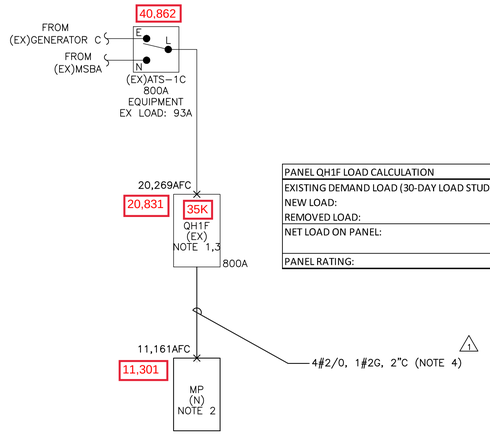

PANEL QH1F LOAD CALCULATION	
EXISTING DEMAND LOAD (30-DAY LOAD STUDY):	77 KVA
NEW LOAD:	34 KVA
REMOVED LOAD:	-22 KVA
NET LOAD ON PANEL:	90 KVA
	108 AMPS
PANEL RATING:	800 AMPS

1 PARTIAL ELECTRICAL ONE-LINE DIAGRAM

N.T.S.

NOTES:

1. PROVIDE 175A/3P CIRCUIT BREAKER IN EXISTING PANEL FOR NEW FEEDER SHOWN.
2. REFER TO SIEMENS POWER SCHEDULE FOR PANEL MP CIRCUIT BREAKER REQUIREMENTS.
3. PROVIDE 15A/3P CIRCUIT BREAKER IN EXISTING PANEL FOR CRAC-1. REFER TO MECHANICAL EQUIPMENT SCHEDULE FOR MORE INFORMATION. 1
4. CONTRACTOR MAY UTILIZE SERVICEABLE PORTIONS OF THE EXISTING FEEDER CONDUIT CURRENTLY SERVING THE IR-3 SYSTEM BEING REPLACED WHERE PRACTICABLE. FEEDER CONDUCTORS SHALL BE NEW.

1

Utility fault contribution

Transformer KVA: 2000
Transformer %Z: 5.32
Secondary Voltage: 480 Volts

$I_{FLA} = \frac{KVA \times 1000}{V_{L-L} \times 1.732} = 2{,}405.7$

Multiplier $= \frac{100}{0.9 \times Transf\ \%Z} = 20.9$

3-Phase I_{SCA} = $_{LA}$ x Multipli$_{x}$ = 45,200

Source: UTILITY
Load: SWBD-MSBA

System Voltage: 480 Volts
Conductor Material: Copper
Conductor Size: 500 AWG or MCM
# of sets (n): 11
Raceway Material: Steel
Conductor Constant (C 22185
Length of Circuit (L): 79 Feet

$f = \frac{1.732 \times L \times I}{C \times n \times V_{L-L}} = 0.00281$

$M = \frac{1}{1+f} = 0.997$

3-Phase I_{SCA} = $I_{SCA} \times M$ = 44,710

Source: SWBD-MSBA
Load: ATS-1C

System Voltage: 480 Volts
Conductor Material: Copper
Conductor Size: 600 AWG or MCM
# of sets (n): 2
Raceway Material: Steel
Conductor Constant (C 22965
Length of Circuit (L): 15 Feet

$f = \frac{1.732 \times L \times I}{C \times n \times V_{L-L}} = 0.00$

$M = \frac{1}{1+f} = 1.000$

3-Phase I_{SCA} = $I_{SCA} \times M$ = 41,297

Source: ATS-1C
Load: QH1F

System Voltage: 480 Volts
Conductor Material: Copper
Conductor Size: 3/0 AWG or MCM
# of sets (n): 4
Raceway Material: Steel
Conductor Constant (C 12844
Length of Circuit (L): 335 Feet

$f = \frac{1.732 \times L \times I}{C \times n \times V_{L-L}} = 1.1$

$M = \frac{1}{1+f} = 0.485$

3-Phase I_{SCA} = $I_{SCA} \times M$ = 20,269

Source: QH1F
Load: PANEL MP

System Voltage: 480 Volts
Conductor Material: Copper
Conductor Size: 2/0 AWG or MCM
# of sets (n): 1
Raceway Material: Steel
Conductor Constant (C 10755
Length of Circuit (L): 120 Feet

$f = \frac{1.732 \times L \times I}{C \times n \times V_{L-L}} = 1.8$

$M = \frac{1}{1+f} = 0.357$

3-Phase I_{SCA} = $I_{SCA} \times M$ = 11,161

PANEL: QH1F | OC DEVICE TYPE: BREAKER | ENCLOSURE: NEMA 1 | MAINS(A): 800 | CONTINUOUS(A): 800
LOCATION: ELEC 1-1516 | DEVICE FAMILY: BOLT ON | MOUNTING: FREE STANDING | WIRING: 3-PHASE 4-WIRE | BUS SC RATING (A): 35,000
FED FROM: ATS 1-C | VOLTAGE: 480/277

CUBICLE NO.	DESCRIPTION	CONNECTED KVA	DEMAND KVA	DESIGN KVA	DESIGN AVE AMPS	OC DEVICE TYPE	SIZE	P	NOTES
1	(EX) QH1F1	-	-	-	-	CB	400	3	NOTE 2
2	(EX) T-QL1F	-	-	-	-	CB	50	3	NOTE 2
3	(EX) AHU FOR X-RAY	-	-	-	-	CB	25	3	NOTE 2
4	(EX) X-RAY EQUIP MAIN	-	-	-	-	CB	125	3	NOTE 2
5	(EX) RTU FOR X-RAY	-	-	-	-	CB	20	3	NOTE 2
6	(EX) PATIENT HOLDING	-	-	-	-	CB	20	1	NOTE 2
7	(EX) LTG - SPECIAL PROCESS	-	-	-	-	CB	20	1	NOTE 3
8	(N) IR-3 MP	30.1	30.1	30.1	30.1	CB	175	3	NOTE 2
9	(N) CRAC-1 IR-3	3.74	3.74	3.74	3.74	CB	15	3	NOTE 2

ALL CONNECTED	KVA	AMPS
TOTAL CONNECTED	33.8	40.7
TOTAL DEMAND	33.8	40.7
TOTAL DESIGN	33.8	40.7

NOTES:
1. LOADS SHOWN REPRESENT NEW LOADS ONLY.
2. SHOWN FOR REFERENCE.

2

PANEL DESIGNATION: (EX) LSL1E | LOCATION: ELEC 1-1341 | MOUNTING: SURFACE | FAULT DUTY: 10,000
MLO: NO | MAIN: 40A | BUS: 125A | VOLTS: 208/120 | PHASE: 3 | WIRE: 4

EQUIPMENT DESCRIPTION	DMD	WATTS A	WATTS B	WATTS C	BRKR SIZE			BRKR SIZE	WATTS A	WATTS B	WATTS C	DMD	EQUIPMENT DESCRIPTION
EXISTING LOAD	EX				20/3	1	2	20/1				EX	EXISTING LOAD
						3	4	20/1				EX	EXISTING LOAD
						5	6	20/1			120	G	+MED GAS AREA ALARM
EXISTING LOAD	EX				20/1	7	8						SPACE
EXISTING LOAD	EX				20/1	9	10						SPACE
SPACE						11	12						SPACE
SPACE						13	14						SPACE
SPACE						15	16						SPACE
SPACE						17	18						SPACE
TOTAL "A"		0			0			0				0.1	CONN.KVA
TOTAL "B"			0		0				0			0.3	CONN. AMPS
TOTAL "C"				0	120						120	0.1	DEMAND KVA
TOTAL "A,B,C"					120 CONN.							0.3	DEMAND AMPS
					120 DEMAND							0.1	DESIGN KVA
					120 DESIGN							0.3	DESIGN AMPS

CL1D NOTES:
1. LOADS SHOWN REPRESENT NET NEW LOADS ONLY. TOTAL ADDED LOAD LESS THAN 1% OF PANELBOARD CAPACITY.
2. +INDICATES NEW LOAD ON EXISTING SPARE CIRCUIT BREAKER.

Only highlighted or clouded revisions are approved on this review. All previous comments apply.

City of Aurora Building Division
Reviewed for Code Compliance
Approved as Noted: *William Griffin*
Date: *May 28, 2021*
2015 INTERNATIONAL CODES & 2020 NEC

RSN: *1517545*
Permit #: *21-1927185 LT*

RSN: *1545058*
Permit #: *21-1983267 REV.*

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Denver, CO 80202
ph: 303.444.1951

No.	Description	Date
1	ASI-01	02/17/21
2	CCD-01	03/04/21
3	CITY COMMENTS	05/27/21

COLORADO LICENSED MICHAEL P THOMPSON 53150 PROFESSIONAL ENGINEER
05/27/2021

20-029 TMCA IR 3 RENOVATION

1501 S. POTOMAC ST., AURORA, CO 80012

Issue	ISSUE FOR CONSTRUCTION
Date	05 FEBRUARY 2021
Project Number	20-029
Drawn by	KDC
Checked by	MT

Sheet Title
ELECTRICAL DETAILS AND SCHEDULES

Sheet Number
E.104 1

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DO NOT SCALE DRAWINGS Last edited by KYLE.CROWLEY on 01-07-2021 @ 5:07

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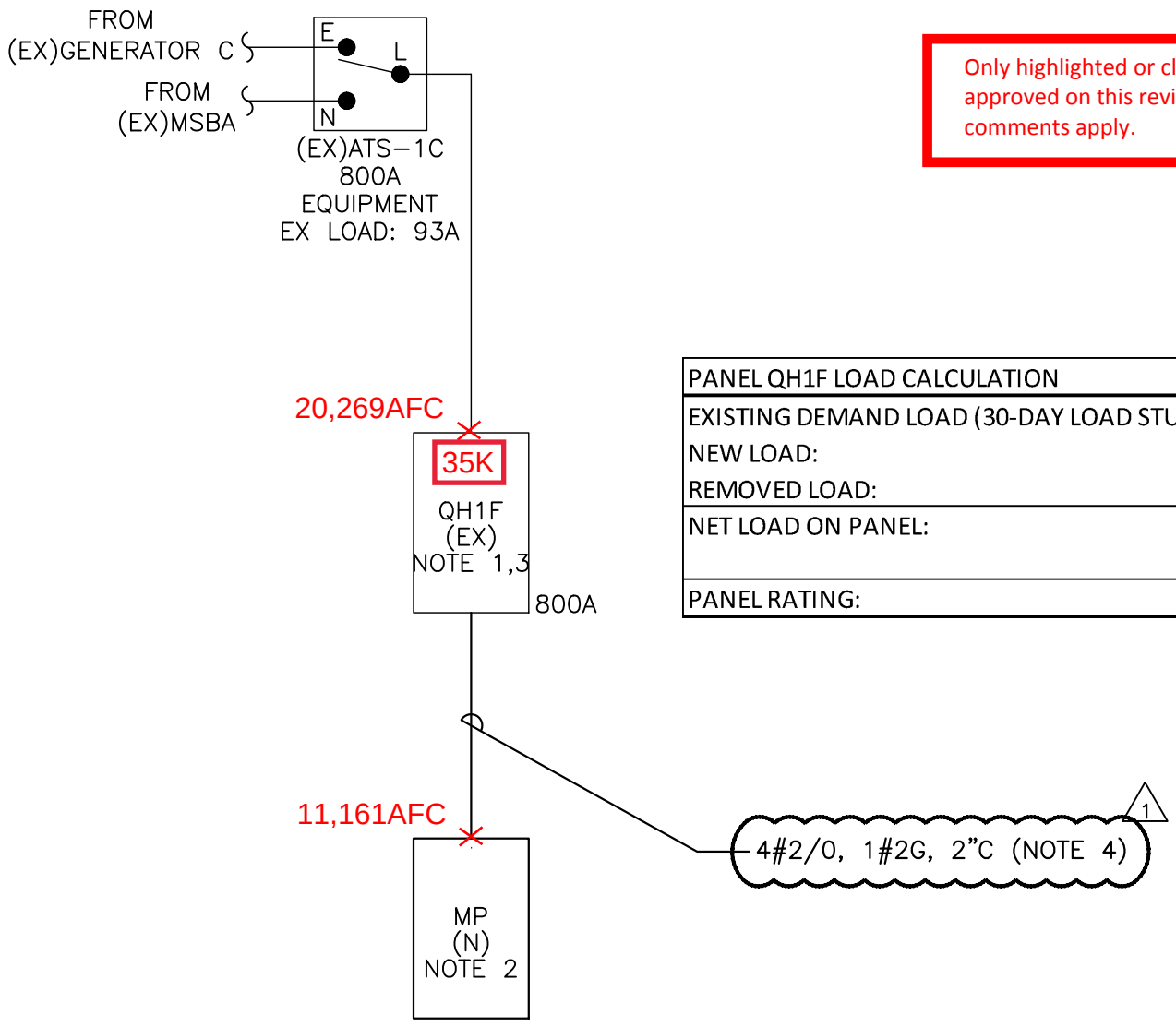

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Source: QH1F Load: Panel MP			
System Voltage:	480	Volts	
Conductor Material:	Copper		
Conductor Size:	2/0	AWG or MCM	
# of sets (n):	1		
Raceway Material:	Steel		
Conductor Constant (C):	10755		
Length of Circuit (L):	120	Feet	
f = $\frac{1.732 \times L \times I}{C \times n \times V_{L-L}}$ =			0.8
M = $\frac{1}{1+f}$ =			0.551
3-Phase I_{SCA} = $I_{SCA} \times M$ =			11,161

COLORADO LICENSED
MICHAEL P THOMPSON
53150
PROFESSIONAL ENGINEER

05/20/2021

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