NIH Policy Manual

1370 - Fire Protection and Life Safety Building Permit Process

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Release Date: 3/15/2019 ? **Technical Revision Date:** 10/22/2019 ?

Transmittal Notice

1. **Explanation of Material Transmitted:** This chapter outlines policies and procedures, and describes individual and organizational responsibilities for obtaining approval from the National Institutes of Health (NIH), Division of the Fire Marshal (DFM) before beginning any construction, renovation, alteration, or major equipment installation in any NIH facilities located at the NIH Bethesda, Maryland; NIH Animal Center (NIHAC) Poolesville, Maryland; Frederick National Laboratory for Cancer Research, Frederick, Maryland; National Institute of Environmental Health Sciences (NIEHS) Research Triangle Park, North Carolina; and Rocky Mountain Laboratories (RML) Hamilton, Montana campuses. This chapter does not apply to NIH leased space and facilities.
2. **Filing Instructions:**

   Remove: NIH Manual Chapter 1370, dated 8/16/2013
   Insert: NIH Manual Chapter 1370, dated 03/15/2019

   PLEASE NOTE: For information on:

   - Content of this chapter, contact the issuing office listed above.
   - NIH Manual System, contact the Division of Management Support, OMA, on (301) 496-4606, or enter this URL: https://oma.od.nih.gov/DMS/Pages/Manual-Chapters.aspx

A. Purpose

This chapter ensures all NIH facilities are designed and constructed in compliance with the International Building Code (IBC), the National Fire Codes, the NIH Design Requirements Manual, and other nationally recognized codes and standards (e.g., The Joint Commission standards for the accreditation of the NIH hospital), as required by 40 U.S.C. Section 3312, “Compliance with Nationally Recognized Codes.”

B. Scope

This chapter applies to NIH facilities located at the NIH Bethesda, Maryland; NIH Animal Center (NIHAC), Poolesville, Maryland; Frederick National Laboratory for Cancer Research, Frederick, Maryland; National Institute of Environmental Health Sciences (NIEHS), Research Triangle Park, North Carolina; and Rocky Mountain Laboratories (RML) Hamilton, Montana campuses. This chapter does not apply to NIH leased space and facilities. Leased facilities occupied by NIH employees but located outside DFM's jurisdiction are subject to the permit requirements of the local and/or state authority having jurisdiction.

C. Background

Proper fire protection and life safety is ensured in construction projects, renovations, or major equipment installations through oversight by the local fire safety "Authority Having Jurisdiction" (AHJ) at various stages of the project. The NIH Division of the Fire Marshal (DFM), Office of Security and Emergency Response (SER), Office of Research Services (ORS), as the designated AHJ for all fire-safety matters at the NIH, accomplishes this mission through: (1) design reviews, (2) fire protection construction submittal reviews and (3) construction inspections, both in-progress and at the completion of the project.

D. Policy

This chapter establishes the requirements for obtaining the fire protection and safety permits before beginning any construction, renovation, alteration, major equipment installation, or change of occupancy/use of the space in all NIH-owned facilities covered in B. Scope above.

The procedures in this chapter must be followed before work commences for any and all covered projects. Specific fire protection requirements for the design or planning phase, the construction phase, and the project completion phase are outlined in Appendices 1 - 5.

Violations of this policy may result in disciplinary action, the severity of which will vary depending upon the nature of the infraction.

E. Responsibilities

1. The Director, Division of the Fire Marshal will:

    a. Serve as the designated local fire safety AHJ for the NIH regarding all fire safety matters in any NIH facilities listed in Section B. Scope above. In the absence of the Director, he/she may designate another senior DFM staff member to serve as the AHJ. The AHJ is responsible for granting approval before any construction, renovation, alteration, major equipment installation, or change of occupancy/use of space is begun in any NIH facilities.

b. Review all required documentation for granting appropriate permits before any construction, renovation, alteration or major equipment installation is begun. Examples of such documentation are design documents, Statements of Work, and fire protection construction submittals for construction, renovation, or major equipment installations in accordance with Section G of this chapter. The DFM will complete reviews within 14 calendar days from the date the complete package is received. If any part of the package is disapproved, the DFM will provide a reason to support this determination.
c. Conduct pre-occupancy/final inspections for compliance with the International Building Code, the National Fire Codes, and the NIH Design Requirements Manual in accordance with Section G of this chapter.
d. Establish and maintain fire safety policies and procedures for the NIH.
e. Assess and enforce equivalent fire protection systems or measures in existing facilities when activities for construction create code deficiencies.

1. The Office of Research Facilities Development and Operations (ORFDO) will:

a. Submit design documents, Statements of Work, and fire protection submittals for renovation, construction, alteration, or major equipment installation projects to DFM for review and approval in accordance with Section G of this chapter.
b. Ensure IC and OD Offices do not occupy newly constructed or renovated space prior to having the DFM conduct a pre-occupancy/final inspection in accordance with Section G.

1. All Institutes/Centers (IC) and Office of the Director (OD) Offices will:

a. Submit for DFM review and approval design documents, Statements of Work, and fire protection construction submittals for construction, renovation, alteration or major equipment installations in accordance with Section G.
b. Ensure they do not occupy newly constructed or renovated space prior to having the DFM conduct a pre-occupancy/final inspection in accordance with Section G.

F. Procedures

I. **Design or Planning Phase**

Any NIH organization engaged in construction, renovation, alteration, major equipment installation, or change of occupancy/use of the space, must submit design and/or planning drawings, specifications, and Statements of Work to the DFM for review. The following submissions are based on the size and scope of the project as described below:

1. **Projects having an estimated cost of over $25,000**

All design submissions must be reviewed by the NIH DFM.

a. All final design submissions must be reviewed and approved by the NIH DFM prior to being released for procurement. Design Build projects shall consult the DFM prior to obtaining a Request for Proposal.
b. Only DFM approved final design documents may be used on the construction site. DFM final design approval will consist of a signed stamp on the cover sheet of the final design documents.
c. Per the NIH Facilities Development Manual, all designs for new structures (including designs for new wing additions or other additions to existing structures that modify the height and area or change the use group) must have a "Fire Protection Engineering Analysis" performed by a registered Fire Protection Engineer at the concept and final design phase.
d. The review and approval process are valid for only one year. Thus, a previously approved project that has not been activated for more than one year must be reviewed again by the DFM to ensure compliance with current codes and the NIH Design Requirements Manual before it is approved for release. Reviews of previously approved projects will be expedited and completed within 7 calendar days from the date the complete review package is received by the DFM. If the design documents are disapproved by the DFM, the DFM will provide a reason to support this determination.
e. If a design is amended during the pre-award period, the DFM must review the scope of the amendment and provide written verification that the amendment does not adversely impact fire protection or life safety and will not result in a code compliance issue. To assist the Project Officer in complying with this policy, a list of the usual project elements reviewed by the DFM to ensure code compliance is included in Appendix 1.

2. **Projects having an estimated cost of under $25,000**

a. All final design documents requiring a DFM review must be reviewed and approved by the DFM prior to procurement.
b. Only the DFM approved final design documents may be used on the construction site. DFM final approval will consist of a signed stamp on the cover sheet of the final design documents.
c. The design documents must be reviewed by the DFM if the project includes any of the project elements described below:

    i. Change in occupancy/use of the space. The DFM will ensure compliance with the National Fire Protection Association (NFPA) 101 Life Safety Code and verify existing fire protection features are appropriate;
    ii. Construction, demolition or removal of walls. The DFM will ensure compliance with the NFPA 101 Life Safety Code and will determine

any impact on sprinkler systems;

iii. Removal or installation of doors. The DFM will ensure compliance with the NFPA 101 Life Safety Code and will determine if any doors must be fire rated;

iv. Relocation, removal or installation of sprinklers and standpipes. The DFM will ensure compliance with NFPA 13, Standard for the Installation of Sprinkler Systems and NFPA 14, Standard for the Installation of Standpipe and Hose Systems;

v. Relocation, removal or installation of fire alarm devices. The DFM will ensure compliance with NFPA 72, National Fire Alarm Code;

vi. Penetration of walls or floors. The DFM will determine if required fire barriers are being penetrated and if fire stopping is required;

vii. Installation, removal or relocation of equipment (i.e. Heating Ventilating and Air Conditioning equipment, piping, furnishings, furniture, etc.). The DFM will determine if existing fire protection features are adversely impacted.

II. Construction Phase

1. **Change Orders**: Any organization including but not limited to the ORFDO, the Center for Information Technology (CIT) or other IC engaged in construction, renovation, alteration or major equipment installation, must submit any proposed change order affecting the project elements identified in Appendix 1 to the DFM for review. Change order reviews will be expedited and completed within 7 calendar days from the date the complete change order package is received by the DFM. If the change order is disapproved, the DFM will provide a reason to support its determination.
2. **Required Fire Protection Construction Submittal Reviews:** Any organization including but not limited to the ORFDO, the Center for Information Technology (CIT) or other IC engaged in construction, renovation, alteration or major equipment installation, must submit the required fire protection construction documents concerning the project elements outlined in Appendix 2 to the DFM for review and approval.

    a. All fire protection construction submittals must be reviewed and approved by the DFM prior to installation; and
    b. Only the DFM approved fire protection construction submittals including but not limited to sprinkler and fire alarm shop drawings can be used on the construction site. The DFM fire protection construction submittal approval will consist of a signed stamp on the cover sheet of the shop drawings and/or product data.

3. **Required In-Progress Construction Inspections:**

a. Any organization including but not limited to the ORFDO, the Center for Information Technology (CIT) or other IC engaged in construction, renovation, alteration or major equipment installation must request DFM inspections for all projects that contain any of the project elements outlined in Appendix 3. These items must be inspected prior to "close-in;" and
b. Depending on the scope of the project, there may be many "in-progress" inspections before the final inspection.

4. **Required Fire Protection System Inspections and Acceptance Tests:** Any organization including but not limited to the ORFDO, the Center for Information Technology (CIT) or other IC, engaged in construction, renovation, alteration or major equipment installation must request DFM inspections for all projects which contain any of the project elements outlined in Appendix 4. These items must be inspected and tested prior to scheduling a final inspection of the entire project.

III. **Project Completion Phase**

a. **Required Fire Protection Pre-Occupancy/Final Inspection**: Any organization including but not limited to the ORFDO, the Center for Information Technology (CIT) or other IC engaged in construction, renovation, alteration or major equipment installation must obtain a DFM pre-occupancy/final inspection approval memorandum for all projects, prior to final payment to the construction contractor. See Appendix 5.

G. Reference

1. International Building Code (IBC) (https://codes.iccsafe.org/public/document/IBC2018) : Available in hard copy in DFM, ORS.
2. National Fire Protection Association (NFPA), National Fire Codes: Available in hard copy in DFM, ORS. Viewable online at https://www.nfpa.org/Codes-and-Standards/All-Codes-and-Standards/Free-access
3. NIH Design Requirements Manual (NIH DRM) or PDF (https://www.orf.od.nih.gov/PoliciesAndGuidelines/Documents/DRM/DRM1.2120718.pdf)
4. NIH Manual Chapter 1743, "Keeping and Destroying Records," Appendix 1, NIH Records Control Schedule: https://policymanual.nih.gov/1743
5. NIH Facilities Development Manual

H. Definitions

1. **Authority Having Jurisdiction (AHJ):** An organization, office or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure. At the NIH, the AHJ for fire

protection and safety has been designated as the NIH Division of the Fire Marshal (DFM), Office of Research Services (ORS).
2. **Design Review:** The process of review and approval of the scope of work, plans and specifications for construction, alteration and renovation.
3. **Fire Protection Construction Submittal Review:** The process of reviewing drawings, calculations and material data for fire protection related system and equipment installations.
4. **Major Equipment Installation:** The installation of a new piece of equipment that may have an adverse impact on existing features of fire safety. Examples are: Equipment that requires a new penetration be made through existing fire rated walls and/or floors for piping and conduit; equipment that may impair or block existing sprinkler protection due to the size and/or location; and equipment that may increase noise to a level where the existing fire alarm devices may no longer be heard.
5. **Nationally Recognized Testing Laboratories (NRTL):** An organization that is acceptable to the AHJ and that evaluates products or services and that periodically inspects production of listed equipment or materials or periodic evaluation of services. The NRTL issued listing states that the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.
6. **Use Group -** A model building code term that is used to indicate use and occupancy classification for all buildings and structures (e.g. business, industrial, storage, etc.)
7. **Sheet Metal and Air Conditioning Contractors National Association (SMACNA®):** An international association of union contractors with 103 chapters throughout the United States, Canada, Australia and Brazil that specialize in heating, ventilating and air conditioning; architectural sheet metal; industrial sheet metal; kitchen equipment; specialty stainless steel work; manufacturing; siding and decking; testing and balancing; service; and energy management and maintenance.

I. Records Retention and Disposal

All records (e-mail and non-e-mail) pertaining to this chapter must be retained and disposed of under the authority of the NIH Manual Chapter 1743, "Keeping and Destroying Records", Appendix 1: Records Control Schedule; and NIH General Records Schedule

J. Internal Controls

The purpose of this chapter is to provide guidance to NIH personnel for obtaining the required NIH Division of the Fire Marshal approvals before beginning any construction, renovation or major equipment installation projects.

1. **Office Responsible for Reviewing this Chapter**: Through this manual issuance, the DFM is responsible for ensuring that internal controls are implemented and working.
2. **Frequency of Review**: Ongoing.
3. **Method of Review**: The DFM will maintain oversight and ensure compliance with this policy by assessing documentation obtained through their routine fire protection and life safety surveys of NIH facilities, monitoring DFM monthly performance data in

conjunction with the ORFDO project status database.

4. **Review Reports**: Reports are sent to the Director, ORS; Director, ORFDO; and the Deputy Director for Management, NIH. Issues of special concern will be brought immediately to the attention of the Director, ORS.

Appendix 1: Project Elements Examined During Design Reviews

PROJECT ELEMENT	AREA OF DFM REVIEW
New or Modification of an Existing Fire Pump	Preliminary design calculations, equipment location, piping diagrams and project specifications.
Building Structure	DFM must verify that the structural fire resistance meets the requirements of the International Building Code (IBC) based on the IBC's height and area limits. DFM will verify the adequacy of fire resistive materials proposed for application to structural steel.
Fire Suppression Systems: Sprinkler work involving the alteration or addition of sprinklers; or new (or modified) wet chemical (kitchen hood), C02, or other suppression systems.	Preliminary design calculations, points of connection, and project specifications.
Fire Alarm System modification or addition	System and device layout diagrams, riser diagram, and project specifications.
Underground Fire Mains and/or Fire Hydrants	Submit points of tie-in, project specifications, design piping layout diagrams.
Fire Extinguisher(s)/Cabinet(s)	Review Fire Extinguisher(s) size and type of agent as well as placement (travel distance) per NFPA 10, Standard for Portable Fire Extinguishers and NIH DRM.
Fire Door(s)/Assembly (ies)	Fire Door(s)/Assembly (ies) ratings as well as proper hardware per NFPA 80, Standard for Fire Doors and Windows.
Fire Damper(s)	Fire Damper(s) ratings as well as proper installation details per NFPA 90A Standard for the Installation of Air-Conditioning and Ventilating Systems.
Exterior Site Work	Exterior site work to ensure fire hydrant and fire department connection locations are accessible; and fire department access

	routes/fire lanes are not impeded.
Floor plan modifications and/or additions which affect required *means of egress and exit* requirements; the addition, deletion, moving or penetration of smoke or fire barriers and rated shafts, changes in occupancy use groups.	Floor plans with rated barriers identified and occupancies shown. As a practical guide only, submit all projects involving: new structures/additions, wing/floor renovations, multiple lab module renovations, lab/office conversions, and renovations where walls or shafts are added/moved/removed.
HVAC Modifications	System layout diagrams, riser diagrams, fire/smoke damper locations to ensure proper duct enclosure and/or equipment to maintain fire barrier ratings. Any revisions to a smoke control system must be reviewed.
Temporary enclosures which affect required *means of egress or exit* requirements.	Submit floor plans with required *means of egress or exit* requirements shown to ensure proper egress is maintained. As a practical guide only, submit all projects involving temporary structures which affect required*means of egress or exit* requirements. This includes temporary construction walls, asbestos abatement enclosures, temporary exits and doors.
Revised or new lighting plans.	Lighting plans to ensure proper emergency illumination of the egress paths, including exit signs.

Appendix 2 -Construction Phase Project Elements

PROJECT ELEMENT	CRITERIA FOR APPROVAL
Fire Stopping Material	Nationally Recognized Testing Laboratories (NRTL) listed fire stopping material and products cited must be specifically listed for the intended use and have the (appropriate) hourly rating.
Spray-On Fireproofing Material	NRTL listed cementitious material with the appropriate application thickness shown for the intended fire resistance rating.
Fire Door(s)/Assembly (ies) - existing installations/ replacements. (New installations are reviewed for	NRTL listed, the DFM will verify: a) appropriate hourly rating for intended use. b) hardware is NRTL listed or meets NFPA 80,

location)	Standard for Fire Doors and Windows. c) certification for fire rated glazing and maximum size.
Fire Damper(s)	NRTL listed, the DFM will verify: a) does not exceed the maximum listed size. b) leakage rating (if combination fire/smoke type). c) proper listed application. d) installation details are in accordance with SMACNA®.
Fire Barrier Wall System(s)	Meets NRTL listed design criteria (shown on approved contract drawings).
Flammable Liquids Cabinet(s)	NRTL listed and provided in every laboratory module.
Fire Pump(s) and Fire Pump Controller(s)	NRTL listed. Catalog data, shop drawings, calculations, piping diagrams, and certified pump curve(s).
Fire Suppression and Standpipe Systems - Sprinkler work involving the alteration or addition of four or more sprinklers, standpipes, wet chemical, and/or CO2.	Equipment, piping plans and hydraulic calculations submissions are per NFPA 13, NFPA 14, NFPA 17A Standard for the Installation of Wet Chemical Extinguishing Systems, and NFPA 12 Standard for the Installation of Carbon Dioxide Extinguishing Systems as applicable.
Fire Alarm System(s) except projects involving the modifications or addition of 3 or fewer notification appliances	Equipment catalog data, shop drawings of point to point wiring diagrams and device installation drawings indicating conduit runs and wiring color code scheme on a floor plan location drawing are included in the submitted documentation. Backup battery calculations are also included.
Underground Fire Service Main(s) and Fire Hydrant(s)	Equipment and piping layout drawings.
Smoke Control System	Appropriate sequence of operations.

Appendix 3 -In-Progress Inspection

PROJECT ELEMENT	SCOPE/FOCUS OF DFM IN-PROGRESS INSPECTION
Fireproofing Material	Inspect conformance to listed installation instructions including verification of proper depth of material before wall installation or other construction that covers the fireproofing. DFM's inspection is concerned with the area of coverage and the removal of material for attachments to the steel – the contractor is required to engage an independent testing company to check depth and adhesion of the fireproofing. (Material which

	will not be concealed can be inspected at the final inspection but the Project Officer (P.O.) should allow time for corrective actions for any deficiencies found.)
Fire stopping Material	Inspect conformance to listed installation instructions including verification of proper depth of material before wall installation or other construction that covers the fire stopping. (Material which will not be concealed can be inspected at the final inspection but the P.O. should allow time for corrective actions for any deficiencies found.)
Sprinklers and Standpipes	Inspect sprinkler piping for proper size, spacing, and hangers before the ceiling is installed. This inspection will normally be performed after the as-built sprinkler drawings have been received. (If done after ceiling installation the contractor will have to remove tiles near every sprinkler head to permit this verification.)
Fire dampers	Fire dampers installed at duct penetrations of shafts must be initially inspected before the shaft is closed in since there are items within the shaft which would not be accessible after the shaft is closed up. (The damper drop test, however, must be performed after all work is complete.)
Shaft wall systems	The inner layer of core board must be inspected before the outer layer(s) of sheetrock are installed.
Underground Fire Service Main(s) and Fire Hydrant(s)	Depth of cover and thrust blocks/restraints must be inspected before they are buried.

Appendix 4 - Required Fire Inspection System Inspections And Acceptance Tests

PROJECT ELEMENT	SCOPE/FOCUS OF DFM INSPECTION AND TESTING
Underground Fire Service Mains	If there was new underground piping installed the DFM must witness the flushing required by NFPA 24 Standard for the Installation of Private Fire Service Mains. Fire hydrants must be flow tested. The DFM must be invited to witness the hydrostatic testing of the underground fire service main required by NFPA 24 but, if not available, the test can be witnessed by the P.O. or a P.O. designee.
Sprinklers and Standpipes	The DFM must be invited to witness the hydrostatic testing and flushing of the sprinkler and standpipe piping required by NFPA 13 and 14 but if not available the test can be witnessed by the P.O. or a P.O. designee. The DFM must be invited to witness the forward flow test of the backflow preventer. For a pre-action or other sprinkler system involving an interface with the fire alarm system, the suppression system must not be tested until the

	fire alarm system is being tested.
Fire Alarm	The DFM must witness a test of every new/relocated device impacted by the project. The test will include all new/relocated sprinkler alarm and supervisory devices. Testing shall also verify operation of at least 10% of the existing initiating devices when programming has been modified. The test must include interface with other systems controlled by the fire alarm system such as duct detector shutdown of an air handler. The test will also verify proper interaction with security hardware/systems if this is part of the project. The fire alarm as-built drawings must be provided to the DFM before the test for verification. The P.O. must not schedule this test until the contractor has performed their own initial, preliminary test of the system and provide the DFM with a Letter of Certification per NFPA 72.
Fire Pump	The DFM must witness a test of every new/relocated fire pump in accordance with the requirements of NFPA 20, with the test being performed by a manufacturer's representative. The DFM will not witness the test until the contractor has performed their own initial, preliminary test of the fire pump.
Kitchen Fire Suppression System	Simulated discharge of the agent must be part of the test (usually a gas cylinder discharging with balloons placed over the discharge nozzles). Shut off of power and fuel supplies must be verified. Monitoring by the fire alarm system must be verified.
Gaseous Fire Suppression System	A room integrity (leakage) test must be performed before the final acceptance test is scheduled. This test must be witnessed by the DFM. Simulated discharge of the agent must be part of the test (usually a gas cylinder discharging with balloons placed over the discharge nozzles). Shut off of power and any other required actions must be verified. Monitoring by the fire alarm system must be verified.

Appendix 5 - Required Fire Protection Pre-Ocupancy/Final Inspection

INSPECTION ELEMENT	SCOPE/FOCUS OF DFM INSPECTION
Fireproofing Material	Inspect conformance to listed installation instructions including verification of proper depth of material.
Fire Barrier System(s)	Inspect conformance to listed installation instructions.
Flammable Liquid Cabinet(s)	Inspect conformance to listed installation instructions and presence of one or more in all laboratories using chemicals.
Fire Extinguisher(s)/Cabinet(s)	Inspect item(s) for conformance to NFPA 10 requirements as well as NIH DRM.
Fire Doors/Frames	Proper installation and operability per the requirements of NFPA 80.

Fire Dampers	Proper installation and successful drop test.
Sprinkler Systems	All escutcheons installed, no sprinklers painted. Validation of as-built record drawings, hangers - if not performed earlier – usually for labs with no ceiling.
Exit signs	Installed per contract, not obstructed by other equipment.
Emergency lighting	Installed per contract, verify not on any switches.
Interior finishes	Comply with the NFPA 101 Life Safety Code.
Exits and exit access	Required width, door swing per the NFPA 101Life Safety Code.