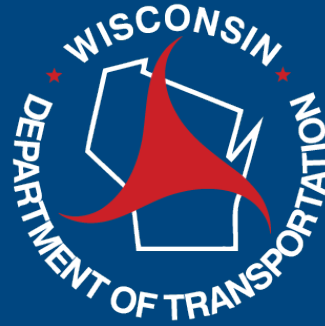




2023 Concrete Updates and Beyond...

Leslie Hidde, PE and Mark Finnell, EIT

WCPA

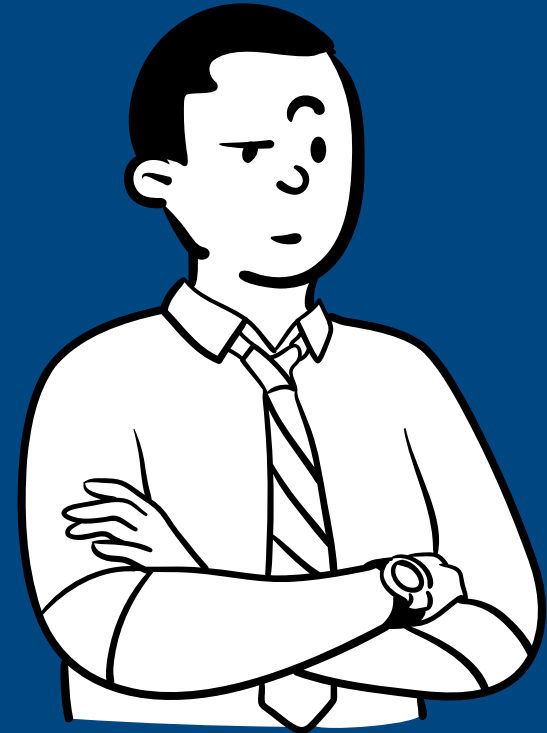
BTS – Consultant Concrete Engineer

2023 Annual WCPA Conference
Oshkosh, WI

February 10, 2023

Why Are We Here?

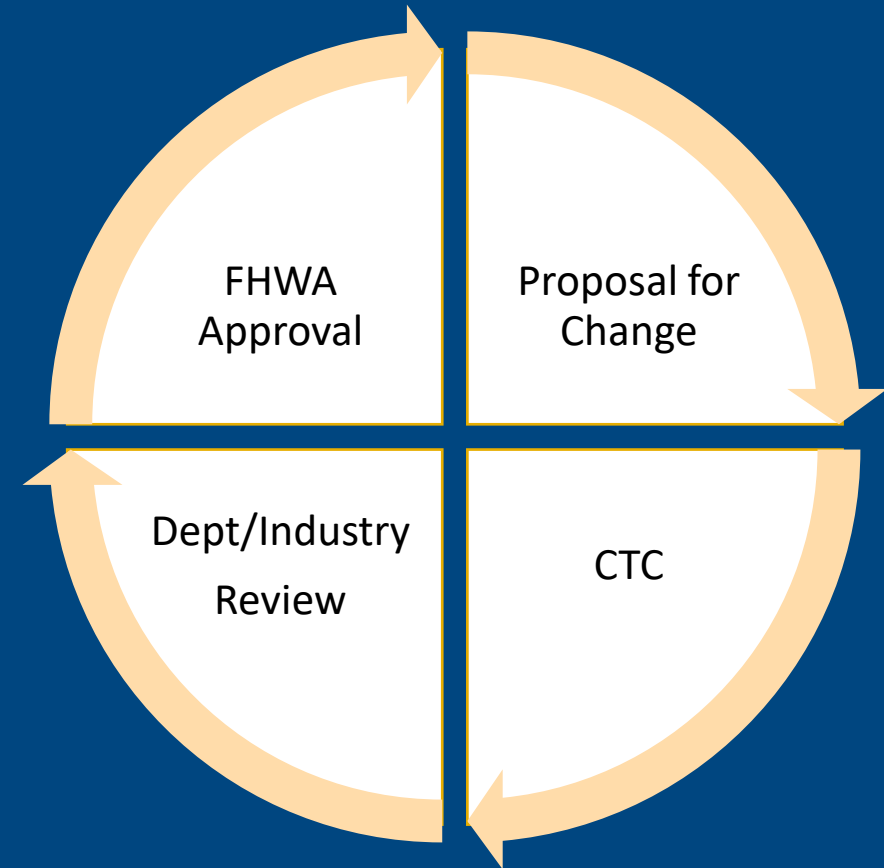
- 2023 Spec & November 2022 ASP 6 Updates
- CMM Updates
 - 835
 - 870
 - 871 – ****NEW****
- The Future of Concrete



How are changes made?

Specification, FDM, CMM, SDD etc.

- Issue brought to the Department
 - Issue in field
 - Research project
 - Other
- Concrete Technical Committee
- Department and Industry review
- FHWA approval



2023 Specification Updates



SS 416 and SS 501



2023 Specification Updates: 416 Concrete Pavement – Appurtenant Construction

- 416.2.4 and 416.2.5: Concrete Pavement Repair and Replacement and SHES (Nov. 2022 ASP 6)
 - Opening strength for Repairs = 2000 psi
 - Result of Fast Track TF
 - More to come...



2023 Specification Updates: 501 Concrete

- 501.2.5.3.3: High range water reducers (superplasticizers): BTS approval prior to use
- 501.3.2.2.2: Supplementary Cementitious Material (SCM) Requirements (fly ash, slag, etc.)
 - **Class I Concrete: minimum 15% SCM content**
 - Pavement, cast-in-place barrier and structure
 - **Class II Concrete: no minimum SCM content**
 - Ancillary concrete: curb, gutter, driveways, etc.



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SS 710, 715 and 716

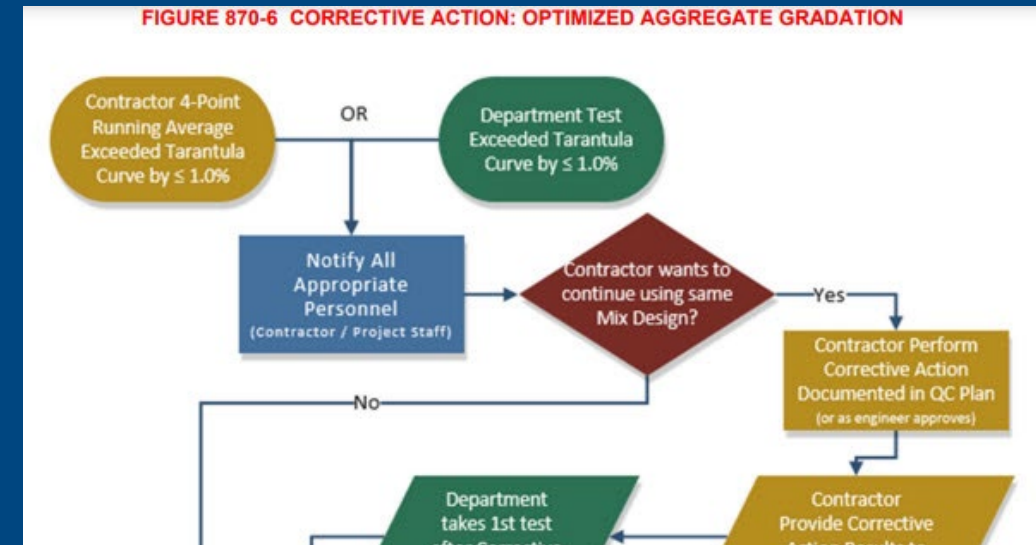


2023 Specification Updates: 710 General Concrete QMP

- 710.4 (4): Concrete Mixture
 - Mix Modifications must be submitted 3 business days prior to use
 - Plants with multiple water sources can change sources without a mix modification IF:
 - **VALID WATER TEST REPORT, 131 Report, IS ON FILE (131 Report)**
 - A change in fly ash source of the same class is NOT a mix modification
 - C Ash → C Ash 
 - F Ash → C Ash 

2023 Specification Updates: 710 General Concrete QMP

- 710.5.7: Corrective Action (Nov. 2022 ASP 6)
 - Clarifies process for contractor if gradation does not meet the Tarantula Curve by 2nd department test
 - Can stick with Tarantula Curve or switch the Combined Aggregate Gradation limits
 - CMM 870 has a flow chart



2023 Specification Updates:

715 QMP Concrete Pavement, Cast-in-Place Barrier & Structures

• 715.2.1

- Mixture design information is needed **3 business days** before producing concrete
- Should include the following:
 - Requirements under 710.4
 - Strength data from trial batching
 - Test dates for each trial batch
 - Name and location of lab that performed the trial batching
- The **DT2220 Form or DT2221 Form must be used for the submittal**
 - Concrete Mix Design Memo – resent out over BTS ListServ 1/10/2023



2023 Specification Updates:

715 QMP Concrete Pavement, Cast-in-Place Barrier & Structures

- 715.5: Payment (November 2022 ASP 6)
 - The ASP 6 puts back old pay equations found in 2021 Specs and older and includes Flexural Strength equation from STSP
 - Pavement Equations:
 - QMP 3.01 for Compressive Strength Incentive
 - QMP 6.02 for Flexural Strength Incentive
 - Structure and Cast-in-place Barrier
 - QMP 2.01 for Compressive Strength Incentive



2023 Specification Updates: 716 QMP Ancillary Concrete

- 716.1.1.2: Quality Control Plan for Ancillary Concrete (Class II)
 - A concrete mix must follow the requirements found in 710.4.
NO TRIAL BATCHING IS REQUIRED
 - Most of this is captured in the DT2220 and DT2221 forms
- 716.2.1 Class II Concrete
 - Concrete temperature must be tested
 - Strength cylinders must be made for each mixture design



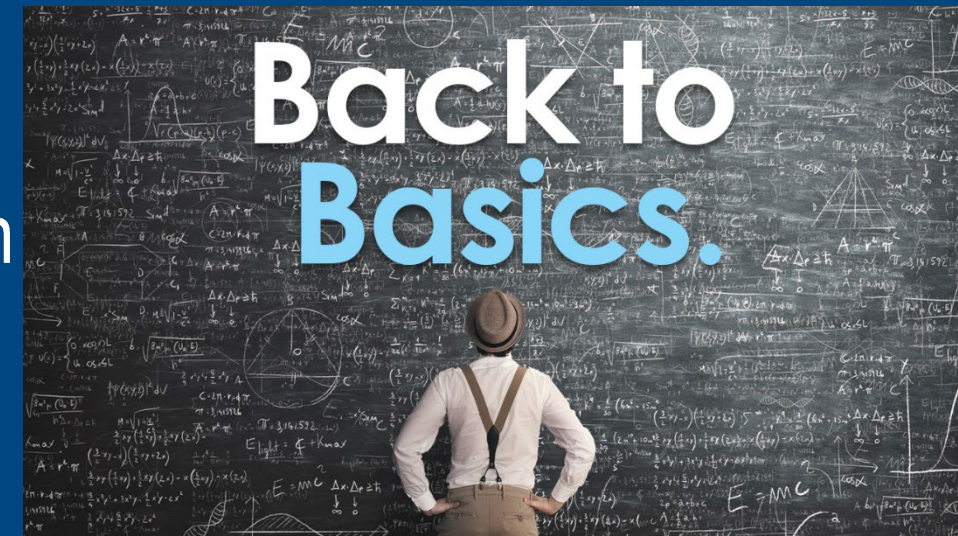
CMM Updates



CMM Updates:

835 QMP - Concrete

- Concrete Grades and Types Guidance
 - What does Grade A or Grade C mean?
 - What does it mean to be HES or SHES?
- Guidance on Class I and Class II Mix Design
 - Who needs it?
- Why Optimized Aggregate Gradations?
- Guidance on Lots and Sublots for Testing
 - How to move from 1 subplot to another subplot



CMM Updates:

870 Materials Testing & Acceptance - Concrete

- Concrete Aggregate Guidance
 - Where to find approved aggregate sources
 - Contractor responsibilities and requirements
 - Flowcharts for Corrective Action
 - Supports SS 710.5.7
- Addition of WisDOT Test Modified (WTM) Procedures
 - T24 – Concrete Coring
 - TP118 – Super Air Meter (T395)
 - T152 – Type B Meter
 - R 60 – Sampling Concrete
 - R100 – Making and Curing Concrete



CMM Updates:

871 Concrete Mixture Design

- Brand new Section of the CMM
- Includes:
 - Why laboratory trial batching is beneficial
 - Guidance on Class I trial batching
 - Concrete mixture design submittal & reporting requirements
 - Mix Modification
 - What is it?
 - When is it needed?



2022 Accomplishments and The Future of Concrete



Concrete ~~Pavement~~ Technical Committee

- Background:
 - Many changes have been implemented in concrete arena that broadly affect the concrete industry.
 - Other concrete communities are needed at the table to ensure all stakeholders are apart of the changes to reduce revisions after initial launch.
- Implemented June 2022:
 - Name change
 - Added representatives from bridge contractors, ready mix industry & WRMCA



CTC Task Force Updates

- SAM Task Force (disbanded 7/2022):
 - To be included in PEM Task Force
- Pausing SAM Field Testing after 2023
 - 2023 – Need SAM data with PLC
 - Effective with 2024 Specs
 - SAM not performed in the field
 - Class I: Required during trial batching
- Air Content: SAM or Type B: 501.3.2.4.2
- Recommendations:
 - Keep current SAM Meters
 - Do not purchase new meters



CTC Task Force Updates

- Sidewalk Task Force (concluded 3/2022):
 - Sidewalk staking bid item into the 2023 standard specs
- Curb Shear Task Force:
 - Identified locations of distress. Implementing strategies to mitigate
- Structure Aggregate Task Force:
 - Reviewing QC aggregate testing frequency
- Fast Track Task Force:
 - Determining concrete requirements for repair & replacement areas



Concrete's Future

- Performance Engineered Mixtures (PEM)
 - Study concluded (0092-17-07)
 - Need to sift through data
- Exploring new SCMs for concrete
 - Current WHRP Study (0092-23-03)
 - Expected completion 10/2024



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