

**ACEC / Caltrans Division of Engineering Services
Structures Liaison Committee**

MEETING MINUTES (FINAL)

DATE: January 20, 2012

TIME: 10:00 AM – 12:00 PM

MAIN LOCATION: California Department of Transportation
Division of Engineering Services
1801 30th Street, Room 102 (Farmers Market 1 Building, 1st Floor)
Sacramento, CA 95816

VIDEO CONFERENCE LOCATION: District 12 Office, Room 333
3337 Michelson Drive, Irvine

MEETING MINUTES: Shawn M. Cullers

I. Call to Order

- A. New committee Co-Chair and Secretary for ACEC
 - *Y. Nien Wang with HNTB was introduced as the new ACEC Co-chair and Todd Goolkasian with Cornerstone Structural Engineering Group was introduced as the new ACEC Secretary. Lam Nguyen praised Tom Walker's performance as ACEC Co-Chair last year noting that he has set a high standard for the future.*
- B. Self-introductions
- C. Changes to Agenda
 - *Column forces due to Creek and Shrinkage*
 - *Additional Technical Questions*

II. Status/Reports on Technical Topics

- A. Tracking and Publishing Consultant Questions (Tom Walker/Sudhakar Vatti)
 - *Tom Walker provided a brief summary of the issue. Currently technical specialists are fielding questions internally from Caltrans and externally from consultants which is putting a high demand on the Caltrans technical specialists. Many of the questions put to the technical specialists are repetitive questions. A subcommittee was formed to define the issues and provide potential solutions.*
 - *The issue has three aspects*
 1. *Technical specialists are overloaded*
 2. *No ability to search previous questions and answers*
 3. *Caltrans internal questions and answers are not currently available to consultants*
 - *Proposed solution is to have online depository of questions and answers that are categorized. Preferred that depository is hosted by Caltrans to provide legitimacy to responses, more traffic, allows Caltrans to control Q/A content, and higher long term stability. Approval process would be required. Consultants would work with specialists to provide answer. A standardized form could be developed by ACEC*

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with background information and proposed solution. The process should be a collaborative effort between consultants and specialists. The specialists would also act as gatekeepers; screening those questions that require responses and those that can be found in Caltrans published materials. ACEC would also compile previous questions and answers that have been discussed.

- *Sudhakar noted that not all specialists have websites and some specialists have internal websites only. Many specialists do not actively update the website. Tom Walker also noted ACEC has a site on the Washington State DOT website with past position papers that is similar in concept to proposed Q/A site.*
- *Mark Ashley noted that some questions may be time dependent and that a blog may provide a better solution to time critical questions. The blog would require a moderator, typically an expert in the field. A blog would have to be outside of Caltrans. Specialists could access the blog. The blog idea can be discussed further in the subcommittee.*
- *Jack Abcarius asked if the specialists currently track there questions including; what the question is, who asked the question, and where are the questions coming from. This information would assist the committee in determining an appropriate solution. Currently the questions are not tracked.*
- *The use of a newsletter, published updates, or quarterly report was proposed to compile the information and questions being asked. The newsletters would provide a response to questions or provide an update on the status of existing questions.*
- *Lam Nguyen noted that the subcommittee should also consider how resource intensive each potential solution is and if Caltrans will have the ability and resources to implement any recommendations that ACEC provides. The solution will also need to work for Caltrans internally. Barton Newton also noted that there is a concern with this new information leading to more questions and with Caltrans having the resources to answer questions on non-project specific standards and guidance.*

Action Items:

Subcommittee to work on providing a draft standardized form for questions and answers. Discussions from this meeting to be sent back to subcommittee for additional discussions

B. ADA Construction Tolerances for POC's (Lam Nguyen)

- *Lam noted that there is no official policy on POC slopes and constructions tolerances. Caltrans has an internal bulletin on their intranet that provides an overview, general information, and links to other intranet sites that provide additional information. Barton noted that the MTD has been pulled and that no policy statement has been issued. The next step would be to work with Design to issue a policy statement. Barton also noted that he was reluctant to provide the internal bulletin due to the Caltrans intranet links it contains that are not useable to outside users. Lam recommended that the issue be closed for now and that Caltrans Design continue to work on a policy.*

C. SDC Technical Questions – Sample Abutment Details (Majid Sarraf)

- *Majid presented an overview of his powerpoint presentation on abutment shear key issues and proposed design alternatives.*

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- *Issues presented include:*
 - a) *50% of adjacent bent stiffness for abutments is not conservative for bent displacements in the displacement demand model*
 - b) *Current design practice uses a shear friction mechanism; stiffness is not easily calculated and allows for a total displacement at the shear key of only 1in; there is no discussion of ductility or strength in the current SDC*
- *Majid proposed a new shear key detail and mechanism that included reinforcing steel surrounded by a compressible material (styrofoam) within the shear key. The proposed mechanism allows stiffness to be easily calculated and modeled. Majid is currently working on a position paper. Jack asked whether any testing has been completed for the proposed detail and whether the proposed detail is reversible. Majid responded that testing has not been completed but the stiffness and strength can be calculated using first principals. The detail can also be jacked back into place following an earthquake. It was agreed that the detail would need to be tested. Caltrans will look at the proposed details and provide feedback. Sue Hida noted that there were already two ongoing abutment research projects. ~~The item would be left on the agenda as a technical issue.~~*

Action Items:

Caltrans will review the proposed shear key alternatives

- D. District Approvals of Bridge Site Data Submittal Package (John Fujimoto)
- *John Fujimoto noted there have been several DES updates and that this one of several updates to the OSFP procedures guide that would occur in the next month. All OSFP updates were sent out by Bob Weber in an email notice. The procedures guide discusses what should be included in the submittals and there has been no changes to the deliverables. Sudhakar noted that design build projects do not require BSDS submittals. The question of whether district approval is required for BSDS submittals. John noted that the structural liaison would only be looking for concurrence from the District project manager for project geometrics. This item will be removed from the agenda.*
- E. Follow Up on Creep and Shrinkage (Walt LaFranchi/Sudhakar Vatti)
- *Walt LaFranchi asked whether the current CTBridge program calculates creep and shrinkage. The current version does not but Caltrans will be releasing an update that will provide the ability to calculate creep and shrinkage. Walt also asked about the methodology used by Caltrans to design the substructure for creep and shrinkage and how the methodology varies between structure types such as CIP/PT box girders and CIP slabs. Marc Friedheim provided an overview of Caltrans methodology for CIP/PT box girders that assumed a strain rate of 0.1ft per 100ft. This assumed strain rate deducts the first 12 weeks due to falsework supporting the bridge structure. Other structures follow the procedures in AASHTO LRFD 5.4.2.3. Marc noted that a CIP/PT box girder has 37% more strain using LRFD procedures than Caltrans standard practice. Reinforced concrete bridges have less of a difference. Walt asked whether MTD 7-10 was being updated. Research is being conducted by Iowa State to validate the 0.63in per 100ft assumed in MTD 7-10. It was noted that CTBridge does not provide design of the substructure and that it only provides the forces to the substructure. Walt asked whether there is a*

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description of the methodology used by CT Bridge to calculate the substructure forces. Sue noted that Caltrans is currently working on a manual for CTBridge.

F. New Items (Walt LaFranchi/Sudhakar Vatti)

- *Walt LaFranchi noted that the 2010 Standard Plans for retaining walls provide strength and service limit foundation pressures but no extreme event pressures. The question was posed of whether the 2010 Standard Plan designs for retaining walls include seismic or barrier impact loads. Sue noted that a new MTD was planned to be issued that provided background on assumptions used in the retaining wall designs.*

Action Items:

Caltrans to respond

- *Walt noted that the new XS sheet XS14-220-2 was released in January 2012. The LRFD bearing pressures on the new XS sheet are much lower compared to the older 1996 loads for service and strength.*
- *Sue noted that updated pile layout sheets for LRFD retaining walls would be updated in the middle of February.*
- *Walt asked whether the new CT-FLEX program for the design of MSE walls would be released to consultants. Caltrans would only be releasing the program internally.*
- *Walt asked what plans Caltrans had for the new 6th Edition of the AASHTO LRFD design specifications. Sue responded that Caltrans would adopt the 6th Edition but not immediately due to the time required to issue new blue sheets*
- *Sue requested that any technical questions be written to be passed to the technical specialists.*

III. Updates

A. DES Updates (Lam Nguyen)

- *There has been no change to the list of updates provided at the last meeting except that Sharri Bender Ehlert, who was acting director of District 6, is now the director. It was noted that the proposed budget from the governor has transportation funding being reduced. The effects of the reduced budgets are not known at this time; A team has been put together to look at department efficiencies. Both Caltrans and local agencies will be meeting over the next three months to discuss efficiencies and a report will be issued with the outcomes; Winter training is ongoing and includes prestress and deck construction.*

B. DES Updates: Memo to Designers, Technical Research, IQA (Barton Newton)

- *Memo to Designers*
 - a) Caltrans is implementing a quiet deck specification*
 - b) Caltrans is currently working on QC/QA procedures for structural concrete. The new specification will place more QC procedures on the contractors*
 - c) MTD 7.1 and 7.2 Bearings is being updated*
 - d) Updating MTD 5 series for Anchor Walls. Changing name of Tiebacks to Anchor Walls.*
 - e) New MTD's for seismic design of slab bridges, bridges near faults,*

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liquefaction, construction adjacent to Caltrans bridges, and seismic reinforcing details

f) *Updating MTD 2-12 series, numbering of retaining walls*

g) *Updating MTD 12 series, steel bridges*

- **Technical Research**

Research for the 12/13 year is currently being selected. There has been no reduction in seismic research. The governor has requested needs based research program that will help solve specific issues versus the current shotgun approach. Discussion centered around increased communication between the consultants and Caltrans on research goals. One method discussed was for consultants to provide need statements and have research institutes provide the research based on need. Another goal was to provide pooled research objectives between the different States. Currently Caltrans has an inhouse team that looks over the proposals from the research institutes and provides comments. This process was started in the last few years.

- **Tools**

A new version of CTBridge will be released next week. CD's will be issued to all current licensees. The new version will address creep and shrinkage and other issues.

- *The 405 D/B MSE wall was discussed. Construction has stopped on all SSL walls with D20 wire.*

- *An update on BDP was discussed. Caltrans plans to update 10 sections this fiscal year, many of which are in draft final form now.*

- *Barton discussed Caltrans internal Technical Gap Assessment. This program provides feedback from those who are completing the work where Caltrans should provide training, what technical issues should Caltrans focus on, and where resources should be placed to produce better bridge design and maintenance. Barton asked that comments and/or ideas be provided by the consultants at the next meeting.*

Action Items:

Comments and/or ideas to TGA to be provided by the consultants at the next meeting

C. **Technical Workshops 2010 Specifications Training Opportunities (Rob Stott)**

- *John McMillan has provided the 2010 modules on the Caltrans website. Caltrans to provide link on the internet to the training modules. Construction will be providing their own training and there is no information on this training currently available. Video modules of internal training should also be available.*

- *Walt asked if Caltrans Structures is still requiring removal of the structure specifications from the roadway specifications. Internally, Caltrans Districts usually combine structure specifications with roadway specifications. It was noted that this was discussed in a previous meeting. The current procedure to follow should be per the OSFP Guide. Caltrans to discuss with specification department about submitting combined roadway and structures specifications.*

D. **ACEC Updates**

- **Invoicing on Caltrans Contracts (John Fujimoto, Mark Ashley)**

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Mark Ashley provided an update. The original issue was the submittal of late invoices from consultants and whether there was a means to simplify the reporting to save time by making it more automated. Changes to reporting would be made statewide and will require DPAC review. Items were identified in previous discussion with John that should be included in the spreadsheets. Mark to submit changes to John for review. Three questions/clarifications were identified and will be incorporated into the revised spreadsheets. Once changes to the reporting have been made it will need to be discussed whether the changes provide enough simplification and time savings to submit to DPAC for review.

Action Items:

Subcommittee to make revisions and discuss whether improvements are worth submitting to DPAC. Mark Ashley to submit additional questions to John Fujimoto to include in final revisions. Subcommittee to report back at next meeting.

- ACEC/DES Structures Liaison Committee 2010/11 Annual Report (Tom Walker)
Tom received feedback from Lam and lam's comments have been addressed.

Action Items:

Tom Walker to distribute the final draft of report to the committee members for final review. Sudhakar to distribute to Caltrans leads for final review too.

E. Project Development Oversight/Updates/Contracting Opportunities (John Fujimoto)

- *Contracting Opportunities*
 - a) Two geotech contracts are being reviewed by legal. Following review, the contracts will be forwarded to DPAC for advertising.*
 - b) A/E Technical Services contract currently with DPAC. Advertised date expected in April.*
 - c) Modeling for Earthquake Engineering contract to be advertised before end of the January.*
 - d) Photogrammetry On-call Contract will likely be advertised in March.*
- *Project Development Oversight*

John discussed a previous project designed five years ago using Conspan software where the live load does not appear to be adequately designed for. The structure is a two span precast bulb tee continuous for live load with 30 degree skew. Structure maintenance noted that the structure was inadequate to carry P13 loading. Caltrans will be completing a forensic review.

F. Statewide Committee Report (Tom Post)

- *Tom Post was not present at the meeting. Tom to provide report at next meeting.*

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IV. 2012 Meeting Schedule

January 20th (Friday)

April 26th (Thursday)

July 26th (Thursday)

October 25th (Thursday)

Distribution:

Sudhakar Vatti, Caltrans
John Fujimono, Caltrans
Lam Nguyen, Caltrans
Tony Marquez, Caltrans
Rob Stott, Caltrans
Barton Newton, Caltrans
Sue Hida, Caltrans
Mike Keever, Caltrans
Dolores Valls, Caltrans
Robert Pieplow, Caltrans
John Stayton, Caltrans
James Davis, Caltrans

Walt LaFranchi, URS Corporation
Wei Koo, WKE
Mark Ashley, TY Lin International
Thomas Post, HNTB
Jay Holombo, TY Lin International
Y. Nien Wang, HNTB
Jim Frost, Simon Wong Engineering
Tom Walker, Mark Thomas & Company
Jack Abcarius, Nolte Associates
Chandu Shenoy, Nolte Associates
Mark Reno, Quincy Engineering
Steve Tayanipour, Huitt Zollars
Todd Goolkasian, Cornerstone Struct. Eng.
Greg Zeiss, HDR
Majid Sarraf, TTG
Ayman Salama, TRC
Kevin Coates, WKE
Syed Kazmi, URS
Po Chen, Mark Thomas & Company
Sunny Jhutti, AECOM
Kevin Thompson, Arora
Patricia Preston, Apex Civil Engineering
Greg Brown, HNTB

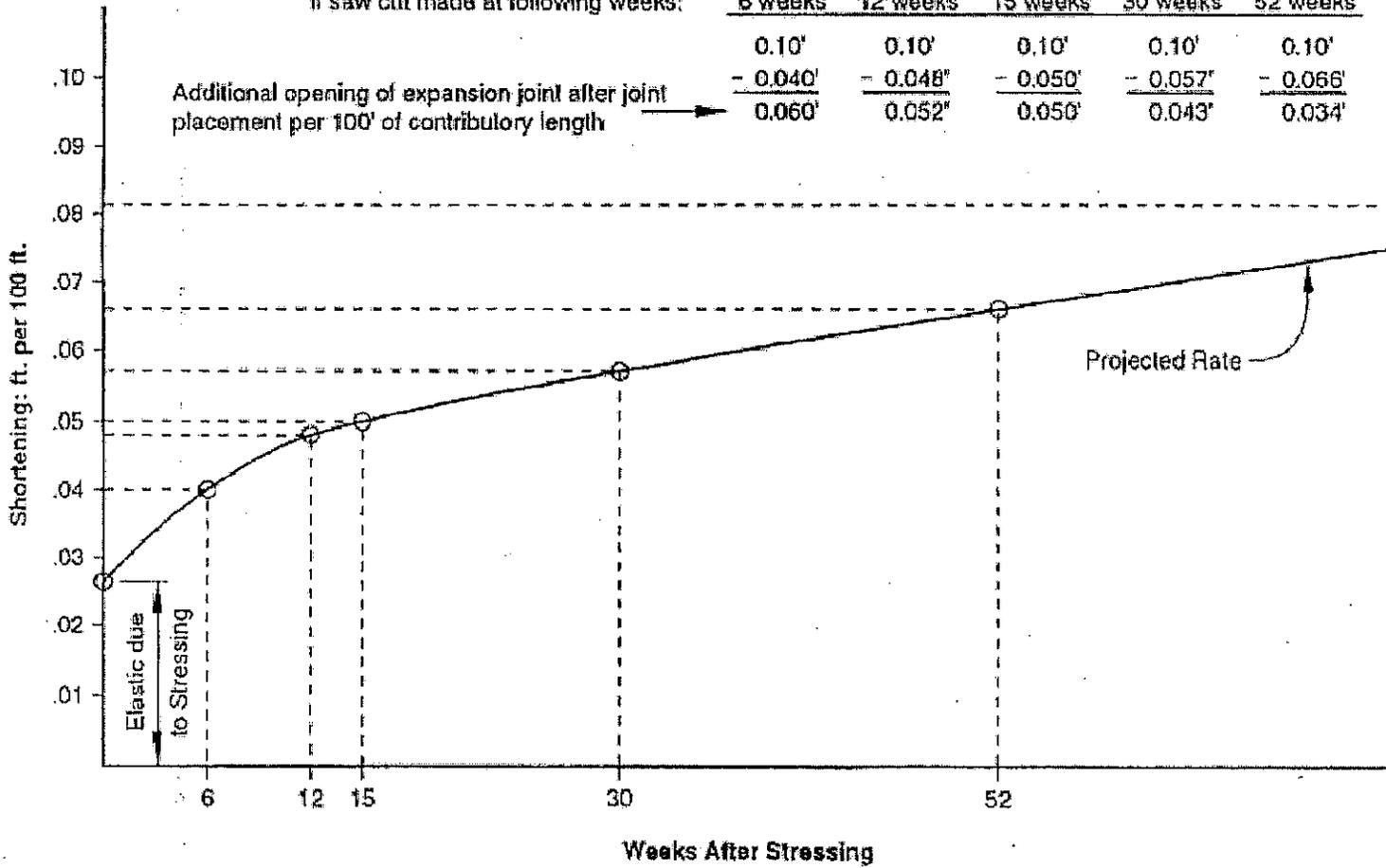
Column Forces due to CR & SH

- Creep and shrinkage forces are a result of prestressing load in the superstructure
- 4 components of force due to prestressing
 - Primary P/S moment
 - Secondary P/S moment
 - Elastic shortening of superstructure
 - Creep and Shrinkage of superstructure (long term)
- The 1st 3 components are captured in linear elastic FE analysis (CTBRIDGE).
- The last component is non-linear and time dependent and estimated using the following chart.

Prestress Shortening

Assume long term total shortening is 0.10'/100'

If saw cut made at following weeks: 6 weeks 12 weeks 15 weeks 30 weeks 52 weeks



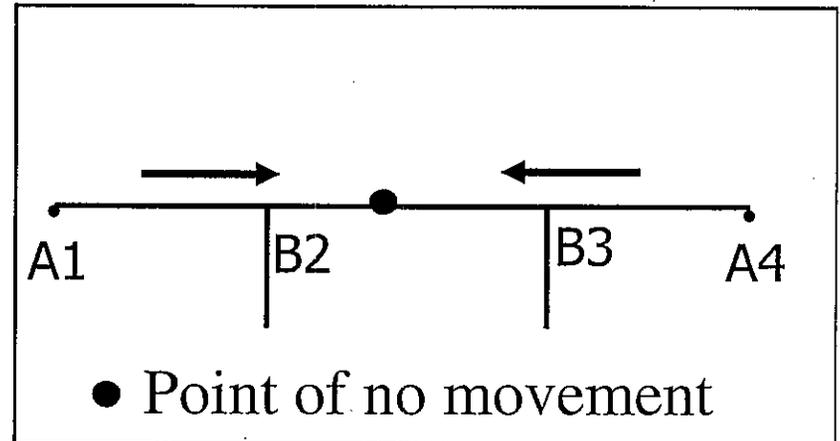
Creep and Shrinkage

- Determine Point of No Movement
- Assumed strain rate is based on long term prestress shortening less 12 week shortening:

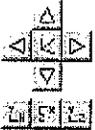
$$0.10' - .048' = 0.052'$$

$$0.052' * 12 = 0.624''$$

Round to 0.63'' / 100 ft



- Why deduct 12 week shortening?
 - Young concrete
 - Column creep
 - Redistribution
 - Foundation flexibility



Creep and Shrinkage Load

Creep and Shrinkage Load is active

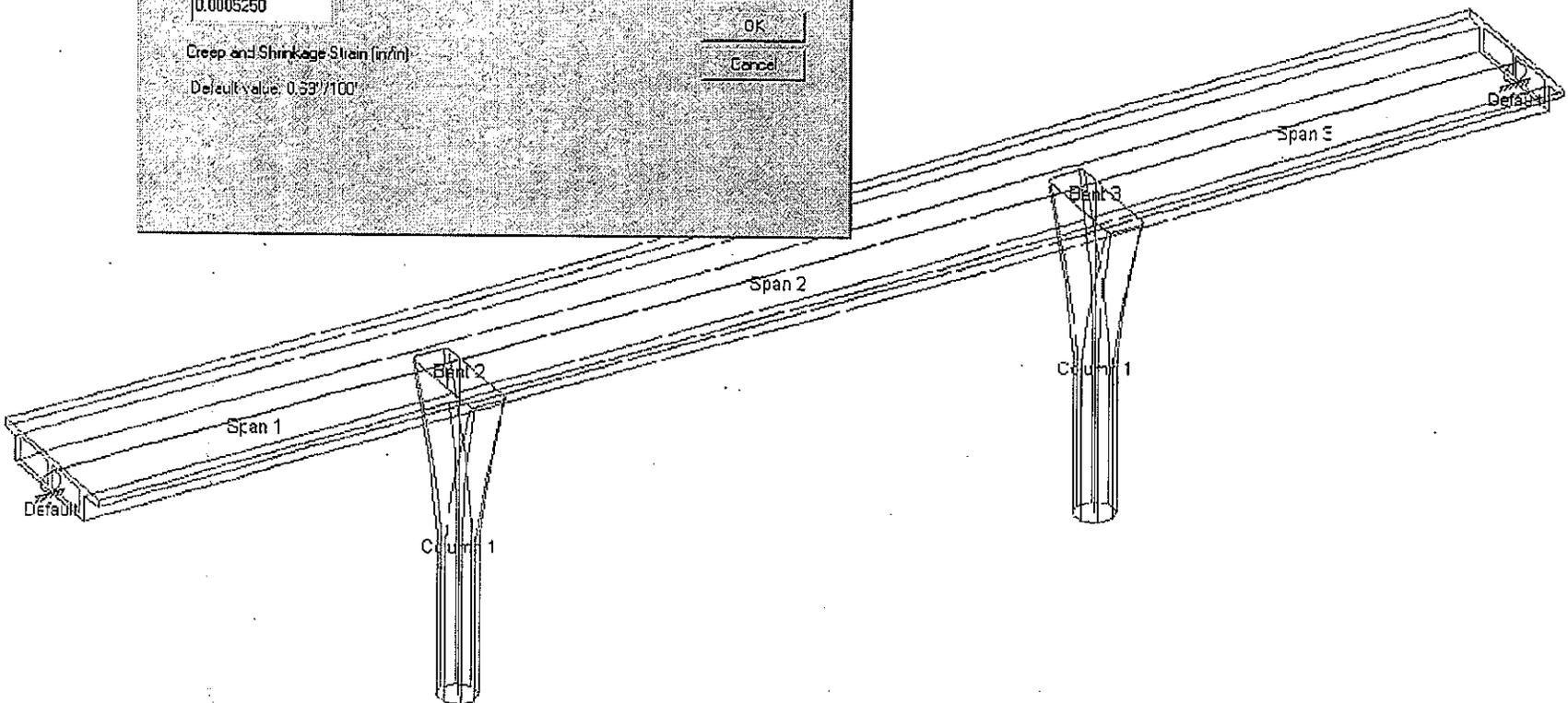
0.0005250

Creep and Shrinkage Strain (in/in)

Default value: 0.53"/100'

OK

Cancel



Creep and Shrinkage Load - Unfactored Bent Reactions

Bent	Location	AX kip	VY kip	VZ kip	TX kip-ft	MY kip-ft	MZ kip-ft
Bent 2	Col Bots	1.5	-5.3	0.0	0.0	0.0	0.0
Bent 2	Col Tops	1.5	-5.3	0.0	0.0	0.0	188.5
Bent 3	Col Bots	1.1	5.3	-0.0	0.0	-0.0	-0.0
Bent 3	Col Tops	1.1	5.3	-0.0	0.0	-0.0	-188.5

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SIGN IN SHEET

Date: January 20, 2012

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