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AI NEC Pre-Check

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Prepared for	[REDACTED]
Job ID	SAMPLE-NEC-01
Order ID	SAMPLE — redacted production test run
Review type	Automated release

AT A GLANCE — 18 FINDINGS

2	12	4	0
CRITICAL	SIGNIFICANT	OBSERVATION	INFORMATION

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EXECUTIVE SUMMARY

What to look at first

18 findings across 3 severity levels — full detail begins on the following page.

SEVERITY DISTRIBUTION

Critical 2 Significant 12 Observation 4

PRIORITY SHORTLIST

NEC-SET-01-2 · set integrity
Three sheets disagree on how many EGCs the PNL-PE→PNL-DP feeder gets

NEC-110-06-5 · ratings
The new PNL-DP disconnect is specified with no interrupting or short-circuit rating

NEC-SET-08-1 · set integrity
A transformer schedule is referenced by the symbol legend and does not exist in the set

NEC-SET-06-3 · set integrity
"BY OTHERS" occupies roughly half the circuits on the PNL-EL-A and PNL-EL-B schedules on an IFC set

BY CATEGORY

set integrity	10
ratings	1
working space	1
marking	1
transformer protection	1
ampacity	1
equipment grounding	1
separately derived	1
overcurrent	1

AI NEC Pre-Check

Job SAMPLE-NEC-01 · Order SAMPLE — redacted production test run · Automated release

SAMPLE — redacted. Client name, address, personnel and contact details removed; equipment tags, manufacturer and model names pseudonymised. Engineering findings unchanged.

Read before relying on anything below.

This is a preliminary code screening, not a compliance determination.

This report checks your electrical drawings, one-lines, panel schedules, and install details against an owner-authored NEC article checklist, grounded in the code edition and amendments you provided. It is not a stamped or sealed engineering review, and it does not constitute a determination of code compliance by any Authority Having Jurisdiction.

Findings are limited to what is visible in the documents submitted. Absence of a finding does not indicate compliance. All findings must be independently verified by the Engineer of Record against the code edition and local amendments adopted by the Authority Having Jurisdiction for this project.

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Submission details

Report	AI NEC Pre-Check — Report NEC-01
Submittal reviewed	[IFC drawing set].pdf — [FINANCIAL CLIENT], [SITE ADDRESS], [CITY] TN. Issue For Construction, 07/22/2026 (16 sheets)
Client identity	Redacted for public release

CRITICAL (2)

NEC-SET-01-2 · set integrity · issue

Critical

Three sheets disagree on how many EGCs the PNL-PE→PNL-DP feeder gets

· grounding_independent (needs no code text)

The same feeder is described three ways in the same set:

Notes G and E600-A agree: two EGCs, one per raceway. Note F, read literally, specifies one. An installer working from E102 alone — which is the sheet carrying the feeder notes — could pull a single EGC in one of two parallel raceways.

E600 note B makes the intent clear, and the intent is correct. The defect is that the sheet an installer is most likely to work from says something different.

> RECOMMENDED ACTION
> Reword E102 note F to match E600 note A. This is a one-line edit and it removes the only genuinely ambiguous instruction in the set.

Source: page not applicable — E102 general notes F and G; E600 Grounding & Bonding Detail, key notes A and B

Code ref: none — general observation | Confidence: high

NEC-110-06-5 · ratings · issue

Critical

The new PNL-DP disconnect is specified with no interrupting or short-circuit rating

E102 note J: "INSTALL 400A OR GREATER LOCAL DISCONNECT SWITCH UPSTREAM OF PANEL PNL-DP." No interrupting rating, no short-circuit current rating, no fused/unfused designation, no type.

E010 establishes the available fault current at panel PNL-DP as 10.9 kA and its SCCR as 25 kA. The new disconnect sits upstream of that point, so it sees at least that fault current — and the set has the number in hand and does not apply it to this device.

E102 note D partially covers this: "ALL NEW DEVICES ADDED TO AND INSTALLED IN EXISTING EQUIPMENT SHALL BE PROVIDED WITH AN AIC RATING THAT MATCHES OR EXCEEDS THE RATING OF THE EXISTING EQUIPMENT." A standalone local disconnect is not a device installed in existing equipment, so note D does not reach it.

For contrast, note L in the same set does this correctly — it specifies "HEAVY DUTY 600V, 200A, 25KA RATED MANUAL DISCONNECT SWITCHES" for the transformer disconnects. The PNL-DP disconnect is the one device specified without a rating.

> RECOMMENDED ACTION
> Specify the PNL-DP disconnect's rating the way note L specifies the transformer disconnects.

Source: page not applicable — E102 note J (specification) and note L (the correctly-rated comparison); E010 available fault current item G, panel PNL-DP

Code ref: none — general observation | Confidence: medium

SIGNIFICANT (12)

NEC-SET-08-1 · set integrity · issue

Significant

A transformer schedule is referenced by the symbol legend and does not exist in the set

· grounding_independent (needs no code text)

Sheet E002 (Electrical Symbols) directs the reader: *"...UPPER CASE LETTER 'T'. SEE THE TRANSFORMER SCHEDULE OR THE..."*.

No transformer schedule appears in the E001 sheet index and no transformer schedule appears among the 16 sheets. The set contains a Feeder Schedule (E400, E401) and a Raceway Schedule (E402) but no transformer schedule.

This compounds finding 8 below: the callout tells the reader where to find transformer data, and the destination does not exist.

> RECOMMENDED ACTION
> Add the transformer schedule, or remove the callout and place the transformer data on the one-lines.

Source: page not applicable — E002 Electrical Symbols, transformer symbol note; E001 sheet index; the 16 sheets present

Code ref: none — general observation | Confidence: high

NEC-SET-06-3 · set integrity · issue

Significant

"BY OTHERS" occupies roughly half the circuits on the PNL-EL-A and PNL-EL-B schedules on an IFC set

· grounding_independent (needs no code text)

On panels PNL-EL-A (225 A MCB, 42 poles) and PNL-EL-B (200 A, 42 poles), circuits from approximately 24 through 42 carry the description "BY OTHERS" with connected load 0 VA. That is roughly nineteen of forty-two positions per panel.

There is a legitimate scope note behind this — E102 note I states "LOADS DOWNSTREAM OF PANEL PNL-DP ARE PROVIDED BY OTHERS" and E300 notes that "LIGHTING, GENERAL RECEPTACLES, AND NON-UPS OUTLETS DONE BY OTHERS." So the intent is scope demarcation, not an unfinished schedule.

The problem is what the schedule now communicates: a circuit directory where half the entries say "BY OTHERS" with 0 VA does not tell anyone what is actually connected, does not support a load calculation, and will be installed and then never corrected. It is also indistinguishable, to a plan reviewer, from a schedule that was simply not finished.

> RECOMMENDED ACTION
> Either populate the descriptions with the intended loads, or mark the positions "SPARE — FUTURE, BY OTHERS" with an explicit note that the panel schedule is to be updated at closeout by the others-scope contractor.

Source: page not applicable — E300 panel schedules for PNL-EL-A and PNL-EL-B, circuits 24–42 (odd and even), description and load columns

Code ref: none — general observation | Confidence: high

NEC-SET-06-4 · set integrity · issue

Significant

Three unresolved instructions on an Issue For Construction set

· grounding_independent (needs no code text)

Three notes on E102 defer a decision to the field on a set stamped ISSUE FOR CONSTRUCTION 07/22/2026:

> RECOMMENDED ACTION
> Select one outcome for ATS-04 and detail it. Fix the PNL-DP disconnect rating. Note E is the least consequential of the three and may be acceptable as written.

Source: page not applicable — E102 general notes E, J and K | Code ref: none — general observation | Confidence: high

NEC-SET-06-6 · set integrity · issue

Significant

The set is Issued For Construction while stating its own fault current data will be superseded

· grounding_independent (needs no code text)

Sheet E010, General Notes — Available Fault Current:

> 1. AVAILABLE FAULT CURRENT PROVIDED BELOW FROM NOVEMBER 2025 ARC FLASH STUDY BY OTHERS.
> 2. UPDATED FAULT CURRENT CALCULATIONS, INCIDENT ENERGY AND PROTECTION SETTINGS WILL BE PROVIDED PRIOR TO CONSTRUCTION.

The eight RESULT = PASS determinations on that same sheet — covering the service entrance, PNL-PE, PNL-UA, PNL-EL-A, PNL-EL-B, PNL-W1, PNL-W2 and PNL-DP — are all computed from the values note 2 says are not final. The set carries a Revision 00 ISSUE FOR CONSTRUCTION stamp dated 07/22/2026 alongside a note saying a governing input is still outstanding.

This is not necessarily wrong — deferring an updated study to a construction submittal is common — but it means the equipment-adequacy conclusions in this set are provisional and nothing on the sheet says so.

> RECOMMENDED ACTION
> Mark the PASS determinations as provisional pending the updated study, and identify who reconciles them and when.

Source: page not applicable — E010 General Notes — Available Fault Current, notes 1 and 2, alongside items A through G and the revision block "00 ISSUE FOR CONSTRUCTION 07/22/2026"

Code ref: none — general observation | Confidence: high

NEC-SET-07-8 · set integrity · issue

Significant

No panel load calculation supports adding a 400 A feeder to panel PNL-PE

· grounding_independent (needs no code text)

The load calculation sheet E010 covers exactly one thing: UPS-01 loading, by two methods (NEC-estimated and measured). It produces UPS-01 at 75 % of its 150 kVA rating using the measured basis, which is a defensible piece of work.

What it does not contain is any load calculation for panel PNL-PE, into which E102 note E adds a new 400AF/400AT breaker feeding panel PNL-DP. PNL-PE is a 277/480 V panel shown at 1200 A on the one-lines. The set does not establish PNL-PE's existing connected or demand load, does not add the PNL-DP load to it, and does not demonstrate that PNL-PE's bus and its upstream device accommodate the addition.

Nor is there a load calculation for the new panels PNL-W1 and PNL-W2 (225 A MCB each) or for PNL-DP itself — though for PNL-DP, E102 note I places the downstream loads in others' scope, which explains that one.

> RECOMMENDED ACTION
> Add a panel load calculation for PNL-PE showing existing plus new. This is the load-side counterpart to the fault-current check the set already does well on E010.

Source: page not applicable — E010 Load Calculations, whole sheet — the only sheet in the set carrying load calculations; E102 note E; E101/E102 one-lines showing PNL-PE at 1200 A

Code ref: none — general observation | Confidence: high

NEC-110-01-11 · working space · issue

Significant

No working space information anywhere in the set

Searching the full 16-sheet set returns no working space dimension, no clearance note, no dedicated-space note, no headroom dimension, no door swing annotation relative to electrical equipment, and no reference to Article 110.26 or equivalent.

The set installs new equipment that requires it: panel PNL-DP, panels PNL-W1 and PNL-W2, transformers T1, T2, XFMR-03 PNL-W1 and XFMR-03 PNL-W2, and a new 400 A local disconnect (E102 note J). E500 shows raceway routing in Area A but carries no equipment clearance dimensions.

This is scored at medium confidence only because degrade mode caps it there. The observation itself — that nothing about working space appears in the set — is not in doubt.

> RECOMMENDED ACTION
> Add dimensioned working space at the new panels, transformers and disconnect. Supply the NEC 2023 text and this check can be run properly.

Source: page not applicable — the whole 16-sheet set; specifically E500 (Cable Tray — Plan Routing), the only plan sheet showing equipment in context, and E102 which introduces the new equipment

Code ref: none — general observation | Confidence: medium

NEC-110-04-12 · marking · issue

Significant

No available-fault-current marking note and no arc flash marking note, on a set that computes the fault currents

The set carries no note requiring field marking of available fault current and the date of calculation at the service equipment, and no note requiring arc flash warning marking at equipment likely to be examined while energized.

What makes this worth flagging rather than routine: sheet E010 already contains the available fault current at the service entrance (19.89 kA at ATS-02 utility breaker) and at seven downstream buses. The number the marking would carry is in the set. The instruction to apply it is not.

The set also references a November 2025 arc flash study by others (E010 note 1) and states that updated incident energy will be provided prior to construction (note 2) — so arc flash information is in the project's orbit — without any note tying that to equipment marking.

> RECOMMENDED ACTION
> Add the marking notes. Given E010 already carries the values, this is a small addition with disproportionate value.

Source: page not applicable — searched E001 (general notes and specifications), E102 (single line notes A–M), E010 (available fault current notes 1–3) — the three sheets where such a note would appear

Code ref: none — general observation | Confidence: medium

NEC-450-01-13 · transformer protection · issue

Significant

Transformer disconnects are upgraded; the primary overcurrent device is not shown

E102 note L: "REPLACE AND INSTALL THE 100A RATED DISCONNECT SWITCHES FOR TRANSFORMERS PNL-EL AND XD AND REPLACE WITH HEAVY DUTY 600V, 200A, 25KA RATED MANUAL DISCONNECT SWITCHES."

The one-lines show XFMR-05 and XFMR-03 both at 112.5 kVA, 480 V primary. Upgrading their 100 A disconnects to 200 A is a correct call — a 112.5 kVA transformer at 480 V draws well above 100 A on the primary, and the existing switches are undersized. The note is one of the better catches in the set.

What the set does not show is the overcurrent device. The note specifies "MANUAL DISCONNECT SWITCHES" — switching means, not protection — and neither the primary overcurrent device rating nor the secondary device rating appears for either transformer. Combined with finding 1 (the transformer schedule is referenced and absent), there is nowhere in the set a reader can find transformer protection data.

> RECOMMENDED ACTION
> Show the primary and secondary overcurrent device rating for both transformers, on the transformer schedule once finding 1 is resolved.

Source: page not applicable — E102 note L; E100/E101 one-lines, XFMR-05 and XFMR-03 blocks showing 112.5 kVA, 480 V, 120/208 V and the "100AS" switch designations

Code ref: none — general observation | Confidence: medium

NEC-SET-02-14 · set integrity · issue

Significant

A third transformer with the same condition is not addressed

· grounding_independent (needs no code text)

The existing one-line E100 shows transformer XFMR-04 at 112.5 kVA with a 100AS disconnect designation — the same kVA and the same switch rating as XFMR-05 and XFMR-03, which E102 note L identifies as needing replacement.

XFMR-04 is not named in note L and does not appear on E101 or E102 among the updated equipment.

There is a plausible explanation: E102 note B states "ELECTRICAL FEEDERS AND EQUIPMENT SHOWN TRANSPARENT ARE NOT WITHIN [DESIGN FIRM] SCOPE AND ARE EITHER EXISTING OR OTHERS SCOPE," so XFMR-04 may be deliberately out of scope. But if the condition that justified replacing two 100 A switches also exists at a third transformer, that is worth a note rather than a silence.

> RECOMMENDED ACTION
> Confirm XFMR-04's disconnect rating. If the same condition exists and it is out of scope, add a note saying so.

Source: page not applicable — E100 Single Line Diagram — Existing, XFMR-04 block (112.5 kVA, 480 V, 120/208 V) and its adjacent 100AS designation; E102 note L, which names only PNL-EL and XD

Code ref: none — general observation | Confidence: medium

NEC-300-01-15 · ampacity · issue

Significant

The cable tray sizing statement does not state the cable diameters it depends on

Sheet E501 carries two related statements:

> THE SPACING BETWEEN ANY TWO TRAY CABLES SHALL BE AT LEAST THE DISTANCE OF THE LARGER CABLE'S DIAMETER PER 2023 NEC 392.80(A)(1)(c)
>
> FOR TRAYS CARRYING 24 4C-8AWG TC-ER AND 2 4C-6AWG TC-ER CABLES OR 24 4C-8AWG TC-ER THE MINIMUM WIRE BASKET TRAY DIMENSIONS ARE 4"x 36"

The approach is sound: maintaining one-cable-diameter spacing in a single uncovered layer is a recognized way to avoid ampacity adjustment, and citing the provision on the drawing is good practice. This review has not verified the citation — no NEC text was supplied, and the checklist forbids citing a section from memory.

The gap is arithmetic and is visible without the code: the tray width conclusion depends on the cable outside diameters, and the outside diameters appear nowhere in the set. 26 cables at one-diameter spacing in a 36" tray requires each cable plus its spacing to average under 1.38". Whether that holds depends on the OD of the specific 4C-8AWG and 4C-6AWG TC-ER products used, which the drawings do not specify and this review will not assume.

> RECOMMENDED ACTION
> State the cable outside diameter the 4" × 36" conclusion is based on, and specify the TC-ER product or a maximum OD. This is the input that makes the tray sizing checkable by anyone.

Source: page not applicable — E501 Cable Tray — Section, Support & Fill Detail, the spacing note and the tray sizing note; E300 UPS branch circuit notes B, C and D (which specify the conductors but not the cable OD)

Code ref: none — general observation | Confidence: medium

NEC-250-03-16 · equipment grounding · issue

Significant

Branch conductors are upsized with no corresponding EGC note

E300 notes C and D upsize the UPS branch circuit conductors substantially above the 20 A circuit rating:

> C. PROVIDE #8 CU CONDUCTORS (MINIMUM) FOR THE ENTIRE LENGTH OF ALL UPS POWERED 20 AMP BRANCH CIRCUITS FOR 208V OR 120V CIRCUITS LESS THAN 175 FT.
> D. PROVIDE #6 CU CONDUCTORS FOR THE ENTIRE LENGTH OF UPS POWERED 20A BRANCH CIRCUITS THAT EQUAL OR EXCEED 175 FT.

The cable is specified as "4C+G MULTICONDUCTOR CABLE TYPE TC-ER" (note B). The G conductor size is never stated — not in notes B, C or D, not on the feeder schedules E400/E401, and not on the panel schedules.

No note addresses whether the EGC is upsized in proportion to the conductor upsizing. The set handles this correctly on the PNL-PE→PNL-DP feeder (E600 key notes A and B, and finding 2 above), which makes its absence on the 105 UPS branch circuits more conspicuous rather than less.

RECOMMENDED ACTION

State the G size in the TC-ER specification and add an EGC-upsizing note if the conductor upsizing requires it under the adopted edition.

Source: page not applicable — E300 Typical UPS Branch Circuit Wiring Notes B, C and D; E400/E401 Feeder Schedules; E600 which addresses the PNL-PE→PNL-DP EGC but not the branch circuits

Code ref: none — general observation | Confidence: medium

NEC-250-04-17 · separately derived · issue

Significant

Separately derived system bonding is detailed; the grounding electrode connection is not

E600 shows a PDU/transformer enclosure detail: 480 V 3-phase 3-wire line side, 208/120 V 3-phase 4-wire load side, neutral bar, equipment ground bus, and a bonding jumper — labeled and drawn. It also shows metal grounding bushings with insulated throat on all conduits, a 1#1/0 insulated bonding jumper, a bonding junction ground bar, and #6 AWG or larger enclosure ground. The bonding detail is thorough.

What the detail does not show is a grounding electrode conductor from the separately derived system to a grounding electrode. The set contains no grounding electrode system detail and no GEC size anywhere.

The service is existing and the project is a tenant fit-out, which explains the absence of a service grounding electrode detail. It does not explain the absence for the new separately derived systems T1, T2, XFMR-03 PNL-W1 and XFMR-03 PNL-W2.

RECOMMENDED ACTION

Show the grounding electrode connection for the new separately derived systems, or note where the existing building electrode system is picked up.

Source: page not applicable — E600 Grounding & Bonding Detail, transformer enclosure/PDU detail; searched the full set for a grounding electrode system detail

Code ref: none — general observation | Confidence: medium

OBSERVATION (4)

NEC-SET-06-7 · set integrity · issue

Observation

Duplicate list label and an apparent unit error on the load calculation sheet

· grounding_independent (needs no code text)

Two clerical defects on E010:

- The available fault current list runs A, B, C, D, E, F, G. PANEL PNL-W2, G. PANEL PNL-DP. Two items share the label G. The second should be H.
- The UPS load calculation row "TOTAL VA LOAD FOR 105 UPS CIRCUITS" reads 113.4 with the unit column showing VA. The value is derived from 105 circuits × 1080 VA, which is 113,400 VA — i.e. 113.4 kVA. The demand-factor rows immediately below treat it as kVA ("103.4 * 50% = 51.7 kVA"), so the arithmetic downstream is right and only the unit label is wrong.

Neither changes an installed condition. Both are the kind of thing that gets copied into the next project.

> RECOMMENDED ACTION
> Relabel the second G as H. Correct the unit to kVA.

Source: page not applicable — E010, available fault current list items labeled G; E010, UPS Load Calculations table, "TOTAL VA LOAD FOR 105 UPS CIRCUITS" row

Code ref: none — general observation

Confidence: high

NEC-SET-01-9 · set integrity · issue

Observation

Raceway schedule unit weights place GRC below EMT of the same trade size

· grounding_independent (needs no code text)

The E402 raceway schedule reports a weight in pound-force per run. Dividing by the stated length gives an implied unit weight:

Within this schedule's own numbers, 2-1/2" GRC is reported as lighter per foot than 2-1/2" EMT. Rigid galvanized conduit is substantially heavier than EMT of the same trade size. No outside reference is needed to see the inconsistency — the schedule contradicts itself.

Separately, the implied unit weights track bare conduit only. C1 and C2 each carry four 250 kcmil conductors plus a #3 EGC over 260 ft, and that conductor weight does not appear to be included in any row. Sheet note A states "'WEIGHT' IS EXPRESSED IN POUND-FORCE" and E402/E501 indicate the values feed structural loading, which is where an understated weight matters.

> RECOMMENDED ACTION
> Confirm what the weight column includes and re-derive C1 and C2. If the values drive hanger and structural design, an understated load on two 260 ft parallel GRC runs is worth catching now.

Source: page not applicable — E402 Raceway Schedule, rows C1, C2, C4, C5 — Size, Length and Weight columns; sheet note A

Code ref: none — general observation

Confidence: high

NEC-SET-01-10 · set integrity · issue

Observation

Termination detail shows 3" conduit; no 3" conduit appears in the raceway schedule

· grounding_independent (needs no code text)

Sheet E502 (Cable Tray — Termination) annotates 3" EMT and 3" GRC, USE BONDED BUSHINGS BEFORE ENTERING BASKET TRAY.

The E402 raceway schedule lists 2-1/2" GRC (C1, C2), 2" EMT (C4), 2-1/2" EMT (C5), 2" EMT (C6), 2-1/2" FMC/EMT (C7, C8) and 2-1/2" EMT (T2). No 3" raceway of any type appears.

The detail may be a generic typical rather than a project-specific instruction, in which case this is not a defect — but as drawn, a detail sheet in an IFC set specifies a size the schedule does not carry.

> RECOMMENDED ACTION
> Either add the 3" runs to the schedule or note E502 as a typical detail with sizes per schedule.

Source: page not applicable — E502 Cable Tray — Termination, wall penetration annotations; E402 Raceway Schedule, Size column

Code ref: none — general observation | Confidence: medium

NEC-408-02-18 · overcurrent · issue

Observation

Main-lug-only panels shown with no basis note

The updated one-line E101 shows a substantial number of main-lug-only panels: REB, REC and RED at 400A MLO; RDB, RDC, RDD and RDE at 400A MLO; PNL-EL-A(2) at 200A MLO; PNL-EL-B(2) at 200A MLO; PNL-16 and PNL-15 at 100A MLO.

No note establishes the basis for main-lug-only application at any of them — that is, which upstream device protects each panel bus.

These are existing panels shown for context, and E102 note B places non-[DESIGN FIRM] equipment out of scope, so this is scored as an observation rather than a defect in the new work. It is recorded because the one-line is the document a reviewer will use, and it presents ten MLO panels without their protection basis.

> RECOMMENDED ACTION
> No action required for the new work. Consider annotating the upstream protective device for the MLO panels on the one-line.

Source: page not applicable — E101 Single Line Diagram — Updated, the MLO panel blocks; E102 note B (scope)

Code ref: none — general observation | Confidence: medium