research report

AISI Standards Development Strategic Planning - Process, Responsibilities and Priorities

RESEARCH REPORT RP17-3

February, 2018

American Iron and Steel Institute

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PREFACE

North American standards for cold-formed steel construction are developed on a six-year cycle by two ANSI-accredited committees of the American Iron and Steel Institute. The completion and publication of the complete suite of AISI design standards in 2015 and 2016 afforded an opportunity for the committees to push back from the grind of balloting changes and engage in some long-range planning. The Strategic Planning Committee of the AISI Standards Council facilitated a process that defined areas of focus (vision statements) for the committees and generated prioritized lists of key issues for the subcommittee to address. This paper provides a description of the strategic planning process and its significant outcomes, which will guide the efforts of AISI standards development over the next cycle and beyond.

The American Iron and Steel Institute is grateful to the following members of the Strategic Planning Committee of the AISI Standards Council who helped manage and guide this effort, and memorialize its findings in this report.

Ben Schafer (chair)	Johns Hopkins University
Jay Larson	American Iron and Steel Institute
Helen Chen	American Iron and Steel Institute

The American Iron and Steel Institute wishes to express their appreciation to the leadership of the AISI standards developing committees.

Committee on Specifications	*Chair*	Rick Haws
Committee on Specifications	*Vice Chair*	Steve Fox
CF-3: Connections and Joints		Perry Green
CF-4: Assemblies and Systems		Vince Sagan
CF-6: Test Based Design		Randy Daudet
CF-22: Stability and Combined Actions		Jim Crews
CF-24: Member Design		Bob Glauz
CF-31: General Provisions		Al Harrold
CF-33: Diaphragm Design		Tom Sputo
Committee on Framing Standards	*Chair*	Roger LaBoube
Committee on Framing Standards	*Vice Chair*	Steve Fox
Framing Design		Pat Ford
Lateral Design		Rob Madsen
Prescriptive Methods		Sutton Stephens
Standard Practices		Jeff Klaiman
Education	*Chair*	Don Allen

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TABLE OF CONTENTS

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AISI STANDARDS DEVELOPMENT STRATEGIC PLANNING – PROCESS, RESPONSIBILITIES AND PRIORITIES

A. BACKGROUND

A1 General

North American standards for cold-formed steel construction are developed on a six-year cycle by two ANSI-accredited committees of the American Iron and Steel Institute. The completion and publication of the complete suite of AISI design standards in 2015 and 2016 afforded an opportunity for the committees to push back from the grind of balloting changes and engage in some long-range planning. The Strategic Planning Committee of the AISI Standards Council facilitated a process that defined areas of focus (vision statements) for the committees and generated prioritized lists of key issues for the subcommittee to address. This paper provides a description of the strategic planning process and its significant outcomes, which will guide the efforts of AISI standards development over the next cycle and beyond.

A2 Process Notes

1. In September 2016, Ben Schafer and Jay Larson met to begin preparatory work.
2. On October 4, 2016, the members of the Strategic Planning Committee (Ben Schafer, Rick Haws, Roger LaBoube, Don Allen, Helen Chen and Jay Larson) met along with several guests (Maribeth Rizzuto and Robert Wills) for a full-day, face-to-face meeting at AISI Headquarters in Washington, DC (Appendix 1).
3. On January 20, 2017, Ben Schafer made a presentation of the recommendations of the Strategic Planning Committee to the AISI Standards Council (Appendix 2). He noted that there were no items requiring immediate action by the AISI Standards Council, but that feedback, questions and comments at this stage would be appreciated. Helen noted that the schedule for the February 2017 face-to-face meetings had been rearranged, with a significant amount of time devoted to the Main Committee meetings to allow for review and discussion of strategic planning for the 2017-2022 development cycle.
4. At the winter 2017 meetings, subcommittees were guided through an exercise to review the focus of the committee, review the scope and responsibilities of the subcommittee, and generate lists of key issues for the subcommittee to consider in the next standards development cycle.
5. Following the winter 2017 meetings, the Strategic Planning Committee compiled and categorized the notes and developed a scheme for prioritizing the key issues, as follows:
   - *Impact*. Define as H, M or L (high, medium or low). The key metric is impact on tonnage, which is influenced by such factors as improvement in cost competitiveness, improvement in reliability, elimination of regulatory barrier, fostering of innovation and new product development and/or applications, increase in number of users/specifiers, etc.
   - *Level of Effort*. Define as 1, 2, 3 or 4 (low-to-high), as follows:
     - 1 = easy / volunteer effort sufficient
     - 2 = moderately easy / needs modest funds for research/contractor
     - 3 = moderately hard / needs significant stakeholder engagement/funding
     - 4 = hard / needs significant external involvement/funding

- *Priority*. Define as green, yellow, orange or red, as follows:
  - Green = delegate to subcommittees
  - Yellow = take to stakeholders (for buy-in and resources) with subcommittees monitoring
  - Orange = take to CFSRC and/or others with Standards Council* monitoring
  - Red = do nothing

Scheme for Prioritizing Key Issues

Impact	Level of Effort			
	1	2	3	4
H	Green	Yellow	Yellow	Orange
M	Green	Yellow	Yellow	Orange
L	Red	Red	Red	Red

* Note: An AISI Standards Council Research Committee could to handle this task.

6. At the summer 2017 meetings, subcommittees reviewed the compiled lists, added any missing items, and assigned the impact and level of effort priorities (*i.e., added priorities that were missing and edited assigned priorities, as needed*). The following was noted:
   - H1 or M1 items should have an action plan (task group, etc.).
   - H2 or M2 items should have a champion(s) to draft a statement of work.
   - H3 or H4 items should have a champion (s), which could be the chair or any member, to draft a statement of work and additional background as needed.
   - For all other items, the prioritization provided by the subcommittee should be utilized to determine a resource allocation plan, with work items potentially to follow.
7. Following the summer 2017 meetings, subcommittee chairs identified the "top 5" items for their subcommittees to work on, and the Strategic Planning Committee then met to organize the output of the process for use at the winter 2018 meetings.

A3 Next Step in Process

8. At the winter 2018 meetings, subcommittees should establish an action item for each of their "top 5" items. These items should be moved to the agenda for the summer 2018 meetings with champions and task groups assigned, as needed.

B. COMMITTEE ON SPEFICICATIONS

B1 General

The AISI Committee on Specifications (COS) is charged by the AISI Standards Council with developing and maintaining standards for construction with cold-formed steel.

Responsibilities of the COS include:

- AISI S100 – Specification
- AISI S310 – Profiled Steel Diaphragm Panel Design
- AISI S900-series – Test Standards

As presented to the AISI Standards Council at its meeting on January 20, 2016, the COS focus (2017-2022) is to leverage analysis to advance CFS structural efficiency and in the long-term enable performance-based design (PBD), or in short "leverage simulation".

B2 Connections and Joints (CF-3)

B2.1 Scope and Responsibilities

The COS Subcommittee on Connections and Joints (CF-3) is charged with developing and maintaining design provisions for construction with cold-formed steel related to connections and joints.

Responsibilities of CF-3 include:

- Chapter J of AISI S100 – Connections and Joints
  - General Provisions
  - Welded Connections
  - Bolted Connections
  - Screw Connections
  - PAF Connections
  - Rupture
  - Connection to Other Materials

B2.2 Key Issues for Next Cycle

Key issues for CF-3 to consider in the next standards development cycle were identified, as follows:

- Maintain and improve strength limit state predictions for connections and joints:
  - M2 - Update fastener prediction based on fasteners in current use (*vs. older int'l. testing*)
  - M2 - Improve transverse fillet weld predictions
  - L2 - Settle block shear vs. tear-out predictor expressions
  - M2 - Implement results from UNT load bearing clip angle design project in standard
  - M3 - Develop SAE bolt prediction equations
  - L1 - Explore slip-critical and pretensioned bolted connections ($t \leq 3/16$")
  - L3 - Screw Pullover and pullout with and without insulation (*from CF-4*)
- Improve (strength) reliability application for connection/joint strength:
  - M1 - Provide clarity in connection design objectives (from COFS)
  - L1 - Define consequence of existing strength limit states

  - H3 - Define target reliability for connections and joints
    - For case when nothing is known about system
    - For case when system application is known
    - As a function of consequence of failure (*see ASCE 7-16*)
    - For different levels of QA/QC (*say field vs. factory*)
  - M1 - Update standards based on selected/justified target reliabilities
- M2 to H3 - Encourage innovation in the application of fastening technology:
  - M2 - Foster deeper engagement w/current stakeholders (producers/suppliers/manufacturers):
    - Welding
    - Bolts
    - Screws
    - PAFs
  - H3 - Identify and engage new stakeholders (producers/suppliers/manufacturers): (*survey of technology → proof of concept applications → prioritize*)
    - Adhesives
    - Clinching
    - Rivets
    - Other: _____
- H3 - Identify and clear barriers to use of proprietary (*i.e., non-standard*) solutions through:
  - Tests (*i.e., improved and expanded suite of AISI test standards and guidance*)
  - Rational engineering analysis (*i.e., improved and expanded use of simulation*)
- L1 to M2 - Improve and expand suite of AISI test standards and guidance (*w/CF-6*):
  - M2 - Develop new test standards
    - Specific topics: e.g., for new fastener technologies
  - L2 - Encourage consistency in (*i.e., establish standards for*) reporting results
    - For AISI standards (*e.g. AISI S310 model vs. current AISI S100 model*)
    - For manufacturers' data
  - L1 - Encourage use of consistent terminology
    - Across AISI standards
    - Across manufacturers' data
- H4 - Encourage and expand use of simulation of CFS connection and joints:
  - Establish state-of-art (understand current capabilities) (*e.g., MBMA rod bracing*)
  - Develop guidance/practice documents (spread the capabilities)
  - Validate the tools and methods (and define applicability limits)
  - Establish standards (standardize the methodology)
  - Improve existing provisions (*e.g. resolve old issues like block shear*)
  - Develop new provisions (*e.g., address new issues like insulation between plies*)
  - Develop new provisions for new fastener technologies
- Expand connection predictions to full range for evaluating performance of systems:
  - M2 - Aggregate experimental summary of full connection performance
  - M1 - Align and make explicit connection performance expectations across AISI standards
    - For seismic review S310, S100, S400, ASCE 41

  - H2 - Develop and agree on idealized models for full connection performance
    - Review ASCE 41 approach
    - Consider initial stiffness, ductility, post-peak cap, strain rate effects (at least)
  - H2 - Provide methods for predicting connector performance
    - Classical expressions, simulation guidelines, test standards, etc.
  - H2 - Integrate developed approaches with CFS system modeling/prediction

B2.3 Liaisons

Key relationships and liaisons for CF-3 to maintain were identified, as follows:

- AISC TC 6 on Connection Design - Larry Kruth
- AWS - Tom Sputo
- RCSC - Al Harrold

B2.4 To/With Education Committee

Items to be pursued by CF-3 in collaboration with the Education Committee were identified, as follows:

- Welding vs. fastening decision-making for the designer
- System reliability education, history of target reliability, where we are at today, more
- Understanding the intersection of connection choice inclusive of labor and economics

B2.5 To/With/From Other Subcommittees

Items to be pursued by CF-3 in collaboration with other technical subcommittees were identified, as follows:

- Improve and expand suite of AISI test standards and guidance → w/CF-6

B2.6 Prioritized "Top 5" Items (from Chairperson)

The following were prioritized by the CF-3 chair as a "Top 5" item:

- Improve (strength) reliability application for connection/joint strength
  - Provide clarity in connection design objectives (M1)
  - Define consequences of existing strength limit states (M1)
  - Define target reliability for connections and joints (H3)
    - For case when nothing is known about system
    - For case when system application is known
    - As a function of consequence of failure (see ASCE 7-16)
    - For different levels of QA/QC (say field vs. factory)
- Encourage innovation in the application of fastening technology
  - Foster deeper engagement w/current stakeholders (producers/suppliers/mfrs) (M2)
    - Welds, bolts, screws and PAFs
  - Identify and engage new stakeholders (H3)
    - Adhesives, clinching, rivets and other
- Improve and expand suite of AISI (connection) test standards and guidance (this would be done along with /CF-6)
  - Develop new test standards (M2)
  - Encourage consistency in (i.e., establish standards for) reporting results (L2)

  - Encourage use of consistent terminology (L1)
- Update, validate, confirm screw fastener predictions in Chapter J
  - Update fastener prediction based on fasteners in current use (vs. older int'l. testing) (M2)
  - Screw Pullover and pullout with and without insulation (from CF-4) (M1)
  - Prying action on screws on pullout and pullover (M1)
- Develop SAE bolt prediction equations Chapter J (M3)

B2.7 Suggested Additional Items (from Strategic Planning Committee)

The following additional items were suggested for CF-3 to pursue by the Strategic Planning Committee:

- Improve transverse fillet weld predictions (M2)
  - Existing small project fellowship on this topic, report next time (Torabian champion).
- Settle block shear vs. tear-out predictor expressions (M1)
  - Subcommittee ballot already exists. Not aligned with Australia on this now.
- Implement results from UNT load bearing clip angle design project in standard (M1)
  - Ongoing project with PMTG in place, possibility of more work to implement needed.
  - Will this even go in Sub3, or will it go to COFS Design Methods?

B3 Assemblies and Systems (CF-4)

B3.1 Scope and Responsibilities

The COS Subcommittee on Assemblies and Systems (CF-4) is charged with developing and maintaining design provisions for construction with cold-formed steel related to assemblies and systems, with the exception of diaphragms. For diaphragms, CF-4 is to collaborate with CF-33.

Responsibilities of CF-4 include:

- Chapter I of AISI S100 – Assemblies and Systems
  - Built-up Sections
  - Floor, Roof, or Wall Steel Diaphragm Construction
  - Mixed Systems
  - CFS Light-Frame Construction
  - Special Bolted Moment Frame Systems
  - Metal Roof and Wall Systems
  - Rack Systems

(*Need scope clarity between CF-4 and CF-22 on system stability issues.*)

B3.2 Key Issues for Next Cycle

Key issues for CF-4 to consider in the next standards development cycle were identified, as follows:

- Improve strength design method for built-up/composite members:
  - H1 - Determine subcommittee responsibility:
    - If method focuses on providing a path to design as a member → Sub 24 purview

    - If method focused on designing as assembly of different bits → Sub 4 purview
  - H2 - Develop general strength method for all-steel built-up members → COFS/Sub24
    - Leverage int'l and domestic research to improve existing provisions (*this is in Ch. I but better for Sub 24 to handle this work*)
  - H4 - Develop general strength method for comp. (conc.) members → COFS/Sub 24
    - H1 - Determine if provisions go in Section I3 or appendix or new standard
    - H4 - Develop general approach to continuously and discretely braced system where (partial) composite action is considered → Sub24
    - H4 - Maintain efficient/prescriptive approach to same systems → COFS/ others
- M1 - Determine whether/how to achieve "convergence" on how various CFS systems are handled
  - M1 - Diaphragm-like behaviors (*e.g., shear wall where we ignore all of the details and just give full capacity, versus a steel diaphragm where we design against many limit states and use very fine resistance factor calculations, as an example*)
  - M1 - Braced-member/system behavior (*e.g., COFS joist with sheathing allowing full capacity with no specific checking vs. a beam in RMI that spends a lot of time trying to figure out how pallets brace a beam; or purlin continuous sheeting bracing vs joist/stud continuous sheathing bracing; or roof truss bracing vs. others*)

(*The scope and responsibility of what Ch. I references is an important conduit for AISI S100's ability to fully support CFS systems. In essence the subcommittee should understand what is in the reference standards - generally applicable information should be in Ch. I for all systems to take advantage of, system specific information should continue to live where it is best served (in other standards, sometimes in Ch. I, etc.). This is a fair bit of work for the committee and needs to be considered an important work item on its own.*)

- H1 - Coordinate with CFS stakeholders and their standards; serve as liaison and clearinghouse for the systems that it supports/references in Chapter I.
  - H1 - Framing (COFS/SFIA):
    - Discuss latest trends in the use of CFS framing systems and examine what changes in AISI S100 are needed, etc.
    - Handle coordination issues between the AISI framing standards and AISI S100 and process/monitor corrections, back-and-forth, etc. as needed.
  - H1 - Roof and Wall Systems (MBMA/MCA):
    - Discuss latest trends in the use of CFS in metal building systems and examine what changes in AISI S100 are needed, etc.
    - M1 - Consider whether the metal and wall roof material should move into an appendix or its own standard.
  - H1 - Racks (MHI/RMI):
    - Discuss latest trends in the use of CFS in rack systems and examine what changes in AISI S100 are needed, etc.

        - Handle coordination issues between the MHI/RMI standards and AISI S100 and process/monitor corrections, back-and-forth, etc. as needed.
    - H1 - Deck (SDI):
        - Discuss latest trends in the use of CFS in deck systems and examine what changes in AISI S100 are needed, etc.
        - Handle coordination issues between the SDI standards and AISI S100 and process/monitor corrections, back-and-forth, etc. as needed.
        - Coordinate with Roof Systems
    - M1 - Joists (SJI):
        - Discuss latest trends in the use of CFS in joist systems and examine what changes in AISI S100 are needed, etc.
        - Handle coordination issues between the SJI standards and AISI S100 and process/monitor corrections, back-and-forth, etc. as needed.
    - M1 - Consider other opportunities for engagement:
        - L1 - NAAMM - National Association of Architectural Metal Manufacturers
        - M1 - Solar panel support structures
        - L3 - Sheet piling
        - Other: _____

(*Strategic Planning's expectation is that the above effort will take regular (meeting) time, and a fair bit of coordination and sharing.*)

- Catalog and monitor CFS assemblies and systems under CF-4 consideration (by AISI staff)
- Organize and goal set for Metal Building Wall and Roof Systems (*This system is recognized for this subcommittee as having separate status, since it is fully detailed in Chapter I, and the subcommittee chair has vested interest*)
    - H1 - Decide on separate reference vs. staying in Chapter I (both acceptable, but decide)
    - M3 - Resolve North American differences in system - such as base test for Canada
    - H3 - Expand use of analysis path for structural strength limits states as initiated in S100-16 (eliminate base test method through analysis)
    - M3 - Support use of analysis path for anchorage forces etc. (Align Moen and Seek work)
    - H3 - Examine and determine action regarding disconnect between analysis for bracing and determination of strength in purlin roof systems
    - H2 - Monitor and implement work on purlins with paired torsion braces (small project) (*See simulation, system reliability, and performance-based efforts of this subcommittee*)
    - L1 - Define and mitigate differences for CFS walls and roof design when it matches metal building applications vs. when similar systems are used in other buildings (potential overlap issues between S310 and S100 Chapter I, metal wall and roof systems) (*e.g., design a wall/roof system by Chapter I vs. similar system by S310*) (*Is this limited to steel construction, or is wood post and beam construction included (NFBA)?*)
    - M1 - Help maintain and improve test standards S906, S908, S912

  - H2 - (Maintain) tweaks to deal with wind loads
- H3 - Develop CFS system provisions (guidance) that leverage/support structural simulation of CFS systems or assemblies and reduce testing (*The ideas, and terms, and maybe objectives are defined here/Ch I. for (structural) system models and then the various other standards and sections pickup those ideas/terminology and use them in describing and expanding their system simulation applications - for example provisions for shear walls. Parallel to Sub 24 but for systems.*)
  - H3 - Support system linear analysis: (*This is our current practice for finding demands, and how our capacities are then used. Goal here is to understand the assumptions that we make today implicitly in our linear analysis.*)
    - Support integration of member and connection level information
    - For each assembly/system committee is pursuing
      - Examples (current practice benchmarks)
  - H3 - Support system linear buckling analysis (*This is not generally used today at system level.*)
  - H3 - Support system geometric nonlinear analysis (*New for AISI we need to get torsion nailed down for future system analysis work. Goal here is to understand the impact of the Ch. C provisions we have approved and learn how to use them better, modify them as needed, and keep up with AISC provisions.*)
    - M2 - Expand System Linear Analysis examples to Geometric Nonlinear per Ch. C
      - For each example determine barriers, suggest solutions, assess impact
      - Include at least some systems with sheathing/sheeting bracing
    - H2 - Support Sub 24's work to improve how we handle unsymm. members + torsion
  - M4 - Support system material nonlinear analysis (*Plastic mechanism analysis not typically used for AISI at this time.*)
  - M3 - Support system geometric and material nonlinear analysis w/ imperfections (*New. Gives the potential to replace the member checking in AISI S100 with analysis. Goal here is to make an entirely new provisions/guidance that allows us to skip the traditional specification approach as much as possible and replace it with system analysis.*)
    - Guidance/provisions on imperfection modeling for CFS systems
    - Guidance/provisions on connection modeling within the CFS system
    - Guidance/provisions on system boundary conditions
    - Guidance/provisions on solution specific issues: solver, computer efficiency, etc.
- H4 - Encourage and develop supporting provisions for (non-structural) simulation of CFS assemblies (Engage stakeholders to understand where CFS has comparative advantage when we pursue such simulations → determine how to verify such models → determine how to validate such models → determine how to gain building official acceptance of such models.)
  - M2 - Thermal
  - H3 - Fire
  - H3 - Acoustic
  - ? - Nonstructural - COFS?
  - Other: _____

- M3 - Develop and propagate a consistent methodology for incorporating system reliability:
  - H3 - Establish and agree to (system) reliability targets (*See ASCE 7-16 as starting point. Consider probability of failure and consequence of failure.*)
  - H3 - Establish formal methodology for system reliability calculation (*NSF SysRel project begins this effort for floors, shear walls, and trusses; FEMA P695 as seismic example. Define your systems/archetypes. Can be expansive. Define your system demand, and how to simulate and use the results.*)
  - M3 - Implement methodology in the standards (*E.g., blanket system phis applied across components, improved phi factors for individual checks, phi=xx if I do not know the system and phi=yy if joist of a "CFS floor system".*)
- M4 - Serve as performance-based design conduit:
  - Develop positions with stakeholders on two major aspects of PBD for CFS Systems
    - M4 - (1) Providing means to predict higher levels of performance than current code minimum (*This is the carrot for seismic PBD = lower insurance costs.*)
    - H3 - (2) Create provisions that stimulate innovation (new products and design) as non-prescriptive as possible (*Steel joists as an example in this context to some extent. E.g. for each chapter/section we have our performance objectives clearly stated and then have our deem-to-comply provisions provided as follows; i.e., Ch. C. is a model.*)
  - H1 - Where maximum benefits exist for 1 or 2 (above) make an implementation plan.
  - H3 - Expand fundamental knowledge of CFS as Systems:
    - H3 - Create system specific performance objectives.
    - M3 - Leverage modern sensing to quantify current CFS performance in situ.

B3.3 Liaisons

Key relationships and liaisons for CF-4 to maintain were identified, as follows:

- COFS Design Methods Subcommittee - Pat Ford
- MBMA - Vince Sagan
- RMI - Jim Crews or Victor Azzi (dedicated responsibilities in comm. education)
- SDI - Tom Sputo
- SJI - Jim Fisher

B3.4 To/With Education Committee

No items to be pursued by CF-4 in collaboration with the Education Committee were identified.

B3.5 To/With/From Other Subcommittees

Items to be pursued by CF-4 in collaboration with other technical subcommittees were identified, as follows:

- Scope clarity on system stability issues → CF-22
- Improve strength design method for built-up/composite members → CF-24 and COFS
- Are current test standards sufficient → CF-6

- Pullover and pullout with insulation → CF-3
- Torsion → CF-24 to start, CF-22 for combined, eventually comes back here
- Coordinate with rack standard advances (from CF-22)

B3.6 Prioritized "Top 5" Items (from Chairperson)

The following were prioritized by the CF-4 chair as a "Top 5" item:

- Determine subcommittee responsibility for built-up members (H1)
  - Sub 4 committee wants this in their scope. Complete.
- Develop general strength method for all-steel built-up members, leverage international and domestic research to improve existing provisions (H2)
  - First step is to get an update on current state of the art.
  - Task Group - Ben Schafer, Rob Madsen - get more members involved.
- Develop general strength method for composite (concrete) members (H4)
  - Existing Ad Hoc Task Group exists – will report up through Sub4 for now.
  - Determine if provisions go in Section IXXX or appendix or new standard.
  - Develop general approach to continuously and discretely braced system where (partial) composite action is considered.
  - Maintain efficient/prescriptive approach to same systems for COFS/ others.
  - Transform Ad Hoc Group into a formal steering group, invite other interested members, schedule meetings, including separate meetings during AISI COS meetings, add to meeting agenda.
- Coordinate with CFS stakeholders and their standards; serve as liaison and clearinghouse for the systems that it supports/references in Chapter I (H1)
  - Jay Larson will provide Chair a contact list for future meeting. Confirm contacts for stakeholders, add them to meeting agenda.

    Note: The Strategic Planning Committee suggests that this item be expanded so that CF-4 serves not just as passive liaison and clearinghouse, but also as active mechanism to pull information from stakeholders and push information to stakeholders. (Perhaps the AISI Steel Industry Code Forum can be leveraged in this regard.)

- Metal Building Wall and Roof Systems
  - Decide on separate reference vs. staying in Chapter I. (H1)
  - Modify provision to deal with ASCE 7-16 wind load, particularly for low slope components. Form task group – Al Harrold, Vince Sagan. Will report back next meeting with plan. (H2)
  - Monitor and implement work on purlins with paired torsion braces. (H2)
  - Expand use of analysis path for structural strength limits states as initiated in S100-16 (eliminate base test method through analysis) - long -term objective. (H3)
  - Examine and determine action regarding disconnect between analysis for bracing and determination of strength in purlin roof systems. (H3)
- Monitor the structural impact of non-structural simulation - fire, acoustic, thermal, etc. (M1)
  - Discuss with Main Committee and AISI on how to keep up with all the non-structural work that impacts us and how to deal with this. Sub 4 wants to focus on structural impact. Develop a plan with Committee input, on

engaging with the other existing groups and have them provide their expertise.

- Develop and propagate CFS system provisions, a consistent methodology for incorporating system reliability (H4)
  - Provide home for Analysis Task Group efforts, add to meeting agenda.
- Serve as incubator for performance-based design (PBD) for CFS systems (M4)
  - Bring internal stakeholders up to speed, perhaps using Steel Industry Code Forum (SICF) with Analysis Task Group assisting progress
  - Create task group
  - Develop objectives for provisions that allow and stimulate innovation, first by getting an update on state-of-the-art by surveying international practice and other industry practices

B3.7 Suggested Additional Items (from Strategic Planning Committee)

The following additional items for CF-4 to pursue were suggested by the Strategic Planning Committee:

- Monitor activities of CF-24 (H1)
  - Interaction solution for P+M+M+T (torsion interaction).
- Support CF-22's effort to coordinate with rack standard advances (M1)
  - With CF-22, have webinar or workshop on rack design (e.g., James Parker at SGH).

B4 Test Based Design (CF-6)

B4.1 Scope and Responsibilities

The COS Subcommittee on Test Based Design (CF-6) is charged with developing and maintaining test standards and design provisions for construction with cold-formed steel related to test based design.

Responsibilities of CF-6 include:

- AISI S900-series test standards
- Chapter K of AISI S100 – Strength for Special Cases
  - Test Standards
  - Tests for Special Cases
    - Tests for Determining Structural Performance
    - Tests for Confirming Structural Performance
    - Tests for Determining Mechanical Properties

B4.2 Key Issues for Next Cycle

Key issues for CF-6 to consider in the next standards development cycle were identified, as follows:

- Evolve and improve AISI test standards:
  - M1 - Ensure alignment of available test standards with needs of stakeholders (monitor subcommittee membership with staff help).
  - L1 - Simplify development of new test standards (e.g., improve template, maybe even develop an online test standard development model).
  - Support more testing alternatives for meeting test objectives in the standards
    - H1 - Subcommittee discussion

    - L2-M2 - Development of alternatives
  - Support more general use of test methods across a given limit state
    - M2 - State all performance objectives for test standards clearly (*start with discussion for example flexural test standard*).
  - M1-M3 - Regularly review and adopt best test practices from competing material standards (*membership reach-out even to users of other materials, surveys among members or larger groups*).
  - H1-H2 - Develop "prototype" test standard that is more performance-based in its structure. (*Establish clear charging language on test objective and its use with design standard. Provide an Appendix with deemed to comply testing method. Identify potential test standard that might benefit from this approach; e.g., S905, new deck, flexure.*)
  - H1-H2 - Review all limit states in S100 and catalog if test-based path exists. (*If test path exists - is path explicit? If test path does not exist - should one be developed?*)
  - L1-L2 - Evaluate if test standard performance objectives are clearly identified and aligned, or if test standards even exist, with final building/system performance as intended
  - L4 - Develop a parallel review on the use of simulation for every limit state (*Assess capability of current simulation to provide accurate predictions. If accurate - develop guidance on how to simulate. If not accurate - what research is needed to improve situation.*)(for consideration by Analysis TG)
  - M1-M3 - Provide full response of component from test when beneficial (e.g. for system model).
  - Consider alternative methods for "packaging" test standards (one standard, etc.)
    - H1 - Discussion (*such as if we should consolidate into one test standard*).
    - M2 - Development "packaging" (*as an example, online searching with or by Education Committee*)
- Identify ways to ease and speed up product evaluation and approval:
  - H1 (AISI staff effort) - Tighter coordination with evaluation services
  - H1 (AISI Staff and Steel Industry Code Forum (SICF)) - Pre-approved pathways (how to make it more efficient)?
  - H1 (AISI staff and SICF) - More test standards?
  - H1 (SICF) - Cost/availability of qualified testing agencies.

(*Need to decide if CF-6 or other group takes lead on developing simulation path.*)

(*Need to decide if Chapter K should be "home" for simulation path provisions.*)

- Support simulation as alternative path for limit states design:
  - M1 - Discussion whether FEM (*computer modeling*) be the future of testing
  - L4 - Explore/pursue the FEM (*computer modeling*) approach
  - L4 - Prequalified modeling
  - L4 - Consider developing prescriptive guidance on use of simulation:
    - "Pre-qualified" modeling path if guidance followed
  - L4 - Develop standardized test vs. model evaluation for simulations:
  - L4 - Determine how to consider uncertainty in simulation-based methods (*e.g., phi factor? Monte Carlo?*)

  - L4 - Education/feedback for acceptance of simulation-based design (→ Education)
    - Engage building officials
    - Engage evaluation services
    - Engage consulting engineering practitioners
- L4 - Support and develop assembly-based testing/simulation methods (Catalog existing test methods that are assembly methods → ensure clarity in performance objectives of assembly testing → prioritize where knowing assembly performance has potential to improve efficiency → provide assembly-based reliability factors for assembly testing. Consider performance vs. confirmatory testing.)
- M4 - Support test or simulation of non-structural performance objectives; e.g., fire, acoustic, thermal
  - L1 - Determine test methods outside of current AISI scope, but in regular use for CFS (Idea here is that CF-6 should understand all tests that are important to CFS products not just the test standards that AISI directly supports, and when appropriate act to "improve" the situation wherever possible.).
  - N/A - Understand costs of existing tests and target barriers:
  - L1 - Develop alternative paths to tests etc. that are acting as market barriers.
    - L1 - Investigate tests that can serve for multiple performance objectives.
  - N/A - Support test or simulation alternatives.
- Miscellaneous:
  - L1 - Encourage use of high-strength steel (possible benefit of efforts here).
  - H1 - Discuss does Sub 6 support simulation efforts or focus only on the test standard aspects?
  - H1 - Discuss does CF-6 or other group take lead on developing simulation path?
  - H1 - Discuss is Chapter K of AISI S100 or other the "home" for simulation path provisions?

B4.3 Liaisons

Key relationships and liaisons for CF-6 to maintain were identified, as follows:

- ICC-ES - Bill Gould
- IAPMO - Brian Gerber
- SICF (Steel Industry Code Forum) – Jay Larson

B4.4 To/With Education Committee

Items to be pursued by CF-6 in collaboration with the Education Committee were identified, as follows:

- Education/feedback for acceptance of simulation-based design

B4.5 To/With/From Other Subcommittees

No items to be pursued by CF-6 in collaboration with other technical subcommittees were identified.

B4.6 Prioritized "Top 5" Items (from Chairperson)

The following were prioritized by the CF-6 chair as a "Top 5" item:

- Develop "prototype" test standard that is more performance-based in its structure

(H1)
  - Establish clear charging language on test objective and its use with design standard. Provide an Appendix with deemed to comply testing method. Identify potential test standard that might benefit from this approach; e.g., S905, new deck, flexure. Provisional standard S922 is this, in the long run improve S905 as well.
- Review all limit states in S100 and catalog if test-based path exists (H1)
  - If test path exists - is path explicit? If test path does not exist - should one be developed?
  - Champion/TG? Chair-Ben (members),Vince (I),Cris (conn.)
- Development "packaging" (as an example, online searching with or by Education Committee) (M2)
  - Maribeth – effort with VA codes have direct links, possible information here.
  - Another example, video of test can be super powerful for specifier, for testing agent, etc.
- Consider alternative methods for "packaging" test standards (one standard, etc.) (H1)
  - Discussion (such as if we should consolidate into one test standard, could this help with easing acknowledgment (visibility?) in building codes – note TS are listed in S100-16 now).
  - This will be on agenda at next meeting.
- Identify ways to ease and speed up product evaluation and approval
  - (AISI staff) - Tighter coordination with evaluation services. (H1)
  - (AISI staff and AISI Steel Industry Code Forum) - Pre-approved pathways (how to make it more efficient)? (H1)
  - (AISI staff and AISI Steel Industry Code Forum) - More test standards? (H1)
  - (AISI Steel Industry Code Forum) - Cost/availability of qualified testing agencies. (H1)
    - Committee still sees importance of this overall issue, testing one aspect of the coordination above, issue here is more one of education on when evaluation and approval is needed. Some of this is outside of the scope of the test standards committee.
  - Education of building officials, specifiers, more on product evaluation and approval (H4)
    - Tom Sputo/SDI willing to champion an aspect of this → Education?

B4.7 Suggested Additional Items (from Strategic Planning Committee)

The following additional items for CF-6 to pursue were suggested by the Strategic Planning Committee:

- Regularly review and adopt best test practices from competing material standards (membership reach-out even to users of other materials, surveys among members or larger groups) (H1)
  - Establish liaisons and regular reporting
    - AWC (wood light-framed shear walls, diaphragms, etc.)
    - TPI (metal plate connected wood trusses)
    - Etc.

B5 Stability and Combined Actions (CF-22)

B5.1 Scope and Responsibilities

The COS Subcommittee on Stability and Combined Actions (CF-22) is charged with developing and maintaining design provisions for construction with cold-formed steel related to stability and combined actions.

Responsibilities of CF-22 include:

- Chapter C of AISI S100 – Design for Stability
  - System analysis (even if simplified), usually frame analysis, P-(D)delta
- Chapter H of AISI S100 – Members under Combined Forces
  - Member analysis, just how to combine demands and capacities

(*Need scope clarity between CF-4 and CF-22 on system stability issues.*)

B5.2 Key Issues for Next Cycle

Key issues for CF-22 to consider in the next standards development cycle were identified, as follows:

- Develop improved system stability (geometric nonlinear) analysis methods:
  - M1 - Partner with COFS for simplifications related to CFS framing and Ch. C
  - H1 - Keep up with and leverage system stability analysis methods of AISC (*AISC TC 3 - Ron Ziemian is chair*)
    - H1 - Fine tuning reduced stiffness tau
    - H1 - Nomenclature
    - M1 - Parallel version of AISC Appendix 1 (*Direct Modeling with Member Imperfections*)
  - L1 - Review Aluminum Association adaptations of system stability analysis
  - L1 - Review AS/NZS 4600 (CFS) and AS 4084 (rack) for system stability analysis
- Improve/expand bracing provisions:
  - L2 - Insure rational analysis/performance-based path through bracing
  - H2 - Implement brace force/stiffness accumulation provisions (flexure and torsion)
  - L3 - Further clarify/develop notions of stability (2nd order) and torsion (1st order) bracing
  - L2 - Partner w/ stakeholders for practical/effective bracing solutions (*SJI, CFS truss, SFIA…*)
- Improve/expand design of members under combined actions:
  - M3 - Implement new DSM beam-column design provisions:
    - M3 - Provide interaction solution for P+M+M+T (torsion interaction)
    - L4 - Combined torsion with other failure modes (bending to start) (software?)
  - H2 - Improve efficiency for assessing combined actions:
    - H2 - Simplify application (tools or methods) of analysis under combined actions
    - H2 - Speed up (pre-processing etc.) analysis under combined actions
    - H2 - Support improvements in software that analyzes CFS in combined actions

  - M3 - Enable simulation methods for members combined actions:
    - H1 - Support CF-24 developments and extensions to combined actions, i.e., "Develop CFS member provisions (guidance) that leverage/support simulation of CFS systems"

B5.3 Liaisons

Key relationships and liaisons for CF-22 to maintain were identified, as follows:

- COFS Design Methods Subcommittee - Pat Ford
- AISC TC 3 on Loads, Analysis & Stability - Ron Ziemian (chair)
- Aluminum Association - ??? (Ron Ziemian is on AA committee)
- AS/NZS 4600 and AS 4084 - Greg Hancock (we need someone at meetings)
- RMI - Jim Crews or Victor Azzi (dedicated responsibilities in comm. education)
- SJI - Jim Fisher
- CFS truss industry - Bill Babich (TrusSteel) and Mike Pellock (Aegis)
- SFIA - Pat Ford

B5.4 To/With Education Committee

Items to be pursued by CF-22 in collaboration with the Education Committee were identified, as follows:

- M1 -Basic education on PBD
  - M1 - Standards development models to follow
  - M1 - PBD as removing prescriptions vs. PBD as different performance levels
- H2 -System stability (Ch C) examples aligned with real world applications

B5.5 To/With/From Other Subcommittees

Items to be pursued by CF-22 in collaboration with other technical subcommittees were identified, as follows:

- M2 - Simplifications related to CFS framing and Ch. C → COFS
- M1 - Coordinate with rack standard advances → CF-4
  - M1 - RMI presentations regularly
  - M1 - Stability analysis updates
  - M1 - System stiffness implementations
  - M1 - Connection stiffness (inc. hysteretic) implementations
  - M1 - Members with holes implementations
  - M1 - CFS/hot-rolled steel merged and how they do that..
- L4 - Manufacturing cost of new, custom or complex sections → w/stakeholders at CF-24
- M2 - Scope clarity on system stability issues (from CF-4)
- L4 - Torsion → CF-24 to start, CF-22 for combined, eventually comes back to CF-4
- H2 - DSM Beam-column implementation (from CF-24)

B5.6 Prioritized "Top 5" Items (from Chairperson)

The following were prioritized by the CF-22 chair as a "Top 5" item:

- Improve/expand bracing provisions - Implement brace force/stiffness accumulation provisions (flexure and torsion) (H2)
  - The ballot for accumulation of brace forces (and required stiffness) is on hold due to concerns from the cold-formed framing group that believes there may

be too much added cost incurred if this ballot is passed. We need to have feedback at the next meeting on how to resolve this concern. (Example – the effects of sheathing are not included.)

- Improve/expand bracing provisions - Partner w/ stakeholders for practical/effective bracing solutions (SJI, CFS truss, SFIA…) (M2)
  - See above note for item 1.
- Improve/expand bracing provisions - Further clarify/develop notions of stability (2nd order) and torsion (1st order) bracing (M3)
  - First clarify terminology and then the methodology. Some added commentary language may be needed that differentiates the two and shows examples of each and also some examples of when each is needed.
- Improve/expand design of members under combined actions - Implement new DSM beam-column design provisions (H1)
  - New specification provisions from the study by Shahab Torabian report have yet to be put in ballot form. We should work to complete this task. Chapter H is our other responsibility.
- Improve/expand design of members under combined actions - Improve efficiency for assessing combined actions (H2/3)
  - Simplify application (tools or methods) of analysis under combined actions.
  - Speed up (pre-processing etc.) analysis under combined actions.
  - Support improvements in software that analyzes CFS in combined actions.
  - Once we know what the above changes will be we need to make sure these can easily be used in day-to-day design where they apply. Software tools are a must. (CUFSM and MASTAN.

B5.7 Suggested Additional Items (from Strategic Planning Committee)

The following additional items for CF-22 to pursue were suggested by the Strategic Planning Committee:

- Keep up with and leverage system stability analysis methods of AISC (H1)
  - AISC TC 3 - Ron Ziemian is chair.
- Monitor activities of CF-24 (H1)
  - Interaction solution for P+M+M+T (torsion interaction).
  - CFS member provisions (guidance) that leverage/support simulation of CFS systems.
- Coordinate with rack standard advances (M1)
  - With CF-4, have webinar or workshop on rack design (e.g., James Parker at SGH).

B6 Member Design (CF-24)

B6.1 Scope and Responsibilities

The COS Subcommittee on Member Design (CF-24) is charged with developing and maintaining design provisions for construction with cold-formed steel related to member design.

Responsibilities of CF-24 include:

- Section B4 of AISI S100 – Dimensional Limits and Considerations
- Chapters D, E, F and G of AISI S100 – Members

- Appendix 1 of AISI S100 – Effective Width of Elements
- Appendix 2 of AISI S100 – Elastic Buckling of Members

(*The defining feature of CF-24's scope is the CFS member under single actions. This alone encompasses a huge range, as CFS members are generally unsymmetric, and there is growing interest in non-prismatic shapes, and analysis of even the individual member is not a settled issue; e.g. torsion.*)

B6.2 Key Issues for Next Cycle

Key issues for CF-24 to consider in the next standards development cycle were identified, as follows:

- Maintain and improve strength limit state predictions for members:
  - M3 - Enable use of higher strength steels:
    - M3 - Steels up to Fy=150 ksi (1000 MPa)
    - L4 - Steel up to Fy=300 ksi (2000 MPa)
  - H2 - Enable unique CFS members:
    - H2 - Members for structural applications
    - M3 Members for multiple objectives (acoustic, thermal, composite, etc.)
  - H2 - Bending provisions for non-symmetric sections
    - H2 - Geometric axes vs Principal axes vs Load direction
    - H2 - Calculation of My using unsymmetric bending stresses
    - M2 - Effective widths using unsymmetric bending stresses
    - M1 - Guidance on stress distribution for numerical methods
    - NA - Biaxial bending interaction equation (→Sub 22)
  - H3 - Develop and validate a design method for torsion:
    - H3 - Direct torsion in CFS members
    - NA - Actions combined with torsion (→Sub 22)
  - M2 - Resolve EWM vs. DSM differences and long-term path:
    - M2 - DSM vs. EWM for deck
  - ?? - Resolve web crippling of steel deck
  - M2 - Simplification of web crippling provisions
  - M2 - Warping restraint provided by end bearing (angles)
  - M2 - Integrate international thin-walled member design research into AISI S100: (*understand → prioritize → code proposal → design example → iterate → vote*)
    - M2 - Generalized web crippling research (DSM) - TU-Lisbon
    - L1 - Shear research - Sydney
    - L1 - Localized loading - Sydney
    - L2 - Local-distortional interaction - TU-Lisbon + others
    - L2 - Distortional-global interaction - TU-Lisbon + Hong Kong
    - L2 - LTB changes at AISC - Don White
    - L2 - LTB improvements at Eurocode - not sure
    - L2 - Single angle provisions - (Beyond updated commentary)
    - M1 - Member response under elevated temperature (gradients) (establish AISI objective in this space → review of available methods; e.g., AISC and AS standards → establish retention factors → establish response → codify as needed; i.e., design guide or specification)

- Improve (strength) reliability application for member strength:
  - M1 - Provide clarity in member design objectives
  - M1 - Define consequence of existing strength limit states
  - M2 - Define target reliability for members:
    - L1 - For case when nothing is known about system
    - M1 - For case when system application is known
    - M1 - As a function of consequence of failure (see ASCE 7-16)
    - M2 - For different levels of QA/QC (as appropriate)
    - Note: Consider impact of overly-specifying phi/omega (*e.g. web-crippling*)
  - M1 - Update standards based on selected/justified target reliabilities
- Encourage innovation in the application of materials and manufacturing technology:
  - M1 - Foster deeper engagement w/current stakeholders (producers/suppliers/manufacturers):
    - M1 - Higher strength grades
    - M1 - New, custom or complex sections
  - M1 - Identify and engage new stakeholders (producers/suppliers/manufacturers):
    (*survey of technology → proof of concept applications → prioritize*)
    - NA - Rotary clinching (→Sub 3, 4, 31?)
    - M1 - Tailor-welded blanks and coils
    - L1 - Stamping
    - L1 - Hydroforming
    - Other: _____
- Develop CFS member provisions (guidance) that leverage/support simulation of CFS systems
  - M2 - Support member linear analysis: (C*urrent practice for finding demands and how capacities are used.*)
    - L1 - Provide/support unique cross-section property calculations of CFS members
    - M2 - Provide accurate secant stiffness predictions for CFS members
    - M2 - Maintain accurate strength limit state predictions (see above)
  - M1 - Support member linear buckling analysis: (C*urrent practice; used extensively in our specification.*)
    - M1 - Maintain/support AISI S100 Appendix 2
    - Support analytical solutions
    - Support computational solutions (shell FE, FSM, GBT)
  - H2 - Support member geometric nonlinear analysis:
    (*New for AISI. We need to get torsion nailed down for future system analysis work.*)
    - H2 - Support/spread tools that properly handle thin-walled unsymmetrical members
    - H2 - Lead/properly incorporate torsion into analysis (and strength)
  - L2 - Support member material nonlinear analysis:
    (*New for AISI. Basis for AISC-style plastic methods, plastic hinge analysis not a traditionally high priority for AISI, but perhaps at >0.100 in. etc. more important.*)
    - L2 - Review AISC moment redistribution and plastic design, AISI extensions?

  - M2 - Support member geometric and material nonlinear analysis w/ imperfections: (*New. Gives the potential to replace member checking in the specification with analysis*)
    - M2 - Guidance/provisions on imperfection modeling for CFS members
    - M2 - Guidance/provisions on residual stress/strain modeling for CFS members
    - M2 - Guidance/provisions on material modeling for CFS members
    - M1 - Guidance/provisions on boundary conditions (particularly warping b.c.)
    - M1 - Guidance/provisions on solution specific issues: element choice, solver, etc.

B6.3 Liaisons

No key relationships or liaisons for CF-24 to maintain were identified.

B6.4 To/With Education Committee

Items to be pursued by CF-24 in collaboration with the Education Committee were identified, as follows:

- Education/support on the use of Appendix 2 Elastic buckling
- Education/support on the use of Appendix 2 for custom shapes

B6.5 To/With/From Other Subcommittees

Items to be pursued by CF-24 in collaboration with other technical subcommittees were identified, as follows:

- DSM Beam-column implementation → CF-22
- Improve strength design method for built-up/composite members (from CF-4)
- Torsion → CF-24 to start, CF-22 for combined, eventually comes back to CF-4

B6.6 Prioritized "Top 5" Items (from Chairperson)

The following were prioritized by the CF-24 chair as a "Top 5" item:

- Maintain/support AISI S100 Appendix 2 (linear buckling analysis) (H1-M1)
  - Complete ballots on global buckling analytical approaches (438 & 439) – Bob Glauz
- Provide clarity in member design objectives; define consequence of existing strength limit states (H1-M1)
  - To prepare us for performance based design and simulation, no research, committee effort.
  - TG: Mike Seek, Cris Moen, Bob Glauz.
- Foster deeper engagement w/current stakeholders: Higher strength grades, complex sections (H1-M1)
  - Discuss with Doug Fox (ISPAN) – Bob Glauz, Don Allen.
- Update reliability standards based on available knowledge (H1-M1)
  - Review Ballot on compression factors – Cris Moen, review by Bob Glauz
- Member response under elevated temperature (gradients); integrate international design research (H1-M1)
  - Reach out to Greg Hancock – Ben Schafer (maybe Greg can Champion this)
- Bending provisions for non-symmetric sections (H2-M2)

  - Ballot 438 rework – Bob Glauz
- Resolve EWM vs. DSM differences (deck) and long-term path (H2-M2)
  - Work with researchers on this – Tom Sputo
- Develop and validate a design method for torsion (direct torsion) (H3-H4)
  - Rework Plan/Statement of Work – Ben Schafer

B6.7 Suggested Additional Items (from Strategic Planning Committee)

No additional items for CF-24 to pursue were suggested by the Strategic Planning Committee.

B7 General Provisions (CF-31)

B7.1 Scope and Responsibilities

The COS Subcommittee on General Provisions (CF-31) is charged with developing and maintaining general provisions and design requirements for construction with cold-formed steel, plus special requirements for serviceability and fatigue.

Responsibilities of CF-31 include:

- Chapter A of AISI S100 – General Provisions
- Chapter B of AISI S100 – Design Requirements (except Section B4)
- Chapter L of AISI S100 – Design for Serviceability
- Chapter M of AISI S100 – Design for Fatigue

B7.2 Key Issues for Next Cycle

Key issues for CF-31 to consider in the next standards development cycle were identified, as follows:

- Maintain and improve existing provisions:
  - M1 - Provide clarity to users for unique configurations or members that are not explicitly included in AISI S100 *(This feels a little like asking "have you properly anticipated and accounted for all unanticipated events?")*
  - Review and potentially update fatigue provisions:
    - M2 - Changes and improvements at AISC to be considered
    - M3 - New steels in use since provisions written to be considered
    - L3 - Low temperature, cold storage issues, to be considered
  - M2/3 - Support improvements in analysis and design for ponding
  - Develop Provisions for [Reserved] Section B areas:
    - M1 - Fabrication and Erection
    - M1/2 - Evaluation of Existing Structures
    - ? - The preceding are parallel to AISC do we need additional related topics in AISI (e.g. material handling)
- Support introduction of system analysis and system reliability:
  - H2/3 - Streamline/simplify application of safety and resistance factors wherever possible
    - Should we have multiple phi factors per limit state? *{Among other approaches we should investigate AISC's approach using basically a single phi factor for ductile limit states and a single phi factor for brittle (ultimate) limit states.}*

  - M1/2 - Potential synergy with removing 95%t rule if we implement system reliability correctly?
  - H2 -Improve validation methodology around the use of rational analysis methods
  - M2 - Support structural analysis of CFS systems
  - M1 - Review and improve charging language for rational analysis as needed
  - M1 - Define levels of analysis for structural
  - M3 - Support development of provisions that define initial conditions for:
    - Material (sub 31)
    - Member (coordinate or enable Sub 24)
    - System (coordinate or enable Sub 4)
  - M2/3 - Determine how to validate and charge simulations that are performed in support of goals beyond structural, i.e., thermal, fire, acoustic, blast, etc.
- Enable AISI S100 to provide multiple performance objectives:
  - M3 - Determine how to establish and charge performance objectives beyond strength (and stiffness)
    - Determine how to connect to the "system" where the component is being considered and provide design path through AISI S100 for isolated component vs. component in known system (CF-31 Chapter B and CF-4 Chapter I)
    - Consider charging language in Chapter C for system
  - M3 - Full structural response (i.e., ASCE 41 type of thinking)
  - M3/4 - Non-structural response (i.e., fire, acoustic, thermal, durability/corrosion)
- Improve and expand provisions that support innovation in steel material choice:
  - Insure S100 Spec. is not a barrier to AHSS adoption
    - H3 - Establish the performance and characteristics of available AHSS vs. steels in wide current use in construction
      - H3 - Structural performance *{Are there new limit states that will surface with AHSS that do not currently show themselves with current steel strengths?}*
      - M3 - Weldability and additional characteristics
  - H3 - Re-evaluate Grade 80 [550 MPa] Fy knockdown factor methodology, and establish reliable alternative
  - Determine the role of material ductility across specified limit states:
    - L2 - Members
    - H3 - Connections
    - M3 - Seismic
- M1/2 - Revisit 95% thickness rule (*Note what ASTM has done → note fabrication factor in LRFD derivation → reliability discussions provide opportunity to potentially "fix" w/o unintended impact → potential to improve perception?*)
  {I think this is primarly a percerption issue as it appears we are being loose with thickness limits when in fact the 95% rule tightens up some of the ASTM tolerances that can range to 10% under thickness being permissible. AISC probably took the better approach and added the 93% t factor for HSS sections when ASTM allowed 10% under. That sort of gets to about the same variation if you assume minimum allowable section but looks more proactive. As a comparison, S16 in Canada went to a 90% t for the same condition. The other problematic factor with this allowance is that I suspect the majority of the industry

orders to minimum t these days, rather than nominal t, so they are in fact taking the full allowance (more or less) as opposed to viewing it as a boundary under ordered thickness.}

B7.3 Liaisons

Key relationships and liaisons for CF-31 to maintain were identified, as follows:

- Materials – ASTM A01.19 – Sheet Steel, A05.11 – Metallic Coated Sheet Steel

B7.4 To/With Education Committee

Items to be pursued by CF-31 in collaboration with the Education Committee were identified, as follows:

- H3 - Evolve engineers perception and understanding of the behavior of thin-walled members, including in seismic
- M3 - Support economic analysis of CFS products and their end use to provide financially sound pathways to innovate and improve CFS (e.g. considering only initial cost no one would ever roll a new cross-section type) → partners/stakeholders

B7.5 To/With/From Other Subcommittees

Items to be pursued by CF-31 in collaboration with other technical subcommittees were identified, as follows:

- L1 - Standards Council - Does AISI S100 scope (and title) need revision to:
  - reflect systems
  - reflect multiple performance objectives

B7.6 Prioritized "Top 5" Items (from Chairperson)

The following were prioritized by the CF-31 chair as a "Top 5" item:

- Ponding provisions (M2)
  - We have a design example to be reviewed
  - Tom Sputo indicated he will provide a design approach to review based on his past work.
- AHSS performance – This is already an active project (H3)
- Provisions for [Reserved] Section B areas
  - Fabrication and Erection – Jay was going to query SICF (M1)
  - Evaluation of Existing Structures– Ben was going to draft something to review with Bonnie's help (M1/2)
- Fatigue – Question to Roger Brokenbrough in regard to newer steels and get his opinion as to fatigue concerns (M1)
- Streamline safety and resistance factors – start with web crippling issues (H2/3)
- 95% thickness rule (M1-M2)
  - Staff survey through SICF regarding current material statistics
  - Modifications here perhaps should start with some additional commentary language covering the rationale for the current limitation and emphasizing that this is a tightening of ASTM tolerances, not a broadening of tolerances.
- Re-evaluate Grade 80 Fy knockdown methodology (M3)

B7.7 Suggested Additional Items (from Strategic Planning Committee)

No additional items for CF-31 to pursue were suggested by the Strategic Planning Committee.

B8 Diaphragm Design (CF-33)

B8.1 Scope and Responsibilities

The COS Subcommittee on Diaphragm Design (CF-33) is charged with developing and maintaining design provisions for construction with cold-formed steel diaphragms.

Responsibilities of CF-33 include:

- AISI S310 – Design of Profiled Steel Diaphragms

B8.2 Key Issues for Next Cycle

Key issues for CF-33 to consider in the next standards development cycle were identified, as follows:

- Maintain and improve the existing standard:
  - M1 - Review scope and definition of the word diaphragm
  - H2 - Implement improved provisions for deck with concrete fill
  - M2 -Provide clear guidance on deck with fill and rebar
  - M2 -Develop design requirements for diaphragms supported by wood
  - H3 - Implement system reliability methods parallel to Sub 4 for deck diaphragms
  - M3 -Evolve standard as needed to align with S100's adoption of new steels
  - L2 -Provide analysis path for warping deflection calculation
  - L2 -Rational analysis provisions parallel to S100 for S310 provisions?
  - M1 - Continue to revise and improve editorial choices
- Insure/enable the use of S310 in all appropriate system standards:
  - M1- Provide clarity on the application of the S310 standard wherever possible:
    - Metal roof and wall systems; i.e., metal building systems (*AISI S100*)
    - Buildings with open web steel joists (*SDI/SJI?*)
    - Structural steel buildings (*AISC 360 and 341*)
    - CFS light-frame construction (*AISI S240 and S400*)
    - General (*ASCE 7*)
    - Seismic rehabilitation (*ASCE 41*)
- H4 - Support and develop the use of S310 for seismic design: (*Need to resolve jurisdiction; i.e., AISI S310 vs. S400*)
  - Implement SDII and RWFD research findings into standard
  - Coordinate with S400 provide clarity on standards applications for engineers
  - Develop language parallel to S400 on energy dissipation mechanism
    - Develop understanding/provisions for capacity-based design of deck diaphragms
    - Coordinate with NEHRP/BSSC/ASCE 7 on seismic response modification coefficients for steel deck diaphragms (*e.g. ASCE 7-16 Rs factor*)
  - Including RWFD buildings
    - Improve ASCE 41 provisions for steel deck diaphragms
    - Enable building models to model deck diaphragms
    - Clarify and make parallel diaphragm vs. shear wall design → AISI S400 (ASCE 7)
    - Support sub-system design of stressed skin deck + framing in shear transfer
- Develop a long term path for S310 standard:

  - H3 -Determine if current scope (*diaphragm behavior only*) is the right long term scope
  - H1 - Evaluate deck as a product standard vs. this product in separate standards (*Two valid viewpoints on this: roll all deck provisions into this standard vs. split it all out.*)
    - Collapse AISI S310 into AISI S100 Chapter I
    - Expand AISI S310 (similar to AISI S240 for CFS framing) by consolidating with:
      - Composite Deck (SDI C1.0)
      - Roof Deck (SDI RD1.0)
      - Non-Composite Floor Deck (SDI NC1.0)
      - Quality Control and Quality Assurance (SDI QA-QC)
  - M3 - Define performance objectives for steel deck diaphragms as first step towards PBD
  - M1 - Determine committee's plan regarding:
    - Wind
    - Welds
    - Other fastening methods
    - Better profiles
- H3 - Streamline adoption of proprietary fasteners for use in steel deck in building designs: (*The issue is DDM lists, AISI S310 does not. Evaluation Reports barrier created when proprietary fasteners are used. Potential solution is to develop performance criteria; e.g., test standards for fasteners used in steel deck that provide compliance path and align with best solutions available.*)

B8.3 Liaisons

Key relationships and liaisons for CF-33 to maintain were identified, as follows:

- Stiff material competition with wood sheathed → partners/stakeholders

B8.4 To/With Education Committee

Items to be pursued by CF-33 in collaboration with the Education Committee were identified, as follows:

- Propagate engineering definition of diaphragm consistent with AISI S310
- Inform engineers of AISI S310 and its use for large variety of systems

B8.5 To/With/From Other Subcommittees

Items to be pursued by CF-33 in collaboration with other technical subcommittees were identified, as follows:

- M3 - Need for system level provisions for joist supporting steel deck → CF-4 w/partners/stakeholders

B8.6 Prioritized "Top 5" Items (from Chairperson)

The following were prioritized by the CF-33 chair as a "Top 5" item:

- Implement new provisions for deck with concrete fill (H2)
  - Easterling/SDII proposal – ballot forthcoming
- Enable the use of S310 in all applicable standards (H1)
- Develop a long term path for S310 (H1-H3)
- Review and improve definition of "diaphragm" (M1)

- Support and develop the use of S310 (or another standard) for seismic design (H4)

B8.7 Suggested Additional Items (from Strategic Planning Committee)

The following additional items for CF-33 to pursue were suggested by the Strategic Planning Committee:

- Develop design requirements for diaphragms supported by wood
  - SDI (Tom Sputo) to engage with MCA (Andy Williams) and National Frame Builders Association, and Amer. Society of Ag and Biological Engineers (M1)
- Implement system reliability methods parallel to Sub 4 for deck diaphragms (H3)
  - Presentation given. SDI to review. Action steps in presentation. SDI to come back with reaction
- Rational analysis provisions parallel to AISI S100 for AISI S310 provisions? (M1)
  - Could this come from seismic diaphragm?, charging language in S100 as model
  - TG – Pat Bodwell, Ben Schafer → Tom Sputo and committee
- Continue to revise and improve editorial choices (M1)
  - It is early days in the new standard, always room for improvement
  - Language, symbols, organization, editorial, user note…
  - Editorial TG – Pat Bodwell (Chair), Helen Chen, Walt Schultz, Steve Potts (Tom Sputo)

C. COMMITTEE ON FRAMING STANDARDS

C1 General

The AISI Committee on Framing Standards (COFS) is charged by the AISI Standards Council with developing and maintaining standards for construction with cold-formed steel framing.

Responsibilities of the COFS include:

- AISI S201 – Product Data
- AISI S202 – Code of Standard Practice
- AISI S220 – Nonstructural Members
- AISI S230 – Prescriptive Method
- AISI S240 – Structural Framing
- AISI S250 – Energy Conservation
- AISI S400 – Seismic

As presented to the AISI Standards Council at its meeting on January 20, 2016, the COFS focus (2017-2022) is to enable growth in mid-rise buildings by both (1) improving the ease of use of the AISI framing standards and (2) supporting and encouraging full system design.

C2 Framing Design

C2.1 Scope and Responsibilities

The COFS Subcommittee on Framing Design is charged with developing and maintaining design methods and installation requirements for construction with cold-formed steel framing.

Responsibilities of the COFS Design Methods Subcommittee include:

- AISI S240 – Structural Framing:
  - Chapter B – Design (except Section B5)
  - Chapter C – Installation
  - Chapter E – Trusses (except Section E5)
  - Chapter F – Testing
  - Appendix 1 – Continuously Braced Design for Dist. Buckling Resistance
  - Appendix 2 – Test Methods for Truss Components and Assemblies
- AISI S220 – Nonstructural Members:
  - Chapter B – Design
  - Chapter C – Installation
  - Chapter D – Connections
  - Chapter E – Miscellaneous
  - Chapter F – Testing
  - Appendix 1 – Screw Penetration Test

C2.2 Key Issues for Next Cycle

Key issues for the COFS Subcommittee on Framing Design to consider in the next standards development cycle were identified, as follows:

- Complexity:

  - H2 - AISI S100-16 review for COFS use (*task group in place with FY2017 project funding*)
  - M3 - BIM and (free) modelling software
  - M3 - Load transfer on irregularly shaped buildings
- Structural Framing Design:
  - H1 - Trusses in mid-rise (*e.g. transfer girders*) (design or COSP?) (S240 & this soln)
  - H2 - Insure ledger framing is fully enabled (eccentricities, etc.) (chords and collectors)
  - H2/3 - Bracing using combination of discrete and sheathing
    - H3 - Resolution of accumulated bridging forces (stiffness)
  - H2 - System reliability assessment for repetitive framing (*e.g., joist rep. member factor*)
    - H2 - (Floors, Walls, Diaphragms, Shear Walls)
    - H3/4 - Buildings
  - H3 - Bearing on concrete (full/partial) (*FY2017 project funded, RFP issued, proposals received*)
  - M3 - Built-up members (point loads) (stud packs) (economic)
  - M3 - Other than 24 in. spacing (note market (deck) and code connections, vibrations?)
  - L1 - Flow of forces (e.g. header design and wall opening design) (lateral bigger deal)
- Connections Details:
  - H1 - Realizing clip angle research (*Year 2 project at UNT is winding down*)
  - H1 - Clarity in connection design objectives
- Building System Design:

a) Structural aspects
  - H1/2 - Floor serviceability (mimic AISC requirements, commentary and guidance)
  - M4 - Full Building Modeling (BIM model that is a structural model)

b) Mixed construction
  - H1 - Barrier removal in panelized and modular construction
  - H1-2 - Various floor systems
  - H2 - Composite C-section joists (*effort as volunteer has dragged along slowly*)
  - H-L4 - Modular construction with (unibody future) (big space) (proprietary)

c) Nonstructural system design issues
  - H1 - Increased fire ratings (*ergo Chicago, 3-hr rating, insulate the floors*) (staff)
  - H2/3 - Thermal or fire breaks vs. acoustics vs. steel to steel connection
    - H1 - Where are we/state-of-the art analysis (staff)
  - M1 - Exterior finishes not vetted as part of fire, acoustic or thermal assembly (COSP?)

C2.3 Liaisons

No key relationships and liaisons for the COFS Subcommittee on Framing Design to maintain were identified.

C2.4 To/With Education Committee

Items to be pursued by the COFS Subcommittee on Framing Design in collaboration with the Education Committee were identified in Section C2.2 (above).

C2.5 To/With/From Other Subcommittees

No items to be pursued by the COFS Subcommittee on Framing Design in collaboration with other technical subcommittees were identified.

C2.6 Prioritized "Top 5" Items (from Chairperson)

The following were prioritized by the COFS Subcommittee on Framing Design chair as a "Top 5" item:

- Bracing / sheathing and resolution on accumulated bn forces (H2/3)
  - AISI and SFIA funding being pursued for research project.
- System reliability factor for repetition (H2)
  - AISI and SFIA funding being pursued for research project.
- Bearing on concrete (H3)
  - Research underway. PMTG in place.
  - Kara Peterman can provide update at next meeting.
- Composite C joists (H2)
  - See if volunteer effort H1 or H2. Need task group.
  - Delete C-section limitation.
  - Coordinate COFS provisions with COS provisions.
- Thermal / fire / acoustical breaks vs. structural connections (H2/3)
  - Pat Ford would like to monitor along with AISI code staff.
  - Kara Peterman has done previous work in this area, and has submitted a proposal for a small project fellowship with Jonathan Humble.

C2.7 Suggested Additional Items (from Strategic Planning Committee)

The following additional items for the COFS Subcommittee on Framing Design to pursue were suggested by the Strategic Planning Committee:

- AISI S100-16 review for COFS use (H2)
  - Develop a plan of attack to assess and address industry and user impacts when updating the references in AISI S240 and other framing standards.
  - Roger LaBoube (chair), Pat Ford, Don Allen, Helen Chen and Jay Larson.
- Trusses in mid-rise (e.g. transfer girders) (H1)
  - Bring more into the mainstream. Design, details and responsibilities.
  - Bill Babich (chair), Pat Ford and Kenny Pagano.
- Insure ledger framing is fully enabled (eccentricities, etc.) (chords and collectors) (H2)
  - Underway (see agenda).
  - Rob Madsen (chair), Deniz Ayhan and Ben Schafer.
- Other than 24 in. spacing (note market (deck) and code connections, vibrations?) (H1)
  - AISI code staff to investigate impact of what if we removed 24" o.c. limitation.
- Realizing clip angle research (Year 2 project at UNT is winding down) (H1)
  - In process… See item __ on agenda.

- Clarity in connection design objectives (H1)
  - Jay Larson to see if he can come up with specific example (template). Look at from user side; define the objective. (Ben Schafer and Roger LaBoube will be his wing men.)
- Floor serviceability (mimic AISC requirements, commentary and guidance) (H1/2)
  - In process… See item __ on agenda.
- Mixed construction
  - Barrier removal in panelized and modular construction (H1)
    - Education issue primarily. Colin Rogers has a project in Australia on connecting CFS to structural steel for use in modular construction. Greg Hancock and ___ Pfen are on the team. We should watch and ride their coat tails.
    - Colin Rogers will provide periodic updates.
  - Various floor systems (H1/2)
    - It might be nice to add explicit references.
    - Roger LaBoube, Jay Larson and Pat Ford to provide something to kick the tires at next meeting.
- Nonstructural system design issues
  - Increased fire ratings (ergo Chicago, 3-hr rating, insulate the floors) (H1)
    - Where are we/state-of-the art analysis (staff).
  - Exterior finishes not vetted as part of fire, acoustic or thermal assembly (COSP?) (M1)
    - Michael Schmieda and Jon-Paul Cardin to develop problem statement.

C3 Lateral Design

C3.1 Scope and Responsibilities

The COFS Subcommittee on Lateral Design is charged with developing and maintaining design methods and installation requirements for construction with cold-formed steel lateral force resisting systems.

Responsibilities of the COFS Lateral Design Subcommittee include:

- AISI S400 – Seismic
- AISI S240 – Structural Framing:
  - Section B5 – Lateral Force Resisting Systems
  - Section D6.9 – Additional QC/QA Requirements for Lateral Force Resisting Systems

C3.2 Key Issues for Next Cycle

Key issues for the COFS Subcommittee on Lateral Design to consider in the next standards development cycle were identified, as follows:

- Improving S400 implementation across standards (codes and standards related efforts):
  - H4 - Ω_E value for CFS framing SFRS (seismic consensus issue > $)
    - H2 - Guidance on the application of Ω_o (Education? SW Guide)
  - ASCE 41
    - M2/3 - education, dissemination, (retrofit opportunity? → H)

        - M3 - maintenance/research/update (plan for long term home at AISI?)
    - L1 - Building type height limits (US/Canada) (*fire height limits; e.g., hose stream test*)
- More robust (higher strength and ductility) and cost effective LFRSs:
    - Higher strength (ductile) shear walls
        - H3 - Mid-ply steel sheet shear wall (path to market? non-proprietary)
        - M2 - Corrugated shear walls (mini-storage)
    - Need for different options for CFS framing compatible diaphragm solutions
        - M3/4 - Other CFS-compatible diaphragm systems (*e.g. Structo-CreteTM*)
        - L1 - Deck diaphragms? (joist spacing influences efficiency) (SDI interest?)
    - M2/4 - LFRS solutions that are also good fire/acoustic/thermal (evaluate current sol'ns)
    - Support innovation pathways for new shear walls (and related LFRS)
        - H3/4 - Seismic pre-qualified testing standard for shear walls; i.e., standards path, without ICC/IAPMO/BSSC approval
        - M4 - Additional innovation pathways - e.g. rocking frame solutions
- Building System Lateral Design:
    - H4 - Dynamic Building Modeling Software
        - - Incentivizing (H3) or creating (H4) software solutions in the market
    - H4 - Integration of non-structural systems in the LFRS of the building
    - M2 - Coupled shear walls (useful Type II)
    - M3 - Analysis methods for LFRSs
        - M3 - Shear wall alternative analysis provisions using fastener models
    - M3 - Analysis methods for diaphragm
    - M3 - Integration of non-designated CFS systems in the LFRS of the building
    - M3 - Mixed systems (horizontal and vertical combinations)
    - L3 - Integration of non-CFS in the LFRS of the building
- Education:
    - M2 - Example problems (CSD shear wall examples with Josh)
    - M3-H4 – Software. I assume this is educational software which depending on robustness could be moderately useful and only kind of hard to very useful, but very challenging.
    - L2 - Basic stiffness analysis and proportioning of forces for LFRS

C3.3 Liaisons

Key relationships and liaisons for the COFS Subcommittee on Lateral Design to maintain were identified, as follows:

- AISI Seismic Code Team → Bonnie Manley
- 2020 NEHRP Provisions → Bonnie Manley

C3.4 To/With Education Committee

Items to be pursued by the COFS Subcommittee on Lateral Design in collaboration with the Education Committee were identified in Section C3.2 (above).

C3.5 To/With/From Other Subcommittees

No items to be pursued by the COFS Subcommittee on Lateral Design in collaboration with other technical subcommittees were identified.

C3.6 Prioritized "Top 5" Items (from Chairperson)

The following were prioritized by the COFS Subcommittee on Lateral Design chair as a "Top 5" item:

- CFS NHERI with companion diaphragm project (H4)
  - AISI and SFIA funding being pursued for research project.
- Continuation of Colin's work on mid-ply shear wall (H3)
  - AISI and SFIA funding being pursued for research project.
- AISC Direct Analysis Method and Seismic Design project (H3)
  - AISI and AISC funding being pursued for research project.
- Omega_E (H2)
  - AISI and SFIA funding being pursued for research project.
- Coupled shear walls (useful Type II approach) (M2)
  - AISI and SFIA funding being pursued for research project.

C3.7 Suggested Additional Items (from Strategic Planning Committee)

The following additional items for the COFS Subcommittee on Lateral Design to pursue were suggested by the Strategic Planning Committee:

- ASCE 41
  - General education and dissemination (M2/3)
  - Exploiting the retrofit opportunity? (H2/3)
  - Maintenance/research/update (plan for long term home at AISI?) (M3)
  - AISC committed to taking control of structural steel provisions and drafting AISC 342. COFS needs to monitor what AISC is doing. Liaison (Bonnie Manley). (H1)
  - Formation of task group to monitor and formulate recommended changes regarding CFS deck in AISC 342 (Bonnie, Ben, Pat (chair), and Tom). (M1)
- Corrugated shear walls (e.g., mini-storage) (H1)
  - What is envisioned? Not necessarily a COFS thing due to 24" o.c. framing spacing. But should allow (wind only) in AISI S240. Task group established.
  - Tom Supto (chair), Pat Bodwell, Cheng Yu, Bonnie Manley and Rob Madsen.

C4 Prescriptive Methods

C4.1 Scope and Responsibilities

The COFS Subcommittee on Prescriptive Methods is charged with developing and maintaining prescriptive methods for construction with cold-formed steel framing.

Responsibilities of the COFS Prescriptive Methods Subcommittee include:

- AISI S230 – Prescriptive Method for One and Two Family Dwellings

C4.2 Key Issues for Next Cycle

Key issues for the COFS Subcommittee on Prescriptive Methods to consider in the next standards development cycle were identified, as follows:

- H2 - Update AISI S230-15 to ASCE 7-16

  - Update all tables in AISI S230 (and the IRC) to comply with ASCE 7-16
- H1/2 - Eliminate building size limits and expand wall bracing options
  - Resolve comments in ballot MC-SC 07-03A;
  - Update table values to ASCE 7-16, AISI S240-15 and AISI S400-15 requirements;
  - Develop prescriptive details for continuous load path (i.e., from the roof diaphragm to the foundation) interior braced wall lines; and
  - Develop prescriptive details for tying together jamb stud and king studs in lieu of wood structural panel sheathing option
- H1 - PAFs and expansion anchors
  - Add prescriptive provisions for PAF's and expansion anchors in Section E13.3.4 and Table E2.1
- H2 - Update AISI S230 Commentary
  - Update AISI S230 Commentary to reflect approves changes in the Standard
- H2 - Flow charts
  - Develop an Appendix to the Commentary with the flow charts previously developed by Roger LaBoube, which will be reviewed and updated to comply with current table and standard references

C4.3 Liaisons

No key relationships or liaisons for the COFS Subcommittee on Prescriptive Methods to maintain were identified.

C4.4 To/With Education Committee

No items to be pursued by the COFS Subcommittee on Prescriptive Methods in collaboration with the Education Committee were identified.

C4.5 To/With/From Other Subcommittees

No items to be pursued by the COFS Subcommittee on Prescriptive Methods in collaboration with other technical subcommittees were identified.

C4.6 Prioritized "Top 5" Items (from Chairperson)

The following were prioritized by the COFS Subcommittee on Prescriptive Methods chair as a "Top 5" item:

- Update AISI S230-15 to ASCE 7-16 (H2)
  - Update all tables in AISI S230 (and the IRC) to comply with ASCE 7-16
- Eliminate building size limits and expand wall bracing options (H1/2)
  - Resolve comments in ballot MC-SC 07-03A;
  - Update table values to ASCE 7-16, AISI S240-15 and AISI S400-15 requirements;
  - Develop prescriptive details for continuous load path (i.e., from the roof diaphragm to the foundation) interior braced wall lines; and
  - Develop prescriptive details for tying together jamb stud and king studs in lieu of wood structural panel sheathing option
- PAFs and expansion anchors (H1)
  - Add prescriptive provisions for PAF's and expansion anchors in Section E13.3.4 and Table E2.1
- Update AISI S230 Commentary (H2)

  - Update AISI S230 Commentary to reflect approves changes in the Standard
- Flow charts (H2)
  - Develop an Appendix to the Commentary with the flow charts previously developed by Roger LaBoube, which will be reviewed and updated to comply with current table and standard references

C4.7 Suggested Additional Items (from Strategic Planning Committee)

No additional items for the COFS Subcommittee on Prescriptive Methods to pursue were suggested by the Strategic Planning Committee.

C5 Standard Practices

C5.1 Scope and Responsibilities

The COFS Subcommittee on Standard Practices is charged with developing and maintaining general provisions, quality criteria and standard practices for the design, fabrication and installation of cold-formed steel framing products.

Responsibilities of the COFS Standard Practices Subcommittee include:

- AISI S240 – Structural Framing:
  - Chapter A – General
  - Chapter D – Quality Control and Quality Assurance (except Section D6.9)
  - Section E5 – Quality Criteria for Steel Trusses
- AISI S220 – Nonstructural Members:
  - Chapter A – General
- AISI S202 – Code of Standard Practice
- AISI S201 – Product Data

C5.2 Key Issues for Next Cycle

Key issues for the COFS Subcommittee on Standard Practices to consider in the next standards development cycle were identified, as follows:

- AISI S202 - Code of Standard Practice:
  - Coordination of cladding and finish systems
    - H1 - General
    - H2/3 - Fire, acoustic and thermal
  - H3 - Design responsibilities for modular construction (MHI and NIBS OSCC)
  - M2 - Design responsibilities related to BIM (*i.e., models versus drawings*)
  - Recognize certification programs (by others)
    - H1 - CFS manufacturers (should we do this?)
    - M1 - Installers
    - M1 - Component manufacturers
    - M1 - Modular manufacturers
  - M2 - Challenges with delegated design of CFS versus traditional materials (education?)
  - H1 - Proprietary products (e.g., custom beam and header products)
  - L1 - Deeper building code references to AISI S202 (should we even do this?)
  - L2/3 - Coordination with metal buildings (or should this be done by MBMA?)

- AISI framing standards:
  - H2/3 - QC/QA for panelized and modular construction (AISI S240 Chapter D)
  - H4 - Higher performance standard cross-sections for CFS framing (AISI S201)
  - M1 - Get feedback on the use of QC/QA provisions in AISI S240 Chapter D
  - M3 - 4' o.c. framing spacing; i.e., go beyond 24" o.c. repetitive framing limit (AISI S240)
  - M3 - Integrate steel deck into CFS-framed structures (AISI S240)
  - M3 - Imperfection and residual stresses (i.e., what to use for analysis)
  - Recognize certification programs (by others) in AISI S240 Chapter D
    - H1 - CFS manufacturers (should we do this?)
    - M1 - Installers
    - M1 - Component manufacturers
    - M1 - Modular manufacturers

C5.3 Liaisons

Key relationships and liaisons for the COFS Subcommittee on Standard Practices to maintain were identified, as follows:

- ASTM Committees A05 and C11 → Greg Ralph
- SFIA Approved Fabricator Program → Pat Ford

C5.4 To/With Education Committee

Items to be pursued by the COFS Subcommittee on Standard Practices in collaboration with the Education Committee were identified, as follows:

- Code of Standard Practice & QA/QC stories, case studies and examples

C5.5 To/With/From Other Subcommittees

No items to be pursued by the COFS Subcommittee on Standard Practices in collaboration with other technical subcommittees were identified.

C5.6 Prioritized "Top 5" Items (from Chairperson)

The following were prioritized by the COFS Subcommittee on Standard Practices chair as a "Top 5" item:

- Coordination of cladding and finish systems in AISI S202
  - General – Klaiman writing ballot in near future (H1)
  - Fire, acoustic and thermal – Michael S and JP Cardin developing problem statement (H2/3)
- Design responsibilities related to BIM (i.e., models versus drawings) in AISI S202 (M2)
  - Task group formed to review what AISC is doing in this regard.
  - Pat Ford (chair), Jon-Paul Cardin, Paul Dalia, Larry Kruth and Jay Larson.
- Recognize CFS manufacturer certification programs (by others) in AISI S202 (H1)
  - Don Allen and Jeff Klaiman working on ballot.
- Coordination with metal buildings in AISI S202 (L2/3)
  - Task Group formed to consider if this should be done by COFS or MBMA.
  - Rick Haws (chair), Vince Sagan, Rahim Zadeh and Scott Douglas.
- Integrate steel deck into CFS-framed structures in AISI S240 (M3)
  - Engage Tom Sputo to create a draft ballot.

- Imperfection and residual stresses (i.e., what to use for analysis) (M3)
  - Awaiting further work by COS Analysis Task Group

C5.7 Suggested Additional Items (from Strategic Planning Committee)

The following additional items for the COFS Subcommittee on Standard Practices to pursue were suggested by the Strategic Planning Committee:

- Design responsibilities for modular construction in AISI S202 (H3)
  - MHI and NIBS OSCC are working on this.
  - Jay Larson can serve as liaison to MBI and NIBS OSCC.
- QC/QA for panelized and modular construction in AISI S240 Chapter D (H2/3)
  - MHI and NIBS OSCC are working on this.
  - Jay Larson can serve as liaison to MBI and NIBS OSCC.
- Get feedback on the use of QC/QA provisions in AISI S240 Chapter D (M1)
  - Hold until 2018 codes being enforced. Then engage truss industry and SFIA/AWCI.
- 4′ o.c. framing spacing; i.e., go beyond 24″ o.c. repetitive framing limit in AISI S240 (M3)
  - Await impact study by AISI code staff (Jon-Paul Cardin).

D. EDUCATION COMMITTEE

D1 General

The Education Committee is charged by the AISI Standards Council with developing and maintaining educational products that directly support the AISI standards.

Responsibilities of the Education Committee include:

- AISI D100 – CFS Design Manual
- AISI D110 – CFS Framing Design Guide
- AISI D111 – CFS Purlin Roof Framing Systems
- AISI D112 – Brick Veneer CFS Framing Design Guide
- AISI D113 – Design Guide for CFS Framed Shear Wall Assemblies

As presented to the AISI Standards Council at its meeting on January 20, 2016, the Education Committee focus (2017-2022) is to monitor the alignment of education products with the standards and ensure adequate educational products are available to support each AISI standard and, where needs are not met, advocate for additional resources to support the standards.

D2 Scope and Responsibilities

There is a scope question whether and to what extent the Education Committee should be responsible for the education of the members of the AISI technical committees/subcommittees on key topics and emerging issues; e.g., simulation and performance based design.) Preliminarily, the following was agreed upon:

- General interest education of committee → Education Committee,
- Special education aligned with strategic objectives → Strategic Planning Committee

D3 Key Issues for Next Cycle

Key issues for the Education Committee to consider in the next standards development cycle were identified, as follows:

- Ease use of AISI standards:
  - M2 - Insert user notes
  - H3 - Create design examples
  - M3 - Develop/improve design guides and manuals
  - M2 - Consider new packaging options (e.g., electronic w/active links)
  - Other: _____.
- Simplify coordination of requirements in multiple standards (e.g., ASCE 7 + AISI S400):
  - M2 - Insert user notes
  - M3 - Create design examples
  - M4 - Develop/improve design guides and manuals
- Maintain and enhance existing AISI design guides and manuals:
  - L4 - AISI D100 – CFS Design Manual
    - 2017 update (underway)
    - Beyond (vision? commitment?)
  - M3- AISI D110 – CFS Framing Design Guide
  - ? - AISI D111 – CFS Purlin Roof Framing Systems
  - L2 - AISI D112 – Brick Veneer CFS Framing Design Guide
  - M3 - DSM Design Guide (?)

- Develop new AISI design guides and manuals (goal = one for each AISI standard):
  - M1 - Determine education plan for each AISI standard
  - H3 - AISI D113 – Design Guide for CFS Framed Shear Wall Assemblies
    - Align w/AISI S213-12
    - Align w/AISI S240-15 and AISI S400-15
  - M3 - CFS Framing Blast and Disproportionate Collapse Mitigation Design Guide
  - H4 - CFS Seismic Design Guide and/or Manual for AISI S400-15
  - L2 - CFS Truss Design Guide
  - M2 - Guide to QC/QA for CFS Framing
  - H2 - Flow charts for AISI S100-16
- Broaden familiarity and use of simulation:
  - H4 - Create example problems and tutorials and videos
    - To teach method; i.e., demonstrate how
    - To promote method; i.e., illustrate why; e.g., resilience
    - To illustrate concepts; i.e., visualization; e.g., local buckling
- Identify, prioritize and effectively communicate education needs/opportunities to (and thereby hope to leverage educational resources of) partners/stakeholders: (*Note: Includes BuildSteel, AISC, ASCE, ATC, CFSEI, CCFSS, CSSBI, MBMA, MCA, RMI, SDI, SFA, SFIA, SJI, SMDI and SSRC.*)
  - Design/construction professionals and building owners realizing the advantages, flexibility, economy, and beauty of CFS structures → partners/stakeholders
  - Educating the educators, not enough faculty trained in CFS → CCFSS
  - H4 - Education of building officials, significant barrier → partners/stakeholders
  - L9 - Use of consistent terminology → Editorial Committee [*9 because no matter how much time/effort/money we throw at this, the industry will keep calling CFS by a variety of other names.*]
  - [*Outside the committee scope*] Better path to and organization of AISI standards and related web page(s), including SEO (search engine optimization)
    - www.buildusingsteel.org → AISI/SMDI
    - www.aisistandards.org → CFSEI
    - www.buildsteel.org → BuildSteel
    - partner/stakeholder web pages → partners/stakeholders
  - Provide free design support for the standards → partners/stakeholders
  - More person-to-person education contact → partners/stakeholders
    - Look at Woodworks as an example of what can be done → BuildSteel
  - Support faculty (engineer/architect) who teach CFS regularly to provide resource/discussion → CCFSS
    - AISC Partnership in Education as a model, also models in Canada
  - Knowledge gap for contractors (e.g., Skills USA) → partners/stakeholders
  - Education for practicing engineers and architects → partners/stakeholders
  - Code official training → partners/stakeholders
  - Develop a hands-on CFS student competition → partners/stakeholders
  - Create a platform where small pieces can be vetted and gathered (e.g., Wiki site with a gatekeeper as a model) → ASCE
  - CFS regular column; e.g., Q&A in monthly magazine like Modern Steel Construction. (*Some experience with this in STRUCTURE in the past.*) → CFSEI

D4 Liaisons

Key relationships and liaisons for the COFS Subcommittee on Standard Practices to maintain were identified, as follows:

- CCFSS: Wei-Wen Yu Center for Cold-Formed Steel Structures (R. LaBoube)
- CFSEI: Cold-Formed Steel Engineers Institute (M. Rizzuto)
- ASCE-SEI: Committee on Cold-Formed Members (N. Rahman)
- MBMA: Metal Building Manufacturers Association (V. Sagan)
- SDI: Steel Deck Institute (T. Sputo)

D5 To/With Education Committee

Items to be pursued by the COFS Subcommittee on Standard Practices in collaboration with the Education Committee were identified, as follows:

- Code of Standard Practice & QA/QC stories, case studies and examples

D6 From/With Technical Committees/Subcommittees

Items to be pursued by the Education Committee in collaboration with technical committees/subcommittees were identified, as follows:

- COFS Design Methods:
  - H2 - MEP Contractor problems during installation
  - H3 - How and where to compile CFS standards
  - H2 - How and whom to disseminate standards
  - H2 - Flow charts
  - M2 - Framing "manual" (i.e., one document that includes AISI S201 ~ S240)
- COFS Lateral Design:
  - M3-H4 - Software (I assume this is educational software which depending on robustness could be moderately useful and only kind of hard to very useful, but very challenging.)
  - M2 - Example problems (CSD shear wall examples with Josh)
  - L2 - Basic stiffness analysis and proportioning of forces for LFRS
- COFS Standard Practices:
  - H2 - Framing "manual" (i.e., one document that includes AISI S201 ~ S240)
- COFS Prescriptive Methods:
  - None identified
- COS CF-3:
  - M2 - Welding vs. fastening decision-making for the designer
  - H2 - System reliability education, history of target reliability, where we are at today, more
  - Understanding the intersection of connection choice inclusive of labor and economics
- COS CF-4:
  - None identified
- COS CF-6:
  - H3 - Education/feedback for acceptance of simulation-based design
- COS CF-22:
  - H4 - Basic education on performance based design (PBD)
    - Standards development models to follow
    - PBD as removing prescriptions vs. PBD as different performance levels

  - System stability (Ch C) examples aligned with real world applications
- COS CF-24:
  - M3 - Education/support on the use of Appendix 2 Elastic buckling
  - L3 - Education/support on the use of Appendix 2 for custom shapes
  - More…
- COS CF-31: [*Both of these are tough and deserve the same rating: they both have the potential to have HUGE impacts on tonnage because of innovative technology and processes, but if nobody uses them the impact would be virtually zero. With that in mind, I will give them both H4.*]
  - H4 - Evolve engineers perception and understanding of the behavior of thin-walled members, including in seismic
  - H4 - Support economic analysis of CFS products and their end use to provide financially sound pathways to innovate and improve CFS (e.g. considering only initial cost no one would ever roll a new cross-section type) → partners/stakeholders
- COS CF-33:
  - L1 - Propagate engineering definition of diaphragm consistent with AISI S310
  - L1 - Inform engineers of AISI S310 and its use for large variety of systems

D7 Prioritized "Top 5" Items (from Chairperson)

The following were prioritized by the Education Committee chair as a "Top 5" item:

- Develop new AISI design guides and manuals (goal = one for each AISI standard):
  - Determine education plan for each AISI standard (M1)
    - Develop roadmap – TG: Don Allen (chair) and Maribeth Rizzuto will recruit members of task group (H1)
- New packaging options for AISI standards: add bookmarks in electronic versions; consider if ebook version is more suitable version than PDF.
- Educate users on new numbering scheme for AISI standards.
- Develop new AISI design guides and manuals (goal = one for each AISI standard):
  - Determine education plan for each AISI standard (M1)
    - Develop roadmap – TG: Don Allen (chair) and Maribeth Rizzuto will recruit members of task group (H1)
- From/With Technical Committees/Subcommittees:
  - COFS Design Methods:
    - MEP Contractor problems during installation (H2)
    - Flow charts (H2)

D8 Suggested Additional Items (from Strategic Planning Committee)

No additional items for the Education Committee to pursue were suggested by the Strategic Planning Committee.

APPENDIX 1: Strategic Planning Committee Meeting Report

American Iron and Steel Institute

AISI STANDARDS COUNCIL – STRATEGIC PLANNING COMMITTEE
MEETING REPORT

October 4, 2016
AISI Headquarters
25 Massachusetts Avenue, NW - Suite 800
Washington, DC 20001

Jay W. Larson, P.E., F. ASCE
Managing Director, Construction Technical
(610) 691-6334

1.0 CHAIRMAN REMARKS. Ben Schafer called the meeting to order at 8:40 AM.

2.0 ATTENDANCE. Six (6) members and two (2) guests attended the meeting, as follows:

- Members:
  - Ben Schafer – Chair of Strategic Planning Committee
  - Rick Haws – Chair of Committee on Specifications (COS)
  - Roger LaBoube – Chair of Committee on Framing Standards (COFS)
  - Don Allen – Chair of Education Committee
  - Helen Chen – Secretary of COS and COFS
  - Jay Larson – Secretary of AISI Standards Council
- Guests:
  - Maribeth Rizzuto – Managing Director of Cold-Formed Steel Engineers Institute (CFSEI)
  - Robert Wills – Vice President, SMDI Construction Market Development

3.0 ANTITRUST GUIDELINES. Jay Larson acknowledged the AISI Antitrust Guidelines that were attached to the meeting agenda. He also reviewed emergency procedures and housekeeping items.

4.0 APPROVAL OF PREVIOUS MEETING REPORT. While not formally approved, the report of the October 20, 2015 meeting of the Task Group on Strategic Planning for the COS and COFS was noted.

Action Item: Jay Larson will send the previous meeting report to Don Allen.

5.0 APPROVAL OF AGENDA. The suggested agenda and goals for the meeting were reviewed and approved. The Chair of the Strategic Planning Committee and staff will develop a standing list of agenda topics to be considered, with the notion that future meetings may focus on narrower areas.

6.0 STRATEGIC PLANNING COMMITTEE OVERVIEW. The Strategic Planning Committee reports to the AISI Standards Council. Its purpose is to help improve the effectiveness of the AISI standards development committees (i.e., COS and COFS) and related efforts (e.g., Education Committee). Outputs of the planning process should include recommendations on long-range goals and strategies for resourcing the efforts, as well as short-term work plans and annual budget requests. Membership on the Strategic Planning Committee is as noted above.

Meeting participants were challenged to consider and list answers to the following statements; (1) *"In 2028 the AISI standards..."* and (2) *"Cold-formed steel must..."*. This reflective exercise helped guide the remainder of the meeting.

7.0 COMMITTEE ON FRAMING STANDARDS. A reflection on COFS efforts in the previous cycle, status of the CFS framing industry and market needs led to the following conclusions and recommendations:

- Stakeholders: The trend towards fragmentation of the CFS framing industry has reversed with substantial realignment under the Steel Framing Industry Association (SFIA). Therefore, while continuing to encourage and accept participation by all CFS framing associations, AISI staff and COFS members should encourage deeper collaboration between the SFIA and COFS.
- Committee Focus: The COFS focus to "Enable Growth in Mid-rise Buildings" must evolve in order to better articulate the desires to both (1) improve the ease of use of the AISI framing standards and (2) support and encourage full system design.
    - Ease of Use: The COFS focus for the next cycle should include a specific challenge to improve the ease of use of the AISI framing standards. Implementation could take several forms, such as making AISI S240 a stand-alone document, simplifying the provisions in AISI S240, incorporating portions of other AISI standards in AISI S240 as user notes, developing simplified deemed-to-comply methods, and partnering with the Education Committee and Cold-Formed Steel Engineers Association (CFSEI) to develop educational resources, such as design manuals and guides, design examples, other derivative documents, technical notes, webinars and videos.

        Action Item: *Helen Chen will manage the process of updating AISI S240-15 to align with AISI S100-16 after a task group of Roger LaBoube, Don Allen, Pat Ford and Jay Larson explore and recommend simplification options. Ideally, this process would be completed before the initiation of any other ballots to modify AISI S240-15.*

    - System Design: The COFS focus for the next cycle should explicitly recognize the need to support and encourage full system design. This is necessary because full system performance, including fire, acoustic, thermal, sustainability, etc. significantly impacts potential growth in mid-rise. This increased focus would also provide transferrable benefits to nonstructural and curtain wall applications where large CFS market share exists and maintaining this position is important. In the short term, the COFS should serve as a focal point for industry discussions of these broader issues. In the long term, deep industry ownership and collaboration towards managing these broader issues effectively should be sought.
- Participation: A broader spectrum of participants at COFS meetings will help improve the AISI framing standards. The COFS Energy Standard Task Group is an example of how expertise and leadership was successfully recruited and engaged to help develop a draft of AISI S250, the proposed *North American Standard for Cold-Formed Steel Framing – Energy Conservation*. Independent of the COFS, the CFS Framing Fire, Blast and Disproportionate Collapse Task Group and the Project Monitoring Task Group (PMTG) on the NRC Acoustic Testing project have been helping to address other codes and standards challenges. Each of these task groups needs increased visibility and engagement with the COFS membership. Further discussion and review of the membership rolls and rosters in the future is worthwhile.

    Action Item: *Jay Larson will inform Jonathan Humble that Roger LaBoube is to replace Rick Haws*

on the COFS Energy Standard Task Group.

Action Item: *Jay Larson will work with Steve Fox to develop a recommendation regarding the possible formation of a COFS Acoustic Task Group with an initial charge to identify the best dissemination vehicle(s) for the recent Canadian research. The existing PMTG might form the right basis for this new task group.*

8.0 COMMITTEE ON SPECIFICATIONS. A reflection on COS efforts in the previous cycle, status of the CFS industry and market needs led to the following conclusions and recommendations:

- Stakeholders: The CFS industry remains characterized by distinct trade associations focused on particular CFS products, with CSSBI, MBMA, RMI, SDI, SJI, and the various CFS framing associations each participating in the COS process for their own specific reasons. This presents challenges with respect to coordination when associations' agendas are not aligned and motivation when there are gaps between associations' scopes. The background reasoning for the COS focus and a roadmap that explains the high level objectives for COS needs to be brought to stakeholders early in the cycle so that they have enough time to digest and determine how to integrate into their own planning. Regular interaction with all COS stakeholders is key to keeping them coordinated and motivated.
- Committee Focus: The COS focus to "Enable Analysis-Based Design" must evolve in order to better articulate the desires to both (1) leverage analysis to advance CFS structural efficiency and (2) in the long-term enable performance-based design (PBD).
    - Leverage Analysis: The path to PBD leads through improving our analysis abilities; therefore, keeping the COS focused on enabling analysis-based design makes sense. In addition, the best path to addressing high-level objectives such as resilience, redundancy, robustness, etc. is by advancing analysis capabilities and their integration into CFS engineering design. Opportunities to create more efficient designs should be available and exploited along the way.

        Action Item: *The Strategic Planning Committee should review the effectiveness of the COS Analysis Task Group to determine if the long term goals for simulation and software are being realized.*

        Action Item: *The Strategic Planning Committee should support and encourage the COS, COFS and Education Committee to leverage opportunities to create more efficient designs; e.g., exploit analysis-based DSM to liberalize EWM limitations on web hole spacing.*

    - Performance Based Design: A clear path is lacking towards what performance based design should mean for AISI standards. A coherent strategy to help guide the COS and the efforts of its steel industry partners in the future is needed. A task group or other efforts should be considered, and further discussion on this matter is needed. As a next step, discussion with AISC is recommended. (Note: The ASCE 41 experience of AISI and AISC is a good jumping off point in terms of industry needs in this area.)
- Name of AISI S100: The name of AISI S100 should evolve to "*Specification for the Design of Cold-Formed Steel in Structures*". Dropping the "*North American*" precursor should have no ill effect and would provide the potential for even wider (i.e., international) use and adoption. Changing "*Structural Members*" to "*in Structures*" helps communicate that AISI S100 goes beyond just structural members. Consideration was given to focusing the name on systems, but instead it was concluded that the focus should instead be on structural cold-formed steel whenever it is used in a structure, which recognizes mixed construction and other situations where cold-formed steel is just

one of the materials used in the structure.

9.0 STANDARDS-TO-EDUCATION ENGINE. A reflection on recent efforts and challenges, the availability of numerous organizations with which to partner, and market needs led to the conclusion that AISI Education Committee should focus its efforts on the educational products that directly support the AISI standards. Specifically the committee should monitor the alignment of education products with the standards and insure adequate educational products are available to support each AISI standard. Where needs are not met, the committee should advocate for additional resources to support the standards.

10.0 RESEARCH-TO-STANDARDS ENGINE. A reflection on recent research prioritization and funding challenges led to the conclusion that a research roadmap is needed for both the COFS and COS to meet the stated next cycle focus areas (i.e., mid-rise and analysis). While an initial roadmap can be developed by a task group or other small group, critique and engagement of the COS, COFS and all stakeholders is needed before it can be finalized. The roadmap should identify efforts that are needed that fit either industry-led or larger/federal-led research. The roadmap should describe the objectives with sufficient detail such that (a) stakeholders understand the objectives and (b) interested researchers could respond to and expand on the needed activities that are aligned with the objectives. The specific role of AISI and other standards development groups (e.g., AISC, ASCE, etc.) in achieving the focus areas also should be detailed. An early draft of these roadmaps is needed and some resources may be needed to achieve this in a timely fashion.

Action Item: The Strategic Planning Committee should review how the COS and COFS can further encourage a culture of innovation in the committees and in the AISI standards.

11.0 OPERATIONAL EFFECTIVENESS. A reflection on previous meetings and meeting preparations led to the following conclusions and recommendations:

- Pre-Meetings. There should be a meeting for COS and COFS chairpersons roughly mid-way between the face-to-face meeting cycles as opposed to specifically focusing on the delivery of pre-meeting information immediately before the face-to-face meetings.
- Seating at Meetings. Chairs and members need to be reminded of the importance of direct and active participation for the meetings where they are members, e.g. sitting at the main table.
- Leadership Development. Given the number of new chairs and assignments, additional activities and meetings for the COS and COFS leadership are encouraged.
- Start of New Cycle. To the extent possible, no new ballots should be introduced prior to the February 2017 meetings and a minimum of ballots should be considered until the subcommittees have had a chance to align their activities with the new committee foci and related roadmap.

12.0 NEXT STEPS AND ACTION ITEMS. Recommendations from this meeting need to be formalized and communicated.

Action Item: Ben Schafer and Jay Larson will review the existing AISI Standards Development Business Plan and create a first draft of an updated version with research roadmap for the 2016-2022 cycle.

13.0 NEXT MEETING. A next meeting of the Strategic Planning Task Group was not scheduled.

14.0 ADJOURNMENT. The meeting adjourned at 3:15 PM.

SUMMARY OF ACTION ITEMS

Champion	Action Item
Jay Larson	Send the previous meeting report to Don Allen.
Helen Chen	Manage the process of updating AISI S240-15 to align with AISI S100-16 after a task group of Roger LaBoube, Don Allen, Pat Ford and Jay Larson explore and recommend simplification options. Ideally, this process would be completed before the initiation of any other ballots to modify AISI S240-15.
Jay Larson	Inform Jonathan Humble that Roger LaBoube is to replace Rick Haws on the COFS Energy Standard Task Group.
Jay Larson	Work with Steve Fox to develop a recommendation regarding the possible formation of a COFS Acoustic Task Group with an initial charge to identify the best dissemination vehicle(s) for the recent Canadian research. The existing PMTG might form the right basis for this new task group.
Strategic Planning Committee	Review the effectiveness of the COS Analysis Task Group to determine if the long term goals for simulation and software are being realized.
Strategic Planning Committee	Support and encourage the COS, COFS and Education Committee to leverage opportunities to create more efficient designs; e.g., exploit analysis-based DSM to liberalize EWM limitations on web hole spacing.
Strategic Planning Committee	Review how the COS and COFS can further encourage a culture of innovation in the committees and in the AISI standards.
Ben Schafer and Jay Larson	Review the existing AISI Standards Development Business Plan and create a first draft of an updated version with research roadmap for the 2016-2022 cycle.
Ben Schafer and Jay Larson	Schedule a next meeting of the Strategic Planning Committee.

APPENDIX 2: Strategic Planning Committee Report to AISI Standards Council

Strategic Planning Committee

Report to AISI Standards Council

20 January 2017

Strategic Planning Committee

Members

- Ben Schafer – Chair of Strategic Planning Committee
- Rick Haws – Chair of Committee on Specifications (COS)
- Roger LaBoube – Chair of Committee on Framing Standards (COFS)
- Don Allen – Chair of Education Committee
- Helen Chen – Secretary of COS and COFS
- Jay Larson – Secretary of AISI Standards Council

Activities

- September 2016 Schafer and Larson preparatory work
- 4 October 2016 face-to-face meeting
  - Wills and Rizutto also guests at this meeting
- November/December 2016 Schafer and Larson work on roadmap
- 10 January Schafer, Larson, Chen face-to-face meeting
  - Manley called in for portion of this meeting

Overview

- The committee recognized the important opportunity that exists due to being at the beginning of the Specification cycles.
- In our face-to-face 1 day meeting we tackled a large agenda
  - COFS: Stakeholders and Committee Focus
  - COS: Stakeholders and Committee Focus
  - Standards-to-Education Engine
  - Research-to-Standards Engine
  - Operational Effectiveness
- The outcome of these discussions and some additional work towards making the discussions actionable are shared here.

COFS

- **Stakeholders**: Further integration with SFIA sought and in progress.*
- **Focus**: The COFS focus to "Enable Growth in Mid-rise Buildings" must evolve in order to better articulate the desires to both
  (1) improve the ease of use of the AISI framing standards and
  (2) support and encourage full system design.
- **Ease of Use**: The COFS focus for the next cycle should include a specific challenge to improve the ease of use of the AISI framing standards.
- **System Design**: The COFS focus for the next cycle should explicitly recognize the need to support and encourage full system design. This is necessary because full system performance, including structural, fire, acoustic, thermal, sustainability, etc. significantly impacts potential growth in mid-rise. This increased focus would also provide transferrable benefits to nonstructural and curtain wall applications where large CFS market share exists and maintaining this position is important.

*paraphrased from minutes by Schafer

COFS - Towards a Roadmap

Topic	AISI Standard	Other AISI Effort	Partners	Research/Resources
Mid-rise	S240 S400	Education Committee and CFSEI	SFIA	$$$ Set archetypes, identify weaknesses, plan out research needs.
Ease of use	Continual effort by COFS and Editorial SC	Design guides, manuals, technical notes, webinars	SFIA	$$ Support standards strongly, derivative documents, tables, software, etc.
Full system design	New standards (or appendices) needed	Thermal (COFS) FBDC (AISI) Acoustic (CSSBI)	SFIA GA Others	$/$$$ Simulation can enable, utilize advances in other fields not create new research, depending on approach can be very expensive with testing…

This table is a draft created by Schafer/Larson/Chen working on roadmap for enabling COFS strategies.

COS

- **Stakeholders**: Outreach and collaboration of COS strategies with customer associations needs to deepen. Challenge to integrate schedules and objectives but more leveraging needs to be sought.*
- **Focus**: The previous COS focus to "Enable Analysis-Based Design" must evolve in order to better articulate the desires to both (1) leverage analysis to advance CFS structural efficiency and (2) in the long-term enable performance-based design (PBD), or in short **"Leverage Simulation"**.
- **Enable Analysis**: The path to PBD leads through improving our analysis abilities; therefore, keeping the COS focused on analysis makes sense. In addition, the best path to addressing high-level objectives such as resilience, redundancy, robustness, sustainability, etc. is by advancing analysis capabilities and their integration into CFS engineering design. Opportunities to leverage simulation and create more efficient designs should be available and exploited along the way.
- **Develop Performance Based Design**: Simulation provides the tool for predicting performance. A clear path is lacking towards what performance based design should mean for AISI standards. A coherent strategy to help guide the COS and the efforts of its steel industry partners in the future is needed. A task group or other efforts should be considered, further discussion needed.
- Evolve name of S100 Standard discussed and internal proposal made, but feedback on implementation negative, so not brought forward, see minutes.

*paraphrased from minutes by Schafer

COS - Towards Roadmap

Topic	AISI Standard	Other AISI Effort	Partners	Research/Resources
Analysis - structural	AISI-S100, New Appendix? AISI-S400	Analysis TG	System specific, AS/NZ	$$$ Voluntary appendix, how to use Spec. to enable not prescribe, Enable software, Get more than ultimate strength.
Analysis – all else	Support any new standards on COFS side	Analysis TG, FBDC and other TGs?	System and hazard specific	$$ Identify best near term targets (energy, thermal, BIM). Prioritize making sure CFS comes along as advances made
PBD - seismic	AISI-S400	-	ASCE 41 AISC	$ Work with AISC to remain parallel. Move provisions to AISI.
PBD - other hazards	Pre-standard next cycle	need home	All standards developers	$$$ Clarity on capacity side what is needed, targets for initial development, leadership in the area.

This table is a draft created by Schafer working on roadmap for enabling COS strategies.

Standards-to-Education Engine

- A reflection on recent efforts and challenges, the availability of numerous organizations with which to partner, and market needs led to the conclusion that AISI Education Committee should focus its efforts on the educational products that directly support the AISI standards. Specifically the committee should monitor the alignment of education products with the standards and insure adequate educational products are available to support each AISI standard. Where needs are not met, the committee should advocate for additional resources to support the standards.
- Essentially tighten AISI scope in education so there is clarity for all parties, both internally and externally.

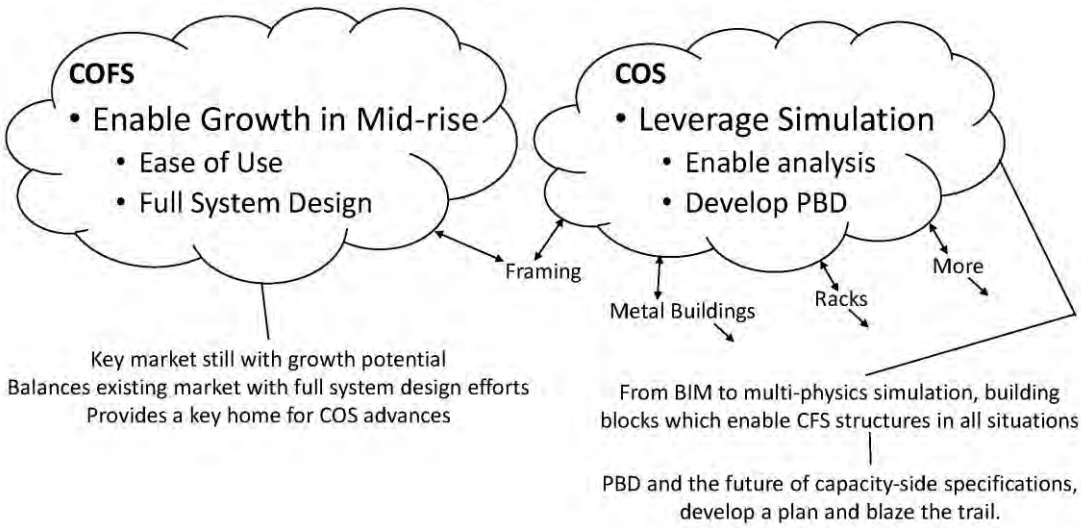
Research-to-Standards Engine

- A reflection on recent research prioritization and funding challenges led to the conclusion that a research roadmap is needed for both the COFS and COS to meet the stated next cycle focus areas (i.e., mid-rise and analysis).
  - Develop with small group initially, but stakeholder engagement a must
  - Objectives need to meet the needs of stakeholders (including outside industry if large $) and researchers who would respond
  - Tasks should give indication of whether industry or outside resources are required
  - Standards aspect of the tasks needs to be detailed
  - Research funding processes may need re-evaluation to meet objectives
  - Resources are needed to kick start this effort

Operational Effectiveness

- Pre-Meetings. There should be a meeting for COS and COFS chairpersons roughly mid-way between the face-to-face meeting cycles as opposed to specifically focusing on the delivery of pre-meeting information immediately before the face-to-face meetings.
- Seating at Meetings. Chairs and members need to be reminded of the importance of direct and active participation for the meetings where they are members, e.g. sitting at the main table.
- Leadership Development. Given the number of new chairs and assignments, additional activities and meetings for the COS and COFS leadership are encouraged.
- Start of New Cycle. To the extent possible, no new ballots should be introduced prior to the February 2017 meetings and a minimum of ballots should be considered until the subcommittees have had a chance to align their activities with the new committee foci and related roadmap.

Summary



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Research Report RP-17-3