UCB Project Manager	David Byrne
Campus Standards Section #	B1011 – Structural Analysis and Design: Embedded Conduit
Type of Issue	Embedded Conduit in Level 1 concrete slabs
CU Standards Language	*Embedded Conduit:* *a. UCB cautions against embedding conduit within horizontal structural elements, even if such conduit is incorporated into the structural analysis. UCB experience indicates significant practical problems with overlapping conduit and large concentrations of conduit which cannot be accurately accounted for in the design phase.*
Variance Request	Conduits in level 1 structural slab

Variance Request Description: There are two scenarios where conduit within the level 1 structural slab is suggested for CU CHAP.

<u>Scenario 1: Level 1 slab-on-void feeder duct bank</u>

a. The project site has expansive soils requiring a slab on void. The hydrostatic uplift pressures do not allow conduits to be direct buried or concrete encased below the slab in the void space without special provisions and numerous vapor barrier penetrations. The design and construction team proposes installing the conduits in a duct bank poured with the level 1 slab. Attached is the conduit routing plan that has been reviewed by the design and construction teams as well as details showing the construction of the duct bank. Routing overhead was investigated. However, the following roadblocks were identified:
    i. Routing feeders out of the main electric room in the basement and up into the floors above is difficult due to the location of the main electrical rooms and because feeders can't be routed above the shared instrument space which houses an X-ray diffractometer.
    ii. Amount of ductwork and other utilities in the upper-level corridors do not provide enough room for all feeders to be routed overhead on level 2.
        1. It is also impractical to provide knockouts in the mass timber beams due to the quantity of conduits initially proposed to be routed in the level 2 plenum space. We are limited to a 3"H x 8"W unreinforced knockout or a 6"H x 20"W reinforced knockout in a 20" deep beam per Nordic Structure's guidelines.
    iii. Overhead routing is not preferred on level 1 due to the sensitivity of the equipment in the optics labs as well as the high visibility of conduits at the level 1 elevator lobby and through other high profile mass timber areas.
b. The conduit routed below the level 1 slab will be difficult to alter in the future. It will also

be difficult to route additional feeders from the basement to other areas of the building in the future based on the amount of MEP equipment in the basement corridors, regardless of routing overhead or below the level 1 slab. The team proposes installing additional spare conduits for future changes to the south end of the building routed via the duct bank. We are including (2) 2" conduits from the main electrical room to the level 1 south electrical room via the duct bank with (1) 2" conduit stubbed between each floor.

Scenario 2: Branch circuitry within level 1 structural slab on the south side of the building

a. There are numerous floor boxes and receptacles mounted in half-height walls in the pre-function space. The ¾" conduit serving these devices is proposed to be installed within the level 1 structural slab due to the inability to run overhead conduit due to congestion with other building systems and the design intent to minimize exposed building systems in mass timber portions of the building. Like scenario 1 above, branch circuitry cannot be routed below the structural slab per UCB standards. While the conduit in slab is limiting for future access/alteration, locations of floor boxes have been thoroughly reviewed and coordinated with the CU stakeholders.

Attachments: EFD0.5, EFD0.31, forthcoming structural details for the duct bank.

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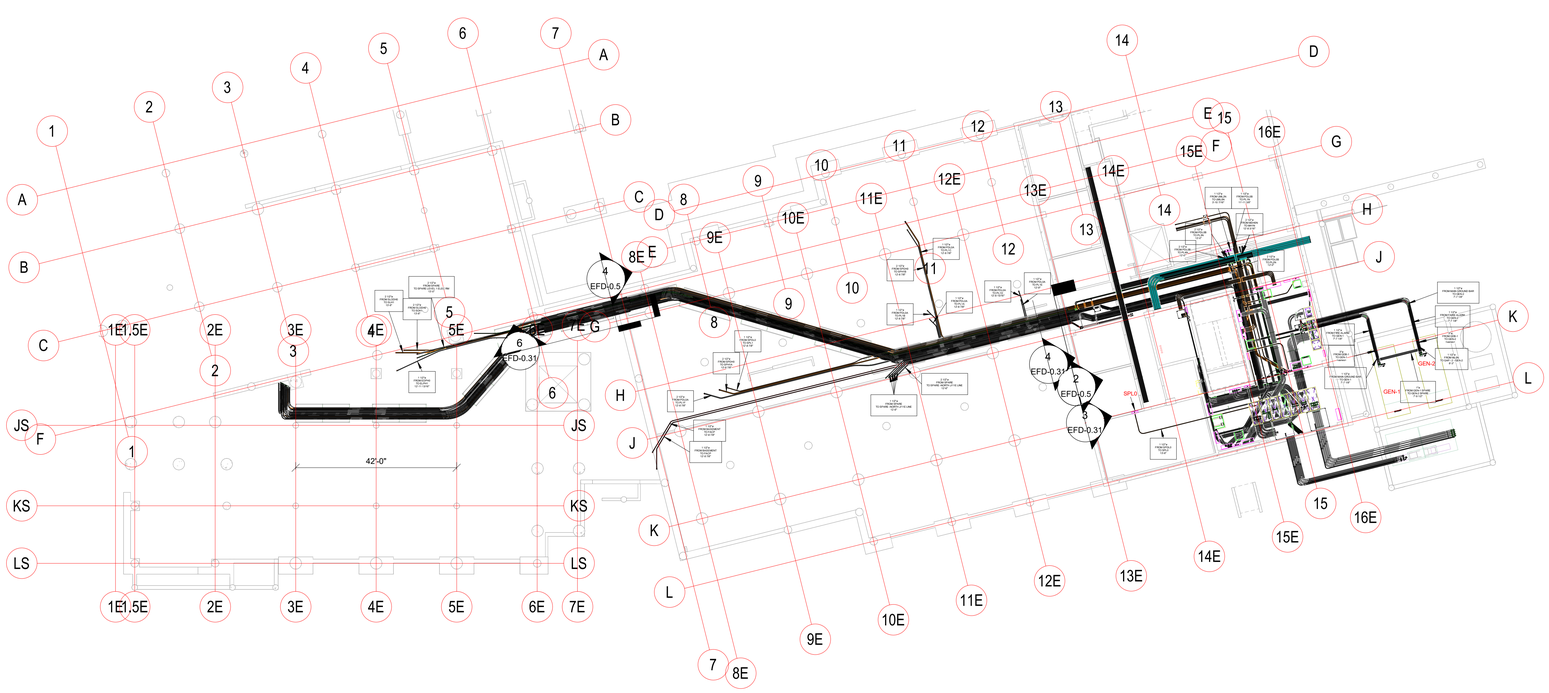


1 BASEMENT RCP CONDUIT LAYOUT
1/16" = 1'-0"

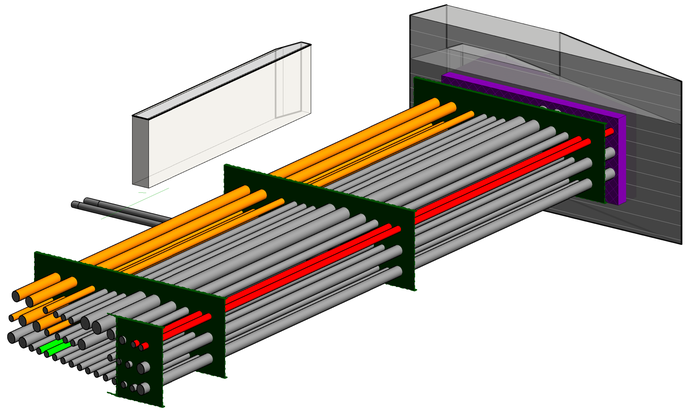
UNDERSLAB Conduit Run Schedule

CONDUIT RUN ORIGINATES	CONDUIT RUN TERMINATES	Diameter(Trade Size)	Length
BASEMENT	FACP	1 1/2"	127'-6 3/8"
BASEMENT	FACP	1"	19'-1 13/16"
BASEMENT	FACP	1"	19'-1 15/16"
BASEMENT	FACP	1 1/2"	130'-10"
EDPH0	ELPH4	1 1/2"	365'-0 1/4"
EDPH0	ELPH2	1 1/2"	331'-7 3/4"
EDPH0	ELPH1	1 1/2"	263'-11 3/4"
EDPH0	ELPH3	1 1/2"	348'-0 3/4"
EOPL0	EOPL2	1 1/2"	345'-6 3/4"
EOPL0	EOPL4	1 1/2"	377'-9 11/16"
MDH0N	MDH5S	3"	68'-9 1/2"
MDH0N	MDH5S	3"	69'-2 9/16"
MDH0N	MDH5S	3"	385'-9 9/16"
MDH0N	MDH5S	3"	385'-2 3/16"
MLI0N	ML2S	2 1/2"	348'-11 3/16"
PDH0B	T-PDL2S	2"	350'-6 11/16"
PDL0A	PL1D	1 1/2"	93'-5 7/16"
PDL0A	PL1A	1 1/2"	115'-8 5/8"
PDL0A	PL1E	1 1/2"	91'-5 3/8"
PDL0A	PL1B	1 1/2"	117'-11 3/8"
PDL0A	PL1C	1 1/2"	139'-2 5/8"
PDL0A	PL1F	2 1/2"	198'-0 7/8"
SLH1	SLH2	2 1/2"	47'-8 7/8"
SLODH0	SLH1	2 1/2"	248'-2 5/8"
SLODH0	SOH1	2 1/2"	246'-11 5/16"
SLODH0	T-SIDL2S	1 1/2"	323'-6 1/4"
SOH1	SOH3	2 1/2"	9'-0 7/16"
SOL0	SOL2	1 1/2"	331'-4 5/16"
SPARE	SPARE	1 1/2"	216'-3 13/16"
SPARE	SPARE LEVEL 1 ELEC RM	2 1/2"	191'-8 1/2"
SPARE	SPARE L2 S. ELEC RM	1 1/2"	240'-3 3/4"
SPARE	SPARE L2 S. ELEC RM	2 1/2"	229'-11 13/16"
SPARE	SPARE L2 S. ELEC RM	2 1/2"	12'-6 5/16"
SPARE	SPARE L2 S. ELEC RM	1 1/2"	263'-7 1/2"
SPARE	SPARE L2 S. ELEC RM	1 1/2"	45'-2 3/8"
SPARE	SPARE L2 S. ELEC RM	2 1/2"	257'-11 3/16"
SPARE	SPARE L2 S. ELEC RM	1 1/2"	258'-5 11/16"
SPARE	SPARE L2 S. ELEC RM	1 1/2"	261'-11 1/4"
SPARE	SPARE L2 S. ELEC RM	1 1/2"	264'-3 3/16"
SPARE	SPARE L2 S. ELEC RM	1 1/2"	262'-7 5/16"
SPARE	SPARE	1 1/2"	22'-9 1/2"
SPARE	SPARE	1 1/2"	22'-9 1/2"
SPARE	SPARE	1 1/2"	22'-9 1/2"
SPARE	SPARE	1 1/2"	22'-9 1/2"
SPARE	SPARE	1 1/2"	22'-9 1/2"
SPDH0	SPH1B	2 1/2"	156'-8 5/16"
SPDH0	SPH1A	2 1/2"	183'-7"
SPDL0	SPL1	1 1/2"	166'-10 5/8"

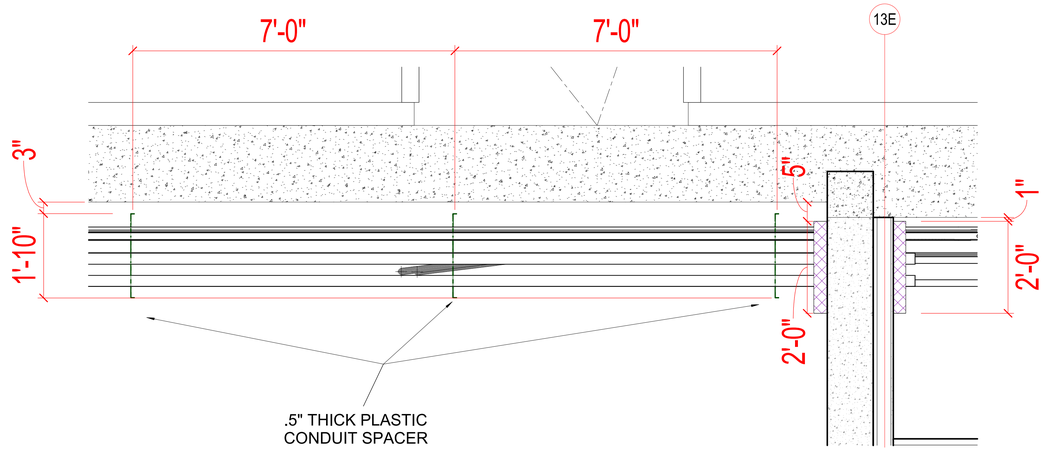
KEY PLAN

ENCORE PROJECT #
25029
DRAWN BY:
Author
CHECKED BY:
Checker
DATE:
6/2/25
SCALE:
As indicated
SHEET TITLE
BASEMENT RCP CONDUIT OVERALL
SHEET NO.
EFD-0.5

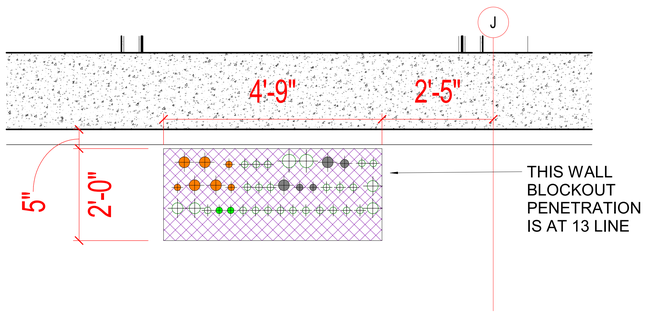
Autodesk Docs://25201 - CU CHAP/CU_CHAP_EE_R25.rvt



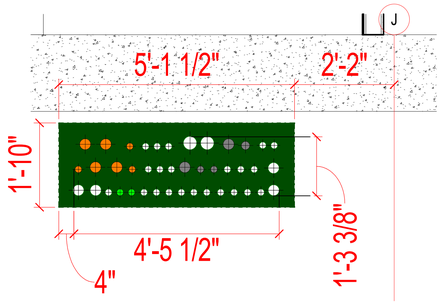
1 UNDERSLAB CONDUITS WITH SPACERS



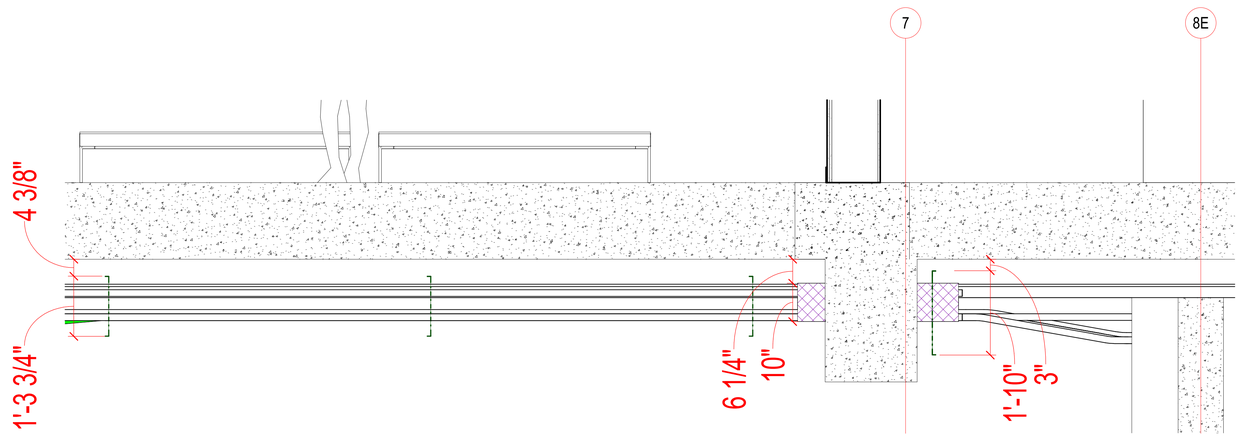
2 UNDERSLAB SIDE VIEW
3/4" = 1'-0"



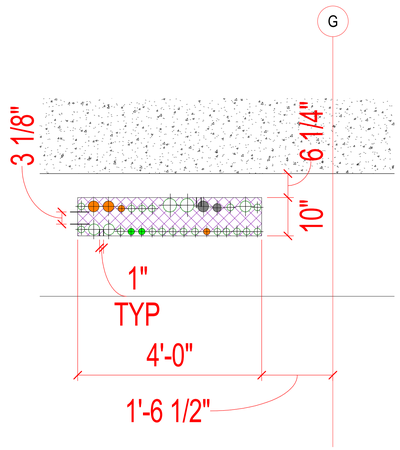
3 13 GRID LINE
3/4" = 1'-0"



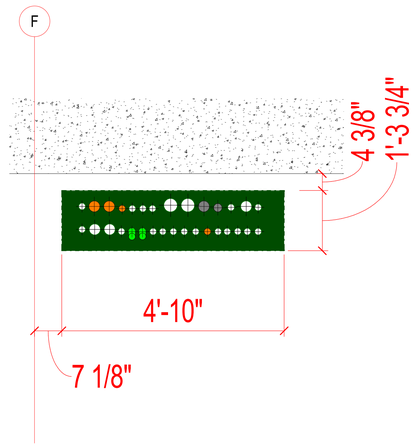
4 SPACER WIDTH AT 13 LINE WALL PENETRATION
3/4" = 1'-0"



5 7 LINE BEAM PENETRATION SIDE VIEW
3/4" = 1'-0"



6 7 GRID LINE BEAM PENETRATION
3/4" = 1'-0"



7 SPACER WIDTH @ 7 LINE TO SOUTH
3/4" = 1'-0"

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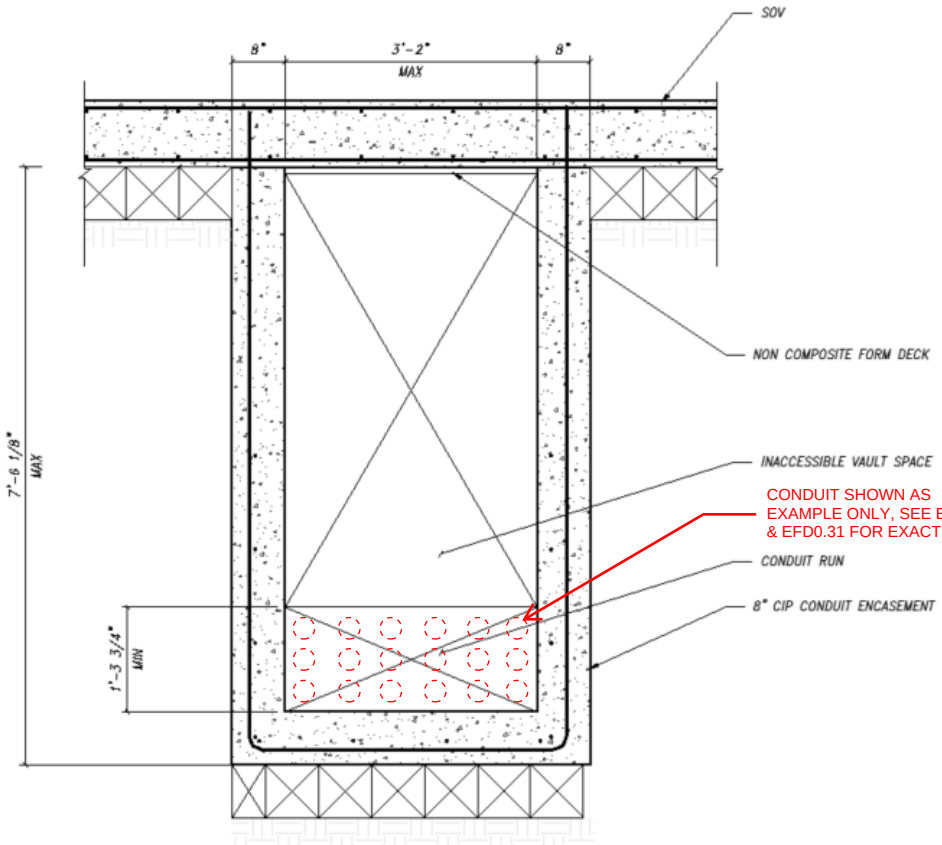
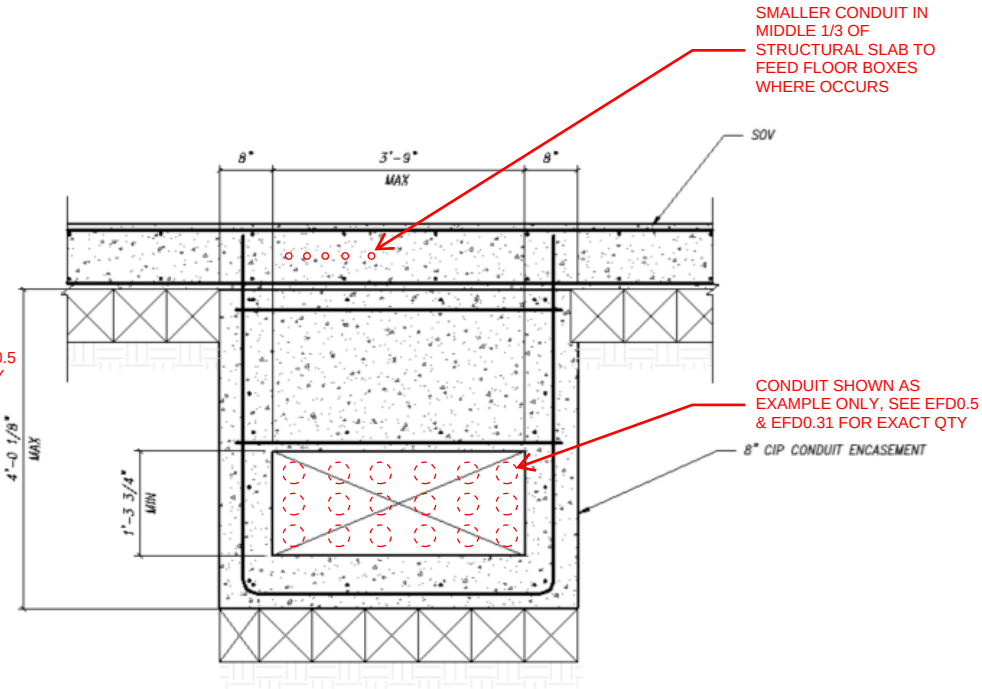
KEY PLAN

ENCORE PROJECT #
25029
DRAWN BY:
JASON YELLICH
CHECKED BY:
Checker
DATE:
6/4/25
SCALE:
3/4" = 1'-0"
SHEET TITLE
UNDERSLAB PENETRATION BLOCKOUTS SPACER LAYOUT
SHEET NO.
EFD-0.31

Electrical Ductbank Structural Details



TALL CONDUIT ENCASEMENT



TYPICAL CONDUIT ENCASEMENT

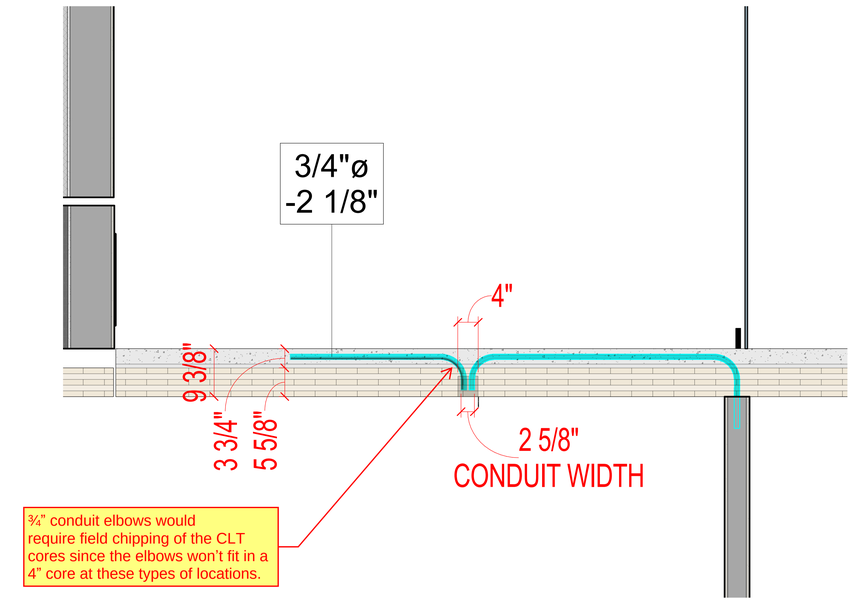
UCB Project Manager	David Byrne
Type of Issue	Embedded Conduit in concrete topping slabs above mass timber
CU Standards Language	*Embedded Conduit:* *a. UCB cautions against embedding conduit within horizontal structural elements, even if such conduit is incorporated into the structural analysis. UCB experience indicates significant practical problems with overlapping conduit and large concentrations of conduit which cannot be accurately accounted for in the design phase.*
Variance Request	Conduits in CLT topping slabs

Variance Request Description: To significantly reduce the amount of exposed conduit in the mass timber areas on the CHAP building, the design and construction teams would like to route smaller conduits within the 3" topping slabs of.

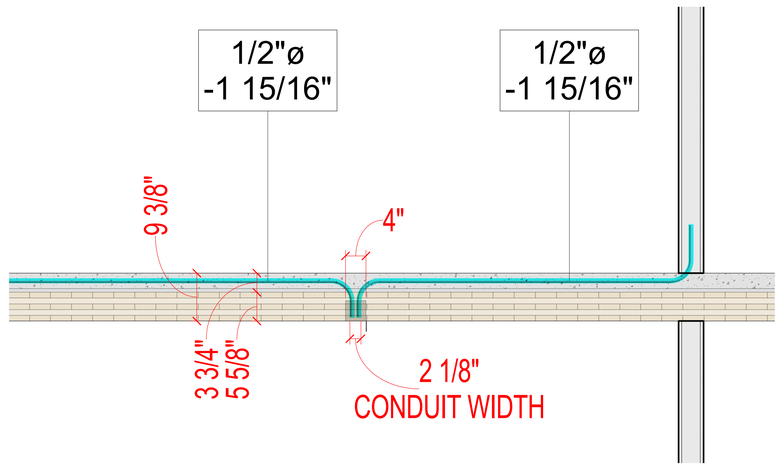
These conduit pathways would serve floor boxes, fire alarm devices, light fixtures, lighting control devices, and other ceiling mounted devices. The conduits will be coordinated such that they do not cross each other and stay in the middle 1/3 of the topping slab per structural requirements.

Shallow floor boxes are proposed where required so that they are flush with the 3" topping slab in lieu of poke throughs which would be visible on the level below. Attached are details of how the conduit would be routed within the topping slab and through pre-cored openings in the cross-laminated timber floor. ½" conduit is proposed for all ceiling mounted devices due to the constructability of the bend radius. ¾" conduit elbows cannot be installed from the topping slab into a 4" core due to their size relative to the depth of the topping slab. ¾" conduit elbows would also require field chipping of the CLT cores since the elbows won't fit in a 4" core. Per CU standard, all other areas of the project would use ¾" conduit.

Attachment: EFD0.03.



1 3/4" PVC 6" RADIUS
1" = 1'-0"



2 1/2" PVC 4.5" RADIUS
1" = 1'-0"

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Lakewood, CO 80235
(303) 934-1234

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CU CHAP
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KEY PLAN

ENCORE PROJECT #
25029
DRAWN BY:
JASON YELLICH
CHECKED BY:
Checker
DATE:
6/2/25
SCALE:
1" = 1'-0"
SHEET TITLE
PVC CONDUIT IN SLAB ROUGH IN DETAIL.
SHEET NO.
EFD-0.03

UCB Project Manager	David Byrne
Type of Issue	Conductor Material
CU Standards Language	*Wire and Cable:* *a. Conductors #10 AWG and larger shall be stranded copper; conductors smaller than #10 AWG shall be solid copper except in UCB Utility Facilities where all conductors must be stranded.*
Variance Request	Aluminum conductors

Variance Request Description: There is a large cost benefit to utilizing aluminum conductors in lieu of copper conductors in certain applications on the CU CHAP project. Modern aluminum conductors are reliably used in various types of critical facilities, including hospitals, data centers, and labs. Added maintenance costs are not considered a concern with this variance and end user experience will be the same regardless of conductor material. We suggest allowing their use for feeders over 400A which results in a savings of $200,000. This savings accounts for increased wire and conduit sizes for the change of material. Attached are the one-line sheets to indicate which feeders will be aluminum.

Attachments: CU CHAP – BP-02 95% CDs Electrical One-Lines (Feeders 400A and above highlighted)

TRANSFORMER SCHEDULE

REMARKS:

1. **OVERCURRENT PROTECTION IS SIZED PER NEC 450.3.**
2. **ALL CONDUCTORS ARE COPPER. SEE PLANS FOR INCREASED CONDUCTOR SIZES DUE TO VOLTAGE DROP, ETC.**
3. **SECONDARY BONDING AND GROUNDING CONDUCTORS ARE SIZED PER NEC 250.66 AND 250.102.**
4. **DIMENSIONS, WEIGHTS & BTUH OUTPUT SHOWN ARE FOR REFERENCE ONLY. ACTUAL DIMENSIONS MAY VARY FROM MANUFACTURER TO MANUFACTURER.**
5. **FOR K-RATED TRANSFORMERS, PROVIDE PARALLEL NEUTRAL CONDUCTORS LUGS AT TRANSFORMERS, LOW VOLTAGE PANELBOARD, DISCONNECTS AND/OR LOAD.**
6. **CONDUIT 40% FILL RATIO IS BASED ON EMT.**

			PRIMARY					SECONDARY					GEC		DIMENSIONS					
Type	PRI FLA 480V	SEC FLA 208V	CB	SWITCH	FUSE	CONDUCTORS	C''	CB	SWITCH	FUSE	CONDUCTORS	C''	CONDUCTORS	C''	HIGH	WIDE	DEEP	WEIGHT	BTUH OTPT	NOTE
T30	36.1	83.3	45 A 3 P	60 A 3 P	FRS-R-	3 # 6 , 1 # 10 G	1	100 A 3 P	100 A 3 P	FRN-R- 100	4 # 1 , 1 # 6 G	1-1/2	1 # 6	3/4	30	20.13	16	370	5753	
T45	54.1	124.9	70 A 3 P	100 A 3 P	FRS-R- 70	3 # 4 , 1 # 8 G	1-1/4	150 A 3 P	200 A 3 P	FRN-R- 150	4 # 1/0 , 1 # 6 G	1-1/2	1 # 6	3/4	39.25	26.13	20	480	7425	
T75	90.2	208.2	110 A 3 P	200 A 3 P	FRS-R- 110	3 # 1 , 1 # 6 G	1-1/2	250 A 3 P	400 A 3 P	FRN-R- 250	4 # 250 , 1 # 2 G	2-1/2	1 # 2	3/4	39.25	30	20	675	10549	
T112.5	135.3	312.3	175 A 3 P	200 A 3 P	FRS-R- 175	3 # 2/0 , 1 # 6 G	2	400 A 3 P	400 A 3 P	FRN-R- 400	2 [4 # 3/0 , 1 # 2 G]		1 # 1/0	3/4	39.25	30	24	725	14168	
T150	180.4	416.4	225 A 3 P	400 A 3 P	FRS-R- 225	3 # 4/0 , 1 # 4 G	2	500 A 3 P	600 A 3 P	FRN-R- 500	2 [4 # 250 , 1 # 1/0 G]	2-1/2]	1 # 1/0	3/4	46.63	32	27	925	16592	
T225	270.6	624.5	350 A 3 P	400 A 3 P	FRS-R- 350	3 # 500 , 1 # 3 G	3	750 A 3 P	800 A 3 P	KRP-C- 750	2 [4 # 500 , 1 # 2/0 G]	3]	1 # 2/0	3/4	62.25	35	30.5	1800	23157	
TK13-75	90.2	208.2	110 A 3 P	200 A 3 P	FRS-R- 110	3 # 1 , 1 # 6 G	1-1/2	250 A 3 P	400 A 3 P	FRN-R- 250	5 # 300 , 1 # 2 G	3	1 # 2	3/4	43.75	32	27	875	12450	
TK13-112.5	135.3	312.3	175 A 3 P	200 A 3 P	FRS-R- 175	3 # 2/0 , 1 # 6 G	2	400 A 3 P	400 A 3 P	FRN-R- 400	2 [5 # 3/0 , 1 # 2 G	2-1/2]	1 # 1/0	3/4	42	34	27	950	16700	

SHORT CIRCUIT SCHEDULE	
EQUIPMENT NAME	ISCA
ATS-EDPH0	37,099
EDPH0	35,129
ELEV-1	5,085
ELEV-2	2,037
ELPH0	32,432
ELPH1	4,456
ELPH2	4,281
ELPH3	4,120
ELPH4	3,876
EOPL0	5,845
EOPL2	1,628
EOPL4	1,523
GAP	4,348
GDB-1	53,181
HTCN	31,216
HTCS	14,962
MDC-1	57,034
MDC-2	57,034
MDH0N	52,981
MDH0S	38,984
MDH5S	16,108
MH1N	22,503
ML0N	6,028
ML2S	2,139
ML4S	2,035
ML5N	1,843
ML5S	1,838
MTS-1	53,952
PDH0A	53,354
PDH0B	51,294
PDL0A	10,770
PDL0B	6,453
PDL2N	10,483
PDL2S	6,168
PDL3	10,345
PDL4	10,211
PL0N	6,222
PL1A	3,828
PL1B	3,828
PL1C	3,385
PL1D	4,271
PL1E	4,271
PL1F	4,763
PL1N	4,133
PL1S	5,397
PL2A	4,351
PL2B	4,351
PL2C	4,351
PL2D	8,624
PL2E	8,624
PL2F	8,624
PL2N	4,109
PL2S	6,049
PL3A	4,328
PL3B	4,328
PL3C	4,328
PL3D	8,529
PL3E	8,529
PL3F	8,529
PL3G	5,611
PL3N	3,850
PL3S	5,717
PL4A	4,306
PL4B	4,306
PL4C	4,306
PL4D	8,436
PL4E	8,436
PL4F	8,436
PL4G	5,572
PL4N	3,621
PL4S	5,418
PV	8,277
SIDL0	6,029
SIDL2S	3,840
SIL0	4,429
SIL1N	3,175
SIL1S	1,413
SIL2N	2,918
SIL2S	1,359
SIL3N	2,699
SIL3S	1,309
SIL4N	2,510
SIL4S	1,262
SLH0	39,426
SLH1	4,529
SLH2	4,292
SLH3	4,078
SLH4	3,884
SLODH0	46,488
SMDH0	42,903
SMDH5	40,215
SMDL5	6,381
SML5N	6,155
SML5S	1,990
SPDH0	52,981
SPDL0	6,366
SPDL5	6,366
SPL0	4,448
SPL1	2,165
SPL2A	4,074
SPL2B	4,074
SPL3	5,465
SPL4	5,772
UML0N	4,031
UML5N	5,214
UPS-1 MBC	6,100
UPS-1	6,005

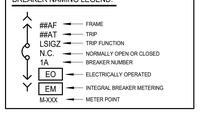
IECC METERING	
METERING BRANCH	METER POINTS
IECC HVAC SYSTEM	*MDH0N + MH0SN*
IECC INTERIOR LIGHTING	*M-SLH1N + M-SLH0*
IECC EXTERIOR LIGHTING	*BRANCH CIRCUITS*
IECC PLUG LOADS	*PDH0B + PDH0A + SDPH0B*
IECC PROCESS LOAD (IT)	*M-SID2L0, M-SIDL2S*
IECC OPERATIONS	*METERS FOR ELEVATORS*

LEED METERING	
PROVIDE ENERGY METER TO SEPARATELY RECORD USAGE ON FEEDER AS INDICATED AS REQUIRED BY LEED ADVANCED ENERGY METERING.	
METERING BRANCH	METER POINTS
MECHANICAL EQUIPMENT	M-HDPHPA
	M-HDPHPB
	M-HDPHPB
LIGHTING	M-LDPH1
	M-ELPH1A
	M-EDC
EQUIPMENT	M-ODPH1
	M-KDPH1

ELECTRICAL EQUIPMENT NAMING LEGEND:

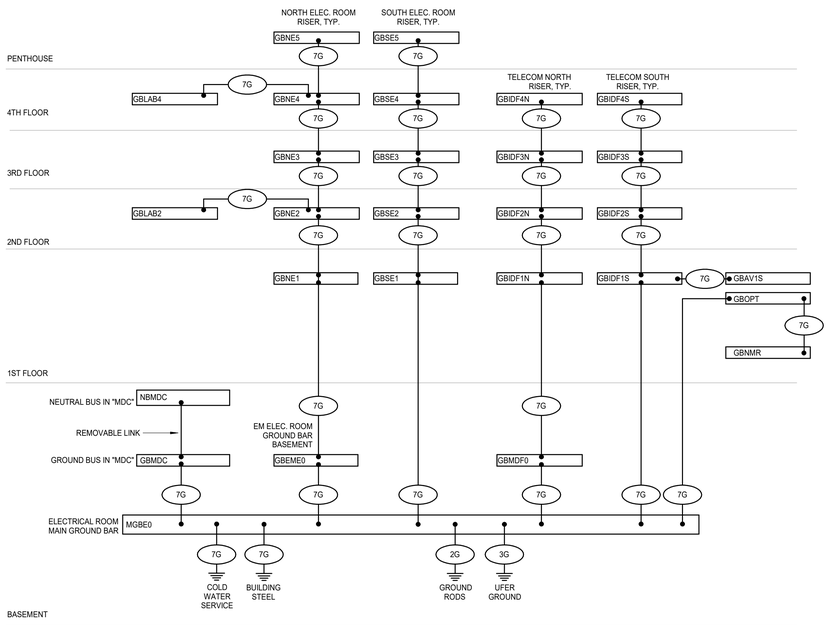
- E = EMERGENCY, S = STANDBY, <BLANK> = NORMAL
- DISTRIBUTION RISER/LOAD TYPE (M= MECHANICAL, L= LIGHTING, X = EXTERIOR LIGHTING, I = IT LOADS, O = OPERATIONS, P = PLUG LOADS).
- DISTRIBUTION PANEL = D, <BLANK> = BRANCH CIRCUIT PANEL
- H=480/277V, L=208/120V, LCP=LIGHTING CONTROL PANEL.
- FLOOR DESIGNATION (0=BASEMENT, 1=1ST FLOOR ,ETC.)
- PANELBOARD DESIGNATION PER FLOOR: N = NORTH, S=SOUTH A, B, C, ETC...

BREAKER NAMING LEGEND:



FEEDER SCHEDULE

KEY	CONDUCTORS	C''
1-1/2C		1 1/2"
2G	1 # 6 G	3/4
3C		3"
3G	1 # 4 G	3/4
7G	1 # 3/0 G	3/4
40.4G	4 # 8 , 1 # 10 G	1
50.4G	4 # 6 , 1 # 10 G	1 1/4
90.4G	4 # 2 , 1 # 8 G	1 1/2
100.3G	3 # 1 , 1 # 8 G	1 1/2
100.4G	4 # 1 , 1 # 8 G	1 1/2
100.5G	5 # 1 , 1 # 8 G	1 1/2
150.4G	4 # 1/0 , 1 # 6 G	2
200.4G	4 # 3/0 , 1 # 6 G	2 1/2
225.4G	4 # 4/0 , 1 # 4 G	2 1/2
225.5G	5 # 4/0 , 1 # 4 G	2 1/2
250.4G	4 # 250 , 1 # 4 G	3
400.4G	2 [4 # 3/0 , 1 # 3 G	2 1/2]
400.5G	2 [5 # 3/0 , 1 # 3 G	2 1/2]
600.4G	2 [4 # 350 , 1 # 1 G	3]
800.4G	3 [4 # 300 , 1 # 1/0 G	3]
1000.4G	3 [4 # 500 , 1 # 2/0 G	3 1/2]
1200.4G	4 [4 # 350 , 1 # 3/0 G	3]
1600.4G	5 [4 # 500 , 1 # 4/0 G	3 1/2]
3000.4	8 [4 # 500	3 1/2]
4000.4	11 [4 # 500	3 1/2]
MEC	SEE MECH'L EQUIPMENT SCHEDULE	SEE MECH'L EQUIPMENT SCHEDULE
SPD	SEE MANUFACTURER DOCUMENTATION	SEE MANUFACTURER DOCUMENTATION
XFMR	SEE TRANSFORMER SCHEDULE	SEE TRANSFORMER SCHEDULE

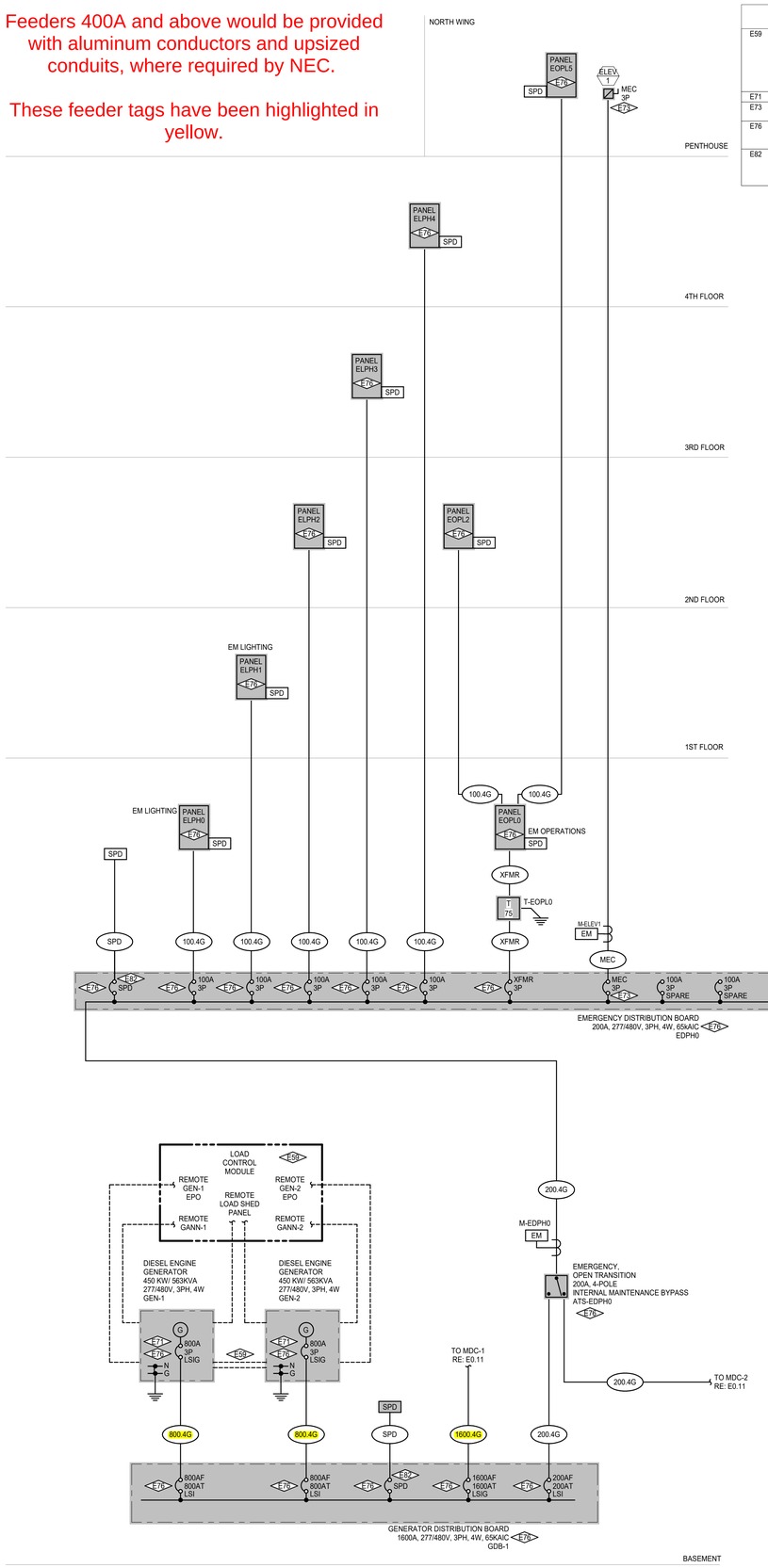


GROUND RISER DIAGRAM

SCALE: NONE

Feeders 400A and above would be provided with aluminum conductors and upsized conduits, where required by NEC.

These feeder tags have been highlighted in yellow.



PARTIAL ONE-LINE DIAGRAM - EMERGENCY

SCALE: NONE

KEYNOTES

E59	PROVIDE LV CONDUCTORS AND CONDUIT FOR GENERATOR COMPONENTS EXTERNAL TO GEN ENCLOSURE AND GENERATOR PARALLELING FUNCTIONALITY. FIELD COORDINATE ROUTING WITH OTHER TRADES. COORDINATE LV CONDUCTOR TYPE, QUANTITY, AND TERMINATIONS WITH GENERATOR MANUFACTURER. NOT ALL GEN COMPONENTS SHOWN ON ONELINE. COORDINATE WITH GEN MFR TO PROVIDE ALL NECESSARY LV CONNECTIONS.
E71	GENERATOR BASIS OF DESIGN: CUMMINS DFEJ
E73	ELEVATOR OCPD TO BE SELECTIVELY COORDINATED TO 0.1 SECONDS PER NEC.
E76	PROVIDE EMERGENCY SYSTEM OCPDS THAT MEET THE EMERGENCY SYSTEM SELECTIVE COORDINATION REQUIREMENTS PER NEC 700.32. REFER TO SPECS FOR MORE INFORMATION.
E82	SPD NOTED AT A CIRCUIT BREAKER INDICATES THE CONTRACTOR SHALL COORDINATE WITH THE EQUIPMENT MANUFACTURER TO PROVIDE A 3-POLE BREAKER COMPATIBLE WITH THAT EQUIPMENT'S SPD. FOLLOW MANUFACTURER'S INSTALLATION REQUIREMENTS.

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Full Design Team Roster on Sheet A0.05

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ELECTRICAL ONE-LINE DIAGRAM - EMERGENCY

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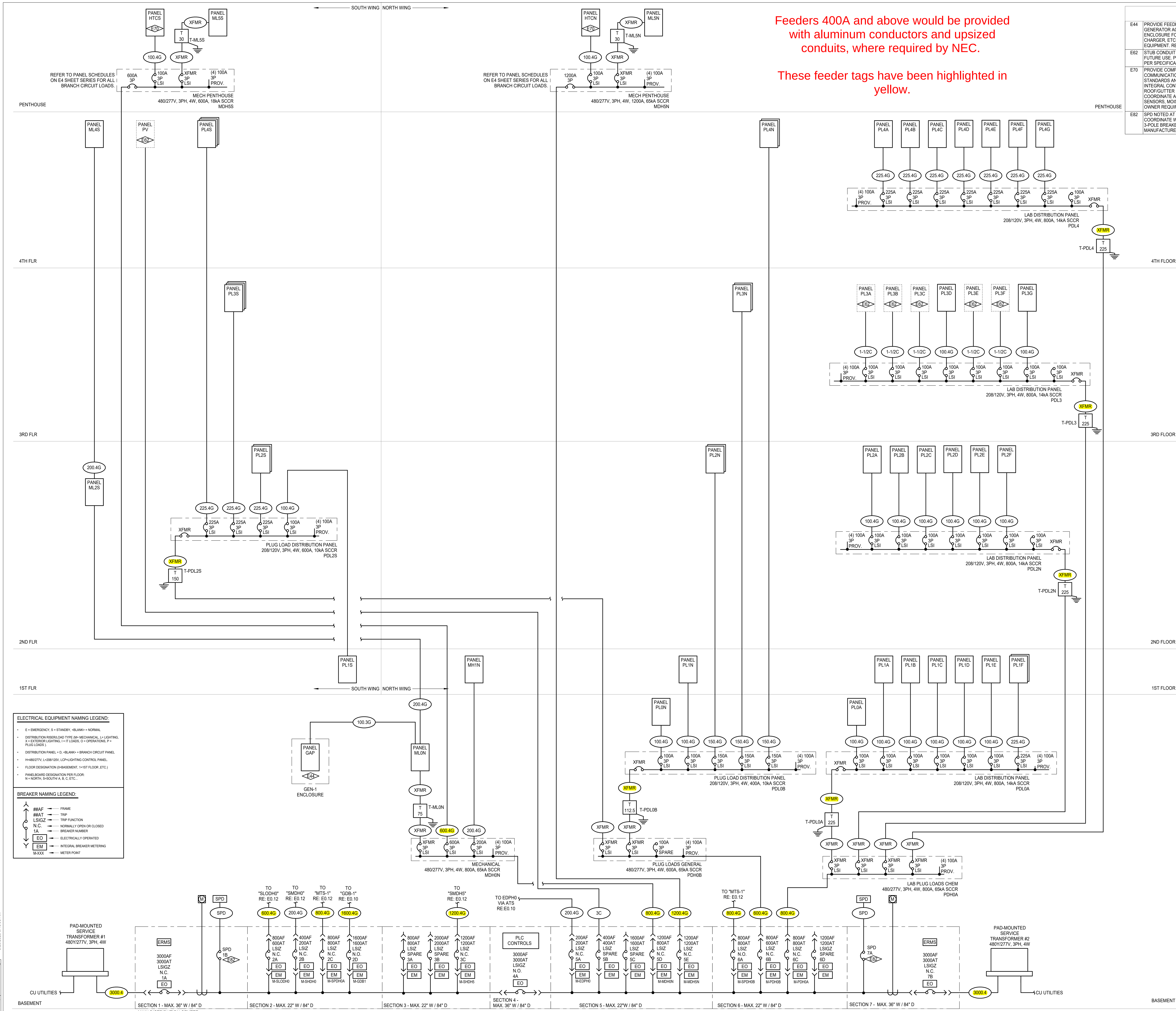
Feeders 400A and above would be provided with aluminum conductors and upsized conduits, where required by NEC.

These feeder tags have been highlighted in yellow.

KEYNOTES

E44	PROVIDE FEEDER CIRCUIT FROM WITHIN BUILDING TO MFR PROVIDED GENERATOR ACCESSORY PANELBOARD (GAP) MOUNTED WITHIN GEN ENCLOSURE FOR DEVICES SUCH AS ENGINE BLOCK HEATER, BATTERY CHARGER, ETC. COORDINATE ROUTING AND STUB UP LOCATION WITHIN EQUIPMENT. REFER TO ONE-LINE DIAGRAM FOR MORE INFORMATION.
E62	STUB CONDUIT IN TO CEILING SPACE ABOVE FUTURE PANELS FOR FUTURE USE. PROVIDE CONDUIT WITH PULL STRING. CAP AND LABEL AS PER SPECIFICATIONS
E70	PROVIDE COMPLETE SNOW MELT SYSTEM PANELBOARD WITH COMMUNICATION, CONTROLS, MONITORING CAPABILITIES PER OWNER STANDARDS AND SPEC SECTION 260537. PANEL SHALL INCLUDE INTEGRAL CONTROLLER, CONTACTORS, AND CIRCUIT PROTECTION FOR ROOF/GUTTER DEICING HEATING CABLES. CONTRACTOR SHALL COORDINATE ALL LOW VOLTAGE CONNECTIONS TO TEMPERATURE SENSORS, MOISTURE SENSORS, AND ANDOVER BAS INTERFACE PER OWNER REQUIREMENTS AND SPEC SECTION 260537.
E82	SPD NOTED AT A CIRCUIT BREAKER INDICATES THE CONTRACTOR SHALL COORDINATE WITH THE EQUIPMENT MANUFACTURER TO PROVIDE A 3-POLE BREAKER COMPATIBLE WITH THAT EQUIPMENT'S SPD. FOLLOW MANUFACTURER'S INSTALLATION REQUIREMENTS.



ELECTRICAL ONE-LINE DIAGRAM

SCALE: NONE

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ELECTRICAL ONE-LINE DIAGRAM - NORMAL

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Feeders 400A and above would be provided with aluminum conductors and upsized conduits, where required by NEC.

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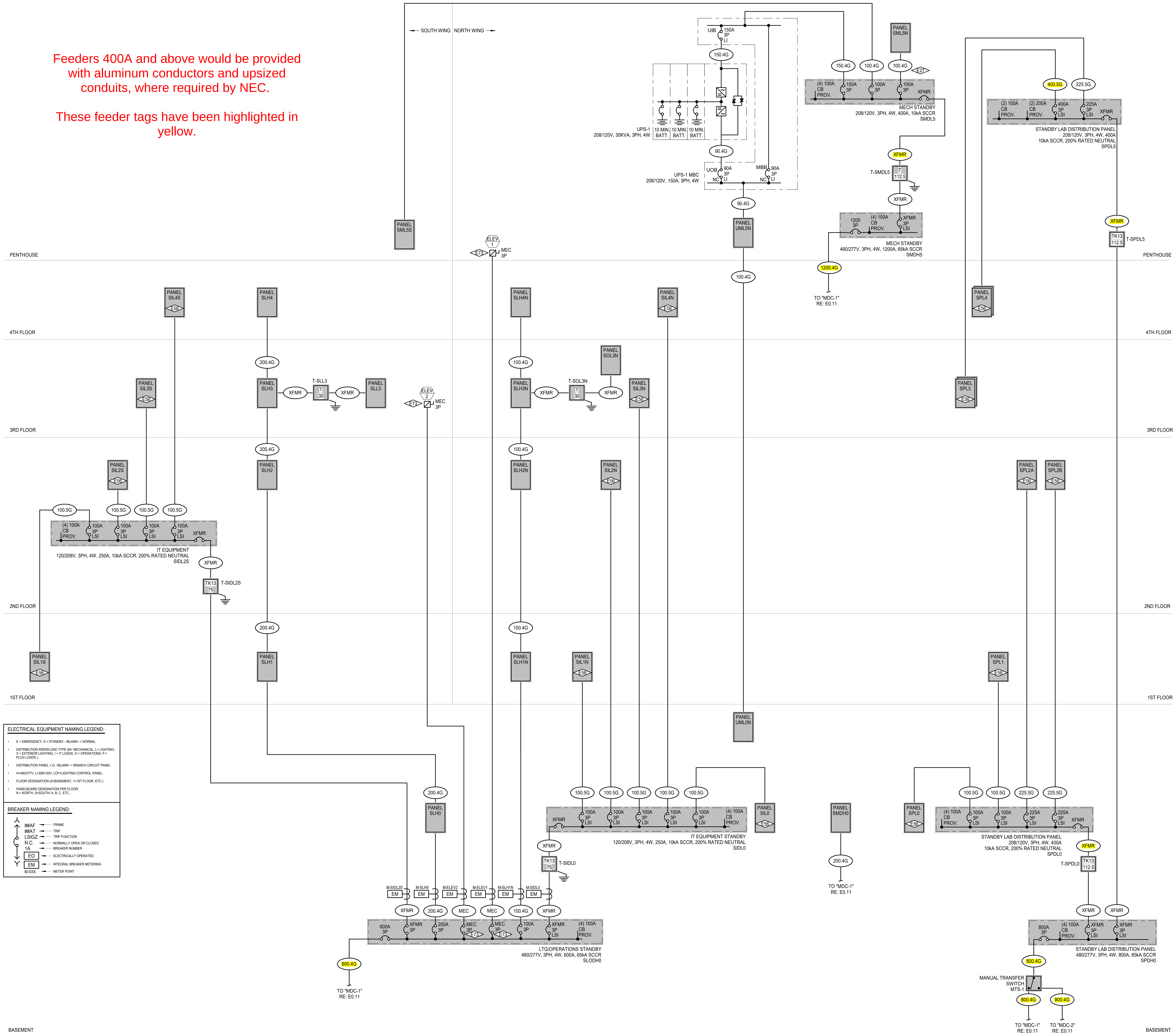
KEYNOTES

E27	FEEDER TO PASS IN CEILING SPACE OF LEVEL 4 BETWEEN MECHANICAL PENTHOUSES.
E56	PROVIDE EQUIPMENT WITH 200% RATED NEUTRAL.
E73	ELEVATOR OCPD TO BE SELECTIVELY COORDINATED TO 0.1 SECONDS PER NEC.



ELECTRICAL EQUIPMENT NAMING LEGEND:

- E = EMERGENCY, S = STANDBY, <BLANK> = NORMAL
- DISTRIBUTION RISER/LOAD TYPE (M= MECHANICAL, L= LIGHTING, X = EXTERIOR LIGHTING, I = IT LOADS, O = OPERATIONS, P = PLUG LOADS).
- DISTRIBUTION PANEL = D, <BLANK> = BRANCH CIRCUIT PANEL
- H=480/277V, L=208/120V, LCP=LIGHTING CONTROL PANEL.
- FLOOR DESIGNATION (0=BASEMENT, 1=1ST FLOOR ,ETC.)
- PANELBOARD DESIGNATION PER FLOOR: N = NORTH, S=SOUTH/ A, B, C, ETC...

BREAKER NAMING LEGEND:

- ##AF — FRAME
- ##AT — TRIP
- LSIGZ — TRIP FUNCTION
- N.C. — NORMALLY OPEN OR CLOSED
- 1A — BREAKER NUMBER
- EO — ELECTRICALLY OPERATED
- EM — INTEGRAL BREAKER METERING
- M-XXX — METER POINT

ELECTRICAL ONE-LINE DIAGRAM

SCALE: NONE

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