



## Conduct of Engineering Request for Variance or Alternate Method

To display the *VAR Request Metadata* pane for this document, click **File > Info > Properties > Show Document Panel.**

### 1.0 General

1.1 Document Number: <b>VAR-10564</b>	1.2 Revision: <b>0</b>				
1.3 Brief Descriptive Title: <b>Test and Inspection Plan (TIP) Development Responsibility</b>					
1.4 Affected Program: <b>Engineering Standards</b>	1.5 Request Type: <b>Variance</b>				
1.6a Affected Tech Area <b>99</b>	1.6b Affected Buildings <b>Sitewide</b>				
1.7 Requestor: <b>Honey, Christine May</b> Organization: <b>ES-FE</b>					
1.8 Revision History <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Revision Number</th> <th style="text-align: left; border-bottom: 1px solid black;">Changes and Comments</th> </tr> </thead> <tbody> <tr> <td style="padding-left: 20px;">0</td> <td>Initial issue.</td> </tr> </tbody> </table>		Revision Number	Changes and Comments	0	Initial issue.
Revision Number	Changes and Comments				
0	Initial issue.				

### 2.0 Affected Conduct of Engineering Program/Documents

2.1 Affected "P" Document: <b>P342 Engineering Standards</b>  If against the P document itself, revision (or <b>N/A</b> ): <div style="text-align: center; padding-left: 40px;"><b>N/A</b></div>	2.2 Subordinate or related document(s) [AP, master spec, LANL ESM chapter & section; or code, Order, standard, etc.]: Document Title/No.: <b>Engineering Standards Manual (ESM) STD-342-100, Chapter 1, General, Section Z10-Attachment C Design Deliverable Schedule, 30-60-90-100%</b>  <div style="padding-left: 20px;">Revision <b>8</b></div> Document Title/No.: <b>ESM, Chapter, 16, IBC Program, Section IBC-GEN – General IBC Program Requirements</b>  <div style="padding-left: 20px;">Revision <b>11</b></div> Document Title/No.: <b>ESM, Chapter 16, IBC Program, Section IBC-IP – IBC Inspection Process</b>  <div style="padding-left: 20px;">Revision <b>9</b></div> Document Title/No.: <b>LANL Tailored Standards Manual (TSM)</b>  <div style="padding-left: 20px;">Revision <b>0</b></div>
2.3 Section/Paragraph: <b>See field 2.4 below</b>	

2.4 Specific Requirement(s) as Written in the Document(s):

**ESM, Chapter 1, Section Z10, Attachment C Design Deliverables Schedule 30-60-90-100%, Table Z10-AttC-2 EOR Deliverables Schedule**

<b>Other</b>			
When IBC/IEBC, (1) Test and Inspection Requirements (TIP or VIT) and (2) Statement of Special Inspections when required by ESM Chapter 16, IBC-GEN; ref. IBC-IP Att. B and I			

**ESM, Chapter 16, Section IBC-GEN – General IBC Program Requirements**

6.4 Design Professional in Responsible Charge (DPIRC)

B. Develop statement of special inspections (SSI) when required by IBC 1704.3, and test and inspection plan (TIP or VIT); see Section IBC-IP.

7.0 Process Overview

Step	Responsible Person	Action	Lowest Risk	Moderate Risk	Highest Risk
<b>Pre-Permit</b>					
2	DPIRC	Develop design (may be phased/multiple packages). [by 60%, develop preliminary inspection plan(s) delineating the degree of test, inspection, and Statement of Special Inspections (SSI, when required by IBC 1704.3) for the work being done. Produce Test and Inspection Plan (TIP or VIT) unless specifically directed to NOT produce TIP by LANL subcontract. See Chapter 16 Section IBC-IP, IBC Inspection Process, for details.] Submit to LANL person acting as Project Engineer, who then submits to PIO-CM, ES-EPD reviewers, and other policy mandated (e.g., PRID) reviewers for LBO review per IBC Permitting Process (EPD desk instruction DI-ES-EPD-001 (internal <a href="#">link</a> ) <sup>1</sup>	AR	AR	X
4	DPIRC	Develop final design and test and inspection plan(s) delineating the degree of test, inspection, and Statement of Special Inspections (SSI, when required by IBC 1704.3) for the work being done. Produce Test and Inspection Plan (TIP or VIT) unless specifically directed to NOT produce TIP by LANL subcontract. See Chapter 16 Section IBC-IP, IBC Inspection Process, for details. Designs shall document final design inputs (including Alt Level if applicable) and fire ratings of any walls being penetrated. Submit to LANL person acting as Project Engineer	AR	AR	X

A. Delegated and/or Deferred Design:

3.d. The DPIRC is also responsible for revising the submittal summary, Test & Inspection Plan, and the SSI as necessary to match the deferred design, then submitting these revised documents with the deferred design.

## ESM, Chapter 16, Section IBC-IP—IBC Inspection Process

### 3.0 Responsibilities and Duties

#### 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<sup>4</sup>. 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).

<sup>4</sup> Other formats providing same information in equally useable manner are acceptable.

### 4.0 Process

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.

## LANL TAILORED STANDARDS MANUAL (TSM), Chapter 16

### 2.0 DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE (DPIRC) DUTIES

A. Develop statement of special inspections (SSI) when required by IBC 1704.3, and test and inspection plan (TIP); see ESM Chapter 16 Section IBC-IP for acceptable templates.

### 2.5 Contractual, preference, or other basis for requirement in 2.4:

Having a Test and Inspection Plan (TIP) is a LANL preference based on industry good practice and benefit to inspection process, so the responsible party to create the TIP is a LANL preference; no contractual requirement exists beyond the need to inspect for quality/conformity.

2.6 Type of VAR from ESM Chap 1, Z10 [*Applies only to standards variances*])

Type 2

2.7 Discipline

IBC Program

## 3.0 Request Information & Comments

3.1 NCR required (work has occurred)? No

If Yes, NCR Number: [Enter text.](#)

3.2 System/Component Affected

OpSystem Acronym & Name BLDG - Building

System Number or Name BLDG

3.3 Highest ML Level

ML-1

3.4 Proposal with Justification/Compensatory Measures:

Proposal—General

Responsibility for the development of the TIP is changed from the Design Professional in Responsible Charge (DPIRC) to the subcontractor for such projects. This aligns with industry practice for constructor responsibility for the planning and scheduling of tests and inspections.

<sup>1</sup> Ref. ESM Chapter 1 Section Z10 including Att C, 30-60-90% Deliverables. Also, Moderate Risk tasks normally require design per applicable ICC-ESR.  
Form 2137: VAR-10564, Page 3

For self-performed work, responsibility is changed to the responsible engineer; this is typically a field engineer but can be a system engineer, design engineer, or any individual designated by management. The TIP for self-performed work is to be developed in collaboration between internal constructor and responsible engineer.

Specific wording changes in affected documents:

**ESM, Chapter 1, Section Z10, Attachment C Design Deliverables Schedule 30-60-90-100%, Table Z10-AttC-2 EOR Deliverables Schedule (or N/A or delete row when subcontracting design)**

<b>Other</b>			
When IBC/IEBC, Special Inspections when required by ESM Chapter 16, IBC-GEN; ref. IBC-IP Att. B and I			

**ESM, Chapter 16, Section IBC-GEN – General IBC Program Requirements**

6.3 Constructor (e.g., Prime Subcontractor or LANL)

C. Develop Test and Inspection Plan (TIP or VIT); see Section IBC-IP.

6.4 Design Professional in Responsible Charge (DPIRC)

B. Develop statement of special inspections (SSI) when required by IBC 1704.3.

7.0 Process Overview

Step	Responsible Person	Action	Lowest Risk	Moderate Risk	Highest Risk
<b>Pre-Permit</b>					
2	DPIRC	Develop design (may be phased/multiple packages). [by 60%, develop preliminary inspection plan(s) delineating the degree of test, inspection, and Statement of Special Inspections (SSI, when required by IBC 1704.3) for the work being done. See Chapter 16 Section IBC-IP, IBC Inspection Process, for details. Submit to LANL person acting as Project Engineer, who then submits to PIO-CM, ES-EPD reviewers, and other policy mandated (e.g., PRID) reviewers for LBO review per IBC Permitting Process (EPD desk instruction DI-ES-EPD-001 ( <a href="#">internal link</a> ) <sup>2</sup>	AR	AR	X
4	DPIRC	Develop final design and test and inspection plan(s) delineating the degree of test, inspection, and Statement of Special Inspections (SSI, when required by IBC 1704.3) for the work being done. See Chapter 16 Section IBC-IP, IBC Inspection Process, for details. Designs shall document final design inputs (including Alt Level if applicable) and fire ratings of any walls being penetrated. Submit to LANL person acting as Project Engineer	AR	AR	X

<sup>2</sup> Ref. ESM Chapter 1 Section Z10 including Att C, 30-60-90% Deliverables. Also, Moderate Risk tasks normally require design per applicable ICC-ESR.

Step	Responsible Person		Action	Low Ris	
		<b>Post-Permit</b>			
9	Constructor		Produce Test and Inspection Plan (TIP or VIT) unless specifically directed to NOT produce TIP by LANL subcontract. See Chapter 16 Section IBC-IP, IBC Inspection Process, for details. Submit TIP for review/approval. See LANL Master Specification 01 4000, Quality Requirements for details.	AF	

A. Delegated and/or Deferred Design:

3.d. The DPIRC is also responsible for revising the submittal summary, and the SSI as necessary to match the deferred design, then submitting these revised documents with the deferred design.

**ESM, Chapter 16, Section IBC-IP—IBC Inspection Process**

3.0 Responsibilities and Duties

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

1. Duties are addressed primarily in LANL Master Specification section 01 4000, Quality Requirements.

a. TIP: Prepare test and inspection plan using the Attachment I template posted with this Section here<sup>4</sup>. 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). The constructor submits the TIP per LANL Master Specification 01 4000, *Quality Requirements* for review and approval by the LBO.

<sup>4</sup> Other formats providing same information in equally useable manner are acceptable.

- b. Constructors are required to perform QC inspections as required by the contract (using third-party, LBO-approved testing agencies where required).
- c. IBC Ch 17 Special Inspections are above and beyond that constructor QC and are performed by LANL, or LBO-approved third-party inspectors.
- d. Constructor QC inspections shall be preplanned, and Subcontractors must submit that schedule to LANL CM-CE Inspection Group prior to start of work.<sup>3</sup>

C. Design Professional in Responsible Charge

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

1. 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.

4.0 Process

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

## LANL TAILORED STANDARDS MANUAL (TSM), Ch. 16

### 2.0 DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE (DPIRC) DUTIES

A. Develop statement of special inspections (SSI) when required by IBC 1704.3; see ESM Chapter 16 Section IBC-IP for acceptable templates.

In conclusion, all references to DPIRC preparing a TIP are no longer applicable in all COE documents including but not limited to the ESM, APs, P34X procedures, specifications, and training documents. For subcontracted work, the constructor is responsible to prepare the TIP and, for self-performed work, it is the responsible engineer. The responsible engineer is typically a field engineer but can be a system engineer, design engineer or any designated individual by management. Procedures and other documents by other organizations could also be affected and should be updated appropriately.

#### Justification

Constructor development of an inspection plan is an industry good practice and benefits the inspection process by driving their understanding and ownership of the expectations. A new TIP template is nearing completion and, when issued in FY23, will facilitate TIP development by the constructor.

#### 3.5 Attachments

Document Title or Description [N/A](#)

3.6a Project ID

[N/A](#)

3.6b: Project Name

[N/A](#)

3.6c: Code of Record Date

[N/A](#)

3.7 Duration:

[Lifetime](#)

3.8a If Finite Period, Start Date:

[Click to enter a date.](#)

3.8b End Date:

[Click to enter a date](#)

3.8c Provide the PFITS number for tracking removal/correction: [\[PFITSNum\]](#)

3.9 USQD/USID required (Nuclear, High/Mod Hazard)? [No](#)

If Yes, USQD/USID Number [Click here to enter text.](#)

3.10 QA Review for process change matters potentially affecting LANL's NQA-1 implementation

Is a QPA Determination required?: [No](#) If **Yes**, then: [Choose an item.](#)

QPA Comments: [Enter text..](#)

3.11 POC Determination: [Accept](#)

POC Comments: [Enter text..](#)

3.12 Management Program Owner's (SMPO) Approval for P341 and APs; P342, ESM, ML-1 and -2, and Contract Matters; and P343

SMPO Determination: [Accept](#)

Comments: [Enter text..](#)

## 4.0 Participant Signatures **NOTE:** DO NOT ADD NAMES FROM WITHIN WORD! Save and close the form first, then do 1-4 below:

1. From the SharePoint library, select the document, then click the **ellipsis (...)** in the second column; a small dialog appears
2. In the small dialog click the **ellipsis** again
3. Click **Edit Properties** and check out the document if prompted to Enter names using the controls provided, then **Save**

<p>4.1 POC (Management Program Owner's Representative):</p> <p>Oruch, Tobin H</p>	<p>Organization ES-FE</p>	<p>Signature</p>
<p>4.2 Facility Design Authority Representative</p> <p>[FDARName] FDAR signature not required <input checked="" type="checkbox"/></p>	<p>Organization Enter text..</p>	<p>Signature</p>
<p>4.3 LANL Owning Manager (FOD or R&amp;D/Program)</p> <p>[FODorPrgmMgrName] FOD or Program Manager signature not required <input checked="" type="checkbox"/></p>	<p>Organization Enter text..</p>	<p>Signature</p>
<p>4.4 Quality Reviewer's Name:</p> <p>[QPAName] QPA review/signature not required <input checked="" type="checkbox"/></p>	<p>Organization Enter text.</p>	<p>Signature</p>
<p>4.5 Safety or Security Management Program Owner's Approval for P341 and APs; P342, ESM and Contract Matters; and P343</p> <p>Apperson, Jason Wesley SMPO signature not required (Type 1 variance) <input type="checkbox"/></p>	<p>Organization ES-FE</p>	<p>Signature</p>
<p>4.6 Additional Signer 1</p> <p>Richardson, Michael Joseph</p> <p>Role: Enter text.</p>	<p>Organization ES-DO</p>	<p>Signature</p>

<p>4.7 Additional Signer 2</p> <p>[AdditionalSigner2]</p> <p>Role: <a href="#">Enter text.</a></p>	<p>Organization</p> <p><a href="#">Enter text.</a></p>	<p>Signature</p>
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<p>4.8 CoE Administrator Signature</p> <p>Leyba, Matthew Anthony</p> <p><u>NOTE:</u> The CoE Admin is always the last signature placed on this document. The date of that signing is the date of this document.</p>	<p>Signature</p>
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