SECTION 01 4000

QUALITY REQUIREMENTS [NUCLEAR PROJECTS VERSION]

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LANL MASTER SPECIFICATION

Author: Delete [NUCLEAR PROJECTS VERSION] above when editing this section. Other sections refer to “01 4000 Quality Requirements” and this title needs to match them.

Word file at <http://engstandards.lanl.gov>

TO SEE the blue Authors notes

In Word2003, USE TOOLS-OPTIONS-VIEW-HIDDEN TEXT

In Word2007, click the Microsoft Office ButtonButton image, then Word Options, then Display, then the Hidden text check box.

In Word2010 and 2013, click paragraph symbol ¶ in Home/Paragraph menu block.

This Section includes administrative and procedural requirements for facility construction quality assurance and quality control. For programmatic equipment fabrication and installation it may be used and modified as needed.

This template must be edited for each project.  In doing so, specifier must add job-specific requirements.  Brackets are used in the text to indicate designer choices or locations where text must be supplied by the designer.  Once the choice is made or text supplied, remove the brackets. The specifications must also be edited to delete specification requirements for processes, items, or designs that are not included or applicable to the scope or project.   To seek a variance from requirements in the specifications that are applicable, contact the Engineering Standards Manual (ESM) General [POC](http://engstandards.lanl.gov/POCs.shtml#gen). Please contact POC with suggestions for improvement as well.  
  
When assembling a specification package, include applicable specifications from all Divisions, especially Division 1, General requirements.  
  
**This specification is to be used for nuclear projects (i.e., new Hazard Category 2 or 3 nuclear facilities and modifications to same) that may include ML-1 through ML-4 work.**

This Section includes quality requirements over and above those required to comply with codes and standards to provide increased confidence in areas including but not limited to procurement, storage and handling, installation and testing, and documentation required for ML-1, 2, and 3 nuclear applications. ML-4 requirements are also included to allow the design agency to include only one version of 01 4000 within a specification package. If only ML-4 work is included, the non-nuclear version of the 01 4000 section shall be used rather than this one. ALSO – design agency must coordinate this section with the requirements to be included in Exhibit H which specify additional Subcontract QA requirements.  
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1. GENERAL
   * + 1. SUMMARY
2. This Section includes quality assurance (QA) requirements for a new nuclear facility or modification to a nuclear facility designated as Hazard Category 2 or 3. Requirements are driven, in part, by 10 CFR 830.122; DOE Order 414.1D–Quality Assurance; SD330, Los Alamos National Laboratory Quality Assurance Program; the LANL Engineering Standards Manual Chapters 16–IBC Program (International Building Code); 15–Commissioning; and 21–Software; and ASME NQA-1 2008 with the NQA-1 2009 addenda (hereafter “NQA-1”).
3. Attachment A to this section summarizes the QA requirements applicable to the Work based on Management Level (ML).
4. Attachment B to this section provides a list of Specifications sections and the MLs that are applicable to each.
5. [Attachment C to this section provides the list of Engineering Systems, the associated safety classification, and applicable safety function.]
6. The functional (safety) classification of individual items and components are specified throughout individual specification sections and Drawings as [Safety Class (SC), Safety Significant (SS), OHC=Other Hazard Controls, Other ML-3, or Non-Safety (NS)].

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Delete ML designations below and throughout the Section that are not included within the Scope of Work.

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1. Structures, Systems, and Components (SSCs) are specified throughout the individual Specification sections with MLs of [ML-1 through ML-4]. The QA/QC requirements are aligned with the significance of the assigned ML with ML-1 being the most significant.

ML-4 = Non-Safety. SSCs shall be constructed and/or procured using the applicable codes and standards and the general QA requirements provided in this section. ML-4 Work shall be performed under the Subcontractor’s Quality Assurance Program and documented processes that are compliant with DOE Order 414.1D through implementation of selected parts of ASME NQA-1 as specified in Attachment A.

ML-3 = Those SSCs that are defined as Other Hazard Controls from Safety Analysis or perform other important functions as determined by Facility Management. ML-3 SSCs shall be constructed and/or procured using the applicable codes and standards, the general QA requirements provided in this section, the ML-3-specific requirements provided in this section, and the equipment-specific specifications. The ML-3 requirements are based on a graded approach to the requirements provided in ASME NQA-1 as specified in Attachment A.

ML-2 = Safety Significant (SS). These SSCs are Safety Related and shall be constructed and procured using the applicable codes and standards; the requirements provided in in this section and the requirements provided in ASME NQA-1.

ML-1 = Safety Class (SC). Same requirements stated for ML-2 above.

1. The terms “Quality Requirements” and Quality Assurance” are synonymous and are used interchangeably in this specification. Quality Assurance applies to all work types using a risk-based graded approach. [Construction and commissioning activities shall be performed under a Quality Assurance Program and associated implementing procedures that have been reviewed and approved by LANL prior to performing work as specified in Exhibit H of the Subcontract.]
   * + 1. DEFINITIONS
2. Certificate of Conformance (COC): A document signed or otherwise authenticated by an authorized individual certifying the degree to which items or services meet the specified requirements.
3. Certified Material Test Report (CMTR): A document attesting that the materials are in accordance with specified requirements, including the actual results of all required chemical and/or mechanical properties/analyses, tests, and examinations.
4. Commercial Grade Dedication (CGD): An acceptance process performed in accordance with NQA-1A 2009, Part II, Subpart 2.14 to provide reasonable assurance that a commercial grade item or service will perform its intended safety function and, in this respect is deemed equivalent to an item or service designed and manufactured or provided under the requirements of NQA-1.
5. Commercial Grade Item: A structure, system, or component, or part thereof, that affects its safety function and that was not designed and/or manufactured in accordance with the requirements of ASME NQA-1.
6. Hold Point: A mandatory verification point in the progression of a process activity that cannot be passed without being released by the responsible party that established the Hold Point. It is mandatory that the Subcontractor formally (in writing) notify the LANL STR five (5) working days in advance of all Hold Points. A Hold Point cannot be bypassed without the specific release by the designating organization by an approved Hold Point Waiver.
7. IBC: International Building Code, published by ICC.
8. ICC: International Code Council, publisher of IBC and parent of ICC-ES.
9. Installer/Applicator/Erector: Sub-tier subcontractor or another entity engaged by Subcontractor as an employee, or lower-tier subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
10. LANL Building Official (LBO): LANL’s Authority for the Building Program as detailed in the Engineering Standards Manual Chapter 16–IBC Program.
11. Measuring and Test Equipment (M&TE): Devices or systems used to calibrate, measure, gage, test, or inspect in order to control or acquire data to verify conformance to specified requirements.
12. Management Level: Grading based on an estimation of consequences of failure to LANL as an institution, which helps in establishing the degree of technical/administrative oversight and control (e.g., quality assurance/quality control) required to ensure that SSCs are capable of meeting their required function in the protection of the public, worker, environment, classified and Special Nuclear Material assets, and/or their ability to support meeting high-level institutional mission requirements.

Delete next paragraph if Project does not require mockups. Revise if any mockups are to be constructed at an off-site location.

1. Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Approved mockups establish the standard by which the Work will be judged.
2. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
3. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
4. Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.
5. Product Testing: Tests and inspections to establish product performance and compliance with industry standards that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to the LBO.
6. Quality Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction meets requirements.
7. Quality Control (QC) Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. .
8. Safety Related Terms (Nuclear):

Other hazard controls (OHCs): Preventive or mitigative controls that do not rise to the level of SC or SS but still enhance the safety of the facility. These controls are identified in the hazard evaluation table, but not explicitly credited with a SC/SS designation as identified in the DSA. Such controls are maintained in accordance with safety management programs and the Unreviewed Safety Question process. Other hazard controls are expected to be designed to the applicable industry code/standard for the given type of non-safety SSC (From DOE-STD-3009-2014).

Non-Safety (NS): Structures, systems, and components (SSC) which are not designated SC, SS, or OHC in the safety analyses.

Safety Related: SSCs which are designated as SC, SS, or OHC in the safety analysis.

Safety Significant (SS): SSCs which are not designated as safe-class SSCs but whose preventive or mitigative function is a major contributor to defense in depth (i.e., prevention of uncontrolled material releases) and/or worker safety as determined from safety analyses.

Safety Class (SC): SSCs, including portions of process systems, whose preventive or mitigative function is necessary to limit radioactive hazardous material exposure to the public, as determined from safety analyses.

1. Source Quality-Control Testing: Tests and inspections that are performed at the source; e.g., plant, mill, factory, or shop.
2. SSI: Statement of Special Inspections. An inspection plan exclusively for the requirements of IBC Chapter 17, per ESM Ch 16 IBC-IP Att H template.
3. Subcontractor: The entity performing fabrication or physical construction activity; normally the general contractor (a subcontractor to DOE), but when LANL is self-performing the Work, LANL takes this role.
4. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
5. TIP: Test and inspection plan for Subcontractor’s work based on the Specifications and Drawings.
6. VIT: A Verification of Inspection and Test Plan based on the TIP and SSI for work identified as Safety Class, Safety Significant, or OHC work.
7. Witness Point: A verification point in the sequence of Work which is designated for LANL to do monitoring and which Work may proceed after notification of the designated organization. It’s mandatory that the Subcontractor formally notify the LANL Subcontract Technical Rep (STR) two (2) business days in advance of all Witness points, or within a time period agreed to by LANL.
   * + 1. CONFLICTING REQUIREMENTS
8. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to LANL for a decision before proceeding.
9. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. Specified numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to LANL for a decision before proceeding.
   * + 1. ACTION SUBMITTALS
10. Project Quality Assurance Plan: Subcontractor shall submit a Project Quality Assurance Plan for review and approval by LANL prior to performing quality affecting Work. Quality affecting work includes siting, designing, procuring, fabricating, constructing, handling, shipping, receiving, storing, cleaning, erecting, installing, inspecting, testing, repairing, modifying, and decommissioning. The Project Quality Assurance Plan shall detail the Subcontractor’s quality assurance and QC implementation strategy for the Work. The Plan shall address how the Subcontractor implements the requirements of Exhibit H and this Specification section (01 4000) including application of the graded approach associated with each Management Level. The Plan shall identify key positions and roles and responsibilities and reference the specific quality related implementing procedures and forms applicable to the Work. If quality affecting changes other than minor changes are made to the Project Quality Assurance Plan, they shall be submitted to LANL for approval prior to implementation.
11. Qualification Data: Name and address of Testing Agencies to be utilized on the project.  The testing agencies will be reviewed to verify that they have been approved by the LBO in accordance with Article 1.7, QUALIFICATION REQUIREMENTS.
12. Test and Inspection Plan (TIP): An initial TIP is developed during design by the design agency and provided to Subcontractor (electronic file available). The initial TIP shall be built upon by Subcontractor to include a comprehensive listing of tests and inspections required by the specifications and Statement of Special Inspections (SSI). Provide TIP within 30 days prior to commencement of the Work included in the TIP. LANL will review and may add additional inspections and witness or hold points. TIP shall include inspections required by specifications and standards in tabular form and include the following:

Specification Section number and title.

Description, type, and periodicity of test and inspection

Applicable standards.

Test and inspection methods.

Number of tests and inspections required.

Time schedule or time span for tests and inspections.

Entity responsible for performing tests and inspections (e.g., Subcontractor qualified personnel, LANL Inspector, LBO-approved Special Inspector, or Structural Engineer-of-Record)

Requirements for obtaining samples.

Unique characteristics of each quality-control service.

Responsibility for who will witness.

Witness, Hold Point

1. Verification of Inspection and Test Plans (VIT) - A VIT Plan is only required for work identified as Safety Related (i.e., Safety Class, Safety Significant, or OHC). The following applies:

Provide a minimum of 30 days prior to commencement of the Work.

See Attachment D of this Specification for a sample form of the VIT Plan to be executed. LANL will review and may add additional inspections and witness or hold points for Safety Related work.

1. Coordination by Subcontractor: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

Schedule times for tests, inspections, obtaining samples, and similar activities.

Distribute schedule to LANL, AE, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1. Test and Inspection Reports: Prepare and submit certified (signed/endorsed) written Test and Inspection reports that include the following:

Date of issue.

Project title and number.

Name, address, and telephone number of organization performing tests.

Dates and locations of samples and tests or inspections.

Names of individuals making tests and inspections.

Description of the Work, test boundaries, and test and inspection method.

Identification of product and Specification Section.

Complete test or inspection data.

Test and inspection results, comparison with acceptance criteria and tolerances, and an interpretation of test results to assure that test requirements have been satisfied.

Reference to information on action taken in connection with test deviations and inspection nonconformances.

Record of temperature, weather conditions, and other pertinent test conditions at time of sample taking and testing and inspecting, if relevant.

Certification statement that indicates whether tested or inspected Work complies with the Subcontract requirements. Report shall be signed by the professional certifying that the tests submitted either complies with the Subcontract requirements or comments on the outcome of the test, as applicable. It is the responsibility of the Subcontractor to confirm that the report has been signed and that LANL STR acknowledges the outcome of the tests or inspection.

Name, signature, and date of responsible inspector or test authority.

Recommendations on retesting and re-inspecting.

Listing of M&TE including serial number, and calibration due date for all test and inspection equipment that requires calibration.

1. Licenses and Certificates: For LANL's records, submit copies of licenses, certifications, correspondence, records, and similar documents used to establish compliance with standards and regulations that pertain to performance of the Work.
2. For IBC work, each Subcontractor and Subtier responsible for the fabrication or erection of a main wind- or seismic-force-resisting system, designated seismic system, or a wind- or seismic-resisting component listed in the Statement of Special Inspections must submit a Statement of Responsibility per ESM Chapter 16 Section IP Att H to LANL as a submittal prior to the commencement of work.

## QUALITY ASSURANCE

1. General QA Requirements (applicable to all work including ML-4 performed at a nuclear facility).

Work (including software and firmware work activities) shall be performed, at a minimum, in accordance with documented processes that meet the criteria of 10 CFR 830.122 and DOE O 414.1D through implementation of selected parts of ASME NQA-1 as specified in Attachment A, the specific Exhibit H of the Subcontract, and the Subcontractor’s approved QA Program.

All Work shall be performed in accordance with Subcontractor’s Quality Assurance Program [and the Project Quality Assurance Plan] as reviewed and approved by LANL. In accordance with Exhibit H, if quality affecting changes are made to Subcontractor’s QA Program following LANL approval, they shall be submitted to LANL for approval prior to implementation.

* 1. Subcontractor/Supplier Quality Assurance Program shall be sufficient to control design, materials, procurement, preparation, fabrication, constructing, installation, repairing, special processes, inspection, testing, cleaning, erecting, installing, handling, packaging, and shipping (as applicable), records to ensure production of an acceptable finished product.
  2. Subcontractor shall provide for access to its facility and records for the following source activities: Inspection, testing, verification, surveillance, or audit by DOE/NNSA and LANL representatives, LANL’s designated representative, or other parties authorized by LANL (i.e., Subcontractors and sub-tier Subcontractors).
  3. Subcontractor is responsible for including (i.e., flowing down) the quality assurance requirements herein in its lower-tier subcontracts and monitoring and enforcing such performance to the extent necessary to ensure Subcontractor’s compliance with these requirements.

Work shall be performed in accordance with the approved design documents. Design questions and design change requests must be transmitted in accordance with Subcontract requirements via formal documents such as Requests for Information (RFI), Field Change Requests (FCR) for field work, or Subcontractor Deviation Disposition Request (SDDR, Form 2178) for engineered fabrications. No design changes will be implemented unless formally approved by LANL. Note: An RFI is not a change document and is not to be used to implement design changes.

Applicable design bases and other requirements necessary to assure adequate quality shall be included or referenced in documents for procurement of items and services.

The preparation, issue, and change of documents that specify quality requirements or prescribe activities affecting quality such as instructions, procedures, and drawings shall be controlled by Subcontractor to ensure that correct documents are being employed in the performance of the Work.

Subcontractor shall verify and document that an item or service being furnished complies with the procurement requirements and approved submittals prior to installation. For certain items (circuit breakers, fasteners, and permanently installed hoisting, lifting, and rigging equipment) this verification shall be performed in accordance with Subcontractor’s receipt/receiving inspection program.

Inspections required to verify conformance of an item or activity to specified requirements or continued acceptability of items in service shall be planned and executed by Subcontractor. Inspection results shall be documented by Subcontractor.

Subcontractor shall plan, execute and document tests in accordance with test requirements and acceptance criteria*.*

Tools, gages, instruments, and other measuring and test equipment used for acceptance determinations shall be controlled, calibrated with NIST traceable standards, at specific periods, adjusted, and maintained to required accuracy limits.

Items that do not conform to specified requirements shall be controlled to prevent inadvertent installation or use. Controls shall provide for identification, documentation, evaluation, segregation when practical, disposition of nonconforming items, and for notification to affected organizations.

LANL may pause Work on affected systems, structures, or components for unresolved or ongoing quality concerns.  Notification will be provided by LANL to Subcontractor specifying the quality concern.  Subcontractor shall respond within 24 hours with proposed corrective action, time frame for implementation, and identify impact to other related Work.  Note this provision is in addition to and separate of the Nonconformance Reporting process and may be implemented for in process Work.

1. QA Requirements for Items that are designated as ML-3

At a minimum apply the QA requirements identified in 1.5.A – General QA Requirements and as follows.

ML-3 activities and services shall be prescribed by and performed in accordance with documented instructions, procedures, or drawings that include or reference appropriate quantitative or qualitative acceptance criteria for determining that prescribed activities have been satisfactorily accomplished. The activity shall be described to a level of detail commensurate with the complexity of the activity and the need to assure consistent and acceptable results.

Software Quality Management

1. Software (including firmware) used in the design or analysis of safety related items or provided as a product (including embedded software) shall be documented to be in compliance with a Software Quality Management process that meets the criteria within DOE Order 414.1D Attachment 4, Safety Software Quality Assurance Requirements and ASME NQA-1, Requirement 3, Design Control, Paragraphs 400, 700, 800 and 900; Requirement 11, Test Control; and Part II, Subpart 2.7, Quality Assurance Requirements for Computer Software for Nuclear Facility Applications.
   1. Software shall be identified as safety software based upon the definition of safety software in DOE Order 414.1D.
2. QA Requirements for Items that are Safety Class or Safety Significant (i.e., ML-1 and ML-2)
   1. At a minimum apply the QA requirements identified in 1.5.A and 1.5.B above and as follows.
   2. For work identified as Safety Class, Safety Significant, or safety software the requirements of ASME NQA-1 apply to the Subcontractor and sub-tier Subcontractors in the performance of the work. This includes the requirement for documented receipt/receiving inspection of ML-1 and 2 items prior to installation.
   3. Supplier/Vendors for ML-1 and 2 SSCs or safety software shall be on the Subcontractors approved Suppliers List or materials/items/services shall be procured under an approved Commercial Grade Dedication (CGD) program.
      * 1. QUALITY CONTROL
3. General QC Requirements (applicable to all work including ML-4)

Subcontractor Responsibilities: Tests and inspections in TIP, SSI, and elsewhere in Specifications and Drawings that are not explicitly assigned to LANL are Subcontractor's responsibility. Unless otherwise indicated, provide quality-control services specified.

1. Engage a qualified, LBO-approved, testing agency to perform quality-control services.
   1. Subcontractor shall not employ the same entity engaged by LANL, unless agreed to in writing by LANL.
   2. Notify LANL STR at least 24 hours in advance of the time when Work that requires testing or inspecting will be performed, unless otherwise indicated in individual Sections.
   3. Provide access to approved designs. The Subcontractor is responsible for providing inspectors with access to approved design.
   4. Submit a certified (signed/endorsed) written report per this Section of each quality-control service.
   5. Testing and inspections requested by Subcontractor and not required by the Subcontract Documents are at Subcontractor’s expense.
   6. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in submittal procedures Section 01 3300.

Subcontractor shall inspect and document acceptance of Work in accordance with Subcontractor’s Project QA Plan and procedures and technical requirements prior to notifying LANL of readiness for LANL required inspection. First line confirmation of compliance with technical requirements is the responsibility of Subcontractor QA/QC personnel, not LANL personnel.

Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Subcontract Documents will be charged to Subcontractor**,** and the Subcontract Sum will be adjusted by Change Order.

Subcontractor shall verify, inspect, and document that systems are complete, constructed, and configured per construction drawings and specifications including any design changes prior to commencement of acceptance testing activities.  Verification of system completion is a Hold Point to be validated by LANL prior to authorization of acceptance testing by Subcontractor.

Retesting/Re-inspecting: Provide, at Subcontractor’s expense, quality-control services for retesting and re-inspecting, for replacement construction Work resulting from work that failed to comply with the Subcontract Documents.

Testing Agency Responsibilities (services retained by Subcontractor): Cooperate with AE and Subcontractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify AE and Subcontractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
   1. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
   2. Submit a certified (signed/endorsed) written report of each test, inspection, and similar quality-control service through Subcontractor.
   3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
   4. Do not release, revoke, alter, or increase the Subcontract Document requirements or approve or accept any portion of the Work.
   5. Do not perform any duties of Subcontractor.

Suspect/Counterfeit Items (S/CI)

1. The Subcontractor shall develop and implement effective controls for the detection and prevention of S/CI that meet the applicable requirements of DOE O414.1D to prevent the introduction of S/CI to LANL facilities. Refer to DOE Handbook DOE-HDBK-1221, *Suspect/Counterfeit Items Resource Handbook* for further information.
2. Types of material, parts, and components known to have been misrepresented include but are not limited to fasteners, such as bolts, nuts, and washers; cranes and hoists, as well as other hoisting, rigging, or lifting equipment; valves; pipe and fittings; flanges; electrical equipment and devices; plates, bars, shapes, channel members, and to structural items, and welding rods and electrodes.
3. An item that does not conform to established requirements is not normally considered and S/CI if the nonconformity results from one or more of the following conditions:

Defects resulting from inadequate design or production QC,

Damage during shipping, handling, or storage,

Improper installation,

Deterioration during service,

Degradation during removal,

Failure resulting from aging or misapplication, or

Other similar causes, which do not involve a misrepresentation about nature, quality, form, or function.

Control and Storage of All Items

1. For all items, controls shall be established to assure that only correct and accepted items are used or installed. Identification shall be maintained on the items or in documents traceable to the items, or in a manner that assures that identification is established and maintained.
   1. Items procured will be stored/staged for use, outside of the construction site boundary, as designated areas for completion of receipt inspection activities. Items in these areas will be identified, controlled, and stored according to approved procedure/processes in compliance with the requirements of the subcontract.
   2. Costs associated with storage/handling of items to be stored on LANL property are the responsibility of Subcontractor.
   3. Subcontractor shall control the handling, receiving, storage, cleaning, packaging, shipping, and preservation of items to prevent damage or loss and to minimize deterioration. Handling, storage, and shipping of items shall be conducted in accordance with established work and inspection instructions, drawings, specifications, shipment instructions, or other pertinent documents or procedures specified for use in conducting the activity.
   4. Items shall be segregated based on the ML of the item.

Non-Conforming Items

1. Subcontractor shall evaluate and notify LANL of each nonconformance against items and services that do not meet procurement document requirements within three (3) working days of discovery in accordance with Subcontract requirements. This includes, but is not limited to, nonconformance with documentation requirements and technical or material requirements, including situations where an item may be restored so as to function unimpaired, but it does not meet the original subcontract/design requirement.
   1. Notice of a nonconformance shall consist of a written description of the nonconformance (with sketches and pictures highlighting the nonconforming condition) and when available, an assessment of the cause and the proposed disposition/corrective action, including technical justifications for any proposed Use-As-Is or Repair dispositions.
   2. In cases where the Subcontractor proposes a Use-As-Is or Repair disposition, the disposition of the nonconformance will be approved by LANL with corresponding disposition implementation verified. Such Use-As-Is or Repair nonconformance documentation will be supplied by Subcontractor to LANL and *all* records of nonconformance shall be maintained by the Subcontractor.
   3. Subcontractor shall allow for the return of any materials determined by LANL to be nonconforming as a result of Subcontractor’s receipt inspection.
   4. Subcontractor shall provide and process all NCRs records in accordance with Exhibit H and Subcontractor’s approved Project Quality Assurance Plan.

Associated Services (actions and efforts of Subcontractor): Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide auxiliary services as requested. Notify agency in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
   1. Incidental labor and facilities necessary to facilitate tests and inspections.
   2. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
   3. Facilities for storage and field curing of test samples.
   4. Delivery of samples to testing agencies.
2. QC Requirements for ML-3 Items

Apply the QC requirements identified in 1.6.A - General QC Requirements and as follows:

Items (batch, lot, component, part) shall be identified from the initial receipt and fabrication of the items up to and including the installation and use for all materials and components that require a CMTR per the specification.

Receiving Items

1. Identification shall be in compliance with the requirements of NQA-1 Part II, Subpart 2.2 Quality Assurance Requirements for Packaging, Shipping, Receiving, Storage, and Handling of Items for Nuclear Facilities and LANL’s Quality Assurance Program.
2. Verify that the identification and markings are in accordance with applicable codes, specifications, approved submittals, purchase orders, and drawings (document with pictures when possible).
   1. Verify, by examining manufacturer documentation, that the item received was fabricated, tested, and inspected prior to shipment in accordance with the applicable code, specification, approved submittals, purchase order, or drawing. Verification of these requirements and confirmation that all required submittals for the item have been reviewed and approved by LANL shall be performed prior to installation of the item. Receiving inspection shall verify by objective evidence at a minimum the following and determine acceptance per the approved submittals, technical specifications and drawings, or other applicable requirements:
3. Configuration
4. Identification including Part Numbers and Markings per applicable code or standard
5. Dimension, physical, and other characteristics
6. Freedom from shipping damage
7. Cleanliness
8. Freedom from Suspect/Counterfeit items
9. Items shall be labeled and controlled in accordance with their receipt inspection status.

Storage and Control of Items

1. Storage and handling shall be in compliance with the requirements of NQA-1 Part II, Subpart 2.2 Quality Assurance Requirements for Packaging, Shipping, Receiving, Storage, and Handling of Items for Nuclear Facilities and Subcontractor’s Quality Assurance Program.
2. At a minimum, ML-3 components shall be stored, handled, and controlled in accordance with the Level D requirements provided in ASME NQA-1 Part II, Subpart 2.2 and as required by the Specification.
   1. Items shall be segregated and marked per their inspection and acceptance status.
3. QC Requirements for Safety Class or Safety Significant Items (i.e., ML-1 and ML-2)

Apply the QC requirements identified in 1.6.A – General QC Requirements and 1.6.B QC Requirements for ML-1 and 2 items as follows:

* + - 1. Comply with the requirements of Subcontractor’s approved QA Program and implementing procedures and in accordance with ASME NQA-1.
      2. Comply with approved Commercial Grade Dedication Plans and Verification Inspection and Test Plans, as applicable.
      3. Inspection and Test Personnel shall be certified in accordance with Subcontractor’s Approved QA Program and ASME NQA-1.
      4. QUALIFICATION REQUIREMENTS
         1. Qualification requirements specified below establish the minimum qualification levels for the skills or organizations listed; individual Specification sections specify additional requirements.

If more detailed requirements are needed for paragraph B below, add this information to specific individual Sections. Examples include Installer employing workers trained and approved by manufacturer, Installer being acceptable to manufacturer, and Installer being an authorized representative of manufacturer for both installation and maintenance.

* + - * 1. Installer: A firm or individual with 5 years of experience in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
        2. Manufacturer: A firm with 5 years of experience in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
        3. Fabricator: A firm with 5 years of experience in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
        4. Steel Fabricator Qualifications: Firms performing structural fabrication subject to IBC Chapter 17 shall be pre-approved by the LBO. In cases where the desired fabricators are not LBO-approved and with LBO permission, Subcontractor shall arrange for the IBC-related activities to be inspected during fabrication in the shop by an LBO-approved special inspector.
        5. Professional Engineer: An engineer registered to practice in New Mexico and experienced and registered as providing engineering services of the discipline and kind indicated. Engineering services are defined as those performed for installation of systems, assembly, or product design that is similar to those indicated for this Project in material, design, and extent.
        6. Testing Agency: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and approved by the LBO per Eng Standards Manual Chapter 16 Section IBC-TIA. Subcontractor shall utilize only LBO-approved testing agencies.
        7. Inspection and Test Personnel: Personnel who conduct inspections and tests must be qualified in accordance with the applicable code, standard, regulation, specification, or other Subcontract requirement. Prior to assigning personnel to perform inspection and test activities, supervision shall determine and document that the individuals have the experience or training commensurate with the scope, complexity, or special nature of the activities. Inspection for acceptance shall be performed by qualified persons other than those who performed or directly supervised the work being inspected.
      1. PRECONSTRUCTION TESTS

1. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

Subcontractor responsibilities include the following:

1. Provide test specimens representative of proposed products and construction.
2. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
3. Provide configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.

Subparagraph below attempts to ensure that tested assemblies will be representative of actual construction. This requirement may complicate testing and add cost.

1. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
2. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
3. When testing is complete, remove test specimens, assemblies, mockups, and laboratory mockups. Do not reuse products on Project.

Testing Agency Responsibilities:

1. Submit a certified (signed/endorsed) written report of each test, inspection, and similar quality-assurance service to LANL with copy to Subcontractor.
2. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Subcontract Documents.

Delete paragraph and subparagraphs below if not required. If retaining, indicate location, size, and other details of specific mockups on Drawings or in individual Specification Sections. Revise wording if only one mockup is required.

1. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

Build mockups in location and of size indicated.

Notify LANL 7 days in advance of dates and times when mockups will be constructed.

Demonstrate the proposed range of aesthetic effects and workmanship.

Obtain LANL’s approval of mockups before starting work, fabrication, or construction. Allow 7days for initial review and each re-review of each mockup.

Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.

Demolish and remove mockups when directed, unless otherwise indicated.

* + - 1. SPECIAL INSPECTIONS AND TESTS
         1. Special Inspections will be conducted by LANL or LANL-approved agency where indicated in individual Specification Sections and in accordance with the SSI.
         2. Onsite Special Inspectors are provided by LANL at LANL expense.
         3. For offsite fabrication work where Subcontractor does not choose a LANL (LBO)-approved fabricator, special inspection by LANL or LANL-approved agency is at Subcontractor’s expense.
         4. Regardless of location, third-party testing and NDE is at Subcontractor’s expense.
         5. Structural steel fabricators whose work includes seismic-force-resisting structures (SFRS) or demand-critical welds are subject to project-specific IBC reviews and approvals for processes, procedures, qualifications and materials prior to start and may require shop inspections by LANL- approved IBC Inspectors prior to, during, or post fabrication.

1. PRODUCTS   
   (Not Used)
2. EXECUTION
   * + 1. Work shall only be accomplished to LANL-approved, controlled design (Specifications, Drawings, and amendments to same such as Field Change Notices and Requests, Supplier Deviation Requests, etc.), of which a copy of latest must be maintained on the work site by Subcontractor.
          1. This design, along with the Subcontract and applicable codes and standards included in the subcontract, specifications, and drawings shall be complied with and must be contractually “passed-down” to any sub-tier fabricators, testing agencies, or others subcontracted or assigned by the Subcontractor.
          2. Work shall comply with the design processes and work processes described in the LANL Quality Assurance Program (QAP) document or the LANL-approved Subcontractor QAP document.
       2. ACCEPTABLE TESTING AGENCIES
          1. Approved agency listing in Engineering Standards Manual [Chapter 16](http://engstandards.lanl.gov/ESM_Chapters.shtml#esm16).
          2. LANL LBO approval does not negate Subcontractors’ responsibility to assure fabricators, testing, and NDE agencies perform correctly.
       3. REPAIR AND PROTECTION
          1. Protect construction exposed by or for quality-control service activities.
          2. Repair and protection are Subcontractor's responsibility, regardless of the assignment of responsibility for quality-control services.
          3. Subcontractors must comply with all LANL standard procedures and processes as specified in the Subcontract including safety, quality (such as hold tags), environmental, and other signs, tags, warnings, etc. For building work, Subcontractors shall comply with the applicable requirements of the IBC (and IEBC, as applicable) as amended by LANL in Engineering Standards Manual Chapter 16 including IBC-GEN Att. A: LANL Building Code (LBC) and Att. B: LANL Existing Building Code (LEBC). Where the LANL Standards including this chapter invoke the IBC, interpret to mean this LANL version of the Building Code.

END OF SECTION

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Do not delete the following reference information:

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

THE FOLLOWING REFERENCE IS FOR LANL USE ONLY

This project specification is based on LANL Master Specification Section 01 4000 (nuclear projects version) Rev. 0, dated November 7, 2017.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Authors Note: Attachment A shall be edited to include only applicable MLs and shall be reviewed prior to issuance by the Project Quality Representative to ensure the applicable NQA-1 requirements are specified and the degree to which they are implemented (i.e., Basic vs. Full compliance) is appropriate for the Work to be performed.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

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| **ATTACHMENT A**  **Graded Approach to NQA-1 Based Upon Management Level (ML) of the Component/System** | | | | | | | |
|  | | **ML-4** | | **ML-3** | | **ML-1/2** | |
| **Requirement** | **Title** | **NQA-1** | **Exhibit H Quality Clauseh** | **NQA-1** | **Exhibit H Quality Clauseh** | **NQA-1** | **Exhibit H Quality Clauseh** |
| 1 | Organization | F | QC-01A / QA-01B | F | QC-01A / QA-01B | F | QC-01A / QA-01B |
| 2 | Quality Assurance Program | F | QC-01A / QA-01B, QC-03 | F | QC-01A / QA-01B, QC-03 | F | QC-01A / QA-01B, QC-03 |
| 3 | Design Control | NR | QC-02 / QC-02A | Fe | QC-02 / QC-02A | F | QC-02 / QC-02A |
| 4 | Procurement Document Control | B | QC-01A / QA-01B, QC-17 / QC-17A | Fa | QC-01A / QA-01B, QC-17 / QC-17A | F | QC-01A / QA-01B, QC-17 / QC-17A |
| 5 | Instructions, Procedures, and Drawings | B | QC-07, QC-11 | B | QC-7,  QC-11 | F | QC-7,  QC-11 |
| 6 | Document Control | F | QC-34 | F | QC-34 | F | QC-34 |
| 7 | Control of Purchased Items and Services | Bb | QC-29 | Fc,d,e | QC-06, QC-29 | Fc | QC-06, QC-29 |
| 8 | Identification and Control of Items | B | QC-16, QC-27 | F | QC-16, QC-13, QC-27 | F | QC-16, QC-13, QC-27 |
| 9 | Control of Special Processes | B | QC-09, QC-10 | F | QC-09, QC-10 | F | QC-09, QC-10 |
| 10 | Inspection | Bf | QC-08 | F | QC-08 | F | QC-08 |
| 11 | Test Control | Bf | QC-08 | F | QC-08 | F | QC-08 |
| 12 | Control of Measuring and Test Equipment | B | QC-12 / QC-12A | F | QC-12 / QC-12A | F | QC-12 / QC-12A/12B |
| 13 | Handling, Storage, and Shipping | Bb | QC-16 / QC-29 | Fc | QC-16 / QC-29 | Fc | QC-16 / QC-29 |
| 14 | Inspection, Test and Operating Status | B | QC-08 | B | QC-08 | F | QC-08 |
| 15 | Control of Non-conforming Items | B | QC-25 / QC-27 | F | QC-25 / QC-27 | F | QC-25 / QC-27 |
| 16 | Corrective Action | B | QC-26 | B | QC-26 | F | QC-26 |
| 17 | Quality Assurance Records | B | QC-34 | F | QC-34 | F | QC-34 |
| 18 | Audits | NRg | QC-22 | NRg | QC-22 | F | QC-22 |
| Subpart 2.2 | QA Requirements for Packaging, Shipping, Receiving, Storage, and Handling of Items for Nuclear Facilities | NR | QC-29b | F | QC-29c | F | QC-29c |
| Subpart 2.7 | Quality Assurance Requirements for Computer Software for Nuclear Facility Applications | NR | QC-36 | Fe | QC-36 | Fe | QC-36 |
| Subpart 2.14 | Quality Assurance Requirements for Commercial Grade Items and Services | NR | N/A | NR | N/A | F | QC-6;  QC-8 |

Key:

B = Applicable NQA-1 Basic Requirement, Section 100 only

F = Applicable NQA-1 Full Requirement, all sections

NR = Not Required

Notes:

a = ML-3 sub-tier suppliers are not required to have an NQA-1 program unless NQA-1 is incorporated by reference in the applicable code or standard (e.g., ASME AG-1) compliance is required.

b = Subpart 2.2 is not required for ML-4 items.

c = Compliance with Subpart 2.2 for items shall be as defined by specifications.

d = Receipt inspection shall be documented as defined in Specification 01-4000, *Quality Requirements.*

e = A commercial grade dedication program is not required for ML-3/Software Risk Level (SRL)-3.

f = Inspection and Test reports must also comply with the requirements within the Specification

g = Subcontractor is required to perform assessments and surveillances per LANL-approved QA program

h = Applicable portions of ASME NQA-1, Subparts 2.4, 2.5, 2.8, and 2.20 are implemented through the ESM as specified in Exhibit D; applicable portions of ASME NQA-1 Subpart 2.15 are implemented in Exhibit F.

| **ATTACHMENT B**  **Example List of Construction Specifications and the Associated Management Levels (MLs)** | | | | |
| --- | --- | --- | --- | --- |
| **Specification No.** | **Title** | **Engineering**  **Control (s)** | **ML-4** | **ML-3** |
| 01 1116 | Work by Owner | NA | X | X |
| 01 2500 | Substitution Procedures | NA | X | X |
| 01 3300 | Submittal Procedures | NA | X | X |
| 01 3545 | Water Discharge Requirements | NA | X |  |
| 01 4000 | Quality Requirements | NA | X | X |
| 01 4200 | References | NA | X |  |
| 01 4444 | Offsite Welding and joining Requirements: General Welding requirements | NA | X | X |
| 10 4400 | Fire Protection Specialties | NA | X |  |
| 10 5100 | Metal Lockers | NA | X |  |
| 11 5000 | Drum Tumbler Enclosure Fabrication | EC-25 |  | X |
| 11 5100 | Drum Transport and Tumbling System | NA | X |  |
| 13 4800 | Sound, Vibration, and Seismic Control | EC-17 |  | X |
| 21 1313 | Wet Pipe Sprinkler Systems - Normal Confidence | EC-10 |  | X |
| 22 0529 | Hangers and Supports for Plumbing Piping and Equipment | EC-17 | X | X |
| 22 0548 | Vibration and Seismic Controls for Plumbing, Piping and Equipment | EC-17 | X | X |
| 22 0554 | Identification for Plumbing, HVAC, and Fire Piping and Equipment | NA | X |  |
| 22 0713 | Plumbing and HVAC Insulation | NA | X |  |
| 22 0813 | Testing Piping Systems | EC-1, EC-2, EC-3, EC-8, EC-14, EC-16, EC-21, EC-24 | X | X |
| 22 0816 | Disinfection of Potable Water Piping | NA | X |  |
| 22 1100 | Facility Water Distribution | NA | X |  |
| 22 1316 | Sanitary Waste and Vent Piping | NA | X |  |
| 22 1413 | Facility Storm Drainage Piping | NA | X |  |
| 22 1500 | Compressed Air Systems | NA | X |  |
| 22 3700 | Domestic Water Heaters | NA | X |  |
| 22 4200 | Plumbing Fixtures | NA | X |  |
| 22 6313 | Gas Piping for Laboratory & Healthcare Facilities | NA | X |  |
| 23 0593 | Testing, Adjusting, and Balancing for HVAC | EC-9, EC-23 |  | X |
| 23 2113 | Hydronic Piping | NA | X |  |
| 23 2123 | Hydronic Pumps | NA | X |  |
| 23 2300 | Refrigerant Piping | NA | X |  |
| 23 2500 | HVAC Water Treatment | NA | X |  |
| 23 3101 | HVAC Ducts | EC-9, EC-23 |  | X |
| 23 3225 | Bag in Bag out Housings | EC-9 |  | X |
| 23 3300 | Air Duct Accessories | EC-9, EC-23 |  | X |

| **ATTACHMENT C**  **Crosswalk by System and Engineering Control [example, produce to match project]** | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **System Name** | **Acronym** | **Subsystem(s)** | **Equipment** | **Engineering Control** | **Safety Function** | **Category** | **ML Level** |
| TRU External Collection  System | TLWECS | Acid Transfer Subsystem | Acid Underground Transfer Piping; Associated Valves | EC-16 | Confine TRU wastewater to protect workers from uncontrolled chemical release or release of radioactive  material. | OEITS | ML-3 |
| Caustic Transfer Subsystem | Caustic Underground Transfer Piping;  Associated Valves | EC-16 | Confine TRU wastewater to protect workers from uncontrolled chemical release or release of radioactive  material. | OEITS | ML-3 |
| Spare Transfer  Subsystem | Spare Underground  Transfer Piping;  Associated Valves | EC-16 | Confine TRU wastewater to protect workers from uncontrolled chemical release or release of radioactive  material. | OEITS | ML-3 |
| Appurtenance  Support Subsystem | Anchors, Hangers, &  Supports | EC-17 | Prevent overhead equipment from falling and damaging process equipment, piping, drums, and tanks. | OEITS | ML-3 |
| Instrumentation  Subsystem | Leak Detection | EC-18 | Protect workers from exposure to hazardous and radioactive material. | OEITS | ML-3 |
| TRU Internal Collection  System | TLWICS | Secondary  Containment  Subsystem | Influent Storage Area  Secondary Containment Basins | EC-4 | Limit worker exposure to spilled hazardous chemicals and radioactive liquids. | OEITS | ML-3 |
| Sumps (Process Area and Chemical Storage Area) | EC-27 | Limit worker exposure to spilled  hazardous chemicals and radioactive liquids. | OEITS | ML-3 |
| Instrumentation  Subsystem | Leak Detection | EC-18 | Protect workers from exposure to hazardous and radioactive material. | OEITS | ML-3 |
| TLW Influent Storage System | TINF | Acid Storage  Subsystem | Acid Influent Tank;  Associated Pumps, Piping, and Valves; and Sample Collection Boxes | EC-1 | Confine TRU wastewater, protecting workers from exposure to hazardous chemicals (nitric acid) and an uncontrolled release of radioactive material. | OEITS | ML-3 |

NA = not applicable

NS = Non-Safety

OEITS = Other Equipment Important to Safety (NOTE, the term now used is OHC = Other Hazard Controls)

SSC = structures, systems, and components

| **ATTACHMENT D**  **Verification of Inspection and Test Plan Development (VIT)** | | | | | | | | | | | | | | | | | | | | |
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| **SPECIFICATION PACKAGE NUMBER:** | | | | | | | | | | | | | | | | | | | | |
| **SPECIFICATION PACKAGE TITLE:** | | | | | | | | | | | | | | | | | | | | |
| Material to be Purchased:  Safety Class  Safety Significant  OHC=Other Hazard Controls  Other ML-3  Non-Safety | | | | | | | | | | | | | | | | | | | | |
| **VIT Plan Coversheet and Revision History** | | | | | | | | | | | | | | | | | | | | |
| **Revision Number** | | | **Revision Date** | **Description/Justification for Revision** | | | | | | **Signature** | | | | | | | | | | **Date** |
| 0 | | |  | Initial Issue | | | | | | **Preparer\*** | | | | | | | | | |  |
|  | | |  | **Checker/Independent Reviewer\*** | | | | | | | | | |  |
|  | | |  | **LANL SME (Security)\*** | | | | | | | | | |  |
|  | | |  | **Design Team Leader\*** | | | | | | | | | |  |
|  | | |  | **Quality Assurance\*** | | | | | | | | | |  |
|  | | |  | **LANL Design Authorization Approval** | | | | | | | | | |  |
|  | | |  | **Classification:**  **DC/RO** | | | | | | | | | |  |
| **Rev. No.** | | | **Date** | **Revision Description** | | | | | **Preparer** | | **Checker/IR** | | | **Design Team Lead** | | | **Design Authority** | | | **LANL Des. Auth.** |
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| **INSPECTION REQUIREMENTS** | | | | | | | | | | | | | | | | | | | | |
| **Insp. No.** | | **Component or Item Description** | | **Specification Number & Paragraph** | **Funct. Class** | **Inspection Requirements** | | **Acceptance Criteria** | | | | | **Implementing Organization** | | | **Witness or Hold Point** | | | **Implementing Activity, Schedule** | |
| I-1 | |  | |  |  |  | |  | | | | |  | | |  | | |  | |
| I-2 | |  | |  |  |  | |  | | | | |  | | |  | | |  | |
| I-3 | |  | |  |  |  | |  | | | | |  | | |  | | |  | |
| I-4 | |  | |  |  |  | |  | | | | |  | | |  | | |  | |
| I-5 | |  | |  |  |  | |  | | | | |  | | |  | | |  | |
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| **TESTING REQUIREMENTS** | | | | | | | | | | | | | | | | | | | | |
| **Test No.** | **Component or Item Description** | | | **Specification Number & Paragraph** | **Funct. Class** | | **Test  Requirements** | **Acceptance Criteria** | | | | **Implementing Organization** | | | **Witness or Hold Point** | | | **Implementing Activity, Schedule** | | |
| T-1 |  | | |  |  | |  |  | | | |  | | |  | | |  | | |
| T-2 |  | | |  |  | |  |  | | | |  | | |  | | |  | | |
| T-3 |  | | |  |  | |  |  | | | |  | | |  | | |  | | |
| T-4 |  | | |  |  | |  |  | | | |  | | |  | | |  | | |
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\* Subcontractors may use equivalent titles for their organizations.

| **ATTACHMENT D**  **Verification of Inspection and Test Plan Development (VIT)** | |
| --- | --- |
| **Content Requirements for VIT Plans** | |
| **Column Title** | **Required Information** |
| Inspection/Test Number | Enter a sequential number for each inspection or test to be performed (e.g., I-1, I-2, through I-n for inspections; T-1, T-2, and T-n for tests). |
| Component or Item Description | Describe the item or component that is to be inspected or tested (e.g., Damper Assembly; instrumentation and controls electrical components; hydraulic actuator assembly; component handling equipment). Multiple inspections or tests may be performed on any specific item or component. Each inspection or test will require a separate line on the inspection or test plan. |
| Specification Number & Paragraph | Cite the specific paragraph in the related Specification that states the requirements for the inspection of test that is to be performed. |
| Functional Class | State the Functional Class that applies to the item or component that is to be inspected or tested (i.e., SC=Safety Class; SS=Safety Significant; OHC=Other Hazard Controls; Other ML-3; NS=Non-Safety). |
| Inspection Requirements | Describe each individual inspection or test that is to be performed. The description must be specific enough to plan and schedule the related inspection or test. The description should include the characteristic to be inspected or tested and method to be performed in accordance with what performance criteria (e.g., for inspection: structural weld visual inspection per Std. XYZ Section 123; critical piping weld joint PT per Std. ABC Section 789; for testing: Damper leak test per Std. EFG Section 456 [or Spec. paragraph number]; post seismic testing operational test). |
| Acceptance Criteria | Cite the specific acceptance criteria (Section/Paragraph/Table) in the Specification or refer to the criteria in the related National/Industry Standard down to the definitive section/paragraph. |
| Implementing Organization | Identify the organization or entity that will perform the inspection or test (e.g., CSUM=CMRR start up management; OII=outside independent inspector; OITA=outside independent test agency; LRI=LANL Receipt Inspection; LOI=LANL Owner's Inspector; LSQR=LANL Supplier Quality Representative; S=supplier; PI=peer inspection group; Other, specify). |
| Witness or Hold Point | State whether a Witness or Hold Point is associated with the inspection or test to be performed. If not, enter NA. |
| Implementing Activity, Schedule | Identify the activity or event related to when in the fabrication process the inspection or test will be performed (e.g., in process first item; in process every item; pre-shipment; pre or post functional test; post seismic evaluation; in process % sample of lot or run). If sampling has been used, ensure that the sampling procedures are based on standard statistical methods that have been approved by engineering. |