

SECTION 850 Materials Testing and Acceptance Guide

Materials sampling and testing methods and documentation prescribed in 850 are mobilized into the contract in standard spec 106.3.

850.1 Materials Testing and Acceptance Guide

Revise 850.1 to change reference for sampling liquid asphalt and emulsified asphalts to WisDOT Test Modified (WTM) methods found in Manual of Test Procedures (MOTP). This information can be found in WTM R66.

The minimum requirements for testing and acceptance of materials are specified for the following:

Aggregates - Source Testing	Electrical
Aggregates - Stockpile Testing	Electrical Conduit
Aggregates - Project Testing	Embankment
Anchor Bolts and Anchor Rods	Erosion Control Materials
Asphaltic Materials	Fencing
Asphaltic Mixtures	Geosynthetics
Asphalt Pavement Density	High Strength Bolts
Bearing Pads	Joint Sealers
Block and Brick	Lumber and Timber
Bridge Fabricated Components	Mortar
Bridge Secondary Fabrications	Paint
Bronze Plates, Lubricated	Pavement Marking
Concrete Materials	Piling
Castings, Gray Iron	Posts, Treated Wood
Concrete Curing and Sealing	Precast Concrete
Concrete Mixing Water	Prestressed Concrete
Concrete Reinforcement	Signing
Concrete	Steel Products
Delineators	Traffic Control Devices
Drainage	Waterstops

Material	Sampled Accepted	Tested	Min Sampling Frequency	Central Lab Sample	Remarks
AGGREGATES - SOURCE TESTING					
Source Testing for Quality: Wear, Soundness, etc.					The regional person responsible for this area will oversee the provisions in items ^[1] and ^[2] below.
Aggregate Base Course (Dense and Open-Graded)	Source	Central Lab or Qualified Lab	^[1] , ^[2]	100# ^[3]	Central and Qualified Laboratory Source Testing under standard spec 106.3.4.2 ^[1] A representative sample of processed material must be submitted from any deposit not previously tested. Samples for testing (except for soundness and wear) must be submitted as follows: Yearly - One per deposit, for deposits that exhibit substantial variation in test results. Five-year period - One per deposit, for deposits that exhibit minor variation in y test results. Additionally - When visually obvious changes in characteristics occur, as deposit is worked or as the material is delivered to the project. ^[2] Soundness and wear tests must be run once per pit deposit per five-year period and once per quarry deposit per three-year period. For deposits having marginal soundness and wear values (within 5 percent of specification maximum limits), at least one test per deposit per year. ^[3] 50# will suffice for wear and soundness tests if only R/No.4 (4.75 mm) material is submitted. This must be obtained by separating the graded material on a No. 4 (4.75 mm) sieve. ^[4] At least one test per contract. ^[5] At least one test for L.A. Wear per contract. Recycled concrete for use in concrete pavement will require a test for wear if material is supplied from a source outside the project limits. ^[6] For concrete-making properties: Processed: One bag (+/-1 cubic foot) each of the fine aggregate and two sizes of coarse aggregate, except as otherwise requested by the laboratory in specific instances. ^[7] 50# will suffice if about 90% or more of the material passes the No. 4 (4.75 mm) sieve.
Asphaltic Mixes			^[1] , ^[2]	100# ^[3]	
Breaker Run Stone			^[1] , ^[23]	100#	
Granular Subbase & Backfills (if there are plastic fines in the material)			^[1]	100# ^[7]	
Pit Run			^[1] , ^[23]	100# ^[7]	
Concrete			^[1] , ^[2]	^[6]	
Recycled/Reclaimed Materials or Industrial By-Products			^[5]	100# ^[3]	
Seal Coat			^[1] , ^[2]	100# ^[3]	
Selected Borrow(when sieve analysis or P.I. required). See standard spec 208 .			^{1]} , ^[23]	100# ^[7]	^[23] Alternate engineer acceptance must be documented in the material records. For Breaker Run refer to standard spec 311.2 , for Select Crushed Material refer to standard spec 312.2 and for Pit Run refer to standard spec 313.2 .
Select Crushed Material			^[1] , ^[23]	100#	
AGGREGATES - STOCKPILE TESTING					
Aggregates Stockpile Testing	Source	Field ^[24]	^[25]		^[24] Refer to appropriate spec section or QMP to determine if WisDOT or contractor is to perform sampling and testing. ^[25] Perform gradation, plastic limit, liquid limit and/or fracture tests on one stockpile or loadout sample from each source before placement.

Material	Sampled Accepted	Tested	Min Sampling Frequency	Central Lab Sample	Remarks
AGGREGATES - PROJECT TESTING (Gradations, Plasticity, Fracture, etc.)					
QMP Contracts	Field	Field			<p>QMP Contracts - See the specific contract documents for guidance.</p> <p>All aggregate QC and QV tests must be reported according to the timeline in the applicable QMP provision on the MIT/MTS prefix 217 or 162 as applicable. Projects require a MIT/MTS prefix 155 QMP Base Aggregate Summary</p> <p>Report base aggregate dense 1 ¼-inch nuclear density QC and QV tests on MIT/MTS prefix 232. Projects require a MIT/MTS prefix 155 and/or QMP Base Aggregate Dense 1 ¼-Inch Compaction Summary report.</p>
Non-QMP Contracts	Field	Field			<p>Non-QMP contracts - All acceptance tests must be reported on the Materials Tracking System.</p> <p>The locations of project acceptance tests must be randomly distributed throughout the project. When the aggregates are used as produced and when uniform production and deposit conditions prevail, the minimum field acceptance tests below must be made and, in addition, observation must be maintained at the point of use for indications of deviations from normal gradation. When such deviation is noted, additional tests and necessary adjustment must be made immediately to rectify the condition.</p> <p>The minimum tests are only adequate after plant operations have been stabilized and uniformity of production, well within specification limits, has been obtained.</p> <p>Each sample must be tested for sieve analysis and other tests, as necessary, for determination of conformance with specifications</p>
Aggregate Base Course (Non-QMP contracts) Includes but is not limited to: - Crushed Agg. Base Course - Crushed Agg. Base Course, Open Graded - Recycled/Reclaimed Aggregates	Field	Field	^[8]		<p>^[8] Contract ≤ 500 tons: Acceptance should be in accordance with CMM 845. tons through 3000 tons /contract. One sample.</p> <p>More than 3000 tons/contract: One sample per 3000 tons cumulative.</p> <p>For 3000 tons or less/contract the material may be sampled for acceptance in the stockpile at the last location before use.</p>
Aggregate for chip seals, seal coats	Field	Field	^[9]		<p>^[9] Contract ≤ 500 tons: Acceptance should be in accordance with CMM 845. tons through 1500 tons/contract: One sample.</p> <p>More than 1500 tons/contract: One sample per 1500 tons cumulative per contract.</p>
Aggregate for Concrete Pavement & Ancillary Concrete (QMP Contracts)					QMP Contracts - See the specific contract documents for guidance.

Material	Sampled Accepted	Tested	Min Sampling Frequency	Central Lab Sample	Remarks
Aggregate for Concrete Masonry Structures (QMP Contracts)					QMP Contracts - See the specific contract documents for guidance.
Aggregate for Concrete Masonry Structures (Non-QMP Contracts)	Field	Field	^[11]		^[11] One CY through 100 CY of concrete/contract: One sample*. <u>CY through 400 CY of concrete/contract:</u> A) One sample* for all substructure units. B) One sample* per deck pour per day. <u>More than 400 CY of concrete/contract:</u> A) One sample* per 350 CY or fraction thereof for substructure units. Contact the regional materials section for guidance when conditions of construction are such that more frequent sampling may be warranted (e.g. an extensive length of construction, mixture/material changes). B) One sample* per deck pour per day. For pours over 450 CY, additional samples may be required, contact the regional person responsible for this area for guidance. * One sample must consist of sampling each size of aggregate being incorporated into the work.
Select Borrow	Field	Region	^[12]		Follow same sampling and testing as Granular Backfill. Refer to special provisions for material requirements.
Granular Backfill ^[A]	Field	Field	^[12]		^[12] Contract ≤ 500 CY (1,000 TONS): Acceptance should be in accordance with CMM 845 . Contract > 500 CY (1,000 TONS): One sample per 3,000 CY (6,000 TONS) or portion thereof. Material may be sampled for acceptance at the source. Contract quantities exceeding 20,000 CY (40,000 TONS) contact the region TSS/Materials unit. Testing frequency to be applied per source of material. Plasticity and Liquid Limit: Test first gradation sample. If sample is Non-Plastic, test a minimum of once per 10 gradation tests If sample is plastic, test every gradation sample. ^[A] Allowable Substitutions: Grade 1 granular backfill is an allowed substitution for Grade 2 granular backfill. Discuss with the Region how to document substitution.
Structural Backfill ^[B]	Field	Region	^[12]		Follow same sampling and testing as Granular Backfill. ^[B] Allowable Substitutions: Type A structure backfill is an allowed substitution for Type B structure backfill. Discuss with the Region how to document substitution.

Material	Sampled Accepted	Tested	Min Sampling Frequency	Central Lab Sample	Remarks
Breaker Run Stone ^[C]	Field	Field	^[13]		^[13] Acceptance must be from a Source with current Quality Testing. If source does not have current quality testing, have Quality Test performed. Alternate source acceptance may be granted in accordance with standard spec 312 . Perform visual gradation, fracture and durability tests. If visually obvious changes in quality characteristics occur or if material appears non-compliant, have fracture and gradation tests performed at the Regional laboratory. ^[C] Allowable Substitutions: Select Crushed is an allowed substitution for Breaker Run. Discuss with the Region how to document substitution.
Select Crushed Material	Field	Field	^[13]		Follow same sampling and testing as Breaker Run Stone.
Pit Run ^[D]	Field	Field	^[13]		Follow same sampling and testing as Breaker Run Stone. ^[D] Allowable Substitutions: 3" BAD, Breaker Run and Select Crushed are allowed substitutions for Pit Run. Discuss with the Region how to document substitution.
Subbase	Field	Region	^[12]		Follow same sampling and testing as Granular Backfill.
Culvert Pipe Backfill Foundation ^[E]	Source	Contractor lab	^[15]		^[15] Contractor to supply sample gradation, plasticity index and liquid limit results to project engineer before placing material. Project engineer may waive contractor testing for known sources.
	Field	Region	^[12]		Follow same sampling and testing as Granular Backfill. ^[E] Allowable Substitutions: Material with a GRADATION of ¾" BAD or 1 ¼" BAD are allowed substitutions for Culvert Pipe Foundation Backfill. Discuss with the Region how to document substitution.
Culvert Pipe Backfill Trench	Field	Field			Perform visual acceptance of material that complies with standard spec 520 . If material does not meet specification, use a project engineer approved material.
Storm Sewer Backfill Foundation ^[F]	Source	Contractor lab	^[15]		Follow same sampling and testing as Culvert Pipe Foundation Backfill.
	Field	Region	^[12]		Follow same sampling and testing as Granular Backfill. ^[E] Allowable Substitutions: ¾" BAD, 1 ¼" BAD and Crushed Stone Chips are allowed substitutions for Storm Sewer Foundation Backfill. Discuss with the Region how to document substitution. Gradation of Crushed Stone Chips is determined based on pipe size. Include pipe size on sample card when submitting to the region lab.
Storm Sewer Backfill Trench	Field	Region	^[12]		Follow same sampling and testing as Granular Backfill. Allowable Materials: Culvert Pipe Foundation Backfill and Granular Backfill

Material	Sampled Accepted	Tested	Min Sampling Frequency	Central Lab Sample	Remarks
ANCHOR BOLTS & ANCHOR RODS,					
Structure Bolts and Rods	Shop				<p>These items are to be supplied from an approved fabricator. The list of Approved Fabricators, Bridge Metal Secondary items is located at:</p> <p>https://wisconsindot.gov/Pages/doing-bus/eng-consultants/cnslt-rsrcs/tools/appr-prod/default.aspx</p> <p>When anchor bolts and rods are not from an approved fabricator, immediately contact the region person responsible for this area, and the Structure Fabrication Unit.</p> <p>See CMM 845 for certification guidelines.</p>
Base Structure Bolts	Field				<p>A manufacturer's certification of compliance is required and must be made available by the contractor. Reference on MIT/MTS prefix 905. See CMM 845 for certification guidelines.</p> <p>The end of each fabricated anchor bolt unit must be painted to identify the grade as follows:</p> <p>(Grade 36 - Blue) (Grade 55 - Yellow) (Grade 105 - Red)</p> <p>Visually inspect and document dimensions, condition, color marking, etc. Reject rods if not correctly marked.</p>
ASPHALTIC MATERIALS					
Asphalt Binder	Source and Field	Central Lab	Central Lab	1 quart (1 L) Tin container	<p>The supplier or contractor personnel will obtain samples, under the observation of a project engineer, at the HMA plant site. For contracts greater than 1,000 ton of mix, obtain an In-Line sample at a rate of one-liter (one-quart) sample per 15,000 tons of mix for each supplier and grade of asphalt binder, or fraction thereof. For contracts with 1,000 ton of mix or less, one (1) non-random In-Line sample may be obtained at the discretion of the project engineer. For all contracts, one (1) non-random truck transport sample may be obtained at the discretion of the project engineer. In addition, obtain samples as directed by the project engineer at any time extra samples are deemed necessary.</p> <p>A list of approved asphalt suppliers and approved sampling methods/locations are shown in the Combined State Binder Group Method of Acceptance for Asphalt Binders at:</p> <p>https://engineering.purdue.edu/~csbg/method.html</p> <p>Provide sample tag DT1352, with sample. See CMM 865 for blank tag and example to be submitted.</p>
Liquid Asphalt (MC, SC types)	Field	Central Lab	See standard spec 455.2.2.2	1 quart (1 L) Tin container	<p>Sample in the field, one sample for each 10,000 gallons. Document sampling per CMM 865. Sample per WTM R66.</p> <p>Provide sample tag DT1352, with sample. See CMM 865 for blank tag and example to be submitted.</p>
Emulsified Asphalts (Tack Coats, Slope Paving, etc.)	Field	Central Lab	See standard spec 455.2.5	2-quart plastic container	<p>Sample in the field, 1 per contract when 2,500 gallons or more are used, no samples on contracts less than 2,500 gallons. Sample per WTM R66.</p> <p>Provide sample tag DT1352, with sample. See CMM 865 for blank tag and example to be submitted. Emulsified asphalts have a limited life and should be submitted to the Central Laboratory as soon as practical. DO NOT allow samples to sit in the sun, be exposed to excessive heat, or freeze. NEVER use metal cans for samples, always use plastic or other non-reactive clean containers (i.e.: ULINE ½ gallon jug, model number S-13509B or equivalent).</p>

Material	Sampled Accepted	Tested	Min Sampling Frequency	Central Lab Sample	Remarks
ASPHALTIC MIXTURES					
Uncompacted	Field	Field	[16]		<p>[16] For QMP contracts, see the specific contract documents for guidance. All QV, and corresponding QC tests must be reported in a timely manner on the MIT/MTS prefix 254. Projects require MIT/MTS prefix 155 QMP HMA Mixtures Summary.</p> <p>[17] One to 500 tons (450 Mg)/contract acceptance may be in accordance with CMM 845. For ASPHALTIC SURFACE (Section 465) a visual inspection must be made and documented in the inspector's diary. If visual inspection indicates a problem may exist, the mixture may be sampled and tested for composition as determined by the project engineer. Reference the approved WisDOT mix design test electronically on a MIT/MTS prefix 905. Sample uncompacted mixtures in accordance with instructions in the CMM, "Methods of Sampling Asphaltic Paving Mixtures". See CMM 865.</p>
ASPHALT PAVEMENT DENSITY					
Density	Field	Field			<p>For QMP contracts, see the specific contract documents for guidance. For Non-QMP contracts, see standard spec 460.3.3. Report all HMA pavement Nuclear Density tests on MIT/MTS prefix 262. Projects require a MIT/MTS prefix 155 QMP HMA Nuclear Density Summary.</p>
BEARING PADS					
Bearing Pads or Laminated Elastomeric Bridge Bearing Pads	Shop				<p>These items are to be supplied from an approved fabricator. The list of approved fabricators for Bridge Metal Secondary items is on the APL.</p> <p>If the bearing pads are not furnished by an approved fabricator, the project engineer must immediately contact the region person responsible for this area, and the Structure Fabrication Unit before installation. If approved by the above, the below noted documentation must be provided to the region contact for this area and the Structure Fabrication Unit.</p> <p>For sheet lead and preformed fabric, a manufacturer's certification of compliance must be made available by the contractor. See CMM 845 for certification guidelines.</p> <p>For elastomeric, the project engineer must have before use a manufacturer's certified report of test or analysis indicating conformance to the contract requirements.</p>
BLOCK and BRICK					
Concrete Brick and Block	Field				<p>These items are to be supplied from an approved fabricator. A list of approved manufacturers of concrete brick and block is on the departments approved products list APL. Bill of Lading or other documentation identifying the manufacturer and plant location is required. This is an incidental/non-pay item. Reference on MIT/MTS prefix 905.</p>

Material	Sampled Accepted	Tested	Min Sampling Frequency	Central Lab Sample	Remarks
BRIDGE FABRICATED COMPONENTS					
Rail Posts, Anchor Assemblies for rail posts, Sleeves, Shims, Plates, Rail panels, Anchor bolts, Protection angles, Structural fasteners, Expansion devices, Sidewalk covers, Floor drains, Guardrail anchors, Elastomeric pads, Bearing assemblies (steel), Structural steel diaphragms	Field				<p>These items are to be supplied from an approved fabricator. The list of approved fabricators for Fabricated Components for Bridges items is on the APL.</p> <p>See CMM 875 for acceptance procedures."</p> <p>If not on an approved list, immediately contact the regional person responsible for this area.</p> <p>Note: Each shipment must include a certification statement and a loading document from the fabricator. See CMM 875 for requirements of certification statement. Reference on MIT/MTS prefix 905.</p>
BRIDGE SECONDARY FABRICATIONS					
Drains and Downspouts for Bridges	Field				<p>An approved fabricator normally furnishes these items. The list of approved fabricators for Bridge Metal Secondary items is on the APL.</p> <p>In the event the item(s) is not furnished by an approved fabricator, a certification of compliance must be made available.</p> <p>See CMM 845 for certification guidelines.</p>
BRONZE PLATES, LUBRICATED					
Bronze Plates, Lubricated	Shop or Field				<p>If sourced from a fabricator on the approved list, the list of approved fabricators for Bridge Metal Secondary items is on the approved products list APL.</p> <p>In the event that the plates are not from an approved fabricator, the project engineer must have before allowing their installation, a manufacturer's certified report, test or analysis indicating conformance with the contract requirements. See CMM 845 for certification guidelines.</p>
CASTINGS, GRAY IRON					
Castings, Gray Iron	Field				<p>The list of approved Gray Iron Casting manufacturers is on the approved products list APL.</p> <p>For all other manufacturers, a certification of compliance must be made available by the contractor. See CMM 845 for certification guidelines.</p>

Material	Sampled Accepted	Tested	Min Sampling Frequency	Central Lab Sample	Remarks
CONCRETE MATERIALS					
Concrete Aggregates					See Aggregate for Concrete in this document: Aggregates - Source Testing for Quality Aggregates - Stockpile Testing Aggregates - Project Testing
Concrete Admixtures					Approved lists for concrete admixtures are on the approved products list APL . Refer to the approved lists for AASHTO M194 Types A and D admixtures and AASHTO M154 air-entraining admixtures. AASHTO M194 Types C, E, F, and G admixtures are accepted by certified report of test, reference on MIT/MTS prefix 905. Calcium Chloride as a set accelerator is not allowed, except as incidental to bid items 416.1715, and 416.1725, accepted by manufacturer's certification of compliance, reference on MIT/MTS prefix 905, diary entry to include concentration and addition rate. * Calcium Chloride is excluded. See separate material entry.
Cementitious Materials: Portland Cement	Region	Central Lab	One per year per source and type when in use on WisDOT work	4 lbs	The list of approved Portland Cement Manufacturers - Certified Suppliers is on the approved products list APL . See CMM 870 for the "Sampling of Cement." Note: Routine field sampling is not required for certified materials, unless noted on the approved list for a specific vendor/plant. Random sampling will be done through region materials staff in accordance with the portland cement certification program
Cementitious Materials: Non-certified cement	Field	Central Lab	One per 400 tons	4 lbs	
CONCRETE MATERIALS					
Cementitious Materials: Fly Ash	Field	Central Lab	One per 2000 tons per source	4 lbs.	At least 14 days before use, the project engineer must have a copy of a report of tests showing acceptable chemical and physical properties. Reference certified reports of test or analysis on MIT/MTS prefix 905. See CMM 845 for certification guidelines. For contracts with less than 100 tons, no sampling is required
Cementitious Materials: Pozzolans	Field	Central Lab	One per 2000 tons		Used as a complete replacement for fly ash. Approved list materials only may be used. The list of Pozzolans - Approved Manufacturers is on the approved products list APL . For contracts with less than 100 tons no sampling is required.

Material	Sampled Accepted	Tested	Min Sampling Frequency	Central Lab Sample	Remarks
Cementitious Materials: Slag	Field	Central Lab	One per 2000 tons	4 lbs.	At least 14 days before use, the project engineer must have a copy of a report of tests showing acceptable chemical and physical properties. Reference certified reports of test or analysis on MIT/MTS prefix 905. For contracts with less than 100 tons, no sampling is required.
Liquid Membrane Curing Compounds	Source or Field	Central Lab	When not source inspected. One per 2000 gallons or fraction thereof. ^[18]	1 quart	Liquid membrane curing compound, when source inspected, must be marked with evidence of being approved for use in Wisconsin. If there is any doubt whether a batch is acceptable, contact the Regional Materials Section. Lists of WisDOT tested and approved batches of Liquid Membrane Curing Compounds for the current year is maintained on the approved products list APL . Lots or batches carried over from the previous year must be re-tested before use. When not source inspected, in addition to field sampling and testing at central lab, a manufacturer's certified report of test or analysis identified with the manufacturer's name or trademark listing the lot or batch number of the material delivered to the job is required, reference on MIT/MTS prefix 905. Field sampling may be waived for small quantities of 220 gallons or less. For these cases, a manufacturer's certificate of compliance must be made available when requested by the project engineer. The "Concrete curing compounds" approved list covers two types of curing compound: Poly-methyl-alpha-styrene (PAMS); ASTM C309 material for curing concrete pavement, called in 415.2.4 White Pigmented - ASTM C309 material called in 501.2.9, must be used in place of PAMS for pavement or base receiving an overlay. See CMM 845 for certification guidelines. A diary entry per CMM 845 is required for these items.
CONCRETE CURING AND SEALING					
Clear and Translucent	Field				A manufacturer's certificate of compliance is required, reference on MIT/MTS prefix 905. This material is called under 502.2.6, for structure concrete surfaces not receiving protective surface treatment. Approved field practice allows substitution of material from the approved list for Cure & Seal Compounds for Non-Trafficked Surfaces on Structural Masonry/Pigmented Surface Sealer. No sampling or testing is required. See CMM 845 for certification guidelines. A diary entry per CMM 845 , is required for lots or batches of curing compound.

Material	Sampled Accepted	Tested	Min Sampling Frequency	Central Lab Sample	Remarks
Crack and Surface Sealers	Field				<p>Lists of WisDOT- approved Crack and surface Sealers are on the approved products list APL. Also see standard spec 502.</p> <p>Crack and Surface Sealer - 502.2.11 calls three lists/applications as follows:</p> <p>Low Viscosity Crack Sealer, Non-pay, incidental to Item 502.0100: Per 502.3.13.1, primarily for use in sealing small deflection and shrinkage cracks in new bridge decks</p> <p>Concrete Protective Surface Treatment, Item 502.3200: Per 502.3.13.2, primarily for use in surface sealing of the top and edges of bridge decks</p> <p>Cure and Seal Compounds for Non-Trafficked Surfaces on Structural Masonry/Pigmented Surface Sealer, Item 502.3210: Per 502.3.13.3, primarily for use in sealing the inside faces and tops of parapets/barriers on bridges.</p> <p>See CMM 845 for certification guidelines. A diary entry per CMM 845 is required for all items.</p>
Clear Protective Coating					<p>Clear Protective Coating, Item 502.6500 - No approved list.</p> <p>Called in 502.2.13(1) primarily for sealing concrete substructure surfaces. A manufacturer's certificate of compliance must be made available by the contractor. Reference on MIT/MTS prefix 905. Also see standard spec 502.</p>
CONCRETE MIXING WATER					
Municipal Sources	Field	Central Lab	^[20] ^[21]		<p>Samples must be submitted in a clean plastic or glass container, well packed for shipment to preclude breakage. Sample card DT1499 needs to accompany sample to be tested.</p> <p>^[20] Water from municipal sources is not required to be tested per standard spec 501.2.6.</p> <p>^[21] If problems with any water source are suspected, based on current conditions or historical data, the department may request sampling at any time.</p> <p>^[22] Surface water sources need to be closely monitored at all times during concrete production. If conditions change significantly during the life of the project (i.e. an algae bloom or muddy storm runoff, etc.) a fresh sample must be tested before approval of continued use of the source.</p>
Private Wells	Field	Central Lab	Source tested once every 5yrs ^[21]	2 quarts (1/2 gal)	
Surface Water	Field	Central Lab	Source tested once annually ^[21] ^[22]	2 quarts (1/2 gal)	

Material	Sampled Accepted	Tested	Min Sampling Frequency	Central Lab Sample	Remarks																		
CONCRETE REINFORCEMENT																							
Bar Steel (Uncoated - "Black Steel") and Bar Steel (Epoxy Coated - "Green Steel")	Field	Central Lab	One for each 50,000 lbs. increment or portion for each individual bar size with a quantity equal to greater than 50,000 lb.	5 feet	<p>It is not necessary to submit samples from all heats and lots. Do not submit splice bars or test bars instead of cut samples. Apply the sampling threshold individually for each size of bar. Sample each bar steel size for which the project quantity equals or exceeds 50,000 lbs. Replace cut samples with bars long enough to provide additional lap length for splicing as prescribed in CMM 515.5.6.</p> <p>When bars are delivered to the field the project engineer must:</p> <ul style="list-style-type: none">- Be sure all bundles are identified with heat numbers.- Obtain one copy of the mill test reports and shipping invoice representing all steel types, grades, bar sizes and heat numbers included in the shipment.- When epoxy coated, in addition to the above, a copy of the resin manufacturer's certification of coating materials and the applicator's certification attesting to compliance with all of the coating details of the specifications.- Attach to the invoice, the mill test reports and when applicable, the coating manufacturer's and applicator's certification. Place in the project records.- Reference electronically on a Materials Tracking System prefix 905 the mill reports and certifications received. <p>For each sample selected, attach a tag with the following information and submit to the Central Laboratory for testing.</p> <ul style="list-style-type: none">- Steel type, Grade, Bar size, Heat Number and manufacturer- If epoxy coated, the epoxy resin manufacturer.- Quantity of material the sample represents. <p>When quantities are less than 50,000 lbs. of any one bar size visually inspect and document in accordance with a diary entry per CMM 845.</p> <p>Bar steel delivered without plainly marked heat # tags must not be accepted. If this occurs immediately contact the regional person responsible for this area.</p> <table><tr><th colspan="2">BAR STEEL MINIMUM SAMPLING FREQUENCY</th></tr><tr><th>BAR STEEL (pounds)</th><th>NUMBER OF SAMPLES</th></tr><tr><td>0 - 49,999</td><td>No sample required</td></tr><tr><td>50,000 – 99,999</td><td>2 samples required</td></tr><tr><td>100,000 – 149,999</td><td>3 samples required</td></tr><tr><td>150,000 – 199,999</td><td>4 samples required</td></tr><tr><td>200,000 – 249,999</td><td>5 samples required</td></tr><tr><td>250,000 – 300,000</td><td>6 samples required</td></tr><tr><td colspan="2">Add one sample for each 50,000 <u>lb</u> or portion thereof.</td></tr></table> <p>The list of approved epoxy coating for bar steel reinforcement is on the approved products list APL.</p>	BAR STEEL MINIMUM SAMPLING FREQUENCY		BAR STEEL (pounds)	NUMBER OF SAMPLES	0 - 49,999	No sample required	50,000 – 99,999	2 samples required	100,000 – 149,999	3 samples required	150,000 – 199,999	4 samples required	200,000 – 249,999	5 samples required	250,000 – 300,000	6 samples required	Add one sample for each 50,000 <u>lb</u> or portion thereof.	
BAR STEEL MINIMUM SAMPLING FREQUENCY																							
BAR STEEL (pounds)	NUMBER OF SAMPLES																						
0 - 49,999	No sample required																						
50,000 – 99,999	2 samples required																						
100,000 – 149,999	3 samples required																						
150,000 – 199,999	4 samples required																						
200,000 – 249,999	5 samples required																						
250,000 – 300,000	6 samples required																						
Add one sample for each 50,000 <u>lb</u> or portion thereof.																							

Material	Sampled Accepted	Tested	Min Sampling Frequency	Central Lab Sample	Remarks
CONCRETE REINFORCEMENT					
Alternate Bar Couplers	Field	Central Lab	Three (3) samples for each type of coupler /rebar connection proposed for use.	Each sample is: Two 2-foot sections of rebar connected with coupler, 4-foot total length rebar required	Do not install bar coupler systems before department proof testing and engineer's written approval. Contractor to provide installation instructions to engineer. Project engineer must verify bar coupler system exceeds 125% of the specified yield strength (i.e. 1.25fy) of the bar steel being spliced.
Threaded Bar Couplers	Field	Field			Threaded bar couplers will not require sampling and may be accepted in the field. The contractor must furnish to the project engineer a certified report of test or analysis based on a minimum of 3 tests for each type of threaded bar coupler used in the work. Project engineer must verify bar coupler system exceeds 125% of the specified yield strength (i.e. 1.25fy) of the bar steel being spliced.
Tie Bars Dowel Bars Dowel Bar Assemblies	Field ^[19]				Tie Bars, Dowel Bars, & Dowel Bar Assemblies in concrete pavement will not require sampling and may be accepted in the field. The contractor must furnish to the project engineer a certified report of test or analysis for all heat numbers used in the work. See CMM 845 for certification guidelines.
Dowel Bar Lubricant	Field				Contractor to provide product data sheets. A diary entry per CMM 845 is required. See CMM 845 for certification guidelines.
Hook Bolts	Source or Field				An approved fabricator usually furnishes hook bolts for bridges. The list of approved fabricators for Bridge Metal Secondary items is on the approved products list APL . For hook bolts furnished by an unapproved fabricator, the contractor will have a manufacturer's certification of compliance available. See CMM 845 for certification guidelines.
CONCRETE					
Note: For contracts with QMP provisions, see specific contract documents for guidance. Projects require MIT/MTS prefix 155 QMP Concrete Pavement Summary, QMP Concrete Structures Summary, and/or QMP Ancillary Concrete Summary. Below are testing and sampling/testing requirements for contracts without QMP provisions.					
Air Entrainment	Field	Field	Two tests per day except for small quantities. See remarks		See instructions in CMM 870 for testing procedures. Observations must be maintained for deviations from selected consistency and entrained air target values and additional tests and adjustments will be necessary when such occurs. Superstructure elements may also require more frequent testing to properly administer the contract requirements. For slip-form paving, slump testing will be as required by the project engineer.
Slump	Field	Field			

Material	Sampled Accepted	Tested	Min Sampling Frequency	Central Lab Sample	Remarks
COMPRESSIVE STRENGTH (Note: One set of cylinders = two cylinders. See specific strength testing requirements below, based on use.)					
Miscellaneous Construction and Ancillary Concrete	Field	Lab	One set per 200 CY per contract		When daily pours exceed 200 CY using the same source and mix, the rate of sampling may be reduced to one set per day. For contracts with quantities less than 100 CY cylinders do not need to be cast. The QMP ancillary concrete item covers most miscellaneous concrete construction. Follow the requirements for QMP ancillary concrete specified in the contract.
Pavement and Base Course	Field	Lab	One set per 10,000 SY or less		
Bridge Substructures	Field	Lab			One set per substructure unit (e.g. pier, abutment).
Bridge Superstructures	Field	Lab			For bridge decks, one set for each 150 CY or fraction thereof, with at least one set for each pour in a span. For parapets, one set per unit.
Bridge Deck Overlay	Field	Lab			One set per pour. For pours over 450 CY, additional samples may be required, contact regional person responsible for this area for guidance
Culverts and Retaining Walls	Field	Lab			Mold and submit one set per 100 CY or fraction thereof.
DELINEATORS					
Bracket, Mounting Hardware, Reflectors, Posts	Field				A manufacturer's certification of compliance must be made available by the contractor when requested by the project engineer. See CMM 845 for certification guidelines.

Material	Sampled Accepted	Tested	Min Sampling Frequency	Central Lab Sample	Remarks
DRAINAGE (See PRECAST CONCRETE for concrete pipe and appurtenances) Note: A diary entry, per CMM 845 , for requirements.					
Corrugated Metal Drainage Products	Field				<p>All corrugated metal drainage materials supplied under the following categories must be from vendor(s) listed fabricators list for Corrugated Metal Pipe Products on the APL.</p> <p>Corrugated Steel Pipe (AASHTO M36/M218, M274, M289, ASTM A928, or AASHTO M218/M246) - Items 520.1000 - 3399, OR 520.3500 - 3599, OR 520.4100 - 8500, OR 521.0100 - 6899, OR 612.0100 - 0599</p> <p>Corrugated Aluminum Pipe (AASHTO M196)- Items 525.0100 - 0499, OR 612.0100 - 0599</p> <p>Structural Plate Pipe and Pipe Arches, Items 527.0100 - 0499, are not required to be from an approved vendor. A manufacturer's certificate of compliance with AASHTO M219 or M167 (as applicable) is required, reference on MIT/MTS prefix 905.</p> <p>For All Metal Pipe Materials:</p> <ol style="list-style-type: none"> 1. Retain the Bill of Lading, or other documentation supplied with the material, which must identify the original manufacturer, plant location, AASHTO specification, the mill and heat number for the steel from which the product was manufactured, and a statement certifying compliance with the provisions of the Buy America Act, 23 CFR 635.410, in the project record. 2. Perform delivered material inspection on CMP. See CMM 550.3 for inspection and acceptance guidelines. 3. A diary entry per CMM 845, is required.
ABS Pipe, Polyvinyl Chloride (PVC) Pipe	Field				<p>Pipe must be marked, ASTM D2680 (ABS Pipe) or AASHTO M278 (PVC Pipe)</p> <p>Bid items 612.0100 - 0599</p> <p>A manufacturer's certificate of compliance must be made available by the contractor when requested by the project engineer. See CMM 845 for certification guidelines.</p>
Corrugated Polyethylene (PE) and Corrugated Polypropylene (PP) Pipe	Source				<p>All corrugated PE and PP drainage materials supplied under the following categories must be from vendor(s) listed on the APL.</p> <p>Corrugated PE Culvert Pipe - Items 520.3300 - 3699, OR 530.0100 - 0299, OR 608.3000 - 3099, OR 612.0100 - 0599. Pipe must be marked AASHTO M294</p> <p>Corrugated PP Culvert Pipe - Items 520.3300 - 3699, OR 530.1100 - 1299, OR 608.3000 - 3099. Pipe must be marked AASHTO M330</p> <p>Corrugated PE Drainage Pipe - Items 612.0100 - 5099. Pipe must be marked AASHTO M252 or M294</p> <p>Production of pipe in a NTPEP fully compliant plant is required. Pipe manufacturer and plant location must be on the approved list and marked with the applicable specification. Pipe not properly marked must be rejected. See CMM 845 for certification guidelines.</p>
Composite Pipe	Field				<p>Pipe must be marked ASTM D2680. A manufacturer's certification of compliance must be made available by the contractor when requested by the project engineer.</p> <p>Items 608.6000 - 6099. See CMM 845 for certification guidelines.</p>

Material	Sampled Accepted	Tested	Min Sampling Frequency	Central Lab Sample	Remarks
DRAINAGE (See PRECAST CONCRETE for concrete pipe and appurtenances) Note: A diary entry, per CMM 845 , for requirements.					
Joint Materials (Storm Sewer) - External Rubber Gaskets - Rubber and Plastic Gaskets	Field				A manufacturer's certification of compliance must be made available by the contractor when requested by the project engineer. See CMM 845 for certification guidelines.
Pipe Mandrel for Deflection Testing	Field	Field	See remarks	N/A	Contractor mandrel testing by hand in the engineer's presence. See CMM 550.9 and standard spec 520.3.7 (culverts) or standard spec 608.3.7 (storm sewer) for mandrel size, type, and testing requirements.
ELECTRICAL					
Controllers and Related Equipment	Shop and Field				Acceptance of these items is based on their performing in accordance with the sequence in the contract and in many cases, passes an acceptance test by the WisDOT Electrical Shop in Madison. See the contract plans and specifications for detailed instructions.
Luminaires, Fuses, Tape, Fuse Holders, Varnish, Connectors, Breakaway Bases, Traffic Signal Standards, Polyethylene Duct, Traffic Signal Mounting Hardware, Traffic Signal Faces, Junction Boxes,-Pull Boxes, Cast Rings and Covers, Electrical Service Material, Splice Kits, Multi-Conductor Cable, Cable-In-Duct (Multiple Wires), Wiring (Lighting & Signalization)	Field				The department specifies approved materials and construction products for electrical work on the QPL . Accept electrical materials not on the QPL in accordance with standard spec 651.2 . See CMM 845 .
Electrical Wire & Cable for Lighting and Signalization	Field			24-inch pieces	Accept these electrical materials in accordance with standard spec 651.2 . * Provide sample when requested by the project engineer or the state electrical engineer.

Material	Sampled Accepted	Tested	Min Sampling Frequency	Central Lab Sample	Remarks
ELECTRICAL					
Anchor Rods Mast Arms Trombone Luminaire Monotubes Poles Bases, Pedestal and Transformer	Field	Central Lab	One per signal location		<p>These items require a manufacturer's certificate of compliance. Submit the certificates of compliance to the project engineer list with the materials list.</p> <p>See CMM 845 for certification guidelines.</p> <p>Poles, arms and pedestal bases must be from an approved manufacturer. Pre-qualified manufacturers are listed in QPL. Per the requirements of standard spec 657, the contractor must furnish a certificate of compliance and shop drawings for all poles and arms. Provide a copy of these along with the materials list to the state electrical engineer (see FDM 8-45.2.4.3).</p> <p>Reference certifications of compliance, certified reports of test or analysis, and shop drawings electronically on MIT/MTS prefix 905.</p> <p>If the project engineer requests, the contractor is to provide one randomly selected sample pedestal base per traffic signal location. The department will base acceptance of all pedestal bases at that traffic signal location on destructive tests of that sample base.</p>
ELECTRICAL CONDUIT					
- Rigid Metallic - Rigid Nonmetallic - PVC Schedule 40 and 80	Field				<p>Conduit with an Underwriters Laboratories, Inc. (UL) label/emblem affixed to each piece signifies acceptable material and may be incorporated into the work.</p> <p>See standard spec 652.2.1. When the UL/NRTL label/emblem is not affixed, or the label/emblem is suspect, do not use the material. See CMM 655.</p>
EMBANKMENT					
Embankment	Field				<p>For QMP contracts, see the specific contract documents for sampling and testing guidance.</p> <p>For non-QMP contracts contact the regional soils engineer for the latest acceptance procedures and required documentation. For additional guidance, see the CMM as follows:</p> <p>Standard Compaction: CMM 330</p> <p>Special Compaction: CMM 330</p> <p>Report QV, QA and QC Soils Nuclear Density tests on MIT/MTS prefix 232 or 805 (if applicable).</p>

Material	Sampled Accepted	Tested	Min Sampling Frequency	Central Lab Sample	Remarks
EROSION CONTROL MATERIALS					
Erosion Control Materials	Field				<p>See the PAL.</p> <p>The list has the following categories:</p> <p>Tackifier - Incidental to Items 627.0200 - 0205</p> <p>Erosion Mat, all Classes and Types - Items 628.2000 - 2099</p> <p>Soil Stabilizer Types A & B - Items 628.6500 - 6599</p> <p>Inlet Protection1 - Items 628.7000 - 7099</p> <p>Temporary Ditch Checks2 - Item 628.7504</p> <p>ACCEPTANCE NOTES:</p> <p>Inlet protection devices may be fabricated according to the Plans, using Type FF fabric from the PAL, or proprietary devices from the PAL.</p> <p>Temporary ditch checks may consist of straw bales as detailed in the Plans, or proprietary devices from the PAL installed per manufacturer's recommendation. Straw bales for ditch checks are incidental to the bid item and will not be paid for separately.</p> <p>All materials listed require a diary entry per CMM 845. Retain the Bill of Lading or other documentation identifying the vendor as listed on the PAL for the material/bid item in the project record.</p>
FENCING					
General	Field	Central Lab	NA	NA	If transporting materials to the central lab, package each sample with zip ties or "stretch wrap" and attach a sample card. If packaging material is unavailable, attach one sample card to each material being transported. Do not use one sample card to represent multiple material types.
Chain Link Fabric	Field	Central Lab	One per 50 rolls or fraction thereof.	1 SF	When test results indicate noncompliance, additional samples must be taken from two rolls, units, or coils other than initially sampled, both of which must meet the requirements. Reference standard spec 616.2.3 .
Metal Posts and Bracing	Field	Central Lab	One per 500 or fraction thereof per size. See remarks	Two 1-foot lengths and one 3-foot length. See remarks	Two specimens for determination of weight of coating must be cut approximately 12 inches in length from opposite ends of the lengths of members selected for testing. Also, a third specimen, for determination of tensile strength, must be cut approximately three feet in length, from the center portion of each member selected for testing. Specimens must be cut from one length selected at random from each lot of 500 lengths, or fraction thereof, of each size. If the weight of coating and/or tensile strength test results of any lot indicate noncompliance, samples of two additional lengths must be taken for each test from the same lot as initially sampled both of which must meet the requirements. Reference standard spec 616.2 .
Wood Posts, Staples, Post Tops, Pipe Fittings, Fabric Fasteners, Gates, Hardware	Field				A manufacturer's certification of compliance must be made available by the contractor when requested by the project engineer. Refer to CMM 845 for certification guidelines. Reference standard spec 616.2 .

Material	Sampled Accepted	Tested	Min Sampling Frequency	Central Lab Sample	Remarks
Tension Wire	Field	Central Lab	One per 10 rolls or fraction	3 foot length	When test results indicate noncompliance, additional samples must be taken from two rolls, units, or coils other than initially sampled, both of which must meet the requirements. Reference standard spec 616.2.3.1 .
Woven Wire Fabric	Field	Central Lab	One per 50 rolls or fraction thereof.	3 foot full width including 3 vertical stay wires	When test results indicate noncompliance, additional samples must be taken from two rolls other than initially sampled, both of which must meet the requirements. Reference standard spec 616.2.1 .
Smooth Wire	Field	Central Lab	One per 50 spools or fraction thereof	3 foot length	When test results indicate noncompliance, additional samples must be taken from two spools other than initially sampled, both of which must meet the requirements. Reference standard spec 616.2.2.3 .
Barbed Wire	Field	Central Lab	One per 50 spools or fraction thereof	6 barb lengths	When test results indicate noncompliance, additional samples must be taken from two spools other than initially sampled, both of which must meet the requirements. Reference standard spec 616.2.2.2 .
GEOSYNTHETICS					
Geosynthetics (geotextile and geogrid) General Requirements	Field	Central Lab	See remarks		<p>Sample size description applies for all types of geosynthetics. Samples must be full width of the material and a minimum of 6 feet long. The total sample size must be a minimum of 60 SF.</p> <p>See standard spec 645 and contract special provision specifications for additional information, including sampling requirements.</p> <p>Product data sheets will not be accepted as a substitute for the manufacturer's certified report of test or analysis. The delivered geosynthetic must bear markings to clearly identify it with the applicable test report furnished to the project engineer. If not so marked, the geosynthetic must not be used.</p> <p>Reference certified reports of test or analysis electronically on MIT/MTS prefix 905.</p> <p>See CMM 845 for certification guidelines.</p> <p>For contracts with quantities or fabrics not requiring a sample, a diary entry per CMM 845 is required.</p> <p>Label each sample roll's machine & cross machine directions. Machine direction is the longitudinal roll direction. Cross machine direction is the transverse roll direction.</p>
Geotextiles	Field	Central Lab	See standard spec 645		Geotextile samples must be protected from ultraviolet light.
Geogrids	Field	Central Lab	See standard spec 645		Do not fold, bend or crease geogrid samples. For geogrid samples that are rolled, the inner diameter of the roll should be 6 in. or greater. These sample/shipping requirements are necessary to arrive at accurate laboratory test results.

Material	Sampled Accepted	Tested	Min Sampling Frequency	Central Lab Sample	Remarks
HIGH STRENGTH BOLTS					
High Strength Bolts, Structures standard spec 506	Shop	Mfgr			
	Field	Field			
	Field	Central Lab	Two bolts per size per length and/or contract. Three sets of nuts and washers per bolt size per length and/or heat contract		<p>This item should be pre-sampled. The project engineer should check the particular project number for which this item is intended, test prefix 115 of the Materials Tracking System.</p> <p>In the event that no Central Laboratory test exists for the lots received, the project engineer must sample as indicated.</p> <p>The contractor must provide two copies of a certified report of test or analysis giving the results of the supplier's rotational-capacity testing.</p> <p>Reference certified reports of test or analysis and field test reports on MIT/MTS prefix 905.</p> <p>Field rotational-capacity testing is completed by the contractor on each bolt, nut, and washer lot combination before installation as specified in Report No. FHWA SA 91-031 "High Strength Bolts for Bridges". Have the contractor complete DT2113. Department staff or consultant must verify the test and submit the completed form as a part of the permanent project records.</p>
JOINT SEALERS					
<ul style="list-style-type: none"> - Cold Poured Silicone Type - Hot Poured Elastic Type - Non-Bituminous 	Field ^[23]				<p>^[23] A diary entry per CMM 845 is required for these items.</p> <p>A manufacturer's certification of compliance must be made available by the contractor when requested by the project engineer.</p> <p>See CMM 845 for certification guidelines.</p>
- Preformed Elastomeric Compression Joint Seals	Field ^[23]				<p>A manufacturer's certified Report of Test or Analysis must be made available by the contractor when requested by the project engineer.</p> <p>See CMM 845 for certification guidelines.</p>
LUMBER AND TIMBER					
Treated	Field				<p>A certification of treatment and specification compliance must be made available by the contractor when requested by the project engineer.</p> <p>See CMM 845 for certification guidelines. A diary entry per CMM 845, is required for these items.</p>
MORTAR					
Mortar Sand					Contractor to supply gradation test results before use.

Material	Sampled Accepted	Tested	Min Sampling Frequency	Central Lab Sample	Remarks
Mortar Cement Portland Cement Masonry Cement Hydrated Lime					A manufacturer's certification of compliance is required. See CMM 845 for certification guidelines. A diary entry per CMM 845 , is required for these items. Document percentage of each material used.
PAINT					
For Use on Metal - New Structural Steel - Structural Maintenance Painting - Other Metal Surfaces	Field Field				See contract special provision specifications for paint system requirements for new structural steel. A Paint - structural steel - new list is on the Structure Painting Systems APL . A Paint - structure maintenance list is on the Structure Painting Systems APL . See contract special provision specifications for all other paint system requirements.
PAVEMENT MARKING					
Cold Preformed Plastic (With Glass Spheres)	Field				Solvent born and Waterborne Paint - The list of approved paint products is on the APL . Items not source inspected - the project engineer must have, before use, a certified report(s) of test(s) for samples of the material(s) furnished for the contract. The reports must contain the batch number(s) to which the results apply. See CMM 845 for certification guidelines. Reference certified reports of test or analysis on MIT/MTS prefix 905.
Preformed Thermoplastic	Field				
Paint (Cold Applied)	Field				
Paint (Hot Applied)	Source				
Epoxy	Source				Furnish epoxy from the departments approved list. Pre-qualified products are listed on the APL . Before use, submit a certificate of compliance certifying the epoxy supplied under the contract conforms to the specification. See standard spec 646.2.4 .
Glass Spheres for Paint	Source				Glass spheres for pavement marking under standard spec 646 require submittal of a certificate of compliance certifying that the beads supplied under the contract conform to the specifications. Central lab is no longer testing glass beads. A manufacturer's certificate of compliance with the specified gradation is required, reference on MIT/MTS prefix 905.

Material	Sampled Accepted	Tested	Min Sampling Frequency	Central Lab Sample	Remarks
PILING					
<ul style="list-style-type: none"> - Steel - Sheet (Permanent Installation) - Bearing - Shell 	Field	See remarks		See remarks	<p>Before use, the project engineer must have certified copies of mill test reports showing acceptable chemical and physical properties for each heat or lot delivered for the contract. All piling materials are to be marked to identify the materials with the certified report of test documents. If identification markings are absent, the contractor must certify that all delivered materials are from the same lot as the test report represents.</p> <p>When mill test reports are not available, the project engineer must submit a section 2-feet in length and 9-inches in width to the Central Laboratory for testing. Reference Certified reports of test or analysis on MIT/MTS prefix 905.</p>
- Steel Oil Field Pipe	Field	Field	See remarks		<p>See standard spec 511.2.2.</p> <p>Each piling delivered for the contract must be marked with a unique identification for each load that must conform to the bill of lading. The marking must be durable and legible. Markings can be transferred by contractor when cut offs are complete.</p> <p>A manufacturer's certification of compliance must be made available by the contractor.</p> <p>See CMM 845 for certification guidelines.</p>
- Steel Oil Field Pipe (Continued)	Field	Field	See remarks		<p>The contractor must also furnish at or before delivery, a certification of chemical composition of the pipe from which a carbon equivalency (CE) may be determined. The CE must be computed by the following equation:</p> $CE = C + 1/6 (Mn + Si + Cr + Mo + V) + 1/15 (Ni + Cu).$ <p>(The equation items are the chemical composition values identified on the certification.)</p> <p>Reference Certified reports of test or analysis on MIT/MTS prefix 905.</p> <p>Pipe delivered in a magnetized condition must be limited to non-welded applications. Pipe delivered with a CE greater than 0.55 must not be incorporated into the work unless approved by a representative of the Metals and Fabrication Inspection Unit.</p>
POSTS, TREATED WOOD					
<ul style="list-style-type: none"> - Guardrail - Right of Way (Security Fence) - Screen Fence - Sign, Etc. 	Field				<p>A manufacturer's certification of treatment must be made available by the contractor upon request of the project engineer.</p> <p>A diary entry, per CMM 845, is required for these items.</p>

Material	Sampled Accepted	Tested	Min Sampling Frequency	Central Lab Sample	Remarks
PRECAST CONCRETE					
Precast Concrete Materials	Shop				<p>The following items are covered by the approved vendors on the APL. All of the following precast materials must be from vendors on the APL:</p> <p>Category A</p> <ul style="list-style-type: none"> Circular Reinforced Pipe - Items 522.0100 - 0699 OR 520.2000 - 5199 Circular Non-Reinforced Pipe - Items 607.0100 - 0399 (Not used on contracts let after 12/2015) Elliptical Reinforced Pipe - Items 523.0100 - 0499 Arch Pipe - SPV Cattle Pass - Item 522.2000 Apron Endwalls - Items 522.1000 - 1199 OR 520.1000 - 1199 <p>Category B</p> <ul style="list-style-type: none"> Manholes - Items 611.2000 - 2699 Components (Cones, Lids, etc.) - Incidental to Items 611.1000 - 3999 Riser Rings - Incidental to Items 611.8105 - 8115 Inlets - Items 611.3000 - 3999 Catch Basins - Items 611.1000 - 1999
Precast Concrete Materials	Shop				<p>The following items are covered by the approved vendors on the APL. All of the following precast materials must be from vendors on the APL:</p> <p>Category C</p> <ul style="list-style-type: none"> Box Culverts - Item 504.2000.S Wall Panels (non-prestressed only) - SPV/MSE Panels Temporary Traffic Barrier - Item 603.8000 Special Structures - SPV/Three-Sided Precast Structures <p>Category D</p> <ul style="list-style-type: none"> Concrete Masonry Units/Concrete Brick - Incidental to Items 611.1000 - 3999 Modular Retaining Wall Blocks - SPV ** See project special provisions for acceptance requirements for precast materials/items not listed above, including: Noise Wall Panels Accelerated Bridge Construction elements (Columns, Pier Caps) <p>All precast materials must be marked as follows:</p> <ul style="list-style-type: none"> Manufacturer and Plant Location Date of manufacture <p>Specification designation (Applies to all Pipe, Inlets, Manholes, Catch Basins, Box Culverts)</p>

Material	Sampled Accepted	Tested	Min Sampling Frequency	Central Lab Sample	Remarks
PRESTRESSED CONCRETE					
Prestressed Concrete					<p>The shipping document must be stamped as indicated in the Plant Certification Program for Fabrication of Prestressed Concrete elements.</p> <p>See CMM 875.</p> <p>Reference the shipping documents on MIT/MTS prefix 905.</p> <p>The list of approved Prestressed Concrete suppliers is on the APL.</p> <p>If the supplier is not on the list of certified plants, immediately contact the regional person responsible for this area.</p>
SIGNING					
<ul style="list-style-type: none"> - Base - Face - Message 	Field				<p>A manufacturer's certification of compliance must be made available by the contractor when requested by the project engineer.</p> <p>See CMM 845 for certification guidelines.</p> <p>A diary entry per CMM 845, is required for these items.</p>
Structural Units <ul style="list-style-type: none"> - Sign Bridges - Sign Supports 	Shop or Field				<p>A manufacturer's certification of compliance or a certified report of test or analysis indicating conformance with the contract requirements must be made available to the project engineer by the contractor for all materials not shop inspected.</p> <p>See CMM 845 for certification guidelines.</p> <p>A diary entry per CMM 845, is required for these items.</p>
STEEL PRODUCTS					
Steel Forgings (Bridges)	Shop				<p>An approved fabricator usually furnishes these items. The list of Approved Fabricators, Bridge Metal Secondary items is on the APL.</p>
Steel Grid Floor	Shop or Field				<p>When not shop inspected a manufacturer's certification of compliance must be made available by the contractor. See CMM 845 for certification guidelines.</p>
Steel Plate Beam Guard, Sheet Steel Beams	Field	Field	See remarks		<p>List of Steel Plate Beam Guard pre-qualified manufacturers is on the APL.</p> <p>See CMM 625.3.5 for acceptance procedure. Projects require MIT/MTS prefix 155 Beam Guard QV Summary Report.</p>
End Shoe Sections, Terminal Sections, Anchor Assembly	Field				<p>If the quantity is 20 or more, the project engineer must also have before installation a manufacturer's certified report of test or analysis indicating compliance with the contract requirements for all heat numbers delivered to the project.</p> <p>See CMM 845 for certification guidelines.</p>
Steel Reinforcement					See "Concrete Masonry Reinforcement."

Material	Sampled Accepted	Tested	Min Sampling Frequency	Central Lab Sample	Remarks
Structural Steel - Bridges					Items are inspected at the steel fabrication shop and acceptance is on the basis of a shop inspection report (DT1832). Reference shop inspection reports on MIT/MTS prefix 905.
STEEL PRODUCTS					
- Carbon Steel, Shaftings - Bronze and Steel Castings					These items are usually furnished through an approved fabricator though they are manufactured items. Acceptance is on the basis of a shop inspection report (DT1832).
Stud Shear Connectors	Field				A manufacturer's certification of compliance must be made available by the contractor when requested by the project engineer. See CMM 845 for certification guidelines.
TRAFFIC CONTROL DEVICES					
Drums	Field				A list of WisDOT approved work zone sheeting products for the current year is located is on the APL .
Barricades Signs					Written certification from the manufacturer or supplier that the device conforms to crashworthiness criteria. Include the federal-aid reimbursement eligibility letter with that submittal.
Flexible Tubular Signs					The list of approved flexible tubular marker products is on the APL . A manufacturer's certification of compliance must be made available by the contractor when requested by the project engineer. See CMM 845 for certification guidelines.
WATERSTOPS					
Polyvinyl Chloride	Field				Polyvinyl Chloride - A manufacturer's certification of compliance must be made available by the contractor when requested by the project engineer. See CMM 845 for certification guidelines.
Rubberized Waterproof Membrane	Field				Must be selected from the department-approved list. The list of approved products is on the APL . The material must be backfilled within 30 days of installation or otherwise protected from ultra violet radiation.