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This mandatory functional series document is available online at http://engstandards.lanl.gov.

It derives from P342, Engineering Standards, which is issued under the authority of the Associate Director of Nuclear and High Hazard Operations as part of the Conduct of Engineering program implementation at the Laboratory.

PLEASE CONTACT THE ESM IBC PROGRAM POC
for upkeep, interpretation, and variance issues

Section IBC-IP	**IBC Program POC and Committee**

1.0 Purpose and Scope

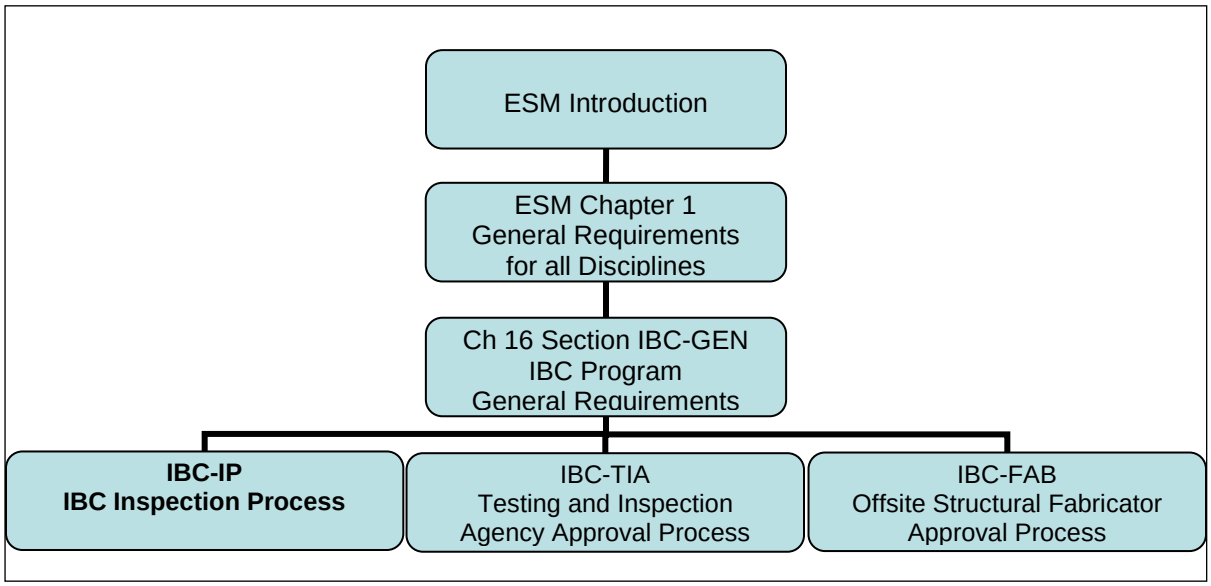
A. The purpose of this section is to establish the process, the authority, and duties and reporting functions of IBC Inspections at LANL[1]. It must be used in conjunction with Section IBC-GEN of this chapter.

B. The scope of this Section IBC-IP applies to design professionals, constructors including Subcontractors and subtiers, and IBC inspectors as they relate to the scope of the IBC, the LANL Program, and other duties assigned by the LBO or in support of activities addressed in the IBC (or IEBC) or this section. IBC Inspectors are those qualified by the LBO either directly or through the LBO's approval of an inspection agency.

C. This IBC inspection process is specifically for IBC and IEBC work. Additional requirements are expected for ML-1 and ML-2 (nuclear) and ML-3 work; such higher-quality processes cannot reduce IBC levels of quality or inspections unless specifically authorized by the LBO in writing.

D. LANL personnel: See P330-8, *Inspection for Test and Acceptance*, for potential additional requirements.

2.0 Chapter Hierarchy



3.0 Acronyms /Definitions

ACI	American Concrete Institute
ASNT	American Society for Nondestructive Testing
ASTM	ASTM International (formerly American Society for Testing and Materials)
AWS/ACWI	American Welding Society/Associate Certified Welding Inspector

[1] LANL (including LBO) right to inspect is guaranteed by Construction Subcontract Exhibit A, GC-31, Inspection, Quality Surveillance, Rejection of Materials and Workmanship and Testing (Jun 2009)

AWS/CWI	American Welding Society/Certified Welding Inspector
DPIRC	Design Professional in Responsible Charge
IAS	International Accreditation Service (subsidiary of ICC)
IBC	International Building Code published by ICC
IBC Inspector	Same as inspector (terms used interchangeably in this Chapter)
ICC	International Code Council
ICC-ESR	International Code Council-Evaluation Service Report
IEBC	International Existing Building Code, published by ICC
LBO	LANL Building Official
project	Term for any type of work/job/task/ that is performed under the purview of the ESM regardless of funding source or facility arrangement.

4.0 Responsibilities and Duties

A. LANL Project Owner (normally PM or Facility Management)

1. The project owner is responsible for funding IBC inspection services. The IBC inspectors and inspection agencies shall not be in the employ of a non-LANL constructing Subcontractor or material supplier.[2]

B. Constructor (e.g., Prime Subcontractor or LANL Self-perform)

1. Duties are addressed primarily in LANL Master Specification Section 01 4000, Quality Requirements. Constructors are required to perform QC inspections as required by the contract (using third-party, LBO-approved testing agencies where required). IBC Ch 17 Special Inspections are above and beyond that constructor QC and are performed by LANL or LBO-approved third-party inspectors. Constructor QC inspections shall be preplanned, and Subcontractors must submit that schedule to LANL CM-CE Inspection Group prior to start of work.[3]
2. Prime Subcontractor must complete and submit Attachment H, Subcontractor's Statement of Responsibility with respect to Special Inspections, and attachments.
3. The constructor (e.g., Prime Subcontractor) must assure that necessary requirements related to the project including hold points, design documents, and IBC requirements are passed-down to subtier subcontractors and suppliers.

C. Design Professional in Responsible Charge

The DPIRC has many duties and responsibilities related to inspection, including the following:

1. TIP: Prepare test and inspection plan using the Attachment I template posted with this Section here[4]. Delete items for LANL Master Spec sections and requirements not applicable (present in) project spec. Add inspections for specifications created beyond the masters following the format provided. [unless specifically directed to NOT produce TIP by LANL subcontract.] A TIP may also be called a VIT (verification, inspection, and test).

[2] IBC 2006 Section 109.1
[3] Self-perform work by LANL may use inspection checklists where available.
[4] Other formats providing same information in equally useable manner are acceptable.

2. SSI: Prepare statement of special inspections (SSI). The DPIRC shall list the special inspections (per IBC Ch 17) to include structural element fabrication observation when required by the Code, whether inspections are continuous or periodic, and the details of such inspection
   a. If this Program or a product's ICC-ES ES Report requires special inspection then the EOR is responsible for ensuring that all info /data necessary for inspector to perform SI is documented & conveyed in an effective manner (e.g., Project drawing notes, abbreviated version of Test & Inspection Plan, etc.)

      Note: LANL-approved design documents supersede the ICC ESRs if there is a difference. *Guidance: But should say "Contrary to ESR XXXX, do YYYY."*

   b. The SSI must also follow IBC Chapter 17 requirements on degree of inspection ("continuous" and "periodic"), and the specific ICC-ESRs and LANL approval documents for special cases (e.g., post-installed anchors).
   c. Attachment B is a partial template for special inspection tasks and serves as an acceptable format and starting point for preparation of the SSI that can be easily reviewed by the LBO designees. Must include identification of any seismic-resisting structural elements[5]. The DPIRC may add additional Special Inspections as they require for "Special Cases" under IBC chapter 17 and more stringent inspection coverage where they deem necessary. Note: listing the specific agency performing special inspection is not required since LANL will provide these services.
3. The DPIRC shall detail structural observations (performed by structural engineer of record not in same company as a Subcontractor; see App B and App G, Structural Observation Report), and any required seismic testing. LBO may authorize observations by those other than the structural DPIRC.

4. Submit plans in native electronic file. LANL design reviewers and inspectors may require additional inspections and hold points to be added. *Also, Section 01 4000 may require construction subcontractor to provide input which must be incorporated.*

5. The DPIRC shall also:

   - *Respond to field discrepancie*s. The DPIRC shall respond to non-conformance reports (NCRs) that are proposed to be dispositioned as Use-As-Is or Repair (not required when Rework or Scrap/Reject).
     - See also ESM Ch 1 Section Z10 subsection on Clarifications, NCRs, etc.
     - NOTE: IBC 1704.1 requires that all special inspection reports be sent to the DPIRC. LANL Construction Inspection (CM-CE) default policy is to send only reports with discrepancies (of any kind) to the DPIRC; if however, the DPIRC desires ALL inspection reports for a given project, then they may request this from CM-CE if they provide an email address to which they desire all reports be sent[6].

[5] Due to LANL's ESM Ch 5 wind criteria (exposure Cat C, 90-mph gust), IBC-2009 Ch 17 has no SI or structural observation for wind-resisting element fab/erection

[6] The default policy meets IBC intent that (1) DPIRC see discrepancies and (2) owner (LANL) sees evidence that special inspections (an owner responsibility) are occurring -- the later occurring due to owner self-inspecting in this case, rather than relying on DPIRC (as owner's agent) ensuring same.

- Review shop and fabrication drawings and submit revisions to approved design documents: The DPIRC shall acknowledge and approve (with a stamp) shop/fabrication drawings. The DPIRC shall submit to the LBO-designated design reviewers for written approval of any deviations to the approved plans, drawings, or specifications and shall re-submit revised plans, drawings, and specifications that may be required due to the shop drawings, etc. Upon approval, send copy to the LANL Construction Inspection group.
- When DPIRC is contracted by LANL to perform special inspection duties (this is rare), submit inspection agencies to the LBO for approval.

D. IBC Inspectors and/or Inspection

1. **General requirements.** IBC inspectors shall review approved plans and specifications for inspection requirements. IBC inspectors will comply with the inspection requirements of LANL.
2. **Signify presence at jobsite.** IBC inspectors shall notify constructors (e.g., Subcontractors) of their presence and responsibilities at the jobsite location. If required by the LBO they shall sign in on the appropriate form posted by a Subcontractor.
3. **Observe assigned work.** IBC inspectors shall inspect all work in the inspection program for conformance with the LBO-approved drawings and specifications, applicable provisions of IBC Section 1704 on special inspection, and applicable workmanship provisions of the IBC; inspections include special inspections in the structural fabricator's shop when required and other inspection identified in the inspection/QA plan for the work. Example inspection plans and records are included as Attachments.
4. For continuous inspection, the inspector shall be onsite at all times observing the work requiring inspection designated as "continuous." Periodic inspection is intended to mean that the inspector at periodic times inspects all work performed but is not required to "witness" the work being performed.
5. Notify the LANL Chief Inspector immediately in cases where project conditions or personnel do not provide adequate notice for hold or witness points, inhibit the inspector's ability to inspect or any conditions that present themselves that would prevent adequate inspection. An example could be related to funding where non-conformances cause additional work and inspection costs but the project does not want to increase funding to cover additional costs for inspection.
6. Welding inspection subject to the IBC shall only be performed by Certified Welding Inspectors that have been approved by the LANL Welding Program Administrator (WPA)/Chief Inspector for IBC welding on behalf of the LBO.
   a. LANL personnel pre-approved for such inspection are listed on the LANL Welding Program website (ESM Chapter 13) in the Approved Inspector listing on the website and as a reference under General Welding Standard GWS 1-03 (e.g., they have a "Yes" in IBC/IEBC column of table). http://engstandards.lanl.gov/ESM_Ch13.shtml#ch13_vol1
   b. Non-LANL CWIs shall be submitted for approval to the LANL WPA via the Project Manager.
   c. Other requirements are summarized in Specification Sections 01 4444 (Offsite) and 01 4455 (Onsite) Welding & Joining Requirements.

7. **Report nonconforming items.** IBC inspectors shall bring all nonconforming items to the immediate attention of the constructor (e.g., Subcontractor). If any such item(s) is not resolved in a timely manner or is about to be incorporated into the work, the LBO and design professional in responsible charge (DPRIC) should be notified immediately and the item noted in the IBC inspector's written report (see IBC Section 1704.1). When not promptly corrected by the constructor, a nonconformance report must be written (example is Attachment C). The IBC inspector shall write a separate report regarding noted discrepancies which should contain, as a minimum, the following information about each nonconforming item:

   a. Description and exact location

   b. Reference to applicable design detail approved

   c. Name and title of each individual notified and method of notification

   d. Resolution or corrective action taken

8. **Provide timely reports**. The IBC inspector shall complete written inspection reports for each inspection visit and provide the reports on a timely basis as determined by the LBO Chief Inspector. The IBC inspector or inspection agency shall furnish these reports directly to the LANL Chief Inspector, DPIRC (when discrepancies), and others as designated by the project manager (see IBC Section 1704.1.2). These reports should be generated on a daily basis and may be submitted weekly at the option of the Chief Inspector. Examples of daily report forms are included in the Attachments. In these reports, IBC inspectors should:
   - Describe inspections and tests made with applicable locations
   - Indicate how nonconforming items were resolved
   - List unresolved items, parties notified, and time and method of notification
   - Itemize changes authorized by DPIRC if not included in nonconforming items
   - Stop work notices, NCRs, or other documentation vehicles that provide information regarding the quality of the IBC-related work.

9. **Submit final report.** IBC inspectors or inspection agencies shall submit a final signed report to the LBO, Chief Inspector, and DPIRC stating that all items requiring IBC inspection and testing were fulfilled and reported and, to the best of their knowledge in conformance with the approved drawings, specifications and the applicable provisions of the IBC (see IBC Section 1704.1.2). Items not in conformance, unresolved items or any discrepancies in inspection coverage, missed inspections, periodic inspection when continuous was required, etc. should be specifically itemized in this report. An example of a final report form is included as Attachment E.

10. The IBC inspector shall notify the LBO (regardless of whether the inspector reports directly to the LBO, the inspection agencies, or other entity on site) immediately when conditions on a project, job or other work under IBC causes the inspector to be unable to perform their duties. This can be due to lack of notification of hold or witness points, lack of funding, reduced funding, or any conditions that impacts the inspectors' independence.

11. The specific duties and responsibilities of the LBO relating to inspection (delegated downward):
    - ***Review submittal documents for compliance with special inspection requirements.*** The LBO is charged with the authority to review the plans, specifications, inspection program, and other submittal documents for compliance with Code requirements.[7]
    - ***Approve inspection program.*** The LBO is responsible for approving the inspection program submitted by the DPIRC (see IBC Section 1704.1) and may require a preconstruction conference to review the program with all applicable members of the construction team. Accomplished through design review process that includes CM-CE Chief Inspector (see IBC-GEN).
    - ***Approve inspectors/inspection agencies***. The LBO is responsible for determining competence of inspectors for the types of work they will be inspecting (see IBC Section 1704). See Attachment F to this section, Job Task List for Special Inspectors; also, qualification guidance for inspectors is contained in ESM Ch 16, Section IBC-TIA, Attachment B.
    - ***Monitor special inspection activities.*** The LBO should monitor the inspection activities at the jobsite to assure that qualified inspectors are performing their duties when work requiring inspection is in progress.
    - ***Review inspection reports.*** The LBO receives and reviews inspection progress reports and final reports for conformance with the approved plans, specifications and workmanship provisions of the Code.[8]
    - ***Approval of NCR dispositions and conditional releases***. The Deputy LBO may also approve these. If not CR is not approved, work on same must stop.
    - ***Perform final inspection.*** The LBO should not release the structure for occupancy or use until the final inspection report has been completed (see Section IBC-GEN).

5.0 Process (see also IBC-GEN Process article)

A. The DPIRC submits the design package including the construction test and inspection plan (TIP) and Statement of Special Inspections (SSI) [and structural observation plan if required], to the LBO for review and approval.

B. LBO designees review and approve the design media and the plan and return it to the project for implementation or they return it with comments that need to be resolved.

C. If there are comments to be resolved the project cannot proceed with construction or structural fabrication activities without the LBO concurrence.

D. Once the package is fully approved by the LBO and returned to the project/job the project team can begin the appropriate phases of the work.

E. The project assures that the inspectors have enough funding to fully comply with the inspection plan(s).

[7] IBC 2006 Sections 104.2, 106.3 and 106.3 through 106.5
[8] IBC 2006 Section 1704.1.2. Delegated to Chief Inspector.

F. Offsite structural member fabrication work is performed by an approved fabricator or is accomplished with one or more special inspectors in the shop when required by IBC Ch. 17. Designation as an approved fabricator is obtained from the LBO (see ESM Chapter 16 Section IBC-FAB). Such structural work requires a Certificate of Conformance (IBC-FAB Att B).

G. Subcontractors must submit Attachment H, *Subcontractor's Statement of Responsibility with respect to Special Inspections*.

H. Work progresses and the inspector(s) perform their inspections, fill out the reports, and notify the LBO if non-conformances occur.

I. Inspection will be performed against design documents including specifications, drawings, shop drawings, deferred design documents approved by the design agency with LANL oversight (see IBC-GEN), and to the TIP(s) and SSI(s). The LANL Inspector has no latitude on waiving above-code (IBC or LANL) features; the Contract Documents approved by the LBO are the basis for construction under the permit even though the details may be in excess of code requirements.[9]

J. Structural Engineer of Record performs required observations and completes report (IBC-IP App G).

K. Upon completion of the work, the project manager notifies the LBO who performs a final inspection review to his/her satisfaction prior to granting an occupancy authorization.

L. All inspection records and any others required by IBC or IEBC are submitted to the LBO's Chief Inspector.

6.0 Attachments (may be labeled Appendix until revision)

A. Special Inspection and Testing Summary – Sample
B. Statement of Special Inspections Template*
C. Nonconformance Report – Sample
D. IBC Inspection Daily Report – Sample*
E. IBC Inspection Final Report – Sample*
F. Job Task List for Inspectors (Guidance)
G. Structural Observation Report (Sample)*
H. Subcontractor's Statement of Responsibility with respect to Special Inspections*
I. Test and Inspection Plan Template*

* Indicates record document.

[9] ICC document 2009 IEBC Q&A 1-19

RECORD OF REVISIONS

Rev	Date	Description	POC	RM
0	10/27/06	Initial issue.	Tobin Oruch, *CENG-OFF*	Kirk Christensen, *CENG-OFF*
1	6/26/07	New App G for structural observation. ML level, reordering, other minor changes. App B, E reformatting.	Tobin Oruch, *CENG-OFF*	Kirk Christensen, *CENG-OFF*
2	7/21/08	Clarified structural observation, AE submittal approval, inspection basis. Minor changes to App B and G.	Tobin Oruch, *CENG-OFF*	Kirk Christensen, *CENG-OFF*
3	9/15/09	Clarified NCRs in 4.0.E. Added App H (SSRwrtSI) and referenced in App B.	Tobin Oruch, *CENG-OFF*	Gary Read, *CENG-OFF*
4	3/1/10	Clarified in-shop seismic- and wind-resistance inspection regardless	Tobin Oruch, *CENG-OFF*	Larry Goen, *CENG-OFF*
5	8/25/10	Corrected that fab shop approval does preclude in-shop special inspection. CM-CE must approve TIP (App B)	Tobin Oruch, *CENG-OFF*	Larry Goen, *CENG-OFF*
6	6/20/11	SSI need not include other inspections. Strengthened req't for CM-CE approval	Tobin Oruch, *CENG-OFF*	Larry Goen, *CENG-OFF*
7	9/24/13	Mandated TIP, new Att I template for same. Clarified no need for wind-resisting element SI or SO. Clarified inspection to shop dwgs. Apps became Atts with minor changes.	Tobin Oruch, *ES-DO*	Larry Goen, *ES-DO*
8	5/22/14	Clarified SI roles and funding, inspector role.	Tobin Oruch, *ES-DO*	Mel Burnett, *ES-DO*