORDANCE WITH THE CODES AND DESIGN LOADS SPECIFIED ON THIS SHEET. SUBMIT CALCULATIONS AND SHOP DRAWINGS FOR APPROVAL, STAMPED AND SIGNED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF DELAWARE.

## FOUNDATIONS:

- PROOF ROLL AND THOROUGHLY DENSIFY EXCAVATED SUBGRADE FOR THE FIRE PUMP BUILDING FOUNDATION, USING A WALK-BEHIND VIBRATORY ROLLER, TO ACHIEVE A MINIMUM ALLOWABLE BEARING CAPACITY OF 1000 PSF. OBTAIN THE SERVICES OF A GEOTECHNICAL ENGINEER LICENSED IN THE STATE OF DELAWARE WHO IS RESPONSIBLE FOR VERIFICATION OF THE SPECIFIED MINIMUM ALLOWABLE BEARING CAPACITY.
- REMOVE ALL UNSATISFACTORY MATERIAL, AT THE DIRECTION OF THE ENGINEER, BELOW THE FOUNDATION TO A COMPETENT SOIL STRATUM AND REPLACE WITH CONTROLLED COMPACTED CRUSHER RUN AGGREGATE.
- PLACE A 12-INCH DEPTH OF DELDOT GRADED AGGREGATE TYPE 'B' (CRUSHER RUN) BENEATH THE FOUNDATION, AND FOR A WIDTH OF 1 FOOT BEYOND FOUNDATION, AND COMPACT TO 95% OF AASHTO T-180.
- PLACE FOUNDATION ON THE SAME DAY THAT EXCAVATION, OR ANY NECESSARY FILL, IS COMPLETE. IF THE BEARING SURFACE IS LEFT UNPROTECTED AND WILL BE EXPOSED TO WEATHER, EXCAVATE AN ADDITIONAL 6 INCHES OR UNTIL A SUITABLE BEARING SURFACE IS REACHED AND FILL WITH LEAN CONCRETE FILL WITH A MINIMUM COMPRESSIVE STRENGTH OF 2500 PSI. ANY BEARING SURFACE NOT PROTECTED WITHIN THE PRESCRIBED TIME MUST BE RE-INSPECTED BY THE CONTRACTOR'S GEOTECHNICAL ENGINEER BEFORE CONCRETE PLACEMENT. KEEP ALL EXCAVATIONS DRY.
- MINIMUM DEPTH BELOW GRADE FOR BOTTOM OF FOUNDATIONS FOR FROST PROTECTION IS 32 INCHES.
- SUBGRADE MUST BE INSPECTED AND APPROVED BY THE CONTRACTOR'S GEOTECHNICAL ENGINEER BEFORE PLACING ANY CONCRETE, NO. 57 STONE, OR CRUSHER RUN.
- REFER TO OTHER DISCIPLINES' DRAWINGS FOR WORK TO BE INCORPORATED IN OR BELOW FOUNDATION WORK.
- PROVIDE SUPPORT FOR ALL EXCAVATIONS REQUIRED TO COMPLETE THE WORK SHOWN ON THE DRAWINGS. SUPPORT OF EXCAVATION SYSTEMS MUST BE DESIGNED BY THE CONTRACTOR'S PROFESSIONAL ENGINEER.

## CONCRETE:

- SUBMIT CONCRETE MIX DESIGN, IN ACCORDANCE WITH ACI 301, FOR APPROVAL AT LEAST 30 DAYS PRIOR TO THE START OF PLACING CONCRETE; AND MEETING THE FOLLOWING REQUIREMENTS:
  - MINIMUM 28-DAY COMPRESSIVE STRENGTH ( $f'_c$ ): 4500 PSI
  - PORTLAND CEMENT: ASTM C150, TYPE I/II OR TYPE II
  - FLY ASH: ASTM C618, CLASS F
  - SLAG CEMENT: ASTM C989, GRADE 100 OR 120
  - COARSE AND FINE AGGREGATE: ASTM C33
  - ALKALI-SILICA REACTION: 0.10 MAXIMUM EXPANSION AT 16 DAYS PER ASTM C1567 FOR EACH AGGREGATE USED IN CONCRETE
  - WATER: ASTM C1602 AND POTABLE
  - WATER-CEMENTITIOUS MATERIAL RATIO: 0.45 MAXIMUM
  - NOMINAL MAXIMUM AGGREGATE SIZE: 1 INCH
  - AIR CONTENT: 6%
  - MAXIMUM WATER-SOLUBLE CHLORIDE ION CONTENT IN CONCRETE: 0.30% BY WEIGHT OF CEMENT
  - SLUMP: 3 TO 5 INCHES
- DETAIL, CONVEY, PLACE, FINISH, AND CURE REINFORCED CONCRETE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE ACI 301, "SPECIFICATION FOR STRUCTURAL CONCRETE", AND AS SPECIFIED HEREIN.
- READY-MIXED CONCRETE SHALL CONFORM TO ASTM C94. OBTAIN PERMISSION FROM THE ENGINEER TO MIX CONCRETE BY HAND.
- DETAIL REINFORCING STEEL IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE ACI 315, "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES" AND ACI SP-66, "ACI DETAILING MANUAL."
- PROVIDE REINFORCING STEEL CONFORMING TO ASTM A615, GRADE 60, DEFORMED BARS.
- REINFORCING STEEL SHALL BE FREE FROM LOOSE, FLAKY RUST AND SCALE, AND FREE FROM OIL, GREASE, OR OTHER COATING WHICH MIGHT DESTROY OR REDUCE THE REINFORCING'S BOND WITH THE CONCRETE.
- UNLESS NOTED OTHERWISE ON THE DRAWINGS, PROVIDE CONCRETE COVER FOR REINFORCEMENT AS FOLLOWS:
  - CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH OR FILL: 3"
  - ALL OTHER CONCRETE: 2"
- SUBMIT REINFORCING STEEL DETAILS (SHOP DRAWINGS) AND PROPOSED CONSTRUCTION JOINT LAYOUT AND RECEIVE APPROVAL FROM THE ENGINEER BEFORE PROCEEDING WITH FABRICATION.
- LAP SPLICE LENGTH FOR #4 BAR MUST BE AT LEAST 19 INCHES.
- CHAMFER ALL EXPOSED CONCRETE EDGES 3/4" UNLESS NOTED OTHERWISE.

## CONCRETE (CONTINUED):

- REVIEW ALL DRAWINGS FROM OTHER DISCIPLINES AND COORDINATE ALL OPENINGS AND EMBEDDED ITEMS SUCH AS SLEEVES, ANCHORS, CONDUIT, ETC THAT WILL BE INCORPORATED INTO THE CONCRETE WORK.
- COLD WEATHER PLACEMENT OF CONCRETE MUST BE IN ACCORDANCE WITH ACI 306R, ACI 306.1.
- HOT WEATHER PLACEMENT OF CONCRETE MUST BE IN ACCORDANCE WITH ACI 305R, ACI 305.1.
- PROVIDE NON-SHRINK NON-METALLIC GROUT CONFORMING TO ASTM C1107.
- EMPLOY AN INDEPENDENT TESTING AGENCY QUALIFIED IN ACCORDANCE WITH ASTM C1077 AND E329 FOR THE FOLLOWING TESTING, AND SUBMIT TEST RESULTS TO ENGINEER FOR APPROVAL. FIELD AND LABORATORY TESTING PERSONNEL SHALL BE QUALIFIED PER ACI 301.
  - SUPPLY ALL CONCRETE, COMPRESSION TEST MOLDS, TAMPING RODS, TROWEL, METAL OR GLASS COVERS, SLUMP CONE, STORAGE CURING BOX AND SAND NECESSARY FOR MAKING COMPRESSION TEST SPECIMENS OUTLINED HEREIN. MAKE AND CURE SPECIFIED NUMBER OF SPECIMENS FOR EACH SAMPLE IN ACCORDANCE WITH ASTM C31 AND C172.
  - COMPOSITE SAMPLES FOR STRENGTH TESTS SHALL BE TAKEN NOT LESS THAN ONCE A DAY.
  - SLUMP: ASTM C143; ONE TEST AT POINT OF DISCHARGE FOR EACH COMPOSITE SAMPLE. PERFORM ADDITIONAL TESTS WHEN CONCRETE CONSISTENCY APPEARS TO CHANGE.
  - AIR CONTENT: ASTM C231, PRESSURE METHOD, FOR NORMAL-WEIGHT CONCRETE; ONE TEST FOR EACH COMPOSITE SAMPLE.
  - COMPRESSION TEST SPECIMENS: ASTM C31.
    - CAST AND LABORATORY CURE TWO SETS OF AT LEAST TWO 6"x12" CYLINDERS OR AT LEAST THREE 4"x8" CYLINDERS FOR EACH COMPOSITE SAMPLE.
    - WHEN TRANSPORTED, THE CYLINDERS SHALL NOT BE THROWN, DROPPED, ALLOWED TO ROLL, OR BE DAMAGED IN ANY WAY.
  - COMPRESSIVE-STRENGTH TESTS: ASTM C39; TEST AT 28 DAYS.
    - A COMPRESSIVE-STRENGTH TEST SHALL BE THE AVERAGE COMPRESSIVE STRENGTH FROM A SET OF TWO 6"x12" CYLINDERS OR THREE 4"x8" CYLINDERS, OBTAINED FROM THE SAME COMPOSITE SAMPLE. CYLINDERS SHALL BE TESTED AT 28 DAYS. THE REMAINING COMPOSITE SAMPLE CYLINDERS SHALL BE HELD FOR BACKUP PURPOSES.

## ADHESIVE ANCHORS:

- THE ADHESIVE ANCHOR SYSTEM USED FOR POST INSTALLED ANCHORAGE TO CONCRETE MUST CONFORM TO THE REQUIREMENTS OF THE MOST RECENTLY PUBLISHED ACI 355.4, "ACCEPTANCE CRITERIA FOR QUALIFICATION OF POST-INSTALLED ADHESIVE ANCHORS IN CONCRETE AND COMMENTARY." EACH ADHESIVE ANCHOR SYSTEM MUST SATISFY THE STRENGTH REQUIREMENTS FOR ITS USE. BULK-MIXED ADHESIVES ARE NOT PERMITTED. ADHESIVE ANCHORAGE DESIGN IS IN ACCORDANCE WITH CHAPTER 17 OF ACI 318-14, FOR ALL OTHER INFORMATION SEE SPECIFICATIONS. ADHESIVE ANCHORS IN CONCRETE MUST BE QUALIFIED FOR USE IN CRACKED CONCRETE IN ACCORDANCE WITH ACI 355.4. THE FOLLOWING ANCHOR SYSTEMS, OR APPROVED EQUALS, MUST BE USED:
  - HILTI HIT-HY 200 WITH TYPE 316 STAINLESS STEEL HILTI HIT-Z-R ROD OR HAS-R THREADED ROD.
- CONCRETE AT THE TIME OF ADHESIVE ANCHOR INSTALLATION MUST HAVE A MINIMUM AGE OF 21 DAYS.
- INSTALL ADHESIVE ANCHORS WITH A MINIMUM EDGE DISTANCE OF 3 INCHES TO ANY FREE EDGE OF CONCRETE, OR EDGE DISTANCE INDICATED ON DRAWINGS, WHICHEVER IS GREATER.
- INSTALL ADHESIVE ANCHORS WITH TRAINED QUALIFIED PERSONNEL, IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS.
- PROVIDE THOROUGHLY CLEANED ANCHOR HOLES PRIOR TO ADHESIVE INJECTION, AS REQUIRED BY THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS. PROTECT DRILLED AND CLEANED ANCHOR HOLES FROM CONTAMINATION UNTIL THE ADHESIVE IS INSTALLED.
- PROVIDE ANCHORS CLEAN, OIL-FREE, AND FREE OF LOOSE RUST, PAINT, OR OTHER COATINGS.
- PROVIDE INSTALLED ADHESIVE ANCHORS SECURELY FIXED IN-PLACE TO PREVENT DISPLACEMENT WHILE THE ADHESIVE CURES.

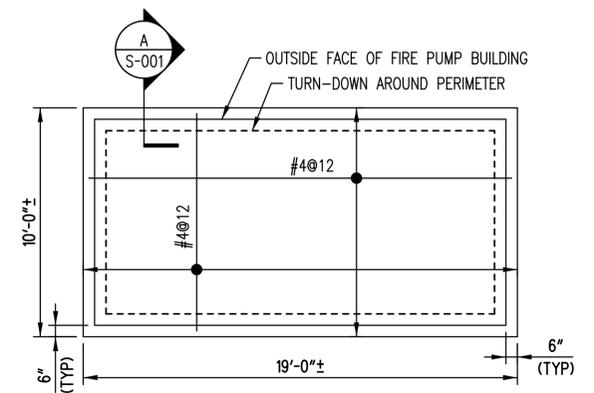
## DESIGN LOADS:

ALL LOADS INDICATED BELOW ARE UNFACTORED

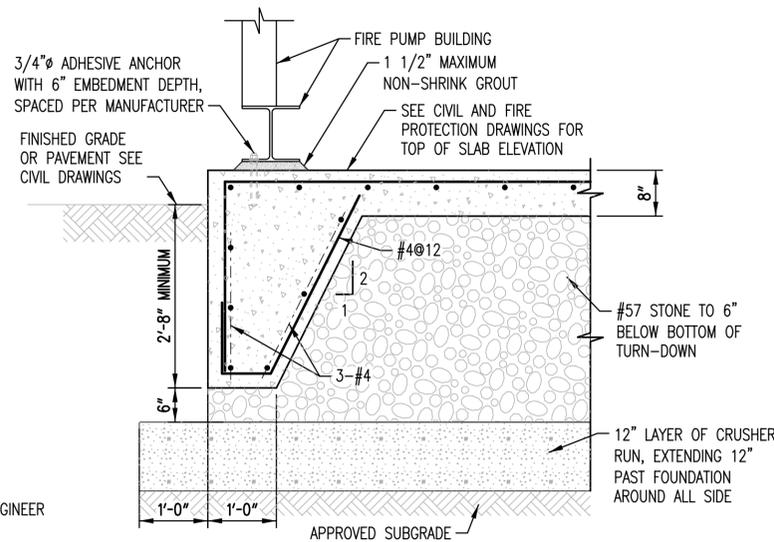
- FIRE PUMP BUILDING RISK CATEGORY: IV
- DEAD LOADS:
  - FIRE PUMP BUILDING: 11,500 LBS
- LIVE LOADS:
  - FIRE PUMP BUILDING FLOOR: 100 PSF
- ROOF LIVE LOAD: 20 PSF
- ROOF SNOW LOAD:
  - GROUND SNOW LOAD ( $P_g$ ): 25 PSF
  - EXPOSURE FACTOR ( $C_e$ ): 1.0
  - THERMAL FACTOR ( $C_t$ ): 1.1
  - SNOW LOAD IMPORTANCE FACTOR ( $I_s$ ): 1.2
  - FLAT ROOF LOAD ( $P_f$ ): 24 PSF
- WIND LOAD:
  - ULTIMATE WIND SPEED ( $V_{ult}$ ): 120 MPH
  - NOMINAL WIND SPEED ( $V_{asd}$ ): 93 MPH
  - EXPOSURE CATEGORY: B
  - INTERNAL PRESSURE COEFFICIENT: AS DETERMINED BY FIRE PUMP BUILDING ENGINEER
- SEISMIC LOAD:
  - MAXIMUM EARTHQUAKE SPECTRAL RESPONSE ACCELERATION AT SHORT PERIODS:  $S_s=0.194g$
  - MAXIMUM EARTHQUAKE SPECTRAL RESPONSE ACCELERATION AT ONE-SECOND:  $S_1=0.059g$
  - SITE CLASSIFICATION: D
  - SITE SEISMIC COEFFICIENT:  $F_0=1.6; F_v=2.4$
  - SPECTRAL RESPONSE COEFFICIENT:  $SDS = 0.207; SD1 = 0.094$
  - SEISMIC DESIGN CATEGORY: C

## CODES AND STANDARDS:

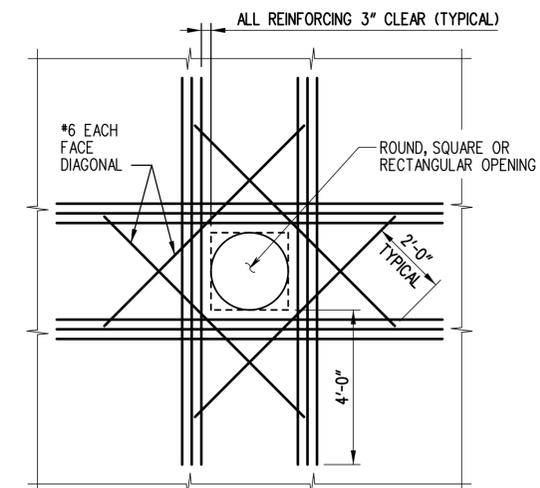
- INTERNATIONAL BUILDING CODE IBC (2015), INCLUDING THE MODIFICATIONS MADE BY LOCAL JURISDICTION
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION AISC-360 (2010) "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS"
- AMERICAN CONCRETE INSTITUTE ACI-318 (2014), "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE"
- AMERICAN SOCIETY OF CIVIL ENGINEERS ASCE 7 (2010), "MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES"
- AMERICAN WELDING SOCIETY AWS D1.1 (2015), "STRUCTURAL WELDING CODE - STEEL"



1 FIRE PUMP BUILDING FOUNDATION PLAN  
S-001 NOT TO SCALE



A SECTION  
S-001 NOT TO SCALE  
REF: S-001



- NOTES:
- PROVIDE ADDITIONAL REINFORCING, (MINIMUM OF ONE-HALF THE NUMBER OF PRINCIPLE REINFORCING BARS INTERRUPTED BY THE OPENING) ON EACH SIDE AND EACH FACE OF THE OPENING.
  - FOR OPENINGS LESS THAN 12" DIAMETER, NO ADDITIONAL REINFORCING IS REQUIRED PROVIDED NO REINFORCING IS INTERRUPTED BY THE OPENING.

ADDITIONAL REINFORCING  
AROUND OPENINGS  
NOT TO SCALE

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ELECTRICAL LEGEND, ABBREVIATIONS & GENERAL NOTES

**SAFETY SWITCHED/BREAKERS/STARTERS**

-  NON-FUSED DISCONNECT SWITCH, SUBSCRIPT INDICATES AMPACITY AND NUMBER OF POLES (600V)
-  MAGNETIC COMBINATION MOTOR STARTER. 30 AMP, 3 POLE SWITCH WITH NEMA SIZE 1 STARTER UON.
-  ENCLOSED BREAKER

**EQUIPMENT CONNECTION**

-  MOTOR, NUMBER INDICATES HORSEPOWER
-  JUNCTION BOX
-  EQUIPMENT CONNECTION AS NOTED
-  UNIT HEATER
-  TRANSFORMER
-  GROUND ROD 3/4" DIAMETER 10'-0" LONG UON

**WIRING**

-  **HPA-1,3,5** BRANCH CIRCUIT HOMERUN TO PANELBOARD. HPA DENOTES TO PANEL. HPA AND NUMERALS IDENTIFY CIRCUIT NUMBERS. ARROWS DENOTE NO. OF CIRCUITS.
-  CONDUIT WITH WIRES, #12 AWG IN 3/4" C. UNLESS OTHERWISE NOTED. NUMBER OF CONDUCTORS AS REQUIRED. PROVIDE SEPARATE NEUTRALS FOR ALL SINGLE PHASE CIRCUITS.
- OR**
-  BRANCH CIRCUIT OR FEEDER WIRING IN CONDUIT. NO TICK MARKS INDICATES 2#12 CONDUCTORS AND 1#12 GROUND IN A 3/4" C (UON)
-  INDICATES A CONDUIT RUN CONCEALED IN CEILING WALL, FLOOR, OR ABOVE SUSPENDED CEILING (UON)
-  EXPOSED CONDUIT RUN AS INDICATED.
-  CONDUIT TURNED UP
-  CONDUIT TURNED DOWN

**PANELBOARDS**

-  ELECTRICAL PANELBOARD (240/120V, 3W+G)
-  ELECTRICAL PANELBOARD (480/277V, 4W+G)

**MISCELLANEOUS**

-  SPECIFIC NOTE NUMBER
-  FEEDER SIZE
-  SECTION NUMBER
-  DRAWING NUMBER WHERE SHOWN
-  DETAIL NUMBER
-  DRAWING NUMBER WHERE SHOWN

**EMERGENCY SYSTEM**

-  GENERATOR
-  AUTOMATIC TRANSFER SWITCH

ABBREV.	DESCRIPTION	ABBREV.	DESCRIPTION
A	AMPERES	MAFC	MAKE ALL FINAL CONNECTIONS
AC	ALTERNATING CURRENT	M/C	MULTI/CONDUCTOR
AFG	ABOVE FINISHED FLOOR	MCB	MAIN CIRCUIT BREAKER
AHU	AIR HANDLING UNIT	MCCB	MOLDED CASE CIRCUIT BREAKER
AIC	AMPERES INTERRUPTING CAPACITY, (SYM, RMS AMPS)	MH	MOUNTING HEIGHT
ATC	AUTOMATIC TEMPERATURE CONTROL	MIN	MINIMUM
AUX	AUXILIARY	MLO	MAIN LUGS ONLY
AWG	AMERICAN WIRE GAUGE	MOD	MOTOR OPERATED DAMPER
		MTD	MOUNTED
		MTG	MOUNTING
		N	NEUTRAL
BCSD	BARE COPPER SOFT DRAWN	NEC	NATIONAL ELECTRICAL CODE
BLDG	BUILDING	NEMA	NATIONAL ELECTRICAL
BKR	BREAKER		MANUFACTURER'S ASSOCIATION
C	CONDUIT	NFSS	NON FUSED SAFETY SWITCH
CB	CIRCUIT BREAKER	NIC	NOT IN CONTRACT
CC1	POWER/CONTROL/INSTRUMENTATION CABLE RUN NUMBER AS INDICATED.	NTS	NOT TO SCALE
		OL	OVERLOAD
CKT	CIRCUIT	P	POLE OR POLES
COMB	COMBINATION	PB	PUSH BUTTON
CLG	CEILING	PH	PHASE
CP	CONTROL PANEL	PL	PILOT LIGHT
CPT	CONTROL POWER TRANSFORMER	PNL	PANELBOARD
CU	COPPER	RC	REMOTE CONTROL
CX	CONNECT TO EXISTING	RE	RELOCATE EXISTING
O/D	OUTDOOR	RECEPT	RECEPTACLE
DISC	DISCONNECT	REQ'D	REQUIRED
DN	DOWN	RGS	RIGID GALVANIZED STEEL
DP	DISTRIBUTION PANEL	RM	ROOM
DWG	DRAWING	RMS	ROOT MEAN SQUARE
EA	EACH	RX	REMOVE EXISTING
EC	EMPTY CONDUIT	SER.	SERVICE
ECD	ELEMENTARY CONTROL DIAGRAM	SF	SUPPLY FAN
EF	EXHAUST FAN	SG1-1A/P	SWGR POWER WIRE RUN NUMBER - SWGR NUMBER AND UNIT NUMBER AS INDICATED
EH	ELECTRIC HEATER		
ELEV	ELEVATION	SIC	SYMMETRICAL INTERRUPTING CURRENT
EMERG.	EMERGENCY	SS	SAFETY SWITCH
EMT	ELECTRIC METALLIC TUBING	ST	SHUNT TRIP
ENCL	ENCLOSURE	STA	STATION
E/O	ELECTRICALLY/OPERATED	STP	SHIELDED TWISTED PAIR
EQUIP	EQUIPMENT	STPS	SHIELDED TWISTED PAIR OVER ALL SHIELD
ER	EXISTING RELOCATED	STR	STARTER
ETR	EXISTING TO REMAIN	STT	SHIELDED TWISTED TRIPLE
EUH	ELECTRIC UNIT HEATER	S/N	SOLID NEUTRAL
EX, EXIST	EXISTING	SW	SWITCH
F	FUSE	SYM	SYMMETRICAL
FA	FRAME AMPS	SYS	SYSTEM
FBO	FURNISHED BY OTHERS UNDER SEPARATE CONTRACT	TA	TRIP AMPS
FC	FAN COIL UNIT	TDD	TIME DELAY DE-ENERGIZED (OFF)
FDR	FEEDER	TDE	TIME DELAY ENERGIZED (ON)
FL	FLOOR	TDC	TIME DELAY CLOSE
FLEX	FLEXIBLE	TDO	TIME DELAY OPEN
FMC	FLEXIBLE METAL CONDUIT	TYP	TYPICAL
FS	FLOW SWITCH	UH	UNIT HEATER
FSS	FUSED SAFETY SWITCH	UON	UNLESS OTHERWISE NOTED
FT	FOOT OR FEET	UPS	UNINTERRUPTIBLE POWER SUPPLY
FVNR	FULL VOLTAGE NON-REVERSING	V	VOLTS OR VOLTAGE
FVR	FULL VOLTAGE REVERSING	VFD	VARIABLE FREQUENCY DRIVE
G	GROUND	W	WATTS
GFI	GROUND FAULT INTERRUPTER	W	WIRE
GFCI	GOVERNMENT FURNISHED CONTRACTOR INSTALLED	W	WITH
GFGI	GOVERNMENT FURNISHED GOVERNMENT INSTALLED	W/	WEATHERPROOF
GFP	GROUND FAULT PROTECTION	WP	WEATHERPROOF
HID	HIGH INTENSITY DISCHARGE	XFMR	TRANSFORMER
HOA	HAND OFF AUTOMATIC	∅	CENTER LINE
HP	HEATER	∅	PHASE
HTR	HORSEPOWER	@	AT
HZ	HERTZ	#	NUMBER
IMC	INTERMEDIATE METALLIC CONDUIT		
JB	JUNCTION BOX		
KAIC	THOUSAND AMPERES INTERRUPTING CAPACITY		
KV	KILOVOLT		
KVA	KILOVOLT AMPERE		
LTG	LIGHTING		
LT/FMC	LIQUID TIGHT/FLEXIBLE METAL CONDUIT		

**GENERAL NOTES**

1. INSTALLATION OF ALL ELECTRICAL WORK SHALL CONFORM TO THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70), AND ALL APPLICABLE LOCAL CODES.
2. CONDUIT RUNS ARE SHOWN DIAGRAMMATICALLY ONLY AND SHALL BE INSTALLED IN A MANNER TO PREVENT CONFLICTS WITH EQUIPMENT AND STRUCTURAL CONDITIONS. EXPOSED CONDUITS ABOVE SUSPENDED CEILING AND INFURRED WALLS SHALL BE INSTALLED PARALLEL TO THE BEAMS AND WALLS.
3. PROVIDE ALL REQUIRED PULL BOXES AND JUNCTION BOXES FOR INSTALLATION OF THE WIRING IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS THOUGH THE BOXES MAY NOT BE INDICATED ON THE DRAWINGS.
4. THE WIRING DIAGRAMS, QUANTITY AND SIZE OF WIRES AND CONDUITS ARE BASED UPON SELECTED STANDARD COMPONENTS OF ELECTRICAL EQUIPMENT. MODIFICATIONS, APPROVED BY THE ENGINEER, MAY BE MADE BY THE CONTRACTOR AT HIS EXPENSE TO ACCOMMODATE EQUIPMENT ACTUALLY PURCHASED.
5. PROVIDE ALL NECESSARY COMPONENTS REQUIRED FOR MAKING FINAL CONNECTION OF ALL EQUIPMENT INSTALLED AS PART OF THIS CONTRACT.
6. ALL INDICATION AND CONTROL WIRING IN JUNCTION BOXES SHALL BE WIRED TO NUMBERED TERMINAL STRIPS AND IDENTIFIED AS TO START AND END OF RUN.
7. ALL ELECTRICAL EQUIPMENT INSTALLED AGAINST CONCRETE OR MASONRY WALLS SHALL BE INSTALLED WITH IN A 1/4" SPACE BETWEEN THE EQUIPMENT AND THE MOUNTING SURFACE. SPACERS SHALL BE STAINLESS STEEL, PVC OR NYLON.
8. ALL JUNCTION AND PULL BOXES SHALL BE LABELED WITH THEIR VOLTAGE AND USAGE.
9. DRAWINGS ARE DIAGRAMMATIC, ACTUAL LOCATION OF EQUIPMENT TO BE DETERMINED IN THE FIELD. NEW EQUIPMENT SHALL FIT INTO AVAILABLE SPACE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE EQUIPMENT WHICH MEETS THE SPACE REQUIREMENT.
10. COORDINATE WORK SCHEDULE WITH OWNER. WORK WILL BE ALLOWED IN CERTAIN AREAS AND GOVERNED BY EXISTING SECURITY REGULATIONS AT THE FACILITY. WORK SHALL ALLOW FOR DAILY OPERATION OF THE FACILITY WITHOUT INTERRUPTION.
11. CONTRACTOR SHALL SUBMIT A LIST OF ALL MAJOR EQUIPMENT TO THE ENGINEER FOR REVIEW AND APPROVAL. NO SUBSTITUTIONS WILL BE ALLOWED WITHOUT THE PERMISSION OF THE PROJECT ENGINEER IN WRITING. ALL EQUIPMENT SHALL BE NEW AND BEAR THE MANUFACTURER'S NAME AND TRADE NAME. ALL EQUIPMENT SHALL BE UL LISTED.
12. THE CIRCUIT NUMBERS ARE FOR IDENTIFICATION PURPOSE ONLY. THE CONTRACTOR IS RESPONSIBLE FOR BALANCING LOADS AND CORRECTLY PHASING THE CIRCUITS IN PANELBOARDS.
13. ELECTRICAL REQUIREMENTS FOR EQUIPMENT ARE BASED ON EQUIPMENT SPECIFIED. COORDINATE EXACT REQUIREMENTS WITH SHOP DRAWINGS PRIOR TO ORDERING AND INSTALLING EQUIPMENT.
14. ALL 120 VOLT BRANCH CIRCUITS LONGER THAN 100 FEET FROM PANELBOARD TO LAST EQUIPMENT SHALL UTILIZE #10AWG OR LARGER WIRES.
15. CONTRACTOR SHALL VISIT THE JOB SITE AND EXAMINE THE EXISTING CONDITIONS THAT MAY AFFECT HIS WORK.
16. CONTRACTOR SHALL OBTAIN A WRITTEN PERMISSION FROM THE OWNER TO DEENERGIZE ANY ENERGIZED BUILDING EQUIPMENT.
17. OPENINGS AND PASSAGE OF CONDUITS OR WIREWAYS THROUGH FLOOR SLABS AND FIRE RATED WALLS OR PARTITIONS SHALL BE PROVIDED WITH UL LISTED FIRE RATED SLEEVING SYSTEMS AS MANUFACTURED BY PROSET SYSTEMS INC.
18. DO NOT INSTALL MORE THAN THREE 120V CIRCUITS IN ONE HOMERUN UON.
19. SERIES RATING OF CIRCUIT BREAKERS SHALL NOT BE ALLOWED UNLESS SPECIFICALLY INDICATED ON CONTRACT DRAWINGS.
20. ALL WORK SHOWN ON THE DRAWINGS SHALL BE NEW UNLESS OTHERWISE NOTED.
21. ALL 120V CIRCUITS SHALL HAVE SEPARATE NEUTRALS.
22. MINIMUM CONDUIT SIZE SHALL BE 3/4".
23. MINIMUM WIRE SIZE SHALL BE #12 AWG.
24. PROVIDE SYSTEM GROUNDING CONDUCTORS AND EQUIPMENT GROUNDING CONDUCTORS IN ACCORDANCE WITH NEC-250, UON.

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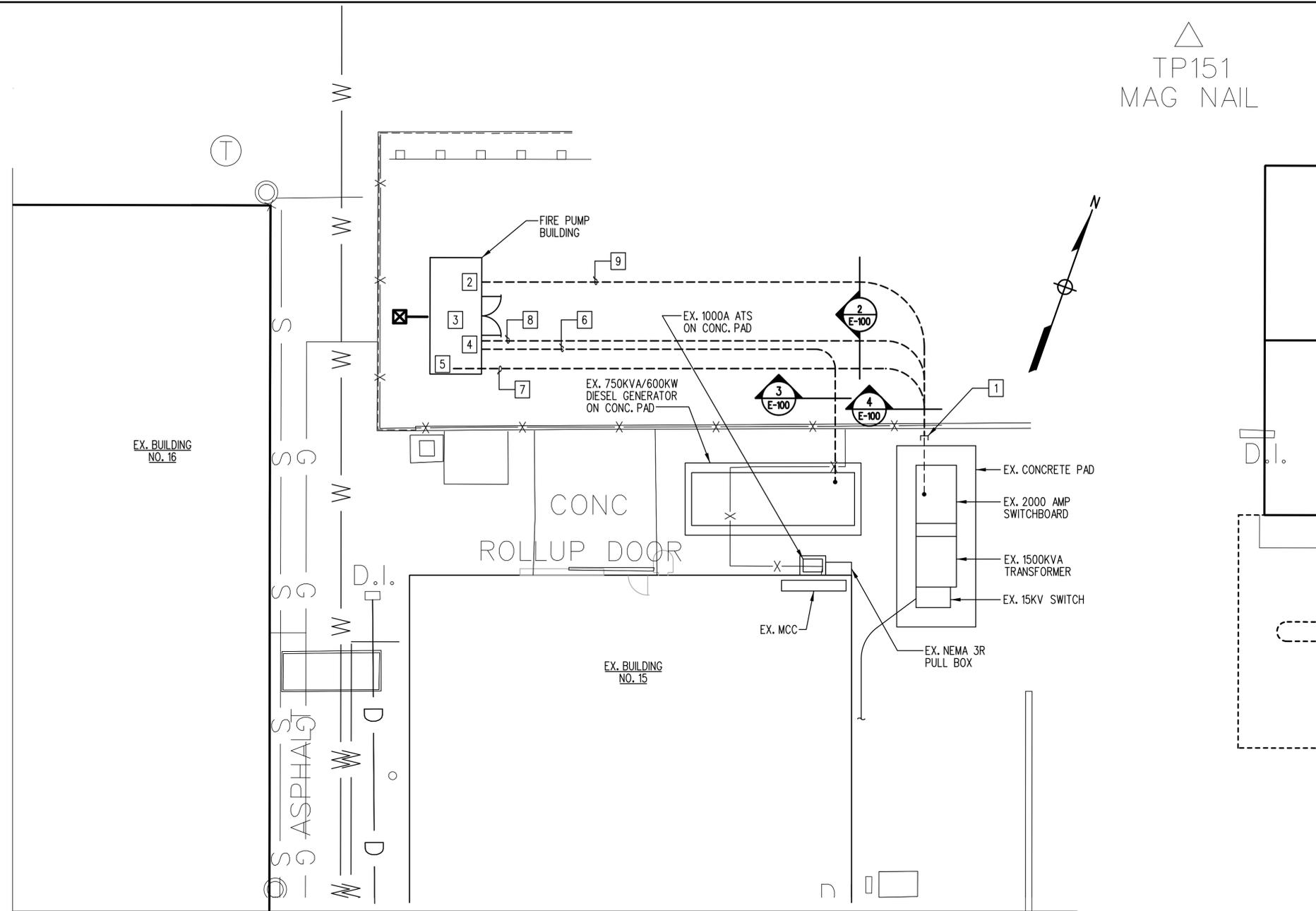
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TP151  
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**DRAWING NOTES:**

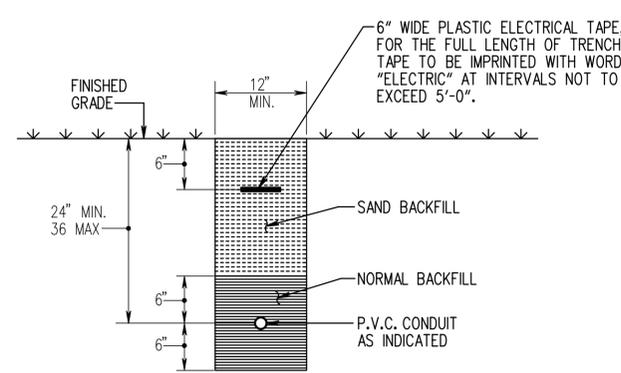
- SEE DRAWING E-001 FOR LEGEND, ABBREVIATIONS, AND GENERAL NOTES.
- SEE DRAWING E-501 FOR SINGLE LINE DIAGRAM.

**SPECIFIC NOTES:**

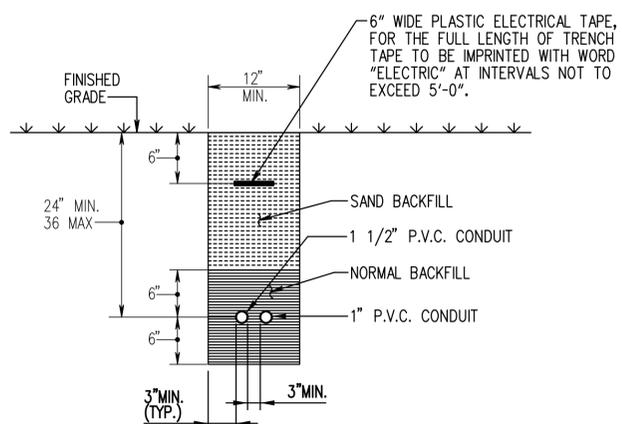
- EXISTING CONDUIT STUBOUTS.
- CONDUIT TO STUB UP TO JOCKEY PUMP CONTROLLER AS INDICATED ON THE SINGLE LINE DIAGRAM. COORDINATE EXACT LOCATION WITH BUILDING MANUFACTURER AND APPROVED FIRE PUMP BUILDING SHOP DRAWING.
- ALL BRANCH WIRING, RACEWAYS, DEVICES AND ELECTRICAL EQUIPMENT FOR THE FIRE PUMP ROOM ARE PREWIRED AND INSTALLED BY THE FIRE PUMP BUILDING MANUFACTURER. CONTRACTOR TO MAKE (3) SINGLE POINT CONNECTIONS SHOWN ON THE SINGLE LINE DIAGRAM.
- CONDUITS TO STUB UP TO FIRE PUMP CONTROLLER AS INDICATED ON THE SINGLE LINE DIAGRAM. COORDINATE EXACT LOCATION WITH BUILDING MANUFACTURER AND APPROVED FIRE PUMP BUILDING SHOP DRAWING.
- CONDUIT TO STUB UP TO MINI-POWER ZONE AS INDICATED ON THE SINGLE LINE DIAGRAM. COORDINATE EXACT LOCATION WITH BUILDING MANUFACTURER AND APPROVED FIRE PUMP BUILDING SHOP DRAWING.
- 3\*2, 1\*2G IN 1 1/2" C, (1) 1" C WITH PULL STRING FOR START SIGNALS.
- 3\*10, 1\*10G IN 1" C
- 3\*2, 1\*2G IN 1 1/2" C
- 3\*12, 1\*12G IN 3/4" C



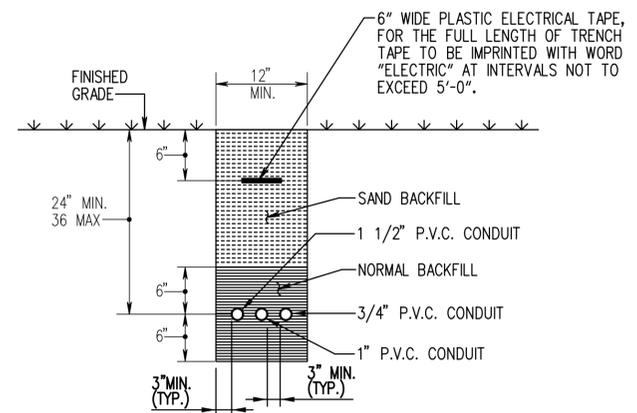
**1 ELECTRICAL PARTIAL SITE PLAN**  
E-100 SCALE: 1" = 10'-0"



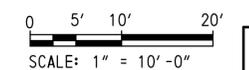
**2 SINGLE DIRECT BURIED CONDUIT DETAIL**  
E-100 SCALE: NTS



**3 TWO WAY DIRECT BURIED CONDUIT DETAIL**  
E-100 SCALE: NTS



**4 THREE WAY DIRECT BURIED CONDUIT DETAIL**  
E-100 SCALE: NTS



NO 9051-077 ACADD VCP01-90181017E-100.dgn 2/2/2019 5:56:14 AM

ADDENDUMS / REVISIONS	

CONTRACT T202053105 DOT1602	BRIDGE NO. <b>NA</b>
COUNTY NEW CASTLE	DESIGNED BY: IHK
	CHECKED BY: IHK

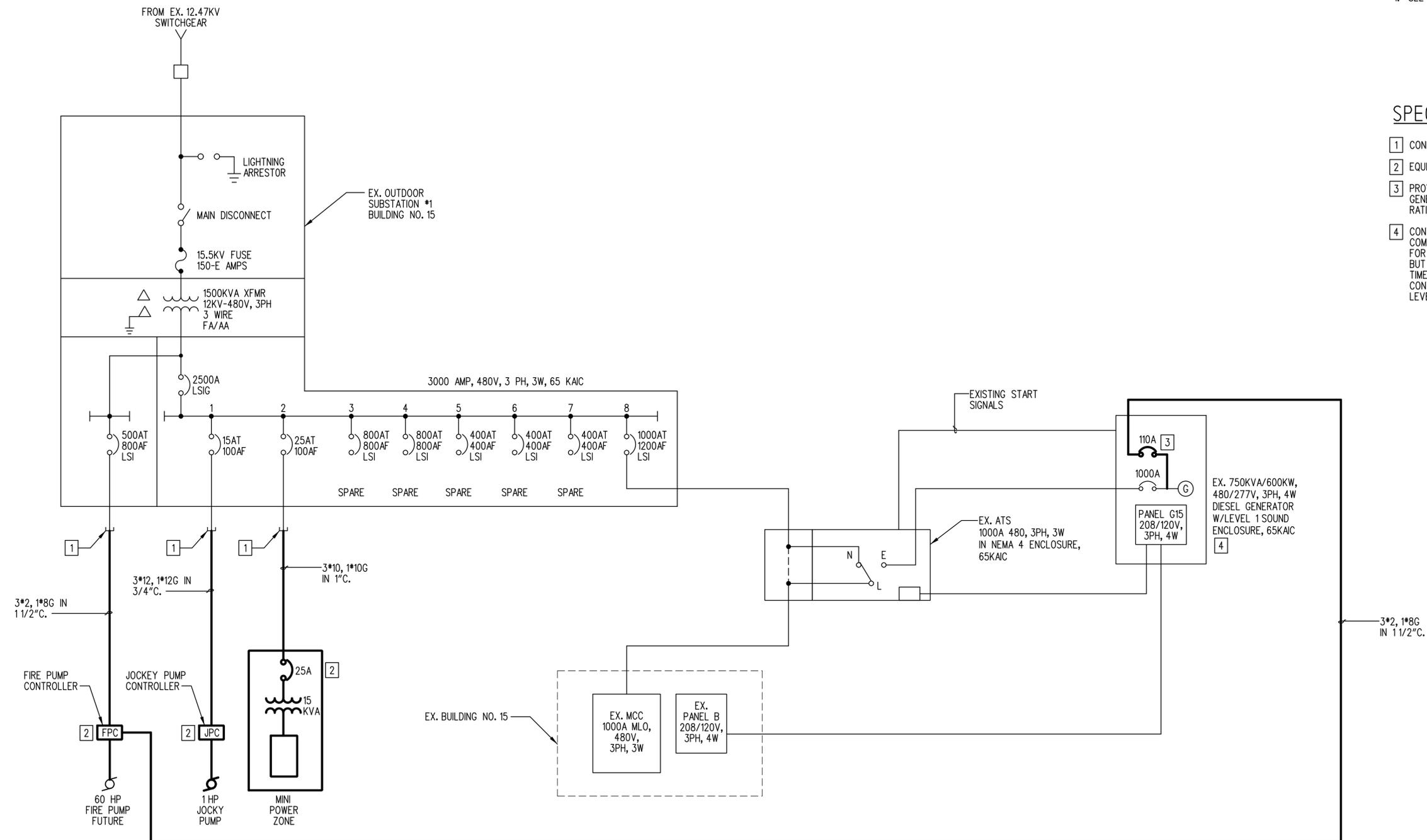
E-100
SHEET NO. 11
TOTAL SHTS. 12

**DRAWING NOTES:**

1. SEE DRAWING E-001 FOR LEGEND, ABBREVIATIONS, AND GENERAL NOTES.

**SPECIFIC NOTES:**

- 1] CONNECT TO EXISTING STUB OUT CONDUIT.
- 2] EQUIPMENT SUPPLIED BY FIRE PUMP ENCLOSURE MANUFACTURER.
- 3] PROVIDE SECOND 110A RATED, 3 POLE OUTPUT BREAKER TO EXISTING GENERATOR FOR CONNECTION TO FIRE PUMP CONTROLLER. NEW BREAKER RATING TO MATCH EXISTING BREAKER AIC RATING.
- 4] CONTRACTOR SHALL FIELD MODIFY THE EXISTING NFPA 110 LEVEL 2 COMPLIANT GENERATOR TO COMPLY WITH ALL REQUIREMENTS LISTED FOR AN NFPA 110 LEVEL 1 COMPLIANT INSTALLATION. THIS SHALL INCLUDE BUT NOT BE LIMITED TO MODIFICATION TO EMISSIONS TIER RATING, START TIME REQUIREMENTS AND ALL REQUIRED INDICATING, PROTECTIVE AND CONTROL DEVICES MANDATED BY NFPA 110 COMPLIANT INSTALLATION FOR LEVEL 1 SYSTEM INSTALLATION.



BUILDING NO. 15

PARTIAL SINGLE LINE DIAGRAM - REVISED FOR NEW FIRE PUMP

1  
E-502 SCALE: NTS

ADDENDUMS / REVISIONS

**DELAWARE TRANSIT CORPORATION**  
**LOWER BEECH STREET**  
**BUILDINGS 15 & 16 FIRE PUMP**

CONTRACT T202053105 DOT1602	BRIDGE NO. <b>N/A</b>
COUNTY NEW CASTLE	DESIGNED BY: IHK
	CHECKED BY: IHK

**SINGLE LINE DIAGRAM FOR  
NEW FIRE PUMP**

E-501

SHEET NO.	12
TOTAL SHTS.	12