CITY OF NEWPORT BEACH

BUILDING DIVISION

SPECIAL INSPECTOR MANUAL

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T A B L E O F C O N T E N T S

SECTIONS:

1. SPECIAL INSPECTION OVERVIEW

1.1 SPECIAL INSPECTION OVERVIEW 2

2. GENERAL PROGRAM GUIDELINES

2.1 GENERAL PROGRAM GUIDELINES 5

3. GUIDELINES FOR SPECIAL INSPECTION IN CONSTRUCTION

3.1 SOILS (Grading, Excavation, and Filling) 11
3.2 FOUNDATIONS (Piles and Piers) 13
3.3 ASPHALT CONCRETE (Hot Mix Asphalt and Rubberized Hot Mix Asphalt) 15
3.4 REINFORCING STEEL 18
3.5. CONCRETE BATCH PLANT 20
3.6 CONCRETE 22
3.7 SHOTCRETE 24
3.8 PRE-TENSIONED CONCRETE 26
3.9 POST-TENSIONED CONCRETE 28
3.10 MASONRY 30
3.11 STRUCTURAL STEEL 33
3.12 HIGH STRENGTH BOLTING 35
3.13 NONDESTRUCTIVE TESTING (NDT) 37
3.14 FIRE-RESISTANT MATERIALS (Sprayed and Mastic & Intumescent) 39
3.15 GLU LAM AND TRUSS JOISTS 41
3.16 POST INSTALLED ANCHORS AND DOWELS (Installation and Proof Load Testing) 44
3.17 SHEAR WALLS AND FLOOR SYSTEMS USED AS HIGH LOAD DIAPHRAGMS 47

4. PROCEDURES AND QUALIFICATIONS

4.1 RECOMMENDED PROCEDURES FOR SPECIAL INSPECTORS 50
4.2 SPECIAL INSPECTOR QUALIFICATIONS 52

5. JOB TASK LISTINGS

5.1 GENERAL INSPECTION PRACTICE 55
5.2 REINFORCED AND PRE-STRESSED CONCRETE SPECIAL INSPECTORS 56
5.3 STRUCTURAL MASONRY SPECIAL INSPECTORS 59
5.4 STRUCTURAL STEEL AND WELDING SPECIAL INSPECTORS 62

6. ORDINANCE /CODE REFERENCE

6.1 ORDINANCE / CODE REFERENCE 65

7. FORMS

7.1 SPECIAL INSPECTORS REPORT 67
7.2 SPECIAL INSPECTION – FINAL INSPECTION REPORT 68

8. **CONTACT INFORMATION**

8.1 CONTACT INFORMATION 70

SECTION 1

SPECIAL INSPECTION OVERVIEW

SECTION 1

1.1 - Special Inspection Overview

The California Building Code (CBC) in its provision for special inspectors, commencing with the 1937 U.B.C., it sets forth a number of situations in which the employment of a special inspector is mandatory. For the first time, the *owner* was required to provide specially qualified inspectors for *continuous* inspection during construction in addition to *called* inspections provided by the municipality and in addition to *periodic site visits* provided by the architect or engineer.

A special inspector is a person who has been approved by the Chief Building Official to perform certain types of inspection. The use of special inspectors is reserved for complex installations requiring highly developed inspection skills in one or more construction crafts. These generally include:

1. **Concrete:** during the taking of test specimens and placing of reinforced concrete and pneumatically placed concrete.
2. **Bolts Installed in Concrete:** during installation of bolts and placing of concrete around such bolts.
3. **Ductile Moment-resisting Concrete Frames**
4. **Reinforcing Steel and Prestressing Steel:** during stressing and grouting of prestressed concrete and placing of reinforced steel, placing of tendons, and prestressing steel.
5. **Welding:** of ductile moment-resisting steel frames, and for all structural welding.
6. **High-strength Bolting:** during all bolt installations and tightening operations.
7. **Structural Masonry:** during preparation of masonry wall prisms, sampling and placing of all masonry units, placement of reinforcement, inspection of grout spaces, and during all grouting operations.
8. **Reinforced Gypsum Concrete:** when cast-in-place Class B gypsum concrete is being mixed and placed.
9. **Insulating Concrete Fill:** during the application of insulating concrete fill when used as part of a structural system.
10. **Spray-applied Fireproofing:** as required by U.B.C. Standard Number 43-8.
11. **Piling, Drilled Piers, and Caissons:** during driving and testing of piles and construction of cast-in-place drilled piles or caissons.
12. **Shotcrete:** during the taking of test specimens and placing of shotcrete.
13. **Special Grading, Excavation, and Filling.**
14. **Structural Wood.**

An additional provision allows the Chief Building Official to use discretion for the employment of a special inspector in other cases where it is deemed appropriate.

The use of special inspectors is not discretionary. Chapter 17 of the CBC clearly states the condition under which they must be utilized, but there is a provision for the Chief Building Official to waive special inspection for work of a minor nature.

It is the responsibility of the Chief Building Official to determine the qualifications of special inspectors. This can be done in any manner satisfactory to the Chief Building Official, and often includes written examinations, oral interviews and a review of relevant education and experience. The CBC does not make specific requirements for the determination of an inspector's qualifications, but that in no way lessens the importance of being selective in this crucial process.

A truly qualified special inspector usually has skills which significantly outpace the skills of regular municipal inspectors except that they are ordinarily narrower in scope. For example, a municipal inspector is required to have a general knowledge of a great number of code requirements. This naturally limits one's ability to specialize in knowledge of one area. Special inspectors, on the other hand, are able to devote their abilities to a limited subject and become more proficient in that subject.

SECTION 2

GENERAL PROGRAM GUIDELINES

SECTION 2

2.1 - General Program Guidelines

Purpose of Special Inspection

Special inspection is the monitoring of the materials and workmanship which are critical to the integrity of the building structure. It is the review of the work of the contractors and their employees to assure that the approval plans and specifications are being followed and that relevant codes and ordinances are being observed. The special inspection process is in *addition* to those conducted by the municipal building inspector and by the engineer or architect of record as part of periodic structural observations. The special inspectors furnish *continuous* inspections at all times that construction requires their presence.

Good communication between the special inspector and the designers, contractor and Building Division is essential.

Duties and Responsibilities of the Project Owner

The project owner or the engineer or architect of record acting as the owner's agent is responsible for funding special inspection services.

Duties and Responsibilities of the Engineer or Architect of Record

The engineer or architect of record has many duties and responsibilities related to special inspection activities. They include the following:

1. **Identify the need for special inspection services.**

   The project plans and/or specifications which are submitted to the Chief Building Official need to clearly indicate the design parameters and material selection. The engineer or architect of record is the development team member who analyzes the critical elements of the design and notes on approved plans where special inspection is necessary in accordance with the CBC

2. **Develop the structural tests and inspection schedule and acknowledge the testing and inspecting agreement.**

   The engineer or architect of record shall specify types of special inspection required in the construction documents.

   The engineer or architect of record should also be a consenting party by written acknowledgement of special inspection and testing agreements. This acknowledgement provides the communications and understanding of special inspection services.

3. **Recommend and assist in the selection of special inspectors.**

   The selection and qualifying of the special inspector can often be a difficult and challenging process. This procedure can be facilitated through the involvement of the engineer and architect of record, with the Chief Building Official's approval, in review of the following:

   - The number of special inspectors required.
   - Procedures for testing in the field and in the shop.
   - Reporting procedures.

4. **Respond to field discrepancies.**

   Material and design discrepancies which are not resolved in a timely manner or are about to be incorporated in the work must be brought to the attention of the engineer or architect of record and the Chief Building Official. Uncorrected field deficiencies observed by the special inspector must be brought to their attention. The engineer or architect of record is instrumental in implementing the remedial process of deficiency correction. The engineer or architect of record is responsible for any design changes in addition to acknowledgement and approval of shop drawings which may detail structural information, and for submission of such changes to the Building Division for approval.

Duties and Responsibilities of the Special Inspector

The special inspectors are individuals with highly developed, specialized skills who observe those critical building or structural features which they are qualified to inspect. Duties of special inspectors and/or inspection agencies include the following:

a. **Acknowledge the testing and inspection agreement and structural tests and inspection schedule.**
   Special inspectors and/or inspection agencies must understand their role and scope of their responsibilities, with written acknowledgement of special inspection and testing agreements.

b. **Signify presence at jobsite.**
   Special inspectors should notify the Building Division and contractor personnel of their presence and responsibilities at the jobsite.

c. **Observe all work for which they are responsible.**
   Special inspectors shall inspect all work for conformance with the Building Division approved (stamped) drawings and specifications and applicable provisions of the CBC

d. Separately identify all nonconforming work.

Special inspectors shall bring all nonconforming items to the immediate attention of the contractor. If any such item is not resolved in a timely manner or is about to be incorporated in the work, the engineer or architect of record and the Chief Building Official should be notified immediately by telephone or in person and the item noted in the special inspector's written report. The report should contain the following information about each nonconforming item:

- Exact nature and exact location of the nonconforming item.
- Reference to applicable detail of approved plans/specifications.
- Name and title of each individual notified and method of notification.
- Resolution or corrective action.
- All other pertinent information.

e. Provide timely reports.

The special inspector should complete written inspection reports for each inspection visit and provide the reports on a timely basis to the inspector of record at the Building Division, unless otherwise determined by the Chief Building Official. The special inspector or inspection agency shall furnish these reports directly to the Chief Building Official, engineer or architect of record and others as designated. These reports should be organized on a daily format and submitted each week. Alternate forms may be approved by the Building Division. In these reports, special inspectors shall:

- Describe inspections and tests made with applicable locations.
- List all nonconforming items.
- Indicate how nonconforming items were resolved
- List unresolved items, parties notified, time and method of notification.
- Itemize changes authorized by architect/engineer of record and approved by the Building Division if not included in nonconforming items.

f. Submit a signed final report.

Special inspectors or inspection agencies shall submit a signed final report to the Building Division stating that all items requiring special inspection and testing were fulfilled and reported and, to the best of their knowledge, in conformance with the approved design drawings, specifications, approved change orders and the applicable provisions of the CBC Items not in conformance, unresolved items or any discrepancies in inspection coverage (i.e. missed inspections, periodic inspections when continuous was required, etc.) should be specifically itemized in this report. Alternate forms may be approved by the Building Division. The final report shall be submitted at the site within seven (7) days of completion of the job.

Duties and Responsibilities of the Chief Building Official

Of all the team members in the development process, the Chief Building Official is the only member who has the legal authority to see all of the provisions of special inspections are carried out. This is clearly identified under the administrative provision of Section 104.1 of the CBC

> ***Section 104.4 Inspections****. The Chief Building Official shall make all of the required inspections, or the Chief Building Official shall have the authority to accept reports of inspection by approved agencies or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such approved agency or by the responsible individual. The Chief Building Official is authorized to engage such expert opinion as deemed necessary to report upon unusual technical issues that arise, subject to the approval of the appointing authority.*

1. **Review and examine plans, specifications, and contract documents for compliance with special inspection requirements.**

   The Chief Building Official is granted the legal authority to review the plans and specifications for compliance with the requirements of the CBC

2. **Communicate special requirements to the development team.**

   Once special requirements are identified in the plan approval process and the structural test and inspection schedule is completed and approved, the Chief Building Official shall stipulate that these requirements be incorporated into the approved plans.

   The Chief Building Official may also require a preconstruction conference to review the conditions of special inspection.

3. **Approve the inspector.**

   Since special inspectors observe specialized work, they must possess very specialized skills. Therefore, special inspectors must be competent individuals, qualified in the areas they are to inspect, and approved by the Chief Building Official to observe the work assigned. Qualifications for special inspectors are listed in Section 4.

4. **Monitor the special inspection activities.**

   The Chief Building Official should monitor the jobsite to see that special inspection is continuous where required and that an adequate number of special inspection staff is present, depending upon extent and complexity of the project.

5. **Review inspection reports.**

   The Chief Building Official receives, reviews, and makes the inspection reports part of the inspection records.

6. **Receive the final report.**

   The Certificate of Occupancy shall not be issued until the final report has been received and accepted by the Chief Building Official.

Duties and Responsibilities of the Contractor

The contractor's duties include the following:

1. **Notify the special inspector.**

   The contractor is responsible for notifying the special inspector or agency regarding individual inspections required by the Building Division. Adequate notice shall be provided so that the special inspector has time to become familiar with the project.

2. **Provide access to approved plans.**

   The contractor is also responsible for providing the special inspector with access to approved plans at the jobsite.

3. **Retain special inspection records.**

   The contractor is also responsible for retaining all special inspection records submitted by the special inspector at the jobsite and providing these records for review by the Building Division's inspector upon request.

STATEMENT OF SPECIAL INSPECTION

Certain types of construction shall have continuous inspection as specified in Section 1704 of the California Building Code (CBC). The level of special inspection (continuous or periodic), in addition to material testing requirements, should be identified in the Statement of Special Inspections, prepared by the registered design professional for each project. For the convenience of our clients, we have reproduced draft copies of the Statement of Special Inspections and Schedule of Structural Testing developed by Structural Engineers Association of Northern California (SEAONC).

SECTION 3

GUIDELINES FOR SPECIAL INSPECTION IN CONSTRUCTION

SECTION 3

3.1 - SOILS (Grading, Excavation, and Filling)

OBJECTIVE

Earthwork as presented in this section includes, in general, those soils construction activities normally associated with special grading, excavation, and filling. The purpose of earthwork observation and testing is to verify that the work is done in compliance with the approved plans and specifications, and, in particular, with the recommendations of the project geotechnical report. .Soil is a highly variable material, is very sensitive to moisture fluctuations, and requires close attention to construction quality control in order to achieve the desired result. Many factors contribute to its suitability and effective performance. Identifying and properly controlling these factors can be divided into two general areas of activity. The first involves the observation or monitoring during construction with particular attention that placement and compaction operations are followed as specified in the contract documents and geotechnical report. The second involves tests to document the soils properties and to verify compliance to the quality specified. Materials engineering laboratories that offer services in this field provide special expertise and equipment to verify the objectives of the design and project specifications. However, this is best accomplished when the design geotechnical consultant provides these construction-related services and can, in turn, achieve continuity and integration of the design-construct process. Without involvement of this geotechnical engineer, the constructed earthwork may not meet the performance requirements intended.

OBSERVATION DUTIES

A. Documents

1. Review the approved plans, specifications, and the geotechnical engineer's report.
2. Note and record the equipment being used on site.

B. Verification

1. Verify materials below footings are adequate to achieve the desired bearing capacity.
2. Verify excavations are extended to proper depth and have reached proper material.
3. Perform classification and testing of controlled fill materials.
4. Verify use of proper materials, densities, and lift thicknesses during placement and compaction of controlled fill.
5. Prior to placement of controlled fill, observe subgrade and verify that site has been prepared properly.

C. Sampling of Materials

1. Sample and verify that the following materials are delivered to the Materials Engineering Laboratory for any required testing:
    a) Subgrade materials;
    b) Native-fill materials;
    c) Imported materials; and

d) Additive materials (lime, cement, sand, pozzolan, etc.).

D. Testing

1. Perform soils classification and properties tests as required on native and/or imported soils.
2. Perform laboratory moisture-density relationship tests or other structural property tests as required.
3. Where applicable, conduct a laboratory testing program to determine soils' properties resulting from admixtures such as cement or lime. 4. In the field, conduct in-place field density and moisture tests using procedures specified in the contract documents. Frequency of testing should be predetermined to allow for representative coverage of each lift, while interfering as little as possible with the earthwork operation's schedule.
4. Conduct testing in a timely manner to avoid having to retest previously covered work. Similarly, test methods should be predetermined so as to take into account the Contractor's procedures and soil types.
5. Periodically sample materials in the field to verify continued compliance with specification requirements (recommended).

E. Reports

1. Submit written progress reports describing the tests and observations made and showing the action taken to correct nonconforming work.

SECTION 3

3.2 - FOUNDATIONS (Piles and Piers)

PILES

OBJECTIVE

The observation of driven piles is a specialized discipline that requires the oversight of a design geotechnical engineer. Interpretation of pile capacity is achieved through knowledge of the anticipated soil types and the types of pile-driving equipment being used to install the piles. Materials engineering laboratories should only perform this service under the supervision and oversight of the design geotechnical engineer. If this inspection is not performed by the geotechnical engineer of record, it is recommended that the geotechnical engineer at least monitor the work of the special inspector to ensure that the inspector has the knowledge, experience, and all pertinent information needed.

OBSERVATION DUTIES

A. Documents

1. Review the approved plans, specifications, and the geotechnical engineer's report.
2. Note and record the equipment being used on site.

B. Verification

1. Verify that pile materials, sizes, and lengths comply with the requirements.
2. Determine capacities of test piles and conduct additional load tests, as required under the supervision of the design geotechnical engineer.
3. Observe driving operations and maintain complete and accurate records for each pile.
4. Verify locations of piles and their plumbness.
    a) Confirm type and size of hammer.
    b) Record number of blows per foot of penetration.
    c) Determine required penetrations to achieve design capacity.
    d) Record tip and butt elevations and record any pile damage.
5. For steel piles, perform additional inspections in accordance with Section 1704.3.
6. For concrete piles and concrete-filled piles, perform additional inspection in accordance with Section 1704.4
7. For specialty piles, perform additional inspections as determined by the registered design professional in responsible charge.
8. For augered uncased piles and caisson piles, perform inspections in accordance with Section 1704.9.

C. Testing

1. Determine capacities of test piles and conduct additional load tests, as required *(CBC Table 1704.8)*.

D. Reports

1. Submit written progress reports describing the tests and observations made and showing the action taken to correct nonconforming work.

PIERS (Cast-In-Drilled-Hole CIDH)

OBJECTIVE

Drilled pier (CIDH) observation requires experience with soil and rock identification and with interpretation of design soil and embedment requirements. Materials engineering laboratories engaging in this service should do so only under the direct supervision and oversight of the design geotechnical engineer. Minor drilled pier foundations for non-structural improvements may be observed without the oversight of the design geotechnical engineer. Additionally, CIDH piles deriving their support in friction for lightly loaded structures can be observed by special inspection personnel provided a design geotechnical engineer is reviewing and accepting the work. CIDH piers for major structures, for critical structures such as schools and hospitals, for any pier constructed underwater using the tremmie method, or for any pier requiring an interpretation of end-bearing capacity or embedment into a specific soil or rock type should only be performed under the supervision of an engineer or geologist.

OBSERVATION DUTIES

A. Documents

1. Review the approved plans, specifications, and the geotechnical engineer's report.
2. Note and record the equipment being used on site.

B. Verification

1. Observe drilling operations and maintain complete and accurate records for each pier.
2. Verify locations of piers and their plumbness. Confirm pier diameters, bell diameters (if applicable), lengths, log of soil types embedment into bedrock (if applicable), and adequate end strata bearing capacity.
3. For concrete piers, perform additional inspections in accordance with Section 1704.4.
4. For masonry piers, perform additional inspections in accordance with Section 1704.5.

C. Sampling of Materials

1. Obtain samples of soil and rock if required by the geotechnical engineer of record for confirmation of classification or strength testing.

D. Testing

1. Perform testing of continuity of pier defects using geophysical methods if required by design professionals.

E. Reports

1. Submit written progress reports describing the tests and observations made and showing the action taken to correct nonconforming work.

SECTION 3

3.3 – Asphalt Concrete

OBJECTIVE

The performance of Hot Mix Asphalt (HMA) and Rubberized Hot Mix Asphalt (RHMA) pavement is as much affected by the careful construction of the subgrade and base as it is by the control of the mix itself. Therefore, the paving inspector must also be knowledgeable in soils. The purpose of observation and testing of HMA and RHMA paving is to verify that paving contractors and their suppliers are exercising adequate quality control in their operations and are providing a finished product that complies with the project plans and specification requirements. This is also to be accompanied by adequate sampling of HMA and RHMA for acceptance testing in accordance with the Quality Assurance Plan. This objective can best be achieved by qualified special inspectors performing the following duties under the direct supervision of the materials engineering laboratory.

OBSERVATION DUTIES

A. Documents

1. Review the approved plans and specifications, and meet with contractor and suppliers before construction to discuss project and to verify that requirements for testing and observation are well understood.
2. Review material certificates and test reports for compliance with job specifications.
3. Review Job Mix Formula (JMF) submittals for compliance to project requirements.

B. Sampling of Materials

1. Sample and perform preliminary tests on proposed aggregates and asphalt cement (virgin asphalt cement, Rubberized Asphalt Binder, or Asphalt Rubber Binder) to verify JMF (gradation, sand equivalent, abrasion, air voids, etc.)

C. Subgrade and Base

1. Confirm that sources of materials have been sampled and approved.
2. Verify that materials delivered are of uniform quality.
3. Verify that control testing of subgrade materials is being performed and recorded as required.
4. Verify that subbase and base courses are of the source, type, thickness and density specified.
5. Verify that soil stabilization is provided, if required.
6. Refer to Section 1, Earthwork, for additional details.

D. Plant (Drum Mix or Batch)

1. The inspector should become familiar with the appearance and physical characteristics of the mix to be used by observing visually the finished mixture so that unsatisfactory conditions may be readily recognized.
2. Check the plant facilities prior to production of HMA or RHMA.
3. Check aggregates in stockpile to verify conformance to materials utilized in the design.
4. Check the temperature and weights of the aggregate fractions and asphalt cement.
5. Check the mixing temperature and the temperature of the mixed batches on the truck.
6. Conduct sampling of the asphalt cement and blended aggregates (and RAP, if any) to verify the (cold feed or hot-bins, whichever is applicable) job mix formula is within tolerance.
7. Before loading, truck beds should be checked for cleanliness and absence of materials that might be detrimental to the mix (such as cleaning solvents). Ensure the trucks are tarped after loading.
8. Coordinate with the job site inspector to obtain a uniform and consistent HMA.

E. Spreading and Paving

1. The field inspector should contact the plant inspector promptly should the observed conditions during placement and spreading operations suggest a need for change at the plant. The following items should be addressed prior to and during placement operations:
    a) Area to be paved, cleaned, crack sealed and properly primed, or tack coated.
    b) Leveling course installed where required.
    c) Suitability of spreading and paving equipment.
    d) Ambient and Base temperature to be noted.
    e) Mix temperature when delivered, during placement, and after final rolling is within limits required.
    f) Density tests by nuclear gauge during rolling (when applicable).
    g) Thickness control by adequate placement and compaction.
    h) Sampling of HMA or RHMA at jobsite during placement for laboratory testing (asphalt content, air voids, etc.).
    i) Core samples taken for verification of thickness and in-place density of the mat.
    j) Application of seal coat and curing in accordance with specification requirements, if required.

F. Verification Tests

1. Stability and air voids.
2. Asphalt content and gradation by extraction (solvent or ignition oven).
3. Physical properties of the asphalt cement: penetration, viscosity, softening point, resilience, ductility, and specific gravity (when applicable).
4. Aggregate quality: gradation, LA abrasion, and equivalent, fractured faces, uncompacted voids, etc.
5. Thickness and Field density of core samples.
6. Smoothness tolerance.

G. Reports

1. Submit written reports describing the observations made and showing the action taken to correct nonconforming work. Itemize any changes authorized by architect/engineer. Report all deviations from plans or specifications.

SECTION 3

3.4 – Reinforcing Steel

OBJECTIVE

The purpose of reinforcing steel observation (continuous or periodic) is to give assurance that the supplier is exercising satisfactory control over production, fabrication, and placing of reinforcing steel so that it meets the project specifications and applicable codes and industry standards. The Statement of Special Inspections, prepared by the responsible design professional, will define the special inspection task(s) required. Qualified special inspectors who diligently perform the duties listed below while under the direct supervision of the materials engineering laboratory can best achieve this objective.

OBSERVATION DUTIES

A. Documents

1. Review the approved plans, specifications, and approved shop drawings.
2. Review applicable sections of referenced codes, such as: the California Building Code (CBC); the Building Code Requirements for Reinforced Concrete (ACI-318) by the American Concrete Institute (ACI); the Manual of Standard Practice of the Concrete Reinforcing Steel Institute (CRSI); the Reinforcing Steel Welding Code (AWS D1.4) by the American Welding Society (AWS).

B. Mill Test Reports

1. Verify reinforcing steel mill test reports (when available) for mill markings and test data, checking against project requirements.
2. Sample material for tests directly from unopened bundles when required by specifications.

C. Fabrication

1. Check each shipment of reinforcing steel for the following:
    a) Bar sizes and grades are as specified.
    b) Mill marking is in conformance with mill test reports.
    c) Corrosion, contaminants, surface cracks, and bars damaged in shipment.
    d) Shop bends for specified radius and cracks.

D. Placement

1. During placement of reinforcing, check for proper bar locations, alignment, laps, ties, form and ground clearance, supports, field bend radii and cracks, gouges or tack welds causing stress concentrations, removal of contaminants, and hardened concrete.
2. If welding of reinforcing is required, it should be observed as defined in CBC Table 1704.3(5b), with particular emphasis on joint configuration, suitability of low hydrogen electrodes, preheat and interpass temperatures, and interpass slag removal. Check for

welding and procedures for conformance to AWS D1.4. 3. Prior to concrete placement, check for complete installation and notify contractor of any variations from plans and specifications. If variations are not corrected prior to start of concreting, immediately notify the design team representative and the building office for appropriate action.

3. During concrete placement, check that reinforcing stays in place and is adequately supported. Check for removal of dirt, concrete spatter, grease, or other contaminants.
4. Check embedded items, including anchorages, inserts, and bolts installed in concrete for compliance to project documents. Verify they are solidly cast in place during placement of concrete.

E. Reports

1. Submit written progress reports describing the tests and observations made and showing the action taken to correct nonconforming work. Itemize any changes authorized by architect/engineer. Report all uncorrected deviations from plans or specifications.

SECTION 3

3.5 – Concrete Batch Plant

OBJECTIVE

The purpose of batch plant observation is to verify that the concrete supplier is exercising adequate quality control to produce concrete that will meet the project requirements for materials, their batch proportions, and mixing and adjustment for moisture. The Statement of Special Inspections, prepared by the responsible design professional, will define the special inspection task(s) required. Qualified special inspectors who diligently perform the duties listed below while under the direct supervision of the materials engineering laboratory can best achieve this objective.

OBSERVATION DUTIES

A. Documents

1. Verify that the class of concrete ordered is being delivered and conforms to approved mix designs.

B. Equipment

1. Check the trucks for worn out or damaged fins, for excessive buildup of hardened concrete, and for the presence of wash water from the previous delivery.
2. Check the National Ready-mix Concrete Manufacturers Association truck rating plate and verify that load capacities are not exceeded.
3. Check the current “weights and measures” seal on scales.
4. Verify that the moisture-metering device is operable.
5. Verify that the scales start at and return to zero after each weighing operation.
6. Verify that the metering devices for admixtures have been calibrated recently and are operating.

C. Materials, Storage, and Handling

1. Visually check the sand and coarse aggregate for method of storage, handling, source, grading, cleanliness, and moisture condition.
2. Obtain samples of aggregates when specified or when it appears that they may not conform to the required gradation or cleanliness.
3. Obtain grab samples of cement and pozzolanic materials when required by project specifications.
4. Check cement temperature when required.
5. For lightweight aggregates, check loose moist unit weight regularly and verify whether the plant is making proper adjustments to batch weights to compensate for variations in weight as well as in moisture.

D. Batching of Materials

1. Record the volume in cubic yards for each class of concrete delivered. Verify that each mix proposed for delivery is of the proper designation and proportions approved for the project. Where discrepancies occur, request that the dispatcher clarify with the general contractor.
2. Verify that the specified materials are dispensed to the weigh hopper and record the adjusted batch weights for all ingredients in the desired proportions of the concrete mix.
3. Verify that the proper adjustments have been made for variations in moisture of aggregates.
4. Record the mixing time and check whether it is sufficient.
5. Visually estimate the slump of the concrete and report immediately to the operator any slumps outside of specified tolerance.
6. Coordinate with the job site and verify the “as delivered” slump, air content, unit weight, mix temperature, general workability, and preparation of test samples.

E. Reports

1. Submit written progress reports describing the tests and observations made and showing the action taken to correct nonconforming work. Itemize any changes authorized by architect/engineer. Report all uncorrected deviations from plans or specifications.

SECTION 3

3.6 - Concrete

OBJECTIVE

Many factors interact to affect the ultimate quality of concrete. To deal properly with these factors, quality assurance is divided into two recognized phases. The first involves collecting evidence from standard tests to verify that the delivered concrete was produced to the standards specified. The second involves verifying that proper construction practices are followed during placement, finishing, and curing. The Statement of Special Inspections, prepared by the responsible design professional, will define the special inspection task(s) required. Qualified special inspectors who diligently perform the duties listed below while under the direct supervision of the materials engineering laboratory can best achieve this objective.

OBSERVATION DUTIES

A. Documents

1. Review the approved plans and specifications.
2. Verify that the class of concrete ordered is being delivered and conforms to specifications, drawings, and/or code requirements and approved mix design.

B. Observation Procedures

1. Verify formwork is of proper size and shape. Verify that the location and preparation of construction joints comply to approved plans, specifications, and building code requirements.
2. Check forms for cleanliness and proper treatment prior to placement.
3. Visually estimate the slump of each batch delivered and perform slump tests regularly.
4. Determine concrete temperature, number of mixing revolutions, and/or length of time since batching.
5. Observe placement procedures for evidence of segregation, possible cold joints, displacement of reinforcing or forms, and proper support of embedded items, anchor bolts, etc.
6. Observe methods used for compaction/consolidation.
7. When specified, verify that concrete is protected from temperature extremes, and that proper curing is initiated.
8. When specified, verify maintenance of cure temperature and techniques.

C. Sampling and Testing Duties

1. Sample and test fresh concrete for the following (or as stipulated by plans and specifications):
    a) Slump
    b) Temperature

   c) Entrained air, when required
   d) Wet unit weight, when required
2. Sample concrete and prepare test cylinders in accordance with ASTM C31.
3. Field sampling and testing of concrete should be performed by a qualified technician, certified by ACI as a Concrete Field Testing Technician – Grade 1 (or approved equal)

D. Reports

1. Submit written progress reports describing the tests and observations made and showing the action taken to correct nonconforming work. Itemize any changes authorized by architect/engineer. Report all uncorrected deviations from plans or specifications.

SECTION 3

3.7 - Shotcrete

OBJECTIVE

The purpose of special observation for shotcrete is to verify that the materials, processes, and the particularly unique application techniques conform to the project documents. The process moves rapidly in often noisy and congested environments; it relies heavily on experienced working crews. The Statement of Special Inspections, prepared by the responsible design professional, will define the special inspection task(s) required. Qualified special inspectors who diligently perform the duties listed below while under the direct supervision of the materials engineering laboratory can best achieve this objective.

OBSERVATION DUTIES

A. Documents

1. Review the approved plans, specifications, and contractor submittals for applications process used.
2. Verify crew qualifications.
3. Verify material sources and approved mix design.
4. Verify test methods and sample procedure.

B. Observation Procedures

1. Verify main and auxiliary equipment for compliance, capacity, pressures, and proper functioning.
2. Check for hot or cold weather limitations and precautions.
3. Verify reinforcing is proper type, grade, and size; free of oil, dirt, and rust; properly coated and/or sheathed as specified; located within acceptable tolerances and adequately supported; and will allow for minimum shotcrete cover.
4. Verify that placement of reinforcing steel (or ducts) complies with spacing, profile, and quantity requirements.
5. Verify hooks, bends, ties, stirrups, and supplemental reinforcement are fabricated and placed as specified.
6. Verify required non-contact lap lengths.
7. Verify proper installation of approved mechanical connections and/or bolts.
8. Ensure all welds of reinforcing steel and other weldments are as specified and have been inspected and approved by welding inspector.
9. Verify formwork is proper size and shape; location of all construction joints; and penetrations and embeds are correct and adequately supported.
10. Check for ground wires or other thickness gauging control method.
11. Verify the nozzleman has suitable shooting positions and access to achieve placement with minimal rebound.
12. Review mixing and placing procedures with crew before commencement of application.

13. Verify that batch tickets indicate delivery of the approved mix as specified.
14. Observe placement for:
    a) Consistency
    b) Consolidation
    c) Coverage
    d) Rebound
    e) Finish
15. Check completed job for defects and corrective action.
16. Verify protection from temperature extremes and determine proper curing is initiated.

C. Sampling and Testing

1. Determine required type, quantity, and frequency of tests on fresh and hardened shotcrete.
2. When required, observe preparation of preconstruction test panel(s), simulating job conditions as closely as possible. The panel(s) thickness and reinforcing should represent:
    a) Most congested area specified in the structural design.
    b) Shot at the same angle, using the same nozzleman, and with the same mix design that will be used.
    c) Same equipment to be used during construction, unless substitution has been approved by the Chief Building Official.
3. During construction, observe preparation of a test panel (either 18” x 18” or 12” x 12” based on aggregate size), or as otherwise specified, to obtain suitable cores for testing. Arrange correct positioning of sample panel to represent job shotcrete. Prearrange with nozzleman the correct timing of the test sample preparation and verify that it is representative of job placement, finish, and cure. Refer to ACI 506 for further guidance.
4. Strength testing requires not less than three specimens from each panel. Specimens shall be either 3” diameter cores or 3” cubes when maximum-size aggregate is larger than 3/8”. Specimens shall be at least 2” diameter cores or 2” cubes when maximum-size aggregate is 3/8” or smaller.
5. Mark panel with specimen identification, protect for curing period, and arrange for transportation to the testing laboratory.

D. Reports

1. Submit written progress reports describing the tests and observations made and showing the action taken to correct nonconforming work. Itemize any changes authorized by architect/engineer. Report all uncorrected deviations from plans or specifications.

SECTION 3

3.8 – Pre-Tensioned Concrete

OBJECTIVE

Because the quality of materials used in prestressed construction is more closely controlled than normal concrete construction, there has developed a strong quality system program by plant manufacturers. As a result, the purpose of pre-tensioned concrete plant observation is to verify the actual control program and to check its effectiveness. The Statement of Special Inspections, prepared by the responsible design professional, will define the special inspection task(s) required. Qualified special inspectors who diligently perform the duties listed below while under the direct supervision of the materials engineering laboratory can best achieve this objective.

OBSERVATION DUTIES

A. Documents

1. Review the approved plans, specifications, and approved shop detail drawings.
2. Verify that concrete mix designs, tensioning data, and calculations for stressing have been approved by the reviewing authority.
3. Verify that jacking equipment has been calibrated.

B. Mill and Plant Test Reports

1. Check conformance of all materials to project specifications. Verify steel mill test reports for prestressing steel and deformed bar steel. Verify mill markings and tags. Verify cement mill test reports and certification.
2. Check fabricator's testing facility and reporting of tests performed under fabricator's quality control program.

C. Sampling

1. Sample and deliver or ship to the laboratory for testing the following when independent tests are required by project specifications:
    a) Concrete aggregates
    b) Prestressing strand or wire
    c) Reinforcing steel
    d) Steel used for structural steel embedded items

D. Steel Fabrication of Embedded Items

1. Verify that qualified welders are employed to perform welding of structural steel using welding procedures qualified in accordance with AWS Structural Welding Code.

E. Pre-Placement Observations

1. Bed layout and form cleanliness.

2. Quantity and spacing of reinforcing and stressing steel.
3. Location of inserts and embedded items.
4. Profile of stressing steel.
5. Witness tensioning of prestressing elements, measure elongation of strand, and record gauge pressure.

F. Tests and Observation During Casting

1. Perform batch plant observations.
2. Conduct slump, air, and unit weight tests. Request adjustments as necessary.
3. Cast compression test specimens.
4. Observe placement and vibration of concrete in forms.
5. Observe finishing treatment.

G. Post-Placement Tests and Observations

1. Observe curing procedures, temperatures, and curing cycles.
2. Monitor compressive strength results for specified release strength.
3. Witness stress transfer.
4. Identify member by component and date cast.

H. Field Erection

1. Check members for damage during storage or shipment.
2. Check field installation and structural connections.

I. Reports

1. Submit written progress reports describing the tests and observations made and showing the action taken to correct nonconforming work. Itemize any changes authorized by architect/engineer. Report all uncorrected deviations from plans or specifications.

SECTION 3

3.9 – Post-Tentioned Concrete

OBJECTIVE

Post-tensioned concrete is normally constructed onsite rather than fabricated in plants. As a result, more responsibility is placed on the independent inspection agency to verify that quality control meets acceptable standards. The Statement of Special Inspections, prepared by the responsible design professional, will define the special inspection task(s) required. Qualified special inspectors who diligently perform the duties listed below while under the direct supervision of the materials engineering laboratory can best achieve this objective.

OBSERVATION DUTIES

A. Documents

1. Review the approved plans, specifications, and approved placing and stressing drawings furnished by the post-tensioning contractor.
2. Review the reinforcing steel placing drawings to check whether they have been coordinated with the stressing drawings.

B. Mill Test Reports

1. Check that reinforcing steel and post-tensioning steel supplied to job is properly identified and mill test reports show conformance to project specifications.

C. Sampling of Materials

1. Sample and deliver to the laboratory for testing the following materials when required by project specifications:
    a) Concrete aggregates and cement
    b) Prestressing strand, rods, or wire
    c) Reinforcing steel
    d) Steel used for structural inserts

D. Steel Fabrication of Embedded Items

1. Visit fabrication plant.
2. Verify that qualified welders only are welding in accordance with AWS Structural Welding Code.
3. Verify that only qualified welding procedures are being used.
4. Observe the welding operations and the finished product for defects and verify that corrections are made, if necessary.

E. Pre-Placement Observations

1. Check the general layout, size, spacing, and profile of all reinforcing steel and post-tensioning steel.

2. Observe all anchorages, inserts, embedded items, blockouts, conduits, etc.
3. Calibrate or review current calibration data on the proposed stressing equipment.

F. Observation During Placement of Concrete

1. Observe batch plant operations when required.
2. Observe concrete placement and report any damage or misalignment of any embedded components (with particular emphasis at end anchorages).
3. Cast compression test specimens.
4. Test slump, air content, and unit weight. Request adjustment as necessary.

G. Stressing

1. Verify that the concrete compressive strength meets the minimum required strength prior to post-tensioning.
2. Check the stressing sequence and verify the required post-tensioning forces.
3. Call to the attention of the structural engineer any out of tolerance discrepancy in force-elongation relationship, spelled concrete, broken tendons, or anchorage slippage.
4. Verify friction losses where applicable.
5. When using bonded tendons, observe grouting procedure.

H. Reports

1. Submit written progress reports describing the tests and observations made and showing the action taken to correct nonconforming work. Itemize any changes authorized by architect/engineer. Report all uncorrected deviations from plans or specifications.

SECTION 3

3.10 - Masonry

OBJECTIVE

The purpose of special observation (level 1 or 2) for masonry is to verify that the workmanship and materials meet the minimum standards required by code and by the approved project plans and specifications. This is particularly difficult in masonry work where so much is dependent upon the capabilities of the individual mason. This requires the inspector to rely on knowledge, experience and judgment while applying the requirements of the applicable code to the particular condition. The Statement of Special Inspections, prepared by the responsible design professional, will define the special inspection task(s) required. Qualified special inspectors who diligently perform the duties listed below while under the direct supervision of the materials engineering laboratory can best achieve this objective.

OBSERVATION DUTIES

A. Documents

1. Review the approved plans, specifications, and Statement of Special Inspections with the masonry contractor and architect's representative in a preconstruction meeting.
2. Verify whether high lift or low lift procedures have been approved and documented for use.

B. Mill Test Reports

1. Verify that mill test certifications for unit masonry, cement, reinforcing steel, and embedded anchors have been furnished by supplier and are acceptable to the architect/engineer.

C. Sampling of Materials

1. Sample and verify that the following materials are delivered to laboratory for testing when required:
    a) Concrete block or brick
    b) Aggregates and cement for mortar and grout
    c) Reinforcing steel as delivered

D. Storage of Materials

1. Verify cement, lime, block, and brick are supported on pallets and covered to protect from exposure to excessive moisture or drying.
2. Verify aggregates for mortar and grout are stored free from contamination and in such a manner as to minimize segregation.
3. Verify reinforcement, ties, and metal accessories are stored off the ground and in a manner to prevent permanent distortions.

E. Preparation for Lay-Up

1. Verify size and spacing of reinforcing dowels.
2. Verify length of dowel protruding from footing is of sufficient length to allow for the splicing of vertical reinforcing steel as required.
3. Verify that foundation concrete is clean and prepared as required by specifications.

F. Lay-Up or Placing of Masonry Units

1. Verify that cleanouts are provided for first course of each pour, if high lift method is used.
2. Verify plumb and lay-up configuration.
3. Verify moisture condition of masonry units.
4. Verify that proper mortar ingredients and batching techniques are being used and prepare mortar compression test specimens.
5. Verify mortar time on board.
6. Verify that head joints are the same thickness as face shells or that full head joints are used when specified.
7. Verify that mortar extrusions (fins) are cleaned off inside.
8. Verify whether joints are tooled as specified.
9. Verify required frequency of masonry wall prisms and observe construction of same as specified.
10. Observe horizontal and vertical reinforcing steel to verify:
    a) Reinforcing steel is of specified size and grade.
    b) Reinforcing steel is located and spliced as specified.
    c) Lap splices are staggered in bond beams and corners as required.
    d) Hooks are specified size and bent as required.
    e) Ties are specified size, spacing, and bent as required.
    f) Reinforcing steel is properly secured and minimum clearances are as required.
11. Verify embedded items are:
    a) Placed at proper location and secured.
    b) Proper size and clearances are as required.
12. Verify masonry is protected from weather:
    a) When ambient or CMU temperature falls below 40°F.
    b) When ambient temperature exceeds 100°F or 90°F (wind velocity greater than 8 mph).

G. Pre-grouting Tasks

1. Verify that cells and starting beds are clean.
2. Verify dowels, anchor bolts, and inserts are all in place, particularly at rooflines, floor lines, and intersecting wall lines.
3. Verify installation of cleanout closures.

H. Grouting Observations

1. Verify grout mix for conformance to approved mix design.
2. Verify slump is in accordance with the specifications.

3. If low lift grouting, verify maximum masonry height is in accordance with the code before grouting.
4. Verify consolidation (mechanical vibrating or puddling) during placement, and later during reconsolidation.
5. Monitor time since batching of grout.
6. Monitor flow of grout throughout wall and each grout pour height for conformance to specifications.
7. Preparation of any required grout specimens and/or prisms shall be observed. Note mortar specimens are no longer required.
8. Verify grout is stopped below top for keying where required.
9. Verify curing requirements are being followed.

I. Reports

1. Submit written progress reports describing the tests and observations made and showing the action taken to correct nonconforming work. Itemize any changes authorized by architect/engineer. Report all uncorrected deviations from plans or specifications.

SECTION 3

3.11 – Structural Steel

OBJECTIVE

The customary practice of fabrication of steel in the shop prior to erection conveniently allows division of observation of structural steel into two basic categories, shop and field. While the purpose is to assure that proper quality control is exercised at each location, the environment differs. Often the shop is fabricating other projects concurrently and may operate two or three shifts per day. The shop work is closely related to mass production, while the fieldwork relates closer to handcrafting. Proper scheduling and coordination by the general contractor is paramount to proper inspections in both venues.

The Statement of Special Inspections (SSI), prepared by the responsible design professional, will define the special inspection task(s) required. Qualified special inspectors who diligently perform the duties listed below while under the direct supervision of the materials engineering laboratory can best achieve this objective. To better achieve the objective of quality assurance, it is wise to use only one agency to fulfill the duties of both shop and field observation.

OBSERVATION DUTIES

A. Documents

1. Review the approved plans and specifications, and review the approved shop drawings.
2. Review applicable sections of referenced codes, particularly the American Welding Society Structural Welding Code (AWS D1.1) and the Manual and Specifications of the American Institute of Steel Construction (AISC).
3. Review all welding procedures (qualified and prequalified) per governing code.

B. Mill Test Reports

1. Review mill test reports and check heat numbers with material as received. Verify that proper identification of steel is maintained during fabrication.

C. Sampling and Testing

1. When required by project specifications, mark sample location with steel stamp on each piece tested.
2. Record sample number and location and check that sample identification is maintained as samples are delivered to laboratory and tested.
3. When steel members are delivered to finish length and no “crop ends” are available for sample cutting, coordinate cutting and patching requirements with architect/engineer and fabricator.

D. Welding Observation (Applicable to Shop and Field)

1. Check all welders' certifications and verify that they work only as covered by their certification.
2. Keep a written record of all welders by name, their identifying steel mark, and the percentage of rejectable welds.
3. Upon detection of a rejectable weld (either visually or by nondestructive test), the inspector will notify the foreman for verification of defect. The inspector will observe removal of defects and repairs to check whether acceptable procedures were used.
4. Inspect joints for proper preparation, including bevel, root faces, root opening, etc.
5. Check the type and size of electrodes to be used for the various joints and positions. Check the storage facilities to see if they are adequate to keep the electrodes dry.
6. Observe the technique of each welder periodically with the use of a welding inspection shield.
7. Verify the use of Welding Procedure Specifications (WPS).
8. Observe multi-pass welds continuously. Continuous observation is defined as follows: The inspector is present in the welding area at all times. The extent of inspection of individual welds will depend on the number of operators welding.
9. Observe single pass fillet welds periodically (in accordance with CBC Section 1704.3.2), after determining that the operator is capable of producing the welds required.
10. If straightening or restraining of weldments is necessary, verify that approved methods will be used.
11. Tag or stamp accepted weldments with the inspector's identification stamp.

E. Workmanship

1. Check straightening and bending procedures.
2. Check cut edges, including those flame-cut, sheared, or milled.
3. Check bolt holes for diameter size in major connections.

F. Additional Duties (if required by the SSI)

1. Verify that the welding sequence complies with approved construction documents.
2. Check steel frame joint details for compliance with approve construction documents, including details such as bracing and stiffening, member locations, and application of joint details at each connection.
3. During adverse weather conditions, check that adequate steps are taken to prevent moisture penetration at welding location.

F. Reports

1. Submit written progress reports describing the tests and observations made and showing the action taken to correct nonconforming work. Itemize any changes authorized by architect/engineer. Report all uncorrected deviations from plans or specifications.

SECTION 3

3.12 – High Strength Bolting

OBJECTIVE

The purpose of high strength bolting observation (continuous or periodic) is to provide assurance that the proper bolt type(s) and installation procedures are used to meet the project specifications and applicable codes and industry standards.

The Statement of Special Inspections, prepared by the responsible design professional, will define the special inspection task(s) required. Qualified special inspectors should diligently perform those duties while under the direct supervision of the materials engineering laboratory.

OBSERVATION DUTIES

A. Documents

1. Review the approved plans, specifications, and approved shop drawings.
2. Review applicable sections of referenced codes, particularly American Institute of Steel Construction (AISC) 360.

B. Mill Test Reports

1. Review mill test reports and check identification markings with material as received.

C. Sampling and Testing

1. Sample high strength bolts, washers, and nuts for testing from the lots in the shop or on the jobsite, if required.
2. Record sample information from each lot and check that sample identification is maintained as samples are delivered to laboratory and tested.

D. High Strength Bolting Observation

1. Review type of joint specified (i.e., slip-critical, bearing-type).
2. Check bolts, nuts, and washers for compliance to project specifications.
3. Review the procedure for installation of bolts. The amount and type of inspection during installation will depend on the method used (i.e., turn-of-nut calibrated wrench, twist-off bolts, direct tension-indicator washers).
4. Check joint surfaces to verify that they are free of burrs, dirt, etc.
5. Observe pre-installation testing and calibration procedures when required.
6. Verify all plies of connected materials have been drawn together and properly snugged.
7. Monitor the installation of bolts to verify the selected installation procedure is properly used to tighten bolts.
8. For joints requiring only snug-tight condition, verify connected materials have been drawn together and properly snugged.

E. Reports

1. Submit written progress reports describing the tests and observations made and showing the action taken to correct nonconforming work. Itemize any changes authorized by architect/engineer. Report all uncorrected deviations from plans or specifications.

SECTION 3

3.13 – Nondestructive Testing (NDT)

OBJECTIVE

The purpose of nondestructive testing is to verify that structural steel and/or completed welds are sound with respect to the given project criteria. Visual observation may not detect hidden fusion defects, cracking, and lamellar tearing. Therefore, it is important that all means necessary be available to the special inspector for reasonable verification of sound welds. Proper scheduling and coordination by the general contractor is paramount to proper inspections.

The Statement of Special Inspections, prepared by the responsible design professional, will define the special inspection task(s) required. Qualified NDT special inspectors performing standard test methods under the direction of the materials engineering laboratory can best achieve this objective. Since NDT tests are indirect (relying on a probing medium to disclose defects), accurate evaluation depends upon experienced, qualified personnel who are thoroughly trained in theory and applications.

OBSERVATION DUTIES

A. Documents

1. Review the approved plans, specifications, and approved shop drawings.
2. Review applicable sections of referenced codes, particularly CBC Section 1708.4 and Section 6 of the AWS Structural Welding Code D1.1.
3. Where applicable, review welding procedures and sequences.

B. Personnel

1. All NDT personnel shall be qualified in accordance with the American Society for Nondestructive Testing, Recommended Practice SNT-TC-1A, (also CP189) and the supplement applicable to the method to be used. Only Level II and III inspectors, or Level I inspectors working under the direct supervision of a Level II or III inspector, are permitted to conduct the tests.

C. Method Selection

1. Method to be used shall be as prescribed by project specifications, building codes, or as recommended by the materials engineering laboratory under the direction of the design professional.
2. Effective use of NDT depends on utilizing the proper test method and techniques. Where field conditions or sequences affect the specified methods, the materials engineering laboratory will contact the project architect or engineer for suitable approved methods or techniques.

D. Tests

1. Perform tests as prescribed by contract documents, for welds, laminations, or lamellar tearing.
2. Upon detection of a defect, mark the defect and notify the foreman.
3. Keep written records of pieces, welds, welder identification marks, length and location of defects, method and date of repair, number of retests, records of performance of each welder (percent of rejected welds), and sampling rate.

E. Reports

1. Submit written progress reports describing the tests and observations made, their location, and any corrective actions taken.
2. Report the current percent of rejectable welds.

F. Standards

1. Many nondestructive testing standards and codes are presently available for information and reference. Most standards and codes specify equipment and personnel requirements, operational steps, and acceptance standards tied to the end-use function. Following is a partial list of the more common standard test methods.
    a) Radiography—AWS D1.1, ASTM E94 and E99, ASME Section V.
    b) Ultrasonic Testing—AWS D1.1, AWS D1.8, ASTM E164, ASME Section V.
    c) Magnetic Particle Testing—ASTM E109, ASME Section V.
    d) Penetrant Testing—ASTM E165, ASME Section V.

SECTION 3

3.14 – Fire-Resistant Materials

Sprayed

OBJECTIVE

The purpose of spray-applied fire-resistant materials observation is to verify that the application of material is in accordance with the project specifications, applicable codes, and manufacturer's recommendations. Proper scheduling and coordination by the general contractor is imperative.

The Statement of Special Inspections, prepared by the responsible design professional, will define the special inspection task(s) required. Qualified special inspectors who diligently perform the duties listed below while under the direct supervision of the materials engineering laboratory can best achieve this objective.

OBSERVATION DUTIES

A. Documents

1. Review the approved plans, specifications, and manufacturer's recommendations.
2. Review applicable sections of referenced codes and standards (CBC Section 1704.10, AWCI 12-A).

B. Observation Procedures

1. Verify substrate condition for cleanliness prior to application.
2. Verify application in accordance with code, referenced standard, and specifications.

C. Testing and Sampling Duties

1. Measure thickness of spray-applied fire-resistive material in accordance with specifications, CBC Section 1704.10 and AWCI 12-A.
2. Remove and deliver samples to materials engineering laboratory for unit weight tests.
3. Perform cohesive/adhesive bond strength tests per ASTM E736.
4. Re-inspect areas repaired due to insufficient thickness or damage by sampling, tenant improvements, panel placement, rain, etc. (This work must be scheduled and coordinated by the general contractor.)

D. Reports

1. Submit written progress reports describing the tests and observations made and showing the action taken to correct nonconforming work. Itemize any changes authorized by architect/engineer. Report all uncorrected deviations from plans or specifications.

Mastic & Intumescent

OBJECTIVE

The purpose of mastic and intumescent fire-resistant coatings observation is to verify that the application of material is in accordance with the project specifications, applicable codes, and manufacturer's recommendations. Proper scheduling and coordination by the general contractor is imperative. The Statement of Special Inspections, prepared by the responsible design professional, will define the special inspection task(s) required. Qualified special inspectors who diligently perform the duties listed below while under the direct supervision of the materials engineering laboratory can best achieve this objective.

OBSERVATION DUTIES

A. Documents

1. Review the approved plans, specifications, and manufacturer's recommendations.
2. Review applicable sections of referenced codes and standards (CBC Section 1704.11, AWCI 12-B).

B. Observation Procedures

1. Verify substrate condition for cleanliness prior to application.
2. Verify application in accordance with code, referenced standard, and specifications.

C. Testing Duties

1. Measure thickness of mastic or intumescent coating in accordance with specifications, CBC Section 1704.11 and AWCI 12-B.
2. Re-inspect areas repaired due to insufficient thickness or damage by sampling, tenant improvements, panel placement, rain, etc. (This work must be scheduled and coordinated by the general contractor.)

D. Reports

1. Submit written progress reports describing the tests and observations made and showing the action taken to correct nonconforming work. Itemize any changes authorized by architect/engineer. Report all uncorrected deviations from plans or specifications.

SECTION 3

3.15 – Glu Lam and Truss Joists

OBJECTIVE

The fabrication of most glu lam and truss joist products is conducted in controlled plant conditions that are designed for a mass-produced product. The primary purpose of observing the product at the plant is to check the critical operations, such as gluing, and to provide verification that the quality control exercised by the fabricator is adequate.
To best achieve this objective, an experienced timber technician should be employed performing the following duties under the direct control of the materials engineering laboratory.

GLU LAM TIMBER OBSERVATION DUTIES

A. Documents

1. Review the approved plans, specifications, and approved shop drawings.
2. Review applicable sections of referenced codes, particularly the Timber Construction Manual by the American Institute of Timber Construction (AITC) and reference standards of the California Building Code (CBC).
3. Verify that the proposed lumber grades, combinations, adhesive, and end joint details meet with code requirements.

B. Materials

1. Verify certifications on lumber grading, adhesives, and preservatives.
2. Verify lumber grade marks on the pieces being used.

C. Observation Requirements - Preliminary

1. Verify that shop drawings have been reviewed and stamped by architect/engineer and general contractor.
2. Verify that spacing of joints meets job and code requirements.
3. Measure moisture content of lumber and verify with acceptance range specified.
4. Check appearance grade requirements.
5. Verify preservative treatment requirements.

E. Observation of Sub-Assemblies (End Joints)

1. Verify lumber grade at end joints.
2. Gluing and curing procedure, verification of following:
    a) Lumber moisture, temperature, and cross section
    b) Workroom humidity and temperature
    c) Adhesive certification, lot, and temperature
    d) Joint match and separation
    e) Assembly temperature, pressure, and time

f) Sample and test representative joints

F. Laminating (Gluing)

1. Recheck lumber grades, combinations and faces, moisture, and temperature.
2. Record workroom temperature and humidity.
3. Adhesive certification, lot verification, and temperature.
4. Verify camber assembly.
5. Gluing and curing:
    a) Observe glue spread and check for skips.
    b) Record open time prior to clamping.
    c) Record clamping pressure.
    d) Record curing temperature and time.
    e) Sample and test (block shear, core shear, cyclic delamination).

G. Finishing

1. Recheck joint spacing and cross-sectional dimensions.
2. Observe repairs for appearance.
3. Record and inspect surface treatment.
    a) Preservative
    b) Sealer
    c) Primer or paint
4. Hammer-brand each member, prepare shipping certificate.
5. Observe and record wrapping.

H. Reports

1. Submit written progress reports describing the tests and observations made and showing the action taken to correct nonconforming work. Itemize any changes authorized by architect/engineer. Report all uncorrected deviations from plans or specifications.

TRUSS-TYPE JOIST CONSTRUCTION

A. Chord Fabrication

1. Perform all requirements of “Glu Lam Timber Observation Duties.”
2. Check end joint spacing at panel points.
3. Check drilling and routing for webs.

B. Web Fabrication

1. Structural Steel:
    a) Review specification requirements.
    b) Review mill certification, steel, and coating.
    c) Sample and test, when specified.
2. Fabrication:
    a) Verify web wall thicknesses and diameters at specified locations.

b) Check for splitting at flattened ends.
c) Check alignment edge distance and pin placement.
d) Check bridging clips, bearing clips, and ridge connector.
e) Check truss dimensions.
f) Check connector welding, if performed.

C. Reports

1. Submit written progress reports describing the tests and observations made and showing the action taken to correct nonconforming work. Itemize any changes authorized by architect/engineer. Report all uncorrected deviations from plans or specifications.

SECTION 3

3.16 – Post Installed Anchors and Dowels

OBJECTIVE

Post installed anchors and dowels involve those systems installed typically into concrete or masonry after it is hardened. Most of these anchor systems require drilling or coring to accomplish the installation. Many of these systems specify special inspection and/or testing to qualify them for certain load capacity. Anchor installation inspection occurs during the installation process to verify the required procedures were followed. Anchor proof load testing occurs after the installation and may be specified for tension (pull-out) or torque (with wrench). Project requirements may require installation inspection or proof load testing and some may require both. The Statement of Special Inspections, prepared by the responsible design professional, will define the special inspection task(s) required. Qualified special inspectors who diligently perform the duties listed below while under the direct supervision of the materials engineering laboratory can best achieve this objective.

OBSERVATION DUTIES FOR ANCHOR/DOWEL

INSTALLATION

A. Documents

1. Review the approved plans, specifications, and other appropriate project documents.
2. Review applicable sections of referenced codes and standards, particularly the product manufacturers specifications and, if available, the ICC Evaluation Service (ES) Reports.

B. Materials

1. Verify brand or manufacturer of anchor.
2. Verify brand or manufacturer of epoxy or grout.
3. Verify the expiration dates on epoxies.

C. Sampling of Materials

1. If required sample the materials in accordance with specified standards required.
2. Refer to the material engineering laboratory for direction in sampling procedures and specimen.

D. Observations Procedures

1. Identity the substrate as standard concrete, lightweight concrete, CMU, or brick.
2. Report the design strength of the concrete and age if known.
3. Report the orientation of the hole.
4. Check the anchor for size (diameter) and length
5. Check the epoxy for approved use
6. Check epoxy is proper for application

7. Verify drill or core size meets manufacture specs
8. Check diameter of hole and depth of holes
9. Check cleanliness of hole
10. Check holes spacing for compliance to specifications
11. Check holes after placement of inserts to verify fullness of epoxy contact.
12. Record ambient temperature and note if outside of specified range.

OBSERVATION DUTIES FOR PROOF LOAD

TESTING OF INSTALLED ANCHORS/DOWELS

A. Documents

1. Review the approved plans, specifications, and other appropriate project documents.
2. Verify the type of test load that is required (tension or torque).
3. Verify the frequency of tests that are required.
4. Verify the test load value is specified and approved as required. The special inspector is not authorized to determine the test value if it is not specified.
5. Review applicable sections of referenced codes and standards, particularly the production manufacturers specifications and, if available, the ICC Evaluation Service (ES) Reports.

B. Materials

1. Record the type of anchor system and epoxy reported as being used, and identify to source of this information. The anchor system cannot be verified unless the installation was witnessed.

C. Observations Procedures

1. Record the proof load equipment being used: rams, gauges, torque wrenches.
2. Verify the proof load equipment has been calibrated and record expiration date if available.
3. Identify any proof loading fixtures being used (load frames) and how they were set up.
4. Describe the anchor type, make, and model reported including diameter and length.
5. Record the testing location within the structure.
6. Record the proposed use of the anchor.
7. Record the quantity of anchors tested (passed and failed).
8. Record the quantity of anchors that were retested (passed and failed).
9. Record the percent anchor tested within that particular location of the structure.
10. Anchors which fail need to include remarks indicating what is being done about them in the future.
11. Record how the tested anchors were marked (pass–green, fail–red) or not.
12. Identity who was notified of the results of the testing.
13. Identify where the specified test loads were obtained.

D. Reports

1. Submit written progress reports describing the tests and observations made and showing the action taken to correct nonconforming work. Itemize any changes authorized by architect/engineer. Report all uncorrected deviations from plans or specifications.

SECTION 3

3.17 – Shear Walls and Floor Systems Used as High Load Diaphragms

OBJECTIVE

The California Building Code is now requiring special inspection during the construction of the wood structural panel sheathing (plywood) shear walls and floor systems used as high load (shear) diaphragms. These are critically important elements to the structural integrity of the building, and are therefore considered appropriate for special inspection. This guideline is intended for use in site-built structural wood assemblies. Prefabricated wood structural elements and assemblies require special inspection as specified in CBC Section 1704.2. The Statement of Special Inspections, prepared by the responsible design professional, will define the special inspection task(s) required. Qualified special inspectors who diligently perform the duties listed below while under the direct supervision of the materials engineering laboratory can best achieve this objective.

OBSERVATION DUTIES

A. Documents

1. Review the approved plans, specifications, and other appropriate project documents.
2. Review applicable sections of referenced codes and standards, particularly the Timber Construction Manual by the American Institute of Timber Construction (AITC) and the California Building Code (CBC).

B. Materials

1. Verify material grades.
2. Verify nail type and size.

C. Sampling of Materials

1. Sample and deliver to the laboratory for testing the following materials when required by project specifications:
    a) Structural panel sheathing (i.e., plywood, gypsum, fiberboard, or particleboard)
    b) Framing lumber
    c) Fasteners used in attaching the sheathing including nails and screws.

E. Observation Procedures

1. Check nail spacing, penetration, and edge distance, and verify nail size.
2. Check for proper plywood thickness and grade.
3. Check for installation of blocking, when blocked edges are required.
4. Check the receiving members for spacing, size, and resistance to splitting.
5. Check for proper plywood layout per project requirements.
6. Check for “shiners” (nails penetrating structural panel sheathing only).
7. Verify that critical members have received the nail specified.

F. Gluing Operations

1. Materials
    a) Verify certifications on lumber grading, adhesives, and preservatives.
    b) Verify lumber grade marks on the pieces being used.
2. Observation Requirements - Preliminary
    a) Verify that spacing of joints meets job and code requirements.
    b) Measure moisture content of lumber and verify with acceptance range specified.
    c) Check appearance grade requirements.
    d) Verify preservative treatment requirements.
3. Observation of Sub-Assemblies
    a) Verify lumber grade at end joints.
    b) Gluing and curing procedure, verification of following:
1. Lumber moisture, temperature, and cross section
2. Workroom humidity and temperature
3. Adhesive certification, lot, and temperature
4. Joint match and separation
5. Assembly temperature, pressure, and time
4. Laminating (Gluing)
    a) Recheck lumber grades, combinations and faces, moisture, and temperature.
    b) Record workroom temperature and humidity.
    c) Adhesive certification, lot verification, and temperature.
    d) Gluing and curing:
6. Observe glue spread and check for skips.
7. Record open time prior to clamping.
8. Record clamping pressure.
9. Record curing temperature and time.

G. Reports

1. Submit written progress reports describing the tests and observations made and showing the action taken to correct nonconforming work. Itemize any changes authorized by architect/engineer. Report all uncorrected deviations from plans or specifications.

SECTION 4

PROCEDURES AND QUALIFICTIONS

SECTION 4

4.1 – Recommended Procedures for Special Inspectors

A. Employment

1. The special inspector/agency shall not be in the employ of the contractor, subcontractor, or material supplier.
2. The owner or the engineer or architect of record acting as the owner's agent shall employ the special inspector/agency with the approval of the Chief Building Official.
3. In the case of an owner-contractor, the special inspector/agency shall be employed as approved by the Chief Building Official.

B. Called Inspections

The employment of a special inspector or inspection agency shall not be deemed to relieve the Building Division of responsibility for progress. Called inspections cannot be delegated to the special inspector. However, Building Division inspections should not be signed off without the concurrence of the special inspector.

C. Notification

The Chief Building Official is required to be notified at least one business day prior to the commencement of any special inspection activities. The notification may be either in writing, telephone, fax or email.

The notification should include the following:

1. Name of the special inspector and the registration number.
2. Project name and address.
3. Combination (building) permit number.
4. Category or categories of work to be inspected.
5. Time and date of inspection.

D. Performance

The special inspector shall remain on the job at all times when work requiring inspection is in progress.

The Chief Building Official should verify the work of the special inspector. Jobsite verification shall be done, at a minimum, in conjunction with called inspections routinely performed by the Chief Building Official or municipal inspection staff. All questions relative to code requirements, interpretations of or modifications/changes to the approved plans should be referred to the Chief Building Official

E. Nonconformance Procedure

When the special inspector observes a nonconformance occurring (or about to occur) the special inspector must take the following steps:

1 Notify the contractor or his/her representative of the nature of the discrepancy and what the code or approved plans require.
2 If the contractor then chooses to proceed with the discrepancy, the special inspector must do the following:

   a. Immediately notify the Chief Building Official by telephone or other means of the nature of the discrepancy;
   b. Notify the engineer or architect of record directly or through his or her employer, and;
   c. Document the discrepancy in the daily report.

F. Written Reports

The special inspector or inspection agency is required to promptly submit required written reports to the Chief Building Official, the engineer or architect of record, and any other persons designated by the Chief Building Official. The outline for the reports is located in the general program guidelines in Section 2 of this manual. Sample reports are shown in Appendix C. The Building Division may approve alternate forms.

SECTION 4

4.2 – Special Inspector Qualifications

A. Competency Standards

The Chief Building Official has the responsibility to ascertain that special inspectors are qualified for the type of inspection required. Qualification requirements are:

- Current ICC certification as a special inspector for the discipline(s) for which he/she is requesting approval. The Chief Building Official may waive this requirement when applicant can prove substantial past experience and knowledge of current codes.
- A written and/or oral examination to verify the applicant's knowledge of jurisdictional procedures and code requirements.
- Additional qualifications (where applicable):

  Reinforced concrete special inspector:

  ACI certification as a concrete field testing technician—Grade I. For further information, contact the following:
  The American Concrete Institute
  P.O. Box 9094
  Farmington Hills, Michigan 48333-9094
  (248) 848-3700
  http://www.concrete.org/certification.aspx

  Structural steel and welding special inspectors (when engaged in nondestructive test methods):

  Qualification in accordance with the current edition of ASNT. Recommended Practice No. STN-TCIA.
  For further information, contact the following:
  The American Society for Nondestructive Testing
  P.O. Box 28518
  1711 Arlingate Lane
  Columbus, OH 43228-0518
  (800) 222-2768
  https://www.asnt.org

- The Chief Building Official may require periodic retesting of certificated personnel.

B. Experience Standards

The Chief Building Official shall require that special inspector applicants provide evidence of experience through the following and/or other means:

1. Written reference verifying related work experience; and/or
2. Personal interview to evaluate the applicant's work experience and suitability to be a special inspector.

C. Performance Standards

The Chief Building Official may use the ICC or California Council of Testing and Inspection Agencies job task listings for special inspector certification exams as guidelines for evaluating the performance of special inspectors in each of the applicable disciplines. These listings of specific job tasks which may be performed for each of the disciplines are included in Appendix A.

These job tasks are representative of tasks which may be performed by special inspectors on large and complex jobs. Actual tasks required on specific jobs will typically be fewer. The Chief Building Official should advise the special inspector of specific tasks necessary for the specific jobs as described under Appendix A of this program.

The Chief Building Official may, in writing, suspend or revoke any special inspector's registration for due cause. This notice shall set forth the time and place evidence would be submitted to show cause why the certificates of registration should not be suspended or revoked. Failure to appear at such hearing by the special inspector may result in immediate revocation of said inspector's certificate of registration.

Special inspector's qualification registrations are to be given only for the execution of work done under Section 104.4 of the CBC in the City of Newport Beach or for work specifically authorized by the Chief Building Official.

D. Fees and Registration

1. Registration fees shall be paid at the time of application and are non-refundable should the applicant fail to qualify for certification.
2. The fee for initial registration is $99 per certification and $64 for renewal of each certification.
3. The renewal date for certificates is July 1 of each year. There is no renewal after this date.
4. To obtain an appointment for testing, call (949) 644-3200. Appointments must be scheduled in advance.

SECTION 5

JOB TASK LISTING

SECTION 5

5.1 – General Inspection Practice

The following tasks apply to all special inspectors:

1. **Responsibilities and Authority:** Apply special inspector responsibilities and authority and comply with requirements of enforcing jurisdiction.
2. **Notification:** Notify the City of the job inspection and specify the type of inspection for which the special inspector has been engaged in accordance with enforcing jurisdiction requirements.
3. **Presence at Job:** Be present for continuous inspection during execution of all work for which the special inspector has been engaged.
4. **Acceptable Conditions:** Verify that the City inspector has approved the conditions at the site when required.
5. **Progress Report:** Submit periodic written and verbal progress reports to the City as required upon approved forms.
6. **Correct Discrepancies:** Notify the contractor when discrepancies occur.
7. **Uncorrected Discrepancies:** Notify the Chief Building Official and the designer when discrepancies are not corrected.
8. **Plans:** Verify that the original structural plans and plan changes are properly documented and approved by the enforcing jurisdiction.
9. **Record Keeping:** Maintain records of work inspected, including discrepancies and actions taken.
10. **Compliance Report:** Submit the final report of compliance on approved forms.

SECTION 5

5.2 – Reinforced and Prestressed Concrete Special Inspectors

Concrete Mix Verification

1. **Mix Design:** Verify concrete is batched based on water/cement ratio or laboratory mix design, that cement type is as specified, that aggregate type, weight, and size are as specified and that ad mixtures are correct.
2. **Trip Ticket:** Determine that mixer truck ticket specified mix in truck is required.
3. **Mixing Water:** Verify that total water added to mix does not exceed that allowed by concrete mix design and is of acceptable quality.
4. **Adequate Equipment:** Verify that concrete mixing and placing equipment at site is adequate for the intended use.
5. **Quality of Concrete:** Verify that the quality of the concrete is indicative of adequate mixing time, consistency, and relevant time limits.

Concrete Reinforcement and Prestressing Steel

1. **Rebar Grade:** Verify grade and visual conformity of rebar with acceptable quality standards.
2. **Rebar Condition:** Verify that rebar is free of oil, dirt, excessive rust, and from damage in shipment to jobsite.
3. **Prestressing Steel Condition:** Verify that prestressing steel is free of rust and damage and is properly wrapped as required.
4. **Rebar Tying and Bracing:** Verify that rebar is adequately tied, chaired, and supported to prevent displacement during concrete placement.
5. **Rebar Clearance:** Verify minimum and maximum clear distances between bars and minimum structural distance to outside of concrete.
6. **Concrete Cover over Rebar:** Verify minimum concrete cover is maintained between rebar and the surface of concrete.
7. **Rebar Placement:** Verify size and placement of rebar.
8. **Rebar Laps and Bends:** Verify bar laps for proper length and stagger, and bar bends for minimum diameter, slope, and length.
9. **Rebar Welding:** Verify that welding of rebar is approved and properly inspected.

The following tasks apply only to the prestressed concrete inspector.

10. **Prestressing Steel Grade:** Verify prestressing steel, size and grade in conformance with acceptable quality standards.
11. **Prestressing Steel Ties and Supports:** Verify that prestressing steel tendons and post-tensioning ducts are adequately tied, chaired, and supported to prevent displacement during concrete placement, and are adequate for intended stresses.

12. **Prestressing Steel Clearance:** Verify minimum and maximum clear distances between prestressing steel and minimum structural distance to outside of concrete.
13. **Concrete Cover over Prestressing Steel:** Verify minimum concrete cover is maintained between prestressing steel and the surface of concrete.
14. **Prestressing Steel Placement:** Verify placement of prestressing steel and ducts as detailed in plans and specifications.
15. **Prestressing Steel Anchorage:** Verify location, size, and placement of prestressing steel anchorage as detailed in plans and specifications.

Concrete Formwork and Embedded Items

1. **Concrete Construction Joints:** Verify proper preparation of construction joint surfaces prior to placing.
2. **Formwork Construction:** Verify that the formwork is tight to prevent leakage and that it will result in a final structure with correct shape and member size.
3. **Embedded Items:** Verify that embedded items are properly sized and placed.

The following task applies only to the prestressed concrete inspector.

4. **Post-tensioning Ducts:** Verify that post-tensioning ducts are correctly sized, are mortar tight, and nonreactive with concrete tendons and filter materials.

Concrete Preparation and Placement

1. **Concrete Base Preparation:** Verify acceptable general condition of the concrete base prior to placement.
2. **Prepour Base Moisture:** Verify that the concrete base is properly wetted and standing water is removed before concrete is placed.
3. **Concrete Placement:** Verify that concrete conveyance and depositing avoids segregation due to rehandling or flowing. Verify proper joint construction.
4. **Concrete Consolidation:** Verify that concrete is properly consolidated.

Samples and Tests

1. **Slump Tests:** Perform consistency (clump) tests.
2. **Specimens Preparation:** Prepare test specimens (cylinders, flex beams, or shrinkage bars).
3. **Hardened Concrete Test Samples:** Witness removal of test samples and perform other test procedures on hardened concrete.
4. **Air Tests:** Perform air content tests.
5. **Specimen Handling/Protection:** Properly handle and place specimens in protected area after preparation and arrange for transportation of specimens to test facility.
6. **Document Tests:** Report tests performed and forward test results when necessary

The following tasks apply only to the prestressed concrete inspector.

7. **Test Type:** Determine the type and number of concrete, grout, and reinforcing/prestressing steel tests required.
8. **Test Sample:** Take proper test samples of fresh concrete, grout, and reinforcing/prestressing steel tests required.

Concrete Protection

1. **Protection:** Verify that appropriate hot- and cold-weather measures are taken for protection of the concrete and grout.

Grouting and Prestressing

The following tasks apply only to the prestressed concrete inspector.

1. **Grout Mix Design and Placement:** Verify grout mix design based on water/cement ratio or laboratory mix design and correct placement of grout into post-tensioning ducts for bonded prestressing tendons.
2. **Calibration of Stressing Ram:** Check for proper calibration of steel stressing ram.
3. **Steel Stressing:** Verify that steel is prestressed at the proper time using proper techniques, including stressing locations, and sequence. Properly record stressing and steel elongations.
4. **Steel Tension:** Verify final prestressing steel tension immediately after anchorage, as specified.

Plan Reading Ability

1. **General Project Requirements:** Review general notes and/or specifications and typical details for concrete strengths, reinforcing steel clearances, prestressed concrete requirements, and special inspection requirements.
2. **Foundations and Below-Grade Walls:** Review approved plans for reinforced and prestressed concrete construction requirements for foundations, below-grade walls, piles or belled caissons, pile caps and grade beams.
3. **Beams, Girders, and Joists:** Review approved plans for reinforced and prestressed concrete requirements for beams, girders, and joists.
4. **Columns:** Review approved plans for reinforced concrete columns construction requirements.
5. **Slabs:** Review approved plans for reinforced and prestressed concrete slab construction requirements.
6. **Miscellaneous Details:** Review approved plans for reinforced and prestressed concrete construction requirements for stairs, above-grade walls, and other special details.

SECTION 5

5.3 – Structural Masonry Special Inspectors

Masonry Materials—Storage and Certifications

1. **Masonry Material Certifications:** Verify masonry material certifications, bills of materials, or other documentation of masonry units, cement, lime, and additives for compliance with plans and specifications. Verify materials are in acceptable condition.
2. **Storage of Materials:** Verify that cement, lime, block, and brick are supported on pallets and covered to protect from exposure to excessive moisture or drying. Verify aggregates are stored free from contamination.
3. **Masonry Reinforcing Material Certifications:** Verify masonry reinforcing materials certifications, or other documentation of masonry reinforcement for compliance with codes, plans, and specifications. Verify reinforcing materials are in acceptable condition.

Mortar Mix

1. **Mortar Aggregates:** Verify that sand and aggregates are clean and have acceptable gradation.
2. **Mortar Cement:** Inspect mortar cement for dryness, type, and conformance to specified requirements.
3. **Mortar Water:** Verify that clean water and only approved additives and ad mixtures are used.
4. **Job-mix Mortar Proportioning and Mixing:** Verify job-mix mortar proportioning of cement, aggregates, and ad mixtures, for consistency, workability, and mixing time.
5. **Ready-mix Mortar:** Inspect ready-mixed mortar for type and conformance to specified requirements.
6. **Mortar Use:** Verify mortar elapsed time since mixed. Verify that mortar is not retempered after set.

Masonry Preparation and Placement

1. **Dowels/Anchors:** Inspect alignment of dowels and anchors extending out of the footings for masonry walls.
2. **Base Conditions:** Verify that masonry footing surfaces are clean.
3. **Conditions of Units:** Verify that masonry units are clean and sound.
4. **Placement:** Inspect the layering of masonry units, checking temperature, dimensions, and alignment of finished work, laying of masonry units, for stack or running bond or variations as per plans. Verify that there is no keep furrowing of bed joints. Inspect mortar joints for proper thickness and tooling.
5. **Joints:** Inspect construction, expansion, and contraction joints for location and continuity of steel.

Masonry Reinforcement

1. **Vertical Reinforcement:** Inspect the placement and alignment of vertical bars and dowels for size, grade, and spacing. Inspect length of lap splices, clearances between bars, clearances to masonry units, and outside face of walls, and positioning of steel.
2. **Horizontal Reinforcement:** Inspect horizontal joint reinforcement (HJR) steel and masonry reinforcement bars for size, length of lap splices, dowels, clearances between bars, clearance to masonry units and outside face of walls, and alignment.
3. **Ties:** Inspect ties in masonry for straightness, embedment, spacing, and size.
4. **Anchor Connections:** Inspect the installation of masonry anchor bolts, joist anchors, inserts, and straps.

Grout Mix

1. **Grout Aggregates:** Verify that sand and aggregates are clean and have acceptable gradation.
2. **Grout Cement:** Inspect grout cement for dryness, type, and conformance to specified requirements.
3. **Grout Water:** Verify that clean water and only approved additives and admixtures are used.
4. **Job-mixed Grout Proportioning and Mixing:** Inspect job-mixed grout proportioning of cement, aggregates, and admixtures for consistency, workability, and mixing time.
5. **Ready-mixed Grout:** Verify ready-mixed grout for conformance with mix design, consistency, and workability.
6. **Grout Use:** Verify grout elapsed time since mixed. Verify that grout is not retempered after set.

Masonry Grouting and Capping

1. **Grout Spaces:** Verify that grout spaces are correctly sized and clean, cleanouts are closed after inspection, and grout barriers are in place before grouting.
2. **Dry Packing:** Verify proper application of dry packing.
3. **Grouting:** Verify proper grouting technique including consolidation to approved height of grout space, reconsolidation, and vibration.
4. **Capping:** Verify construction of wall cap for weather tightness.

Plan Reading

1. **Test Prisms:** Inspect the construction of test prisms including those required prior to beginning construction. Verify that test prisms contain the same masonry units, moisture content, mortar and workmanship as those used in the building.
2. **Tests and Specimens:** Observe test specimens and field tests as required.
3. **Specimen Handling/Protection:** Verify protection of test specimens and arrangements for pickup or delivery of specimens to appropriate persons.

4. **Masonry Samples:** Witness removal of test specimens from completed masonry.

Masonry Protection

1. **Special Protection:** Verify that masonry protection is in conformance with code, plans, and specifications.

Plan Reading

1. **General Project Requirements:** Review specifications, general notes, and typical details for general project requirements for masonry type, reinforcing steel grades, clearances, and special inspection and testing requirements.
2. **Foundations and Below-grade Walls:** Review approved plans for reinforced masonry construction requirements for foundations and below-grade walls.
3. **Above-grade Walls:** Review approved plans for reinforced masonry construction requirements for above-grade walls.
4. **Beam and Lintels:** Review approved plans for reinforced masonry construction requirements for beams and lintels.
5. **Columns:** Review approved plans for reinforced masonry construction requirements.
6. **Miscellaneous Details:** Review approved plans for special reinforced masonry construction requirements.

SECTION 5

5.4 – Structural Steel and Welding Special Inspectors

Steel and Welding Materials

1. **Structural Steel Materials:** Verify mill test reports, steel identification markings, or other documentation of structural steel for compliance with plans and specifications. Visually inspect bolts, nuts, and washers for conformance.
2. **Welding Materials:** Verify mill test reports, container identification markings, or other documentation of welding materials for compliance with plans and specifications. Verify that rod containers are undamaged or electrodes are otherwise dried when required.

Welding

1. **Qualifications of Welders:** Verify qualifications of welders, welding operators, and tackers for conformance with AWS specifications.
2. **Drying Ovens:** Verify that appropriate drying ovens are utilized when required.
3. **Welding and Joint Preparation:** Verify that base metal to be welded is smooth, uniform, free from fins, tears, and cracks, and that cut edges are acceptable.
4. **Welding Procedures:** Visually verify that welding is done in conformance with AWS requirements for process, materials, workmanship, number of passes, preheat and interpass temperatures, cleaning between passes, weld lengths, welding technique, and welding sequence.
5. **Welding Process:** Verify that the welding process is in conformance with approved procedures.
6. **Weld Repairs and Heat Straightening:** Verify that weld repairs and heat straightening of structural members is done in accordance with approved procedures.
7. **Fabrication and Materials Tolerances:** Verify that fabrication and material are within permissible tolerances.
8. **Rebar Welding:** Verify that welding of reinforcing steel is done in conformance with approved procedures.
9. **Production Tests:** Verify that preproduction and production welding tests are correctly performed.

Steel Erection

1. **Base Plates and Anchor Bolts:** Verify correct size, location, and setting of base plates, and size of anchor bolts and base plate holes.
2. **Welding Sequence:** Verify that welding sequence is followed where specified.
3. **Faying Surfaces:** Verify faying surfaces on connections utilizing high-strength bolts for compliance to applicable standards.

4. **Bolts:** Verify correct type, location, and size of bolts, size of bolt holes in connections and tightness of high-strength bolts to applicable standards.

Samples and Nondestructive Tests

1. **Bolt and Nut Sampling:** Sample bolts, nuts, and washers for testing, if required.
2. **Steel Sampling:** Mark steel members for sampling, record sample numbers and locations, observe specimen cutting, and arrange for transportation of specimens to test facility.
3. **Nondestructive Testing:** Arrange for and/or verify nondestructive testing in accordance with approved procedures.

Plan Reading

1. **General Project Requirements:** Review general notes and/or specifications and typical details for general project requirements for steel strengths, fabrication tolerances, and special inspection requirements.
2. **Orientation and Frame Member Sizes:** Review approved plans for structural steel orientation and frame elevation member size.
3. **Decking:** Review approved plans for structural steel decking requirements.
4. **Columns and Base Plans:** Review approved plans for column and base plate member sizes.
5. **Joints:** Review approved plans for all steel-to-steel connections.
6. **Other Details:** Review approved plan details for structural steel and welding requirements for stairs, elevator shafts, concrete-to-steel connections and other structural steel requirements.

Structural Wood

Check Approved Plans For**:**

1. Check nail spacing, penetration, and edge distance, and verify nail size.
2. Check for proper plywood thickness and grade.
3. Check for installation of blocking, when blocked edges are required.
4. Check the receiving members for spacing, size, and resistance to splitting.
5. Check for proper plywood layout per project requirements.
6. Check for “shiners” (nails penetrating structural panel sheathing only).
7. Verify that critical members have received the fasteners.
8. Check for over notching/over boring.
9. Check for location/length of drag struts.

SECTION 6

ORDINANCE / CODE REFENCE

SECTION 6

6.1 - Municipal Ordinances and Codes

The City of Newport Beach has adopted the latest editions of the following codes as part of municipal ordinances:

- California Building Code (CBC)
- California Residential Code (CRC)
- California Plumbing Code (CPC)
- California Mechanical Code (CMC)
- California Electrical Code (CEC)
- California Green Code
- Uniform Spa & Pool Code (USPC)
- International Property Maintenance Code (IPMC)
- California Energy Code (Title24, Part 6)

SECTION 7

FORMS

CITY OF NEWPORT BEACH
COMMUNITY DEVELOPMENT DEPARTMENT
BUILDING DIVISION
100 Civic Center Drive | P.O. Box 1768 | Newport Beach, CA 92658
www.newportbeachca.gov | (949) 644-3200

SPECIAL INSPECTION REPORT

Project Address:_____

Permit Number:_____

Inspection Type (s):_____

Inspection Date (s):_____ ( ) Periodic ( ) Continuous

Describe Inspection, Including Location(s):

List Tests Made:

Total Inspection Time Each Day:						
Date:						
Hours:						

List All Items Requiring Correction (Include Previously Listed Uncorrected Items):

Comments:

To the best of my knowledge, the work inspected was in accordance with the Building Division approved design drawings, specifications and applicable workmanship provisions of the U.B.C. except as noted above.

Special Inspector Signature:	Date:
Print Full Name:	**Newport Beach Registration No.:**

SpecialInspectionReport 08/25/2015

CITY OF NEWPORT BEACH
COMMUNITY DEVELOPMENT DEPARTMENT
BUILDING DIVISION
100 Civic Center Drive | P.O. Box 1768 | Newport Beach, CA 92658
www.newportbeachca.gov | (949) 644-3200

SPECIAL INSPECTION
Final Project Report

Project Address:_____

Permit Number:_____

Inspection Type (s):_____

Inspection Date (s):_____

This is to certify that I performed special inspection on the following portions of the work at the above address which required continuous inspection, and which I was employed to inspect:

Based upon my personal observation and written reports of this work, it is my judgment that the inspected work was performed, to the best of my knowledge, in accordance with the approved plans, specifications, and the applicable workmanship provisions of the Uniformed Building Code.

Special Inspector Signature:	Date:
Print Full Name:	**Newport Beach Registration No.:**

SpecialInspectionFinalProjectReport 08/25/2015

SECTION 8

CONTACT INFORMATION

SECTION 8

8.1 – Contact Information

CITY STAFF CONTACT INFORMATION:

Community Development Main Line:	949 644-3200
Permit Center	949 718-1888
Fax Number	949 644-3250
Inspection Request Line:	949 644-3255

Building Inspector Supervisors:

John Burckle	949 644-3262
Paul Sobek	949 644-3268

Chief Building Official:

Seimone Jurjis	949 644-3282