

FACP Battery Calculation					3/13/2018
PROJECT NAME: 5 DAVIS FARM ROAD					
Required Standby Time: 24 Hours					
Required Alarm Time: 5 Minutes					
AC Branch Current					
AC Branch Current: _____ Amps @ 120V					
Regulated Load in Standby					
Device Type	Number of Devices	Current (Amps)		Total Current (Amps)	
FACP MAINBOARD	1	X	0.21500	= 0.21500	
SLC EXPANDER	1	X	0.05500	= 0.05500	
SMOKE DETECTOR	159	X	0.00030	= 0.04770	
HEAT DETECTOR	11	X	0.00030	= 0.00330	
MONITOR MODULE	13	X	0.00038	= 0.00494	
RELAY MODULE	5	X	0.00026	= 0.00128	
PULL STATION	12	X	0.00030	= 0.00360	
POWER SUPPLY	2	X	0.04000	= 0.08000	
ANNUNCIATOR	1	X	0.02000	= 0.02000	
TOTAL STANDBY LOAD				0.43082	
Regulated Load in ALARM					
Device Type	Number of Devices	Current (Amps)		Total Current (Amps)	
FACP MAINBOARD	1	X	0.85000	= 0.85000	
SLC EXPANDER	1	X	0.12500	= 0.12500	
SMOKE DETECTOR	159	X	0.00650	= 1.03350	
HEAT DETECTOR	11	X	0.00650	= 0.07150	
MONITOR MODULE	13	X	0.00500	= 0.06500	
RELAY MODULE	5	X	0.00026	= 0.00128	
PULL STATION	12	X	0.00030	= 0.00360	
POWER SUPPLY	2	X	0.16000	= 0.32000	
ANNUNCIATOR	1	X	0.02500	= 0.02500	
FACP-1 (See Voltage Drop Calculations)	1	X	1.58300	= 1.58300	
FACP-2 (See Voltage Drop Calculations)	1	X	1.61300	= 1.61300	
FACP-3 (Spare)	1	X	0.00000	= 0.00000	
FACP-4 (Spare)	1	X	0.00000	= 0.00000	
TOTAL ALARM LOAD				5.69088	
Battery Requirements					
Standby Load Current (Amps)	0.43082	X	Required Standby Time in Hours	24.00000	
				= 10.33956	
Alarm Load Current (Amps)	5.69088	X	Required Alarm Time in Hours	0.08333	
				= 0.47424	
Total Ampere Hours (before derating factor)				10.81380	
Derating Factor				X 1.2	
TOTAL AMPERE HOURS REQUIRED				= 12.97656	
BATTERIES TO BE PROVIDED (2 - 12v)					
15 AH					

FPS1 Battery Calculation					3/7/2018
PROJECT NAME: 5 DAVIS FARM ROAD					
Required Standby Time: 24 Hours					
Required Alarm Time: 5 Minutes					
AC Branch Current					
AC Branch Current: _____ Amps @ 120V					
Regulated Load in Standby					
Device Type	Number of Devices	Current (Amps)		Total Current (Amps)	
FPS1 MAINBOARD	1	X	0.04000	= 0.04000	
SLC EXPANDER	1	X	0.05500	= 0.05500	
SMOKE DETECTOR	88	X	0.00030	= 0.02640	
HEAT DETECTOR	3	X	0.00030	= 0.00090	
PULL STATION	1	X	0.00030	= 0.00030	
TOTAL STANDBY LOAD				0.12260	
Regulated Load in ALARM					
Device Type	Number of Devices	Current (Amps)		Total Current (Amps)	
FPS1 MAINBOARD	1	X	0.16000	= 0.16000	
SLC EXPANDER	1	X	0.12500	= 0.12500	
SMOKE DETECTOR	88	X	0.00650	= 0.57200	
HEAT DETECTOR	3	X	0.00650	= 0.01950	
PULL STATION	1	X	0.00030	= 0.00030	
FPS1-1 (See Voltage Drop Calculations)	1	X	1.09870	= 1.09870	
FPS1-2 (See Voltage Drop Calculations)	1	X	1.19900	= 1.19900	
FPS1-3 (See Voltage Drop Calculations)	1	X	1.49000	= 1.49000	
FPS1-4 (Spare)	1	X	0.00000	= 0.00000	
TOTAL ALARM LOAD				4.66450	
Battery Requirements					
Standby Load Current (Amps)	0.12260	X	Required Standby Time in Hours	24.00000	
				= 2.94240	
Alarm Load Current (Amps)	4.66450	X	Required Alarm Time in Hours	0.08333	
				= 0.38871	
Total Ampere Hours (before derating factor)				3.33111	
Derating Factor				X 1.2	
TOTAL AMPERE HOURS REQUIRED				= 3.99733	
BATTERIES TO BE PROVIDED (2 - 12v)					
7 AH					

FPS2 Battery Calculation					3/7/2018
PROJECT NAME: 5 DAVIS FARM ROAD					
Required Standby Time: 24 Hours					
Required Alarm Time: 5 Minutes					
AC Branch Current					
AC Branch Current: _____ Amps @ 120V					
Regulated Load in Standby					
Device Type	Number of Devices	Current (Amps)		Total Current (Amps)	
FPS2 MAINBOARD	1	X	0.04000	= 0.04000	
SLC EXPANDER	1	X	0.05500	= 0.05500	
SMOKE DETECTOR	92	X	0.00030	= 0.02760	
HEAT DETECTOR	3	X	0.00030	= 0.00090	
TOTAL STANDBY LOAD				0.12350	
Regulated Load in ALARM					
Device Type	Number of Devices	Current (Amps)		Total Current (Amps)	
FPS2 MAINBOARD	1	X	0.16000	= 0.16000	
SLC EXPANDER	1	X	0.12500	= 0.12500	
SMOKE DETECTOR	92	X	0.00650	= 0.59800	
HEAT DETECTOR	3	X	0.00650	= 0.01950	
FPS2-1 (See Voltage Drop Calculations)	1	X	1.13300	= 1.13300	
FPS2-2 (See Voltage Drop Calculations)	1	X	1.08400	= 1.08400	
FPS2-3 (See Voltage Drop Calculations)	1	X	1.11800	= 1.11800	
FPS2-4 (Spare)	1	X	0.00000	= 0.00000	
TOTAL ALARM LOAD				4.23750	
Battery Requirements					
Standby Load Current (Amps)	0.12350	X	Required Standby Time in Hours	24.00000	
				= 2.96400	
Alarm Load Current (Amps)	4.23750	X	Required Alarm Time in Hours	0.08333	
				= 0.35313	
Total Ampere Hours (before derating factor)				3.31713	
Derating Factor				X 1.2	
TOTAL AMPERE HOURS REQUIRED				= 3.98055	
BATTERIES TO BE PROVIDED (2 - 12v)					
7 AH					

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5 DAVIS FARM ROAD
PORTLAND, ME 04103
FIRE ALARM CALCULATIONS

DRAWN: CWS UNICAD JOB #08139
 CHECKED: WAYNE B. HAWS NICET IV 90496
 DATE: 3/13/2018
 REVISION: 0
 SCALE: 1/8"=1'-0"

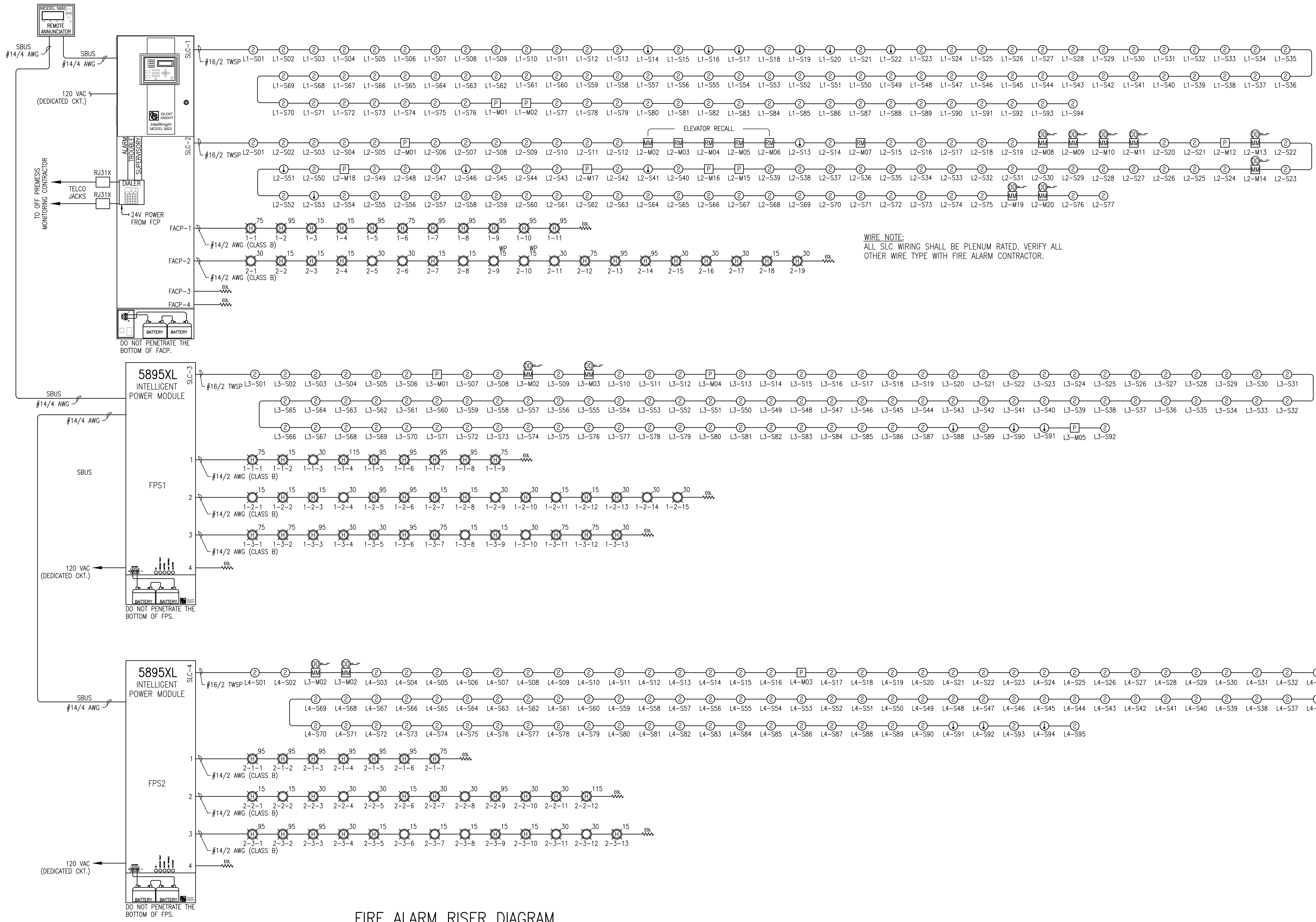
Point to Point NAC Voltage Drop Calculation					3/13/2018
Project Name: 5 DAVIS FARM ROAD					
Circuit Number: FACP-1					
Nominal System Voltage	20.4	Volts	Wire Gauge	Resistance Per 1000	
Minimum Device Voltage	16.0	Volts	14	3.07	
Distance from source to 1st device	85	feet	14	3.07	
Wire Gauge for balance of circuit					
Max Output Current	3.00	amps			
Total Circuit Current	1.583	amps			
End of Line Voltage	17.46	volts			
Circuit is within limits					
Device	Current	Distance previous device	Voltage at Device	Drop from source	Percent Drop
Device 1	0.143	85	19.57	0.826	4.05%
Device 2	0.185	50	19.13	1.268	6.22%
Device 3	0.071	30	18.90	1.503	7.37%
Device 4	0.071	20	18.75	1.651	8.09%
Device 5	0.165	45	18.44	1.964	9.63%
Device 6	0.143	45	18.17	2.231	10.94%
Device 7	0.165	40	17.97	2.434	11.93%
Device 8	0.165	50	17.76	2.637	12.93%
Device 9	0.165	50	17.61	2.789	13.67%
Device 10	0.165	50	17.51	2.890	14.17%
Device 11	0.165	45	17.46	2.936	14.39%
Totals	1.583	510			
Notes: Wire resistance is doubled in the calculations for two wires (Positive and Negative). The voltage calculated to the last device must not be lower than the manufactures listed minimum operating voltage (IE: rated operating voltage 16-33 VDC (24 VDC nominal)).					

Point to Point NAC Voltage Drop Calculation					3/7/2018
Project Name: 5 DAVIS FARM ROAD					
Circuit Number: FPS1-1					
Nominal System Voltage	20.4	Volts	Wire Gauge	Resistance Per 1000	
Minimum Device Voltage	16.0	Volts	14	3.07	
Distance from source to 1st device	30	feet	14	3.07	
Wire Gauge for balance of circuit					
Max Output Current	3.00	amps			
Total Circuit Current	1.099	amps			
End of Line Voltage	18.86	volts			
Circuit is within limits					
Device	Current	Distance previous device	Voltage at Device	Drop from source	Percent Drop
Device 1	0.143	30	20.20	0.202	0.99%
Device 2	0.071	25	20.05	0.349	1.71%
Device 3	0.063	30	19.89	0.512	2.51%
Device 4	0.019	40	19.69	0.714	3.50%
Device 5	0.165	60	19.39	1.010	4.95%
Device 6	0.165	60	19.16	1.245	6.10%
Device 7	0.165	60	18.98	1.419	6.96%
Device 8	0.165	50	18.89	1.514	7.42%
Device 9	0.143	35	18.86	1.544	7.57%
Totals	1.099	390			
Notes: Wire resistance is doubled in the calculations for two wires (Positive and Negative). The voltage calculated to the last device must not be lower than the manufactures listed minimum operating voltage (IE: rated operating voltage 16-33 VDC (24 VDC nominal)).					

Point to Point NAC Voltage Drop Calculation					3/7/2018
Project Name: 5 DAVIS FARM ROAD					
Circuit Number: FPS1-3					
Nominal System Voltage	20.4	Volts	Wire Gauge	Resistance Per 1000	
Minimum Device Voltage	16.0	Volts	14	3.07	
Distance from source to 1st device	35	feet	14	3.07	
Wire Gauge for balance of circuit					
Max Output Current	3.00	amps			
Total Circuit Current	1.490	amps			
End of Line Voltage	18.34	volts			
Circuit is within limits					
Device	Current	Distance previous device	Voltage at Device	Drop from source	Percent Drop
Device 1	0.143	35	20.08	0.320	1.57%
Device 2	0.143	50	19.67	0.734	3.60%
Device 3	0.165	35	19.41	0.992	4.87%
Device 4	0.090	35	19.18	1.216	5.96%
Device 5	0.090	15	19.10	1.303	6.39%
Device 6	0.165	25	18.96	1.435	7.03%
Device 7	0.143	45	18.77	1.627	7.97%
Device 8	0.041	30	18.67	1.728	8.47%
Device 9	0.071	25	18.59	1.807	8.86%
Device 10	0.063	25	18.53	1.874	9.19%
Device 11	0.143	40	18.43	1.966	9.64%
Device 12	0.143	45	18.37	2.031	9.95%
Device 13	0.090	50	18.34	2.058	10.09%
Totals	1.490	455			
Notes: Wire resistance is doubled in the calculations for two wires (Positive and Negative). The voltage calculated to the last device must not be lower than the manufactures listed minimum operating voltage (IE: rated operating voltage 16-33 VDC (24 VDC nominal)).					

Point to Point NAC Voltage Drop Calculation					3/7/2018
Project Name: 5 DAVIS FARM ROAD					
Circuit Number: FPS2-2					
Nominal System Voltage	20.4	Volts	Wire Gauge	Resistance Per 1000	
Minimum Device Voltage	16.0	Volts	14	3.07	
Distance from source to 1st device	30	feet	14	3.07	
Wire Gauge for balance of circuit					
Max Output Current	3.00	amps			
Total Circuit Current	1.084	amps			
End of Line Voltage	18.51	volts			
Circuit is within limits					
Device	Current	Distance previous device	Voltage at Device	Drop from source	Percent Drop
Device 1	0.071	30	20.20	0.200	0.98%
Device 2	0.041	45	19.92	0.480	2.35%
Device 3	0.090	50	19.62	0.778	3.81%
Device 4	0.063	35	19.43	0.968	4.74%
Device 5	0.063	30	19.28	1.118	5.48%
Device 6	0.071	25	19.17	1.234	6.05%
Device 7	0.090	35	19.02	1.382	6.77%
Device 8	0.063	45	18.85	1.546	7.58%
Device 9	0.165	35	18.74	1.660	8.14%
Device 10	0.090	50	18.63	1.773	8.69%
Device 11	0.090	35	18.57	1.833	8.98%
Device 12	0.187	50	18.51	1.890	9.26%
Totals	1.084	465			
Notes: Wire resistance is doubled in the calculations for two wires (Positive and Negative). The voltage calculated to the last device must not be lower than the manufactures listed minimum operating voltage (IE: rated operating voltage 16-33 VDC (24 VDC nominal)).					

Point to Point NAC Voltage Drop Calculation					3/13/2018
Project Name: 5 DAVIS FARM ROAD					
Circuit Number: FACP-2					
Nominal System Voltage	20.4	Volts	Wire Gauge	Resistance Per 1000	
Minimum Device Voltage	16.0	Volts	14	3.07	
Distance from source to 1st device	45	feet	14	3.07	
Wire Gauge for balance of circuit					
Max Output Current	3.00	amps			
Total Circuit Current	1.613	amps			
End of Line Voltage	17.74	volts			
Circuit is within limits					
Device	Current	Distance previous device	Voltage at Device	Drop from source	Percent Drop
Device 1	0.063	45	19.95	0.446	2.18%
Device 2	0.071	20	19.76	0.636	3.12%
Device 3	0.071	20	19.58	0.818	4.01%
Device 4	0.071	20	19.41	0.991	4.86%
Device 5	0.063	30	19.16	1.237	6.06%
Device 6	0.063	25	18.97	1.432	7.02%
Device 7	0.071	20	18.82	1.581	7.75%
Device 8	0.041	15	18.71	1.686	8.27%
Device 9	0.066	15	18.61	1.787	8.76%
Device 10	0.066	15	18.52	1.882	9.23%
Device 11	0.0				



FIRE ALARM RISER DIAGRAM
SCHEMATIC: NO SCALE

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5 DAVIS FARM ROAD
PORTLAND, ME 04103
FIRE ALARM RISER DIAGRAM

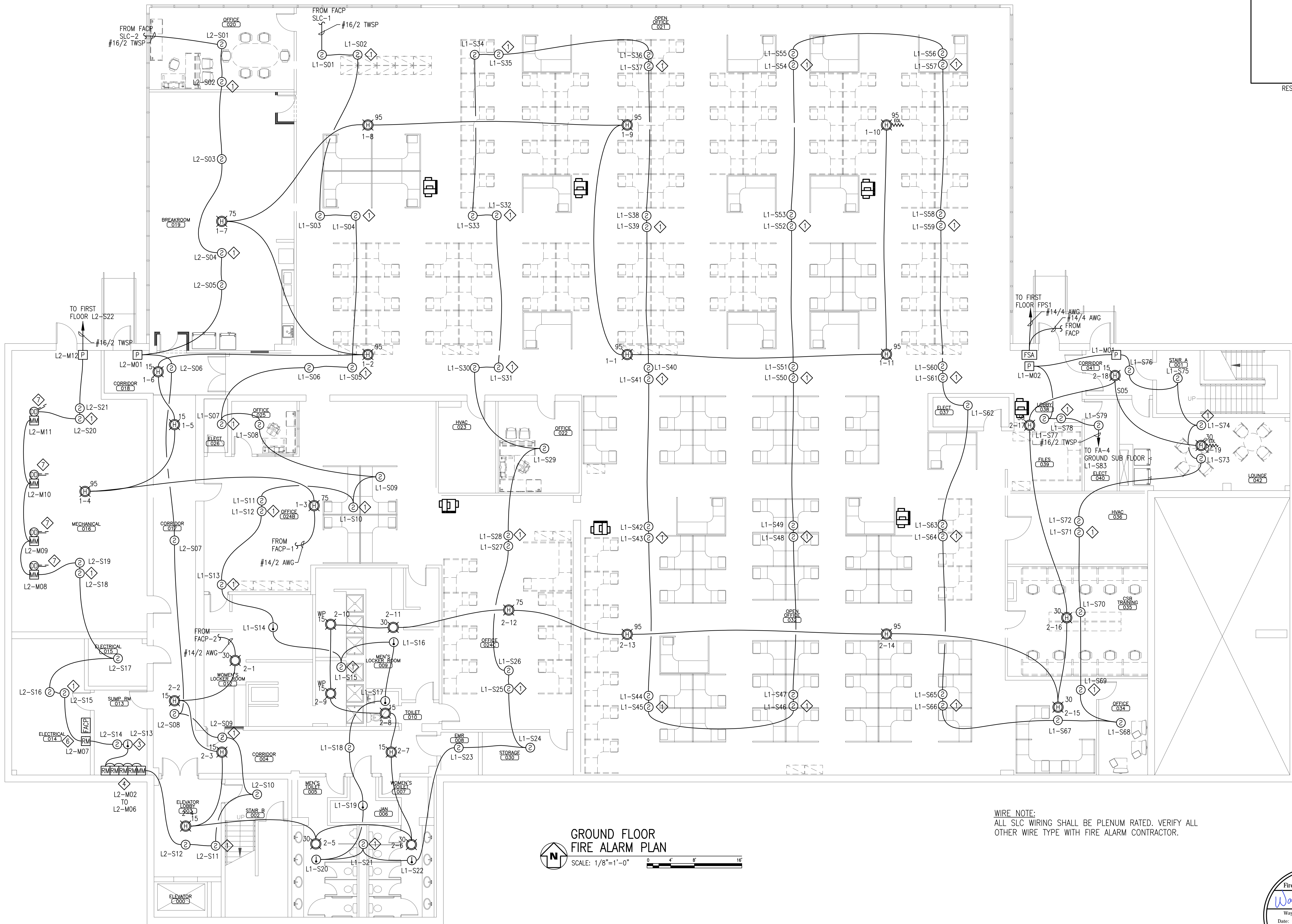
DRAWN	CWS UNICAD JOB #08139
CHECKED	WAYNE B. HAWS NICET IV 90496
DATE	3/13/2018
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SCALE	1/8"=1'-0"



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Fire Alarm Design & Drafting Services

FA-2



**GROUND FLOOR
FIRE ALARM PLAN**
SCALE: 1/8"=1'-0"

WIRE NOTE:
ALL SLC WIRING SHALL BE PLENUM RATED. VERIFY ALL OTHER WIRE TYPE WITH FIRE ALARM CONTRACTOR.

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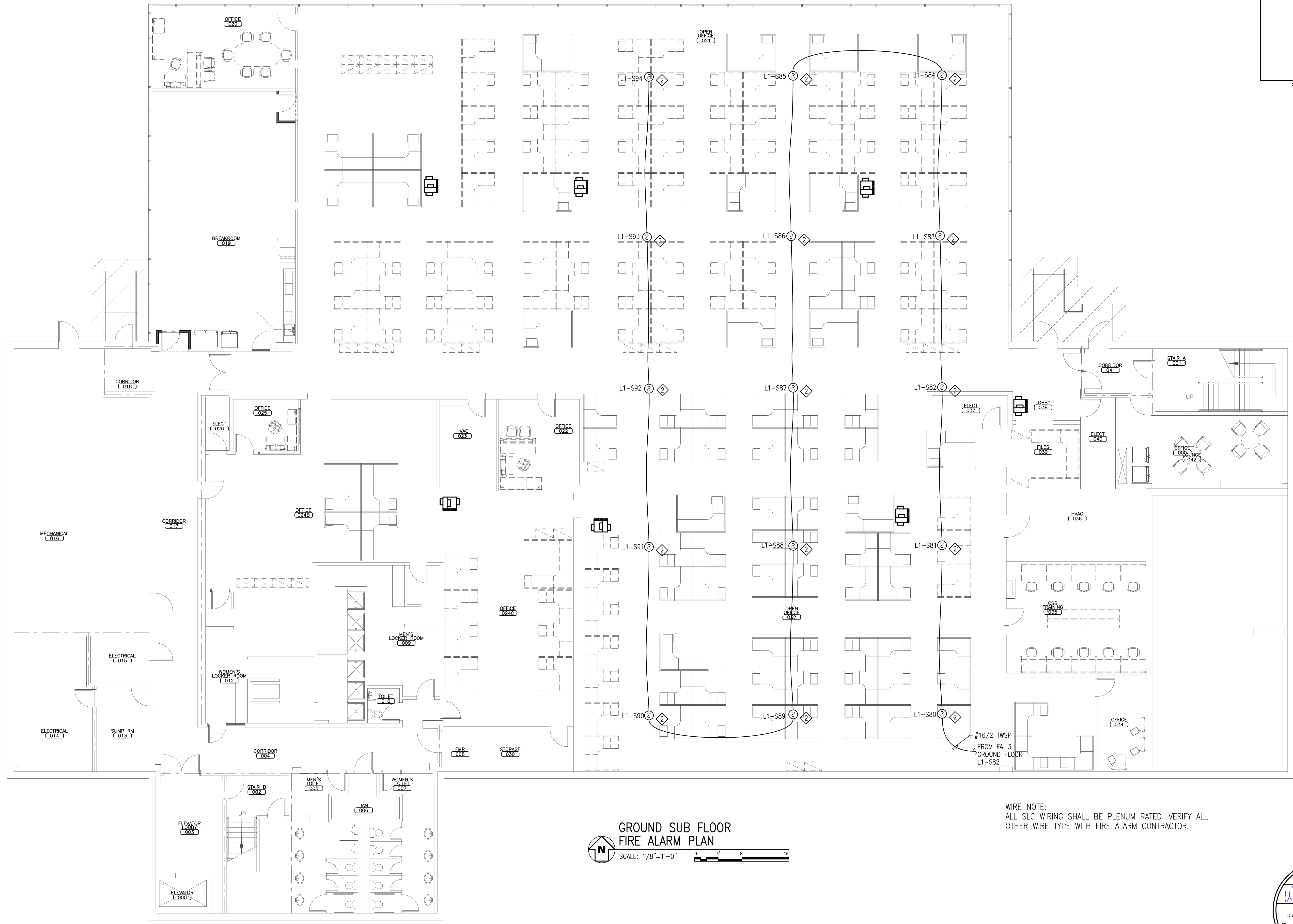
**5 DAVIS FARM ROAD
PORTLAND, ME 04103
GROUND FLOOR FIRE ALARM PLAN**

NICET IV
Fire Alarm Systems
Wayne B. Haws
Wayne B. Haws / Signature
Date: 3/13/2018
Fire Protection Engineering
Technology
Fire Alarm Systems
Cert. No. 90496
Exp 5/1/2020

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DATE	3/13/2018
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SCALE	1/8"=1'-0"

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**GROUND SUB FLOOR
FIRE ALARM PLAN**
SCALE: 1/8"=1'-0" 0 4 8 16'

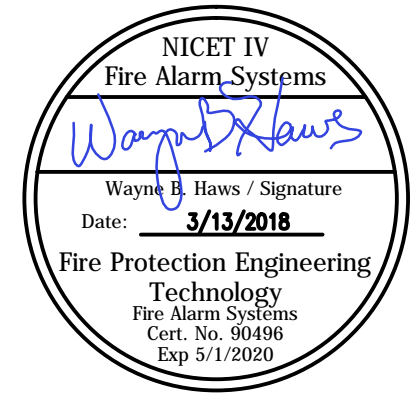
WIRE NOTE:
ALL SLC WIRING SHALL BE PLENUM RATED. VERIFY ALL OTHER WIRE TYPE WITH FIRE ALARM CONTRACTOR.

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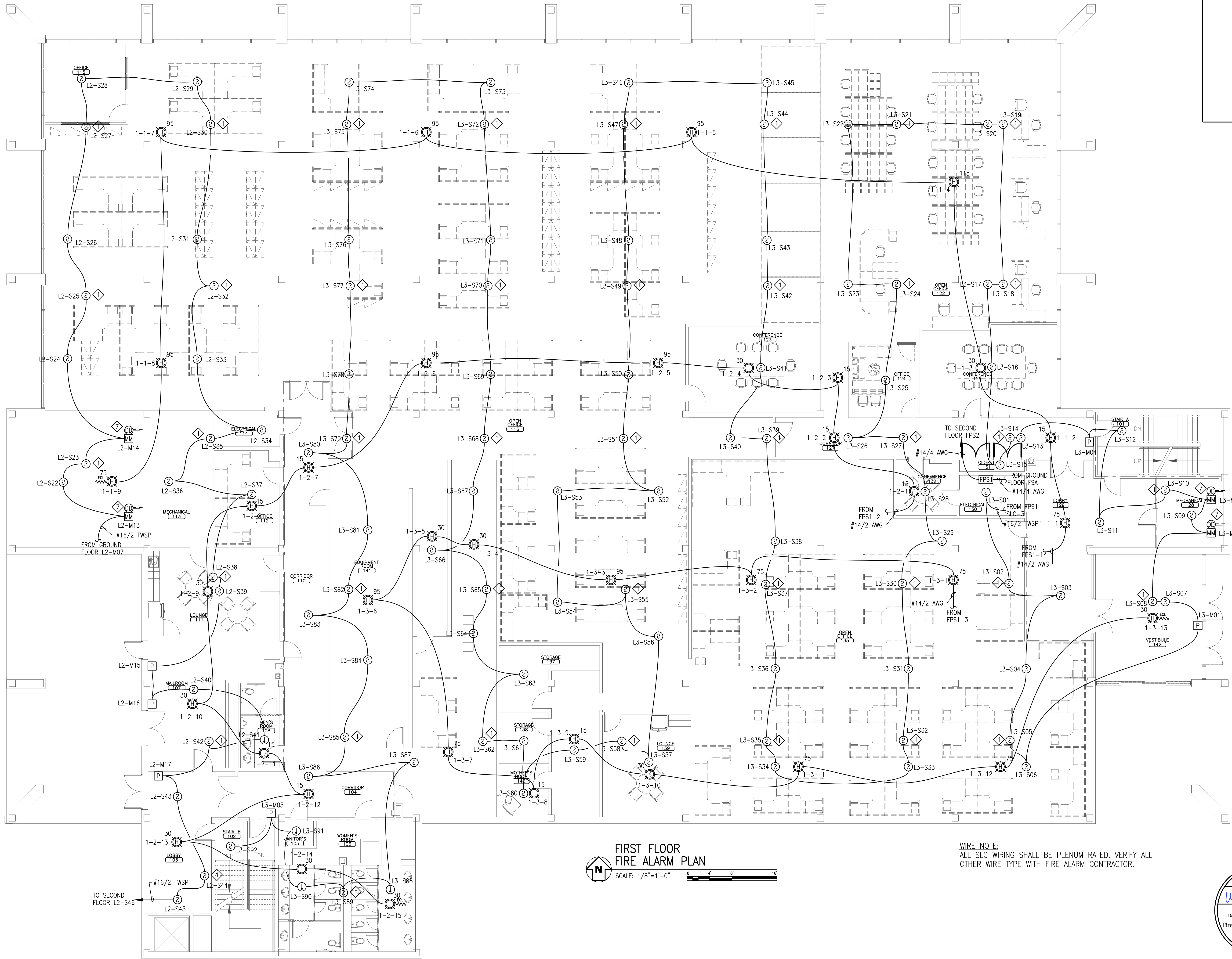
5 DAVIS FARM ROAD
PORTLAND, ME 04103
GROUND SUB FLOOR FIRE ALARM PLAN

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DATE	3/13/2018
REVISION	0
SCALE	1/8"=1'-0"



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5 DAVIS FARM ROAD
PORTLAND, ME 04103
FIRST FLOOR FIRE ALARM PLAN

**FIRST FLOOR
 FIRE ALARM PLAN**
 SCALE: 1/8"=1'-0"

WIRE NOTE:
 ALL SLC WIRING SHALL BE PLENUM RATED. VERIFY ALL
 OTHER WIRE TYPE WITH FIRE ALARM CONTRACTOR.

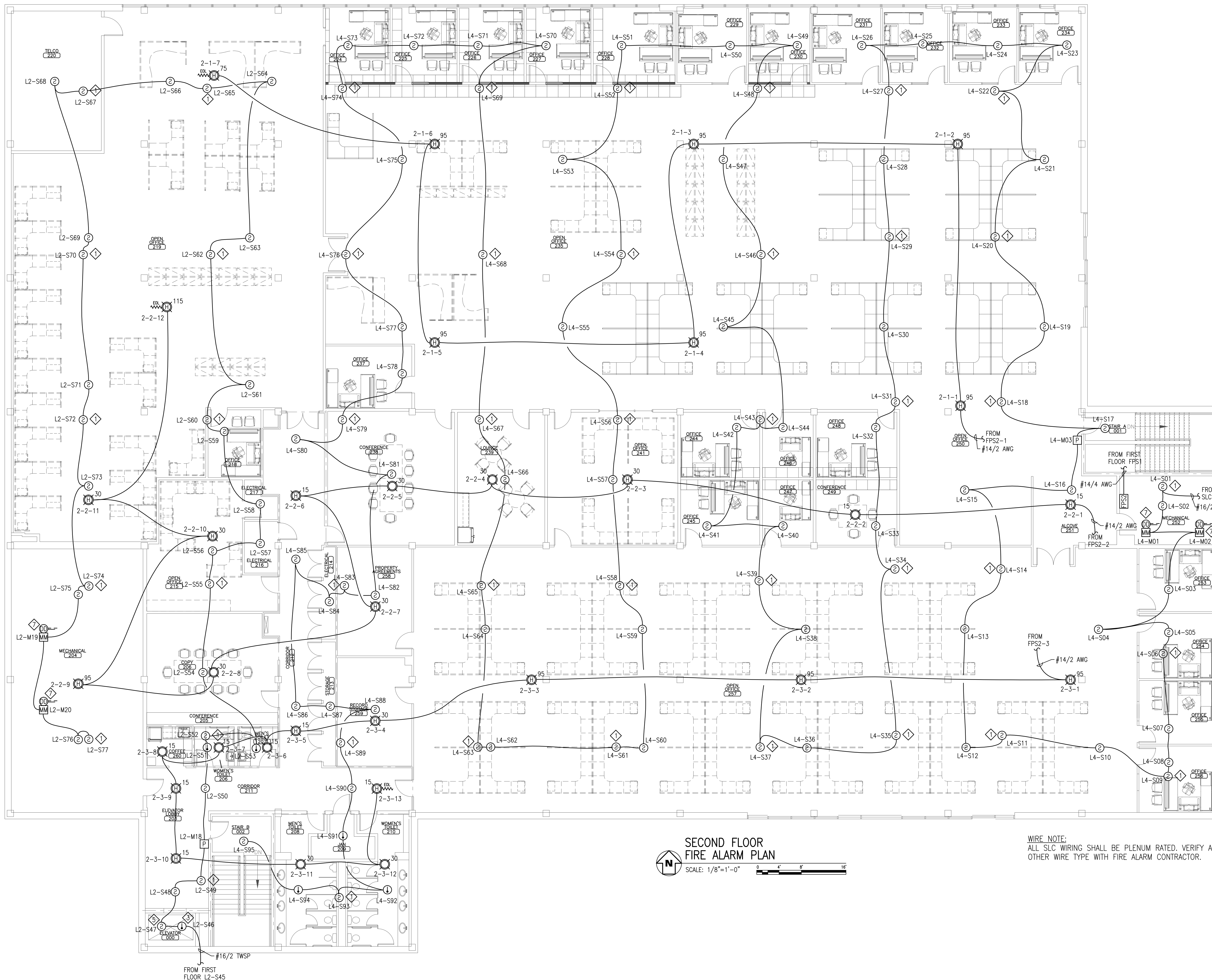


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DATE	3/13/2018
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SCALE	1/8"=1'-0"

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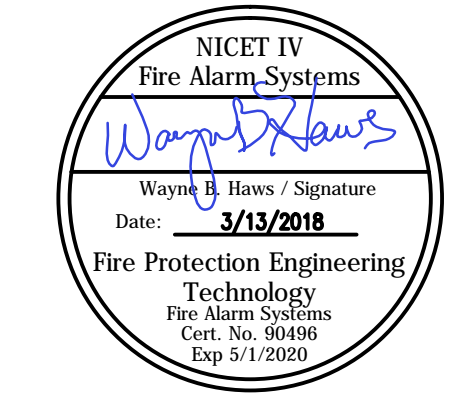
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SECOND FLOOR
FIRE ALARM PLAN
SCALE: 1/8"=1'-0"

WIRE NOTE:
ALL SLC WIRING SHALL BE PLENUM RATED. VERIFY ALL
OTHER WIRE TYPE WITH FIRE ALARM CONTRACTOR.



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5 DAVIS FARM ROAD
PORTLAND, ME 04103
SECOND FLOOR FIRE ALARM PLAN

DRAWN	CWS UNICAD JOB #08139
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DATE	3/13/2018
REVISION	0
SCALE	1/8"=1'-0"

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