



LARGE ELECTRICAL EQUIPMENT DESIGN REVIEW, SUBMITTAL REQUIREMENTS, AND MATERIAL APPROVAL

presented by

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BUILD SAFE | LIVE SAFE **CONFERENCE 2019**

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DESCRIPTION

This presentation will review and include an analysis of draft 1 RCNY 4000-01 and relevant (NYCEC) Code for electrical installations larger than 1000KVA or 600V. Code Requirements for the physical layout of electrical service rooms and safety concerns will be discussed. Case studies will be presented for Special Permission Requests for **Electrical Equipment Installations** and **Electrical Material Approvals** to highlight relevant Code requirements and their outcomes will be discussed.

LEARNING OBJECTIVES

At the end of this presentations, you will be able to:

1. Participants will analyze proposed legislation that amends Section 34-05 of Title 1 of RCNY in draft 1RCNY 4000-01 for Electrical Work subject to review, which updates requirements for electrical installations and electrical equipment to ensure adequate designs for enhanced safety.
2. Participants will discuss and be able to locate New York City Electrical Code requirements for electrical service rooms; as they relate to electrical equipment layouts and required clearances.
3. Participants will review requirements for Special Permissions Approvals for Electrical Installations and be able to determine when there is justifiable hardship and safe design alternatives to meet the intent of the Code.
4. Participants will review DOB analysis criteria for new technology that is not Code prescribed to ensure that electrical installations meet NYC Electrical Code requirements.

PURPOSE OF LEGISLATIONS AMENDMENTS

The Department of Buildings (DOB) is amending its Electrical Code rules as follows:

- Repeal 1 RCNY 34-01, standards for electrical work
- Repeal 1 RCNY 34-02, electrical permits and certificates of electrical inspection
- Repeal 1 RCNY 34-03, temporary certification to perform low voltage work

NOTE: Repealed rules 34-01, 34-02, and 34-03 refer to a phase in period that ended in 2003.

PURPOSE OF LEGISLATIONS AMENDMENTS

(continued)

- Amend 1 RCNY 34-05, to eliminate electrical advisory board, and standardizes plan review process.
- Renumbering 1 RCNY 34-05 as 1 RCNY 4000-01 to align the rule with the DOB rule numbering scheme
- Amend subdivisions of 1 RCNY 101-12, to expand jurisdiction of the Office of Technical Certification and Research

AMENDMENT TO SECTION 34-05

Renumbered as section 4000-01, **Electrical Work Review**, is comprised of:

- Electrical Review
 - Electrical Installations
 - Electrical Equipment
- Filing Requirement
 - Electrical Installation
 - Special Permissions
 - Electrical Equipment (Subdivisions of Section 101-12 of 1 RCNY)
- Compliance with NYC Energy Conservation Code

AGENDA

- **Electrical Review**
 - **Electrical Installations**
 - **Scope of 1RCNY 4000-01**
 - Electrical Equipment
 - Not addressed in the NYCEC
 - Equipment not bearing a listing or label
- Code Requirements for Layout of Electrical Service Rooms
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ELECTRICAL REVIEW

When is an Electrical Review required per 4000-01?

Electrical Installations. An electrical review is required if any of following conditions are met for proposed service equipment:

- A new installation of equipment totaling 1000 KVA or higher
- Any change in an installation with a rating of 1000 KVA or higher, up to and including the second level overcurrent protection, unless it was fully described and approved as **future** on the original approved plan
- Any addition to an existing installation which would bring the total to 1000 KVA or higher
- A new installation or revised installation above 600 volts, irrespective of KVA rating. Not including PV.
- The addition of any equipment in a room, which would affect clearances around the equipment of a 1000 KVA installation.

EXAMPLE: ELECTRICAL INSTALLATION WORK REQUIRING REVIEW



Voltage (V) Volts	Current (I) Amps
120/208	Over 2800
480/277	Over 1200
5000	Over 115

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ELECTRICAL REVIEW

(continued)

When is an Electrical Review required per 4000-01?

Electrical Equipment. An electrical review is required for:

- Electrical equipment not specifically addressed in the NYCEC technical standard, for example:
 - Low Voltage Lighting Systems
 - Energy Storage System
- Electrical equipment not bearing the label of approval of an electrical testing laboratory acceptable to the Commissioner:
 - Foreign decorative luminaires
 - Waterless toilets

EXAMPLE: ELECTRICAL EQUIPMENT REVIEW BATTERY ENERGY STORAGE SYSTEMS (BESS)

BESS Container



An approved BESS installation under construction

BESS Rack



<https://www.neces.com/products-services/battery-systems/energy-storage-rack-systems>

EXAMPLE: ELECTRICAL EQUIPMENT REVIEW FOAM TOILET



<https://www.clivusne.com/what-we-do.php>

EXAMPLE: ELECTRICAL EQUIPMENT REVIEW UNLISTED EQUIPMENT

- Where the equipment is not listed or labeled, a field evaluation is permitted to be applied. OSHA maintains a list of Nationally Recognized Testing Labs (NRTLs).
- An NRTL will perform the evaluation in accordance with New York City Electric Code (NYCEC) provisions and specific standards.
- Upon equipment being found satisfactory, a label of compliance is attached.
- Field evaluation is site specific

EXAMPLE: ELECTRICAL EQUIPMENT REVIEW UNLISTED EQUIPMENT



A Generator Set serving emergency or standby loads shall be listed to UL2200 listed

- Alternatively may undergo field evaluation for approval

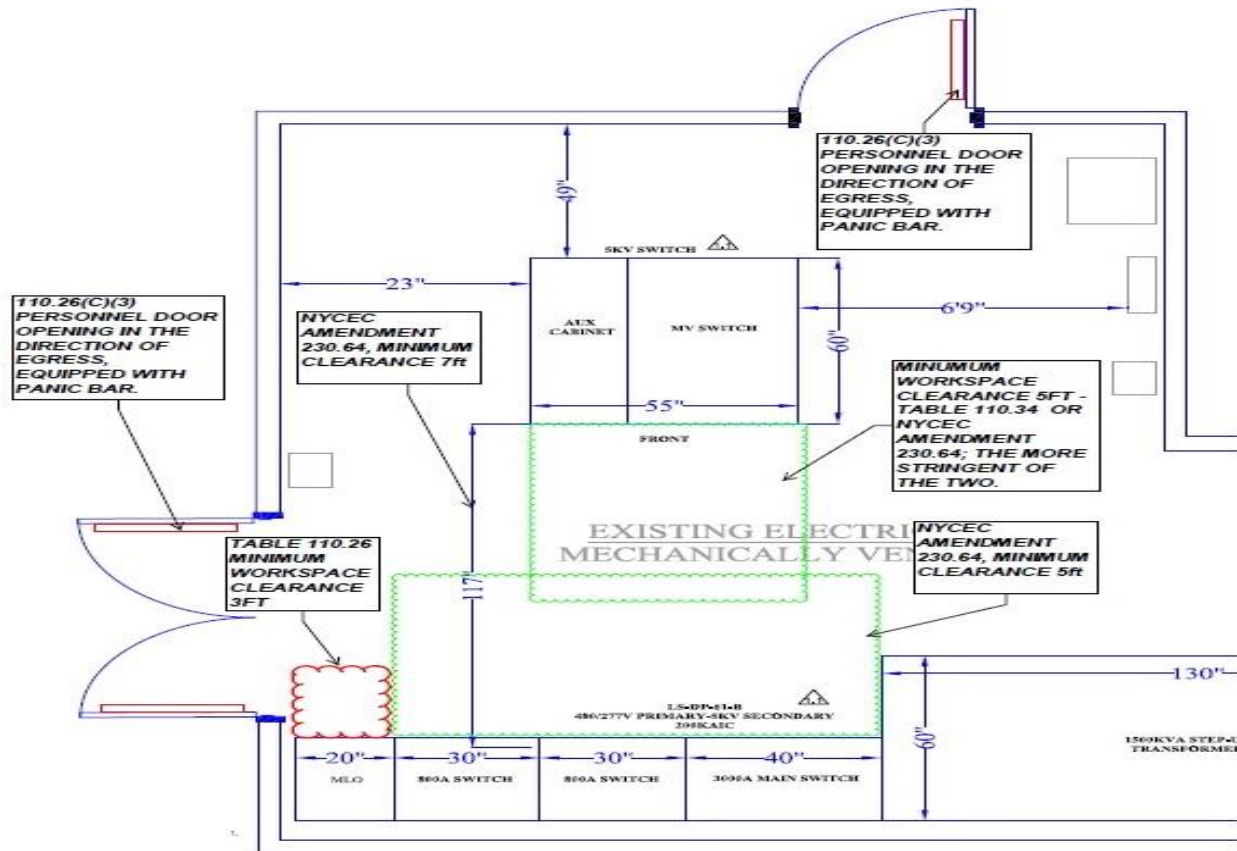
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CODE REQUIREMENTS FOR LAYOUT OF ELECTRICAL SERVICE ROOM

- Egress from equipment rooms, NYC EC Section 110.26.(C)(3)
 - Hardware and opening requirements of egress door
- Minimum workspace clearance, NYC EC table 110.26(A)(1) or table 110.34 (A)
- NYC Specific Clearance requirements for service equipment, NYC EC Section 230.64
 - Minimum clearance of 7 feet in front of switchboards
 - Single line clearance of 5 feet in front of switchboard
- Rating requirement for service equipment room, NYC EC Section 230.64
 - Noncombustible construction with a 2 hour fire resistance rating

CODE REQUIREMENTS FOR LAYOUT OF ELECTRICAL SERVICE ROOM



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FILING REQUIREMENTS

What are the filing requirements per 4000-01?

Electrical Installation Filing – Who can file?

Submission must be made, by a New York State Licensed and Registered Professional Engineer, New York State Licensed and Registered Architect, or an individual with comparable qualifications from an outside jurisdiction.

A Master Electrician cannot submit an electrical installation filing.

FILING REQUIREMENTS

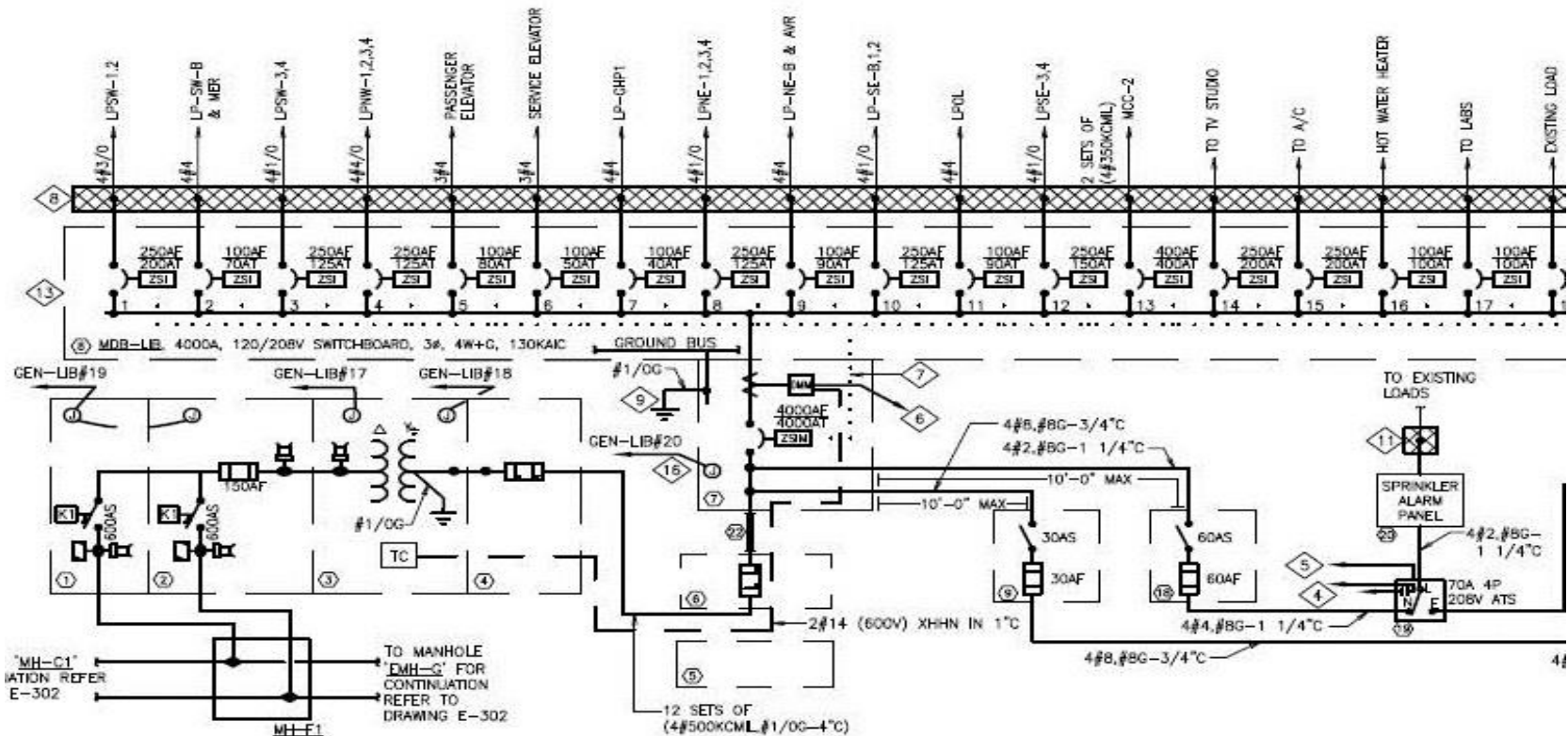
What are the filing requirements per 4000-01?

Electrical Installation Filing - Initial Submission

- Submit an application with a \$650 filing fee, and include the following :
 - One line diagram
 - Plan view / service equipment room layout
 - Statement confirming coordination of overcurrent protection devices.

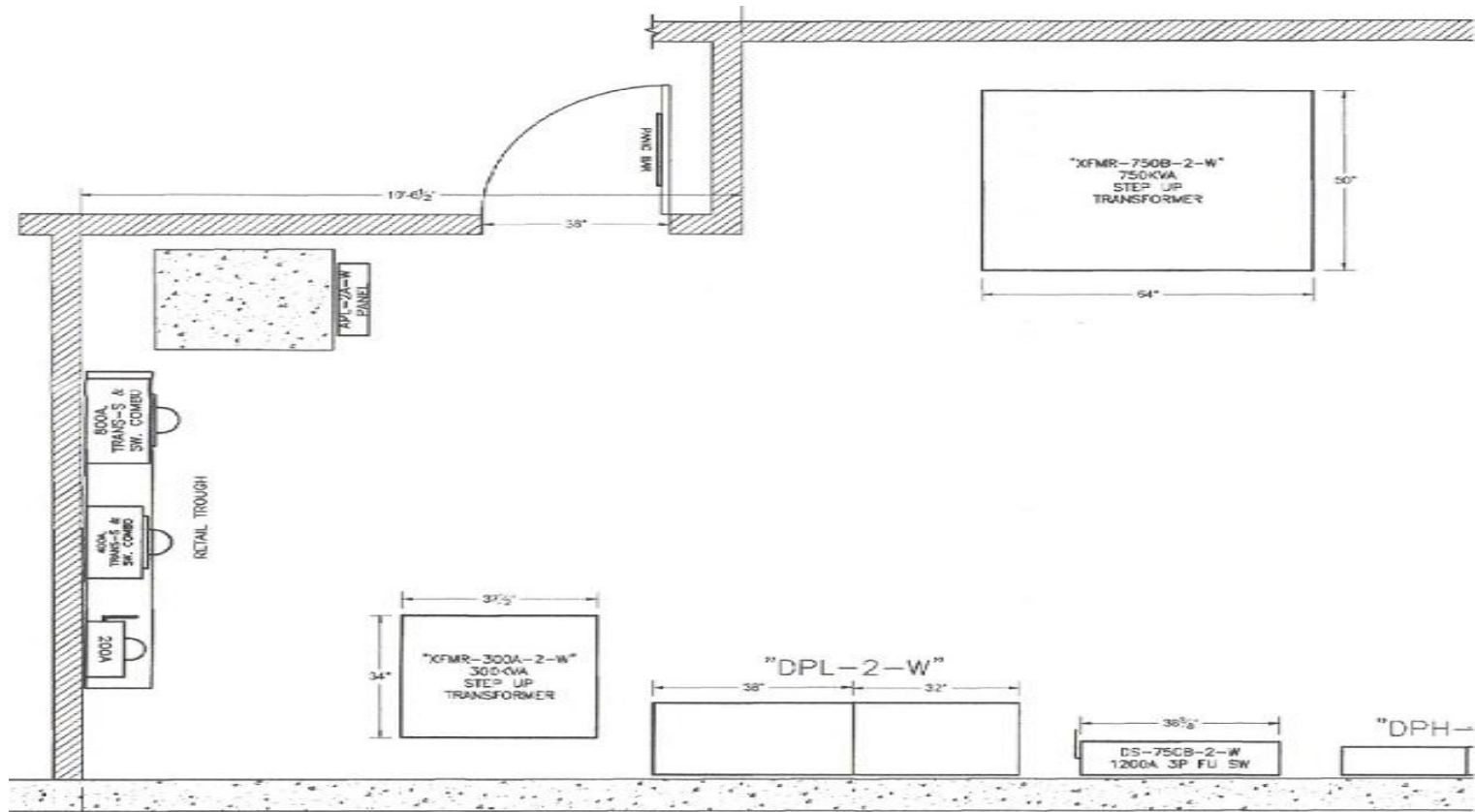
EXAMPLE: REQUIRED FILED 'PACKAGE' FOR ELECTRICAL INSTALLATIONS

One-Line Diagram section



EXAMPLE: REQUIRED FILED 'PACKAGE' FOR ELECTRICAL INSTALLATIONS

Electrical Equipment, Room Layout Section



FILING REQUIREMENTS

What are the filing requirements per 4000-01?

Electrical Installation Filing – Prior to Inspection

- Where installation of equipment differs from the original approved drawings, amended drawings showing the as-built condition must be filed with the Department prior to electrical inspection.
- A selective coordination report prepared by a professional engineer must be filed with the Department prior to electrical inspection. Such engineer may be different from the applicant.

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FILING REQUIREMENTS

What are the filing requirements per 4000-01?

Special Permission. To be granted a Special Permission, the applicant must document the following in their application:

- Demonstrate practical difficulty and provide supporting documentation
- Propose equally safe alternative methods

SPECIAL PERMISSION: SUBMISSION EXAMPLES

1. Ungrouped Service Switches – request a variance from NYC EC 230.72 which requires services switches to be grouped together. *(see example)*
2. Permission to install elevator feeder inside existing elevator shaft in accordance with NYC EC 620.37(C)(1)
3. Previously installed equipment with clearances that are non-code compliant as required by NYC EC 110.26.

SPECIAL PERMISSION



- **Electrical inspection objection:** Electrical service panel in bathroom
- **Hardship :**Original installation was not prohibited at time of installation. Relocating the panel and extending circuits to outside the bathroom will damage the bathroom and finished spaces outside.
- **Determination:** installation allowed.

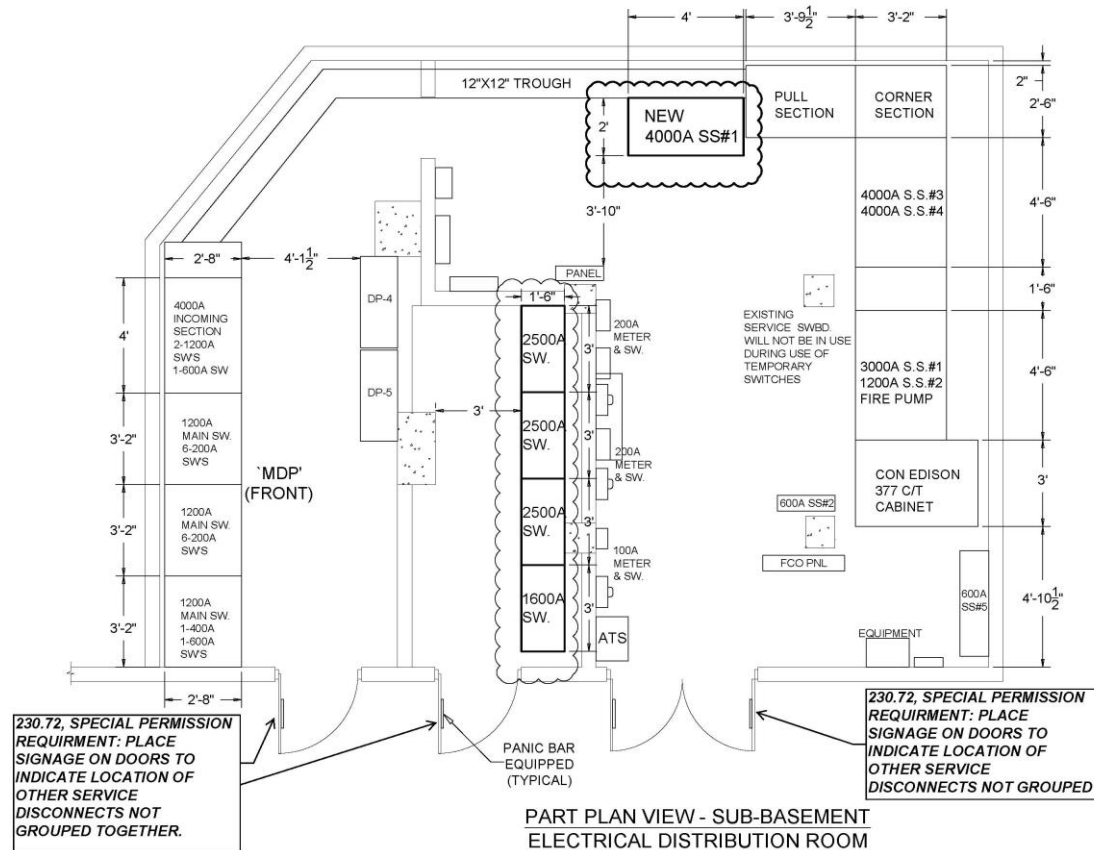
SPECIAL PERMISSION



- **Electrical inspection objection:**
Proximity of service equipment is too close to pool.
- **Hardship :** The house doesn't have a setback to relocate the equipment outdoors. Request was made for alternate method to protect equipment from water damage.
- **Determination:** A stainless steel NEMA 4X enclosure was proposed as a separate structure to isolate the service equipment from splashing and corrosion.

SPECIAL PERMISSION

Plan View Example: Ungrouped Service Disconnects



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FILING REQUIREMENTS

(continued)

What are the filing requirements per 4000-01?

Electrical Equipment

- Submit a notarized application with \$600 filing fee, and include a cover letter indicating:
 - Type/model numbers of material/equipment being submitted for approval.
 - Items included in support of the submittal.
 - Explanatory information/comments, if applicable.

FILING REQUIREMENTS

(continued)

What are the filing requirements per 4000-01?

Electrical Equipment

- Two (2) brochures, or catalog data sheets, and a set of unmounted photographs or photographs
- All applicable certifications and/or listings and test reports
- Equipment samples **only when requested by OTCR**

FILING REQUIREMENTS

(continued)

What are the filing requirements per 4000-01?

Product Testing and Labeling –



Manufacturer: Nepon Inc. (Japan)



Testing Agency: Japanese Electrical Testing (J.E.T.), not an OSHA recognized testing lab

FILING REQUIREMENTS

(continued)

What are the filing requirements per 4000-01?

Excerpt from certificate issued by a non-approved OSHA testing lab:

Certificate of Conformity

The technical standards stipulated in Article 8, paragraph 1 of the Electrical Appliance and Material Safety Law and the economic industry of Article 9, paragraph 2 of the same law
Proof that it conforms to the criteria specified by ministerial ordinance (limited to those pertaining to inspection pertaining to Article 9, paragraph 1, item 2 of the law)

1. Certificate number:	J E T 2 9 0 5 - 9 1 0 4 3 - 1 0 0 2
Delivery of certificate date:	2016 July 27
Date of expiration:	2019 July 26
Address of applicant:	1-4-2 Shibuya, Shibuya-Ku, Tokyo
Name of applicant:	Nepon Inc.
Specified electrical goods name:	Other electric bubble generator
Classification of model type:	Attached sheet
Address of manufacturing plant:	411 Kamifurusawa Atsugi-Shi Kanagawa-Ken Japan
Plant name:	Nepon Inc. Atsugi Office

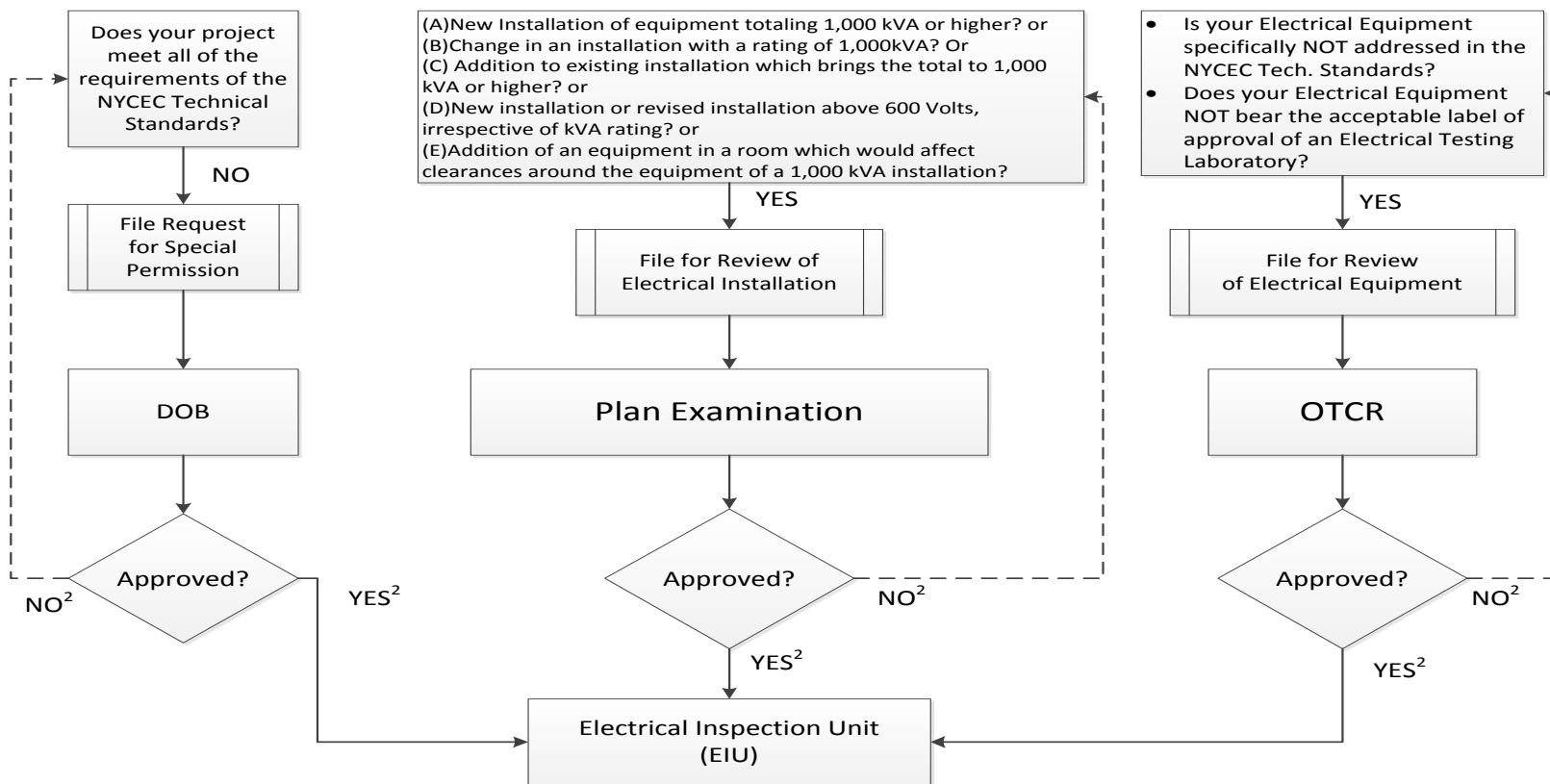
Applicability test standard: interpretation of ministerial ordinance that sets technical standards for electrical goods
Appended Table 8, 2 (78) and appended table 10 chapter 5

ELECTRICAL EQUIPMENT REVIEW: OFFICE OF TECHNICAL CERTIFICATION AND RESEARCH

Amendments are also being made to Subdivisions (a) and (b) of Section 101-12 of Title 1 of the Rules of the City of New York

- To expand the jurisdiction of the **Office of Technical Certification and Research (OTCR)**, allowing it to replace the electrical advisory board in reviewing electrical equipment and materials.
- OTCR's jurisdiction is currently limited to equipment and materials covered by Title 28 of the New York City Administrative Code. The Electrical Code is in Title 27.

ELECTRICAL WORK REVIEW PROCESS



Notes:

(1) This figure depicts, in general, an overview of the proposed Electrical Work Review process. Specific operational aspects of this workflow will be performed in accordance with details prescribed by the Department.

(2) Approval or Denial will be evaluated on a case by case scenario and may or may not result in the Applicant being required to resubmit, as shown in this figure.

CONSTRUCTION PROJECT GUIDELINES ELECTRICAL SYSTEMS WORK

Building Systems Installation & Modifications:
Boiler



Purpose

Provide a general overview of the Department's project requirements for stakeholders



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