Construction/Targetry Interface QA

CCI-TII Checklist Instructions

Purpose

The Range Project Construction Checklists provide the construction contractor and those involved in the construction quality oversight with a checklist of common items required during the construction phase of a range project. Range designers should also use the checklist to ensure that the design meets the interface required by the RDG. The Government should include the requirement for the contractor's support of the inspections in the construction contract and discuss the inspection requirements at the construction kickoff meeting. The checklists are a quality assurance guide only and do not replace the Army publications (ARs, TCs, FMs, RDG, etc.).

Inspection Checklists

There is a checklist for each unique emplacement, feature, and facility that is included as part of any range and interfaces with the targetry system. Each range type has a CCI/TII checklist that combines all of the emplacements, features, and facilities that are standard on the specific range. Use the checklist that is specific to each range type. The CCI/TII checklist portfolio includes the CCI/TII range specific checklists.

Procedures

Each checklist item is marked preferred **(P)** or required **(R)** on the checklist. The checklist user should mark the **"YES"** or **"NO"** block after each item and write clarifying remarks in the **"NOTES"** column when appropriate. Resolve the required items marked **"NO"** prior to continuing to the next project phase.

Construction Inspections

AR 350-19 mandates two inspections, a Construction Compliance Inspection (CCI), and a Target Interface Inspection (TII) during the construction phase of a range project.

CCI

The CCI is an inspection to ensure the construction contractor understands the concept for constructing each target type. At the CCI, the contractor will provide one emplacement of each

type for inspection. (Mock-up emplacements must include all elements of work required for a fully constructed emplacement.) The CCI should occur early in the construction period to minimize re-work by the contractor. It is recommended that the contractor only purchase the materials necessary for the construction the emplacements demonstrated at the CCI.

TII

The TII is a final inspection conducted near the completion of the construction phase of a range project. The TII includes an inspection of all targets, features, and facilities interfaces required by the target system. This inspection validates the construction will interface with standard Army targetry. The transition between the construction contractor and the target installer is coordinated during the TII. The TII generates a list of all deficient interface items requiring correction with a designation of responsibility for the correction. A formal MFR Target Interface Inspection Deficiencies List signed by the Government construction contract Contracting Officer (KO) or the Contracting Officers Representative (COR), verifying that all TII deficiencies have been corrected, must be submitted to the MCX prior to issuing notice to proceed to the target installer.

High Risk Projects

On projects with higher risks, consider requiring the submittal of a mock-up target emplacement to the MCX for review and approval prior to purchase of materials for all target emplacements. High risk projects are those being constructed by contractors with very limited or no prior experience constructing ranges, projects constructed in locations where ranges have not been constructed through the MILCON program recently, or due to the importance of the project to the Army. The mock-up process benefits the construction contractor and the Government quality assurance representatives. The MCX may elect to conduct site visits in conjunction with the construction of the mock-up emplacements. These site visits provide a preconstruction brief on the MCX inspection process for the project with lessons learned and target interface requirements for the follow-on target contract.

DESIGN PHASE

The construction contractor must be made aware of the inspections and the construction contract must require him to support the inspection. The preconstruction conference should include the topic with a provision of the CCI/TII checklist. The inspection requirements should also be included in a Division 1 section of the construction contract specifications. The Quality Control section is the recommended location, or inserting a separate specification section to address other Government inspection and quality assurance issues. The following sections include the suggested language specific to the range types (Small Arms or Maneuver Range, CACTF, Shoothouse, and UAC). Use only the language for the specific range type.

Small Arms or Maneuver Range

3.1 CONSTRUCTION COMPLIANCE INSPECTION (CCI)

The Government will perform a Construction Compliance Inspection (CCI) to assess construction progress and to identify problem areas with target interface items early to avoid costly and extensive corrective actions and project delays at the Target Interface Inspection (TII). Target interface items include all portions of

construction that physically connect to the target equipment or provide for the protection of the equipment. The US Army TRADOC Capability Manger for Ranges (TCM-Ranges) will schedule the CCI in conjunction with the RTLP MCX (HNC), the applicable Corps of Engineers District, PEO-STRICOM, TACOM-Warren, the installation, and the Major Command (MACOM) when construction has reached the point that the following items can be checked. A minimum of one of each type of target emplacement shall be complete, including the installation of all electrical power equipment, all data equipment including power and data cables and conduits. In all cases, the data termination racks and samples of the power and data cables and associated connectors shall be on site and available for inspection, but they do not have to be installed. Space shall be shown for the master data panel(s) and cable trays or wireways for routing cables to range operating system(s). A CCI Checklist has been developed to conduct this inspection. Any "required" items noted during the CCI shall be corrected prior to continuing to the next phase, all other items shall be corrected in a timely manner.

3.2 TARGET INTERFACE INSPECTION (TII)

The Government will perform a Target Interface Inspection (TII) when all target equipment interface points are completed and ready for inspection (usually around 90 – 95 percent construction completion or about 30 days prior to the end of construction). The US Army TRADOC Capability Manger for Ranges (TCM-Ranges) will schedule the TII in conjunction with the RTLP MCX (HNC), the applicable Corps of Engineers District, the installation, the MACOM, PEO-STRICOM, TACOM-Warren, and the target installation contractor. All target emplacements shall be complete, including the installation of all electrical power equipment, and all data equipment including power and data cables and conduits. Power cables shall be connected to all associated electrical equipment and tested. At the target emplacements, data cables shall be terminated/ connected in the MTDP (Master Target Data Panel) and tested. At the range operations center, data cables shall be terminated/connected in the data termination rack (DTR) and tested. Cable tray(s) or wireway(s) for routing cables to range operating system(s) shall be installed. 120/240V, 20A circuits shall be installed in junction boxes near the master data panel or the data termination rack. A TII Checklist has been developed to conduct this inspection. Any items noted during the TII shall be corrected prior to closeout of the construction contract.

OPTIONAL SECTION. Coordinate during the design of every range project if mock-up of electrical equipment is required prior to contractor purchasing materials.

3.3 TARGET EMPLACEMENT MOCK-UP

Provide two mock target emplacements with all required electrical power and communication equipment prior to purchase of any electrical materials for target emplacements. Both mock-up emplacements shall contain all electrical components assembled on plywood of the dimensions of a Stationary Infantry

Target (SIT) emplacement, 54" wide x 18" tall. One mock-up shall be constructed with the equipment required in an emplacement that contains a Master Target Data Panel and the other emplacement shall be constructed with the equipment required in an emplacement that contains a Target Data Panel. The mock-up shall also contain all conduit, conduit fittings, and cable seal fittings required in typical emplacements. Provide enough wire and cables to complete all terminations inside the data enclosures. The mock-up emplacements shall be retained on site for the duration of the construction contract.

The purpose of the mock up emplacement is to verify the materials used for the electrical components in the target emplacements, and to permit the review of the quality of workmanship used to assemble the components. The contractor shall not purchase materials for the electrical components in the target emplacements until the mock-up emplacement has been reviewed and accepted by the RTLP MCX.

Combined Arms Collective Training Facility

3.1 CONSTRUCTION COMPLIANCE INSPECTION (CCI)

The Government will perform a Construction Compliance Inspection (CCI) to assess construction progress and to identify problem areas with target interface items early to avoid costly and extensive corrective actions and project delays at the Target Interface Inspection (TII). Target interface items include all portions of construction that physically connect to the target equipment or provide for the protection of the equipment. The US Army TRADOC Program Integration Office (TPIO-Live) will schedule the CCI in conjunction with the RTLP MCX (HNC), the applicable Corps of Engineers District, PEO-STRICOM, and the installation, and the Major Command (MACOM) when construction has reached the point that the following items can be checked (usually about midpoint of construction). A minimum of one training building shall be complete, including the installation of all electrical power equipment, all data equipment including power and data cables and conduits. In all cases, the data termination racks and samples of the power and data cables and associated connectors shall be on site and available for inspection, but they do not have to be installed. In the control building Range Operations Center (ROC), space shall be shown for the master data panel(s) and cable trays or wireways for routing cables to range operating system(s). A CCI Checklist has been developed to conduct this inspection. Any "required" items noted during the CCI shall be corrected prior to continuing to the next phase all other items shall be corrected in a timely manner.

3.2 TARGET INTERFACE INSPECTION (TII)

The Government will perform a Target Interface Inspection (TII) when all target equipment interface points are completed and ready for inspection (usually around 90 – 95 percent construction completion or about 30 days prior to the end of construction). The US Army TRADOC Program Integration Office (TPIO-Live) will schedule the TII in conjunction with the RTLP MCX (HNC), the applicable Corps of Engineers District, the installation, the MACOM, PEO-STRICOM, and

the target installation contractor. All training buildings shall be complete, including the installation of all electrical power equipment, and all data equipment including power and data cables and conduits. Power cables shall be connected to all associated electrical equipment and tested. At the target emplacement locations and data termination racks, data cables shall be terminated/ connected and tested. At the ROC, fiber data cables shall be terminated/connected in the data termination rack (DTR) and tested. Cable tray(s) or wireway(s) for routing cables to range operating system(s) shall be installed. 120V, 20A circuits shall be installed near the locations for the master data panels (OPA installed) and the data termination rack. A TII Checklist has been developed to conduct this inspection. Any items noted during the TII shall be corrected prior to closeout of the construction contract.

Live Fire Exercise Shoothouse

3.1 CONSTRUCTION COMPLIANCE INSPECTION (CCI)

The Government will perform a Construction Compliance Inspection (CCI) to assess construction progress and to identify problem areas with target interface items early to avoid costly and extensive corrective actions and project delays at the Target Interface Inspection (TII). Target interface items include all portions of construction that physically connect to the target equipment or provide for the protection of the equipment. The US Army TRADOC Program Integration Office (TPIO-Live) will schedule the CCI in conjunction with the RTLP MCX (HNC), the applicable Corps of Engineers District, PEO-STRICOM, and the installation, and the Major Command (MACOM) when construction has reached the point that the following items can be checked (usually about midpoint of construction).

At a minimum:

- *Data Enclosure is mounted in Shoothouse electrical room.*
- *The lighting contactor and panelboard mounted in Shoothouse electrical room.*
- *The power and data outlets (UTO) to one target location mounted in Shoothouse area.*
- *Provisions should be shown in the Shoothouse for routing of the power and data cables to the UTO locations from the electrical room data enclosure.*
- *Provisions should be shown in AAR for routing data cables from the data termination rack throughout the AAR.*
- *Wireway (conduit) routed for fiber cable from underground into the data enclosure at the Shoothouse and data termination rack in AAR.*
- *Provide samples of SC type connector, fiber optic cable, and cat6 cable.*
- *The AAR should have the data termination rack on-site and the location identified within the AAR.*

A CCI Checklist has been developed to conduct this inspection. Any "required" items noted during the CCI shall be corrected prior to continuing to the next phase all other items shall be corrected in a timely manner.

3.2 TARGET INTERFACE INSPECTION (TII)

The Government will perform a Target Interface Inspection (TII) when all target equipment interface points are completed and ready for inspection (usually around 90 – 95 percent construction completion or about 30 days prior to the end of construction). The US Army TRADOC Program Integration Office (TPIO-Live) will schedule the TII in conjunction with the RTLP MCX (HNC), the applicable Corps of Engineers District, the installation, the MACOM, PEO-STRICOM, and the target installation contractor.

At a minimum:

- *Power is turned on to the AAR and Shoothouse site.*
- *All items such as the data enclosure, lighting contactor, UTO (power and data), fiber cabling, data cabling, power cabling, wireways(conduits), lightning protection, and grounding for the Shoothouse is complete.*
- *All items such as the data termination rack, wireways(cable trays/conduits), power to the DTR, lightning protection, and grounding for the AAR is complete.*
- *HVAC in AAR is located and on-site or installed to determine size.*

A TII Checklist has been developed to conduct this inspection. Any items noted during the TII shall be corrected prior to closeout of the construction contract.

Urban Assault Course

3.1 CONSTRUCTION COMPLIANCE INSPECTION (CCI)

The Government will perform a Construction Compliance Inspection (CCI) to assess construction progress and to identify problem areas with target interface items early to avoid costly and extensive corrective actions and project delays at the Target Interface Inspection (TII). Target interface items include all portions of construction that physically connect to the target equipment or provide for the protection of the equipment. The U.S. Army TRADOC Program Integration Office (TPIO-Live) will schedule the CCI in conjunction with the RTLP MCX (HNC), the applicable Corps of Engineers District, PEO-STRICOM, the installation, and the Major Command (MACOM) when construction has reached the point that the following items can be checked (usually about midpoint of construction).

At a minimum:

- *Minimum one stationary infantry target (SIT) emplacement on the Grenadier Gunnery station shall be complete, including the installation of all electrical power equipment and all data equipment in the emplacement.*

- *Minimum one training building shall be constructed to a point where one Single Target Outlet and One Double Target Outlet is installed.*
- *The installation of the conduit system in the trainings buildings shall be at a point where it can be determined during the inspections how the complete system will be constructed.*
- *For the Grenadier Gunnery station, all equipment used in the data circuits shall be on site and available for inspection. This includes the control pedestal, all data terminating equipment in the pedestal, and any other equipment used in providing the complete data system.*
- *The power and data cables do not have to be installed for the CCI, but samples of the power and data cables and associated connectors shall be on site and available for inspection.*

A CCI Checklist has been developed to conduct this inspection. Any "required" items noted during the CCI shall be corrected prior to continuing to the next phase all other items shall be corrected in a timely manner.

3.2 TARGET INTERFACE INSPECTION (TII)

The Government will perform a Target Interface Inspection (TII) when all target equipment interface points are completed and ready for inspection (usually around 90 – 95 percent construction completion or about 30 days prior to the end of construction). The U.S. Army TRADOC Program Integration Office (TPIO-Live) will schedule the TII in conjunction with the RTLP MCX (HNC), the applicable Corps of Engineers District, the installation, the MACOM, PEO-STRICOM, and the target installation contractor.

At a minimum:

- *All training stations shall be complete, including the installation of all electrical power equipment and all data equipment.*
- *Power cables shall be connected to all associated electrical equipment and tested.*
- *At the target emplacement locations, data termination racks, and target control pedestals all data cables shall be terminated, and connected. It is preferred that all cable testing is complete, but not a requirement.*
- *Power is on to all training stations.*

A TII Checklist has been developed to conduct this inspection. Any items noted during the TII shall be corrected prior to closeout of the construction contract.