ACEC/NCDOT

STRUCTURES SUBCOMMITTEE

Structures Conference Room C
November 6, 2023, 10:30 AM

MEETING NOTES

1) **Attendance**
    a) Trey Carroll
    b) David Stutts
    c) Gichuru Muchane
    d) Emily Murray
    e) Liz Lawes
    f) Tom Koch
    g) Domenic Coletti
    h) Jeff Loftus
    i) Brian Hanks

2) **Meeting Kick-off**
    a) Previously approved and published minutes from 8-7-2023 meeting were reviewed.

3) **Bridge Design Workshop Series**
    a) Feedback on 8-15-2023, 11:30AM-1:00PM, McKimmon Center workshop on Wando River Bridge Repairs (Kent Dickens, HDR). Feedback was generally positive. Interesting presentation. Good turnout (80+)
    b) Feedback on 10-25-2023, 11:30AM-1:00PM, McKimmon Center, Lake Pontchartrain Causeway Bay Safety Project, (Christopher D. White, Volkert). Feedback was generally positive. Good balance of design and construction issues. Decent turnout (50+) despite unanticipated conflicts with CLEAR webinar and WTS event.
    c) Feedback on Venues for Lunch Workshops: McKimmon Center vs. NC Rural Center – there are pros and cons to each. Domenic will check with Jessica Hartong regarding cost, ease of scheduling, setup, etc.
    d) Review Bridge Design Workshop tracking spreadsheet
        i) Review results of October scoring of current topics. See spreadsheet.
        ii) Update current potential topics and add new potential topics. See spreadsheet and notes below:
            a. T-052 (Strut and Tie Design for NCDOT Projects): Popular topic, but research is not expected to finish until December 2024. Consider a workshop after that.
            b. T-056 (Harkers Island): Popular Topic. For the lunch workshop focus on the details of the design and construction of the FRP features. Presenter would probably be Trey Carroll and others from

NCDOT who worked on the project, plus someone from Balfour Beatty to provide contractor's perspective. Plan on scheduling the lunch workshop in late April/early May 2024, after the March 2024 PCI bridge design workshop.

c. T-062 (Alligator River Bridge Replacement): Popular Topic, but project will not be complete for several years. Delay workshop until then.
d. T-051 (Open Bridge, Projectwise, PDN): A perennial popular topic these days, but there is an NCLUG workshop coming up in February; the Structures session is expected to address OBD and ProjectWise. The specifics of NCDOT SMU's implementation of OBD and ProjectWise is evolving; for now, continue to rely on NCLUG workshops and webinars to put out information and updates and solicit feedback and delay an ACEC lunch workshop until the specifics are more firmly established.
e. Topic T-055 (Integral Abutment Research): Wait until research project final report is complete.
f. Topic T-057 (CMGC Project Delivery): Not discussed.
g. Topic T-060 (Rehabilitation Details and Materials): Not discussed.
h. Topic T-036 (Engineering Judgement and the use of Bridge Design Software): Move this topic to the "Discarded Topics" list; consider addressing aspects of this topic as part of Topic T-065.
i. Topic T-061 (Corrosion Policy Refresher/Updates): Not discussed.
j. Topic T-053 (FRP Applications in Bridge Repair): Not discussed.
k. Topic T-054 (Press Brake Formed Steel Tub Girders): Wait and see if this structure type is used in NCDOT and if it becomes recognized as a tool in the NCDOT toolbox.
l. Topic T-035 (Bottomless Culverts: Permitting and Construction Issues): Topic is dated (originally suggested in May 2014) and no longer timely. Move to the "Discarded Topics" list.
m. Topic T-064 (Perquimanns Movable Bridge): New topic, not ranked yet. Not discussed in detail at the meeting.
n. Topic T-065 (NCDOT Standard Designs): New topic. NCDOT feels that just describing how the standard designs were developed would not take a full hour; instead consider combining that aspect with other related topics such as: identifying project details that might trigger need for a non-standard design; understanding how different programs and different design assumptions affect parameters such as camber, deflection, prestress losses, etc. (i.e., borrow from Topic T-036).

iii) Identification of the next workshop topic and timeframe: Topic T-056 (Harkers Island) in late April or May, after the PCI workshop

4) **Training Opportunities**
   a) PCI Seminar update
      i) Full day event at McKimmon Center on March 5, 2024.
      ii) Anticipate nominal cost.
      iii) Topics currently TBD. Here are some ideas for topics to send to Marti Harrell and Reid Castrodale.
         - High level review of Harker's Island project (FRP materials)
         - Review of basics of prestressed girder design (similar to Reid's presentation at the last PCI workshop several years ago). This could/should include both some basic topics (for EITs/young engineers) and some more advanced topics (for mid-level/more senior engineers).
            - Explain prestress losses, how they affect performance, how predictable they are, what affects the losses.
            - Discuss reinforcing detailing: Congestion, consolidation, field bending of bars projecting from girders (diaphragm anchorage, stirrups up into deck).
            - Discuss fabrication (how quickly the beds need to be cycled, what the fabricator has to do with regard to admixtures etc. to achieve high release strengths). Include lots of photos.
            - Discuss what fabricators have to do in response to what is presented on design plans. Discuss at what point a high release strength becomes a significant issue.
         - A retrospective on how things have changed in recent years, both in terms of design and fabrication.
         - Discuss the various changes appearing in the upcoming 10th Edition of AASHTO LRFD BDS.
         - Roundtable/Panel discussion (similar to previous workshop), with questions submitted in advance and/or audience questions.
   b) NSBA Steel Bridge Forum update (tentatively fall 2024): Not discussed in detail. Will discuss in more detail at a future Subcommittee meeting.

5) **Anticipated PEF Opportunities**
   a) SMU plan for use of the recently awarded LSC contracts.
      i) Expect "business as usual" – NCDOT is not planning any big changes with regard to how the LSCs will be used.
      ii) As projects progress after initiated, the letting dates may change (may be delayed); in those situations, the general direction will be to keep working on the projects so they are "shelf ready," rather than slowing production if the letting date is pushed out.
      iii) Approximately 40 prescreened projects will come back to SMU this month. They will be prioritized by level of complexity and then how they fit into the program over the next five years. That will determine timelines for scoping and assigning to PEFs. SMU will coordinate

with PMU and Divisions to see who will manage the projects. Not all will be scoped and initiated this year; all will be assigned, but some start dates may be pushed out.

iv) Some bigger interstate bridge projects (probably six to eight bridges) will be assigned to PEFs through LSCs.

v) SMU will make best effort to have all PEFs with LSCs have some assignments.

vi) "Structure design" projects are being evaluated on a case-by-case basis when PMU initiates projects. If more than, say, five bridges are included in a given project, SMU may explore the option of breaking up the structure design assignments and distributing them to more than one firm. This is primarily intended to give smaller firms more opportunities for assignments that involve purely structure design work.

6) **Technical Topics**

a) Recent revisions to manuals, standards, etc.

i) Approach slab standards were updated to match the 2024 Roadway Standards.

b) Upcoming revisions to manuals, standards, etc.

i) Other standards are being reviewed for consistency with 2024 Standard Specifications.

ii) SMU Manual is also being reviewed for consistency with 2024 Standard specifications as well as consolidation of guidance on walls into a new chapter.

c) OBD/Open X implementation.

i) Nick Pierce has drafted a memo on SMU's implementation of OBD; the memo is currently under review. The memo will be very brief (approximately 1 page) and will only address converting Microstation V8i drawings to OBD and making modifications to the drawings in OBD. The memo will not be a "step by step" guideline for OBD implementation.

ii) Individual SMU standard drawings will converted to the OBD format, but will only be updated for the OBD workspace when the actual technical content of the standard changes. In the interim some standards may have different font from other drawings; SMU understands this and is OK if plansets are submitted with some drawings having different fonts. SMU does not want PEFs to spend time converting files solely to update fonts, linestyles, etc. for consistency of appearance.

iii) There is an NCLUG workshop in February; the Structures session is expected to address OBD and ProjectWise implementation.

iv) There is an NCDOT SMU OBD manual available (https://connect.ncdot.gov/resources/Structures/Documents/NCD

OT%20Structure%20Management%20Unit%20OpenBridge%20Manual_Ver10.10.pdf). There are also training videos, but they are not available to PEFs.

v) The manual includes a lot of guidance on 3D modeling, but SMU is not asking for 3D modeling at this time. Currently, SMU is focused on having designers do their 2D plan production in OBD (rather than Microstation V8i). NCDOT SMU recognizes that the messaging from NCDOT regarding Open X implementation has been inconsistent from various units (e.g., messaging from SMU is different from messaging from Roadway Design Unit, etc.). SMU will gradually introduce 3D modeling requirements at a later date.

vi) NCDOT had two pilot projects done in OpenX, but both projects used OpenX just to produce 2D plans; 3D modeling was not included.

vii) SMU is being regularly consulted regarding which projects should be converted to OpenX. The most recent "rule of thumb" is that projects with letting dates 18 months out should probably be fully converted to OpenX.

viii) Overall, bigger picture: NCDOT is eventually going to move to Digital Delivery.

d) ProjectWise implementation.

i) Chief Engineer's memo on ProjectWise was recently published.

ii) PEFs have been asking questions related to how the NCDOT workspace will be shared in ProjectWise. The original plan was to have PEFs work within NCDOT's workspace on NCDOT's ProjectWise server (allowing seamless updating), but the Chief Engineer's recent memo has delayed the implementation of policy requiring PEFs to perform their work in NCDOT's ProjectWise.

e) Digital Delivery

i) There is a "Digital Transformation" committee working right now. Initial focus is capturing cross-pipe information.

ii) There is an OpenX Steering Committee. They are addressing the topic of "converting projects" in general.

f) Research project updates.

i) Integral abutment research project: Draft final report has been reviewed. Closeout meeting in a few weeks. Publish after that. Current NCDOT guidance is to extend the diaphragm all the way to the face of wingwalls.

ii) No other research project updates are available at this time.

7) **Open Discussion/Other Topics**

a) Design "Moratoria" (i.e., SMU policy): The SMU Manual is the single authoritative written source of "official" SMU design policy. Beyond that, any other "policies" are informal. The best advice for PEFs is to "call and ask" when they have questions or are unsure about whether a particular

structure type, design detail, or design approach is considered acceptable. When asking a question about the use of a particular detail, structure type, design approach, etc. the "best practices" include coordinating with SMU as early as possible and providing SMU a concise summary of the issues in the unique context of your project.

b) It is also very helpful to SMU if PEFs bring up changes that potentially have implications with regard to scope creep/construction cost increases.

c) QA/QC Checklists: The QA/QC Checklists have been available for nearly a year now, but PEFs have not been consistently including them with submittals. As of today, if a submittal does not include a completed QA/QC checklist, SMU will be asking for them to be provided before the submittal will be reviewed. This is true for both central- and division-managed projects, for both PGDs and final plans. Preference is to fill out in MS Word, then convert to PDF and sign (Docusign, Adobe, etc.) and then flatten and submit. QA/QC checklists are on the NCDOT Project Management / SMU website under Structures Documents.
   i) https://connect.ncdot.gov/resources/Structures/Documents/Structures%20QA%20Checklists.zip
   ii) https://connect.ncdot.gov/resources/Structures/Documents/Structures%20QC%20Checklist.zip

d) When scoping projects, use the PDN scope generator (which can be found here https://connect.ncdot.gov/projects/Project-Management/Pages/Tools-Templates.aspx), but also include the "Structures Bridge Data Sheet" spreadsheet that can be found on the NCDOT Structures website under Structures Documents (https://connect.ncdot.gov/projects/Project-Management/Pages/Tools-Templates.aspx). Make sure the project's overall PM remembers to include the Structures Bridge Data Sheet with the other scope and fee documents.

e) PEF Evaluation Forms: SMU will be preparing PEF Evaluation Forms for each PGD and Final Design Review submittal. For some cases (Central Letting for example) the Final Plans submittal will also be evaluated. The PEF Evaluation Forms will be posted to Connect NCDOT. Intent is to build up a "database" of PEF Evaluation Forms to be used by NCDOT to gauge how PEFs are performing.

8) **Next Meeting: February 5, 2024**