Draft hospital essential supply single-line distribution schematic

Software: AutoCAD

Task statement

Draft a single-line distribution schematic for a hospital essential electrical supply on one sheet. Use inch units, not to scale. No dimensions or hatching are needed.

At the top, draw a horizontal 11 kV overhead feeder line that ends in a large arrowhead at the left, labelled "UTILITY 11KV". Draw two vertical transformer branches off this line. Each branch has:

- a lightning arrester labelled "LA";
- a drop-out fuse drawn as two arcs, labelled "3P 100A";
- a transformer drawn as two circles, each containing a triangle;
- an outgoing Q0 breaker drawn with circle contacts and a diagonal blade.

The left branch is labelled "TR-1 1250KVA 3 433V" and "Q0 160A". It feeds board "EMDB-01", marked "EXISTING", with "ACB INCOMER 3P 630A". Its horizontal busbar has four feeders:

- F1 160A, OT DB 4CX25MM2
- F2 160A, ICU DB 4CX70MM2
- F3 200A, LIFE SAFETY 4CX50MM2
- F4 63A, UPS INPUT 4CX95MM2

The right branch is labelled "TR-2 1250KVA 3 433V" and "Q0500A". It feeds "LDB-02", marked "NEW INSTALLATION", with "ACB INCOMER 3P 400A". Its busbar has seven feeders:

- F1 32A, OT DB 4CX25MM2
- F2 100A, ICU DB 4CX70MM2
- F3 250A, LIFE SAFETY 4CX50MM2
- F4 125A, UPS INPUT 4CX95MM2
- F5 100A, HVAC DB 4CX25MM2
- F6 63A, LIFT DB 4CX70MM2
- F7 63A, SPARE 4CX25MM2

Each feeder has a breaker with circle contacts and ends in a triangular arrow. Each feeder carries its rating and its cable label as listed above.

Add a METERING element with a "V5" box and an ammeter "A". Add a rectangular box labelled "APFC/CAP BANK" and "12 STEP 100KVA". Connect it to the LDB-02 busbar and place capacitor symbols inside it. Draw a PE bar line under each board. Insert a title block border.

CAD standards (all objects ByLayer colour, linetype and lineweight; nothing on layer 0):

- E-ONEL (ACI 7, Continuous, 0.35 mm): all schematic lines, circles and arcs.
- E-ONEL-SYMB (ACI 4, Continuous, 0.25 mm): symbol blocks. Use block LIGHTNING-ARRESTER for both arresters (2 references) and block CAPACITOR-STEP for the capacitor symbols (2 references).
- E-ANNO-TEXT (ACI 3, Continuous, 0.25 mm): all labels, as MTEXT.
- E-ANNO-TTLB (ACI 7, Continuous, 0.25 mm): title block references NO_NUM_acade_title and WD_M, one each.

Rubrics

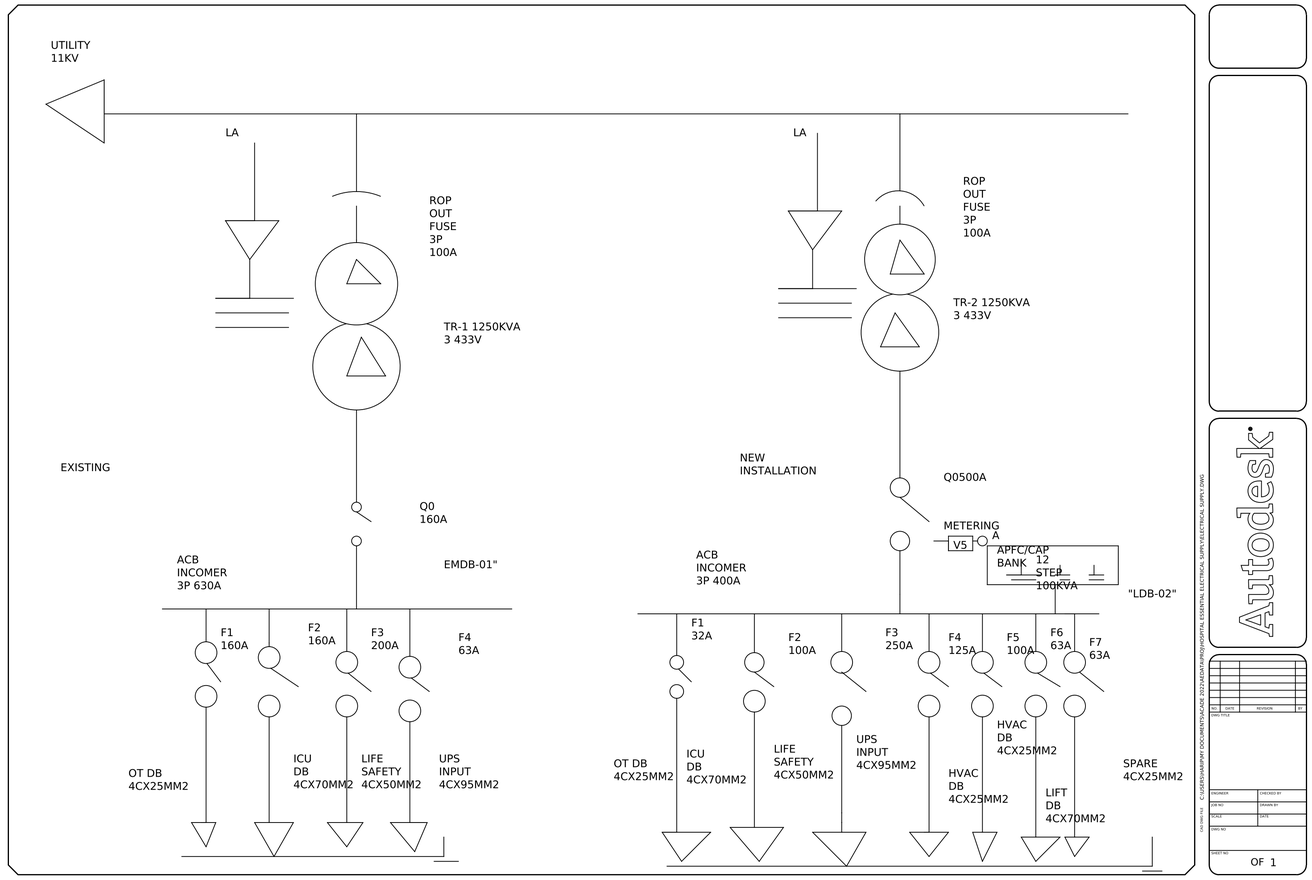
- **R1:** The drawing shall show a horizontal 11 kV feeder line with a left-end arrowhead labelled "UTILITY 11KV".
- **R2:** The drawing shall show two transformer branches, each with a drop-out fuse drawn as arcs, a transformer of two circles with triangles, and a Q0 breaker.
- **R3:** The drawing shall show a lightning arrester labelled "LA" on each transformer branch.
- **R4:** The drawing shall show an EMDB-01 busbar with exactly four outgoing feeders, each with a breaker and a terminating arrow.
- **R5:** The drawing shall show an LDB-02 busbar with exactly seven outgoing feeders, each with a breaker and a terminating arrow.
- **R6:** The drawing shall include an APFC/CAP BANK box connected to the LDB-02 busbar, and a METERING element with a V5 box and an "A" meter.
- **R7:** The drawing shall label the transformers "TR-1" and "TR-2" with 433V, label the breakers "Q0 160A" and "Q0500A", and label the incomers "ACB INCOMER 3P 630A" and "ACB INCOMER 3P 400A".
- **R8:** The drawing shall label the feeders with their ratings: EMDB-01 F1 160A, F2 160A, F3 200A, F4 63A; LDB-02 F1 32A, F2 100A, F3 250A, F4 125A, F5 100A, F6 63A, F7 63A.
- **R9:** The drawing shall label the feeder cables with load names and sizes, including OT DB 4CX25MM2, ICU DB 4CX70MM2, LIFE SAFETY 4CX50MM2, UPS INPUT 4CX95MM2, HVAC DB 4CX25MM2, LIFT DB 4CX70MM2 and SPARE 4CX25MM2.
- **R10:** The drawing shall include the board tags "EMDB-01" and "LDB-02", the notes "EXISTING" and "NEW INSTALLATION", and the text "12 STEP 100KVA".
- **R11:** The drawing shall contain layers E-ONEL (ACI 7, Continuous, 0.35 mm), E-ONEL-SYMB (ACI 4, Continuous, 0.25 mm), E-ANNO-TEXT (ACI 3, Continuous, 0.25 mm) and E-ANNO-TTLB (ACI 7, Continuous, 0.25 mm).
- **R12:** The drawing shall place all schematic lines, circles and arcs on layer E-ONEL.
- **R13:** The drawing shall place all text (MTEXT) on layer E-ANNO-TEXT.
- **R14:** The drawing shall define block LIGHTNING-ARRESTER and insert it 2 times on layer E-ONEL-SYMB, once for each arrester.
- **R15:** The drawing shall define block CAPACITOR-STEP and insert it 2 times on layer E-ONEL-SYMB within the APFC bank.
- **R16:** The drawing shall insert the title block blocks NO_NUM_acade_title and WD_M once each on layer E-ANNO-TTLB.
- **R17:** The drawing shall have every object's colour, linetype and lineweight set to ByLayer.
- **R18:** The drawing shall have no drawing geometry on layer 0.

Input files

- task_files/diagrams/diagram_01.pdf
- task_files/diagrams/diagram_01.png
- task_files/diagrams/diagram_01_detail01.png
- task_files/diagrams/diagram_01_detail02.png
- task_files/diagrams/diagram_01_detail03.png
- task_files/diagrams/diagram_01_detail04.png
- task_files/diagrams/diagram_01_detail05.png
- task_files/diagrams/diagram_01_detail06.png

Deliverables

- **.dwg:** output_files/project_files/ELECTRICAL_SUPPLY.dwg: A single-sheet single-line schematic of the hospital essential supply with the 11 kV feeder, two transformer branches, EMDB-01 (4 feeders) and LDB-02 (7 feeders), metering, the APFC bank and a title block, on the E-ONEL/E-ANNO layer scheme.
- **.dxf:** output_files/project_files/ELECTRICAL_SUPPLY.dxf: DXF export of the model in the same units.



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OF 1

DRAWING TITLE

HOSPITAL ESSENTIAL SUPPLY SINGLE-LINE DISTRIBUTION SCHEMATIC

SYMBOLS (BLOCKS IN THIS DRAWING)

- LIGHTNING-ARRESTER ×2
- CAPACITOR-STEP ×2
- WD M ×1

GENERAL NOTES

1. DIAGRAM IS NOT TO SCALE.
2. DEVICE TAGS, RATINGS AND WIRE / LINE NUMBERS ARE AS SHOWN

UNITS
NOT TO SCALE

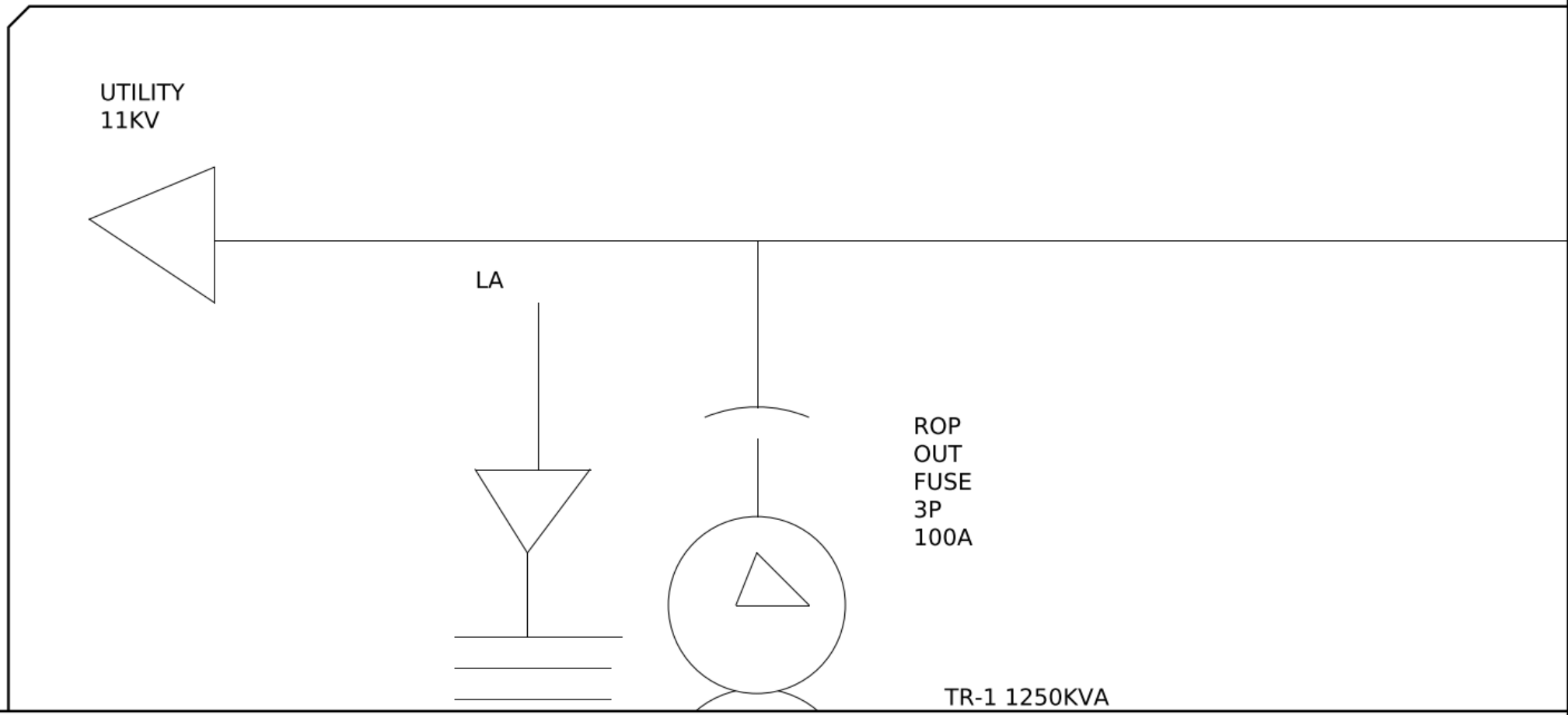
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NTS

SIZE
A1

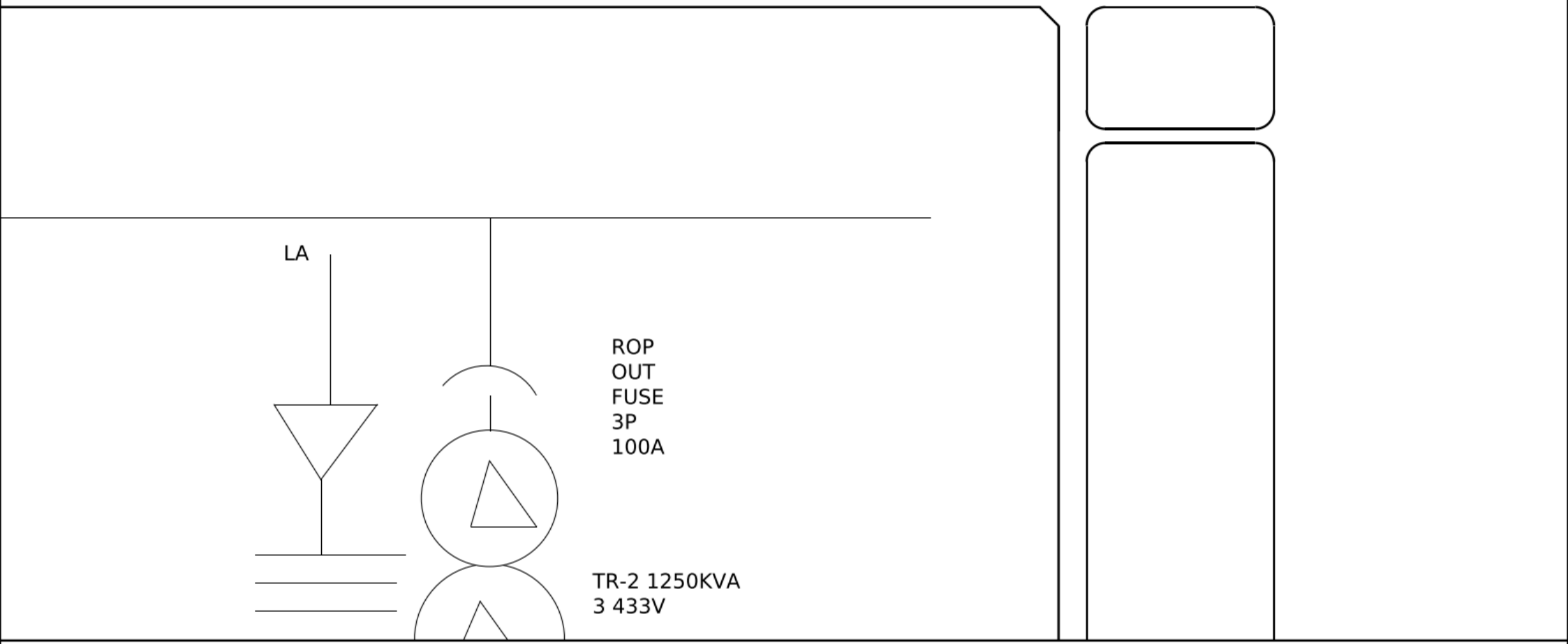
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SHEET
E-601

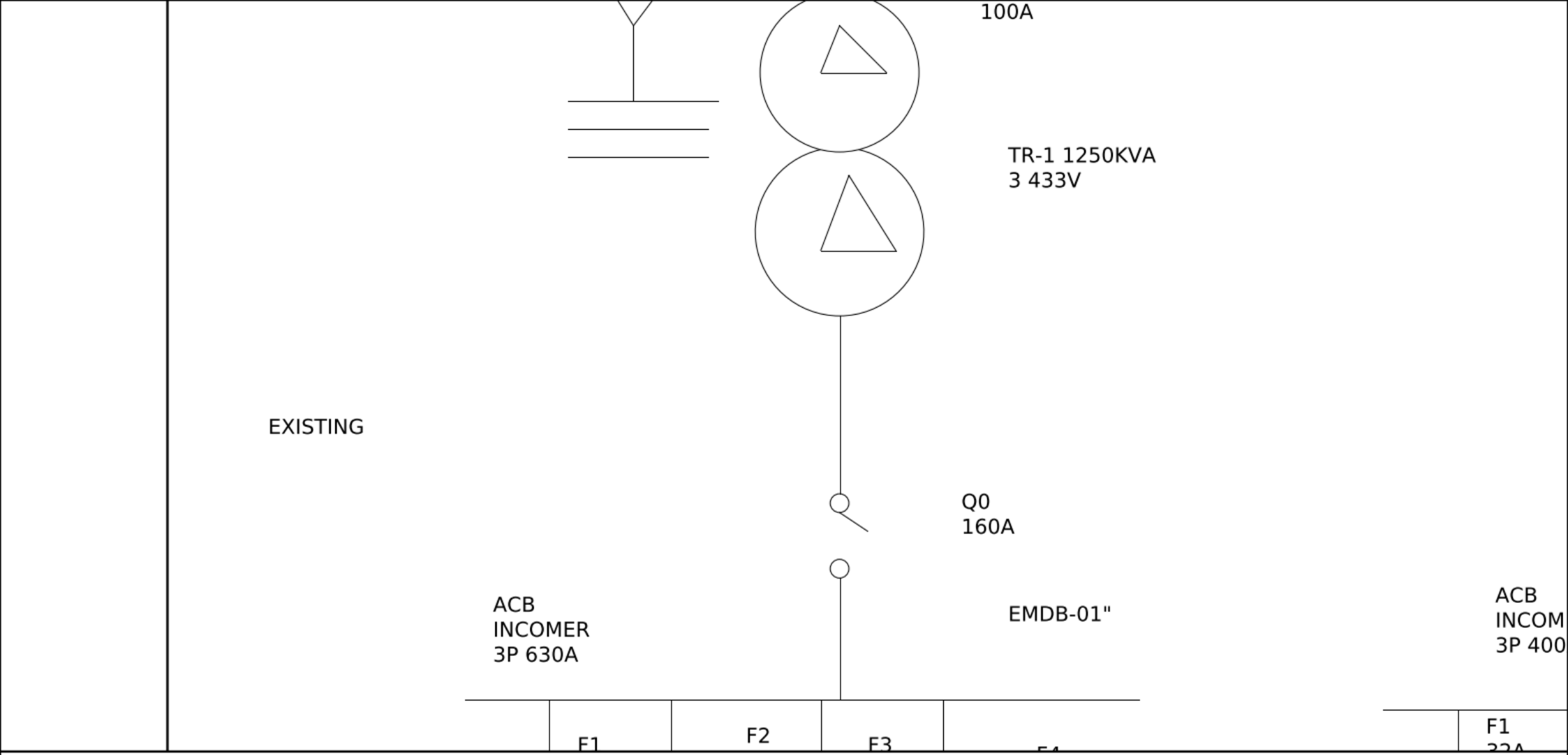
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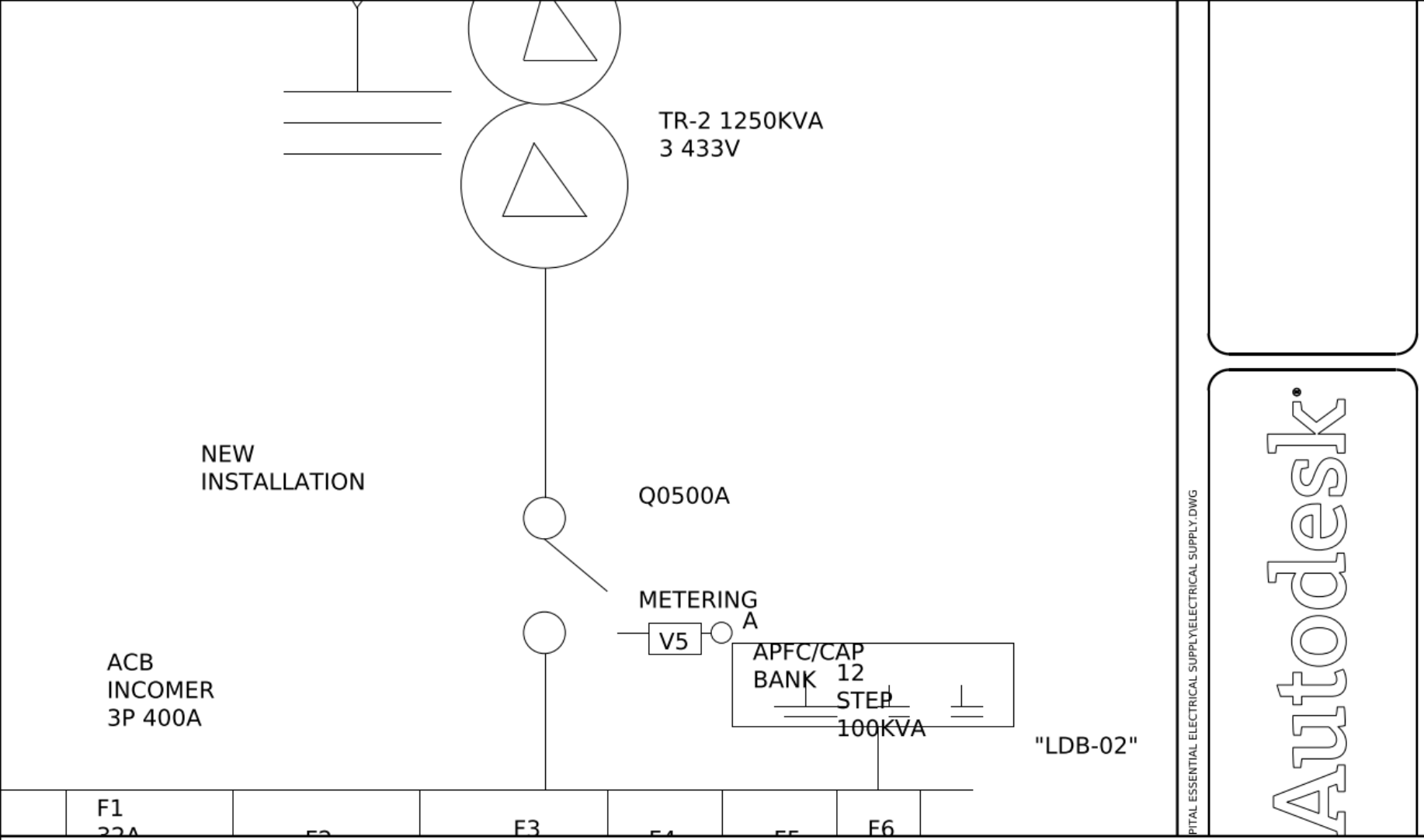


DETAIL 1 · VIEW 1 · SHEET ZONES C1-F6



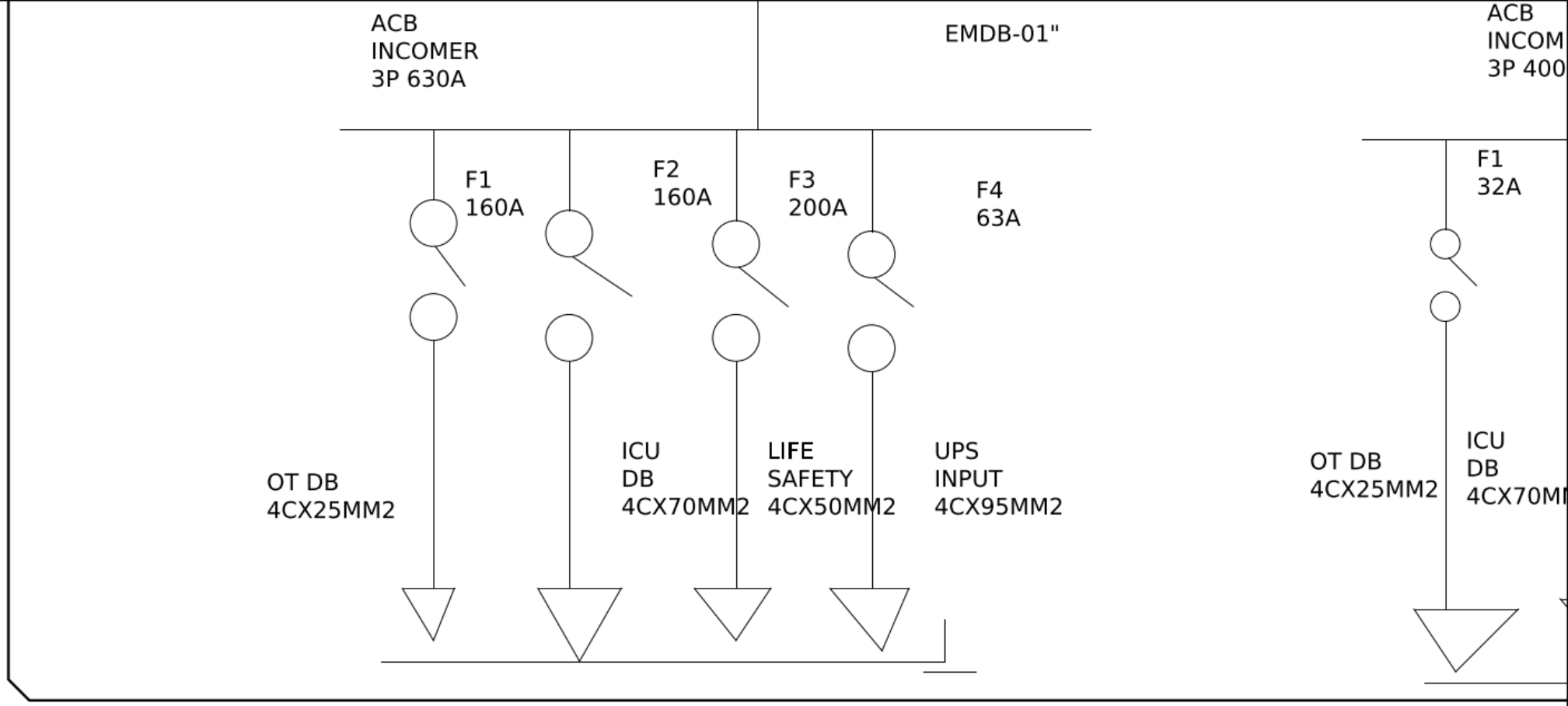
DETAIL 2 · VIEW 1 · SHEET ZONES C5-F10

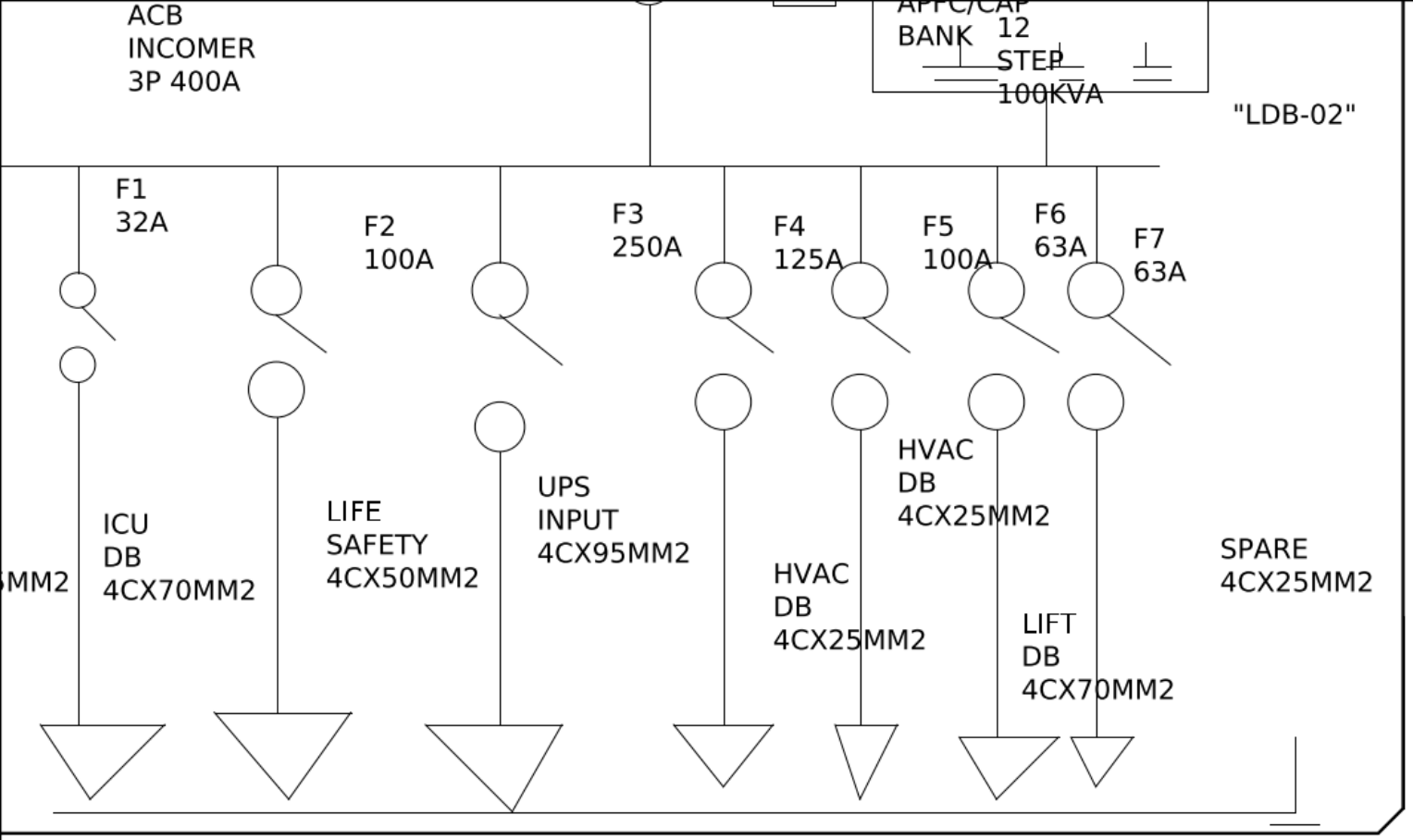

100A
TR-1 1250KVA
3 433V
EXISTING
Q0
160A
ACB
INCOMER
3P 630A
EMDB-01"
ACB
INCOM
3P 400
F1
F2
F3
F1



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ACB
INCOMER
3P 630A
EMDB-01"
ACB
INCOM
3P 400
F1
160A
F2
160A
F3
200A
F4
63A
F1
32A
OT DB
4CX25MM2
ICU
DB
4CX70MM2
LIFE
SAFETY
4CX50MM2
UPS
INPUT
4CX95MM2
OT DB
4CX25MM2
ICU
DB
4CX70MM



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CAD DWG FILE

NO.	DATE	REVISION	BY

DWG TITLE

ENGINEER	CHECKED BY
JOB NO	DRAWN BY
SCALE	DATE

DWG NO

SHEET NO

OF 1