

Eighth Edition

CONSTRUCTION INSPECTION MANUAL

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Foreword

The goal of the *Construction Inspection Manual* is to improve inspection procedures on all types of construction work and to achieve a consensus among owners, architects, engineers, contractors and construction inspectors as to the best methods and practices.

Because good plans and specifications are the cornerstone of good construction, this manual also provides valuable guidelines for improvement of the design and specification processes.

The need for consistent field inspection is imperative, due to the number of overlapping codes, specification standards and individual interpretations among architects, engineers and agencies, as well as the demanding designs and requirements for precise execution of the work.

It is hoped that this manual will encourage an on-going effort to which all segments of the industry can contribute their expertise to accomplish a more uniform application of inspection methods that will benefit all parties.

Blair Tulloch

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Part 1:

Recommended Duties and Responsibilities

Today, more than ever, construction requires a team effort. The escalation of costs, the need for faster scheduling and changes in the industry require full cooperation and understanding among all the parties.

Successful production of the work under the traditional process requires the utmost order and efficiency to obtain the highest potential benefits. This goal can be reached only through the understanding that all parties have a mutual function and obligation to perform. Successful construction requires continuous checking, coordination, foresight, good judgment and overlapping efforts by informed and qualified parties.

The following parts reflect the Editorial Committee's recommendations concerning the duties and responsibilities of the construction inspector, design professional (architect/engineer), contractor/subcontractor, owner, lawyer, manufacturer's representative and special consultants.

Part 1.1:

Contract: Definition of Responsibilities

By definition, a contract is a legally enforceable agreement that sets forth the obligations of each party to the other. Any violation of these obligations (breach) can expose the party committing the breach to sanctions of law. The significant benefit of having an agreement is that a mutual understanding is developed by communicating expectations through clear definition of scope and general/terms and conditions.

Contracts come in many shapes and sizes. The most recognized standard document is the *Standard Form of Agreement Between Owner and Architect* – AIA B141; however, many public owners, major private enterprises and design firms use their own “custom contracts”. In order to provide contracts that equitably serve the interest of both parties and meet the specific concerns of the project, amendments to both standard AIA and custom agreements are negotiated. It is of the utmost importance that the project inspector thoroughly review the agreements and the family of documents that define duties and responsibilities among the construction team composed of the owner, contractor and architect. The AIA A201/*General Conditions of the Contract for Construction* is the part of this family of contract documents that establishes the ground rules for this construction team, where contractual relationships exist between the owner and the contractor and the owner and the architect but not between the contractor and the architect. Additionally, the supplementary conditions are prepared to modify the provisions of the general conditions in order to meet the particular requirements of the project by changing, adding to or deleting this document. The general conditions can also be drafted as “custom general conditions” by many public owners and major private enterprises.

Roles of the Construction Team

Owner - Entity that furnishes relevant information relative to project requirements, pays for costs associated with the development of project and makes decisions based on recommendations made by the design professional.

Owner’s Representative - Entity occasionally designated as the official representative of the owner. Its extent of project involvement will vary according to the owner’s requirements. It is critical that the extent of the representative’s responsibilities and authority is clearly described in its agreement with the owner and the general conditions of the contract for construction and is coordinated with the inter-related agreements of the other construction team members with the owner. This will prevent inconsistencies and overlapping of responsibilities and authority.

Contractor - Entity that prepares bid proposals for the cost of the work and, upon award of contract, directs construction and builds project in conformance with the contract documents.

Design Professional - Entity that designs the work, prepares construction and bidding documents and administers the construction contract by serving as the owner’s professional adviser and an impartial interpreter of the contract documents.

Part 1.2:

The Construction Inspector

The importance of selecting a competent construction inspector is sometimes underestimated. Good inspection can be worth many times its cost in preventing errors and omissions that might impair the quality, soundness, and durability of the project and interfere with obtaining value for the money invested.

The construction inspector's basic function is to make sure compliance with the construction documents is achieved. In addition, the inspector serves as an extra pair of eyes and should not be satisfied with merely reporting mistakes in the work after they are made.

The inspector can prevent problems and avoid misunderstandings by continually reviewing the construction documents and working in conjunction with the superintendents and subcontractors.

The inspector should look ahead and be fully acquainted with the construction documents and all phases of the work. The preparation will prevent costly and time-wasting mistakes and bottlenecks due to delayed delivery of material and improper scheduling of the work.

Prompt inspection of delivered materials, preparation and installation can prevent costly tearout, replacement or redoing of the work.

In these and other ways, the inspector can perform a real service to the owner, design professional and contractor, and thus becomes an important member of the team needed to procure a smooth-running construction process, a sound and properly constructed project and an on-schedule delivery of work.

Note, however, that the inspector is not responsible for and should not undertake responsibilities that are not a part of the inspection services. For example:

- Trying to tell the contractor how to construct the work. This is the responsibility of the contractor.
- Guaranteeing that the work is constructed in strict compliance with the contract documents. This is the responsibility of the contractor.
- Interpreting or ruling on the intent of the contract documents. This is the responsibility of the design professional.
- Accepting the work or portions of it. The design professional is responsible for recommending acceptance to the owner.

Part 1.2.1:

Qualifications and Requirements

A single, full-time construction inspector may often be employed on building projects of simple or average complexity. In this case, the inspector is expected to be sufficiently qualified to oversee the complete project. This manual refers mainly to these circumstances. On more complex and larger projects, the budget should include an inspection team or staff consisting of a chief inspector, specialized inspectors, secretary, accountant, etc.

The general construction inspector is usually expected to observe mechanical and electrical installations; however, inspectors fully expert in all materials, systems and methods used in construction today are rare. Specialized inspectors are now available, especially in the fields of mechanical and electrical installation. They are engaged as part of the inspection team on larger or more complex projects.

A testing laboratory is normally engaged to provide tests and inspections of materials, installations or procedures.

Sources

Construction inspectors are drawn from three general sources:

1. Those having attended or graduated from a college of construction or engineering and obtained practical experience in construction by working with a construction firm or agency.
2. Those who have risen through the ranks, primarily as a carpenter, up to the capacity of job superintendent and have chosen construction inspection as a career. Field experience is often supplemented by attending special courses.
3. Those who have worked for an architect or engineer, have been exposed to construction through periodic jobsite observation and have become knowledgeable in construction procedures and techniques.

Qualifications

The qualifications of an inspector encompass three parts — technical, personal and experience.

1. Technical — The technical qualifications recommended for construction inspectors should be:

- (a) A minimum of two years in a community college or junior college, or an adequate curriculum in instructional courses, with an AA degree and at least two years of practical experience in the construction industry, preferably in a management and on-site capacity.
- (b) A bachelor's degree from a university or college with a construction curriculum and at least one year of practical experience as in (a). The curriculum should contain sufficient courses in mathematics, physics and engineering to give the student a reasonable technical, scientific and engineering background.

2. Personal — From a personal standpoint, the “ideal” inspector should:

- (a) Be a diplomat, tactful but candid.
- (b) Have natural ability to work harmoniously without being a “boss.”
- (c) Be able to speak and write well.
- (d) Have no connection with and accept no loan, gift or gratuity directly or indirectly from any contractor or subcontractor company that is in any way connected with the construction contract.
- (e) Never use intoxicants or drugs while on duty or appear for duty under their influence.
- (f) Not suggest or recommend any person for employment to any individual or firm connected with the contract.
- (g) Not assume the responsibility for giving instructions for changes in the work covered by contract without approval of the architect and owner.
- (h) Not assume any duties of or give any orders reserved for the superintendent.
- (i) Have enough personal confidence in his ability to make “showing who's boss” unnecessary.
- (j) Always keep in mind that he is the owner's or architect's project representative and act in their best interests.
- (k) Have thorough knowledge of construction.
- (l) Have ability to rigorously enforce the requirements of the drawings and specifications.
- (m) Use good judgment based on years of experience and education as well as the personal characteristics of honesty, restraint, firmness, fairness, alertness and patience.
- (n) Have the personal qualifications that will enable him to maintain satisfactory relations with the personnel associated with the project.
- (o) Have the ability to handle the necessary paperwork without creating a “paper war.”

- 3. Experience** —The record of an inspector shows the nature of prior projects and tells whether he has been able to stick with projects rather than jumping around every few months.

More important than a personal interview are discussions with the owners, architects and contractors who have dealt with the inspector on past projects. Talking with all three will give one an insight into the inspector's abilities.

One should never hesitate to test or quiz a potential inspector as to what they would do under specific instances or problems relating to construction work.

Other Requirements

Qualifications for an inspector to serve on certain types of construction — for example, public schools and medical facilities —may need to be approved by an agency. The inspector may need to demonstrate that he can adequately inspect structural materials or systems installations such as concrete, masonry, steel and wood.

Some states have licensing laws for construction inspectors which may entail specific prerequisites, responsibilities and liabilities.

Model codes contain requirements for special inspection.

Summary

In conclusion, inspection is not an easy job. It requires people who are well trained, adequately paid and properly supported by their employers. It requires properly prepared, realistic construction documents, properly and justly administered. It requires capable supervision on the part of the contractor. Proper inspection advocates that the owner gets the value and quality he is paying for, within the design intent required by the architect and acceptable construction industry standards complied with by the contractor.

Part 1.2.2:

Employment and Compensation and Agreements

Here are a few of the many ways in which the construction inspector can be employed:

- (a) The owner engages the construction inspector for the project and the construction inspector works under the direction of the architect. In some instances, this is a legal requirement for many public governing boards. The design professional often is required to select the construction inspector.
- (b) The design professional engages the construction inspector under a mutually agreed upon extension of the design professional's agreement with the owner. The architect may select and employ the construction inspector for the project. Sometimes the selected person may be a fully qualified member of the design professional's staff.
- (c) The owner maintains a staff of inspectors and assigns one or more to the project to provide inspection. Depending upon the owner's organization and methods, the construction inspector may or may not work fully under the direction of the design professional.
- (d) On public projects, an agency may provide the owner with a construction inspector who may or may not work fully under the direction of the design professional.

Compensation

The cost of inspection is based on the degree of inspection required, the type, complexity and size of the project and the quality of inspectors required.

As a rule of thumb, the American Construction Inspectors Association recommends that a full-time construction inspector be compensated at a rate not less than the average of the foreman of the four highest paid trades working on the proposed project. This assumes that compensation is reasonably equivalent to that of the personnel being observed.

Some public agencies classify construction inspectors into categories to suit the position of employment required and establish salary ranges. Factors considered are the type of work, cost of the work, the qualifications and experience required, the number of projects involved and supervising capability if a construction inspection staff is involved.

The type and extent of benefits, such as mandatory medical insurance, vacation, sick leave, etc., included or not included in the terms of employment are important in the consideration of salary or compensation.

Agreement

The types or forms of agreements used to employ a construction inspector are numerous, and the terms and conditions of agreements vary considerably.

A general outline of items to be considered, if applicable, is as follows:

Date of agreement.***Legal name of the employer and the construction inspector—***

Definition of parties.

Definitions of the project—

Scope, location, etc.

Intent —

Agreement to employ or contract for the project and stipulation that the construction inspector is qualified.

Form of engagement —

As an “independent contractor” or an employee (temporary, permanent, etc.):

1. Reference to other documents that may apply, i.e., AIA, Doc. B-352.
2. Owner — Relationship.
3. Design Professional — Relationship, communications, correspondence, notification, etc.
4. Record keeping — Daily log, reports, etc.
5. Legal requirements of agencies — Recording, submission of documents, information required, performance of required duties, etc.
6. Supervision — Other inspectors or staff.
7. Specialized inspection — By others.
8. Other requirements — Unique to the project, more than one project.

Duration of agreement —

Time period (number of months), definition of commencement and completion of services, and times of work:

1. Additional services required in disputes, claims, extensions, etc.
2. Absences or sickness — Authority to substitute, deductive compensation.

Terms of payment —

Amount, times of payment, and commencement:

1. Overtime — Due to unusual circumstances.
2. Additional services required in disputes, claims, extensions, etc.
3. Benefits included, if applicable.

Owner's responsibility —

Suppliers, forms, materials, postage, equipment, clerical assistance, etc.

Reimbursement —

Mileage, photographs, other project expenses authorized.

Termination —

Time of notice, terminal expenses, cause, non-penalty, records transfer.

Execution of agreement —

Authorized signatures, attestation, approval as-to-form, etc.

The above outline is given for information only. It is recommended that both parties to an agreement retain legal counsel as to type of form and its terms and conditions.

Part 1.2.3:

Construction Inspector: Recommended Duties and Responsibilities

1. Be completely familiar with the contract documents before commencement of the work. Notify the design professional of any discrepancies observed and request clarification for all items not fully understood.
2. Organize a complete system of construction records:
 - Daily log book, daily report system.
 - Progress report system on a periodic basis (weekly, monthly).
 - Correspondence file.
 - Payment file.
 - Clarifications/ Requests for Information (RFIs) file.
 - Construction Change Directive file.
 - Change Order file.
 - Shop drawing, product data, and sample submittal file.
 - Substitutions file.
 - Test and inspections file.
 - Site conference file.
 - Job memo file.
 - Visual recordings (photo, video) file.
 - City Agency correspondence file (or Agency having jurisdiction).
 - Electronic transmissions file (E-mail).
 - Owner file.
 - Owner's representative file.
 - Owner's consultants file.
 - Owner furnished items file.
 - Contractor file.
 - Subcontractor file.
 - Contractor's design-builders file.
 - Design Professional file.
 - Close-out file.
3. Obtain a complete set of contract documents.
4. Obtain or have access to all codes and standards governing the work.

5. Comply with requirements of agencies with jurisdiction over inspection, and submit reports required. Remind the contractor of inspections required by agencies.
6. Determine that a method of procedures is developed concerning communications, correspondence, shop drawings, samples, substitutions, payments, changes, tests and specialized inspection. Recommend a preconstruction meeting if not specified.
7. Obtain a schedule of values for progress payment evaluation; also obtain a progress schedule.
8. Communicate with the various parties of the work as described in "Coordination," Part 1.7.3 of this manual.
9. Keep in touch with the architect. Notify him about all phases of the work and meetings that may require the inspector's presence at the site.
10. Keep ahead of the work being performed so as to anticipate items that might interfere with the progress of the construction.
11. Conduct on-site inspections of the work in progress to determine compliance with the contract documents.
12. Report deficiencies observed to the superintendent and the design professional.
13. Get further details or information from the architect if required for the proper execution of the work.
14. Help the superintendent to understand the contract documents. Request the design professional's interpretation or decision on all matters needing clarification.
15. Be familiar with codes applicable to the work. Request interpretation if in doubt.
16. Generally be acquainted with and have access to referenced standards.
17. Request manufacturer's literature or printed instructions if referenced and in doubt.
18. Observe that the testing laboratory performs all tests and inspections required. Keep a record of type and location. Review test results and notify the design professional of observed deficiencies.
19. Consider suggestions or recommendations made by the contractor and refer them to the architect.
20. Review contractor's progress payment applications and report agreement or non-agreement to the architect.
21. Accompany the design professional's consultants when observing or inspecting the work.
22. Notify the design professional of material deliveries that are out of sequence.

23. Observe actual progress in comparison with estimated progress. Record and report conditions that may cause a delay in completion of the work.
24. Keep an accurate record of time and materials and force account work. Obtain written concurrence from the contractor's representatives on a daily basis of labor, materials, and equipment being used on and charged to the force account work.
25. Observe owner occupancy or delivery of owner-furnished equipment before completion. Record and report any damages occurring so that claims can be fully documented.
26. Do not authorize deviations from the contract documents.
27. Neither interfere with the work to be performed by the contractor nor assume any responsibility for the performance of the contractor's work.
28. Do not take instructions from the owner or the owner's employees. Refer all such matters to the design professional.
29. Do not advise on or issue directions relative to any aspect of construction means, methods, techniques, sequences or procedures.
30. Do not assume responsibility for any safety procedures or advise on remedy. Should hazards be observed, report conditions to the superintendent and record them, with a copy to the owner, design professional, and contractor. If an emergency situation arises, contact the owner and governing authorities.
31. Do not stop the work except with written authority of the owner.
32. Notify contracting parties if the owner occupies the work before completion.
33. The use of a camera or camcorder serves as an invaluable visual record of job conditions. The use of photographs or videotape to indicate preconstruction conditions, foundation and utilities placement, and conditions prior to "closing-in" provides a good record and assists owner in future maintenance.
34. Be able to affirm that, in your best judgment, the project conforms to the construction documents at the completion of the work.
35. Realize that approved shop drawings are not contract documents and are not change orders. They serve to clarify or show more detail; however, the drawings and specifications prevail if there is a conflict.

Part 1.3:

Design Professional (Architect/Engineer): Recommended Duties and Responsibilities

Today, the construction of a project requires the integrated efforts of a design team composed of competent individuals. The complexity of the numerous disciplines that interact in the construction process necessitates a division of responsibility to different team members based on area of expertise. Although the project designer conceives the design concept, the actual project realization and delivery requires the technical and management capabilities offered by other team members. Therefore, for the sake of simplicity, the following major positions are represented: Project A/E, designer, job captain, specifier, and field administrator.

1. Thoroughly review the contract documents with the owner to define the scope of the work involved and recommend the necessary procedures to be performed by the owner.
2. If the owner agrees, help formulate qualifications for the construction inspector and/or inspection staff. Assist in interviewing and selecting the inspector. Ask the consultants to participate in this selection if necessary.
3. Establish the nature and extent of services by the testing laboratory and soils engineer and advise the owner of a probable budget. Assist the owner in the selection of a testing laboratory.
4. Assign a design professional representative who is competent and experienced in the construction process to perform construction administration of the work.
5. Specify an adequate job office for the construction inspector, with space, equipment, and conditions sufficient for the functions to be performed.
6. Publish and/or describe the contract administration required for the execution of the work. It is recommended that guidelines tailored for this particular work be developed and that a pre-construction conference describing them be conducted at the onset of construction. It is further recommended that the owner, contractor, construction inspector, design professional consultants, agency representatives, and major subcontractors be present at this conference. Establish pre-installation conferences for specific critical phases of the work.

Develop an orderly system of reviewing, routing and distributing submittals, such as shop drawings, product data, and samples; process and return to the contractor in a timely fashion. Develop final color and material selections, early in the project so as not to delay the work. Develop a method of correspondence to “put in writing” observations of the project, intent, interpretations, decisions, memorandums, etc. of meetings, and progress of the work. Keep the owner, the construction inspector, the contractor, and consultants fully informed and distribute copies of all correspondence, forms, reports and approvals to all parties.

7. Review the contractor’s schedule of values and generally evaluate whether the breakdown is an adequate representation for payments and cash flow.
8. Make timely observations of the work with the construction inspector and promptly notify the contractor of deficiencies observed. Make periodic reports to the owner concerning the progress of the work.
9. Establish standards of acceptability.
10. Receive contractor’s applications for payment and generally evaluate the progress of the work as is claimed. If in order, promptly issue a certificate for payment to the owner.
11. Make timely decisions concerning interpretation of documents and details of design. Do not get involved in the craft jurisdiction. Do not communicate directly with the subcontractors, vendors or suppliers unless authorized by the contractor. All such communication shall be recorded in writing and distributed.
12. Require that the design professional’s consultants make timely visits to the work to observe the general installation of systems and equipment designed by them.
13. Return field phone calls promptly.
14. Do not issue a “stop work” notice.
15. Do not expect the contractor to correct deficiencies of the document for which he is not responsible.
16. Do not instruct the contractor as to methods of job safety. However, if the design architect sees a hazardous condition, tell the contractor or superintendent at once and instruct the construction inspector to note this in the log or daily report.

17. Inspect the work when the contractor notifies that the date of substantial completion has been attained and attaches the inspection (punch) list. Request the consultants to inspect the work at this time and to modify the contractor's inspection list. Prepare an inspection list (punch list) of deficient or nonacceptable items and insist the owner, contractor, and construction inspector understand or approve the items.
18. Distribute the inspection list to all parties. If the work at that time (or thereafter) is completed to the extent that the owner may take occupancy, the architect should recommend to the owner to accept the work as substantially completed. At that time, and if the remaining items involve a cessation of labor, recommend to the owner, with concurrence of the owner's legal counsel, to have notice of completion processed or take other necessary actions.
19. Accompanied by the owner, contractor and construction inspector, make a final inspection of the work after the contractor notifies the owner that the work is totally completed. Promptly process all outstanding change orders and other contract document requirements and execute a final certificate for payment.

Part 1.3.1:
Project Design Professional
(Architect/Engineer)
Description

This experienced individual is assigned by the principal-in-charge to manage the project and serve as the owner's contact relative to the day-to-day activities of the project. The design professional's ability to efficiently lead the design team and direct the administrative and technical aspects of the design is critical to the success of the project. This includes meeting the owner's requirements within the real constraints of cost and time.

Part 1.3.2:
Project Designer
Description

This individual is assigned by the principal-in-charge to come up with a design concept and solutions that meets the project requirements established by the owner. Although the aesthetic aspect of the design is very important, a true solution is tested by attaining the functional requirements of the project. The major refinements of visually exposed elements are comprehensively articulated by the project designer.

Part 1.3.3:
Project Job Captain
Description

This experienced individual is selected for a specific project to further develop the design concept from design development through construction documents. The project job captain's technical ability to integrate the interdisciplinary expertise of the design team, including the project specifier and other technical resources, is critical to the success of the project.

Part 1.3.4:

Project Specifier

Description

This experienced individual is assigned to prepare the project manual. The most effective use of this person's abilities is participation in the early formulation of materials, equipment, and construction systems and definition of the quality requirements for the project. The ability of the specifier to be integrated as a technical resource throughout the development and delivery of the project is critical to the success of the project.

Part 1.3.5:

Field Administrator (Construction Contract Administrator)

Description

This experienced individual, who could already be part of the project team i.e., job captain, is assigned the responsibility the requirements of the construction documents during construction. The field administrator's services include certifying pay requests, reviewing contractor's submittals, responding to clarifications, requests for information (RFI's), preparing construction change authorizations/change orders, and conducting project site walkthroughs to observe substantial conformance with the contract documents.

Part 1.3.6:

Observations and Inspections

Description

Inspections are conducted by specialized individuals who may be members of an independent testing laboratory hired by the owner, full time representatives hired by the owner or architect or officials representing local jurisdictions or authorities. According to customary practice, architects conduct periodic site visits to observe substantial conformance with the contract documents of visually exposed and accessible conditions; however, they do not generally conduct inspections since this denotes a level of detailed review and scrutiny not afforded by their scope of work or expertise relative to quantitative assessment and testing. For the sake of simplicity, where the matrix indicates design professional's (architect/engineer) inspection (AI), it denotes observation work for which the design professional is generally responsible according to prevailing professional standards.

Part 1.4:

Contractor: Recommended Duties and Responsibilities

1. Carefully study contract documents. Report any error, inconsistency or omission that may be discovered.
2. Assign a superintendent and necessary personnel to be on site during the construction of the work. Delegate sufficient authority to the superintendent to represent and act for the contractor.
3. Provide subcontractors with construction documents indicating the work of all crafts. Require the superintendent and subcontractors to familiarize themselves fully with the specifications and general and special conditions.
4. Provide and become familiar with the standards specified. Provide codes at the site, if stipulated.
5. Notify the testing laboratory personnel in sufficient time to permit proper inspections. Become fully acquainted with all tests and inspections required of the testing laboratory and special inspections required by agencies. Work requiring continuous inspection should be expedited or scheduled so as to minimize costs. Advise the persons scheduled to inspect of any delay in the work schedule so that unproductive inspection time will be avoided.
6. Require subcontractors, vendors and suppliers to communicate with the design professional through the contractor or his superintendent.
7. Assume fully that the work to be completed and performed is in full compliance with the contract documents. Be responsible for the progress and control of the work and for fully coordinating and overseeing the work of the subcontractors, vendors and suppliers to meet this obligation.
8. Submit a schedule of values for the various portions of the work, with breakdowns in sufficient detail to meet the design professional's approval and allow the architect and the construction inspector to rely on the schedule as a basis for progress payments. It is recommended that this schedule follow the CSI MASTERFORMAT (see Appendix).
9. Prepare a progress schedule for the work, including a schedule of submittals, showing the various phases, and update it periodically.
10. Maintain on the site a complete set of construction documents (with agency approvals as required) including drawings, specifications, addenda (cut-in to drawings and specifications), approved shop drawings, product data and samples, change orders and all correspondence concerning the work.
11. Update the construction documents periodically to record changes.

12. Prepare a schedule of shop drawings, product data, and samples. Coordinate and process submission to allow a reasonable time for review and/or approval by all parties and maintain proper sequence for timely progress of the work.
13. Process and note substitutions as allowed. Be responsible for equivalency and compatibility. Submit in a timely sequence so that the design professional may coordinate color selections and other decisions with the owner.
14. Require, check and verify that subcontractors, suppliers or vendors perform and/or supply their work, materials and equipment so as to be available in a proper sequence for efficient progress of the work.
15. Give the construction inspector advance notice of delivery of materials or equipment.
16. Periodically observe, inspect and review the work of contractor's employees and the material, equipment and installation of contractors, subcontractors, vendors and suppliers so that the construction is in compliance at all times. Promptly correct or remove all defective work.
17. Comply with the requirements of agencies relating to permits and agency-required inspections during the various phases of the work.
18. Coordinate mechanical, electrical and other installation sequences and assign priorities where drawings are diagrammatic.
19. Promptly make approved payments to subcontractors, vendors and suppliers in accordance with the contract documents.
20. Perform changes to the work only through processes allowed in the construction documents.
21. Notify the owner, through the architect, in writing concerning coordination of owner-furnished equipment, items not-in-contract, etc. Allow sufficient time for orderly sequencing and incorporation of these items into the work.
22. Notify the design professional in writing when substantial completion is reached, prepare a punchlist, and request inspection by the design professional and consultants.
23. Promptly submit all record drawings, reports, instructions, guarantees and other requirements of the construction documents to the architect.
24. Accurately and promptly submit, in writing, any delays due to "Acts of God" (i.e. weather), strikes, or any other disruption in the project's completion beyond the control of the contractor.
25. Complete the work within the time stipulated after substantial completion and notify the design professional. Request a final inspection in writing.

Part 1.5:

Owner: Recommended Duties and Responsibilities

1. Establish proof of legal title. Obtain valid site survey and geotechnical investigations necessary for the project design.
2. Delegate or assign an owner's representative for the construction of the work. Give the owner's representative enough authority to make timely decisions on the part of the owner. Thoroughly review the contract documents to grasp the full concept and scope of the project.
3. Determine with the professional the need for construction inspection based upon the type, size and complexity of the project. Establish a sufficient allowance in the project budget to compensate the construction inspector and/or the construction inspection staff adequately. Consult with the design professional as to how much inspection is required.
4. Consult with the design professional to establish the qualifications required for inspection of the work. Design professional's consultants should participate in the selection of personnel. Allow sufficient time for recruitment. If interviews are required, allow applicants sufficient time to present their qualifications.
5. Ensure engagement of the construction inspector before construction is begun so that full familiarization of the work is allowed and administrative procedures can be established. Engagement before putting the project out for bid is recommended.
6. Communicate only through the design professional. The owner's representative, accompanied by the architect, should periodically visit the project to review progress. Do not allow unauthorized persons to interfere with the work by communicating with the design professional, contractor or construction inspector. All important communications should be in written form.
7. The owner's representative should make timely decisions based on the recommendations of the design professional, with fair judgment of the conditions involved.
8. Organize the financing of the project to allow orderly cash flow. Process certificates of payment promptly to avoid undue delay of monies due the contractor.
9. Realize that the normal "basic" services of the design professional include only "periodic observation" of the work. Do not expect the design professional to observe all the processes, installations, workmanship, etc.

10. Realize that the function of the design professional during construction is as an “interpreter of the documents.” The design professional may have to impartially take the side of the owner or the contractor as the documents require.
11. Allow an adequate budget for changes required by unforeseen factors occurring during construction. It is customary to allow approximately 3 to 10 percent, depending on the size, type and complexity of the project. Where additions and alterations are included and the project is small, budget a greater contingency.
12. Process and approve change orders in a timely manner. When the process for approving change orders is cumbersome or complex due to organizational requirements, it is suggested that the owner’s representative should be delegated to approve “field change orders” (within a maximum dollar limitation), since this process appears to have legal precedence for public and private bodies when a contingency is budgeted.
13. Allow reasonable time extensions for causes beyond the control of the contractor. Realize in some cases that the construction sequence may be so interrupted as to warrant an even longer period than the work stoppage. If necessary, allow extra compensation for making up lost time by shift work or a limited amount of overtime.
14. Do not request quotations from the contractor for changes not fully expected to be incorporated in the work.
15. For owner-furnished equipment to be incorporated into work and/or items not-in-contract, it is the owner’s responsibility to supply all needed information in a timely fashion so as not to delay construction. This information includes size, weight, points and methods of anchorage, rough-in locations, utility connections and characteristics, etc.
16. During the preparation of contract documents, consider and allow payment for items suitably stored on-site or off-site and not incorporated into the work when the contractor submits bills of sale or adequacy of storage, insurances, etc. In addition, consider reducing the withholding or retained monies on the work to 5 percent when the work is 50 percent completed. This practice is used frequently by public and private agencies.
17. Do not request the contractor or design professional to perform services that are not included as part of the work without additional compensation.
18. Do not request the construction inspector to provide services other than those for which he is employed without additional compensation.

19. Retain legal and insurance counsel knowledgeable in construction practices. Realize that the design professional can only make recommendations on matters within the extent of his professional licensing.
20. Avoid occupancy of the work until the date of substantial completion. If “beneficial occupancy” is necessary, realize that the owner is responsible for damages and delays occurring during move-in and thereafter which are caused by him or his employees.
21. Accept the work without undue delay. Accompanied by the architect, the contractor and the construction inspector, arrange for the inspection and acceptance of the work in an organized manner. It is normally the duty of the architect to rule on acceptability of the work or portions of it and recommend acceptance to the owner.
22. With the advice of legal counsel do not delay taking recommended actions concerning occupancy and acceptance and executing required documents.
23. Realize that the work generally has a one-year “correction period” (longer in certain cases and/or where stipulated) from the time of occupancy and acceptance (or use of equipment in some cases). Payment for 100 percent of the contract amount, less the retainage, should be made when the work is substantially completed. In many cases, the work may not be “totally complete” to the last detail. If withholding is necessary, it should be commensurate with the situation.
24. Investigate as to whether building site or existing facility may contain hazardous materials and have environmental, chemical, and pollution testing performed, as necessary.
25. Make the final payment promptly upon expiration of lien periods and the issuance of design professional’s final certificate of payment.
26. Lastly, realize that construction is usually a “one-of-a-kind” process and that the parties involved cannot guarantee perfection. The quality of materials and workmanship and their acceptance must be commensurate with the constraints established by the contract documents.

Part 1.6: Lawyer's Description

Lawyers are professionals licensed to practice law. The lawyer provides legal counsel for contract negotiations relative to drafting custom contracts, amending AIA agreements, establishing general conditions and providing risk management advice when disputes or claims arise.

Due to an increasingly litigious environment, presence and effect of lawyer have has made an indelible mark on the construction industry. The lawyers referred to specialize in construction law and therefore are experts in construction related matters. Their participation in contract formulation and negotiations, not just conflict resolution, increases the ability to deliver a project that meets the originally intended goals, reduces disputes, and encourages early resolution of conflict. In order to avoid escalation of disputes into litigation, mechanisms for alternative dispute resolution like arbitration and mediation are now being used to expedite the settlement process and diminish losses and aggravation. Additionally, new attitudes of collaboration such as partnering as a team to resolve construction disputes establishes a collective commitment to prevent any impending legal action.

Part 1.7: Manufacturer's Representative Inspections

In order to confirm that the work as installed meets the manufacturers recommendations, certain sections of the technical specifications of the project manual may require inspection by a manufacturer's representative. A written confirmation by the manufacturer's representative of the application and installation of the product provides additional validation of its final performance. This becomes necessary when certain warranties require manufacturer's representative site inspection and approval endorsing such application.

Part 1.7.1:

Required by Contract Documents

Determine which sections of the project manual will require inspections by a manufacturer's representative. This serves as a no-cost way to validate the application and address specific site conditions that may have not been detailed in the construction drawings or may have been created during construction.

Part 1.7.2:

Required for Warranties and Guarantees

Generally, specifications for specialty items like roofing and waterproofing that protect the integrity of the building envelope require an extended warranty by specifying progress inspections by the manufacturer's representative. This are critical when inspections are not conducted in conjunction with an independent testing laboratory, when new products are installed, or when field installation is susceptible to problems due to specific site concerns.

Part 1.7.3:

Coordination

To get the most out of the manufacturer's representative field service, advanced notification is required to ensure scheduling of inspections and attendance at pre-installation conferences. Be certain the total assembly is considered and a comprehensive interdisciplinary coordination is made by a team of competent individuals, and that the appropriate action is not the determination of a single judgement of an applicator only focused on the task, and not the system assembly, adjacent product or material compatibility.

Part 1.8:

Special Consultants

With the growing complexity of technology and the resulting specialized areas of expertise, consultants for various specialized fields continue to make their way in the construction industry. Some of these disciplines, which may be hired by the owner, design professional or contractor, may have design-build capabilities.

SPECIAL CONSULTANTS

- | | |
|-------------------------------|------------------------------|
| 1. Acoustical | 24. Landscaping |
| 2. Arborist | 25. Land Surveyors |
| 3. Art | 26. Library Science |
| 4. Audio/Visual | 27. Lighting |
| 5. Civil | 28. Mechanical |
| 6. Cost Estimating | 29. Medical Equipment |
| 7. Data/Communications | 30. Parking |
| 8. Electrical | 31. Physicist |
| 9. Elevator | 32. Programming |
| 10. Energy | 33. Plumbing |
| 11. Equipment | 34. Public Sector Management |
| 12. Exhibit | 35. Roofing |
| 13. Fire Protection | 36. Security |
| 14. Fitness | 37. Shielding |
| 15. Food Service | 38. Signage |
| 16. Fountain | 39. Specialty Design |
| 17. Furniture and Furnishings | 40. Specifications |
| 18. Geotechnical | 41. Structural |
| 19. Graphics | 42. Surgical |
| 20. Hardware | 43. Transportation |
| 21. Historic Preservationist | 44. Water Feature |
| 22. Interior Design | 45. Waterproofing |
| 23. Laboratory | |

SPECIAL CONSULTANTS WITH DESIGN-BUILD CAPABILITIES

1. Acoustical
2. Audio/Visual
3. Data/Communications
4. Electrical
5. Energy
6. Equipment
7. Exhibit
8. Fire Protection
9. Food
10. Fountain
11. Furniture and Furnishings
12. Graphics
13. GFRC
14. Hardware
15. Landscaping
16. Lighting
17. Mechanical
18. Parking
19. Precast
20. Plumbing
21. Roofing
22. Security
23. Signage
24. Specialty Design
25. Waterproofing
26. Window Wall

Part 2:

Standards and Codes

Many organizations and agencies have developed standards and codes applying to the construction industry. These standards and codes make up a large portion of a specification which, by inference, establishes levels of acceptability in the manufacture, installation, workmanship or performance of systems, methods and materials incorporated into the work. These standards and codes apply on a local, regional or national basis.

A general description and listing of major codes appears in Part 2.2. A general listing of the most common agencies that develop standards appears in Part 2.3. For a complete, detailed listing of building codes and regulations, please refer to the *Directory of Building Codes and Regulations, By City and State*, and *Code Finder For Building and Construction*, both published by and available through BNi Building News.

Many professional and trade organizations and agencies have published documents, forms, manuals and other useful information that is widely accepted and used by owners and the industry in both a legal and technical aspect. Since the scope of this manual is limited, these have not been included in the Standards section; however, they and others are listed in Appendix A, "Construction Industry Organizations."

Part 2.3 contains a numerical listing, to the left, of the name of a standard and a CSI MASTERFORMAT section number. In addition, assigned initials are listed before the name. The numerical listing is cross-references the initials of the standard listed at the top of each page in various sections of Part 3 Checklist for Field Inspection." The CSI MASTERFORMAT section number indicates typical sections in which the standard might be referenced.

While the *Construction Inspection Manual* has attributed the section numbers to CSI (*Construction Specifications Institute*), it is emphasized that the MASTERFORMAT, the official title since 1978, is a joint publication with CSC (*Construction Specifications Canada, Document 004E*). Prior to MASTERFORMAT, the official titles were known as the CSI Format for Construction Specifications, the Uniform System for Construction Specifications, Data Filing and Cost Accounting and the Uniform Construction Index. The formulation of the MASTERFORMAT predecessors involved American Institute of Architects, American Society of Landscape Architects, Associated General Contractors of America Inc., Associated Specialty Contractors Construction Products Manufacturing Council, National Society of Professional Engineers, as well as CSI and CSC. Among others, the U.S. Department of Defense has adopted MASTERFORMAT for use on Naval, Air Force, and Army Corps of Engineers projects. McGraw-Hill Information System Co. adopted MASTERFORMAT for Sweets Catalog Files. MASTERFORMAT is the framework for SPECTEXT, the CSRF master guide specification system marketed by CSI and for other commercially available master guide specification systems.

Part 2.1: Contract, Contract Documents & Specifications

As previously indicated in Chapter 1.1, a contract is a legally enforceable agreement that sets forth the obligations of each party to the other. Any violation of these obligations (breach) can expose the party committing the breach to sanctions of law. The significant benefit of having an agreement is that a mutual understanding is developed by communicating expectations through clear definition of scope and general/terms and conditions.

Contract documents are composed of the agreement between the owner and contractor, conditions of the contract (general, supplementary and others when applicable), drawings, specifications, addenda, and any other modifications issued after the signing of the contract.

Technical specifications are the technical portions of the project manual that do not include the “front end,” bidding requirements, contract forms, contract conditions and Division 1 sections. It is within a specification section that reference standards are included to define the level of quality and industry-accepted practices relative to installation or construction of a component or system assembly. For example, the installation of metal flashings require conformance with the Architectural Sheet Metal Manual by SMACNA (Sheet Metal and Air Conditioning Contractors National Association).

All the above documents provide the basis for the enforcement of the agreed upon contract requirements for project delivery. It is highly encouraged that the inspector develop an intimate familiarity with the contract documents to better serve the owner’s interest and achieve the successful execution of the design intent.

Part 2.2:

Codes and Regulations

The proliferation of codes and regulations applying to construction continues year by year. Codes are adopted by federal, state and local governments and can be supplemented by countless agencies.

Model codes have been developed and published by various forms of consensus processes, usually chaired/controlled by organizations for code enforcement officials such as the Building Officials and Code Administrators (BOCA), the Southern Building Code Congress International (SBCCI), the International Conference of Building Officials (ICBO) and the National Fire Protection Association (NFPA). Currently, in addition to model codes published by NFPA, the International Code Council (ICC), formed by BOCA, SBCCI and ICBO published the *International Code Series*.

Other codes and regulations may be developed based on actual or perceived problems and may be incorporated with no more input than the power of a special interest group. Among the national regulations impacting construction are the Occupational Safety and Health Act (OSHA), the federal Safety Glazing Standards, the Fair Housing Accessibility Guidelines and the Americans with Disabilities Act Accessibility Guidelines.

State and regional requirements vary widely. Some states adopt voluminous sets of codes and regulations based loosely on one of the model codes. Other states adopt one of the model codes in its entirety to ensure that various jurisdictions throughout the state maintain a consistent quality of construction. The same can be said for local government agencies.

It is important that the design professional (architect, engineer), contractor and building inspector be aware of codes applicable to a particular project. Additionally, it is important to use the appropriate edition, because changes are constantly occurring. The most recent edition of a code is not always the applicable edition. For a complete, detailed listing of building codes and regulations, please refer to the *Directory of Building Codes and Regulations, By City and State*, and *Code Finder For Building and Construction* – both published by, and available through, BNi Building News.

The major national model codes agencies are listed below with their related codes:

ICC – International Code Council, 5203 Leesburg Pike Ste. 600, Falls Church, VA 22041 publishes the following:

- International Building Code
- International Energy Conservation Code
- ICC Electrical Code
- International Existing Building Code
- International Fire Code
- International Fuel Gas Code
- International Mechanical Code
- ICC Performance Code
- International Plumbing Code
- International Private Sewage Disposal Code
- International Property Maintenance Code
- International Residential Code
- International Urban-Wildland Interface Code
- International Zoning Code

BOCA – Building Officials and Code Administrators, International, Inc., 4051 W. Flossmoor Rd., Country Club Hills, IL 60477-5795, (708) 799-2300, has formally published the following:

- National Building Code
- National Fire Prevention Code
- National Property Maintenance Code
- International Mechanical Code
- International Plumbing Code
- BOCA Energy Conservation Code

With certain exceptions, the above codes have been generally adopted in the Northeast and Midwest.

SBCCI –Southern Building Code Congress, International, Inc., 900 Montclair Rd., Birmingham, AL 35213-1206, (205) 591-1853, has formally published the following:

- Standard Building Code
- Standard Fire Prevention Code
- Standard Gas Code
- International Mechanical Code
- International Plumbing Code
- Standard Housing Code

National

With certain exceptions, SBCCI codes have been generally adopted in the Southeast.

ICBO – International Conference of Building Officials, 5360 South Workman Mill Rd., Whittier, CA 90601-2298, (562) 699-0541, has formally published the following:

- International Building Code
- International Mechanical Code
- Uniform Housing Code
- Uniform Code for the Abatement of Dangerous Bldgs.
- Uniform Sign Code
- Uniform Fire Code
- Uniform Code for Building Conservation

With certain exceptions, ICBO codes have been generally adopted west of the Mississippi River.

IAPMO – International Association of Plumbing and Mechanical Officials, E Philadelphia Street, Ontario, CA 91761-2816.

- Uniform Plumbing Code

NFPA – National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269, (617) 770-3000, (800) 344-3555, publishes the following:

- National Electric Code, NFPA 70
- Life Safety Code, NFPA 101

The National Electric Code is universally adopted throughout the United States. The Life Safety Code is often adopted by state and local fire departments and is often used in conjunction with model building codes relating to life safety.

In many states, it is usually necessary to comply with more than a single code or enforcing agency to design and construct the work. The work (especially public or institutional) may also be governed by one or more of the following codes/regulations:

Federal

FHA – Federal Housing Administration, U. S. Department of Housing and Urban Development (HUD), 451 Seventh Street S. W. Washington, DC 20410-0500, (202) 275-7543, publishes the following:

- Minimum Property Standards for Multi-family Housing
- Minimum Property Standards for One and Two Living Units
- Manual of Acceptable Practices
- Fair Housing Accessibility Guidelines

These publications result from the Fair Housing Amendments Act of 1988 concerning accessibility for persons with disabilities to both public and private housing, including requirements relating to design and construction.

OSHA – Occupational Safety and Health Administration, United States Department of Labor, 200 Constitution Ave. NW, Room N3101, Washington DC 20210, publishes the following:

- **Construction Industry Standards.** 29 CFR 1926, 29 (CFRP 1900-1910)

These publication results from the Occupational Safety and Health Act of 1970, concerning health and safety requirements for employees and applies to design and construction.

ADA – Americans with Disabilities Act, Civil Rights Division, U.S. Department of Justice, Washington DC 20530, (202) 514-0381, publishes the following:

- **ADAAG**, –Americans with Disabilities Act Accessibility Guidelines
- **Americans with Disabilities Act Handbook**

These publications result from the Americans with Disabilities Act of 1990, concerning accessibility for persons with disabilities, including requirements of state and local government services (Title II) and public accommodations in commercial facilities (Title III), both relating to design and construction.

ANSI–American National Standards Institute, Inc. ANSI 117.1 2003 Standards on Accessible and Usable Buildings and Facilities. American National Standards Institute, Inc., 1819 L Street NW, 6th Floor, Washington DC 20036.

In the past, various editions of this publication have been adopted by some state and local agencies; however, the common practice has changed to accept the ADAAG and FHAG as the standards for accessibility for persons with disabilities.

State

In addition, many states adopt their own versions of the model codes. The following is an example of the California Codes of Regulations:

CCR –California Code of Regulations General Services. Publication Section, P.O. Box 1015, Sacramento, CA 95660, publishes the following, applicable to building construction:

Title 8 – Industrial Relations

Part 1, Chapters 3.2, 3.3, 3.5 Occupational Safety and Health Regulations, Appeals and Standards; Chapter 4, Division of Industrial Safety (includes all Safety Orders).

Title 17 – Public Health

Title 19 – Public Safety

Title 21 – Public Works

Title 22 – Health Planning and Facility Construction; Division 7 and 8, T22.

Title 24 – California State Building Standards Codes

Part 1, Administration, Building Standards Commission

Part 2, California Building Code

Part 3, California Electrical Code

Part 4, California Mechanical Code

Part 5, California Plumbing Code

Part 6, Special Building Regulations

Part 7, Elevator Safety Regulations

Part 8, State Historical Building Code

Part 9, California Fire Code

Part 10, State Uniform Code Building Conservation

Part 12, Reference Standards Code

Title 25 – Housing and Community Development

Chapter 1, State Housing Law and Earthquake Protection Regulations

Chapter 3, Factory Built Housing, Mobile Homes, Recreational Vehicles and Commercial Coaches.

These state codes may or may not apply to all design and construction. Most are applicable to institutional and/or public buildings; however, private buildings often are subject to the codes. Local building departments and fire marshals can indicate applicable titles, chapters, or parts.

Public Safety:

The construction inspector is not directly responsible for public safety. However, unsafe conditions cannot be ignored. Codes and regulations are typically developed in order to ensure the public health, safety, and welfare. If the construction inspector observes anything which might be unsafe, it should be immediately reported to the contractor's superintendent. If a member of the general public might be in danger, it would be appropriate for the construction inspector to do whatever is possible to prevent a potential accident.

One public safety requirement which can be especially important is the safety standards for architectural glazing materials. These federal regulations, which have been incorporated into the model building codes, require safe glazing materials be used indoors and in areas where there is potential impact on people. Safety glazing is easily identified by a permanent mark required in the lower corner of each safety glazing lite, usually noting that the glass is safety glass or conforms with ANSI A97.1. Only wired glass used in fire rated doors and sidelights is exempt from the safety glazing requirements.

Life Safety:

The design professionals should include life safety requirements related to codes and regulations in the contract documents. As such, the construction inspector can be responsible for verification of compliance. Some knowledge of the codes and regulations in addition to the contract documents would be especially useful.

Access for Persons with Disabilities:

Design of proper accessibility should be part of the construction documents. Verification of compliance should, be part of the construction inspector's observations. Access regulations such as ANSI A117.1 and the Americans with Disabilities Act Accessibility Guidelines can provide some understanding of how to ensure accessibility in a construction project.

Hazardous Materials:

Many public agencies now require material safety data sheets (MSDS) be kept on-site. The construction inspector may or may not have some responsibility for the MSDS; even when there is no direct responsibility, it would be appropriate for the construction inspector to know where these sheets are kept. Refer also to Appendix J.

Part 2.3: Standards

NO.		STANDARD	CSI SECTION		
1.	AIMA	Acoustical and Insulating Materials Association, 205 W. Touhy Ave, 205 W. Park Ridge, IL 60068 Tel: (630) 553-0129			09800
2.	AA	Aluminum Association, 900 19th St, NW, Washington DC 20006 Tel: (202) 862-5100 Fax: (202) 862-5164	05700 07600 08400 08900 10750	05100 07400 08100 08500 10400	08300 08600 10550 14200 12490
3.	ANLA	American Nursery and Landscape Association, 1250 1 St. NW, Ste. 500 Washington, DC 20005 Tel: (202) 789-2900		02480	
4.	AASHTO	American Association of State Highway and Transportation Officials, 444 N Capitol St. NW, Washington DC 20001 Tel: (202) 624-5800		02300 02700	
5.	ACI	American Concrete Institute, 3880 Country Club Dr. Farmington Hills, MI 48331 Tel: (248) 848-3800	02450 02475 02930 03200 03370	02500 03100 03300 03400	02400 02900 03150 03360 03500
6.	AGA	American Gas Association, 1515 Wilson Blvd., Arlington, VA 22209 Tel: (703) 841-8400	15010 15600	15050 15650	10960 15400 15800
7.	AHA	American Hardware Association, 20 N Wacker Dr., Chicago, IL 60606			08700

NO.		STANDARD	CSI SECTION		
8.	AHMA	American Hardware Manufacturers' Association, 801 N Plaza Dr., Schaumburg, IL 60173 Tel: (847) 605-1025			08700
9.	AHDGA	American Hot Dipped Galvanizers' Association 6881 S Holly Cir, Ste 108, Centennial, CO 80112	03200 05400	02530 05120 05500	02900 05300 07400
10.	AISC	American Institute of Steel Construction, Inc, 1 E Wacker Dr., Chicago, IL 60601 Tel: (312) 670-2400	03100	05120	02300 02450 05200
11.	AITC	American Institute of Timber Construction, 7012 S Revere Parkway #140, Centennial, CO 80112 Tel: (303) 792-9559, Fax:(303) 792-0669	06130	06100 06170	06070
12.	AIA	American Insurance Association, 1130 Connecticut Ave. NW, Ste 1000, Washington DC 20036 Tel: (202) 828-7100	04200	08100	04090
13.	AISI	American Iron & Steel Institute, 1140 Connecticut NW, Ste 705, Washington, DC 20036 Tel: (202) 452-7100 (800) 545-2433	03200 04200 05300 07400 10750	03400 05100 05400 09800 10800	04150 05200 05700 10150 14200
14.	ALA	American Library Association, 50 E Huron St, Chicago, IL 60611 Tel: (312) 944-6780		11650	
15.	API	American Petroleum Institute, 1220 L ST, NW, Washington DC 20005 Tel: (202) 682-8000	02550	15600	
16.	ANSI, ANS	American National Standards Institute, Inc. 11 W 42nd St, 13th Fl, New York, NY 10036, Tel: (212) 642-4900		02450	

NO.		STANDARD	CSI SECTION		
17.	APA	American Plywood Association, PO Box 11700, Tacoma, WA 98411 Tel: (206) 565-6600	06100	06200	03100 06400
18.	APWA	American Public Works Association 1401 K St NW, 11 th Fl, Washington DC 20005 Tel: (202) 408-9541			02300 02500
19.	ASTM	American Society for Testing and Materials, 100 Barr Harbor Dr., West Conshohocken, PA 19428-2959 Tel: (610) 832-9585		02475	02300 02450
20.	ASAHC	American Society of Architectural Hardware Consultants 1815 N Ft. Myer Dr, Ste 412, Arlington, VA 22209	08100	08400	08700
21.	ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers, Inc. 1791 Tullie Cir. NE, Atlanta, GA 30329 Tel: (800) 527-4723		15700	15600 15800
22.	ASME	American Society of Mechanical Engineers, 3 Park Ave, New York, NY 10016 Tel: (800) 843-2763			15600

NO.		STANDARD	CSI SECTION		
23.	AWS	American Welding Society, 550 NW, Jeune Rd, Miami, FL 33126 Tel: (305) 443-9353 (800) 334-9353	02400 02450 02900 05120 05400 15600	02530 02930 05200 05700	02870 03200 05300 15400 15700
24.	AWWA	American Water Works Association 6666 W Quincy Ave, Denver, CO 80235 Tel: (303) 794-7711	05120	15400 05200	15600 05300
25.	AWPA	AWPA — American Wood Preservers Association Box 361784, Birmingham, AL 35244 Tel: (205) 773-4077	02450 06200	06300	06100 06400
26.	AAMA	Architectural Aluminum Manufacturers' Assoc., 35 E Wacker Dr, Chicago, IL 60601 Tel: (312) 782-8256	05500 08300	05700 08500	08100 08900
27.	AWI	Architectural Woodwork Institute, 46179 Westlake Dr, Potomac Falls, VA 20165 Tel: (571) 323-3636	06400	08200	06200 12490
28.	AI	Asphalt Institute, Research Park Dr. Lexington, KY 40511 Tel: (859) 288-4960			02500
29.	BIA	Brick Institute of America, 355 Lexington Ave, 17 th Fl New York, NY 10017 Tel: (212) 297-2122	04900	04090 04550	04090
29A.	BHMA	Builders Hardware Manufacturers Association, 11490 Commerce Park Dr., Reston, VA 20191 Tel: (703) 620-0010		08700	

NO.		STANDARD	CSI SECTION		
30.	CRA	California Redwood Association 405 Enfrete Dr. Ste 200, Novato, CA 94949 Tel: (415) 382-0662, Fax: (415) 382-8531	02530 06170	03100 06200	06100 06400
31.	CSS	California Standard Specifications, Division of Highways, Documents Section, Sacramento, CA 94807	02300	02500	
32.	CRI	Carpet & Rug Institute, PO Box 2048 Dalton, GA 30722 Tel: (706) 278-3176	09680	12480	
33.	CTI	Ceramic Tile Institute, 12061 Jefferson Blvd, Culver City, CA 90230 Tel: (310) 574-7800	05120	05200	05300
34.	CLFMI	Chain Link Fence Manufacturer's Institute, 10051 Old Columbia Rd, Ste. B- 215, Columbia, MD 21046 Tel: (301) 596-2583	02530		
35.	CS	Commercial Standard (U.S. Dept. of Commerce), Govt. Printing Office, Washington DC 20402	06200	08100	02530 08200
36.	CRSI	Concrete Reinforcing Steel Institute, 933 No. Plum Grove Rd, Schaumburg, IL 60173-4758 Tel: (800) 328-6306	03200		
37.	CDA	Copper Development Association, 260 Madison Ave, New York, NY. 10016 Tel: (212) 251-7200	05500 10350	05700 14200 16400	07600 15700 15770

NO.		STANDARD	CSI SECTION		
38.	DFPA	Douglas Fir Plywood Association (see American Plywood Association), 7011 S. 19 th , Tacoma, WA 98466 Tel: (253) 565-6600	03100	06100	06200
39.	FTI	Facing Tile Institute, c/o Box 8880, 04150 Canton, OH 44711 Tel: (216) 488-1211			04050
40.	FM	Factory Mutual Global 1301 Altwood Ave, PO Box 7500, Johnston, RI 02919 Tel: (401) 275-3000	05300 08100	08100 14200	
41.	FS	Federal Specifications, Dept. of Documents, Government Printing Office, Washington, DC 20234			
42.	FGMA	Flat Glass Marketing Association, 3310 SW Harrison St., Topeka, KS 66611 Tel: (913) 266-7013, Fax: (913) 266-0272	08800		
43.	FPL	Forest Products Lab. U.S. Dept. of Agriculture, Madison, WI 53705	06100	06130	06070
44.	GTA	Glass Association of North America, 2745 SW Wanamaker Dr, Ste. A, Topeka, KS 66614 Tel: (785) 271-0208	08800		
45.	GA	Gypsum Association, 810 1 st St, NE Ste. 510, Washington, DC 20002 Tel: (202) 289-5440	09100	09250	

NO.		STANDARD	CSI SECTION		
46.	HPMA	Hardwood Plywood Manufacturers' Association, PO Box 2789, Reston, VA 22090 Tel: (703) 435-2900	06200	06400	12500
47.	HI	Hydraulic Institute, 9 Sylvan Way, Parsnippany, NJ 07054 Tel: (201) 267-9700	02700	15400	
48.	ILIA	Indiana Limestone Institute of America, Inc, Stone City Bank Bldg, Ste. 400, Bedford, IN 47421 Tel: (812) 275-4426			04400
49.	WLPDIA	Western Lath/Plaster/Drywall Industries Assn, 8635 Navajo Rd, San Diego, CA 92119 Tel: (619) 466-9070			
50.	MFMA	Maple Flooring Manufacturers 60 Revere Dr. #500, Northbrook, IL 60062 Tel: (847) 480-9138	09620	09640	
51.	MIA	Marble Institute of America, 42 East St, Annapolis, MD 21401 Tel: (410) 280-1305	04400		
52.	MI	International Masonry Institute, 815 15th St. NW, Washington, DC 20005 Tel: (202) 783-3908	04200	04060 04500	04090
53.	MLA	Metal Lath Steel Framing Division of National Association of Architectural Metal Manufacturers, 8 S. Michigan Ave, Ste. 1000, Chicago, IL 60603 Tel: (312) 456-5590			09100

NO.		STANDARD	CSI SECTION		
54.	NAAMM	National Association of Architectural Metal Manufacturers, 8 South Michigan Ave, Ste. 1000 Chicago, IL 60603 Tel: (312) 332-0405	05700 08400 10400	08100 08500 10700	05500 08900 08300 14200
55.	NBHA	National Builders Hardware Association, 1815 N Ft. Myer Dr, Ste. 412, Arlington, VA 22209 Tel: (703) 527 -2060	08100	08400	08700
56.	NBGQA	National Building Granite Quarries Association, 1220 L St. NW, Ste. 100-167, Washington, DC 20005 Tel: (800) 557-2848	04900		
57.	NBS	National Bureau of Standards, U.S. Dept. of Commerce, Dept. of Government Printing Officer, Washington, DC 20234			
58.	NCMA	National Concrete Masonry Association, 13750 Sunrise Valley Dr, Herndon, VA 20171 Tel: (703) 713-1900	04070	04090	04200
59.	NEC	National Electric Code, National – Fire Protection Assn, One Batterymarch Park, Quincy, MA 02269 Tel: (617) 770-3000	16100	16400	14200 16500
60.	NEMA	National Electrical Manufacturers' Association, 1300 N 17 th St, Ste 1752, Roslyn, VA 22209, (703) 841-3200	06200 10750 16400	08200 11650 16500	10150 14200

NO.		STANDARD	CSI SECTION		
61.	NEMI	National Elevators Manufacturing Industry, Inc, 1677 Country Route 164, PO Box 838, Salem, NY 12865 Tel: (518) 854-3100			14200
62.	NFMA	National Fan Manufacturers' Association, 5-157 General Motors Building, Detroit, MI 48202			15800
63.	NFPA	National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269 Tel: (617) 770-3000 (800) 344-3555	08100 09300 09650 16100	08200 09400 10250 16400	07200 08500 09800 16500
64.	AFPA	American Wood Council (Successor NFOPA), 1111 19th St. NW, #800, Washington, DC 20036 Tel: (202) 463-2766	06100	06130	08100
65.	NOFMA	National Oak Flooring Manufacturers' Assoc. PO Box 3009, Memphis, TN 38173-0009 Tel: (901) 526-5016	09640		
66.	NPVLA	National Paint & Coatings Association, 1500 Rhode Island Ave. NW, Washington, DC 20005 Tel: (202) 462-6272	09960	09900	
67.	NPA	National Particleboard Association, 18928 Premiere Ct, Gaithersburg, MD 20879 Tel: (301) 670-0604	06200	06400	06100 09680

NO.		STANDARD	CSI SECTION		
68.	<i>NRMCA</i>	National Ready Mixed Concrete Association, 900 Spring St, Silver Springs, MD 20910 Tel: (301) 587-1400			
69.	<i>NSF</i>	N S F International, NSF Building, 201 N Maple, Ste. 208, Purcellville, VA 20132 Tel: (540) 751-0935			
77.	<i>PS</i>	Products Standards Section, U.S. Dept. of Commerce, 14th and Constitution Ave. NW, Washington, DC 20230 Tel: (301) 670-0604	06200	06400	06100 09680
78.	<i>RCSHSB</i>	Cedar Shake and Shingle Bureau. PO Box 1178, Sumas, WA 98295 (604) 820-7700	06130	06400	02530 07300
79.	<i>RIS</i>	Redwood Inspection Service, California Redwood Assn, Enfrente Dr., Ste. 209, Navato, CA 94949 Tel: (415) 352-0662		06100	06200
80.	<i>RFCI</i>	Resilient Floor Covering Institute, 401 E Jefferson St, Ste. 102, Rockville, MD 20850, Tel: (301) 340-8580		09650	09680
81.	<i>RMA</i>	Rubber Manufacturers' Association, 1400 K St. NW, #900, Washington, DC 20005 Tel: (202) 682-4800		09650	
82.	<i>SMACNA</i>	Sheetmetal & Air Conditioning Contractors' - National Association, 4201 Lafayette Center Dr, Chantilly, VA 20151 Tel: (703) 803-2980	07600	05700 08600	07400 15800

NO.		STANDARD	CSI SECTION		
83.	<i>SPR</i>	Simplified Practice Recommendation, U.S. Dept. of Commerce, 14th & Constitution Ave NW, Washington, DC 20230	06100	06200	03100 10100
84.	<i>SPI</i>	Society of the Plastics Industry, Inc, 1667 K St, Ste. 1000, Washington, DC 20006, Tel: (206)974-5200	06200	06500	06600
85.	<i>SPA</i>	Southern Forest Products Association, PO Box 641700, Kenner, LA 70064 Tel: (504) 443-4464	06170	06100 06200	06130 06400
86.	<i>SDI</i>	Steel Deck Institute, PO Box 25, Fox River Grove, IL 60021, Tel: (847) 458-4647		05300	
87.	<i>SDI</i>	Steel Door Institute, 30200 Detroit Rd, Cleveland, OH 44145 Tel: (440) 899-0010		08100	
88.	<i>SJI</i>	Steel Joist Institute, 3217 Mr. Joe White Ave, Myrtle Beach, SC 29577 Tel: (843) 626-1995		05200	
89.	<i>SSPC</i>	Steel Structures Painting Council 4024 th St, Ste. 600, Pittsburgh, PA 15213 Tel: (412) 281-2310	05200	02400 02450 05500 08100	05100 05700 08900
90.	<i>SWI</i>	Steel Window Institute, 1300 Summer Ave, Cleveland, OH 44115 Tel: (216) 241-7333		08500	08900

NO.		STANDARD	CSI SECTION		
91.	TCA	Tile Council of America Research Center, 100 Clemson Research Blvd. Anderson, SC 29625 Tel: (864) 646-8453		09300	
92.	TPI	Truss Plate Institute, 218 N Lee St, Ste. 312, Alexandria, VA 22314 Tel: (703) 683-1010		06170	
93.	UL	Underwriters' Laboratories, 333 Pfingsten Rd, Northbrook, IL 60062 Tel: (847) 272-8800			
94.	WCLIB	West Coast Lumber Inspection Bureau, PO Box 23145, Portland, OR 97281 Tel: (503) 639-0651 Fax: (503) 684-8928		03100	
95.	WRCLA	Western Red Cedar Lumber 1501-700 W Pender St, Vancouver, BC, CANADA V6C 1G8 Tel: (604) 684-0266		06100	06200
96.	WWPA	Western Wood Products Assn, 1500 Yeon Blvd, Portland, OR 97204 Tel: (503) 224-3930 Fax: (800) 825-0100	06100	06130 06200	06400
97.	WFI	Wood Flooring Institute, 1800 Pickwick Ave, Glenview, IL 60025			09640
98.	WIC	Woodwork Institute of California, PO Box 980247 West Sacramento, CA 95718, Tel: (916) 372-9943	06200 08300	06400 08600	08200 12300

Part 3:

Checklist for Field Inspection

The Checklist for Field Inspection has been developed to list items that a full-time construction inspector might reasonably be expected to check and observe during the construction phase of a project.

This checklist compiles a list of items pertaining to various divisions and sections of the work from known data sources and from practical comments made by members of the construction industry. The organization of certain activities into particular categories is solely for the purpose of agreeing with the Construction Specifications Institute format and is not intended to imply that certain activities are required to be performed by any particular trade or craft. Further, it is impossible to provide a fully comprehensive checklist covering every facet of construction. Certain materials listed in the “Bibliography” (Appendix A) and other publications provide a much more detailed inspection procedure for particular phases of the work. Many items will seem to be redundant to the contract documents; however, they are listed to serve as reminders.

It should not be construed that this part of the manual in any manner implies any legal or contractual obligation or responsibility on the part of any party or person. It is to be used only as a guide or aid by the inspector. The contract documents and various legal agreements govern the execution of the work. Many of the items listed herein could be construed to be duties or responsibilities of other parties; however, the whole purpose and intent of this checklist is to discover and avoid misunderstanding as early as possible in the best interests of the work and for the benefit of all parties involved.

“As required” may imply that the items is “as specified,” “as approved” or “as indicated,” required by code or customary in normal good practice of the industry.

Part 3.1:

Checklist Introduction

HOW TO USE THE CHECKLIST

A good way to use the checklist is as follows:

Read the specifications and review the drawings with the checklist at hand. Determine which items are applicable and make a note of other items relative to the project.

A list of standards that may be applicable is provided at the top of the first page in each section of the Technical Items Checklists. If the inspector is not familiar with the standards indicated, they should be reviewed since they may modify or affect the materials, installation or performance of the work. (See also Part 2 “Standards and Codes.”)

Give attention to substitutions, shop drawings or samples that have been approved, since they may affect the work.

Review codes referred to in the contract documents and note relevant items.

Because it is important for the inspector to be fully familiar with the specifications at all times, it is recommended that the applicable specification sections should be re-read at the start of each new phase of the work. Many inspectors recommend, as a good practice, meeting with the superintendent and subcontractor foreman at the start of each phase.

HOW TO READ THE MATRIX

A matrix indicating which construction entities should make the primary and secondary inspections for each line item activity has been placed on each page of the Field Inspection Checklist. The design professional, contractor, subcontractor, owner or special consultant can quickly scan the columns to find the activities relating to their type of business.

The first four columns represent four main inspection groups: Special Inspections (SI), Architectural Inspections (AI), Engineering Inspections (EI) and Other Inspections (OI). The last column contains the line number of the activity.

Within the main groups, there are secondary inspections subgroups indicated by the following designations:

- Special Inspections **SI**
 - Testing Laboratory **[T]** [t]
 - Hazardous Materials **[H]** [h]
 - Safety **[Y]** [y]
- Architectural Inspections **AI**
 - Architect **[A]** [a]
 - Landscape Architect **[LA]** [la]
 - Interior Designer **[ID]** [id]
- Engineering Inspections **EI**
 - Civil **[V]** [v]
 - Structural **[S]** [s]
 - Mechanical **[M]** [m]
 - Electrical **[E]** [e]
- Other Inspections **OI**
 - Owner **[O]** [o]
 - Contractor **[C]** [c]
 - Subcontractor **[B]** [b]
 - Legal **[L]** [l]
 - Government **[G]** [g]
 - Fire Protection **[F]** [f]
 - Plumbing **[P]** [p]
 - Acoustical **[AC]** [ac]
 - Roofing **[R]** [r]

An **UPPERCASE BOLD LETTER** indicates the primary responsibility or inspection. A lowercase letter indicates a secondary inspection. Note that there can be several inspections listed for one activity. Use the footer on each page as a convenient guide to the matrix.

If the activity can be applicable to all subgroups of a main group, **[X]** or **[x]** is used.

Part 3.2:

Field Inspection Checklist

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BIDDING AND CONTRACTING REQUIREMENTS

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		BIDDING AND CONTRACTING	<u>NOTES</u>
[]	[X]	[]	[L] [O]	1.	Verify that the agreement between contractor and owner establishes form of Contract, i.e., stipulated sum, cost plus fee, construction management or other.	
[]	[X]	[]	[]	2.	Verify that the required list of unit prices and allowances as shown in bid form has been submitted.	
[X]	[X]	[X]	[X]	3.	Read the general conditions as applied to contract and the supplementary conditions or special conditions as applied to specific project.	
[]	[X]	[]	[1] [O]	4.	Verify that bonds and certificates are properly filed for faithful performance, labor and materials payment, maintenance, insurance.	
[]	[X]	[]	[]	5.	Verify that addenda and other modifications to the contract are included.	
[]	[X]	[]	[1] [O]	6.	Verify that the date of start of construction is established by notice to proceed or other instrument in writing.	
[]	[X]	[]	[1] [O]	7.	Verify the time period for construction in writing.	
[]	[X]	[]	[C]	8.	Ensure the contract documents are identified and available onsite.	
[]	[x]	[]	[C]	9.	Ensure regulatory agencies are notified, if necessary.	
[]	[x]	[]	[C]	10.	Verify permits are obtained and provided on site, as required.	

Legend: Upper Case Letter and BOLD = Primary Inspection; Lower Case = Secondary Inspection

Main Groups SI: Special Inspections, AI: Architectural Inspections, EI: Engineering Inspections, OI: Other Inspections

Sub-Groups SI: [T] Testing Laboratory, [H] Hazardous Materials, [Y] Safety AI: No Sub-Groups

EI: [V] Civil, [S] Structural, [M] Mechanical, [E] Electrical OI: [O] Owner, [C] Contractor, [B] Subcontractor, [L] Legal, [G] Government, [F] Fire Protection, [P] Plumbing, [A] Acoustical

DIVISION 1 — GENERAL REQUIREMENTS - SUMMARY 01100

It is recommended that a pre-construction meeting be held to ensure that, at a minimum, the information required under this checklist is available, coordinated and clearly understood by all construction process participants.

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		GENERAL REQUIREMENTS	<u>NOTES</u>
[]	[X]	[]	[C]	1.	Ensure that the scope of work performed under each prime contract is properly distinguished.	
[]	[x]	[]	[C]	2.	Confirm requirements for access to the construction site.	
[]	[x]	[]	[O] [C]	3.	Ensure that procedures for accounting for owner requested allowances are established.	
[]	[X]	[]	[O]	4.	Ensure that submission and acceptance procedures for owner requested alternates are established.	
[]	[X]	[]	[]	5.	Ensure that procedures for making changes in the contract documents are established.	
[]	[X]	[]	[]	6.	Ensure that procedures for measuring unit price quantities are established.	
[]	[X]	[]	[]	7.	Ensure that procedures for submitting application for payment are established.	
[]	[X]	[]	[]	8.	Ensure that requirements for breakdown of line item amounts in the schedule of values are established.	

Legend: Upper Case Letter and BOLD = Primary Inspection; Lower Case = Secondary Inspection

Main Groups **SI:** Special Inspections, **AI:** Architectural Inspections, **EI:** Engineering Inspections, **OI:** Other Inspections

Sub-Groups **SI:** [T] Testing Laboratory, [H] Hazardous Materials, [Y] Safety **AI:** No Sub-Groups

EI: [V] Civil, [S] Structural, [M] Mechanical, [E] Electrical **OI:** [O] Owner, [C] Contractor, [B] Subcontractor, [L] Legal, [G] Government, [F] Fire Protection, [P] Plumbing, [A] Acoustical

**DIVISION 1 — GENERAL REQUIREMENTS
ADMINISTRATIVE REQUIREMENTS 01300**

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		ADMINISTRATIVE REQUIREMENTS	<u>NOTES</u>
[]	[x]	[]	[C]	1.	Obtain a complete directory of names, addresses, phone and fax numbers, e-mail addresses, etc. of all entities involved in the work. Obtain emergency telephone numbers for owner and contractor.	
[]	[X]	[]	[C]	2.	Ensure that site is secure. Confirm that required fencing, locks and security guards are in place.	
[]	[X]	[]	[C]	3.	Ensure that current construction progress schedule is available, which indicates the anticipated times for starting and completing the various elements of the work. Include submittal approval period within schedule.	
[X]	[X]	[]	[C]	4.	Ensure that all samples which require testing are submitted in sufficient time so as not to impede the construction schedule.	
[]	[X]	[]	[C]	5.	Ensure that approved submittals, samples and color schedules are available on-site.	
[]	[X]	[]	[C]	6.	Ensure that there is a clear delineation of responsibility for coordinating the work.	
[]	[X]	[]	[C]	7.	Confirm requirements for project meetings.	
[X]	[X]	[]	[C]	8.	Confirm requirements for project site administration. Ensure that a complete set of contract documents is at the job-site and is available to the inspector.	
[]	[x]	[]	[C]	9.	Ensure that all materials are delivered in time to suit the construction sequence.	
[]	[]	[]	[C]	10.	Verify that all product accessories and parts are on-site before installation is begun on that specific portion of the work.	
[]	[]	[]	[C]	11.	Ensure that adequate equipment, tools, and workers are available for proper and timely execution of the work.	

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Main Groups SI: Special Inspections, **AI:** Architectural Inspections, **EI:** Engineering Inspections, **OI:** Other Inspections

Sub-Groups SI: [T] Testing Laboratory, [H] Hazardous Materials, [Y] Safety **AI:** No Sub-Groups

EI: [V] Civil, [S] Structural, [M] Mechanical, [E] Electrical **OI:** [O] Owner, [C] Contractor, [B] Subcontractor, [L] Legal, [G] Government, [F] Fire Protection, [P] Plumbing, [A] Acoustical

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		ADMINISTRATIVE REQUIREMENTS (CON'T)	<u>NOTES</u>
[]	[X]	[]	[C]	12.	Confirm requirements for construction progress documentation.	
[]	[X]	[]	[C]		a. Photographs.	
[]	[X]	[]	[C]		b. Progress reports.	
[]	[X]	[]	[C]		c. Record documents.	
[]	[X]	[]	[C]	13.	Review distinction between substitutions and submittals. Confirm submittal procedures.	
[X]	[X]	[]	[C]	14.	Ensure that all applicable codes and referenced standards are readily available.	

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Sub-Groups SI: [T] Testing Laboratory, [H] Hazardous Materials, [Y] Safety AI: No Sub-Groups

EI: [V] Civil, [S] Structural, [M] Mechanical, [E] Electrical OI: [O] Owner, [C] Contractor, [B] Subcontractor, [L] Legal, [G] Government, [F] Fire Protection, [P] Plumbing, [A] Acoustical

**DIVISION 1 — GENERAL REQUIREMENTS
QUALITY REQUIREMENTS 01400**

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		QUALITY REQUIREMENTS	<u>NOTES</u>
[]	[X]	[]	[C]	1.	Confirm requirements of regulatory agencies. Verify that permits and approvals have been obtained from all jurisdictional agencies. Verify that approvals are readily available at jobsite for inspection.	
[X]	[X]	[]	[C]	2.	Confirm that regulatory agency inspections have been performed. Accompany agency inspector.	
[]	[]	[]	[C]	3.	Ensure that applicable hazardous material regulations, requirements, and restrictions are being observed.	
[]	[X]	[]	[C]	4.	Ensure that applicable accessibility regulations and requirements are being observed.	
[X]	[X]	[]	[C]	5.	Testing agency	
[X]	[X]	[]	[C]		a. Establish requirements of testing agency.	
[X]	[X]	[]	[C]		b. Review qualifications for testing agency.	
[X]	[X]	[]	[C]		c. Select testing agency.	
[X]	[X]	[]	[C]		d. Review testing laboratory required services.	
[X]	[x]	[]	[C]	6.	Observe field tests; record locations and conditions under which tests are performed.	
[X]	[]	[]	[C]	7.	Verify that proper test equipment is on-site.	

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Sub-Groups SI: [T] Testing Laboratory, [H] Hazardous Materials, [Y] Safety **AI:** No Sub-Groups

EI: [V] Civil, [S] Structural, [M] Mechanical, [E] Electrical **OI:** [O] Owner, [C] Contractor, [B] Subcontractor, [L] Legal, [G] Government, [F] Fire Protection, [P] Plumbing, [A] Acoustical

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		QUALITY REQUIREMENTS (CON'T)	<u>NOTES</u>
[X]	[]	[]	[C]	8.	Record who has taken a particular sample. Verify how samples are taken as well as storage requirements for samples.	
[X]	[x]	[]	[C]	9.	Collect, review, and file copies of all tests, certificates, reports, delivery tags, etc. issued by onsite and offsite entities, agencies and other inspectors.	
[]	[]	[]	[C]	10.	Review requirements for manufacturer field services.	
[X]	[X]	[X]	[C]	11.	Ensure that work is inspected in a timely manner so that deficiencies in materials or methods can be discovered at the earliest possible moment.	
[X]	[X]	[X]	[C]		a. Review requirements for field tests and reports	
[X]	[X]	[X]	[C]		b. Review requirements for plant inspections and reports	
[X]	[X]	[X]	[C]	12.	When required by either code or contract documents, notify the architect or design group leader before portions of the work requiring their inspection are covered.	

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Main Groups SI: Special Inspections, **AI:** Architectural Inspections, **EI:** Engineering Inspections, **OI:** Other Inspections

Sub-Groups SI: [T] Testing Laboratory, [H] Hazardous Materials, [Y] Safety **AI:** No Sub-Groups

EI: [V] Civil, [S] Structural, [M] Mechanical, [E] Electrical **OI:** [O] Owner, [C] Contractor, [B] Subcontractor, [L] Legal, [G] Government, [F] Fire Protection, [P] Plumbing, [A] Acoustical

**DIVISION 1 — GENERAL REQUIREMENTS -
TEMPORARY FACILITIES AND CONTROLS 01500**

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		FACILITIES AND CONTROLS	<u>NOTES</u>
[]	[X]	[]	[C]	1.	Confirm source and connection requirements for utilities used in the construction.	
[x]	[x]	[]	[C]	2.	Verify location and suitability of construction facilities, temporary construction, construction aids, and temporary controls.	
[x]	[x]	[]	[C]		a. Ensure that inspector and contractor have adequate field offices.	
[x]	[]	[]	[C]		b. Ensure adequacy of sanitation facilities.	
[x]	[]	[]	[C]		c. Verify and coordinate location of temporary ramps, overpasses, barriers, enclosures, etc.	
[]	[]	[]	[C]		d. Verify and coordinate location of special construction elevators, hoists and cranes.	
[]	[x]	[]	[C]		e. Verify and coordinate location of vehicular access and parking.	
[]	[x]	[V]	[C]		f. Ensure existence of a plan for erosion and sediment control.	
[]	[X]	[]	[C]		g. Ensure identification signage is provided and located as required by the contract documents and jurisdictional authorities.	
[X]	[]	[]	[C]		h. Ensure that a job safety program is developed and maintained.	

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DIVISION 1 — GENERAL REQUIREMENTS - PRODUCT REQUIREMENTS 01600

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		PRODUCT REQUIREMENTS	<u>NOTES</u>
[]	[X]	[]	[C]	1.	Determine procedures for submission of proposed substitute products or methods of installation.	
[]	[X]	[]	[C]	2.	Determine requirements for installation of products furnished by the owner.	
[]	[x]	[]	[C]	3.	Verify that basic procedures are established for delivery and acceptance of products.	
[X]	[x]	[x]	[C]		a. Ensure that all materials delivered to the site are inspected for damage.	
[X]	[x]	[x]	[C]		b. Verify that materials containers are sealed and are identified by tags, markings and stamps and are of type, size, material, gauge, weight, grade, treatment, finish, pattern and color as required by the contract documents and approved submittals.	
[X]	[X]	[X]	[C]		c. Verify that products are new, unless otherwise permitted by the contract documents.	
[x]	[X]	[X]	[C]		d. Obtain certificates that are required by the contract documents at time of delivery.	
[x]	[x]	[]	[C]	4.	Verify that basic procedures are established for storage and handling of products on-site.	

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DIVISION 1 — GENERAL REQUIREMENTS - EXECUTION REQUIREMENTS 01700

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		EXECUTION REQUIREMENTS	<u>NOTES</u>
[]	[]	[]	[C]	1.	Verify that adjacent connection points are in place.	
[B]	[x]	[]	[B] [C]	2.	Ensure that surfaces over which materials are to be installed are suitable for such installation.	
[]	[x]	[]	[B] [C]	3.	Ensure that climatic and temperature conditions are as required for installation of the work.	
[]	[]	[]	[B] [C]	4.	Ensure that protection of adjacent surfaces is in place before commencing portions of the work. Ensure that protective procedures remain in place during the course of construction.	
[]	[]	[]	[B] [C]	5.	Ensure that adequate lighting and other working conditions are provided to facilitate good workmanship and worker safety.	
[]	[X]	[]	[C] [O]	6.	Determine requirements for salvaging existing improvements.	
					a. Determine requirements for removal of salvaged materials.	
					b. Determine requirements for storage of salvaged materials.	
					c. Determine requirements for re-installation of salvaged materials.	
[]	[x]	[v]	[C]	7.	Verify requirements for layout of the construction and requirements for field engineering.	
[X]	[X]	[V]	[C]	8.	Ensure that survey information is available and accurate. Verify that there are sufficient bench-marks, monuments, and stakes to identify key points.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		EXECUTION REQUIREMENTS (CON'T)	<u>NOTES</u>
[X]	[X]	[V]	[O] [C]	9.	Obtain a geotechnical investigation including sub-surface ground moisture, bearing capacity of the soils, geologic features, chemical composition and other data pertaining to the sub-surface conditions.	
[]	[x]	[]	[C]	10.	Verify basic requirements for cutting and patching of the work.	
[]	[X]	[]	[C]	11.	Verify basic requirements for progress cleaning and final cleaning.	
[]	[X]	[]	[C]	12.	Verify basic requirements for progress cleaning and final cleaning.	
[]	[X]	[]	[C]	13.	Verify that contract close-out procedures are established and general requirements for close-out submittals are followed.	
					a. Verify punchlisting procedures	
					b. Verify that maintenance binders, warranties, and guarantees are bound and presented in accordance with contract requirements.	

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DIVISION 1 — GENERAL REQUIREMENTS - CLOSEOUT PROCEDURES 01770

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		CLOSEOUT PROCEDURES	<u>NOTES</u>
[X]	[X]	[X]	[C]	1.	After written notification of readiness is provided by the contractor and the construction inspector is satisfied that work is complete, the date of substantial completion is established. Architect inspection is made with contractor's and owner's representative present and forms are processed as required.	
[x]	[X]	[X]	[C]	2.	Inspection list (punch list) of items deficient or still required is made first by the contractor and then amended by the architect at substantial completion. This includes lists furnished to the contractor by the architect's consultants and should be promptly distributed to all parties.	
[]	[X]	[]	[C]	3.	Again review drawings, specifications, addenda, change orders, etc. for work to be done. Note further work.	
[]	[X]	[]	[C] [O]	4.	If owner has occupied portions of work before substantial completion (beneficial occupancy), note all items not the responsibility of contractor.	
[x]	[X]	[]	[C] [O]	5.	If required, and through legal advisement, record date and information concerning processing and recording of notice of completion and other notice of lien documents, or lien waiver as advised.	
[]	[x]	[X]	[C]	6.	Verify coordination for final utility and service connections, meters, etc. has been made.	
[X]	[]	[M]	[C]	7.	Verify sterilization of plumbing systems has been performed, if required.	
[]	[X]	[]	[C] [O]	8.	Verify final agency inspections have been arranged and permission to occupy work is obtained, as required.	
[]	[X]	[]	[C] [O]	9.	Verify owner-furnished equipment and furnishings is coordinated and placed, as required.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		CLOSEOUT PROCEDURES (CON'T)	<u>NOTES</u>
[X]	[x]	[M]	[C]	10.	Verify operational tests of systems and equipment have been performed as required.	
[X]	[x]	[M]	[C]	11.	Verify systems adjustments such as balancing, equipment operations, etc. have been performed. Ensure reports have been submitted.	
[X]	[X]	[X]	[C] [O]	12.	Verify owner's personnel are instructed in system and equipment operations as required.	
[X]	[X]	[]	[C]	13.	Verify schedule for corrections, deficiencies and items to be supplied is established by contractor. Assist contractor and trades as to location of specific defects, if necessary.	
[x]	[x]	[]	[C]	14.	Verify removal of contractor's temporary work; verify cleanup and debris removal are performed.	
[X]	[X]	[X]	[C]	15.	Verify record drawings (as-built) requirements are performed.	
[]	[X]	[]	[C]	16.	Verify final change orders are processed.	
[]	[X]	[X]	[C] [O]	17.	Verify guarantee/warranty one year correction period requirements are met. Determine and provide list of extended warranties.	
[]	[X]	[]	[C] [O]	18.	Verify instruction, manuals, guides and charts are transmitted to owner.	
[]	[X]	[]	[O]	19.	Verify insurance coverage is transferred, as required.	
[X]	[X]	[]	[C] [O]	20.	Ensure that air quality requirements are met.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		CLOSEOUT PROCEDURES (CON'T)	<u>NOTES</u>
[X]	[X]	[]	[C] [O]	21.	Verify permanent keying, keys and keying instructions have been performed and owner-coordinated maintenance is scheduled.	
[]	[X]	[]	[C] [O]	22.	Verify extra materials, specified overage and spares are delivered to owner.	
[X]	[X]	[]	[C] [O]	23.	Verify final inspection date is established, final inspection is made and owner's acceptance is made.	
[]	[X]	[]	[C] [O]	24.	Verify final payment forms are being processed.	
[X]	[X]	[]	[O]	25.	Verify all records, reports, files and documents of construction inspector are in order and turned over to owner as arranged.	
[]	[X]	[X]	[C] [o]	26.	Verify post-contract maintenance conditions such as equipment and landscaping, are arranged and owner is notified of the arrangement.	

**DIVISION 1 — GENERAL REQUIREMENTS -
FACILITY OPERATION 01800**

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		FACILITY OPERATION	<u>NOTES</u>
[X]	[X]	[X]	[C]	1.	Verify start-up procedures for equipment.	

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DIVISION 2 — SITEWORK - EARTHWORK 02300

STANDARDS: AASHTO (4) APWA (18) ASTM (19) CSS (31)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		SITEWORK EARTHWORK	<u>NOTES</u>
[x]	[]	[V]	[C]	1.	Verify soil information report is on job and reviewed. Note elevation of water table.	
[x]	[]	[V]	[B] [C]	2.	Review job survey monuments and stakes. Verify limits of work are established.	
[x]	[x]	[V]	[C]	3.	Observe removal of existing buildings and foundations.	
[x]	[]	[V]	[C]	4.	Note condition of or photograph offsite and onsite improvements to remain, such as paving curbs, gutters and walks, before work begins.	
[]	[]	[V]	[C]	5.	Verify existing vegetation to remain is protected.	
[x]	[]	[V]	[B] [C]	6.	Verify existing utility lines to remain are located, staked and protected. Observe conditions of uncovered lines. Verify utility companies have been notified. Verify lines to be removed or abandoned are properly capped. If unknown lines are encountered, notify appropriate parties.	
[]	[x]	[V]	[C]	7.	Verify adjacent property is protected. Verify whether adjacent property owner is notified as required by work or code.	
[x]	[]	[V]	[B] [C]	8.	Verify shoring and underpinning is provided, if required.	
[]	[]	[V]	[B] [C]	9.	Verify extent of grubbing and removal of stumps and matted roots is performed and depressions are properly filled and compacted.	
[Y]	[]	[V]	[C]	10.	Ensure spillage of materials or soil on streets and sidewalks is promptly removed for public safety. Verify hazardous material handling regulations are followed.	
[]	[]	[V]	[B] [C]	11.	Ensure spillage of gas, oil and slurry is prevented in areas to be planted or near existing vegetation to be retained.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		SITWORK EARTHWORK (CON'T)	<u>NOTES</u>
[Y]	[x]	[V]	[C]	12.	Verify contractor provides public safety methods such as protective covers, fences, barricades, lighting, warning devices and signs, as required.	
[x]	[]	[V]	[C]	13.	Verify dust control is provided, as required.	
[x]	[]	[V]	[B] [C]	14.	Verify deleterious material is removed from site and/or otherwise properly disposed of.	
[]	[]	[V]	[C]	15.	Verify stripping of site, preservation and depth of removal of topsoil and location of stockpile are performed and established.	
[x]	[]	[V]	[B]	16.	Observe that topsoil is not contaminated with subsoil and is free from roots, stones and other deleterious materials.	
[]	[]	[V]	[B] [C]	17.	Check that satisfactory materials are used and unsuitable materials are disposed of properly and legally in waste areas. Do not allow contamination.	
[]	[]	[V]	[C]	18.	Observe removal of material and note unusual conditions. Observe subsoil conditions for irregularities such as soft spots, springs and previous debris.	
[]	[]	[V]	[C]	19.	Verify excavation is performed in scheduled sequence, if required.	
[]	[]	[V]	[C]	20.	Verify excavating does not cause unusual rutting and appears adequate for work to be performed.	
[x]	[]	[V]	[B] [C]	21.	Observe that over-excavation does not occur.	
[]	[]	[V]	[C]	22.	Verify drainage is provided continuously as excavation progresses, other dewatering methods such as well points are provided, drainage ditches are maintained and ponding does not occur.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		SITEWORK EARTHWORK (CON'T)	<u>NOTES</u>
[T]	[x]	[V]	[B] [C]	23.	Verify testing, inspection and compaction are performed during excavation and filling.	
[]	[]	[V]	[C]	24.	Verify that borrow excavation procedures and materials are adequate.	
[]	[]	[V]	[B] [C]	25.	Verify source and type of imported materials are as approved. Verify samples are tested and approved.	
[x]	[]	[V]	[B] [C]	26.	Verify compaction is performed in lifts, as required.	
[x]	[x]	[V]	[B] [C]	27.	Verify building layout is properly established, setbacks are observed and batterboards and elevations are established. See that compacted material extends beyond foundation line, as required.	
[Y]	[]	[V]	[B] [C]	28.	Inspect foundation excavating for adequacy, bracing, form clearances, and type of soil.	
[x]	[]	[V]	[B] [C]	29.	See that corrective measures are performed where over-excavation occurs.	
[x]	[]	[V]	[C]	30.	Observe methods of dewatering foundation excavations and see that footing beds are not disturbed or softened. Verify methods for surface drainage are provided.	
[]	[]	[V]	[B] [C]	31.	Verify footing drains are installed in manner specified.	
[X]	[]	[V]	[B] [C]	32.	Verify backfill materials are from approved source. Verify they are installed in specified layers and adequate compaction equipment is used. Verify relative density of backfill is checked. Verify walls are properly cured before backfilling.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		SITWORK EARTHWORK (CON'T)	<u>NOTES</u>
[X]	[]	[V]	[B] [C]	32.	Verify backfill materials are from approved source. Verify they are installed in specified layers and adequate compaction equipment is used. Verify relative density of backfill is checked. Verify walls are properly cured before backfilling.	
[]	[]	[V]	[C]	33.	Verify waterproof membranes are protected against damage during backfilling operations.	
[]	[]	[V]	[C]	34.	Observe fine grading, deposits of top soil in scheduled areas, proper drainage conditions and job cleanup.	
[]	[]	[V]	[B] [C]	35.	Verify soil poisoning, if required, uses approved method and materials.	
[X]	[]	[V]	[B] [C]	36.	Ensure preservation of monuments and markers is observed. Verify construction survey grading stakes are in place prior to grading and are protected or replaced to ensure proper site grading elevations are achieved.	
[X]	[x]	[V]	[C]	37.	Verify record survey of site is performed, if required.	
[H] [Y] [T]	[]	[V]	[B] [C]	38.	Have soils suspected to be contaminated with hazardous materials tested. Verify that suspect soils have been revised on site until soils tests confirm compliance with legal standards.	
[]	[]	[V]	[B] [C]	39.	Have soils engineering representative on-site as needed to certify compaction and method of soil work.	
[X]	[]	[V]	[B] [C]	40.	If archeological remains are encountered, stop that portion of work until qualified people can analyze remains.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		SITework EARTHWORK (CON'T)	<u>NOTES</u>
[]	[]	[V]	[B] [C]	41.	Review erosion control plan and ensure that appropriate measures are undertaken during the wet season. Make sure erosion control devices are replaced at the end of each day's work.	
[x]	[]	[V]	[C]	42.	Check to see if contractor has notified Dig Safe, Underground Service Alert, or other appropriate agency or authority governing excavation near existing underground utilities and has obtained any required permits. These agencies alert all utilities who have underground services in the area at least 48 hours before any excavation work is commenced at a particular site so that such utilities may mark their services and post appropriate surface warning signs. In most states, such notification and/or obtaining a permit is mandatory by law at least 48 hours before work commences.	
[]	[]	[V]	[C]	43.	Check to see if a National Pollution Discharge Efficiency System (NPDES) Notice of Intention plan has been filed, if required, and is being complied with.	
[]	[]	[V]	[C]	44.	Verify import or export haul routes have been approved by local agencies, if required.	

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DIVISION 2 — FOUNDATION AND LOAD - BEARING ELEMENTS 02450

STANDARDS: ACI (5) AISC (10) ANSI (16) ASTM (19) AWPA (25)
AWS (23) SSPC (89)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		FOUND. AND LOAD-BEARING	<u>NOTES</u>
[x]	[]	[V]	[B] [C]	1.	Check whether test piles are required.	
[x]	[]	[V]	[B] [C]	2.	Verify known underground utilities are protected.	
[]	[]	[V]	[B] [C]	3.	Note conditions of nearby structures. Record and report to architect if cracks and other deficiencies are evident.	
[x]	[]	[V] [s]	[C]	4.	Verify that the parameters for “refusal” of this work are understood by the contractor.	
[]	[]	[V]	[C]	5.	If predrilling is proposed, verify that approval has been granted.	
[]	[]	[V]	[B] [C]	6.	Check whether jetting is allowed.	
[x]	[]	[V]	[B] [C]	7.	For precast concrete piling, verify length, dimensions, delivered condition, mix utilized test run, type, and time of curing. Note inspector’s marks if plant inspected.	
[x]	[]	[V]	[B] [C]	8.	For wood piling, verify species, treatment, length, circumference, diameter at tip and 3 feet from butt, straightness, presence and severity of shalies, banding, and tip protection.	
[x]	[]	[V]	[B] [C]	9.	For steel piling, verify dimensions of “H” or pipe piling; test reports as required. Verify thickness of pile and condition of interlock for steel sheet piling.	
[x]	[]	[V]	[B] [C]	10.	For steel shell piling, verify gauge, diameter, and length of sections to be driven and filled with concrete. Check fit of driving mandrel.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		FOUND. AND LOAD-BEARING (CON'T)	<u>NOTES</u>
[]	[]	[V]	[C]	11.	Mark piles as necessary to observe compliance with requirements.	
[]	[]	[V]	[C]	12.	Verify waterproofing at joints is provided if required on shells.	
[]	[]	[V]	[C]	13.	Verify concrete delivery method is approved — tremie, pump, and limited free fall.	
[]	[]	[V]	[B] [C]	14.	Verify proper driving block or shoe is used to avoid end damage.	
[x]	[]	[V]	[B] [C]	15.	Record:	
					a. Make and method of hammer energy source	
					b. Weight of striking parts*	
					c. Height of fall of striking parts*	
					d. Weight of pile	
					e. Blows per unit of penetration	
					f. Abnormal difference in sound of driving	
					* For double-acting pile driver, record energy per blow in ft. per lb. from manufacturer's data sheet. Check required steam or water pressure for rated energy during driving. Check height of fall for diesel hammers.	
[]	[]	[V]	[B]	16.	Verify plumbness before driving.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		FOUND. AND LOAD-BEARING (CON'T)	<u>NOTES</u>
[x]	[]	[V]	[B] [C]	17.	Verify as-driven location is within tolerances required.	
[]	[]	[V]	[B]	18.	Report excessive vibration during driving.	
[x]	[]	[V]	[B] [C]	19.	Visually check steel shells in place for plumbness, straightness and damage from driving and look for water in pipe and metal shells to be filled with concrete.	
[x]	[]	[V]	[C]	20.	Observe condition of tops of precast and wood piles after all driving.	
[x]	[]	[V]	[B]	21.	Observe heaving; check as required.	
[x]	[]	[V]	[B] [C]	22.	For rebar cages, verify size, spacing, steel grade, clearances and dowel and tendon extensions.	
[x]	[]	[V]	[B] [C]	23.	Verify agency inspections were made, if required.	
[]	[]	[V]	[C]	24.	Check driving equipment to ensure it meets or is capable of meeting specifications for driving.	

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DIVISION 2 — SITEWORK —

CAISSONS 02475

STANDARDS: ACI (5) AISC (10) ASTM (19)

SI	AI	EI	OI		CAISSONS	NOTES
[x]	[]	[V]	[B] [C]	1.	Verify drilling apparatus for diameter and bucket and reamer if belled bottoms are required.	
[]	[]	[V]	[B] [C]	2.	Verify material removed correlates with soil report.	
[Y]	[]	[V]	[B] [C]	3.	Observe stability of material and caving.	
[]	[]	[V]	[B] [C]	4.	Verify sufficient quantity of casing available at site.	
[]	[]	[V]	[B] [C]	5.	If water is encountered, record depths.	
[x]	[]	[V]	[B] [C]	6.	For rebar cages, verify size, length and grade of verticals and size and spacing of ties.	
[]	[]	[V]	[C]	7.	Verify concrete delivery method is approved — tremie, pump and limited free fall.	
[x]	[]	[V]	[B] [C]	8.	Verify holes are dry. If wet, check that an approved method of handling water is used — pump, bail, dry mix and tremie.	
[x]	[]	[V]	[B] [C]	9.	Check bottom of hole for cleanliness; use light or downhole inspection if necessary.	
[x]	[]	[V]	[B] [C]	10.	Record location, depth and diameter.	
[x]	[]	[V]	[B] [C]	11.	Observe placement of steel. Check clearances and dowel projections.	
[x]	[]	[V]	[B] [C]	12.	Observe placement of concrete. Check coordination of casing withdrawal, where required, and placement of concrete. Casing should remain below surface of concrete at all times.	
[]	[]	[Y]	[B] [C]	13.	Check for straightness and plumbness.	
[x]	[]	[V]	[B] [C]	14.	Verify agency inspections are made, if required.	

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DIVISION 2 — SITEWORK — SANITARY SEWERAGE 02530

STANDARDS: ASSHTO (4) APWA (18) ASTM (19)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		SANITARY SEWERAGE	<u>NOTES</u>
[]	[]	[V]	[B] [C]	1.	Determine where all surface site drainage is directed. In general, all site drainage will be directed to underground storm drain systems which will carry it offsite. If there are areas of the site draining directly onto adjacent sites and/or if catch basins located in low points would back storm water into a structure if the catch basin becomes blocked, bring these facts to the architect's attention.	
[]	[]	[V]	[B] [C]	2.	Determine where all underground site drainage is directed, making sure that there is no reverse flow in pipes. Review plans for possible conflicts between underground storm drain pipes and other utility lines, especially other gravity flow pipes (sanitary sewer lines). If possible conflicts, expose conflict before storm drain excavation is begun and have surveyor verify that no vertical conflicts exist.	
[]	[]	[V]	[B] [C]	3.	Review standards for catch basins and manholes (or junction boxes). Require catalog cut to be submitted to architect if structures are precast.	
[x]	[]	[V]	[B] [C]	4.	Verify elevations of tops and bottoms of drainage structures and flow lines of storm drain pipes against layout survey stakes.	
[x]	[]	[V]	[B] [C]	5.	Review backfill standards for drainage structures and storm drain lines. Have soils engineer test and certify backfill methods and compaction.	
[Y]	[]	[V]	[B] [C]	6.	Know types of storm drain pipes allowed. Obtain manufacturer's recommendations on jointing methods. Review bedding against local codes and manufacturer's recommendations.	
[Y]	[]	[V]	[B] [C]	7.	Review safety shoring requirements for excavations over 5 feet in depth.	
[]	[]	[V]	[B] [C]	8.	Determine concrete mix and strength requirements. Collect delivery tags. Obtain certificate of conformance to specifications. Observe concrete slump tests and cylinders, if required.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		SANITARY SEWERAGE (CON'T)	<u>NOTES</u>
[X]	[]	[V]	[B] [C]	9.	Test site for finish drainage slopes by water testing all site areas and looking for "bird baths."	
[x]	[]	[V]	[C]	10.	Have contractor clean all catch basins and flush all storm drain lines prior to job acceptance.	
[]	[]	[V]	[B] [C]	11.	Review inside of all drainage structures for rock pockets and defects in workmanship. All forms are to be removed.	
[]	[]	[V]	[C]	12.	Ensure that any required permit is obtained by the contractor for tying in site drainage storm drain lines into the jurisdiction's main lines.	
[]	[]	[V]	[B] [C]	13.	Inspect all storm drain lines for joint integrity; ensure that lines are true for slope and horizontal alignment and that bedding is proper prior to allowing contractor to backfill storm drain lines and structures.	

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DIVISION 2 — SITEWORK — BASES, BALLASTS, PAVEMENTS AND APPURTENANCES 02700

STANDARDS: ASSHTO (4) ACI (5) AI (28) APWA (18) ASTM (19) CSS
(31) NRMCA (68) PCA (75)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		SUBGRADES & BASES	<u>NOTES</u>
[x]	[]	[V]	[B] [C]	1.	Verify subgrade is to proper elevation and cross-section.	
[x]	[]	[V]	[B] [C]	2.	Verify subgrade is dense and properly compacted.	
[]	[]	[V]	[C]	3.	Verify drains, utilities and other underground construction are in place.	
[]	[]	[V]	[B] [C]	4.	Verify trench backfilling is performed, as required.	
[x]	[]	[V]	[B] [C]	5.	Verify control testing of subgrade and subgrade materials is being performed and recorded, if required.	
[x]	[]	[V]	[B] [C]	6.	Verify subbase and base courses are of source, type, thickness, and material specified.	
[X]	[]	[V]	[B] [C]	7.	Ensure source of material is sampled and approved by testing laboratory.	
[]	[]	[V]	[B] [C]	8.	Verify materials delivered are of uniform quality.	
[]	[]	[V]	[B] [C]	9.	Verify equipment is suitable.	
[]	[]	[V]	[B] [C]	10.	Verify hauling equipment does not produce ruts in subgrade.	
[]	[]	[V]	[B] [C]	11.	Verify location of all manholes, outlets and surface features are known.	
PRIMING AND TACK COATS						
[]	[]	[V]	[B] [C]	12.	Verify soil sterilization is provided, if required.	
[h]	[]	[V]	[B] [C]	13.	Verify prime coat is provided and applied as specified. Verify whether prime coat is required by local governing authorities, e.g. Air Quality Management Board.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		PRIMING AND TACK COATS (CON'T)	<u>NOTES</u>
[]	[]	[V]	[B] [C]	14.	Verify prime coat properly seals the surface voids and provides proper binding.	
[]	[]	[V]	[B] [C]	15.	Verify prime coat is applied to surface free of water and objectionable substances.	
[]	[]	[V]	[B] [C]	16.	Verify prime coat is applied uniformly and receives proper curing time.	
[]	[]	[V]	[B] [C]	17.	Verify tack coat is applied to all conforming concrete and asphalt surfaces.	
ASPHALT PAVING						
[]	[]	[V]	[B] [C]	18.	Verify concrete against which paving is to be placed is at least 7 days old.	
[]	[]	[V]	[B]	19.	Verify truck beds are tight and smooth.	
[]	[]	[V]	[B] [C]	20.	Verify suitable covers are provided to protect mix, if required or because of climatic conditions.	
[]	[]	[V]	[B] [C]	21.	Verify spreading equipment is suitable.	
[]	[]	[V]	[B] [C]	22.	Verify size and type of roller and paving equipment is as specified.	
[]	[]	[V]	[B] [C]	23.	Verify asphalt is of proper mix and approved for work.	
[x]	[]	[V]	[B] [C]	24.	Verify plant inspection has been made, if required.	
[x]	[]	[V]	[B] [C]	25.	Verify temperature of mix when delivered is within limits required.	
[]	[]	[V]	[B] [C]	26.	Verify weather limitations are observed.	
[x]	[]	[V]	[B] [C]	27.	Verify records of placement and suspension of operations are kept.	
[x]	[]	[V]	[B] [C]	28.	Verify headers and screeds are properly installed for thickness control, as required.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		ASPHALT PAVING (CON'T)	<u>NOTES</u>
[]	[]	[V]	[B] [C]	29.	Verify materials are properly spread, raked and placed for thickness and uniformity. Raking is to be kept at a minimum.	
[]	[]	[V]	[B] [C]	30.	Verify rollers are operated within speed range and have proper backup features, drum scrapes and wetting devices. Ensure roller is backed only over compacted areas.	
[]	[]	[V]	[B] [C]	31.	Verify correction of humps and depressions to obtain smoothness and uniformity is performed before the start of compaction.	
[]	[]	[V]	[B] [C]	32.	Verify temperature after final rolling is within limits.	
[]	[]	[V]	[B] [C]	33.	Verify tie-ins to adjacent surfaces are as required.	
[]	[]	[V]	[B] [C]	34.	Verify damage to adjacent surfaces is corrected.	
[x]	[]	[V]	[B] [C]	35.	Verify drainage tests are made.	
[]	[]	[V]	[B] [C]	36.	If required, verify seal coat is properly applied and of material called for and with proper curing period before and after installation.	
[]	[]	[V]	[B] [C]	37.	Verify special topping surfaces, color coatings, and striping are applied of materials required and proper curing times are observed.	
[]	[]	[V]	[B] [C]	38.	Verify a copy of all truck delivery tags is collected as trucks enter site and is kept for reference. Verify the total weight of asphalt delivery is equal to or over the calculated weight required for the project. (If underweight, possible thin areas in the paving may exist and core thickness tests may be warranted).	

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SI	AI	EI	OI		CONCRETE PAVING	NOTES
					Refer to Sections 03100, 03200 and 03300 where applicable.	
[x]	[]	[V]	[B] [C]	39.	Verify requirements for mixes, batching plant, and mixing plant are met and approved if specified. Verify admixtures are as approved.	
[]	[]	[V]	[B] [C]	40.	Verify all paving equipment is available on job, is in good condition, and meets requirements.	
[]	[]	[V]	[B] [C]	41.	Verify base course is maintained in a firm, moist condition and is as required.	
[]	[]	[V]	[B] [C]	42.	Verify all forms, headers, outlets, boxes and equipment are in place before pouring.	
[]	[]	[V]	[B] [C]	43.	Verify all embedded items, sleeves, dowels and reinforcement are as required. Verify that reinforcement is not shifted or forced to the bottom of the pour.	
[]	[]	[V]	[B] [C]	44.	Verify joint methods and materials are provided and observed.	
[x]	[]	[V]	[B] [C]	45.	Verify grade, slope, pitch, and thickness control is provided, as required.	
[]	[]	[V]	[B] [C]	46.	Verify concrete is deposited, rodded and vibrated to suit conditions. See that reinforcement is maintained at elevation required.	
[]	[]	[V]	[B] [C]	47.	Verify time interval between pours allows for continuous working.	
[]	[]	[V]	[B] [C]	48.	Verify controls joints, construction joints and expansion joints are provided, as required.	
[]	[]	[V]	[B] [C]	49.	Verify color, if required, is of proper type, tone and amount.	
[]	[]	[V]	[B] [C]	50.	Verify finishing treatment and texture is as required.	
[]	[]	[V]	[B] [C]	51.	Verify curing provisions are as required and work is properly protected.	

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[]	[]	[V]	[B] [C]	52.	Ensure over-troweling is avoided.	
[]	[]	[V]	[B] [C]	53.	Verify jointing of old concrete to new work is properly performed.	
[]	[]	[V]	[B] [C]	54.	Ensure forms are not removed until minimum required time after placement has elapsed.	
[]	[]	[V]	[B] [C]	55.	Verify sawed joints are made at proper time and are properly aligned.	
[]	[]	[V]	[B] [C]	56.	Verify sawed joints are of proper width and depth.	
[]	[]	[V]	[B] [C]	57.	Verify joints are cleaned and cured, as required.	
[]	[]	[V]	[B] [C]	58.	Verify joints are sealed properly, as required.	
[]	[]	[V]	[B] [C]	59.	See that concrete is protected from damage during backfilling.	
[x]	[]	[V]	[B] [C]	60.	Verify tests for drainage and surface variation are made.	
[]	[]	[V]	[B] [C]	61.	Verify agency requirements are met for design regarding sidewalks, curbs, gutters and aprons.	
[]	[]	[V]	[C]	62.	Ensure that contractor protects against vandalism while concrete is still green and able to be marked. Inspect first thing next morning for marks which can then be stoned out.	
[]	[X]	[V]	[B] [C]	63.	Verify location and layout of parking for disabled persons.	
[]	[X]	[V]	[B] [C]	63.	Verify location and layout of parking for disabled persons.	
[]	[X]	[V]	[B] [C]	64.	Verify wheelchair curb-cuts, slopes of sidewalks, curb-cuts, ramps and marking of stairs for visually impaired persons.	

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DIVISION 2 — SITEWORK — IRRIGATION SYSTEM 02810

STANDARDS: AAN (3)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		IRRIGATION SYSTEM	<u>NOTES</u>
[]	[X]	[]	[B] [C]	1.	Verify layout of main service heads, valves, controllers and vacuum breakers is as required. Record field conditions, as required.	
[]	[x]	[V]	[B] [C]	2.	Verify trenching depth and backfill are as required. Refer to Section 15400, "Plumbing," for applicable items concerning installation of piping, connectors, and equipment.	
[]	[X]	[]	[B] [C]	3.	Verify pressure tests are performed.	
[]	[X]	[]	[B] [C]	4.	Verify electrical work is provided, as required. Observe work related to lighting of landscape features.	
[]	[X]	[V]	[B] [C]	5.	Verify that the controller is installed, as required. Observe installation.	
[]	[X]	[V]	[B] [C]	6.	Observe operation, adjustment, and coverage of completed irrigation system, including controller timing.	

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DIVISION 2 — SITEWORK — PLANTING 02900

STANDARDS: AAN (3)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		SITEWORK & VEGETATION	<u>NOTES</u>
[]	[X]	[]	[B] [C]	1.	Verify existing trees and other vegetation to remain are protected, as required. Verify barricades and fencing are provided, if required.	
[]	[X]	[]	[C]	2.	Verify traffic, parking, storage of materials or debris is not allowed within drip line of trees.	
[]	[X]	[]	[B] [C]	3.	Verify existing trees and other vegetation are maintained by regular feeding and watering during construction, if required.	
[]	[X]	[]	[B] [C]	4.	Verify pruning of branches is performed only by qualified persons.	
[]	[X]	[]	[B] [C]	5.	Observe excavation adjacent to existing trees. Unless otherwise required, do not allow exposure of root systems; keep equipment beyond drip line.	
[]	[X]	[]	[B] [C]	6.	Verify ponding around base of existing trees does not occur.	
[]	[X]	[]	[B] [C]	7.	Verify existing vegetation not to be saved is removed as required.	
[x]	[X]	[]	[B] [C]	8.	Verify depth of cuts and other conditions required are met for retainage and/or reuse of on-site topsoil. Observe required stockpiling and verify that topsoil is not intermixed with deleterious materials.	
[]	[x]	[V]	[B] [C]	9.	Verify subgrade is carried sufficiently below finish grade to provide depth of topsoil required. Do not allow in subgrade debris that is detrimental to landscaping.	
[]	[X]	[]	[B] [C]	10.	Verify elevations of manholes, catch basins, valves and boxes are coordinated to finished grades required on landscaping plans. Verify coordination to other drawings.	
[]	[X]	[]	[B] [C]	11.	Verify backfill against foundation walls that receive planting is clean and free of rocks, concrete and debris.	

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[]	[X]	[]	[C]	12.	Verify paints, solvents, oils, old plaster and other debris are not placed in areas to receive planting. Do not allow maintenance of construction equipment to be performed in areas to receive planting.	
[]	[X]	[]	[C]	13.	In general, ensure that all deep utility work is to be done before soil preparation and all shallow utilities such as irrigation laterals are done after soil preparation.	
FINISH GRADING						
[]	[X]	[]	[B] [C]	14.	Verify subgrade is scarified as required and prepared to receive finish grading.	
[]	[X]	[]	[B] [C]	15.	Verify stockpiled topsoil is distributed, prepared and of depths required.	
[T]	[x]	[]	[B] [C]	16.	Verify import, borrow or selected off-site soil is used, as required. Get certificates and weight tags, if required. Verify source is as required.	
[T]	[]	[]	[B] [C]	17.	Verify topsoil mixture, including amendments and preparation, is as required.	
[]	[x]	[V]	[B] [C]	18.	Verify installation of sleeves, raceways, boxes and piping required for irrigation, drainage and electrical is provided as required and is installed in coordination with site improvements, paving and walks.	
[]	[X]	[]	[B] [C]	19.	Verify areas to receive planting are not excessively compacted by traffic storage or equipment.	
[]	[X]	[]	[C]	20.	Verify scheduling of phases of landscaping work is in accordance with overall construction. Verify work is scheduled to avoid out-of-phase sequences that could cause damage or require rework. In general, ensure that all deep utility work is to be done before soil preparation and all shallow utilities such as irrigation laterals are done after soil preparation.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		LANDSCAPE CONSTRUCTION	<u>NOTES</u>
[]	[X]	[]	[B] [C]	21.	Verify layout of landscape construction such as walls, fences, paving, paths and benches is as required.	
[]	[x]	[V]	[B] [C]	22.	Verify grades and elevations. Record field conditions, as required.	
PLANTING						
[]	[X]	[]	[B] [C]	23.	Verify planting areas are in horticultural condition required.	
[]	[X]	[]	[B] [C]	24.	Verify that required drainage conditions are provided.	
[]	[X]	[]	[B] [C]	25.	Verify layout of major plant materials and adjustment to field conditions is provided, as required.	
[]	[X]	[]	[B] [C]	26.	Verify plant materials are approved and inspected before installation, as required.	
[]	[X]	[]	[B] [C]	27.	Verify staking, pruning, and spraying are as required.	
[]	[X]	[]	[B] [C]	28.	Verify plants are watered in after planting to settle soil around root ball.	
[]	[X]	[]	[B] [C]	29.	Verify plants are protected from acid backsplash used to clean or etch concrete. Do not allow diluted acid near root zones of trees or shrubs.	
[]	[X]	[]	[C]	30.	To avoid scorching of foliage, ensure hot tar boilers are not allowed near trees or vegetation.	
[]	[X]	[]	[C]	31.	Verify maintenance is provided as required during construction and arrangements with permanent maintenance are coordinated, as required.	

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DIVISION 3 — CONCRETE —

CONCRETE FORMS AND ACCESSORIES 03100

STANDARDS: ACI (5) AISC (10) APA (17) CRA (30) DFPA (38) PS (77) SPR (83)
WCLIB (95)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		FORMS & ACCESSORIES	<u>NOTES</u>
[x]	[]	[S]	[B] [C]	1.	Verify location, dimensions and grades are as required.	
[]	[]	[S]	[B] [C]	2.	Verify formwork materials are as specified. Verify formwork is properly sealed, oiled or wetted and treatment is compatible with other materials to be applied.	
[]	[]	[S]	[B] [C]	3.	Verify reused formwork is properly reconditioned and treated for reuse.	
[]	[]	[S]	[B] [C]	4.	Verify construction provides mortar-tight condition, free from offsets and defects.	
[X]	[]	[S]	[B] [C]	5.	Verify completed formwork provides structural sections required.	
[X]	[]	[S]	[B] [C]	6.	Observe type of form spacers, ties and bracing used. Verify ties indicated to be set to pattern are of proper type and spacing. Verify ties are arranged to be withdrawn or snapped off to leave no metal within specified or required distance to surface of concrete.	
[]	[]	[S]	[B] [C]	7.	Verify temporary spreaders are arranged for easy removal. Verify removal.	
[]	[]	[S]	[B] [C]	8.	Verify foundation forms are deepened as required for pipes, conduits, soft spots, etc.	
[]	[]	[X]	[B] [C]	9.	Verify sleeves for piping and conduits are provided, as required.	
[]	[]	[X]	[B] [C]	10.	Verify provisions are made for anchors, hanger wires, inserts, cans, bucks, etc.	
[]	[]	[S]	[B] [C]	11.	Verify forms are secured against movements during placing operations. Verify reference lines are established. Verify screeds are set high to allow for deflection and deflection is checked during pour.	
[]	[X]	[]	[B] [C]	12.	Verify chamfer strips, nailer strips, chases and rustication strips are accurately placed, aligned fastened and protected.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		FORMS & ACCESSORIES (CON'T)	<u>NOTES</u>
[]	[]	[S]	[B] [C]	13.	Verify cleanouts are provided at ends and low points of forms and ports are provided in high forms. Verify number and location.	
[x]	[x]	[S]	[B] [C]	14.	Verify expansion, construction and contraction joints are provided, as required or indicated.	
[]	[]	[S]	[B] [C]	15.	Verify filler is installed and securely fastened in expansion joints.	
[]	[]	[S]	[B] [C]	16.	Verify free movement of expansion and contraction joints can occur. Verify there is no reinforcement or fixed metal continuous through the joint.	
[]	[]	[S]	[B] [C]	17.	Verify form cut-offs and bulkheads are established in locations approved.	
[]	[]	[S]	[B] [C]	18.	Verify forms are in alignment, especially at top of walls.	
[]	[]	[S]	[B] [C]	19.	Verify forms provide for depressed slab areas, cut outs, curbs, etc.	
[]	[X]	[]	[B] [C]	20.	Verify pattern for architectural concrete is as required.	
[]	[X]	[]	[B] [C]	21.	Verify non-corrosive nails are used to hold curtains.	
[]	[X]	[]	[B] [C]	22.	Verify forms are taped and prepared as required for architectural concrete. Verify joint patterns are formed as indicated.	
[]	[]	[S]	[B] [C]	23.	Verify keys are provided in construction joints. Verify provisions for waterproofing are met.	
[]	[]	[S]	[B] [C]	24.	Verify forms allow sufficient space and openings for depositing of concrete. Contact architect if field conditions appear difficult.	
[]	[]	[S]	[B] [C]	25.	Verify forms provide for features such as doors, windows, openings, etc. and that they are removable. Ensure cross bracing is provided in formed openings to prevent bowing.	
[]	[]	[S]	[C]	26.	Verify proper provisions are made during pour for sawed joints location, equipment, personnel and timing.	
[]	[]	[S]	[B] [C]	27.	Verify forms are properly cleaned of all debris and surface-treated as required prior to pour.	

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SI	AI	EI	OI		FORMS & ACCESSORIES (CON'T)	NOTES
[]	[]	[S]	[B] [C]	28.	Note appearance of obvious defects in formwork that might impair its ability to withstand concrete pressure without excessive deflection.	
[]	[]	[S]	[B] [C]	29.	Check shoring for location and bearing. Check shores for settlement during pouring.	
[]	[]	[X]	[B] [C]	30.	Verify trench ducts, boxes, cleanouts, flanges, etc. are set at proper elevation to allow for flush or required installation of finish floor. Verify sufficient anchorage is provided to avoid movement.	
[]	[]	[S]	[B] [C]	31.	Verify scaffolds or other accessories are adequate and do not affect form work.	
FORM REMOVAL						
[]	[]	[S]	[B] [C]	32.	Verify concrete is sufficiently strong before removal of forms and surfaces are not damaged or spilled by early removal.	
[]	[]	[S]	[B] [C]	33.	Ensure forms remain in place until expiration of curing period required.	
[]	[]	[S]	[B] [C]	34.	Ensure forms are tightened and maintained snug against concrete surfaces.	
[]	[]	[S]	[B] [C]	35.	Verify reshoring requirements are observed.	
[]	[]	[]	[C]	36.	Verify wood formwork is completely removed above and below grade.	
[]	[X]	[s]	[B] [C]	37.	Ensure preparations for patching are made as soon as practicable and methods are approved, if required.	

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DIVISION 3 — CONCRETE — CONCRETE REINFORCEMENT 03200

STANDARDS: ACI (5) AGDGA (9) ASTM (19) AWS (23) CRS1 (36) PCI (76)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		CONC. REINFORCEMENT	<u>NOTES</u>
[x]	[]	[S]	[B] [C]	1.	Verify grade of steel delivered to jobsite is identified, as required.	
[x]	[]	[S]	[B] [C]	2.	Verify steel is installed in accordance with approved drawings and of grade and sizes indicated: bar length, bar diameter, bar-to-bar spacing. Verify spacing is coordinated to suit units where masonry walls are scheduled.	
[]	[]	[S]	[B] [C]	3.	Verify required clearance of steel from earth and forms is provided.	
[x]	[]	[S]	[B] [C]	4.	Verify splice lapping, length of splices and staggering of splices are as required.	
[]	[]	[S]	[B] [C]	5.	Verify bends are within radii and tolerance required and are uniformly made.	
[]	[]	[S]	[B] [C]	6.	Ensure additional bars such as wall intersection bars, trim bars, at openings and corner bars, are provided.	
[x]	[]	[S]	[B] [C]	7.	Verify reinforcement is cleaned of all loose or flaky rust or scale, dried concrete, oil, bond-breaker and other foreign material that might reduce bond. Verify tags are removed.	
[]	[]	[S]	[B] [C]	8.	Verify dowels are provided for marginal bars at wall ends and openings.	
[x]	[]	[S]	[B] [C]	9.	Verify beam and slab bars are spliced near supports for bottom steel and near midspan for top steel.	
[]	[]	[S]	[B] [C]	10.	Ensure no bent bars and tension members are installed except where approved.	
[]	[]	[S]	[B] [C]	11.	Verify vertical bars at wall ends are installed inside horizontal bars unless otherwise required.	
[]	[]	[S]	[B] [C]	12.	Verify extra turns are provided at top and bottom of spiral columns.	
[]	[]	[S]	[B] [C]	13.	Verify reinforcement is tied and supported securely to prevent displacement during placement.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		CONC. REINFORCEMENT (CON'T)	<u>NOTES</u>
[x]	[]	[S]	[B] [C]	14.	Verify reinforcement spacers, tie wires, chairs and supports are of type, size, and finish required.	
[]	[]	[X]	[B] [C]	15.	Verify conduits are separated from other conduit and rebar by three diameters minimum.	
[]	[]	[S]	[B] [C]	16.	Ensure no conduit or piping is placed below rebar mat in suspended slabs unless approved by consultant.	
[]	[]	[X]	[B] [C]	17.	Verify no secured pipes are embedded in concrete (liquid carrying).	
[x]	[]	[S]	[B] [C]	18.	Verify no contact of bars is made with dissimilar metals.	
[]	[]	[S]	[B] [C]	19.	Verify bars are not placed near surfaces that might allow rusting.	
[]	[]	[S]	[B] [C]	20.	Ensure rebars are welded only with consultant's approval, in accordance with reinforcing steel welding code AWS D1.4.	
[]	[]	[S]	[B] [C]	21.	Verify adequate space and clearance are provided for proper deposit of concrete and use of vibrators.	
[]	[]	[S]	[B] [C]	22.	Verify embedded items are securely anchored in place and in proper location.	
[]	[]	[S]	[B] [C]	23.	Unless approved, ensure boxing-out is not allowed for subsequent grouting-in.	
[]	[]	[S]	[B] [C]	24.	Verify embedded items are supplied and installed as required. Generally review drawings for anchor bolts, piping, sleeves, conduits, boxes, special items, etc. Verify embedded items are suitably protected from damage during placement operations.	
[]	[]	[S]	[B] [C]	25.	If conflict occurs between embedded items and reinforcing bars, allow no cutting, bending, or omission without consultant's approval.	
[]	[]	[S]	[B] [C]	26.	Check placing tolerances of reinforcing. (See Appendix.)	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		CONC. REINFORCEMENT (CON'T)	<u>NOTES</u>
[x]	[]	[S]	[B] [C]	27.	Use the following rules of thumb for bar splices:	
					For 24d lap: multiple bar size by 3 = lap in inches.	
					For 32d lap: multiple bar size by 4 = lap in inches.	
					For 40d lap: multiple bar size by 5 = lap in inches.	
[]	[]	[S]	[B] [C]	28.	Verify the rebar is not bent excessively ("hickeying"). To determine proper bending, use Max slope =1:6. Field bending of partially embedded bar is done with consultant's approval.	
[X]	[]	[S]	[B] [C]	29.	Ensure agency inspection is performed, if required.	

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DIVISION 3 — CONCRETE — CAST-IN-PLACE CONCRETE 03300

STANDARDS: ACI (5) ASTM (19) NRMCA (68) PCI (76) PI (72) VI (94)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		CAST-IN-PLACE CONC.	<u>NOTES</u>
[x]	[]	[S]	[C]	1.	Ensure agency approval of forms and rebar is obtained prior to pour, if required.	
[t]	[]	[S]	[C]	2.	Verify requirements of concrete specifications have been met before delivery or placement of concrete — tests, mix design, ingredients, inspections, etc.	
[t]	[]	[S]	[C]	3.	Ensure testing laboratory is notified prior to pour and testing is arranged at plant and site.	
[]	[]	[S]	[B] [C]	4.	Verify areas to receive concrete are cleaned, wetted or otherwise prepared, as required. Verify foundations are free of frost and water. Verify previously placed concrete is properly prepared to receive new.	
[]	[]	[S]	[B] [C]	5.	Verify vibrators, standby vibrators and other necessary tools are available and in working condition. Check frequency and amplitude, if required.	
[]	[]	[S]	[B] [C]	6.	Verify that conveying equipment and depositing equipment is capable of reaching all areas of placement without segregation, loss of ingredients, formation of air pockets or cold joints.	
[]	[]	[S]	[B] [C]	7.	Confirm adequate manpower is available for timely placement.	
[]	[]	[S]	[B] [C]	8.	Verify temporary form openings, tremies, chutes, etc. are provided.	
[]	[]	[S]	[B] [C]	9.	Verify “pockets” are vented to prevent air entrapment.	
[x]	[]	[S]	[B] [C]	10.	Verify subbase and capillary fills are compacted and membrane is provided and installed, as required.	
[]	[]	[S]	[B] [C]	11.	Confirm arrangements have been made for specified curing, sawed joints and protection including cold weather protection, if needed.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		CAST-IN-PLACE CONC. (CON'T)	<u>NOTES</u>
[t]	[]	[S]	[B] [C]	12.	Verify cylinders, measuring equipment and slump cone are at site and samples are properly taken.	
[t]	[]	[S]	[C]	13.	Confirm time interval between adding water to concrete and placement in final position is known.	
[]	[]	[S]	[C]	14.	Confirm delivery of concrete and sequence of delivery is scheduled to allow continuous placement to prevent cold joints.	
[t]	[]	[S]	[C]	15.	Verify age of concrete is within specified or required time limit and delivery tickets contain proper information.	
[]	[]	[S]	[B] [C]	16.	Verify modified grout is provided at first lift and where rebar congestion occurs, as required.	
[]	[]	[S]	[B] [C]	17.	Ensure layers are kept approximately horizontal and do not exceed required lifts.	
[]	[]	[S]	[B] [C]	18.	Verify bolts and loose items to be embedded are properly located and installed.	
[]	[]	[S]	[C]	19.	Record date and location of pours.	
[x]	[]	[S]	[B] [C]	20.	Verify grades, elevations, alignment, form adjustment and supports are being checked during pouring.	
[]	[]	[S]	[B] [C]	21.	Verify time delay is made for concrete in columns, piers, walls and openings to allow concrete to settle before placing concrete above them; however, initial set is to be avoided.	
[]	[]	[S]	[B] [C]	22.	Verify vibration is performed properly using correct equipment and forms are not damaged.	
[]	[]	[S]	[B] [C]	23.	Verify instruction concerning watering and drainage at site.	
[t]	[]	[S]	[B] [C]	22.	Ensure cylinders are cast and stored and slump and other tests are performed, as required (shrinkage bars, air entrainment, unit, etc.).	

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SI	AI	EI	OI		CAST-IN-PLACE CONC. (CON'T)	NOTES
[]	[]	[S]	[B] [C]	23.	Verify instruction concerning watering and drainage at site.	
[t]	[]	[S]	[B] [C]	24.	Ensure cylinders are cast and stored and slump and other tests are performed, as required (shrinkage bars, air entrainment, unit, etc.).	
FINISHING AND CURING						
[]	[X]	[]	[B] [C]	25.	Verify type of finishes on unformed surfaces such as smooth, rubbed, broomed, nonslip, exposed aggregate, and colored is checked and provided, as required.	
[]	[]	[S]	[B] [C]	26.	Verify screeds are provided as required and wood screeds are removed.	
[]	[]	[S]	[B] [C]	27.	Verify over-troweling is avoided and troweling is not performed while bleed water is on surface.	
[]	[]	[S]	[B] [C]	28.	Verify curing methods are started as soon as possible. Verify curing compounds are as required and compatible with subsequent finishes.	
[x]	[]	[S]	[B] [C]	29.	Verify finishing method provides evenness, smoothness and levelness of surfaces within tolerance indicated. Verify slopes are provided to properly drain. Ensure marks left by tools are removed.	
[]	[x]	[S]	[B] [C]	30.	Ensure that joints, edges and corners are carefully finished and/or match.	
[]	[]	[S]	[B] [C]	31.	Verify wet spray or moist curing method is adequately performed.	
[]	[X]	[S]	[B] [C]	32.	Verify waterproof paper or similar covers are applied with sufficient lap and seal and adequately protected during curing period. (Colored surfaces may require special covers to avoid staining, etc.)	
[]	[]	[S]	[C]	33.	Confirm loading and traffic are controlled over surfaces to protect concrete.	
[]	[X]	[S]	[B] [C]	34.	Confirm methods of repairing defective areas and removal of fins, form marks, ties, etc. on formed surfaces are understood and provided as soon as possible upon removal of forms.	

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DIVISION 3 — CONCRETE — PRE-CAST CONCRETE 03400

STANDARDS: ACI (5) AISI (13) ANSI (16) ASTM (19) PCA (75) PCI (76)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		PRE-CAST CONC.	<u>NOTES</u>
[]	[X]	[s]	[B] [C]	1.	Verify required samples have been submitted and approved as to color, texture, form, finish, treatment, anchors and reinforcement. Verify mock-up is provided and approved, if required.	
[]	[X]	[s]	[B] [C]	2.	Confirm special items and conditions are understood.	
[]	[]	[S]	[B] [C]	3.	Verify conditions to receive precast material are as required. Verify structural support members are properly located, installed and within tolerance. Confirm erection contractor accepts conditions.	
[]	[]	[S]	[C]	4.	Verify masons and welders are qualified, as required.	
[t]	[]	[S]	[B] [C]	5.	Verify testing procedure is scheduled and performed at fabrication source and in field.	
[]	[]	[S]	[B] [C]	6.	Verify connectors, anchors and fasteners are of type, metal, finish and size required and are installed as required.	
[]	[]	[S]	[B] [C]	7.	Verify shields to protect materials are provided during welding.	
[]	[]	[S]	[B] [C]	8.	Confirm lead buttons or soft wood wedges are used to prevent crushing of mortar and are removed, as required. Verify patching is performed.	
[]	[]	[S]	[C]	9.	Verify cutting or drilling material to accommodate others' work is accurately and properly performed.	
[]	[X]	[S]	[C]	10.	Verify flexible gaskets for joints are properly sealed.	
[]	[X]	[]	[B] [C]	11.	Confirm nonstaining back-up caulking, cement or materials are provided and tests are performed or attested to in respect of non-staining qualities.	
[]	[X]	[]	[B] [C]	12.	Verify joint caulking, sealing, painting, etc. is performed under required conditions.	
[]	[X]	[]	[B] [C]	13.	Verify joint caulking, sealing and painting are of type, color and method of installation required.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		PRE-CAST CONC. (CON'T)	<u>NOTES</u>
[x]	[x]	[S]	[B] [C]	14.	Verify bolt or dowel holes in top of copings are grouted.	
[]	[x]	[S]	[B] [C]	15.	Verify expansion or control joints are located and provided, as required.	
[]	[X]	[]	[B] [C]	16.	Verify built-in flashings are properly formed and located, as required. Verify that weep holes are provided.	
[]	[x]	[S]	[B] [C]	17.	Verify joint and panel alignment is within specified tolerances.	
[]	[X]	[]	[B] [C]	18.	Confirm water-repellent treatments are applied using materials and methods required.	
[]	[X]	[]	[B] [C]	19.	Confirm protection is provided for pre-cast sills and projecting work.	
[]	[X]	[]	[C]	20.	Verify cleaning of work is performed as required, proceeding from top of building downward.	
[]	[X]	[]	[C]	21.	Verify adjacent metal and other materials are protected during cleaning operations.	

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Sub-Groups SI: [T] Testing Laboratory, [H] Hazardous Materials, [Y] Safety **AI:** No Sub-Groups

EI: [V] Civil, [S] Structural, [M] Mechanical, [E] Electrical **OI:** [O] Owner, [C] Contractor, [B] Subcontractor, [L] Legal, [G] Government, [F] Fire Protection, [P] Plumbing, [A] Acoustical

DIVISION 4 — MASONRY —

UNIT MASONRY 04200

STANDARDS: AISC (10) AINA (12) ANSI (16) ASTM (19) BIA (29) GA (45) MI (52) NCMA (58) PCA (75)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		UNIT MASONRY	<u>NOTES</u>
[]	[x]	[S]	[B] [C]	1.	Verify materials are suitably stored off the ground and covered with waterproof material.	
[]	[X]	[s]	[B] [C]	2.	Verify site materials match approved samples for color, texture, grade and size and contain no defects such as chips, cracks, crazing, warps, kiln marks on face and size differential, except for tolerances as allowed by the appropriate ASTM Standard. Verify required types and shapes are available and compatible with field materials.	
[t]	[]	[S]	[C]	3.	Confirm schedule of test and inspections is arranged before installation. Verify wall prisms, grout prisms, grout tests, mortar tests, type of mortar, mix, and ingredients are as approved and required.	
[]	[X]	[]	[B] [C]	4.	Confirm sample panels have been provided and approved, as required.	
[]	[]	[S]	[B] [C]	5.	Verify wetting of bricks is properly performed, if required, to ensure that mortar will bond to brick. Verify concrete masonry units are not wet.	
[]	[X]	[s]	[B] [C]	6.	Verify mortar color is provided and approved, if required.	
[]	[x]	[S]	[B] [C]	7.	Verify layout of work, coursing, and dimensions are as required or indicated. Confirm story-pole is used, if required.	
[]	[X]	[s]	[B] [C]	8.	Confirm joint size, type, tooling method and equipment are understood and produced.	
[]	[]	[S]	[B] [C]	9.	Verify mortar is mixed as required and methods and equipment are suitable to produce the approved mix.	
[]	[X]	[s]	[B] [C]	10.	Verify indicated bonding patterns are provided. Verify uniformity of laying.	

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SI	AI	EI	OI		UNIT MASONRY (CON'T)	NOTES
[]	[]	[S]	[B] [C]	11.	Generally observe mortar application to materials — full head and bed joints, shoving and “buttering.” Verify that complete filling of collar joints is as required in composite wall construction.	
[]	[]	[S]	[B] [C]	12.	Verify joints are tooled in such a manner as to provide a dense surface unless otherwise specified.	
[]	[x]	[S]	[B] [C]	13.	Verify cutting of units is as required.	
[]	[]	[S]	[B] [C]	14.	Verify cleanouts are provided, as required.	
[]	[X]	[s]	[B] [C]	15.	Verify spaces between wythes are of sizes required and kept free of excess droppings.	
[]	[]	[S]	[C]	16.	Confirm provisions are adequate to protect work at least 48 hours from freezing, or longer if required, to properly cure. Consult with International Masonry Institute and All-Weather Council for cold weather requirements. Verify that acceptable cold weather precautions are provided when the temperature is less than 40°F.	
[]	[X]	[s]	[B] [C]	17.	Confirm methods of cleaning are understood and performed as required. Ensure droppings and splatters on finished surfaces are cleaned as soon as possible.	
[]	[]	[S]	[B] [C]	18.	Verify anchors and ties are of type of material and size required and are installed as required.	
[]	[]	[S]	[B] [C]	19.	Verify reinforcement is of type, size, splicing and spacing required and that it is properly doweled, tied and installed. Confirm additional reinforcement is provided as required for corners, intersections, openings and lintels. Refer also to 03200 “Concrete Reinforcement.”	
[]	[]	[S]	[B] [C]	20.	Do not allow bending rebar excessively to fit masonry cells. Verify approval has been obtained, if required.	
[]	[]	[S]	[B] [C]	21.	Verify bucks, anchors, forming, supports and other embedded materials are available, secured, plumb or level and otherwise properly installed.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		UNIT MASONRY (CON'T)	<u>NOTES</u>
[]	[x]	[X]	[B] [C]	22.	Confirm provision for flashings, cut-outs and later installation of other items is made.	
[]	[X]	[s]	[B] [C]	23.	Confirm provision for parging or treatment of backs of walls which are to receive backfill is performed, as required.	
[]	[]	[S]	[B] [C]	24.	Verify expansion joints for brick masonry and control joints for concrete masonry are located and provided, as indicated or required.	
[]	[]	[S]	[B] [C]	25.	Verify weeps holes are provided, if required.	
[]	[]	[S]	[B] [C]	26.	Verify structural members to receive masonry are located, supported, and anchored and have suitable attachments, as required.	
[]	[]	[S]	[B] [C]	27.	Verify prior to grout pour that all wythes, reinforcement, etc. are properly cleaned. Ensure that precautions such as ties and braces are considered so as to avoid "blow-outs."	
[]	[]	[S]	[B] [C]	28.	Verify pipes, conduits, sleeves and boxes are located, secured, protected, insulated and spaced, as required.	
[]	[]	[S]	[C]	29.	Verify measuring box is used for job mixed grout. Allow no shovel measures.	
[X]	[]	[S]	[B] [C]	30.	Ensure agency inspection is performed before grouting, if required.	
[T]	[]	[s]	[C]	31.	Verify wall prisms are made at proper frequency and are properly stored, delivered, cured, and tested, all as required.	
[t]	[]	[S]	[B] [C]	32.	Verify lifts of grout are poured in a timely sequence and as required. Generally observe bond beam filling and compaction methods, including consolidation. Note height limitations required for lifts.	
[t]	[]	[S]	[B] [C]	33.	Verify hollow metal frames are filled solid.	
[t]	[]	[S]	[B] [C]	34.	Ensure backfilling is performed only after proper curing or support units are provided and as required.	
[T]	[]	[]	[C]	35.	Confirm pointing, replacement of defective units and repair of other defects are promptly performed and as deemed necessary.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		UNIT MASONRY (CON'T)	<u>NOTES</u>
[]	[X]	[s]	[C]	36.	Verify water-proofing of walls is performed, if required. Verify moisture content prior to waterproofing is as required or specified.	
[]	[X]	[s]	[C]	37.	Confirm methods of final cleaning are as required.	
UNREINFORCED MASONRY RETROFIT						
[T]	[]	[s]	[B] [C]	38.	Verify lay-up of existing walls, in particular full-length header courses, are in compliance with code requirements.	
[T]	[]	[s]	[c]	39.	Test the quality of the existing mortar by performing in-place shear tests in accordance with code requirements.	
[T]	[]	[s]	[c]	40.	Test in-place existing wall anchors in accordance with code requirements.	
[T]	[]	[s]	[c]	41.	Perform special inspection or testing of new shear bolts and combined tension and shear bolts in accordance to code.	
[T]	[]	[s]	[c]	42.	Verify archaic materials are investigated and tested in accordance with code requirements.	
[]	[]	[S]	[B] [C]	43.	Verify pointing of unreinforced masonry, when required due to deteriorated mortar points, is in accordance with code.	

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**DIVISION 5 — METALS —
STRUCTURAL STEEL 05120**

STANDARDS: AA (2) AHDGA (9) AISC (10) AISI (13)

ASTM (19) AWS (23) FS (41) SSPC (89)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		STRUCTURAL STEEL	<u>NOTES</u>
[]	[]	[S]	[B] [C]	1.	Verify setting of foundation anchor bolts, size and location are as required.	
[]	[]	[S]	[C]	2.	Verify foundations are provided as required under all column locations.	
[t]	[]	[S]	[C]	3.	Verify testing and inspection laboratory has observed shop fabrication, as required or specified.	
[]	[]	[S]	[B] [C]	4.	Verify delivered materials are of correct size, shape, and weight.	
[]	[]	[S]	[B] [C]	5.	Ensure beams made up of welded plates are not substituted for specified rolled sections without approval.	
[]	[]	[S]	[B] [C]	6.	Verify size and type of bolts, rivets, washers and hole diameters are as required.	
[t]	[]	[S]	[c]	7.	Verify welds on delivered materials are of size required.	
[]	[]	[S]	[C]	8.	Verify shop painting is provided as required and items to be embedded are not shop coated unless required.	
[]	[]	[S]	[B] [C]	9.	Verify delivered steel is new, undamaged and free of distortions.	
[]	[]	[S]	[C]	10.	Verify steel is suitably stored, blocked off ground and covered where prolonged storage occurs.	
[]	[]	[S]	[C]	11.	Observe erection contractor's proposed methods, sequence of operations and erection equipment. Ensure long trusses are to be erected by double choker or sling method to avoid overstress.	
[]	[]	[S]	[B] [C]	12.	Verify column ends are milled and protected, if required.	
[]	[]	[S]	[B] [C]	13.	Observe setting of base and bearing plates. See that full engagement of nut occurs and that bending of anchor bolts or undue chipping of concrete does not occur. Verify clearances required for finish coverings or materials are provided.	

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SI	AI	EI	OI		STRUCTURAL STEEL (CON'T)	NOTES
[t]	[]	[S]	[B] [C]	14.	Verify temporary connections to hold steel in place are provided and members are accurately wedged, shimmed, plumbed, fitted, aligned or leveled before final rivets, bolts or weld connections are made.	
[]	[]	[S]	[B] [C]	15.	See that concrete is cleaned and free of dirt and laitance and grouting is properly performed. Space between concrete and bottom of bearing plate usually must not exceed 1/24 bearing plate width. See that dry pack mortar is properly rammed and cured.	
[]	[]	[S]	[B] [C]	16.	Verify shims are steel plates of varying thickness and not odd pieces of metal.	
[]	[]	[S]	[B] [C]	17.	See that temporary connections, guys, and braces are provided to hold work in place before permanent connections are completed. Verify work is installed plumb and to tolerances required.	
[]	[]	[S]	[B] [C]	18.	Verify drift pins are used to bring together the parts but do not damage or distort metal.	
[x]	[]	[S]	[B] [C]	19.	Verify beam members are set with natural camber up. Verify camber is furnished where required.	
[]	[]	[S]	[C]	20.	Verify steel members have stud bolts or other method of connection provided to attach other materials suitably.	
[x]	[x]	[X]	[C]	21.	Verify steel members are not cut for passage of conduit, pipes, etc. unless so indicated on shop drawings.	
BOLTING						
[x]	[]	[S]	[B] [C]	22.	Ensure bolts and rivets are not allowed in same connection unless otherwise required.	
[x]	[]	[S]	[B] [C]	23.	Verify type, size and length of bolt, size and type of washer and size of hole are as required.	
[x]	[]	[S]	[B] [C]	24.	Verify all heads and nuts are resting squarely against metal; check to see that bolts have been drawn adequately tightly.	
[X]	[]	[S]	[B] [C]	25.	Verify holes are properly aligned. Ensure burning to correct misalignment is not permitted.	
[]	[]	[S]	[B] [C]	26.	Verify use of ribbed bolts or turned bolts.	

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HIGH STRENGTH BOLTING						
[T]	[]	[S]	[B]	27.	Ensure identification of bolt is made and washer and nut are of proper type. (Testing may be required.)	
[]	[]	[S]	[B] [C]	28.	Verify whether paint is allowed on contact surface. Generally, all deleterious materials such as dirt, oil or loose scale or defects such as burrs or pits should not be present.	
[T]	[]	[S]	[B] [C]	29.	Verify that impact wrenches are accurately calibrated and that frequency of calibration checks. Turn-of-the-nut method is allowed. Direct tension indicator devices are acceptable.	
[]	[]	[S]	[B] [C]	30.	Verify slope of flanges (1:20) and beveled washers, as required.	
[]	[]	[S]	[B] [C]	31.	Verify hardened washers are provided, as required.	
WELDING						
[x]	[]	[S]	[B] [C]	32.	Review mill certificate for metals to be joined.	
[T]	[]	[s]	[B] [C]	33.	Review the Welding Procedure Specifications on-site and previously approved by the Engineer-of-Record for the specific project.	
[T]	[]	[s]	[B] [C]	34.	Review welder qualifications for the specified welding.	
[T]	[]	[]	[B] [C]	35.	Inspect weld preparation prior to welding for conformance with approved welding Procedure Specifications, including:	
					a. type of joint	
					b. base metals	
					c. filler metals, class, and diameter	
					d. shielding	
					e. preheat	
					f. welding positions	
					g. electrical travel speed	
					i. postweld heat treatment	
					j. process characteristic, current volts	
					h. technique	
[T]	[]	[]	[C]	36.	Inspect in-process welding.	

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DIVISION 5 — METALS —

METAL JOISTS 05200

STANDARDS: AISC (10) AISI (13) ASTM (19) AWS (23) SJI (88) SSPC (89)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		METAL JOISTS	<u>NOTES</u>
[]	[]	[S]	[B] [C]	1.	Verify proper equipment is used for unloading and handling.	
[]	[]	[S]	[B] [C]	2.	Verify joists are stored with top or bottom chords up.	
[]	[]	[S]	[B] [C]	3.	Verify joists are coated with type of paint and number of coats required.	
[T]	[]	[S]	[C]	4.	Visually inspect welds for length and size.	
[]	[]	[S]	[B] [C]	5.	Verify nailer on top and/or bottom chord is provided, if required.	
[]	[]	[S]	[B] [C]	6.	Verify holes in bearing plate at one end have been slotted, if required.	
[]	[]	[S]	[B] [C]	7.	Verify joists are accurately spaced and have proper bearing and anchorage.	
[x]	[]	[S]	[B] [C]	8.	Verify installation and connections are as required.	
[]	[]	[S]	[B] [C]	9.	Verify ceiling extensions are provided where required.	
[]	[]	[S]	[B] [C]	10.	Verify bridging and anchoring are installed as soon as joists are placed and before application of loads.	
[]	[]	[S]	[B]	11.	Verify ends of bridging lines terminating at walls or beams are anchored at plane of top and bottom chords, as required.	
[]	[]	[S]	[C]	12.	Allow no cutting or drilling of web or chord members.	
[]	[]	[S]	[C]	13.	Do not allow excessive concentrated loads of heavy building materials or moving of heavy equipment over joists.	
[]	[X]	[s]	[C]	14.	Verify all rust, scale, slag and splatter are removed and joist is clean before it is painted.	

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DIVISION 5 — METALS —

METAL DECK 05300

STANDARDS: AHDGA (9) AISC (10) AISI (13) ASTM (19)
AWS (23) FMU (40) SDI (86)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		METAL DECK	<u>NOTES</u>
[]	[]	[S]	[B] [C]	1.	Verify material is of approved type, material, finish, shapes, gauge and size. Verify approved samples are on job if required. Review approved decking layout submissions.	
[]	[x]	[S]	[B] [C]	2.	Verify material is properly stored on-site and protected.	
[]	[]	[S]	[B] [C]	3.	Verify all accessory items are furnished and approved type and sequence of fastening is performed.	
[]	[]	[S]	[B] [C]	4.	Verify closures at edges and over walls are provided, as required.	
[t]	[]	[S]	[B] [C]	5.	Verify welders are certified, if required. Verify that a welding inspection by a testing laboratory is provided if required. Make sure decking is in contact with beams and joists to ensure proper tack welds.	
[]	[]	[X]	[C]	6.	Verify provisions such as tabs, hangers and supports are met in regard to mechanical and electrical equipment and hung ceilings.	
[]	[]	[X]	[C]	7.	Verify coordination is performed with related trades: sheet metal, roofing, insulation and electrical.	
[T]	[]	[s]	[B] [C]	8.	Verify decking is continuous over supports, if required, and welded connections and spacings are as required. Observe panel to panel seams for tack weld or button punch connections. Check seam welding for burn-outs.	
[]	[]	[S]	[B] [C]	9.	Verify reinforcement around columns and at penetrations is provided, as required.	
[x]	[]	[S]	[B] [C]	10.	Verify reinforcement at locations of major concentrated loads is as required.	
[]	[]	[S]	[B] [C]	11.	Verify seams are aligned. Verify type and spacing of seam connections are as required.	
[]	[]	[S]	[B] [C]	12.	Verify electric cell units are aligned and no rough or dented edges occur, so that insulation is not damaged when wire is pulled through cell. Observe that butt ends are taped to keep concrete fill out of cell.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		METAL DECK (CON'T)	<u>NOTES</u>
[]	[]	[S]	[C]	13.	Ensure no concentrated loads are placed on decking during construction.	
[]	[]	[S]	[B] [C]	14.	If decking is to receive concrete topping, verify if shoring is required.	
[]	[]	[S]	[B] [C]	15.	If decking is to receive a topping material, observe that decking is free of loose dirt, oil or debris.	
[]	[]	[S]	[B] [C]	16.	On roof decking, verify deslag welds and paint out with approved zinc preparation, as required. Point out all abrasions.	
[]	[]	[S]	[B] [C]	17.	Verify if U.L. labels are required.	
[]	[X]	[s]	[B] [C]	18.	Deformation of ¼" or more across any three ribs is unacceptable if roof decking is to receive insulation and built-up-roofing conforming to FM standards. Verify compliance.	
[]	[X]	[s]	[]	19.	Verify roof ventilation provisions are met.	
[]	[X]	[s]	[C]	20.	Inspect exterior siding or roofing during installation, especially factory finished surfaces requiring sequence installation.	
[]	[]	[S]	[B] [C]	21.	Verify touch up of exposed and cut galvanized metal is performed.	
[]	[]	[S]	[B]	22.	Report all damaged panels to contractor and architect.	
[T]	[]	[s]	[B] [C]	23.	Check weld washers used, if required (check gauge).	

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**DIVISION 5 — METALS —
METAL FABRICATIONS 05500**

STANDARDS: AA (2) AAMA (26) AHDGA (9) AISC (10) AWS (23) CDA (37)
NAAMM (54) SMUACNA (82) SSPC (89)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		METAL FABRICATIONS	<u>NOTES</u>
[]	[x]	[S]	[B] [C]	1.	Verify delivered materials are fabricated from approved shop drawings, if required, and meet specifications of steel fabrication, riveting, welding, galvanizing, sheet metal or other metals required.	
[]	[]	[S]	[B] [C]	2.	Verify templates are furnished for proper placement and anchorage, if required.	
[]	[]	[S]	[B] [C]	3.	Ensure prior provisions are made for adequate bracing, blocking and anchorage of items.	
[]	[]	[S]	[B] [C]	4.	Verify sleeves, bolts, cut-outs, holes and connectors are located and provided, as required.	
[]	[X]	[s]	[C]	5.	Verify materials are protected from damage before and after installation.	
[]	[X]	[s]	[B] [C]	6.	Verify opening bucks, angles and thresholds are adequately braced, anchored and aligned and bear labels, if required.	
[]	[X]	[s]	[B] [C]	7.	On railings, see that heights, vertical spacing, returns and anchorage will meet code requirements after installation. Notify architect of discrepancies.	
[]	[X]	[s]	[B] [C]	8.	On metal stairs, verify bearing of supports, levelness, variation of risers, coordination with adjacent finish surfaces, spacings and tolerances required are adequate. Verify nosings of pan treads are protected.	
[]	[X]	[s]	[B] [C]	9.	Observe installation techniques and workmanship: smooth and ground welds, touch up, caulking, galvanizing and touch-up shop coats.	
[]	[X]	[s]	[B] [C]	10.	Verify closed risers, smooth nosings, railing extensions for stairs and ramps, marking of stairs for visually impaired, and other accessibility compliance items are observed.	

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EI: [V] Civil, [S] Structural, [M] Mechanical, [E] Electrical **OI:** [O] Owner, [C] Contractor, [B] Subcontractor, [L] Legal, [G] Government, [F] Fire Protection, [P] Plumbing, [A] Acoustical

DIVISION 6 — WOOD AND PLASTICS —

ROUGH CARPENTRY 06100

*STANDARDS: AITC (11) ANSI (16) APA (17) AWPA (25) CRA (30) CS (35)
DFPA (38) FPL (43) FS (41) AFPA (64) NOFMA (65) NPA (67) PS (77) RIS (79)
RIS (79) SPR (83) SPA (85) TPI (92) UCLIB (95) WRCLA (96) WWP (97)*

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		ROUGH CARPENTRY	<u>NOTES</u>
[X]	[]	[s]	[c]	1.	Verify delivered lumber is of proper species and grade and has treatment required.	
[X]	[]	[s]	[c]	2.	Verify framing lumber is grade-stamped or suitably identified.	
[X]	[]	[s]	[c]	3.	Generally spot check for splits, shake, decay, pockets, wane, crook, bow, cup, loose knots or other defects not in compliance with specified grade.	
[X]	[]	[s]	[c]	4.	Verify lumber is suitably stored off the ground, stacked to prevent warp and protected to prevent increase in moisture content.	
[X]	[]	[s]	[c]	5.	Verify grade stamp indicates that moisture content is as specified.	
[X]	[]	[s]	[c]	6.	Verify if preservative treatment is as required and affidavits are supplied, if required.	
[X]	[]	[s]	[c]	7.	Verify materials in contact with concrete or masonry or near earth are treated or of suitably graded species of lumber for these conditions.	
[X]	[x]	[s]	[c]	8.	Verify surfaces to be painted are treated with proper preservatives.	
[X]	[]	[s]	[c]	9.	Verify framing is in alignment, plumb and level and temporary bracing is provided during construction.	
[X]	[]	[s]	[c]	10.	Verify nails, bolts and connectors are as required. Observe usage of box and common nails. Observe spacing and penetration of nails. Verify no coatings are provided on nails such as to reduce friction.	
[X]	[]	[s]	[c]	11.	Verify predrill for nails, if required.	
[X]	[]	[s]	[c]	12.	Verify joists are set with crown up, have adequate bearing and are properly fire cut when bearing in masonry walls.	
[X]	[]	[s]	[c]	13.	Verify allowance is made for expansion or contraction of lumber, concrete, masonry and steel.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		ROUGH CARPENTRY (CON'T)	<u>NOTES</u>
[X]	[]	[s]	[c]	14.	Make sure that unspecified notching, drilling, or cutting of framing members have been reviewed for structural adequacy.	
[X]	[]	[s]	[c]	15.	Verify bridging, blocks, and bracing are provided as required and in suitable manner. Verify fire blocking is provided, as required.	
[x]	[]	[s]	[C]	16.	Verify blocking is provided for equipment and other features to be attached.	
[X]	[]	[s]	[c]	17.	Verify plates are lapped and properly connected.	
[x]	[]	[s]	[C]	18.	Verify metal connectors will not protrude or interfere with finish surfaces.	
[X]	[]	[s]	[c]	19.	Verify metal connectors are adequately nailed or fastened.	
[X]	[]	[s]	[c]	20.	Verify connections to metal are as required.	
[X]	[]	[s]	[c]	21.	Verify framing members are doubled where required.	
[X]	[]	[s]	[c]	22.	Verify headers are of size required, have proper bearing and are suitably connected.	
[X]	[x]	[s]	[c]	23.	Verify attention is given to ventilation of lumber and enclosed spaces.	
[X]	[]	[s]	[c]	24.	Verify plywood sheathing is applied as specified: grade, dimension, staggering, nailing, blocking, number of plies, and no overdriven nails.	
[X]	[x]	[s]	[c]	25.	Verify clearances are provided, such as for chimneys and flues or other spacing requirements are indicated.	
[X]	[x]	[s]	[c]	26.	Verify furring and grounds are as required, properly aligned, and plumb.	
[X]	[x]	[]	[c]	27.	Verify all bolts are tight or retightened before closing up.	
[X]	[x]	[]	[c]	28.	Verify sealing, especially for acoustical or waterproofing purposes, is provided where required.	
[X]	[x]	[s]	[c]	29.	Verify sheathing paper, air infiltration, or vapor barrier is provided as required, installed properly, and not damaged.	
[X]	[x]	[s]	[c]	30.	Verify seasoned, preservative-treated or fire-resistive lumber is identified and is provided where required.	

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DIVISION 6 — WOOD AND PLASTICS
CARPENTRY PREFABRICATED STRUCTURAL WOOD
06170

STANDARDS: AITC (11) CRA (30) AFPA (64) NOFMA (65) SPA (85)
TPI (92) WCLIB (95) WWPA (97)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		PREFAB. STRUCT. WOOD	<u>NOTES</u>
[X]	[]	[s]	[c]	1.	Ensure testing laboratory and inspection report are provided before erection, if required.	
[x]	[]	[s]	[C]	2.	Verify material is handled on-site using proper equipment and is suitably stored and protected.	
[X]	[]	[s]	[c]	3.	Verify protective covering is provided, if required, and is not damaged.	
[X]	[]	[s]	[c]	4.	Verify type, species, grade, and finish are as specified for glue-laminated beams and wood trusses.	
[X]	[]	[s]	[c]	5.	Verify water resistant adhesive is used for exterior exposure.	
[X]	[]	[s]	[c]	6.	Verify cutting, notching, drilling and fitting are performed in an acceptable manner.	
[X]	[]	[s]	[c]	7.	Verify fastenings and connections are provided, as required.	
[X]	[]	[s]	[c]	8.	Verify field splices and connections are observed.	
[X]	[]	[s]	[c]	9.	Allow no unscheduled drilling or notching without consultant's approval.	
[X]	[]	[s]	[c]	10.	Verify all cuts are sealed, as required.	
[X]	[]	[s]	[c]	11.	Verify exposed work is protected from weather and humidity.	
[Y]	[]	[s]	[c]	12.	Verify bracing schedule is provided and adhered to during erection sequence.	
[X]	[x]	[s]	[c]	13.	Verify metal end fittings are furnished and fitted by fabricator of structural laminated timber, if required.	

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DIVISION 6 — WOOD AND PLASTICS — FINISH CARPENTRY 06200

STANDARDS: APA (17) AWI (27) AWWA (25) CRA (30) CS (35) DFPA (38)
HPMA (46) NEMA (60) VMWA (71) PS (77) RIS (79) SPA (85) SPI (84) SPR
(83) UL (93) WIC (99) WRCLA (96) WWPA (97)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		FINISH CARPENTRY	<u>NOTES</u>
[X]	[]	[]	[c]	1.	Verify materials delivered to site are of grade, species, type, and sizes approved or specified and are suitably stored. Verify kiln dried materials are not exposed to conditions that affect moisture content.	
[X]	[x]	[]	[c]	2.	Inspect for condition of materials — warps, splits, graining, and finishing.	
[X]	[x]	[s]	[c]	3.	Verify preservative treatment or backpriming are performed, if required. (All wood resting against masonry or concrete usually requires treatment.)	
[X]	[x]	[s]	[c]	4.	Observe workmanship — sawing, fitting, splicing, coping, shouldering and mitering.	
[X]	[x]	[s]	[c]	5.	Observe fastening and that types and methods are understood.	
[X]	[x]	[s]	[c]	6.	Fastenings such as bolts and nails on exterior work are usually required to be corrosion resistant. Verify with requirements.	
[X]	[x]	[s]	[c]	7.	Verify type of nail head, set of nails, exposure of nails, pattern of nails and puttying are provided, as required. Ensure excessive nailing is avoided.	
[X]	[x]	[s]	[c]	8.	Verify material is of length to provide indicated joints, splicing is staggered, and avoidance of excessive splicing is observed.	
[X]	[x]	[s]	[c]	9.	Verify metal installations and accessories on exterior work are observed for weather tightness.	
[X]	[x]	[s]	[c]	10.	Verify grounds and anchorage provisions are adequate for finish attachment.	
[X]	[x]	[s]	[c]	11.	Verify kerfing and hollow backs are provided if required or indicated.	
[X]	[x]	[]	[c]	12.	Verify work is sanded smooth and edges are eased as required.	
[X]	[x]	[s]	[c]	13.	Verify gluing and other means of fastenings are of types or methods required.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		FINISH CARPENTRY (CON'T)	<u>NOTES</u>
[X]	[x]	[s]	[c]	14.	Splits due to nailing should be pointed out during installation and corrected, as should hammer marks and dents, poor quality material, etc.	
[X]	[x]	[]	[c]	15.	Verify sequence of setting base to floor is understood. If shoe mold is required, nailing is to base only.	
[X]	[x]	[]	[c]	16.	Verify doors are installed with necessary beveling and uniform tolerances as required for proper operation and good practice. Ensure warped doors are not installed.	
[X]	[x]	[]	[c]	17.	Verify top and bottom edges of doors are immediately sealed, stained, painted, or otherwise protected.	
[X]	[x]	[]	[c]	18.	Verify clearances required for thresholds, carpeting, and weather-stripping, etc. on doors are understood.	
[X]	[x]	[]	[c]	19.	Verify scribing or scribe strips are provided, as required.	
[X]	[x]	[]	[c]	20.	Verify installation of equipment furnished by others is done in accordance with requirements.	

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DIVISION 6 — CARPENTRY —

ARCHITECTURAL WOODWORK 06400

STANDARDS: APA (17) AWI (27) AWP (25) CRA (30) CS (35) HPMA (46)
NPA (67) NWMA (71) UL (9) WIC (99) WWPA (97)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		ARCHITECTURAL WOODWORK	<u>NOTES</u>
[X]	[x]	[]	[c]	1.	Refer to Section 12300 “Manufactured Casework” where applicable to this section.	
[X]	[x]	[]	[c]	2.	Refer to Section 06200 “Finish Carpentry” where applicable to this section.	
[X]	[x]	[]	[c]	3.	Refer to Section 09900 “Paints and Coatings” where applicable to this section.	
[X]	[x]	[]	[c]	4.	Verify furring and blocking are provided and installed as required to receive materials.	
[X]	[x]	[]	[c]	5.	Verify subsurfaces to receive finish materials are as required. Verify moisture is checked, as required.	
[X]	[x]	[]	[c]	6.	Verify finish materials are not delivered before closing in building and interior conditions such as temperature, humidity and sequence are as required.	
[X]	[x]	[]	[c]	7.	Verify materials are of grade, species, treatment, construction, thickness, pattern, finish, matching and appearance required.	
[X]	[x]	[]	[c]	8.	Verify methods of installation and connection are as required. Verify workmanship is adequate with no tool marks, open joints or other defects.	
[X]	[x]	[]	[c]	9.	Verify surfaces are thoroughly cleaned and finished, as required.	
[X]	[x]	[]	[c]	10.	Verify surfaces are protected, as required.	
[X]	[x]	[]	[c]	11.	Verify requirements for access to kitchen counters and lavatory countertops for persons with physical disabilities.	

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DIVISION 7 — THERMAL AND MOISTURE PROTECTION — WATERPROOFING 07100

STANDARDS: FS (41)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		WATERPROOFING	<u>NOTES</u>
[]	[X]	[]	[C]	1.	Where required by contract documents or warranties, verify that waterproofing is installed by manufacturer's approved installers.	
[x]	[]	[]	[C]	2.	Before waterproofing or dampproofing subcontractor is allowed to commence work, see that:	
					a. Surfaces are free from foreign material.	
					b. Excess mortar or concrete is removed all holes, joints and cracks are pointed and rough or high spots are ground smooth.	
					c. Wood nailers or other attachment conditions are adequate.	
					d. Surfaces are dry to receive heated asphalt, coal tar, or other membrane. Check for dampness if necessary.	
					e. Special conditions are provided as required at corners, intersections and connections to existing works.	
[x]	[]	[]	[C]	3.	Installation should not proceed if temperature is below 40°F or weather is damp or foggy.	
[x]	[]	[]	[C]	4.	Hot-applied bituminous materials must comply with manufacturer recommended EVT. If asphalt is being used, heated requirements are EVT, plus or minus 25°F, at point of application. (EVT [Equiviscous Temperature] is the temperature at which asphalt will attain a viscosity of 125 centistokes, which is the practical and optimum temperature for wetting and fusion at the point of application.) In the event EVT information is not furnished by the manufacturer, the following maximum heating temperatures may be used as guidelines:	
					Dead Level Asphalt Type I 475°F max. Flat Grade Asphalt Type II 500°F max. Steep Grade Asphalt Type III 525°F max. Special Steep Asphalt Type IV 525°F max.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		WATERPROOFING (CON'T)	<u>NOTES</u>
					In no case should kettle or tanker be heated above flash point. Observe kettle temperature. Verify method and sequence of transporting and application of bituminous materials are appropriate.	
[]	[]	[]	[C]	5.	Verify surfaces are primed, if required.	
[x]	[]	[]	[C]	6.	Ensure pipes, ducts, conduits and other items penetrating membrane are watertight.	
[x]	[]	[]	[C]	7.	Observe appropriateness of changes in planes membrane lap inside and outside corners and that perimeter is secured and flashed, as required.	
[]	[]	[]	[C]	8.	Verify joinery between each day's work is adequate.	
[]	[]	[]	[C]	9.	Verify that interstitial moisture is not present .	
[x]	[]	[]	[C]	10.	Verify stored materials are protected against moisture.	
[]	[]	[]	[C]	11.	Verify proper nails, adhesives, and fastenings are used.	
[X]	[]	[]	[]	12.	Verify proper coverage and quantities of materials such as mil thickness.	
[]	[]	[]	[C]	13.	Verify membrane is applied smooth with no "fish mouths" or buckles.	
[]	[]	[]	[C]	14.	Verify protective covering is provided and installed as required, backfilling takes place immediately, and covering remains in place during backfilling.	
[]	[]		[C]	15.	Ensure installation is protected from damage by other trades or by general contractor during installation and following completion. If subject to heavy traffic, verify movement of equipment, plywood sheets or other protection is provided.	

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DIVISION 7 — THERMAL AND MOISTURE PROTECTION —INSULATION 07200

STANDARDS: FM (40) NFPA (63) PI (72) UL (93) VI(94)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		INSULATION	<u>NOTES</u>
[]	[x]	[]	[C]	1.	Verify materials are of type required (surfaces, treatment, ratings, sizes, thickness, etc.)	
[x]	[x]	[]	[C]	2.	Ensure materials are stored to prevent moisture infiltration, are installed dry, and remain dry until covered by roofing.	
RIGID INSULATION						
[]	[]	[]	[C]	3.	Verify wood nailers/stops are provided, as required.	
[]	[]	[]	[C]	4.	Ensure vapor barrier is provided, if required. Check that vapor barrier seals insulation at gravel stops, walls, and openings.	
[]	[]	[]	[C]	5.	Verify method of installation.	
[x]	[]	[]	[C]	6.	Verify fasteners, when specified, are of proper type and spaced as required.	
[x]	[]	[]	[C]	7.	Verify joints are staggered, except when joints are to be taped. When two layers are being installed, vertical joints should be offset. Do not allow joints over flute openings in steel deck.	
[]	[]	[]	[C]	8.	Ensure insulation is covered by roofing each day.	
[]	[]	[]	[C]	9.	Ensure the components of fire-rated assemblies are in compliance with fire ratings.	
[x]	[]	[]	[C]	10.	Verify expansion provisions are observed.	
REFLECTIVE INSULATION						
[x]	[]	[]	[C]	11.	Verify batt insulation is of adequate width to fit between framing members and is of specified thickness or "R" value.	
[x]	[]	[]	[C]	12.	Verify facing/vapor barrier is provided where required.	
[]	[]	[]	[C]	13.	Verify insulation is properly secured.	
[x]	[]	[]	[C]	14.	Verify fitting and cutting around penetrations is tight and surfaces are not torn or damaged.	
[x]	[]	[]	[C]	15.	Verify ventilation and airspace are maintained open and free.	
[]	[]	[]	[C]	16.	Verify reflective vapor barrier material is on correct warm side (typically inside except at refrigerated spaces.)	
LOOSE FILL INSULATION						
[x]	[]	[]	[C]	17.	Verify there is no settlement. Verify there are no voids.	
[x]	[]	[]	[C]	18.	Verify horizontal surfaces are filled to required depth.	

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DIVISION 7 — THERMAL AND MOISTURE PROTECTION —SHINGLES AND ROOFING TILES 07300

STANDARDS: RCSHSB (78) UL (93)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		SHINGLES & ROOFING TILES	<u>NOTES</u>
[]	[]	[]	[C]	1.	Verify delivered materials are of grades, types, shapes, sizes, colors, fire-rated classification and pattern texture required, as applicable.	
[]	[]	[]	[B]	2.	Carefully check subsurfaces and decking before installation and have corrected as required. Knotholes and splits should be covered.	
WOOD SHINGLES & SHAKES						
[]	[x]	[]	[B]	3.	Verify underlayment, where required, is provided and installed with proper lapping shingle style.	
[]	[x]	[]	[C]	4.	Verify exposure and fastening is as required, layout provide full shingle courses and overall alignment is controlled. Review pattern is indicated.	
[]	[]	[]	[B] [c]	5.	Verify starter courses provided, as required. Verify gutter installed if of type attached to decking.	
[]	[]	[]	[B] [c]	6.	Verify construction methods: open or closed valley construction, hip, ridge and venting construction.	
[]	[x]	[]	[C]	7.	Check flashings to be installed in conjunction with shingling.	
[]	[x]	[]	[C]	8.	Shingles narrower than 3 inches, shakes narrower than 4 inches and shingle and shakes wider than 14 inches should not be installed unless permitted by code. Verify compliance.	
[]	[x]	[]	[C]	9.	Verify that all jointing is as required and nailing is as required. Observe that nails do not penetrate underside of exposed decking.	
[]	[]	[]	[C] [b]	10.	Verify slope is as required. If roof surfaces do not have sufficient slope, contact architect before installation of roofing starts.	
[]	[x]	[]	[C]	11.	Verify interlay is performed for shake installation, as required.	
[]	[x]	[]	[C]	12.	Verify details of fire treatment or fire retardant spray coatings are appropriate for fire-resistive assemblies.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		ASPHALT SHINGLES	<u>NOTES</u>
[]	[x]	[]	[C]	13.	Verify underlayment or membrane is provided, if required.	
[]	[]	[]	[C] [b]	14.	Verify slope is as required. If roof surfaces do not have sufficient slope, contact architect before installation of roofing starts.	
[]	[]	[]	[B]	15.	Verify temperature is over 40°F.	
[]	[]	[]	[C] [b]	16.	Verify flashings are installed or on hand to be installed in conjunction with roofing.	
[]	[]	[]	[C] [b]	17.	Verify starter courses are provided, as required. Verify gutter is installed if of type attached to decking.	
[]	[]	[]	[C] [b]	18.	Verify alignment of layers and rows is maintained. Verify overall layout is made to provide full shingle courses.	
[]	[x]	[]	[C]	19.	Verify exposure required is provided and nailing is as required.	
[]	[]	[]	[B]	20.	Verify tabbing of shingles is performed, as required. Verify self-sealing shingles are installed, as required.	
SLATE SHINGLES						
[]	[x]	[]	[B] [c]	21.	See items above where applicable.	
[]	[x]	[]	[C]	22.	Verify bedding of slaters is performed at valleys, ridges, chimneys and dormers as required.	
CONCRETE & CLAY TILE						
[]	[x]	[]	[B]	23.	Verify underlayment, where required, is provided and installed with proper lapping shingle style.	
[]	[x]	[]	[C]	24.	Verify exposure and fastening, as required. Layout to provide tile courses and overall alignment is controlled. Review patterns if indicated.	
[]	[]	[]	[C] [b]	25.	Verify starter courses provided, as required. Verify gutter installed if of type attached to decking.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		CONCRETE & CLAY TILE (CON'T)	<u>NOTES</u>
[]	[]	[]	[C] [b]	26.	Verify construction method is appropriate and as specified for hips, valleys and ridges. Check manufacturer's specification or code enforcement reports for requirements for mortar at hips/ridges. If required, check for cement/sand ratio and color requirement.	
[]	[x]	[]	[C]	27.	Verify flashings to be installed in conjunction with laying of the tile. Some tile configurations may require lead flashings or flashings made from other flexible material.	
[]	[x]	[]	[C]	28.	Verify all jointing is as required and fastening is as required. Observe that nails do not penetrate underside of exposed decking. Exposed decking should be minimum of 1 inch (net) in thickness to provide adequate base to receive nails. Code requires nails to be driven into deck minimum ¾ inch or through the sheathing if less than ¾ inch thick. Verify with manufacturer's specifications or code reports.	
[]	[]	[]	[C] [b]	29.	Verify slope is as required. If roof surfaces do not have sufficient slope, contact architect before installation of roofing starts.	
[]	[]	[]	[C] [b]	30.	If wood stripping is to be installed over sheathing for purposes of anchoring tile, check for type (i.e., redwood, D.F., treated D.F., etc.), securement to sheathing, and spacing which controls tile exposure.	
[]	[]	[]	[c] [b]	31.	Before roofing contractor is allowed to commence work	
					a. If tile is to be installed over open-spaced sheathing, check spacing; and	
					b. If nailers are required at hips, ridges and eaves, check size and attachment.	
[]	[x]	[]	[C]	32.	Verify proper fastener is provided for the tile being used.	
[]	[x]	[]	[O] [b] [c]	33.	Inspect for broken or missing tile promptly as soon as roofing installation is completed. Report to general contractor and roofing contractor so that final repairs can be made before roofing contractor leaves jobsite. Protection of finished roof is the responsibility of the general contractor.	

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DIVISION 7 — THERMAL AND MOISTURE PROTECTION — MEMBRANE ROOFING 07500

STANDARDS: ASTM (19) FS (41) FM (40)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		MEMBRANE ROOFING	<u>NOTES</u>
[]	[]	[]	[B] [C]	1.	Refer to Section 07300 “Shingles, Roof Tiles, and Roof Covering” and Section 07600 “Flashing and Sheet Metal.”	
[]	[x]	[]	[B] [C]	2.	Before roofing contractor is allowed to commence work verify that:	
					a. Surfaces are free from foreign material;	
					b. Excess mortar or concrete is removed; all holes, joints, and cracks are pointed and rough or high spots are ground smooth;	
					c. Wood nailers or other attachment conditions are adequate;	
					d. Surfaces are dry to receive membrane heated asphalt, coal tar and petroleum solvent asphalt mastics. Surfaces are tested for dampness if necessary;	
					e. Slope is as required. If roof surface does not have sufficient slope, contact architect;	
					f. Pipes, conduits, and other items penetrating the membrane are in place and ready to receive flashings; and	
					g. All sheet metal and roof accessories are in place or on hand to be installed in conjunction with roofing as required.	
[]	[]	[]	[C] [b]	3.	Verify materials of types required are provided. Verify softening point of bitumen is as required. Verify materials are identifiable and comply with ASTM or FS standards. Verify roll roofing is stood on end and kept free of contact with earth or moisture. Verify protective coverings of stored roll roofing is vented so condensation will not occur.	
[]	[]	[]	[B] [c]	4.	Verify nails and fasteners are of length, shank, head and coating as required.	
[]	[]	[]	[C]	5.	Verify felts for use with asphalt are asphalt-saturated and felts for use with coal tar pitch are coal-tar saturated.	
[]	[]	[]	[B] [c]	6.	Verify surface to receive roofing is primed or otherwise prepared, if required.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		MEMBRANE ROOFING (CON'T)	<u>NOTES</u>
[]	[]	[]	[B] [c]	7.	Verify asphalt or pitch is not overheated. Check kettle thermometer. Verify methods to transport heated material are provided to avoid overcooling. Measure installation temperature. If asphalt is being used, heated requirements are EVT, plus or minus 25°F, at point of application. (EVT [Equiviscous Temperature] is the temperature at which asphalt will attain a viscosity of 125 centistokes, which is the practical and optimum temperature for wetting and fusion at the point of application.) In the event EVT information is not furnished by the manufacturer, the following maximum heating temperatures should be used as guidelines:	
					a. Dead Level Asphalt Type I 475°F maximum	
					b. Flat Grade Asphalt Type II 500°F maximum	
					c. Steep Grade Asphalt Type III 525°F maximum	
					d. Special Steep Asphalt Type IV 525°F maximum	
					e. In no case should kettle or tanker be heated above flash point. Final blowing temperature should not be exceeded for more than four hours.	
[]	[]	[]	[B] [c]	8.	Roofing materials should not be applied unless correct bitumen application temperatures can be maintained. Ensure that the correct temperatures are maintained.	
[]	[]	[]	[B] [c]	9.	Observe lap, mailing, and quantity of pitch or asphalt applied. In no case should felt touch felt; there should be no bare spots.	
[]	[]	[]	[B] [c]	10.	See that felts are laid so that each layer is free of air pockets, wrinkles and buckles. Brooming may be required. Glass fiber felts should not be broomed. Do not allow "flopping" of roofing felts, except in the application of cap sheets. See that no felt touches felt. Verify mopping is full to ply lines.	
[]	[]	[]	[B] [c]	11.	Verify all surfaces are kept moisture-free. Under no condition allow exposure of insulation or felts overnight without a mopping. Verify stored material from moisture.	
[]	[x]	[]	[B] [c]	12.	When felt layer equipment is used, observe that jets are clear and an adequate and uniform layer of bitumen is deposited.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		MEMBRANE ROOFING (CON'T)	<u>NOTES</u>
[]	[x]	[]	[B] [c]	13.	Observe installation of roofing at cant strips, vertical surfaces, reglets and penetration. Observe sealing of roofing membrane envelopes where use of envelope is required.	
[]	[x]	[]	[C]	14.	Verify concrete walls to receive roofing are primed. Verify wall membranes are properly prepared and attached or fastened as specified.	
[]	[]	[]	[B]	15.	Observe aggregates for surfacing of type, color, and size specified, clean and dry.	
[]	[]	[]	[B]	16.	Verify aggregates in quantity required is spread over flood coat while bitumen is hot.	
[]	[x]	[]	[B] [c]	17.	Verify roll roofing or cap sheet, if utilized, is of weight, selvage, finish and color, as required. Verify cap sheet installed, as required.	
[]	[x]	[]	[C] [b]	18.	Verify operations are performed in a manner to avoid plugging of drains and weeps and do not damage or interfere with adjoining surfaces.	
[]	[x]	[]	[C]	19.	Observe that roof drains are set to permit proper drainage.	
[]	[]	[]	[C] [b]	20.	Verify roofing plies are mopped into clamping ring. Verify lead collar flashing is installed and stripped in, if required.	
[]	[x]	[]	[C] [b]	21.	Verify roofing is protected from damage by other trades or by general contractor during installation and following completion. If subject to heavy traffic, movement of equipment, storage or materials or used as a work surface, verify that runways, plywood sheets, or other protection is provided.	
[]	[x]	[]	[B] [c]	22.	Observe and/or cut samples, if required. Verify patching is properly performed where samples are cut. Samples are to be taken before finish surface (aggregate, cap sheet, emulsion) is applied.	
[]	[x]	[]	[C]	23.	Verify clean-up is provided after installation, drains cleared, and debris is removed from site.	

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DIVISION 7 – THERMAL AND MOISTURE PROTECTION — FLASHING AND SHEET METAL 07600

STANDARDS: ASTM (19) CDA (37) SMACNA (82)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		FLASHING & SHEET METAL	<u>NOTES</u>
[]	[]	[]	[C] [b]	1.	Verify delivered material is of approved type, shape, gauge, metal, fabrication and priming, as required, and all accessories are provided.	
[]	[x]	[]	[C] [b]	2.	Verify isolation provisions are made for dissimilar metals. Do not allow copper and aluminum flashings to be in contact with each other or with ferrous metal. Copper or aluminum flashings are to be fastened with non-ferrous nails or screws. Ferrous equipment bases are not to be set on copper flashings. Verify flanges embedded in plastic cement or asphalt are asphalt primed.	
[]	[x]	[]	[C] [b]	3.	Verify expansion joints are provided and installed, as required or as specified. Note location of joints with respect to drains, downspouts, scuppers, corners and other outlets.	
[X]	[x]	[]	[]	4.	Observe methods of installation — nailing and cleating types for spacing and location, soldering, welding, bolting and riveting.	
[]	[x]	[]	[C]	5.	Verify flashing does not interfere with structural requirements.	
[x]	[x]	[]	[B]	6.	Generally see that edge metal is lapped a minimum of 4 inches with 12 inches staggered nailing or fastening through the back flange, unless otherwise required.	
[]	[x]	[]	[B] [c]	7.	Verify all edge metal laps are coated with sealant on horizontal flange and vertical rise. Verify coating covers entire lap and is sandwiched between.	
[]	[x]	[]	[C] [b]	8.	Verify lengths are as long as practical or specified.	
[]	[x]	[]	[C]	9.	Verify installation is coordinated with roofing and/or siding installation.	
[]	[]	[]	[C] [b]	10.	Verify nailer or cant strip is provided for fastening flashing to roof deck and is of proper material, well secured and allows venting if required or specified.	
[]	[x]	[]	[C] [b]	11.	Verify flashing is embedded and installed over roof membrane assembly with additional roofing membrane material.	
[x]	[]	[]	[C]	12.	Verify method of anchoring lower edge of fascia is as required. Observe alignment and stiffness.	

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SI	AI	EI	OI		FLASHING & SHEET METAL (CON'T)	NOTES
[]	[x]	[]	[C]	13.	Verify gravel stops are flush with deck unless otherwise required.	
GUTTERS						
[x]	[x]	[]	[B] [c]	14.	Verify gutters are adequately supported and allow for movement. Observe attachment size, type, location and spacing of hangers and supports.	
[]	[x]	[]	[C]	15.	Verify gutters are pitched, if required, and provide for drainage to outlets. Factors of settlement of wood and concrete cantilevered overhangs sometimes affect drainage pattern.	
[x]	[x]	[]	[C]	16.	Verify gutter joints are lapped in direction of flow.	
[x]	[x]	[]	[C]	17.	Verify expansion joints, concealed or standing, are provided midway between outlets or downspouts and/or as required.	
[x]	[x]	[]	[C]	18.	Verify scuppers are installed low enough not to dam water on roof. Verify overflow drains and scuppers if indicated or required by code are provided and located properly, (i.e., low point of roof) are of size required, and have correct inlet flow elevation.	
[]	[x]	[]	[C] [b]	19.	Verify accessories are provided, if required — basket strainer, bird screens and covers.	
DOWNSPOUTS						
[]	[x]	[]	[C]	20.	Verify lengths are as long as practical and in accordance with specifications.	
[]	[x]	[]	[C]	21.	Verify slip joints in direction of flow or allowance for movement is provided.	
[]	[x]	[]	[C] [b]	22.	Verify hangers or straps, as required, are provided. Verify spacing and location are as required or specified and each section is supported. Verify connection of hangers does not damage finish wall material.	
[]	[x]	[]	[C] [b]	23.	Verify contact is not made with wall surfaces except for supports.	
[]	[x]	[]	[C]	24.	Verify downspouts are installed plumb and without excessive lateral or angled joints, unless indicated or if required to conduct drainage.	
[]	[x]	[]	[C]	25.	Verify special items are furnished: heads, scuppers and linings.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		DOWNSPOUTS (CON'T)	<u>NOTES</u>
[]	[x]	[]	[B]	26.	Verify downspouts that are indicated to terminate in drainage lines are neatly fitted and are cleaned and free of building debris or other materials.	
BASE & CAP FLASHING						
[]	[x]	[]	[C]	27.	Verify flashing is provided to suit conditions: cant, size, gauge, and fabrication.	
[]	[x]	[]	[C] [b]	28.	Verify base flashing extends up sufficiently and flange is properly secured and embedded at least 4 inches in roofing membrane and is installed similarly to gravel stops. Verify mopped felt or suitable membrane covering flashings or cleats are provided. It is good practice to cover as much metal as practical to avoid movement from temperature variations.	
[]	[x]	[]	[C]	29.	Verify seams are lapped, locked and soldered, as required.	
[]	[x]	[]	[C] [b]	30.	Verify secure anchorage is provided for size, spacing and fixing of cleats or other equipment mountings.	
[]	[x]	[]	[C] [b]	31.	Verify cap flashings are of shapes, sizes and gauges required and are installed to provide secure anchorage, allow movement and have sufficient laps and spacing.	
[]	[x]	[]	[B] [b]	32.	Verify counter flashing is extended sufficiently into masonry walls or into reglet and is securely anchored and caulked, if necessary.	
OTHER ROOF FLASHING						
[]	[x]	[]	[C] [b]	33.	Verify hip and ridge flashing and venting is provided, as required. Check fabrication, size, gauge, anchorage and lap. Observe caulking and painting procedures.	
[]	[x]	[]	[C] [b]	34.	Verify valley flashing is provided, as required: open or closed, width, gauge, anchorage and lap.	
[]	[x]	[]	[C]	35.	Verify stepped flashing is provided, as required: depth of insertion into wall and length of material attached to deck and lap. Verify plastic cement or approved material is filled into joints between edges of shingles and flashing, as required.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		OTHER ROOF FLASHING (CON'T)	<u>NOTES</u>
[]	[x]	[]	[C]	36.	Verify reglets are provided at required areas; observe the setting in concrete or masonry to assure firm anchorage. Verify reglets are protected to prevent deformation or filling during installation.	
[]	[x]	[]	[C]	37.	Observe installation of sheet metal into reglets for tightness, weather-proofness, caulking and lap.	
WALL FLASHING						
[]	[x]	[]	[B] [c]	38.	Verify locations for flashings fabrication and design with contractor.	
[]	[x]	[]	[C]	39.	Verify lap, turn up, location in wall, depth in masonry, length, etc. are as required.	
[]	[x]	[]	[C] [b]	40.	Verify sill flashing and pans extend full depth, are turned up, extend beyond horns or 4 inches and are installed for proper drainage.	
MISCELLANEOUS						
[]	[x]	[]	[C]	41.	Verify louvers and vents have adequate flanges and connections for anchorage and flashings are watertight against driving rains after installation. Verify insect screen, bird screen and shutters are provided, as required.	
[]	[]	[]	[C] [b]	42.	Review drawings and specifications for sheet metal items.	
[]	[x]	[]	[C] [b]	43.	Items such as skylight, roof, hatches and fans may be suited for installation with or without flashing. Verify installation meets manufacturers' specifications when required.	
[]	[x]	[]	[C] [b]	44.	Verify plastic flashing is of type required and is installed in accordance with requirements.	
[]	[x]	[]	[C]	45.	Verify sheet metal termite shields are provided, as required.	

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DIVISION 7 — THERMAL AND MOISTURE PROTECTION— CEMENTITIOUS FIREPROOFING 07810

STANDARDS: IBC, ASTM (19)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		CEMENTITIOUS FIREPROOFING	<u>NOTES</u>
[]	[X]	[]	[C]	1.	Verify installation is by a firm approved by the sprayed fireproofing material manufacturer.	
[T]	[]	[]	[C]	2.	Verify fireproofing provides fire-resistance ratings as tested by appropriate laboratories.	
[]	[]	[]	[C]	3.	Verify manufacturers' data and instructions for proper application of sprayed fireproofing are on file.	
[T]	[]	[]	[C]	4.	Verify laboratory test results for fireproofing are on file for performance criteria such as:	
					a. Bond strength.	
					b. Compressive strength.	
					c. Deflection.	
					d. Bond impact.	
					e. Air erosion.	
					f. Corrosion resistance.	
[]	[]	[]	[C]	5.	Verify material is delivered in original unopened packages, fully identified as to manufacturer, brand or other identifying data and bears the proper Underwriters' Laboratories, Inc. labels for fire hazards and fire-resistance classification.	
[]	[]	[]	[C]	6.	Verify material is stored above ground, under cover, and in a dry location until ready for use. Ensure bags exposed to water before use are discarded as unsuitable.	
[]	[]	[]	[C]	7.	Verify temperature range is within manufacturers' recommended range.	
[]	[]	[]	[C]	8.	Verify ventilation for proper drying of the fireproofing.	
[]	[]	[]	[B]	9.	Verify surfaces to receive sprayed fireproofing are free of oil, grease, paints/primers, loose mill scale, dirt, or other foreign substances which may impair proper adhesion of the fireproofing to the substrate.	
[]	[]	[]	[C]	10.	Ensure that clips, hangers, support sleeves, and other attachments required to penetrate the fireproofing are in place.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		CEMENTITIOUS FIREPROOFING (CON'T)	<u>NOTES</u>
[]	[]	[]	[C]	11.	Verify roofing applications are completed. Ensure roof traffic is prohibited upon commencement of the fireproofing application and until the fireproofing material is cured and fully dried.	
[T]	[]	[]	[]	12.	Ensure an independent testing laboratory is to sample and verify the thickness and density of the fireproofing.	
[x]	[]	[]	[C]	13.	Check final condition of fireproofing after the work of other construction trades is completed.	

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DIVISION 8 — DOORS AND WINDOWS — METAL DOORS AND FRAMES 08100

STANDARDS: AA (2) AAMA (26) AIA (12) ANSI (16) ASTM (19) CS (35) FM (40) NAAMA (54) NFoPA (64) SDI (87) SSPC (89) UL (93)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		DOORS	<u>NOTES</u>
[]	[x]	[]	[C]	1.	Verify doors are as approved — size, type design, panel, lights, louvers and features — and have no defects such as dents, buckles or warps.	
[]	[x]	[]	[C]	2.	Verify fabrication, construction and workmanship and look for smooth edges and joints, finish and straightness.	
[]	[x]	[]	[C]	3.	Verify additional reinforcement is provided for hardware. Observe backing plates during drilling operations. Observe that closure channels are provided, as required.	
[]	[x]	[]	[C]	4.	Verify provisions to receive hardware are adequate. Observe type and installation of factory-applied hardware. Verify backset is matched to finish hardware.	
[]	[x]	[]	[C]	5.	Verify type of stile edges and astragals required for pairs of doors.	
[]	[x]	[]	[C]	6.	Verify fire-rated doors have labels and proper identification. Verify rated glass and louvers are provided, as required.	
[]	[x]	[]	[C]	7.	Observe installation and verify proper clearances are provided. Verify doors are hung straight, level and plumb.	
[]	[x]	[]	[C]	8.	Verify doors function smoothly and easily and hardware is properly adjusted.	
[]	[x]	[]	[C]	9.	Observe glazing operation.	
[]	[x]	[]	[C]	10.	Verify factory prime is retouched, factory finish is not damaged, and surfaces are adequate to receive applied finish.	
[]	[x]	[]	[C]	11.	Verify doors are cleaned. Report doors that cannot be properly cleaned. Verify protection is provided as required to avoid marring and other damage.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		DOORS (CON'T)	<u>NOTES</u>
[]	[x]	[]	[C]	12.	Verify that raised and recessed door trim and molding do not interfere with opening doors for wheelchair passage.	
[]	[x]	[]	[C]	13.	Verify doors and space at doors allow for wheelchair passage.	
FRAMES						
[]	[x]	[]	[C]	14.	Verify fabrication and construction of frame is as required. Verify smooth joints, welded if required; verify gauge, size, straightness and features are as required. Verify frames are prefabricated, if required.	
[]	[x]	[]	[C]	15.	Verify additional reinforcement is provided at head, corners and hardware locations as required.	
[]	[x]	[]	[C]	16.	Verify adequate provisions are made to receive hardware.	
[]	[x]	[]	[C]	17.	Verify proper type and number of anchors are provided. Verify adequate anchorage is made during installation.	
[]	[x]	[]	[C]	18.	Verify sound-deadening treatment is provided, if required.	
[]	[x]	[]	[C]	19.	Verify fire-rated frames have labels and proper identification.	
[]	[x]	[]	[C]	20.	Verify special light-proof, sound-proof and lead-lined frames are provided and function as required.	
[]	[x]	[]	[C]	21.	Verify frames are provided with special features such as silencer holes, if required.	
[]	[x]	[]	[C]	22.	Verify frame is grouted during installation and frame is caulked if required.	
[]	[x]	[]	[C]	23.	Verify frames are installed straight, level and plumb and adequately braced where "built in."	
[]	[x]	[]	[C]	24.	Verify priming or factory finish is provided. See also "Doors" above.	

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DIVISION 8 — DOORS AND WINDOWS — WOOD AND PLASTIC DOORS 08200

STANDARDS: AWI (27) CS (35) NEMA (60) NWMA (80) WIC (98)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		WOOD & PLASTIC DOORS	<u>NOTES</u>
[]	[X]	[]	[C]	1.	Verify rough framing for doors and jambs is as required	
[]	[X]	[]	[C]	2.	Verify doors are stored and handled properly. Ensure doors are stored flat and in clean, dry surroundings. They should be protected from dirt, water and abuse. If stored for long periods, doors should be sealed with a non-water based sealer or primer. Doors should not be exposed to excessive moisture, heat, dryness or direct sunlight. Doors should always be handled with clean hands or while wearing clean gloves. Doors should be lifted and carried, not dragged across one another. Verify doors are as approved and have identification and/or certification	
[]	[X]	[]	[C]	3.	Verify jambs for doors are blocked as required for hinges and securely anchored to rough bucks. Verify they are installed plumb and square.	
[]	[X]	[]	[C]	4.	Verify doors are as required; check grade, species, veneer cut, number of piles, match and edge banded. Observe manufacturer's instruction or standards.	
[]	[X]	[]	[C]	5.	Verify core type is as required.	
[]	[X]	[]	[C]	6.	Verify wood doors are sealed with a non-based sealer or primer. Verify top and bottoms are sealed after fitting.	
[]	[X]	[]	[C]	7.	Verify doors are factory pre-drilled, routed, cut or otherwise prefabricated when required and in accordance with hardware templates and other requirements.	
[]	[X]	[]	[C]	8.	Verify doors are installed with uniform and required tolerance. Verify doors are beveled as required and suit astragal requirements for pairs of doors.	
[]	[X]	[]	[C]	9.	Verify stiles and rails are cut a minimal amount so as not to impair integrity of door. Verify that backsets match finish hardware and stiles are not weakened.	
[]	[X]	[]	[C]	10.	Verify hardware installation does not impair integrity of door. Observe that lock blocks and other blocking is provided.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		WOOD & PLASTIC DOORS (CON'T)	<u>NOTES</u>
[]	[X]	[]	[C]	11.	Verify cut-outs for glazed lights and vents are within allowed standards of door manufacturers. Ensure edges are resealed immediately after cutting.	
[]	[X]	[]	[C]	12.	Verify clearances for acceptance of thresholds, weatherstripping, gasketing and carpeting are made.	
[]	[X]	[]	[C]	13.	Verify fire-rated doors and assemblies are provided, as required, and labels and identification are provided on door and assembly. Ensure fire-rated doors are not cut out or trimmed in any manner that would void their rating. Verify openings meet rating requirements. Verify ball-bearing type hinges or other approved alternates are used.	
[]	[X]	[]	[C]	14.	Verify plastic doors are of approved fabrication and are undamaged and protected.	
[]	[X]	[]	[C]	15.	Verify face sheets on plastic doors are lapped over stile pieces.	
[]	[X]	[]	[C]	16.	Verify doors, openings, and space at doors allow for accessibility requirements.	
[]	[X]	[]	[C]	17.	Verify provisions for cap flashing of weather exposed areas are provided.	

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DIVISION 8 — DOORS AND WINDOWS — ENTRANCES AND STOREFRONTS 08400

STANDARDS: AA (2) NAAMM (54)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		STOREFRONTS	<u>NOTES</u>
[]	[X]	[]	[B] [C]	1.	Refer to Division 8 “Hardware 08700,” Division 8 “Glazing 08800,” and Division 8 “Glazed Curtain Wall 08900.”	
[]	[x]	[]	[C]	2.	Verify components or pre-assembled panels are checked for shipping damage after uncrating; verify size, shape and thickness of metal extrusions or parts match full size details when available. Check that gauges, patterns, and colors are as approved and match samples.	
[]	[x]	[]	[C]	3.	Verify protective coating and/or lacquers are provided to proper thickness.	
[]	[x]	[]	[C]	4.	Verify shop-applied sealant is provided at shop-assembled joints, as required.	
[]	[x]	[]	[C]	5.	Verify field-applied sealant is provided, as required.	
[]	[x]	[]	[C]	6.	Verify color matches between panels and parts are within specified range.	
[]	[x]	[]	[C]	7.	Verify dissimilar metals and materials are isolated; for example, aluminum, in contact with other metals and cementitious surfaces, may require nylon, polystyrene or pressure tape, separators, or stainless steel bolts.	
[]	[x]	[]	[C]	8.	Verify field-applied sealant is of proper type and color and applied where required.	
[]	[x]	[]	[C]	9.	Verify expansion joints are provided between units, as required.	
[]	[x]	[]	[C]	10.	Verify weep holes and drainage systems are provided and are clean before and after erection.	
[]	[x]	[]	[C]	11.	Verify erection tolerances regarding horizontal and vertical alignment and plumbness are maintained.	
[]	[x]	[]	[C]	12.	Verify reveals are of consistent size and alignment.	
[]	[x]	[]	[C]	13.	Verify anchorage to structure is secure for transfer of wind load and is permanently tightened after alignment.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		STOREFRONTS (CON'T)	<u>NOTES</u>
[]	[x]	[]	[C]	14.	Verify hardware provisions have been coordinated.	
[]	[x]	[]	[C]	15.	Verify electric or pneumatic outlets and locations, if required, are provided.	
[]	[x]	[]	[C]	16.	Verify exterior is reasonably clean and free from cementitious materials after erection.	
[]	[x]	[]	[C]	17.	Verify final cleaning is performed, as required.	
[]	[x]	[]	[C]	18.	Verify doors, openings, and space at doors allow for accessibility requirements.	

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DIVISION 8 — DOORS AND WINDOWS — METAL WINDOWS 08500

STANDARDS: AA (2) AAMA (26) ANSI (16) ASTM (19) NAAMM (54) SWI (90)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		METAL WINDOWS	<u>NOTES</u>
[]	[X]	[]	[B] [C]	1.	Refer to Division 8 “Glazing 08800” for applicable items.	
[]	[x]	[]	[C]	2.	Verify delivered windows are of type, size, finish and operation as approved.	
[]	[x]	[]	[C]	3.	Verify windows are properly stored and clipped shut until hardware is installed.	
[]	[x]	[]	[C]	4.	Verify hardware is of required type, metal, finish and function.	
[]	[x]	[]	[C]	5.	Verify special items, such as window cleaner’s bolts, pull-down hooks, poles, special mullions and trim, are furnished.	
[]	[x]	[]	[C]	6.	Verify required type of glazing beads or stops are provided and are suitable to receive glass and glazing thicknesses. Verify method of fastening is as required.	
[]	[x]	[]	[C]	7.	Verify windows are set plumb, square and level in alignment and at proper location and elevation.	
[]	[x]	[]	[C]	8.	Verify windows have provision for suitable anchorage and that it is provided during installation. Verify windows are adequately braced where “built in.”	
[]	[x]	[]	[C]	9.	Verify windows are sealed as required for metal-to-metal surfaces and other surfaces. Observe that solid grouting, caulking, and backup are provided, if required.	
[]	[x]	[]	[C]	10.	Verify finish is protected and maintained during and after installation. Observe that protection against cement, plaster, acids and other harmful materials is provided.	
[]	[x]	[]	[C]	11.	Verify windows are installed to be weathertight. Observe that weeps are provided, if required, and are maintained in a clean condition.	
[]	[x]	[]	[C]	12.	Ensure dissimilar metals are isolated.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		METAL WINDOWS (CON'T)	<u>NOTES</u>
[]	[x]	[]	[C]	13.	Verify windows are properly adjusted for tolerance, clearance and operation before glazing.	
[]	[x]	[]	[C]	14.	Observe glazing operation. Verify type of sealant is as required and applied in accordance with instructions. See also Division 8 "Glazing 08800."	
[]	[x]	[]	[C]	15.	Verify cleaning of metals and glass is properly performed.	
[]	[x]	[]	[C]	16.	Verify screens of proper type, mesh and size are provided, if required, and suit installation.	
[]	[x]	[]	[C]	17.	Verify and test operable windows for hardware and friction adjustment and ease of operation on completion of installation.	

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DIVISION 8 — DOORS AND WINDOWS — HARDWARE 08700

STANDARDS: AHA (7) AHMA (8) BHMA (21A) UL (93)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		HARDWARE	<u>NOTES</u>
[]	[x]	[]	[C]	1.	Recommended order of inspection:	
					a. In hardware storage room before installation	
					b. Door butts and hinges during and after installation	
					c. Locksets, latchsets and exit devices during and after installation	
					d. Door closers after installation	
					e. Door stops, holders and push, pull, and kickplates after installation.	
[]	[x]	[]	[C]	2.	Verify hardware is installed in accordance with manufacturers' templates and instructions.	
[]	[x]	[]	[C]	3.	Verify finishes are as required and finishes match as specified.	
[]	[x]	[]	[C] [B]	4.	Verify hardware is removed and/or protected during painting and cleaning operations.	
BUTTS AND HINGES						
[]	[x]	[]	[B] [c]	5.	Verify ball bearing, oilite or nylon type is provided, as required.	
[]	[x]	[]	[C]	6.	Verify solid brass, bronze, aluminum or stainless steel is provided, if required.	
[X]	[x]	[]	[C]	7.	Verify fire-door hinges are steel with ball bearings or as otherwise approved for a labeled assembly.	
[]	[x]	[]	[C]	8.	Verify mortise-type hinges are mortised flush.	
[]	[x]	[]	[C]	9.	Verify sufficient throw is provided to clear trim and leaf can swing functionally as required.	
[]	[x]	[]	[C]	10.	Verify NRP hinges are provided as required and set screws are tightly screwed down.	
[]	[x]	[]	[B] [c]	11.	Verify one-half surface hinges are used on composite doors.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		BUTTS AND HINGES (CON'T)	<u>NOTES</u>
[]	[x]	[]	[C]	12.	See that floor hinges are set level and that door is checked for plumbness, with face closed and face and edge open.	
LOCKSETS & LATCHSETS						
[]	[x]	[]	[C]	13.	Predrilled or jig bored provides most accurate installation. After boring, ensure no planing is allowed on lockset edge.	
[]	[x]	[]	[C]	14.	Verify mortise for strike provides for full latchbolt projection. Fire assemblies require full throw and in some instances dead bolts will not latch without full projection.	
[]	[x]	[]	[C]	15.	Verify backsets are provided, as required, and clear stops.	
[]	[x]	[]	[C]	16.	Verify cylinder cores are installed with tumblers up.	
[]	[X]	[]	[C] [B]	17.	Verify hand-operated hardware, such as levers or push-pulls, is operable without requiring grasping and twisting of wrist.	
[]	[X]	[]	[C] [B]	18.	Verify hand-operated hardware meets accessibility requirements.	
[]	[X]	[]	[C]	19.	Confirm access/exit from dead-end spaces such as balconies.	
DOOR CLOSERS						
[]	[x]	[]	[C]	20.	Verify closers are attached to wood doors with through bolts and grommet nuts and to metal doors with through bolts unless otherwise specified.	
[]	[x]	[]	[C]	21.	Observe operation of closers as soon as possible after installation for proper operation, such as silent closing and smooth operation at arc opening. Verify panic devices are properly latching.	
[]	[x]	[]	[C] [b]	22.	Verify closers are adjusted by hardware supplier representative, if required, and after handling system is operational.	
[]	[x]	[]	[C] [b]	23.	Verify door operation is within required limits for accessibility, where not in conflict with fire rating requirements.	
[]	[x]	[e]	[C]	24.	Observe that voltage requirements are coordinated with electric power supplied.	

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SI	AI	EI	OI		EXIT & FLUSH BOLTS	NOTES
[]	[x]	[]	[C]	25.	Verify exit cross bars are level with both ends firmly attached to lever arms and return at same time when depressed or released. Verify top and bottom bolts are fully seated in strikes on vertical rod devices.	
[]	[x]	[]	[B] [c]	26.	Verify latch bolt enters strike and seats properly on rim or mortise lock devices. If equipped with dead-locking bolt, observe that proper operation is provided.	
[]	[x]	[]	[C]	27.	Verify label agrees with door assembly rating and no “dogging” features are allowed.	
[]	[x]	[]	[C]	28.	Verify panic bolts have mullion stabilizers at mullions unless not required, i.e. structural mullions.	
STOPS, HOLDERS AND PLATES						
[]	[x]	[]	[C]	29.	Verify every door is provided with a door stop, as required.	
[]	[x]	[]	[C] [b]	30.	Verify stops will suit anticipated conditions if furniture or equipment layout is known.	
[]	[x]	[]	[C]	31.	Verify stops or holders to be attached to wallboard and plaster are screwed to solid blocking.	
[]	[x]	[]	[B] [C]	32.	Verify wiring and outlet boxes are provided for smoke-sensing or heat-sensing devices and magnetic holders. Verify magnetic holders are installed horizontally in same location as closer to prevent doorwarp unless otherwise required.	
MISC. HARDWARE						
[]	[x]	[]	[B] [C]	33.	Verify sliding-door hardware capacity generally matches weight of door, as required.	
[]	[x]	[]	[C]	34.	Verify sliding-door tracks are installed level and door is plumb. If separate tracks are used, verify bracket supports are directly over hangers when door is open or closed (especially required on fire-rated assemblies). Verify spacing and number of brackets are provided, as required.	
[]	[x]	[]	[C]	35.	Verify thresholds are of required size, type and interlock and are anchored, as required.	
[]	[x]	[]	[C]	36.	Verify weather stripping and sound stripping allow proper operation of door.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		MISC. HARDWARE (CON'T)	<u>NOTES</u>
[]	[x]	[]	[C]	37.	Verify all hardware is complete and with required type and number of bolts, screws and fastening devices installed.	
[]	[x]	[]	[C]	38.	Verify keying instructions are followed and keys are delivered to owner, as required. Observe that construction locks are removed and permanent cores are provided.	
[]	[x]	[]	[B] [C]	39.	Verify thresholds meet accessibility requirements.	

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DIVISION 8 — DOORS AND WINDOWS — GLAZING 08800

STANDARDS: ANSI (16) FGMA (42) GTA (44) UL (93)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		GLAZING	<u>NOTES</u>
[]	[x]	[]	[C]	1.	Verify types, thickness, quality, pattern and finish of glass are as required and glass is labeled or otherwise identified.	
[]	[x]	[]	[C]	2.	Verify type, materials and methods of glazing. Verify putty, glazing compound, tape, gasketing, glazier points, screws, shims, separators, beads and special sections are as required.	
[]	[x]	[]	[B] [c]	3.	Verify surfaces to receive glass are dry, clean, and properly prepared.	
[]	[x]	[]	[B]	4.	Verify wood and steel rabbets and beads are primed before glazing, lacquer and grease are removed from metals and weathering steel is primed or otherwise prepared.	
[]	[x]	[]	[B] [c]	5.	Verify required clearance between glass and frames is provided (extremely important for plastic panes).	
[]	[x]	[]	[C]	6.	Verify heat-absorbent glass has clean-cut edges. If altered at site, see that this condition is met.	
[]	[x]	[]	[C]	7.	Verify no alteration or attempt to alter size or edge of heat-strengthened, tempered or insulating glass is made on job.	
[]	[x]	[]	[C]	8.	Verify glazing blocks and shims are provided for proper positioning and setting, as required.	
[]	[x]	[]	[C]	9.	Verify embedding requirements such as puttying and back-puttying, use of points and use of putty or compound, are as required. Observe that corrosion-resistant fasteners are used. Verify glazing compound or sealant is applied in accordance with manufacturer's requirement, including proper rod stock material.	
[]	[x]	[]	[C]	10.	Verify plastic panes are protected with covering. Verify covering is removed after installation where exposed to sunlight. Verify plastic panes are protected from paint, tar, plaster and solvents and cleaning is performed in strict accordance with manufacturers' recommendations. Look for bubbles or scratches.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		GLAZING (CON'T)	<u>NOTES</u>
[]	[x]	[]	[C]	11.	Verify patterned glass is set in exterior opening with smooth side to exterior. Verify pattern of adjacent panes is consistent.	
[]	[x]	[]	[C]	12.	Verify gasketing in metal sash is not painted.	
[]	[x]	[]	[C]	13.	Verify stop beads are securely fastened and non-removable types are used, if required.	
[]	[x]	[]	[C]	14.	Verify interior glass is installed using required sound-proofing methods and is otherwise vibration free.	
[]	[x]	[]	[C]	15.	Verify mirrors are installed as required — built-in anchorage method, concealed, non-tamperable fastening, centered on fixtures or otherwise located frames or rosettes.	
[]	[x]	[]	[C]	16.	Verify requirements for maintaining labels and protective identification on glass until final cleaning are met.	
[]	[x]	[]	[C]	17.	Verify cleaning of glass is performed properly without scratches and all surfaces are free of labels, putty, compounds and paint.	

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DIVISION 8 — DOORS AND WINDOWS — GLAZED CURTAIN WALL 08900

STANDARDS: AA (2) NAAMM (54) PEI (74) SSPC (89) SWI (90)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		GLAZED CURTAIN WALL	<u>NOTES</u>
[]	[X]	[]	[B] [C]	1.	Refer to Division 8 “Entrances and Storefront 08400,” Division 8 “Metal Windows 08500,” and Division 8 “Glazing 08800” for applicable items.	
[]	[x]	[]	[C]	2.	Verify components or pre-assembled panels are checked for shipping damage after uncrating ; verify size, shape and thickness of metal extrusions or parts match full size details when available. Check that gauges, patterns and colors are as approved and match samples.	
[]	[x]	[]	[C]	3.	Verify protective coating and/or lacquers are provided to proper thickness.	
[]	[x]	[]	[C]	4.	Verify joint sealer is provided at shop-assembled joints, as required.	
[]	[x]	[]	[C]	5.	Verify shop-applied sealant is provided, as required.	
[]	[x]	[]	[C]	6.	Verify sound deadening material and/or insulation is provided, as required.	
[]	[x]	[]	[C]	7.	Verify color matches between panels and parts are within specified range.	
[]	[x]	[]	[C]	8.	Ensure dissimilar metals and materials are isolated; for example, aluminum, in contact with other metals and cementitious surfaces, may require nylon, polystyrene or pressure tape, separators, or stainless steel bolts.	
[]	[x]	[]	[C]	9.	Verify field-applied sealant is of proper type and color and applied where required.	
[]	[x]	[]	[C]	10.	Verify expansion joints are provided between units, as required	
[]	[x]	[]	[C]	11.	Verify weep holes and drainage systems are provided and are clean before and after erection.	
[]	[x]	[]	[C]	12.	Verify erection tolerances regarding horizontal and vertical alignment and plumbness are maintained.	
[]	[x]	[]	[C]	13.	Verify reveals and align are of consistent size.	
[]	[x]	[s]	[C]	14.	Verify anchorage to structure is secure for transfer of wind load and is permanently tightened after alignment.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		GLAZED CURTAIN WALL (CON'T)	<u>NOTES</u>
[]	[x]	[]	[C]	15.	Verify debris such as spray fireproofing is removed from within curtain wall sections after erection.	
[]	[x]	[]	[C]	16.	Verify exterior is reasonably clean and free from cementitious materials after erection.	
[]	[x]	[]	[C]	17.	Verify final cleaning is performed, as required.	

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DIVISION 9 — FINISHES — LATH AND PLASTER 09200

STANDARDS: ANSI (16) GA (45) LPI (49) MLA (53) UL (93) PI (72) VI (94).

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		FRAMING & FURING	<u>NOTES</u>
[]	[X]	[]	[C]	1.	Verify materials are non-corrosive where exposed to exterior and damp conditions, if required.	
[]	[x]	[]	[C]	2.	Verify stud spacing is as required. Verify studs are doubled-up at jambs and special reinforcement and heavy gauge studs are provided, as required.	
[]	[x]	[]	[C]	3.	Verify studs are set to allow for vertical movement, such as shrinkage and slab deflection.	
[]	[x]	[]	[C]	4.	Verify studs are friction fit or securely anchored to runner tracks. Verify soundproofing, such as caulking beads, is provided at floors and walls as required.	
[]	[x]	[]	[C]	5.	Verify locations, layout and plumbness.	
[]	[x]	[]	[C]	6.	Verify channel stiffeners are provided, as required.	
[]	[x]	[]	[C]	7.	Observe special field conditions of fastening and connection for accuracy.	
[]	[x]	[]	[B] [C]	8.	Verify anchorages, blocking and plates required for other equipment support and fastening are provided and installed.	
[]	[x]	[]	[C] [b]	9.	Verify cut-outs and openings are properly framed. Verify that flashing sleeves and saddles are in place.	
[]	[x]	[]	[C]	10.	Observe size, gauge, spacing and fastening of runner and furring channels.	
[]	[x]	[]	[C] [b]	11.	Verify hangers of proper type, size and gauge are provided and are saddle-tied, bolted or clipped, as required.	
[]	[x]	[]	[C]	12.	Verify tie wire material and size for connection of channels to runners is provided and properly tied.	
[]	[x]	[]	[C]	13.	Verify ground elevation and layout of furring with controller before installation. Verify installation provides a true plane surface, plumb or level as required.	

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SI	AI	EI	OI		FRAMING & FURING (CON'T)	NOTES
[]	[x]	[s]	[C]	14.	Verify grounds and screeds are set for a true, level and plane surface and to obtain proper depth of plaster. Verify long lengths are used and, where required, splices are properly provided.	
[]	[x]	[]	[C]	15.	Verify wood grounds are provided, as required.	
[]	[x]	[]	[C]	16.	Verify corner beads, expansion devices, vent screeds, casings, trim and other accessories are provided and properly installed. Verify long lengths or single lengths are provided. Discuss control and contraction joint type, installation and method with contractor.	
[]	[x]	[]	[B]	17.	Verify frames are provided for access panels, as required.	
[]	[x]	[]	[C]	18.	Verify connections and provisions are made at corners or adjoining surfaces of different materials.	
[]	[x]	[]	[C]	19.	Verify metal lath is of type and gauge required for spacing, galvanized as required, lapped and tied. Verify ends of galvanized wire ties are bent to prevent rust. On paperbacked lath, see that wire is to wire and paper is to paper. Verify that horizontal and vertical weather lapping is provided.	
[]	[x]	[]	[B] [C]	20.	Verify gypsum lath and gypsum wallboard are provided and installed as required: staggered application, staggered back-to-back application or staggered wall-to-ceiling. Verify fastenings are provided of type and spacing required. In addition, verify for proper separation between paper backing and lath. Confirm required paper or crimped mesh spacer.	
[]	[x]	[]	[B] [C]	21.	Verify two layers of Grade D paper are installed over wood-based sheathing.	
[]	[x]	[]	[C]	22.	Verify termination of paper flashings on order underlayment are not in contact with exterior paving.	
[]	[x]	[]	[B] [C]	23.	Ensure agency inspection is performed before closing in, if required.	
PLASTER						
[]	[x]	[]	[C]	24.	Verify plaster mix, proportions and mixing equipment are as required and adequate.	

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SI	AI	EI	OI		PLASTER (CON'T)	NOTES
[]	[x]	[]	[B] [C]	25.	Verify spaces to be plastered have been heated before installation and provision is made for regulated ventilation.	
[]	[x]	[]	[B] [C]	26.	Verify masonry and concrete surfaces that are directly plastered have been roughened, cleaned and dampened and bonding requirements are met, including means to avoid telegraphing masonry joints.	
[]	[x]	[]	[B] [C]	27.	Verify setting and curing times are as required. Ensure minimum cement plaster is moist cured for a minimum of 48 hours.	
[]	[x]	[]	[C]	28.	Verify adjacent spaces and surfaces are protected during plastering operations.	
[]	[x]	[]	[C]	29.	Verify proper type of plaster required for various types of areas is provided.	
[]	[x]	[]	[C]	30.	Verify adequate lighting is provided for proper workmanship.	
[]	[x]	[]	[C]	31.	Verify proper basecoat plaster thickness is provided. Confirm scratch coat cover most of the metal or with lath, 1.x. 90 percent or more.	
[]	[x]	[]	[C]	32.	Verify cement plaster is scratched or scored horizontally only. Verify gypsum plaster is cross-scored. Verify brown coats are left flat within ¼ of 5'-0".	
[]	[x]	[]	[C]	33.	Inspect smoothness and/or texture. Smooth troweled gypsum plaster should reflect a true, even plane when inspected at an oblique angle. Verify texture is provided using method in accordance with 1 approved sample, and is uniform.	
[]	[x]	[]	[B] [C]	34.	Verify color coat is of approved mix and adequately covers undercoat. For integrally colored plaster, closely observe color appearance of sections completed at different times. Confirm need for final color fogging for color consistency.	
[]	[x]	[]	[B] [C]	35.	Verify cording, if required, is set in expansion screeds, removed at completion of each phase and completely cleared of all buildup at completion.	
[]	[x]	[]	[C]	36.	Confirm color fastness of plaster veneers while curing for color match with representative sample.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		PLASTER (CON'T)	<u>NOTES</u>
[]	[x]	[]	[C]	37.	Verify clean-up at intervals is performed and complete clean-up and debris disposal is performed at end of operations. Do not allow excessive debris to accumulate and see that precautions are taken to prevent tracking to other areas.	
[]	[x]	[]	[C]	38.	Verify that alternate curing measures will be used during extremely hot weather.	
[]	[x]	[]	[C]	39.	Verify masking is promptly removed at the end of operations.	

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DIVISION 9 — FINISHES —

GYPSUM BOARD 09250

STANDARDS: GA (45) UL (93)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		FRAMING SYSTEM	<u>NOTES</u>
[]	[X]	[]	[C]	1.	Verify material is stored in dry location and does not overload floor systems.	
[]	[x]	[]	[C]	2.	Verify metal framing materials are galvanized where exposed to exterior and damp conditions and where otherwise required. Verify wood framing materials are straight and properly cured and chemically treated for fire resistance or other properties, as required.	
[]	[x]	[]	[C]	3.	Verify stud spacing is as required, studs are doubled-up at jambs and special reinforcement and heavy gauge studs are provided as required.	
[]	[x]	[]	[C]	4.	Verify studs are set to allow for vertical movement, such as shrinkage and slab deflection.	
[]	[x]	[]	[C]	5.	Verify studs are friction fit or fastened as required to securely anchored runner track. Verify soundproofing, such as caulking beads, is provided at floors and walls, if required.	
[]	[x]	[]	[B] [C]	6.	Verify locations, layout, plumbness, and alignment.	
[]	[x]	[]	[C]	7.	Verify channel stiffeners are provided, as required.	
[]	[x]	[]	[C]	8.	Verify special field conditions of fastening and connection are observed for accuracy.	
[]	[x]	[]	[B] [C]	9.	Verify anchorages, blocking and plates required for other equipment support and fastening are provided and installed.	
[]	[x]	[]	[C]	10.	Verify cut-outs and openings are properly framed.	
[]	[x]	[]	[C]	11.	Observe size, gauge, spacing and fastening of runner and furring channels.	
[]	[x]	[]	[C]	12.	Verify hangers of proper type, size and gauge are provided and are saddle tied, bolted or clipped, as required.	
[]	[x]	[]	[C]	13.	Verify proper tie wire material and size for connection of channels to runners is provided and properly tied.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		FRAMING SYSTEM (CON'T)	<u>NOTES</u>
[]	[x]	[s]	[C]	14.	Verify elevation and layout of furring is understood. Verify installation provides a true plane surface, plumb or level, as required.	
[]	[x]	[]	[C]	15.	Verify corner beads, expansion devices, casings, trim and other accessories are provided and properly installed. Confirm long lengths or single lengths are provided as specified.	
[]	[x]	[]	[B] [C]	16.	Verify frames are provided for access panels, as required.	
[]	[x]	[]	[C]	17.	Verify connections and provisions are made at corners or adjoining surfaces of different materials.	
[]	[x]	[]	[C]	18.	Verify holes in metal studs are in alignment	
[]	[x]	[]	[C]	19.	Verify perimeter sealing or treatment is provided as required for sound or thermal isolation.	
[]	[x]	[]	[C]	20.	Verify wood studs are in alignment and out-of-line members are corrected. Verify spacing and construction are as specified.	
[]	[x]	[]	[B] [C]	21.	Verify blocking, bracing, nailers and back-up to attach gypsum board are provided. Verify whether all edges of gypsum board require continuous blocking. Verify provisions are made for required anchorage and support of other equipment.	
[]	[x]	[]	[B] [C]	22.	Verify wood materials are sufficiently dry to avoid "nail popping" due to shrinkage.	
GYPSUM BOARD						
[X]	[x]	[]	[B] [C]	23.	Verify agency inspection is performed before closing-in, if required.	
[]	[x]	[]	[C]	24.	Verify type, thickness, length and edges are as required. Verify if horizontal or vertical application is required.	
[]	[x]	[]	[C]	25.	Verify type of nail or fastener, gauge, length and spacing are provided, as required. Verify whether special screwing or nailing is, required.	
[]	[x]	[]	[C]	26.	Verify installation complies with manufacturers' recommendations or other requirements.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		GYPSUM BOARD (CON'T)	<u>NOTES</u>
[]	[x]	[]	[B] [C]	27.	Verify gypsum board is not erected until building is closed-in (depends on weather). Verify ventilation for air circulation is provided with adequate dry heat.	
[]	[x]	[]	[C]	28.	Verify fire-rated gypsum board compound and installation system is provided where required by type of construction, occupancy, or otherwise.	
[X]	[x]	[]	[C]	29.	If fire-rated, verify all penetrations are tight, sealed and otherwise as required by codes.	
[]	[x]	[]	[B] [C]	30.	Verify appropriate gypsum board is used for damp and other special locations, if required. Observe that cut edges and cut outs of moisture resistant gypsum board edges are properly sealed. Confirm horizontal joints have factory edges.	
[]	[x]	[]	[C]	31.	Verify special lengths are provided, if required.	
[]	[x]	[]	[C]	32.	Verify special installations required for soundproofing are provided. Observe method and see that isolation is achieved. See that rigid jointing is tight to obstruct passage of sound.	
[]	[x]	[]	[B] [C]	33.	Verify correct sizing for cut-outs and outlet boxes is performed to avoid patching, sound passage and thermal loss. Require sawing and do not allow scoring and knock-out.	
[]	[x]	[]	[C]	34.	Verify gypsum board is held up from floor at a minimum of 3/8".	
[]	[x]	[]	[C]	35.	Confirm gypsum board is installed with staggered application: back-to-back staggering, wall-to-ceiling staggering, and double-layer staggering. Verify gypsum board on steel stud framing is installed always working towards the open face of studs.	
[]	[x]	[]	[C]	36.	Verify vertical joints are aligned with door jambs.	
[]	[x]	[]	[C]	37.	Verify fastening is performed as required. Verify fastening is from center outward, paper surfaces are not broken and sheets are not driven together. Observe that non-metallic cable, plastic or copper piping is not close to surfaces or damaged.	
[]	[x]	[]	[C]	38.	Observe that excessive piecing or jointing is not provided. Ensure damaged sheets are not to be used and are discarded.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		GYPSUM BOARD (CON'T)	<u>NOTES</u>
[]	[x]	[]	[C]	39.	Verify taping system is of type, compound and method required.	
[]	[x]	[]	[C]	40.	Verify number of coatings required is provided, equipment and tools are suitable, sanding between coats is performed, feathering is out 12 inches to 16 inches and joints will be unnoticeable after finish is applied. Observe that curing time is adequate and check for bubbles and dimples.	
[]	[x]	[]	[B] [C]	41.	Verify type of texture or finish specified will be applied.	
[]	[x]	[]	[C]	42.	Verify types of internal and external metal corners are provided, as required. Verify gypsum board accessories are of type required.	
[]	[x]	[]	[C]	43.	Verify clean-up is performed at intervals and complete clean-up and debris disposal is performed at end of operations. Do not allow excessive debris to accumulate and see that precautions are taken to prevent tracking to other areas.	

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DIVISION 9 — FINISHES — TILE 09300

STANDARDS: ANSI (16) ASTM (19) CTI (33) FS (41) SPR (83) TCA (91)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		GENERAL	NOTES
[]	[X]	[]	[C]	1.	Verify containers are sealed upon delivery with Grade Seals identifying grades of tile as required for glazed interior and ceramic mosaic tiles (quarry, glass mosaic, cement body, and marble tiles are not grade sealed).	
[]	[x]	[]	[C]	2.	Verify tile color, sizes, patterns, shapes and type are as approved.	
[]	[x]	[]	[C]	3.	Verify trim shapes are appropriate for use and as required: bullnose edges for thinset and radius edges for mortar set.	
[]	[x]	[]	[C]	4.	Verify mastergrade certificates are delivered with tile shipment.	
[]	[x]	[]	[C]	5.	Verify grout type and color is approved.	
[]	[x]	[]	[B] [C]	6.	Verify tile color is uniform and shading of color is within acceptable tolerances.	
[]	[x]	[]	[C]	7.	Verify layout is as approved, generally with no cuts smaller than half tile size with cuts balanced and areas centered.	
[]	[x]	[]	[C]	8.	Verify pattern of layout, alignment of trim, juncture with ceiling and field tile are as specified.	
[]	[x]	[]	[C]	9.	Verify tile joints are straight and true.	
[]	[x]	[]	[C]	10.	Verify tile surfaces are true to plane, level, and plumb.	
[]	[x]	[]	[C]	11.	Verify tile corners are flush or level with adjacent tile.	
[]	[x]	[]	[C]	12.	Verify tile edges are on an even plane and smooth to touch.	
[]	[x]	[]	[C]	13.	Verify tile cuts are smooth and without jagged or flaked edges.	
[]	[x]	[s]	[B] [C]	14.	Verify bonding is complete and sound.	
[]	[x]	[s]	[B] [C]	15.	Verify finished tile is free from pits, chips, cracks or scratches.	

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SI	AI	EI	OI		GENERAL (CON'T)	NOTES
[]	[x]	[]	[C]	16.	Verify grout is uniform in color, tooled uniformly on cushion edged tiles, flush to top of square edged tiles, smooth, without voids, hard and durable.	
[]	[x]	[]	[C]	17.	Verify finished tile surface is cleaned of setting and grouting materials and do not allow muriatic acid on glazed tile.	
[]	[x]	[]	[C]	18.	Verify finished tile is protected from damage.	
[]	[x]	[]	[C]	19.	Verify tile is properly spaced, as required.	
[]	[x]	[]	[B] [C]	20.	Verify use of glass mesh mortar unit substrate conforms to manufacturers' specifications.	
[]	[x]	[]	[B] [C]	21.	Verify use of sound absorbing matting conforms to manufacturers' specifications.	
[]	[x]	[]	[B] [C]	22.	Verify surface applied accessories are fastened through tile by drilling tile or grout joints without inducing cracks.	
WALL TILE, MORTAR SET						
[]	[x]	[]	[B] [C]	23.	Verify studs and furring are properly anchored and braced.	
[]	[x]	[]	[B] [C]	24.	Verify backing for accessories and partitions is in place.	
[]	[x]	[]	[B] [C]	25.	Verify waterproof membrane is installed, if required.	
[]	[x]	[]	[C]	26.	Verify lath is properly located, lapped and tied, with galvanized lath and wires in wet areas and galvanized or painted lath in dry areas as specified.	
[]	[x]	[]	[C]	27.	Verify that the Mortar is Portland cement type without gypsum, scratch coat is fully keyed to lath and mortar bed is uniformly floated to cured scratch coat or masonry surface, maximum 3/4" thick, single or double back coats.	
[]	[x]	[]	[C]	28.	Verify that the bond coat is cement paste on uncured mortar bed or latex-portland-cement or dry set on cured mortar bed.	
[]	[x]	[]	[C]	29.	Verify wall tile is set before floor tile.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		WALL TILE, MORTAR SET (CON'T)	<u>NOTES</u>
[]	[x]	[]	[B] [C]	30.	Verify built-in accessories are set, firmly anchored and aligned with grout joints as required.	
[]	[x]	[]	[C]	31.	Verify tile is protected from movement for 48 hours after setting and 48 hours after grouting and no work is done on opposite side of wall.	
WALL TILE, THINSET						
[]	[x]	[]	[B] [C]	32.	Verify wall backing is properly secured and of specified type and water resistant if gypsum board. Verify surface is sealed as required and gypsum board penetrations are caulked with special sealant.	
[]	[x]	[]	[C]	33.	Verify setting materials are as specified, with organic adhesive on gypsum board, and dry set or latex-portland-cement on gypsum board, cementitious backer unit, masonry or cured mortar bed.	
[]	[x]	[]	[C]	34.	Verify wall tile is set before floor tile.	
[]	[x]	[]	[B] [C]	35.	Verify built-in accessories are set, firmly anchored and aligned with grout joints as required.	
[]	[x]	[]	[C]	36.	Verify tile is protected from movement for 48 hours after setting and 48 hours after grouting and no work on opposite side of wall is allowed.	
FLOOR TILE						
[]	[x]	[]	[B] [C]	37.	Verify non-slip tile is provided for required areas.	
[]	[x]	[]	[C]	38.	Verify all masonry thresholds or metal edge bars are set to finish grade.	
[]	[x]	[]	[B] [C]	39.	Ensure floor drains are set to finish grade at low point.	
[]	[x]	[]	[B] [C]	40.	Verify floor and/or mortar bed are uniformly sloped for drainage and accessibility as required.	
[]	[x]	[]	[C]	41.	Verify expansion joints are located and of type required.	
[]	[x]	[]	[B] [C]	42.	Verify substrate is clean and dry, without bumps and hollows for thinset application.	
[]	[x]	[]	[B] [C]	43.	Verify waterproof membrane or cleavage membrane is properly installed for mortar bed application.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		FLOOR TILE (CON'T)	<u>NOTES</u>
[]	[x]	[]	[C]	44.	Verify mortar bed is properly reinforced.	
[]	[x]	[]	[C]	45.	Verify mortar bed for plastic bed is installed as work progresses and ensure excessive bed is not placed to avoid initial set.	
[]	[x]	[]	[C]	46.	Verify bond coat is cement paste on plastic mortar bed, dry set or latex-portland-cement on cured mortar bed or concrete, organic adhesive on concrete or plywood and epoxy on cured mortar bed, concrete or plywood.	
[]	[x]	[]	[B] [C]	47.	Verify tile is tamped in to assure good bond and excess bond coat immediately removed before set up.	
[]	[x]	[]	[B] [C]	48.	Where epoxy grouted verify tile is wax coated on face and ensure no wax is on back or edges.	
[]	[x]	[]	[C]	49.	Ensure tile is protected from traffic and dirt for 48 hours after setting and 48 hours after grouting.	

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DIVISION 9 — FINISHES — TERRAZZO 09400

STANDARDS: ASTM (19) NTNA (70)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		TERRAZZO	<u>NOTES</u>
[]	[x]	[]	[B] [C]	1.	Verify substrate to receive terrazzo will provide good bonding and is clean and free of oil, dirt and other deleterious matter.	
[]	[x]	[]	[C]	2.	Verify required divider strips, inserts and reinforcements are provided and layout and spacing are understood. See that secure anchorage, proper elevation and tight joints are provided. Verify expansion strips are provided, as required.	
[]	[x]	[]	[B] [C]	3.	Verify precast materials are on hand as approved and installed as required.	
[]	[x]	[]	[C]	4.	Verify base beads or temporary screeds are in place and of required height.	
[]	[x]	[]	[C]	5.	Verify type of nonslip surface specified is installed where indicated.	
[]	[x]	[]	[C]	6.	Verify conductive terrazzo is installed, as required.	
[]	[x]	[]	[C]	7.	Ensure surfaces to receive terrazzo are moistened.	
[]	[x]	[]	[C]	8.	Ensure proper curing provisions are observed.	
[]	[x]	[]	[C]	9.	Verify grinding operations produce a smooth, true, even surface of good visual appearance.	
[]	[x]	[]	[C]	10.	Verify moisture control due to grinding operations is provided in adjacent areas.	
[]	[x]	[]	[C]	11.	See that hard-to-get-at spaces are rubbed.	
[]	[x]	[]	[C]	12.	Verify surfaces are cleaned of stains, cement and smears.	
[]	[x]	[]	[C]	13.	Verify finish sealer is provided and applied, as required.	
[]	[x]	[s]	[C]	14.	Verify finish floor is protected, properly cured and not subject to abuse during remainder of construction.	
[]	[x]	[s]	[C]	15.	Verify color matches aggregate and matrix of color sample.	
[]	[x]	[]	[C]	16.	Verify material is the specified thickness.	

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DIVISION 9 — FINISHES — WOOD FLOORING 09640

STANDARDS: MFMA (50) NOFMA (65) WFI (97)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		WOOD FLOORING	<u>NOTES</u>
[]	[x]	[]	[B] [C]	1.	Verify areas to receive flooring are closed-in and adequate temperature of above 50° is provided and maintained. Do not allow overheating.	
[]	[x]	[]	[B] [C]	2.	Verify interior surfaces such as plaster, concrete and masonry are dry. Obtain moisture meter test, if required.	
[]	[x]	[]	[C]	3.	Verify delivered material is of grade size, type and species specified and stored in area at least 72 hours before installation.	
WOOD STRIP FLOORING						
[]	[x]	[]	[C]	4.	Verify floor material temperature has been conditioned.	
[]	[x]	[]	[B] [C]	5.	Verify subfloor surface is securely nailed, level, even jointed, cleaned and free of defects that might affect finish flooring.	
[]	[x]	[]	[B] [C]	6.	Verify felt paper (“slip sheet”) or underlayment is provided as required.	
[]	[x]	[]	[C]	7.	Verify expansion space is provided at perimeter of flooring, as required.	
[]	[x]	[]	[C]	8.	Verify joints are driven up tight and tongue is undamaged.	
[]	[x]	[]	[C]	9.	Verify nails or fasteners are of type and size approved and pre-drilling is provided, if required. Ensure nails are diagonally driven, usually 8d, spiral, screw or cut type as required, and usually spaced at 12”cc. with both ends of each strip nailed.	
[]	[x]	[]	[C]	10.	Verify end joints are alternated to provide at least two courses between joints.	
[]	[x]	[]	[C]	11.	Verify specified pattern, border, grain, field direction, feature and strips before installation.	
[]	[x]	[]	[B] [C]	12.	Ensure warped and twisted material is not used.	
[]	[x]	[]	[C]	13.	Verify short pieces and varied colors are spread throughout floor and not concentrated or utilized in closets.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		WOOD STRIP FLOORING (CON'T)	<u>NOTES</u>
[]	[x]	[]	[B] [C]	14.	Verify sleepers are of material required, and are set and securely anchored over subsurface required and ventilation method is effective.	
PARQUET FLOORING						
[]	[x]	[]	[B] [C]	15.	Verify surface of substrate, if concrete, is dry, even, level at joints, clean and otherwise acceptable. Ensure moisture meter test is performed, if required.	
[]	[x]	[]	[B] [C]	16.	Verify vapor barrier, waterproof membrane or other treatment is provided, as required.	
[]	[x]	[]	[C]	17.	Verify adhesives or application materials are non-toxic as approved. Verify installation complies with manufacturers' recommendations or as otherwise required.	
[]	[x]	[]	[C]	18.	For prefinished material, observe that joints are even and within tolerances required.	
MISCELLANEOUS						
[]	[x]	[]	[C]	19.	Verify sanding is performed using methods and materials required and produces a smooth, acceptable surface. Observe sanding in hard-to-get-at spaces. It is recommended that sanding be delayed until other finishing operations are complete.	
[]	[x]	[]	[C]	20.	Verify fillers, stains and floor finish materials are provided and applied as recommended by manufacturer or as required.	
[]	[x]	[]	[C]	21.	Verify protection is provided, as required. Observe that floors and stair treads are protected from droppings, paint and traffic. See that heavy equipment is lifted, not dragged, into place.	
[]	[x]	[]	[C]	22.	Verify floor waxing and buffing is provided, as required.	

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DIVISION 9 — FINISHES —

RESILIENT FLOORING 09650

STANDARDS: FS (41) NPA (67) RFCA (80) RMA (81)

SI	AI	EI	OI		RESILIENT FLOORING	NOTES
[]	[x]	[]	[C]	1.	Verify type, size, thickness, pattern and color of material are as approved. Use single lot for any one area.	
[]	[x]	[]	[C]	2.	Verify primer, adhesive or cement is as required.	
[]	[x]	[]	[C]	3.	Verify base complies with approvals concerning size, thickness, cove, color and type, as well as molded exterior, interior and ends.	
[]	[x]	[]	[B] [C]	4.	On slabs, verify substrate is free of cracks, holes, trowel marks and other defects. Surfaces are primed, if required.	
[]	[x]	[]	[B] [C]	5.	On slabs, verify all patching, grinding and correction of defects is performed before installation; verify all areas are dry, hard and non-powdery and moisture test is performed, as required.	
[]	[x]	[]	[B] [C]	6.	Verify that nailing or fastening on wood subfloors is adequate and non-rising fasteners are used. Test for squeaks. Verify subfloors are filled and sanded before installation, using filler as recommended by manufacturer or as specified, and all defects are corrected.	
[]	[x]	[]	[C]	7.	Verify all areas are cleaned before installation.	
[]	[x]	[]	[C]	8.	Verify underlayment ("slip sheet") and felt lining are provided, as required.	
[]	[x]	[]	[C]	9.	Verify floor material is stored at proper temperature before installation, as required, and area temperature is maintained during and after installation.	
[]	[x]	[]	[C]	10.	Verify rolled material is unrolled at least 24 hours before installation, if required.	
[]	[x]	[]	[B] [C]	11.	Verify floor material is installed in proper sequence to minimize damage by other trades.	
[]	[x]	[]	[C]	12.	Verify pattern matching is observed in sheet material installation. Observe evenness of color.	
[]	[x]	[]	[C]	13.	Verify direction of tile is as specified and layout is as specified. Allow ½ tile minimum at border.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		RESILIENT FLOORING (CON'T)	<u>NOTES</u>
[]	[x]	[]	[C]	14.	If more than one lot of tile is used in one area, ensure all material is pre-shuffled to achieve random distribution.	
[]	[x]	[]	[C]	15.	Verify cement is applied at proper rate and has proper dryness or tackiness.	
[]	[x]	[]	[C]	16.	Observe neatness of cutting and fitting. Verify joints and seams are tight and level.	
[]	[x]	[]	[C]	17.	Verify sheet flooring is rolled with 150-pound roller, starting from center, to eliminate air bubbles and wrinkles.	
[]	[x]	[]	[C]	18.	On top set base, observe that firm contact is obtained to floor and wall.	
[]	[x]	[]	[C]	19.	Verify minimum length of pieces is observed.	
[]	[x]	[]	[C]	20.	Verify pre-formed corners and ends stops are provided, if required.	
[]	[x]	[]	[C]	21.	Ensure gun application of adhesive for base is not allowed.	
[]	[x]	[]	[C]	22.	On coved base, observe proper trim and use of non-rusting nails, as required.	
[]	[x]	[]	[C]	23.	Verify that provision for thresholds, breaks and joining to adjacent materials are understood.	
[]	[x]	[]	[B] [C]	24.	Verify level joining at flush floor electrical cover plates and cleanout.	
[]	[x]	[]	[B] [C]	25.	Verify excess adhesive, material and stains are removed immediately after installation.	
[]	[x]	[]	[C]	26.	Verify scuffed, broken or discolored tile is replaced. Recheck at completion of work and observe looseness, bubbles or substrate defects.	
[]	[x]	[]	[C]	27.	Observe application of wax when required. (Do not allow factory finish to be stripped unless specified.)	
[]	[x]	[]	[C]	28.	Ensure temporary protective cover is provided, if required.	

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DIVISION 9 — FINISHES — CARPET 09680

STANDARDS: ASTM (19) CRI (32) FS (41) NPA (67) RFCA (80)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		CARPET	<u>NOTES</u>
[]	[x]	[]	[B] [C]	1.	Verify substrate is acceptable. Check plywood subfloors for secure nailing to avoid “nail pops” and squeaking. Verify large splits, knots or unlevel areas are filled, patched with proper material and sanded flat. Make similar observation of concrete floors, with attention paid to levelness of joints (to be ground smooth).	
[]	[x]	[]	[B] [C]	2.	Verify substrate is properly leveled, cleaned and vacuumed.	
[]	[x]	[]	[B] [C]	3.	Verify areas are sufficiently finished before carpet is laid to avoid undue traffic, construction debris and damage exposure.	
[]	[x]	[]	[C]	4.	Verify pad is not exposed to weather. Do not allow wet or damp pad to be installed.	
[]	[x]	[]	[C]	5.	Verify supplied materials are as approved, including special features such as flame resistance, sound absorptivity and static. Double-check padding requirements.	
[]	[x]	[]	[C]	6.	Confirm carpet was unrolled for 24 hours before installation.	
[]	[x]	[]	[B] [C]	7.	Verify conditions of thresholds and edges joining other materials before installation. Give special attention to trench duct cover plates and other floor outlets.	
[]	[x]	[]	[C]	8.	Verify same color (dye) run is used in one area and matches approved sample.	
[]	[x]	[]	[C]	9.	Verify material is laid in same direction and in conformance with seaming diagram.	
[]	[x]	[]	[B] [C]	10.	Verify whether seam and pattern layout is understood. If layout is not specified, arrange so that seams are located to avoid high traffic areas or highly visual areas as much as possible. Do not allow cross seams.	
[]	[x]	[]	[C]	11.	Verify seam cuts are made along weave line and no dimpling or puckering occurs along finished seam.	
[]	[x]	[]	[C]	12.	Confirm normal overage of carpet is provided. Do not allow excessive seams.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		CARPET (CON'T)	<u>NOTES</u>
[]	[x]	[]	[C]	13.	Verify conditions of installation at stairways, cut outs, protrusions and access areas.	
[]	[x]	[]	[C]	14.	Confirm use of standard or oversize tape.	
[]	[x]	[]	[C]	15.	Verify carpeted areas are properly cleaned and protected as required. Confirm unauthorized persons are to be kept out.	
[]	[x]	[]	[C]	16.	Scraps over 2 sq. ft. and larger than 8 inches wide may be required for owner maintenance. Verify arrangements made for receipt of excess material.	
[]	[x]	[]	[C]	17.	In large open floor areas, review manufacturer's roll sequence numbers. Give special attention to directional patterns and confirm installation is as indicated on drawings or specifications.	

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DIVISION 9 — FINISHES — ACOUSTICAL TREATMENT 09800

STANDARDS: AIMA (1)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		SUSPENSION SYSTEMS	<u>NOTES</u>
[]	[x]	[]	[C]	1.	Verify layout of suspended system is understood and coordinated with work of other trades to allow adequate plenum space and avoid interference.	
[]	[x]	[]	[C]	2.	Verify hangers of proper material, gauge, and spacing are provided, as required. Verify intermediate hangers and bridging are provided as required by field conditions.	
[]	[x]	[]	[C]	3.	Verify hangers anchored to concrete support systems are installed as required and fastened by twisting around rebar, to devices installed by powder-actuated anchors, to devices with expansion shields drilled into concrete or other approved method providing adequate support.	
[]	[x]	[]	[C]	4.	Verify hangers anchored to wood-support systems are installed as required and fastened by screws, nails, drilled holes or other approved method that provides adequate support. Observe number of twists. Verify minimum number of twists are provided, as required.	
[]	[x]	[]	[C]	5.	Verify hangers anchored to steel support systems are installed, as required.	
[]	[x]	[]	[C]	6.	Verify isolators are provided and installed in accordance with manufacturers' requirements.	
[]	[x]	[]	[C]	7.	Verify turnbucklers are provided, if required.	
[]	[x]	[]	[C]	8.	Verify sway and seismic bracing is provided, if required.	
[]	[x]	[]	[C]	9.	Verify suspension system, components, and accessories are provided and installed as specified.	
[]	[x]	[]	[C]	10.	Verify perimeter and edge conditions are provided and installed, as required. Ensure joint treatment is consistent.	
[]	[x]	[]	[C]	11.	Verify system is installed and adjusted in true alignment and is square and level.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		SUSPENSION SYSTEMS (CON'T)	<u>NOTES</u>
[]	[x]	[]	[B] [C]	12.	Verify system does not receive loading from other equipment, fixtures or materials not included in its design.	
[]	[x]	[]	[C]	13.	Verify fire-rated systems are installed in accordance with UL requirements. Ensure hold-down clips are required if acoustical material is less than one pound per square foot.	
[]	[x]	[]	[C]	14.	Verify access to equipment above ceiling is provided, as required. Verify identification of access is provided by use of labels on "T" bars, colored pins or as required.	
[]	[x]	[]	[C]	15.	Verify sound isolation elements above ceiling are provided and installed, as required.	
[]	[x]	[]	[C]	16.	Verify fire blankets or rated hats over recessed light fixtures and mechanical outlets are provided, as required.	
[]	[x]	[]	[C]	17.	Verify exposed rivets are painted out.	
ACOUSTICAL TILE & BOARD						
[]	[x]	[]	[C]	18.	Verify material is of type, thickness, material, pattern, and edge condition specified.	
[]	[x]	[]	[C]	19.	Verify material is installed in accordance with mounting specified.	
[]	[x]	[]	[C]	20.	Verify adhesives and air space are in accordance with manufacturers' instructions.	
[]	[x]	[]	[C]	21.	If tile is to be sprayed, verify paint material is approved for application and will not affect acoustical performance of tile.	
ACOUSTICAL INSULATION & BARRIERS						
[]	[x]	[]	[C]	22.	Verify batts are of thickness and density required and are identified.	
[]	[x]	[]	[C]	23.	Verify batts are installed tightly to all adjoining surfaces, cutouts and edges and all spaces are completely filled.	
[]	[x]	[]	[C]	24.	Verify suspended insulation is well secured, tight fitting and sealed as required.	
[]	[x]	[]	[C]	25.	Verify wall insulation is provided and installed in locations as required before installation of finish surfaces.	
[]	[x]	[]	[C]	26.	Verify accoustical pads are provided at outlet boxes (minimum stocking: 1-2 stud spaces), if required.	

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DIVISION 9 — FINISHES — PAINTS AND COATINGS 09900

STANDARDS: FS (41) NPVLA (66)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		PAINTS & COATINGS	<u>NOTES</u>
[]	[x]	[]	[B] [C]	1.	Verify storage area for painting materials is well ventilated and used rags and debris are removed from storage area.	
[]	[x]	[]	[C]	2.	Verify color schedule is complete and understood. Verify approved color samples are on jobsite and jobsite “paint-outs” are matched against samples. Before application, confirm stopping points for change of color and finish. Confirm requirements for field mock-ups.	
[]	[x]	[]	[C]	3.	Verify all materials are new and materials are products of same manufacturer, if required. Verify containers are adequately identified. Do not allow containers showing evidence of broken seal.	
[]	[x]	[]	[B] [C]	4.	Verify surfaces to receive paint are dry. Ensure moisture meter tests on plaster, concrete or masonry surfaces are made, if required. Damp, not wet, surfaces are allowed for water-thinned paints.	
[]	[x]	[]	[B] [C]	5.	Verify surfaces to receive paint are sanded, holes are puttied or filled and pitch pocket, knot and shakes are shellacked or treated and otherwise cleaned of deleterious substances. Verify metal surfaces are treated, primed or otherwise cleaned, as required.	
[]	[x]	[]	[C]	6.	Confirm special requirements for renovation work.	
[]	[x]	[]	[B] [C]	7.	Verify areas are suitably cleaned and free of conditions affecting drying and finish.	
[]	[x]	[]	[B] [C]	8.	Verify dust control is maintained.	
[]	[x]	[]	[B] [C]	9.	Verify temperature conditions for type of paint are provided and heating is provided sufficiently in advance in order to have surfaces up to temperature and to avoid condensation.	
[]	[x]	[]	[B] [C]	10.	Verify adequate lighting is provided for proper working conditions.	
[]	[x]	[]	[C]	11.	Verify protection of adjacent areas, surfaces and items is provided. Verify hardware, trim, fixtures and similar items are removed during painting operations or otherwise suitably protected. Verify clean drop cloths are provided over finished surfaces.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		PAINTS & COATINGS (CON'T)	<u>NOTES</u>
[]	[x]	[]	[C]	12.	Occasionally observe the mixing and thinning of paints. Thinning should be controlled and the need demonstrated.	
[]	[x]	[]	[C]	13.	Verify required number of coats is provided. Verify tinting of undercoats is performed, if required. Verify opacity is being achieved.	
[]	[x]	[]	[C]	14.	Confirm texture and method of application — spray, brush, or roller - before application.	
[]	[x]	[]	[B] [C]	15.	Verify lumps or bumps do not appear on applied coats. These imperfections indicate improper area cleaning and dust control, paint drying in cans due to excessive exposure or being on “shelf” too long or dirty brushes and rollers. Straining may be done in some instances; otherwise, paint should not be used.	
[]	[x]	[]	[C]	16.	Verify workmanship and application are adequate. Do not allow runs, drops, laps, brush marks, “lace curtains” or variations in color, texture and finish.	
[]	[x]	[]	[C]	17.	Keep paint records of areas being painted on large jobs.	
[]	[x]	[]	[C]	18.	Recommend that an electric trim plate be used for checking outlet boxes to avoid later patching and refinishing.	
[]	[x]	[]	[C]	19.	Verify doors receive first coats on both faces of wood at essentially the same time. Observe that tops and bottoms receive treatment.	
[]	[x]	[]	[C]	20.	Verify curing time required between coats is provided.	
[]	[x]	[]	[C]	21.	Verify sealers, fillers and stains are applied and treated, as required. Verify putty is not applied until after stain or priming and matches stained wood.	
[]	[x]	[]	[C]	22.	Verify hard-to-get-at places, such as bottoms of shelves and back of trim in corners, are painted.	
[]	[x]	[]	[C]	23.	Verify correction of all unsuitable work is made promptly. Confirm cleanup of area and removal of splatters and smears are made as soon as possible on adjacent surfaces.	
[]	[x]	[]	[C]	24.	Verify marking of stairs and platforms for accessibility requirements.	

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DIVISION 12 — FURNISHING — MANUFACTURED CASEWORK 12300

STANDARDS: AWI (27) WIC (98)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		MANUFACTURED CASEWORK	<u>NOTES</u>
[]	[x]	[]	[B] [C]	1.	Verify blocking is provided to receive materials, as required.	
[]	[x]	[]	[C]	2.	Verify certificates or grade stamps are provided.	
[]	[x]	[]	[C]	3.	Verify materials are not delivered before closing-in building and are suitably stored.	
[]	[x]	[]	[C]	4.	Verify materials have adequate temporary bracing and skids to prevent wracking, loosened members or other defects due to handling.	
[]	[x]	[]	[C]	5.	Verify species, cut and finishes are as required. Visually inspect exposed surfaces for evenness. Match with selected flitch.	
[]	[x]	[]	[C]	6.	Verify doors are properly fitted with a uniform clearance on all edges.	
[]	[x]	[]	[C]	7.	Verify drawers have required guides and operate smoothly.	
[]	[x]	[]	[C]	8.	Verify internal features are provided.	
[]	[x]	[]	[C]	9.	Verify method of attachment is as required.	
[]	[x]	[]	[C]	10.	Verify installation of floor-set cabinets is over a finished floor or mounted directly on subfloor.	
[]	[x]	[]	[C]	11.	Verify accessories such as scribe and trim molds are provided.	
[]	[x]	[]	[C]	12.	Verify base and toe space will suit adjacent conditions.	
[]	[x]	[]	[C]	13.	Verify installation of base cabinets is suitably shimmed to distribute weight uniformly and suit field conditions.	
[]	[x]	[]	[C]	14.	Verify installed materials are suitably protected against damage.	
[]	[x]	[]	[C]	15.	Verify specified hardware is provided. Verify job-installed hardware is as approved.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		MANUFACTURED CASEWORK (CON'T)	<u>NOTES</u>
[]	[x]	[]	[C]	16.	Verify tops are provided, as required. Verify cutting of holes for sinks and other appliances is performed, as required. Verify cuts are sealed to preclude moisture penetration behind finish.	
[]	[x]	[]	[C]	17.	Verify tops to receive other materials, such as tile vinyl and marble, have proper provisions.	
[]	[x]	[]	[C]	18.	Verify requirements are met for access for persons with physical disabilities to kitchen counters and lavatory countertops.	

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DIVISION 12 — FURNISHING — WINDOW TREATMENTS 12500

STANDARDS: UL (93)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		DRAPERY	<u>NOTES</u>
[]	[x]	[]	[B] [C]	1.	Verify blocking and backing are provided, as required.	
[]	[x]	[]	[C]	2.	Verify stacking and panel overlapping are provided, as required.	
[]	[x]	[]	[C]	3.	Verify rods are supported adequately to prevent sagging.	
[]	[x]	[]	[C]	4.	Verify location and height of controls is understood.	
[]	[x]	[]	[C]	5.	Verify material is flame-proofed, as required.	
[]	[x]	[]	[C]	6.	Verify non-rusting weights are provided.	
[]	[x]	[]	[C]	7.	Ensure carriers are provided as necessary.	
[]	[x]	[]	[C]	8.	Verify by-passing arms are provided for by-parting types.	
[]	[x]	[]	[C]	9.	Verify fullness required (usually 2½ times).	
[]	[x]	[]	[C]	10.	Verify type and length of batons required are provided.	
[]	[x]	[]	[C]	11.	Verify carriers run freely, especially on curved track.	
[]	[x]	[]	[C]	12.	Verify backing is provided, as required.	

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**DIVISION 13 — SPECIAL CONSTRUCTION —
SUPPRESSION 13900
DIVISION 15 —MECHANICAL —
FIRE PROTECTION PIPING 15300**

STANDARDS: CDA (37) NFPA (63) UL (93)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		FIRE SUPPRESSION SYSTEMS	<u>NOTES</u>
[]	[]	[m] [f]	[B] [C]	1.	Verify temporary protection is provided during construction, as required.	
[X]	[]	[M] [F]	[B] [C]	2.	Verify approval of system by local/state fire and insurance authorities is received as required before installation and work is coordinated with other trades to avoid congestion and interference.	
[]	[]	[m] [f]	[B] [C]	3.	Verify location of siamese connections, post indicators, hose and threading connections and alarm system has been approved by local fire department.	
SPRINKLER SYSTEM						
[]	[]	[m] [f]	[B] [C]	4.	Verify approved layout has been coordinated with other drawings as to head and pipe routing to avoid conflict with structure, lighting fixtures, ductwork and diffusers. Verify installation conforms with approved drawings.	
[]	[]	[m] [f]	[B] [C]	5.	Verify location of concealed and exposed lines is understood.	
[]	[]	[m] [f]	[B] [C]	6.	Verify fire protection system serving other occupied buildings is not interrupted or shut off during construction.	
[]	[]	[m] [f]	[B] [C]	7.	Verify main service, distribution, gong or alarm locations and space provisions.	
[]	[]	[m] [f]	[C]	8.	Observe installation for pipe, size, fittings and valves pipes are reamed, valves are accessible, gravity slope to drain is provided, hangers of proper type and spacing are rigidly installed, branch piping is off top of main and no unscheduled cutting of structural members occurs.	
[t]	[]	[m] [f]	[B] [C]	9.	Verify inspection test connections and low point plugs. Verify holes through fire walls are plated and sleeved as required by applicable standards.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		SPRINKLER SYSTEM (CON'T)	<u>NOTES</u>
[t]	[]	[m] [f]	[B] [C]	10.	Verify heads for spaces are provided as required and installed in accordance with NFPA. Ensure all heads are new, unpainted, properly temperature-rated, provided with guards where subject to mechanical injury and have required clearances.	
[]	[]	[m] [f]	[B] [C]	11.	Verify drainage valves or plugs allow complete drainage of entire system and are located so as not to cause water damage.	
[]	[]	[m] [f]	[B] [C]	12.	For wet pipe systems, check alarm, valve assembly conformance and water flow indicators for conformance with connection diagram. Observe test of waterflow alarm signal.	
[]	[]	[m] [f]	[B] [C]	13.	For dry pipe systems, check valve installation for conformance with connection diagram. Verify proper installation of air compressors and tanks is provided. Observe test of alarm signal time, etc.	
[]	[]	[m] [f]	[B] [C]	14.	Verify all alarm devices have been provided and are in operable condition.	
[]	[]	[m] [f]	[B] [C]	15.	Verify electric power, if used, is supplied as required.	
[]	[]	[m] [f]	[B] [C]	16.	Ensure alarm tie-in system is made with fire department, if required.	
[]	[]	[m] [f]	[B] [C]	17.	Verify system is completely cleaned, painted, insulated, tested and approved, as required. Confirm system is flushed free of debris.	
[]	[]	[m] [f]	[B] [C]	18.	Verify spare heads are provided, as required.	
[]	[]	[m] [f]	[B] [C]	19.	Verify expansion requirements are provided for at building expansion joints and where required.	
[]	[]	[m] [f]	[B] [C]	20.	Verify system supports, anchorage and sway bracing are in accordance with NFPA.	
OTHER SYSTEMS & EQUIPMENT						
[]	[]	[m] [f]	[B] [C]	21.	Verify wet standpipe cabinets of proper type, size, and base length are provided, located, and installed as required. Confirm valve is not over 5'6" above floor.	
[]	[]	[m] [f]	[B] [C]	22.	Verify dry standpipes and hose valve are located and installed in accordance with NFPA.	
[]	[]	[m] [f]	[B] [C]	23.	Verify extinguishers and cabinets of proper size and type are provided, located, and installed as required. Verify that extinguishers are new and are activated so as to be operational.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		OTHER SYSTEMS & EQUIPMENT (CON'T)	<u>NOTES</u>
[]	[]	[m] [f]	[B] [C]	24.	Verify location of alarms.	
[X]	[X]	[M] [F]	[B] [C]	25.	Verify that all installations meet accessibility requirements.	

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DIVISION 15 — MECHANICAL — PLUMBING FIXTURES AND EQUIPMENT 15400

STANDARDS: AGA (6) AWWA (24) HI (47) PPI (73)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		PLUMBING FIXTURES	<u>NOTES</u>
[]	[]	[M] [p]	[B] [C]	1.	Verify grades and location of piping with respect to other features of the building are understood.	
[]	[]	[m] [p]	[B] [C]	2.	Verify existing lines are coordinated to avoid congestion or interference. Verify excavation of stubs or lines to which connection will be made is performed before trenching for new work.	
[]	[]	[m] [p]	[B] [C]	3.	Verify number, size and locations of sleeves before foundations, slabs, walls and floors are placed. Verify adequacy of slopes to receive insulation, caulking or other requirements.	
[]	[]	[m] [p]	[B] [C]	4.	Allow no unscheduled cutting of structural members. See that special provisions for pipes passing through or parallel to footings are met, as required. Allow no overcutting of holes and weakening of framing. Verify that plates and straps are provided.	
[]	[]	[m] [p]	[B] [C]	5.	Verify pipe supports, hangers and anchorages are provided and spaced as required. Verify isolation between pipe and support is provided, as required.	
[]	[]	[m] [p]	[B] [C]	6.	Verify expansion requirements are provided for at building expansion joints and where required	
[]	[]	[m] [p]	[B] [C]	7.	Verify protection is provided to keep concrete, trash and debris out of lines. Verify capping and plugging is as required. Verify lines are cleaned and thoroughly flushed at completion.	
[]	[]	[m] [p]	[B] [C]	8.	Verify manufacturers' recommendations (in submittals) are adhered to unless otherwise noted.	
[]	[]	[m] [p]	[B] [C]	9.	Verify pipe supports and earthquake bracing are provided, as required.	
PIPE & PIPE FITTINGS-GENERAL						
[]	[]	[m] [p]	[B] [C]	10.	Verify pipes to be threaded are squarely cut, threaded and reamed properly. Verify equipment used is adequate. Verify joints are wiped clean.	
[]	[]	[m] [p]	[B] [C]	11.	Verify pipes to be soldered are cut with tool, reamed, brightened, and soldered using flux and solder required. Verify pipes and fittings weakened by overheating are replaced. Verify nonlead solder is used. Verify piping for medical gas service conforms to the requirements of NFPA. Verify piping is prepared as required by NFPA, including reaming, deburring, and brazing without flux. Verify certified welder/brazer requirements.	

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[]	[]	[m] [p]	[B] [C]	12.	Verify pipes with flanged joints are properly gasketed. Ensure drift pins and spud wrenches are not used.	
[]	[]	[m] [p]	[B] [C]	13.	Verify pipes to be welded are properly prepared. Verify welder is certified, if required.	
[]	[]	[m] [p]	[B] [C]	14.	Verify pipes to be cemented are properly jointed and manufacturers' instructions for pipe, cleaner, and cement are followed.	
[]	[]	[m] [p]	[B] [C]	15.	Verify installation of valves, unions and fittings is properly made and access to valves and valve systems is as required.	
[]	[]	[m] [p]	[B] [C]	16.	Verify dissimilar metals have dielectric or isolating couplings and no contact of dissimilar metal piping occurs. Verify copper pipes are wrapped with tape against metal studs.	
[]	[]	[m] [p]	[B] [C]	17.	Verify pipes and joints are wrapped or coated, as required.	
[]	[]	[m] [p]	[B] [C]	18.	Verify depth, alignment and grade of pipes are as required.	
[]	[]	[m] [p]	[B] [C]	19.	Verify trench bottom is adequately compacted and pipes are supported or bedded and backfilled, as required.	
[]	[]	[m] [p]	[B] [C]	20.	Verify future provisions, such as capped lines, and proper location and identification are provided, if required.	
[]	[]	[m] [p]	[B] [C]	21.	Verify all pipes are inspected for damage, tested and agency inspected, if required, before covering up. Observe testing process.	
SOIL, WASTE & VENT SYSTEMS						
[]	[]	[m] [p]	[B] [C]	22.	Verify exterior manholes, lampholes and cleanouts are located and installed, as required. Verify cleanouts to grade are provided, as required.	
[]	[]	[m] [p]	[B] [C]	23.	Verify pipes and fittings are of required material, type, size and weight and are connected and installed, as required.	

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SI	AI	EI	OI		SOIL, WASTE & VENT SYSTEMS (CON'T)	NOTES
[]	[]	[m] [p]	[B] [C]	24.	Verify requirements for dielectric unions and connectors are met.	
[]	[]	[m] [p]	[B] [C]	25.	Verify slope and alignment of lines are as required.	
[]	[]	[m] [p]	[B] [C]	26.	Verify no-hub pipe is installed as required, with hanger at every other joint or at every joint if over 4'0". Verify clamps are provided at base of risers and at every floor penetration, support provided at every closet bend, trap and arm unless otherwise required.	
[]	[]	[m] [p]	[B] [C]	27.	Verify provisions for settlement and shrinkage are made if required. Observe soil stack supports.	
[]	[]	[m] [p]	[B] [C]	28.	Verify floor drains, areaway drains and floor sinks are elevated and properly located with respect to finish floor and will adequately drain area served. Verify provisions are adequate for connection to membranes and waterproofness. Verify square-type floor drains and cleanouts are aligned with room axis.	
[]	[]	[m] [p]	[B] [C]	29.	Verify trap primers are provided, if required.	
[]	[]	[m] [p]	[B] [C]	30.	Verify cleanouts are located to allow access and locations are as understood or required.	
[]	[]	[m] [p]	[B] [C]	31.	Verify clamping rings are provided as required in floors with membranes.	
[]	[]	[m] [p]	[B] [C]	32.	Verify rough-ins for fixtures and equipment are located and installed, as required.	
[]	[]	[m] [p]	[B] [C]	33.	Verify requirements for dielectric unions and connectors are met.	
[]	[]	[m] [p]	[B] [C]	34.	Inspect vent piping and verify it is combined and concealed in spaces provided, sloped on horizontals, extended through roof and flashed and counterflashed as required.	
WATER SUPPLY SYSTEM						
[]	[]	[m] [p]	[B] [C]	35.	Verify pipes and fittings are of required material, type and size and are located and installed as required. Verify non-lead solder is used.	
[]	[]	[m] [p]	[B] [C]	36.	Verify exterior lines are installed to depth required and properly bedded and backfilled. Verify thrust blocks are provided as required. Confirm coordination is made for meters, shut-offs, hydrants and boxes.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		WATER SUPPLY SYSTEM (CON'T)	<u>NOTES</u>
[]	[]	[m] [p]	[B] [C]	37.	Verify exterior lines are installed to depth required and properly bedded and backfilled. Verify thrust blocks are provided as required. Confirm coordination is made for meters, shut-offs, hydrants, and boxes.	
[]	[]	[m] [p]	[B] [C]	38.	In large structures, verify shut-off valves are provided if required to isolate portions of system.	
[]	[]	[m] [p]	[B] [C]	39.	Verify rough-ins to fixtures and equipment are located and installed, as required.	
[]	[]	[m] [p]	[B] [C]	40.	Verify valves are used as required for proper function and location and accessibility are understood. Verify location and type of access panels. See that water system can be drained at lowest point. Verify all valves are labeled, if required.	
[]	[]	[m] [p]	[B] [C]	41.	Verify air chambers or shock absorbers are provided, if required.	
[]	[]	[m] [p]	[B] [C]	42.	Verify sound and vibration isolators are provided, as required.	
[]	[]	[m] [p]	[B] [C]	43.	Verify dielectric fittings are provided for connection of dissimilar metals.	
[]	[]	[m] [p]	[B] [C]	44.	Verify allowance for expansion and contraction is provided.	
[]	[]	[m] [p]	[B] [C]	45.	Verify system is tested before concealment or installation of insulation. Observe testing process.	
[]	[]	[m] [p]	[B] [C]	46.	Verify insulation is of required size, weight, thickness and type and is installed as required.	
[]	[]	[m] [p]	[B] [C]	47.	Verify lines are identified as required.	
[]	[]	[m] [p]	[B] [C]	48.	Verify lines are sterilized as required — proper dosage, distribution, retention and final flush-out. Ensure certification is provided.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		GAS PIPING SYSTEM	<u>NOTES</u>
[]	[]	[m] [p]	[B] [C]	49.	Verify materials, sizes and installation are as required.	
[]	[]	[m] [p]	[B] [C]	50.	Verify location, depth, alignment and coating of exterior lines is as required. Verify isolation, sleeves and installation in building are in compliance with codes and safety regulations. See that proper ventilation is provided.	
[]	[]	[m] [p]	[B] [C]	51.	Verify locations of drip pockets are provided, as required.	
[]	[]	[m] [p]	[B] [C]	52.	Verify plug cocks, gas pressure regulators, earthquake valves, and insulating couplings are installed as required. Verify they are labeled, if required.	
FIXTURES						
[]	[]	[m] [p]	[B] [C]	53.	Verify adequate blocking, backing and brackets are provided to receive fixtures. Verify chairs and carriers are provided, as required. Verify fixtures are rigidly installed.	
[]	[]	[M] [P]	[B] [C]	54.	Verify installed fixtures are undamaged and protected during construction. Ensure use of fixtures is avoided until system is complete and tested.	
[]	[]	[M] [P]	[B] [C]	55.	Verify fixtures are installed with accessories, trim, and brass specified. Verify finish is as specified and stops are provided, as required. Verify vacuum breakers are provided as required. Verify that code-required laminar-flow type devices are used on all hospital sink fixtures.	
[]	[]	[m] [p]	[B] [C]	56.	Verify fixtures are installed level. Ensure that the hot water generators are securely anchored. Verify all gauges, valves, and strainers are visible and accessible.	
[]	[]	[m] [p]	[B] [C]	57.	Check temperature and pressure settings for relief valves. Verify strainers are provided as required, piping is provided to floor drains or exterior from relief valves and pressure reducing valve is installed and set to pressure as required.	
[]	[]	[M] [P]	[B] [C]	58.	Verify escutcheons, flanges and cover plates are of type and finish required.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		FIXTURES (CON'T)	<u>NOTES</u>
[]	[]	[m] [p]	[B] [C]	59.	Observe that floor drains and roof drains with clamping rings are properly installed to membrane and weeps are cleared as provided. Observe that shower drains are similarly installed as required.	
[]	[]	[m] [p]	[B] [C]	60.	Verify fixtures are properly cleaned at completion. Verify faucets operate easily and are in proper position. Flush water-closets to confirm proper operation.	
[]	[]	[M] [P]	[B] [C]	61.	Verify fixtures allow for use by persons with physical disabilities, including fixture types and space at fixtures.	
FUEL OIL PIPING SYSTEM						
[]	[]	[m] [p]	[B] [C]	62.	Verify pipe “dope” (sealant) used at screwed joints is as specified and suitable for use with petroleum product transported.	
[]	[]	[m] [p]	[B] [C]	63.	Verify piping for petroleum product (diesel oil, etc.) is of material specified and per code requirements.	
[]	[]	[m] [p]	[B] [C]	64.	Verify secondary containment material and system is specified and suitable for use for petroleum products.	
[]	[]	[m] [p]	[B] [C]	65.	Verify fire protection enclosures or coverings for piping, hangers and bracing support systems are as specified and per code requirements.	
[]	[]	[m] [p]	[B] [C]	66.	Verify fuel oil day-tanks and storage tanks are of type specified, with code required secondary containment, leak-detection and monitoring features specified.	

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**DIVISION 15 — MECHANICAL —
HEAT-GENERATION EQUIPMENT 15550
LIQUID HEAT TRANSFER 15750**

STANDARDS: AGA (6) ASHRAE (21) ASME (22) AWS (23) NFPA (63) UL (93)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		GENERAL	NOTES
[]	[]	[M]	[B] [C]	1.	Verify location, spacing and size of all required sleeves, inserts, foundation bolts, foundations, pads and openings are coordinated with trades involved and are provided.	
[]	[]	[m]	[B] [C]	2.	Verify space and headroom are provided and approved equipment is accessible for operation, servicing, cleaning and repair. See that floor drains are located properly and lighting is suitably located with respect to equipment.	
[]	[]	[m]	[B] [C]	3.	Verify nameplates, identification and characteristics of equipment are attached. Confirm they match approved requirements and are not covered by insulation or painted out.	
[]	[]	[m]	[B] [C]	4.	Verify tube removal, cleaning spaces or similar provisions are adequate.	
[]	[]	[M]	[B] [C]	5.	Verify code clearances for all equipment and associated electric panels are adequate.	
[]	[]	[m]	[C]	6.	Verify uses of building equipment for temporary heat are understood and/or approved.	
BOILERS, EQUIPMENT & DISTRIBUTION						
[]	[]	[M]	[B] [C]	7.	Verify pressure boilers conform with or are identified with ASME code.	
[]	[]	[m]	[B] [C]	8.	Verify bases or refractory bases are provided, as required.	
[]	[]	[m]	[B] [C]	9.	Verify expansion joints are provided and guided. Check requirement for expansion joint in floor around boiler.	
[]	[]	[m]	[B] [C]	10.	For oil burning equipment, check size of burner tips, location of electrodes, position of gas or oil pilot and clearances for removal of burner from furnace.	
[]	[]	[m]	[B] [C]	11.	For gas burners, verify approved standard, position of pilot flame and sensing element, regulators and controls, regulator installed in a vertical position and gas vents piped to exterior.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		BOILERS, EQUIPMENT & DISTRIBUTION (CON'T)	<u>NOTES</u>
[]	[]	[m]	[B] [C]	12.	For forced draft fans, check fans for these features: anchorage, alignment, rotation, accessibility for lubrication, damper operation as required, insulation application and safety control interlocks, verify air-flow switches.	
[]	[]	[m]	[B] [C]	13.	For oil storage tank, verify approved standard, tank capacity and calibration, required openings, proper anchorage, minimum cover and/or clearance, tank heaters if required and coatings. Verify buried tanks are provided in double wall configuration with monitoring, as required.	
[]	[]	[m]	[B] [C]	14.	Verify piping is of material, size, weight, and type required, fabrication is performed using proper equipment, lines are reamed, openings are protected and fittings connections are as approved.	
[]	[]	[m]	[B] [C]	15.	Verify piping is hung, guided, or anchored as required, provisions for expansion and contraction are made, pitch of horizontal runs is correct, and provisions for dielectric connection or isolation of dissimilar metals is performed. If hangers are required to be installed over insulation, see that high-density insulation inserts and metal shields are provided as required.	
[]	[]	[m]	[B] [C]	16.	Verify valves are installed of type and position required and all fittings such as strainers, checks, gauges, air reliefs, drips, traps, etc. are provided.	
[]	[]	[m]	[B] [C]	17.	Verify piping and equipment are insulated with approved materials and extent and installation are as required. Verify vapor seal is provided, as required. Verify thickness and continuity are as required and band spacing is as required.	
[]	[]	[m]	[B] [C]	18.	Verify radiant heating coils are of type, size, and material approved, accurately placed, firmly secured and positioned, and tested before encasement. Verify test pressure is maintained while concrete is deposited.	
[]	[]	[M]	[B] [C]	19.	Verify piping is painted and/or identified for flow and type, as required.	

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SI	AI	EI	OI		BOILERS, EQUIPMENT & DISTRIBUTION (CON'T)	NOTES
[]	[]	[m]	[B] [C]	20.	Verify shut-offs for fuel and water are provided. Verify valves are provided to shut down sections of system, if required. Verify valves are labeled, if required.	
[]	[]	[m]	[B] [C]	21.	Verify safety and relief valves are provided and set to PSIG. Verify discharges are piped to drains.	
[]	[]	[m]	[B] [C]	22.	Verify safety operating controls are provided, as required.	
[]	[]	[m]	[B] [C]	23.	Verify combustion air system is provided, as required.	
[]	[]	[m]	[B] [C]	24.	Verify breaching and flues are of proper material, construction and type and are installed, as required.	
[]	[]	[m]	[B] [C]	25.	Verify expansion tanks are located, mounted, and anchored as required and provided with accessories and drain.	
[]	[]	[m]	[B] [C]	26.	Verify valves and fittings are insulated, as required.	
TERMINAL UNITS						
[]	[]	[m]	[B] [C]	27.	For heating and ventilating units, verify anchored and provided with vibration isolators as required. Verify access doors are provided and are tight, flexible pipe connectors are provided as required, controls are provided as required and location and layout are coordinated.	
[]	[]	[m]	[B] [C]	28.	For unit heaters, verify noise level is within approved range, clearances and location are as approved, adequate air distribution is provided and controls are required are provided.	
[]	[]	[m]	[B] [C]	29.	For base board units, verify location, type, size, mounting and controls are provided as required. Verify covers, access doors, dampers and end plates are provided to extent required.	
CLEANING, TESTING & BALANCING						
[]	[]	[m]	[B] [C]	30.	Verify system is completely clean and flushed of all debris. Operate system in presence of agencies and/or engineers, as required.	
[]	[]	[M]	[B] [C]	31.	Verify system is completely balanced and balancing report is available. Coordinate location of all balancing devices.	

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DIVISION 15 — MECHANICAL — REFRIGERATION EQUIPMENT 15650

STANDARDS: AGA (6) ASHRAE (21) ASTM (19) AWS (23)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		REFRIGERATION EQUIPMENT	<u>NOTES</u>
[]	[]	[M]	[B] [C]	1.	Verify all materials and equipment are as approved and nameplates, identification and characteristics are provided and are not covered by insulation or painted out.	
[]	[]	[m]	[B] [C]	2.	Verify space is adequate for maintenance, operation, repair and servicing of equipment. Verify mounting and anchorage methods are provided and located, i.e. pads, hangers.	
[]	[]	[m]	[B] [C]	3.	Verify all rotating parts and belts have guards or provide protection.	
[]	[]	[m]	[B] [C]	4.	Verify vibration isolators and flexible connections are provided as approved and required.	
[]	[]	[m]	[B] [C]	5.	Verify fire separation from fuel-fired equipment is provided if required by code or by specified requirements.	
[]	[]	[m]	[C]	6.	Verify freeze protection devices and materials are provided, if required.	
[]	[]	[m]	[B] [C]	7.	Verify tube removal space and tube cleaning space is adequate	
[]	[]	[M]	[B] [C]	8.	Verify code clearances to all equipment electric panels are adequate.	
PIPING						
[]	[]	[m]	[B] [C]	9.	Verify type, size, weight, material and fittings are as approved and required.	
[]	[]	[m]	[B] [C]	10.	Verify installation method of piping is as required, pipes are square cut and reamed, soldering is as required, internal valve parts are protected against heat or removed, joints are thoroughly cleaned and fluxed and excess flux and acid are removed. Verify solder used is of an approved type.	
[]	[]	[m]	[B] [C]	11.	Verify flexible connections are provided, as required.	
[]	[]	[m]	[B] [C]	12.	Verify unions and flanges installed for maintenance are as required.	
[]	[]	[m]	[B]	13.	Verify lines are properly sloped, as required.	

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SI	AI	EI	OI		PIPING (CON'T)	NOTES
[]	[]	[m]	[B] [C]	14.	Verify air vents are installed at high points and drains installed at low points as required in water lines. Verify proper type of valves are provided, i.e. gate or globe.	
[]	[]	[m]	[B] [C]	15.	Verify balancing cocks are installed, as required. Verify pressure gauges and thermal elements are provided.	
[]	[]	[m]	[B] [C]	16.	Verify piping is hung, guided or anchored as required, provisions for expansion and contraction are made, pitch of horizontal runs is correct and provisions are made for dielectric connection or isolation of dissimilar metals. If hangers are required to be installed over insulation, see that high-density insulation inserts and metal shields are provided, as required.	
[]	[]	[m]	[B] [C]	17.	Verify system is checked and tested for leaks.	
[]	[]	[m]	[B] [C]	18.	Verify insulation is provided and installed, as required. Verify vapor barriers, adhesives, and arid sealants are non-combustible, if required. Verify requirements for insulating flanges, fittings and valves are met.	
[]	[]	[M]	[B] [C]	19.	Verify piping is properly scaled and flashed, as required, when penetrating building elements.	
EQUIPMENT						
[]	[]	[m]	[B] [C]	20.	Verify air cooled condenser-air flow is not obstructed and wind deflectors are provided, if required.	
[]	[]	[m]	[B] [C]	21.	For water-cooled condensers, verify proper flow and no leaks.	
[]	[]	[m]	[B] [C]	22.	For evaporative condenser, check for spray coverage, quiet float valve and water level.	
[]	[]	[m]	[B] [C]	23.	For reciprocating compressor, check for shaft alignment on direct drive, suction and discharge pressures, installation of required gauges, motor amperage under maximum load and cylinder heat overheating.	
[]	[]	[m]	[B] [C]	24.	For centrifugal compressor, check for alignment of unit, drive and gear box, noise and vibration and required gauges.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		EQUIPMENT (CON'T)	<u>NOTES</u>
[]	[]	[m]	[B] [C]	25.	Verify receiver location is out of direct sun if installed outside building.	
[]	[]	[m]	[B] [C]	26.	Verify relief valve on receiver is of size required and discharges to atmosphere.	
[]	[]	[m]	[B] [C]	27.	Verify receiver drain, purge valve, liquid level indication and shutoff valves are provided and/or as required and piped to exterior, as required.	
[]	[]	[m]	[B] [C]	28.	For cooling tower, verify location and provision for mounting are as approved and required, mist eliminators are provided if required, and overflow and drain piping are provided.	
[]	[]	[m]	[B] [C]	29.	For mechanical draft cooling tower, verify unobstructed air intake is provided, fan rotation speed, belt tension is as required and weather protection is provided for motor if required.	
[]	[]	[m]	[B] [C]	30.	Verify pumps are supported properly and free of excess vibration, piping around is adequately supported and all gauges and motors are provided.	
[]	[]	[m]	[B] [C]	31.	Verify all insulating materials are provided and installed as approved.	
[]	[]	[m]	[B] [C]	32.	Observe procedures for testing of systems. Verify future operating personnel are instructed in operation of equipment, if required.	

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DIVISION 15 — MECHANICAL —**AIR DISTRIBUTION 15800**

STANDARDS: AGA (6) ASHRAE (21) ASTM (19) NFMA (62) NFPA
(63) SMACNA (82) UL (93)

SI	AI	EI	OI		GENERAL	NOTES
[]	[]	[M]	[B] [C]	1.	Verify equipment has identification and nameplates and characteristics are as approved.	
[]	[]	[m]	[B] [C]	2.	Verify approved vibration isolators and flexible connections are furnished and installed, as required.	
[]	[]	[m]	[B] [C]	3.	Verify provision is made for proper mounting and anchorage of equipment, including pads and hangers.	
[]	[]	[m]	[B] [C]	4.	Verify equipment operates without excessive vibration or noise	
[]	[]	[]	[B] [C]	5.	Verify uses of building equipment for temporary heat are understood and/or approved.	
FURNACES						
[]	[]	[m]	[C]	6.	Verify units are located and mounted, as required.	
[]	[]	[m]	[B] [C]	7.	Verify suitable service access is provided.	
[x]	[]	[m]	[B] [C]	8.	Verify fire-resistive surfaces and spacing are provided, as required.	
[x]	[]	[m]	[B] [C]	9.	Verify combustion air provisions are made, as required.	
AIR HANDLING UNITS & FANS						
[]	[]	[m]	[B] [C]	10.	Verify rotation of fan is as required before power is connected.	
[]	[]	[m]	[B] [C]	11.	For drive method, if belt is driven, check means of adjustment and that pulley and belt are aligned. Note bearing and belt numbers before connection of ducts is made to unit.	
[x]	[]	[m]	[B] [C]	12.	Verify guards are provided for rotating equipment and belts.	
[]	[]	[m]	[B] [C]	13.	Verify lubrication of equipment, if required, is accessible and extends to exterior of unit.	
[]	[]	[m] [p]	[B] [C]	14.	Verify equipment exposed to weather is weatherproof.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		AIR HANDLING UNITS & FANS (CON'T)	<u>NOTES</u>
[x]	[x]	[m]	[B] [C]	15.	Verify roof mounted equipment is properly flashed at curbs. Verify service accessibility is provided.	
[]	[]	[m]	[B] [C]	16.	Verify backdraft dampers and/or sound traps are provided as required on exhaust fans. Check for operation, rattle, felt strips and separate frames, as required.	
[]	[]	[m]	[B] [C]	17.	Verify exhaust and supplies are oriented to avoid conflict. Verify exhaust air discharges and outside air intakes are separated by code required distances and located to account for prevailing winds.	
FILTERS & SCREENS						
[]	[]	[m]	[B] [C]	18.	Verify required type is furnished and installed. Verify filters are clean at completion of final tests.	
[]	[]	[m]	[B] [C]	19.	Verify accessibility is provided for removal and replacement of filter, as required.	
[]	[]	[m]	[B] [C]	20.	Verify method of mounting is as required. Observe that air stream can be distributed over all filter areas.	
[]	[]	[m]	[B] [C]	21.	Verify proper amount of adhesive and washing tanks for viscous medium type filters are provided.	
[]	[]	[m]	[B] [C]	22.	Verify sealing strips are provided, as required.	
[]	[]	[m]	[B] [C]	23.	Verify electrostatic filters have warning lights and interlocks as required and ionizers have free access and do not have loose wires or sparking.	
[]	[]	[m]	[B] [C]	24.	Verify automatic sprays provide complete washing and spray coverage.	
[]	[]	[m]	[B] [C]	25.	Verify traveling screen are observed for oil charge and operation of screen.	
[]	[]	[m]	[B] [C]	26.	For renewable roll filters, check for tracking of roll, media runout switch, tinier setting, static pressure control and tension on media.	
[]	[]	[m]	[B] [C]	27.	Verify spare filters are provided, as required. Verify equipment filters are cleaned and/or replaced as required at date of acceptance.	
[]	[]	[m]	[B] [C]	28.	Verify bird and insect screen of proper mesh size and material is provided as required and isolation is made between dissimilar metal.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		DUCTWORK	<u>NOTES</u>
[]	[]	[m]	[B] [C]	29.	Verify ductwork layout is coordinated with other trades to avoid congestion and interference. A ductwork drawing coordinating plumbing, electrical and sprinklers is recommended on complex work.	
[]	[]	[m]	[B] [C]	30.	Verify type, material, thickness and shape are as required. Verify field changes are approved before installation.	
[]	[]	[m]	[B] [C]	31.	Verify joint connections are of required type. Check seams and breaks for cracks. Verify joint provides a smooth surface on interior of duct and laps are in direction of air flow.	
[]	[]	[m]	[B] [C]	32.	Verify slope ratio of transitions, radius of curved duct, air turns and deflectors are provided, as required.	
[]	[]	[m]	[B] [C]	33.	Verify bracing, reinforcement stiffeners and hangers are provided and ductwork is installed.	
[]	[]	[m]	[B] [C]	34.	Verify that all volume dampers, branch duct dampers, register or diffuser dampers, and splitter dampers are provided as required and operating mechanism is accessible.	
[x]	[]	[m]	[B] [C]	35.	Verify fire dampers and smoke fire dampers of type required are furnished and installed as required by NFPA. Verify that access is provided to dampers.	
[]	[]	[m]	[B] [C]	36.	Verify flexible connectors are fabricated and provided where required.	
[x]	[]	[m]	[B] [C]	37.	Verify access doors and/or access space is provided at all items requiring servicing, such as fire dampers, automatic dampers, manual dampers, coils, heaters, filters and thermostats. Verify size is sufficient for access and maintenance.	
[]	[]	[m]	[B] [C]	38.	Verify proper sleeves and openings through walls and floors are provided as required and are sealed as required. Allow no unscheduled cutting of structural members without approval.	
[]	[]	[m]	[B] [C]	39.	Verify ductwork is properly taped or sealed, if required.	

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Sub-Groups SI: [T] Testing Laboratory, [H] Hazardous Materials, [Y] Safety **AI:** No Sub-Groups

EI: [V] Civil, [S] Structural, [M] Mechanical, [E] Electrical **OI:** [O] Owner, [C] Contractor, [B] Subcontractor, [L] Legal, [G] Government, [F] Fire Protection, [P] Plumbing, [A] Acoustical

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		DUCT LINING AND INSULATION	<u>NOTES</u>
[x]	[]	[m]	[B] [C]	40.	Verify ducts are tested for air tightness, if required, before installation of insulation.	
[]	[]	[m]	[B] [C]	41.	Verify type, thickness, material, extent and method of fastening and installation are as required.	
[]	[]	[m]	[B] [C]	42.	Verify sound deadening and vapor barrier are provided, as required.	
[]	[]	[m]	[B] [C]	43.	Verify insulation subject to damage is protected, as required	
[]	[]	[m]	[B] [C]	44.	Verify materials are fire retardant or incombustible, as required.	
[]	[]	[m]	[B] [C]	45.	Verify vapor barrier integrity is maintained.	
OUTLETS, DIFFUSERS, REGISTERS AND GRILLES						
[]	[]	[m]	[B] [C]	46.	Verify all ducts, plenums and equipment are thoroughly cleaned of all debris before supply outlets are installed.	
[]	[x]	[m]	[B] [C]	47.	Verify all items are furnished and installed as required and approved. Verify finishes in areas match, as required.	
[]	[]	[m]	[B] [C]	48.	Verify volume control devices are provided as required and are accessible.	
[]	[]	[m]	[B] [C]	49.	Verify gaskets are provided and installed, as required.	
[x]	[]	[m]	[B] [C]	50.	Verify items are securely attached and supported, as required.	
[]	[]	[m]	[B] [C]	51.	Verify all bearings are lubricated, tension of pulleys and belts is adjusted, guards are in place and adjustments and connections are made.	
[x]	[]	[m]	[B] [C]	52.	Verify necessary equipment to provide balancing of air flow is available and each outlet is tested, if required. Confirm final air flows and verify that a report is submitted, if required.	
<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		BALANCING AND TESTING (CON'T)	<u>NOTES</u>
[x]	[x]	[m]	[B] [C]	53.	Verify objectionable noise due to velocity, distribution, vibration or inability to achieve required air is to be brought to attention of architect and consultant.	

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DIVISION 16 — ELECTRICAL — BASIC ELECTRICAL MATERIALS AND METHODS 16050

STANDARDS: CDA (37) NEC (59) NEMA (60) UL (93)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		GENERAL	NOTES
[]	[]	[E]	[B] [C]	1.	Verify materials are listed by a nationally recognized testing laboratory.	
RACEWAYS						
[]	[]	[e]	[B] [C]	2.	Observe limitations required on use of rigid conduit, thinwall conduit, flexible metal conduit, plastic conduit, and other non-metallic conduit (ex. liquidtight flexible metal conduit).	
[]	[]	[e]	[B] [C]	3.	Verify conduit size complies with code and is acceptable for the application. Verify required types of fittings are provided and are compatible with conduit type.	
[]	[]	[e]	[B] [C]	4.	Verify conduits are provided and properly installed before slabs on grade are installed. Check thickness of slab to allow for conduit size.	
[]	[]	[e]	[B] [C]	5.	Verify slab to allow for conduit size; verify stub-ups and couplings are installed above finish floor level for free-standing equipment, as required. Exposed conduit should be installed so that bent portion will not extend above floor level.	
[]	[]	[e]	[B] [C]	6.	Verify insulating bushings and connector linings are provided as specified.	
[]	[]	[e]	[B] [C]	7.	Verify field cutting of conduit is square cut, reamed or filled and cleaned of oil and filings.	
[x]	[]	[e]	[B] [C]	8.	Verify conduit is secured and fastened as required and in accordance with applicable code. Verify runs in wet areas are spaced at least 1/4" off surface. Maintain clearances between dissimilar metals to prevent galvanic action.	
[]	[]	[e]	[B] [C]	9.	Verify support of vertical raceways at each floor level is provided in multi-story structures, if required.	
[]	[x]	[e]	[B] [C]	10.	Verify areas where exposed conduit is allowed. Exposed conduits should be installed parallel or perpendicular to structure. Verify vertical runs are plumb.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		RACEWAYS (CON'T)	<u>NOTES</u>
[]	[]	[e]	[B] [C]	11.	Verify raceways are kept plugged during construction.	
[]	[]	[e]	[B] [C]	12.	Ensure no damage or deformation effectively reducing inside area occurs.	
[]	[]	[e]	[B] [C]	13.	Verify coating and surface treatment are provided as required, including connections. No treatment is normally provided if enclosed in concrete, unless otherwise required.	
[]	[]	[e]	[B] [C]	14.	Verify depth of installation in relation to finish grade is minimum per code. Coordinate with other utilities below grade. Verify concrete encasement and sand bed are provided as required. Verify backfill is free of debris and compacted to prevent future settlement.	
[]	[]	[e]	[B] [C]	15.	Verify pull wires are provided for cable installation. Verify use of non-metallic cord or rope for aluminum conduit. Verify pull cords for empty conduits.	
[]	[]	[e]	[B] [C]	16.	Ensure stub-ups for future extensions are provided as required and location identification is provided and recorded.	
[]	[]	[e]	[B] [C]	17.	Verify sleeves for future work are provided, as required. Verify empty conduits have been labeled for their intended future use.	
[]	[]	[e]	[B] [C]	18.	Verify means are provided to accommodate contraction and expansion at building expansion joints, as required.	
[x]	[]	[e]	[B] [C]	19.	Verify seismic bracing is provided for all conduit 2½" diameter and larger or in accordance with accepted regulations by the governing authorities.	
BUSWAYS						
[]	[]	[e]	[B] [C]	20.	Verify proper support is provided at required intervals and transverse and longitudinal bracing is provided to prevent lateral movement in accordance with codes and the governing authorities.	
[]	[]	[e]	[B] [C]	21.	Verify provision for expansion is in accordance with manufacturers' instructions.	
[]	[]	[e]	[B] [C]	22.	Verify busway housing is grounded by ground conductor either externally or internally.	

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SI	AI	EI	OI		BUSWAYS (CON'T)	NOTES
[]	[]	[e]	[B] [C]	23.	Verify plug-in features and top of devices are as approved and required. Verify handle of overcurrent devices do not exceed height limits above finished floor.	
[x]	[]	[e]	[B] [C]	24.	Verify component sections are legibly identified and marked with voltage, amperage and name of manufacturer.	
[]	[]	[e]	[B] [C]	25.	Verify joints are torqued in accordance with manufacturers' instructions.	
[]	[]	[e]	[B] [C]	26.	Verify busway is accessible throughout its installation.	
[]	[]	[e]	[B] [C]	27.	Verify trolley busways, trolleys, brushes, contact rollers and flexible cables have good contact and move freely.	
[]	[]	[e]	[B] [C]	28.	Verify busway expansion joints are provided at all building expansion joint locations.	
UNDERFLOOR RACEWAYS						
[]	[]	[e]	[B] [C]	29.	Verify cross-sectional dimensions are as required.	
[]	[]	[e]	[B] [C]	30.	Verify sufficient setting depth has been provided at junction boxes.	
[]	[]	[e]	[B] [C]	31.	Verify raceways are parallel with floor construction, firmly supported at proper elevation and in straight alignment.	
[]	[]	[e]	[B] [C]	32.	Verify that no damaged joints are allowed.	
[]	[]	[e]	[B] [C]	33.	Verify all joints are tight and sealed in accordance with manufacturers' instructions between sections and to junction boxes.	
[]	[]	[e]	[B] [C]	34.	Verify inserts, both pre-set and after set, are or will be secure to raceways and set flush with floor.	
CONDUCTORS						
[]	[]	[e]	[B] [C]	35.	Verify the type of conductors, materials, size, stranding and type of insulation are as required.	
[]	[]	[e]	[B] [C]	36.	Verify pulling of conductors and cables is as required, using suitable equipment and methods. Allow no damage to sheath jackets or insulation.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		CONDUCTORS (CON'T)	<u>NOTES</u>
[]	[]	[e]	[B] [C]	37.	Verify connectors and joints are clean tight, and torqued as necessary.	
[]	[]	[e]	[B] [C]	38.	Verify connectors, lugs, clamps, etc. to connect copper and aluminum are approved for specific application and where subject to moisture are compatible to avoid galvanic corrosion.	
[]	[]	[e]	[B] [C]	39.	Verify all connections are made in junction or outlet boxes, not in conduits.	
[]	[]	[e]	[B] [C]	40.	Verify color coding of wire insulation, including neutral and ground is as specified.	
[]	[]	[e]	[B] [C]	41.	Verify ground conductor has been installed as required.	
[]	[]	[e]	[B] [C]	42.	Verify grounding conductor is securely attached to equipment, devices, etc. and forms complete grounding system.	
[]	[]	[e]	[B] [C]	43.	Verify branch circuit conductors are as specified and suitable for their use.	
[]	[]	[e]	[B] [C]	44.	Verify vertical cable supports are provided in conduit risers at each floor level.	
CABLE SYSTEMS						
[]	[]	[E]	[B] [C]	45.	Verify metal-clad cable is installed where specified, cutting is performed without conductor damage and bushings are installed.	
[]	[]	[E]	[B] [C]	46.	Verify nonmetallic-cable is installed in areas allowed by contract documents and permitted by codes and is located so as to prevent driving of fasteners into cable. Code gauge protection plates are provided where required.	
[]	[]	[E]	[B] [C]	47.	Verify cables are secured within 12 inches of box or fitting and otherwise at intervals not exceeding limits for proper support without excessive sagging. Cable supports should be independent of support members.	
[]	[]	[E]	[B] [C]	48.	Verify NMC cable is used in wet locations or areas exposed to dampness (including exterior masonry walls).	
[]	[]	[E]	[B] [C]	49.	Verify cables are installed in spaces allowing accessibility for installation and removal.	

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SI	AI	EI	OI		OUTLETS	NOTES
[]	[]	[E]	[B] [C]	50.	Verify architectural drawings are referred to for comparison of all conditions affecting layout of outlets. Coordinate work with other trades.	
[]	[]	[E]	[B] [C]	51.	Verify special equipment outlets have been roughed-in per manufacturers' rough-in drawings.	
[]	[x]	[E]	[B] [C]	52.	Verify floor outlets of required type are properly located. Verify dimensions if indicated or critical. Request equipment and furniture layout.	
[]	[]	[E]	[B] [C]	53.	Verify ground fault receptacles are provided in locations, as required.	
[]	[x]	[E]	[B] [C]	54.	Verify wall receptacle, switch outlets and fixture outlets are mounted at height and location required.	
[]	[]	[E]	[B] [C]	55.	Verify door swings, equipment and other features are not in conflict for convenience of use.	
[]	[]	[E]	[B] [C]	56.	Verify light outlets in mechanical and equipment rooms are located to suit servicing and maintenance and extend below ducts and ceiling.	
[]	[]	[E]	[B] [C]	57.	Verify junction pull and outlet boxes are of type, size and location required by code.	
[]	[]	[E]	[B] [C]	58.	Verify boxes are secure and independently supported and do not rely on conduits for this support, except as permitted by code.	
[]	[]	[E]	[B] [C]	59.	Verify boxes are accessible.	
[]	[]	[E]	[B] [C]	60.	Verify cast boxes and special boxes are provided as required in exposed areas, exterior areas, wet locations and hazardous locations. Verify all boxes exposed to weather are weatherproof.	
[]	[]	[E]	[B] [C]	61.	Verify plaster rings and extension rings are provided. Ensure no combustible material is exposed to interior of box.	
[]	[x]	[E]	[B] [C]	62.	Verify architect is notified before closing-in and agency inspection is provided, if required.	
[]	[]	[E]	[B] [C]	63.	Verify boxes are sized to allow number of conductors and/or splices in boxes as per code.	

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SI	AI	EI	OI		OUTLETS (CON'T)	NOTES
[]	[]	[E]	[B] [C]	64.	Verify unused openings are closed.	
[]	[]	[E]	[B] [C]	65.	Ensure grounding continuity is maintained, including jumper, if required.	
[]	[]	[E]	[B] [C]	66.	Verify installed devices are of required type, voltage, amperage, and color.	
[]	[]	[E]	[B] [C]	67.	Verify switches are installed in phase conductor of circuit (not neutral) and with "on" position up, except for momentary contact, 3-way, and 4-way switches.	
[]	[]	[E]	[B] [C]	68.	Verify device plates are of material, type, ganging and finish required and identification and pilot lights are provided, as required.	
[]	[x]	[E]	[B] [C]	69.	Verify plates completely cover openings and are in contact with finish surface.	
[]	[x]	[E]	[B] [C]	70.	Verify plates are plumb and aligned with wall surfaces.	
[]	[x]	[E]	[B] [C]	71.	Verify surface-mounted boxes are provided with plates for their intended use.	
[]	[]	[E]	[B] [C]	72.	Verify neutral of multi-wire circuit will not be interrupted by removal of device or fixture.	
MOTORS						
[]	[]	[E]	[B] [C]	73.	Verify motors have voltage rating and number of phases to suit supply system.	
[]	[]	[E]	[B] [C]	74.	Verify motor rotation is correct for driven machine.	
[]	[]	[E]	[B] [C]	75.	Verify motors subject to vibration or mounted on adjustable bases are connected with flexible metal conduit. Verify liquidtight or explosion-proof flexible metal conduit are provided in damp or hazardous locations.	
[]	[]	[E]	[B] [C]	76.	Verify flexible metal conduit length is as required and allows flexibility in all possible motor locations.	
[]	[]	[E]	[B] [C]	77.	Observe lubrication requirements are met prior to operation.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		MOTOR CONTROL, DISCONNECTS AND STARTERS	<u>NOTES</u>
[]	[]	[E]	[B] [C]	78.	Verify manual disconnect switch is provided at each motor and motor starter, as required by code.	
[]	[]	[E]	[B] [C]	79.	Verify control accessories are furnished as required by operation (start-stop pushbuttons, pilot lights, selector switches and similar devices).	
[]	[]	[E]	[B] [C]	80.	Verify motor full-load rated currents are compared with ratings of motor-running overcurrent protective devices (heater). Verify heaters of proper size are installed in starters.	
[]	[]	[E]	[B] [C]	81.	Verify motor controllers are as required for motor being served. Horsepower and voltage rating are to be at least equal to motor controlled.	
[]	[]	[E]	[B] [C]	82.	Verify automatic control devices such as thermostats, floats and pressure switches are adequately rated and as required for operation.	
[]	[]	[E]	[B] [C]	83.	Verify magnetic coil voltage is same as control circuit voltage (may be different from motor voltage).	
[]	[]	[E]	[B] [C]	84.	Verify motor does not exceed noise limits under operating conditions.	

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DIVISION 16 — ELECTRICAL — TRANSMISSION AND DISTRIBUTION 16300

STANDARDS: CDA (37) NEC (59) NEMA (60) UL (93)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		GENERAL	NOTES
[]	[]	[E]	[B] [C]	1.	Ensure equipment is listed by a nationally recognized testing laboratory and is tested in accordance with contract documents.	
SERVICE						
[]	[]	[E]	[B] [C]	2.	Verify provisions are made for service entrance system in accordance with utility company requirements and are coordinated with drawings. Verify clearances under service drops are provided.	
[]	[]	[E]	[B] [C]	3.	Verify sleeves and spaces are provided of sizes required.	
[]	[]	[E]	[B] [C]	4.	Verify meter location and main disconnect location are as specified or indicated on contract documents.	
TRANSFORMERS						
[]	[]	[E]	[B] [C]	5.	Verify pad for exterior transformer is of size required and location and installation method are understood.	
[]	[]	[E] [a]	[B] [C]	6.	Verify transformer is of type required. Verify noise does not exceed specified limits.	
[]	[]	[E]	[B] [C]	7.	Verify final connection with flexible conduit.	
SWITCHBOARDS AND PANELBOARDS						
[]	[]	[E]	[B] [C]	8.	Verify space provided is minimum required by code and distance from handle of top switch or breaker to finish floor does not exceed 6'6."	
[]	[]	[E] [s]	[B] [C]	9.	Verify boards are rigidly and securely anchored to floors and walls with supports of sufficient strength to support weight and resist seismic forces.	
[]	[]	[E]	[B] [C]	10.	Verify ground fault protection has been provided where required by NEC.	

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SI	AI	EI	OI		SWITCHBOARDS AND PANELBOARDS (CON'T)	NOTES
[]	[]	[E]	[B] [C]	11.	Verify spaces are provided as required by contract documents for future circuits.	
[]	[]	[E]	[B] [C]	12.	Verify spare breakers are provided and installed, as required by contract documents.	
[]	[]	[E]	[B] [C]	13.	Verify locations are coordinated with other trades which do not permit other utilities (i.e. ductwork, piping) within code clearances of boards.	
GROUNDING						
[]	[]	[E]	[B] [C]	14.	Visually inspect all grounding system conductors, connections and electrodes as work progresses and verify continuity of grounding conductors.	
[]	[]	[E]	[B] [C]	15.	Verify grounding connectors are accessible for inspection and protected against mechanical injury.	
[]	[]	[E]	[B] [C]	16.	If water piping system is used, check that pipe is metallic and no insulating fitting is interposed in pipe between ground wire connection point and interior or exterior pipe system (N.E.C. 250-81 metallic water piping system is always used supplemented if required).	
[]	[]	[E]	[B] [C]	17.	Verify contact surfaces are clean and dry, are metal-to-metal and have tight bolt connections.	
[]	[]	[E]	[B] [C]	18.	Observe size, length, number, material, and installation of ground rods.	
[]	[]	[E]	[B] [C]	19.	Verify connectors are compatible with metal and pipes used.	
[]	[]	[E]	[B] [C]	20.	Verify grounding conductors are connected to both ends of metallic raceway in which they are installed and are connected to grounding electrode in accordance with code.	
[X]	[]	[E]	[B] [C]	21.	Verify ground fault protection has been provided where required by National Electric Code.	
[X]	[]	[E]	[B] [C]	22.	Test impedance to ground, as required by specifications.	
BONDING						
[x]	[]	[E]	[B] [C]	23.	Verify bonding raceway systems, cable tray, and other enclosures comply with NEC Article #250C.	

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DIVISION 16 — ELECTRICAL — LIGHTING 16500

STANDARDS: NEC (59) NEMA (60) UL (93)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		LIGHTING	<u>NOTES</u>
[X]	[]	[E]	[B] [C]	1.	Verify fixtures are listed by a nationally recognized testing laboratory.	
[x]	[X]	[E]	[B] [C]	2.	Verify lighting layout is coordinated with architectural drawings and discrepancies are reported. Verify layout is coordinated with work of other trades.	
[]	[X]	[E]	[B] [C]	3.	Verify fixtures comply with specified fixtures and accessories are provided.	
[x]	[]	[E]	[B] [C]	4.	Verify suspension, supporting and mounting methods are as required based upon weight, dimensions, and seismic restraint of fixture. Observe plumbness and alignment.	
[X]	[X]	[E]	[B] [C]	5.	Verify mounting height and location are as indicated.	
[x]	[x]	[E]	[B] [C]	6.	During installation, verify defective louvers, cracked glass or plastic, chipped porcelain or finish, distortion or other defects are corrected before completion. Verify doors are properly aligned with clearance for operation. Verify retaining devices function properly.	
[]	[]	[E]	[B] [C]	7.	Verify ballast type is as specified — fluorescent or high-intensity discharge, voltage, power factor, overload protection, proper rating and low temperature.	
[]	[]	[E] [a]	[B] [C]	8.	Verify ballast noise does not exceed specified limits. Verify required replacements have been made.	
[x]	[x]	[E]	[B] [C]	9.	Verify lamp type is as required — wattage, energy saving, style, color, characteristics and long life. Note fluorescent lamp colors at start of installation. Check that lamps are operating properly.	
[x]	[]	[E]	[B] [C]	10.	Verify lamps are new and installed before completion or reinstalled if required. Verify additional new lamps are provided to compensate for contractor's use of building lighting system, if required.	
[x]	[x]	[E]	[B] [C]	11.	Verify frames and accessories are as required — compatible with adjacent surfaces, no light leaks, weatherproof and corrosion resistant and matching finish.	

Legend: Upper Case Letter and BOLD = Primary Inspection; Lower Case = Secondary Inspection

Main Groups **SI:** Special Inspections, **AI:** Architectural Inspections, **EI:** Engineering Inspections, **OI:** Other Inspections

Sub-Groups **SI:** [T] Testing Laboratory, [H] Hazardous Materials, [Y] Safety **AI:** No Sub-Groups

EI: [V] Civil, [S] Structural, [M] Mechanical, [E] Electrical **OI:** [O] Owner, [C] Contractor, [B] Subcontractor, [L] Legal, [G] Government, [F] Fire Protection, [P] Plumbing, [A] Acoustical

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		LIGHTING (CON'T)	<u>NOTES</u>
[x]	[x]	[E]	[B] [C]	12.	Verify fixtures are adjusted or aimed as required for intended illumination.	
[x]	[x]	[E]	[B] [C]	13.	Verify fixtures are suitably protected and cleaned at completion of work.	
[X]	[]	[E]	[B] [C]	14.	Verify fixtures are grounded as required by code.	
[X]	[x]	[E]	[B] [C]	15.	Verify fixtures are anchored per contract documents.	
[x]	[x]	[E]	[B] [C]	16.	Verify fixtures installed in suspended ceilings are secured to the structure above the ceiling. Verify fixtures are independent of ceiling supports as regulated by governing authorities.	
[X]	[x]	[E]	[B] [C]	17.	Verify earthquake clips and seismic wires per codes and specifications, as required by governing authorities.	

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DIVISION 16 — ELECTRICAL — COMMUNICATIONS 16700

STANDARDS: NEC (59) NEMA (60) UL (93)

<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		COMMUNICATIONS	<u>NOTES</u>
[x]	[]	[E]	[B] [C]	1.	Verify boxes, conduits and fittings conform to Section 16050 requirements.	
[x]	[]	[E]	[B] [C]	2.	Verify barriers are provided between low voltage and line voltage wiring.	
[X]	[]	[E]	[B] [C]	3.	Verify wiring terminations are identified.	
[X]	[]	[E]	[B] [C]	4.	Verify all wiring installed in equipment cabinets are installed neatly racked, bundled and organized with wire ties or in wireways within cabinets.	
[x]	[X]	[E]	[B] [C]	5.	Verify as-built records are kept on all wiring deviations from contract documents.	
[x]	[]	[E]	[B] [C]	6.	Verify backboxes are grounded.	
[X]	[]	[E]	[B] [C]	7.	Confirm components are testing agency listed (UL, etc.).	
[X]	[]	[E]	[B] [C]	8.	Verify devices and systems are tested for proper operation.	
[]	[]	[E]	[B] [C]	9.	Verify systems are installed by personnel qualified in communication system installation.	
[x]	[]	[E]	[B] [C]	10.	Verify that all equipment is listed for the environment in which it is installed.	
[x]	[]	[E]	[B] [C]	11.	Verify devices are mounted so that vibration and jarring will not cause accidental operation or malfunction.	
FIRE ALARM						
[X]	[]	[E]	[B] [C]	12.	Verify devices are state fire marshal (or governing authority) and testing agency listed.	
[x]	[]	[E]	[B] [C]	13.	Verify system is installed by or under the direct supervision of factory trained service technicians, where specified. Check approved shop drawing for installation.	

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<u>SI</u>	<u>AI</u>	<u>EI</u>	<u>OI</u>		FIRE ALARM (CON'T)	<u>NOTES</u>
[X]	[]	[E]	[B] [C]	14.	Ensure all devices are tested for correct operation.	
[X]	[X]	[E]	[B] [C]	15.	Verify audible alarm devices are heard distinctly in all areas of the building, as required by code and governing authorities.	
[X]	[]	[E]	[B] [C]	16.	Refer to NFPA references for testing and maintenance procedures and acceptable power supply sources for normal and emergency power.	
[X]	[X]	[E]	[B] [C]	17.	Verify visual alarm devices are clearly visible from all points within the visual alarm area and are in accordance with code and governing authority requirements.	
[X]	[]	[E]	[B] [C]	18.	Check code requirements and governing authority for installation of wiring in raceways.	
[X]	[x]	[E]	[B] [C]	19.	Ensure that records are kept of all fire alarm system tests and record status of all devices tested. Record all deficiencies observed during the test.	
[X]	[x]	[E] [F]	[B] [C]	20.	Pre-test check items:	
					a. Verify that all building occupants have been alerted of the test.	
					b. Verify building ancillary functions to the fire alarm system are bypassed if they are not a part of the test.	
					c. Coordinate test with the local fire department, if applicable.	
[X]	[x]	[E]	[B] [C]	21.	Verify certification of proper operation of all fire alarm system equipment has been completed.	

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Part 4:

Coordination

Coordinating the various disciplines involved in design is usually the responsibility of the architect, principal engineer or construction manager. Coordinating the work of the various suppliers, trades and subcontractors is the responsibility of the contractor as part of the construction means and methods. However, successful coordination requires all parties of both the design and construction teams to communicate with each other so that the construction can proceed in an orderly manner. Proper form and process need to be defined and followed to ensure information is properly transmitted and officially received.

While verbal communication is used extensively throughout the construction process through meetings (scheduled and impromptu) and phone conversations, the scheduling and legal procedures involved in the construction process require written records with proper distribution to all concerned entities.

Part 4.1:

Generally outlines the traditional communications procedures that have been recognized by the industry as a type of “protocol” to keep participants involved as fully informed as possible and to avoid misunderstandings. Naturally, exceptions occur.

Part 4.2:

Discusses scheduling and the methods typically employed during construction to ensure an orderly process, free of unnecessary delays and costs.

Part 4.3:

Discusses correspondence and related coordination.

Part 4.4:

Introduces standards and forms. Appendix D, “Forms,” contains examples of recommended forms.

Part 4.1:

Communication

The owner communicates directly with the design principal (an architect, engineer or construction manager), and through the design principal with the contractor. The owner does not communicate in writing directly with the construction inspector, consultants, subcontractor, vendors or suppliers. Verbal communications between the owner and contractor should be avoided except when circumstances require additional clarification, and then only in the presence of the design principal. Written communication should always go directly from the owner to the design principal and from design principal to the contractor.

The design principal communicates directly with the owner, contractor (or, more specifically, the contractor's superintendent), the design consultants and the construction inspector. The design principal does not communicate directly with the subcontractors, vendors or suppliers. When circumstances require additional clarification, verbal communications may occur in the presence of the contractor. Written communications should only be from the design principal to the contractor and from the contractor to the subcontractors, vendors and suppliers.

The contractor communicates directly with the design principal and with the contractor's subcontractors, vendors and suppliers. The contractor communicates with the owner through the design principal and with the construction inspector through the contractor's superintendent. The contractor does not directly communicate in writing with the design consultants. Again, verbal communication between the contractor and the design consultants should be avoided except in the presence of the design principal and then only when circumstances require additional clarification.

The construction inspector communicates directly with the design principal and the contractor's superintendent. The inspector should not communicate in writing directly with the owner, design consultants, subcontractors, vendors or suppliers.

Exceptions:

Where the construction inspector is retained by the owner as a permanent or staff employee, the construction inspector may communicate directly with the owner. In all such instances, the design principal should direct the construction inspector's work and be fully informed of communications concerning it.

The design principal may specifically or partially delegate direct communications between design consultants and the construction inspector or the contractor to expedite the work; however, the design principal must be fully informed in writing of all such communications and must approve in writing any actions resulting from communications directly from the direct contractor to the design consultants

The contractor may specifically or partially delegate direct communications between his subcontractors, vendors and suppliers and the design principal, design consultants or the construction inspector. However, such direct communications require that both the contractor and the design professional be fully informed in writing of any communications and that each must approve in writing any resultant actions.

The owner directly communicates with the contractor concerning legal or contractual matters; however, the owner should keep the design principal informed in writing of all direct owner to contractor communications and any resultant actions.

Other direct communications between members of the design and the construction teams may be made where required by laws or codes; however, all responsible parties should be kept informed in writing.

Part 4.2:

Scheduling

Either the construction manager or the general contractor should be responsible for preparing the project schedule. Whether a simple bar chart or the most complex computerized critical path format, the project schedule needs to establish the steps necessary to complete the project in a timely manner.

It is not the responsibility of the construction inspector to take an active role in either the creation of the project schedule or enforcement. The construction inspector must, however, maintain a familiarity with the schedule, along with its updates, in order to ensure that personnel and materials required for inspections are available at the proper times.

When a simple bar chart is used, it is probable that the construction inspector's services will not be required full-time. In such situations, it will not be critical for the construction inspector to coordinate his schedule thoroughly coordinated with the bar chart schedule, making sure the timing for each required inspection is established and understood by those responsible for keeping the inspector informed of the work progress. It will also be critical for the construction inspector to be in periodic contact with those responsible for maintaining the project schedule in order to keep his own schedule up-to-date.

More complex projects requiring full-time construction inspection services will probably have a critical path schedule. The construction inspector needs to make sure the inspection dates are kept up-to-date in the project schedule, especially those related to items on the critical path which would result in project delays if the inspections are not properly coordinated.

Even in the most complicated project with the most advanced critical path project schedule, the construction inspector should maintain his own schedule and coordinate his schedule with the project schedule. Full-time project involvement does not relieve the construction inspector from the need to verify that both schedules are kept up-to-date. Paperwork such as scheduling seems easy to set aside when seemingly more urgent matters demand attention. Yet failure to maintain the inspection schedule can be costly, when construction conceals the work requiring inspection and has to be removed and rebuilt in order to ensure proper inspection.

Part 4.3:

Correspondence and Coordination

The orderly continuation of the work requires written correspondence in order to ensure proper coordination. Written correspondence among the construction participants should be used along with the contract documents. Such correspondence is not as official as the agreement, contract documents and change orders; however, it is a necessary part of the process to be prepared with the same consideration as the rest of the documents.

Correspondence can be in the form of letters, memoranda, bulletins, reports, graphs, faxes and emails. It is recommended that adequate documentation should be developed as a good practice by all the project participants. Correspondence should take the form of simple declarative sentences which clearly state intent. Each form of correspondence must include the project name, project number (especially where there might be more than one phase to a project or even the potential of future phases), a date (critical) and the parties involved in the correspondence.

The project name should be consistent throughout correspondence and the contract documents, preferably the same title used on the title sheets of the drawings. When there is any possibility of confusion, the name should include sufficient information to differentiate between multiple projects, such as including a building address, phase number or similar location identifier. Project numbers can also be helpful in verification, although most projects have different numbers for each of the parties involved.

Each piece of correspondence should be dated. Once a subject becomes important enough to require special correspondence, it is possible that the correspondence will result in various possible decisions. When multiple correspondences exist on one subject, the dates on the correspondence identify which is the most recent decision.

Identification of persons involved in the correspondence might be as simple as identifying who the correspondence is from and to whom it is directed. It might also include an extensive list of persons who require the information in order to ensure proper coordination. This is frequently done with a “cc” list in a letter, fax or email. Blind copies might also be appropriate for certain types of correspondence; however, the decision to include blind copies should be based on prior mutual agreement between specific persons, such as the owner requesting a blind copy of correspondence between the construction manager and design principal.

Part 4.4:

Forms

Many organizations, individually or through collaboration with other organizations, have developed forms in an effort to standardize procedures; however, complete unanimity as to type, contents, and arrangements has not been universally achieved. The American Institute of Architects has developed a complete series of documents and forms; several of these are reproduced as a part of Appendix D, "Forms."

Although it would be impossible to discuss all possible forms, several widely used forms are identified below:

Application for Payment — A form filled out by the contractor requesting payment due for completed portions of the work. It describes each phase of the work, phase value, previous applications, present application, completion to date and balance to be completed. Changes are included. The total value of phases, stored materials, previous payments and retention age is given. It is usually completed in accordance with the contract documents. The contractor certifies that all amounts for items previously requested have been paid. This form is executed by the contractor, signed by the construction inspector and sent in multiple copies to the architect for his approval and signature.

Certificate for Payment — A form filled out by the design principal (typically the architect) which is a non-negotiable certificate to the owner confirming that the amount of money requested in the application for payment is due the contractor. It recaps the original contract sum, change orders and contract sum to date. The listed figures agree with the application as to total completed, total stored, retaining and amounts due. It requires the contractor's signature. This certificate is executed by the architect and distributed with multiple copies to the owner, who issues payment to the contractor and distributes copies to the contractor and other parties.

The design principal receives an executed copy to confirm that payment has been made. The number of copies may vary, since a financing agency, etc. may be involved. The construction inspector should receive a copy of the application for payment and the certificate for payment. This form should include a distribution list.

Change Order — A written order to the contractor authorizing a change or adjustment in the work. Filled out by the design principal (architect), this form describes the date, the change (sometime by reference to other forms such as construction bulletins or requests for information), the amounts involved, the time increase or decrease and a recap of the status of the original contract as affected by cost or time. It is typically executed by the design principal (architect) with multiple

copies to the contractor, who signs the change order and forwards it to the owner for signature of approval. Executed copies are then distributed to the design principal (architect), contractor and others involved. It should be remembered that each change order is a contract on its own and requires the same legal consideration as any contract.

Construction Change Directive — Used only in the absence of total agreement on the terms of a change order, this form is a written instruction to the contractor. Filled out by the design principal (architect), this form describes the change prior to agreement on the amounts involved. A formal change order should be prepared to replace the construction change directive order as soon as possible.

Transmittal — An all-purpose form that can be used by all parties, this form usually requires minimal additions to transmit items such as shop drawings, samples and reports. The transmitted item is described and requested actions are checked (v) beside the appropriate action or descriptive item. It indicates distribution to various parties.

Inspector's Daily Report — Filled out by the construction inspector, this form lists the day, weather, site condition, contract time status, work forces on the site, work performed, major equipment, material deliveries to the site, phone calls and visitors and makes remarks. It is filled out daily and usually sent to the design principal (architect) weekly.

Proper and timely distribution of correspondence is extremely important. The construction inspector should receive copies of all material concerning the contract documents. An organized method of written record-keeping is critical to avoid confusion.

Here are examples of suggested correspondence:

Owner: Put all matters concerning the project in writing to the design principal (architect). A good policy is to follow up a phone call with a letter.

Architect: Promptly produce memoranda of meetings and discussions, including important phone conversations, and distribute copies to the owner, contractor, construction inspector, consultants and other parties affected. Indicate distribution on correspondence.

Follow up phone conversations in writing for important items as soon as possible.

Keep a log of occurrences and organize an “action” system to act on all items in a timely manner.

Enclose the design consultant's correspondence with the design principal's (architect's) correspondence for all matters affecting the work.

Contractor: Follow up phone conversations in writing for important matters as soon as possible and make sure distribution list includes all affected parties.

Enclose copies of correspondence received from subcontractors, suppliers and vendors with correspondence "cover" for all matters affecting the work.

Construction Inspector: Use a field memorandum form consecutively numbered and list all items to be discussed with the design principal (architect). Use duplicated forms to ensure rapid transfer to all affected parties.

All Parties: React promptly to all correspondence received. Review memoranda and take action when stipulated. Clarify misunderstandings. Some firms stipulate on their memoranda that all items requiring clarification should be called to the attention of the writer within a specific period of time.

Part 5:

Project Location

While location may be an obvious aspect of a construction project, it is nonetheless a crucial one. The location of both the project itself and the construction inspector is critical to the success of the project.

Construction inspection is not limited to walking around the site and taking notes, regardless of whether inspection is done by a full time construction inspector, a design professional, a construction professional (contractor, subcontractor, tradesperson) or any of the other multitude of persons who play an active role in the construction inspection process.

As with any project, there are tasks which must be done in the company office, things which must be done in the field office and things which must be done in the field. Failure to recognize the importance of any of these responsibilities can result in problems for the project.

There are also specific concerns which must be considered due to the location of the project itself, such as regional considerations, geographic considerations and climate. Recognition of each of these and how they impact a particular project is critical to successful construction inspection.

Part 5.1:

Office Practice Concerns

Paperwork begins and ends in the main office. Even the largest projects with full time field office staff rely on main office support for accounting, records storage and administrative assistance.

Each office should establish standard procedures for construction inspection responsibilities to ensure that everyone working on a particular project is aware of the standard procedures. For the full-time field administrator who works out of a field office and a small room in the house with a computer and file cabinet, standard office procedure is based on experience. For the large firm with a regular turnover in personnel, standard office procedure needs to be written down and distributed, with each new employee given the responsibility to read and discuss procedures with the rest of the project team.

The first item of importance is to decide what is being done where. As with any project management, construction administration needs to be organized. Responsibilities need to be established early with communication channels between those involved clearly defined. Does the construction inspector work directly on the computer doing his own word processing, scheduling and record keeping, or is there staff available to free up time for more field work and administrative duties?

Record keeping responsibilities need to be established. Is the construction inspector going to dictate notes into a recorder for secretarial staff to transcribe? Is the transcription going to be done in the field office or the main office? What staff is available where, and what is the desired turnaround time?

Where the field inspector is responsible for keeping records, it is beneficial to establish specific times for that responsibility. Just as standard project meeting times are scheduled, so should be time to do administrative and record keeping tasks. Where administrative staff is available, it is just as important to establish procedure to ensure administrative tasks are being done, files kept up-to-date and an appropriate schedule maintained.

Part 5.2:

Field Office Concerns

The field office should be an extension of the main office, even if the main office is a room at home. The question of what is done in the field office versus in the main office becomes a project-by-project issue. What funds are available and what benefits are realized by using the main office versus the field office becomes the primary factor in deciding what is done where.

Regardless of staffing, the field office requires the bare essentials: climate control, power, water, sanitary facilities, light, access and parking. Furniture should include a desk and chair for each staff member, with files and at least one drawing table for laying out the project drawings. Shelving for storage is critical. Where space is available, a meeting area is helpful. Field office equipment begins with communication. The construction inspector will have a cellular (mobile) phone, as will other staff members. A fax machine is also a standard piece of equipment for the field office, especially where drawings and documents are being transmitted. For optimal support, a phone line should be designated specifically for the fax.

Computers and internet connections are essential to the field office. Computers can also serve as the fax machine, and offer a direct-line connection to the main office computer, allowing access to almost limitless information. Once again, it is necessary to decide whether or not to have a designated phone line for the computer. A one-person field office with at least three telephone lines is typical.

A field office copier can be another consideration, although this, too, can be eliminated in several circumstances. Storefront-type copy services are often readily available. Computers with scanners can provide most of the copier functions. Fax machines are typically capable of some copier capabilities (although few have the ability to accept oversize drawings). Also, some computer printers function as printer/fax/copier.

Part 5.3:

On-Site Concerns

By definition, most construction inspection takes place on-site and includes multiple responsibilities. The key to successful inspection, and a successful project, is for the construction inspector to become familiarized with the requirements of the construction documents. Knowing the contract documents and project schedule, as well as making the proper preparations before beginning on-site inspection, can help the inspector stay ahead of the project and know what is supposed to happen next.

Jobsite Safety:

Is safety everybody's business? If so, what is expected of a construction inspector relative to safety conditions at a jobsite? A good deal of confusion exists in the minds of many people on this subject.

When it comes to observable hazards, the answer is easy. Any unsafe condition which the construction inspector sees or which is called to the construction inspector's attention should be reported immediately to the contractor's superintendent. Verbal notification should be followed up with a written memo and a copy to the owner.

What about hidden hazards or ones not easily detected? Is there a duty on the part of the construction inspector to search them out? The answer is a definite "No!" The construction inspector is not a Safety Engineer or a Safety Inspector. That is not what they are hired for or trained to do.

Jobsite safety measures and procedures are the sole responsibility of the contractor and are normally specified as such in the contract documents.

Many safety concerns of a project involve the adequacy of shoring in trenches or scaffolding or falsework, which is not easily determined without an engineering analysis of size and placement of support members. This is the complete and sole responsibility of the contractor and the contractor's personnel. The inspector should know who the contractor has designated as the site safety engineer or representative in charge of site safety, as well as who the contractor designates as second-in-charge if the contractor's safety representative is absent. These are the ones whose job it is to maintain safe conditions at the jobsite for the workmen, for authorized visitors, and for others who have a right to be there, including the design principal (architect), design consultants and, of course, the construction professional. It should be

made clear to the contractor and the contractor's superintendent at the pre-construction conferences that the inspector is not there to review the adequacy of the contractor's safety program.

As a general rule, the inspector should be trying to observe and report any discrepancies between the requirements of the contract documents and the contractor's work. However, there is one important exception to this rule. Although the contract documents do require the contractor to institute and maintain certain safety precautions, that is one contractor activity which the inspector is not hired to review. The inspector should bear in mind that there are two main categories of safety on a construction project: safety during construction and the adequacy of the final result. The "house-keeping" safety measures and the safety of workmen assembling the structure are solely the contractor's responsibility. The contractor must conduct construction reviews to determine whether adequacy and compliance with regulated safety requirements are maintained. The adequacy of the final result -that is, whether it is safe to use after it is finished, presuming the project is constructed precisely as designed -is normally the responsibility of the owner's design professionals (typically the architect) and the design consultant. Inspectors should remember that if they volunteer to do something they have not originally agreed to, and do it negligently, they may be responsible for the damages you cause.

Human safety is a serious matter. The inspector should make sure he knows at the beginning of the personnel who are specially trained and qualified to handle safety questions. If there have doubts about how the contractor is treating this subject, such deficiencies should be reported to the owner and to appropriate governmental safety authorities. However, the inspector should not volunteer to become a safety engineer any more than he should volunteer to assume the responsibilities of the design team or contractor. It is equally important that the other parties involved in the project understand the extent of the inspector's duties.

Part 5.4:

Regional Concerns

Regional concerns include the politics of the site, both governmental and special interests. One of the advantages of experience is knowing the potential pitfalls and problems that can occur. Experience within a particular region is especially beneficial. When an inspector doesn't have regional experience, it is possible to take some precautions.

Regulations regarding hazardous materials, dust abatement, noise abatement and air quality are common concerns for communities and authorities regarding construction operations. Work hours can be restricted due to noise or traffic conditions, specific types of mufflers may be required on construction equipment for noise control and engines may be limited to specified idling periods for pollution control. Local disposal areas may not be available for construction debris, requiring the debris to be hauled long distances.

Some areas are beginning to require recycling of construction materials rather than allowing them to become landfill. Wood, metal and paper materials generated by construction operations for blocking, formwork and packaging may be required to be separated and stored in a manner allowing easy removal for recycling. Other recycling concerns might include restrictions on disposal of paints, plastics and other products.

Special regional concerns might also include concerns for local animal and plant life, including the potential of toxic hazards from construction operations. Other communities might have special concerns for artifacts, requiring local archeologists to be on-site during any excavation to ensure any potential archeological finds are not destroyed.

The construction inspector should be clear regarding responsibilities relating to such regional concerns and equipped along with the necessary information (such as phone numbers) about how to comply with the requirements. Part of this should be covered in the construction inspection agreement. Additional information might be gathered from the design team and local authorities, especially local building departments, planning commissions, fire departments, departments of public works and the local administrative offices (state governor's office, mayor's office, county supervisor's office, etc).

Part 5.5:

Geographic Concerns

Geographic concerns relate to the actual physical site rather than the political aspects of the site. Soil conditions, ground water, flooding and potential seismic activity all play an important role.

Known soil conditions should be identified in the contract documents; however, no report can be so thorough as to eliminate the possibility of unexpected conditions. Rock outcroppings, underground water and variations in the natural topography can all have an impact on a project. The construction inspector should attempt to keep abreast of where unexpected conditions are encountered and make sure the design team is also aware as soon as possible. This is especially critical because changes in the conditions might require changes in the contract documents.

Ground water control is easily handled where information is accurate and conditions don't change appreciably. However, construction inspectors should watch for the unanticipated, such as the impact on adjacent properties.

Where the project is located on a flood plain, consideration needs to be given to how the potential of water on-site might impact the construction. On-site storage of materials during the wet season might justify special conditions and observations to ensure materials susceptible to water damage are kept dry.

Construction in seismic areas needs to be given some consideration by the construction inspector. In areas where seismic activity is frequent, such as the West Coast, construction inspectors should pay extra attention to materials storage. Although safety is not the responsibility of the construction inspector, materials stacked higher than four or five feet might prove a potential hazard during an earthquake. Shoring and bracing should never be "adequate," since additional seismic loads need to be recognized. It is not the construction inspector's responsibility to design shoring and bracing; however, recognition of potential seismic activity can be justification for indicating a concern regarding systems that seem inadequate.

Additionally, some areas have special inspections that required immediately after seismic events to establish the extent of potential damage. Even a relatively small earthquake can be a problem for a construction project where final seismic bracing has not been completed.

Part 5.6:

Climate Concerns

Climate plays as large a role in construction as the contract documents, codes, regulations, regional concerns and geographic concerns. Few areas have perfect weather all year round. Even those areas where temperature extremes are rare have their own special concerns such as fog, hurricanes, humidity and even acid rain. One of the construction inspector's most common responsibilities is to record the weather on a daily basis (or at least on every day the construction inspector is on-site).

Cold climates most often bring concerns relating to snow, yet any wet conditions can become a problem when the temperature falls below freezing. Knowing that temperatures are anticipated to fall below freezing can be just as important to a project as knowing that they are already below freezing. Temperatures ranging above and then falling below freezing should be recorded, since the higher temperatures can cause ice and snow to melt and then refreeze as the temperature drops.

Storage of materials in cold climates should also be considered, especially where extended bad weather might result in the project being delayed for an extended period. Materials stored on-site need to be kept elevated above potential standing water and ice and kept covered to protect from rain, snow and ice, yet allow air circulation to prevent moisture from being trapped. In especially harsh climates, it might be beneficial to either store materials off-site or to provide temporary storage containers or buildings on-site.

Extremely hot climates can be detrimental to any materials which require curing or drying. Too much heat can remove necessary moisture before curing is complete which means concrete might not reach the required strength, plasters will have higher shrinkage and more cracks and paints may not form proper films. High humidity in a hot climate can also cause problems, especially where the dew point is higher than the night time temperatures, which causes moisture to form on surfaces.

Fog is another form of moisture that needs to be considered. Ocean fog has a high saline content which is left on surfaces when the moisture evaporates. Salts on metals tend to be corrosive. Salts in cementation products, including salts in the sand and on aggregates, can re-desolve later and be carried by water to the surface of the material, resulting in efflorescence.

Wood should be at least surface dry (S-dry) when used in construction. Many contract documents require kiln dried wood. Either type of wood absorbs water, which causes expansion. Framing lumber that gets wet and is not allowed to dry out goes through seasonal changes of expansion and

contraction, which results in creaks and groans in the structure as the nails move in and out. Moisture on decks during roofing can result in future blisters.

Wind can be a problem as well. Too much wind can be as much of a problem to concrete and plaster as too much sun, causing premature drying, potential loss of strength, and cracking. Winds can also become a safety concern if stored materials are not properly secured. A record of extreme winds should be kept along with a record of temperatures.

Manufacturers' instructions should always be reviewed; when there are any questions relating to applicability to specific project conditions, the inspector should contact the manufacturer's representative.

Introduction

The purpose of this manual is to supply useful information about construction inspection.

Owners, architects, engineers, contractors and others in the construction industry have discussed the need for a construction inspection manual for years. The original intent of the previous Editions was to discuss, in a general way, the duties, qualifications and abilities of the construction inspector and the working relationships among the parties during construction.

The Founding Committee, delegated as representatives by the various organizations directly involved in construction, collected data concerning inspection from as many sources as possible. The data was then reviewed and edited and the most pertinent material was incorporated into a first draft. The draft was distributed to approximately one hundred other individuals and organizations for review and comment before publication.

Due to the complexity of the topic, it is understandable that some material, information, organizations or other data may have been overlooked or not included. This omission was not intentional in any respect.

The Coordinating Committee recognizes that the manual may not be comprehensive enough for all types of projects. It was originally written to apply to both public and private “building” construction projects of average complexity where a full-time construction inspector is engaged. Construction inspection for smaller projects might be the responsibility of a part-time construction inspector or even members of the design team. For highly complex projects, the construction inspection may require a staff of inspectors, including specialized inspectors and assistants.

It did not seem feasible to attempt to discuss all arrangements and methods of construction and inspection within the limited scope of the manual. Traditional methods of construction and inspection can be impacted by many factors. The role of the developer, who can be a contractor, architect or other party changes the concerns relating to construction inspection. New methods of construction management and design/build also impact the role of construction inspection. Laws governing certain types of public projects may include specific duties for the construction inspector.

With the arrival of the 21st Century, the Coordinating Committee realized the need to make modifications to the recent Edition to reflect major changes in the construction industry.

Recognition of the need for involvement by more members of the construction team resulted in the addition of matrix tables which attempt to provide the Coordinating Committee's recommendation regarding the primary and secondary responsibilities for inspection. These recommendations should be considered a guide only, intended for the average building construction project. The matrixes will hopefully help readers find information which is of interest to specific members of the construction team.

Further, it is hoped that as this and later Editions are developed, recognition will be given to a broader understanding of the full extent of the construction process. More and more people are beginning to recognize that the construction process is not limited to just the design and build process. Construction actually begins with conception of a potential building, including design. It then encompasses construction, commissioning, maintenance, remodeling, alterations and potential changes in occupancy type and only ends when the building is finally demolished. Construction inspection, likewise, should be recognized as a part of the complete construction process, from conception through demolition.

Terminology used in the manual may differ in some instances from what some organizations may have established. The reader is referred to Appendix B, "Terms and Definitions."

The reader is cautioned that this publication is not intended as a guide book to legal relationships or as a compendium of forms, legal or otherwise. It is published solely as a working manual, prepared not by lawyers but by a collaborative effort of the construction industry to provide general information regarding construction inspection. Those using the manual should not rely on it to eliminate or solve legal problems. They should consult their legal counsel on all matters involving contractual or other legal relationships.

The masculine gender was utilized in the original 1973 Edition of this manual. Where traces still escaped editing, please accept that the feminine gender is intended to be just as applicable in all cases, i.e., he/she, his/her, etc.

APPENDIX

APPENDIX A — BIBLIOGRAPHY

The American Institute of Architects, *Duties, Responsibilities, and Limitations of Authority of Full-Time Project Representative*. AIA Document B352, The American Institute of Architects, 1735 New York Avenue NW, Washington DC 20006.

The American Institute of Architects, *General Conditions of the Contract for Construction*. AIA Document A201, The American Institute of Architects, 1735 New York Avenue NW, Washington DC 20006.

The American Institute of Architects, *Architect's Handbook of Professional Practice, Chapter 18, Construction Contract Administration*. The American Institute of Architects, 1735 New York Avenue NW, Washington DC 20006.

The American Society for Testing and Materials, *Standards in Building Codes*, The American Society for Testing and Material, 1916 Race Street, Philadelphia, PA 19103.

Birch, Silas B. Jr., *Public Works Inspector's Manual*, BNi Building News, 990 Park Center Dr, Suite E, Vista, CA 92081.

Construction Specifications Institute, MASTERFORMAT, 2004 Edition Numbers & Titles, 99 Canal Center Plaza, Suite 300, Alexandria, VA 22314.

Masonry Institute, *Reinforced Concrete Masonry Construction Inspector's Manual*, Masonry Institute of America, 386 Beach Ave, Unit #4, Torrance, CA 90501-6202.

Southern California Chapter, American Public Works Association and Southern California District, *Associated General Contractors of California, Standard Specifications for Public Works Construction*, BNi Building News, 990 Park Center Dr, Suite E, Vista, CA 92081.

APPENDIX B — TERMS AND DEFINITIONS ⁽¹⁾

Addendum: Written or graphic instruments issued prior to the execution of the contract which modify or interpret the bidding documents, including drawings or specifications, by additions, deletions, clarifications or corrections. Addenda become part of the contract documents when the construction contract is executed. Plural: *Addenda*.

Agency:* Administrative subdivision of a public or private organization having jurisdiction over construction of the work.

Application and Certificate for Payment: Contractor's written request for payment of amount due for completed portions of the work and, if the contract so provides, for materials delivered and suitably stored pending their incorporation into the work.

Accepted:* Written acknowledgement of review by the architect/engineer or other authority having jurisdiction.

Architect:* Designation reserved, usually by law, for a person or organization professionally qualified and duly licensed to perform architectural services, including analysis of project requirements, creation and development of project design, preparation of drawings, specifications and bidding requirements and general administration of the construction contract. As used in this manual, the primary design professional with whom the owner contracts for design services; either the architect or the engineer.

Architect's Representative:* An individual assigned by the architect to act as his liaison and assist in the administration of the construction contract.

Beneficial Occupancy: Use of a project or portion thereof for the purpose intended.

Building Inspector: A representative of a governmental authority employed to inspect construction for compliance with applicable codes, regulations and ordinances.

Certificate for Payment: A statement from the architect to the owner confirming the amount of money due the contractor for work accomplished or materials and equipment suitably stored, or both.

(*) Many of the terms and definitions have been excerpted from the "Glossary of Construction Industry Terms," copyright 1970 by the American Institute of Architects. Refer to this publication for a comprehensive glossary. However, for the purposes of the manual, certain terms and/or their definitions have been changed or added. An asterisk (*) following the term indicates these exceptions.

Change Order: A written order to the contractor signed by the owner and the architect, issued after the execution of the contract, authorizing a change in the work or an adjustment in the contract sum or the contract time.

Codes:* Regulations, ordinances or statutory requirements of a governmental unit relating to building construction and occupancy, adopted and administered for the protection of the public health, safety and welfare.

Consultant:* A individual or organization engaged by the architect/engineer to render professional consulting services complementary to or supplementing his services.

Construction Documents: Working drawings and specifications.

Construction Inspector:* A qualified person engaged to provide full-time inspection of the work. In this manual, may refer to the inspector, specialized inspectors and staff.

Contract:* The legally enforceable promise or agreement executed by the owner and the contractor for the construction of the work.

Contract Documents: The owner-contractor agreement, the conditions of the contract (general, supplementar, and other conditions), the drawings, the specifications, all addenda issued prior to execution of the contract, all modifications thereto and any other items specifically stipulated as being included in the contract documents.

Contractor:* The person or organization performing the work and identified as such in the contract.

Date of Substantial Completion: The date certified by the architect when the work or a designated portion thereof is sufficiently complete in substantial accordance with the contract documents so that the owner may occupy the work or designated portion thereof for the use for which it was intended.

Engineer:* Designation reserved, usually by law, for a person or organization professionally qualified and duly licensed to perform engineering services, including analysis of project requirements, development of project design, preparation of drawings, specifications and bidding requirements and general administration of the construction contract. See also *Consultant*.

Field Change Order:* A written order used for emergency instruction to the contractor where the time required for the preparation and execution of a formal change order would result in a delay or stoppage of the work.

The usage of a field change order may be subject to prior legal approval and limitations. A duly authorized change order should replace a field change order as soon as possible.

Final Acceptance: The owner's acceptance of the project from the contractor upon certification by the architect that it is complete and in substantial accordance with the contract requirements. Final acceptance is confirmed by making of final payment, unless otherwise stipulated at the time of making such payment.

Final Inspection: Final review of the project by the architect prior to his issuance of final certificate of payment.

Inspection:* Examination of the work completed or in progress to determine its compliance with contract requirements. The architect ordinarily makes only two inspections of a construction project, one to determine the date of substantial completion and the other to determine final completion. **These inspections should be distinguished from the more general observations of visually exposed and accessible conditions made by the architect on periodic site visits during the progress of the work.** A full-time construction inspector makes continuous inspection.

Inspection List: A list of items of work to be completed or corrected by the contractor.

Owner: (1) The architect's client and party to owner-architect agreement; (2) the owner of the project and party to the owner-contractor agreement.

Owner Representative:* A person delegated by the owner to act in his behalf as a liaison to the architect during the development of the project and construction of the work. The responsibilities delegated should be stipulated to the extent that this person may or can make decisions on the part of the owner.

Progress Payment: Partial payment made during the progress of the work on account of work completed and/or materials received and suitably stored.

Progress Schedule: A diagram, graph or other pictorial or written schedule showing proposed or actual times of starting and completion of the various elements of the work.

Project: The total construction designed by the architect, of which work performed under the contract documents may be a whole or part.

Punch List: See *Inspection List*.

Record Drawings:* Construction drawings revised to show significant changes made during the construction process, usually based on marked-up prints, drawings and other data furnished by the contractor to the architect. Sometimes the term “as-built drawings” has been used in the past. The contractor is responsible for the accuracy of the information provided.

Required:* Need of contract documents, code, agency, normally accepted practice or other authority, unless context implies a different meaning.

Schedule of Values: A statement furnished by the contractor to the architect reflecting the portions of the contract sum allotted for the various parts of the whole. Used as a basis for reviewing the contractor’s applications for progress payments.

Shop Drawing: Drawings, diagrams, illustrations, schedules, performance charts, brochures and other data prepared by the contractor or any subcontractor, manufacturer, supplier or distributor which illustrate how specific portions of the work shall be fabricated and/or installed.

Standards:* Organizations or public agencies that are recognized or have established by authority, custom general consent, industry standards or other manner a method, criterion, example or test for the manufacture, installation, workmanship or performance of a material or system.

Subcontractor: A person or organization that has a direct contract with a primary contractor to perform a portion of the work at the site.

Substantial Completion: See *Date of Substantial Completion*.

Supplier: A person or organization that supplies materials or equipment for the work, including that fabricated to a special design, but does not perform labor at the site. See also *Vendor*.

Superintendent: Contractor’s representative at the site who is responsible for continuous field supervision, coordination, completion of the work and, unless another person is designated in writing by the contractor to the owner and architect, prevention of accidents.

Vendor: A person or organization that furnishes materials or equipment not fabricated to a special design for the work. See also *Supplier*.

Work: All labor necessary to produce the construction required by the contract documents and all materials and equipment incorporated or to be incorporated in such construction.

APPENDIX C — CONSTRUCTION INDUSTRY ORGANIZATIONS

In addition to the organizations and agencies listed in Part 2 of this manual, the other professional and trade organizations and agencies listed below represent members of the construction industry. Many of these groups publish documents and provide other information relating to design, materials, systems, specifications and construction.

National Organizations

Acoustical Society of America, 120 Wall St, New York, NY 10005 (212) 248-0373

Adhesive and Sealant Council, 1627 K St. NW, Ste. 1000, Washington DC 20006 (202) 452-1500, Fax: (202) 452-1501

Advisory Council on Historic Preservation, The Old Post Office Bldg, 1100 Pennsylvania Ave NW, Ste. 809, Washington DC 20004 (202) 606-8503 , Fax: (202) 606-8647

Air Conditioning and Refrigeration Institute, 4301 N Fairfax Dr, #425, Arlington, VA 22203 (703) 524-8800, Fax: (703) 524-8800

Air Conditioning and Refrigeration Wholesalers, 1351 South Federal Highway, PO Box 640, Deerfield Beach, FL 33441

Air Conditioning Contractors of America, 1228 17th St. NW, Washington DC 20036

Air Pollution Control Association, PO Box 2861, Pittsburgh, PA 15230

Allied Stone Industries, Carthage Marble Co, Carthage, MO 64836

American Arbitration Association, 140 W. 51st St, New York, NY 10020, (212) 484-4006, (800) 778-7879

American Association for Hospital Planning, Century Bldg. Ste. 830, 2341 Jefferson Davis Hwy, Arlington, VA 22202

American Association of Junior Colleges, National Center for Higher Education, One DuPont Circle NW, Washington DC 20036

American Association of Museums, 1575 I St. NW, Ste 400, Washington DC 20005, (202) 289-1818, Fax: (202) 289-6578

American Association of School Administrators, 1801 N Moore St, Arlington, VA 22209, (703) 528-0700, Fax: (703) 841-1543 (800) 771-1162

American Concrete Institute, PO Box 9094, Farmington Hills, IL 48333

American Concrete Pipe Association, 8300 Boone Blvd, #400, Vienna, VA 22182

American Construction Inspectors Association, 2275 W. Lincoln Ave, Ste. B, Anaheim, CA 92801

American Forest Council, 1111 19th St. NW, #800, Washington DC 20036, (202) 463-2455

American Forestry Association, 1319 18th St. NW, Washington DC 20036.

American Gas Association, 1515 Wilson Blvd, Arlington, VA 22209
(703) 841-8400

American Hardware Manufacturers Assoc, 801 N Plaza Dr, Schaumburg, IL 60173, (312) 885-1025, Fax: (847) 605-1093

American Hospital Association, 840 N Lakeshore Dr, Chicago, IL 60611 (312) 280-6000.

American Institute of Architects, 1735 New York Ave NW, Washington DC 20006 (202) 626-7300, (800) 242-3837

American Institute of Kitchen Dealers, 124 Main St, Hackettstown, NJ 07840

American Institute of Landscape Architects, 6810 N. Second Pl, Phoenix, AZ 85012

American Institute of Planners. 1313 E. 60th St, Chicago, IL 60637

American Institute of Real Estate Appraisers of the National Assn. of Realtors, 875 N Michigan, Ste 2400, Chicago, IL 60611, (312) 335-4100

American Insurance Association, 1130 Connecticut Ave NW, #1000, Washington DC 20036 (202) 828-7100, Fax: (202) 293-1219

American Iron and Steel Institute, 1101 17th St. NW, Washington DC 20005, (202) 452-7100

American Library Association, 50 E. Huron St, Chicago, IL 60611,
(312) 944-6780, (800) 545-2433

American National Standards Institute, 11 W. 42nd St, 13th Floor, New York, NY 10036, (888) 267-4783, Fax: (212) 398-0023

American Plywood Association, 7011 S. 19th St, Tacoma, WA 98466, (253) 565-6600

American Public Power Association, 2301 M St. NW, Washington, DC 20037, (202) 775-8300, Fax: (202) 467-2910

American Public Works Association, 1313 E. 60th St, Chicago, IL 60637, (773) 667-2200, Fax: (773) 667-2304

American RD and Transportation Builders Association, ARBA Bldg, 1010 Massachusetts Ave, Washington DC 20001, (202) 289-4434

American Segmental Bridge Institute, 9201 N 25th Ave, Ste. 150B, Phoenix, AZ 85021, (602) 997-9964, Fax: (602) 997-9965

American Society of Civil Engineers, 1801 Alexander Bell Dr, Reston, VA 20190, (800) 548-2723

American Society of Golf Course Architects, 221 N LaSalle St, Chicago, IL 60601, (312) 372-7090, Fax: (312) 372-6160

American Society of Heating, Refrigeration and Air Conditioning Engineers, Inc, 1791 Tullie Circle N.E, Atlanta, GA 30329, (404) 636-8400 , Fax: (404) 321-5478, (800) 527-4723

American Society of Mechanical Engineers, United Engineering Center, 345 E. 47th St, New York, NY 10017, (212) 705-7722, (800) THE-ASME

American Society of Planning Officials, 1313 E. 60th St, Chicago, IL, 60637, (312) 947-2560

American Society of Real Estate Counselors, 430 N Michigan Ave, Chicago, IL 60611, (312) 329-8431, Fax: (312) 329-8881

American Society for Testing & Materials, 100 Barr Harbor Dr. W, Conshocken, PA 19428, (610) 832-9585

American Welding Society, Inc, PO Box 351040, 550 NW 42nd Ave, Miami, FL 33135

American Wood Preservers Association, PO Box 286, Woodstock, MD 21663, (410) 465-3169

Architectural Precast Association, 825 E. 64th St, Indianapolis, IN 46220, (317) 251-1214

Asphalt Institute, Research Park Dr, Lexington, KY 40512, (606) 288-4961

Association Builders and Contractors, Inc., 1300 N 17th ST, Roslyn, VA 22209, (703) 812-2000

Associated Equipment Distributors, 615 W. 22nd St, Oakbrook, IL 60523, (630) 574-0650

Associated General Contractors of America, 1957 E St. NW, Washington, DC 20006, (202) 393-2040

Associated Specialty Contractor, Inc., 3 Bethesda Metro Center #1100, Bethesda, MD 20814, (301) 657-3110

Association of American Universities, One DuPont Circle, Washington, DC 20036, (202) 387-3760

Association of University Architects, c/o Forrest M. Kelly, Jr, Physical Planning Officer State University System of Florida Collins Bldg, Tallahassee, FL 32301

Association of Wall and Ceiling Industries International, 1600 Cameron St, Alexander, VA 22314-2705, (703) 684-2924, Fax: (703) 684-2935

Association of Women in Architecture, 7440 University Dr, Saint Louis, MO 63130, (314) 621-3484

Better Heating-Cooling, 35 Russo Pl, Berkeley Heights, NJ, (908) 464-8200

Builders Hardware Manufacturers Association, 355 Lexington Ave, 17th Fl, New York, NY 10017, (212) 661-4261, Fax: (212) 370-9047

BLDG Congress and Exchange, 2301 N Charles St, Baltimore, MD 21218

BLDG Materials Research Institute, Inc., 15 E. 40th St, New York, NY 10017

BLDG Research Institute, 2101 Constitution Ave NW, Washington, DC 20418

BLDG Stone Institute, 420 Lexington Ave, New York, NY 10017, (212) 490-2530

BLDG Systems Research Institute, 2101 Constitution Ave NW, Washington, DC 20418

BLDG Thermal Envelope Coordinating Council, 101 15th St. NW, Ste. 700, Washington, DC 20005, (202) 347-5710

California Association of Realtors, 525 S. Virgil Ave, Los Angeles, CA 90020, (213) 739-8200

Ceilings and Interior Systems Contractors Association, 1500 Lincoln Hwy, STE 202, St, Charles, IL 60174, (630) 584-1919

Cellular Concrete Association, 715 Boylston St, Boston, MA 02116

Ceramic Tile Distributors Association, 15 Salt Creek Lane, Ste 422, Hinsdale, IL 60521

Ceramic Tile Institute, 700 N Virgil Ave, Los Angeles, CA, 90029

Committee of Steel Pipe Producers American Iron And Steel Institute, 1000 16th St. NW, Washington DC 20036

Concrete Reinforcing Steel Institute, 933 N Pilluli Grove RD Schaumburg, IL. 60173-4758, (312) 517-1200, Fax: (312) 517-1206

Construction Financial Management Assn, 40 Brunswick Ave, Edison, NJ 08818

Construction Labor Research Council, 1730 M St. NW, STE 503, Washington, DC 20036

Construction Specifications Institute, 601 Madison St, Alexandria, VA 22314, (800) 689-2900

Construction Writers Association, PO Box 5586, Buffalo Grove, IL 60089 (847) 398-7756

Contracting Plasterers Research Institute, 2101 Constitution Ave NW, Washington, DC 20418

Copper Development Association, Inc, 260 Madison Ave - 16th Floor, New York, NY 10016, (212) 251-7200, (800) 232-3282

Council of Educational Facility Planners, 29 W. Woodruff Ave, Columbus, OH 43210

Council of Mechanical Specialty Contracting Industries, Inc, 7315 Wisconsin Ave, Washington, DC 20014

Electrical Association, 140 S. Dearborn St, Chicago, IL 60603

Electric Power Research Institute, 2000 L St, Ste 805 NW, Washington, DC 20036, (202) 872-9222, Fax: (202) 293-2697

The Energy Bureau, Inc, 41 E. 42nd St, New York, NY 10017

Engineers Joint Council, 345 E. 47th St, New York, NY 10017

Federal Housing Administration, Dept. of Housing and Urban Development, 451 7th St.. S.W, Washington, DC 20410, (202) 708-2495, Fax: (202) 708-2583

Fine Hardwoods Association, 5603, West Raymond, Ste 0, Indianapolis, IN 46241, (317) 873-8780

Flexicore Manufacturers Association, PO Box 1807, Dayton, OH 45401, (937) 223-7420

Food Facilities Consultants Society, 1800 Pickwick Ave, Glenview, IL 60025

Forest Products Research Society, 2801 Marshall Ct, Madison, WI 53705, (608) 231-1361, (800) 354-7164

Gardens For All, 180 Flynn Ave, Burlington, VT 05401

Guild For Religious Architecture, 1913 Architects Bldg, Philadelphia, PA 19103

Historic American BLDGs Survey, 801 19th St. NW, Washington, DC 20006

Illuminating Engineers Society, 120 Wall St, 17th Floor, New York, NY 10005, (212) 248-5000

Information Bureau of Lath/Plaster/Drywall, 3127 Los Feliz Blvd, Los Angeles, CA 90039, (213) 663-2213

Institute of Electrical and Electronic Engineers, 345 E. 47th St, New York, NY 10017, (212) 705-7900, (800) 678-4333

Institute of Noise Control Engineering, PO Box 3206, Arlington Branch, Poughkeepsie, NY 12603

Institute of Real Estate Management, 430 N Michigan Ave, Chicago, IL 60611, (312) 661-1930, (800) 837-0706, Fax: (800) 338-4736

International Association of Plumbing and Mechanical Officials, 2001 S. Walnut Dr, Walnut, CA 91789-2825

International Conference of BLDG Officials, 14545 Leffingwell, Whittier, CA 90604, (562) 903-1478, Fax: (561) 903-1480

International Council of Shopping Centers, 665 Fifth Ave, New York, NY 10022, (212) 421-8181, Fax: (212) 421-6464

International Institute of Ammonia Refrigeration, 111 East Wacker Dr, Chicago, IL 60601, (312) 644-6610, Fax: (312) 565-4658

International Masonry Institute, 815 15th ST NW, Washington DC 20005, (202) 783-3908

Inter-Society Color Council, Inc., Rensselaer Polytechnic Institute, Troy, NY 12181

Landscape Architecture Foundation, 636 I St. NE, Washington DC 20001 (202) 898-2444

Mason Contractors Association of America, 1910 So. Highland Ave, Ste 101, Lombard, IL 60148, (630) 705-4200, Fax: (630) 705-4209

Masonry Institute of America, 2550 Beverly Blvd, Los Angeles, CA 90057, (213) 388-0472, Fax: (213) 388-6958

Metal BLDGs Manufacturers Association, c/o Thomas Assoc, 1300 Summer Ave, Cleveland, OH 44115, (216) 241-7333, Fax: (216) 241-0105

Model Codes Standardization Council, National Bureau of Standards, Washington, DC 20234

Mortar Manufacturers Standards Association, 315 S. Hicks Rd, Palatine, IL 60067

Mortgage Bankers Association of America, 1125 15th St. NW, Washington, DC 20005, (202) 861-6500

National Asphalt Pavement Association, 5100 Forbes Blvd. Lanham MD 20706, (301) 731-4748

National Association of Corrosion Engineers, 1440 South Creek Dr, Houston, TX 77084, (281) 492-0535

National Association of Decorative Architectural Finishes, 112 N Alfred St, Alexandria, VA 22314

National Association of Garage Door Manufacturers, 1300 Summer Ave, Cleveland OH 44115, (216) 241-7333

National Association of Home Builders National Housing Center, 1201 15th St. NW, Washington DC 20005, (202) 822-0200, (800) 223-2665

National Association of Home Builders of the J.S., 1201 15th St. NW, Washington, DC 20005, (202) 822-0200

National Association of Housing and Redevelopment Officials, 630 Eye St. NW, Washington DC 20001, (202) 289-3500

National Association of Realtors, 700 11th St. NW, Washington DC 20001, (202) 283-1043

National Association of Store Fixture Manufacturers, 5975 W. Sunrise, Sunrise, FL 33312, (305) 587-9190

National Board of Boiler and Pressure Vessel Inspectors. 1055 Crupper Ave, Columbus, OH 43229, (614) 888-8320

National Institute of Standards and Technology, Fire and BLDG Research Labs, Gaithersburg, MD 20899

National Concrete Masonry Association, 2302 Horse Pen Rd, Herndon, VA 22071, (703) 713-1900

National Construction Association, 1730 M St. NW, Ste 503, Washington DC 20036, (202) 466-8880

National Corporation for Housing Partnership, 1133 15th St. NW, Washington DC 20005, (202) 216-2900

National Crushed Stone Association, 1415 Elliott PI NW, Washington DC 20007

National Decorating Products Assn, 415 Ax Minister, St. Louis, MO 63026.

National Electrical Contractors Association, Inc, 3 Bethesda, MD 20814.

National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269, (800) 344-3555

National Housing Conference, 815 15th ST NW, Ste 711, Washington DC 20005, (202) 393-5772

National Institute of BLDG Sciences, 1201 L St. NW, #400, Washington DC 20005, (202) 289-7800

National Petroleum Council, 1625 K St. NW, Ste 600, Washington DC 20006, (202) 393-6100

National Precast Concrete Association, 10333 N Meridian St, Ste. 272, Indianapolis, IN 46290, (317) 571-9500

National Ready Mixed Concrete Association, 900 Spring St, Silver Springs, MD 20910, (301) 587-1400, Fax: (301) 585-4219

National Roofing Contractors Association, 10255 W. Higgins Rd, Ste 600, Rosemont, IL 60018, (708) 299-9070

National Science Foundation, 4201 Wilson Blvd, Arlington, VA 22230, (703) 306-1070

National Slag Association, 900 Spring St, Silver Springs, MD 20910, (301) 587-1400

National Wood Flooring Association, 233 Old Meramec Stations Rd, Manchester, MO 63021, (314) 391-5161

North American Wholesale Lumber Association, 3601 Algonquin Rd, Ste. 400, Rolling Meadows, IL 60008, (708) 870-7470

Painting and Decorating Contractors of America, 3913 Old Lee Highway, Ste. 33-B, Fairfax, VA 22030, (703) 359-0826, Fax: (703) 359-2576 (800) 332-7322

Plastering Information Bureau, 21243 Ventura Blvd, Ste. 115, Woodland Hills, CA 91364

Plastic in Construction Council, 355 Lexington, New York, NY 10001.

Plumbing and Drainage Institute, PO Box 93, Indianapolis, IN 46206, (317) 251-5298

Portland Cement Association, 5420 Old Orchard Rd, Skokie, IL 60077, (800) 868-6733

Prestressed Concrete Institute, 175 W. Jackson Blvd, Chicago, IL 60604, (312) 786-0300

Red Cedar Shingle and Handsplit Shake Bureau, 515 116th Ave. NE, Ste. 275, Bellevue, WA 98004, (425) 453-1323

Scaffold Industry Association, Inc., 14039 Sherman Way, Van Nuys, CA 91405, (818) 782-2012, Fax: (818) 786-3027

Scaffolding and Shoring Institute, c/o Thomas Associates, Inc, 1300 Summer, OH 44115, (216) 241-7333

Screen Manufacturers Association, 2850 S. Ocean Blvd, No. 311, Palm Beach, FL 33480, (407) 533-0991

Sealed Insulating Glass Manufacturers Association, 401 N Michigan Ave, Chicago, IL 60611, (312) 644-6610

Sheet Metal and Air Conditioning Contractors National Assn, Inc., 4201 Lafayette Center Dr, Chantilly, VA 20151, (703) 803-2989

Sheet Metal and Air Conditioning Contractors' National Association, Inc., 4201 Lafayette Center Dr, Chantilly, VA 20151, (703) 803-2980

Society of the Plastic Industry, 1275 K St. NW, Washington DC 20005, (202) 371-5200

Solar Energy Industries Association, 122 C St. NW, 4th Floor, Washington, DC 20001, (202) 383-2600

Southern Cypress Manufacturers Association, 400 Penn Center Blvd, Pittsburgh, PA 15235, (412) 829-0770

Stained Glass Association of America, PO Box 22642, Kansas City, MO 64113, (816) 333-6690

Steel Door Institute, 30200 Detroit Rd, Cleveland, OH 44145, (216) 226-0010

Stucco Manufacturers Association, 507 Evergreen, Pacific Grove, CA 93950, (408) 649-3466

Truss Plate Institute, 583 D'Onofrio Dr., Ste. 200, Madison, WI 53719, (608) 833-5900

United Brotherhood of Carpenters and Joiners of America, 101 Constitution Ave. NW, Washington, DC 20001, (202) 546-6206

United States Conference of Mayors, 1620 Eye St. NW, Washington, DC 20006, (202) 293-7330

United States League of Savings Institutions, 111 E. Wacker Dr, Chicago, IL 60601, (312) 644-3100

Urban Institute, 2100 M St. NW, Washington, DC 20037, (202) 624-7062.

Vermiculite Association, 11 S. La Salle St, Ste. 1400, Chicago, IL 60603, (312) 201-0101

Waferboard Assn, PO Box 724533, Atlanta, GA 30339

Wallcovering Information Bureau, 66 Morris Ave, Springfield, NJ 07081.

Wallcovering Wholesalers Association, 401 N Michigan Ave, Chicago, IL 60611, (312) 245-1083

Western Red Cedar Lumber Association, 1500 Yeon Bldg, Portland, OR 97204

Western Wood Products Association, 522 SW 5th Ave, Ste. 500, Portland, OR 97204, (503) 224-3930

Wood and Synthetic Flooring Institute. 1800 Pickwick Ave, Glenview, IL 60025

Wood Truss Council of America, 1 WTCA Center, 6425 Normandy Ln, Madison, WI 53719, (608) 274-3329

CALIFORNIA ORGANIZATIONS

Air Conditioning and Refrigeration Contractors Association of Southern California, 401 Shatto Pl, Los Angeles, CA 90020, (213) 738-7238, (213) 738-5260

American Public Works Association, Northern California Chapter

American Subcontractors Association, Los Angeles/Orange County Chapter, c/o Philip B. Greer, Atkinson, Andelson, et al, 13304 E. Alondra Blvd, Ste. 200, Cerritos, CA 90701

Associated Builders and Contractors, Golden Gate Chapter, 11875 Dublin Blvd, Ste. 258 Dublin, CA 94568, (510) 829-9230

Associated General Contractors of California, East Bay District, 1390 Willow Pass RD, STE 1030, Concord, CA 94520, (510) 827-2422

Associated General Contractors of California, State Office, 3095 Beacon Blvd, West Sacramento, CA 95691, (916) 371-2422

Associated Plumbing and Mechanical Contractors of Sacramento, 50 Fullerton CT, #100, Sacramento, CA 95825, (916) 452-4917, Fax: (916) 452-0532

Associated Roofing Contractors of the Bay Area Counties, 8301 Edgewater Dr, Oakland, CA 94621, (510) 635-8800

Associated Tile Contractors of Southern California, 2736 S. La Cienega Blvd, Los Angeles, CA 90034

Builders Exchange of Alameda, 3055 Alvarado St, San Leandro, CA 94577, (510) 483-8880

Builders Exchange of Contra Costa, 1900 Bates Ave, Suites E & F, Concord, CA 94520, (510) 685-8630

Builders Exchange of Modesto, PO Box 4307, Modesto, CA 95352, (209) 522-9031

Builders Exchange of Monterey Peninsula, 343 Ocean AVE, Monterey, CA 93940, (408) 373-3033, Fax: (408) 373-8682

Builders Exchange of Napa/Solano, 135 Camino Dorado, Napa, CA 94558, (707) 255-2515

Builders Exchange of the Peninsula, 735 Industrial Rd, San Carlos, CA 94070, (650) 591-4486, Fax: (650) 591-8108

Builders Exchange of Salinas Valley, 590-A Brunched Ave, Ste. A, Salinas, CA 93901, (408) 758-1624, Fax: (408) 758-6203

Builders Exchange of San Francisco, 850 S. Van Ness Ave, San Francisco, CA 94110, (415) 282-8220

Builders Exchange of Santa Clara, 400 Reed St, Santa Clara, CA 95050, (408) 727-4000

Builders Exchange of Santa Cruz, 2555 So. Cal Dr, Santa Cruz, CA 95065, (408) 476-6349

Builders Exchange of Stockton, 7500 N West Lane (plans only), Stockton, CA 95210,

PO Box 8040 (letters only), Stockton CA 95208, (209) 478-1005, Fax: (209) 478-2132

California Association of Realtors, 525 So. Virgil Ave, Los Angeles, CA 90020, (213) 365-9256, Fax: (213) 365-9256

California BLDG Industry Association, 1107 9th St, Ste. 1060, Sacramento, CA 95814, (916) 443-7933, Fax: (916) 443-1960

California Conference of Masonry Contractor Associations, 7844 Madison Ave, STE. 140, Fair Oaks, CA 95628

California Contractors Association, 6055 E. Washington Blvd, Ste. 200, Los Angeles CA, 90040 (213) 726-3511, Fax: (213) 726-2366

California, Division of State Architecture.

California Landscape Contractors Association, 2021 N St. #300, Sacramento, CA 95814, (916) 448-2522

California OSHPD.

California Wall and Ceiling Contractors Association, 1111 Town and Country Rd. #45, Orange, CA 92668.

Ceramic Tile Institute of Northern California, 10408 Fair Oaks Blvd, Fair Oaks, CA 95628, (916) 965-8453, Fax: (916) 965-8454

Concrete Masonry Association of California and Nevada, 6060, Sunrise Vista Dr, Citrus Heights, CA 95610, (916) 722-1700

Concrete Pumpers Association of Southern California, 1567 Colorado Blvd, Los Angeles, CA 90041, (213) 257-5266

Construction Industry Research Board, 2511 Empire AVE, Burbank, CA 91504, (818) 8341-8210

Contractors Bonding Association, 529 W. Imperial Way, Ste. 5, Los Angeles, CA 90044

El Dorado Builders Exchange, 2808 Mallard LN #B, Placerville, CA 95667, (530) 622-8642

Electric Power Research Institute, 3412 Hillview Ave, Palo Alto, CA 94304, (415) 855-2000

Electric Contractors of California and Nevada, 7700 Edgewater Dr. #640, Oakland, CA 94621

Engineering Contractors Association, 8310 Florence Ave, Downey, CA 90240, (562) 861-0929

Floor Covering Institute, 400 Reed St, Santa Clara, CA 95050, (408) 727-4320

Fresno Builders Exchange, PO Box 111, Fresno, CA 3707, CA 95667, (209) 237-1831

Independent Roofing Contractors of California, 3478 Buskirk Ave. #1040, Pleasant Hill, CA 94523, (510) 939-3715

Kern County Builders Exchange, 1121 Baker St, Bakersfield, CA 93305, (805) 324-5364

Los Angeles County Painting and Decorating Contractors Association, Inc, 1106 Colorado Blvd, Los Angeles, CA 90041, (213) 258-8136, Fax: (213) 258-2279

Marin Builders Exchange, 110 Belvedere ST, San Rafael, CA 94901, (415) 456-3222.

Masonry Contractors Association of Sacramento, 7844 Madison Ave, Ste. 140, Fair Oaks, CA 95628, (916) 966-7666

Mechanical Contractors Legislative Council of California, 7 Crow Canyon Ct, Ste. 200, San Ramon, CA 94583

Merced-Mariposa Builders Exchange, PO Box 761, Merced, CA 95341, (209) 722-3612

Minority Contractors Association of Los Angeles, 3707 W. Jefferson, Los Angeles, CA 90016, (213) 737-7952

National Association of Women in Construction of Los Angeles, PO Box 90935, Pasadena, CA 91109.

National Association of Women in Construction, 4865 Pasadena Ave, Sacramento, CA 95841, (916) 483-2724

National Electrical Contractors Association, Los Angeles Chapter, 401 Shatto Pl, Los Angeles, CA 90020, (213) 487-7313, Fax: (213) 388-5230

North Coast Builders Exchange, 216 W. Perkins St, Ukiah, CA 95482, (707) 462-9019

North Coast Builders Exchange, 987 Airway Ct, Santa Rosa, CA 95403, (707) 542-9502

Northern California Drywall Contractors Association, 12241 Saratoga-Sunnyvale Rd, Saratoga, CA 95070, (408) 255-1544.

Northern California Engineering Contractors Association, 3354 Regional Prkwy, Santa Rosa, CA 95403, (707) 525-1910.

Pacific Coast Builders Conference, 605 Market St, San Francisco, CA 94105, (415) 821-3307

Painting and Decorating Contractors of California, 3504 Walnut Ave, Ste. A, Carmichael, CA 95608, (916) 972-1055, Fax: (916) 972-9831.

Painting and Decorating Contractors of Central Coast Counties, 4050 Ben Lomond Dr, Palo Alto, CA 94306, (650) 493-6200

Painting and Decorating Contractors of Sacramento, 3913 Old Lee Highway, Ste. 33B, Fairfax, VA 22030, (800) 332-7322.

Peninsula Builders Exchange, 735 Industrial Rd, San Carlos, CA 94070, (650) 591-4486.

Roofing Contractors Association of Southern California, 6280 Manchester Blvd, Ste. 104, Buena Park, CA 90621, (714) 522-4694.

Roofing Industry Council, 400 Reed St, Ste. D, Santa Clara CA 95050

Sacramento Builders Exchange, 1331 T St, Sacramento, CA 95814,
(916) 442-8991

San Francisco Builders Exchange, 850 S. Van Ness Ave, San Francisco, CA
94110, (415) 282-8220.

San Luis Obispo County BLDG Contractors Association, 3563 Sueldo St,
Ste. G, San Luis Obispo, CA 93401, (805) 543-7016

Santa Barbara Contractors Association, PO Box 41622 Santa Barbara, CA
93410, (805) 964-9175

Santa Maria Valley Contractors Association, 2003 N Preisker Ln. Santa
Maria, CA 93454, (805) 925-1191

Shasta BLDG Exchange, 2990 Innsbruck, Redding, CA 96003
(530) 221-2140

Society of American Military Engineers, Orange County Post, c/o Tim
Kashuba, Moffatt and Nichol, 250 Wardlow Rd, Long Beach, CA 90807,
(213) 426-9551, Fax: (213) 424-7489

Southern California Builders Association, 4552 Lincoln, Ste. 207, Cypress,
CA 90630, (714) 995-5841

Southern California Drywall Contractors Association, 111 Town and
Country Rd, Ste. 45, Orange, CA 92668, (714) 998-8125

Southern California Environmental Balancing Bureau, PO Box 605, Santa
Ynez, CA 93460

Ventura County Contractors Association, PO Box 7365, Oxnard, CA 93031,
(805) 981-8088

Western Electrical Contractors Association, Sacramento Valley Chapter,
7500 14th Ave. #25, Sacramento, CA 95820, (916) 453-0112

Western States Ceramic Tile Contractors Association, 5004 E. 59th Pl,
Maywood, CA 90270, (213) 560-1673

APPENDIX D – FORMS

The following data and forms are included:

1. **Field Change Order**
Developed by the Editorial Committee.
2. **Inspector's Daily Report:**
Developed by the Editorial Committee.
3. **CSI Masterformat, MP-2-88, 2004 Edition**
©1988 Construction Specifications Institute.

Date: _____

DISTRIBUTION: ☐ Owner
☐ Architect
☐ Contractor
☐ Inspector
☐ Other

PROJECT _____		PROJECT NO. _____	
		REPORT NO. _____	
Contract Time _____	Date _____		
Days Elapsed _____	Day: M T W Th F S		
Extensions _____	Weather: Clear _____ Overcast _____ Rain _____ Mist _____ Hot _____ Cold _____ Warm _____ Foggy _____		
Days Left _____	Site Condition: Clear _____ Muddy _____ Dusty _____ Other _____		
	Temperature Range: _____		

CONTRACTOR'S LABOR FORCE	Supervision	Carpenters	Laborers	Other	TOTAL

SUBCONTRACTORS					

WORK PERFORMED: _____

REMARKS or ACTION: _____

MAJOR DELIVERIES: _____

PHONE CALLS: _____

VISITORS: _____

INSPECTOR _____

CSI MASTERFORMAT

1 General Data		03150	Concrete accessories
01317	Associations & professional organizations	03300	Cast-in-place concrete
2 Site Construction		03450	Architectural precast concrete
02250	Shoring & underpinning	03500	Cementitious decks
02342	Geotextiles/geomatrixes	03540	Cementitious underlayments
02622	Subsurface drainage materials	03900	Concrete restoration & cleaning
02624	Subsurface drainage piping	4 Masonry	
02636	Precast trench drain systems	04065	Masonry mortar & masonry grout
02772	Curbs & gutters	04082	Masonry anchorage, reinforcement & accessories
02780	Unit pavers	04200	Masonry units
02790	Athletic & recreational surfaces	04270	Glass masonry units
02792	Synthetic grass & turf	04400	Stone
02795	Porous paving	04412	Limestone
02815	Fountains, pools, & water displays	04413	Granite
02825	Fences, gates, & hardware	04415	Slate
02827	Gate operators	04418	Reconstructed stone
02832	Retaining walls	04720	Cast stone
02840	Walk, road & parking appurtenances	04730	Simulated/manufactured stone
02852	Bridges—pedestrian, vehicular	04810	Unit masonry wall assemblies
02870	Site, street, & mall furnishings	04812	Masonry veneer assemblies
02872	Street/mall clocks, belts & carillons	04840	Preassembled masonry panels
02874	Bicycle racks & lockers	5 Metals	
02875	Site & street shelters	05060	Metal materials
02882	Recreational facilities & playground equipment	05080	Metal coatings
02930	Exterior plants	05100	Structural metal framing
02945	Planting accessories	05150	Wire rope assemblies
3 Concrete		05165	Space frame systems
03050	Concrete materials	05300	Metal decking
03100	Concrete formwork	05380	Bridge flooring
03125	Form liners	05400	Cold-formed metal framing

CSI MASTERFORMAT (Con't)

05515	Ladders & rungs	06600	Plastic fabrications
05532	Gratings & trench covers	06610	Glass-fiber-reinforced plastic
05542	Floor plates	06650	Solid polymer fabrications
05560	Metal castings	06900	Wood & plastic restoration & cleaning
05580	Formed metal fabrications	7 Thermal & Moisture Protection	
05586	Architectural metalwork	07100	Waterproofing & dampproofing
05712	Straight run stairs	07190	Water repellents
05715	Spiral & circular stairs	07210	Building insulation
05720	Railings & handrails	07220	Roof & deck insulation
05723	Treads & nosings	07240	Exterior insulation & finish systems
05735	Perforated metals	07260	Vapor retarders
05760	Ornamental metal extrusions	07272	Air infiltration barriers
05800	Expansion control	07310	Shingles
6 Wood & Plastics		07320	Roof tiles
06062	Lumber	07410	Roof & wall panels
06070	Wood treatments	07415	Wall panels
06092	Connectors & supports	07460	Siding
06094	Adhesives	07500	Membrane roofing
06120	Structural panels	07610	Metal roofing
06130	Heavy timber construction	07620	Sheet metal flashings & trim
06150	Wood decking	07650	Flexible flashings
06164	Laminated & processed sheets	07710	Prefabricated roof specialties
06170	Prefabricated structural wood	07715	Fascias, soffit panels & penthouse enclosures
06172	Prefabricated wood joists & trusses	07720	Roof accessories
06180	Glued-laminated timber	07762	Roof pavers & ballast materials
06182	Glued-laminated decking	07812	Applied fireproofing
06400	Architectural woodwork	07840	Firestopping
06412	Cabinet & drawer hardware	07915	Sealants, caulking, & seals
06422	Wood veneers & flitches	8 Doors & Windows	
06430	Wood stairs & handrails	08100	Metal doors & frames

CSI MASTERFORMAT (Con't)

08180	Metal screen & storm doors	08625	Skylight structures
08200	Wood & plastic doors & frames	08710	Door hardware
08266	Glazed wood & plastic patio doors	08712	Exit devices
08270	Door louvers & vision lights	08714	Sliding & folding door hardware
08300	Specialty doors	08715	Door operators
08310	Access doors & panels	08724	Weatherstripping, thresholds & seals
08314	Sliding doors & grilles	08810	Glass
08330	Coiling doors & grilles	08812	Decorative glass
08342	Industrial & hangar doors	08840	Plastic glazing
08345	Corrosion-resistant doors	08850	Glazing accessories
08346	Darkroom doors	08870	Glazing film
08348	Sound control doors	08900	Glazed curtain walls
08350	Folding doors & grilles	08950	Translucent watt & roof assemblies
08352	Folding fire barriers	08970	Structural glass curtain walls
08360	Upward-acting sectional doors	9 Finishes	
08380	Traffic/impact doors	09120	Ceiling suspension
08392	Airtight & watertight doors	09206	Lath & plaster
08394	Blast-resistant doors	09250	Gypsum board, framing, & accessories
08400	Entrances & storefronts	09255	Gypsum fabrications
08460	Automatic entrance doors	09300	Tile
08470	Revolving entrance doors	09305	Tile-setting materials & accessories
08505	Metal windows	09400	Terrazzo
08550	Wood windows	09510	Acoustical ceilings
08560	Vinyl windows	09547	Metal ceilings
08572	Fiberglass windows	09614	Detectable/tactile warning surfaces
08581	Detention/security windows & screens	09618	Sound isolation membranes
08582	Pass & observation windows	09624	Resilient athletic surfacing—indoor
08584	Exterior window shutters	09640	Wood flooring
08590	Replacement windows	09642	Wood athletic flooring
08620	Unit skylights	09650	Resilient flooring

CSI MASTERFORMAT (Con't)

09670	Fluid-applied flooring	10450	Pedestrian control devices
09682	Carpet cushion	10500	Lockers
09684	Carpet tile	10501	Locker accessories & locks
09720	Wall coverings	10512	Tenant storage compartments
09772	Special wall surfaces	10520	Fire protection specialties
09775	Sanitary wall & ceiling panels	10530	Protective covers
09800	Acoustical treatments	10536	Awnings
09820	Acoustical insulation & sealants	10550	Postal specialties
09835	Sound diffusers & reflectors	10605	Wire mesh partitions
09840	Acoustical wall treatments	10615	Demountable partitions
09910	Paint	10650	Operable partitions
09940	Decorative finishes	10670	Storage shelving
09960	High-performance coatings	10705	Exterior sun control devices
10 Specialties		10800	Toilet, bath, & laundry accessories
10110	Chalkboards & tackboards	10824	Tub & shower doors/enclosures
10155	Toilet compartments	10914	Hat & coat racks & accessories
10190	Hospital cubicles	10916	Closet specialties
10200	Louvers & vents	11 Equipment	
10235	Brick & block vents	11014	Window washing & building facade maintenance equipment
10240	Grilles & screens	11030	Bank equipment
10260	Wall & corner guards	11040	Ecclesiastical equipment
10270	Access flooring	11050	Library equipment
10280	Prefabricated ramps & walkways	11060	Theater & stage equipment
10290	Bird & pest control	11106	Merchandising/display equipment
10300	Fireplaces & stoves	11110	Commercial laundry & dry cleaning equipment
10350	Flagpoles	11132	Projection screens
10410	Directories & bulletin boards	11150	Parking control equipment
10416	Computerized directories, message boards & audible signage	11160	Loading dock equipment
10420	Letters & plaques	11175	Waste chutes & collectors
10426	Signage & graphics	11190	Detention equipment

CSI MASTERFORMAT (Con't)

11435	Ice machines	13046	Shelters & booths
11452	Residential appliances	13052	Saunas & equipment
11457	Television units & accessories	13054	Steam baths & equipment
11458	Disappearing stairs	13070	Bullet-resistant protection
11460	Unit kitchens	13074	Pressure-relief panel assemblies
11470	Photographic & graphic arts equipment	13080	Sound, vibration, & seismic control
11480	Athletic, recreational & therapeutic equipment	13090	Radiation protection
11486	Shooting range equipment	13095	Radio frequency-shielded enclosures
11530	Industrial safety equipment	13100	Lightning protection
11700	Medical & hospital equipment	13121	Pre-engineered buildings
11780	Mortuary equipment	13122	Metal building systems
12 Furnishings		13125	Grandstands & bleachers
12310	Metal casework	13130	Cable-supported & fabric structures
12350	Specialty casework	13132	Dome structures
12352	Laboratory casework	13134	Glazed structures
12484	Floor mats & frames	13138	Mezzanine systems
12492	Blinds, shades, & interior shutters	13140	Equipment/storage enclosures
12498	Motorized hardware for blinds, shades, draperies	13152	Swimming pools & equipment
12500	Furniture	13172	Whirlpool spas & hot tubs
12564	Mailroom furniture	13700	Security access & surveillance
12567	Ecclesiastical furniture	13830	Clock control systems
12612	Fixed audience seating	13850	Detection & alarm
12650	Multiple-use fixed seating	14 Conveying Systems	
12660	Telescoping stands	14100	Dumbwaiters
13 Special Construction		14200	Elevators
13032	Athletic rooms	14235	Residential elevators
13034	Sound-conditioned rooms	14420	Wheelchair lifts

CSI MASTERFORMAT (Con't)

14450	Vehicle lifts	15460	Domestic water conditioning equipment
14500	Materials handling	15510	Heating boilers & accessories
14555	Vertical reciprocating conveyors	15540	Fuel-fired heaters
14580	Pneumatic tube systems	15700	Heating, ventilating, & air-conditioning equipment
14700	Turntables	15762	Convectors & radiators
15 Mechanical		15773	
15062	Hangers & supports	15810	Ducts Electric heating cables, mats, modules, Panels & controls
15075	Mechanical identification	15842	Air curtain units
15080	Mechanical insulation	15852	Registers, grilles & diffusers
15082	Duct insulation	15864	Fume exhaust equipment
15105	Pipes & tubes	16 Electrical	
15190	Fuel piping	16128	Undercarpet cabling systems
15300	Fire protection piping	16130	Raceways & boxes
15410	Plumbing fixtures	16500	Lighting
15412	Water coolers & drinking fountains	16520	Exterior luminaires
15426	Fittings, trim, & accessories	16584	Ballasts
		16705	Electronic scoreboards

APPENDIX E – INSPECTOR’S BASIC BOOKSHELF

Following is a descriptive listing of books and reference documents for the construction inspector. Many of these books are updated and republished on a regular basis. Where appropriate, the date of the latest edition available at the time of the publication of this manual is cited.

Each book listed appears under a Divisional heading from the Technical Items Checklist. There may be more than one book listed under a particular Division, in which case it is at the discretion of the inspector as to whether he wishes to possess one or all of these particular books.

All of the books listed are stocked and sold by **BNi Building News, Inc.** They may be purchased over the counter at the company’s professional store, 990 Park Center Dr., Ste E, Vista, CA 92081 or by calling 1-888-BNI-BOOK.

Division 2 Sitework

Standard Specifications, State of California, Department of Transportation (Caltrans), Sacramento, CA.

Standard Specifications for Public Works Construction (Greenbook), BNi Building News for Joint Co-operative Committee of the Southern California Chapter of American Public Works Association (APWA) and the Southern California Districts, Associated General Contractors of California, published every three years.

Public Works Inspector’s Manual, Silas B. Birch, Jr. BNi Building News.

Manual of Traffic Controls for Construction and Maintenance Work Zones, Regulations of State of California, Department of Transportation, Sacramento, CA. BNi Building News.

Division 3 Concrete

ACI’s Manual of Concrete Practice, American Concrete Institute

Part 1: *Materials and General Properties of Concrete*

Part 2: *Construction Practice and Inspection.*

Part 3: *Use of Concrete in Buildings – Design, Specifications, and Related Topics*

Part 4: *Bridges, Substructures, Sanitary, and Other Special Structures – Structural Properties*

Part 5: Masonry – Precast Concrete – Special Processes

ACI Manual of Concrete Inspection. Placing Reinforcing Bars,
Conforms to ACI Building Code –Concrete Reinforcing Steel
Institute.

Division 4 Masonry

Reinforced Concrete Masonry Construction Inspector's Handbook, Masonry
Institute of America and International Conference of Building Officials.

Residential Masonry Fireplace and Chimney Handbook, Masonry Institute of
America.

Division 5 Metals

Manual of Steel Construction – Allowable Stress Design, American Institute
of Steel Construction-

Division 6 Carpentry

Manual of Millwork, Standard of the Industry, Woodwork Institute of
California,

Architectural Woodwork – Quality Standards, Guide Specifications and
Quality Certification Program, Architectural Woodwork Institute

Timber Design and Construction Sourcebook: A Comprehensive Guide to
Methods and Practice, Karl-Heinz Goetz, Dieter Hoor; Karl Moehler, Julius
Natterer, with Peter F. Martecchini. McGraw-Hill Publishing Co.

Design of Wood Structures, Donald E. Breyer. McGraw-Hill Publishing
Company.

Timber Construction Manual, Published for American Institute of Timber
Construction, by John Wiley & Sons, New York.

Western Woods Use Book, Structural Data and Design Tables, Western Wood
Products Association, Portland, OR. 97204.

West Coast Lumber Standard Grading Rules #16, West Coast Lumber
Inspection Bureau,

Western Lumber Grading Rules 88, Western Wood Products Association,

Division 7 Thermal and Moisture Protection

Architectural Sheet Metal Manual, Sheet Metal and Air Conditioning
Contractors Association.

Building Energy Efficiency Standard, California Energy Commission,
Energy Conservation Manual for New Residential Buildings, California
Energy Commission.

Division 8 Doors and Windows

NFPA 80: Fire Doors and Windows, National Forest Fire Protection
Association.

Division 9 Finishes

Gypsum Construction Handbook, U.S. Gypsum Company.

Plaster and Drywall Systems Manual, J.R. Gorman, Walter Pruter and James J. Rose, BNi Building News.

Plastering Skills, By F. Van Den Branden and Thomas Hartsell, American Technical Publishers.

Ceiling Systems Handbook, Ceilings & Interior Systems, Contractors Association.

Ceramic Tile Manual, Ceramic Tile Institute.

Paint Handbook, Guy E. Weismantel. McGraw-Hill Book Company.

Division 15 Mechanical

ASHRAE Handbook, American Society of Heating, Refrigerating and Air Conditioning Engineers.

ASHRAE Fundamentals Handbook

ASHRAE Handbook of Applications

ASHRAE Handbook of Refrigeration Systems & Applications

ASHRAE Equipment Handbook

ASHRAE Systems Handbook

SMACNA HVAC Duct Construction Standards, Metal and Flexible, Sheet Metal and Air Conditioning Contractors National Association.

NFPA 13 – Installation of Sprinkler Systems, National Fire Protection Assn.

NFPA Automatic Sprinkler Systems Handbook, National Fire Protection Assn.

Division 16 Electrical

National Electrical Code (NFPA 70), National Fire Protection Association.

National Electrical Code Handbook, National Fire Protection Association.

California Electrical Code, Title 24, Part 3 of California Code of Regulations, Published for California Building Standards Commission.

Ferm's Fast Finder Index to the National Electrical Code.

International Building Code, International Conference of Building Officials.

BOCA National Building Code, Building Officials & Code Administrators International, Inc.

SBCCI Standard Building Code, Southern Building Code Congress International

ASTM Standards in Building Codes, 4-Volume Set, American Society for Testing and Materials.

CABO One- and Two-Family Dwelling Code, Council of American Building Officials.

Dictionaries – Reference

BNi Building News Construction Dictionary Illustrated. BNi Building News.
Construction Dictionary Pocket Edition. BNi Building News-

Means Illustrated Construction Dictionary, R.S. Means Co.,

Dictionary of Architecture and Construction, Cyril M. Harris. McGraw-Hill Publishing Company.

Compilation of ASTM Standard Definitions. American Society for Testing and Materials, Philadelphia, PA 19103.

Construction Dictionary. National Association of Women in Construction.

Inspection

Construction Inspection Manual, Published for the California Construction Advancement Program, Building News.

Field Inspection Manual, International Conference of Building Officials.

Construction Inspection Handbook, by James J. O'Brien. Van Nostrand Reinhold.

Field Inspection Handbook, Brock & Sutcliffe-McGraw-Hill Book Company,

Construction Inspection, James E. Clyde John Wiley & Sons.

APPENDIX F - INSPECTOR'S BASIC TOOLS

Basic Tools, usable in most divisions:

- 12-16 ft. steel tape
- 50-100 ft. steel tape
- 2 or 2½ ft. carpenter's level
- 10 ft. straight edge
- Machinist's mirror with handle
- Pocket scale (architect's)
- Pocket scale (engineer's)
- Calipers and dividers (machinist's type)
- Pocket mirror for flashing in wall forms, etc.
- Magnifying glass
- 50 ft. string line
- Pocket knife
- Magnet
- Camera/camcorder
- Pocket calculator
- Electronic measuring device

Special Tools, required in certain divisions only:

<u>Division</u>	<u>Tools</u>
2	Hand level (locke type)
2	Folding rule (reading in tenths/foot)
2	Asphalt thermometer (to 500°F.)
3	Slump cone and rod
3	Cylinder carriers and two 5 gallon buckets
3	Pocket thermometer (32° to 125° ±)
5	Weld gauges (set)
5	Welding hood or shield
5	Tempil stix
7	Asphalt thermometer (to 500°F.)
8	Glass thickness gauge (use with flashing)
9	Adjustable depth gauge (for fireproofing)
15	Micrometer
15	2 thermometers (32° to 220°F.)
15	Anemometer or draft gauge
15	Sling psychrometer
15	Chlorine solution test papers
16	Receptacle tester
16	"Wiggy"
16	Clamp-on ammeter
16	Phase rotation meter

APPENDIX G - INSPECTOR'S BASIC PROJECT FILE

I. General Information:

- Clarification
- Field Orders
- Proposed Changes
- Quotations and Acceptances (of proposed changes)
- Change Orders
- Cost Breakdown (Schedule of Values)
- Certificates of Payment
- Requests for Payment
- Testing Lab Reports
- T & M (Time and Material) Reports
- List of Equipment Furnished by Owner
- Segregated Contracts
- Color and Material Selections

II. Correspondence:

- Between Architect and Owner
- Between Architect and Inspector
- Between Architect and Contractor
- General Correspondence
- Testing Laboratory
- Soils Laboratory
- Architects/Consultants (Mechanical, Electrical, Structural, etc.)

III. Government Agencies and Programs:

- Fire Marshal
- USPHS (United States Public Health Service)
- HEW (Health Education Welfare)
- HUD (United States Department of Housing and Urban Development)
- Department of Public Health
- City or County Building Official
- Local Affirmative Action Program
- Certified Data, (including Davis-Bacon, Landrum-Griffiri, Copeland Acts, etc.)

IV. Field Information:

- Transmittals Outgoing
- Field Sketches
- Transmittals Incoming
- Field Memoranda
- Job Meetings
- Schedule
- Deficiency List
- Job Problems (written questions to architect)
- Daily Comments (to architect or owner)
- Job Security and Safety

V. Project Closeout:

- Special Tools
- Valve Schedule
- Electrical On-line Diagram
- Schematic of Mechanical System
- Instruction of Owner's Personnel
- Certificates of Compliance
- Notice of Cessation
- Notice of Completion
- Guarantees
- Spare Parts or Materials (received from contractors)
- Instruction Manuals
- Receipts from Owner (for spare parts, etc.)
- Record Drawings

VI. Technical Information:

- Use CSI format to develop files
- Make a folder marked "Testing Lab Reports" for any division where appropriate.

APPENDIX H - MISCELLANEOUS CONSTRUCTION AIDS

Cylinder Casting

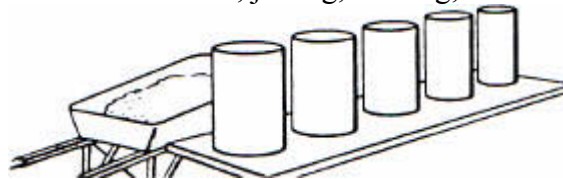
(Reproduced through courtesy of Master Builders, Inc.)

Note: For complete and related procedures, see ASTM Designations: C 470 Single-Use Molds for Forming 6×12-in. Concrete Compression Test Cylinders; C 31 Standard Method of Making and Curing Concrete Compressive and Flexural Strength Test Specimens in the Field; C 94 Standard Specifications for Ready Mixed Concrete; and C 172 Standard Method of Sampling Fresh Concrete.



Use Only Non-Absorbent Waterproof Molds

For casting concrete cylinders in the field, use only approved non-absorbent waterproof molds, 6" (15 cm) in diameter by 12" (30 cm) high, with base plates or bottoms. They should be placed on a smooth, firm, level surface for filling and cast in the area where they are to be stored during the first 24 hours and where they will be protected from vibration, jarring, striking, etc.



Take 3-Part Sample; Combine And Remix

Three samples of the concrete should be obtained at regularly spaced intervals directly from the mixer discharge. Combine the samples in a wheelbarrow, buggy or metal pan and remix with a shovel to ensure uniformity of the 3-part sample.

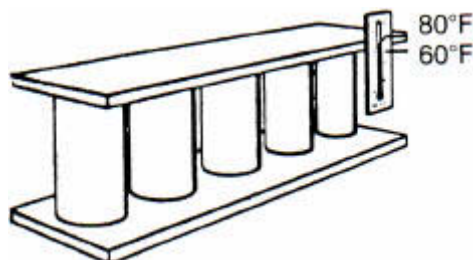


Fill Molds In Three Equal Layers and Rod Each Layer 25 Times

Fill molds in three equal layers and uniformly rod each layer 25 times with a $\frac{5}{8}$ " bullet-nosed rod. When rodding the second and third layers, the rod should just break through into the layer beneath. Fill all molds uniformly — that is, place and rod the bottom layer in all cylinders, then place and rod the second layer, etc. The third layer should contain an excess amount of concrete which is struck off smooth and level after rodding.

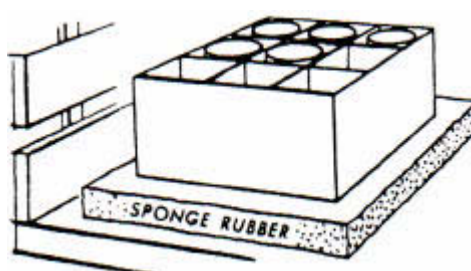
01400 QUALITY CONTROL

Cylinder Casting (Con't.)



Protect Cylinders From Moisture Loss, Movement, and Temperature Extremes

Cover the tops of the cylinders to prevent loss of moisture by evaporation. Do not disturb or move cylinders for 24 hours after casting. Protect them against temperatures that fall below 60°F (16C) or exceed 80°F (27C). Cylinders left on the job for several days and exposed to high or low temperatures will give substandard results. Additional cylinders used for determining when forms may be stripped or when concrete may be put into service should be removed from the molds after 24 hours and then job-cured adjacent to and under the same conditions as the concrete they represent.



Cure And Handle Cylinders With Care

After 24 hours, cylinders for acceptance tests should be placed in moist curing at $73.4^{\circ}\text{F} \pm 3^{\circ}\text{F}$ ($23 \pm 1.7^{\circ}\text{C}$) or sent to a laboratory for similar standard curing. Careful handling during moving is necessary since cylinders which are allowed to rattle around in a box or in the back of a car or pick-up truck can suffer considerable damage.

Important:

Always Use Accepted Standards — Standard test procedures were developed to establish lines of uniformity and reproducibility. Only specimens tested according to accepted, reliable standards, such as those established by the American Society for Testing and Materials, give valuable indications of the uniformity and potential quality of the concrete in a structure.

01400 QUALITY CONTROL

Concrete Slump Test

(Reproduced courtesy of Master Builders, Inc.)

Purpose of Test: To determine the consistency of fresh concrete and to check its uniformity from batch to batch. This test is based on ASTM C 143: Standard Method of Test for Slump of Portland Cement Concrete.

Take two or more representative samples — at regularly spaced intervals — from the middle of the mixer discharge; do not take samples from beginning or end of discharge. Obtain samples within 15 minutes or less. **Important:** Slump test must be made within 5 minutes after taking samples.

Combine samples in a wheelbarrow or appropriate container and remix before making test.

Dampen slump cone with water and place it on a flat, level, smooth, moist, non-absorbent, firm surface.



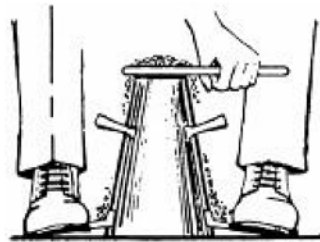
2. Fill cone $\frac{2}{3}$ full by volume [6" (23mm) or half the height] and again rod 25 times with rod just penetrating into, but not through, the first layer. Distribute strokes evenly as described in Step 1.

1. Stand on two foot pieces of cone to hold it firmly in place during Steps 1 through 4. Fill cone mold $\frac{1}{3}$ full by volume [2½" (63.5mm) high] with the concrete sample and rod it with 25 strokes using a round, bullet-nosed steel rod $\frac{5}{8}$ " (16mm) diameter × 24" (61mm) long. Distribute rodding strokes evenly over entire cross section of the concrete by using approximately half the strokes near the perimeter (outer edge) and then progressing spirally toward the center.



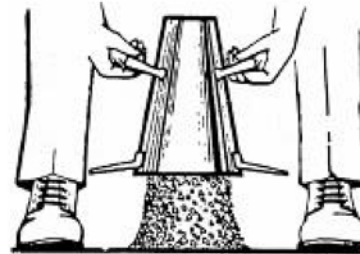
Concrete Slump Test (Con't.)

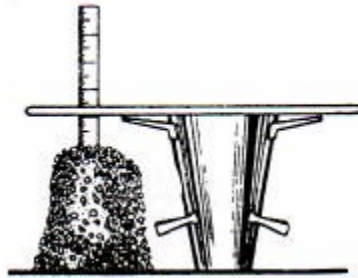
3. Fill cone to overflowing and again rod 25 times with rod just penetrating into, but not through, the second layer. Again distribute strokes evenly.



4. Strike off excess concrete from top of cone with the steel rod so that the cone is exactly level full. Clean the overflow away from the base of the cone mold.

5. Immediately after completion of Step 4, the operation of raising the mold shall be performed in 5 to 10 seconds by a steady upward lift, with no lateral or torsional motion being imparted to the concrete. The entire operation from the start of the filling through removal of the mold shall be carried out without interruption and shall be completed within an elapsed time of 2½ minutes.

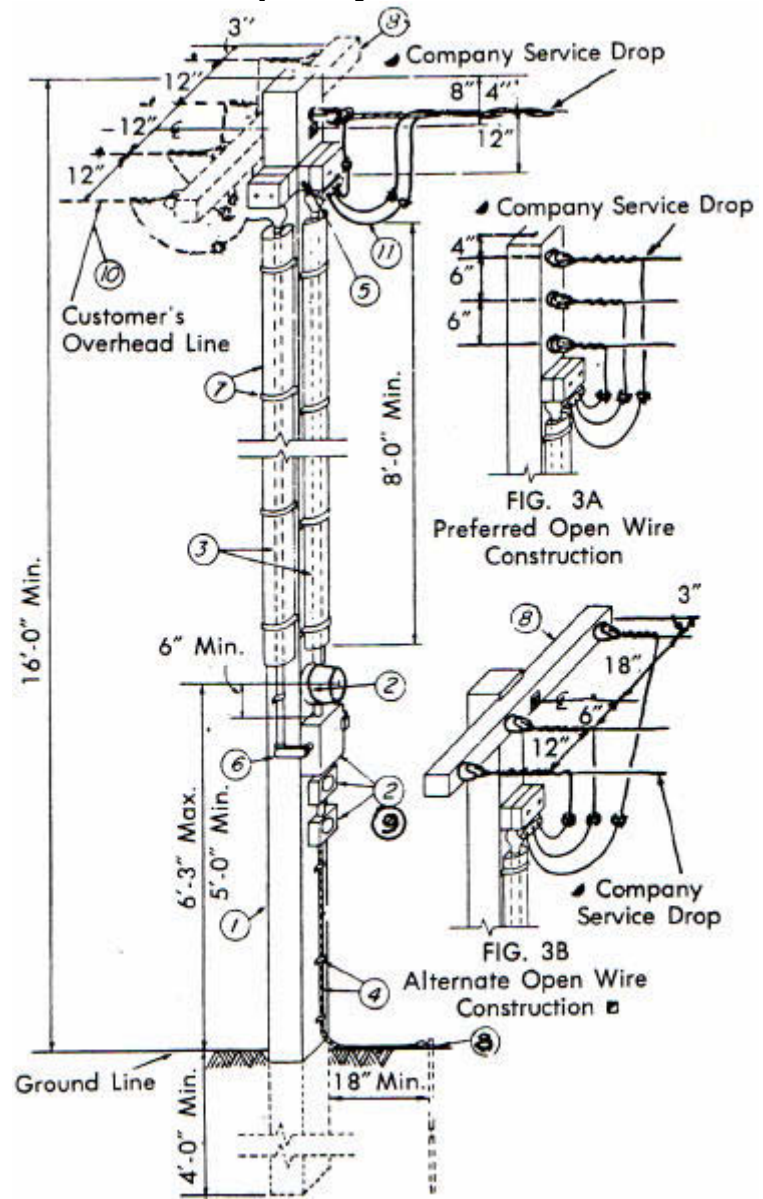


Concrete Slump Test (Con't.)

6. Place the steel rod horizontally across the inverted mold so the rod extends over the slumped concrete. Immediately measure the distance from bottom of the steel rod to the original center of the top of the specimen. This distance, to the nearest $\frac{1}{4}$ inch (6mm), is the slump of the concrete.

01400 QUALITY CONTROL

Temporary Power Pole



(See Next Page For Key To Diagram)

Key to Diagram of Temporary Power Pole on Previous Page

- (1) **Service Pole.** (1) One piece self-supporting timber 6" x 6" x 20' minimum, or (2) 25-foot pole with 5-inch minimum top diameter, or (3) self-supporting 20-foot minimum metal pole meeting equivalent strength requirements for (1) and (2) or equal.
- (2) **Service Entrance Raceway.** (1) Galvanized rigid steel conduit; (2) electrical metallic conduit; or (3) polyvinyl chloride schedule 80 plastic conduit without protective covering. Metal conduit shall be covered with wood molding or fiber conduit.
- (3) **Ground:**
 - A. No. 8 AWG minimum armored copper wire.
 - B. No. 8 AWG minimum copper wire covered with minimum galvanized rigid iron conduit.
- (4) -4" x 4" x 6" wood block, bolted to pole in 1/2" gain. Block not required for polyvinyl chloride schedule 80 plastic conduit nor on metal pole.
Note: Covering of metallic conduit and wood blocks over the tops of the risers will not be required on metal poles, provided the metal pole is effectively grounded, and provided all metallic conduits are adequately bonded to the metal pole with approved clamps or connectors.
- (5) Conduit fitting threaded with cover and gasket.
- (6) Extend protective covering to bottom of service heads. Do not leave conduits exposed.
- (7) Ground to metallic water line where available. Where a water line is not available, one or more of the following ground rods driven 8 feet into the ground shall be installed to provide ground resistance within limits required by the governing inspection authority:
 1. 3/4" minimum inside diameter galvanized iron pipe or conduit.
 2. 3/4" minimum outside diameter solid iron rod.
 3. 1/2" minimum outside diameter rod or copper clad steel, solid brass or copper.
- (8) Raintight boxes and receptacles of approved type. Different voltages require receptacles that are not interchangeable for equipment grounding purposed only.
- (9) A continuous conductor shall be provided for any secondary service pole or distribution point.
- (10) Wire, insulated, size as required (24" minimum extension from service head).

ALLOWABLE CURRENT-CARRYING CAPACITY OF FLEXIBLE CORD

Size AWG Wire	Rubber Types S, SO, SR, Si, SJO
	Thermoplastic Types ST, SRT, SJT
	Amperes
16	10
14	15
12	20
10	25
8	35
6	45
4	60
2	80

Approved Configurations For Plugs And Receptacles



















































































































































	15 AMPERE		20 AMPERE		30 AMPERE		50 AMPERE		60 AMPERE	
	RECEPTACLE	PLUG	RECEPTACLE	PLUG	RECEPTACLE	PLUG	RECEPTACLE	PLUG	RECEPTACLE	PLUG
2-POLE, 2-WIRE	1 125 V	1-15R	1-15P		1-20R	1-20P	1-30R	1-30P		
	2 250 V		2-15P	2-20R	2-20P	2-30R	2-30P			
	3 277 V AC				(RESERVED FOR FUTURE CONFIGURATIONS)					
	4 600 V				(RESERVED FOR FUTURE CONFIGURATIONS)					
2-POLE, 3-WIRE UNGROUNDED	5 125 V	5-15R	5-15P	5-20R	5-20P	5-30R	5-30P	5-50R	5-50P	
	6 250 V	6-15R	6-15P	6-20R	6-20P	6-30R	6-30P	6-50R	6-50P	
	7 277 V AC	7-15R	7-15P	7-20R	7-20P	7-30R	7-30P	7-50R	7-50P	
	8 347 V AC									
	9 480 V AC	24-15R	24-15P	24-20R	24-20P	24-30R	24-30P	24-50R	24-50P	
	10 600 V AC				(RESERVED FOR FUTURE CONFIGURATIONS)					
					(RESERVED FOR FUTURE CONFIGURATIONS)					
					(RESERVED FOR FUTURE CONFIGURATIONS)					
					(RESERVED FOR FUTURE CONFIGURATIONS)					
2-POLE, 3-WIRE	11 125/250 V		11-20R	11-20P	11-30R	11-30P	11-50R	11-50P		
	12 250 V	11-15R	11-15P	11-20R	11-20P	11-30R	11-30P	11-50R	11-50P	
	13 480 V				(RESERVED FOR FUTURE CONFIGURATIONS)					
	14 600 V				(RESERVED FOR FUTURE CONFIGURATIONS)					
3-POLE, 4-WIRE GROUNDING	15 125/250 V	14-15R	14-15P	14-20R	14-20P	14-30R	14-30P	14-50R	14-50P	
	16 250 V	15-15R	15-15P	15-20R	15-20P	15-30R	15-30P	15-50R	15-50P	
	17 480 V				(RESERVED FOR FUTURE CONFIGURATIONS)					
	18 600 V				(RESERVED FOR FUTURE CONFIGURATIONS)					
4-POLE, 4-WIRE	19 3- ϕ 208Y/120 V	18-15R	18-15P	18-20R	18-20P	18-30R	18-30P	18-50R	18-50P	
	20 3- ϕ 480Y/277 V				(RESERVED FOR FUTURE CONFIGURATIONS)					
	21 3- ϕ 600Y/347 V				(RESERVED FOR FUTURE CONFIGURATIONS)					
					(RESERVED FOR FUTURE CONFIGURATIONS)					
4-POLE, 5-WIRE GROUNDING	22 3- ϕ 208Y/120 V				(RESERVED FOR FUTURE CONFIGURATIONS)					
	23 3- ϕ 480Y/277 V				(RESERVED FOR FUTURE CONFIGURATIONS)					
	24 3- ϕ 600Y/347 V				(RESERVED FOR FUTURE CONFIGURATIONS)					

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16050 ELECTRICAL MATERIALS AND METHODS

Approved Configurations For Plugs And Receptacles (Con't)

		15 AMPERE		25 AMPERE		30 AMPERE		50 AMPERE		60 AMPERE	
		RECEPTACLE	PLUG	RECEPTACLE	PLUG	RECEPTACLE	PLUG	RECEPTACLE	PLUG	RECEPTACLE	PLUG
2-POLE 2-WIRE	125 V L1										
	250 V L1, L2										
	277 V AC 3					(RESERVED FOR FUTURE CONFIGURATIONS)					
	600 V 4					(RESERVED FOR FUTURE CONFIGURATIONS)					
2-POLE 3-WIRE GROUNDING	125 V L1, L2, L3										
	250 V L1, L2, L3										
	277 V AC L1, L2, L3										
	347 V AC L1, L2, L3										
	480 V L1, L2, L3										
	600 V L1, L2, L3										
3-POLE 3-WIRE	125/250 V L1, L2, L3										
	250 V L1, L2, L3										
	480 V L1, L2, L3										
	600 V L1, L2, L3										
3-POLE 4-WIRE GROUNDING	125/250 V L1, L2, L3, L4										
	250 V L1, L2, L3, L4										
	480 V L1, L2, L3, L4										
	600 V L1, L2, L3, L4										
4-POLE 4-WIRE	3 Ø 208Y/120 V L1, L2, L3, L4										
	3 Ø 480Y/277 V L1, L2, L3, L4										
	3 Ø 600Y/347 V L1, L2, L3, L4										
4-POLE 5-WIRE GROUNDING	3 Ø 208Y/120 V L1, L2, L3, L4, L5										
	3 Ø 480Y/277 V L1, L2, L3, L4, L5										
	3 Ø 600Y/347 V L1, L2, L3, L4, L5										

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16050 ELECTRICAL MATERIALS AND METHODS

**Criteria For Stairs, Ladders And
Ramps Or Inclines**
Table Of Risers And Runs For Stairs

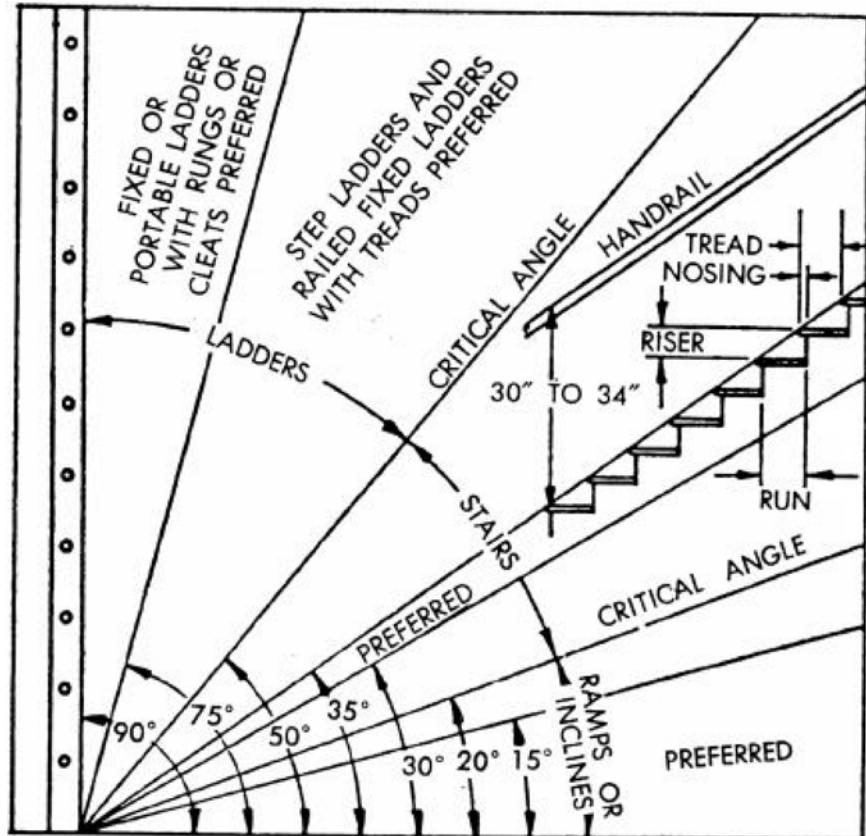
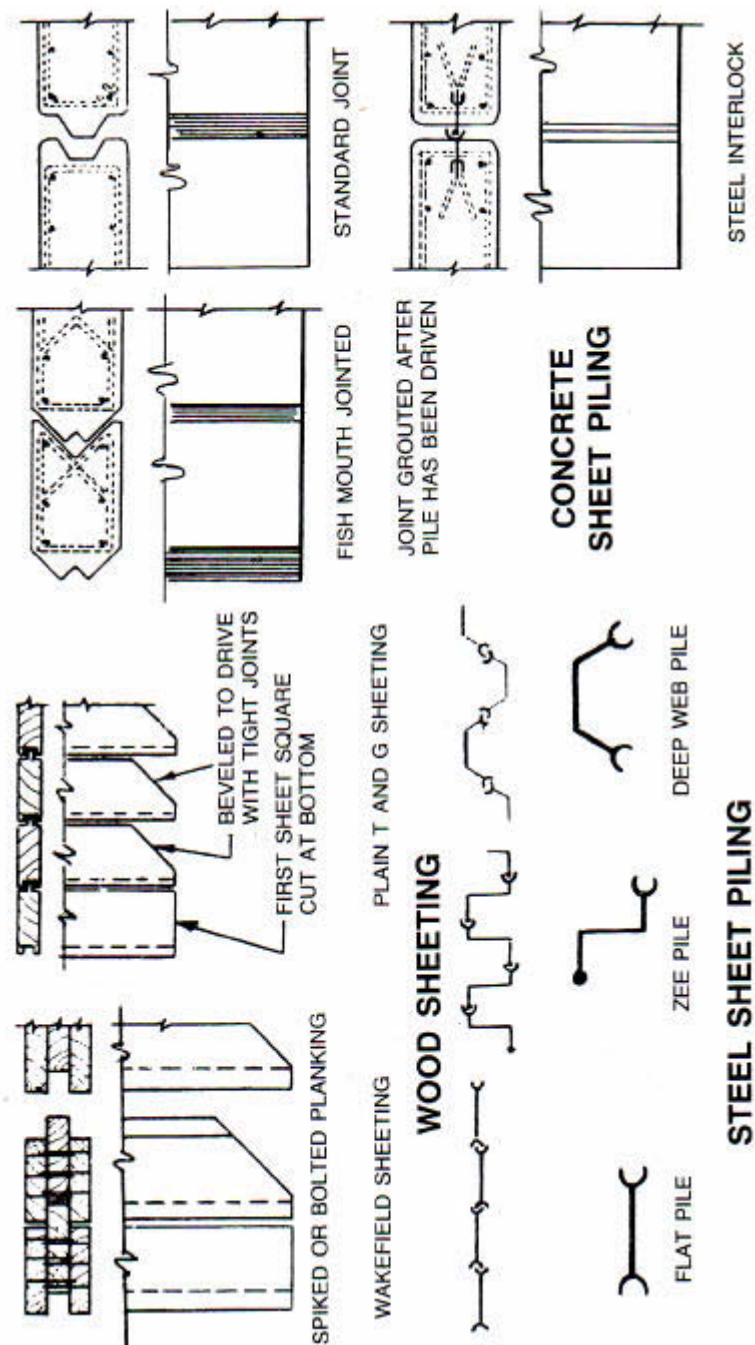


TABLE OF RISERS AND RUNS FOR STAIRS

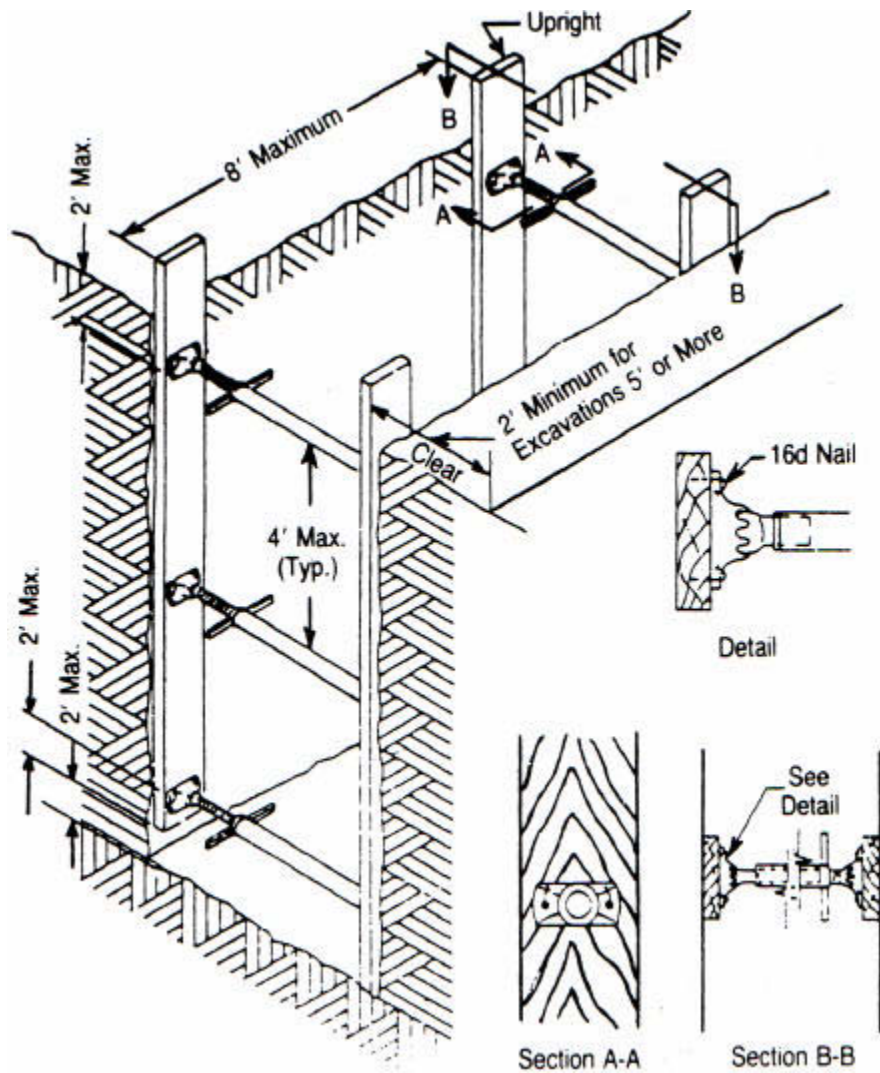
(Run + Riser = 17%)

Angle with Horizontal	Riser in Inches	Run in Inches	Angle with Horizontal	Riser in Inches	Run in Inches
22°—0'	5	12 1/2	36°—52'	7 1/2	10
23°—14'	5 1/4	12 1/4	38°—29'	7 3/4	9 3/4
24°—38'	5 1/2	12	40°—08'	8	9 1/2
26°—00'	5 3/4	11 3/4	41°—44'	8 1/4	9 1/4
27°—33'	6	11 1/2	43°—22'	8 1/2	9
29°—03'	6 1/4	11 1/4	45°—00'	8 3/4	8 3/4
30°—35'	6 1/2	11	46°—38'	9	8 1/2
32°—08'	6 3/4	10 3/4	48°—16'	9 1/2	8
33°—41'	7	10 1/2	49°—54'	9 1/2	8
	7 1/2	10 1/4			

Sheet Piling



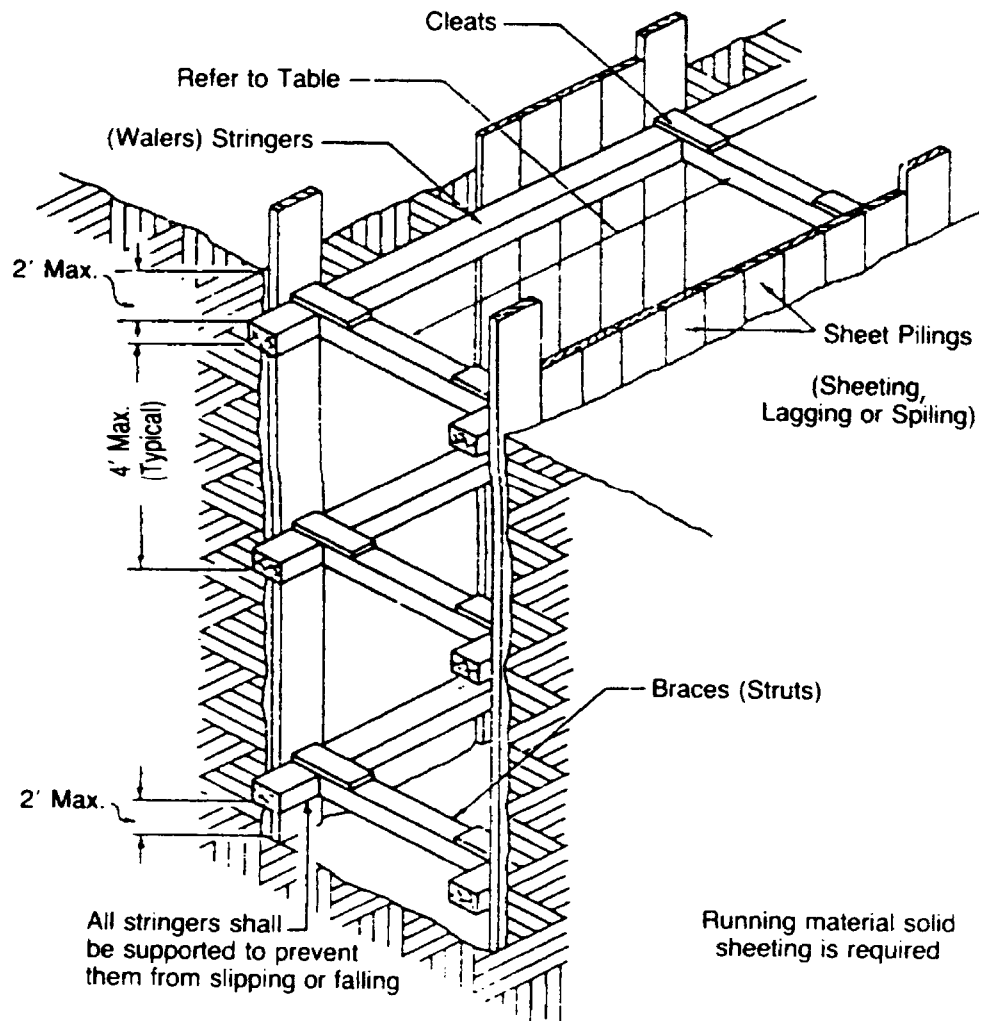
Shoring System For Trenches Minimum Shoring Requirements in Hard Compact Soil



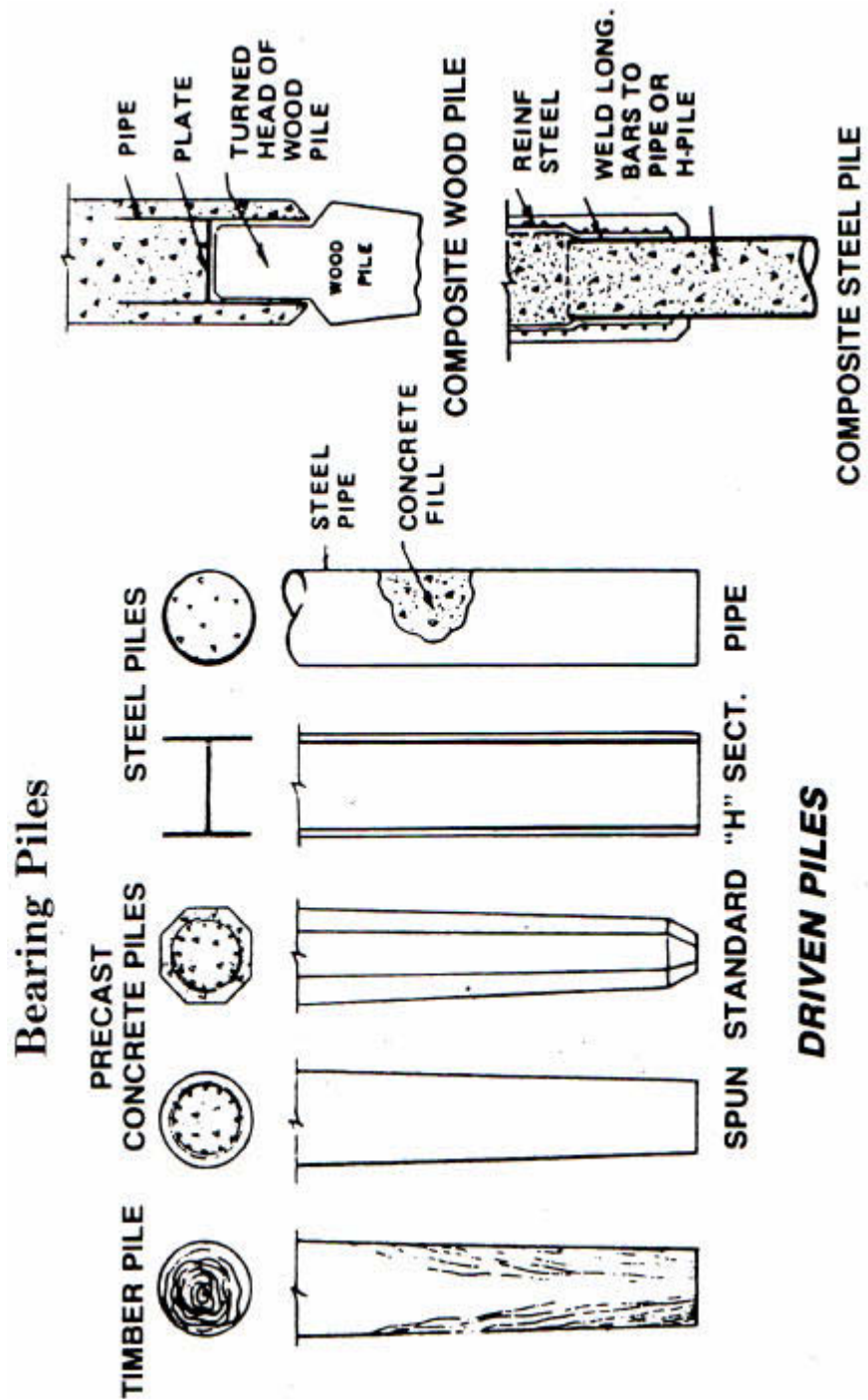
02150 SHORING AND UNDERPINNING

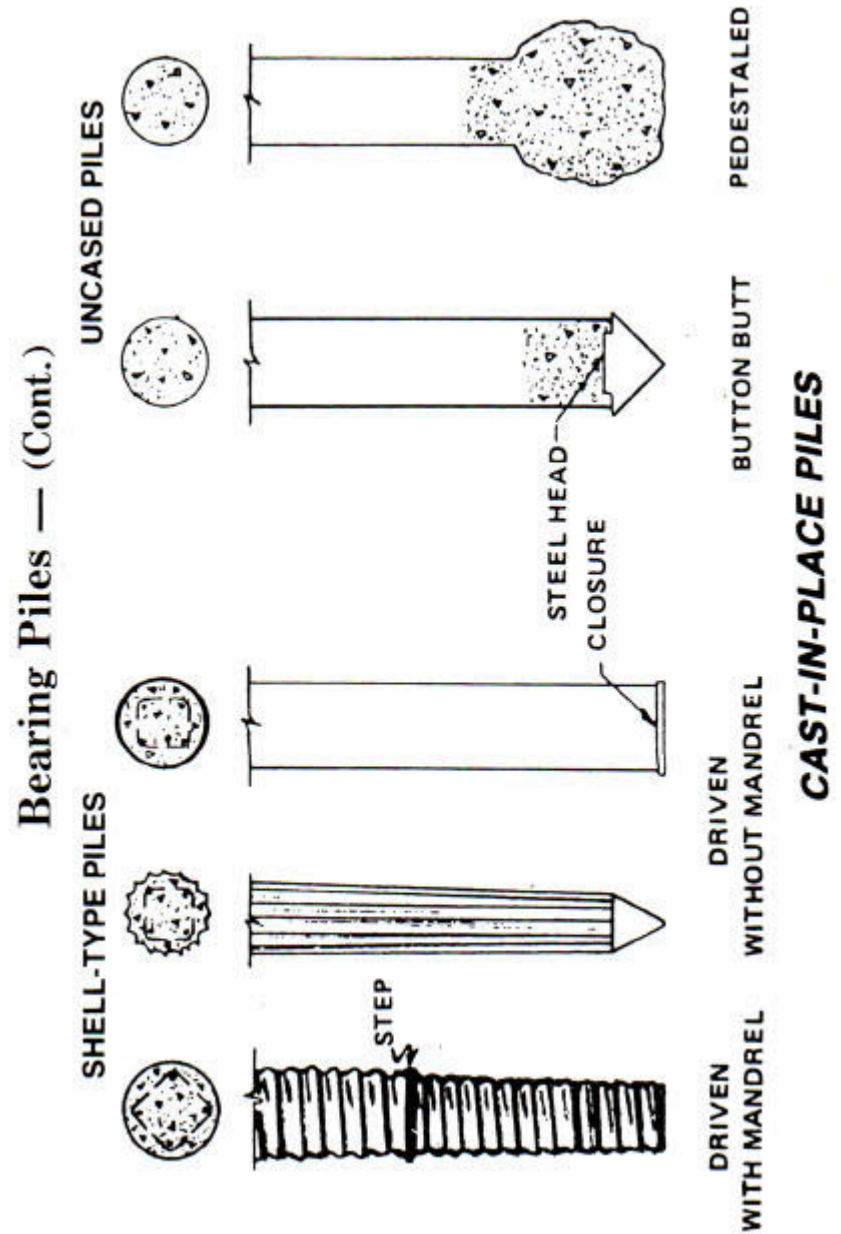
Shoring System For Trenches

Minimum Shoring Requirements in Hard Compact Soil



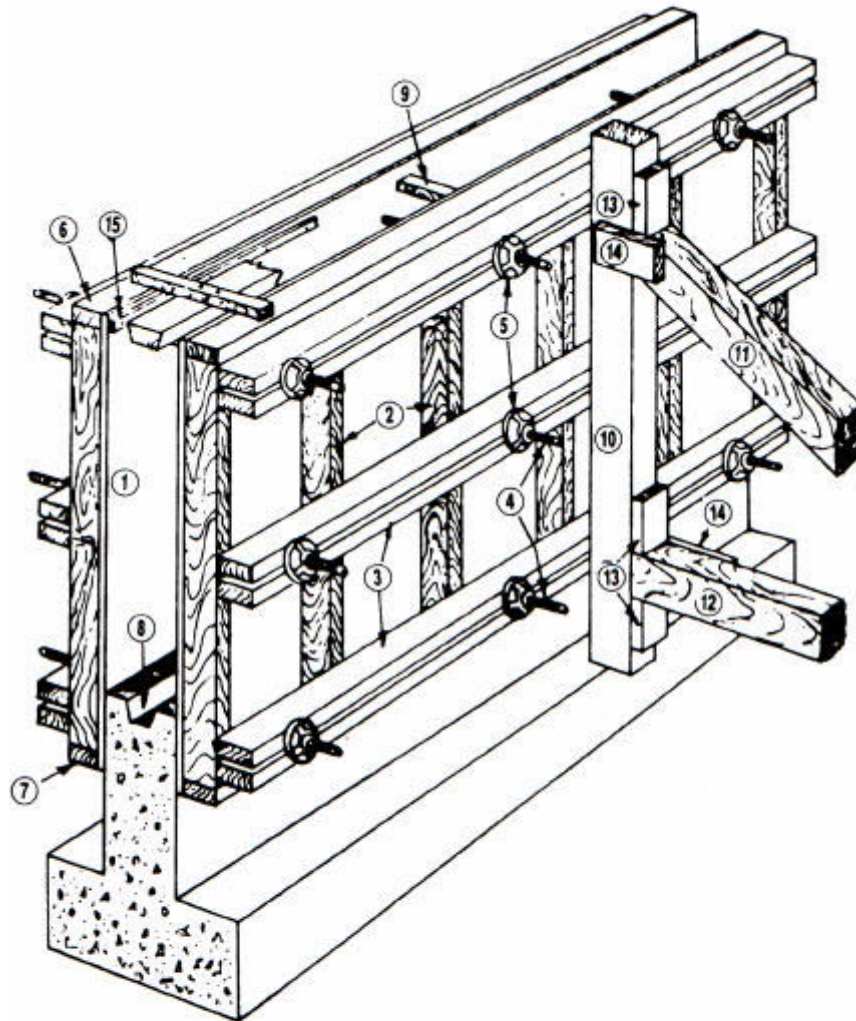
Bearing Piles



Bearing Piles (Cont.)**Cast-in-Place Piles**

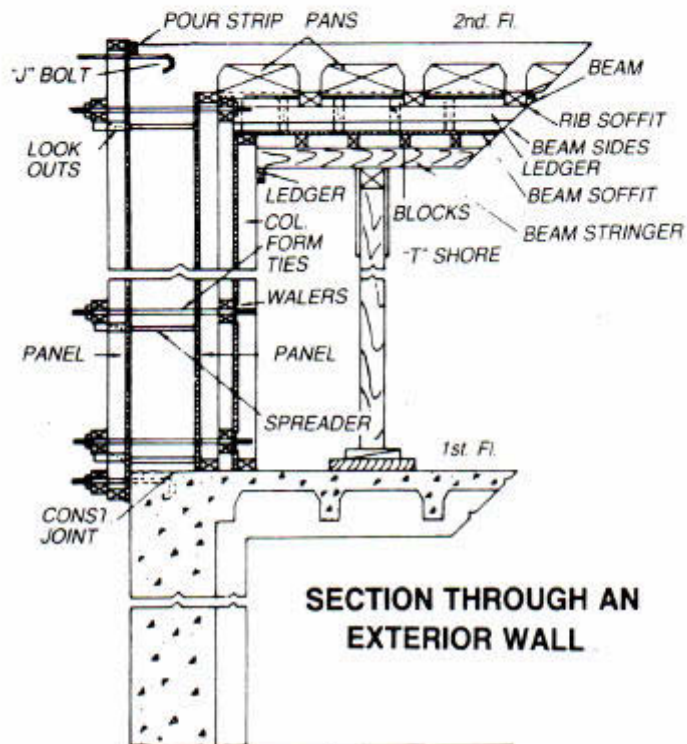
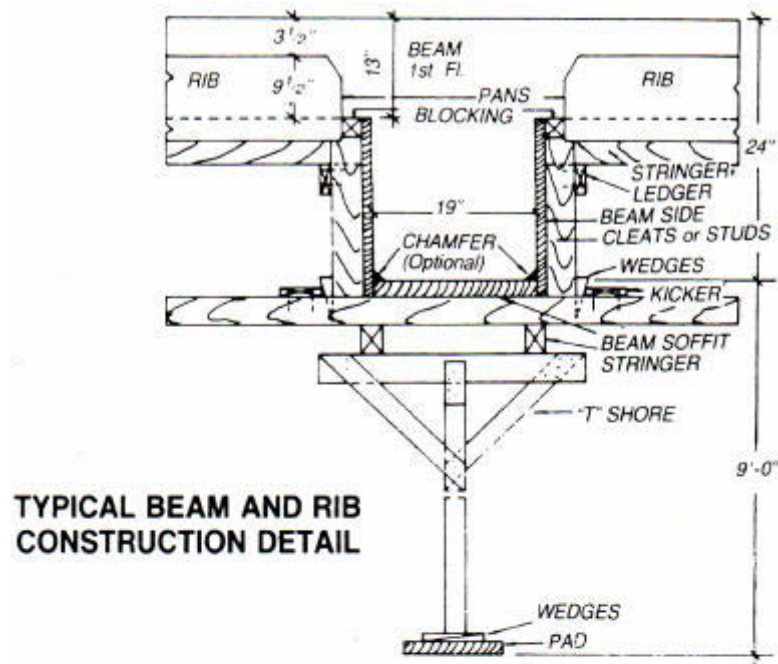
02350 PILES AND CAISSONS

Form Nomenclature



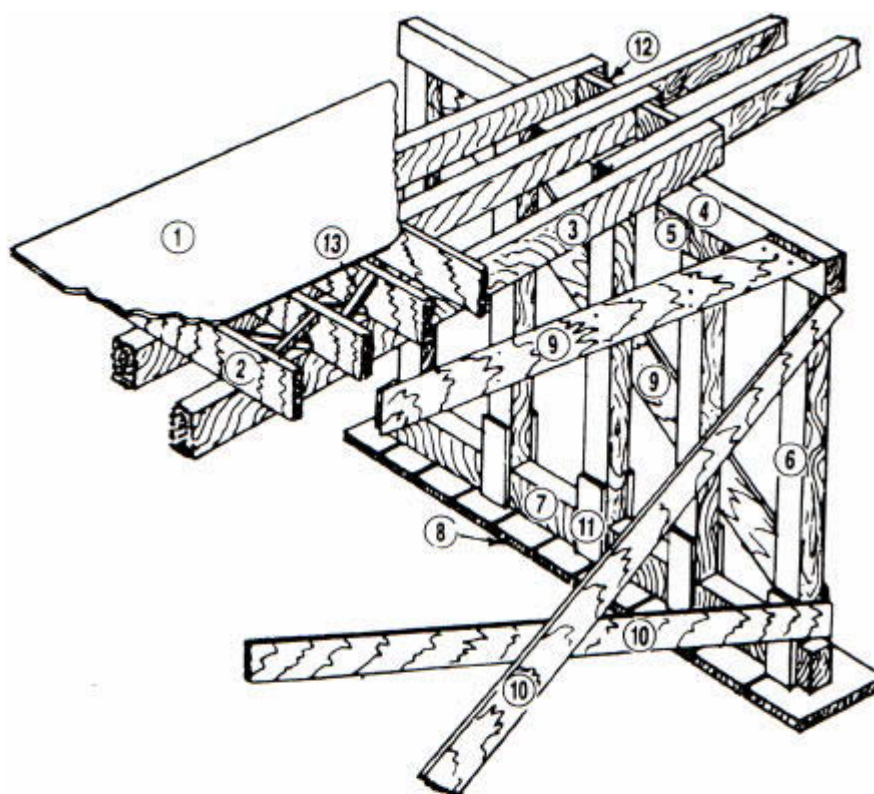
- | | | |
|---------------|-----------------|----------------|
| 1. SHEATHING | 6. TOP PLATE | 11. BRACE |
| 2. STUDS | 7. BOTTOM PLATE | 12. STRUT |
| 3. WALES | 8. KEY-WAY | 13. CLEATS |
| 4. FORM BOLTS | 9. SPREADER | 14. SCAB |
| 5. NUT WASHER | 10. STRONGBACK | 15. POUR STRIP |

03100 CONCRETE FORMWORK

Typical Form Details

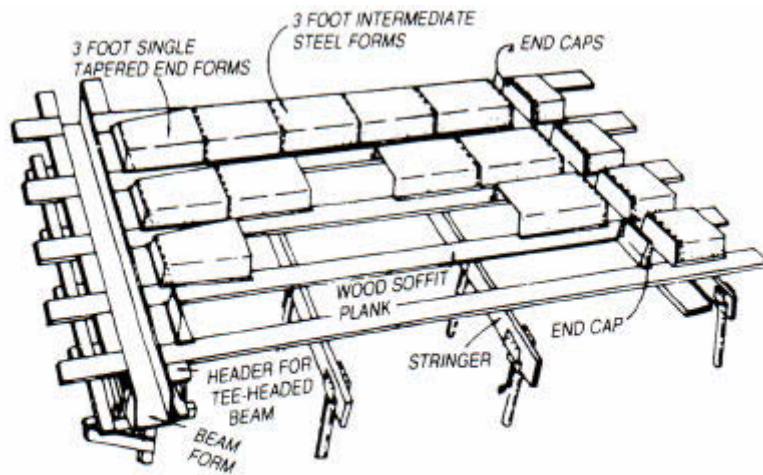
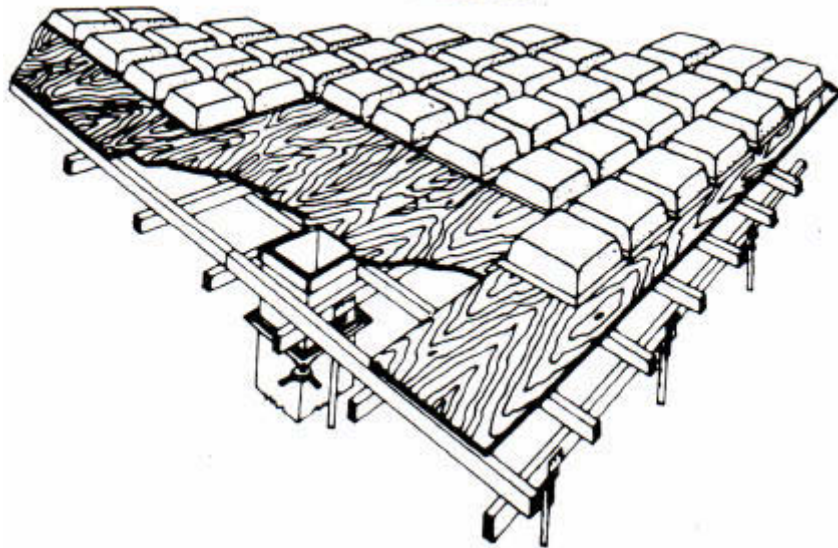
03100 CONCRETE FORMWORK

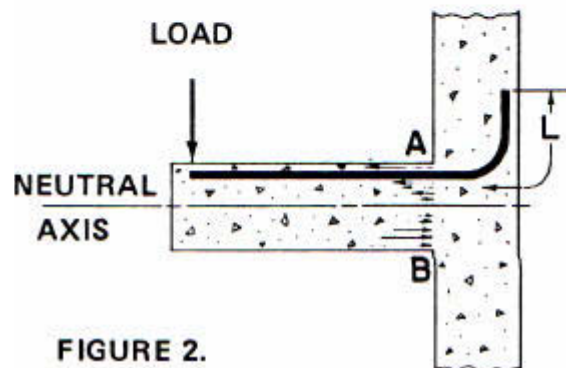
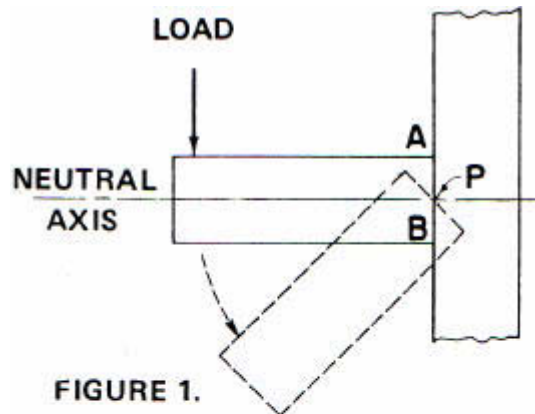
Falsework Nomenclature



- | | |
|--------------|------------------------|
| 1. SHEATHING | 7. SILL |
| 2. JOIST | 8. FOOTING |
| 3. STRINGER | 9. SWAY BRACE |
| 4. CAP | 10. LONGITUDINAL BRACE |
| 5. CORBEL | 11. SCAB |
| 6. POST | 12. BLOCKING |
| | 13. BRIDGING |

03100 CONCRETE FORMWORK

Typical Pan-Joist Form Construction**Typical Waffle Slab Form Construction****03100 CONCRETE FORMWORK**

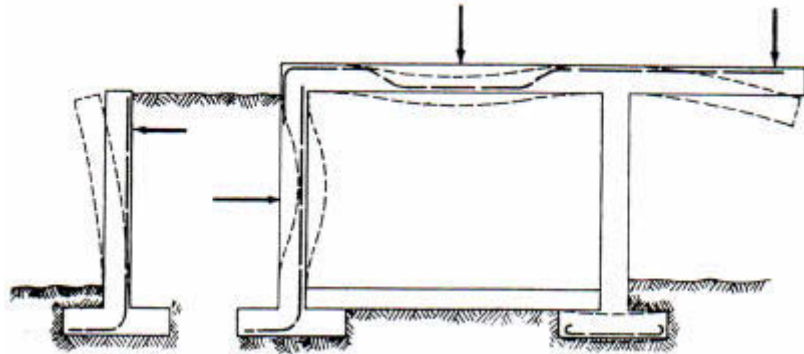
Basic Principles Of Concrete Reinforcement

In Figure 1, the horizontal concrete member, when loaded vertically near its free end, would tend to rotate about point P, a point on an imaginary line drawn through the geometric center of the horizontal member called the NEUTRAL AXIS. It can be readily seen that the movement of the member to the position represented by the dotted lines will place the contact surface represented by PA in tension while simultaneously placing PB in compression. This is typical for all structural members under a bending load. The cross-sectional area on one side of the neutral axis will be in tension while the area on the other side of the neutral axis is in compression. The values of tension and compression increase in a straight line ratio from zero at the neutral axis to a maximum at the outer surface of the member.

By placing a steel bar as shown in Figure 2 in the area of maximum tension, the tension forces can be effectively resisted by the steel bar which, by preventing rotation of the member, results in the maximum utilization of the compression resistance of the concrete in the lower portion (below the neutral axis) of the member. In many cases, steel is placed in compression areas where stresses are too high for the concrete to resist the compression forces alone.

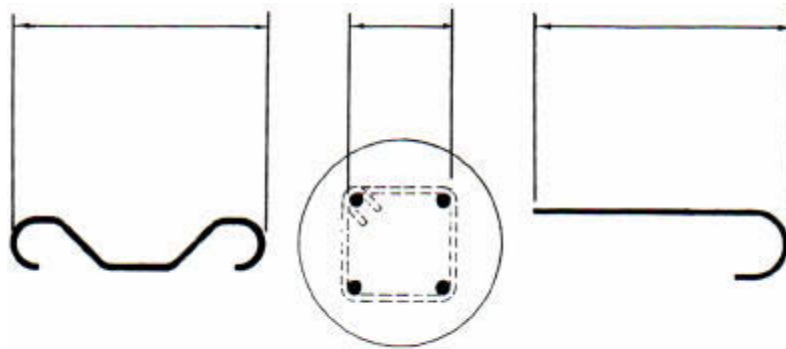
03200 CONCRETE REINFORCEMENT

***Location Of Main Steel Reinforcement
On Tension Side Of Member***



Reinforcement Bar Measurement

***All measurements of bar lengths, truss bar lengths and
Column cores are measured from out to as shown below:***



TRUSS BAR

COLUMN CORE

HOOK BAR

Principles of Reinforcement Concrete Beams

Principles Of Reinforcement Concrete Beams



In the above figure, a plain beam has broken as a result of a load applied at the center. The break first occurs at the bottom, concrete being weak in tension.



The addition of rebar, strong in tension, resists such a break. When such a simply reinforced concrete beam is loaded until it begins to break, cracks appear due to a combination of tension and vertical shear. This stress is known as diagonal tension.

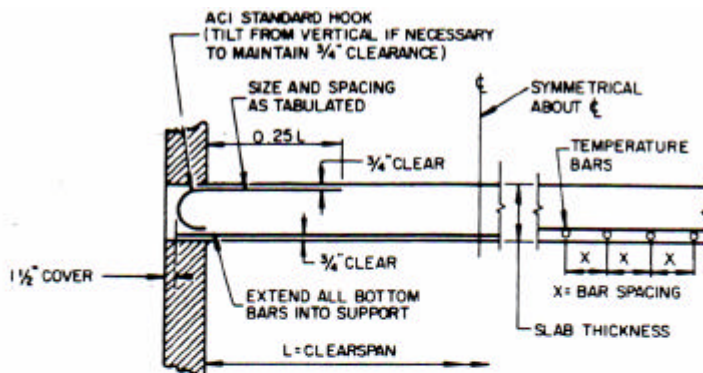


Cracking is best resisted by rebars at right angles to the cracks. This is impractical since it would require very complicated placing of rebar. The compromise then is to let some of the longitudinal bars be straight and these will be at right angles to the cracks near the center. Other bars are bent (called double bent or truss bars) to resist cracks towards the ends and approximate a right angle to the direction of cracks.

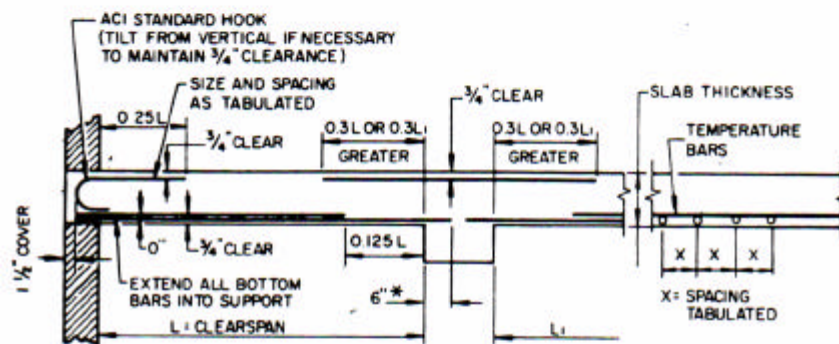


Finally, to complete the reinforcement, stirrups (vertical bars in the shape of a "U" hooked at their upper ends) are added to resist diagonal tension and to firmly anchor the longitudinal steel to the compressed part of the beam. These stirrups are called web reinforcement. In most cases it is not necessary to use web reinforcement for the entire length of the beam, shear being maximum at the supports and decreasing toward the center.

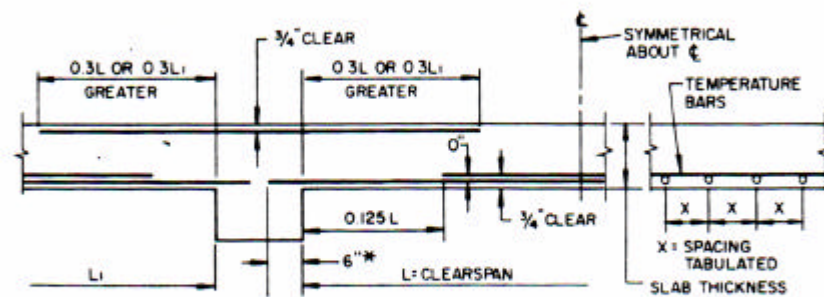
Basic Concrete Reinforcement Steel Details



SINGLE SPAN, SIMPLY SUPPORTED



END SPAN, SIMPLY SUPPORTED



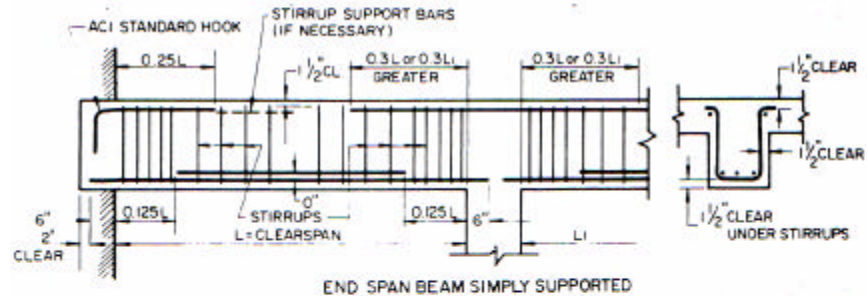
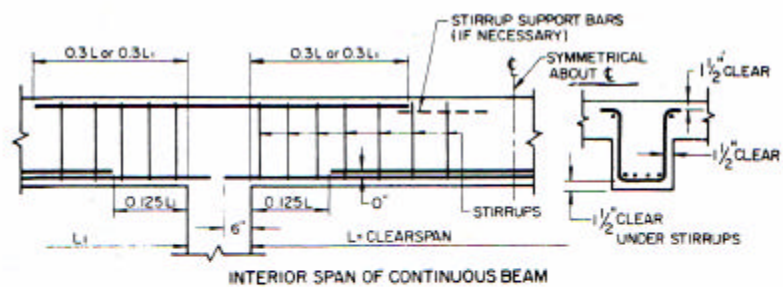
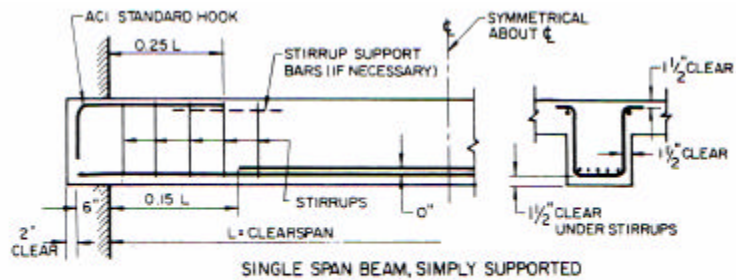
INTERIOR SPAN, CONTINUOUS

* MIN. 6", UNLESS OTHERWISE SPECIFIED BY THE ENGINEER

Note: Except for short single span slabs where top steel is unlikely to receive construction traffic, top bars lighter than #4 at 12 in. are not recommended.

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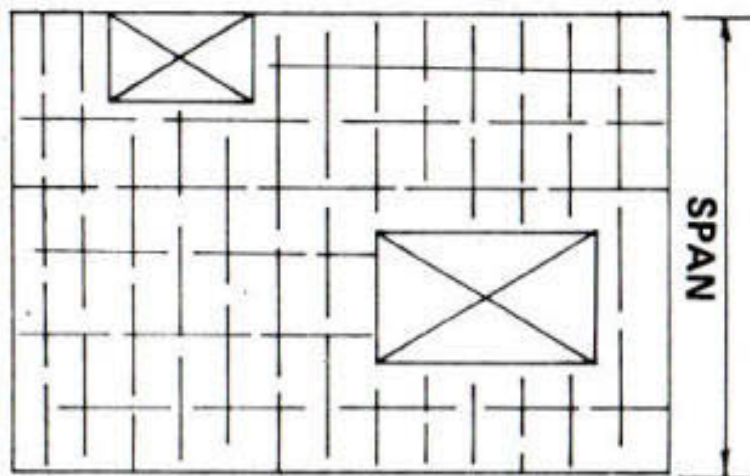
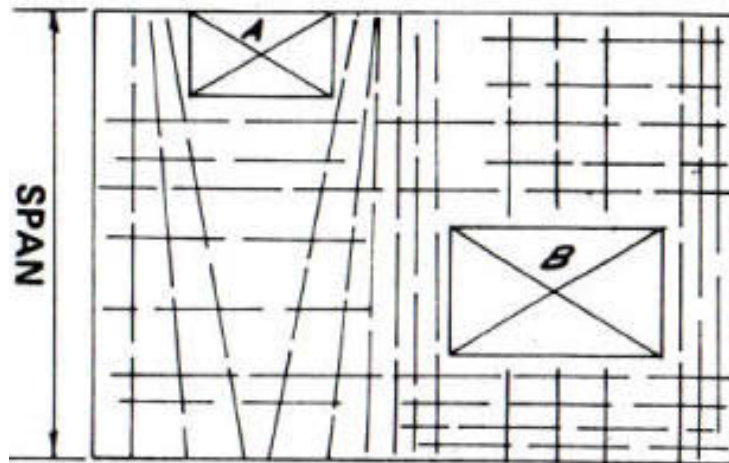
Basic Concrete Reinforcement Steel Details (Con't)



TYPICAL REINFORCING STEEL DETAILS FOR BEAMS

Note: Check available depth, top and bottom, for required cover on ACI standard hooks. At each end support, add top bar $0.25L$ in length to equal the area of bars required.

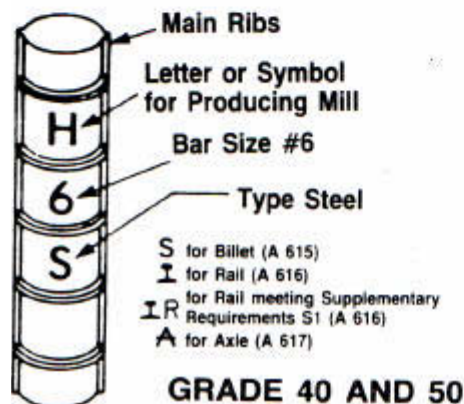
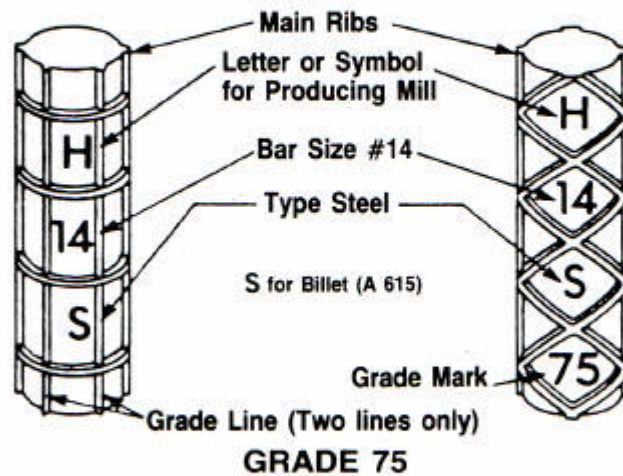
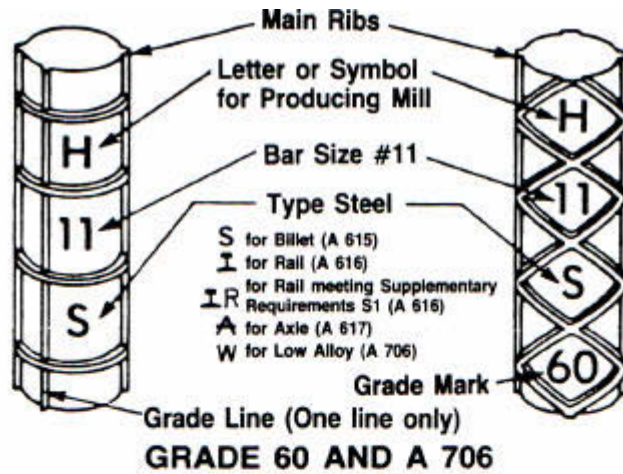
Reproduced with permission of American Concrete Institute from its publication, ACI Detailing Manual — 1988

**Basic Concrete Reinforcement
Steel Details (Con't)****WRONG****RIGHT**

For openings of substantial size, details of rebar placement will normally be shown on the drawings. This is not ordinarily done for openings of moderate size. Rebar should not be interrupted where it is practical to place the rebar as shown for opening "A." Where it is not practical, equivalent rebar for length of the span is added on either side of the opening as shown at "B." Some additional transverse rebar is used to transfer the load to adjacent spanning rebar.

03200 CONCRETE REINFORCEMENT

Common Types of Steel Reinforcing Bars



VARIATIONS:

Bar identification marks may be oriented as illustrated or rotated 90°. Grade mark numbers may be placed within separate consecutive deformation spaces. Grade line may be placed on the side opposite the bar marks.

Identification Marks On Steel Reinforcing Bars

The ASTM specifications for billet-steel, rail-steel, axle-steel and low-alloy steel and low-alloy steel reinforcing bars (A 615, A 616, A 617 and A 706, respectively) require identification marks to be rolled into the surface of one side of the bar to denote the producer's mill designation, bar size, type of steel and minimum yield designation. Grade 60 bars show these marks in the following order:

1st	Producing Mill	(usually a letter)	
2nd	Bar Size Number	(#3 through #18)	
3rd	Type Steel:		
	S	For Billet	(A 615)
	I	For Rail	(A 616)
	IR	For Rail meeting Supplement Requirements Si	(A 616)
	A	For Axle	(A 617)
	W	For Low-Alloy	(A 706)

4th Minimum Yield Designation

Minimum yield designation is used for Grade 60 and Grade 75 bars only. Grade 60 bars can either have one (1) single longitudinal line (grade line) or the number 60 (grade mark). Grade 75 bars can either have two (2) grade lines or the grade mark 75.

A grade line is smaller and between the two main ribs which are on opposite sides of all U.S.-made bars. A grade line must be continued at least five deformation spaces. A grade mark is the fourth mark on a bar.

Grade 40 and 50 bars are required to have only the first three identification marks (no minimum yield designation).

ASTM Standard Reinforcing Bars

Bar Size (Sq. Inches)	Nominal Area (Pounds per Ft.)	Weight (Inches)	Nominal Diameter (Inches)
# 3	0.11	0.376	0.375
# 4	0.20	0.668	0.500
# 5	0.31	1.043	0.625
# 6	0.44	1.502	0.750
# 7	0.60	2.044	0.875
# 8	0.79	2.670	1.000
# 9	1.00	3.400	1.128
#10	1.27	4.303	1.270
#11	1.56	5.313	1.410
#14	2.25	7.650	1.693
# 18	4.00	13.600	2.257

03200 CONCRETE REINFORCEMENT

Steel Bar Reinforcing — Field Erection

Tolerances in Placement

Unless otherwise specified, reinforcing bars should be placed within the following tolerances:

- (a) Tolerance for depth, d, and minimum clear concrete cover in flexural members, walls and columns should be as follows:

	Tolerance on d	Tolerance On Minimum Concrete Cover
d= 8 in.	$\pm \frac{3}{8}$ in.	$-\frac{3}{8}$ in.
d >8 in.	$\pm \frac{1}{2}$ in.	$-\frac{1}{2}$ in.

Except that the tolerance for the clear distance to formed soffits should be inches, and the tolerance for cover should not exceed minus 1/3 of the minimum cover required on the design drawings or in the specifications.

Note: "d" is the specified effective depth.

- (b) Tolerance for longitudinal location of bends and ends of bars should be ± 2 in. except at discontinuous ends of members where the tolerance should be $\pm \frac{1}{2}$ in.
- (c) As long as the total number of bars specified is maintained, a reasonable tolerance in spacing individual bars is ± 2 in., except where openings, inserts, embedded items, etc. might require some additional shifting of bars.
- (d) Tolerance for length of laps in lap splices should be ± 1 in.
- (e) Tolerance for embedded length should be ± 1 in. for #3 through #11 bars and 2 -2 in. for #14 and #18 bars.

Concrete Protection for Reinforcement

The following minimum concrete cover should be provided for reinforcing bars. For bundled bars, the minimum cover should be equal to the equivalent diameter of the bundle but need not be greater than 2 in.; for concrete cast against and permanently exposed to earth, the minimum cover should be 3 in.

(a) Cast-In-Place Concrete (non-prestressed)

	<u>Minimum Cover, In.</u>
Concrete cast against and permanently exposed to earth	3
Concrete exposed to earth or weather: #6 through #18 bars	2

Steel Bar Reinforcing (Cont.)

	Minimum
#5 bars, W31 or D31 wire, and smaller	1 ½
Concrete not exposed to weather or in contact with the ground:	
Slabs, walls, joists:	
#14 and #18 bars.....	1 ½
#11 bars and smaller.....	¾

(b) Precast Concrete (manufactured under plant control conditions)

Concrete exposed to earth or weather:

 Wall panels:

#14 and #18 bars	1 ½
#11 and smaller	¾

 Other members:

#14 and #18 bars	2
#6 through #11 bars.....	1 ½
#5 bars, W31 or D31 wire, and smaller	1 ¼

Not exposed to weather or in contact with the ground:

 Slabs, walls, joists:

#14 and #18 bars	1 ¼
#11 bars and smaller	5/8

 Beams, girders, columns:

Primary reinforcement	d _b but not less than 5/8
	and need not exceed 1 ½

 Ties, stirrups or spirals

 Shells and folded plate members:

#6 bars and larger	5
#5 bars, W31 or D31 wire, and smaller	3/8

- (c) In corrosive atmospheres or severe exposure conditions, the amount of concrete protection should be suitably increased the denseness and nonporosity of the protecting concrete should be considered or other protection should be provided.

Mechanical Requirements For Standard Deformed Reinforcing Bars

Type of Steel and ASTM Specification No.	Size Nos. Inclusive	Grade ⁽¹⁾	Tensile Strength Min., psi	Yield ⁽²⁾ Min., psi	Percent Elongation in 8" Minimum	Cold Bend Test ⁽³⁾ (d = nominal diameter of specimen)
Billet-Steel A 615-84a	3-6	40	70,000	40,000	#3 11 #4, #5, #6 12	Under Size #6 4d "per S1 3½d #6 5d
	3-11 14, 18	60	90,000	60,000	#3, #4, #5, #6 9 #7, #8 8 #9, #10, #11, #14, #18 7	Under Size #6 4d "per S1 3½d #6 5d #7, #8 6d "per S1 5d #9, #10, #11 8d "per S1 7d #14, #18, (90°) 9d
Rail-Steel ⁽⁴⁾ A 616-84	3-11	50	80,000	50,000	#3, #7 6 #4, #5, #6 7 #8, #9, #10, #11 5	Under Size #9 6d #9, #10 8d #11 8d (90°)
	3-11	60	90,000	60,000	#3, #4, #5, #6 6 #7 5 #8, #9, #10, #11 4.5	Under Size #9 6d #9, #10 8d #11 8d (90°)
Axle-Steel ⁽⁵⁾ A 617-84	3-11	40	70,000	40,000	#3, #7 11 #4, #5, #6 12 #8 10 #9 9 #10 8 #11 7	Under Size #6 3½d #6 and Larger 5d
	3-11	60	90,000	60,000	#3, #4, #5, #6, #7 8 #8, #9, #10, #11 7	Under Size #6 3½d #6, #7, #8 5d #9, #10, #11 7d
Low-Alloy Steel ⁽⁶⁾ A 706-84a	3-11 14, 18	60	80,000 ⁽⁶⁾	60,000 ⁽⁷⁾	#3, #4, #5, #6 14 #7, #8, #9, #10, #11 12 #14, #18 10	Under Size #6 3d #6, #7, #8 4d #9, #10, #11 6d #14, #18 8d

- (1) Minimum yield designation.
- (2) Yield point or yield strength. See specifications.
- (3) Test bends 180° unless noted otherwise.
- (4) Under supplementary requirement (S1) of A 615.
- (5) Complete specifications for Rail-Steel (A 616). Axle-Steel (A 617) and Low-Alloy Steel (A 706) Reinforcing Bars can be obtained from the American Society for Testing and Materials, 1916 Race St. Philadelphia, PA 19103.
- (6) Tensile strength shall not be less than 1.25 times the actual yield strength (A 706 only).
- (7) Maximum yield strength 78,000 psi (A 706 only).

03200 CONCRETE REINFORCEMENT

Basic Concrete Reinforcing Data

BAR LAP SCHEDULE IN FEET - MINIMUM LAP 1'0"							
Bar Size	12D	15D	17D	20D	24D	27D	30D
#11	1-5	1-9	2-0	2-4	2-10	3-2	3-6
#10	1-3	1-7	1-11	2-1	2-6	2-10	3-2
#9	1-2	1-5	1-7	1-11	2-3	2-6	2-10
#8	1-0	1-3	1-5	1-8	2-0	2-3	2-6
#7		1-1	1-3	1-6	1-9	2-0	2-2
#6			1-1	1-3	1-6	1-8	1-11
#5				1-1	1-3	1-5	1-7
#4					1-0	1-2	1-3

Bar Size	330D	35D	400	450	50D	60D
#11	3-11	4-1	4-8	5-3	5-11	7-1
#10	3-6	3-8	4-3	4-9	5-4	6-4
#9	3-1	3-3	3-9	4-3	4-8	5-8
#8	2-9	2-11	3-4	3-9	4-2	5-0
#7	2-5	2-7	2-11	3-3	3-8	4-5
#6	2-1	2-2	2-6	2-10	3-2	3-9
#5	1-9	1-11	2-2	2-4	2-7	3-2
#4	1-5	1-6	1-8	1-11	2-1	2-6
#3	1-0	1-1	1-3	1-5	1-7	1-11

Welded Wire Fabric — Common Stock Styles Of Welded Wire Fabric

Style Designation	Steel Area sq. In. per Ft.		Weight Approx. lbs. per 100 sq. ft.
	Longit.	Transv.	
Rolls			
6x6—W1.4xW1.4	.03	.03	21
6x6—W2xW2	.04	.04	29
6x6—W2.9xW2.9	.06	.06	42
6x6—W4xW4	.08	.08	58
4x4—W 1.4xW 1.4	.04	.04	31
4x4—W2xW2	.06	.06	43
4x4—W2.9xW2.9	.09	.09	62
4x4—W4xW4	.12	.12	86
Sheets			
6x6—W2.9xW2.9	.06	.06	42
6x6—W4xW4	.08	.08	58
6x6—W 5.5x W 5.5	.11	.11	80
4x4—W4xW4	.12	.12	86

Certain styles of welded wire fabrics as shown in the Table have been recommended by the Wire Reinforcement Institute as common stock styles. Use of these styles is normally based on empirical practice and quick availability rather than on specific steel area designs. Styles of fabric produced to meet other specific steel area requirements are ordered for designated projects or, in some localities, may be available from inventory.

ASTM SPECIFICATIONS

Welded wire fabric used for concrete reinforcement consists of cold-drawn wire in orthogonal patterns, square or rectangular and resistance welded at all intersections. Welded wire fabric (WWF) is commonly but erroneously called "mesh," which is a much broader term not limited to concrete reinforcement. Welded wire fabric must conform to ASTM A 185 if made of smooth wire or A497 if made of deformed wire. These Specifications require shear tests on the welds essential to proper anchorage for bond in concrete. ASTM yield strength is 65,000 psi for smooth fabric (A 185) and is 70,000 psi for deformed fabric (A 497).

Unless otherwise specified, welded wire fabric conforming to ASTM A 185 will be furnished.

An example style designation is: WWF 6x12-W16xW8. This designation identifies a style of fabric in which:

Spacing of longitudinal wire..... = 6"
 Spacing of transverse wires = 12"
 Longitudinal wire size = W16
 Transverse wire size = W8

A deformed fabric style would be designated in the same manner with the appropriate D-number wire sizes.

It is very important to note that the terms "longitudinal" and "trans-verse" are related to the method of fabric manufacture and have no reference to the position of the wires in a completed concrete structure.

03200 CONCRETE REINFORCEMENT

Basic Concrete Data

SLUMP						
Aggr. Size	2"	2½"	3"	4"	5"	6"
¾"	301/36.1	306/36.7	310/37.2	319/38.3	327/39.2	333/40.0
⅞"	296/35.5	301/36.1	305/36.6	314/37.7	322/38.6	330/39.6
1"	291/34.9	296/35.5	300/36.0	309/37.1	317/38.0	327/39.2
1¼"	281/33.7		290/34.8	299/35.9	307/36.8	316/37.9
1½"	271/32.5		280/33.6	289/34.7	297/35.6	305/36.6

Water requirement in pounds/gals per cubic yard

Rule of thumb: 1 gal. will change slump approximately 1 inch

TIME TABLE OF CEMENT STRENGTHS

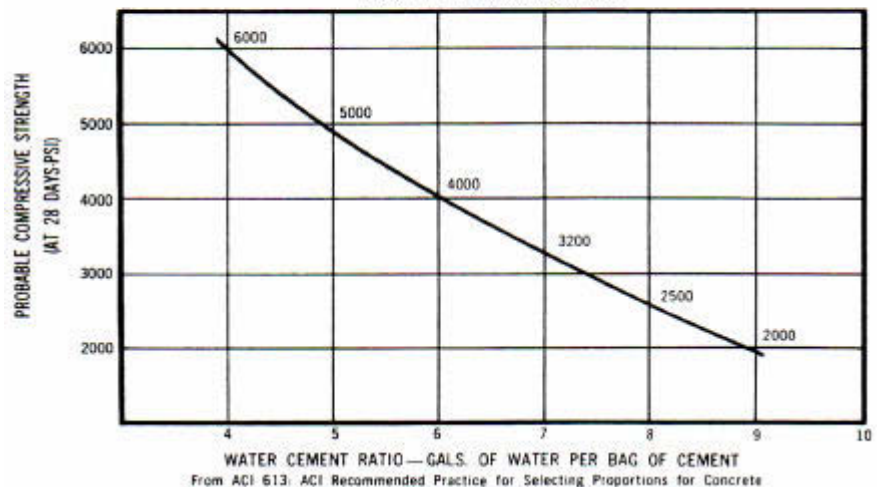
Cem. Type	3 days	7 days	14 days	28 days	60 days
I	40	60	80	100	100
II	33	55	65	80	
III	60	80	100	120	
IV	20	40	55	75	
V	20	40	60	80	

Compressive strength rated on percentage of Type I 28 day strength

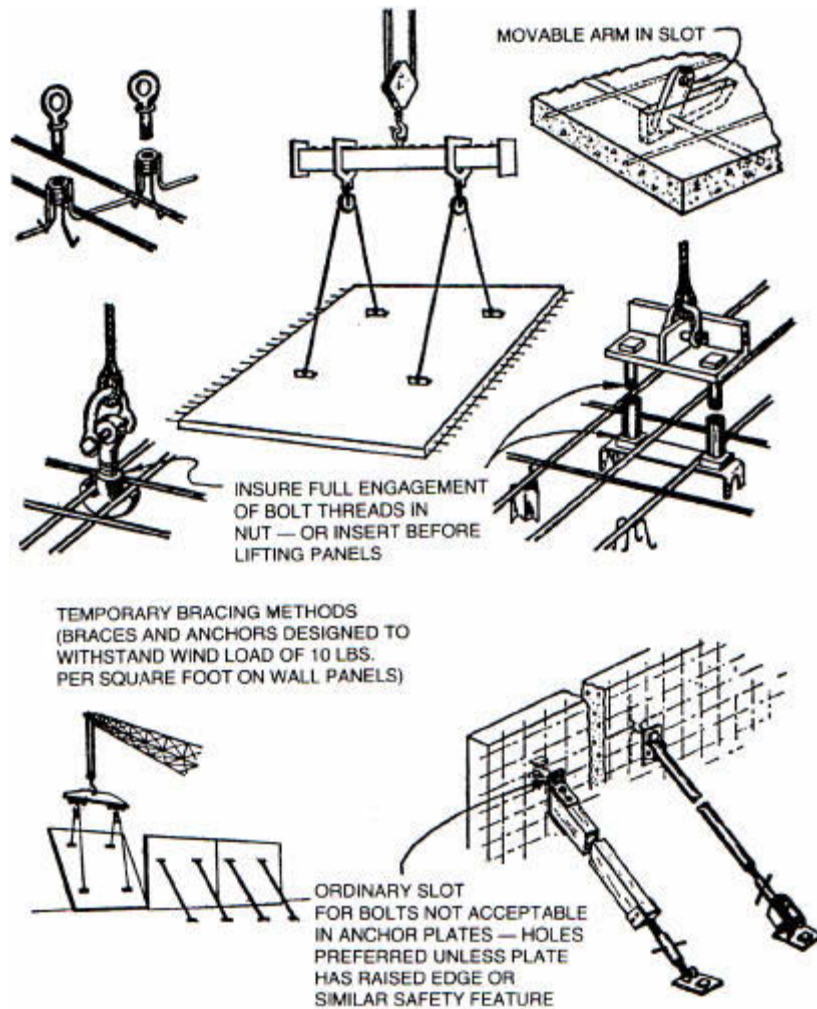
All types increased in one year 133%

**EFFECT OF WATER CONTENT ON
COMPRESSIVE STRENGTH OF CONCRETE**

(Non Air Entrained Concrete)

**03200 CONCRETE REINFORCEMENT**

**Basic Concrete
Construction Techniques**
TILT-UP CONCRETE SLAB ERECTION METHODS
(SHOWING TYPICAL PICK-UP DEVICES)



03400 PRECAST CONCRETE

Standard Welding Symbols

Typical Welding Symbols		
Double-Fillet Welding Symbol	Chain Intermittent Fillet Welding Symbol	Staggered Intermittent Fillet Welding Symbol
<p>Weld size Length Pitch (distance between centers of increments)</p> <p>Omission indicates that weld extends between abrupt changes in direction or as dimensioned</p>	<p>Pitch (distance between centers of increments) Stagger Length of increments Size (length of leg)</p>	<p>Pitch (distance between centers of increments) Length of increments Size (length of leg)</p>
Plug Welding Symbol	Back Welding Symbol	Backing Welding Symbol
<p>Pitch (distance between centers of welds) Size (diameter of hole at root) Depth of filling in inches (omission indicates filling is complete)</p>	<p>Back weld 1st operation 2nd operation</p>	<p>Backing weld 1st operation 2nd operation</p>
Spot Welding Symbol	Stud Welding Symbol	Seam Welding Symbol
<p>Size or strength Number of welds Pitch Process</p>	<p>Size Pitch Number of studs</p>	<p>Size or strength Increment length Pitch Process</p>
Square-Groove Welding Symbol	Single-V Groove Welding Symbol	Double-Berrel-Groove Welding Symbol
<p>Weld size Root opening</p>	<p>Depth of preparation Weld size Root opening Groove angle</p>	<p>Weld size Arrow points toward member to be prepared</p>

The welding symbols reproduced in this section are from the publication, *Standard Symbols for Welding, Brazing and Nondestructive Examination*, published and copyrighted by the American Welding Society, Miami, Florida 33135.

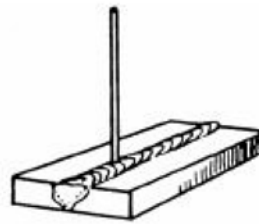
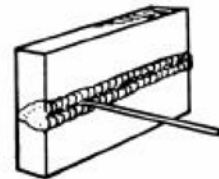
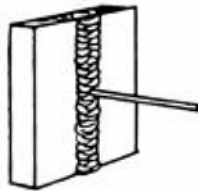
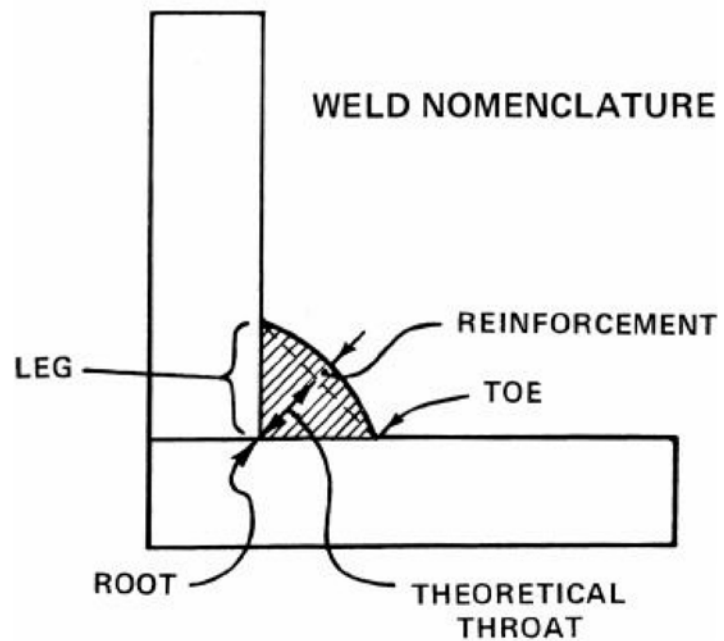
Standard Welding Symbols

Supplementary Symbols					Location of Elements of a Welding Symbol	
Weld-All Around	Field Weld	Melt-Thru	Consumable Insert	Backing Spacer	Contour	
					Flush	Concave
Basic Joints						
Identification of Arrow Side and Other Side of Joint						
Butt Joint						
Corner Joint						
Lap Joint						
T-Joint						
					Process Abbreviations	
					Where process abbreviations are to be included in the tail of the welding symbol, reference is made to Table 1, Designation of Welding and Allied Processes by Letters, of AWS A2.4-86	
					AMERICAN WELDING SOCIETY, INC. 550 N.W. LeJeune Rd., Miami, Florida 33126	

05050 METAL FASTENING

General Information On Welding

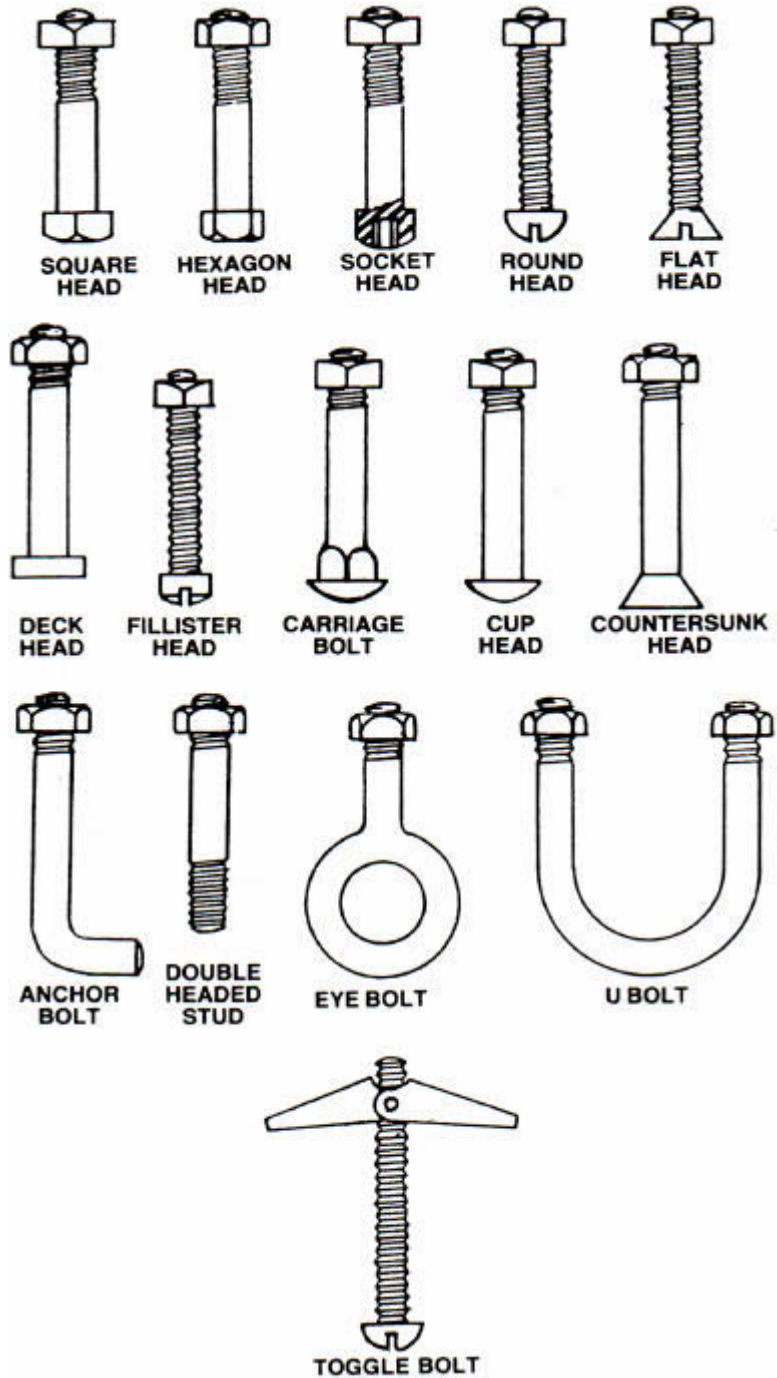
WELDING POSITIONS

**FLAT (F)****HORIZONTAL (H)****VERTICAL (V)****OVERHEAD (OH)****05050 METAL FASTENING**

General Information On Welding (Con't)

WELD CHARACTERISTICS

Common Bolts



High Strength Bolts Tightening Procedures

Equipment and Power

Installation equipment in good working order is vital to proper tightening of high-strength bolts in structural connections. The type of wrench to be used is not designated in the *Specifications for Structural Joints Using ASTM A325 or A490 Bolts* as published by the Research Council. However, three methods of tightening are recommended by the Council Specifications.

1. **Calibrated Wrench Tightening** requiring the use of a torque-controlled wrench that cuts off when a pre-set torque is reached.
2. **Turn-of-Nut Tightening** which can be accomplished with either a hand wrench or a standard impact wrench.
3. Tightening by **use of a Direct Tension Indicator** which requires use of any device allowing accurate direct measurement of bolts tension, such as the load indicator washer.

Bolts installed with a load indicator washer are tightened with a standard impact wrench.

The usual source of power is compressed air. There must be an adequate pressure at the tool — an absolute minimum of 100 psi for bolts $\frac{7}{8}$ " diameter and smaller. For larger bolts, pressure must be higher. Hose lines should be adequate for the number and size of wrenches used.

Calibration

Whether bolts are installed by the calibrated wrench method or by the turn-of-nut method, the use of a calibrating device to check out tools and equipment and to provide a means of reliable inspection is essential.

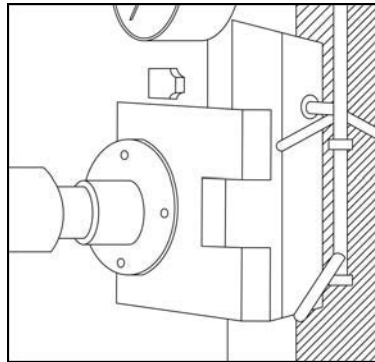


Fig. 1 — The bolt-tension calibrator is a hydraulic load cell which measures bolt tension created by tightening. As the bolt or nut is turned, the internal bolt tension or clamping force is transmitted through the hydraulic fluid to a pressure gauge which indicates bolt tension directly in pounds. The dial of the gauge may be marked to show the required minimum tension for each bolt diameter. (See Bolt Tension Table as published in the current Research Council Specifications.)

When torque-control wrenches are used, they must be calibrated at least once each working day by tightening not less than three bolts of each diameter from the bolts to be installed. The average torque determined by this calibration procedure may then be used to pre-set the cut-off device built into torque-control wrench. The torque-control device must be set to provide a bolt tension 5 to 10 percent in excess of the minimum bolt tension.

High Strength Bolts (Con't.)

The bolt-tension calibrator is also necessary to calibrate the hand-indicator torque wrenches used by inspectors for checking torque as a measure of tension after tightening by either the calibrated wrench method or the turn-of-nut method.

Proper Tightening Procedure

Regardless of the method used to tighten high-strength structural bolts, the sequence of operations is basically similar. Accordingly, we show below the step-by-step procedure for tightening a simulated beam-to-girder connection by the turn-of-nut method, using 1 in. diameter A 325 bolts. For clarity, the beam is omitted and only the clip angles which had been previously bolted to the girder web are shown.

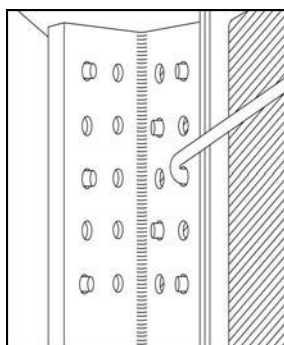


Fig. 2 - First, holes are "faired up" with enough drift pins to maintain dimensions and plumbness. Next, sufficient high-strength bolts of the proper grade and size are installed to hold the connection in place. Only hand tightening is required at this point. Since these bolts will remain in place as permanent fasteners, washers, if required, should be installed with the bolts during fitting-up.

Fig. 3 - The balance of the holes are now filled with bolts and assembled with nuts and washers. Note the gap between the angles which will be drawn together during the "snugging" operation. In a true connection, this gap would be filled by the beam web. However, it may be considered representative of "difficult" fitting-up conditions.

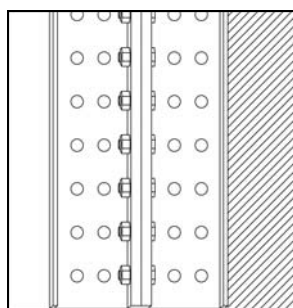
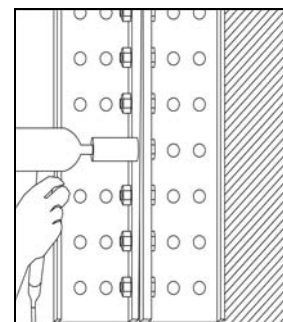


Fig. 4 - The bolting crew starts to "snug" the bolts and nuts ("snug" is defined as the point at which the wrench begins to impact solidly). Note that the "snug" condition creates sufficient *tension* to draw the top half of the angles tightly together while the bottom half still remains open because those bolts are only "hand tight."

Fig. 5 - The crew completes "snugging" the entire connection. As a result, the gap between the angles has entirely disappeared.

05050 METAL FASTENING

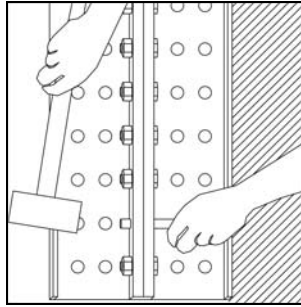
High Strength Bolts (Con't.)

Fig. 6 - Now the drift pins are knocked out and the remaining holes filled with bolts and torqued up to "snug." The connection is now ready for final tightening.

Fig. 7 - In this view, the bolts have been numbered to show the suggested tightening sequence. Bolts and nuts should always be tightened progressively away from the fixed or rigid points to the free edges.

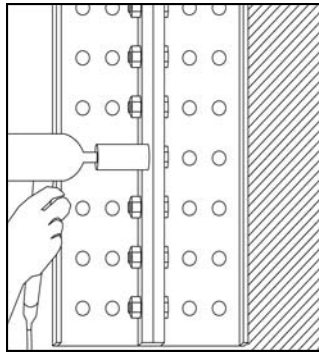
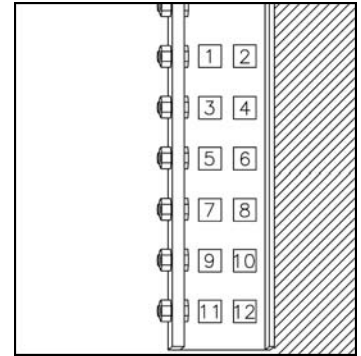
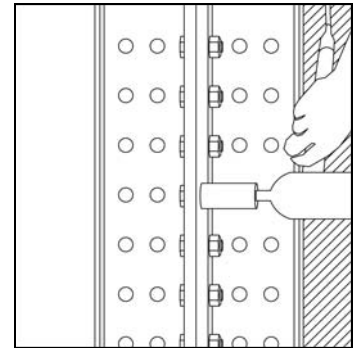


Fig. 8 - Here, the wrench operator is just starting final tightening of Bolt No. 2 to the required half-turn beyond "snug" condition (see Nut Rotation Council Specifications). In final tightening, a hand wrench is used to hold the end not being torqued to ensure that the true required turn measurement is not lost.

Fig. 9 - Here, the operator has completed the half-turn on Bolt No. 12, as shown by the twin double lines on the wrench socket located 90 degrees apart. Notice in Fig. 8 (showing the beginning of a required half-turn) that there are twin single lines 90 degrees apart. These socket markings enable the operator to easily measure nut rotation.



High Strength Bolts (Con't.)

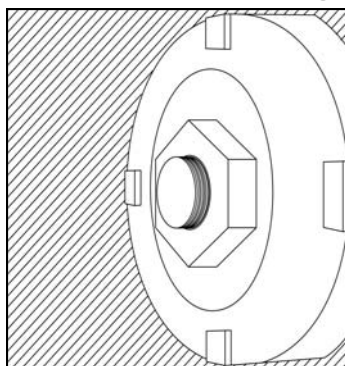
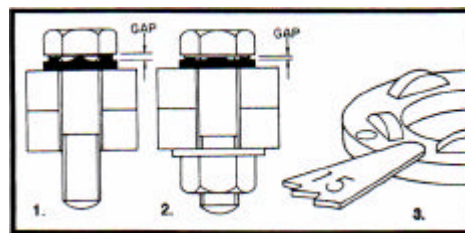


Fig. 10- This is a close-up of a nut after final tightening. Close examination will disclose slight burrs or peening marks near the edge of each nut "flat." These marks are caused by the "hammering" action of the wrench as it impacts. If A325 nuts show no such markings, a thorough inspection should be made to ensure that the bolts were properly tightened. Nuts furnished with A490 bolts may not show any distortion because of their greater hardness. However, a slight burnishing of the edges should be evident.

Load Indicator Washer

The Bethlehem Load Indicator Washer (LIW) is a hardened flat circular washer with protrusions on one face. In use, the LIW is placed on the bolt with the protrusions bearing against a hardened surface of the bolt-nut assembly, usually the underside of the bolt head (Figure 1). As the bolt is tightened the protrusions are flattened and the gap reduced (Figure 2).

While tightening, be sure the bolt head does not spin on the load indicator protrusions. At a specified average gap, measured by feeler gauge as in Figure 3, the induced bolt tension will not be less than the minimum required by various standards. If connection details require placing the LIW at the nut end or if the fastener must be tightened from the end where the LIW is located, a supplemental hardened flat washer must be used against the protrusions. The maximum gaps between load indicator washer and bolt head (or hardened flat washer) after tightening are shown in Table 1. Table 2 shows the induced bolt tension which correspond to these gaps. The LIW is available for both A325 and A490 bolts, in two distinct configurations.



Inspection and Verification

Inspection is accomplished by checking the average gap of the LIW bolt assembly with a metal feeler gauge (Figure 3). Two important rules for inspection should be emphasized:

1. Inspection should be based upon the average gap because the bolt will never be perfectly centered in the LIW; therefore, the protrusions will not collapse uniformly.
2. The feeler gauge is used as a "no go" inspection tool; that is, if the gauge does not enter the gap (but a gap is evident), the installation is considered satisfactory.

High Strength Bolts (Con't.)

TABLE 1 Load Indicator Gaps To Give Required Minimum Bolt Tension		
Load Indicator Fitting	A 325	A 490
Under Bolt Head Black Finish Bolts	0.025 in.	0.015 in.
Under Nut with Hardened Flat Washer Black Finish	0.015 in.	0.010 in.
With the gaps shown above, required minimum bolt tensions will be induced as given in Table 2.		

TABLE 2 Minimum Bolt Tensions In thousands of pounds (Kips)		
Bolt Dia. (In.)	A 325	A 490
1/2	12	—
5/8	19	—
3/4	28	35
7/8	39	49
1	51	64
1 1/8	56	80
1 1/4	71	102

Turn-Of-Nut Tightening

When the turn-of-nut method is used to provide the bolt tension specified, there shall first be enough bolts brought to a "snug tight" condition to ensure that the parts of the joint are brought into good contact with each other. Snug tight is defined as the tightness attained by a few impacts of an impact wrench or the full effort of a man using an ordinary spud wrench. Following this initial operation, bolts shall be placed in any remaining holes in the connection and brought to snug tightness. All bolts in the connection shall then be tightened additionally by the applicable amount of nut rotation specified in table below, with tightening progressing systematically from the most rigid part of the joint to its free edges. During its operation, there shall be no rotation of the part not turned by the wrench.

Nut Rotation (a) From Snug Tight Condition

Bolt Length (As measured from underside of head to extreme end of point)	Disposition of Outer Faces of Bolted Parts		
	Both faces normal to bolt axis	One face normal to bolt axis and other face sloped not more than 1:20 (bevel washer not used)	Bolt faces sloped not more than 1:20 from normal to bolt axis (bevel washers not used)
Up to and including 4 diameters	1/3 turn	1/2 turn	2/3 turn
Over 4 diameters but not exceeding 8 diameters	1/2 turn	2/3 turn	5/6 turn
Over 8 diameters but not exceeding 12 diameters (b)	2/3 turn	5/6 turn	1 turn

(a) Nut rotation is relative to bolt, regardless of the element (nut or bolt) being turned. For bolts installed by 1/2 turn and less, the tolerance should be plus or minus 300; for bolts installed by 2/3 turn and more, the tolerances should be plus or minus 45°.

(b) No research work has been performed by the Council to establish the turn-of-nut procedure when bolt lengths exceed 12 diameters. Therefore, the required rotation must be determined by actual tests in a suitable tension device simulating the actual conditions.

05050 METAL FASTENING

High Strength Bolts (Con't.)

Commentary on 1985 Changes to the Specification for Structural Joints Using A325 or A490 Bolts

The terms *friction connection* and *bearing connection* are now discontinued.

Slip critical connection is the new term for joints where slip between connected parts is undesirable, such as in fatigue loading or where there is significant stress reversal.

Paint is now permitted on the faying surfaces of slip critical connections but must be qualified by test; the slip coefficient of the paint must be determined.

Bolts in connections identified as not being slip-critical or subject to direct tension need not be inspected for bolt tension other than to ensure that plies of the connected elements have been brought into snug contact. *Snug tight connections* must be clearly identified on the drawings.

Fasteners must be protected at the jobsite from dirt and moisture. Unused fasteners must be returned to protected storage at the end of the day. *Slip-critical* fasteners must be cleaned and relubricated if dirty.

Calibrators are required with all tightening methods.

In *turn-of-the-nut* installations, check three-bolt assemblies in a calibrator at the start of the work and when changes occur.

If using a calibrator wrench, calibrate daily with calibrator; whenever changes in bolt condition occur, use three-bolt assemblies. Hardened washers are required under the turned element. Verify that rotation of the turned element does not exceed rotation shown in Table 3. Use of "standard" torque values is prohibited.

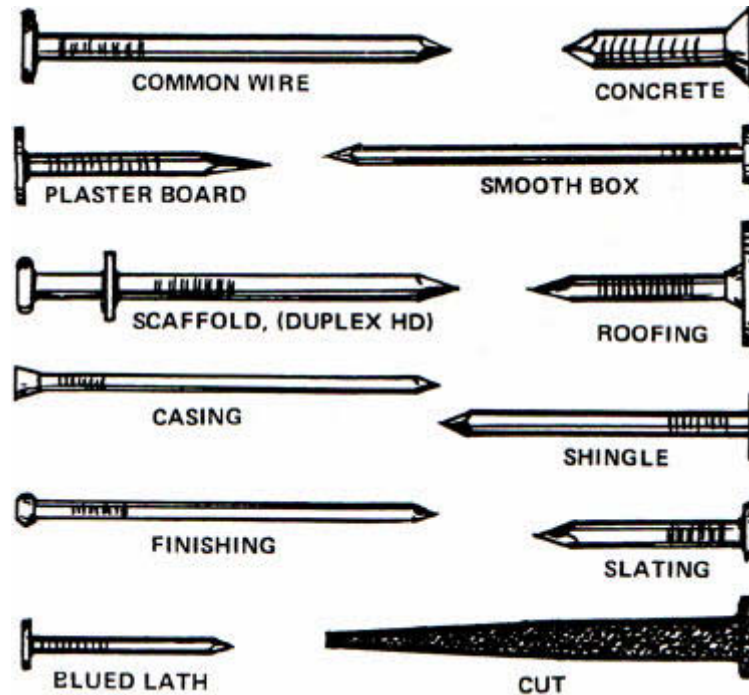
With *alternate design bolts* and *direct tension indicators*, ensure three-bolt assemblies in calibrator have tension five percent over Table 2 requirements, per manufacturers' instructions, at the start of work and when changes in the bolt condition occur.

A new bolt is available in lengths not more than four times the bolt's diameter; threaded full length. These bolts are identified as A 325T.

Tests have shown that the slip resistance of joints was unchanged or slightly improved by the presence of burrs, which do not prevent solid seating of the connected parts in the *snug tight* condition. These burrs, therefore, do not need to be removed. In the case of *arbitration inspection*, the inspection torque is developed by five-bolt assemblies in the calibrator; formerly only three were required.

In the case of *delayed verification inspection*, exposure conditions may affect the validity of torque testing. Specific situations need to be individually evaluated and appropriate procedures must be developed.

05050 METAL FASTENING

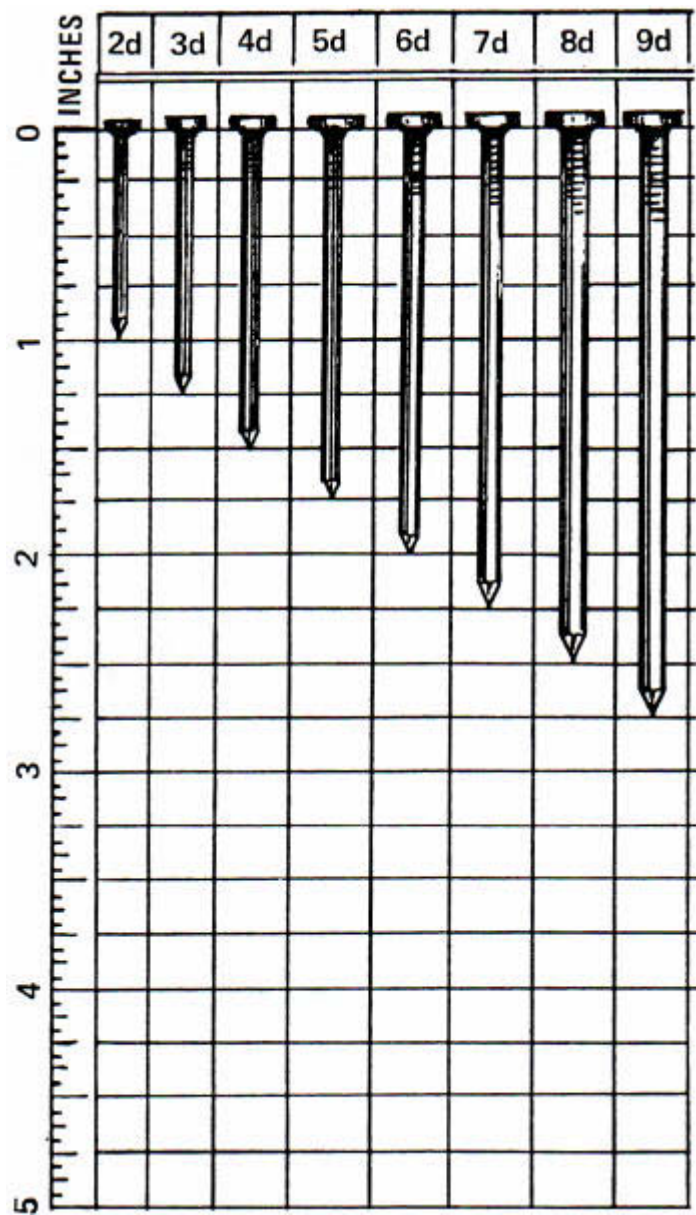
Types Of Nails

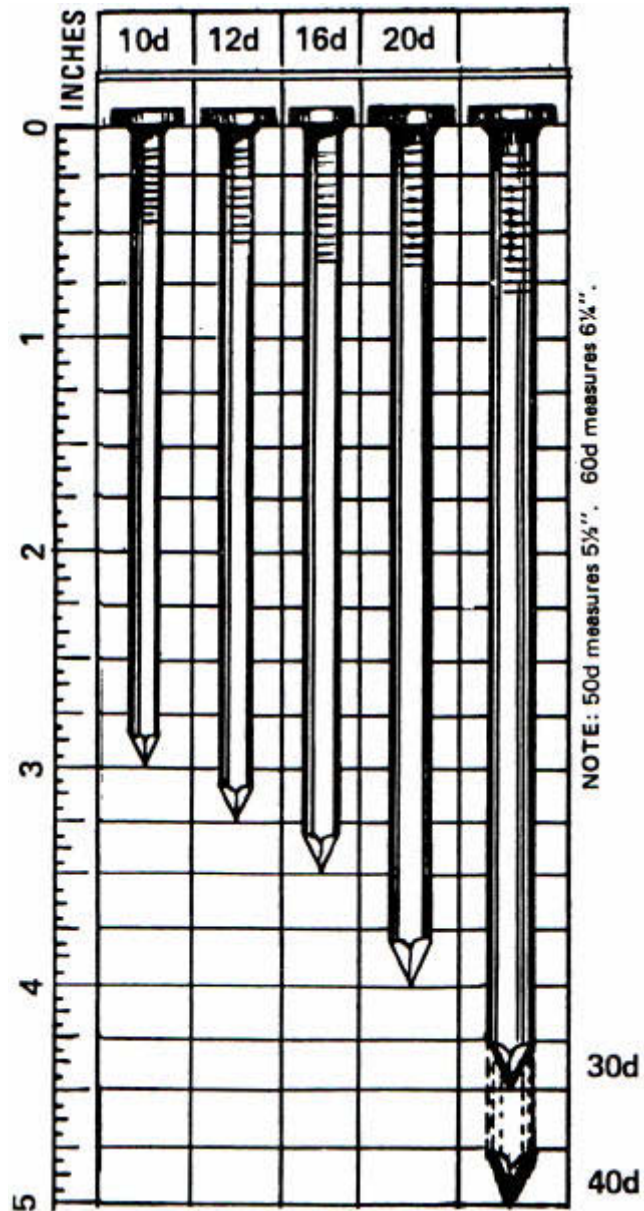
Cut Nails. Cut nails are angular-sided and wedge-shaped with a blunt point.

Wire Nails. Wire nails are round shafted, straight, pointed nails and are used more generally than cut nails. They are stronger than cut nails and do not buckle as easily when driven into hard wood, but usually split wood more easily than cut nails. Wire nails are available in a variety of sizes varying from 2 penny to 60 penny.

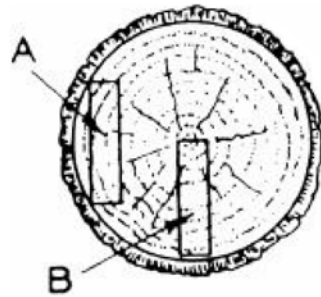
Nail Finishes. Nails are available with special finishes. Some are galvanized or cadmium plated to resist rust. To increase resistance to withdrawal, nails are coated with resins or asphalt cement (called cement coated). Nails which are small, sharp-pointed and often placed in the craftsman's mouth (such as lath or plaster board nails) are generally blued and sterilized.

Common Wire Nails



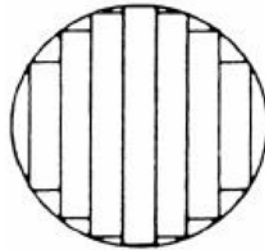
Common Wire Nails

Methods for Laying Out and Sawing Timber

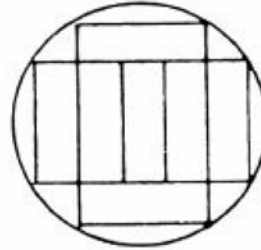


Plank "A" will be flat grained and will wear quickly, sliver easily, have greater shrinkage and tend to cup or warp.

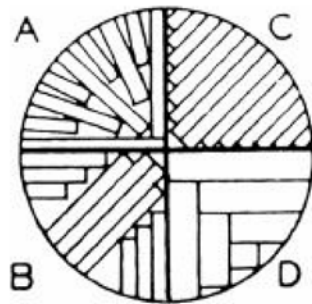
Plank "B" will be vertically grained and will wear evenly, seldom sliver and have less shrinkage and tendency to warp.



BASTARD SAWING produces variable width planks ranging from vertical to flat grain.



Uniform width and thickness planks are cut by this method with most from vertical to flat grain.



QUARTER SAWING, showing variations. Used to obtain high quality planks.

Method "A" produces best quality planks at highest cost and greatest waste.

Method "B" produces high quality planks at lower cost and less waste.

Method "C" costs less with least waste but produces only 1 5 high grade planks.

Method "D" is used to secure large planks and timbers of high quality.








Lumber Grading

GRADING-MARK ABBREVIATIONS	
ABBREVIATIONS	GRADES
	(Listed alphabetically - not by quality)
COM	Common
CONST	Construction
ECON	Economy
No.1	Number One
SEL-MER	Select Merchantable
SEL-STR	Select Structural
STAN	Standard
UTIL	Utility
	ALSC TRADEMARKS
CLIS	Califomia Lumber Inspection Service
NELMA	Northeastern Lumber Manufacturers Association, Inc.
NH&PMA	Northern Hardwood & Pine Manufacturers Association, Inc.
PLIB	Pacific Lumber Inspection Bureau
RIS	Redwood Inspection Service
SPIB	Southern Pine Inspection Bureau
TP	Timber Products Inspection
WCLB	West Coast Lumber Inspection Bureau
WWP	Western Wood Products Association
	SPECIES GROUPINGS
AF	Alpine Fir
DF	Douglas Fir
HF	Hem Fir
SP	Sugar Pine
PP	Ponderosa Pine
LP	Lodgepole Pine
IWP	Idaho White Pine
ES	Engelmann Spruce
WRC	Western Red Cedar
INC CDR	Incense Cedar
L	Larch
LP	Lodgepole Pine
MH	Mountain Hemlock
WW	White Wood
	MOISTURE CONTENT
S-GRN	Surfaced at a moisture content of more than 19%.
S-DRY	Surfaced at a moisture content of 19% or less.
MC-15	Surfaced at a moisture content of 15% or less.

06100 ROUGH CARPENTRY






Redwood Grade Marks

California Redwood Association

ALL HEARTWOOD	CONSTRUCTION GRADES	MAY CONTAIN SAPWOOD
<p>MILL ONE SEL HT REDWOOD</p> 	<p>SELECT HEART — Tight-knotted, heartwood grade with face free of splits or shake. Sample uses: decks, posts, garden structures, industrial tanks where decay hazards exist.</p>	<p>SELECT — Same general characteristics as Select Heart, but contains sapwood and some imperfections not allowed in Select Heart. Sample uses: decking, fence boards and other above ground uses.</p> <p>MILL ONE SEL REDWOOD</p> 
<p>MILL ONE FDTN REDWOOD</p> 	<p>FOUNDATION GRADE — High quality heartwood grade, specially selected from Construction Heart for durability and resistance to insects. Always grade stamped Sample uses: sill plates, crib walls.</p>	
<p>MILL ONE CONST HT REDWOOD</p> 	<p>CONSTRUCTION HEART — All purpose heartwood grade, contains knots of varying sizes and other slight imperfections. Sample uses: decks, posts, retaining walls or other uses on or near soil.</p>	<p>CONSTRUCTION COMMON — Versatile grade with same general characteristics as Construction Heart, but contains sapwood. Sample uses: decking, railings, and other above ground uses.</p> <p>MILL ONE CONST COM REDWOOD</p> 
<p>MILL ONE MERCH HT REDWOOD</p> 	<p>MERCHANTABLE HEART — Ecological grade, allows some holes, splits and slightly larger knots than Construction Heart. Sample uses: fences, retaining walls, farm uses, structures where decay hazard exists.</p>	<p>MERCHANTABLE — Same general characteristics as Merchantable Heart, but contains sapwood. Sample uses: fence boards, railings, temporary construction and other above ground uses.</p> <p>MILL ONE MERCH REDWOOD</p> 

06100 ROUGH CARPENTRY

Redwood Grade Marks (Cont)

ALL HEARTWOOD	FINISH GRADES	MAY CONTAIN SAPWOOD
<p>MILL ONE CLR HT VG REDWOOD</p> 	<p>CLEAR ALL HEART VERTICAL GRAIN — Finest architectural grade, specially selected for grain, free of defects one face. Sample uses: siding, paneling, mill work, processing tanks.</p>	<p>CLEAR VERTICAL GRAIN — Same general quality as Clear All Heart Vertical Grain, except contains sapwood. Sample uses: siding, cabinetry, garden shelters and other above ground uses.</p> <p>MILL ONE CLEAR VG REDWOOD</p> 
<p>MILL ONE CLR HT REDWOOD</p> 	<p>CLEAR ALL HEART — Same quality as Clear All Heart Vertical Grain, except contains flat grain pieces. Sample uses: siding, trim, fine garden structures, industrial storage.</p>	<p>CLEAR — Same general quality as Clear All Heart, except contains sapwood. Accepts some imperfections not permitted in Clear All Heart. Sample uses: paneling, soffits and other above ground uses.</p> <p>MILL ONE CLR REDWOOD</p> 
		<p>B-GRADE — Quality grade, contains sapwood, limited knots and other characteristics not permitted in Clear. Sample uses: siding, molding, fascia and other above ground uses.</p> <p>MILL ONE B REDWOOD</p> 

Redwood Gradenarks

Redwood grades are established by the Redwood Inspection Service in the Standard Specifications for Grades of California Redwood Lumber. Properly grade-marked lumber will bear the RIS mark or that of another accredited inspection bureau. Gradenarks may be on seasoned or unseasoned lumber on face, edge or end of piece. "Certified Kiln Dried" marks lumber kiln dried to accepted standards. CRA trademark is on products of member mills of the California Redwood Association only and is an additional assurance of quality.



Lumber Grading

INTERPRETING GRADE MARKS

Most grade stamps, except those for rough lumber or heavy timbers, contain five basic elements:

(a) Certification mark of certifying association of lumber manufacturers.

(b) Mill identification. Firm name, brand or assigned mill number.

(c) Grade designation.

Grade name, number or abbreviation.

(d) Species identification. Indicates species by individual species or species combination.

(e) Condition of seasoning. Indicates condition of seasoning at time of surfacing:

S-DRY — 19% maximum moisture content

MC-15 — 15% maximum moisture content

S-GRN — Over 19% moisture content (unseasoned)



INSPECTION CERTIFICATE



When an inspection certificate issued by a certifying association is required on a shipment of lumber and specific grade marks are not used, the stock is identified by an imprint of the association mark and

the number of the shipping mill or inspector.

CERTIFIED AGENCIES AND TYPICAL GRADE MARKS

California Lumber
Inspection Service
1790 Lincoln Avenue
San Jose, California 95125
(408) 297-8071



Northeastern Lumber
Manufacturers
Association, Inc.
4 Fundy Road
Falmouth, Maine 04105
(207) 781-2252

Lumber Grading (Con't)

**Northern Hardwood and
Pine Manufacturers
Association, Inc.**
Suite 501, Northern Building
Green Bay, Wisconsin 54301
(414) 432-9161



**Pacific Lumber Inspection
Bureau, Inc.**
1411 Fourth Avenue Building
(Suite 1130)
Seattle, Washington 98101
(206) 622-7327

**Redwood Inspection
Service**
591 Redwood Highway,
Suite 3100
Mill Valley, California 94941
(415) 381-1304



**Southern Pine Inspection
Bureau**
4709 Scenic Highway
Pensacola, Florida 32504
(904) 434-2611

**Timber Products
Inspection**
P.O. Box 919
Conyers, Georgia 30207
(404)922-8000



**West Coast Lumber
Inspection Bureau**
Box 23145
Portland, Oregon 97223
(503) 639-0651

**Western Wood Products
Association**
1500 Yeon Building
Portland, Oregon 97204
(503) 224-3930



Lumber Grading (Con't)

A.F.P.A.® 00
S-P-F
S-DRY STAND

Alberta Forest Products Association
11710 Kingsway Avenue, #204
Edmonton, Alberta T5G 0X5, (403) 452-2841

0 0 CONST
1 GRN
D FIR

Mac Donald Inspection
211 SchoolHouse Street
Coquitlan, B.C. V3K 4X9, (604) 520-3321

C L A
S-P-F
100
No. 1
S-GRN.

Canadian Lumberman's Association
27 Goulburn Avenue,
Ottawa, Ontario K1N 8C7, (613) 233-6205

M L B
SPRUCE
PINE
FIR
STAND
1-200
M L B - 400

Maritime Lumber Bureau
P.O. Box 459, Amherst,
Nova Scotia B4H 4A1, (902) 667-3880

(LMA) 1 S-GRN 1
D FIR (N)

Cariboo Lumber Manufacturers Association
301 Centennial Building
197 Second Avenue North, Williams Lake,
B.C. V2G 1 Z5, (604) 392-7778

O.L.M.A.® 01-1
CONST. S-DRY
SPRUCE - PINE - FIR

Ontario Lumber Manufacture Association
159 Bay Street, Suite 414
Toronto, Ontario M5J 1J7, (416) 367-9717

(CFPA)® 38
S-P-F S-GRN
CONST

Central Forest Products Association
P.O. Box 1169, Hudson Bay, Saskatchewan
S0E 0Y0, (306) 865-2595

RIB. NLGA RULE
No 1
S-GRN
00 HEM-FIR-N

Pacific Lumber Inspection Bureau
Suite 1130, 1411 Fourth Avenue Building
Seattle, Washington 98101
B.C. Division: 1460-1055 West Hastings St.
Vancouver, B.C. V6E 2E9, (604) 689-1561

CFA S-P-F
S-GRN
100 No 1

Council of Forest Industries
of British Columbia
1500-1055 West Hastings Street,
Vancouver, B.C. V6E 2H1, (604) 684-0211

ILMA S-DRY 1
00 S-P-F

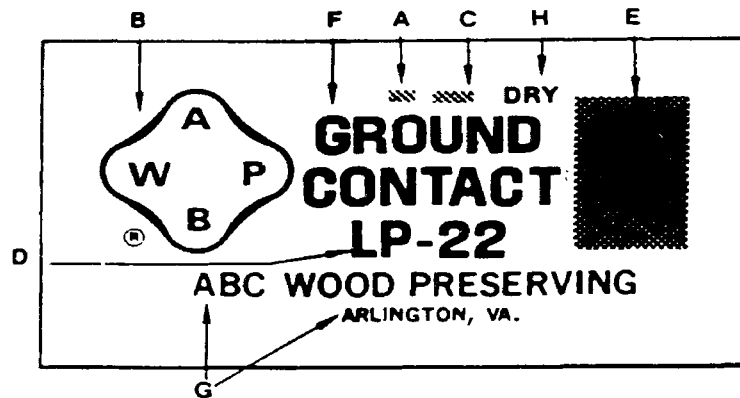
Interior Lumber Manufacturers Association
203-2350 Hunter Road
Kelowna, B.C. V1 X 6C1, (604) 860-9663

2
031

Quebec Lumber Manufactures Association
3555 Boul. Hamel-ouest, Suite 200
Quebec, Canada G2E 2G6, (418) 872-5610

06100 ROUGH CARPENTRY

Lumber Grading (Con't)



- A Year of treatment
- B American Wood Preservers Bureau trademark or trademark of the AWPB certified agency
- C The preservative used for treatment
- D The applicable American Wood Preservers Bureau quality standard
- E Trademark of the AWPB certified agency
- F Proper exposure conditions
- G Treating company and plant location
- H Dry or KDAT if applicable



Jason Associates, Inc.
Fort Collins, CO 80522



Timber Products
Inspection and
Testing Services
Conyers, GA 30207
Timber Products
Inspection and
Testing Services
Portland, OR 97220



Southwestern Laboratories
Houston, TX 77249

Southern Wood Products
Inspection Company
Pensacola, FL 32504



McCutchan
Inspections, Inc.
Portland, OR 97203



California Lumber
Inspection Services
San Jose, CA 95150



C. M. Rou Service, Inc.
Mobile, AL 36606



Bode Inspection, Inc.
Pake Oswego, OR 97034



PFS Corporation
Madison, WI 53704



Florida Lumber
Inspection Service
Perry, FL 32347



Thurlow Inspection
Sandpoint, ID 83864

Lumber Grading (Con't.)

AWPB Standards For Software Lumber, Timber, and Plywood

Preservative	Standard For Use*	
<i>General Purpose Standards</i>		
Waterborne preservatives	LP-2	LP-22
Light-hydrocarbon-solvent/penta	LP-3	LP-33
Volatile-hydrocarbon-solvent (LPG)/penta	LP-4	LP-44
Creosote or creosote/coal-tar solutions	LP-5	LP-55
Heavy-hydrocarbon-solvent/penta	LP-7	LP-77
<i>Special-Purpose</i>		
Waterborne preservatives for use in residential and light commercial foundations	FDN'	FDN'
All preservatives for use in marine (saltwater) exposure	LMP*	LMP'

* Ground-contact grades are treated to a higher degree than above-ground grades which, in some instances, utilize preservatives not permitted for ground or fresh-water contact. In all cases, materials permitted for ground contact are suitable for fresh-water installation. And, because of their higher retention requirements, ground-contact materials may always be safely used where above ground grade is required. Material designated for above-ground use should not be substituted for ground or water contact. None of these materials should be specified for salt-water installations. (See special-purpose standards, above and below.)

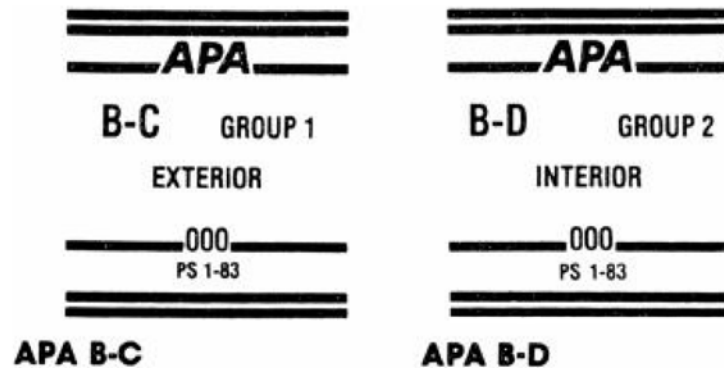
AWPB Standards For Marine Piling And Construction Poles

Preservative	Standard Designation
<i>Marine Piling</i>	
Waterborne and creosote (dual treatment)	MP-1
Creosote and creosote/coal-tar solution	MP-2
Waterborne	MP-4
<i>Construction Poles</i>	
All preservatives	CP

Lumber Grading (Con't.)

APA proprietary concrete form panels designed for high reuse. Sanded both sides and mill-oiled unless otherwise specified. Class I, the strongest, stiffest and more commonly available, is limited to Group 1 faces, Group 1 or 2 cross-bands, and Group 1, 2, 3 or 4 inner plies. Class II is limited to Group 1 or 2 faces (Group 3 under certain conditions) and Group 1, 2, 3 or 4 inner plies. Also available in HDO for very smooth concrete finish, in Structural I, and with special overlays. **Exposure Durability Classification:** Exterior. *Common Thicknesses:* 19/32, 5/8, 23/32, 3/4 .

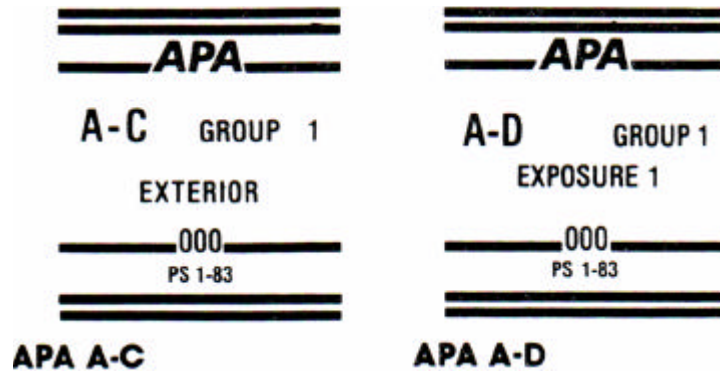
Plywood panel manufactured with smooth, opaque, resin-treated fiber overlay providing ideal base for paint on one or both sides. Excellent material choice for shelving, factory work surfaces, paneling, built-ins, signs and numerous other construction and industrial applications. Also available as a 303 Siding with texture-embossed or smooth surface on one side only and Structural I. **Exposure Durability Classification:** Exterior. *Common Thicknesses:* 11/32, 3/8, 15/32, 1/2, 19/32, 5/8, 23/32, 3/4.



Utility panel for farm service and work buildings, boxcar and truck linings, containers, tanks, agricultural equipment, as a base for exterior coatings and other exterior uses. **Exposure Durability Classification:** Exterior. *Common Thicknesses:* 1/4, 11/32, 3/8, 15/32, 1/2, 19/32, 5/8, 23/32, 3/4

Utility panel for backing, sides or builtins, industry shelving, slip sheets, separator boards, bins and other interior or protected applications. **Exposure Durability Classifications:** Interior, Exposure 1. *Common Thicknesses:* 1/4, 11/32, 3/8, 15/32, 1/2, 19/32, 5/8, 23/32, 3/4.

06100 ROUGH CARPENTRY



For use where appearance of one side is important in exterior applications such as soffits, fences, structural uses, boxcar and truck linings, farm buildings, tanks, trays, commercial refrigerators, etc.
Exposure Durability Classification: Exterior. **Common Thicknesses:** 1/4, 11/32, 3/8, 15/32, 1/2, 19/32, 5/8, 23/32, 3/4.

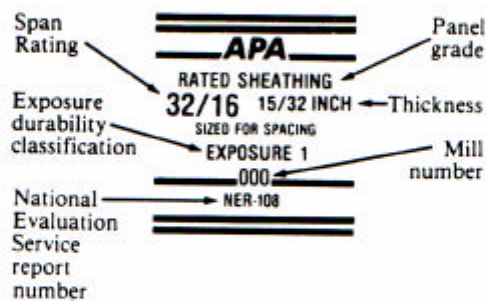
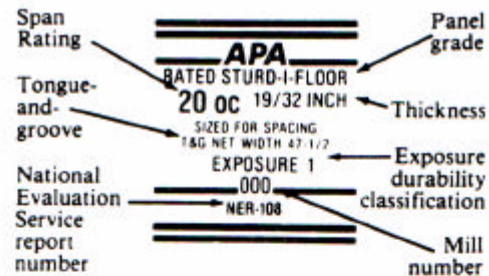
For use where appearance of only one side is important in interior applications, such as paneling, built-ins, shelving, partitions, flow racks, etc. **Exposure Durability Classifications:** Interior, Exposure 1. **Common Thicknesses:** 3/4, 11/32, 3/8, 15/32, 1/2, 19/32, 5/8, 23/32, 3/4.

06100 ROUGH CARPENTRY

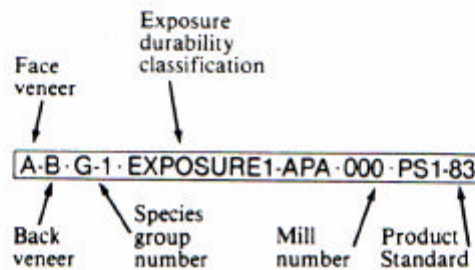
Lumber Grading (Con't)

PLYWOOD — BASIC GRADE MARKS AMERICAN PLYWOOD ASSOCIATION (APA)

The American Plywood Association's trademarks appear only on products manufactured by APA member mills. The marks signify that the product is manufactured in conformance with APA performance standards and/or U.S. Product Standard PS 1-83 for Construction and Industrial Plywood.



Unsanded and touch-sanded panels, and panels with "B" or better veneer on one side only, usually carry the APA trademark on the panel back. Panels with both sides of "B" or better veneer, or with special overlaid surfaces (such as Medium Density Overlay), carry the APA trademark on the panel edge, like this:



Identification Index^(a)**Table for Sheathing Panels**

Species of face and back		Grade			
Group 1	C-C Str. I C-C, C-D Str. II C-C, C-D (c) C-D	(b)			
Group 2	C-C Str. II C-C, C-D C-D	(d)			
Group 3					
Group 4					
Nominal Thickness	5/16	20/0	16/0	12/0	
	3/8	24/0	20/0	16/0	
	1/2	32/16	24/0	24/0	
	5/8	42/20	32/16	30/12	
	3/4	48/24	42/20	36/16	
	7/8		48/24	42/20	
	(e)				

- (a) Identification Index refers to the numbers in the lower portion of the table which are used in the marking of sheathing grades of plywood. The numbers are related to the species of panel face and back veneers and panel thickness in a manner to describe the bending properties of a panel. They are particularly applicable where panels are used for subflooring and roof sheathing to describe recommended maximum spans in inches under normal conditions and to correspond with commonly accepted criteria. The left hand number refers to spacing of roof framing, while the right hand number relates to spacing of floor framing. Actual maximum spans are established by local building codes.
- (b) Panels of standard nominal thickness and construction.
- (c) Panels manufactured with Group 1 faces but classified as Structural II by reason of Group 2 or Group 3 inner plys.
- (d) Panels conforming to the special thickness and panel construction provisions of PS 1-74 (3.8.6.).
- (e) Panels thicker than 7/8 inch shall be identified by group number.

Wire and Sheet Metal Gages**(In Decimals of an Inch)**

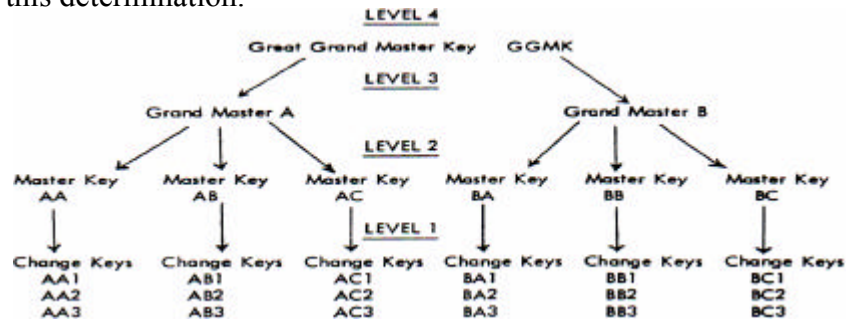
Name of Gage	American Wire Gages (A.W.G.) (Corresponds to Brown & Sharps Gage)	Birmingham Iron Wire Gage (B.W.G.)	United States Standard Gages (U.S.S.G.)
Principal Use	Electrical Wire & Non-Ferrous Sheet Metal	Iron or Steel Wire	Ferrous Sheet Metal
Gage No.			
00 00000			
0 00000	.5800		
00000	.5165	.500	
0000	.4600	.454	
000	.4096	.425	
00	.3648	.380	
0	.3249	.340	
1	.2893	.300	
2	.2576	.284	
3	.2294	.259	.2391
4	.2043	.238	.2242
5	.1819	.220	.2092
6	.1620	.203	.1943
7	.1443	.180	.1793
8	.1285	.165	.1644
9	.1144	.148	.1495
10	.1019	.134	.1345
11	.0907	.120	.1196
12	.0808	.109	.1046
13	.0720	.095	.0897
14	.0641	.083	.0747
15	.0571	.072	.0673
16	.0508	.065	.0598
17	.0453	.058	.0538
18	.0403	.049	.0478
19	.0359	.042	.0418
20	.0320	.035	.0359
21	.0285	.032	.0329
22	.0253	.028	.0299
23	.0226	.025	.0269
24	.0201	.022	.0239
25	.0179	.020	.0209
26	.0159	.018	.0179
27	.0142	.016	.0164
28	.0126	.014	.0149
29	.0113	.013	.0135
30	.0100	.012	.0120
31	.0089	.010	.0105
32	.0080	.009	.0097
33	.0071	.008	.0090
34	.0063	.007	.0082
35	.0056	.005	.0075
36	.0050	.004	.0067
37	.0045		.0064
38	.0040		.0060
39	.0035		
40	.0031		

07600 FLASHING AND SHEET METAL

Locks And Locksets

Levels of Control in Master Keying

The establishment of the proper level of control for a master key system is of paramount importance. Only when this has been determined are you ready to lay out the system. One of the main reasons many master key systems are allowed to disintegrate is the fact that they were not established at the proper level when originally planned. The chart shown below will assist you in making this determination.



The following is a suggested guide in determining or selecting the proper level of control:

One Level - Change Key: All locks operated by change keys only and keyed different or alike as required. Example: Home, stores.

Two Levels - Master Key: All locks operated by change keys and master key. Examples: Small school, apartments.

Three Levels - Grand Master Key: All locks operated by change keys, master keys and grand master key. Examples: Office buildings, hospitals.

Four Levels - Great Grand Master Key: All locks operated by change key, master keys, grand master keys, and great grand master key.

Five Levels - Great Great Grand Master Key: All locks operated by change key, master key, grand master key, great grand master key and great great grand master key. Example: Large university complexes, large industrial complexes.

Cross Keying

"Controlled cross keying" is where two or more change keys under the same master key must operate one cylinder.

"Uncontrolled cross keying" is where two or more change keys under different master keys are set up to operate one cylinder. This greatly reduces the amount of available changes in a keying system by putting these unrelated keys together. It also reduces the security of the cylinder itself by requiring additional master split pins to accommodate these added keys.

Cross keying of either type should be held to a minimum and uncontrolled cross keying should be discouraged.

Locks And Locksets (Con't.)

It has been common practice to use the terminology "To Pass" or "To Be Passed By" in indicating certain interkeying situations. This terminology encourages misinterpretation, and we recommend the use of the following:

To Operate	Identifying a key or keys to operate other cylinders having different key changes.
To Be Operated By	Identifying a cylinder to be operated by one or more individual keys other than its own key.

Explanation Of Coding System

Where grand master keys are used, double letter symbols should be used to identify the grand and master key sets. The grand master symbol should be the first letter, followed by the master symbol.

GMK	A - Master A = AA
	A - Master B = AB
	A - Master C = AC
	B - Master D = BD
	B - Master E = BE

Key symbols using this new key code system automatically indicate the function of each key in the keying system, without any further explanation. Each key has a different key symbol. Key symbol AA1 indicates a lock operated by AA1 change key, AA Master, A Grand Master, and GGM - Great Grand Master. AA1 in this case is a keyed different change. In the case of an alike change AA2, etc., this change or symbol is merely repeated next to each set using this change key.

This key code system allows for exceptions. Examples of a few are listed herein.

1. Single Master Key Systems:
 - a. Always use symbol "AA" for the master key and prefix the change key number (i.e.: IAA, 2AA, etc.)
2. Grand Master Key Systems:
 - a. Always use symbol "AA" for the master key and suffix the change key number (i.e.: AA1, AA2, etc.)
3. Symbol "A" only is subject to the "A" grand only.
4. Symbol "AA" only is subject to the "AA" master and "A" grand only.
5. Symbol "A1," "A2," etc. are under the "A" grand only.
(Note: Always start these changes with the number "1")
6. Symbol "A1," "A2," etc. are under the GGM only.
(Note: Always start these changes with the number "1")
7. Symbol "IAA," "2AA," etc. used in a great grand master key system. The change numbers are prefixed on all locks operated by master keys under the great grand master key only - no grand master.
8. Symbol "SKD1," "SKD2," etc. used for locks in a master, grand, or great grand master key system, but not master keyed. Example: Narcotics cabinets, food storage.










Pipe Weights

CAST IRON PIPE			
Service Weight			
Size, Inches-Diameter	Weight of Pipe-Lbs./LF	Weight of Water-Lbs.	Total Weights-Lbs./LF
2"	3.8	1.45	5.3
3"	5.6	3.2	8.8
4"	7.5	5.5	13.0
5"	9.8	8.7	18.5
6"	12.4	12.5	24.9
8"	18.5	21.7	40.2
Extra Heavy			
2"	4.3	1.45	5.8
3"	8.3	3.2	11.5
4"	10.8	5.5	16.3
5"	13.3	8.7	22.0
6"	16.0	12.5	28.5
8"	26.5	21.7	48.2
Steel Pipe			
Pipe Size-Diameter	W/40	H₂O/Lbs.	Total Lbs./LF
2"	3.65	1.45	5.1
2"	5.79	2.07	7.86
3"	7.57	3.2	10.77
3"	9.11	4.28	13.39
4"	10.8	5.51	16.31
5"	14.6	8.66	23.26
6"	18.8	12.5	30.5
8"	28.6	21.66	50.26
10"	40.5	34.15	74.65

15400 PLUMBING

Air Conditioning

Air Conditioning RECOMMENDED SHEET METAL GAUGES AND CONSTRUCTION FOR RECTANGULAR DUCT

LOW PRESSURE — LOW VELOCITY = 2" W.G. MAX				AT JOINTS									
Plate No.	Dimension of Longest Side of Duct	Steel Metal Gauges		Plain "15" Slip (B)	 Pocket Lock (K)	 Hemmed Slip (C)	 Reinforced Bar Slip (G)	 Angle Slip (H)	 Alternate Bar Slip (F)	 Angle RFD Pocket (L)	 Angle Reinforced Standing Seam (J)	 Companion Angles (M)	 Reinforcing Between Joints
		Steel	Aluminum										
6	Thru 12"	26	24 (.020)										
6	13" thru 18"	24	22 (.025)										
7 7A	19" thru 30"	24	22 (.025)	K @ 5' cc A		C-E @ 5' cc C-E @ 10' cc							1" x 1" x 1/8" @ 5' cc

Air Conditioning (Con't)

Air Conditioning — (Cont.)
RECOMMENDED SHEET METAL GAUGES AND
CONSTRUCTION FOR RECTANGULAR DUCT (CONT.)

8	31" thru 42"	22	20 (.032)	K @ 5' cc	E-G-K @ 5' cc E-G-K @ 10' cc	—	—	—	1" x 1" x 1/8" @ 5' cc
9	43" thru 54"	22	20 (.032)	K @ 4' cc K @ 8' cc	E @ 4' cc E @ 8' cc	G @ 4' cc G @ 8' cc	—	—	1 1/2" x 1 1/2" x 1/8" @ 4' cc
9	55" thru 60"	20	18 (.040)	K @ 4' cc K @ 8' cc	E @ 4' cc E @ 8' cc	G @ 4' cc G @ 8' cc	—	—	1 1/2" x 1 1/2" x 1/8" @ 4' cc
10	61" thru 84"	20	18 (.040)	—	—	G @ 4' cc	H @ 4' cc F @ 4' cc L @ 4' cc	—	1 1/2" x 1 1/2" x 1/8" @ 2' cc
11	85" thru 96"	18	16 (.051)	—	—	—	H @ 4' cc L @ 4' cc H @ 5' cc L @ 5' cc	J @ 2' cc	1 1/2" x 1 1/2" x 3/16" @ 2' cc 1 1/2" x 1 1/2" x 3/16" @ 2' cc 1 1/2" x 1 1/2" x 3/16" @ 2' cc
12	Over 96"	18	16 (.051)	—	—	—	H @ 4' cc L @ 4' cc H @ 5' cc L @ 5' cc	M @ 4' cc M @ 5' cc J @ 2' cc	2" x 2" x 1/4" @ 2' cc 2" x 2" x 1/4" @ 2' cc 2" x 2" x 1/4" @ 2' cc

H (height dimension)—up to 42" = 1"
H (height dimension)—43" to 96" = 1 1/2"
H (height dimension)—over 96" = 2"

15880 AIR DISTRIBUTION

Air Conditioning (Con't.)
LONGITUDINAL SEAMS
FOR SHEET METAL DUCTWORK

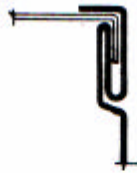


Fig. "N"
PITTSBURGH LOCK

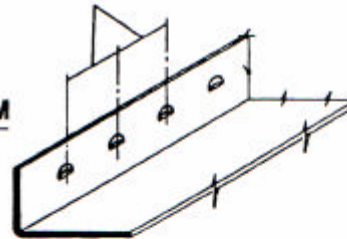


Fig. "Z"
BUTTON PUNCH SNAP LOCK



Fig. "O"
ACME LOCK-GROOVED SEAM

Approximately 2" Spacing
Between "Buttons"



DETAIL NO. 1
MALE PIECE-SNAP LOCK

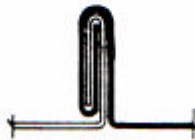
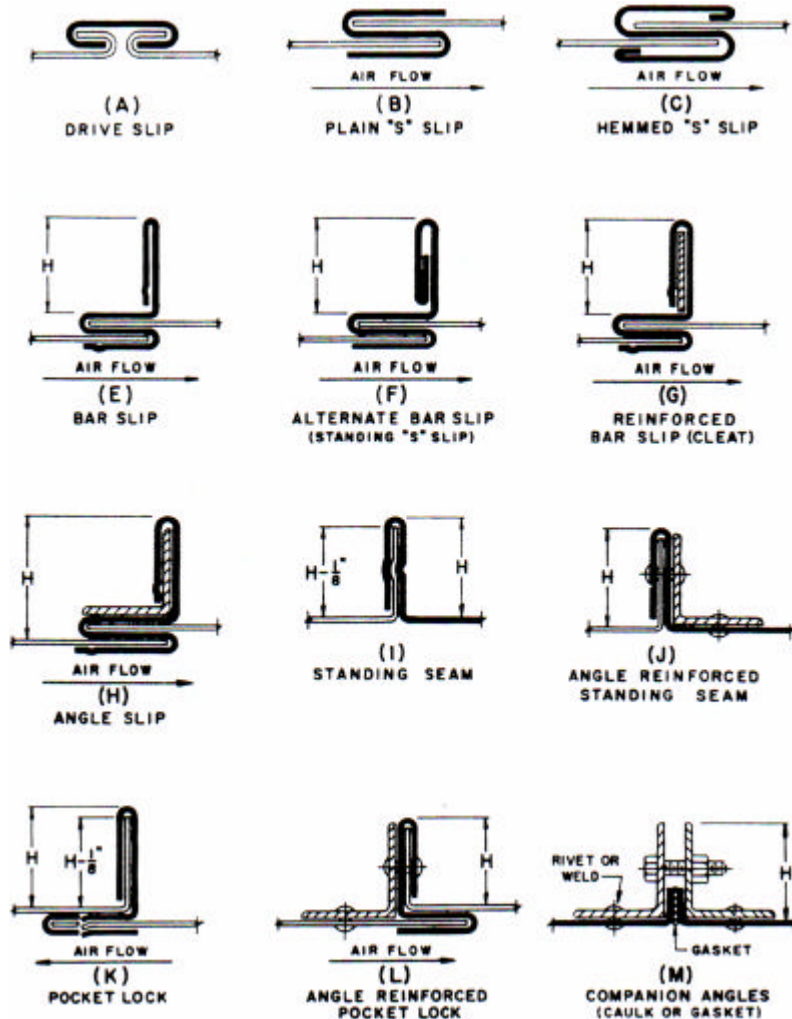
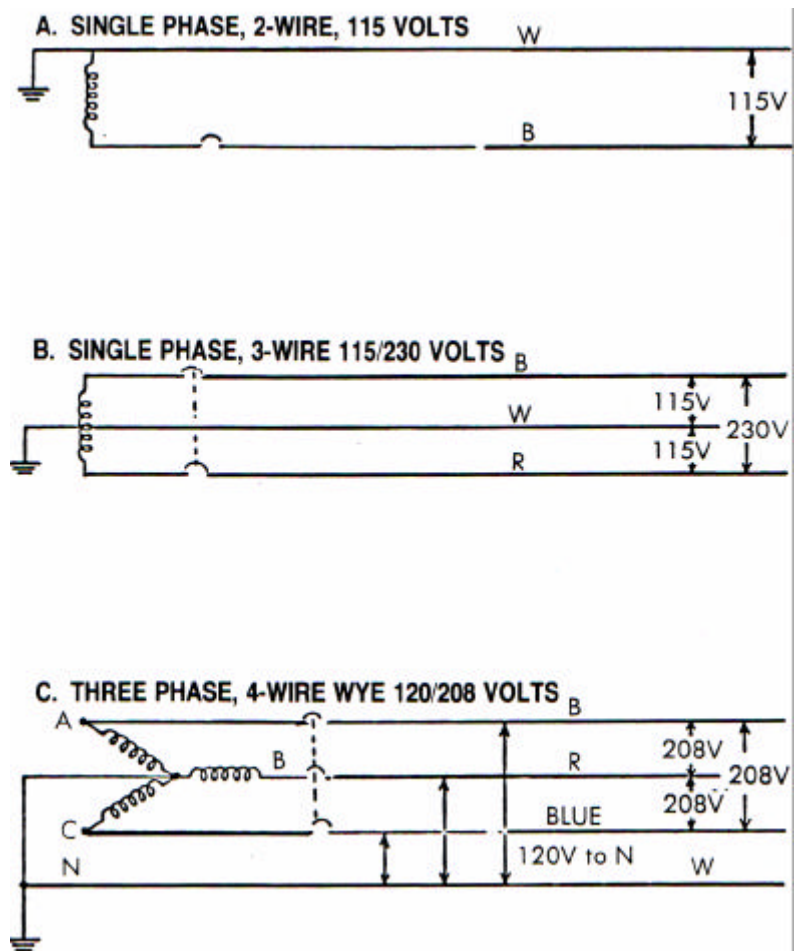


Fig. "T"
DOUBLE SEAM

Air Conditioning (Con't.)

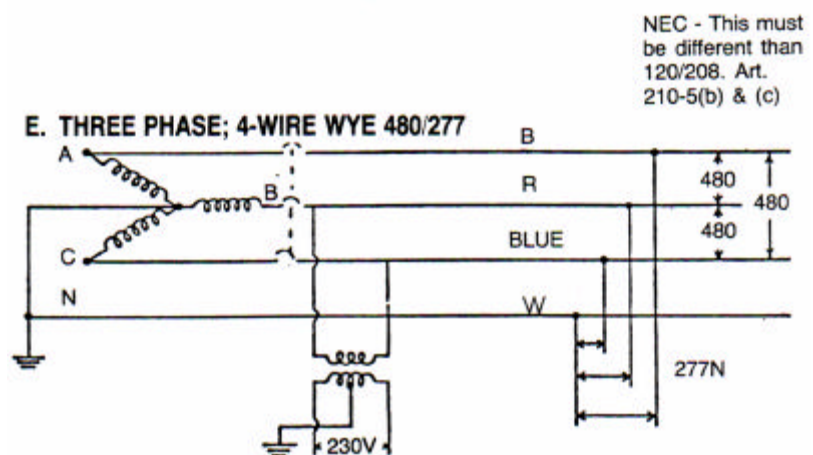
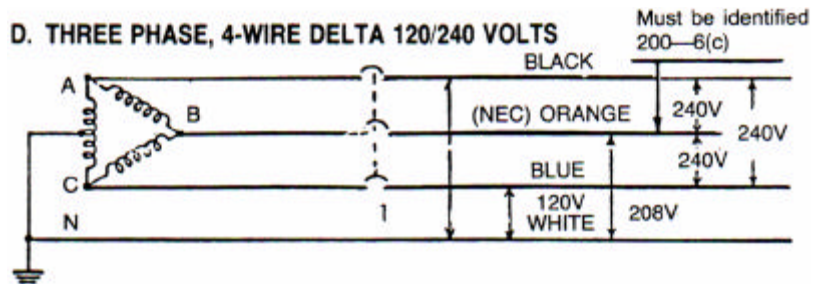
TYPICAL DUCT CONNECTIONS CROSS JOINTS FOR SHEET METAL DUCTWORK (NOT TO SCALE)



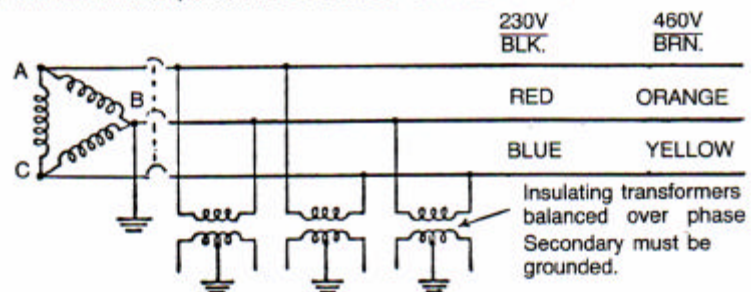
Electrical Systems**TYPES OF A.C. DISTRIBUTION
600 VOLTS OR LESS****16300 MEDIUM VOLTAGE DISTRIBUTION**

Electrical Systems (Con't.)

TYPES OF A.C. DISTRIBUTION -600 VOLTS OR LESS



F. THREE PHASE, 3-WIRE DELTA 230 OR 460 VOLTS



16300 MEDIUM VOLTAGE DISTRIBUTION

APPENDIX I - MATHEMATICS

Mensuration

Area of a square = length x breadth or height.

Area of a rectangle = length x breadth or height.

Area of a triangle = base x 1/2 altitude.

Area of parallelogram = base x altitude.

Area of trapezoid = altitude x 1/2 the sum of parallel sides.

Area of trapezium = divide into two triangles, total their areas.

Circumference of circle = diameter x 3.1416.

Circumference of circle = radius x 6.283185.

Diameter of circle = circumference x .3183.

Diameter of circle = square root of area x 1.12838.

Radius of a circle = circumference x .0159155.

Area of a circle = half diameter x half circumference.

Area of a circle = square of diameter x .7854.

Area of a circle = square of circumference x .07958.

Area of a sector of circle = length of arc x 1/2 radius.

Area of a segment of circle = area of sector of equal radius - area of triangle when the segment is less, + area of triangle when segment is greater, than the semi-circle.

Area of circular ring = sum of the diameter of the two circles x difference of the diameter of the two circles and that product x .7854. Side of square that shall equal area of circle = diameter x .8862.

Side of square that shall equal area of circle = circumference x .2821.

Diameter of circle that shall contain area of a given square = side of square x 1.1284.

Side of inscribed equilateral triangle = diameter x .86.

Side of inscribed square = diameter x .7071.

Side of inscribed square = circumference x .225.

Area of ellipse = product of the two diameters x .7854.

Area of a parabola = base x 2/3 of altitude.

Area of a regular polygon = sum of its sides x perpendicular from its center to one of its sides divided by 2.

Surface of cylinder or prism = area of both ends plus length and x circumference.

Surface of sphere = diameter x circumference.

Solidity of sphere = surface x 1/6 diameter.

Solidity of sphere = cube of diameter x .5236.

Solidity of sphere = cube of radius x 4.1888.

Solidity of sphere = cube of circumference x .016887.

Diameter of sphere = cube root of solidity x 1.2407.

Diameter of sphere = square root of surface x .56419.

Circumference of sphere = square root of surface x 1.772454.

Circumference of sphere = cube root of solidity x 3.8978.

Contents of segment of sphere = (height squared plus three times the square of radius of base) x (height x .5236).

Contents of a sphere = diameter x .5236.

Side of inscribed cube of sphere = radius x 1.1547.

Side of inscribed cube of sphere = square root of diameter.

Surface of pyramid or cone = circumference of base x 1/2 of the slant height plus area of base.

Contents of pyramid or cone = area of base 1/3 altitude.

Contents of frustum of pyramid or cone = sum of circumference at both ends x 1/2 slant height plus area of both ends.

Contents of frustum of pyramid or cone = multiply areas of two ends together and extract square root. Add to this root the two areas and x 1/3 altitude.

Contents of a wedge = area of base x 1/2 altitude.

Metric Conversions

Metric System SI (Système International d'Unités) with exception noted.*

Table 1 - Abbreviation Of Units

ENGLISH S.I. (Metric)			
Name	Symbol	Name	Symbol
Inch	In	Meter	m
Feet	Ft	Liter	L
Yard	Yd	Hertz	Hz
Mile	Mi	gram	g
Ounce	Oz	newton	N
Pound	lb	radian	rad
Kip	k	pascal	Pa
Second	s	Joule	J
Minute	m	Degree Celsius	°C
Hour	h		
Second	"		
Minute	'		
Degree	°		
Degree Fahrenheit	°F		
Pint	pt		
Quart	qt		
Gallon	gal		
British Thermal Unit	BTU		

Table 2 - S.I. Prefixes For Magnitude

Amount	Exponential Factor	Prefix	Symbol
1000000000000	10 ¹²	tera	T
1000000000	10 ⁹	giga	G
1000000	10 ⁶	mega	M
1000	10 ³	kilo	k
100	10 ²	hecto	h
10	10 ¹	deca	da
0.1	10 ⁻¹	deci	d
0.01	10 ⁻²	centi	c
0.001	10 ⁻³	milli	m
0.000001	10 ⁻⁶	micro	μ
0.000 000001	10 ⁻⁹	nano	n

Table 3 - Metric Conversion

Millimeters	mm			
Centimeters	cm	10 mm		
Meter	m		1,000 mm	100 cm
Kilometer	Km	1,000,000 mm	100,000 cm	1000 m
Square	mm mm ²			
Square	cm cm ²	100 mm ²		
Square	m m ²	1,000,000 mm ²	10,000 cm ²	
Square	km km ²	1,000,000,000,000 mm ²	10,000,000,000 cm ²	1,000,000 m ²
Cubic	mm mm ³			
Cubic	cm cm ³	1,000 mm ³	liter	1000 g (water)
Cubic	m mm ³	m m ³	1,000,000 cm ³ (cc)	
Cubic	km km ³	1,000,000 mm ³		
Milligram	mg			
Centigram	cg	10 g		
gram	g	1,000 mg	100 cg	
kilogram	kg	1,000,000 mg	100,000 cg	
megagram	Mg	1,000,000,000 ng	100,000,000 cg	1,000,000 g = 1000 kg

Metric Conversions (Con't)

Metric System S.I.

Table 4 - Conversion Tables

English to Metric		Metric to English	
Length			
1 inch	2.54 cm	1 cm	0.3937 inch
1 foot	0.3048 m	1 m	3.2808 feet
1 yard	0.9144 m	1 m	1.0936 yards
1 mile - 4280 ft.	1.6093 km	1 km	0.6214 mile
Area			
1 square inch	6.452 cm ²	1 cm ²	0.1549 in ²
1 square foot	0.0929 m ²	1 m ²	10.7643 ft ²
1 square yard	0.8361 m ²	1 m ²	1.196 yd ²
1 square mile	2.5899 km ²	1 m ²	0.3861 mile ²
1 acre - 43560 ft ²	4046.9 m ²	1 km ²	0.000247 acre
Volume			
1 inch ³	16.387 cc	11 cc	0.061 in ³
1 foot ³	0.2832 m ³	1 m ³	35.315 ft ³
1 yard ³	0.7646 m ³	1 m ³	1.308 yd ³
1 gallon	3.7854 liter	1 liter	0.2642 gal
1 quart	0.94635 liter	1 liter	1.0567 qt
1 pint	0.47318 liter	1 liter	2.1134 pt
1 ounce	29.574 cc	1 cc	0.0338 oz
Mass			
1 ounce	28.35 g	1 g	0.03527 oz
1 pound	453.59 g	1 g	0.002205 lb
1 kip	453.59 kg	1 kg	0.002205 k
1 ton(short) 2000lb ..	907.18 kg	1 kg	0.0011 ton(s)
1 ton(long) 2240lb ..	1016.05 kg	1 kg	0.0010 ton(l)
Density			
1 lb/ft ³	16018 g/m ³	1 g/m ³	0.00006216 lb/ft ³
	16.018 kg/m ³		
1 lb/in ³	27.68 g/cm ³	1 kg/m ³	0.03612 lb/in ³ or 0.062428 lb/ft ³
Force			
1 lb force	4.448 N	1 newton	0.2248 lb force
1 kip force	4.448 kN	1 kilo newton	224.8 k force
Pressure			
1 lb/m ²	6894.8 Pa	1 pascal	0.000145 lb/in ²
1 kip/m ²	6.895 MPa	1 megapascal	145 lb/in ²
1 lb/ft ²	47.88 pa	1 pascal	0.0209 lb/ft ²
Energy			
1 BTU	1054.35 J	1 joule	0.0009485 BTU
	1.054 kJ	100 joule	0.9485 BTU
Temp			
°F	(°F-32) 5/9 °C	° Celsius	(1.8°C) + 32 °F
0°F	-17.8 °C	0°C	32 °F
50°F	10 °C		
70°F	21.1 °C		
100°F	37.8 °C	100°C	212 °F

Metric Conversions (Cont)**Table 5 - Metric Information****(a) Carpet Weight**

20 oz/yd ²	678.25 g/m ²
30 oz/yd ²	1017.38 g/m ²
40 oz/yd ²	1356.51 g/m ²
50 oz/yd ²	1695.63 g/m ²

(b) Earth Pressure

200 lbs/ft ²	976.51 kg/m ²
250 lbs/ft ²	1220.64 kg/m ²
300 lbs/ft ²	1464.77 kg/m ²

(c) Stress

2000 lbs/in ²	140.60 kg/cm ²
2500 lbs/in ²	175.76 kg/cm ²
3000 lbs/in ²	210.91 kg/cm ²
3500 lbs/in ²	246.06 kg/cm ²
4000 lbs/in ²	281.21 kg/cm ²

(d) Concrete Strength

lb/in ²	MPa	kgf/cm ² • f=force
2000	14	140
2500	17	175
3000	21	210
3500	24	245
4 000	28	280
4500	31	315
5000	34	350

(e) Illumination

1 ft.-candle	= 10.76 lux	1 lux = 1 m ³
1 lumen/m ³		
1 lumen per sq. ft.	= 10.76 lux	

(f) Refrigeration

1 ton = 3519 watts (W)

(g) Power

1 horsepower = 745.7 W
= 0.7457 kW

(h) Heating

"k" value; 1 BTU in/ft.² h °F = 0.1442 W/m °C; thermal conductivity
BTU per inch per square foot hour degree F; watt per degree Celsius;
W/m °C "U" value; 1 BTU/ft.²h°F = 5.678 W² °C; Coeff. of heat
transfer BTU per square foot hour °F; watt per square meter degree
Celius; W/m²°C.

Heat	BTU	joule	J	1 BTU = 1055 J
		kilojoule	kJ	1 BTU = 1.055 kJ
		megajoule	MJ	1 Therm = 105.5 MJ
Heat	flow rate			
	BTU/hr.	watt	W	1 BTU/h = 0.2931 W
		kilowatt	kW	1 BTU/h = 0.0002931 kW

APPENDIX J - HAZARDOUS MATERIALS

It is virtually impossible to cover the vast subject of hazardous materials in just a few short paragraphs, so a few recommended procedures are given below.

It should be incumbent upon the owner to make a determination as to whether or not the building site has a potential for containing hazardous materials, i.e. previous occupant was a gasoline service station, paint factory, chemical plant, etc.

If the building site does contain a potential for toxic materials, either the site should be cleaned up prior to advertising for bids on the construction project or the specifications for the project should include site cleanup as a part of the bid together with recommended procedures for the cleanup.

This will then also make it incumbent upon the owner to conduct a study of what toxic materials could be on or under the building site and to contact the proper authority as to what will be required for the cleanup.

After award of the contract, it shall be the duty of the general contractor to monitor use of any hazardous material on the jobsite by proper labeling, proper handling, and proper storage.

One of the prime duties of the construction inspector is to be fully informed of the dangers of hazardous materials and to alert the contractor as to any potential violation of OSHA regulations.

There are many hazardous materials associated with construction activities and they exist in various forms: liquid, solid and gaseous. The main categories of toxic materials are corrosives, solvents and asbestos products.

APPENDIX K- HANDY CONSTRUCTION DATA

Handy Things to Know

1. To Find

- (a) The circumference of a circle, multiply the diameter by 3.1416 (approx. $3 \frac{1}{7}$).
- (b) The diameter of a circle, multiply the circumference by .31831.
- (c) The area of a circle, multiply the square of the diameter by .7854.
- (d) The area of a triangle, multiply the base by $\frac{1}{2}$ the perpendicular height.
- (e) The volume of a sphere, multiply cube of the diameter by .5236.
- (f) A gallon of water weights $8\frac{1}{2}$ pounds. A gallon of water contains 231 cubic inches.
- (g) A cubic foot of water contains $7\frac{1}{2}$ gals., 1728 cubic inches and weighs $62\frac{1}{2}$ lbs.
- (h) In board measure, all boards are assumed to be 1 inch thick. Area of a lineal foot multiplied by length in feet will give the surface contents in square feet.

WIND FORCE

FORCE OF WIND IN POUNDS PER SQUARE FOOT

Miles Per Hour	Force Per Square Foot – In Lbs.	Miles Per Hour	Force Per Square Foot – In Lbs.
1	0.005	20	1.969
2	0.020	25	3.075
3	0.044	30	4.429
4	0.079	35	6.027
5	0.123	40	7.873
6	0.177	45	9.963
7	0.241	50	12.30
8	0.315	55	14.9
9	0.400	60	17.71
10	0.492	65	20.85
12	0.708	70	24.1
14	0.964	75	27.7
15	1.107	80	31.49
16	1.25	100	49.2
18	1.55		—

Measurements

1 Square Mile	= 640 acres
	= 6400 square chains
1 Acre	= 10 square chains
	= 4840 square yards
	= 43,560 square feet
	= A square, each side of which is 208.7 feet
1 Square Chain	= 16 square rods
	= 484 square yards
	= 4356 square feet
1 Square Rod	= 30.25 square yards
	= 272.25 square feet
	= 625 square links
1 Square Yard	= 9 square feet
1 Square	= 144 square inches
1 U.S. Gallon	= 0.1337 cubic feet
	= 231 cubic inches
	= 4 quarts
	= 8 pints
1 Cubic Foot	= 7.48 U.S. Gallons

Weights Of Materials

<u>Material</u>	<u>Approximate Weight per Cubic Foot-Lbs.</u>	
Aluminum	166	
Ashes	43	
Asphalt	81	
Brass	524	
Brick (common)	120	(about 3 tons per 1000)
Brick (fire)	145	
Bronze	534	
Concrete	150	(4050 lbs. per cubic yard)
Copper	537	
Crushed Rock	95	(2565 lbs. per cubic yard)
Dry earth, loose	76	(2052 lbs. per cubic yard)
Granite	179	
Iron, casting	450	
Lead	708	
Lumber, Fir	32	(2666 lbs. 1000 ft.)
Lumber, Oak	62	(5166 lbs. 1000 ft.)
Marble	168	
Mortar	100	
Portland Cement	94	(376 lbs. per barrel)
River Sand	120	(3240 lbs. cubic yard)
Steel	490	
Tar	63	
Tile	115	
Water	62.5	
Zinc	437	

APPENDIX L

RESIDENTIAL CONSTRUCTION INSPECTION CHECKLIST

This checklist will provide an organized method for conducting residential construction inspections. It was designed to be a "memory jogger" for the inspector and to remind him/her of the crucial items that should be checked. It can be modified to meet a project's particular needs.

The checklist has been divided into sections based on building systems (how a structure is actually built). In each section, various methods are detailed even though they would not all be used on the same project.

GENERAL CONSTRUCTION REQUIREMENTS

	<i>Temporary facilities:</i>
	Check field office located properly.
	Check sanitary facilities installed.
	Check temporary fencing and barricades installed, if required.
	<i>Temporary Utilities:</i>
	Heat
	Water
	Electric
	Telephone
	<i>Storage & Protection:</i>
	Check materials are stored to protect against weather/theft.
	Check protection is provided for finished surfaces: jambs/thresholds.
	Check protection is provided for finished floors.
	<i>Cleaning:</i>
	Daily
	Removal of scrap, debris, waste material.
	<i>Other:</i>

SITEWORK

	<i>Demolition:</i>
	Ensure area to be demolished has been clearly marked.
	Dispose of debris in accordance with local regulations.
	<i>Structure location/layout:</i>
	Check that surveyor staked building corners in accordance with site plan. Check setbacks.
	<i>Site clearing & brush removal as required:</i>
	Ensure correct area has been cleared and precautions taken for protection of remaining trees and plants.
	Dispose of debris in accordance with local regulations.
	<i>Excavation:</i>
	Check storage area for topsoil has been designated.
	Check for underground utilities before excavating.
	Check location and depth of all excavations to be in accordance with site plan.
	Foundation/footings.
	Septic system (tank and distribution box).
	Underground utilities.
	<i>Backfill:</i>
	Do not backfill full foundations until deck is installed or foundation is braced.
	Check material to be used: no large rocks or construction scraps.
	Compact backfill to prevent excessive settling.

SITEWORK (Con't)

	Grading:
	Check that all grading is to the lines/elevations on the site plan.
	Retaining walls:
	Located in accordance with site plan. Drainage holes in lower portion of wall.
	Asphalt Paving:
	Ensure subgrade has been compacted to 95%.
	Ensure mix is at required temp. (min 280° F).
	Smoothness tolerance: 3/8" in 10'.
	Thickness tolerance: - 0" , +1/2".
	Do not place when local temp. is below 500 F.
	Concrete Paving:
	Wood/metal forms should be used.
	Check subgrade preparation: proper thickness of crushed stone.
	Check type and number of reinforcement if required. Rebar held in position by saddles.
	Concrete mix: Slump 1 - 3"
	28 day strength: _____
	Finish: _____
	Curing:
	Prevent premature drying, excessive hot/cool temp.
	Brick Paving:
	Check thickness of leveling bed.
	Check brick pattern.
	Check for cracks or holes in mortar joints.

SITEWORK (Con't)

	<i>Water Distribution System:</i>
	Check that depth of excavation is in accordance with local regulations.
	Check that materials are in accordance with plans/specs.
	<i>Gas Distribution System:</i>
	Check that depth of excavation is in accordance with local regulations.
	Check that materials are in accordance with plans/specs.
	<i>Sanitary Sewerage System:</i>
	<i>Municipal system:</i>
	Check for proper materials.
	Check for proper depth/slope of waste line.
	<i>Septic system:</i>
	Check for proper excavation depth in accordance with septic design.
	Check for proper tank size and type.
	Check for proper slope/elevation of waste lines.
	<i>Leach field:</i>
	Check for proper location, size and type of fill.
	Check for proper materials in accordance with septic design.
	Check distribution location and elevation.
	Check for proper waste line elevation and slope.
	<i>Leach pit:</i>
	Check for proper location, size and elevation.
	Check for correct amount of fill under/around pit. Check elevation and slope of waste lines.

SITEWORK (Con't)

	<i>Storm Drainage:</i>
	Check location, size, elevation, and slope of lines.
	If using leach pit, see notes under Sanitary Sewerage/Leach Pit.
	<i>Foundation Drain:</i>
	Check for proper materials and fill.
	Check for proper elevation and slope of lines.
	<i>Trees, Plants, Groundcover:</i>
	Check for proper preparation: topsoil, soil amendments.
	Check for quantity, species, and size.
	Check for proper planting: peat moss, mulch, watering.

FOUNDATIONS & SLABS

	Check to ensure that all materials are in accordance with plans, specifications, and building code.
	Footings:
	Check for location: walls, fireplace, columns.
	Check for proper elevation.
	Check for proper size: width, depth.
	Check for proper keyway size and position.
	Check to ensure forms are level.
	Check rebar size, number, and spacing.
	Check for bracing or backfill to prevent forms from moving.
	Foundation Walls:
	Check dimensions: length, width (+ 3/8", - 1/4"), height (1/4" in 20'). Check fireplace jog: size/location.
	Check foundation windows/vents: size/location.
	Check bulkhead: size/location.
	Check beam pockets: size/location.
	Check form ties and/or bracing.
	Check forms: plumb, square, straight, level.
	Check sill bolts: size/spacing.
	Check reinforcing steel: size, number, spacing.
	Check wall penetrations: size/location.

FOUNDATIONS & SLABS (Con't)

	<i>Concrete:</i>
	Check concrete mix: slump: slab/footings: 3"; other: 4".
	During placement, do not allow more than 5' drop from chute.
	During placement, do not move concrete more than 20' once it is poured. Check for proper curing: prevent premature drying, excessive hot/cool temperatures.
	<i>Prior to Backfill:</i>
	Form ties removed; holes patched.
	Honeycomb repaired.
	Seam at wall/footing sealed watertight.
	Foundation waterproofing completed.
	Foundation drains installed.
	Floor drains installed.
	Debris removed from excavation.
	<i>After Backfill:</i>
	For crawl space, check for proper installation of vapor barrier.
	<i>Slab on Grade/Basement Floor:</i>
	Check for proper size: length, width, depth.
	Check subgrade compacted to 95%.
	Check for installation of insulation if required: type, thickness. Check for reinforcing steel: size, number, location.
	Check for concrete additives: fiberglass mesh.
	Smoothness tolerance: 1/4" in 10'.

MASONRY

	General:
	Check reinforcement/anchoring/ties:
	Bars: Grade 40, No. 3 & larger.
	Strap anchors: Bent steel; galv. finish; 1/4' thick. Wall ties: Corrugated; galv. finish.
	Joint reinforcement: Truss type; cold-drawn steel.
	Check grout: min strength 2,000 psi.
	Brick/Brick Veneer:
	Check for proper sheathing/backing.
	Check bricks: type, size, color.
	Check mortar: Type S (use type I or II cement), color.
	Check pattern in accordance with plans/specs.
	Check joints in accordance with plans/specs.
	Check weeps/vents: clear of mortar & debris. Check flashing in accordance with plans/specs.
	Concrete Masonry Units (CMU):
	Check CMU: size, type, grade as per plan or use Grade N, Type I, natural gray.
	Check mortar: Type S (use type I or II cement). Check control/expansion joints.
	Check for proper application of water repellent coating.
	Check bond beam: check proper rebar placement/grout.
	Fireplace/Chimney:
	Check firebox:
	Firebrick: super-duty, regular.
	Mortar: refractory.

MASONRY (Con't)

	<i>Fireplace/Chimney:</i>
	Check firebox:
	Firebrick: super-duty, regular.
	<i>Mortar: refractory.</i>
	Dimensions in accordance with plans/specs & local building code.
	Check cleanout, ash dump, damper for proper operation.
	Check cleanout, ash dump, damper for proper operation.
	Check chimney flashing at roof.

STRUCTURAL STEEL

Steel is designated by shape, size, and weight per foot. For example, a WF 10 X 19 steel beam is a wide flange beam, 10" deep (approx.) and weighs 19 pounds per linear foot. Steel can be ordered in various weights for each size and shape. The heavier the beam, the stronger it is. If you have questions about any steel used in the project, you should consult the architect or structural engineer.

	<i>Rolled Steel:</i>
	Check size: depth, weight.
	Check priming covers steel except where welds or high strength fittings are located.
	Check connections for proper size bolts or welds.
	Check beam stiffeners are installed in accordance with plans/specs.
	<i>Joists:</i>
	Check for correct size: length, depth.
	Check spacing in accordance with plans/specs.
	Check end attachments are in accordance with plans/specs.
	Check bridging in accordance with plans/specs.
	<i>Decking:</i>
	Check for correct size, type, finish.
	Check for proper attachment to joists in accordance with plans/specs.

WOOD FRAMING

You should consult your local building code to determine requirements for sizing structural members and for fastening schedules.

	<i>Floor Framing:</i>
	Check sill sealer installed between sill and foundation.
	Check sill bolts/straps properly installed: Min. 2 fasteners per plate, max 16" from ends, max 6' o.c. Check for termite shield if required.
	Check joists doubled at all openings.
	Check joist hangers are properly installed where necessary.
	Check subfloor: Proper thickness; glued and/or nailed; if plywood
	Check 1/16" spacing all around. Check bridging: size, spacing.
	Check for solid blocking installed if required.
	Check cantilevers are framed as per plan; check overhang and double joists. Check for proper clearance around masonry chimney.
	<i>Wall Framing:</i>
	Check walls located as per plan.
	Check wall framing: straight, plumb, square.
	Correct size lumber.
	Check window/door openings: dimensions, plumb, square, proper header size
	Check plate splices are located over studs.
	Check backing plates for towel bars installed.
	Check that walls have proper temporary bracing.
	<i>Exterior Sheathing:</i>
	Check sheathing: type, thickness, grade.
	Check installation: tight joints, proper fastening.

WOOD FRAMING (Con't)

	<i>Roof Framing:</i>
	Check rafters: size, straight, true, no sag.
	Check ridge pole: larger than rafters.
	Check rafters are properly braced.
	Check rafters properly fastened to wall plates.
	Check collar ties: size, spacing.
	Check soffit, ridge, gable vents properly installed. Check soffits, fascia, rake boards properly installed. Check for proper clearance around chimney.
	Check sheathing: thickness, type, grade, proper fastening.
	<i>Exterior Trim:</i>
	Check window/door trim, corner boards, soffits, fascia, rake boards to be in accordance with plans/specs.
	Check flashing over windows/doors.
	<i>Stairs:</i>
	Check risers: should be equal; max variation 1/8".
	Check treads for level.
	Check balusters/railings for proper fastening.

ROOFING

	<i>Framing:</i>
	Check rafter size, spacing, grade.
	<i>Sheathing:</i>
	Check for proper thickness, tight joints, proper fastening.
	<i>Soffit Construction:</i>
	Check for construction in accordance with plans/specs.
	Check soffit vents properly installed.
	<i>Attic ventilation:</i>
	Check for proper installation of gable and/or ridge vents.
	Flashing: check flashing at all roof penetrations and valleys.
	Eaves: check metal roof edge or ice dam protection if required.

ROOFING MATERIALS

	<i>Asphalt Shingles:</i>
	Check metal drip edge if required.
	Check roofing felt edge overlaps: min 2" on sides; 4" on ends. Check shingles: type, color.
	Check shingle installation:
	Manufacturer approved fasteners.
	Exposure to weather.
	Wood Shingles:
	Check sheathing: solid or strapped.
	Check exposure to weather in accordance with plans/specs.
	Check fasteners: quantity per shingle, type.
	Check shingles doubled or tripled at eaves.
	Check spacing between shingles: 1/4" to 3/8".
	Check spacing between shingles: 1/4" to 3/8".
	Check joints of adjacent courses: Min 1-1/2" between joints.
	Single-ply Roofing:
	Check for correct material: Manufacturer, thickness. Check for proper seam overlaps: usually 3".
	Check for manufacturer-approved seam sealer.
	Check membrane attached in accordance with manufacturer's instructions.
	Tile:
	Check underlayment: 2 layers No. 30 roofing felt.
	Side laps: min. 2-1/2".
	End laps: min. 6".
	Fasteners: 12 Ga., 3/8" galv. roofing nails, 6" o.c.
	Check hips & ridges: 1" wood stringers.
	Check flashing in valleys: 16 oz. copper, min 20" wide, 1/4" edge turned over and fastened with cleats, lap joints 4".
	Fastened with cleats, lap joints 4".
	Check tile fasteners: Type: copper, 11 Ga., 5/16" head.

ROOFING MATERIALS (Cont'd)

	<i>Roll Roofing - Single Coverage:</i>
	Check metal drip edge installed on all edges (gables and eaves).
	Check laps: nailed and cemented.
	Side laps: 2-6" overlap.
	Blind nailed = 9" o.c.
	Exposed nailed = 12" o.c.
	End laps: 3" overlap; nailed 3" o.c.
	Check end laps min 3' from end laps on adjacent courses.
	<i>Metal Standing Seam:</i>
	Because installation requirements vary between manufacturers, check the manufacturer's instructions for the particular product you are installing.

EXTERIOR SIDING & TRIM

	Check sheathing for tight joints and proper fastening.
	Check window/door flashing and trim properly installed.
	Check proper installation of corner boards, soffits, frieze, fascia, rake boards.
	Check building paper/air infiltration barrier properly installed.
	Check overlaps and all seams taped.
	<i>Caulking:</i>
	Check all exterior wall penetrations have been properly caulked.
	<i>Painting:</i>
	If specified, check trim for back prime and knot sealing.
	<i>Brick veneer: see masonry.</i>
	<i>Wood clapboards:</i>
	Check type, size, species, grade.
	Check exposure in accordance with plans/specs.
	<i>Wood shingles:</i>
	Check exposure to weather in accordance with plans/specs.
	Check spacing between shingles: 1/4".
	<i>Vinyl/Aluminum:</i>
	Check substrate prepared in accordance with manufacturers' instructions.
	Check siding installed in accordance with manufacturers' instructions.

EXTERIOR SIDING & TRIM (Con't)

	<i>Stucco - traditional application:</i>
	Check substrate preparation: 15 lb. building paper.
	Check lath installation: Min 1/4' space between substrate and lath.
	Check stucco application: scratch coat, brown coat, finish coat.
	<i>Stucco:</i>
	Various stucco systems are available on the market. Some have special backing boards and fiberglass mesh lath with two coats of stucco. Check your local supplier for the most commonly used system in you area and follow the manufacturers' installation instructions.
	<i>Gutters, Downspouts, Splashblocks:</i>
	Check that gutters and downspouts have been properly installed.
	Check that splashblocks have been placed under downspouts.

WALLS & CEILINGS

	<i>Veneer Plaster Over Gypsum Lath:</i>
	Check proper installation of gyp. lath: 1-1/4" Type W bugle head screws or ring nails.
	Check joint tape applied with compound.
	Check for corner beads/trim applied as required.
	Check for proper thickness:
	One coat: 3/32".
	Two coat: 1/16" each coat.
	Check for smooth finish: 1/8" in 10'.
	Check around windows/doors for proper fit and finish.
	<i>Gypsum Board:</i>
	Check proper installation of gypsum board: 1-1/4" Type W bugle head screws or ring nails.
	Check for corner beads/trim applied as required.
	Check joint tape applied with compound: min 3 coats; feathered for smooth finish.
	<i>Ceramic Wall Tile:</i>
	Check tile: color, size, pattern.
	Check substrate:
	Check for moisture resistant gypsum board or other tile backer.
	Check for surface variations: 1/8" in 8'.
	Check for proper setting materials:
	Dry-Set: ANSI A118.1.
	Latex Modified Thin-Set: ANSI A118.4.

WALLS & CEILINGS (Con't)

	Organic Adhesives: ANSI A136.1, Type II.
	Check for proper grout materials: ANSI A1 18.6.
	Check for proper tub/shower sealant: Fed Spec TT-S-001530, Class A or B. Check shower pan: copper, lead or waterproof membrane, min 5" above floor.
	Wallpaper:
	Check seams for gaps.
	Check pattern matched at seams.
	Check ceiling and base joints for straight cuts.
	Check cleanliness: all excess paste removed from surface.

INTERIOR FINISH

	Wood Strip Floors:
	Check substrate for level, smoothness and proper fastening. Check for proper fasteners: ring-shank flooring nails.
	Check finish:
	Smooth surface; no sander marks.
	Check for proper type and color stain.
	Check for proper finish.
	Parquet:
	Check flooring material: species, size, grade.
	Check substrate for level, smoothness and proper fastening.
	Check mastic: cold, cut-back asphalt or other recommended by manufacturer.

INTERIOR FINISH (CON'T)

	<i>Resilient Flooring:</i>
	Check flooring material: color, pattern, quantity.
	Check substrate for level, smoothness, proper fastening and cleanliness. Check for proper adhesive: waterproof, approved by flooring manufacturer. Check seams and edges for smoothness and adherence to substrate. Check transitions: thresholds properly installed.
	<i>Carpeting:</i>
	Check materials: color, pattern.
	Check substrate for level, smoothness, proper fastening and cleanliness.
	Check pad (if required): type, thickness.
	Check adhesive (if used): waterproof, strippable type recommended by carpet manufacturer.
	Check seams for tightness.
	Check metal threshold strips for appearance and security.
	<i>Quarry and Ceramic Tile:</i>
	Check tile: color, pattern, size.
	Check substrate for level, smoothness, proper fastening and cleanliness.
	Check for proper setting materials:
	Dry-Set: ANSI A118.1.
	Latex Modified Thin-Set: ANSI A118.4.
	Organic Adhesives: ANSI A136.1, Type II.
	Check for proper grout materials: ANSI A118.6.
	Check for proper tub/shower sealant: Fed Spec TT-S-001530, Class A or B. Check shower pan: copper, lead or waterproof membrane, min 5" above floor.

INTERIOR FINISH (Con't)

	<i>Miscellaneous</i>
	<i>Countertops :</i>
	<i>Plastic laminate:</i>
	Check edges for nicks and cracks.
	Check mitered corners for fit.
	<i>Ceramic tile:</i>
	See checklist under ceramic wall tile.
	Use organic or epoxy adhesive only; no latex or silicone.
	<i>Cabinets – Manufactured:</i>
	Check cabinets: size, quantity, type, style.
	Check for proper installation:
	Check level and plumb.
	Check door installation for fit/finish.
	Check for correct hardware as per plans/specs.
	<i>Cabinets – Custom:</i>
	Check for construction in accordance with approved plans/specs. Check finish for smoothness and scratches.
	Check installation for proper fit.
	<i>Interior Trim, Casings, Molding:</i>
	Check for proper shapes used.
	Check for installation in accordance with plans/specs.

INTERIOR FINISH (Con't)

	<i>Bath Accessories:</i>
	Check for proper installation:
	Mirror
	Paper holder
	Towel rack
	Shower curtain rod
	Other
	<i>Stairs:</i>
	Check for proper materials and installation:
	Treads
	Ballusters
	Newel post
	Skirtboard
	Handrail
	Trim
	Finish
	<i>Closets/storage:</i>
	Check for proper installation of clothes rod and shelf.
	Check linen/pantry for proper shelving.

INTERIOR FINISH (Con't)

	<i>Painting:</i>
	Check for proper preparation:
	Nail holes filled.
	Woodwork sanded, dusted clean.
	All knot holes, pitch pockets shellacked or sealed with knot sealer. Cracks or defects puttied after first coat.
	Cracks, holes and imperfections in plaster filled with matching plaster and smoothed off to match adjacent surfaces.
	Check materials in accordance with Interior Finish Schedule:
	Type, color, number of coats.
	Check woodwork installed against masonry, concrete or plaster: back primed.

PLUMBING

	Check materials are in accordance with plans/specs.
	Check fixtures are in accordance with Plumbing Fixture Schedule.
	Check gas piping: location, meter, shutoff.
	Check sanitary sewerage system: see Sitework.
	Check installation of special plumbing fixtures:
	Hot tub
	Jacuzzi
	Steam unit
	Other
	Check installation of any appliances requiring plumbing connections.
	Check to ensure plumbing system has been tested/inspected in accordance with local requirements.

HEATING, VENTILATING & AIR CONDITIONING

	Check for correct systems: manufacturer, model, size, capacity. Check ductwork for proper installation.
	Check ductwork insulation properly installed.
	Check hot water heating pipe insulation properly installed. Check radiators for cleanliness: no dust or debris.

ELECTRICAL

	Check for proper size of service panel/sub panel: ____ amps.
	Check service entry (trenches/overhead) for proper installation. Check caulking around service entrance wall penetration.
	Check for proper placement and installation of equipment:
	Telephone
	Television antenna or cable
	Fire/smoke detectors
	Intrusion alarm
	Check for proper placement and installation of electrical fixtures:
	Switches
	Convenience outlets
	Special outlets: 220 v.
	Lighting fixtures: see Lighting Fixture Schedule Appliances: see appliance schedule

FINAL INSPECTION

	<i>Foundation:</i>
	Check form ties completely removed and holes patched. Check cracks and honeycomb repaired.
	<i>Sitework:</i>
	Check backfill compacted properly.
	Check final grade 2% away from structure.
	Check sidewalks, patio and/or retaining walls installed according to plan/specs.
	Check splashblocks under downspouts.
	Check plantings properly installed.
	Check utility meters properly installed.
	Check all construction debris removed from site.
	<i>Exterior Finish:</i>
	Check all exterior trim properly installed: nails set, holes filled.
	Check painting completed: no bare spots; all drips/overspray cleaned.
	Check shutters properly installed.
	Check gutters and downspouts properly installed.
	Check all cracks or potential air/water leaks caulked.
	Check deck/porch properly installed: steps, railings properly secured.
	Check exterior doors properly installed: weather stripping; threshold.
	Check garage doors/door openers operate properly.

FINAL INSPECTION (Con't)

	<i>Check roofing properly installed:</i>
	All shingles/other roofing properly installed.
	All roof penetrations properly flashed/caulked. Ridge cap.
	<i>Interior Finish:</i>
	Check doors properly installed: fit, operation, door stops.
	Check all base, chair rail, and crown moulding joints for tightness.
	Check painting completed: no bare spots; no runs; all drips/overspray cleaned. Check attic access properly installed and insulated.
	Check attic insulation properly installed: thickness, vent baffles.
	Check attic vents are clear of obstructions.
	Check convenience outlets and switches for proper installation: no gaps behind plates.
	Check lights, outlets, and appliances for proper operation. Provide owner with operating manuals.
	Check HVAC systems for proper operation. Provide owner with operating manuals. Check all closets for proper installation of shelves and clothes rods. Check proper installation of bath accessories: towel bar, paper holder, mirror, shower curtain rod.
	Check tubs, showers, tile cleaned.
	Check all windows cleaned.
	Check tile installed properly: level, no missing grout, caulked.
	Check operation of all plumbing fixtures.
	Check kitchen and bath countertops for proper installation: level, caulked where needed.
	Check kitchen and bath cabinets for proper installation: trim installed properly;
	Check all floor coverings for proper installation and cleanliness.
	Check basement for cleanliness.

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BNi Building News

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