HCAi Department of Health Care Access and Information

Advisory Guide Series

A13

NPC UPGRADE CONSTRUCTION PROCESS FOR EXISTING CEILINGS AND ABOVE CEILING UTILITIES

Office of Statewide Hospital Planning and Development

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SECTION 1
PURPOSE AND SCOPE

Purpose

The nonstructural components and systems are the lifelines of hospital operations and must be anchored and braced to ensure continued function of the hospital after an earthquake. HCAI has developed Nonstructural Performance Category (NPC) classifications to indicate the degree to which these components and systems are anchored and braced in each hospital building. For buildings not constructed under an OSHPD permit (or pre-1982/83), information regarding the layout and bracing conditions of utilities above ceilings is limited or incorrect. Surveys of these utilities are disruptive to hospital operations, and the subsequent upgrade construction causes further disruption. Repeatedly accessing ceilings to perform work increases project costs. The purpose of this Advisory Guide is to minimize disruption and expedite NPC upgrade construction for components at or above ceilings.

Scope

The focus of this Advisory Guide is solely on the NPC upgrade of existing components and systems at or above ceilings. Examples of these components and systems items are ceiling components, light fixtures, ducts, conduits, pipes, inline HVAC units, hung OR lights, wall bracing, etc. This Advisory Guide does not apply to wall-mounted equipment, floor-mounted equipment, new equipment, systems and utilities, or deferred submittals.

Tenant Improvement (TI) projects may use this Advisory Guide if the ceiling and above-ceiling items retain their original configuration, with only seismic bracing upgrades. If the configuration is modified, such as by replacing ceilings, light fixtures, equipment, etc., or if the space is being remodeled such that large portions of the ceiling are removed, this Advisory Guide is not applicable.

SECTION 2
ASSESSING EXISTING CONDITIONS

The Design Professional of Record (DPOR) should review record drawings along with the facility's historic documentation and their archives. Additionally, DPOR may request drawings from state archives through the HCAI Records Management to ensure a comprehensive understanding of the existing documentation.

The DPOR is required to visit the site to observe and document typical conditions in various locations with proper photographs.

It is also important to identify significant potential abatement issues such as asbestos, lead, and mold.

SECTION 3
PREPARATION OF CONSTRUCTION DOCUMENTS

Construction drawings should include typical brace and attachment details. While above-ceiling utility layout drawings are recommended, they are not required for plan approval or permit. Bracing details must be specific to the building construction and tailored to site seismicity. Non-applicable details, such as including concrete over metal deck details for a wood building, should not be included.

The construction documents must include the following:

- Clearly defined boundaries of NPC upgrade
- The SRU project number under which the NPC evaluation report was reviewed
- A statement on the cover sheet that all above ceiling existing components will meet NPC-4/NPC-4D requirements for the area identified
- A statement requiring detailed photographs of each above ceiling location, subject to review by the DPOR and HCAI (when requested).
- Bracing schedules and details based on the building specific survey
- A statement requiring utility consequential damage per ASCE 7 Section 13.2.3 to be addressed during the construction phase
- An architectural floor plan showing the room descriptions. This floor plan will be used and updated to show seismic bracing upgrade locations and installed details during construction. Please see following sections for further info.

Use of Pre-approved Details

In addition to project-specific typical details, the construction drawings may include relevant OPM and OPD details. It is acceptable to use more than one OPM in a project as long as individual pipe bracing details don’t mix and match components from different OPMs. Only one preapproved bracing system may be used for a run of pipe, duct or raceway, as stated in HCAI PIN 62.

These pre-approved details shall be shown on the drawings; simply referring to a preapproval number or detail page is not acceptable. See “ACD vs NMA” Section below and CAN 1-7-153(b) for further information about NMAs.

Application and Plan Review

Plan review will be performed at the corresponding HCAI region, following the typical plan approval and permitting process. Clearly indicate the scope of work and include " NPC 4 upgrade" or “NPC 4D Level 1 / 2 / 3” in the project description. If the scope does not cover all required areas to achieve NPC upgrade, then include a note that this is a

"partial" upgrade, and completing this scope is not sufficient for NPC approval by itself. Since the construction cost is unknown, the project review cost may be billed hourly by HCAI.

Testing, Inspections and Observation (TIO)

Milestones in TIO form should clearly identify phases/stages/areas on the approved plans or on reference plans included as reference documents for the TIO. The scope of work should be divided into manageable phases/stages/areas to allow incremental sign-off by the HCAI field staff. If the scope has a large area, multiple milestones are recommended.

The first milestone shall be reserved for On-Site First Assessment (OSFA). When the first phase/stage/area is prepared for upgrade, DPOR will assess the existing conditions for code compliance. For non-conforming conditions, DPOR will select applicable details from the approved drawings. See discussion in "ACD vs NMA" section below for discovered conditions. Notify HCAI field staff at least one week prior to OSFA.

To clear each subsequent milestone, HCAI field staff will conduct spot-checks for areas covered under each milestone to observe completion of the work. Spot checks may also include verification of existing braces that were assumed to be compliant. Spot check locations will be chosen to minimize disruption to operations. Physical site visit by HCAI staff and the DPOR is required for OSFA. Subsequent milestone clearance by HCAI staff may be done in-person or remotely.

Milestones must be cleared with the HCAI staff in a timely manner. Contact HCAI field staff when a milestone is complete.

Pre-Construction Meeting

After HCAI plan approval and building permit is issued, the DPOR must coordinate a pre-construction meeting with the DPOR, SEOR, HCAI CO/DSE, IOR, Contractor(s), Inspection Agencies, and Facility Representatives. HCAI staff will address issues and concerns to clarify the construction TIO process.

Construction TIO Process

The first phase/stage/area identified in the TIO form will be completed with HCAI staff presence, where possible, to provide critical feedback. HCAI field staff will sign off on the OSFA prior to proceeding to other areas.

Construction in each phase/stage/area shall be documented, photographed and maintained by the DPOR. No area shall be closed before photographing and documentation are complete. If the area did not require any work for NPC compliance,

photograph the area, from multiple angles, where possible. These photos shall be made available to HCAI staff, upon request, and added to the photographic records.

Site Verification

The contractor or licensed professional is permitted to perform site verification but the licensed architect, licensed structural engineer or a licensed civil engineer who is listed as the design professional of record for the project shall take responsibility for the attachment detail and shall document bracing locations and dimensions on the layout drawing. Decisions for adequacy of the approved details compared to the existing conditions shall be done only by the licensed professional. The braces that are added during construction should be noted on the layout drawings with accurate locations identified by the DPOR. It is the responsibility of the DPOR to present the layout drawings for HCAI field staff when requested. Bracing information for each area shall be added to the layout drawings before closing out the area.

Bracing Layout Plans

The DPOR shall submit a layout plan or as-builts to HCAI field staff showing the locations of all new braces and existing verified braces. Final project close-out shall not be done before receiving layout plan or as-builts. The layout plan is maintained by the DPOR at all phases.

The layout plan is an architectural floor plan showing the room descriptions inside the scope of the project with the seismic bracing locations (existing and new) and details (new and verified). The layout plan needs to be updated every time a new location is opened, showing the layout of the existing utility lines.

The DPOR shall submit layout drawings showing the locations of any new work required to meet NPC requirements. Existing bracing should be verified as explained under the sections below.

Utilities that require no added bracing, either because existing bracing is adequate, or because the utility is exempt from bracing requirements, may be listed for each room, rather than shown. The transition from where bracing is required to where bracing is not required should be clearly shown and noted. For example, note where a pipe size is reduced so it becomes exempt (and then may not be shown on the layout drawing, but photographs showing the utility lines in the area are required to be made available upon request).

The layout drawing must be submitted and approved prior to requesting Construction Final from the HCAI field staff. The layout drawings are not required to be approved prior to closing the ceilings in an area. Any work which has been performed and is later changed due to a plan review comment on the layout drawings to achieve code compliance will be subject to the Office’s review and possible destructive investigation.

SECTION 4
EXISTING BRACES

Existing braces, whether documented in a previous project or not, may be used to meet NPC requirements under the following conditions.

Existing Braces With Existing Drawings:

For non-OSHPD projects (plan submittal to the Office prior to 1982) with bracing layout, the DPOR shall implement an onsite verification process that shall be described on the construction documents. The DPOR shall establish verification criteria throughout the area of work. Verification can be through various methods, including torque testing, pull testing, visual inspections, etc. The details from the original project are required to either be duplicated in the approved construction document or provided as a reference document, with clear indication which details are applicable, in order that the construction and inspection team can visually verify the existing work. Any observed deviation shall be evaluated by the design professional of record.

Existing fire sprinkler bracing verification under 1987, 1989, 1991 and 1994 NFPA 13:

1. Buildings where fire sprinklers are designed under the 1994 edition of NFPA 13 (plan submittal date earlier than 4/30/1996) and 1991 edition of NFPA 13: Design team is required to add missing end-of-line restraints only.
2. Buildings where fire sprinklers are designed under the 1987 and 1989 edition of NFPA 13: Design team to perform a site visit and verify the existence of branch line bracing and end-of-line restraints. The design team is required to add missing end of branch line restraints, missing longitudinal sway bracing for feed and cross mains, and missing lateral sway bracing for feed and cross mains.
3. Buildings where fire sprinklers are designed under the 1985 and earlier editions of NFPA 13: All fire sprinkler piping above the ceiling shall be evaluated.

Existing Braces Without Documentation:

For conditions where existing braces are discovered without any known existing documentation, the DPOR shall verify the bracing details and spacing and evaluate for conformance. The DPOR shall provide calculations to justify existing conditions if asked by the HCAI field staff. The DPOR shall include a sketch of existing bracing detail under the layout drawings. Similar to existing braces with documentation above, the DPOR shall establish a verification criteria throughout the area of work.

Utility Bracing Exceptions

For NPC 4D Level 1, 2, or 3 upgrades, the 1995 California Building Code (CBC) code shall be used to determine which components need seismic bracing. For NPC 4D upgrade scope, bracing exceptions in the 1995 CBC or later editions of the CBC are acceptable. The CBC year selected should be consistent through the entire project. The

seismic force level for NPC 4D is per 1998 CBC or later code. (See 2022 California Administrative Code (CAC) Chapter 6 Table 11.1 for further details)

For NPC 4, all architectural, mechanical, electrical systems, components and equipment shall meet the 1998 CBC or later code. For NPC 4 scope, exceptions in 1998 CBC or later, is acceptable, such as minimum pipe diameter for bracing etc. Abandoned utilities within the scope of work must be restrained to prevent excessive movement or removed. Exceptions that apply to NPC 3, such as 300 sq ft for ceilings, are not acceptable under NPC 4; therefore, these areas need to also be upgraded per 1998 CBC or later code versions.

Where existing utilities cross seismic joints without flex joints, the DPOR shall evaluate if the installation of bracing might have an adverse effect on the seismic performance of the utilities. The best performance will result from installing flexible joints and bracing. Where installing flexible joints is not possible, provide justification that the existing condition is adequate to HCAI for review.

SECTION 5
ACD VERSUS NMA

Changes to bracing locations and utility layout based on discovered conditions will be incorporated into the layout drawing and would not be classified as either an NMA or an ACD.

If a condition is discovered that can be accommodated by using another detail in the OPM or the approved drawings, this will be incorporated into the layout drawing and would be classified as either an NMA or an ACD. Only one preapproved bracing system may be used for a run of pipe, duct or raceway, as stated in HCAI PIN 62. If the OPM detail is not yet included in the approved drawings, it shall be added as an NMA. Please note that HCAI does not allow OPMs to be brought into a project through the NMA process, they must be ACD. This NMA process is an exception, as it only applies to this NPC upgrade guide. The OPM detail is required to be shown on the drawings per 2022 CAC Section 7-115(d)2. These details will be incorporated into the layout drawings before closeout.

If a condition is discovered that requires a minor non-material modification to a project approved detail that would generally be considered a non-material alteration, construction can commence based on stamped and signed sketch provided by a licensed professional approved for the project. Work may commence under this direction, however, the DPOR shall prepare and issue an NMA to HCAI field staff within 24 hours.

If a condition is discovered that requires a minor modification to an OPM detail, such as slightly increasing the allowable brace angle range, this may follow the same NMA process described above with issuance to HCAI field staff within 24 hours. Make such changes with notes outside the border of the OPM detail so it is clear how the detail is

modified. If the change requires a calculation where determination cannot be made by inspection, it must be submitted as an ACD.

If a material alteration is required, then an ACD must be prepared and approved by HCAI. If the DPOR can provide a stamped sketch to the construction team before the space must be closed, then construction may proceed with inspection performed to the stamped detail. DPOR shall issue the ACD to HCAI within 24 hours. Please note, any work performed in this manner is subject to the Office's review and possible destructive investigation.

Final Closeout

Layout drawings must be submitted and approved by HCAI prior to project closeout.

The DPOR shall clearly state on the layout drawings that all conditions in the area are compliant with the NPC requirements of the 2022 CAC.

Photographs need not be uploaded to the eSP HCAI project portal. The photographs with proper documentation are required to be kept with the facility and the design professional until the NPC 5 upgrade (which also includes NPC 4 or NPC 4D upgrade) is achieved. Please note that this documentation storage duration may be many years after completion of the project.

The DPOR shall request that HCAI field staff review the project for Construction Final when all work is complete and the layout drawings have been approved by the Office. Photographs shall be available for review. All ACDs must be approved and all NMAs must be concurred with. Test, Special Inspection reports and IOR Daily Field Records shall be presented to HCAI field staff for sign off/acceptance for each item on the TIO.

SECTION 6
NPC UPGRADE REQUEST

After completing all NPC 4 or NPC-4D construction projects, submit an updated reconciliation report under the previously accepted SRU project. If deviations from the previously submitted evaluation report are observed during construction, these shall be identified and reported as part of the reconciliation report. The reconciliation report shall include the list of all relevant projects completed as part of the NPC upgrade. SCU may ask for additional photographic verification of any area for confirmation when necessary. Therefore, it is critical to establish the custody of past photographs by the facility owner. SCU will review and approve the reconciliation report, then change the rating and send an upgrade approval letter to the facility contact.