



INDIANA DEPARTMENT OF TRANSPORTATION

100 North Senate Avenue
Room N758 CM
Indianapolis, Indiana 46204

www.in.gov/indot

Eric Holcomb, Governor
Mike Smith, Commissioner

AGENDA

January 16, 2025, Standards Committee Meeting

MEMORANDUM

January 7, 2025

TO: Standards Committee

FROM: Scott Trammell, Secretary

RE: Agenda for the January 16, 2025, Standards Committee Meeting

A Standards Committee meeting is scheduled for 09:00 a.m. on Thursday, January 16, and will be held virtually via *Teams* (Microsoft application). Please contact Scott Trammell (strammell@indot.in.gov) for instructions on how to join this event.

The following items are listed for consideration:

A. GENERAL BUSINESS

OLD BUSINESS

(No items on this agenda)

NEW BUSINESS

Approval of the Minutes from the [December 18, 2024](#) meeting

B. CONCEPTUAL PROPOSAL

[Divisions 400, 500, and 600 \(editorial changes\) 2026 SS](#) K. Pelz pg. 3

C. STANDARD SPECIFICATIONS, SPECIAL PROVISIONS, AND STANDARD DRAWINGS PROPOSAL

OLD BUSINESS

(No items on this agenda)

NEW BUSINESS

Item No. 1 Mr. Novak pg. 4

2024 Standard Specifications:

<i>SECTION 629</i>	<i>TOPSOIL PROCESSING AND DISTRIBUTION</i>
203.09	General Requirements
621.01	Description
621.05	Applying Fertilizer, Seed, and Mulch
621.13	Method of Measurement
621.14	Basis of Payment
914.03	Fertilizer

Item No. 2 Mr. Reilman pg. 16

2024 Standard Specifications:

703.06	Placing and Fastening
707.04	Steel and Concrete Requirements
707.12	Basis of Payment
910.01	Reinforcing Bars, Dowel Bars and WWR

Item No. 3 Mr. Reilman pg. 24

2024 Standard Specifications:

<i>SECTION 106</i>	<i>CONTROL OF MATERIAL</i>
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Item No. 4 Mr. White pg. 35

2024 Standard Specifications:

<i>SECTION 711</i>	<i>STEEL STRUCTURES</i> (various subsections)
910.02	Structural Steel
910.23	<i>Stud Shear Connectors</i>

Item No. 5 Mr. Novak pg. 62

Recurring Special Provision:

<i>309-R-xxx</i>	<i>LEAN CONCRETE BASE</i>
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Item No. 6 Mr. White pg. 69

2024 Standard Specifications:

726.02	Materials
910.02	Structural Steel
915.04	Elastomeric Bearings

cc: Committee Members
FHWA
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CONCEPTUAL ITEM

EDITORIAL REVISIONS to divisions 400, 500, and 600 (preparation for publishing 2026 STANDARD SPECIFICATIONS)

CONCEPTUAL PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: INDOT Standard Specifications have been regularly updated by adding new or revising existing statements, work procedures, materials, methods, etc.

Prior to publishing a 2026 Standard Specifications book (effective September 1, 2025), the review of the current edition, 2024 Standard Specifications, is underway.

Listed divisions with shown proposed edits can be reviewed at:

<https://www.in.gov/dot/div/contracts/standards/sc/>

“Conceptual Item” for the January 16, 2025 SC meeting posted under the “Agenda”.

DIVISION 400 – ASPHALT PAVEMENTS

DIVISION 500 – CONCRETE PAVEMENT

DIVISION 600 – INCIDENTAL CONSTRUCTION

PROPOSED SOLUTION (conceptual): Continue to review all Divisions (100 thru 900) of the 2024 Standard Specifications and make editorial corrections, as found necessary, rewrite statements that are not clearly formulated, or their written intentions are hard to follow.

APPLICABLE STANDARD SPECIFICATIONS: 2024 Standard Specifications and approved RSPs

APPLICABLE STANDARD DRAWINGS: n/a

APPLICABLE DESIGN MANUAL SECTION: n/a

APPLICABLE SECTION OF GIFE: n/a

APPLICABLE RECURRING SPECIAL PROVISIONS: various RSPs (if affected)

PAY ITEMS AFFECTED: n/a

APPLICABLE SUB-COMMITTEE ENDORSEMENT: ad-hoc Specification’s review group: Kurt Pelz, Scott Trammell, Lana Podorvanova.

IMPACT ANALYSIS (attach report): n/a

Submitted By: Kurt Pelz

Title: Construction Management Technical Support

Organization: INDOT

Phone Number: 317-691-4800

Date: 01/02/2025

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: The current RSP for Plant Growth Layer, 629-R-630, has specific requirements for the finished Plant Growth Layer material. Some of the requirements have been difficult to meet since the added materials require a reaction time to meet the target values. This proposed RSP will move the requirements from a performance specification to a method specification. With the CSGP requirement for vegetation coverage prior to obtaining an NOT, a successful method of producing an acceptable stand of grass is needed for project closeout.

The current specification on topsoil stripping is based on removing material unsuitable for use in an embankment. This revision modifies the stripping requirement toward salvaging suitable material for vegetation growth.

PROPOSED SOLUTION: Remove the stripping language from 203.08 and modify the PGL RSP, 629-R-630, to require that existing topsoil be salvaged for later distribution in the areas of permanent vegetation. Provides a budget item to pay for recommended soil modification materials based on onsite sampling and testing.

APPLICABLE STANDARD SPECIFICATIONS: 203.08, RSP 629-R-630,

APPLICABLE STANDARD DRAWING: None

APPLICABLE DESIGN MANUAL CHAPTER: Add instruction for estimating the budget item.

APPLICABLE SECTION OF GIFE: None

APPLICABLE RECURRING SPECIAL PROVISION OR PLAN DETAILS: RSP 629-R-630.

PAY ITEMS AFFECTED: Adds pay items for Topsoil Processing and Distribution, and Topsoil Amendment Budget.

Make the following pay item obsolete:

629-12029 PLANT GROWTH LAYER SYS

APPLICABLE SUB-COMMITTEE ENDORSEMENT: ad hoc group of Tom Harris, Matt Krauser, Subhi Bazlamit with review by ICI and Environment Services

IF APPROVED AS RECURRING SPECIAL PROVISION OR PLAN DETAILS, PROPOSED BASIS FOR USE:
Contracts with a CSGP.

IMPACT ANALYSIS (attach report): Yes

Submitted By: Joe Novak

Title: State Construction Engineer

Division: Construction Management

E-mail: jnovak@indot.in.gov

Date: 12/13/24

IMPACT ANALYSIS REPORT CHECKLIST

Explain the business case as to why this item should be presented to the Standards Committee for approval. Answer the following questions with Yes, No or N/A.

Does this item appear in any other specification sections? No

Will approval of this item affect the Qualified Products List (QPL)? No

Will this proposal improve:

Construction costs? Yes

Construction time? No

Customer satisfaction? Yes

Congestion/travel time? No

Ride quality? No

Will this proposal reduce operational costs or maintenance effort? Yes

Will this item improve safety:

For motorists? No

For construction workers? No

Will this proposal improve quality for:

Construction procedures/processes? Yes

Asset preservation? Yes

Design process? No

Will this change provide the contractor more flexibility? Yes

Will this proposal provide clarification for the Contractor and field personnel? Yes

Can this item improve/reduce the number of potential change orders? Yes

Is this proposal needed for compliance with:

Federal or State regulations? Yes

AASHTO or other design code? No

Is this item editorial? No

Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda:

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 629 – TOPSOIL PROCESSING AND DISTRIBUTION (proposed new)

SECTION 203 – EXCAVATION AND EMBANKMENT

203.09 General Requirements

SECTION 621 – SEEDING AND SODDING

621.01 Description

621.05 Applying Fertilizer, Seed, and Mulch

621.13 Method of Measurement

621.14 Basis of Payment

SECTION 914 - ROADSIDE DEVELOPMENT MATERIALS

914.03 Fertilizer

(Note: Proposed new SECTION 629)

The Standard Specifications are revised as follows:

SECTION 628, AFTER LINE 511, INSERT AS FOLLOWS:

SECTION 629 – TOPSOIL PROCESSING AND DISTRIBUTION

629.01 Description

This work shall consist of stripping, stockpiling, testing of topsoil, procuring, application, and processing of amendments and fertilizer, and distributing the topsoil in the locations of permanent vegetation or as shown in the plans.

MATERIALS

629.02 Materials

Materials shall be in accordance with the following:

<i>Compost.....</i>	<i>914.03</i>
<i>Lime.....</i>	<i>913.04(b)1</i>
<i>Topsoil.....</i>	<i>914.01</i>
<i>Water.....</i>	<i>913.01</i>

Soils used for topsoil processing shall be obtained from stripping the existing soils within the construction limits.

Topsoil processing material shall be free from any objectionable plant material or undesirable vegetative debris which would be harmful to plant life or prevent the formation of a suitable seedbed.

All topsoil stockpiles shall be stabilized in accordance with 205 and the accepted SWQCP.

The Contractor shall provide all necessary labor and equipment for installing the required amendments and fertilizer and distributing the topsoil layer.

CONSTRUCTION REQUIREMENTS

629.03 General Requirements

The topsoil and all amendments and fertilizer shall consist of materials suitable for

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 629 – TOPSOIL PROCESSING AND DISTRIBUTION (proposed new)**SECTION 203 – EXCAVATION AND EMBANKMENT****203.09 General Requirements****SECTION 621 – SEEDING AND SODDING****621.01 Description****621.05 Applying Fertilizer, Seed, and Mulch****621.13 Method of Measurement****621.14 Basis of Payment****SECTION 914 - ROADSIDE DEVELOPMENT MATERIALS****914.03 Fertilizer**

the healthy and sustained growth of permanent vegetation in accordance with 914. All topsoil amendments and fertilizer shall be blended into the topsoil processing material to provide a uniform and homogeneous mixture.

Areas where excavations are to be made, or embankments are to be placed, shall be stripped of existing topsoil. Materials unsuitable for vegetative growth such as rocks larger than 2 in. and large roots shall be disposed of. All material suitable for vegetative growth including non-objective decayed vegetative matter such as sod, grass, residue of agricultural crops, and sawdust removed during the stripping operation shall be stockpiled and used as topsoil in accordance with this section or as directed. Suitable topsoil growth layer materials shall be retained within the project limits or other approved location and redistributed in the areas of proposed permanent vegetation after excavation or embankment work has been completed. If more topsoil is excavated and stockpiled than is needed to fill the topsoil processing areas, then the excess material that cannot be used constructively shall be disposed of off the right-of-way in accordance with 203.08.

629.04 Testing

An initial assessment of the existing topsoil conditions will be provided in the geotechnical report. The Contractor shall be responsible for additional tests required to determine the necessary amendments and fertilizer for the topsoil to support the sustained growth of permanent vegetation.

Each separate topsoil stockpile shall be sampled with each sample representing up to 250 CYD of stockpiled topsoil. The samples shall be submitted to an agronomy laboratory that is qualified to test soil and recommend amendments for turf establishment purposes. Minimum testing requirements include: organic matter, phosphorus, potassium, calcium, magnesium, sodium, CEC, pH, buffer pH, conductivity, boron, copper, iron, manganese, sulfur, and zinc. A textural analysis shall also be performed by the agronomy laboratory. The distribution of the topsoil from each stockpile shall be managed such that locations where the topsoil is redistributed shall have the appropriate recommended soil amendments and fertilizer added.

629.05 Process Control

At least 14 days prior to installation, the Contractor shall prepare and submit to the Engineer a Topsoil Amendment Plan containing copies of all reports from the agronomy lab, a list of all proposed topsoil amendments and fertilizer, their application rates, their material sources, estimated material cost, and an installation timeline. The Topsoil Amendment Plan shall provide specifics describing all materials to be added to the topsoil. The Topsoil Amendment Plan shall be specific to the contract and be signed and dated by the Contractor. Upon receipt, the Engineer will perform a review of the

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 629 – TOPSOIL PROCESSING AND DISTRIBUTION (proposed new)

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203.09 General Requirements

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621.01 Description

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914.03 Fertilizer

Topsoil Amendment Plan within 14 days for acceptance. Acceptance of the Topsoil Amendment Plan will not relieve the Contractor from producing and placing a viable topsoil layer.

629.06 Installation and Finishing

The topsoil shall be installed uniformly in the locations of proposed permanent vegetation. The area on which the topsoil is to be placed shall be free of rocks or other foreign material that may hinder the growth of vegetation.

Prior to placement of the topsoil, the existing surface shall be scarified to a nominal depth of 3 in. to ensure bonding of the topsoil with the existing surface.

The Contractor shall place the topsoil using a method which will produce a nominal six in. depth of uniform and homogeneous topsoil mixture that is bonded to the scarified surface. When stripping the existing excavation and embankment areas does not provide sufficient topsoil to provide a nominal six-inch depth, the contractor shall propose an alternative topsoil distribution depth plan.

The Contractor shall apply the appropriate soil amendments and fertilizer in accordance with the recommendations from the agronomy laboratory. The agronomy laboratory shall recommend the needed amendments and fertilizer based on the sustainable growth of the planned seed mixture.

Seeding or sodding shall take place within seven calendar days after final topsoil placement. Seeding of the topsoil layer shall be in accordance with 621.05(b) and 621.05(c). Sodding of the topsoil layer shall be in accordance with 621.09.

629.07 Method of Measurement

The quantity of Topsoil Processing and Distribution for which payment will be made will be that shown in the schedule of pay items, provided that the work is constructed as shown on the plans. When the plans have been altered or when a disagreement exists as to the accuracy of the contract quantity, either party shall have the right to have the quantities involved measured.

Topsoil material excavated in cut areas will be included in the class of excavation involved. Undercutting for placement of the topsoil processing material in excavation areas will be measured in accordance with 203.27(b) for the class of excavation involved.

629.08 Basis of Payment

REVISION TO 2024 STANDARD SPECIFICATIONS

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203.09 General Requirements

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621.01 Description

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621.14 Basis of Payment

SECTION 914 - ROADSIDE DEVELOPMENT MATERIALS

914.03 Fertilizer

The accepted quantity of topsoil processing and distribution will be paid for at the contract unit price per square yard, complete in place.

The Department will include the pay item Topsoil Amendment Budget, with an established dollar amount, in the proposal to pay for materials used for treatment of the topsoil. This established amount is the Department's estimate of the total cost of the topsoil amendments and fertilizer required to be installed. The established amount shown in the proposal is included in the total bid amount. The Department will pay for those topsoil amendments and fertilizer for the quantities installed as specified in the submitted and accepted Topsoil Amendment Plan. The price paid will be the invoice price of the topsoil amendments and fertilizer materials only plus shipping. If the recommended amount exceeds the Department's estimated amount, the additional materials shall be submitted as a revision to the Topsoil Amendment Budget. The additional work will be reviewed for acceptance in accordance with 104.03.

Payment will be made under:

Pay Item	Pay Unit Symbol
<i>Topsoil Processing and Distribution</i>	<i>SYS</i>
<i>Topsoil Amendment Budget.....</i>	<i>DOL</i>

The cost of all soil sampling, testing, recommendations, preparation of the component list, Topsoil Amendment Plan, placing, tilling, compaction, final grade preparation, and all necessary incidentals shall be included in the cost of the topsoil processing and distribution.

Erosion control methods used for the protection of stockpiled topsoil shall be in accordance with 205. Payment will be made in accordance with 205.

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(Note: Proposed changes to 2024 Standard Specifications shown highlighted gray)

The Standard Specifications are revised as follows:

SECTION 203, BEGIN LINE 419, DELETE AS FOLLOWS:

~~Sufficient quantities of excavated materials suitable for the growth of vegetation shall be preserved from within the planned excavation area and used on constructed cut, fill, and shoulder slopes to help develop the growth of vegetation. Materials suitable for vegetative growth shall be at least 6 in. deep or as indicated within the contract documents and shall be measured perpendicular to the face of the slope. Unless otherwise provided, no additional compensation will be allowed for this work except payment will be made for the class of excavation involved for authorized undercutting of back slopes. Encasement of rock embankment and cut slopes will not be required unless otherwise directed.~~

~~Material suitable for the growth of vegetation shall be in accordance with 914.01 prior to placement. The material placed on backslopes of cut sections shall be placed in accordance with 203.21.~~

~~If sufficient excavation materials suitable for the growth of vegetation and used on constructed cut, fill, and shoulder slopes are not available, borrow or other material suitable for vegetative growth shall be furnished. The sources of all borrow material shall be in accordance with 203.08 and 914.01. Payment for borrow will be made in accordance with 203.28. If the contract does not contain a pay item for borrow, a change order will be executed for payment of borrow. Suitable portions of common excavation may be preserved or borrow material may be furnished for encasement provided all suitable excavation is used constructively.~~

SECTION 621, BEGIN LINE 3, DELETE AS FOLLOWS:

621.01 Description

This work shall consist of either or both plain and mulched seeding or placing approved sod. It includes furnishing and placing seed, ~~fertilizer~~, inoculants, ~~top soil~~, and mulch, if required, in a prepared seed bed or furnishing and placing sod at locations in accordance with 105.03.

SECTION 621, BEGIN LINE 54, DELETE AND INSERT AS FOLLOWS:

621.05 Applying Fertilizer, Seed, and Mulch

(a) Fertilizer

Fertilizer as ~~specified~~ *recommended in the Topsoil Amendment Plan* shall be spread

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SECTION 629 – TOPSOIL PROCESSING AND DISTRIBUTION (proposed new)**SECTION 203 – EXCAVATION AND EMBANKMENT****203.09 General Requirements****SECTION 621 – SEEDING AND SODDING****621.01 Description****621.05 Applying Fertilizer, Seed, and Mulch****621.13 Method of Measurement****621.14 Basis of Payment****SECTION 914 - ROADSIDE DEVELOPMENT MATERIALS****914.03 Fertilizer**

uniformly over the area to be seeded. ~~Fertilizer shall be spread at the rate of 800 lb/ac unless otherwise specified.~~

SECTION 621, BEGIN LINE 363, DELETE AS FOLLOWS:

621.13 Method of Measurement

~~Fertilizer and mulching material will be measured by the ton. Seed mixtures will be measured by the pound. Spring Summer Cover Crop and Fall Cover Crop seed mixtures used in conjunction with seed mixture Floodplain will not be measured for payment. Topsoil will be measured by the cubic yard in accordance with 211.09.~~ Mulched seeding and sodding will be measured by the square yard. Water will be measured by the 1,000 gal. Mobilization and demobilization for seeding will be measured per each trip, when directed, to the project site. “Do Not Spray” signs will be measured by the number of signs installed.

621.14 Basis of Payment

The accepted quantities of ~~fertilizer and~~ mulching material, furnished and delivered complete in place, will be paid for at the contract unit price per ton, except as set out below for sodding. Seed mixtures will be paid for at the contract unit price per pound for the class and type specified. Mulched seeding will be paid for at the contract unit price per square yard for the class and type specified, complete in place. ~~Topsoil will be paid for at the contract unit price per cubic yard.~~ Sodding and nursery sodding will be paid for at the contract unit price per square yard, complete in place. “Do Not Spray” signs will be paid for at the contract unit price per each.

Payment for mobilization and demobilization for seeding will be made for the initial movement to the project site so that permanent or mulching work, as specified, is performed. When one or more operations are completed within the same mobilization, payment will be made for one mobilization. Payment will be for all work necessary to move personnel and equipment to and from the project site. Payment will also be made for additional mobilization, when directed.

Payment will be made under:

Pay Item**Pay Unit Symbol**

Erosion Control Blanket.....	SYS
Fertilizer	TON
Mobilization and Demobilization for Seeding	EACH
Mulched Seeding _____ class	SYS

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 629 – TOPSOIL PROCESSING AND DISTRIBUTION (proposed new)

SECTION 203 – EXCAVATION AND EMBANKMENT

203.09 General Requirements

SECTION 621 – SEEDING AND SODDING

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621.13 Method of Measurement

621.14 Basis of Payment

SECTION 914 - ROADSIDE DEVELOPMENT MATERIALS

914.03 Fertilizer

Mulching Material.....	TON
Seed Mixture _____ class	LBS
Sign, "Do Not Spray".....	EACH
Sodding	SYS
Sodding, Nursery.....	SYS
Topsoil.....	CYS
Water	kGAL

The cost of leguminous inoculants, preparing seed beds, sowing, raking, and all other necessary incidentals shall be included in the cost of seed mixtures. The cost of Spring Summer Cover Crop and Fall Cover Crop used in conjunction with seed mixture Floodplain shall be included in the cost of seed mixture Floodplain. The cost of furnishing and placing ~~fertilizer~~, water, seed mixtures, and mulching material, in addition to the incidentals listed above for seed mixtures shall be included in the cost of mulched seeding.

The cost of furnishing, hauling, and placing the material, including material used as tie-down, repair of areas for which mulch fails to stay in place, all labor, equipment, and necessary incidentals shall be included in the cost of mulching material.

Repair of areas outside the construction limits which must be disturbed to construct the work required by the contract will be paid for in accordance with 201.07(e).

Water will be paid for only when ordered after the 30 day period, in accordance with 621.10.

Payment will not be made for topsoil which is obtained from within the right of way.

The cost of ~~fertilizer~~, water, excavation of earth bed, disposal of surplus material, and all necessary incidentals shall be included in the cost of sodding or nursery sodding.

SECTION 621, BEGIN LINE 470, DELETE AS FOLLOWS:

(b) ~~Changed Fertilizer~~ Blank

A fertilizer may be required with a higher nitrogen content than that specified, or the fertilizer specified may be required to be enriched by adding chemicals in order to be in accordance with such requirements. All additional cost incurred due to such procedure will be paid at the prices shown by certified vouchers. Such payment will include and will be full compensation for furnishing the required chemicals, or furnishing and processing

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SECTION 914 - ROADSIDE DEVELOPMENT MATERIALS

914.03 Fertilizer

the additional materials required.

SECTION 914, BEGIN LINE 24, DELETE AND INSERT AS FOLLOWS:

914.03 Fertilizer***Soil Amendments***

Fertilizer shall be standard commercial fertilizer with an analysis of 12-12-12.

Tests will not be required, but fertilizer standards shall be governed by the rulings of the Indiana State Seed Commissioner.

(a) Compost

Compost shall be well decomposed, stable organic matter. It shall be derived from agricultural, food, or industrial residuals; bio-solids including treated sewage sludge, yard trimmings, vegetable matter or source-separated or mixed solid waste. The product shall contain no substances toxic to plants and shall be well composted so as not to possess objectionable odors or resemble the raw material from which it was derived. Compost shall be 98% free of any inert objects such as textiles, glass, plastics, and metal objects. Compost used shall be free of known weeds and productive plant parts classified in the IC 15-16-7-2 or 312 IAC 18-3-25 as a noxious weed species, and any plants listed on the Indiana Invasive Species Council Invasive Plant List under the high invasive rank category.

Compost shall have a pH range of 5.5 to 8.0. Compost shall have a minimum of 30% organic matter in accordance with AASHTO T 267. The moisture content shall range from 30 to 60% by dry weight in accordance with AASHTO T 265. Compost particle size shall have 98% passing the 3/4 in. sieve.

All bio-solids, industrial and yard waste compost suppliers shall be IDEM certified. Certification of compost suppliers shall be as follows:

- 1. Bio-solids and industrial waste compost suppliers shall possess an IDEM Marketing and Distribution Permit.**
- 2. Yard waste compost suppliers shall be an IDEM Registered Yard Waste facility.**

All bio-solids shall be in accordance with 40 CFR Part 503 and 327 IAC 6.1.

(b) Lime for pH modification

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914.03 Fertilizer

Lime shall be a lime product marketed for agricultural purposes to be used for pH modification of soil.

(c) Sulphur for pH Modification

Sulphur shall be sulphur products marketed for agricultural purposes to be used for pH modification of soil.

COMMENTS AND ACTION

SECTION 629 – TOPSOIL PROCESSING AND DISTRIBUTION (proposed new)

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621.13 Method of Measurement

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DISCUSSION:

Motion: Second: Ayes: Nays: FHWA Approval:	<u>Action:</u> ____ Passed as Submitted ____ Passed as Revised ____ Withdrawn
2024 Standard Specifications Sections: 203 pg. 159-160; 621 pg. 562 -563, 570 - 573; 914 pg. 1102.	____ 2026 Standard Specifications ____ Revise Pay Items List ____ Notification to Designers if change is <u>not</u> addressed by RSP
Recurring Special Provisions or Plan Details: <u>629-R-630 Plant Growth Layer</u>	____ Create RSP (No.____) Effective:
Standard Drawing affected: TBD	____ Revise RSP (No.____) Effective:
Design Manual Chapter: NONE	____ Standard Drawing Effective:
GIFE Section: NONE	____ Create RPD (No. ____) Effective: ____ GIFE Update ____ Frequency Manual Update ____ SiteManager Update

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Specifications currently require reinforcing bars meeting ASTM A615. There are concerns that there may be occasional material shortages of rebar. There are also instances in precast concrete item fabrication where it is advantageous to tack weld rebar to provide a more rigid rebar cage. A615 rebar is not weldable.

PROPOSED SOLUTION: Allow ASTM A706 reinforcing bars which are weldable to be used in addition to A615 rebar.

APPLICABLE STANDARD SPECIFICATIONS: 703, 707, 910

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION: None

APPLICABLE SECTION OF GIFE:

APPLICABLE RECURRING SPECIAL PROVISIONS: create new 703 RSP

PAY ITEMS AFFECTED: None

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad hoc: IKOCPA representatives (Steve Smart & John Susong), Jim Reilman, Pete White

IF APPROVED AS RECURRING SPECIAL PROVISION OR PLAN DETAILS, PROPOSED BASIS FOR USE:
Required for all contracts, except mowing, herbicide, sweeping, light bulb replacement, or tree removal/trimming.

IMPACT ANALYSIS (attach report):

Submitted By: Jim Reilman

Title: State Materials Engineer

Organization: INDOT

Phone Number: (317) 522-9692

Date: 12/19/24

IMPACT ANALYSIS REPORT CHECKLIST

Explain the business case as to why this item should be presented to the Standards Committee for approval. Answer the following questions with Yes, No or N/A.

Does this item appear in any other specification sections? No

Will approval of this item affect the Approved Materials List? Yes

Will this proposal improve:

Construction costs? Yes

Construction time? N/A

Customer satisfaction? N/A

Congestion/travel time? N/A

Ride quality? N/A

Will this proposal reduce operational costs or maintenance effort? N/A

Will this item improve safety:

For motorists? N/A

For construction workers? N/A

Will this proposal improve quality for:

Construction procedures/processes? Yes

Asset preservation? N/A

Design process? N/A

Will this change provide the contractor more flexibility? Yes

Will this proposal provide clarification for the Contractor and field personnel? Yes

Can this item improve/reduce the number of potential change orders? N/A

Is this proposal needed for compliance with:

Federal or State regulations? No

AASHTO or other design code? No

Is this item editorial? No

Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda:

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 703 – REINFORCING BARS

703.06 Placing and Fastening

SECTION 707 – PRECAST CONCRETE AND PRECAST PRESTRESSED CONCRETE STRUCTURAL MEMBERS

707.04 Steel and Concrete Requirements

707.12 Basis of Payment

SECTION 910 – METAL MATERIALS

910.01 Reinforcing Bars, Dowel Bars and WWR

(Note: Proposed changes shown highlighted gray. Previously approved changes by the Standards Committee on [July 18, 2024](#) meeting - shown shaded.)

The Standard Specifications are revised as follows:

SECTION 703, BEGIN LINE 52, INSERT AS FOLLOWS:

703.06 Placing and Fastening

(a) General Requirements

Reinforcing bars shall not be ordered for piers or bents to be founded on soil or rock until the foundation conditions have been investigated. The bottom elevations of such footings will then be determined. Written permission will then be given to order such reinforcing bars. Sufficient excavation and all necessary soundings shall be made as directed so that exact bottom elevations of footings may be determined.

All dimensions shown on the plans for spacing of reinforcing bars apply to centers of bars unless otherwise noted. All bars shall be accurately placed and, during placing of the concrete, held firmly in the position as shown on the plans. Distances from the forms shall be maintained by means of chairs, ties, hangers, or other approved support devices. All reinforcing bars shall be wired rigidly or fastened securely at sufficient intervals to hold the bars in place. *Welding of reinforcing bars shall not be performed except as noted in 703.06(c).* Epoxy coated reinforcing bars shall be tied with epoxy coated or plastic coated tie wire. ~~Chairs and supports holding upper layers of reinforcing bars shall support the transverse bars.~~ The upper layer and lower layer of reinforcing bars in RCBAs and bridge floors shall be tied or fastened at a minimum of every other intersection of the longitudinal and transverse bars to prevent an upward or a lateral movement of a bar from the planned position.

Layers of reinforcing bars shall be separated by ~~spacers~~*support devices in accordance with 910.01(b)11 or epoxy coated reinforcing bars. Epoxy coated reinforcing bars used to separate and support layers of reinforcing bars shall be shop bent to the dimensions required to secure the layers of reinforcing bars in the positions shown on the plans. The size and spacing of support devices or epoxy coated reinforcing bars used as supports shall be such that the plan reinforcing bars are not displaced by the weight of the concrete, upper layers of reinforcing bars, or construction loads, but in no case shall the spacing exceed 4 ft in any direction.* Reinforcing bars shall be separated from horizontal surfaces by being suspended or supported on approved ~~chairs and spacers~~*support devices* capable of supporting the designed loads. Supports and spacers shall be of such shape as to be easily encased in concrete. That portion which is in contact with the forms shall be non-corrosive and non-staining material. They shall be of an approved type. ~~Vertical stirrups shall always pass around main tension members and shall be securely attached~~

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 703 – REINFORCING BARS

703.06 Placing and Fastening

SECTION 707 – PRECAST CONCRETE AND PRECAST PRESTRESSED CONCRETE STRUCTURAL MEMBERS

707.04 Steel and Concrete Requirements

707.12 Basis of Payment

SECTION 910 – METAL MATERIALS

910.01 Reinforcing Bars, Dowel Bars and WWR

thereto. The use of pebbles, pieces of broken stone or bricks, metal pipe, wooden blocks, and similar devices for holding bars in position will not be allowed.

SECTION 703, BEGIN LINE 81, INSERT AS FOLLOWS:

After being placed, reinforcing bars will be inspected and approved before the concrete is deposited. The positions of the reinforcing bars shall not be disturbed both during and after depositing the concrete. All concrete placed in violation of this requirement may be rejected and its removal will be required. Where reinforcing bars project from construction joints, all mortar clinging to the reinforcing bars from previous pours shall be removed before the next enveloping pour is made.

(b) Splicing and Lapping

1. Reinforcing Bars

All reinforcing bars shall be furnished in the full lengths shown on the plans unless splices are indicated. No other splicing will be allowed except with written permission. Unless otherwise shown on the plans, reinforcing bars shall be lapped ~~3264~~ diameters to make a splice. Construction joints shall not be made within the limits of lapped bars. For lapped splices, reinforcing bars shall be placed in contact and rigidly clamped or wired in an approved manner. Insofar as possible, splices shall be staggered and well distributed or located at points of low tensile stress. Splices will not be allowed at points where the section does not provide a distance of at least 2 in. between the splice and the nearest adjacent bar or surface of the concrete.

When splicing is indicated or allowed, an appropriate splice system on the QPL of Reinforcing Bar Splicing Systems may be used in lieu of lapped bars. The splicing system shall be installed in accordance with the manufacturer's recommendations. If an offset splicing system is selected, it shall only be used on spiral, hoop, or ring-type reinforcement.

~~WWR, when required, shall be placed as shown on the plans or as otherwise directed. The sheets shall overlap sufficiently to maintain uniform strength and shall be securely fastened at lapped ends and edges. The laps shall be no less than one mesh in width.~~

2. Spiral Reinforcement

Spiral reinforcement, consisting of evenly spaced continuous spirals, shall be held firmly in place by attachment to vertical reinforcement. The spirals shall be held true to line by vertical spacers. Anchorage for spiral reinforcement shall be provided with 1 1/2 extra turns of the spiral rod or wire at each end of the spiral unit. Splices in spiral rods or wire shall be made with a lap of 1 1/2 turns.

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 703 – REINFORCING BARS

703.06 Placing and Fastening

SECTION 707 – PRECAST CONCRETE AND PRECAST PRESTRESSED CONCRETE STRUCTURAL MEMBERS

707.04 Steel and Concrete Requirements

707.12 Basis of Payment

SECTION 910 – METAL MATERIALS

910.01 Reinforcing Bars, Dowel Bars and WWR

3. Threaded Tie Bar Assemblies

Threaded tie bar assemblies may be used in lieu of spliced reinforcing bars shown on the plans. Threaded tie bar assemblies shall achieve the minimum strength in accordance with 910.01(b)2. The Contractor shall coat any exposed part of threaded bar assemblies in accordance with 910.01(b)2.

(c) Tack Welding Reinforcing Bars in Precast Concrete Products

In lieu of tying or using WWR in accordance with 737, reinforcing bars used in the precast concrete products listed below in (4) may be tack welded in accordance with the following:

(1) Reinforcing bars to be tack welded shall be in accordance with 910.01(b)1.

(2) All welding procedures shall be qualified to AWS D1.4. All weld procedures shall be approved by an AWS Certified Welding Inspector prior to any production welding. Welds shall have a satisfactory appearance. Reinforcing bars that exhibit notching, undercutting, or a loss of cross-section shall be replaced.

(3) Tack welding shall only be performed at intersections of reinforcing bars. Reinforcing bars shall not be spliced by welding.

(4) Tack welding of reinforcing bars shall only be used when manufacturing the following precast concrete products:

- a. manhole lids,*
- b. manhole cone sections,*
- c. basins, including top and bottom slabs,*
- d. inlets, including top and bottom slabs,*
- e. square, rectangular, and round grade extensions,*
- f. median barriers.*

(5) Mats or sheets of reinforcing bars created by tack welding the intersections of a grid of reinforcing bars shall be made continuous by providing lap splices in accordance with AASHTO LRFD Bridge Design Specifications and 703.06.

(6) Epoxy-coated reinforcing bars that are to be tack welded shall

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 703 – REINFORCING BARS

703.06 Placing and Fastening

SECTION 707 – PRECAST CONCRETE AND PRECAST PRESTRESSED CONCRETE STRUCTURAL MEMBERS

707.04 Steel and Concrete Requirements

707.12 Basis of Payment

SECTION 910 – METAL MATERIALS

910.01 Reinforcing Bars, Dowel Bars and WWR

have the epoxy coating removed in the vicinity of the weld. Once the welded area has cooled below 90°F and before visible oxidation appears, the welded area and surrounding bare metal shall be cleaned and recoated in accordance with 910.01(b)9.

SECTION 703, BEGIN LINE 157, INSERT AS FOLLOWS:

The cost of ~~metal chairs support devices or epoxy coated reinforcing bars used as supports~~, spacers, clips, wire, or other mechanical means used for fastening or holding reinforcement in place, and laps shall be included in the cost of reinforcing bars. The cost of coating materials and repair of damaged or removed coating materials on reinforcing bars and on metal chairs, spacers, clips, or other mechanical means used for fastening or holding reinforcement in place, and laps shall be included in the cost of epoxy coated reinforcing bars. If threaded tie bar assemblies are used in lieu of spliced reinforcing bars as shown on the plans, the cost of such assemblies shall be included in the cost of reinforcing bars.

If WWR is required, the cost of furnishing and placing shall be included in the cost of the concrete in which it is placed.

SECTION 707, BEGIN LINE 84, INSERT AS FOLLOWS:

707.04 Steel and Concrete Requirements**(a) Reinforcing Bars**

A tight coat of concrete grout extending 1/2 in. maximum from the top of precast concrete and precast prestressed concrete structural members will be allowed to remain on reinforcing bars extending from precast concrete and precast prestressed concrete structural members. All loose and flaky material on these reinforcing bars shall be removed. Lap splices shall be in accordance with 703.06. *In lieu of tying or using WWR in accordance with 737, reinforcing bars used in precast or precast prestressed concrete structural members may be welded in accordance with 703.06(c).*

SECTION 707, AFTER LINE 565, INSERT AS FOLLOWS:

All costs associated with welding weldable reinforcing bars, including but not limited to welding consumables, qualifying procedures and welders to AWS D1.4, other AWS D1.4 documents, QC inspection and approval by an AWS certified welding inspector, and all other items incidental to this work shall be included in the cost of the pay items of this section.

The cost of tensioning rods and steel plates shall be included in the cost of the pay items of this section.

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 703 – REINFORCING BARS

703.06 Placing and Fastening

SECTION 707 – PRECAST CONCRETE AND PRECAST PRESTRESSED CONCRETE STRUCTURAL MEMBERS

707.04 Steel and Concrete Requirements

707.12 Basis of Payment

SECTION 910 – METAL MATERIALS

910.01 Reinforcing Bars, Dowel Bars and WWR

SECTION 910, BEGIN LINE 22, INSERT AS FOLLOWS:

(b) Specific Requirements

1. Billet Steel Bars

Billet steel bars shall be in accordance with ASTM A615 *or ASTM A706*.

When the specifications allow for welding of bars, and the Contractor chooses to weld, only bars produced in accordance with ASTM A706 and marked with a W or both an S and W shall be welded. Bars produced in accordance with ASTM A615 and marked only with an S shall not be welded.

SECTION 910, BEGIN LINE 93, INSERT AS FOLLOWS:

8. Steel Spiral Reinforcement

Steel spiral reinforcement shall be either:

- a. deformed billet steel, ASTM A615 *or ASTM A706*, grade 60, or
- b. cold drawn steel wire, ASTM A1064.

SECTION 910, BEGIN LINE 135, INSERT AS FOLLOWS:

10. Dowel Bars

Dowel bars shall be plain billet steel in accordance with ASTM A615, grade 40 or higher, *or ASTM A706 grade 60 or higher*, except that the bend test and elongation requirements will not apply. The dowel bar area and weight for the nominal bar diameter shall be as follows:

COMMENTS AND ACTION

703.06 Placing and Fastening
 707.04 Steel and Concrete Requirements
 707.12 Basis of Payment
 910.01 Reinforcing Bars, Dowel Bars and WWR

DISCUSSION:

	<u>Action:</u>
Motion:	
Second:	<input type="checkbox"/> Passed as Submitted
Ayes:	<input type="checkbox"/> Passed as Revised
Nays:	<input type="checkbox"/> Withdrawn
FHWA Approval:	
2024 Standard Specifications Sections: 703 pg. 650 - 652; 707 pg. 665, 675, 676; 910 pg. 1051 - 1055.	<input type="checkbox"/> 2026 Standard Specifications <input type="checkbox"/> Revise Pay Items List <input type="checkbox"/> Notification to Designers if change is <u>not</u> addressed by RSP
Recurring Special Provisions or Plan Details: NONE	<input type="checkbox"/> Create RSP (No. __) Effective:
Standard Drawing affected: NONE	<input type="checkbox"/> Revise RSP (No. __) Effective:
Design Manual Chapter: NONE	<input type="checkbox"/> Standard Drawing Effective:
GIFE Section: TBD	<input type="checkbox"/> Create RPD (No. __) Effective: <input type="checkbox"/> GIFE Update <input type="checkbox"/> Frequency Manual Update <input type="checkbox"/> SiteManager Update

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO 2024 STANDARD SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Updates are needed to the 106 section. Some of the language is antiquated and no longer serves a useful purpose.

PROPOSED SOLUTION: Incorporate proposed edits into 106.

APPLICABLE STANDARD SPECIFICATIONS: 106

APPLICABLE STANDARD DRAWINGS: none

APPLICABLE DESIGN MANUAL SECTION: none

APPLICABLE SECTION OF GIFE: none

APPLICABLE RECURRING SPECIAL PROVISIONS: create new 106 RSP

PAY ITEMS AFFECTED: none

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad hoc: Matt Beeson, Jim Reilman

IF APPROVED AS RECURRING SPECIAL PROVISION OR PLAN DETAILS, PROPOSED BASIS FOR USE:
Required for all contracts, except mowing, herbicide, sweeping, light bulb replacement, or tree removal/trimming.

IMPACT ANALYSIS (attach report):

Submitted By: Jim Reilman

Title: State Materials Engineer

Organization: INDOT

Phone Number: (317) 522-9692

Date: 12/19/24

IMPACT ANALYSIS REPORT CHECKLIST

Explain the business case as to why this item should be presented to the Standards Committee for approval. Answer the following questions with Yes, No or N/A.

Does this item appear in any other specification sections? No

Will approval of this item affect the Approved Materials List? No

Will this proposal improve:

Construction costs? N/A

Construction time? N/A

Customer satisfaction? N/A

Congestion/travel time? N/A

Ride quality? N/A

Will this proposal reduce operational costs or maintenance effort? N/A

Will this item improve safety:

For motorists? N/A

For construction workers? N/A

Will this proposal improve quality for:

Construction procedures/processes? Yes

Asset preservation? N/A

Design process? N/A

Will this change provide the contractor more flexibility? N/A

Will this proposal provide clarification for the Contractor and field personnel? Yes

Can this item improve/reduce the number of potential change orders? N/A

Is this proposal needed for compliance with:

Federal or State regulations? No

AASHTO or other design code? No

Is this item editorial? No

Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda:

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 106 – CONTROL OF MATERIAL

(Note: Proposed changes shown highlighted gray. Previously approved changes, shown shaded in 106.01 and 106.05, have been approved by the Standards Committee on the January 18, 2024 and the December 18, 2024 meetings.)

The Standard Specifications are revised as follows:

SECTION 106, BEGIN LINE 1, DELETE AND INSERT AS FOLLOWS:

SECTION 106 – CONTROL OF MATERIAL

106.01 Source of Supply and Quality Requirements

~~The Contractor shall furnish the Engineer a complete statement of the origin, composition, and manufacture of any or all materials to be used in the construction of the work at the pre construction conference. If, during the course of the contract, changes or additions to the statement are required, the Contractor shall provide the information five calendar days prior to the source supplying materials to the project. The materials used in the work shall meet all quality requirements of the contract. To expedite the inspection and testing of materials, the Contractor shall notify the Engineer of the proposed sources of materials prior to delivery. The Engineer may deem materials acceptable for use at the source of supply before delivery. All materials tested at the source may be subjected to further testing from production to after incorporation into the work. The Contractor shall also advise the Engineer when orders for materials are placed and when such materials are received. The quantity, source of supply, and the locations where the materials have been stored shall be included in the notice.~~

If a combination of materials individually tested and deemed acceptable for use do not produce final products that meet contract requirements, that combination shall not be used. Other materials from different sources shall be furnished. Acceptance of materials or a product made from a combination of materials will be based on the results of tests made nearest to incorporation into the work.

A specific material deemed acceptable for use shall not constitute acceptance of all materials from that source.

Material tested prior to incorporation into the work and found not to be in accordance with the contract will be rejected. Material tested after incorporation into the work and found not to be in accordance with the contract will be governed by 105.03.

The application of all epoxy, galvanizing, painting, and other coatings required by the contract to metal products shall be domestically applied.

(a) Approved or Prequalified Materials

Certain materials and equipment ~~require pre-approval~~ will be prequalified by brand name or source of manufacture. ~~Lists of~~ QPLs are maintained by the Department as provided in the specifications. The Department will review all QPLs prior to January 1 of even numbered years. Unless otherwise provided, any item listed for three years prior to the review without being supplied to a contract ~~will~~ may be removed from the list.

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 106 – CONTROL OF MATERIAL

~~The materials used shall be those prescribed for the items which constitute the finished work and shall comply with all the requirements for such materials in accordance with this specification and 900. In any combination of materials, even though the individual components meet the specifications, such combination shall also meet the specifications and produce the required results. Failure to do so will be cause for rejection.~~

~~Approval of a material at its source will not necessarily constitute acceptance of materials from that source. All materials tested at the source may be subjected to further testing from production to after incorporation into the work.~~

~~Approval will be based on the results of tests made nearest to incorporation into the work. Material tested prior to incorporation into the work and found not to be in accordance with the requirements will be rejected. Material tested after incorporation into the work and found not to be in accordance with the requirements will be governed by 105.03.~~

~~If a material from a source has a continued approval as shown by five or more consecutive tests, it may, if allowed, be placed on an immediate usage basis and while on that basis may be incorporated into the work prior to the receipt of test results. If any subsequent test reveals non-conformance with the specifications, material from that source shall be removed at once from the immediate usage basis and shall not be used until tests indicate conformance. If, after any test showing non-conformance, five or more consecutive tests show conformance, the material may be restored to an immediate usage basis.~~

~~If a material on an immediate usage basis has been incorporated into the work and later is found not to be in accordance with the specifications, the Engineer may, in accordance with 105.03, require its removal from the work or allow it to remain. If allowed to remain, the appropriate contract unit price will be reduced.~~

All packaged materials shall be marked plainly showing the amount and nature of contents and shall be delivered intact.

(b) Material Records

The Engineer will prepare the material record from the documentation provided by the Contractor.

1. Documentation of Material Delivery

The Contractor shall provide a copy of each delivery ticket and certifications, if required, to the Engineer not later than the next business day, except as specified herein. If providing this information on the next business day is not possible, the Contractor and the Engineer will agree upon other arrangements for the receipt of the necessary documentation prior to the event.

2. Delivery Ticket Information

The material delivery ticket shall include an itemized quantity of all materials delivered, the date of delivery, and the contract number. The material delivery ticket shall

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 106 – CONTROL OF MATERIAL

document the source of supply and source code, if known, and shall contain information necessary to obtain a basis for use as required by Department specifications. The material delivery ticket may be either a paper ticket or an electronic ticket, e-ticket.

When e-tickets are to be supplied, the Contractor shall either be approved to use the Department's e-ticketing system or request approval of the Engineer to use an alternate e-ticketing system. The approval of an alternate e-ticketing system shall warrant the following minimum requirements:

- a. The Contractor shall provide a user guide document and answer questions as needed.
- b. The Contractor shall provide the Department access to the e-ticket data in real-time via software compatible with both Apple macOS and Microsoft Windows desktop operating systems and both Apple iOS and Google Android mobile operating systems.
- c. The Contractor shall provide the Department the ability to acknowledge the ~~acceptance~~ *delivery* of e-tickets within both the desktop and the mobile systems *in real time*.
- d. The system shall compile e-tickets into a single PDF format document by date and material description with the number of tickets per page limited to maintain legibility. The system shall also compile a PDF format e-ticket summary by date and material description with the total ~~quantity~~ *delivered*. E-tickets and summaries shall include ~~acceptance~~ *the delivery* status input by the Department.
- e. The Contractor shall provide software access to the Department for direct download of all e-tickets and summaries, or in the absence of such access, the Contractor shall be responsible for emailing the required documents.
- f. The Department may request paper tickets at any time due to system failures, cellular connectivity failures, or lack of reliability due to inaccuracy or inconsistency of the data provided.

All required certifications shall be in accordance with 916 or as directed.

3. Payment Procedures

If the Contractor does not provide the necessary documentation for the materials, such materials will not be paid for. The Engineer will notify the Contractor of those materials held from the estimate with the justification for withholding payment. If corrective action has not been taken within six weeks of the materials delivery to the project

site, the entire estimate payment may be withheld.

(c) Buy America Requirement

All contracts shall be supplied with steel and iron products that are produced in the United States. Steel and iron products shall comply with IC 5-16-8 and the 23 CFR 635.410.

A Buy America Certification shall be submitted and received for each product or source of material prior to being incorporated into the contract in accordance with 916.02(e) and 916.03(e).

1. Steel and Iron Products

All steel and iron products incorporated permanently into a contract shall be made of steel or iron produced in the United States and all subsequent manufacturing shall be performed in the United States except for pig iron and processed, pelletized, and reduced iron ore. Manufacturing is any process that modifies the chemical content; physical shape or size; or final finish of a product. Manufacturing begins with the initial melting and mixing and continues through the bending and coating stages. If a domestic product is taken out of the United States for any process, it becomes a foreign source material.

Manufactured products that are partially or predominantly steel, shall be entirely produced with domestic steel. If a product has miscellaneous foreign steel incorporated, such as fasteners or brackets, then those miscellaneous pieces shall be replaced or substituted.

a. Exceptions

The Engineer may grant specific written permission to use foreign steel or iron products when both of the following conditions apply:

- (1) The total cost of all foreign products to be used does not exceed 0.1 percent of the total Contract cost, or \$2,500, whichever is greater. The cost is the value of the product as delivered to the project.
- (2) The specified products are not produced in the United States in sufficient quantity or otherwise are not reasonably available to meet the requirements of the Contract Documents. The Engineer may require the Contractor to obtain letters from three different suppliers documenting the unavailability of a product from a domestic source if the shortage is not previously established by the Department.

106.02 Samples, Tests, and Cited Specifications

The Engineer will inspect, test, and determine whether the materials comply with the contract requirements before they are incorporated into the work. The Department may sample and test materials or require certifications. The minimum required number of

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 106 – CONTROL OF MATERIAL

samples and tests will be as set out in the Frequency Manual. Samples will be taken by or under the supervision of a representative of the Department. All materials being used are subject to inspection, test, or rejection at any time.

Such facilities as may be required for collecting and forwarding samples shall be provided and the materials represented by the samples shall be held until tests have been made and such materials found to have the qualities required in the ~~specifications~~*contract*. All samples required and additional material required to replace samples shall be furnished without charge.

~~To facilitate the sampling and testing of materials, the Engineer shall promptly be advised when orders for materials are placed and when such materials are received. The quantity, source of supply, and the locations where the materials have been stored shall be included in the notice.~~

All tests of materials will be made in accordance with the methods described or designated in ~~these specifications~~*the contract*. When tests are made at places other than the laboratory, every needed facility shall be furnished for the verification of all scales, measures, and other devices which are used.

If the Contractor elects to supply materials other than structural steel and prestressed structural members which require on-site sampling or testing as they are manufactured in out-of-state manufacturing plants located more than 60 mi outside a State line, the Contractor shall provide the sampling or testing services required. ~~Such services shall be conducted by a Department-approved testing laboratory. No additional payment will be made for such services. Such services shall be conducted by a Department-approved testing laboratory.~~

~~The standards for materials and methods of tests of AASHTO and ASTM or other specification referred to herein or elsewhere shall be the standard, interim, or tentative specifications included in the latest published edition which is on file on January 1, unless otherwise specified. Indiana Test Methods will become effective immediately upon approval by the ITM Committee unless otherwise directed. Unless otherwise specified, the Department will pay for and test materials in accordance with AASHTO, ASTM, or other specifications or methods referred to herein or elsewhere. The version of the AASHTO, ASTM, or other specification will be the standard, interim, or tentative specification included in the latest published edition as of January 1 of the current year, unless otherwise specified. ITMs will become effective immediately upon approval by the ITM Committee unless otherwise directed. All materials being used are subject to inspection, test, or rejection at any time.~~ In case of discrepancy, the following relationships apply:

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 106 – CONTROL OF MATERIAL

Special Provisions	hold over:	ITM, AASHTO and ASTM or other specification for materials and methods of tests
ITM	hold over:	AASHTO and ASTM or other specification for materials and methods of tests
AASHTO	hold over:	ASTM or other specification for materials and methods of tests

~~Tests will be made by and at the expense of the Department unless otherwise specified. The minimum required number of samples and tests will be as set out in the Frequency Manual. Samples will be taken by or under the supervision of a representative of the Department. All materials being used are subject to inspection, test, or rejection at any time.~~

106.03 Plant Inspection

The Engineer may undertake the inspection of materials at the source.

If plant inspection is undertaken, the following conditions shall be met:

- (a) The Engineer shall have the cooperation and assistance of the Contractor and the material supplier. All reasonable facilities to assist in determining whether the materials meet the requirements of the ~~specifications~~~~contract~~ shall be furnished without additional payment.
- (b) The Engineer shall have entry at all times to such parts of the plant as may concern the manufacture or production of the materials being furnished.
- (c) Adequate safety measures shall be provided and maintained.

106.04 Blank

106.05 Storage of Materials

Storage of materials shall be such that will ~~assure~~~~ensure~~ the preservation of their quality and fitness for the work. When considered necessary, materials shall be placed on raised, clean platforms, constructed of wood or other hard surfaced material, and under cover. Stored materials shall be located to facilitate proper inspection. Materials to be used for all contracts shall be stored separately and intact and, after being tested for such work, shall not be used for other purposes except unless otherwise approved. *All stored materials will be inspected at the time of use in the work, even though they may have been inspected and accepted before being placed in storage.*

No flammable, inflammable, or combustible materials shall be stored within 50 ft of a bridge or overhead sign structure. Such materials shall be stored in accordance with directions from the manufacturer. These materials include, but are not limited to, fuel, paint, solvents, fertilizer, PVC products, wood and timber not currently being used for falsework. No Contractor equipment, equipped with a fuel tank shall be stored beneath a bridge or overhead sign structure when workers are not present.

The portion of the right-of-way not required for public travel may be used for storage purposes and for placing the Contractor's plant and equipment, subject to requirements set out in 107.08 and only by written request. Approval will be based on compliance with 107.08 and the Contractor's proposed procedure for re-establishing vegetation in the affected area to its original condition or better. Except as provided in 105.07 and except where necessary for drainage, if storage limits are shown on the plans, the right-of-way within such storage limits will be available for construction operations and storage of materials. Private property shall not be used for storage purposes without written permission of the owner or lessee. If requested, copies of such written permission shall be furnished. All storage sites shall be restored to their original condition with no additional payment.

106.06 Handling of Materials

All materials shall be handled in such manner as to preserve their quality and fitness for the work.

Aggregates shall be transported to the project in tight vehicles so constructed as to prevent loss or segregation of materials after loading and measuring in order to prevent inconsistencies in the quantities of materials intended for incorporation in the work as loaded, and the quantities as actually received on the project.

106.07 Unacceptable Materials

All materials not in accordance with the ~~specifications~~ contract at the time they are used will shall be considered as unacceptable and all such materials will be rejected and shall be removed immediately from the site of the work unless otherwise ~~instructed~~ directed by the Engineer. If in place, they shall be removed and replaced with acceptable materials at no additional cost to the Department. No rejected material, the defects of which have been corrected, shall be used until approval has been given.

If rejected materials are not removed within the time specified, the Department may order their removal with no additional payment or complete the contract in accordance with 108.09.

106.08 Hazard Communication Program

The Contractor and all subcontractors will be required to furnish the Engineer with Safety Data Sheets for each hazardous material which each firm uses or stores on the project site for Department maintained roadways. Such sheets shall be generated by each hazardous material manufacturer and shall be in accordance with ~~Indiana~~ OSHA requirements.

106.09 Department Furnished Materials

The Contractor shall furnish all materials required to complete the work, except those specified to be furnished by the Department. Materials furnished by the Department will be delivered or made available at the locations specified. The cost of handling and placing materials after they are delivered to the locations specified shall be included in the contract price for the item in connection with which they are used. The Contractor will be held responsible for all materials delivered. Deductions will be made from any monies due to the Contractor to make good all shortages or deficiencies and for all damage which might occur after delivery or for demurrage charges.

106.10 Proportioning Materials

All materials used shall be proportioned as specified for each type of work, kind of unit, or item of work required by the contract. No change in the source, or kind of materials, or blending of asphalt materials will be allowed during construction without written consent. Application for such consent shall be in writing. Material which is not in accordance with the quality requirements set out in ~~these specifications contract~~ shall not be blended with a better quality material to upgrade the end product.

Where not explicitly set out, the size and amount of aggregate as well as the grade and amount of asphalt material to be used shall be as ordered.

106.11 Sample Asbestos Exclusion Letter

Asbestos-containing materials shall not be used in the construction or reconstruction of buildings or bridges. A letter of exclusion for each building or bridge shall be submitted by the Contractor to the Engineer prior to acceptance of work and final payment. Such letter shall indicate that no asbestos-containing material was used as a building material during the project using the exclusion form in 916.04.

COMMENTS AND ACTION

SECTION 106 – CONTROL OF MATERIAL

DISCUSSION:

	<u>Action:</u>
Motion:	
Second:	<input type="checkbox"/> Passed as Submitted
Ayes:	<input type="checkbox"/> Passed as Revised
Nays:	<input type="checkbox"/> Withdrawn
FHWA Approval:	
2024 Standard Specifications Sections:	<input type="checkbox"/> 2026 Standard Specifications
106 pg. 63 - 69.	<input type="checkbox"/> Revise Pay Items List
Recurring Special Provisions or Plan	<input type="checkbox"/> Notification to Designers if change is <u>not</u>
Details:	addressed by RSP
NONE	<input type="checkbox"/> Create RSP (No. <u> </u>)
Effective:	
Standard Drawing affected:	<input type="checkbox"/> Revise RSP (No. <u> </u>)
NONE	Effective:
Design Manual Chapter:	<input type="checkbox"/> Standard Drawing
NONE	Effective:
GIFE Section:	<input type="checkbox"/> Create RPD (No. <u> </u>)
NONE	Effective:
	<input type="checkbox"/> GIFE Update
	<input type="checkbox"/> Frequency Manual Update
	<input type="checkbox"/> SiteManager Update

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Section 711 – Steel Structures currently includes outdated references and doesn't cover several current grades of structural steel and structural bolts. There are also various sections that could benefit from additional clarification. Section 910 – Metal Materials contains some outdated information on structural steel and doesn't cover several grades of widely used structural bolts or stud shear connectors.

PROPOSED SOLUTION: Update Sections 711 and 910.02 to current standards and add Section 910.23 to cover stud shear connectors.

APPLICABLE STANDARD SPECIFICATIONS: 711, 910.02, 910.23 [added]

APPLICABLE STANDARD DRAWING: N/A

APPLICABLE DESIGN MANUAL CHAPTER: 407 – Steel Structure (updates forthcoming)

APPLICABLE SECTION OF GIFE: 5.23 (updates required to mention added bolt grades)

APPLICABLE RECURRING SPECIAL PROVISION OR PLAN DETAILS: RSP 711-B-315 and 711-R-758 are incorporated into these proposed revisions

PAY ITEMS AFFECTED: N/A

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad hoc committee including Derrick Hauser, Jim Reilman, and Pete White

IF APPROVED AS RECURRING SPECIAL PROVISION OR PLAN DETAILS, PROPOSED BASIS FOR USE: All contracts with 711 pay items.

IMPACT ANALYSIS (attach report):

Submitted By: Pete White

Title: Design Manager

Division: Bridge Engineering

E-mail: pewhite@indot.in.gov

Date: December 20, 2024

IMPACT ANALYSIS REPORT CHECKLIST

Explain the business case as to why this item should be presented to the Standards Committee for approval. Answer the following questions with Yes, No or N/A.

Does this item appear in any other specification sections? Yes

Will approval of this item affect the Qualified Products List (QPL)? No

Will this proposal improve:

Construction costs? Yes

Construction time? Yes

Customer satisfaction? No

Congestion/travel time? No

Ride quality? No

Will this proposal reduce operational costs or maintenance effort? No

Will this item improve safety:

For motorists? No

For construction workers? Yes

Will this proposal improve quality for:

Construction procedures/processes? Yes

Asset preservation? No

Design process? Yes

Will this change provide the contractor more flexibility? Yes

Will this proposal provide clarification for the Contractor and field personnel? Yes

Can this item improve/reduce the number of potential change orders? Yes

Is this proposal needed for compliance with:

Federal or State regulations? No

AASHTO or other design code? No

Is this item editorial? No

Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda:

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 711 – STEEL STRUCTURES (various subsections, as shown)

SECTION 910 – METAL MATERIALS

910.02 Structural Steel

910.23 *Stud Shear Connectors*

(Note: Proposed changes shown highlighted gray. Previously approved changes by the Standards Committee shown shaded and are in RSP [711-R-758 WELDING SPECIFICATIONS](#))

The Standard Specifications are revised as follows:

SECTION 711, BEGIN LINE 9, DELETE AND INSERT AS FOLLOWS:

711.02 Materials

Materials shall be in accordance with the following:

Bronze and Copper-Alloy	910.06
Castings	910.05
Elastomeric Bearings	915.04
Steel forgings and Steel Shafting	910.04
Structural Steel	910.02
<i>Stud Shear Connectors</i>	910.23

Where grades *HPS 50W*, *HPS 70W*, or ~~grade HPS 50W~~*HPS 100W* steel is shown on the plans, the high performance steel shall be in accordance with 910.02(d).

Where grade 50W steel is shown on the plans, the weathering steel shall be in accordance with 910.02(b).

Material specifications shall be shown on the working drawings if the materials are different than those shown on the plans. ~~Materials which do not require mill test reports may be changed from those shown on the plans subject to approval. Mill test reports shall be furnished for all materials. All materials shall be produced within the United States of America in accordance with 106.01(c).~~

SECTION 711, BEGIN LINE 35, DELETE AND INSERT AS FOLLOWS:

711.03 General Requirements

The fabrication methods used shall be those applicable to and prescribed for the several parts of fabrication as it progresses and shall be in accordance with the requirements thereof and as further set out in this specification. Workmanship and finish shall be first-class, equal to the best general practice in a modern fabricating shop, and in strict accordance with these specifications, the plans, and such additional instructions as may be given.

Fabrication of ~~high performance~~*structural* steel shall be in accordance with the ~~Guide Specification for Highway Bridge Fabrication with HPS 70W Steel except as modified herein~~*AASHTO/AWS D1.5 Bridge Welding Code current edition*. The *AASHTO/AWS D1.5 Bridge Welding Code, current edition, will hereinafter be referred to as the Bridge Welding Code*.

The requirements contained herein will not be waived, nor will they be modified to conform with any set of rules that any shop has adopted as its standard unless so authorized

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 711 – STEEL STRUCTURES (various subsections, as shown)

SECTION 910 – METAL MATERIALS

910.02 Structural Steel

910.23 Stud Shear Connectors

in writing.

Structural steel, regardless of its source, shall be fabricated within the continental limits of the United States of America components designated in the contract documents as fracture-critical shall conform to the provisions of the Bridge Welding Code, clause 12.

711.04 Certification of Fabricators

(a) General Information

If the fabrication of secondary structural steel members and other miscellaneous structural steel components, such as but not limited to, diaphragms, bearing assemblies, and miscellaneous plates does not involve any welding or heating of the steel, the fabrication facility for these components will not be required to be American Institute of Steel Construction, AISC, certified as described in this section.

Prior to approval for fabrication, the results of the latest AISC certification review and the the QCP provided to AISC, including updates shall be made available to the Engineer to determine if items critical to successful fabrication meet the needs of the specific work.

The fabricator shall be certified from the start of the fabrication process, through and including the shop assembly in accordance with 711.44. If the certification lapses during the project, the fabricator shall have plans to maintain certification or complete the fabrication process before the expiration of the certification. Failure of the fabricator to maintain valid certification during the fabrication will result in a 1025% reduction in the bid price for structural steel.

Approval of the fabricator shall be requested in writing prior to ordering structural steel. A valid certification with annual endorsement shall be submitted with the request.

(b) Certification Categories

The fabricator of structural steel furnished under this section shall be certified in accordance with the AISC Certification Program for Steel Bridge Fabricators – Standard for Steel Bridges, to the certification category commensurate with the work to be fabricated. Fabricators producing fracture-critical members, intermediate bridges, or advanced bridges, shall also meet the applicable supplemental requirements of the certification program. For shop painting, the Department will only accept an AISC-420-10/SSPC-QP 3 certification. It shall be the fabricator's responsibility to maintain a valid certification and annual endorsements thereto.

1. Simple Bridges

Fabricators of main load carrying components for simple span bridges or bridges that do not have welded or bolted splices shall consist of unsplined rolled sections, as a

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 711 – STEEL STRUCTURES (various subsections, as shown)

SECTION 910 – METAL MATERIALS

910.02 Structural Steel

910.23 Stud Shear Connectors

minimum, be certified under the simple bridges category.

SECTION 711, AFTER LINE 131, DELETE AND INSERT AS FOLLOWS:

(c) Quality Control Inspector

The fabricator shall have on staff a Quality Control Inspector, QCI, whose sole responsibility is for the quality of the work. The fabricator shall also have on staff a Certified Welding Inspector, CWI, in accordance with the Bridge Welding Code. The QCI shall be responsible for inspection of all facets of work at the facility. The QCI shall perform no production activities and shall have the authority to stop all production activities at the fabricator's facility.

(d) Nonconforming Materials

Materials found to be nonconforming with the contract documents shall be documented in writing by the QCI and given to the Engineer. No further work shall be done on the nonconforming materials until the Engineer or authorized representative has given approval. Details of the nonconforming material shall include the date, contract number, fabricator job number, working drawing and piece number, along with a complete description of the nonconforming material including marked up working drawings showing the nonconforming material in detail. Also included shall be the status of the material in the fabrication process. This document shall include a space for both the fabricator and Engineer, to sign and date confirming the nonconforming material exists. The document shall include the fabricator's proposed remedy to the nonconforming material along with a space for both the fabricator and the Engineer to sign and date once a remedy has been agreed upon. Changes to the fabricator's approved working drawings resulting from nonconforming material shall be submitted with the as-built working drawings.

711.05 Working Drawings

Working drawings shall be submitted in accordance with 105.02.

Working drawings shall include a detailed bill of materials showing weights of materials completed in accordance with 711.73(b) if payment is on a unit weight basis. The working drawings shall indicate whether reaming is to be done in the shop or in the field. The working drawings shall indicate which *field* splices *shown on the plans* are *proposed* to be eliminated.

If the contract plans include detailed structural steel drawings, they may be used. Such drawings shall be checked. The Contractor shall provide notification in writing that ~~it is~~*they are* assuming responsibility for ~~the~~*the* correctness *of the details shown on the contract plans being used for fabrication.*

SECTION 711, BEGIN LINE 155, INSERT AS FOLLOWS:

711.08 Mill Test Reports

A copy of all mill test reports for all steel on hand that is to be used to fabricate structural steel members shall be furnished prior to the start of fabrication. *A letter shall*

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 711 – STEEL STRUCTURES (various subsections, as shown)

SECTION 910 – METAL MATERIALS

910.02 Structural Steel

910.23 Stud Shear Connectors

accompany the mill test reports which summarizes the mill test reports submitted and their intended use on the contract. The letter shall be signed and dated by an authorized representative of the fabricator. Material purchased indirectly from the producing steel mill shall have the mill test report along with shipping documents to show complete traceability from the producing mill to the fabricator. Complete traceability shall include the vendor's name and address, purchaser, date purchased, quantity purchased, size, grade, and heat number. For steel not on hand when fabrication is started that arrives during fabrication, a copy of the mill test reports for that steel shall be provided within 24 h of receipt of the steel. If copies of mill test reports are not provided within the specified timeframe, the Engineer may suspend the fabrication of all structural steel members until such time that copies of the missing mill test reports are provided. Delays due to suspension of fabrication will be considered non-excusable.

SECTION 711, BEGIN LINE 181, DELETE AND INSERT AS FOLLOWS:

711.09 Notice of Beginning WorkPrefabrication Meeting and Shop Inspection

Written notification shall be given 10 days in advance of the date on which fabrication is intended to start. Between the dates of such notification and the start of fabrication, a surface inspection of the proposed materials will be made. Any such materials cut or work performed prior to this inspection may be rejected. Prior to the beginning of fabrication, a prefabrication meeting shall be held at the fabrication facility. The prefabrication meeting may be held at an alternative site or by conference call if approved by the Engineer. The meeting shall be conducted by the Contractor and attended by the fabricator's production supervisor and quality control inspector, and the Engineer. The Contractor shall take notes of the meeting and distribute copies to all attending parties within five days of the date of the meeting. Items to be discussed at the meeting shall include a minimum of: fabrication and shipping schedule including hours of operation; line of communication between Contractor and Engineer; welding procedures and welder qualifications; inspection personnel qualifications; material test reports; working drawings; special fabrication methods; fabrication hold points for inspection; final inspection and acceptance of materials; method of shipment. All duties designated as responsibilities of the Contractor may be transferred to the Contractor's fabricator. The requirement to hold prefabrication meetings may be waived by the Department.

A Type A field office in accordance with 628 shall be provided at any facility that fabricates steel structural members for the Department's exclusive use. In lieu of a field office, a work area and the following items in accordance with 628 for the exclusive use by the Department shall be provided on the property where the structural members are being fabricated.

1. office desk,
2. office chair,
3. broadband internet service,
4. access to a copier with electronic scanning ability, and

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 711 – STEEL STRUCTURES (various subsections, as shown)

SECTION 910 – METAL MATERIALS

910.02 Structural Steel

910.23 Stud Shear Connectors

5 filing cabinet.

The Department will provide QA Inspection in accordance with 711.09(b) for structural steel fabrication. The fabricator must establish and maintain an effective quality control program in accordance with AISC and the contract. The Department's shop QA inspection is not a substitute for the fabricator's quality control program.

(a) Notice of Beginning Work

Written notification shall be given 10 days in advance of the date on which fabrication is intended to start. Between the dates of such notification and the start of fabrication, a surface inspection of the proposed materials will be made. Any such materials cut or work performed prior to this inspection may be rejected.

(b) QA Inspection

All material and workmanship will be subject to QA inspection by the Engineer. The cost of inspection, both at mill and shop, will be borne by the Department. Prior to shop inspection of a component, the Contractor shall furnish the Engineer's QA Inspector with a list of its main stress carrying material, correlating the piece mark and heat numbers. The heat number, established by the rolling mill, shall be preserved on material through fabrication until the component is joined into a member with a permanent piece mark.

(c) Facilities for Inspection

Facilities for the inspection of material and workmanship in the mill and shop shall be furnished, and the Engineer's QA inspector shall be allowed free access to the necessary parts of the works.

711.10 Facilities for Inspection

Facilities for the inspection of material and workmanship in the mill and shop shall be furnished, and the QA inspector shall be allowed free access to the necessary parts of the works.

711.11 Cleaning, Straightening, and Traceability of Material

Material, before being laid off or worked, must be straight. If straightening is necessary, it shall be done by methods that do not injure the metal. Sharp kinks and bends will be cause for rejection of the material.

The straightening of plates, angles, and other shapes, and built up members, when allowed, shall be done by methods that do not produce fracture or other injury to the steel. Distorted members shall be straightened by mechanical means or, if approved, by the carefully planned and supervised application of a limited amount of localized heat. Heat straightening of ASTM A709 grade HPS 100W steel members will not be allowed. The temperatures of the heated area shall not exceed 1,200°F, a dull red be within the limits

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 711 – STEEL STRUCTURES (various subsections, as shown)

SECTION 910 – METAL MATERIALS

910.02 Structural Steel

910.23 Stud Shear Connectors

shown in 729.10, as controlled by temperature indicating crayons, liquids, or bimetal thermometers. Parts to be heat straightened shall be substantially free of stress and from external forces, except stresses resulting from mechanical means used in conjunction with the application of heat. They shall be allowed to cool ~~very slowly naturally using only clean, dry air~~. Water quenching will not be allowed. Following the straightening of a bend or buckle, the surface of the metal shall be inspected for evidence of fracture.

Short term application of heat to high performance steel for purposes of heat curving, heat straightening, camber and sweep adjustment, or for other reasons is limited and shall ~~not exceed 1,100°F be within the limits shown in 729.10. Heat applications shall be in accordance with Department approved procedures.~~

For members distorted by welding, straightening shall be in accordance with clause 5 of the Bridge Welding Code.

All primary members or materials used to fabricate primary members shall have their heat number stenciled, computer numerically controlled scribed, or otherwise marked into the member by a method approved by the Engineer. Stenciling or marking shall be done near the location of the fabricator's piece identification mark and shall be done using low-stress stencils or other methods approved by the Engineer.

SECTION 711, BEGIN LINE 235, DELETE AND INSERT AS FOLLOWS:

711.13 Flame Cutting

Structural steel in accordance with these specifications may be flame cut, provided a smooth surface free from cracks and notches and an accurate profile obtained and secured using a mechanical guide. Hand cutting shall be done only where approved.

In all flame cutting, the cutting flame shall be so adjusted and manipulated as to avoid cutting inside the prescribed lines. Flame cut surfaces shall meet the ~~ANSI surface roughness rating value of 1,000, except that flame cut surfaces of members not subject to calculated stress shall meet the surface roughness value of 2,000 roughness requirements of AWS D1.5~~. Flame cut surfaces of members carrying calculated stress shall have their corners rounded to a 1/16 in. radius by grinding after flame cutting.

Re-entrant cuts shall be filleted to a radius of not less than ~~3/4~~ in.

~~Surface roughness exceeding the above values and occasional gouges not more than 3/16 in. deep on otherwise satisfactory flame cut surfaces shall be removed by machining or grinding. Corrections of the defects must be faired with the surface of the cut on a bevel of 1:6 or less. Occasional gouges of flame cut edges more than 3/16 in. deep but not more than 7/16 in. deep may be repaired by welding with low hydrogen electrodes not exceeding 5/32 in. in diameter and with a preheat of 250°F. The completed weld shall be ground smooth and flush with the adjacent surface. Notches, gouges, or surfaces not meeting the~~

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 711 – STEEL STRUCTURES (various subsections, as shown)

SECTION 910 – METAL MATERIALS

910.02 Structural Steel

910.23 Stud Shear Connectors

surface roughness requirements specified herein may be repaired in accordance with AWS D1.5.

711.14 Edge Planing*Base Metal Inspection and Repair of Cut Edges*

Base metal shall be prepared in accordance with clause 5 of the Bridge Welding Code. All sheared or flame cut edges of plates and shapes shall be ground smooth.

~~Edge planing will not be required on plates having rolled edges~~
~~Discontinuities discovered visually prior to fabrication or during inspection of welded joints may be repaired in accordance with AWS D1.5.~~

~~Sheared edges of plates more than 1/2 in. in thickness and carrying calculated stress shall be planed to a depth of 1/4 in. Re-entrant cuts shall be filleted before cutting.~~

~~Visually observed defects in sheared or flame cut edges of plates 4 in. or less in thickness, except ASTM A709 grade HPS 100W steel plates, shall be investigated or repaired in accordance with the following table. Repairs made by welding shall be in accordance with 711.32.~~

Description of Discontinuity	Repair Required
All discontinuity of 1/8 in. max. depth.	None. Depth shall be explored as directed.
Any discontinuity over 1 in. in length with depth over 1/8 in. but not greater than 1/4 in.	Remove and weld.
Any discontinuity over 1 in. in length with depth over 1/4 in. but not greater than 7/16 in.	Remove completely and weld. Aggregate length of welding not over 20% of plate edge length being repaired.
Any discontinuity over 1 in. in length with depth greater than 7/16 in.	Plate rejected. Defective portion may be removed and remainder may be used in 7/16 in. depth.

SECTION 711, BEGIN LINE 283, DELETE AND INSERT AS FOLLOWS:

711.17 Blank Dimensional Tolerances

Dimensional tolerances for base metal delivered to the fabricator's facility shall be in accordance with ASTM A 6.

Dimensional tolerances for all fabricated members shall be in accordance with clause 5 of the Bridge Welding Code, unless other dimensional tolerances are shown on the plans.

711.18 Blank**711.19 Bent Plates**

~~Cold bent, load carrying, rolled steel plates shall be in accordance with the~~

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 711 – STEEL STRUCTURES (various subsections, as shown)

SECTION 910 – METAL MATERIALS

910.02 Structural Steel

910.23 Stud Shear Connectors

following:

(a) ~~They shall be so taken from the stock plates that the bend line will be at right angles to the direction of rolling.~~

(b) ~~The radius of bends shall be such that no cracking of the plate occurs. Generally accepted minimum radii, measured to the concave face of the metal, are shown in the following table:~~

Thickness, t , in inches	Up to 1/2 in.	Over 1/2 in. to 1 in.	Over 1 in. to 1 1/2 in.	Over 1 1/2 in. to 2 1/2 in.	Over 2 1/2 in. to 4 in.
All grades of structural steel in this specification	$2t$	$2\frac{1}{2}t$	$3t$	$3\frac{1}{2}t$	$4t$

~~If a shorter radius is essential, the plates shall be bent hot at a temperature no greater than 1,200°F. Hot bent plates shall be in accordance with requirement (a) of 711.19.~~

(c) ~~Before bending, the corners of the plate shall be rounded to a radius of 1/16 in. throughout that portion of the plate at which the bending is to occur.~~

Fracture-critical and nonfracture-critical plates and bars shall be cold bent, at room temperature, unless otherwise permitted in 711.19(b). The bending shall be performed in accordance with the Bridge Welding Code and 711.19(a).

(a) Cold Bending

For all grades and thicknesses of steel conforming to ASTM A709, the minimum bend radii for cold bending measured to the concave face of the plate shall be $5.0t$, where t is the thickness of the plate in inches. For cross-frame or diaphragm connection plates up to 3/4 in., the minimum bending radii may be reduced to $1.5t$. For all other grades and thicknesses of steel, the minimum bend radii shall be as recommended by the plate producer, however in no case shall it be less than the minimums specified herein.

Bend lines shall be perpendicular to the direction of rolling of the plate. If the bend line is parallel to the direction of rolling of the plate the minimum radius shall be increased to $7.5t$. Steel web splice plates, fillers, gusset plates not serving as chord splices, connection plates, and web stiffeners shall not be included in this rolling direction requirement.

(b) Hot Bending

Fracture-critical and nonfracture-critical plates and bars may be hot bent

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 711 – STEEL STRUCTURES (various subsections, as shown)

SECTION 910 – METAL MATERIALS

910.02 Structural Steel

910.23 Stud Shear Connectors

subject to the approval of the Engineer. The heating and bending procedure shall be submitted to the Engineer for review and approval. The plates and bars shall be bent hot at temperatures in accordance with 729.10. The minimum radii of the hot bend shall be in accordance with 711.19(a). Before bending, the corners of the plate shall be rounded to a radius of 1/16 in. throughout that portion of the plate at which the bending is to occur.

711.20 Fit of Stiffeners

Bearing stiffeners of girders and stiffeners intended as supports for concentrated loads shall have full bearing. This bearing shall consist of either milled, ground, or weldable steel in compression areas of flanges, welded as shown on the plans, or as otherwise specified on the flanges to which they transmit load or from which they receive load. ~~The opposite end of bearing stiffeners may have a gap between the end of the stiffener and the flange not exceeding six times the web thickness.~~

Stiffeners not intended to support concentrated loads, including transverse intermediate stiffeners and full depth diaphragm connection plates, shall be attached to the ~~compression flanges~~ as shown on the plans. ~~These stiffeners may bear on the tension flange or may have a gap between the end of the stiffener and the near face of the flange not exceeding six times the web thickness. Regardless of the gap dimension, the distance between the end of the web-to-stiffener weld and the near edge of the web-to-flange fillet weld shall not be less than four times the web thickness and not more than shall not exceed the lesser of six times the web thickness and 4 in.~~

711.21 Bolt Holes

(a) High Tensile Strength Bolts, and Unfinished Bolts

All holes for bolts shall be punched or drilled. Material forming parts of a member composed of not more than five thicknesses of metal may be punched 1/16 in. larger than the nominal diameter of the bolts ~~whenever the thickness of the metal is no greater than 3/4 in. for structural steel or 5/8 in. for high strength steel for bolts smaller than 1 in. in diameter, and 1/8 in. larger than the nominal diameter of the bolt for bolts 1.0 in. in diameter and larger. If there are more than five thicknesses or when the main material is thicker than 3/4 in. for structural steel, or 5/8 in. for high strength steel, or if required in accordance with 711.24, all holes shall be subpunched or subdrilled 3/16 in. smaller and, after assembling, reamed 1/16 in. larger or drilled from the solid to 1/16 in. larger than the nominal diameter of the bolts full-size while in assembly.~~

(b) Ribbed Bolts, Turned Bolts, or other Approved Bearing-Type Bolts

All holes for ribbed bolts, turned bolts, or other approved bearing type bolts shall be subpunched or subdrilled 3/16 in. smaller than the nominal diameter of the bolt. They shall be reamed ~~when assembled, reamed or drilled~~ to a steel template, or, after assembling, drilled from the solid at the option of the fabricator. The finished holes shall always provide

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 711 – STEEL STRUCTURES (various subsections, as shown)

SECTION 910 – METAL MATERIALS

910.02 Structural Steel

910.23 Stud Shear Connectors

a driving fit as shown on the plans or as specified.

711.22 Punched Holes

The diameter of the die shall not exceed the diameter of the punch by more than 1/16 in. If any holes need to be enlarged to admit the bolts, such holes shall be reamed. Holes shall be clean cut without torn or ragged edges. Poor matching of holes will be cause for rejection. *Holes in longitudinal main load-carrying members, transverse floorbeams, and any components designated as fracture-critical shall not be punched full size.*

711.23 Reamed or Drilled Holes

Reamed or drilled holes shall be cylindrical, perpendicular to the member, and shall be in accordance with 711.21 as to size. Where practicable, reamers shall be directed by mechanical means. ~~Drilled holes shall be 1/16 in. larger than the nominal diameter of the bolt.~~ Diameters of holes in all material connecting top shoes to beam or girder flanges shall be 1/8 in. larger than the diameters of the bolts. Bolts connecting the flange to the top shoe shall extend into the top shoe a minimum of 1 in. Open holes for high strength bolts shall be 15/16 in. in diameter unless otherwise shown on the plans. Burrs on the outside surfaces shall be removed. Poor matching of holes will be cause for rejection. Reaming and drilling shall be done with twist drills. If required, assembled parts shall be taken apart for removal of burrs caused by drilling. Connecting parts requiring reamed or drilled holes shall be assembled and held securely while being reamed or drilled and shall be match marked before disassembling.

SECTION 711, AFTER LINE 398, INSERT AS FOLLOWS:

711.24.1 Computer Numerically Controlled Drilled Field Connections

Computer numerically controlled, CNC, equipment may be used to produce full-sized holes in components otherwise requiring reamed, sub-sized holes, subject to the Engineer's approval and the demonstrated accuracy of the CNC system. Accuracy must be verified by periodic check assemblies of components, and the fabricator's quality control plan for the system must be acceptable to the Engineer.

Errors detected by check assemblies will require additional assemblies to define the extent of the problems and subsequent CNC work may be restricted or prohibited until system corrections are accepted by the Engineer. The Contractor shall be responsible for the fit of work in the field per section 711.52.

SECTION 711, BEGIN LINE 416, DELETE AS FOLLOWS:

711.27 Fitting for Bolting

Mating surfaces of steel shall be cleaned before assembling. The parts of a member shall be assembled, well pinned, and firmly drawn together with bolts before reaming is commenced. Assembled pieces shall be taken apart, ~~if necessary~~, for the removal of burrs and shavings produced by the reaming operation. The member shall be free from twists, bends, and other deformation.

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 711 – STEEL STRUCTURES (various subsections, as shown)

SECTION 910 – METAL MATERIALS

910.02 Structural Steel

910.23 Stud Shear Connectors

SECTION 711, BEGIN LINE 456, DELETE AND INSERT AS FOLLOWS:

All welding shall be in accordance with the applicable section of the Bridge Welding Code. All welding shall be performed by AWS certified welders. Weld repair shall be in accordance with Bridge Welding Code, ~~Section~~ clause 5.7.

SECTION 711, BEGIN LINE 473, DELETE AND INSERT AS FOLLOWS:

711.32 Welds

Welding of steel shall be done only as shown on the plans or as specified and only with specific approval. Welding may be performed to remedy minor defects, if approved. No temporary or permanent welds, if not shown on the plans or otherwise specified, shall be made without specific written authorization.

(a) AWS Requirements

Welding of steel bridges and bridge components, *including high performance steels*, shall be performed in accordance with ~~AASHTO/AWS D1.5 the~~ Bridge Welding Code *current edition*, hereinafter referred to as the Bridge Welding Code. Welders, welding operators, and tack welders shall be qualified in accordance with Bridge Welding Code, ~~C~~lause 7, Part B.

When welding steel structural or steel non-structural tubing or steel structural supports for highway signs, luminaires, or traffic signals, it shall be performed in accordance with AWS D1.1 Structural Welding Code – Steel *current edition*, hereinafter referred to as AWS D1.1. Welders, welding operators, and tack welders shall be qualified in accordance with AWS D1.1, Clause 6, Part C.

Welding procedure specifications shall be submitted to the Engineer with fully documented and accepted procedure qualification records for approval prior to any welding operations.

In general, post weld heat treatment will not be required. The use of such post weld heat treatment will require additional qualification testing.

(b) Welding of High Performance Steel

All welding on high performance steel shall be in accordance with the Bridge Welding Code, except as modified herein and by the AASHTO Guide Specification for Highway Bridge Fabrication with HPS 70W Steel, hereinafter referred to as the Guide.

Only submerged arc welding, SAW, and shielded metal arc welding, SMAW, processes will be allowed. Consumable handling requirements shall be in accordance with the Bridge Welding Code, Sections 12.4 and 12.5, when using reduced preheat as described in Table 3 of the Guide, except that SAW consumables for matching weld metal shall meet the hydrogen control level of H4 in accordance with Section 12.6. Consumable handling requirements shall meet the provisions of the Bridge Welding Code, Clause 6, when using

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 711 – STEEL STRUCTURES (various subsections, as shown)

SECTION 910 – METAL MATERIALS

910.02 Structural Steel

910.23 Stud Shear Connectors

~~the preheat requirements contained in Clause 6, except that the diffusible hydrogen level shall never exceed H8. SMAW consumables may meet diffusible hydrogen levels of either H4 or H8 except the higher preheat and interpass temperatures as noted in Table 3 of the Guide shall apply to H8 conditions.~~

~~Filler metals used to make single pass fillet welds for web to flange applications which join HPS 70W steel plates, HPS 70W to grade 50W plates, and for attaching stiffeners and connection plates to grade HPS 70W webs and flanges, shall be in accordance with the Bridge Welding Code, Table 6.1 for ASTM A709, grade 50W base metal. Filler metals for single pass 5/16 in. fillet welds need not meet the requirements for exposed bare applications.~~

~~Filler metals used for all complete penetration groove welds joining grade HPS 70W plate to ASTM A709, grade HPS 50W or grade 50W plate shall conform to the requirements for welding grade 50W base metal.~~

~~Filler metals used for all complete penetration groove welds joining grade HPS 70W plates to grade HPS 70W plates shall conform to the requirements for HPS 70W base metal as follows:~~

1. Submerged Arc Welding process:

~~Wire – LA85 by Lincoln Electric Company~~

~~Flux – MIL800HPNi by Lincoln Electric Company~~

2. Shielded Metal Arc Welding process:

~~Matching – E9018MR*~~

~~Undermatching – E7018MR*~~

~~* The designator 'MR', for moisture resistant coating, is required for all SMAW electrodes used for welding HPS 70W steels.~~

~~The Contractor may request approval of alternate consumables for matching weld strengths in lieu of the above filler metals for SAW. The request for approval shall include documentation of successful welding and shall also include diffusible hydrogen tests, both in accordance with the Bridge Welding Code.~~

~~All welding procedures shall be qualified in accordance with the Bridge Welding Code, Clause 7, Qualification. The provisions of Section 7.12 shall apply. Qualification tests shall measure strength, toughness, and ductility and results shall be evaluated in accordance with Section 7.12. If specified on the plans, additional tests shall measure the Charpy V-notch toughness of the coarse grained area of the heat affected zone, HAZ. The notch in the specimens shall be carefully located in the coarse grained area of the HAZ, as~~

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 711 – STEEL STRUCTURES (various subsections, as shown)

SECTION 910 – METAL MATERIALS

910.02 Structural Steel

910.23 Stud Shear Connectors

~~determined by macro-etching the specimens prior to machining and testing. The toughness requirement for the HAZ shall be the same as the weld metal.~~

~~All procedure qualification tests shall be ultrasonically tested in accordance with the requirements of the Bridge Welding Code, Clause 8, Part C. Evaluation shall be in accordance with Table 8.4, UT Acceptance Rejection Criteria Tensile Stress. Indications found at the interface of the backing bar may be disregarded regardless of the defect rating.~~

~~A representative of the Department will witness all welding procedure qualification tests.~~

~~Results of the welding procedure qualification tests and final welding procedure specifications shall be submitted to the Engineer for review and approval.~~

~~In general, post weld heat treatment will not be required. The use of such post weld heat treatment will require additional qualification testing.~~

~~Wherever magnetic particle testing is done, only the yoke technique will be allowed, as described in Section 8.7.8.2 of the Bridge Welding Code, modified to use alternating current only.~~

(c) Field Welding

Field welding shall be ~~by the shielded metal arc welding, SMAW, process and shall be in accordance with performed in accordance with the Bridge Welding Code and the requirements herein. Magnetic particle testing will not be required on welded connections that do not carry calculated stresses. All field welding shall be preheated in accordance with Clause 6 of the Bridge Welding Code. The Contractor shall provide a copy of the minimum preheat and interpass temperature table to the Engineer prior to beginning welding. Electrodes with a low hydrogen classification shall be used.~~

711.33 Stud Shear Connectors

Stud shear connectors shall be in accordance with 711.302 and as shown on the plans. ~~Stud shear connectors shall not be applied in the shop unless otherwise specified.~~

SECTION 711, BEGIN LINE 614, INSERT AS FOLLOWS:

711.36 Facing of Bearing Surfaces

Plates required to be finished to a specified thickness shall be ordered with sufficient thickness to allow for finishing. Ordered plate thicknesses shall be a minimum of 1/16 in. more than the planned finished thickness.

The top and bottom surfaces of steel slabs, base plates, and cap plates of columns and pedestals shall be planed or the plates heat-straightened. Parts in contact with them

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 711 – STEEL STRUCTURES (various subsections, as shown)

SECTION 910 – METAL MATERIALS

910.02 Structural Steel

910.23 Stud Shear Connectors

shall be faced.

Sole plates of beams and girders shall have full contact with flanges. Sole plates and masonry plates shall be planed or heat straightened.

Cast pedestals shall be planed on surfaces to be in contact with steel and shall have surfaces to be in contact with masonry, rough finished.

Surfaces of bronze bearing plates intended for sliding contact shall be finished.

The surface finish of bearing plates, base plates, and other bearing surfaces intended to contact each other or with concrete shall meet the following ANSI surface roughness requirements as defined in ANSI B-46.1:

Bridge rollers and rockers	ANSI 250 $\mu\text{in.}$
Heavy plates in contact with shoes to be welded.....	ANSI 1000 $\mu\text{in.}$
Milled ends of compression members, milled or ground ends of stiffeners and fillers.....	ANSI 500 $\mu\text{in.}$
Pins and pin holes.....	ANSI 125 $\mu\text{in.}$
Sliding bearings.....	ANSI 125 $\mu\text{in.}$
Steel slabs.....	ANSI 2000 $\mu\text{in.}$

711.37 Pins and Rollers

Pins and rollers shall be turned to the dimensions shown on the working drawings and shall be straight, smooth, and free from flaws. Pins and rollers more than 9 in. in diameter shall be forged *and annealed or normalized and tempered*. Pins and rollers 9 in. or less in diameter may be forged or cold finished carbon steel shafting. In pins larger than 9 in. in diameter, a hole no less than 2 in. in diameter shall be bored full length along the axis after the forging has been allowed to cool to a temperature below the critical range under suitable conditions to prevent damage by cooling too rapid.

711.38 Boring Pin Holes

Pin holes shall be bored true to the specified diameter, smooth and straight, at right angles with the axis of the member, and parallel with each other unless otherwise required. The final surface shall be produced by a finishing cut. The distance outside-to-outside of end holes in tension members, and inside-to-inside of end holes in compression members, shall not vary from that specified more than 1/32 in. Boring of *pin* holes in built-up members shall be done after the bolting is completed.

711.39 Pin Clearances

The diameter of the pin hole shall not exceed the pin by more than 1/50 in. for pins 5.0 in. or less in diameter, or *by* 1/32 in. for larger pins.

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 711 – STEEL STRUCTURES (various subsections, as shown)

SECTION 910 – METAL MATERIALS

910.02 Structural Steel

910.23 Stud Shear Connectors

SECTION 711, BEGIN LINE 770, INSERT AS FOLLOWS:

711.47 Shop Cleaning and ~~Painting~~Coating

Shop cleaning and ~~painting~~coating shall be in accordance with applicable requirements of 619.11.

SECTION 711, BEGIN LINE 821, INSERT AS FOLLOWS:

711.53 Shipping

Material shall not be loaded for shipment until the coating has been allowed to cure for a minimum of 48 h. Structural members shall be loaded on trucks or cars in such manner that they can be transported to and unloaded at their destination without being excessively stressed, deformed, or otherwise damaged. No material shall be shipped without written authorization of the Engineer. All inspection reports shall be provided to the Engineer before the shipping release will be signed.

SECTION 711, BEGIN LINE 851, DELETE AND INSERT AS FOLLOWS:

No erection shall be performed without the approval by the Engineer. Before starting erection, information *in the form of working drawings and calculations in accordance with 711.05* shall be fully provided concerning the erection methods and the amount and character of the equipment proposed to be used, ~~which shall be subject to approval~~. Approval shall not be considered as relieving the Contractor of its responsibility for the safety of its methods or equipment or from carrying out the work in full accordance with the plans and specifications.

SECTION 711, BEGIN LINE 873, DELETE AND INSERT AS FOLLOWS:

711.57 Falsework

The falsework shall be properly designed and substantially constructed and maintained for the loads which come upon it. ~~Plans~~*Working drawings and calculations in accordance with 105.02* for falsework or for changes in an existing structure necessary for maintaining traffic shall be prepared and submitted for approval. Approval of these plans shall not be considered as relieving the Contractor of any responsibility.

SECTION 711, BEGIN LINE 892, INSERT AS FOLLOWS:

711.59 Field Straightening Material

If it is necessary to straighten beams, plate girders, plates, angles, and other shapes in the field, it shall be done in accordance with the applicable requirements of 711.11.

Before straightening a *load* carrying member, a proposed method of straightening shall be submitted in writing. Approval shall be received prior to commencing the work.

SECTION 711, BEGIN LINE 928, DELETE AND INSERT AS FOLLOWS:

Splices shall be set to grade with the steel unsupported by falsework and prior to final bolting. After bolting is complete, these elevations ~~will be checked~~*shall be surveyed and submitted to the Engineer for review and concurrence*. Adjustment shall be made as directed if steel elevations are not within allowable tolerances. *Forms used for concrete*

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 711 – STEEL STRUCTURES (various subsections, as shown)

SECTION 910 – METAL MATERIALS

910.02 Structural Steel

910.23 Stud Shear Connectors

deck slabs shall not be set to final elevation until all structural steel within the continuous superstructure unit being formed has been erected to proper grade.

SECTION 711, BEGIN LINE 955, DELETE AND INSERT AS FOLLOWS:

711.64 Diaphragm Connections

Diaphragm connections other than those shown on the plans may be allowed. If other connections are proposed, details shall be submitted for approval. The Contractor shall assume full responsibility for layout of all diaphragm connections and for the accuracy of all fitted parts. Connections will not be allowed which require *field* welding to the web, except at supports.

711.65 Bolted Connections Using High Strength Bolts

(a) General

This subsection covers the assembly of structural joints using ASTM F3125, grades A325, A490, and F1852 high strength ~~heavy hex~~ bolts ~~tightened to a high~~ installed so as to develop the minimum required bolt tension specified in 711.65(d)1. The bolts are to be used in holes provided in accordance with 711.21, 711.22, and 711.23.

High strength bolts shall be 7/8 in. in diameter unless noted.

(b) Bolts, Nuts, and Washers

Bolts, nuts, and washers shall be *of the grade shown on the plans and in accordance with 910.02(g). Grades A490 or F1852 may be furnished, at no additional cost to the Department, when grade A325 is shown on the plans.* All galvanized nuts shall be lubricated with lubricant containing a visible dye. Black bolts shall be oily to the touch when installed. Weathered or rusted bolts shall be cleaned and lubricated prior to installation.

(c) Bolted Parts

The slope of surfaces of bolted parts in contact with the bolt head and nut shall not exceed 1:20 with respect to a plane normal to the bolt axis. Bolted parts shall fit together solidly when assembled and shall not be separated by gaskets or any other interposed compressible material. When assembled, all joint surfaces, including those adjacent to the bolt heads, nuts, or washers, shall be free of scale, except tight mill scale surfaces shall also be free of dirt, loose scale, burrs, other foreign material, and other defects that would prevent solid seating of the parts.

Contact surfaces within slip-critical joints shall be free of oil, grease, and any other material that reduces friction between the contact surfaces. *Faying surfaces shall be coated in accordance with 619.11(a).*

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 711 – STEEL STRUCTURES (various subsections, as shown)

SECTION 910 – METAL MATERIALS

910.02 Structural Steel

910.23 Stud Shear Connectors

(d) Installation**1. Bolt Tension**

When all fasteners in the joint are tightened, each shall provide at least the minimum bolt tension shown in Table A for the size and grade of fastener used.

TABLE A

Minimum Bolt Tension for ASTM F3125, Grade A325 Bolts, lb		
Bolt Size, in.	Minimum Bolt Tension,* lb Grades A325 and F1852	Grade A490
1/2	12,05012,000	15,000
5/8	19,20019,000	24,000
3/4	28,40028,000	35,000
7/8	39,25039,000	49,000
1	51,50051,000	64,000
1 1/8	64,90064,000	80,000
1 1/4	82,40081,000	102,000
1 3/8	98,20097,000	121,000
1 1/2	119,500118,000	148,000

* Equal to the proof load 70% of the min. tensile strength given in ASTM F3125

Threaded bolts shall be tightened with properly calibrated wrenches or by the turn-of-nut method. If required because of bolt entering and wrench operation clearances, tightening by either procedure may be done by turning the bolt while the nut is prevented from rotating. Impact wrenches, if used, shall be of adequate capacity and sufficiently supplied with air to perform the required tightening of each bolt in approximately 10 s.

Installation of all high strength bolts shall be in accordance with AASHTO LRFD Bridge Construction Specifications. Any Grade A325 or A490 bolted assemblies that accumulate rust or dirt prior to assembly shall be cleaned, relubricated, and two fasteners from each lot shall be tested for rotational capacity in accordance with ASTM F3125. Any Grade F1852 bolted assemblies that accumulate rust, dirt, or have their factory applied lubrication compromised shall be discarded. Grade A325, Type 3 bolts may be reused once if the nut can be run down the entire threaded length of the bolt by hand. No other grade or type of high strength bolts shall be reused after being fully tensioned. The snug tight condition as defined in AASHTO LRFD Bridge Construction Specifications shall be obtained for all prior to final tightening by all tightening methods listed herein. The snug tight condition is typically achieved with a few impacts of an impact wrench, application of an electric torque wrench until the wrench begins to slow, or the full effort of a worker with a spud wrench.

A Skidmore-Wilhelm calibrator or other acceptable bolt tension indicating devices

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 711 – STEEL STRUCTURES (various subsections, as shown)

SECTION 910 – METAL MATERIALS

910.02 Structural Steel

910.23 Stud Shear Connectors

shall be ~~required~~provided on the project site for use during bolt installation. ~~Periodic Verification~~ tests shall be performed *prior to the start of work, and at the frequency specified for each method of tensioning*, to ensure the installed bolt, nut, and washer assembly ~~meets the above requirements~~develops the required tension. ~~Such tests shall be performed each work day when calibrated wrench tightening is used. For short grip bolts, direct tension indicators with solid plates may be used to perform these tests. Direct tension indicators shall first be checked with a longer grip bolt in the Skidmore-Wilhelm calibrator.~~

2. Washers

All fasteners shall have a hardened washer under the nut or bolt head turned in tightening, ~~under both the head and nut when Grade A490 bolts are used for steel with yield less than 40 ksi, and at all oversize or slotted holes~~. Where an outer face of the bolted parts has a slope of more than 1:20 with respect to a plane normal to the bolt axis, a smooth beveled washer shall be used to compensate for the lack of parallelism.

3. Calibrated Wrench Tightening

If calibrated wrenches are used to provide the bolt tension specified in 711.65(d)1, the settings shall induce a bolt tension of 5% to 10% in excess of this value. *Tightening shall only be performed by turning the nut of the assembly when the calibrated wrench method is used.* These wrenches shall be calibrated at least once each working day by tightening, in a device capable of indicating actual bolt tension, no less than three typical bolts of each diameter from the bolts to be installed. *Verification testing shall also be performed when the lot of any bolted component is changed, when any component of the bolted assembly is relubricated, when any component of the wrench including hose or air supply is altered, or as directed by the Engineer.* Power wrenches shall be adjusted to stall or cut-out at the selected tension. If manual torque wrenches are used, the torque indication corresponding to the calibrating tension shall be noted and used in the installation of all bolts of the tested lot. Nuts shall be in tightening motion when torque is measured. When using calibrated wrenches to install several bolts in a single joint, the wrench shall be turned to touch up bolts previously tightened which may have been loosened by the tightening of subsequent bolts. This shall be continued until all are tightened to the required amount.

4. Turn-of-Nut Tightening

~~When the turn of nut method is used to provide the bolt tension specified in 711.65(d)1, there shall first be enough bolts brought to a snug tight condition to ensure that the parts of the joint are brought into full contact with each other. Snug tight is defined as the tightness attained by a few impacts of an impact wrench or the full effort of a man using an ordinary spud wrench. Following this initial operation, bolts shall be placed in all remaining holes in the connection and brought to snug tightness. Verification testing shall be performed on a representative sample of not less than three typical bolts of each diameter prior to the start of work, and as directed by the Engineer. Each bolted assembly shall be tested in a bolt tension measuring device, and in accordance with the measuring device manufacturer's recommendations. After bringing the assembly to a snug tight~~

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 711 – STEEL STRUCTURES (various subsections, as shown)

SECTION 910 – METAL MATERIALS

910.02 Structural Steel

910.23 Stud Shear Connectors

condition, the nut and protruding end of the bolt shall be match-marked to visually inspect the nut rotation during the test. The nut shall then be tightened by the applicable amount of nut rotation specified in Table B, and the resulting bolt tension, as measured by the tension measuring device, shall be recorded. The resulting bolt tension shall be equal to or greater than the verification tension in Table C.

After all bolts in the connection have been tightened to a snug tight condition, the nut and protruding end of each bolt shall be match-marked to allow for visual inspection at the completion of tensioning. All bolts in the joint shall then be tightened additionally by the applicable amount of nut rotation specified in Table B with tightening progressing systematically from the most rigid part of the joint to its free edges. During this operation there shall be no rotation of the part not turned by the wrench.

TABLE B

Nut Rotation ⁽¹⁾⁽²⁾ from Snug Tight Condition Disposition of Outer Faces of Bolted Parts		
Both faces normal to bolt axis, or 1 face normal to axis and other face sloped ⁽³⁾ (bevel washer not used)		Both faces sloped ⁽³⁾ from normal to bolt axis (bevel washers not used)
Bolt length ⁽⁴⁾ not exceeding 8 diameters or 8 in.	Bolt length ⁽⁴⁾ exceeding 8 diameters or 8 in.	For all lengths of bolts
1/2 turn	2/3 turn	3/4 turn

(¹) For coarse thread heavy hexagon structural bolts of all sizes and lengths and heavy hexagon semi-finished nuts.

(²) Nut rotation is rotation relative to bolt regardless of the element (nut or bolt) being turned. Tolerance on rotation: 1/6 of a turn over and nothing under.

(³) Slope 1:20 maximum.

(⁴) Bolt length is measured from underside of head to extreme, end of point.

TABLE B

Bolt length measured from underside of head to end of bolt ⁽³⁾	Geometry of Outer Faces of Bolted Parts		
	Both faces normal to bolt axis	One face normal to bolt axis and other face sloped not more than 1:20 ⁽⁴⁾	Both faces sloped not more than 1:20 from normal to bolt axis ⁽⁴⁾
Up to and including four diameters	1/3 turn	1/2 turn	2/3 turn
Over four diameters, but not exceeding eight diameters	1/2 turn	2/3 turn	5/6 turn
Over eight diameters, but not exceeding 12 diameters	2/3 turn	5/6 turn	1 turn

(¹) Nut rotation is rotation relative to bolt regardless of the element (nut or bolt) being turned.

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 711 – STEEL STRUCTURES (various subsections, as shown)

SECTION 910 – METAL MATERIALS

910.02 Structural Steel

910.23 Stud Shear Connectors

Tolerance on rotation: 1/6 of a turn over and nothing under.

(2) Applicable only to joints in which all material within the grip is steel.

(3) When the bolt length exceeds 12d_b, the required nut rotation shall be determined by actual testing in a suitable bolt tension measurement device.

(4) Bevel washer not used.

TABLE C

Verification Bolt Tension for ASTM F3125, Grade A325 Bolts, lb		
Bolt Size, in.	Grades A325 and F1852	Grade A490
1/2	13,000	16,000
5/8	20,000	25,000
3/4	29,000	37,000
7/8	41,000	51,000
1	54,000	67,000
1 1/8	67,000	84,000
1 1/4	85,000	107,000
1 3/8	102,000	127,000
1 1/2	124,000	155,000

5. Twist-Off Tension Control Bolt Method

Verification testing shall be performed on a representative sample of not less than three typical bolts of each diameter prior to the start of work, and as directed by the Engineer. The bolted assemblies shall be tested in the condition they will be used during erection and shall not be cleaned or relubricated prior to testing. After the bolted assembly has been installed in the tension measuring device and brought to a snug tight condition using the installation tool, the spline shall be inspected to verify that it hasn't been severed. The installation tool shall then be used to complete tensioning and sever the splined end from the bolt. The final tension as measured by the tension measuring device shall not be less than that specified in 711.65(d)4 Table C. If any bolted assemblies develop lower tension than specified, the cause of the deficiency shall be determined and resolved prior to retesting. Any modifications or corrections to the bolted assemblies, such as relubrication, shall only be performed by the bolt manufacturer.

All bolts in the connection shall initially be brought to the snug tight condition without severing the spline at the end of the bolt. Any bolt that has the spline severed during the snug tightening operation shall be removed and replaced prior to final tensioning. The final tensioning shall be performed with the installation tool, progressing systematically from the most rigid part of the joint to its free edges.

SECTION 711, BEGIN LINE 1117, DELETE AND INSERT AS FOLLOWS:

711.68 Structural Steel Cutting, Rivet and Bolt Removal, and Drilled Bolt Holes in Repair Projects

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 711 – STEEL STRUCTURES (various subsections, as shown)

SECTION 910 – METAL MATERIALS

910.02 Structural Steel

910.23 Stud Shear Connectors

Field cutting of structural steel shall be done as shown on the plans or as directed. *Flame cutting in the field shall not be performed unless approved by the Engineer. Approval will be based on a review of the Contractor's proposed flame cutting methods, which shall include written descriptions of the specific methods to be used and measures to be taken to ensure there are no heat affected zones or rough edges on load carrying structural components that are to remain in place. [Mr. White note: This is similar to RSP 711-B-315, but has been revised to remove the Department's Bridge Engineering section email].*

Rivets or bolts connecting steel at locations shown on the plans or as directed shall be removed. This work shall be done in a manner that does not damage the surrounding steel. If necessary, such work shall be done by drilling.

Bolt holes shall be drilled as directed in the field. A bolt hole is a hole required for one bolt drilled through any number and thicknesses of metal plates.

711.69 Jacking and Supporting Beams

When jacking and supporting a beam is required on a bridge repair project, ~~the proposed method~~*working drawings and calculations, in accordance with 105.02* for jacking and supporting shall be submitted ~~for approval~~. This work shall not be performed until ~~a method is the working drawings are~~ approved.

SECTION 711, BEGIN LINE 1278, DELETE AND INSERT AS FOLLOWS:

The cost of stud shear connectors placed on new structural steel ~~will~~*shall* be included in the cost of structural steel.

SECTION 910, BEGIN LINE 195, DELETE AND INSERT AS FOLLOWS:

(d) High Performance Steel

High performance steel, HPS, shall be in accordance with ASTM A709. In addition to the conditions listed in Section ~~6.76.6~~ of ASTM A709, high performance steel may be furnished as hybrid/mixed design structural components using high performance steel plates in combination with high strength, low alloy steel plates and shapes, for welded or bolted applications in bridge construction.

~~The impact testing requirements for HPS in accordance with 10.1 and 10.2 of ASTM A709 shall meet temperature zone 2.~~

(e) Charpy V-Notch Toughness Tests

Structural steel, except members exempted below, shall meet the longitudinal Charpy V-Notch test requirement as specified in ~~the following table for the type or types of steel specified or furnished. Sampling and testing procedures shall be in accordance with ASTM A673~~*ASTM A709 for Temperature Zone 2*. The H frequency of ~~heat~~ testing shall be used ~~for non-fracture critical components, and the P frequency of testing shall be used for components identified on the plans as fracture critical~~. Charpy V-Notch test data shall be included on the mill test reports for structural steel specified in 711.08 and 916.

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 711 – STEEL STRUCTURES (various subsections, as shown)

SECTION 910 – METAL MATERIALS

910.02 Structural Steel

910.23 Stud Shear Connectors

ASTM Designation	Thickness, in.	Foot-Pounds Joule @ 40°F
A709, grade 36		15
A709, grade 50*	Up to 4 in. mechanically fastened	15
	Up to 2 in. welded	15
A709, grade 50W*	Up to 4 in. mechanically fastened	15
	Up to 2 in. welded	15
	Over 2 in. to 4 in. welded	20

* If the yield point of the material exceeds 65,000 psi, the temperature for the CVN value for acceptability shall be reduced by 15°F for each increment of 10,000 psi above 65,000 psi.

This test requirement shall apply to all *primary* structural steel members and components. *Secondary members and components that do not carry gravity loads through a necessary load path, such as except diaphragms, and cross frames in straight bridges, stiffeners, top flange lateral bracing, railroad ballast retainers and components, bearingsshoe assemblies, expansion joints, and compression members of trussesfiller plates, do not require Charpy V-Notch testing unless otherwise noted on the plans.*

(f) Mill Test Reports

Mill test reports for structural steel shall be in accordance with 711.08 and 916 and shall include Charpy-Impact test data as set out in 910.02(e).

(g) High Strength Bolts, Nuts, and Washers

1. General Use

High strength heavy hex bolts shall be in accordance with ASTM F3125. ~~g~~ Grade A325 or grade F1852 shall be provided, unless grade A490 is specified. When used with weathering grades of steel, the bolts shall be Type 3. Type 1 bolts shall be furnished for all other grades of steel. Grades A325 and F1852, Type 1 bolts, and the nuts and washers used with these bolts shall be either hot dip galvanized in accordance with ASTM F2329 or mechanically galvanized in accordance with ASTM B695, Class 55. High strength bolts and nuts that are used in the same assembly shall receive the same coating process. Grade A490, Type 1 bolts, and the nuts and washers used with these bolts shall be zinc-flake coated in accordance with ASTM F3393. High strength heavy hex nuts shall be of the grade and finish specified in ASTM F3125 and ASTM A563. Washers shall be of the type specified in ASTM F3125 and ASTM F436. ~~Type 1 bolts, and the nuts and washers used with these bolts, shall be either hot dip galvanized in accordance with ASTM F2329 or mechanically galvanized in accordance with ASTM B695, Class 55.~~

2. Assembly of Structural Steel in Bridges

High strength bolts, nuts, and washers used in the assembly of structural steel in bridges, excluding shoes and bearing assemblies, shall be provided in accordance with

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 711 – STEEL STRUCTURES (various subsections, as shown)

SECTION 910 – METAL MATERIALS

910.02 Structural Steel

910.23 Stud Shear Connectors

910.02(g)1 and the following additional requirements.

a. Bolts

The maximum tensile strength shall be 150,000 psi for bolts 1 in. or less in diameter. The maximum tensile strength shall be 120,000 psi for bolts greater than 1 in. in diameter. The maximum hardness shall be 33 Rc.

b. Nuts and Washers

The nuts and washers shall be in accordance with ASTM A563, grade DH; or ASTM A194, grade 2H the recommended matching components specified in ASTM F3125.

c. Tests**(1) Rotational Capacity and Tension**

~~Grade A325 and A490~~ ~~H~~igh strength fasteners shall be subjected to the rotational capacity test in accordance with ASTM F3125. ~~Grade F1852~~ ~~high strength fasteners shall be subjected to the assembly tension test in accordance with ASTM F3125.~~ The fastener shall complete two times the required number of turns from snug tight conditions in accordance with AASHTO LRFD Bridge Construction Specifications, in a Skidmore-Wilhelm calibrator or equivalent tension measuring device without stripping or failure. During this test, the maximum recorded tension shall be at least 1.15 times the required fastener tension indicated in AASHTO LRFD Bridge Construction Specifications. The measured torque required to produce the required fastener tension shall not exceed the value obtained by the following equation:

$$\text{Torque} = 0.25 \text{ PD}$$

where:

Torque = Measured Torque, (foot pounds)

P = Measured Bolt Tension, (pounds)

D = Nominal Diameter (feet)

(2) Proof Loads

Proof load tests for bolts shall be conducted in accordance with ASTM F606, Section 3.2.3. Proof load test for nuts shall be conducted in accordance with ASTM F606, Section 4.2.

(3) Wedge Tension Test

The wedge tests of full size bolts shall be conducted in accordance with ASTM F606, Section 3.5.

(4) Additional Testing for 150 ksi Bolts

~~Grade A490~~ high strength bolts shall be subjected to the magnetic particle

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 711 – STEEL STRUCTURES (various subsections, as shown)

SECTION 910 – METAL MATERIALS

910.02 Structural Steel

910.23 *Stud Shear Connectors*

inspection and carburization/decarburization testing in accordance with ASTM F3125.

d. Certification

The supplier shall provide a certification of compliance with all requirements for high strength bolts, nuts, and washers used in the assembly of structural steel in bridges. The certification, in addition to complying with the applicable requirements of 916, shall include the ~~lot number on the shipping package and indicate when or where all testing was performed~~ *test report information, results, and statements in accordance with ASTM F3125.*

SECTION 910, AFTER LINE 1452, INSERT AS FOLLOWS:

910.23 *Stud Shear Connectors*

Stud shear connectors shall be produced from cold-finished steel bar produced from hot-wrought carbon or alloy steel bar in accordance with ASTM A29. They shall be in accordance with ASTM A108 cold-drawn, either semi-killed or killed deoxidation, steel grade 1010, 1015, 1016, 1018, or 1020, round, of the dimensions shown on the plans. They shall be in accordance with the mechanical property requirements for Type B studs in accordance with clause 9 of the Bridge Welding Code.

A Type A certification in accordance with 916 shall be provided for the stud shear connectors. The certification shall include the heat or lot number, size, cross sectional area, tensile strength, yield strength, load elongation, and reduction of area.

COMMENTS AND ACTION

SECTION 711 – STEEL STRUCTURES (various subsections, as shown)

910.02 Structural Steel

910.23 *Stud Shear Connectors*DISCUSSION:

Motion: Second: Ayes: Nays: FHWA Approval:	<u>Action:</u> — Passed as Submitted — Passed as Revised — Withdrawn
2024 Standard Specifications Sections: 711 pg. 686 - 715; 910.02 pg. 1055 - 1058; 910.23 [added new]	— 2026 Standard Specifications — Revise Pay Items List — Notification to Designers if change is <u>not</u> addressed by RSP
Recurring Special Provisions or Plan Details: 711-B-315 STEEL STRUCTURES and 711-R-758 WELDING SPECIFICATIONS	— Create RSP (No. __) Effective: — Revise RSP (No. __) Effective:
Standard Drawing affected: NONE	— Standard Drawing Effective:
Design Manual Chapter: 407 – Steel Structure (updates forthcoming)	— Create RPD (No. __) Effective:
GIFE Section: 5.23 (updates required to mention added bolt grades)	— GIFE Update — Frequency Manual Update — SiteManager Update

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: JTRP Research project SPR-4004: Development of Subgrade Stabilization and Slab Undersealing Solutions for PCC Pavements Restoration and Repairs, Report No. FHWA/IN/JTRP-2020/13 was completed in 2020. The research cited the loss of functionality and the development of distress in concrete pavements is often attributable to the poor subbase and subgrade conditions and/or loss of support due to the development of the voids underneath the slab. The research was implemented to find solutions for these issues.

The summary and conclusions of the final report included a statement that Cement Treated Aggregate and Lean Concrete had the best performance as they prevented the formation of any noticeable settlements in the underlying subgrade layer. Whereas Subbase for PCCP (3" of #8s over 6" of #53s) was never stable for patching operations.

PROPOSED SOLUTION: INDOT developed a USP for Lean Concrete Base (LCB) which has been utilized successfully in several recent INDOT contracts as a subbase for PCCP in patching operations and RCBA rehabilitation projects. Approval of the RSP is needed to enable its utilization on contracts as appropriate and streamline the process.

APPLICABLE STANDARD SPECIFICATIONS: Create new section 309, and revise section 609.03.

APPLICABLE STANDARD DRAWINGS: N/A

APPLICABLE DESIGN MANUAL SECTION: Create Design Memo for guidance

APPLICABLE SECTION OF GIFE: 6

APPLICABLE RECURRING SPECIAL PROVISIONS: none

PAY ITEMS AFFECTED: The following 3 pay items should be made obsolete:

305-000103 LEAN CONCRETE BASE, 6 IN.

305-12695 LEAN CONCRETE BASE, 9 IN.

309-12646 CEMENT TREATED PERMEABLE BASE

A new pay item will be needed: 309-xxxx, LEAN CONCRETE BASE, 9 IN.

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad hoc (Jacob Blanchard, Nick Cosenza, Gary Fox, Mike Nelson, Jim Reilman)

IF APPROVED AS RECURRING SPECIAL PROVISION OR PLAN DETAILS, PROPOSED BASIS FOR USE:

Required for all contracts with 309-xxxx, LEAN CONCRETE BASE, 9 IN. pay item

IMPACT ANALYSIS (attach report):

Submitted By: Joe Novak

Title: State Construction Engineer

Organization: INDOT

Phone Number: 317-501-7805

Date: 12/20/24

IMPACT ANALYSIS REPORT CHECKLIST

Explain the business case as to why this item should be presented to the Standards Committee for approval. Answer the following questions with Yes, No or N/A.

Does this item appear in any other specification sections? No

Will approval of this item affect the Approved Materials List? No

Will this proposal improve:

Construction costs? Yes

Construction time? Yes

Customer satisfaction? Yes

Congestion/travel time? N/A

Ride quality? Yes

Will this proposal reduce operational costs or maintenance effort? Yes

Will this item improve safety:

For motorists? N/A

For construction workers? N/A

Will this proposal improve quality for:

Construction procedures/processes? Yes

Asset preservation? Yes

Design process? N/A

Will this change provide the contractor more flexibility? Yes

Will this proposal provide clarification for the Contractor and field personnel? N/A

Can this item improve/reduce the number of potential change orders? Yes

Is this proposal needed for compliance with:

Federal or State regulations? No

AASHTO or other design code? No

Is this item editorial? No

Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda: N/A

REVISION TO SPECIAL PROVISIONS

309-R-xxx LEAN CONCRETE BASE (proposed new)

309-R-xxx LEAN CONCRETE BASE

(Adopted xx-xx-xx)

The Standard Specifications are revised as follows:

SECTION 308, AFTER LINE 401, INSERT AS FOLLOWS:

SECTION 309 – LEAN CONCRETE BASE**309.01 Description**

This work shall consist of placing Lean Concrete Base, LCB, material on subgrade as the subbase material in accordance with 105.03.

MATERIALS**309.02 Materials**

Materials shall be in accordance with the following:

<i>Admixtures*</i>	912.03
<i>Calcium Chloride, Type L</i>	913.02
<i>Coarse Aggregate, Class A or Higher,</i>	
<i>Size No. 8, CS</i>	904
<i>Fine Aggregate, Size No. 23</i>	904.02(a)
<i>Portland Cement, Type IL or Type III</i>	901.01(b)
<i>Water</i>	913.01

* Other admixtures that improve flowability or decrease setting time may be used as approved by the Engineer.

309.03 Lean Concrete Base Mix Design

The LCB mix shall be proportioned to produce a workable mixture with the properties listed in the table below. Aggregate weights shall be based on saturated surface dried, SSD, conditions. The batch water shall be adjusted to account for moisture in the aggregates. The mix design shall be submitted a minimum of 7 calendar days prior to the trial batch and include the following.

- (a) list of all materials
- (b) source of all materials
- (c) batch weights
- (d) names of all admixtures

Materials and Properties	Requirements
<i>Portland Cement Content, lb/cu yd</i>	155 max.
<i>Fine Aggregate, lb/cu yd</i>	1,744
<i>Coarse Aggregate, lb/cu yd</i>	1,931
<i>Water, lb/cu yd</i>	195
<i>High Range Water Reducing Admixture, Type F</i>	<i>Dosage as required to achieve flow for placement</i>

REVISION TO SPECIAL PROVISIONS

309-R-xxx LEAN CONCRETE BASE (proposed new)

Entrained Air, %	9 - 15
Compressive strength @ 28 days, psi, ASTM C39	150 min. – 600 max.
Slump, in.	As required for placement

309.04 Trial Batch

A trial batch shall be produced by the Contractor and will be tested to verify that the mix design meets the criteria as stated in 309.03.

The trial batch shall be of sufficient quantity to allow the Department to perform all required tests from the same batch. The LCB material shall be batched within the proportioning tolerances of 508.02(b) except that admixture dosages may be modified from the targets shown on the mix design submittal to achieve the target air content and desired flow consistency.

The mixture may be tempered with admixtures shown on the mix design within 30 minutes of the original batch time. The LCB mixture shall flow freely from the truck by gravity with a minimum of three chutes. Flow consistency will be based on visual assessment and as needed for field placement.

The Department will determine the test results for air content of the plastic mixture and 28-day compressive strength of the hardened LCB. A minimum of four 6 in. by 12 in. cylinders will be made and tested in accordance with 702.24. The cylinders will be cured in standard conditions in accordance with AASHTO R 100 section 10.1. All test results will be provided to the Contractor.

309.05 Job Control

LCB material will be tested for air content once per 50 cu yds. One set of three 6 in. by 12 in. cylinders for compressive testing at 28 days will be made during each day of production. The cylinders will be cured in standard conditions in accordance with AASHTO R 100 section 10.1. The Engineer will notify the Contractor when test results for air content or compressive strength are outside the requirements of 309.03

CONSTRUCTION REQUIREMENTS**309.06 Placement**

Prior to placement, the Contractor shall ensure that the total depth of the patch area is sufficient to allow for placement of the depths for both the LCB material and overtopping material. The subgrade shall be sufficiently damp prior to placement. Dry subgrade material shall be wetted to a damp condition without creating ponding of water or mud. LCB material shall not be placed in standing water or on frozen ground and shall be protected from freezing for 72 h or until the overtopping material is placed.

The LCB material shall be placed to a depth of 9 in. When directed by the Engineer to perform additional undercutting below 9 in. due to unsuitable existing subgrade material, the maximum depth of the additional undercutting will be 6 in. The Contractor shall ensure that there is sufficient depth remaining above the LCB surface to

REVISION TO SPECIAL PROVISIONS

309-R-xxx LEAN CONCRETE BASE (proposed new)

accommodate the required thickness of the overtopping material. During placement, the LCB material shall be compacted with internal vibration. After placement, a liquid membrane forming curing compound shall be applied within 30 minutes in accordance with 702.22(b) and shall have a final appearance similar to a white sheet of paper.

Plastic sheeting, a minimum of 3 mils thick, shall be placed on the LCB surface as a debonding layer between the LCB and the overtopping material.

The overtopping material may be placed on top of the LCB as soon as placement can be done without deformation of the LCB.

309.07 Method of Measurement

Lean concrete base will be measured by the square yard.

309.08 Basis of Payment

Lean concrete base will be paid for at the contract unit price per square yard, complete in place.

Payment will be made under:

Pay Item

Pay Unit Symbol

Lean Concrete Base, 9 in. SYS

The cost of variations in admixture dosage rates, the addition of calcium, other changes to the production mix that occur after the trial batch, liquid membrane forming compound, plastic sheeting, and all other incidentals necessary to construct the LCB shall be included in the cost of the LCB pay item.

The cost of excavation, disposal of existing materials, and preparation of the subgrade prior to placement of the LCB shall be included in the cost of the LCB pay item.

When directed by the Engineer, areas of excavation between 9 in. and 15 in. depth will be paid for by multiplying the quantity for LCB, 9 in. by 1.5. LCB placed thicker than 9 in. due to variations in depth of excavations by the Contractor, will not be paid

SECTION 609, AFTER LINE 24, INSERT AS FOLLOWS:

609.03 General Requirements

Subgrade shall be prepared in accordance with 207. Subbase shall be prepared in accordance with 302. Geotextile shall be installed in accordance with 214. LCB when shown on the plans shall be in accordance with 309 and as follows.

Two layers of polyethylene plastic sheeting shall be placed on top of the LCB as a debonding layer between the LCB and the RCBA. Preformed expansion joint filler 3 in. in thickness shall be placed along the notch between the sloped edge of LCB and the thickened portion of the RCBA. The RCBA may be placed on top of the LCB as soon as placement of

REVISION TO SPECIAL PROVISIONS

309-R-xxx LEAN CONCRETE BASE (proposed new)

the reinforcing steel and concrete can be done without deformation of the LCB. When the LCB is placed adjacent to semi-integral or fully integral end bents, 3 in. of preformed expansion joint filler shall be placed between the bent and the vertical edge of the LCB.

COMMENTS AND ACTION

309-R-xxx LEAN CONCRETE BASE

DISCUSSION:

	<u>Action:</u>
Motion:	
Second:	
Ayes:	
Nays:	
FHWA Approval:	<ul style="list-style-type: none"> <input type="checkbox"/> Passed as Submitted <input type="checkbox"/> Passed as Revised <input type="checkbox"/> Withdrawn
2024 Standard Specifications Sections: Create new section 309, and revise section 609.03	<ul style="list-style-type: none"> <input type="checkbox"/> 2026 Standard Specifications <input type="checkbox"/> Revise Pay Items List <input type="checkbox"/> Notification to Designers if change is <u>not</u> addressed by RSP
Recurring Special Provisions or Plan Details: NONE	<ul style="list-style-type: none"> <input type="checkbox"/> Create RSP (No. __) <input type="checkbox"/> Effective:
Standard Drawing affected: NONE	<ul style="list-style-type: none"> <input type="checkbox"/> Revise RSP (No. __) <input type="checkbox"/> Effective:
Design Manual Chapter: NONE	<ul style="list-style-type: none"> <input type="checkbox"/> Standard Drawing <input type="checkbox"/> Effective:
GIFE Section: Section 6	<ul style="list-style-type: none"> <input type="checkbox"/> Create RPD (No. __) <input type="checkbox"/> Effective: <input type="checkbox"/> GIFE Update <input type="checkbox"/> Frequency Manual Update <input type="checkbox"/> SiteManager Update

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: The current specifications don't adequately address the anchor bolts and steel components used in elastomeric bearing assemblies.

PROPOSED SOLUTION: Update 726, 910, and 915 to the current AASHTO/ASTM grades for anchor bolts and steel used in elastomeric bearing assemblies.

APPLICABLE STANDARD SPECIFICATIONS: 726.02, 910.02(g), 915.04(b)

APPLICABLE STANDARD DRAWING: 726-BEBP (no changes required)

APPLICABLE DESIGN MANUAL CHAPTER: Chapter 409 (no changes required))

APPLICABLE SECTION OF GIFE: Section 5 – Bridges (no changes required)

APPLICABLE RECURRING SPECIAL PROVISION OR PLAN DETAILS: RSP 726-B-323 (no changes required)

PAY ITEMS AFFECTED: N/A

APPLICABLE SUB-COMMITTEE ENDORSEMENT:

IF APPROVED AS RECURRING SPECIAL PROVISION OR PLAN DETAILS, PROPOSED BASIS FOR USE:
Contracts including 726 pay items.

IMPACT ANALYSIS (attach report):

Submitted By: Pete White

Title: Design Manager

Division: Bridge Engineering

E-mail: pewhite@indot.in.gov

Date: December 23, 2024

IMPACT ANALYSIS REPORT CHECKLIST

Explain the business case as to why this item should be presented to the Standards Committee for approval. Answer the following questions with Yes, No or N/A.

Does this item appear in any other specification sections? No

Will approval of this item affect the Qualified Products List (QPL)? No

Will this proposal improve:

Construction costs? No

Construction time? No

Customer satisfaction? No

Congestion/travel time? No

Ride quality? No

Will this proposal reduce operational costs or maintenance effort? No

Will this item improve safety:

For motorists? No

For construction workers? No

Will this proposal improve quality for:

Construction procedures/processes? Yes

Asset preservation? No

Design process? No

Will this change provide the contractor more flexibility? No

Will this proposal provide clarification for the Contractor and field personnel? Yes

Can this item improve/reduce the number of potential change orders? No

Is this proposal needed for compliance with:

Federal or State regulations? No

AASHTO or other design code? No

Is this item editorial? No

Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda:

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 726 – BEARING ASSEMBLIES

726.02 Materials

SECTION 910 – METAL MATERIALS

910.02 Structural Steel

SECTION 915 – BRIDGE PILES AND BEARINGS

915.04 Elastomeric Bearings

(Note: Proposed changes shown highlighted gray)

The Standard Specifications are revised as follows:

SECTION 726, BEGIN LINE 11, DELETE AND INSERT AS FOLLOWS:

726.02 Materials

The materials shall be in accordance with the following:

Anchor Bolts	910.02(g)
Elastomeric Bearings	915.04
Grout	707.09
Polytetrafluoroethylene Sliding Surfaces.....	915.05
Shim and Fill Plates	910.02(a)
Side Retainers.....	910.02(a)
Threaded Studs and Hex Nuts.....	910.02(e)915.04(b)4

SECTION 910, BEGIN LINE 223, DELETE AND INSERT AS FOLLOWS:

(g) High Strength Bolts, Anchor Bolts, Nuts, and Washers**1. General Use**

High strength heavy hex bolts shall be in accordance with ASTM F3125, ~~g~~Grade A325 or grade F1852 shall be provided, unless grade A490 is specified. When used with weathering grades of steel, the bolts shall be Type 3. Type 1 bolts shall be furnished for all other grades of steel. Grades A325 and F1852, Type 1 bolts, and the nuts and washers used with these bolts shall be either hot dip galvanized in accordance with ASTM F2329 or mechanically galvanized in accordance with ASTM B695, Class 55. High strength bolts and nuts that are used in the same assembly shall receive the same coating process. Grade A490, Type 1 bolts, and the nuts and washers used with these bolts shall be zinc-flake coated in accordance with ASTM F3393. High strength heavy hex nuts shall be of the grade and finish specified in ASTM F3125 and ASTM A563. Washers shall be of the type specified in ASTM F3125 and ASTM F436. ~~Type 1 bolts, and the nuts and washers used with these bolts, shall be either hot dip galvanized in accordance with ASTM F2329 or mechanically galvanized in accordance with ASTM B695, Class 55.~~ [Note: proposed changes shown in this paragraph are also shown in item 4 listed on this Agenda]

Anchor bolts shall be in accordance with ASTM F1554, Grade 36 unless otherwise noted. Nuts used with anchor bolts shall be in accordance with ASTM A563 or ASTM A194. All nuts shall be lubricated with a lubricant containing a visible die in accordance with ASTM A563. Washers used with anchor bolts shall be in accordance with ASTM F436. All anchor bolts, nuts and washers shall be either hot dip galvanized in accordance with ASTM F2329 or mechanically galvanized in accordance with ASTM B695, Class 55. Anchor bolts and nuts that are used in the same assembly shall receive the same coating process.

REVISION TO 2024 STANDARD SPECIFICATIONS

SECTION 726 – BEARING ASSEMBLIES

726.02 Materials

SECTION 910 – METAL MATERIALS

910.02 Structural Steel

SECTION 915 – BRIDGE PILES AND BEARINGS

915.04 Elastomeric Bearings

SECTION 915, BEGIN LINE 217, DELETE AND INSERT AS FOLLOWS:

1. Elastomer

Elastomeric bearing pads shall be made from elastomeric materials and shall be steel reinforced as shown on the plans. They shall be in accordance with Articles 18.1 and 18.2 of the AASHTO LRFD Bridge Construction Specifications and AASHTO M 251 with the exception that Table ~~X1 – Elastomeric Properties~~ is not applicable. The elastomer portion of the elastomeric compound shall be 100% virgin natural polyisoprene known as natural rubber, or 100% virgin polychloroprene known as neoprene. The cured compound shall be in accordance with Table A for natural rubber, or Table B for neoprene, depending on which type is furnished.

SECTION 915, BEGIN LINE 240, DELETE AND INSERT AS FOLLOWS:

2. Structural Steel

Structural steel shims, top plates, bottom plates, and other steel components shall be in accordance with ASTM A36 or ASTM A709 unless otherwise noted. Anchor bolts shall be in accordance with 910.02(g).

Structural steel spacer plates, top and bottom load plates, and other steel components, including anchor bolts, exposed to the environment shall be galvanized in accordance with AASHTO M 111, zinc metallized with a coating of 7 mils in accordance with SSPC-CS 23.00, or painted with the structural steel coating system in accordance with 619.09(a). The finish coat for painted steel shall be in accordance with 909.02(d). The color shall be in accordance with SAE-AMS-STD-595, color No. 20045.

When stainless steel load plates are specified, the material shall be in accordance with ASTM A240, Type 304.

3. Internal Steel Shims

Internal steel shims shall be rolled hot and cold steel and shall be in accordance with ~~AISI 1015 through 1025, ASTM A1008, ASTM A36~~ or ASTM A1011 grade 36 or higher. Shims shall be of the thickness specified with a tolerance of ± 0.015 in.

4. Threaded Stud *and* Hex Nut

Threaded studs, where required, shall be in accordance with ASTM A307 and mechanically zinc coated in accordance with ASTM B695, class 50. *Hex nuts shall be in accordance with ASTM A563 and shall be hot dip galvanized in accordance with ASTM F2329.*

COMMENTS AND ACTION

726.02 Materials
 910.02 Structural Steel
 915.04 Elastomeric Bearings

DISCUSSION:

<u>Motion:</u>	<u>Action:</u>
Second:	<input type="checkbox"/> Passed as Submitted
Ayes:	<input type="checkbox"/> Passed as Revised
Nays:	<input type="checkbox"/> Withdrawn
FHWA Approval:	
2024 Standard Specifications Sections: 726.02 pg. 818; 910.02 pg. 1057, and 915 pg. 1117 - 1123.	<input type="checkbox"/> 2026 Standard Specifications <input type="checkbox"/> Revise Pay Items List <input type="checkbox"/> Notification to Designers if change is <u>not</u> addressed by RSP
Recurring Special Provisions or Plan Details: RSP 726-B-323 (no changes required)	<input type="checkbox"/> Create RSP (No. __) Effective:
Standard Drawing affected: 726-BEBP (no changes required)	<input type="checkbox"/> Revise RSP (No. __) Effective:
Design Manual Chapter: Chapter 409 (no changes required)	<input type="checkbox"/> Standard Drawing Effective:
GIFE Section: 5	<input type="checkbox"/> Create RPD (No. __) Effective: <input type="checkbox"/> GIFE Update <input type="checkbox"/> Frequency Manual Update <input type="checkbox"/> SiteManager Update