Special Inspections Manual

for the City of Irvine

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Overview

All Special Inspectors who work in the City of Irvine shall be registered with the City and abide by all requirements of the City of Irvine Municipal Code and Chapter 17 of the California Building Code.

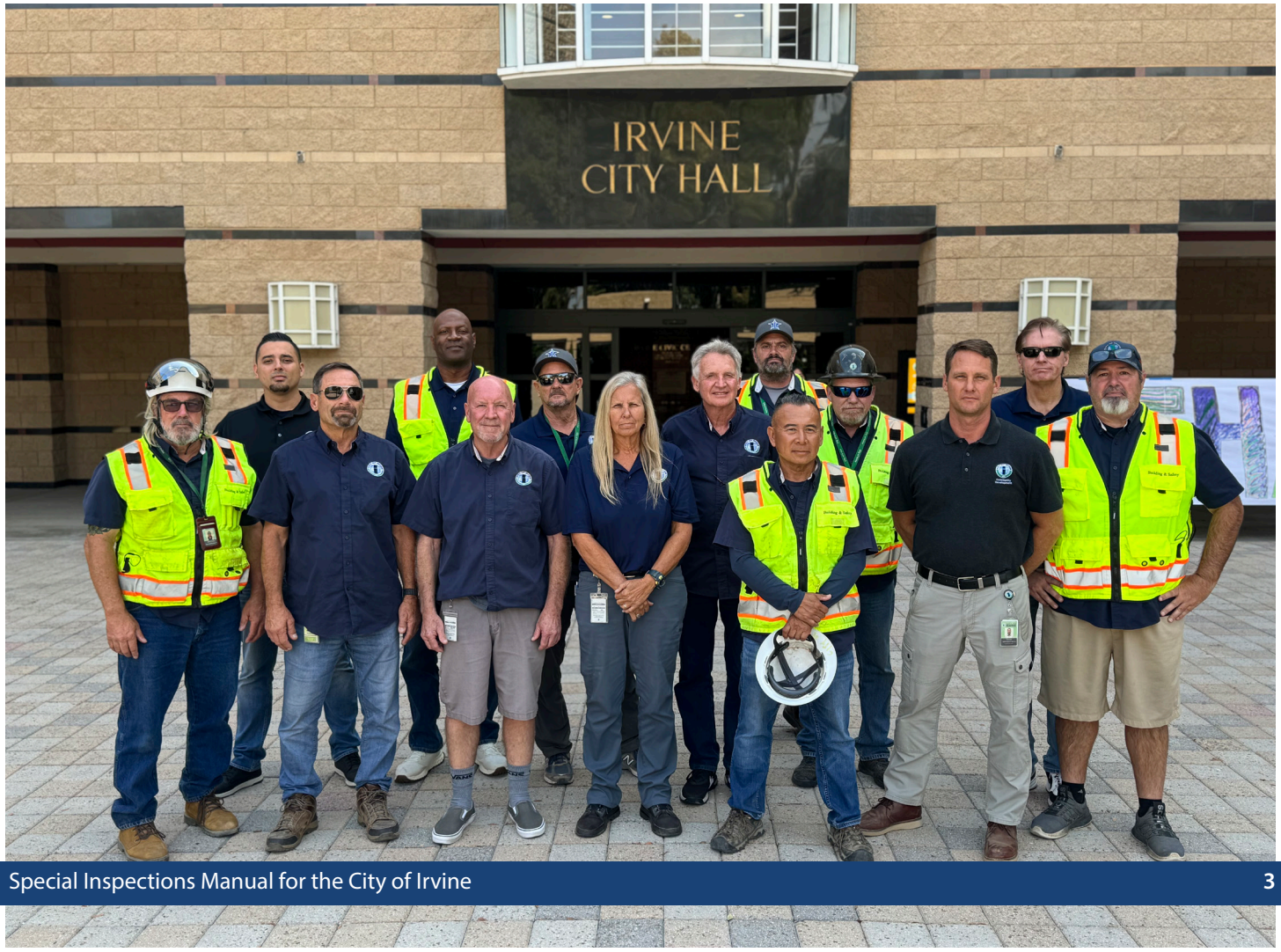
The purpose of this manual is not to cover the requirements of the California Building Code or the Irvine Municipal Code, or even to detail all forms of Special Inspection, but rather to clarify the City's expectations for all Special Inspectors who work within the City and to describe the most common types of Special Inspections carried out.

All questions and concerns related to the City's requirements and expectations can be referred to the Commercial Inspection Supervisor who oversees the Special Inspection Program.

Find City of Irvine Forms and Informational Bulletins Online

All forms referred to in this manual can be found and downloaded on the City of Irvine website at *cityofirvine.org* by searching "Forms Directory."

City of Irvine Informational Bulletins are referenced throughout this manual. These can be found online here or by searching "Informational Bulletins" on the City website at *cityofirvine.org*.



Licensing Requirements

All Special Inspectors who perform work within City limits shall first obtain a City of Irvine license for the particular type(s) of construction or operation that is subject to Special Inspection. The Special Inspector's name and Irvine license number shall be included on all documents submitted.

Evidence of qualification for each type of construction or operation must be provided at the time of application. Examples of suitable evidence include certification from a recognized agency such as ACI, AWS, ICC, LA City, LA County, DSA, OSHPD/HCAI, etc. Please note that for shear nailing and asphalt licenses, a résumé, and/or in-person interview will be required prior to the issuance of your City license.

Special Inspector licenses must be renewed annually. At the time of renewal, evidence of qualification must be shown to be current. Each Special Inspector who performs inspection work on a jobsite shall provide a copy of their City of Irvine license to be filed on-site and available for the City Inspector to review.

How to Apply/Renew a City License

You can apply for or renew your Special Inspection City license online here. Or, you can visit *cityofirvine.org* and search "Special Inspector." Click on the link for "Apply as a Special/ Deputy Inspector."

If you are unable to complete the online process, you may visit the Community Development front counter for assistance. Make sure to bring all applicable licenses and certifications with you.

Special Inspection Licenses issued by the City of Irvine include, but are not limited to, the following:*

- Reinforced Concrete
- Concrete Testing (ACI Field Technician Grade I)
- Prestressed Concrete
- Structural Masonry
- Structural Steel and Bolting
- Structural Welding
- Spray Applied Fire Proofing
- Asphalt**
- Shear Nailing (High Load Diaphragm/Shear Wall)***
- Others

**The City of Irvine does not issue licenses for Soils Special Inspectors, and they are not required to use the Special Inspector Daily Performance Report.*

***Contact the Grading Inspection Supervisor to arrange an interview/submit a résumé.*

****Contact the New Residential Inspection Supervisor or the Commercial Inspection Supervisor to arrange an in person interview.*

Special Inspector Duties & City Expectations

The primary responsibility of a Special Inspector is to perform inspections based on a City of Irvine-approved set of plans. Shop drawings, RFIs and other non-City approved documents may be used to aid in the outworking of an inspection but in no way should be used as replacing or superseding the City-approved plans.

Thorough Inspections

Thorough inspections should be the foundation of all inspection work done by Special Inspectors who perform work in the City of Irvine. Careful adherence to the approved set of plans and knowledge of the applicable codes and trades is critical. All Special Inspectors are expected to inspect all aspects of any given work that is required to be inspected by the Statement of Special Inspections as outlined in the approved set of plans and as required by code. If a Special Inspector writes a Daily Performance Report stating that all work was complete and per plan for work they have not personally witnessed, work a contractor promised to complete or fix, or work that is simply not complete, their license will be subject to suspension or revocation.

Communication

Regular, effective, and open communication with the City Inspector is highly desired and expected. Your City Inspector will make themselves available for phone calls, emails, and on-site interactions and sees their partnership with all Special Inspectors as a valuable and indispensable tool in working for the success of a project. If any concerns or needs arise, utilize your City Inspector as a resource in the resolution of the issue and keep them updated as to the details of the project.

Communication with the contractor performing the work is also crucial, and contractor personnel shall always be informed of the Special Inspector's presence on a jobsite as well as any deficiencies, code violations, or poor workmanship observed.

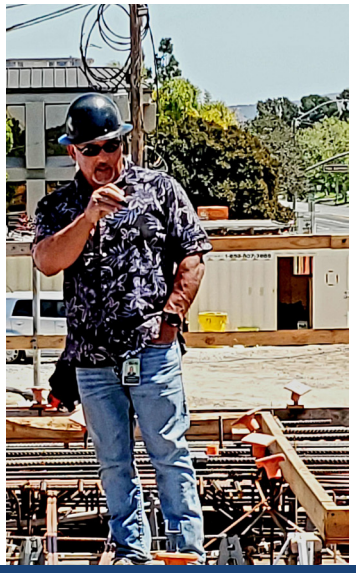
Special Inspection Report File

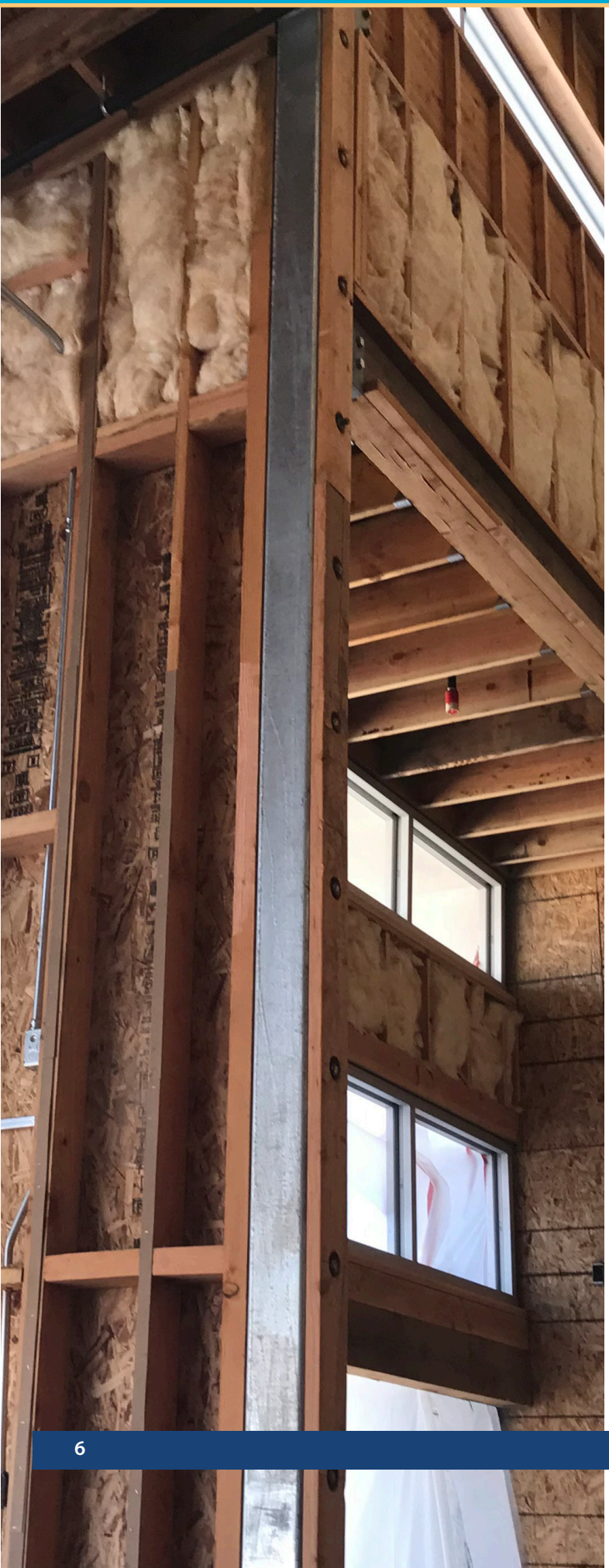
An Inspection Report File is to be maintained at the jobsite for the City Inspector to reference. This file shall consist of a three-ringed binder or binders, subdivided by main categories of work subject to Special Inspection. The City of Irvine Special Inspection Report File shall be used as a means of recording the contents of the file and should be kept as the first page of this file.

Note: Daily report forms provided by the Special Inspector's company may be substituted for the City of Irvine Special Inspector Daily Performance Report form, provided prior authorization is obtained from the City Inspector and the information therein is consistent with the City's form.

Concise & Thorough Daily Reports

Daily reports are used by the City Inspector to understand the work that they were not able to personally witness and should be recorded on the City of Irvine Special Inspector Daily Performance Report. Daily reports should be thorough and note locations, grid lines, details, methods, quantities, and any other pertinent information that will aid the City Inspector in having a complete picture of the work performed. Please refer to the specific section of this manual that pertains to the trade for which you will be performing inspections as a guide in helping you understand the minimum requirements for your daily reports and some pitfalls to avoid in the outworking of inspections.





Special Inspector Duties & City Expectations (continued)

Special Inspection Reports are to be generated on a daily basis at a minimum, and a separate report should be used for each permit as well as for each separate trade being inspected. The Special Inspector generating the report is responsible for properly numbering each report, filing a copy in the Inspection Report File, and logging each entry prior to leaving the jobsite on the day of which the inspection was performed.

Final Reports

Special Inspectors or inspection agencies (if employed by one) shall submit a final signed report to the building department stating that all items requiring Special Inspection and testing by the Statement of Special Inspection, as shown on the approved set of plans and as required by Code, were inspected and reported on and, to the best of their knowledge, is in conformance with the approved plans and specifications. Items not in conformance, unresolved items and any discrepancies in inspection coverage (*i.e.*, missed inspections, Periodic Inspections when Continuous was required, etc.) should be specifically itemized in this report.

Final reports shall include a cover sheet that lists the project name, address, lot, and tract number (if applicable), permit number, and the Special Inspector's name and City license number.

For projects where there are no deficiencies or issues pending that must be included in the final report, the following completed statement must also be included: "All (state the main categories of work) requiring Special Inspection has been inspected, reported, and found to be in conformance to the approved plans, specifications, and codes."

When Issues Arise in the Field

Special Inspectors working in the City of Irvine are considered the eyes and ears of the City Inspector and represent the owner, architect, or engineer of record. As such, they perform a vital function of quality control and are encouraged to communicate regularly with the City Inspector assigned to the project. Due to the nature of construction, issues arise from time to time with contractors, designers, or consultants. The following should be used as a guide in handling such issues.

Unpermitted Work

Any Special Inspector who becomes aware that work is being performed without proper City of Irvine permits or stamp-approved plans shall immediately notify the Building Official, appropriate Inspection Supervisor, or City Inspector by telephone or in person. If a Daily Performance Report is written for unpermitted work, the report shall specifically state that the work is unpermitted and no statement shall be included on the report that the work was done per plan.

Non-Compliant Work

All work that deviates from the approved set of plans, specifications, and/or applicable workmanship provisions of the code should be brought to the immediate attention of the contractor doing the work. A description of this work shall be included in the Exceptions section of the Daily Performance Report if the issue has not been resolved prior to the writing of the report. If the issue is not resolved in a timely manner or is about to be incorporated into the work, the Special Inspector shall immediately notify the contractor, architect or engineer of record and the Building Official, Inspection Supervisor, or City Inspector by telephone or in person. Such work shall be documented in a City of Irvine Special Inspector Non-Compliance Report and filed in the report file. Such a report shall include as a minimum the following information about each non-conforming item:

- Description and exact location
- Reference to applicable detail of approved plans/ specifications
- Name and title of each individual notified and method of notification

Once resolution of a Non-Compliance Report has been reached and the appropriate corrective work has been performed, a City of Irvine Special Inspector Record of Correction Report shall be completed and filed in the report file. The Special Inspector shall notify the City Inspector of the resolution and shall also make available a copy of the Record of Correction Report, which shall include the following:

- Reference to the corresponding Non-Compliance Report
- Description of the non-complying item/condition and state that the non-complying item/condition is now cleared and in compliance
- Describe the re-inspection/testing process, results and location
- If acceptance is provided through an engineering letter or detail approved by the Building Official, a copy of such letter or detail shall be attached.

Non-Approved Documentation Directing Work (RFIs, Emails, Bulletin, etc.)

If any document other than the approved set of plans is used as the basis for an inspection, it shall be noted as such on the Daily Performance Report as an exception and noted in the Exception section, and it shall not be stated that the approved plans were followed. Any work that is not performed in accordance with the City-approved plans is subject to rejection by the City Inspector, and failure of the Special Inspector to report it as non-compliant work could be a cause for the suspension/revocation of a Special Inspector's license to work in the City of Irvine.

Hazardous Conditions

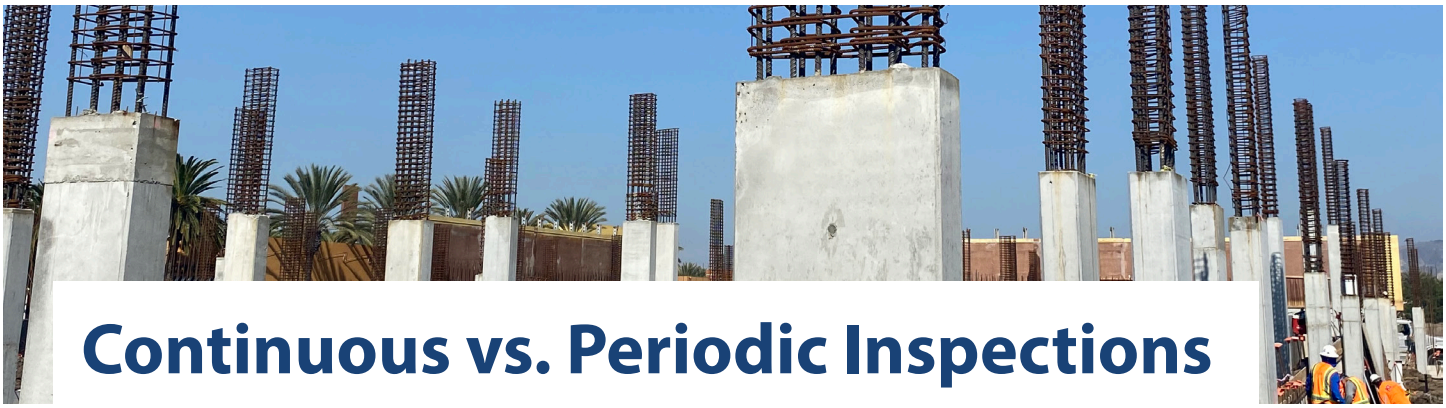
The Special Inspector is responsible for immediately notifying, by phone or in person, the Building Official, appropriate Inspection Supervisor, or City Inspector of any structural failure, collapse, or condition that, in the opinion of the Special Inspector, may lead to structural failure.

Requests for Inspection After Work is Performed

Any Special Inspector who is requested to write a Daily Performance Report for work that has already been performed and for which proper inspections have not and cannot be completed shall fill out a Special Inspector Non-Compliance Report and inform, by phone or in person, the Building Official, appropriate Inspection Supervisor, or City Inspector of the situation. Under no circumstances should a Special Inspector fill out a Daily Performance Report stating that all items have been properly inspected and are in compliance when the required inspections have not been properly performed.

Work Being Undone After City Inspection

From time to time contractors wish to undo work that has previously been inspected and approved by the City Inspector prior to proceeding. One example of this is removing hold downs and anchor bolts for a slab on grade prior to concrete placement. If a Special Inspector sees that work is being undone, they are to notify the contractor that this activity will be noted in the Daily Inspection Report as an exception and the City Inspector shall be notified immediately by phone or in person. Although it is not a Special Inspector's responsibility to direct work, they can often do much good when it comes to avoiding corrections through effective communication with the contractor.



Continuous vs. Periodic Inspections

Special Inspections are typically performed on either a Periodic or Continuous basis. Although the definition of these two terms are found in the Building Code in Chapter 2 and some trades specifically require periodic or continuous inspection based on the type of work being inspected and as defined in the code, this is not true in all cases. The codes that govern each trade as specified in Chapter 17 of the Building Code often clarifies the amount of time that a Special Inspector is to be present while work is ongoing.

For instance, Structural Steel Welding Special Inspection is governed by AISC 360, per Chapter 17 of the CBC. AISC 360 does not use a Continuous vs. Periodic Inspection standard but rather requires certain aspects of a weld, such as the fit up and the completed weld, to be looked at regardless of the type or size of weld. Since the fit up must be looked at for all welds and occurs prior to the welding process, proper Structural Welding Special Inspection must be performed in stages and cannot be solely performed after the welding process is complete. Unlike some types of periodic inspection where the inspector can arrive on the jobsite after the work has been performed, such as reinforced concrete rebar inspection, this would not be possible for welding due to the nature of the inspections required.

Please refer to the applicable code for clarification if Chapter 17 of the CBC does not specify periodic or continuous inspection.

Disciplinary Procedure

If a Special Inspector is found negligent, dishonest, or otherwise incompetent in the performance of their duties, their licensing with the City can be suspended or revoked at any time. They will be notified in person or in writing, either by letter or electronically using the email that was provided on their application for a Special Inspection License. This notice will inform the Special Inspector of their right to appeal the suspension/revocation. At the appeals hearing, evidence is to be presented by the Special Inspector showing good and sufficient cause in favor of retaining their City of Irvine license. Failure to appear for an appeals hearing will result in immediate suspension/revocation of their license. Typically, a determination will not be made at the appeals hearing but the Special Inspector will be notified by email or phone call of the determination within 48 hours.

Special Inspection Expectations

The following pages contain information pertinent to the different types of Special Inspections that are most common to jobsites throughout the City of Irvine. The information contained within is meant to serve as a guide and although extensive is not intended to be all encompassing or exhaustive.

Please use it as a guide in assisting you to perform thorough and accurate inspections as well as to properly document inspections performed in a concise and effective manner. If you have any questions, please feel free to consult with your City of Irvine Building Inspector or the Commercial Inspection Supervisor who is in charge of the Special Inspection Program for the City.

Reinforced Concrete

A Reinforced Concrete Special Inspection license allows for the inspection of numerous items, the most common of which are listed below and are addressed separately in this section:

- Reinforcing Steel
- Concrete Placement
- Pneumatically Placed Concrete (Shotcrete/Gunite)
- Post Installed Anchors and Epoxy Doweling
- Non-Shrink Grout Placement

Note: Although welded reinforcing steel may be an element of Reinforced Concrete, an American Welding Society (AWS) Certified Welding Inspector (CWI) License or ICC Structural Welding Special Inspection License is required to perform the welding inspection of such reinforcing steel.

Applicable Codes and References
(Not Meant to be an Exhaustive List)

- California Building Code (CBC)
- Building Code Requirements for Structural Concrete by the American Concrete Institute (ACI 318)
- Manual of Standard Practice of the Concrete Reinforcing Steel Institute (CRSI)
- ASTM's A615, A706, C31, C94, C138, C142, C172, C173, C231, C1064
- Applicable manufacturer's product specifications
- Irvine Informational Bulletins 181, 206, 267, 295, 317

Note: During concrete placement, it is common for Special Inspectors to have to deal with the addition of water to loads of concrete and to evaluate whether this addition of water is in conformance with the requirements of ASTM C94. The following is meant to serve as a basis for understanding those requirements but in no way should be taken as superseding the job spec or other job specific or agency specific requirements.

Per 12.7 of ASTM C94, a one-time addition of water should be added to the load on arrival at the jobsite if the slump is less than that specified by the approved set of plans. A one-time addition of water may be several distinct additions within a 15 minute time frame until the required slump is obtained. No additional water should be added after this initial slump adjustment. Discharge of the concrete shall be completed within 1½ hours from the time recorded on the concrete ticket, or before the drum of the concrete truck has revolved 300 revolutions, whichever comes first. These limitations on time and revolutions are permitted to be waived by the contractor if the slump of the concrete still complies with the job-specific slump requirements and no additional water has been added since the initial addition of water for the purposes of slump adjustment.

The following sections are meant to serve as a guide which outlines inspection duties, the minimum information required in a Daily Performance Report, and some additional items for which attention should be given.

Reinforcing Steel

Observation Duties

- Review the City of Irvine-approved set of plans and specifications. Approved shop drawing may be used as an aid to inspection but in no case should take the place of the approved set of plans.
- If applicable (typical for larger jobs), verify the mill test reports and compare to the job specs prior to allowing the unloading of steel at the site.
- Examine steel to ensure the required size, strength (*i.e.*, 40, 60, 90, etc.) and type (*i.e.*, A615, A706, etc.), as well as verifying that the steel is free from any unacceptable contamination, laitance or damage.
- Assure that the footing size and depth are per plan and that all debris, water, and loose dirt have been removed.

- Utilizing the approved details and notes, ensure that all reinforcing steel, embed plates, anchor bolts, etc., have been placed with proper spacing, splice length, alignment, orientation, support, clearances, and bends, and is securely fastened so as not to move during concrete placement.
- Verify required clearances to soil, forms, and proper coverage.
- Ensure that the required reinforcing steel samples are taken and tested per the job spec and per plan, if applicable.

Commonly Overlooked Items

- Proper orientation of columns
- Pay special attention to slab dowels and other items that connect two separate elements.
- Reinforcing steel typically requires 3" of clearance to soil.
- Field bending is not allowed, except for one permissible bend of a previously unbend member.
- If bars are called out as continuous (cont.), corner bars are to be placed at all intersections of bars to ensure continuity.
- Pay special attention to added bars.
- Plumbing and electrical piping or conduit is sometimes placed in footings or other areas where concrete is to be placed. Designer approval is often required as well as protection by sleeve or some other approved means.
- For pneumatically placed concrete, ensure that all splices are non-contact and with appropriate separation unless testing has been performed to allow for contact lap splices.

Daily Performance Report Minimum Requirements

- Specify Periodic or Continuous Inspection
- Applicable details and locations
- All reinforcing steel strength, size, grade per plan
- All reinforcing steel placed per plan
- All clearances per plan and code
- All accessory items such as anchor bolts, embeds, etc., placed per plan
- Footings and rebar clean and free from contamination/ defects
- If applicable, results of any tests performed
- All discrepancies and non-conformities per the approved set of plans and applicable code
- All materials issues or other violations of good workmanship

Concrete Placement

Observation Duties

- Review the City of Irvine-approved set of plans and specifications for mix design, concrete strength, slump, number/frequency of samples to be taken as well as all testing requirements (temperature, air content, etc.).
- Verify that all required tests are performed and all required samples of the proper size, type, and frequency are taken throughout the concrete placement.
- Monitor each concrete load for slump, temperature, and timing of additions of water or ice.
- Verify sufficient consolidation and required placement techniques (*i.e.*, use of tremie, etc.).
- Ensure that forms, reinforcing steel, or other embedded items remain in place and secured with required clearances maintained.
- All adjoining concrete to be clean, dampened, and roughened to ¼" amplitude.
- Inspect for trash or other contaminates and ensure removal prior to concrete placement.
- Monitor weather conditions such as rain and extreme temperatures.
- Note any requirements for treatment/finishing of placed concrete.
- Observe timing between loads and note cold joints or other placement issues.

Commonly Overlooked Items

- Poor consolidation
- Removal of embedded items, such as anchor bolts prior to concrete placement
- Proper storage of samples taken
- Wash out to be placed in wash out containers and not on the ground

Daily Performance Report Minimum Requirements

- Specify Periodic or Continuous Inspection
- Number of yards placed
- Mix design number and strength
- Clear description of location and elements
- Method of consolidation
- Whether any loads were outside of the slump or temperature requirements

- Whether any loads exceeded their time limit
- Violations of maximum allowable water being exceeded or water added outside of conformity with ASTM C94, see note on C94 above
- Frequency of samples taken, how many, and what size cylinders
- Whether the test results (temperature, air, etc.) conformed to code and plan
- All discrepancies and non-conformities per the approved set of plans and applicable code.
- All materials issues or other violations of good workmanship

A Special Inspector who is observing the placement of concrete and who is doing their own sampling, meaning no ACI technician is present to care for the sampling obligations, should include in their observation and reporting the following items:

Observation Duties

- Review the City of Irvine approved set of plans and specifications for mix design, concrete strength, slump, number/frequency of samples to be taken as well as all testing requirements (temperature, air content, etc.).
- Monitor each concrete load for slump, temperature, and timing of additions of water or ice.
- Verify that all appropriate tests are performed and all appropriate samples of the proper size, type and frequency are taken throughout the concrete placement.
- Monitor weather conditions such as rain and extreme temperatures.

Daily Performance Report Minimum Requirements

- Number of yards placed
- Mix design number and strength
- Whether any loads were outside of the slump requirements
- Whether any loads exceeded their time limit
- Violations of maximum allowable water being exceeded or water added outside of conformity with ASTM C94; see note on C94 above
- Frequency of samples taken, how many, and what size cylinders
- Whether the test results (temperature, air, etc.) conformed to code and plan
- All discrepancies and non-conformities per the approved set of plans and applicable code
- All materials issues or other violations of good workmanship

Pneumatically Placed Concrete Placement (Shotcrete/Gunite)

Observation Duties

- Review the City of Irvine-approved set of plans and specifications for mix design, concrete strength, slump, number/frequency of samples to be taken as well as all testing requirements (temperature, air content, etc.).
- Ensure that the same nozzle man who made the preconstruction panel sample is the same one placing the concrete.
- Verify that all appropriate tests are performed and all appropriate samples of the proper size, type and frequency are taken throughout the concrete placement.
- Monitor each concrete load for slump, temperature, and timing of additions of water or ice.
- Ensure that forms, reinforcing steel, or other embedded items remain in place and secured with proper clearances maintained.
- All adjoining concrete to be clean, dampened, and roughened to ¼" amplitude.
- Inspect for trash or other contaminates and ensure removal prior to concrete placement.
- Monitor weather conditions such as rain and extreme temperatures.
- Note any requirements for treatment/finishing of placed concrete.
- Observe timing between loads and note cold joints or other placement issues.

Commonly Overlooked Items

- Removal of embedded items such as anchor bolts/embed plates prior to concrete placement
- Making of proper samples and proper storage of samples taken
- Wash out to be placed in wash out containers and not on the ground

Daily Performance Report Minimum Requirements

- Specify Periodic or Continuous Inspection
- Number of yards placed
- Mix design number and strength
- Clear description of location and elements
- Whether any loads were outside of the slump requirements
- Whether any loads exceeded their time limit
- Violations of maximum allowable water being exceeded or water added outside of conformity with ASTM C94; see note on C94 above
- Frequency of samples taken, how many, and size of panels.
- Whether the test results (temperature, air, etc.) conformed to code and plan.
- All discrepancies and non-conformities per the approved set of plans and applicable code.
- All materials issues or other violations of good workmanship.

Post Installed Anchors and Epoxy Doweling

Observation Duties

- Review the City of Irvine-approved set of plans and specifications for type, size, length, required embedment, and number/spacing.
- Inspect holes for proper diameter and depth, as well as proper cleaning technique.
- Observe placement of epoxy and verify expiration date, manufacturer and type specified per plan ensuring that enough epoxy is placed to fill cavity and produce at least minimal squeeze out.
- Inspect for proper placement of epoxy dowels into cavity with appropriate twisting of dowel if required per manufacturer's installation instructions.
- Ensure required distances to edge of slab, curb, etc., if applicable.
- Verify that all appropriate tests are performed including pull or torque testing, if required.

Commonly Overlooked Items

- Proper cleaning technique for holes
- Proper embedment depth is attained.
- Proper materials and type of anchor are used.

Daily Performance Report Minimum Requirements

- Specify Periodic or Continuous Inspection.
- Clear description of location and elements.
- Detailing of type, size, length, embedment, and number/spacing of the anchor or dowel
- Diameter of hole and cleaning technique utilized
- Epoxy manufacturer, type, and expiration date
- Whether the test results, if applicable, conformed to code and plan
- All discrepancies and non-conformities per the approved set of plans and applicable code.
- All materials issues or other violations of good workmanship

Non-Shrink Grout

Observation Duties

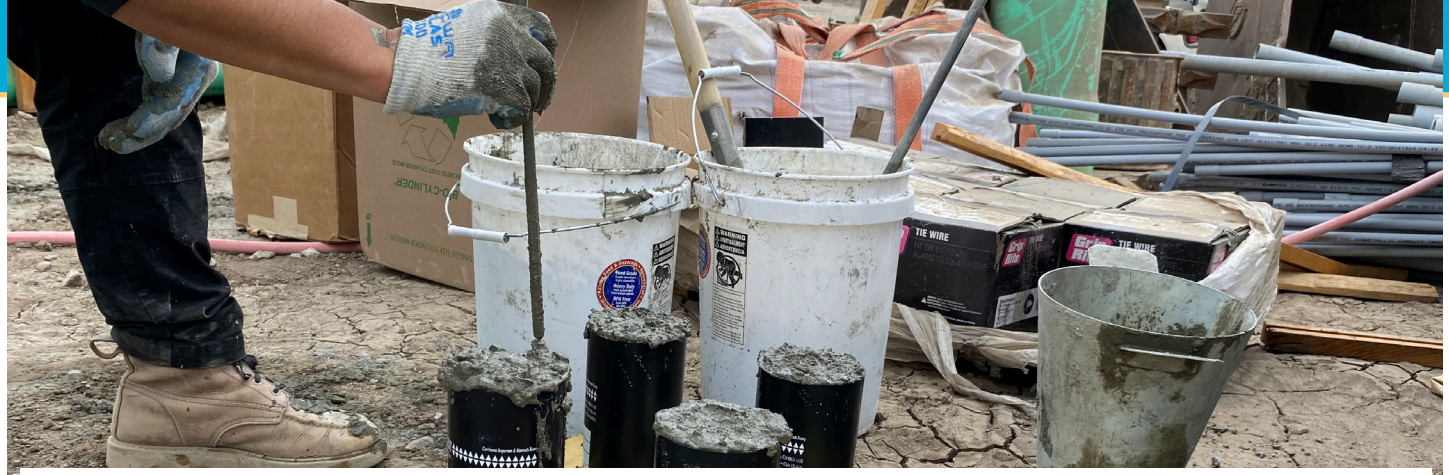
- Review the City of Irvine-approved set of plans and specifications for product and product strength.
- Monitor proper mixing and addition of water to be per the manufacturer's product specifications.
- Ensure that the location for grout placement is properly cleaned and moistened yet free from standing water and that all clearances and spacing has been provided per plan.
- Monitor for placement to ensure no voids or contamination.
- Verify that all appropriate tests are performed and all appropriate samples of the proper size, type, and frequency are taken throughout the grout placement.

Commonly Overlooked Items

- Too much or too little water
- Taking of samples

Daily Performance Report Minimum Requirements

- Specify Periodic or Continuous Inspection
- Product name and strength
- Clear description of location and elements
- Any issues with mixing including too little or too much water as well as the allowance of too much elapsed time
- Frequency of samples taken, how many, and what size
- All discrepancies and non-conformities per the approved set of plans and applicable code
- All materials issues or other violations of good workmanship



Concrete Testing (ACI Field Technician Grade I)

The ACI Field Technician Grade I has the responsibility of working along with the Special Inspector observing the placement of concrete. Typically, they work on larger concrete placements where the delivery of the concrete is not in close proximity to the concrete placement or is in such large quantity that the inspector observing the concrete placement is not able to perform the testing and at the same time sufficiently monitor the placement. There may be multiple ACI field technicians for a single concrete placement.

Applicable Codes and References
(Not Meant to be an Exhaustive List)

- California Building Code (CBC)
- Building Code Requirements for Structural Concrete by the American Concrete Institute (ACI 318)
- ASTM's C31, C94, C138, C142, C172, C173, C231, C1064

Note: During concrete placement, it is common for Special Inspectors to have to deal with the addition of water to loads of concrete and to evaluate whether this addition of water is in conformance with the requirements of ASTM C94. The following serves as a basis for understanding those requirements but shouldn't supersede job- or agency-specific requirements.

Per 12.7 of ASTM C94, a one-time addition of water should be added to the load upon arrival at the jobsite if the slump is less than that specified by the approved set of plans. A one-time addition of water may be several distinct additions within a 15 minute time frame until the required slump is obtained. No additional water should be added after this initial slump adjustment. Discharge of the concrete shall be completed within 1 ½ hours from the time recorded on the concrete ticket, or before the drum of the concrete truck has revolved 300 revolutions, whichever comes first. These limitations on time and revolutions are permitted to be waived by the contractor if the slump of the concrete still complies with the job specific slump requirements and no additional water has been added since the initial addition of water for the purposes of slump adjustment. The following sections are meant to serve as a guide which outlines ACI technician duties, the minimum information required in a Daily Performance Report, and some additional items for which attention should be given.

Observation Duties

- Review the City of Irvine-approved set of plans and specifications for mix design, concrete strength, slump, number/frequency of samples to be taken, as well as all testing requirements (temperature, air content, etc.).
- Monitor each concrete load for slump, temperature, and timing of additions of water or ice. Any discrepancies should be immediately communicated to the Special Inspector observing the placement of the concrete.
- Verify that all required tests are performed and all required samples of the proper size, type and frequency are taken throughout the concrete placement.
- Monitor weather conditions such as rain and temperature.

Daily Performance Report Minimum Requirements

- Number of yards placed
- Mix design number and strength
- Whether any loads were outside of the slump requirements
- Whether any loads exceeded their time limit
- Violations of maximum allowable water being exceeded or water added outside of conformity with ASTM C94, see note on C94 above
- Frequency of samples taken, how many, and what size cylinders/panels
- Whether the test results (temperature, air, etc.) conformed to code and plan
- All discrepancies and non-conformities per the approved set of plans and applicable code
- All materials issues or other violations of good workmanship

Prestressed Concrete

A Prestressed Concrete Special Inspector has many of the same responsibilities as the Reinforced Concrete Special Inspector and for a Prestressed Concrete Special Inspector's ICC license to be valid, they must also be certified through ICC as a Reinforced Concrete Special Inspector. The additional duties of a Prestressed Concrete Special Inspector revolve around the placement and stressing inspections of steel tendons, often referred to as post tensioned cables. A Reinforced Concrete City of Irvine license would be required if a Special Inspector wishes to work on concrete projects without steel tendons or other stressing procedures and a Prestressed Concrete license would be required to work on project with steel tendons or other stressing procedures.

Note: Although welded reinforcing steel may be an element of Prestressed Concrete, an American Welding Society (AWS) Certified Welding Inspector (CWI) License or ICC Structural Welding Special Inspection License is required to perform the welding inspection of such reinforcing steel.

Applicable Codes and References
(Not Meant to be an Exhaustive List)

- California Building Code (CBC)
- Building Code Requirements for Structural Concrete by the American Concrete Institute (ACI 318)
- Manual for Quality Control, For Plants and Production of Structural Precast Concrete Products published by the Precast/Prestressed Concrete Institute
- PTI M10.2: Specification for Unbonded Single Strand Tendons, Published by the Post-Tensioning Institute
- Field Procedures Manual for Unbonded Single Strand Tendons, Published by the Post-Tensioning Institute
- Recommendations for Prestressed Rock and Soil Anchors, Published by the Post-Tensioning Institute
- Manual of Standard Practice of the Concrete Reinforcing Steel Institute (CRSI)
- ASTM's A416, A421, A615, A706, C31, C94, C138, C142, C172, C173, C231, C1064

Note: During concrete placement, it is common for Special Inspectors to have to deal with the addition of water to loads of concrete and to evaluate whether this addition of water is in conformance with the requirements of ASTM C94. The following is meant to serve as a basis for understanding those requirements but in no way should be taken as superseding the job spec or other job specific or agency specific requirements.

Per 12.7 of ASTM C94, a one-time addition of water should be added to the load upon arrival at the jobsite if the slump is less than that specified by the approved set of plans. A one-time addition of water may be several distinct additions within a 15 minute time frame until the required slump is obtained. No additional water should be added after this initial slump adjustment. Discharge of the concrete shall be completed within 1 ½ hours from the time recorded on the concrete ticket, or before the drum of the concrete truck has revolved 300 revolutions, whichever comes first. These limitations on time and revolutions are permitted to be waived by the contractor if the slump of the concrete still complies with the job specific slump requirements and no additional water has been added since the initial addition of water for the purposes of slump adjustment.

The following sections are meant to serve as a guide which outlines inspection duties, the minimum information required in a Daily Performance Report, and some additional items for which attention should be given.

Reinforcing Steel & Tendons

Observation Duties

- Review the approved set of plans and specifications. Approved shop drawing may be used as an aid to inspection but in no case should take the place of the approved set of plans.
- If applicable (typical for larger jobs), verify the mill test reports and compare to the job specs prior to allowing the unloading of steel on the site.

Prestressed Concrete (continued)

- Examine steel to ensure the required size, strength (*i.e.*, 40, 60, 90, etc.) and type (*i.e.*, A416, A421, A615, A706, etc.) as well as verifying that the steel is free from any unacceptable contamination, oil, laitance, or damage.
- Assure that the footing size and depth are per plan and that all debris, water, and loose dirt have been removed.
- Utilizing the approved details and notes, ensure all reinforcing steel, embed plates, and anchor bolts have been placed with required spacing, splice length, alignment, orientation, support, clearances, and bends, and is securely fastened so as not to move during concrete placement.
- Verify required clearances to soil, forms, and proper coverage.
- Ensure that the required reinforcing steel and tendon samples are taken and tested per the job spec and per plan if applicable.

Additional Inspections for Placement of Tendons

- For tendons encased in sheathing, verify that the tendon is fully enclosed in the sheathing with no damage to the sheathing unless specifically stated in the plans or code that a specified amount can be exposed.
- Ensure that anchorage and pocket formers are placed on the appropriate ends of the tendons with required clearances and orientation.
- Verify number, location, spacing, profile (high and low points), appropriate support, and whether they run through the approved elements such as columns, upturned beams, etc.
- Inspect for added bars required including backup bars, hairpins at bundles, and radiuses.
- Observe anchorage distance from edges and other tendons.
- Any penetrations within the anchorage zone must be schedule 40 or more steel pipe.

Commonly Overlooked Items

- Proper orientation of columns
- Pay special attention to slab dowels and other items that connect two separate elements.
- Reinforcing steel typically requires 3" of clearance to soil.
- Field Bending of reinforcing steel is not allowed, except for one permissible bend of a previously unbend member.
- If bars are called out as continuous (cont.), corner bars are to be placed at all intersection of bars to ensure continuity.
- Pay special attention to added bars.
- Use of tendons is common for elevated decks and it is often necessary to ensure code compliance and receive designer approval for plumbing piping and electrical conduit within these areas.

Additional Items for Tendons

- Ensure no reverse curvature.
- Six or more tendons placed 12" on center or closer are considered a bundle and require additional reinforcement such as a bursting cage. This is often accomplished with the use of hairpins or stud rails.
- Excessive horizontal wobble
- Grouting of the pocket formers should be completed no longer than 10 days after the cutting of the tendon tails.

Daily Performance Report Minimum Requirements

- Specify Periodic or Continuous Inspection
- Applicable details and locations
- All reinforcing steel/tendons strength, size, grade per plan
- All reinforcing steel/tendons placed per plan
- All clearances per plan and code
- All accessory items such as anchor bolts, embeds, etc., placed per plan
- Footings and rebar clean and free from contamination/ defects
- If applicable, results of any tests performed
- All discrepancies and non-conformities per the approved set of plans and applicable code
- All materials issues or other violations of good workmanship

Concrete Placement

Observation Duties

- Review the City of Irvine-approved set of plans and specifications for mix design, concrete strength, slump, number/frequency of samples to be taken, as well as all testing requirements (temperature, air content, etc.).
- Verify that all required tests are performed and all required samples of the proper size, type and frequency are taken throughout the concrete placement.
- Monitor each concrete load for slump, temperature, and timing of additions of water or ice.
- Verify proper consolidation and proper placement techniques (*i.e.*, use of tremie, etc.).

Prestressed Concrete (continued)

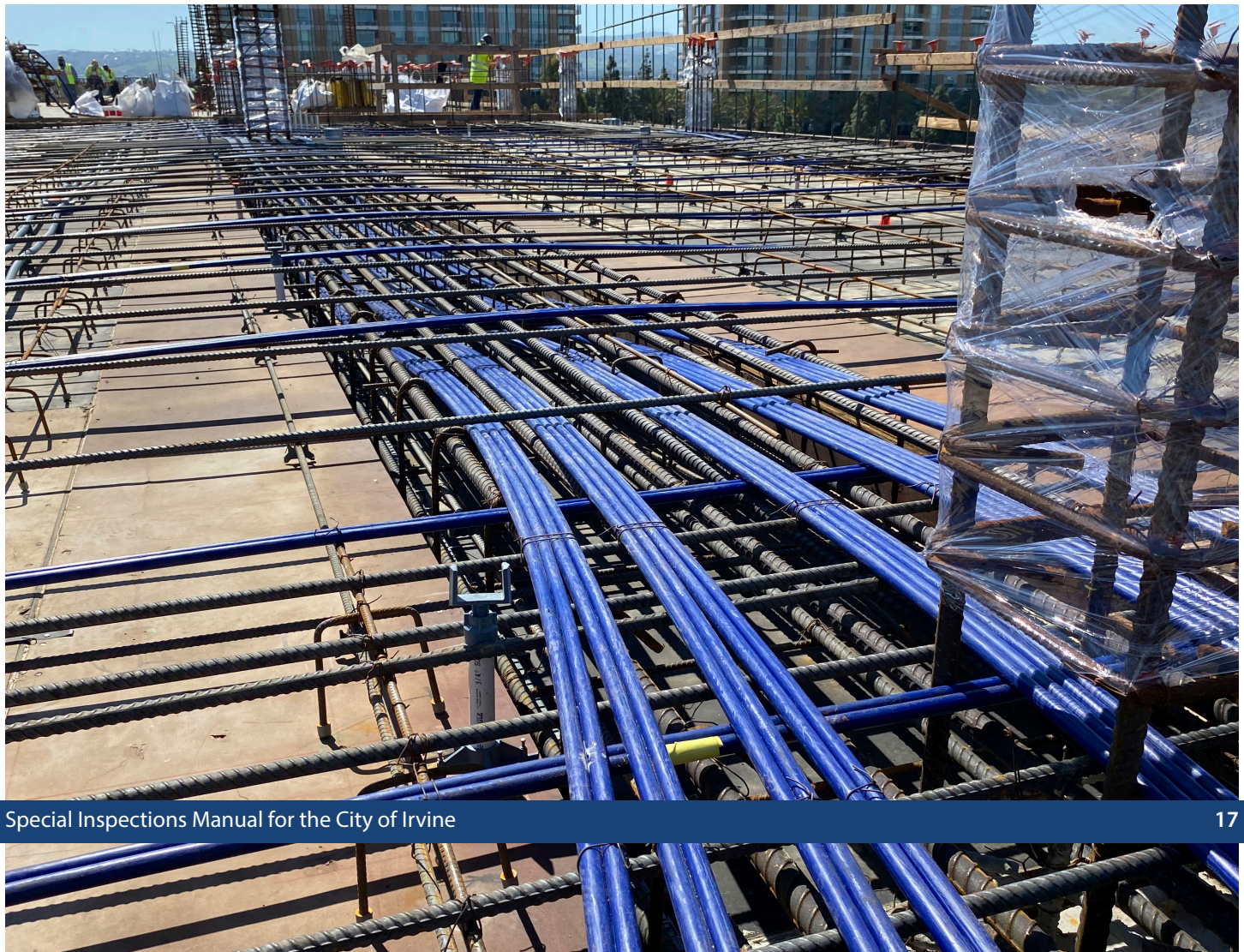
- Ensure that forms, reinforcing steel, tendons, or other embedded items remain in place and secured with required clearances maintained.
- All adjoining concrete to be clean, dampened, and roughened to ¼" amplitude.
- Inspect for trash or other contaminates and ensure removal prior to concrete placement.
- Monitor weather conditions such as rain and extreme temperatures.
- Note any requirements for treatment/finishing of placed concrete.
- Observe timing between loads and note cold joints or other placement issues.
- It is often necessary to obtain an additional concrete cylinder to accommodate a compression test at three days to confirm the minimum strength has been attained and to allow for stressing operations to begin.

Commonly Overlooked Items

- Poor consolidation
- Removal of embedded items, such as anchor bolts prior to concrete placement
- Proper storage of samples taken
- Wash out to be placed in wash out containers and not on the ground

Daily Performance Report Minimum Requirements

- Specify Periodic or Continuous Inspection
- Number of yards placed
- Mix design number and strength
- Clear description of location and elements
- Method of consolidation
- Whether any loads were outside of the slump requirements
- Whether any loads exceeded their time limit
- Violations of maximum allowable water being exceeded or water added outside of conformity with ASTM C94; see note on C94 above



- Frequency of samples taken, how many, and what size cylinders
- Whether the test results (temperature, air, etc.) conformed to code and plan.
- All discrepancies and non-conformities per the approved set of plans and applicable code.
- All materials issues or other violations of good workmanship.

A Special Inspector who is observing the placement of concrete and who is doing their own sampling, meaning no ACI technician is present to care for the sampling obligations, should include in their observation and reporting the following items.

Observation Duties

- Review the City of Irvine-approved set of plans and specifications for mix design, concrete strength, slump, number/frequency of samples to be taken, as well as all testing requirements (temperature, air content, etc.).
- Monitor each concrete load for slump, temperature, and timing of additions of water or ice.
- Verify that all required tests are performed and all required samples of the proper size, type and frequency are taken throughout the concrete placement.
- Monitor weather conditions such as rain and extreme temperatures.

Daily Performance Report Minimum Requirements

- Number of yards placed
- Mix design number and strength
- Whether any loads were outside of the slump requirements
- Whether any loads exceeded their time limit
- Violations of maximum allowable water being exceeded or water added outside of conformity with ASTM C94; see note on C94 above
- Frequency of samples taken, how many, and what size cylinders
- Whether the test results (temperature, air, etc.) conformed to code and plan
- All discrepancies and non-conformities per the approved set of plans and applicable code
- All materials issues or other violations of good workmanship

Tendon Stressing

Observation Duties

- Verify jack calibration and ensure a concrete compression test has been done to confirm the concrete has attained a minimum of 3000 psi prior to allowing any tendons to be stressed.
- All tendons must be marked prior to stressing to allow for a measurement of elongation.
- Inspect stressing pockets for debris, concrete squeeze out, etc.
- Ensure that all grippers have been properly and uniformly seated.
- Assure that all stressing attains no more than the specified pressure, *i.e.*, 33 Kips for ½" strands.
- Elongations shall be measured as tendons are stressed and not at the end of the stressing operation.
- All elongation measurements shall be recorded on a stressing record.
- If measured elongations consistently do not fall within the allowable variance or +/- 7%, discontinue stressing and contact the contractor and engineer for directions.

Commonly Overlooked Items

- Poor consolidation near stressing pockets, especially common in slabs for single family residential, must be addressed prior to commencement of stressing operations.
- Cutting of the tendon tails should be performed as soon as possible after stressing but only after the Engineer of Record approves the measured elongations.
- Extra care must be taken to ensure that all tendons have been stressed and accounted for.

Daily Performance Report Minimum Requirements

- Stressing equipment serial number and calibration information
- Locations of tendons stressed
- Any variances where tendon elongation exceeded 7%
- Broken or damaged tendons
- Any special data/remarks related with the stressing
- A copy of stressing records shall accompany the Daily Performance Report
- All discrepancies and non-conformities per the approved set of plans and applicable code
- All materials issues or other violations of good workmanship

Structural Masonry

Note: Although welded reinforcing steel may be an element of Structural Masonry, an American Welding Society (AWS) Certified Welding Inspector (CWI) License or ICC Structural Welding Special Inspection License is required to perform the welding inspection of such reinforcing steel.

Applicable Codes (Not Meant to be an Exhaustive List)

- California Building Code (CBC)
- TMS 402/602, ACI 530, 530.1 Building Code Requirements for Masonry Structures
- ASTM's C90, C94C140, C216. C270, C476, C1019, A615, A706, A951, C1314
- Irvine Informational Bulletin 306

Note: Grout that is used for masonry construction is essentially a concrete that has a higher ratio of water to allow for moisture absorption into the CMU. As such, the requirements of C94 governs the timing of additions of water to grout. During concrete placement, it is common for Special Inspectors to have to deal with the addition of water to loads of concrete and to evaluate whether this addition of water is in conformance with the requirements of ASTM C94. The following is meant to serve as a basis for understanding those requirements but in no way should be taken as superseding the job spec or other job specific or agency specific requirements.

Per 12.7 of ASTM C94, a one-time addition of water should be added to the load upon arrival at the jobsite if the slump is less than that specified by the approved set of plans. A one-time addition of water may be several distinct additions within a 15 minute time frame until the required slump is obtained. No additional water should be added after this initial slump adjustment. Discharge of the concrete shall be completed within 1 ½ hours from the time recorded on the concrete ticket, or before the drum of the concrete truck has revolved 300 revolutions, whichever comes first. These limitations on time and revolutions are permitted to be waived by the contractor if the slump of the concrete still complies with the job specific slump requirements and no additional water has been added since the initial addition of water for the purposes of slump adjustment.

The following sections are meant to serve as a guide which outlines inspection duties, the minimum information required in a Daily Performance Report, and some additional items for which attention should be given.

Block (CMU) Placement

Observation Duties

- Review the approved set of plans and specifications to verify materials for required CMU type, size and strength as well as mortar type and strength. Approved shop drawing may be used as an aid to inspection but in no case should take the place of the approved set of plans.
- Ensure the required masonry test prisms have been made and taken to lab for testing.
- Examine footings and ensure cleanliness and roughness.
- Verify vertical dowels coming out of the footing were placed in sufficient number and spacing. Missing bars may need to be placed by epoxy or some other means by the Engineer of Record's direction. Any appropriate RFI's are to be noted in the Daily Performance report and brought to the City Inspector's attention.
- Observe all mortar joint thicknesses for code compliance.
- Verify wall is plumb and level as construction progresses.
- Ensure proper and complete mortar placement at joints and monitor the presence and size of mortar protrusions.
- Reinforcing steel, embeds, ties and securing of such items must be verified.
- Control and expansion joint must be placed at appropriate intervals.
- Any CMU lift more than 5'4" must have clean outs placed every 32" on center minimum and approval is obtained for High Lift grout placement.

- Frequency of mortar samples taken, how many, and what type/size.

Commonly Overlooked Items

- Mortar protrusions
- Failure to fully mortared joints
- Removal of mortar from horizontal reinforcing steel
- Securing of vertical reinforcing steel
- Clean cells

Reinforcing Steel

Observation Duties

- Review the approved set of plans and specifications. Approved shop drawing may be used as an aid to inspection but in no case should take the place of the approved set of plans.
- If applicable (typical for larger jobs), verify the mill test reports and compare to the job specs prior to allowing the unloading of steel on the site.
- Examine steel to ensure the required size, strength (*i.e.*, 40, 60, 90 etc.) and type (*i.e.*, A615, A706, etc.), as well as verifying that the steel is free from any unacceptable contamination, laitance or damage and securely fastened to prevent movement during concrete placement.
- Assure that the footing size and depth are per plan and that all debris, water and loose dirt have been removed.
- Utilizing the approved details and notes, ensure that all reinforcing steel, embed plates, anchor bolts, etc., have been place with required spacing, splice length, alignment, orientation, support, clearances, bends etc., and is securely fastened so as not to move during grout placement.
- Verify required coverage and clearances for all elements of the CMU and embedded items.
- Ensure that the required reinforcing steel samples are taken and tested per the job spec and per plan, if applicable.

Commonly Overlooked Items

- Pay special attention to slab dowels and other items that connect two separate elements.
- Reinforcing steel must be free of mortar droppings.
- Field Bending is not allowed, except for one permissible bend of a previously unbend member and bending of reinforcing steel at the footing may not be bent more than 1:6 in order to accommodate the webs of CMU.
- If bars are called out as continuous (cont.), corner bars are to be placed at all intersection of bars to ensure continuity.
- Pay special attention to added bars.
- Plumbing and electrical piping or conduit is sometimes placed in the cells of a CMU wall where concrete is to be placed. Designer approval is often required as well as protection by sleeve or some other means.

Daily Performance Report Minimum Requirements (A single report is often written that includes both CMU and Reinforcing Steel Placement.)

- Specify Periodic or Continuous Inspection
- Applicable details and locations
- All reinforcing steel strength, size, grade per plan
- All CMU and mortar placed per plan
- All clearances per plan and code
- All accessory items such as anchor bolts, embeds, etc., placed per plan
- If applicable, results of any tests performed
- All discrepancies and non-conformities per the approved set of plans and applicable code
- All materials issues or other violations of good workmanship

Grout Placement

Observation Duties

- Review the City of Irvine-approved set of plans and specifications for mix design, grout strength, slump, number/frequency of samples to be taken as well as all testing requirements (temperature, air content, etc.).
- Verify that all required tests are performed and all required samples of the proper size, type and frequency are taken throughout the grout placement.
- Monitor each grout load for slump, temperature, and timing of additions of water or ice.
- Verify proper consolidation and proper placement techniques including reconsolidation after initial setting
- Ensure that forms, reinforcing steel, or other embedded items remain in place and secured with proper clearances maintained.
- Inspect for trash or other contaminates and ensure removal prior to grout placement.
- Monitor weather conditions such as rain and extreme temperatures. If CMU is saturated, grout placement must wait until CMU is dried out.

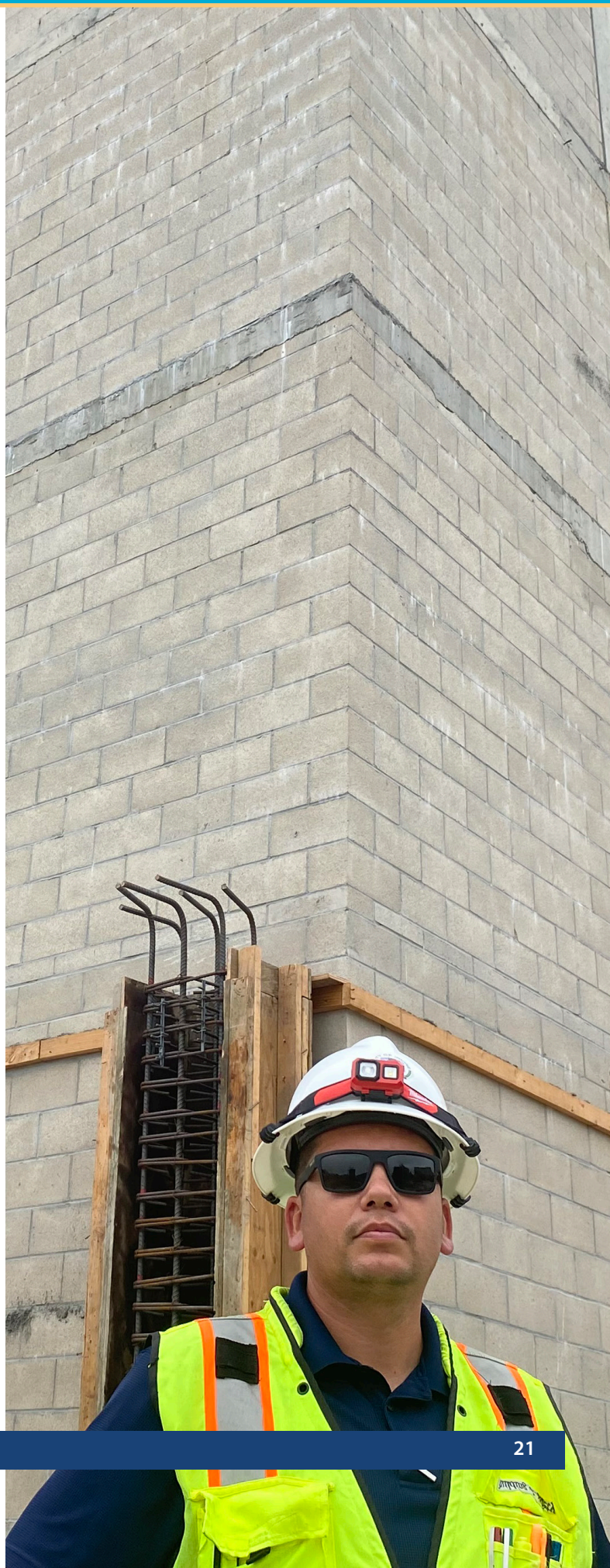
Structural Masonry (continued)

Commonly Overlooked Items

- Poor consolidation and failure to consolidate twice
- Removal of embedded items such as anchor bolts prior to concrete placement
- Proper storage of samples taken
- Wash out to be placed in wash out containers and not on the ground

Daily Performance Report Minimum Requirements

- Specify Periodic or Continuous Inspection
- Number of yards placed
- Mix design number and strength
- Clear description of location and elements
- Method of consolidation
- Whether any loads were outside of the slump requirements
- Whether any loads exceeded their time limit
- Violations of maximum allowable water being exceeded or water added outside of conformity with ASTM C-94 (see note on C-94 above)
- Frequency of samples taken, how many and what type/size.
- Whether the test results (temperature, slump, etc.) conformed to code and plan
- Any blow outs that may have occurred
- All discrepancies and non-conformities per the approved set of plans and applicable code
- All materials issues or other violations of good workmanship



Structural Steel & Bolting

High Strength Bolting Special Inspection is an inspection that is often performed in conjunction with Structural Welding. In order to receive a Structural Welding Special Inspection License from ICC, obtaining the High Strength Bolding License is a prerequisite.

The following sections are meant to serve as a guide which outlines inspection duties, the minimum information required in a Daily Performance Report and some additional items for which attention should be given.

Observation Duties

- Review the City of Irvine-approved set of plans and specification. Approved shop drawing may be used as an aid to inspection but in no case should take the place of the approved set of plans.
- Review and confirm the pre-installation verification testing by installation personnel for fastener assemblies and methods used (required for slip critical and pretensioned joints only).
- All steel delivered on site shall be examined prior to being incorporated into work. Mill certs are to be compared to the approved set of plans and job spec for compliance and to ensure the proper materials are used.
- Ensure a representative sample of not fewer than three complete fastener assemblies of each combination of diameter, length, grade and lot to be used in the work is checked at the site of installation in a tension calibrator to verify that the pretensioning method develops a pretension that is equal to or greater than those prescribed by code is completed (required for slip critical and pretensioned joints only).
- Verify proper fit of steel members and that they are plumb and level prior to being secured into place by either final tensioning of bolts or welding.
- Verify joints and connections, identifying which are slip critical and which are not.
- Inspect joints and connections to verify that they are per plan.
- Verify required bolt type and length as well as washer type to ensure proper tightening.
- Verify proper final tightening of bolts.
- Observe the field testing of bolts using the method as required per plan, *i.e.*, Turn-of-the-Nut, Twist-Off bolt, Calibrated wrench, Direct Tension Indicator, etc.

Commonly Overlooked Items

- Enlarging of bolt holes always require engineer approval and often a fix.
- Steel members must be within AISC tolerance as to shape irregularities.
- Testing of each batch of bolts
- Proper storage and lubrication of bolts
- Daily verification of pre-installation testing of joints has and ensuring proper functioning and calibration of any hydraulic tensioner used (required for slip critical and pretensioned joints only).

Daily Performance Report Minimum Requirements

- Specify Periodic or Continuous Inspection
- Applicable details and locations
- Specify tasks performed and areas where work is complete
- Results of tests performed
- All discrepancies and non-conformities per the approved set of plans and applicable code
- All materials issues or other violations of good workmanship

Structural Welding

A Structural Welding Special Inspection license with the City of Irvine may be obtained by having either an ICC (International Code Council) Structural Welding Certification or an AWS (American Welding Society) CWI (Certified Welding Inspector) Certification. Although either certification can be used to obtain a City license they are not interchangeable and for jobs that specifically require an AWS CWI license a welding inspector with an ICC license would not be permitted to perform welding inspections on such a project even though they might obtain a City of Irvine Structural Welding License.

An ICC Structural Welding Certification has the primary purpose of performing structural welding inspections only and is often not sufficient to perform inspections on school, hospitals and other essential facilities, whereas a CWI license enables the inspector to perform any manner of welding inspection.

Although welded reinforcing steel may be an element of Reinforced Concrete, an AWS CWI license or an ICC Structural Welding Special Inspection Certification is required to perform the welding inspection of reinforcing steel.

A Structural Welding Special Inspection license allows for the inspection of numerous items, the most common of which are listed below and are addressed separately in this section:

- Structural Steel
- Light Gauge Steel for Elevated Decks
- Stud Welding at Elevated Decks
- Reinforcing Steel

Applicable Codes and References (Not Meant to be an Exhaustive List)

- California Building Code (CBC)
- AISC Steel Construction Manual
- AWS D1.1 Structural Welding Code
- AWS D1.3 Structural Welding Code – Sheet Steel
- AWS D1.4 Structural Welding Code – Reinforcing Steel
- AWS D1.8 Structural Welding Code – Seismic Supplement
- AWS A2.4 Standard Symbols for Welding, Brazing and Nondestructive Examination

Note: For the Shielded Metal Arc Welding Process (SMAW) low hydrogen electrodes are commonly required. These electrodes are to be delivered to the jobsite in unopened hermetically sealed containers and require special handling. Per Code they must be stored in a rod oven that is continuously kept at the appropriate temperature to ensure that moisture does not infiltrate them which often leads to excess hydrogen in a finished weld. Any electrodes that arrive on site that are in an opened container, a plastic container or otherwise compromised are not to be used unless they are subjected to the requirements of the D1.1.

The following sections are meant to serve as a guide which outlines inspection duties, the minimum information required in a Daily Performance Report and some additional items for which attention should be given.

Structural Steel

Observation Duties

- Review the City of Irvine-approved set of plans and specification. Approved shop drawing may be used as an aid to inspection but in no case should take the place of the approved set of plans.
- All steel delivered on site should be examined prior to being incorporated into work. Mill certs are to be compared to the approved set of plans and job spec for compliance and to ensure the proper materials are used.
- All welders shall have been qualified for any weld that they perform. This involves the type of weld, the materials used, the position and the classification of the weld. If not a D1.1

Structural Welding (continued)

prequalified weld, qualification for the specific weld may be necessary.

- Welds are to be performed per the approved detail and a Welding Procedure Specification (WPS). Compliance with the WPS shall be monitored by the Special Inspector. Welds that are a prequalified D1.1 weld do not need supporting documentation other than what is found in the D1.1.
- If not a prequalified D1.1 weld, all WPSs must be accompanied by a Welding Procedure Qualification Record (WPQR or PQR) to ensure that proper testing has been performed to demonstrate that the weld will have the required structural integrity.
- Verify fit up for root opening, angles and allowable tolerances.
- Verify any applicable filler metal, welding process, preheat procedures, interpass temperatures and interpass cleaning.
- Weather monitoring shall be continuously performed as welding in inclement weather, including rain and/or excessive wind, is not permissible.
- A final visual inspection must be done to ensure that no discontinuities or defects are present that would require the weld being ground down and performed again.
- Any non-destructive testing such as ultrasound, mag particle, etc., are to be performed by the appropriately certified personnel and their reports are to accompany the Welding Special Inspector's Daily Performance Report.

Commonly Overlooked Items

- All demand critical welds are to be performed by D1.8 qualified welders.
- All rebar welding is to be performed by a D1.4 certified welder. Typically, a 60 series electrode is not to be used in conjunction with a grade 60 rebar. Series 80 or 90 are often required, refer to the WPS or the approved set of plans for clarification.
- All low hydrogen electrodes are to be obtained from unopened hermetically sealed containers and kept in the appropriate rod oven that shall be in continuous operation until the electrodes are used.
- All welds require Special Inspection.
- Periodic and Continuous Inspections are defined and governed by AISC 360 and are unique to the welding process. All welds, regardless of type and size, require intermittent monitoring and periodic verification of the root opening, welding process and final visual inspection.

Daily Performance Report Minimum Requirements

- Specify items and stages of the welding procedure inspected
- Applicable details and locations
- Name and qualification of welders
- Reference the WPS or WPQR, if applicable
- Type and size of weld
- Welding process and filler metal designation
- If applicable, results of any tests performed
- All discrepancies and non-conformities per the approved set of plans and applicable code
- All materials issues or other violations of good workmanship

Light Gauge Steel for Elevated Decks

Observation Duties

- Review the City of Irvine-approved set of plans and specification. Approved shop drawing may be used as an aid to inspection but in no case should take the place of the approved set of plans.
- All steel delivered on site shall be examined prior to being incorporated into work. Mill certs are to be compared to the approved set of plans and job spec for compliance and to ensure the proper materials are used.
- All welders shall have been qualified for any weld that they perform. This involves the type of weld, the materials used and the position and the classification of the weld. If not a D1.3 prequalified weld, qualification for the specific weld may be necessary.
- Welds are to be performed per the approved detail and a Welding Procedure Specification (WPS). Compliance with the WPS shall be monitored by the Special Inspector. Welds that are a prequalified D1.3 weld do not need supporting documentation other than what is found in the D1.3.
- If not a prequalified D1.3 weld, all WPSs must be accompanied by a Welding Procedure Qualification Record (WPQR or PQR) to ensure that proper testing has been performed to demonstrate that the weld will have the required structural integrity.
- Verify fit up for root opening and allowable tolerances including how many sheets are being welded through and whether materials have been placed flat against structural steel or whether there are gaps or spaces between them.
- Verify any applicable filler metal, welding process and sufficient diameter for any arc spot welds, commonly known as puddle welds.
- Weather monitoring shall be continuously performed as welding in inclement weather, including rain and/or excessive wind, is not permissible.
- A final visual inspection must be done to ensure that no sufficient discontinuities or defects are present that would require rejection.

Commonly Overlooked Items

- All low hydrogen electrodes are to be obtained from unopened hermetically sealed containers and kept in the appropriate rod oven that shall be in continuous operation and held at the proper temperature until the electrodes are used.
- All welds require Special Inspection.
- Periodic and Continuous inspections are defined and governed by AISC 360 and are unique to the welding process. All welds, irregardless of type and size, require intermittent monitoring and periodic verification or the root opening, welding process and final visual inspection.
- Removal of slag and verification that no cracks or other discontinuities are present that would require rejection.

Daily Performance Report Minimum Requirements

- Specify items and stages of the welding procedure inspected
- Applicable details and locations
- Name and qualification of welders
- Reference to the WPS or WPQR's, if applicable
- Type and size of weld
- Welding process and filler metal designation
- If applicable, results of any tests performed
- All discrepancies and non-conformities per the approved set of plans and applicable code
- All materials issues or other violations of good workmanship

Stud Welding at Elevated Decks

Observation Duties

- Review the City of Irvine-approved set of plans and specification. Approved shop drawing may be used as an aid to inspection but in no case should take the place of the approved set of plans.
- All steel delivered on site shall be examined prior to being incorporated into work. Mill certs are to be compared to the approved set of plans and job spec for compliance and to ensure the proper materials are used.
- All welders shall have been qualified for any weld that they perform. This involves the type of weld, the materials used, the position and the classification of the weld. If not a D1.1 prequalified weld, qualification for the specific weld may be necessary.
- Welds are to be performed per the approved detail and a Welding Procedure Specification (WPS). Compliance with the WPS shall be monitored by the Special Inspector. Welds that are a prequalified D1.1 weld do not need supported documentation other than what is found in the D1.1.
- If not a prequalified D1.1 weld, all WPSs must be accompanied by a Welding Procedure Qualification Record (WPQR or PQR) to ensure that proper testing have been

Structural Welding (continued)

performed to demonstrate that the weld will have the required structural integrity.

- At the start of each shift testing of the first two studs placed and any follow up testing per code.
- Weather monitoring shall be continuously performed as welding in inclement weather, including rain and/or excessive wind, is not permissible.
- A final visual inspection must be done to ensure that no sufficient discontinuities or defects are present that would require the weld being ground down and performed again, as well as a stress test by use of a sledge hammer or other suitable equipment.
- Any non-destructive testing such as ultrasound, mag particle, etc., are to be performed by the appropriately certified personnel and their reports are to accompany the Welding Special Inspector's Daily Performance Report.

Commonly Overlooked Items

- All low hydrogen electrodes are to be obtained from unopened hermetically sealed containers and kept in the appropriate rod oven that shall be in continuous operation and held at the proper temperature until the electrodes are used.
- All welds require Special Inspection.
- Periodic and Continuous inspections are defined and governed by AISC 360 and are unique to the welding process. All welds, irregardless of type and size, require intermittent monitoring and periodic verification of the root opening, welding process and final visual inspection.
- Removal of slag and verification that no cracks or other discontinuities are present that would require rejection
- Manual testing of studs by the Special Inspector which often involves a non-destructive means such as the use of a sledge hammer to ensure sound welds.

Daily Performance Report Minimum Requirements

- Specify items and stages of the welding procedure inspected
- Applicable details and locations
- Name and qualification of welders
- Reference to the WPS or WPQR's, if applicable
- Type and size of weld
- Welding process and filler metal designation
- If applicable, results of any tests performed
- All discrepancies and non-conformities per the approved set of plans and applicable code
- All materials issues or other violations of good workmanship

Reinforcing Steel

Observation Duties

- Review the City of Irvine-approved set of plans and specification. Approved hop drawing may be used as an aid to inspection but in no case should take the place of the approved set of plans.
- All steel delivered on site shall be examined prior to being incorporated into work. Mill certs are to be compared to the approved set of plans and job spec for compliance and to ensure the proper materials are used. This is especially important for welding to existing reinforcing steel that is not per ASTM A706 where carbon content and compatibility of electrodes must be verified. In these cases, it is often necessary to ensure proper testing and analysis of existing reinforcing steel prior to the performance of any welding.
- All welders shall have been qualified for any weld that they perform. This involves the type of weld, the materials used, the position and the classification of the weld.
- Welds are to be performed per the approved detail and a Welding Procedure Specification (WPS). Compliance with the WPS shall be monitored by the Special Inspector. There are no prequalified welds per D1.4 and unless the weld is a fillet weld the appropriate WPS with a supporting WPQR must be provided.
- Verify fit up for root opening, angles and allowable tolerances.
- Verify any applicable filler metal, welding process, preheat procedures, interpass temperatures and interpass cleaning.
- Weather monitoring shall be continuously performed as welding in inclement weather, including rain and/or excessive wind, is not permissible.
- A final visual inspection must be done to ensure that no sufficient discontinuities or defects are present that would require the weld being ground down and performed again.
- Any non-destructive testing such as ultrasound, mag particle, etc., are to be performed by the appropriately certified personnel and their reports are to accompany the Welding Special Inspector's Daily Performance Report.

Commonly Overlooked Items

- All rebar welding is to be performed by a D1.4 certified welder. Typically, a 60 series electrode is not to be used in conjunction with a grade 60 rebar. Series 80 or 90 are often required, refer to the WPS or the approved set of plans for clarification.
- All low hydrogen electrodes are to be obtained from unopened hermetically sealed containers and kept in the appropriate rod oven and that shall be in continuous operation at the proper temperature until the electrodes are used.
- All welds require Special Inspection.
- Periodic and Continuous inspections are defined and governed by AISC 360 and are unique to the welding process. All welds, irregardless of type require intermittent monitoring and periodic verification or the root opening, welding process and final visual inspection.

Daily Performance Report Minimum Requirements

- Specify items and stages of the welding procedure inspected
- Applicable details and locations
- Name and qualification of welders
- Reference to the WPS or WPQR's, if applicable
- Type and size of weld
- Welding process and filler metal designation
- If applicable, results of any tests performed
- All discrepancies and non-conformities per the approved set of plans and applicable code
- All materials issues or other violations of good workmanship

Spray Applied Fire Proofing

Applicable Codes and References
(Not Meant to be an Exhaustive List)

- California Building Code (CBC)
- Technical Manual 12-B, published by the Association of the Wall and Ceiling Industry (AWCI)
- Technical Manual 12-A: Field-Applied Sprayed Fire-Resistive Materials, published by the Association of the Wall and Ceiling Industry (AWCI)
- Applicable manufacturer's product specifications

The following sections are meant to serve as a guide which outlines inspection duties, the minimum information required in a Daily Performance Report and some additional items for which attention should be given.

Spray Applied Fireproofing Material (SFRM)

Observation Duties

- Review the City of Irvine-approved set of plans and specification. Approved shop drawing may be used as an aid to inspection but in no case should take the place of the approved set of plans.
- Ensure that the substrate is free of any condition that might prevent adhesion such as dirt, oil, grease, etc., along with any paints, primers, etc., that are not tested and approved for the fireproofing products being used or for the member for which it is being applied. If the process being used requires preparation of the steel member by the attachment of lath, studs or other method this too much be verified prior to the placement of fireproofing material.
- Thickness of application
- Density in pounds per cubic foot
- Bond strength-adhesion
- Condition of finished application
- Inspection of patching

Commonly Overlooked Items

- Sufficient placement in hard to reach places and where numerous structural members converge
- Proper treatment of structural members prior to product placement

Daily Performance Report Minimum Requirements

- Specify Periodic or Continuous Inspection
- Applicable details and locations
- Identification of product name, manufacturer, etc.
- Monitor proper mixing procedure
- Testing quantities and results
- Results of thickness testing and locations and types of members where the testing was performed
- Final acceptance by visual inspection
- All discrepancies and non-conformities per the approved set of plans and applicable code
- All materials issues or other violations of good workmanship

Intumescent Paint

Observation Duties

- Review the City of Irvine-approved set of plans and specification. Approved shop drawing may be used as an aid to inspection but in no case should take the place of the approved set of plans.
- Ensure that the substrate is free of any condition that might prevent adhesion such as dirt, oil, grease, etc., along with any paints, primers, etc., that are not tested and approved for the fireproofing products being used or for the member for which it is being applied.
- Substrate temperature, both during application and after application for the required amount of time per the product listing
- Thickness and condition of finished application
- Inspection of patching
- Verification of thicknesses per approved method

Commonly Overlooked Items

- Sufficient placement in hard to reach places and where numerous structural members converge
- Proper treatment of the structural member prior to product placement
- Providing the necessary clearance around the item to allow for the product to adequately expand in the event of a fire

Daily Performance Report Minimum Requirements

- Specify Periodic or Continuous Inspection
- Applicable details and locations
- Identification of product name, manufacturer, etc.
- Monitor proper mixing procedure, if applicable
- Testing quantities and result
- Thickness
- Final acceptance by visual inspection
- All discrepancies and non-conformities per the approved set of plans and applicable code
- All materials issues or other violations of good workmanship

Shear Nailing
(High Load Diaphragm/Shear Wall)

The City of Irvine Shear Nailing Special Inspector license is unique from most other licenses in that it requires an in-person interview from either the New Residential Inspection Supervisor, the Commercial Inspection Supervisor, or someone designated by them. Once approval is received the approval must be submitted along with an application. The possession of no other license or certification allows an applicant to be licensed with the City in place of the in-person interview.

Although the name of the license is Shear Nailing, a licensed Special Inspector has the obligation of inspecting and reporting on all components and elements that compose part of the load path in a shear condition. This would include, but not limited to, anchor bolts, hold downs, framing, sheathing, nailing, straps, hardware, etc.

Applicable Codes and References
(Not Meant to be an Exhaustive List)

- California Building Code (CBC)
- Special Design Provisions for Wind and Seismic, published by the American Wood Council

The following sections are meant to serve as a guide which outlines inspection duties, the minimum information required in a Daily Performance Report and some additional items for which attention should be given.

Observation Duties

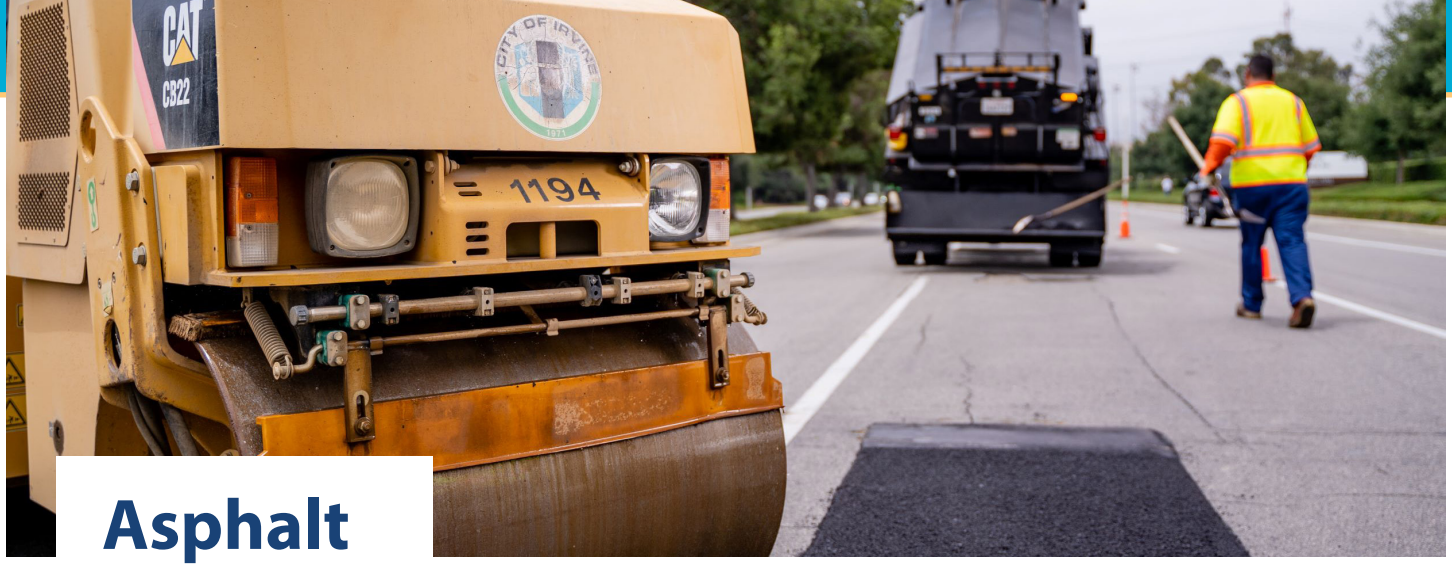
- Review the City of Irvine-approved set of plans and specifications. Approved shop drawing may be used as an aid to inspection but in no case should take the place of the approved set of plans.
- Hold down and anchor bolt type and spacing
- Sill plate connection
- Anchor bolt washer size and placement, typically ½" maximum from the shear panel
- Appropriately treated lumber when placed on or adjacent to concrete
- Use of fire treated lumber when required per type of construction, typical for some 3A conditions
- Stud size and spacing
- Shear panel thickness and type
- Edge and field nailing
- Staggered nailing and offset nailing at edge joints
- Allowable opening sizes
- Hardware type and spacing
- Vertical and horizontal transfer straps
- Verify any manufactured seismic system (*i.e.*, Zone 4, STS hold down or Simpson Strong-Tie Strong Wall systems) and their components per the manufacturer's installation instructions and per plan
- Lumber moisture 19% or less

Commonly Overlooked Items

- Nails countersunk into sheathing
- Nails less than 3/8" from the edge of sheathing

Daily Performance Report Minimum Requirements

- Applicable details and locations
- All discrepancies and non-conformities per the approved set of plans and applicable code
- All materials issues or other violations of good workmanship



Asphalt

The City of Irvine Asphalt Special Inspector License is unique from most other licenses in that it requires the submittal of a resume and possibly an in person interview with the Grading Inspection Supervisor or someone designated by them. Once approval is received, it must be submitted along with an application. The possession of no other license or certification allows an applicant to be licensed with the City in place of the resume submittal and in person interview.

Applicable Codes and References
(Not Meant to be an Exhaustive List)

- California Building Code (CBC)
- Greenbook: Standard Specifications for Public Works Construction
- City of Irvine Grading Manual
- City of Irvine Municipal Code Division 10 – Grading Code and Encroachment Regulations Grading Code
- Various City Public Works/City of Irvine Standards
- Irvine Informational Bulletin 151

The following sections are meant to serve as a guide which outlines inspection duties, the minimum information required in a Daily Performance Report and some additional items for which attention should be given.

Observation Duties

- Review the City of Irvine-approved set of plans and required street section
- Inspection of subgrade/aggregate base surface conditions
- Verify saw cut or T-grind on existing roadway sections
- Full TAC (Asphalt emulsion bond) coat coverage on all vertical cuts
- Confirm required equipment for spreading and compaction of asphalt
- Record truck travel time (batch plant to surface placement)
- Verify type/class of asphalt being used for specific application (½" for cap paving and ¾" for base course)
- Monitor asphalt temperature from the truck and along the mat during placement
- Verify mat thickness attains required minimum
- Ensure edge thickness: 3/8" lip along the gutter must be uniform and not fluctuate (City of Irvine requirement) and any edge verticality where the two mats meet
- Collect samples for testing when required
- Uniformity of the finish surface, no low or high points within the surface and no rock pockets
- Perform and record in-place density testing results of the compacted asphalt mat (Minimum 95% compaction)

Commonly Overlooked Items

- Confusion of Plant Max versus Laboratory Max
- Failure to properly sample
- Failure to properly monitor and take appropriate action due to weather conditions
- Over compaction
- Saw cutting of existing asphalt

Daily Performance Report Minimum Requirements

- All activities pertaining to the paving operations must be summarized and recorded
- All test locations and data to support testing results should be plotted on the approved City of Irvine plans
- All discrepancies and non-conformities per the approved set of plans and applicable codes
- All materials issues or other violations of good workmanship

City of Irvine Contacts

(as of September 2024)

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