

SLAC National Accelerator Laboratory

Understanding BIO Reviews, Workflows, and Approval Expectations

Kevin Brenton | Department Head | AHJ Services | Code Compliance | ES&H

June 1, 2026

PURPOSE OF TODAY'S DISCUSSION



COLLABORATION

COMMUNICATION

COMPLIANCE

SUCCESS



BUILDING INSPECTION OFFICE (BIO) SCOPE AND AHJ AUTHORITY



STANFORD UNIVERSITY
SLAC National Accelerator Laboratory
Operated by Stanford University for the U.S. Department of Energy

[DOE Order 420.1C, Chg. 3 \(LtdChg\) - Facility Safety \(11/14/2019\)](#)
Site Compliance Plan (Final Rev, 1/12/2021)

420.1C REQUIREMENT	METHOD OF COMPLIANCE
Facilities, and major modifications thereto, <u>must be constructed to meet applicable codes and standards</u> that are in effect when design criteria are approved. Other facility changes must meet the <u>most recent applicable codes and standards</u> to the extent determined by the <u>authority having jurisdiction (AHJ)</u> .	Requirements for conventional and experimental project code compliance review are found in <u>ESH Manual Chapter 1 General Policies and Responsibilities</u> , and the <u>Chapter 1 Project Review Procedure</u> .



BUILDING INSPECTION OFFICE (BIO) SCOPE AND AHJ AUTHORITY

SLAC CONDUCT OF ENGINEERING POLICY



DOCUMENT APPROVAL (signature/date)

Deputy Director for Projects and Infrastructure:

Vitaly Yakimenko

Vitaly Yakimenko (Dec 4, 2023 05:34:22 PST)

CONDUCT OF PROJECTS



DOCUMENT APPROVAL (signature/date)

Vitaly Yakimenko

March 18, 2020

Deputy Director for Projects and Infrastructure:

Vitaly Yakimenko



NATIONAL ACCELERATOR LABORATORY

ENVIRONMENT, SAFETY & HEALTH DIVISION

Chapter 1: [General Policy and Responsibilities](#)

ESH Project Review Procedure

Product ID: 476 | Revision ID: 1741 | Date published: 27 May 2015 |

Date effective: 27 May 2015

URL: <http://www-group.slac.stanford.edu/esh/eshmanual/references/eshProcedProjectReview.pdf>

1 Purpose

The purpose of this procedure is to ensure that the environment, safety, and health (ESH) aspects of project activities are adequately identified and mitigated before projects are authorized and released. The goals of this procedure are to

1. Establish a uniform process of project reviews
2. Establish consistent thresholds for a graded approach
3. Clarify and streamline the structure and process of reviews
4. Provide a framework that fosters timely and adequate planning and support to project sponsors

This procedure covers the three main elements of the review process:

- Threshold and applicability determination
- Experimental project review
- Conventional project review

This procedure applies to line management, responsible persons, ESH coordinators, and reviewers involved in the proposal, review, and approval of project (experimental and conventional) activities at SLAC.

2 Roles and Responsibilities

2.1 Line Management

- Supports the implementation of this procedure throughout the organization
- Ensures that adequate resources are allocated to supporting projects
- Sets the tone to enable/promote self-policing of process/voluntary compliance/self-governance

DOE ORDER 420.1C, CHG. 3 (LTDCHG) –
FACILITY SAFETY (11/14/2019)



STANFORD UNIVERSITY
SLAC NATIONAL ACCELERATOR LABORATORY

Operated by Stanford University for the
U.S. Department of Energy

[DOE Order 420.1C, Chg. 3 \(LtdChg\) –
Facility Safety \(11/14/2019\)](#)

Site Compliance Plan (Final Rev, 1/12/2021)

SLAC INJURY AND ILLNESS PREVENTION PROGRAM



7.4 New Construction and Facilities Modifications Design Review

New construction projects and facilities modifications are reviewed for hazards and risks and to ensure the appropriate ESH requirements are integrated into the planned project or facility. ESH requirements are identified through the Project ESH Review Process and are incorporated into the design. This process originates from ESH Manual Chapter 1, "General Policy and Responsibilities". ESH Division professionals are assigned review and concurrence authority in all four phases of project design: conceptual design, preliminary design, final design, and construction inspection (refer to Section 8, "Hazard Control and Abatement", of this Plan.

References:

- [ESH Manual Chapter 1, "General Policy and Responsibilities"](#)
- [ESH Manual Chapter 12, "Fire and Life Safety"](#)

September 2025

SLAC-I-720-0A21B-001-R018

17



Building Inspection Office (BIO) Scope And AHJ Authority

BIO COORDINATION AND STAKEHOLDER INTEGRATION AT SLAC

The Building Inspection Office (BIO) serves as the central Authority Having Jurisdiction (AHJ) coordinating project review, code compliance, inspections, and stakeholder alignment.

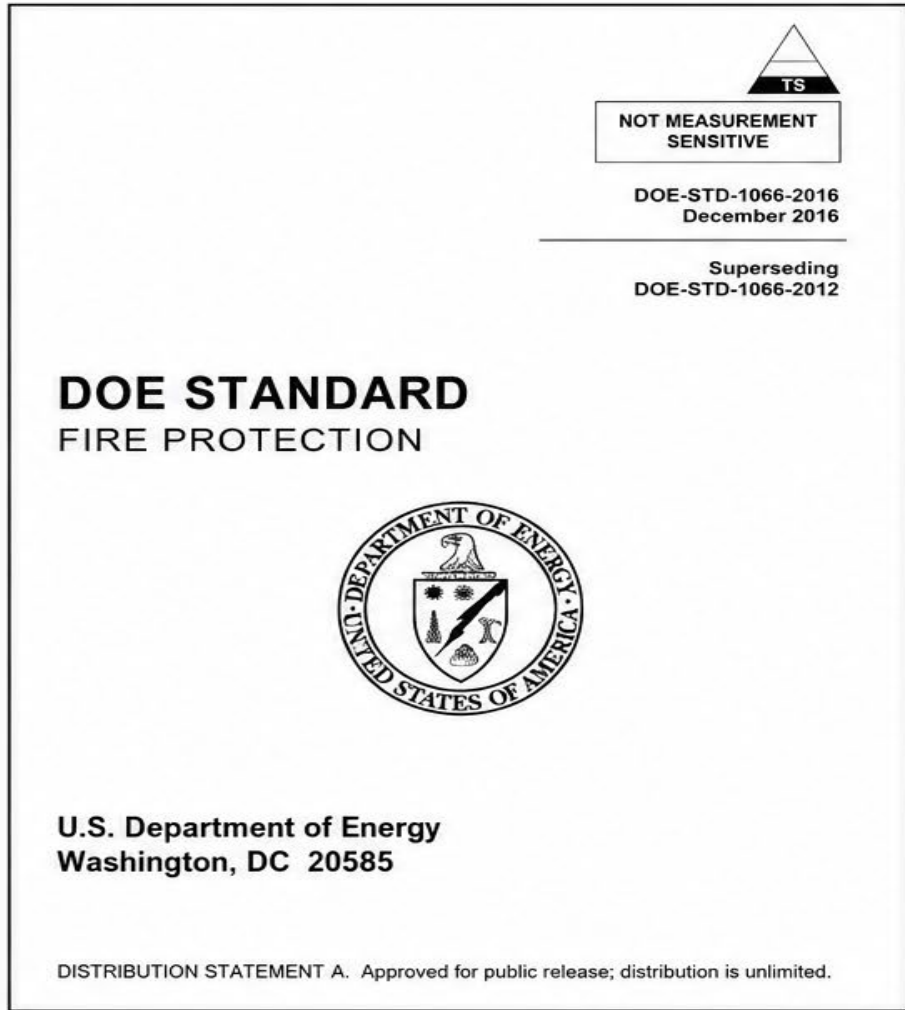


COLLABORATION | COMMUNICATION | COMPLIANCE | SUCCESS

Table 1 – Building Inspection Office Plan Review Matrix

ENTITY PERFORMING REVIEW	NFPA CODES	CBC CPC CMC	NFPA 70 NEC	CA FIRE CODE	Access-ibility	29 CFR 1910, 1926 (OSHA)	CAL/OS HA CCR Title 8	OTHER REVIEW
BIO Plan Reviewers M. Matthews, K. Brenton, 4 Leaf SME	X	X	X	X	X	X		X ^{3,4,5,13, 14}
Fire Marshal Office – R. Kerwin, S. Coleman, T. Bermudez, 4 Leaf SME,	X	X ¹	X	X	X ²			X ¹⁷
Explosives Safety Ian Evans	X	X		X		X		X ⁵
Electrical Systems – NFPA 70 D. Stickney, L. Primas			X			X		X ¹⁶
Electrical Safety Officer - NFPA 70E K. Jobe, L. Primus								X ¹⁶
Electrical Power Department QA/QC A. Krishna			X					X ¹⁶
Structural Review B. Brunette, 4 Leaf SME -K Chen		X ³						
Pressure Systems Program Manuel Gonzalez								X ^{4, 15}
Construction and Industrial Safety G. Johnson,						X (1910 & 1926)	X	X ⁵
Industrial Hygiene M. McDaniel, R. Razik						X (1910 & 1926)	X	X ¹¹
Air Quality P. Cable, M. Coladonato								X ⁶ X ⁷
Hazardous Materials A. Alexiev				X				X ⁸
Waste Management A. Alexiev, A. Leung	X			X				X ^{16,46,7, 9}
Waste Minimization M. DeCamara, C. Daqiq								X ¹²
Environmental Compliance M. Coladonato, H. Benz								X ⁹
Radiation Protection H. Brogonia, J. Blaha, J. Liu								X ⁴
OSHA G. Johnson, R. Razik						X	X	
NEPA M. Grooms, M. Coladonato								X ¹⁸
Plants/Wildlife M. Coladonato								X
Wastewater and Storm Water (SWPPP) H. Beaz								X
Spill Prevention Controls and Countermeasures C. Daqiq								X ¹⁹

WHAT IS AN AHJ?



AUTHORITY HAVING JURISDICTION (AHJ):

An ...individual *responsible for enforcing the requirements of a code...*

...In DOE the head of field element is the AHJ, but...
...***routine activities*** (code interpretation and code enforcement) can be assigned to a contractor.



BUILDING CODE OFFICIAL (OR BUILDING OFFICIAL):

The officer... ..charged with the administration and enforcement of the building code... ..The DOE head of field element or designee is the Building Code Official, unless otherwise directed by the Cognizant Secretarial Officer.

DIFFERENCE WITH QA/QC vs. BUILDING INSPECTION OFFICE



QUALITY ASSURANCE / QUALITY CONTROL (QA/QC)

QA/QC is the project team's process for making sure work is completed **correctly and meets project specifications, engineering requirements, and contract documents**. It is typically performed by the **contractor, engineer, or owner's quality team** and focuses on workmanship, testing, and performance.



BUILDING INSPECTION OFFICE (BIO)

The Building Inspection Office (BIO) acts as the **Authority Having Jurisdiction (AHJ)** and verifies that construction complies with **adopted building, fire, accessibility, electrical, mechanical, and plumbing codes**, as well as the **approved construction documents**. BIO inspections focus on **life safety, code compliance, and public safety requirements required by law**.

BIO WEBSITE

YOUR CENTRAL RESOURCE FOR BIO INFORMATION AND PROCESSES



BIO REVIEW AND AUTHORIZATION MANUAL

Policies, procedures, guidance, and requirements for project reviews and authorizations.



ADOPTED CODES AND STANDARDS

SLAC's adopted building, fire, mechanical, electrical, plumbing, and accessibility codes and standards.



BIO PROCESS REVIEW TRIGGERS

Determine when BIO review and permits are required for your project.



SME MATRIX

Subject Matter Expert (SME) contact information for plan reviews and technical support.



ES&H MANUAL

Environment, Safety & Health Manual and applicable requirements.



PLAN REVIEW SYSTEM (PRS)

Submit projects, track reviews, respond to comments, and manage approvals in PRS.



HANDOUTS AND CODE INTERPRETATIONS

Helpful handouts, guidance documents, and code interpretations for common questions.

Building Inspection Office

Chemical Management

Environment Resources

ISEMS

Occupational Health Center

Radiation Protection

Building Inspection Office

The ESH Building Inspection Office (BIO) provides review, oversight, and authorization for construction, modifications, renovations, demolitions, use, occupancy, alteration, and retro-fits of all buildings, structures, and areas at SLAC. BIO applies 10 CFR 851, thereby reinforcing SLAC's commitment to safeguard its employees, scientists, visitors, and infrastructure.

Contact: [Cheryl Nadler](#) [Mark Matthews](#)

BIO Documents

These files are publicly available.

- [BIO: Project Review and Authorization Manual \(RAAM\)](#) [pdf] January 2026
- [RAM Update Presentation](#) [pdf] February 2025
- [BIO Plan Review Process Changes](#) [pdf] May 2024

Administration

- [Adopted Codes Tables](#) [pdf] January 2026
- [BIO/Fire Inspection Flow Chart](#) [pdf] March 2022
- [BIO/FMO Inspection Request Procedures](#) [pdf] March 2022
- [BIO Review Flow Chart](#) [pdf]
- [BIO Process Review Process Triggers](#) [pdf] (part of the ESH Threshold Review Form, listed separately here) January 2025
- [BIO SME Matrix Table](#) [pdf] April 2026

Programs (ESH Manual)

- [Fire and Life Safety](#) (Chapter 12)
- [General Policy and Responsibilities](#) (Chapter 1)
- [Subcontractor Safety](#) (Chapter 42)

Internal SLAC files

These files are the internal SLAC site. SLAC log-in required.

Handouts, Code Interpretations, and Other Documents

- [Accessibility](#)
- [Building](#)
- [Electrical](#)
- [Fire - FMO](#)
- [Inspections](#)
- [Mechanical](#)
- [Parking](#)
- [Plan Check](#)
- [Plumbing](#)
- [Pressure Testing](#)
- [PRS System](#)
- [SA of EE](#)
- [Science](#)
- [Structural](#)
- [Other](#)

[BIO Team Working Site](#) (restricted access to BIO Team)



SINGLE SOURCE.
CURRENT INFORMATION.
BETTER PROJECTS.



VISIT THE BIO WEBSITE TODAY

[Building Inspection Office](#) | [Environment Safety & Health](#)



NOT SURE WHERE TO START?

Check the BIO Process Review Triggers or contact the BIO team for guidance.

PLAN REVIEW TRIGGERS

ENVIRONMENT SAFETY AND HEALTH DIVISION BUILDING INSPECTION OFFICE



NATIONAL ACCELERATOR LABORATORY

SLAC-I-730-2A24Z-001-R012

ENVIRONMENT SAFETY AND HEALTH DIVISION

BUILDING INSPECTION OFFICE

Project Review and Authorization Manual

December 3, 2018

SLAC-I-730-2A24Z-001-R012

Page 8 of 38



GENERAL ASPECTS OF A PROJECT THAT TRIGGER BIO REVIEW

- 1 Construction, enlargement, alteration, moving, or demolishing a building or structure
- 2 Any element under review that has a known code violation (as an existing condition)
- 3 A change of character, use or occupancy of a space, building, parking lot, road, or structure
- 4 Tents, temporary structures, and membrane structures, including construction trailers and fences
- 5 Excavations, grading, and fill, or other earth moving activities
- 6 Partitions greater than 5'9"
- 7 Installations or modifications of science and experimental equipment as follows: BIO review and authorization required for the attachment/support/interface of the equipment and devices to building structures and building systems
- 8 Installation or alteration of a chemical or biological laboratory
- 9 Installation, alteration, repair, or replacement of pressure vessel, cryogenic, vacuum, or compressed gas systems
- 10 Initial installation or modification of piping or tubing used to deliver highly toxic or reactive (for example, unstable, pyrophoric, water reactive) fluids (gaseous or liquid) from a source container to the process/research equipment



AMERICANS WITH DISABILITIES ACT ASPECTS THAT TRIGGER BIO REVIEW

- 30 Additions to or alteration of any accessible element, including paths of travel, ramps, walkways, doors, restroom facilities, exit paths, parking lots, sidewalks, stairs, required signage, elevators, break rooms, kitchenettes, or new elements



These triggers help determine when BIO review and authorization are required for your project.



REFER TO THE BIO REVIEW AND AUTHORIZATION MANUAL for complete policies, procedures, and requirements.



NOT SURE?

Check the BIO Process Review Triggers or contact the BIO team for guidance.

ESH MANUAL CHAPTER 1

PROJECT REVIEW PROCEDURE



PURPOSE

Ensure that ESH aspects of project activities are adequately identified and mitigated before projects are authorized and released.



ROLES

Project Manager, PM Engineers, BIO/ESH, SMEs, and Stakeholders



THIS PROCEDURE COVERS

- Threshold & applicability determination
- Experimental project review
- Conventional project review
- Line management, responsible persons, ESH coordinators, and reviewers



REVIEW TIME GUIDELINES

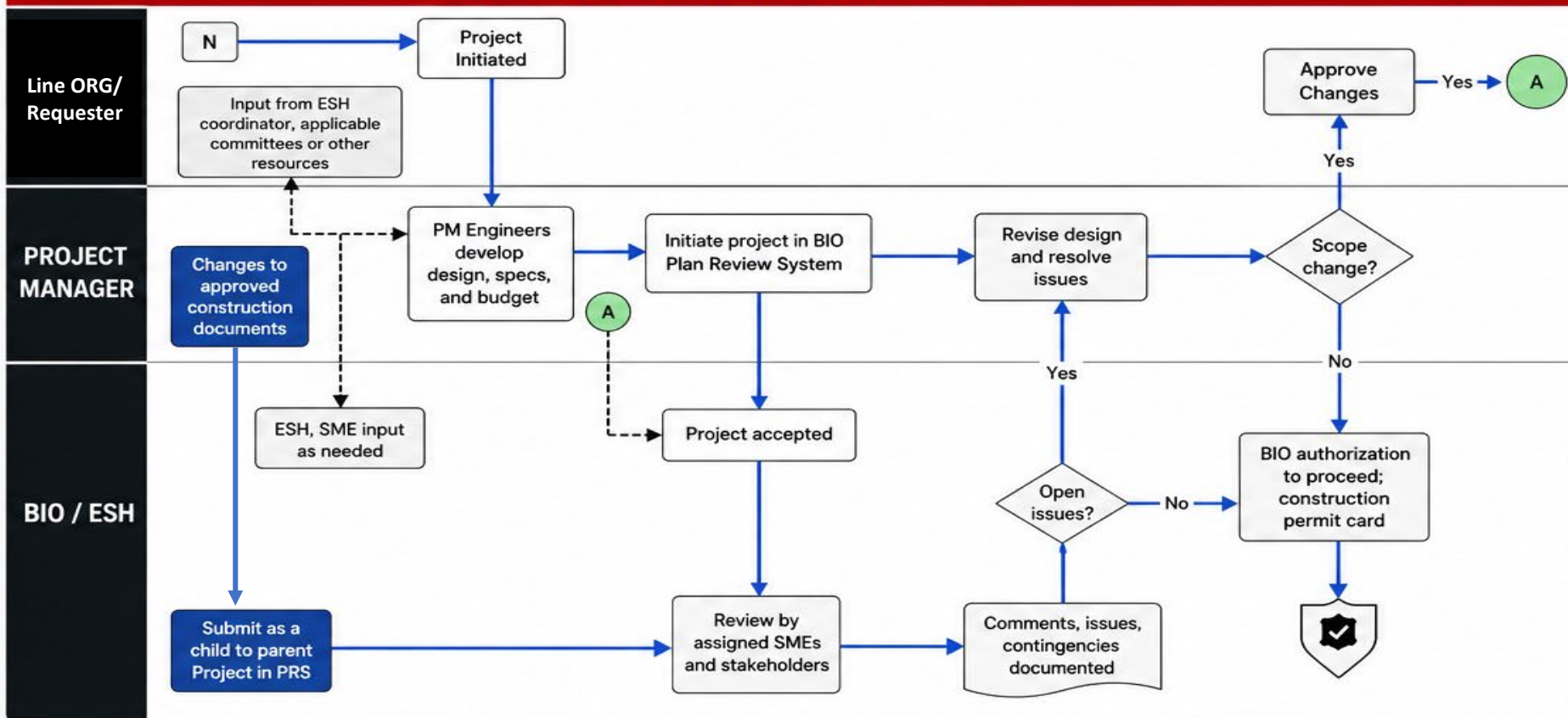
	Initial Review	5 DAYS
	Backcheck	2 – 3 DAYS



COLLABORATE EARLY.
SUBMIT RIGHT. KEEP PROJECTS MOVING.

CONVENTIONAL PROJECT REVIEW PROCESS

Rev. 3/27/2021



Approval from applicable committee or authority as required



Process flow



Information / input flow



Authorization issued; permit card required before construction



Deliverables / documentation

REASONS FOR **SUBMISSION DELAYS** — IN APPROVALS —

1



INCOMPLETE SUBMITTAL PACKAGES

Missing drawings, calculations, specs, narratives, or required documents cause rework and delays.

2



DELAY IN OBTAINING APPROVALS TO START

Late Building Manager or Department Head approvals delay the start of the review process.

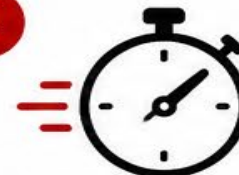
3



UNREALISTIC REVIEW TIMES

Submitting with unrealistic or compressed timelines creates bottlenecks and manages expectations.

4



EXPEDITED REVIEWS

Last-minute requests for expedited reviews strain resources and extend processing times.

5



DELAY IN RESPONSE TO SME COMMENTS

Slow responses or missing information keep reviews on hold.

6



INCOMPLETE SME RESPONSES

Responses that lack required details or clarification lead to additional review cycles.

7



CHANGING DOCUMENTS DURING REVIEW

Revising documents during review requires re-review and resets the clock.

8



CHANGING APPROVED DOCUMENTS

Modifying approved documents before or after issuance causes confusion, rework, and delays.



KEEP IT MOVING!

- ✓ Submit complete and coordinated packages
- ✓ Plan ahead and allow realistic review time
- ✓ Respond to comments quickly and completely
- ✓ Freeze documents before review
- ✓ Communicate early and often with all stakeholders



**GOOD SUBMITTALS =
FASTER APPROVALS**



PLAN AHEAD. SUBMIT RIGHT. STAY ENGAGED. KEEP PROJECTS MOVING.

PROJECT SUCCESS WITH BIO

Early Coordination. Clear Communication. Code Compliance. On Time. On Budget.



ENGAGE BIO EARLY

- Involve BIO during conceptual and early design
- Identify permit triggers, deferred items, and code requirements
- Prevent redesign, delays, and unexpected impacts



SUBMIT COMPLETE PACKAGES

- Provide complete drawings, calculations, specs, and narratives
- Coordinate with ESH SMEs, F&O, and stakeholders
- Incomplete packages cause the most delays



COLLABORATE THROUGH REVIEW

- Respond to SME comments quickly and completely
- Keep communication open in PRS
- Monitor progress and follow up early



BUILD RIGHT

- Follow approved construction documents
- Coordinate inspections before work is covered
- QA/QC verifies workmanship; BIO verifies code and life safety compliance



CLOSE OUT STRONG

- Complete as-builts, test reports, and certifications
- Resolve all BIO comments
- Final inspections and approvals
- Lessons learned for continuous improvement

KEY PRINCIPLES FOR PROJECT SUCCESS



COMMUNICATE
EARLY & OFTEN



PLAN AHEAD &
COORDINATE



SUBMIT COMPLETE,
ACCURATE DOCS



RESPOND QUICKLY
TO COMMENTS



ENSURE CODE
COMPLIANCE



WORK TOGETHER
AS ONE TEAM



OUR GOAL: SAFE FACILITIES. CODE COMPLIANT. ZERO SURPRISES. PROJECT SUCCESS.

CRMf

BUILDING TODAY.
ADVANCING TOMORROW.

SPECIAL INSPECTIONS

WHAT IS IT AND WHY IS IT REQUIRED?



Special inspections are required by CBC Chapter 17 to provide **independent verification** that specific building elements and systems are built in accordance with the approved construction documents and applicable codes. These inspections focus on **critical work that is difficult or impossible to verify after it is concealed**.

WHAT IS SPECIAL INSPECTION?

Special inspection is the continuous or periodic examination of specific work by, **approved third-party inspectors** who have the training, experience, and certification to verify that the work complies with the approved construction documents and applicable codes and standards.



SPECIAL INSPECTIONS INCLUDE:

- ✓ Observation of construction activities
- ✓ Verification of materials and installation
- ✓ Performance of tests and measurements
- ✓ Documentation and reporting of results

PERFORMED BY:



Approved special inspectors with demonstrated competence and certifications in accordance with CBC Section 1704.

WHY IS IT REQUIRED?



PROTECTS LIFE SAFETY

Verifies that critical building elements are constructed to perform as designed under normal use and in emergency conditions.



VERIFIES HIDDEN OR INACCESSIBLE WORK

Confirms work that will be concealed, embedded, or otherwise inaccessible can't be fully evaluated later.



ENSURES CODE COMPLIANCE

Helps ensure compliance with CBC Chapter 17 and referenced standards through independent verification.



REDUCES RISK OF FAILURE AND REWORK

Identifies issues early, reducing the risk of structural failures, costly rework, delays, and disputes.



REQUIRED FOR PROJECT APPROVAL

Special inspection reports must be submitted to BIO/AHJ. Work cannot be concealed until approved.



THE GOAL

Ensure the long-term safety, durability, and code compliance of SLAC facilities through independent verification of critical work.

KEY TAKEAWAY

Special inspections are a code requirement and an essential partner to BIO inspections in delivering safe, code-compliant buildings.



SPECIAL INSPECTIONS

◆ CBC CHAPTER 17 REQUIREMENTS

Special inspections and tests are required in accordance with CBC Chapter 17.
The table below summarizes the types of work that require special inspection or testing.

1  SOILS • Fill placement and compaction • Subgrade preparation • Geotechnical observations • Laboratory testing CBC 1705.6	2  CONCRETE CONSTRUCTION • Reinforcing steel placement • Anchor installation • Concrete testing • Shotcrete CBC 1705.3	3  STRUCTURAL STEEL • Welding inspections • Bolted connections • Steel decking • Joists and girders CBC 1705.2	4  MASONRY • Reinforced masonry • Grouting operations • Reinforcement placement CBC 1705.4	 KEY POINTS ✓ Required by CBC Chapter 17 ✓ Performed by approved special inspectors ✓ Separate from BIO inspections ✓ Reports submitted to BIO/AHJ ✓ Work cannot be concealed until approved
5  WOOD CONSTRUCTION • High load diaphragms • Long span trusses • Mass timber CBC 1705.5	6  DEEP FOUNDATIONS • Driven piles • Drilled piers • Helical piles CBC 1705.7 to 1705.9	7  SEISMIC INSPECTIONS • Structural systems • Architectural components • Mechanical, electrical and plumbing anchorage CBC 1705.13	8  FIRE RESISTIVE SYSTEMS • Fireproofing • Intumescent coatings • Firestopping • Fire resistant joints CBC 1705.15 to 1705.18	



COMMON SLAC SPECIAL INSPECTIONS



SOILS



CONCRETE



STRUCTURAL
STEEL



WELDING



FIRESTOPPING



SEISMIC
ANCHORAGE



DEEP
FOUNDATIONS

KEY TERMS AND DEFINITIONS

TERM		DEFINITION	DOES BIO REVIEW?
	Approved Construction Documents	The final EOR stamped and BIO approved plans and specifications authorized for construction. These are the governing documents for inspections and compliance.	YES – Governing Documents
	Construction Documents (CDs)	The drawings, specifications, calculations, and supporting information submitted for permit and review. Once approved, they become approved construction documents.	YES
	Submittals	Contractor provided documents showing products, materials, equipment, manufacturer data, and installation information for approval by the design team.	Usually NO unless design changes occur
	Shop Drawings	Detailed contractor or fabricator drawings showing how systems or components will be fabricated or installed to match approved plans.	Usually NO unless they modify approved design
	Request for Information (RFI)	Formal request asking for clarification when plans are unclear, conflicting, or incomplete.	Sometimes if design or code compliance changes
	Deferred Submittal / Deferred Design	Systems intentionally postponed from permit review and approved later by the EOR and BIO (example: fire alarm, structural steel, delegated engineering).	YES – Required BIO Review
	Delegated Design	Engineering performed by a specialty engineer after permit issuance based on performance requirements in approved plans.	YES
	Plan Revision	Modification to approved construction documents after permit issuance.	YES – Required
	PCO (Potential Change Order)	Proposed change to project scope, cost, or schedule before formal change order approval.	Depends – BIO if design or code changes occur
	Change Order	Formal approved change to contract scope.	YES if code or permit scope changes
	Means and Methods	Contractor's construction approach, sequencing, or installation method.	NO unless it changes design intent
	Field Change	Change made during construction due to unforeseen conditions.	Usually YES if affecting approved plans
	As Built Drawings	Drawings updated to reflect what was <u>actually constructed</u> in the field.	May be required at closeout
	Backcheck	BIO review of revised plans to verify comments were addressed.	YES
	Special Inspection	Inspection by approved third party inspector for CBC Chapter 17 items like welding, bolting, shotcrete, etc. Special inspector reports to the Building Code Official.	YES – BIO oversight

Thank you

For your commitment to safety, compliance, and successful project delivery.
We look forward to partnering with you.



Kevin Brenton

Building Inspection Office

BIO-Department Head, AHJ Services, CASp #964



SLAC National Accelerator Laboratory | Menlo Park, CA



m: (408) 472-9105



e: brentonk@slac.stanford.edu



COLLABORATION



COMMUNICATION



COMPLIANCE



SUCCESS