

**OCCUPATIONAL SAFETY
AND HEALTH STANDARDS BOARD**

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**ADVISORY COMMITTEE MEETING MINUTES****California Code of Regulations, Title 8,
Construction Safety Orders, Section 1711, 1712, 1713, 1717 and 1721****Petition No. 537 Regarding Proposed Standards
Addressing the Hazards Associated with Reinforcing Steel and
Post-Tensioning in Concrete Construction**

October 27 & 28, 2014
Sacramento, CA

The meeting was called to order by the Chair, George Hauptman, Senior Engineer, Occupational Safety and Health Standards Board (Board) at 9:00 a.m. on Monday October 27, 2014. The Chair was assisted by Bernie Osburn, Standards Board Staff Services Analyst. The Division of Occupational Safety and Health (Division) was represented by Acting Principal Safety Engineer, Eric Berg and Senior Safety Engineers, Joel Foss, Larry McCune and Keummi Park. The Chair welcomed committee members and asked for self-introductions.

The Chair reviewed the Board's policies and procedures concerning advisory committees. The Chair explained that the committee role is to advise the Board. The Board will consider the committee recommendations, usually accepting them, sometimes modifying them and less frequently rejecting the recommendations. The Chair noted that the committee was convened as a result of the Board's Petition No. 537, dated September 11, 2013, submitted by Mr. Walter Wise, General President of the International Association of Bridge, Structural, Ornamental and Reinforcing Iron Workers. The Board's Decision directed staff to convene an advisory committee to consider the Petitioner's recommendations.

The Petition states that the current provisions in the Construction Safety Orders (CSO) Section 1712 "Reinforcing Steel and Other Similar Projections" contain limited references pertaining to reinforcing steel construction activities and post-tensioning operations¹. The Petition states there is a correlation related to the hazards and injuries to workers involved in concrete reinforcing steel and post-tensioning activities and the lack of specific regulations addressing the associated hazards of these activities. The Chair explained that the Petitioner recommended regulatory

¹ Post-tensioning is a technique for reinforcing concrete. Post-tensioning tendons are steel cables placed inside plastic ducts or sleeves that are positioned in concrete forms before the concrete is placed. Afterwards, once the concrete has gained strength but before the service loads are applied, the cables are pulled tight, or tensioned, usually by hydraulic jacking systems and then anchored against the outer edges of the concrete to ensure support for service loads.

language for placement into CSO Section 1712 as a vertical (industry specific) standard. However, the Chair stated that the proposal for committee review is placed primarily into Section 1711 for optimal formatting and organization of the proposal.

The Petitioner's representative, Steve Rank, Ironworkers International, presented a slide show which showed some of the main hazards associated with job site conditions and reinforcing steel concrete construction and post-tensioning operations. Some of the concerns mentioned included, but were not limited to, the need for written notification of safe site conditions, adequate bracing, shoring or otherwise securing of columns and formwork and safe space for post-tensioning beyond the construction formwork. Mr. Rank explained that a similar petition to California's has been submitted to federal OSHA which has been requesting information from stakeholders and interested parties for several years before proceeding further. Several members stated that at this time it does not appear that federal OSHA will be promulgating any proposal in the near future.

Mr. Rank further explained that the proposed language of the petition comes from the ANSI/ASSE A10.9-2013 consensus standard "Safety Requirements for Concrete and Masonry Work." The petition recommends that California adopt the portion of that standard that addresses the hazards associated with reinforced steel construction and post-tensioning operations. The Chair noted that the proposal is nearly verbatim to the ANSI Standard's Section 10.3 for post-tensioning operations. The Chair agreed the level of safety in the CSO could be improved by including a number of the provisions that are provided in the ANSI 10.9, Section 10.3 standards. The Chair stated that the Division and Board staff reviewed the petition to identify areas in the proposal that could be in conflict, present clarity issues or duplicate existing provisions related to concrete construction and post-tensioning operations.

The Chair stated that the proposal for committee review is based in large part on the petition language. However, the Chair noted that the Division and Board staff added a number of definitions to the proposal for clarity. Also, the Chair stated that both existing California Title 8 standards and federal OSHA standards have existing provisions for impalement protection, fall protection, hoisting and rigging, stability of formwork and falsework which in part, or in whole conflict with, or may duplicate similar provisions in the petitioner's proposal. The Chair stated that is why the draft proposal for review is not identical to the petition language and why there are a number of comment and question boxes in the text for committee discussion.

Lyle Sieg, representing Harris Rebar and who is the Safety Committee Chair for the Concrete Reinforcing Steel Institute (CRSI), indicated that their operations are involved in concrete construction in nearly all U.S. states and post-tensioning in approximately 20 states. The greatest extent of activity is taking place on the West Coast and California but he indicated federal OSHA is looking at similar provisions for other states which essentially present the same safety issues the Mr. Rank presented for California's petition.

The committee discussed accidents and hazards on the jobsites. Hart Keeble, Director of Safety and Health for Ironworkers Local 416 representing 2500 ironworkers stated strong support for the proposal. He stated that injuries often happen as a result of miscommunication or accountability among various types of contractors on the jobsite. He stated that the proposal

places the pertinent safety requirements into a focused area of the regulations and is ideal for training and education of workers. He felt that the proposal would prevent serious injuries and fatalities. In general, the committee discussed accidents caused by structural collapses of formwork, falsework, columns and other issues such as impalement and post-tensioning hazards.

Lyle Sieg discussed a column collapse that involved a unique design that was not braced or guyed adequately and it fell crushing a worker who was tied off to it. Mr. Sieg stated that it is very important to have a vertical standard for these operations that can serve as a checklist for the worker and subcontractors and general contractors to make sure that important safety procedures and actions are taken. Carlos Crisonino, Corporate Safety Manager, Gerdau RSW Company, stated that post-tensioning equipment for jacking/tightening cables is very heavy and awkward to work with and that safety hazards are compounded where there is insufficient access and working areas for the tensioning operations. One of their employees sustained a finger crushing injury while trying to position the equipment without adequate access and working space at the end of a construction beam. He was off work for one year. The Chair added that while reviewing OSHA accident histories, it was clear that accidents, usually serious and fatal, are happening from work involving the types of hazards in concrete construction and post-tensioning operations.

One member stated that this proposal has some similar provisions to that of CSO Section 1710 for steel erection with respect to controlling contractor responsibilities including adequate site conditions and custody of guardrails after the steel erection contractor had completed their work. The Chair asked how those provisions had been working since 2002 when they went into effect. Brian Miller, Safety Director, Rudolph and Sletten Inc., stated at first general contractors had concerns about the custody issue for guardrails and after adjustments were made, the controlling contractor responsibilities in Section 1710 provisions have been effective and not problematic. Russell McCrary, Director of Safety and Health, California Ironworker Employers Council/District Council of Ironworkers stated that those controlling contractor responsibilities in Section 1710 have given all contractors on the jobsite responsibilities and have improved the overall level of safety on jobsites effectively.

Greg McClelland, Executive Director, Western Steel Council stated that their workers represent 6 to 8 million man-hours a year. He stated it is difficult to explain to the reinforcing steel workers in concrete construction why the provisions for safe jobsite conditions for areas such as safe access and egress are not afforded the same provisions that are provided to structural steel workers in Section 1710. He stated that employers rely on clear, vertical standards to provide fundamental safety conditions and he felt the proposal establishes those safe working conditions. He stated that the Western Steel Council as a labor/management entity fully supports the proposal.

Steve Rank stated that the structural steel standard adopted in 2001 had several main controlling contractor provisions. These are related to improved jobsite conditions, written notification of concrete strength for the placement of columns that has greatly reduced anchor bolt and column collapse injuries, custody for guardrails, and barring other trades and contractors from working below structural steel erection work. There is widespread agreement among stakeholders that

those provisions have significantly reduced injuries and fatalities and have improved productivity. Joel Foss, Division, agreed and stated that at the time Section 1710 was amended there were discussions that conflicts or disagreements between the steel erectors and controlling contractors would occur. However, he noted that did not happen and he said the provisions have been very successful.

The Chair stated that based on the accidents discussed, the lack of industry specific standards especially for post-tensioning operations, and the discussion thus far, that he felt there was merit to proceeding with a proposal as a vertical standard in the format that was e-mailed for committee review. The committee members agreed and therefore, the Chair affirmed that there is strong consensus to proceed with the proposal. The Chair also thanked the Division representatives, Joel Foss and Larry McCune for their assistance and detailed evaluation of the formatting, organization and requirements of the proposal.

The Chair noted that in pre-committee discussions with the Division that it was recommended moving the one sentence provision in existing Section 1711 pertaining to “oiling forms” into Section 1713 and use Section 1711 for the primary provisions of the proposal. The committee began review of the proposal starting with the change in title to Section 1711 “Reinforcing Steel and Post-Tensioning in Concrete Construction.” Joel Foss stated that the existing language in Section 1711 for the term “oiling forms” may not be commonly used. Brian Miller stated that the revision could state the application of form release or oil would be current. The committee agreed on the revised language that was relocated to Section 1713(d) in the proposal.

The committee reviewed and discussed the Scope and Application provisions of Section 1711(a) including notes 1 and 2 and retained the language shown in the proposal. The Chair stated that the new definitions in subsection (b) are provided for clarity and open for discussion. Jose Mendoza, Pacific SW Manager for CRSI stated that the word “mass” in the definition of “Dead Load” means the weight. Fred Coddling, Executive Director, National Association of Reinforcing Steel Contractors stated that the proposal’s definition is the same as that provided in the ANSI A10.9 standard. The committee agreed to place the word “weight” in the parenthetical of the definition.

Steve Rank recommended adding the definition for “Competent Person” since it is used often in the proposal. The Chair noted that this term is already defined for the CSO in Section 1504. The Division had no objection to placing the term in Section 1711 because the language is the same so it is included in subsection (b). The committee including the Division also agreed for clarity to include the definitions for a “qualified person” and “qualified rigger” into the proposal consistent and verbatim to those provided in CSO Section.

The definitions of “reinforcing steel assemblies” and “reinforced concrete” were developed with lengthy committee discussion and consensus in order to accommodate different types of rebar that are now being used in addition to steel rebar such as fiberglass and Kevlar rebar products.

Michael Strunk, Director of Safety, Operating Engineers Local Union 3, stated the proposal should define who the jobsite inspectors are, and that special inspectors required by the

California Building Code, Title 24, are already on the jobsites inspecting activities such as post-tensioning operations. He stated that building owners are already obligated to have these inspectors on the job site. The Chair added that these inspectors most likely would be considered qualified to perform those inspections and that the Division would recognize them as qualified and rely on their inspections. The Chair indicated that we should further discuss this in review and discussion of the proposal inspection requirements (see pages 6 and 7 of these minutes).

The committee reviewed Section 1711(c) Site Access and Layout. The Chair stated that these provisions are similar in part, to those of Section 1710, steel erection. Brian Miller expressed a concern that subsection (c)(2) provisions for jobsite conditions in reinforcing steel concrete construction present greater difficulties to provide compared to steel erection construction. When preparing concrete and building footings it is earlier in the building process than steel erection and there are a number of other construction activities that make it a challenge to have ideal jobsite and access conditions. In rainy weather it is problematic to expect that areas will always be drained and graded, especially with environmental requirements of how water is removed from a site.

Greg McClelland stated that it is fortunate that there are a number of very good contractors such as Rudolf and Sletten that are conscientious about providing safe jobsite conditions. He recalled that when Section 1710 was amended, that many controlling contractors had similar concerns. The provisions in subsection (c)(1) and (2) promote better preplanning and management of jobsites and would result in better efforts not only by the controlling contractor but subcontractors and building owners to schedule jobsite activities. He felt the proposed provisions would as they did for steel erection, result in better, and more productive, safe jobsites through preplanning.

Steve Rank stated that he recognizes that jobsites are different when opening and establishing the footings than at the time of steel erection. However, he added that the intent of the provisions are to have an access point and adequate location on the jobsite where trucks can unload their rebar and other materials. In continued discussion the committee by consensus agreed to also add language addressing the “safe assembly and rigging of materials” in subsection (c)(2).

The committee reviewed proposed subsection (c)(3) which requires an adequate landing for materials on the floors of multi-tiered buildings. One member stated that on all structural buildings it is an issue as to the landing of rebar and wire mesh on upper floor levels. Brian Miller stated that the landing of materials is planned for but infrequently they encounter tight quarters with space constraints and it is not always possible for the ideal exterior landing to accommodate materials.

Hart Kebble stated that the issue of adequate landing for materials is most prevalent on retrofit buildings where inadequate landing space can result in a difficult and risky situation. Don Anderson, Safety Director, Peck and Hiller stated that he has been in the construction industry for 29 years and on new reinforced concrete structures has never seen an exterior landing platform solely for the delivery of heavy materials such as rebar. The Chair asked if there should be an exception for structures that allow for the safe landing of materials without the exterior

platform. Steve Rank agreed that not all buildings need the exterior landing and the intent of the regulation was that it be provided when it is needed for the safe landing of materials. The committee eventually agreed upon the two exceptions to subsection (c)(3) to address concerns raised by Brian Miller and Don Anderson.

Proposed Section 1711(c)(4) continues the controlling contractor's provisions to ensure that adequate benching and shoring are maintained. Brian Miller stated that as a general contractor sometimes his firm digs the excavation but it can also be a subcontractor. He felt that the language removes responsibility from the subcontractor to the general contractor. If his company digs the excavation, it is inspected by a competent person for adequate shoring, and benching where applicable and he stated any contractor entering the excavation should do the same inspections.

Michael Strunk stated that the provisions for special inspections of excavations by building inspectors already exists in Title 24, the California Building Code (CBC), Chapter 17. The term "special inspection" is defined in Section 1702A of the CBC. The requirements of special inspections are outlined in CBC Section 1714. Special inspectors inspect nearly all aspects of the concrete and post-tensioning operations at certain phases during the construction project. With respect to excavations, Joel Foss, Division stated that Section 1541(k) also requires the employer to perform daily inspections. Brian Miller stated that the building special inspector checks for proper conditions such as stability of the soil, clearances of rebar from dirt which can corrode rebar. Jose Mendoza stated that the table in Chapter 17 provides a list of certain continuous and periodic inspections performed by specialty inspectors.

The Chair indicated that it seems that the inspections performed by building officials may serve as a type of inspection that a contractor could use for certain Division requirements. Larry McCune stated that the building inspections are in addition to what is required by Cal/OSHA and are necessary to finish a building or have approval to proceed to the next phase of the construction process. Brian Miller emphasized that no matter what the hazard is, it is every employer's responsibility to ensure that their employees are safe. The controlling contractors can do their best to identify unsafe conditions and require corrections of unsafe conditions, but cannot provide constant patrol of the jobsite so ultimately, the individual contractor/employer has shared responsibility for the safety of employees.

Michael Strunk stated that it is not well understood but the CBC specialty inspector has the responsibility for inspections. Although one member stated that a problem could be that the CBC inspector may not always be there on the jobsite at a specific time when a problem might occur. Maryrose Chan, Senior Engineer, Standards Board, stated that CBC Title 24 is to ensure that a building is constructed and built according the approved plans while Title 8 is intended to specifically address employee safety. In post committee evaluation, the Chair believes that a Petition could be submitted to further identify, evaluate and consider the role and purpose of the CBC specialty inspections and how they relate to employee safety and whether Title 8 standards should incorporate related provisions. There was not a consensus to do so at the committee meeting.

One member stated that Title 8 provisions adequately address the inspections of excavations in CSO Sections 1541 and 1541.1. Eric Berg pointed out that the controlling contractor is responsible for safe conditions, but the direct or exposing employer also has to ensure by a competent person that conditions are safe. Joel Foss stated that the Division's permit requirements place the responsibility for safe excavations (shoring or sloping etc.) upon the excavating employer or the general contractor. The other contractors that use the trench/excavation are not required to get a permit from the Division. Mr. Foss expressed the need to retain subsection (c)(4) because other contractors using a trench such as the rebar/reinforcing steel contractor does not have the authority or the ability to make excavation corrections on the job site but the controlling contractor can ensure the corrections are made.

Brian Miller stated he was somewhat opposed to the language in subsection (c)(4) and as it does not require the individual reinforcing steel contractor to check excavations prior to entering them. However, one member pointed out the individual employer or subcontractor still has the responsibility to protect his/her employees for exposure to hazardous conditions and that would include notifying the controlling contractor of unsafe conditions.

Joel Foss stated that some general contractors are not providing a safe excavation and the subcontractors pressed for time or scheduling are sending their employees into those excavations. Hart Keeble stated that being one of those persons that during his career, has been instructed to enter excavations that that are not entirely safe, felt the discussion thus far supports the need to retain the provision. Notwithstanding Mr. Miller's concerns, the committee ultimately retained the proposed language for Section 1711(c)(4). In post committee review of the written notification requirements, note that the revised proposal, developed with the committee's assistance, modified subsection (d)(3) to state that the benching and shoring of excavations have been inspected by a competent person and removed original language that specified the inspection must be done by the controlling contractor.

The committee reviewed Section 1711(d)(1). With respect to the previous discussions about CBC specialty inspections, Greg McClelland stated that Table 1705.3 of CBC code delineates that the periodic specialty inspections for formwork requires inspection for the shape, location and dimensions of the concrete member being formed but does not address whether the formwork design will support the intended loads. One could conclude that the focus of the CBC inspection focus is on quality control of the structure. Formwork has failed causing injuries in the past because it was not designed to support the intended loads and that is the reason for the provisions in proposed subsection (d)(1). Maryrose Chan, Standards Board, restated that CBC Title 24 provisions are to ensure that a building is constructed and built according the approved plans while Title 8 is intended to address employee safety.

Larry McCune stated that subsection (d)(1) could be improved by adding that formwork and falsework be inspected "to meet the design requirements" by a competent person. Brian Miller stated that it is not always the controlling contractor that constructs the formwork or falsework so he suggested that it was unnecessary and problematic to require the inspection specific to the controlling contractor. Steve Rank stated the entity/contractor that is setting/installing the formwork or falsework should inspect it before written notification is given to commence

reinforcing steel activities. The committee also discussed that the controlling contractor is sometimes the entity setting or installing the formwork/falsework. Therefore, the committee agreed that the formwork/falsework contractor (which in some cases could be the controlling contractor) should perform the inspection required by subsection (d)(1).

The existing provisions in CSO Sections 1713 and 1717 were reviewed as their stability requirements are referenced in proposed Section 1711(d)(2). The Chair indicated that referencing these two Sections provides relief for the smaller residential contractors that may be using rebar or reinforcing steel for a driveway or retaining wall. For example, structures over 14 feet in Section 1717(b) require a civil engineer to calculate the design for falsework and vertical shoring. However, for smaller structures, Section 1717(b)(2)(C) provides that the falsework and shoring can be in accordance with a licensed contractor's representative who is qualified in the usage and erection of falsework and vertical shoring. The committee agreed to the provisions as shown in proposed subsections (d)(2) and (3).

The Chair explained that the provisions of existing CSO Section 1712(f) were moved to a more appropriate location as proposed Section 1711(e) regarding the stability of columns, walls and other reinforcing steel assemblies. He also noted that subsection (e) is similar to the Petitioner's language. The committee agreed that proposed language for subsection (e)(1) that referenced "free standing" structures lacked clarity and in lieu of that language added that support (guying or bracing etc.) should also be provided for "prefabricated reinforcing steel assemblies." The committee also agreed to clarity edits for (e)(1) to ensure that "vertical structures shall be guyed, braced or supported to prevent collapse."

Note that for optimal formatting and clarity, the Chair combined provisions relating to guys, bracing and supports as subsections (e)(2)(A) and (B). After discussion and rationale from the Division and Steve Rank, the committee agreed that subsection (e)(2)(B) requirements should be under the direction of a "competent person" because that person has the authority to take appropriate action and give directions while the design provisions of systems for guying, bracing, or supports in subsection (e)(2)(A) are best performed by a "qualified person." Note that a competent person and a qualified person are both defined terms that are located in proposed Section 1711(b). The committee then agreed to the remainder of the language outlined as subsections (e)(3) through (5).

The Committee agreed with the provisions of Section 1711(f)(1) that refer to CSO Section 1712 for the requirements related to impalement protection. The committee continued by reviewing Section 1711(f)(2) related to the controlling contractors responsibilities related to the control and custody of impalement protection. Steve Rank stated that the provisions in subsection (f)(2) only are applicable if the protective covers are installed by the reinforcing steel contractor and the controlling contractor or other trades request that the covers remain in place after the reinforcing steel activities/work has been completed. Don Anderson and Brian Miller both expressed concerns that the provisions of subsections (f)(1) through (3) seem to place all the responsibility for protective covers on the controlling contractor when each individual employer/subcontractor has responsibility to ensure the safety of their own employees.

Steve Rank responded that the problem is both safety and legal liability related for the condition of covers and the protection provided by the covers long after the reinforcing steel contractor is no longer on that project site area to know of, or take any corrective action necessary, if covers are damaged, knocked off or taken off of impalement hazards. There was lengthy discussion back and forth about the responsibility for the protective covers. Brian Miller expressed concerns that any subcontractor's employees could accidentally knock off a cover and it may not be replaced. With hundreds to thousands of protective covers on a jobsite, it is a burdensome responsibility for the controlling contractor to provide written notifications and/or be solely responsible for conditions that they may not have knowledge of.

One member stated that each employer still has the responsibility for the protection of their workers if they are allowing them to work at or near unprotected impalement hazards. Hart Keeble acknowledged that impalement protection is a big problem on jobsites. Covers are taken off or compromised. Mr. Keeble stated that with multiple contractors on a jobsite, no one really has the authority among various subcontractors to demand or enforce that corrections be made except for the controlling contractor. Mr. Keeble stated that if the contractors installing covers always remove their protective covers when the work is completed then we are not doing our best to protect the many other workers and other subcontractor's employees immediately exposed to the hazards.

The Chair asked Division representatives how they would handle the situation where the controlling contractor had taken custody for the covers but then for example, an electrician's employee(s) removed and did not re-install covers. Eric Berg stated that it would depend on the circumstances. The exposing contractor (the electrician) would or could be cited. However, if the condition had been of short duration, it is doubtful that the controlling contractor would be cited. However, if the hazardous condition existed for days and the controlling contractor was aware of those conditions, then the controlling contractor could be cited.

Greg McClelland stated that the situation is similar to that which existed years ago, for structural steel erection [Section 1710(o)] when the controlling contractor assumed custody of guardrails after the steel erector had completed its work. There were some growing pains and everyone (all craftsmen) on the jobsite had to heighten their awareness of unsafe conditions and ensure that the leading edge cable guardrail systems were maintained and not misused. Training was increased and safety awareness increased that has ultimately led to safer and more productive jobsites.

Several members stated that the affirmative defense is available for the controlling contractor that has done due diligence to ensure a safe jobsite. Larry McCune affirmed that if the controlling contractor had conducted an inspection at the time of taking responsibility/custody for protective covers and had with due diligence advised all subcontractors that protective covers must be maintained and kept in place, then the affirmative defense could be used by the general or controlling contractor. The Chair indicated that he would be open to further post advisory committee evaluation of Section 1711(f)(2)(A) – (C) and this concluded the committee's discussions for Day 1.

In post-committee evaluation of the proposal, additional edits were made to Section 1711(f)(2)(C) by the Chair for clarity and a “Note” is added to Section 1711(f)(2)(A) – (C) to ensure that the individual employer/subcontractor is aware that the responsibilities the controlling contractor may accept related to the custody of protective covers, does not relieve the individual employer or subcontractor from protecting their employees from impalement hazards in accordance with the provisions of Section 1712(c).

October 28, 2014 – Day 2.

The Chair opened Day 2 with discussion of proposed Section 1711(g) “Requirements for Hoisting and Rigging Reinforcement Assemblies.” Greg McClelland and Steve Rank expressed that it was necessary to retain similar language to that in the Petition, Section V that allows for a rigger or other persons necessary for connections, securing or placement of loads, including hooking and unhooking loads to be underneath a load to perform those normal activities. Larry McCune agreed and stated that those are normal rigging activities that must be performed in order to do the work. Another member stated that the Petitioner’s proposal for hoisting and rigging is similar to that for steel erection work in Section 1710(d). Greg McClelland recommended that all of the petition language in Section V is necessary in order to address safe hoisting and handling of materials and loads.

Steve Rank added that similar hoisting/rigging language in the steel erection standard since 2001 has been very effective in preventing accidents and injuries and has worked well. The committee agreed that proposed Sections 1711(g)(1) – (4) should be included in the proposal similar to the petition language in its Section V with the exception that subsection (g)(1) should reference the applicable California Title 8 standard in lieu of the federal standard referenced in the petition language.

With respect to Section 1711(g)(5), Larry McCune stated that for this specialized work that the lifting devices below the hook should be designed by a California professional engineer. The committee felt that this would be preferred rather than permitting the design by a qualified person which could be subject to interpretation. Steve Rank added that a registered engineer will also ensure that the rated load capacity would be marked on any devices designed by a professional engineer. The committee discussed and agreed to the language as outlined in subsection (g)(5) and (6).

The Chair stated that the proposed language for subsection (h) Post-Tensioning Operations, is taken primarily from the Petitioner’s recommended language in its proposal Section VI with some edits for clarity from both the Chair and the Division’s work by Joel Foss. The Chair stated that proposed subsection (h) has a great deal of merit since the provisions specific to post-tensioning operations are quite minimal in both the state and federal standards.

The committee discussed proposed subsections (h)(1) through (4). It was agreed that in subsection (h)(3) that “signs and barricades” be erected to limit access to stressing areas. There was some discussion from Don Anderson that subsection (h)(4) may be unnecessary in light of the requirement for signs and barricades in subsection (h)(3). However, several examples were

given of serious accidents resulting from other trades being in a stressing area. Todd Stevens, Gerdau Co. and member of the Post-Tension Institute, stated that without the support and authority of the controlling contractor that other trades can and have ignored signs and barriers and employees of other trades wind up in dangerous areas during stressing operations. Consequently, the committee supported the wording of subsection (h)(4).

The committee reviewed subsection (h)(5). Don Anderson stated that with respect to mandating a 3-foot work platform for tensioning operations that some building structures have space constraints that do not allow adequate room for this provision. Todd Stephens stated that on many structures, there is adequate space for a safe work platform but it is not provided. The jacking machine is about 2 feet and depending on the manufacturer, the stressing jack extends about another 8 to 12 inches and that is why the work platform is specified at 3 feet. However, he did acknowledge that in rare cases, there are structures with space constraints that may limit the ability to have a complete 3-foot platform length. Special jacks may be used; however, the job is much more difficult and hazardous without the full work platform.

After considerable and lengthy discussion, it was agreed that an exception should be provided for subsection (f)(5) for structures with limited space constraints. Brian Miller and Don Anderson added that for some construction projects, such as parking facilities that providing a 3-foot exterior platform would be challenging because such structures are not typically designed to accommodate that type of work platform. Other members added that it would be necessary to include such provisions in the construction contract. The exception for subsection (h)(5) was developed with assistance from the committee.

In order to provide protection from falling objects, and to ensure that is not solely the responsibility of the controlling contractor to keep debris off the working platform, a new subsection (h)(6) was added as shown the attached proposal. The committee agreed to language outlined in subsections (h)(6) – (10). Brian Miller questioned in subsection (h)(8) whether it was clear that the reference to stressing equipment calibration contract specifications is applicable to, and the responsibility of the post-tensioning contractor. The committee affirmed that it was sufficiently clear since the post-tensioning contractor would be the only contractor needing to use the equipment and to ensure that the equipment was appropriately calibrated.

The Chair asked if it was necessary to list fall protection provisions in this proposal when existing Section 1712(e) has requirements for working above 6 feet during the placement or tying of reinforcing steel. Joel Foss stated that the paragraph and its exception in Section 1712(e) are specific to reinforcing steel concrete construction activities and that Section 1712(e) should be in this vertical standard and moved from Section 1712 to the proposal as Section 1711(i). Steve Rank and others agreed with Mr. Foss and the Division. Mr. Rank further stated that Section 1712(e) “fall protection” is specific to the reinforcing steel ironworker only and the proposal in Section 1711(i) should reflect that.

The Division and other members discussed that the exception to existing Section 1712(e) allows for point to point travel on reinforcing steel up to 24 feet is only applicable to the reinforcing steel ironworker and should not be applicable to other trades such as carpenters, etc. The Chair

asked Matthew Rowlett, Training Officer for the Carpenter's Training Committee if he agreed and his response was affirmative. Larry McCune added that the problem with this language remaining in Section 1712(e) is that other trades use the reinforcing steel assemblies as ladders to reach elevated areas on the job site which is a very unsafe practice. Greg McClelland agreed with Mr. McCune's comment and suggested that the exception allowing point to point travel be clarified to state that it is applicable only to the reinforcing steel ironworker.

Joel Foss stated that accidents associated with carpenters using rebar assemblies as a ladder are common and he has conducted accident investigations related to this. He further recommended that the term reinforcing ironworker should be defined in subsection (b). Both Greg McClelland and Hart Keeble stated that the reinforcing steel/ironworker is trained in apprenticeship programs to safely work and travel on reinforcing steel assemblies. Steve Rank clarified that ironworkers do not work without fall protection and use positioning devices on reinforcing steel structures which consist of a wall hook, D-rings and a wall chain for safe travel on such structures. Brian Miller asked for clarification as to whether the proposed exception is intended to prohibit any other trades from accessing reinforcing steel structures/assemblies to do their work. Others responded that no, they can access those areas/structures but they are not afforded the exception that the reinforcing ironworker has as the wall or vertical structure is being built. Mr. Miller stated that the responses adequately addressed his concerns.

Dave Otey, Regional Safety Manager, Rebar International Inc., stated that the existing exception in Section 1712(e) has resulted in much confusion on jobsites where some controlling contractors or construction managers do not permit reinforcing steel ironworkers to work under the conditions of the exception without the use of redundant and cumbersome, unnecessary fall protection that actually makes the work less safe for his people. He fully supported the need to modify and clarify the exception. Brian Miller concurred with Mr. Otey's comments and stated that he experiences many situations where safety personnel lack a clear understanding of what constitutes appropriate fall protection equipment for the work being performed.

The Chair then summarized that the committee consensus is to move the fall protection language from Section 1712(e) into proposed Section 1711(i) and modify the exception so that it is clear the exception is applicable only to the reinforcing ironworker. The committee believed that a definition of the term "reinforcing ironworker" was necessary for clarity and this definition is included in Section 1711(b).

The Chair noted that the Petitioner's proposal related to fall protection in Section VII (2) had language that required the controlling contractor to provide for guardrail systems and floor covers. The Chair also noted that existing standards already require guardrail systems and floor covers. The Chair questioned whether placing this responsibility solely on the controlling contractor is necessary and possibly confusing since both any employer installing guardrail systems and other contractors with employees exposed to elevated locations have the responsibility for guardrail systems or covers where necessary. The committee agreed that existing provisions (e.g. CSO Sections 1620 and 1621) already address the requirements for guardrails. Therefore, the committee agreed that it was unnecessary to expand the fall protection provisions of the proposal that are outlined in Section 1711(i).

The committee discussed that subsection (j) requires that formwork and falsework be provided in accordance with Sections 1713 and 1717. The Chair stated that the committee previously discussed that these referenced sections afford more extensive protections than the petition's language with respect to the design and inspection of formwork, falsework, and vertical shores. The Chair noted that the language in proposed Section (d) regarding formwork and falsework pertain to written notifications only and subsection (j) provides the specific requirements for formwork and falsework activities. Eric Berg stated that the Division supported the references in subsection (j) and that those referenced sections provide necessary protection for such activities. Other committee members agreed to the language for subsection (j).

The Chair asked in light of the general training provisions related to CSO Section 1509 and GISO 3203, if it is necessary to include the specific training provisions as outlined in proposed subsection (k). Steve Rank commented that those training provisions were included in the petition because of the importance of specific training related to the hazards of reinforcing steel and post-tensioning operations. In those activities they are finding accidents directly related to the lack of specific training. For example, training has been lacking related to the safe use of wall chains in a personal positioning device system for reinforcing ironworkers. The training provisions are included so that employers and employees understand the hazards of reinforcing steel construction and post-tensioning operations.

The Chair indicated that he would likely add language in the first sentence of subsection (k) to ensure that employers know that the listed training requirements in the subsection are in addition to those required by the Injury and Illness Prevention Program (IIPP) of Section 1509. The committee including the Division agreed to this concept as noted in the attached proposal for Section 1711(k).

The committee discussed that employees involved in post-tensioning stressing operations are subject to hazards such that subsection (k)(3) should require that the training be conducted by a person that is qualified to do so. One member stated the level of potential hazards is increased during the cable stressing operations because of the high levels of tension placed on the cables. The Chair noted that the Petitioner's language for these operations would require the training to be performed by third party "qualified evaluator." The Chair asked if training by a third party not associated with the employer was necessary and that third party certifications typically generate questions and concerns regarding the necessity of certification and who is considered qualified to affirm that one is certified for a specific task or operation.

Steve Rank commented that the term "qualified evaluator" originates from crane standards (CSO Section 1610.3) and sets forth a benchmark to ensure that the trainers have appropriate experience and qualifications. Larry McCune commented that there usually is an institute or benchmark to denote a qualified certifying agency or person. The committee had considerable discussion as to what the term certification means. In this case, the Chair indicated that if third party certification is considered then questions would need to be answered such as, 1) what the certification means, 2) what is the curriculum and tests to get certified, 3) who can perform the certification and 4) how much does it cost.

Larry McCune stated that anytime the terms certification or evaluator are used that a list of organizations or entities that can perform the certification/verification is provided. Larry McCune stated that it was a problem in crane operator certification standard that initially, only one organization was considered qualified to test and issue the certifications. One member mentioned that the California Building Code requirements do not mandate certified post-tensioning work yet, but they are considering it.

Mr. McCune suggested that the training could be provided by a “qualified person” because that defined term requires that person to have appropriate training, ability and experience to perform the work, but also when it is required, to be properly licensed in accordance with federal, state, or local laws and regulations. Fred Coddling pointed out that the ANSI A10.9 Standard in Section 3.16 has a workable definition for the term “qualified person.” Several members pointed out that the ANSI definition and the CSO definition of “qualified person” are nearly identical. Therefore, proposed subsection (3) requires that a qualified person perform the training. This completed the discussion for the vertical standard, Section 1711.

The Chair noted that in prior discussions the committee agreed to revise the title of Section 1712 to reflect that this section pertains to the “Requirements for Impalement Protection.” The Chair also noted that in previous discussion the committee agreed to move the language of Section 1712 into proposed Section 1711(i). Additionally, the committee had also concluded the provisions of Section 1712(f) should be moved into proposed Section 1711(e).

Moving to Section 1713, Joel Foss recommended that the title of this section be revised for clarity so that the title reads, “Framed Panels and Concrete Forms.” He stated that the existing word “framing” in the title has caused confusion and some stakeholders mistakenly believe that this section is related to residential framing activities. The committee agreed to the title change and Hart Keeble’s recommendation to add the words “and forms” to Section 1713(b)(1) because not all concrete forms are designed as panels. Some concrete forms are cylindrical columns or rectangular forms. Brian Miller also questioned the clarity of existing Section 1713(c). As a result the committee revised this subsection to make it clear that reinforcing steel is not to be used as a guy or brace in securing framed panels or concrete forms.

The committee discussed that appropriate guys or bracing (e.g. steel cables) are sometimes attached directly to vertical columns/plates of reinforcing steel which is an acceptable practice when it is part of the engineered plan. Therefore, similar language to the aforementioned Section 1713(c) is also proposed in Section 1711(e)(3) to prohibit reinforcing steel for use as a brace or guy that would be under tension to support a reinforcing column, wall or other reinforcing steel assemblies. The committee had already agreed to the language for Section 1713(d) regarding the application of form release or oil to formwork on the first day (see page 4 of these minutes).

Moving to Section 1717, the Chair explained that proposed Section 1717(f) was added to this section in order to address the petition language, [Section VIII, (2)] pertaining to the need to prohibit employee access to bridge decks during jacking and grading operations. The committee members supported the need for this provision in order to prevent serious and fatal accidents that

have occurred when bridges under construction have collapsed. The Chair noted that the committee had already discussed moving the provisions of existing Section 1721 pertaining to post-tensioning operations to proposed Section 1711(h). There being no further comments regarding the proposal, the review and development of the proposed text was complete.

The Chair then asked if there would be any cost impact that may result from the proposal. He suggested that one area may be the provisions of Section 1711(h)(5) which requires an adequate safe work platform of at least three feet for post-tensioning operations. Brian Miller stated that the design of some buildings would make it challenging to meet this provision. Buildings such as those constructed with “flying deck forms”² may present the need for such safe work platforms to be planned for in the design and contract stages of the structure.

Hart Keeble stated that many of the large concrete form suppliers in Southern California have the added space necessary for the safe work platforms allowed for in their flying deck form systems, although not all of the form suppliers do. Mr. Keeble noted that many of the concerns could be resolved or addressed in the engineering and architectural planning of those structures. Mr. Miller stated that he would need to contact several contractors/entities to confirm what the maximum floor extensions are for some of those structures.

One other example given was parking structures that currently may not be designed to accommodate a three-foot work platform extension beyond the exterior floor slab. Even though Section 1711(h)(5) has an exception for structures with space constraints, it is possible in some cases that scaffolding may be necessary. Another member agreed that many of the concerns could be resolved or addressed in the engineering and architectural planning of those structures which would minimize any cost factors at the planning stages of the project.

With respect to any potential costs associated with the safe three-foot work platform, Fred Codding added that the safe working space would reduce accidents, increase productivity and ultimately result in a cost savings for all employers. Hart Keeble agreed that serious and fatal accidents by will be prevented by this proposal. The benefits to employers, workers and families in preventing those serious injuries far outweigh any initial or planning costs that may be associated with providing a safe working platform for post-tensioning operations.

The Chair stated that the rest of the proposal does not appear to present any concerns related to new or additional costs since the proposal in large part addresses procedures and practices that should already be taking place such as providing a safe worksite, providing impalement protection, fall protection and stability for reinforcing steel structures, formwork and falsework. No other comments forthcoming, the Chair proceeded to explain the rulemaking process and that the committee should next expect the minutes of this meeting, the post-committee roster and the draft proposal most likely by e-mail in the near future.

² A “flying deck form” is defined in the proposal’s definitions section as a prefabricated formwork system for floor slabs incorporating support that is moved in large sections by mechanical equipment (crane, forklift, etc.).

The Chair thanked the members for their time, assistance and participation in developing the proposal and adjourned the meeting.