

NOTICE TO BIDDERS

LETTING OF: Friday, January 10, 2020

ADDENDUM "A"

Prospective bidders of the 01/10/2020, Michigan Department of Transportation (MDOT), Bid Letting, are hereby advised that this Addendum "A" noting an updated MI20190001 General Wage Determination, effective 12/27/2019, REPLACES the General Decision Wage Determination MI20190001, dated 11/08/2019, included in the proposal of the following project letting items.

<u>ITEM NO.</u>		<u>PROJECT NO.</u>	<u>FEDERAL NO.</u>
2001 002	BHT	28000 - 133068A	20A0081
2001 003	BHT	61000 - 202399A	2009102
2001 004	ST	55031 - 130236A	20A0143
2001 005	HRRR	58000 - 203473A	20A0012
2001 006	HRRR	13000 - 207223A	20A0078
	HSIP	13000 - 207349A	20A0079
	HRRR	13000 - 207221A	20A0077
2001 007	HSIP	75000 - 207203A	20A0008
2001 008	STU	77147 - 133415A	20A0019
2001 009	STU	63000 - 205947A	20A0043
2001 010	HSIP	47082 - 132613A	20A0149
2001 011	ST	46082 - 204092A	20A0167
2001 012	HSIP	84911 - 127585A	20A0163
2001 013	IM	11014 - 207872A	20A0162
2001 014	ST	36022 - 208433A	20A0168
2001 017	TA	63000 - 204888A	20A0047
2001 018	STU	82000 - 203584A	20A0074
2001 019	TAU	81000 - 204934A	20A0050
2001 020	STU	39000 - 131000A	20A0110
2001 021	STU	41000 - 206386A	20A0083
2001 026	IM	25031 - 130175A	20A0164
2001 027	ST	29022 - 204385A	20A0172
2001 028	NH	83033 - 203983A	20A0203
2001 029	NH	47061 - 201004A	20A0207
2001 030	NH	18011 - 204387A	20A0179
2001 032	NH	24051 - 131799A	20A0181
2001 033	NH	49023 - 128867A	20A0180
2001 034	NH	63043 - 204333A	20A0208
2001 035	ST	08032 - 200108A	20A0192
	NH	08012 - 202014A	20A0182
2001 036	ST	08041 - 200146A	20A0198
	NH	34081 - 200152A	20A0199
	ST	03021 - 200138A	20A0197
2001 037	ST	54014 - 204379A	20A0194
	NH	54014 - 204213A	20A0183
2001 038	NH	32011 - 204298A	20A0184
2001 039	NH	20014 - 204286A	20A0195
2001 040	ST	09081 - 204375A	20A0215
2001 041	ST	78062 - 204317A	20A0213
2001 042	NH	11012 - 203692A	20A0221
2001 043	NH	11013 - 203693A	20A0222
2001 044	IM	58151 - 203994A	20A0243
2001 045	BRT	72000 - 202423A	20A0118
2001 046	STU	63000 - 205938A	20A0107
2001 048	HIPU	50000 - 209102A	20A0141

2001	049	STU	82000 - 203592A	20A0140
2001	051	STU	81000 - 203568A	20A0127
		STU	81000 - 205954A	20A0123
		STU	81000 - 203572A	20A0122
2001	052	STUL	77147 - 133414A	20A0111
2001	054	STUL	61000 - 132823A	20A0109

Paul C. Ajegba
DIRECTOR
Michigan Department of Transportation

1/2/2020
Lansing, MI

"General Decision Number: **MI20190001 12/27/2019**

Superseded General Decision Number: MI20180001

State: Michigan

Construction Types: Highway (Highway, Airport & Bridge xxxxx and Sewer/Incid. to Hwy.)

Counties: Michigan Statewide.

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.60 for calendar year 2019 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.60 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2019. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate, if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/04/2019
1	01/25/2019
2	03/08/2019
3	07/05/2019
4	07/19/2019
5	08/09/2019
6	08/30/2019
7	09/20/2019
8	10/25/2019
9	11/01/2019
10	11/08/2019
11	12/27/2019

CARP0004-004 06/01/2019

REMAINDER OF STATE

	Rates	Fringes
CARPENTER (Piledriver).....	\$ 27.62	20.59

CARP0004-005 06/01/2018

LIVINGSTON (Townships of Brighton, Deerfield, Genoa, Hartland, Oceaola & Tyrone), MACOMB, MONROE, OAKLAND, SANILAC, ST. CLAIR AND WAYNE COUNTIES

	Rates	Fringes
CARPENTER (Piledriver).....	\$ 30.50	27.28

 ELEC0017-005 06/03/2019

STATEWIDE

Line Construction	Rates	Fringes
Groundman/Driver.....	\$ 28.58	15.27
Journeyman Signal Tech, Communications Tech, Tower Tech & Fiber Optic Splicers.	\$ 40.35	18.80
Journeyman Specialist.....	\$ 46.40	20.62
Operator A.....	\$ 34.10	16.93
Operator B.....	\$ 31.84	16.25

Classifications

Journeyman Specialist: Refers to a crew of only one person working alone.
 Operator A: Shall be proficient in operating all power equipment including: Backhoe, Excavator, Directional Bore and Boom/Digger truck.
 Operator B: Shall be proficient in operating any 2 of the above mentioned pieces of equipment listed under Operator A.

 ENGI0324-003 06/01/2019

ALCONA, ALPENA, ARENAC, BAY, CHEBOYGAN, CLARE, CLINTON, CRAWFORD, GENESEE, GLADWIN, GRATIOT, HURON, INGHAM, IOSCO, ISABELLA, JACKSON, LAPEER, LENAWEE, LIVINGSTON, MACOMB, MIDLAND, MONROE, MONTMORENCY, OAKLAND, OGEMAW, OSCODA, OTSEGO, PRESQUE ISLE, ROSCOMMON, SAGINAW, ST. CLAIR, SANILAC, SHIAWASSEE, TUSCOLA, WASHTENAW AND WAYNE COUNTIES:

OPERATOR: Power Equipment (Steel Erection)	Rates	Fringes
GROUP 1.....	\$ 46.52	24.35
GROUP 2.....	\$ 47.52	24.35
GROUP 3.....	\$ 45.02	24.35
GROUP 4.....	\$ 46.02	24.35
GROUP 5.....	\$ 43.52	24.35
GROUP 6.....	\$ 44.52	24.35
GROUP 7.....	\$ 43.25	24.35
GROUP 8.....	\$ 44.25	24.35
GROUP 9.....	\$ 42.80	24.35
GROUP 10.....	\$ 43.80	24.35
GROUP 11.....	\$ 42.07	24.35
GROUP 12.....	\$ 43.07	24.35
GROUP 13.....	\$ 41.71	24.35
GROUP 14.....	\$ 42.71	24.35
GROUP 15.....	\$ 41.07	24.35
GROUP 16.....	\$ 38.37	24.35
GROUP 17.....	\$ 23.89	11.50
GROUP 18.....	\$ 27.38	11.50

FOOTNOTE:

Paid Holidays: New Year's Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day and Christmas Day.

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1: Engineer when operating combination of boom and jib 400' or longer

GROUP 2: Engineer when operating combination of boom and jib 400' or longer on a crane that requires an oiler

GROUP 3: Engineer when operating combination of boom and jib 300' or longer

GROUP 4: Engineer when operating combination of boom and jib 300' or longer on a crane that requires an oiler

GROUP 5: Engineer when operating combination of boom and jib 220' or longer

GROUP 6: Engineer when operating combination of boom and jib 220' or longer on a crane that requires an oiler

GROUP 7: Engineer when operating combination of boom and jib 140' or longer

GROUP 8: Engineer when operating combination of boom and jib 140' or longer on a crane that requires an oiler

GROUP 9: Tower crane & derrick operator (where operator's work station is 50 ft. or more above first sub-level)

GROUP 10: Tower crane & derrick operator (where operator's work station is 50 ft. or more above first sub-level) on a crane that requires an oiler

GROUP 11: Engineer when operating combination of boom and jib 120' or longer

GROUP 12: Engineer when operating combination of boom and jib 120' or longer on a crane that requires an oiler

GROUP 13: Crane operator; job mechanic and 3 drum hoist and excavator

GROUP 14: Crane operator on a crane that requires an oiler

GROUP 15: Hoisting operator; 2 drum hoist and rubber tired backhoe

GROUP 16: Forklift and 1 drum hoist

GROUP 17: Compressor or welder operator

GROUP 18: Oiler

ENGI0324-004 06/01/2019

AREA 1: ALLEGAN, BARRY, BERRIEN, BRANCH, CALHOUN, CASS, EATON, HILLSDALE, IONIA, KALAMAZOO, KENT, LAKE, MANISTEE, MASON,

MECOSTA, MONTCALM, MUSKEGON, NEWAYGO, OCEANA, OSCEOLA, OTTAWA,
ST. JOSEPH, VAN BUREN

AREA 2: ANTRIM, BENZIE, CHARLEVOIX, EMMET, GRAND TRAVERSE,
KALKASKA, LEELANAU, MISSAUKEE AND WEXFORD COUNTIES:

	Rates	Fringes
OPERATOR: Power Equipment (Steel Erection)		
AREA 1		
GROUP 1.....	\$ 46.52	24.35
GROUP 2.....	\$ 43.25	24.35
GROUP 3.....	\$ 41.71	24.35
GROUP 4.....	\$ 38.37	24.35
GROUP 5.....	\$ 23.89	11.50
GROUP 6.....	\$ 27.38	11.50
AREA 2		
GROUP 1.....	\$ 46.52	24.35
GROUP 2.....	\$ 43.25	24.35
GROUP 3.....	\$ 41.71	24.35
GROUP 4.....	\$ 38.37	24.35
GROUP 5.....	\$ 23.89	11.50
GROUP 6.....	\$ 27.38	11.50

FOOTNOTES:

Crane operator with main boom and jib 300' or longer: \$1.50 additional to the group 1 rate. Crane operator with main boom and jib 400' or longer: \$3.00 additional to the group 1 rate.

PAID HOLIDAYS: New Year's Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day and Christmas Day.

POWER EQUIPMENT OPERATOR CLASSIFICATIONS:

GROUP 1: Crane Operator with main boom & jib 400', 300', or 220' or longer.

GROUP 2: Crane Operator with main boom & jib 140' or longer, Tower Crane; Gantry Crane; Whirley Derrick.

GROUP 3: Regular Equipment Operator, Crane, Dozer, Loader, Hoist, Straddle Wagon, Mechanic, Grader and Hydro Excavator.

GROUP 4: Air Tugger (single drum), Material Hoist Pump 6" or over, Elevators, Brokk Concrete Breaker.

GROUP 5: Air Compressor, Welder, Generators, Conveyors

GROUP 6: Oiler and fire tender

* ENGI0324-005 09/01/2019

AREA 1: GENESEE, LAPEER, LIVINGSTON, MACOMB, MONROE, OAKLAND,
ST. CLAIR, WASHTENAW AND WAYNE COUNTIES

AREA 2: ALCONA, ALLEGAN, ALGER, ALPENA, ANTRIM, ARENAC, BARAGA,
BARRY, BAY, BENZIE, BERRIEN, BRANCH, CALHOUN, CASS,
CHARLEVOIX, CHEBOYGAN, CHIPPEWA, CLARE, CLINTON, CRAWFORD,
DELTA, DICKINSON, EATON, EMMET, GLADWIN, GOGEBIC, GRAND
TRAVERSE, GRATIOT, HILLSDALE, HOUGHTON, HURON, INGHAM, IONIA,

IOSCO, IRON, ISABELLA, JACKSON, KALAMAZOO, KALKASKA, KENT, KWEENAW, LAKE, LEELANAU, LENAWEE, LUCE, MACKINAC, MANISTEE, MARQUETTE, MASON, MECOSTA, MENOMINEE, MIDLAND, MISSAUKEE, MONTCALM, MONTMORENCY, MUSKEGON, NEWAYGO, OCEANA, OGEMAW, ONTONAGON, OSCEOLA, OSCODA, OTSEGO, OTTAWA, PRESQUE ISLE, ROSCOMMON, SAGINAW, SANILAC, SCHOOLCRAFT, SHIAWASSEE, ST. JOSEPH, TUSCOLA, VAN BUREN AND WEXFORD COUNTIES

	Rates	Fringes
OPERATOR: Power Equipment (Underground construction (including sewer))		
AREA 1:		
GROUP 1.....	\$ 34.63	24.35
GROUP 2.....	\$ 29.90	24.35
GROUP 3.....	\$ 29.17	24.35
GROUP 4.....	\$ 28.60	24.35
AREA 2:		
GROUP 1.....	\$ 32.92	24.35
GROUP 2.....	\$ 28.03	24.35
GROUP 3.....	\$ 27.53	24.35
GROUP 4.....	\$ 27.25	24.35

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1: Backfiller tamper; Backhoe; Batch plant operator (concrete); Clamshell; Concrete paver (2 drums or larger); Conveyor loader (Euclid type); Crane (crawler, truck type or pile driving); Dozer; Dragline; Elevating grader; Endloader; Gradall (and similar type machine); Grader; Mechanic; Power shovel; Roller (asphalt); Scraper (self-propelled or tractor drawn); Side boom tractor (type D-4 or equivalent and larger); Slip form paver; Slope paver; Trencher (over 8 ft. digging capacity); Well drilling rig; Concrete pump with boom operator; Hydro Excavator

GROUP 2: Boom truck (power swing type boom); Crusher; Hoist; Pump (1 or more - 6-in. discharge or larger - gas or diesel- powered or powered by generator of 300 amperes or more - inclusive of generator); Side boom tractor (smaller than type D-4 or equivalent); Tractor (pneu-tired, other than backhoe or front end loader); Trencher (8-ft. digging capacity and smaller); Vac Truck

GROUP 3: Air compressors (600 cfm or larger); Air compressors (2 or more-less than 600 cfm); Boom truck (non-swinging, non- powered type boom); Concrete breaker (self-propelled or truck mounted - includes compressor); Concrete paver (1 drum-1/2 yd. or larger); Elevator (other than passenger); Maintenance person; Pump (2 or more-4-in. up to 6-in. discharge-gas or diesel powered - excluding submersible pumps); Pumpcrete machine (and similar equipment); Wagon drill (multiple); Welding machine or generator (2 or more-300 amp. or larger - gas or diesel powered)

GROUP 4: Boiler; Concrete saw (40 hp or over); Curing machine (self-propelled); Farm tractor (with attachment); Finishing machine (concrete); Fire person; Hydraulic pipe pushing machine; Mulching equipment; Oiler; Pumps (2 or more up to 4-in. discharge, if used 3 hours or more a day, gas or diesel powered - excluding submersible pumps); Roller

(other than asphalt); Stump remover; Trencher (service); Vibrating compaction equipment, self-propelled (6 ft. wide or over); End dump operator; Sweeper (Wayne type); Water wagon and Extend-a boom forklift

 * ENGI0324-006 06/01/2019

GENESEE, MACOMB, MONROE, OAKLAND, WASHTENAW, WAYNE, ALCONA, ALGER, ALLEGAN, ALPENA, ANTRIM, ARENAC, BARAGA, BARRY, BAY, BENZIE, BERRIEN, BRANCH, CALHOUN, CASS, CHARLEVOIX, CHEBOYGAN, CHIPPEWA, CLARE, CLINTON, CRAWFORD, DELTA, DICKINSON, EATON, EMMET, GLADWIN, GOGEBIC, GRAND TRAVERSE, GRATIOT, HILLSDALE, HOUGHTON, HURON, INGHAM, IONIA, IOSCO, IRON, ISABELLA, JACKSON, KALAMAZOO, KALKASKA, KENT, KEWEENAW, LAKE, LAPEER, LEELANAU, LENAWEE, LIVINGSTON, LUCE, MACKINAC, MANISTEE, MARQUETTE, MASON, MECOSTA, MENOMINEE, MIDLAND, MISSAUKEE, MONTCALM, MONTMORENCY, MUSKEGON, NEWAYGO, OCEANA, OGEMAW, ONTONAGON, OSCEOLA, OSCODA, OTSEGO, OTTAWA, PRESQUE ISLE, ROSCOMMON, SAGINAW, ST. CLARE, ST. JOSEPH, SANILAC, SCHOOLCRAFT, SHIAWASSEE, TUSCOLA, VAN BUREN AND WEXFORD COUNTIES

	Rates	Fringes
Power equipment operators: (AIRPORT, BRIDGE & HIGHWAY CONSTRUCTION)		
GROUP 1.....	\$ 34.16	24.35
GROUP 2.....	\$ 27.43	24.35
GROUP 3.....	\$ 26.87	24.35
GROUP 4.....	\$ 26.70	24.35

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1: Asphalt plant operator; Crane operator (does not include work on bridge construction projects when the crane operator is erecting structural components); Dragline operator; Shovel operator; Locomotive operator; Paver operator (5 bags or more); Elevating grader operator; Pile driving operator; Roller operator (asphalt); Blade grader operator; Trenching machine operator (ladder or wheel type); Auto-grader; Slip form paver; Self-propelled or tractor-drawn scraper; Conveyor loader operator (Euclid type); Endloader operator (1 yd. capacity and over); Bulldozer; Hoisting engineer; Tractor operator; Finishing machine operator (asphalt); Mechanic; Pump operator (6-in. discharge or over, gas, diesel powered or generator of 300 amp. or larger); Shouldering or gravel distributing machine operator (self-propelled); Backhoe (with over 3/8 yd. bucket); Side boom tractor (type D-4 or equivalent or larger); Tube finisher (slip form paving); Gradall (and similar type machine); Asphalt paver (self-propelled); Asphalt planer (self-propelled); Batch plant (concrete-central mix); Slurry machine (asphalt); Concrete pump (3 in. and over); Roto-mill; Swinging boom truck (over 12 ton capacity); Hydro demolisher (water blaster); Farm-type tractor with attached pan; Vacuum truck operator; Batch Plant (concrete dry batch); Concrete Saw Operator (40h.p. or over); Tractor Operator (farm type); Finishing Machine Operator (concrete); Grader Operator (self-propelled fine grade or form (concrete)).

GROUP 2: Screening plant operator; Washing plant operator; Crusher operator; Backhoe (with 3/8 yd. bucket or less); Side boom tractor (smaller than D-4 type or equivalent); Sweeper (Wayne type and similar equipment); Greese Truck; Air Compressor Operator (600 cu.ft. per min or more); Air Compressor Operator (two or more, less than 600 cfm);

GROUP 3: Boiler fire tender; Tractor operator (farm type with attachment); Concrete Breaker; Wagon Drill Operator;

GROUP 4: Oiler; Fire tender; Trencher (service); Flexplane operator; Cleftplane operator; Boom or winch hoist truck operator; Endloader operator *under 1 yd. capacity); Roller Operator (other than asphalt); Curing equipment operator (self-propelled); Power bin operator; Plant drier (6 ft. wide or over); Guard post driver operator (power driven); All mulching equipment; Stump remover; Concrete pump (under 3-in.); Mesh installer (self-propelled); End dump; Skid Steer.

 ENGI0324-007 05/01/2019

ALGER, BARAGA, CHIPPEWA, DELTA, DICKINSON, GOGEBIC, HOUGHTON, IRON, KEWEENAW, LUCE, MACKINAC MARQUETTE, MENOMINEE, ONTONAGON AND SCHOOLCRAFT COUNTIES:

	Rates	Fringes
OPERATOR: Power Equipment (Steel Erection)		
Compressor, welder and forklift.....	\$ 33.90	24.10
Crane operator, main boom & jib 120' or longer.....	\$ 39.87	24.10
Crane operator, main boom & jib 140' or longer.....	\$ 40.17	24.10
Crane operator, main boom & jib 220' or longer.....	\$ 40.76	24.10
Mechanic with truck and tools.....	\$ 39.00	24.10
Oiler and fireman.....	\$ 31.86	24.10
Regular operator.....	\$ 37.22	24.10

 ENGI0324-008 10/01/2015

ALCONA, ALGER, ALLEGAN, ALPENA, ANTRIM, ARENAC, BARAGA, BARRY, BAY, BENZIE, BERRIEN, BRANCH, CALHOUN, CASS, CHARLEVOIX, CHEBOYGAN, CHIPPEWA, CLARE, CLINTON, CRAWFORD, DELTA, DICKINSON, EATON, EMMET, GENESEE, GLADWIN, GOGEBIC, GRAND TRAVERSE, GRATIOT, HILLSDALE, HOUGHTON, HURON, INGHAM, IONIA, IOSCO, IRON, ISABELLA, JACKSON, KALAMAZOO, KALKASKA, KENT, KEWEENAW, LAKE, LAPEER, LEELANAU, LENAWEE, LIVINGSTON, LUCE, MACKINAC, MACOMB, MANISTEE, MARQUETTE, MASON, MECOSTA, MENOMINEE, MIDLAND, MISSAUKEE, MONTCALM, MONTMORENCY, MONROE, MUSKEGON, NEWAYGO, OAKLAND, OCEANA, OGEMAW, ONTONAGON, OSCEOLA, OSCODA, OTSEGO, OTTAWA, PRESQUE ISLE, ROSCOMMON, SAGINAW, ST. CLARE, ST. JOSEPH, SANILAC, SCHOOLCRAFT, SHIAWASSEE, TUSCOLA, VAN BUREN, WASHTENAW, WAYNE AND WEXFORD COUNTIES

	Rates	Fringes
OPERATOR: Power Equipment (Sewer Relining)		
GROUP 1.....	\$ 30.70	12.93
GROUP 2.....	\$ 29.17	12.93

SEWER RELINING CLASSIFICATIONS

GROUP 1: Operation of audio-visual closed circuit TV system, including remote in-ground cutter and other equipment used in connection with the CCTV system

GROUP 2: Operation of hot water heaters and circulation systems, water jettors and vacuum and mechanical debris removal systems

ENGI0325-012 05/01/2019

	Rates	Fringes
Power equipment operators - gas distribution and duct installation work:		
GROUP 1.....	\$ 31.34	24.45
GROUP 2.....	\$ 31.31	24.45
GROUP 3.....	\$ 29.60	24.45

SCOPE OF WORK: The construction, installation, treating and reconditioning of pipelines transporting gas vapors within cities, towns, subdivisions, suburban areas, or within private property boundaries, up to and including private meter settings of private industrial, governmental or other premises, more commonly referred to as "distribution work," starting from the first metering station, connection, similar or related facility, of the main or cross country pipeline and including duct installation.

Group 1: Backhoe, crane, grader, mechanic, dozer (D-6 equivalent or larger), side boom (D-4 equivalent or larger), trencher(except service), endloader (2 yd. capacity or greater).

GROUP 2: Dozer (less than D-6 equivalent), endloader (under 2 yd. capacity), side boom (under D-4 capacity), backfiller, pumps (1 or 2 of 6-inch discharge or greater), boom truck (with powered boom), tractor (wheel type other than backhoe or front endloader). Tamper (self-propelled), boom truck (with non-powered boom), concrete saw (20 hp or larger), pumps (2 to 4 under 6-inch discharge), compressor (2 or more or when one is used continuously into the second day) and trencher(service).

GROUP 3: Oiler, hydraulic pipe pushing machine, grease person and hydrostatic testing operator.

IRON0008-007 06/01/2019

ALGER, BARAGA, CHIPPEWA, DELTA, DICKINSON, GOGEBIC, HOUGHTON, IRON, KEWEENAW, LUCE, MACKINAC MARQUETTE, MENOMINEE, ONTONAGON AND SCHOOLCRAFT COUNTIES:

	Rates	Fringes
Ironworker - pre-engineered metal building erector.....	\$ 23.70	6.95
IRONWORKER		
General contracts		
\$10,000,000 or greater.....	\$ 33.00	27.12
General contracts less than \$10,000,000.....	\$ 33.00	27.12

Paid Holidays: New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day & Christmas Day.

* IRON0025-002 06/01/2019

ALCONA, ALPENA, ARENAC, BAY, CHEBOYGAN, CLARE, CLINTON, CRAWFORD, GENESEE, GLADWIN, GRATIOT, HURON, INGHAM, IOSCO, ISABELLA, JACKSON, LAPEER, LIVINGSTON, MACOMB, MIDLAND, MONTMORENCY, OAKLAND, OGEMAW, OSCODA, OTSEGO, PRESQUE ISLE, ROSCOMMON, SAGINAW, SANILAC, SHIAWASSEE, ST. CLAIR, TUSCOLA, WASHTENAW AND WAYNE COUNTIES:

	Rates	Fringes
Ironworker - pre-engineered metal building erector		
Alcona, Alpena, Arenac, Cheboygan, Clare, Clinton, Crawford, Gladwin, Gratiot, Huron, Ingham, Iosco, Isabella, Jackson, Lapeer, Livingston (west of Burkhardt Road), Montmorency, Ogemaw, Oscoda, Otsego, Presque Isle, Roscommon, Sanilac, Shiawassee, Tuscola & Washtenaw (west of U.S. 23).	\$ 24.26	22.11
Bay, Genesee, Lapeer, Livingston (east of Burkhardt Road), Macomb, Midland, Oakland, Saginaw, St. Clair, The University of Michigan, Washtenaw (east of U.S. 23) & Wayne...	\$ 25.48	23.11
IRONWORKER		
Ornamental and Structural...	\$ 36.77	29.03
Reinforcing.....	\$ 30.98	27.99

IRON0055-005 07/01/2019

LENAWEE AND MONROE COUNTIES:

	Rates	Fringes
IRONWORKER		
Pre-engineered metal buildings.....	\$ 23.59	19.35
All other work.....	\$ 30.38	24.40

IRON0292-003 06/01/2019

BERRIEN AND CASS COUNTIES:

	Rates	Fringes
IRONWORKER (Including pre-engineered metal building erector).....	\$ 30.95	22.25

IRON0340-001 06/19/2017

ALLEGAN, ANTRIM, BARRY, BENZIE, BRANCH, CALHOUN, CHARLEVOIX, EATON, EMMET, GRAND TRAVERSE, HILLSDALE, IONIA, KALAMAZOO, KALKASKA, KENT, LAKE, LEELANAU, MANISTEE, MASON, MECOSTA, MISSAUKEE, MONTCALM, MUSKEGON, NEWAYGO, OCEANA, OSCEOLA, OTTAWA, ST. JOSEPH, VAN BUREN AND WEXFORD COUNTIES:

	Rates	Fringes
IRONWORKER (Including pre-engineered metal building erector).....	\$ 24.43	24.67

LABO0005-006 10/01/2017

	Rates	Fringes
Laborers - hazardous waste abatement: (ALCONA, ALPENA, ANTRIM, BENZIE, CHARLEVOIX, CHEBOYGAN, CRAWFORD, EMMET, GRAND TRAVERSE, IOSCO, KALKASKA, LEELANAU, MISSAUKEE, MONTMORENCY, OSCODA, OTSEGO, PRESQUE ISLE AND WEXFORD COUNTIES - Zone 10)		
Levels A, B or C.....	\$ 17.45	12.75
class b.....	\$ 18.00	12.85
Work performed in conjunction with site preparation not requiring the use of personal protective equipment;		
Also, Level D.....	\$ 16.45	12.75
class a.....	\$ 17.00	12.85

Zone 10

Laborers - hazardous waste abatement: (ALGER, BARAGA, CHIPPEWA, DELTA, DICKINSON, GOGEBIC, HOUGHTON, IRON, KEWEENAW, LUCE, MACKINAC, MARQUETTE, MENOMINEE, ONTONAGON AND SCHOOLCRAFT COUNTIES - Zone 11)		
Levels A, B or C.....	\$ 21.63	12.88
Work performed in conjunction with site preparation not requiring the use of personal protective equipment;		
Also, Level D.....	\$ 20.63	12.88

Laborers - hazardous waste abatement: (ALLEGAN, BARRY, BERRIEN, BRANCH, CALHOUN, CASS, IONIA COUNTY (except the city of Portland);

KALAMAZOO, KENT, LAKE,
MANISTEE, MASON, MECOSTA,
MONTCALM, MUSKEGON, NEWAYGO,
OCEANA, OSCEOLA, OTTAWA, ST.
JOSEPH AND VAN BUREN COUNTIES
- Zone 9)

Levels A, B or C.....\$ 20.95	12.85
Work performed in conjunction with site preparation not requiring the use of personal protective equipment;	
Also, Level D.....\$ 19.95	12.85

Laborers - hazardous waste
abatement: (ARENAC, BAY,
CLARE, GLADWIN, GRATIOT,
HURON, ISABELLA, MIDLAND,
OGEMAW, ROSCOMMON, SAGINAW
AND TUSCOLA COUNTIES - Zone 8)

Levels A, B or C.....\$ 20.65	12.85
Work performed in conjunction with site preparation not requiring the use of personal protective equipment;	
Also, Level D.....\$ 19.65	12.85

Laborers - hazardous waste
abatement: (CLINTON, EATON
AND INGHAM COUNTIES; IONIA
COUNTY (City of Portland);
LIVINGSTON COUNTY (west of
Oak Grove Rd., including the
City of Howell) - Zone 6)

Levels A, B or C.....\$ 24.65	12.85
Work performed in conjunction with site preparation not requiring the use of personal protective equipment;	
Also, Level D.....\$ 23.65	12.85

Laborers - hazardous waste
abatement: (GENESEE, LAPEER
AND SHIAWASSEE COUNTIES -
Zone 7)

Levels A, B or C.....\$ 23.61	13.41
Work performed in conjunction with site preparation not requiring the use of personal protective equipment;	
Also, Level D.....\$ 22.61	13.41

Laborers - hazardous waste
abatement: (HILLSDALE,
JACKSON AND LENAWEЕ COUNTIES
- Zone 4)

Levels A, B or C.....\$ 24.19	12.85
Work performed in conjunction with site preparation not requiring the use of personal protective equipment;	
Also, Level D.....\$ 23.19	12.85

Laborers - hazardous waste

abatement: (LIVINGSTON COUNTY
(east of Oak Grove Rd. and
south of M-59, excluding the
city of Howell); AND
WASHTENAW COUNTY - Zone 3)
Levels A, B or C.....\$ 29.70 14.20
Work performed in
conjunction with site
preparation not requiring
the use of personal
protective equipment;
Also, Level D.....\$ 28.70 14.20

Laborers - hazardous waste
abatement: (MACOMB AND WAYNE
COUNTIES - Zone 1)
Levels A, B or C.....\$ 28.35 16.75
Work performed in
conjunction with site
preparation not requiring
the use of personal
protective equipment;
Also, Level D.....\$ 27.35 16.75

Laborers - hazardous waste
abatement: (MONROE COUNTY -
Zone 4)
Levels A, B or C.....\$ 30.85 14.45
Work performed in
conjunction with site
preparation not requiring
the use of personal
protective equipment;
Also, Level D.....\$ 29.84 14.45

Laborers - hazardous waste
abatement: (OAKLAND COUNTY
and the Northeast portion of
LIVINGSTON COUNTY bordered by
Oak Grove Road on the West
and M-59 on the South - Zone
2)
Level A, B, C.....\$ 28.85 16.75
Work performed in
conjunction with site
preparation not requiring
the use of personal
protective equipment;
Also, Level D.....\$ 27.85 16.75

Laborers - hazardous waste
abatement: (SANILAC AND ST.
CLAIR COUNTIES - Zone 5)
Levels A, B or C.....\$ 25.19 15.86
Work performed in
conjunction with site
preparation not requiring
the use of personal
protective equipment;
Also, Level D.....\$ 24.19 15.86

LABO0259-001 09/01/2018

AREA 1: MACOMB, OAKLAND AND WAYNE COUNTIES
AREA 2: ALCONA, ALGER, ALLEGAN, ALPENA, ANTRIM, ARENAC, BARAGA,
BARRY, BAY, BENZIE, BERRIEN, BRANCH, CALHOUN, CASS, CHARLEVOIX,
CHEBOYGAN, CHIPPEWA, CLARE, CLINTON, CRAWFORD, DELTA,

DICKINSON, EATON, EMMET, GENESEE, GLADWIN, GOGEBIC, GRAND TRVERSE, GRATIOT, HILLSDALE, HOUGHTON, HURON, INGHAM, IONIA, IOSCO, IRON, ISABELLA, JACKSON, KALAMAZOO, KALKASKA, KENT, KEWEENAW, LAKE, LAPEER, LEELANAU, LENAWEE, LIVINGSTON, LUCE, MACKINAC, MANISTEE, MARQUETTE, MASON, MECOSTA, MENOMINEE, MIDLAND, MISSAUKEE, MONROE, MONTCALM, MONTMORENCY, MUSKEGON, NEWAYGO, OCEANA, OGEMAW, ONTONAGON, OSCEOLA, OSCODA, OTSEGO, OTTAWA, PRESQUE ISLE, ROSCOMMON, SAGINAW, ST. CLARE, ST. JOSEPH, SANILAC, SCHOOLCRAFT, SHIAWASSEE, TUSCOLA, VAN BUREN, WASHTENAW AND WEXFORD COUNTIES

	Rates	Fringes
Laborers - tunnel, shaft and caisson:		
AREA 1		
GROUP 1.....	\$ 22.57	16.80
GROUP 2.....	\$ 22.68	16.80
GROUP 3.....	\$ 22.74	16.80
GROUP 4.....	\$ 22.92	16.80
GROUP 5.....	\$ 23.17	16.80
GROUP 6.....	\$ 23.50	16.80
GROUP 7.....	\$ 16.78	16.80
AREA 2		
GROUP 1.....	\$ 24.10	12.85
GROUP 2.....	\$ 24.19	12.85
GROUP 3.....	\$ 24.29	12.85
GROUP 4.....	\$ 24.45	12.85
GROUP 5.....	\$ 24.71	12.85
GROUP 6.....	\$ 25.02	12.85
GROUP 7.....	\$ 17.29	12.85

SCOPE OF WORK: Tunnel, shaft and caisson work of every type and description and all operations incidental thereto, including, but not limited to, shafts and tunnels for sewers, water, subways, transportation, diversion, sewerage, caverns, shelters, aquifers, reservoirs, missile silos and steel sheeting for underground construction.

TUNNEL LABORER CLASSIFICATIONS

GROUP 1: Tunnel, shaft and caisson laborer, dump, shanty, hog house tender, testing (on gas) and watchman

GROUP 2: Manhole, headwall, catch basin builder, bricklayer tender, mortar machine and material mixer

GROUP 3: Air tool operator (jackhammer, bush hammer and grinder), first bottom, second bottom, cage tender, car pusher, carrier, concrete, concrete form, concrete repair, cement invert laborer, cement finisher, concrete shoveler, conveyor, floor, gasoline and electric tool operator, gunite, grout operator, welder, heading dinky person, inside lock tender, pea gravel operator, pump, outside lock tender, scaffold, top signal person, switch person, track, tugger, utility person, vibrator, winch operator, pipe jacking, wagon drill and air track operator and concrete saw operator (under 40 h.p.)

GROUP 4: Tunnel, shaft and caisson mucker, bracer, liner plate, long haul dinky driver and well point

GROUP 5: Tunnel, shaft and caisson miner, drill runner, key

board operator, power knife operator, reinforced steel or mesh (e.g. wire mesh, steel mats, dowel bars, etc.)

GROUP 6: Dynamite and powder

GROUP 7: Restoration laborer, seeding, sodding, planting, cutting, mulching and top soil grading; and the restoration of property such as replacing mailboxes, wood chips, planter boxes, flagstones, etc.

LABO0334-001 09/01/2018

	Rates	Fringes
Laborers - open cut:		
ZONE 1 - MACOMB, OAKLAND AND WAYNE COUNTIES:		
GROUP 1.....	\$ 22.42	16.80
GROUP 2.....	\$ 22.53	16.80
GROUP 3.....	\$ 22.58	16.80
GROUP 4.....	\$ 22.66	16.80
GROUP 5.....	\$ 22.72	16.80
GROUP 6.....	\$ 20.17	16.80
GROUP 7.....	\$ 16.79	16.80
ZONE 2 - LIVINGSTON COUNTY (east of M-151 (Oak Grove Rd.)); MONROE AND WASHTENAW COUNTIES:		
GROUP 1.....	\$ 23.75	12.85
GROUP 2.....	\$ 23.86	12.85
GROUP 3.....	\$ 23.98	12.85
GROUP 4.....	\$ 24.05	12.85
GROUP 5.....	\$ 24.20	12.85
GROUP 6.....	\$ 21.50	12.85
GROUP 7.....	\$ 18.14	12.85
ZONE 3 - CLINTON, EATON, GENESEE, HILLSDALE AND INGHAM COUNTIES; IONIA COUNTY (City of Portland); JACKSON, LAPEER AND LENAWEE COUNTIES; LIVINGSTON COUNTY (west of M-151 Oak Grove Rd.); SANILAC, ST. CLAIR AND SHIAWASSEE COUNTIES:		
GROUP 1.....	\$ 21.94	12.85
GROUP 2.....	\$ 22.08	12.85
GROUP 3.....	\$ 22.20	12.85
GROUP 4.....	\$ 22.25	12.85
GROUP 5.....	\$ 22.39	12.85
GROUP 6.....	\$ 19.69	12.85
GROUP 7.....	\$ 16.84	12.85
ZONE 4 - ALCONA, ALLEGAN, ALPENA, ANTRIM, ARENAC, BARRY, BAY, BENZIE, BERRIEN, BRANCH, CALHOUN, CASS, CHARLEVOIX, CHEBOYGAN, CLARE, CRAWFORD, EMMET, GLADWIN, GRAND TRAVERSE, GRATIOT AND HURON COUNTIES; IONIA COUNTY (EXCEPT THE CITY OF		

PORTLAND); IOSCO,
 ISABELLA, KALAMAZOO,
 KALKASKA, KENT,
 LAKE, LEELANAU, MANISTEE,
 MASON, MECOSTA, MIDLAND,
 MISSAUKEE, MONTCALM,
 MONTMORENCY, MUSKEGON,
 NEWAYGO, OCEANA, OGEMAW,
 OSCEOLA, OSCODA, OTSEGO,
 OTTAWA, PRESQUE ISLE,
 ROSCOMMON, SAGINAW, ST.
 JOSEPH, TUSCOLA, VAN BUREN

AND WEXFORD COUNTIES:

GROUP 1.....	\$ 20.97	12.85
GROUP 2.....	\$ 21.10	12.85
GROUP 3.....	\$ 21.21	12.85
GROUP 4.....	\$ 21.28	12.85
GROUP 5.....	\$ 21.40	12.85
GROUP 6.....	\$ 18.62	12.85
GROUP 7.....	\$ 16.96	12.85

ZONE 5 - ALGER, BARAGA,
 CHIPPEWA, DELTA,
 DICKINSON, GOGEBIC,
 HOUGHTON, IRON,
 KEWEENAW, LUCE, MACKINAC,
 MARQUETTE, MENOMINEE,
 ONTONAGON AND SCHOOLCRAFT

COUNTIES:

GROUP 1.....	\$ 21.19	12.85
GROUP 2.....	\$ 21.33	12.85
GROUP 3.....	\$ 21.46	12.85
GROUP 4.....	\$ 21.51	12.85
GROUP 5.....	\$ 21.56	12.85
GROUP 6.....	\$ 18.94	12.85
GROUP 7.....	\$ 17.05	12.85

SCOPE OF WORK:

Open cut construction work shall be construed to mean work which requires the excavation of earth including industrial, commercial and residential building site excavation and preparation, land balancing, demolition and removal of concrete and underground appurtenances, grading, paving, sewers, utilities and improvements; retention, oxidation, flocculation and irrigation facilities, and also including but not limited to underground piping, conduits, steel sheeting for underground construction, and all work incidental thereto, and general excavation. For all areas except the Upper Peninsula, open cut construction work shall also be construed to mean waterfront work, piers, docks, seawalls, breakwalls, marinas and all incidental work. Open cut construction work shall not include any structural modifications, alterations, additions and repairs to buildings, or highway work, including roads, streets, bridge construction and parking lots or steel erection work and excavation for the building itself and back filling inside of and within 5 ft. of the building and foundations, footings and piers for the building. Open cut construction work shall not include any work covered under Tunnel, Shaft and Caisson work.

OPEN CUT LABORER CLASSIFICATIONS

GROUP 1: Construction laborer

GROUP 2: Mortar and material mixer, concrete form person, signal person, well point person, manhole, headwall and catch basin builder, headwall, seawall, breakwall and dock builder

GROUP 3: Air, gasoline and electric tool operator, vibrator operator, driller, pump person, tar kettle operator, bracer, rodder, reinforced steel or mesh person (e.g., wire mesh, steel mats, dowel bars, etc.), welder, pipe jacking and boring person, wagon drill and air track operator and concrete saw operator (under 40 h.p.), windlass and tugger person and directional boring person

GROUP 4: Trench or excavating grade person

GROUP 5: Pipe layer (including crock, metal pipe, multi-plate or other conduits)

GROUP 6: Grouting man, audio-visual television operations and all other operations in connection with closed circuit television inspection, pipe cleaning and pipe relining work and the installation and repair of water service pipe and appurtenances

GROUP 7: Restoration laborer, seeding, sodding, planting, cutting, mulching and top soil grading; and the restoration of property such as replacing mailboxes, wood chips, planter boxes, flagstones, etc.

LABO0465-001 06/01/2019

LABORER: Highway, Bridge and Airport Construction

AREA 1: GENESEE, MACOMB, MONROE, OAKLAND, WASHTENAW AND WAYNE COUNTIES

AREA 2: ALLEGAN, BARRY, BAY, BERRIEN, BRANCH, CALHOUN, CASS, CLINTON, EATON, GRATIOT, HILLSDALE, HURON, INGHAM, JACKSON, KALAMAZOO, LAPEER, LENAWEE, LIVINGSTON, MIDLAND, MUSKEGON, SAGINAW, SANILAC, SHIAWASSEE, ST. CLAIR, ST. JOSEPH, TUSCOLA AND VAN BUREN COUNTIES

AREA 3: ALCONA, ALPENA, ANTRIM, ARENAC, BENZIE, CHARLEVOIX, CHEBOYGAN, CLARE, CRAWFORD, EMMET, GLADWIN, GRAND TRAVERSE, IONIA, IOSCO, ISABELLA, KALKASKA, KENT, LAKE, LEELANAU, MANISTEE, MASON, MECOSTA, MISSAUKEE, MONTCALM, MONTMORENCY, NEWAYGO, OCEANA, OGEMAW, OSCEOLA, OSCODA, OTSEGO, OTTAWA, PRESQUE ISLE, ROSCOMMON AND WEXFORD COUNTIES

AREA 4: ALGER, BARAGA, CHIPPEWA, DELTA, DICKINSON, GOGEBIC, HOUGHTON, IRON, KEWEENAW, LUCE, MACKINAC, MARQUETTE, MENOMINEE, ONTONAGON AND SCHOOLCRAFT COUNTIES

	Rates	Fringes
LABORER (AREA 1)		
GROUP 1.....	\$ 27.07	12.90
GROUP 2.....	\$ 27.20	12.90
GROUP 3.....	\$ 27.38	12.90
GROUP 4.....	\$ 27.46	12.90

GROUP 5.....	\$ 27.67	12.90
GROUP 6.....	\$ 27.97	12.90
LABORER (AREA 2)		
GROUP 1.....	\$ 24.02	12.85
GROUP 2.....	\$ 24.22	12.85
GROUP 3.....	\$ 24.46	12.85
GROUP 4.....	\$ 24.81	12.85
GROUP 5.....	\$ 24.68	12.85
GROUP 6.....	\$ 25.02	12.85
LABORER (AREA 3)		
GROUP 1.....	\$ 23.27	12.85
GROUP 2.....	\$ 23.48	12.85
GROUP 3.....	\$ 23.77	12.85
GROUP 4.....	\$ 24.21	12.85
GROUP 5.....	\$ 23.83	12.85
GROUP 6.....	\$ 24.26	12.85
LABORER (AREA 4)		
GROUP 1.....	\$ 23.32	12.85
GROUP 2.....	\$ 23.53	12.85
GROUP 3.....	\$ 23.82	12.85
GROUP 4.....	\$ 24.26	12.85
GROUP 5.....	\$ 23.88	12.85
GROUP 6.....	\$ 24.31	12.85

LABORER CLASSIFICATIONS

GROUP 1: Asphalt shoveler or loader; asphalt plant misc.; burlap person; yard person; dumper (wagon, truck, etc.); joint filling laborer; miscellaneous laborer; unskilled laborer; sprinkler laborer; form setting laborer; form stripper; pavement reinforcing; handling and placing (e.g., wire mesh, steel mats, dowel bars); mason's tender or bricklayer's tender on manholes; manhole builder; headwalls, etc.; waterproofing, (other than buildings) seal coating and slurry mix, shoring, underpinning; pressure grouting; bridge pin and hanger removal; material recycling laborer; horizontal paver laborer (brick, concrete, clay, stone and asphalt); ground stabilization and modification laborer; grouting; waterblasting; top person; railroad track and trestle laborer; carpenters' tender; guard rail builders' tender; earth retention barrier and wall and M.S.E. wall installer's tender; highway and median installer's tender (including sound, retaining, and crash barriers); fence erector's tender; asphalt raker tender; sign installer; remote control operated equipment.

GROUP 2: Mixer operator (less than 5 sacks); air or electric tool operator (jackhammer, etc.); spreader; boxperson (asphalt, stone, gravel); concrete paddler; power chain saw operator; paving batch truck dumper; tunnel mucker (highway work only); concrete saw (under 40 h.p.) and dry pack machine; roto-mill grounds person.

GROUP 3: Tunnel miner (highway work only); finishers tenders; guard rail builders; highway and median barrier installer; earth retention barrier and wall and M.S.E. wall installer's (including sound, retaining and crash barriers); fence erector; bottom person; powder person; wagon drill and air track operator; diamond and core drills; grade checker; certified welders; curb and side rail setter's tender.

GROUP 4: Asphalt raker

GROUP 5: Pipe layers, oxy-gun

GROUP 6: Line-form setter for curb or pavement; asphalt screed checker/screw man on asphalt paving machines.

LABO1076-005 04/01/2019

MICHIGAN STATEWIDE

	Rates	Fringes
LABORER (DISTRIBUTION WORK)		
Zone 1.....	\$ 21.47	12.90
Zone 2.....	\$ 19.77	12.90
Zone 3.....	\$ 17.95	12.90
Zone 4.....	\$ 17.32	12.90
Zone 5.....	\$ 17.30	12.90

DISTRIBUTION WORK - The construction, installation, treating and reconditioning of distribution pipelines transporting coal, oil, gas or other similar materials, vapors or liquids, including pipelines within private property boundaries, up to and including the meter settings on residential, commercial, industrial, institutional, private and public structures. All work covering pumping stations and tank farms not covered by the Building Trades Agreement. Other distribution lines with the exception of sewer, water and cable television are included.

Underground Duct Layer Pay: \$.40 per hour above the base pay rate.

- Zone 1 - Macomb, Oakland and Wayne
- Zone 2 - Monroe and Washtenaw
- Zone 3 - Bay, Genesee, Lapeer, Midland, Saginaw, Sanilac, Shiawassee and St. Clair
- Zone 4 - Alger, Baraga, Chippewa, Delta, Dickinson, Gogebic, Houghton, Iron, Keweenaw, Luce, Mackinac, Marquette, Menominee, Ontonagon and Schoolcraft
- Zone 5 - Remaining Counties in Michigan

PAIN0022-002 07/01/2008

HILLSDALE, JACKSON AND LENAWEЕ COUNTIES; LIVINGSTON COUNTY (east of the eastern city limits of Howell, not including the city of Howell, north to the Genesee County line and south to the Washtenaw County line); MACOMB, MONROE, OAKLAND, WASHTENAW AND WAYNE COUNTIES:

	Rates	Fringes
PAINTER.....	\$ 25.06	14.75

FOOTNOTES: For all spray work and journeyman rigging for spray work, also blowing off, \$0.80 per hour additional (applies only to workers doing rigging for spray work on off the floor work. Does not include setting up or moving rigging on floor surfaces, nor does it apply to workers engaged in covering up or tending spray equipment. For all sandblasting and spray work performed on highway bridges, overpasses, tanks or steel, \$0.80 per hour additional. For all brushing, cleaning and other preparatory work (other than spraying or steeplejack work) at scaffold heights of

fifty (50) feet from the ground or higher, \$0.50 per hour additional. For all preparatorial work and painting performed on open steel under forty (40) feet when no scaffolding is involved, \$0.50 per hour additional. For all swing stage work-window jacks and window belts-exterior and interior, \$0.50 per hour additional. For all spray work and sandblaster work to a scaffold height of forty (40) feet above the floor level, \$0.80 per hour additional. For all preparatorial work and painting on all highway bridges or overpasses up to forty (40) feet in height, \$0.50 per hour additional. For all steeplejack work performed where the elevation is forty (40) feet or more, \$1.25 per hour additional.

 PAIN0312-001 06/01/2018

EXCLUDES: ALLEGAN COUNTY (Townships of Dorr, Fillmore, Heath, Hopkins, Laketown, Leighton, Manlius, Monterey, Overisel, Salem, Saugatuck and Wayland); INCLUDES: Barry, Berrien, Branch, Calhoun, Cass, Hillsdale, Kalamazoo, St. Joseph, Van Buren

	Rates	Fringes
PAINTER		
Brush and roller.....	\$ 23.74	13.35
Spray, Sandblast, Sign		
Painting.....	\$ 24.94	13.35

 PAIN0845-003 05/10/2018

CLINTON COUNTY; EATON COUNTY (does not include the townships of Bellevue and Olivet); INGHAM COUNTY; IONIA COUNTY (east of Hwy. M 66); LIVINGSTON COUNTY (west of the eastern city limits of Howell, including the city of Howell, north to the Genesee County line and south to the Washtenaw County line); AND SHIAWASSEE COUNTY (Townships of Bennington, Laingsbury and Perry):

	Rates	Fringes
PAINTER.....	\$ 25.49	13.74

 PAIN0845-015 05/10/2018

MUSKEGON COUNTY; NEWAYGO COUNTY (except the Townships of Barton, Big Prairie, Brooks, Croton, Ensley, Everett, Goodwell, Grant, Home, Monroe, Norwich and Wilcox); OCEANA COUNTY; OTTAWA COUNTY (except the townships of Allendale, Blendone, Chester, Georgetown, Holland, Jamestown, Olive, Park, Polkton, Port Sheldon, Tallmadge, Wright and Zeeland):

	Rates	Fringes
PAINTER.....	\$ 25.49	13.74

 PAIN0845-018 05/10/2018

ALLEGAN COUNTY (Townships of Dorr, Fillmore, Heath, Hopkins, Laketown, Leighton, Manlius, Monterey, Overisel, Salem, Saugatuck and Wayland); IONIA COUNTY (west of Hwy. M-66); KENT, MECOSTA AND MONTCALM COUNTIES; NEWAYGO COUNTY (Townships of

Barton, Big Prairie, Brooks, Croton, Ensley, Everett, Goodwell, Grant, Home, Monroe, Norwich and Wilcox); OSCEOLA COUNTY (south of Hwy. #10); OTTAWA COUNTY (Townships of Allendale, Blendone, Chester, Georgetown, Holland, Jamestown, Olive, Park, Polkton, Port Sheldon, Tallmadge, Wright and Zeeland):

	Rates	Fringes
PAINTER.....	\$ 25.49	13.74

FOOTNOTES: Lead abatement work: \$1.00 per hour additional.

PAIN1011-003 06/02/2019

ALGER, BARAGA, CHIPPEWA, DELTA, DICKINSON, GOGEBIC, HOUGHTON, IRON, KEWEENAW, LUCE, MACKINAC, MARQUETTE, MENOMINEE, ONTONAGON AND SCHOOLCRAFT COUNTIES:

	Rates	Fringes
PAINTER.....	\$ 25.76	13.33

FOOTNOTES: High pay (bridges, overpasses, watertower): 30 to 80 ft.: \$.65 per hour additional. 80 ft. and over: \$1.30 per hour additional.

PAIN1474-002 06/01/2010

HURON COUNTY; LAPEER COUNTY (east of Hwy. M-53); ST. CLAIR, SANILAC AND TUSCOLA COUNTIES:

	Rates	Fringes
PAINTER.....	\$ 23.79	12.02

FOOTNOTES: Lead abatement work: \$1.00 per hour additional. Work with any hazardous material: \$1.00 per hour additional. Sandblasting, steam cleaning and acid cleaning: \$1.00 per hour additional. Ladder work at or above 40 ft., scaffold work at or above 40 ft., swing stage, boatswain chair, window jacks and all work performed over a falling height of 40 ft.: \$1.00 per hour additional. Spray gun work, pick pullers and those handling needles, blowing off by air pressure, and any person rigging (setting up and moving off the ground): \$1.00 per hour additional. Steeplejack, tanks, gas holders, stacks, flag poles, radio towers and beacons, power line towers, bridges, etc.: \$1.00 per hour additional, paid from the ground up.

PAIN1803-003 06/01/2019

ALCONA, ALPENA, ANTRIM, ARENAC, BAY, BENZIE, CHARLEVOIX, CHEBOYGAN, CLARE, CRAWFORD, EMMET, GLADWIN, GRAND TRAVERSE, GRATIOT, IOSCO, ISABELLA, KALKASKA, LAKE, LEELANAU, MANISTEE, MASON, MIDLAND, MISSAUKEE, MONTMORENCY AND OGEMAW COUNTIES; OSCEOLA COUNTY (north of Hwy. #10); OSCODA, OTSEGO, PRESQUE ISLE, ROSCOMMON, SAGINAW AND WEXFORD COUNTIES:

	Rates	Fringes
PAINTER		
Work performed on water, bridges over water or moving traffic, radio and powerline towers, elevated tanks, steeples, smoke stacks over 40 ft. of falling heights, recovery of lead-based paints and any work associated with industrial plants, except maintenance of industrial plants.....	\$ 25.39	14.68
All other work, including maintenance of industrial plant.....	\$ 25.39	14.68

FOOTNOTES: Spray painting, sandblasting, blowdown associated with spraying and blasting, water blasting and work involving a swing stage, boatswain chair or spider: \$1.00 per hour additional. All work performed inside tanks, vessels, tank trailers, railroad cars, sewers, smoke stacks, boilers or other spaces having limited egress not including buildings, opentop tanks, pits, etc.: \$1.25 per hour additional.

PLAS0514-001 06/01/2018

ZONE 1: GENESEE, LIVINGSTON, MACOMB, MONROE, OAKLAND, SAGINAW, WASHTENAW AND WAYNE COUNTIES

ZONE 2: ALCONA, ALGER, ALLEGAN, ALPENA, ANTRIM, ARENAC, BARAGA, BARRY, BAY, BENZIE, BERRIEN, BRANCH, CALHOUN, CASS, CHARLEVOIX, CHEBOYGAN, CHIPPEWA, CLARE, CLINTON, CRAWFORD, DELTA, DICKINSON, EATON, EMMET, GLADWIN, GOGEBIC, GRAND TRAVERSE, GRATIOT, HILLSDALE, HOUGHTON, HURON, INGHAM, IONIA, IOSCO, IRON, ISABELLA, JACKSON, KALAMAZOO, KALKASKA, KENT, KEWEENAW, LAKE, LAPEER, LEELANAU, LENAWEE, LUCE, MACKINAC, MANISTEE, MARQUETTE, MASON, MECOSTA, MENOMINEE, MIDLAND, MISSAUKEE, MONTCALM, MONTMORENCY, MUSKEGON, NEWAYGO, OCEANA, OGEMAW, ONTONAGON, OSCEOLA, OSCODA, OTSEGO, OTTAWA, PRESQUE ISLE, ROSCOMMON, SANILAC, SCHOOLCRAFT, SHIAWASSEE, ST. CLAIR, ST. JOSEPH, TUSCOLA, VAN BUREN AND WEXFORD COUNTIES

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER		
ZONE 1.....	\$ 31.47	13.81
ZONE 2.....	\$ 29.97	13.81

PLUM0190-003 05/01/2015

ALCONA, ALGER, ALLEGAN, ALPENA, ANTRIM, ARENAC, BARAGA, BARRY, BAY, BENZIE, BERRIEN, BRANCH, CALHOUN, CASS, CHARLEVOIX, CHEBOYGAN, CHIPPEWA, CLARE, CLINTON, CRAWFORD, DELTA, DICKINSON, EATON, EMMET, GENESEE, GLADWIN, GOGEBIC, GRAND TRAVERSE, GRATIOT, HILLSDALE, HOUGHTON, HURON, INGHAM, IONIA, IOSCO, IRON, ISABELLA, JACKSON, KALAMAZOO, KALKASKA, KENT, KEWEENAW, LAKE, LAPEER, LEELANAU, LENAWEE, LIVINGSTON, LUCE, MACKINAC, MACOMB, MANISTEE, MARQUETTE, MASON, MECOSTA,

MENOMINEE, MIDLAND, MISSAUKEE, MONTCALM, MONTMORENCY, MONROE, MUSKEGON, NEWAYGO, OAKLAND, OCEANA, OGEMAW, ONTONAGON, OSCEOLA, OSCODA, OTSEGO, OTTAWA, PRESQUE ISLE, ROSCOMMON, SAGINAW, ST. CLARE, ST. JOSEPH, SANILAC, SCHOOLCRAFT, SHIAWASSEE, TUSCOLA, VAN BUREN, WASHTENAW, WAYNE AND WEXFORD COUNTIES

	Rates	Fringes
Plumber/Pipefitter - gas distribution pipeline:		
Welding in conjunction with gas distribution pipeline work.....	\$ 33.03	20.19
All other work:.....	\$ 24.19	12.28

TEAM0007-004 06/01/2019

AREA 1: ALCONA, ALGER, ALLEGAN, ALPENA, ANTRIM, ARENAC, BARAGA, BARRY, BAY, BENZIE, BERRIEN, BRANCH, CALHOUN, CASS, CHARLEVOIX, CHEBOYGAN, CHIPPEWA, CLARE, CLINTON, CRAWFORD, DELTA, DICKINSON, EATON, EMMET, GLADWIN, GOGEBIC, GRAND TRAVERSE, GRATIOT, HILLSDALE, HOUGHTON, HURON, INGHAM, IONIA, IOSCO, IRON, ISABELLA, JACKSON, KALAMAZOO, KALKASKA, KENT, KEWEENAW, LAKE, LAPEER, LEELANAU, LENAWEE, LUCE, MACKINAC, MANISTEE, MARQUETTE, MASON, MECOSTA, MENOMINEE, MIDLAND, MISSAUKEE, MONTCALM, MONTMORENCY, MUSKEGON, NEWAYGO, OCEANA, OGEMAW, ONTONAGON, OSCEOLA, OSCODA, OTSEGO, OTTAWA, PRESQUE ISLE, ROSCOMMON, SAGINAW, SANILAC, SCHOOLCRAFT, SHIAWASSEE, ST. CLAIR, ST. JOSEPH, TUSCOLA, VAN BUREN AND WEXFORD COUNTIES

AREA 2: GENESEE, LIVINGSTON, MACOMB, MONROE, OAKLAND, WASHTENAW AND WAYNE COUNTIES

	Rates	Fringes
TRUCK DRIVER		
AREA 1		
Euclids, double bottoms and lowboys.....	\$ 27.30	.50 + a+b
Trucks under 8 cu. yds.....	\$ 27.05	.50 + a+b
Trucks, 8 cu. yds. and over.....	\$ 27.15	.50 + a+b
AREA 2		
Euclids, double bottomms and lowboys.....	\$ 24.895	.50 + a+b
Euclids, double bottoms and lowboys.....	\$ 27.40	.50 + a+b
Trucks under 8 cu. yds.....	\$ 27.15	.50 + a+b
Trucks, 8 cu. yds. and over.....	\$ 27.25	.50 + a+b

Footnote:

- a. \$455.10 per week
- b. \$68.70 daily

TEAM0247-004 04/01/2013

AREA 1: ALCONA, ALGER, ALLEGAN, ALPENA, ANTRIM, ARENAC, BARAGA, BARRY, BAY, BENZIE, BERRIEN, BRANCH, CALHOUN, CASS, CHARLEVOIX, CHEBOYGAN, CHIPPEWA, CLARE, CLINTON, CRAWFORD, DELTA, DICKINSON, EATON, EMMET, GLADWIN, GOGEBIC, GRAND TRAVERSE, GRATIOT, HILLSDALE, HOUGHTON, HURON, INGHAM, IONIA, IOSCO, IRON, ISABELLA, JACKSON, KALAMAZOO, KALKASKA, KENT, KEWEENAW,

LAKE, LAPEER, LEELANAU, LENAWEE, LUCE, MACKINAC, MANISTEE, MARQUETTE, MASON, MECOSTA, MENOMINEE, MIDLAND, MISSAUKEE, MONTCALM, MONTMORENCY, MUSKEGON, NEWAYGO, OCEANA, OGEMAW, ONTONAGON, OSCEOLA, OSCODA, OTSEGO, OTTAWA, PRESQUE ISLE, ROSCOMMON, SANILAC, SCHOOLCRAFT, SHIAWASSEE, SAGINAW, ST. CLAIR, ST. JOSEPH, TUSCOLA, VAN BUREN AND WEXFORD COUNTIES

AREA 2: GENESEE, LIVINGSTON, MACOMB, MONROE, OAKLAND, WASHTENAW AND WAYNE COUNTIES

	Rates	Fringes
Sign Installer		
AREA 1		
GROUP 1.....	\$ 21.78	11.83
GROUP 2.....	\$ 25.27	11.8375
AREA 2		
GROUP 1.....	\$ 22.03	11.83
GROUP 2.....	\$ 25.02	11.8375

FOOTNOTE:

a. \$132.70 per week, plus \$17.80 per day.

SIGN INSTALLER CLASSIFICATIONS:

GROUP 1: performs all necessary labor and uses all tools required to construct and set concrete forms required in the installation of highway and street signs

GROUP 2: performs all miscellaneous labor, uses all hand and power tools, and operates all other equipment, mobile or otherwise, required for the installation of highway and street signs

 TEAM0247-010 04/01/2018

AREA 1: LAPEER AND SHIAWASSEE COUNTIES

AREA 2: GENESEE, MACOMB, MONROE, OAKLAND, ST. CLAIR, WASHTENAW AND WAYNE COUNTIES

	Rates	Fringes
TRUCK DRIVER (Underground construction)		
AREA 1		
GROUP 1.....	\$ 23.82	19.04
GROUP 2.....	\$ 23.91	19.04
GROUP 3.....	\$ 24.12	19.04
AREA 2		
GROUP 1.....	\$ 24.12	19.04
GROUP 2.....	\$ 24.26	19.04
GROUP 3.....	\$ 24.45	19.04

PAID HOLIDAYS: New Year's Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day and Christmas Day.

SCOPE OF WORK: Excavation, site preparation, land balancing, grading, sewers, utilities and improvements; also including but not limited to, tunnels, underground piping, retention,

oxidation, flocculation facilities, conduits, general excavation and steel sheeting for underground construction. Underground construction work shall not include any structural modifications, alterations, additions and repairs to buildings or highway work, including roads, streets, bridge construction and parking lots or steel erection.

TRUCK DRIVER CLASSIFICATIONS

GROUP 1: Truck driver on all trucks (EXCEPT dump trucks of 8 cubic yards capacity or over, pole trailers, semis, low boys, Euclid, double bottom and fuel trucks)

GROUP 2: Truck driver on dump trucks of 8 cubic yards capacity or over, pole trailers, semis and fuel trucks

GROUP 3: Truck driver on low boy, Euclid and double bottom

SUMI2002-001 05/01/2002

	Rates	Fringes
Flag Person.....	\$ 10.10	0.00
LINE PROTECTOR (ZONE 1: GENESEE, MACOMB, MONROE, OAKLAND, WASHTENAW AND WAYNE)....		
	\$ 18.98	12.85
LINE PROTECTOR (ZONE 2: STATEWIDE (EXCLUDING GENESEE, MACOMB, MONROE, OAKLAND, WASHTENAW AND WAYNE).....		
	\$ 17.14	12.85
Pavement Marking Machine (ZONE 1: GENESEE, MACOMB, MONROE, OAKLAND, WASHTENAW AND WAYNE COUNTIES)		
Group 1.....	\$ 25.74	12.85
Pavement Marking Machine (ZONE 1: GENESEE, MACOMB, MONROE, OAKLAND, WASHTENAW AND WAYNE)		
Group 2.....	\$ 23.17	12.85
Pavement Marking Machine (ZONE 2: STATEWIDE (EXCLUDING GENESEE, MACOMB, MONROE, OAKLAND, WASHTENAW AND WAYNE COUNTIES)		
Group 1.....	\$ 23.67	12.85
Pavement Marking Machine (ZONE 2: STATEWIDE (EXCLUDING GENESEE, MACOMB, MONROE, OAKLAND, WASHTENAW AND WAYNE)		
Group 2.....	\$ 21.30	12.85

WORK CLASSIFICATIONS:

PAVEMENT MARKER GROUP 1: Drives or operates a truck mounted striper, grinder, blaster, groover, or thermoplastic melter

for the placement or removal of temporary or permanent pavement markings or markers.

PAVEMENT MARKER GROUP 2: Performs all functions involved for the placement or removal of temporary or permanent pavement markings or markers not covered by the classification of Pavement Marker Group 1 or Line Protector.

LINE PROTECTOR: Performs all operations for the protection or removal of temporary or permanent pavement markings or markers in a moving convoy operation not performed by the classification of Pavement Marker Group 1. A moving convoy operation is comprised of only Pavement Markers Group 1 and Line Protectors.

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were

prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination

- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION"

NOTICE TO BIDDERS
LETTING OF JANUARY 10, 2020
ADDENDUM “B”

This Addendum changes the terms of the Bid Proposal and/or plans associated with the project indicated below. By submitting a bid, any and all changes included in this Addendum are made a part of the contract.

ITEM NUMBERS: 001, 004, 010, 013, and 032

CHANGES TO PROPOSAL OR PLANS (e-PROPOSAL)

In this addendum, page numbers refer to the electronic proposal and/or plans (if separate) published on the MDOT e-Proposal website. (www.michigan.gov/mdot-eprop)

When instructions are for additions, deletions or revisions are made to a non-bid item (e.g., progress clause, unique special provision, plan sheet detail), revised page(s) will be included in the issued Addendum and **MUST** be considered in developing a bid.

CHANGES TO ELECTRONIC BID (EXPEDITE BID)

If an electronic addendum (e.g., .001, .002, etc.) is issued to warrant changes that occur to the Schedule of Items page(s) referenced by this addendum, apply the electronic addendum to the electronic proposal (EBS proposal file). **NOTE:** Bids cannot be electronically submitted without applying any and all numeric type electronic addenda issued for this project item.

Acknowledge any and all addendums (both alpha and numeric type) in the Addendum Acknowledgement folder prior to submitting the electronic bid.

FAILURE TO CARRY OUT THE INSTRUCTIONS IN THIS ADDENDUM MAY RESULT IN THE REJECTION OF YOUR BID.

Prospective bidders of the above-referenced item numbers are hereby advised of the following:

Proposal

1. **REPLACE** 12SP-501U-08, titled “SPECIAL PROVISION FOR SUPERPAVE HOT MIX ASPHALT PERCENT WITHIN LIMITS”, dated 06-14-19, **WITH REVISED** 12SP-501U-09, titled “SPECIAL PROVISION FOR SUPERPAVE HOT MIX ASPHALT PERCENT WITHIN LIMITS”, dated 12-13-19.

This change was requested by Construction Field Services.

Paul C. Ajegba, Director
Michigan Department of Transportation

Lansing, Michigan
Date: 12/26/2019

MICHIGAN
DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION
FOR
SUPERPAVE HOT MIX ASPHALT PERCENT WITHIN LIMITS

CFS:KPK

1 of 29

APPR:CJB:DBP:12-13-19
FHWA APPR:12-13-19

a. Description. This special provision sets forth the quality control (QC) and quality assurance (QA) procedures that will be followed for acceptance of and payment for Superpave Hot Mix Asphalt (HMA). Except as explicitly modified by this special provision, all materials and HMA mixture requirements of the standard specifications and the contract apply.

Delete subsection 501.03.N.2.b of the Standard Specifications for Construction.

1. Terminology.

Alternate Density Acceptance. Density acceptance criteria for applications where standard coring cannot be performed due to core thickness requirements. Alternate density acceptance applies to Hand Patching, Joint Repairs, Driveways, Gores, and Widening less than or equal to 5 feet. Scratch Course density is accepted using Alternate Acceptance In-Place Density Method if the application rate does not meet the minimum core thickness per section f.5 of this special provision.

Base Price. Price established by the Department to be used in calculating incentives or adjustments to pay items and shown in the contract.

Binder Content. The percent by weight of asphalt cement in the total mixture.

Bulk Specific Gravity of Aggregate (G_{sb}). The ratio of the oven dry weight in air of a unit volume of an aggregate at a stated temperature to the weight of an equal volume of water at a stated temperature.

Effective Specific Gravity (G_{se}). The ratio of the oven dry weight in air of a unit volume of an aggregate (excluding voids permeable to asphalt) at a stated temperature to the weight of an equal volume of water at a stated temperature.

HMA Design. The selection and proportioning of aggregate(s), mineral filler (if required), reclaimed asphalt pavement (RAP), and asphalt binder to meet mixture design criteria.

Initial Production Lot. A process used in which HMA Production for specific HMA mixtures and HMA plants are limited to 400 to 1000 tons per day for a maximum of 3 (consecutive or separate) days and 400 to 750 tons for the fourth and subsequent days until it is determined that HMA Production has met the requirements in section e of this special provision, prior to moving into Unlimited Daily HMA Production.

Job Mix Formula (JMF). An HMA Design for a specific project. This may include adjustments to the mix design to optimize the field application.

Lot. A lot is made up of a discrete tonnage of one mixture. Each lot is typically made up of five sublots.

Maximum Specific Gravity of Mixture (G_{mm}). The ratio of the weight in air of a unit volume of an un-compacted HMA at a stated temperature to the weight of an equal volume of water at a stated temperature.

Outlier. A value identified by the percent within limits (PWL) program that deviates markedly from test results for other samples from the same lot which will be investigated. Outlier applies only to core density evaluation.

Overall Lot Pay Factor (OLPF). Value to be used to determine the lot pay adjustment.

Overall Sublot Pay Factor (OSPF). Value to be used to determine the sublot pay adjustment when Single Test Acceptance (STA) is used.

Percent Within Limits (PWL). The percentage of material within the specification limits or tolerance for a given quality index parameter.

Quality Assurance (QA). All activities dealing with acceptance of the product, including but not limited to materials sampling, testing, construction inspection, and review of Contractor QC documentation. The Engineer's HMA QA procedures are contained in *HMA Production Manual* and in the HMA-QA Plan.

QA Lot Acceptable Quality Limits (AQL) (Table 4 Col. VI). PWL value for an individual quality index parameter that will still result in a PF of 100 for that quality index parameter. AQLs are specified in Table 4.

QA Lot Rejectable Quality Limits (RQL) (Table 4 Col. VII). PWL value for an individual quality index parameter that will result in either a PF = 50; remove and replace or corrective action plan. RQLs are specified in Table 4.

QA Sublot Rejectable Quality Limits (RQL) (Table 4 Col. V). A range of values defined in Table 4 that, if exceeded on a single QA test may result in the Engineer issuing a Notice of Non-Compliance with Contract Requirements (Form 1165).

QA Suspension Limits (Table 4 Col. IV). A range of values defined in Table 4 that, if exceeded may result in the Engineer issuing a Notice of Non-Compliance with Contract Requirements (Form 1165).

Quality Characteristic (Table 4 Col. I). The material and mixture characteristics of HMA that are deemed to have direct bearing on the quality and performance of the HMA pavement and for which specification limits have been established.

Quality Control (QC). All activities dealing with process control to ensure quality, including but not limited to training, materials sampling, testing, project oversight and documentation. The Contractor's HMA QC procedures are contained in the HMA-QC Plan.

QC Action Limits (Table 4 Col. II). A range of values established by the Contractor in the HMA-QC Plan or specified in Table 4 that, if exceeded on two consecutive QC tests, requires that the Contractor take corrective action to bring the mixture produced into conformance with the specifications.

QC Suspension Limits (Table 4 Col. III). A range of values established by the Contractor in the HMA-QC Plan or specified in Table 4 that, if exceeded on a single QC test, requires that the Contractor suspend operations and determine, document and correct the cause before continuing production.

Quality Index Parameter. The HMA quality characteristics that are evaluated under the Department's QA Acceptance Program and on which payment for HMA material is based. The Quality Index Parameters for this project are VMA, Air Voids, Binder Content, and In-Place Density.

Rounding of Numbers and Significant Figures. Rounding of numerical data will follow the Rounding Method as described in the *HMA Production Manual* and the associated *MTMs*.

Single Test Acceptance(STA). Acceptance criteria for non-PWL applications as outlined in section f.9 of this special provision.

Sublot. A portion of a lot or an individual sample that is represented by a complete set of QA tests. Sublots will be approximately equal size of 1000 tons. The Contractor and the Engineer may agree to reduce the typical 1000 ton sublots based on project staging or other project conditions.

Target Value. A JMF parameter value which may be adjusted, if approved by the Engineer, to account for changes in the physical properties of the mixture.

Unlimited Daily HMA Production. Unrestricted daily HMA production tonnage.

Vibratory Exclusion Areas. An area of inadequate base condition shown on the plans; or identified by the Contractor and Engineer prior to or during the paving operation; or an area having conditions that are sensitive to vibration as determined by the Engineer. In these areas, during field production Percent of Maximum Specific Gravity (%G_{mm}) at the design number of gyrations, (N_d) will be increased to 97.5 percent. The area, if limited, will be accepted using the STA methodology. If the area is large enough to constitute a Lot, it will be accepted using standard PWL acceptance criteria. The contract requirements for density still apply. Any additional asphalt cement required for regression will be included in the base price bid for that particular mix if the areas are identified on the plans. For areas not identified on the plans there will be no compensation for the additional asphalt if the total tonnage for vibratory exclusion areas are under 1000 tons. Oscillatory rollers are allowed in vibratory exclusion areas as long as the vibratory mode is turned off.

Voids in Mineral Aggregate (VMA). The volume of void space between the aggregate particles of a compacted paving mixture that includes the air voids and the asphalt binder not absorbed into the aggregate, expressed as a percent of the total volume of mixture.

2. Partnering Sessions. The Engineer will schedule a pre-production meeting 3 to 28 calendar days prior to the start of production. The Engineer will provide written notification to all parties a minimum of 14 calendar days prior to the meeting.

Discussion at the pre-production meeting will cover the following:

- The HMA-QC Plan
- The HMA-QA Plan
- The roles and responsibilities of all parties involved in the work covered by this special provision
- The elected binder content procedure.

Notify the Engineer in writing a minimum of 7 calendar days prior to production which method per mix design is selected for binder content determination: ignition method or vacuum extraction. For each mix, the method approved will be used exclusively throughout the project for QA acceptance, including Dispute Resolution.

Department personnel attending the meetings will include the following:

- MDOT Project or Resident Engineer
- Field inspector for the project
- All Traveling Mix Inspectors [TMI(s)] with responsibility for this project
- Any consultant involved in any part of the HMA sampling or testing on this project

Contractor personnel attending the partnering meetings will include the following:

- Project Superintendent
- HMA-QC Plan Administrator
- Any subcontractor involved in any part of the HMA QC sampling or testing on this project

b. Contractor Quality Control. Be responsible for the quality of the HMA produced and placed on this project and perform QC sampling and testing, provide inspection, and exercise management control to ensure that work conforms to the contract requirements. Perform all testing in accordance with the accepted HMA-QC Plan. Provide the Engineer the opportunity to observe sampling and testing. Sample, test, and evaluate all HMA mixtures in accordance with the requirements of this special provision.

Develop and follow an HMA-QC Plan for HMA production and placement as required by the *HMA Production Manual* and herein. Utilize personnel and testing equipment capable of providing a product that conforms to contract requirements. Do not start work on the subject items without an accepted HMA-QC Plan.

Perform QC sampling, testing, and inspection during all phases of the work at the minimum guidelines specified for that item or at an increased frequency sufficient to ensure that the work conforms to the contract requirements. Continual production of nonconforming material at a reduced price in lieu of making adjustments to bring material into conformance is prohibited.

The Engineer will not sample or test for QC or assist in controlling the HMA production and placement operations. The results of department QA testing may not be available for use in QC activities and should not be included in the HMA-QC Plan discussion.

1. HMA-Quality Control Plan. Develop and follow an HMA-QC Plan that addresses personnel; sampling and testing equipment and calibration records; supplies and facilities for obtaining samples, performing tests, and documenting results; and other activities to control the quality of the product to meet contract requirements. Include methodology for addressing material that appears to be inconsistent with similar material being sampled. Perform all QC sampling and testing according to the *HMA Production Manual* and herein unless specifically documented in the HMA-QC Plan and discussed at the pre-production meeting.

A. Plan Submittal. Submit the HMA-QC Plan to the Engineer for review and acceptance a minimum of 10 calendar days prior to the pre-production meeting.

B. Plan Acceptance. Revisions to the HMA-QC Plan may be required by the Engineer prior to its acceptance. The Engineer will request plan revisions in writing prior to or the day of the pre-production meeting. If revisions are required by the Engineer, these revisions must be made and the HMA-QC Plan accepted before HMA production or placement commences.

Acceptance of the HMA-QC Plan does not imply any warranty by the Engineer that the HMA-QC Plan will result in production of HMA that complies with all contract requirements. It remains the responsibility of the Contractor to demonstrate such compliance.

C. Plan Modification. The HMA-QC Plan may be refined or modified as work progresses. Such refinements or modifications are subject to review and acceptance by the Engineer.

2. HMA-Quality Control Plan Contents. Include the following specific items in the HMA-QC Plan.

A. Quality Control Organization. Include an organization chart showing key personnel involved in production, placement, compaction, and QC for this project. Provide the names of the HMA-QC Plan Administrator and Quality Control Technician(s) [QCT(s)]. Clearly identify all subcontractor personnel involved in HMA QC.

Maintain consistency in the QC organization throughout the life of the project to the extent practicable. Substitution of qualified personnel is allowed provided that the names are forwarded to the Engineer and approved by the Engineer prior to the substitution.

B. Quality Control Personnel Qualifications and Responsibilities. Provide the qualifications of each individual or position listed on the organization chart and a brief narrative of their area of responsibilities. Describe the coordination of the activities of the Plan Administrator and the QCT(s).

(1) Plan Administrator. This individual will be responsible for administering the HMA-QC Plan and will institute any actions necessary to successfully implement the HMA-QC Plan.

(2) Quality Control Technicians (Plant). All equipment calibration; QC sampling and testing; and QC documentation must be performed by qualified technicians. Document the certification of all QCT(s) through the Michigan Bituminous QC/QA Technician Certification Program or other approved program.

(3) Placement Personnel. Identify the personnel that will be responsible for inspecting all transport, lay down and compaction equipment to ensure it is operating properly and for verifying that all lay down and compaction conforms to the contract requirements.

C. HMA Mix Design. Provide the approval status and a copy of the HMA mix design for all HMA mixtures to be produced for this contract and the plant location for production of each mixture.

D. Quality Control Sampling and Testing. Develop and include the schedule of QC testing for the quality characteristics shown in Table 1. For each quality characteristic listed, define test method; minimum sampling and testing frequency; when the sampling and testing will be performed in relationship to production; and sampling location. Describe the random sampling method used.

Minimum QC sampling locations must be determined independently from QA sampling locations. In addition to the minimum QC sampling required by Table 1, additional non-random QC testing may be included in the HMA-QC Plan, except as otherwise specified.

E. Quality Control Laboratory Facilities. Provide the location of the testing facilities and include a copy of the plant certification. All laboratories that are used to prepare HMA mix designs or perform QC testing of HMA materials must demonstrate that they are equipped, staffed, and managed so as to be capable of mixing and testing HMA in accordance with the applicable test methods.

F. Corrective Action. Tables 2 and 4 specify the action limits and/or list the quality characteristics for which action limits must be defined in the HMA-QC Plan. Complete and include Tables 2 and 4 with the QC Action Limits defined as indicated. Describe the procedures that will be followed to ensure that test results are properly reviewed and that corrective action, based on the test results, is taken and documented when necessary to control HMA quality.

G. Suspension of Production. Table 4 specifies the QC Suspension Limits. Discuss the steps to be taken when any suspension criteria is met. Steps must include notifying the Engineer and making all necessary corrections whenever production is suspended. Include discussion of the following suspension criteria, as a minimum.

(1) QC Suspension limits specified in Table 4 Col. III for any of the quality characteristics that are exceeded.

(2) The PWL for VMA, Air Voids, Binder Content, or In-Place Density is below 50 for any lot.

(3) The HMA-QC Plan is not followed.

(4) Visible pavement distress occurs such as segregation or flushing.

(5) Additional QC suspension criteria may be included.

H. Control Charts. Discuss the use of control charts for all quality characteristics listed in Table 1. Include examples of the control charts to be used. As a minimum, the control charts must identify the project number, the pay item code, the test number, test parameter, the specification limits, the action limits, suspension limits, and the test results. Keep the control charts current and available in an accessible location at the laboratory facility.

I. Plant Reports. At the request of the Engineer, provide copies of plant certification and electronic daily cumulative project tonnage report.

c. Quality Control Sampling and Testing During Production.

1. Fifteen cores approximately 6 inches in diameter will be allowed per lot of material for QC of In-Place Density.

2. At the time any QA or QC cores are taken, remove free standing water from the core hole; apply tack coat to the interior of the core hole, fill with hot mixture, and compact. Obtain and document approval for the type of mix to be used for filling holes and for obtaining compaction at the pre-production meeting.

3. At the time any QA or QC sample is collected from behind the paver, provide and place loose mixture according to *MTM 324* or as directed by the Engineer.

4. In addition to maintaining test reports and control charts, enter all QC data into the PWL Program that can be downloaded from the Construction and Technology web site, provide the results to the Engineer as they become available. QA results will not be provided to the Contractor until corresponding QC results are submitted to the Engineer. If production is truncated and the random QC sample has not been obtained then the QA results will be provided to the Contractor.

5. Sample and test the plant produced material in accordance with the approved HMA-QC Plan.

d. HMA-Quality Assurance Plan. The Engineer will develop and follow an HMA-QA Plan. The Engineer will submit the HMA-QA Plan to the HMA-QC Plan Administrator a minimum of 7 calendar days prior to the pre-production meeting. The HMA-QA Plan will be reviewed at the pre-production meeting and any proposed changes will be documented.

All QA sampling and testing will be performed according to the *HMA Production Manual* and herein unless specifically documented in the HMA-QA Plan and discussed at the pre-production meeting. The Engineer will provide the Contractor the opportunity to observe QA sampling and testing. The following specific items will be included in the HMA-QA Plan.

1. Quality Assurance Organization. Key personnel involved in sampling, testing, construction inspection, review of QC, and QA management will be identified. The names of the Engineer, support staff, and Quality Assurance Technician(s) [QAT(s)] involved in HMA QA for this project will be included along with phone numbers, fax numbers, and e-mail addresses. The Engineer will notify the HMA-QC Plan Administrator of any deletions or additions to the HMA QA team.

2. Quality Assurance Personnel Qualifications and Responsibilities. The HMA-QA Plan will include a brief narrative of the area of responsibilities of each HMA QA team member and will describe the coordination of the activities of the Engineer, support staff and the QAT(s).

A. HMA-Quality Assurance Plan Administrator. The Engineer will be responsible for administering the HMA-QA Plan and will institute any actions necessary to successfully implement the HMA-QA Plan.

B. Quality Assurance Technicians. All QA and testing; and QA documentation will be performed by qualified technicians, as defined in the *HMA Production Manual*. All QAT(s) will be certified through the Michigan Bituminous QC/QA Technician Certification Program or other approved program. Certifications required for QAT(s) will be included in the project files.

C. Construction Personnel. The personnel responsible for field inspection and for obtaining QA samples will be identified. Certifications/qualifications required for individuals collecting QA samples will be included in the project files.

D. Laboratory Facilities. The testing facilities with responsibility for QA testing on this project will be identified. All laboratories that perform QA testing of HMA materials must demonstrate that they are equipped, staffed, and managed so as to be capable of testing HMA in accordance with the applicable test methods.

e. Initial Production Lot (IPL) Procedure. The purpose of the IPL is:

- To verify that the produced mixture is within specification limits.
- To verify test results, procedures, and equipment used are capable of generating QC test results that agree with QA results to within allowable tolerances.
- To establish roller patterns that will achieve the desired compaction results.

Prior to proceeding with unlimited daily HMA production the Contractor must meet the acceptance requirements of section e.3.D of this special provision. The IPLs will be placed on the jobsite at locations including: mainline, shoulders, temporary pavement, detour paving or other mutually agreed upon locations within the jobsite. Substitution of an equal or better mix may be allowed at an alternate location than specified for purposes of an IPL. There will be no unit price adjustment from the original plan pay items other than quality adjustments as noted in section k of this special provision. An alternate location off the jobsite at no cost to the Department may be allowed.

The In-Place Density QC Suspension Limits (Table 4 Col. III) do not apply to IPLs.

1. JMF Adjustment Requests. JMF adjustments may be requested prior to the IPL run based on test data submitted from previous use of the approved mix designs. The previous usage may be on commercial, local agency, or state construction projects. JMF adjustments may also be requested based on the IPL(s) results.

JMF adjustments will be in accordance with the *HMA Production Manual's* section on PROCEDURES FOR JOB MIX FORMULA ADJUSTMENTS. All JMF adjustments must meet Superpave mix design requirements and consensus properties.

2. Initial Production Lot (IPL). An IPL will consist of one day of HMA production ranging from 400 tons to 1000 tons. Each IPL will be evaluated as a single lot. The Contractor will be allowed to construct three IPLs for a given mixture. The mixture will be subject to pay adjustments and/or removal based on test results for a complete IPL.

3. Initial Production Lot (IPL) Sampling and Testing. Each IPL will consist of four approximately equal sublots.

A. The Engineer will:

(1) Collect one 45,000 gram IPL split sample per subplot, and provide the Contractor with splits of all subplot samples, for testing of all quality characteristics listed in Table 1. These split sample test results will be evaluated using the current lab correlation procedure found in the *HMA Production Manual*. The Department's split portion will be used as the QA acceptance test.

(2) Collect one independent 20,000 gram sample per subplot using the same random number as the 45,000 gram sample for possible dispute resolution of the IPL results.

(3) Locate and mark four random core locations per subplot, take possession of the cores when extracted by the Contractor and test the In-Place Density.

(4) Complete all tests and report all results to the Contractor within 48 hours of the time of sampling. When consecutive IPLs are placed and the test results from the first passing IPL result in the Contractor moving into full production then the Engineer will have 4 calendar days to complete the tests for the remaining IPL(s).

B. The Contractor must:

(1) Conduct tests on the IPL split sample collected by the Engineer for all QC quality characteristics listed in Table 1.

(2) Complete all tests and report all results to the Engineer within 48 hours of the time of sampling.

(3) Continue with production only when all of the conditions in subsections e.3.C and e.3.D of this special provision are met.

(4) Construct additional IPLs as required in subsection e.3.D of this special provision.

C. The current lab Correlation Procedure in the *HMA Production Manual* will be used to evaluate the Contractor's and the Engineer's test results for IPL split samples.

If the IPL split subplot sample test results do not correlate, the Contractor and the Engineer will jointly review the results, check equipment and review the test procedures for all testing laboratories to determine if there is an identifiable cause for the discrepancy; recalibrate equipment; and arrange for independent assurance sampling and testing reviews for the QAT(s) and QCT(s), if necessary, before continuing with production or conducting tests on a subsequent IPL. If the vacuum extraction process is used to

determine the binder content, the Engineer and Contractor will communicate the number of washes used.

D. The Contractor will be allowed to construct up to three IPLs for a given mixture on three separate days. After the third IPL is constructed, paving will be suspended unless the requirements for moving into Unlimited Daily Production have been achieved as outlined below.

Prior to proceeding with full HMA production, the PWL value for each measured QA property (In-Place Density, Air Voids, Binder Content and VMA) for an IPL must be equal to or greater than 80 or the OLPF is equal to or greater than 100.

If the first IPL does not achieve a PWL value equal to or greater than 80 for each measured QA property or the OLPF is not equal to or greater than 100, the acceptance and payment for the tonnage of material for the first IPL will be adjusted as described in sections k and m of this special provision.

If the second IPL for the mixture does not achieve a PWL value equal to or greater than 80 for each measured QA property or the OLPF is not equal to or greater than 100, the acceptance and payment for the tonnage of material for the second IPL will be adjusted as described in sections k and m of this special provision.

If the third IPL does not achieve a PWL value equal to or greater than 80 for each measured QA property or the OLPF is not equal to or greater than 100, the acceptance and payment for tonnage of material for the third IPL will be adjusted as described in sections k and m of this special provision.

The Contractor will produce a fourth IPL that will be approximately 400-750 tons and will consist of four approximately equal sublots. If the fourth or any subsequent IPL does not achieve a PWL value equal to or greater than 80 for each measured QA property or the OLPF is not equal to or greater than 100, then it will be removed and another IPL will be attempted.

All costs associated with this removal and replacement will be borne by the Contractor.

MDOT will complete all IPL tests and report all results to the Contractor within 48 hours of the time of sampling.

IPLs that are interrupted due to project level conditions such as plant or equipment breakdown, weather shutdown, etc. are still counted as an IPL. These interrupted IPLs will be accepted in accordance with subsection f.9 (STA Testing) of this special provision, if there have been less than 3 sublots placed.

E. The IPLs can be waived and the Contractor allowed to go to Unlimited Daily Production if all of the following criteria are met:

- (1) The mix design has passed IPL requirements on another project from the current or prior season and a Gsb verification sample has been submitted to the MDOT Construction Field Services Laboratory Mix Design Unit and the mix design has been approved for use. If a waiver was used on the prior season then the IPL will not be waived for the current season.

(2) On the previous project, an overall PWL value of 85 for each QA value was achieved for the last two full (or last full production lot if there were fewer than 2 full production lots) lots of production or an OLPF of equal to or greater than 100 was achieved.

(3) The mix is produced from the same plant and location that was used on the previous project.

f. Quality Assurance Sampling and Testing. Acceptance of HMA is the responsibility of the Engineer and will be accomplished by conducting QA sampling and testing, monitoring the Contractor's adherence to the HMA-QC Plan, and inspection of field placed material (see section 104 of the Standard Specifications for Construction). The Engineer will notify the Contractor prior to conducting QA sampling. This notification will be done in a manner that allows the Contractor to witness the sampling but does not provide for the opportunity for the Contractor to alter their production in anticipation of a sample being taken.

1. Random Sampling. Except as modified herein, QA sample locations will be determined as outlined in Section 1.06 of the *Materials Quality Assurance Procedures Manual*.

A. Prior to the pre-production meeting, the Engineer will generate three columns of random numbers using a computer spreadsheet program or a calculator. The random numbers will be used for the longitudinal and the transverse measurement for determining the core location.

For HMA mixture sample location, use the random number from the third column, then multiply it by subplot tonnage. An excess amount of random numbers will be generated to take into account overruns or any situation where another random number is required.

B. At the pre-production meeting, each page that lists random numbers, with the numbers covered by a separate sheet of paper, will be presented to be signed by the HMA-QC Plan Administrator and the Engineer.

C. The original signed list will be placed in the project file and a copy will be provided to the field inspector for the project.

D. Random numbers and associated field calculations for completed sublots will be provided to the Contractor upon request.

2. Production Lot size. Each lot will be divided into sublots of approximately equal size but not greater than 1000 tons.

If only one or two sublots remain at the end of production of a mixture, the test results for these sublots will be combined with the previous lot for evaluation of PWL and PF.

3. Plant Produced Material (Mixture) Quality Assurance Sampling. Location of QA sample sites within each subplot will be by a random process managed by the Engineer. Immediately after the Engineer acquires the samples, fill the voids with HMA in accordance with *MTM 324*.

The Engineer will sample the mixture in accordance with *MTM 324* or *MTM 313*, Sampling HMA Loose Mix from Mini-stockpile., collecting two separate 20,000 gram samples at each sample site. These are the QA and dispute resolution samples. The Engineer will assign an identifier to each sample consisting of contract ID, mixture, lot and subplot and deliver the samples to the testing facility identified in the HMA-QA Plan where one will be tested and the other retained for possible Dispute Resolution testing.

Sampling for wedging operations will be in accordance with *MTM 313*, Sampling HMA Loose Mix from Mini-stockpile.

4. Plant Produced Material (Mixture) Quality Assurance Testing. Plant produced material acceptance testing will be completed by the Engineer within 4 calendar days after the Engineer has taken the samples from the project site. The Engineer will conduct the following tests.

- A. Maximum Specific Gravity, G_{mm} (*MTM 314*)
- B. Bulk Compacted Density, N_{des} (*AASHTO T312-08*)
- C. Air Voids, N_{ini}^* , N_{des} , (*AASHTO R35-04*) (* for information only)
- D. Voids in Mineral Aggregate, VMA (*AASHTO R35-04*)
- E. Voids Filled with Asphalt, VFA* (*AASHTO R35-04*) (* for information only)
- F. Ratio of Fines to Effective Asphalt Binder, $P_{\#200}/P_{be}$
- G. Composition of the Mixture (Using one of the following methods)

Method 1. Asphalt binder content based on ignition method (*MTM 319*). Gradation (*ASTM D 5444*) and Crushed particle content (*MTM 117*) based on aggregate from *MTM 319*. If method 1 is selected, the incineration temperature will be established at the Pre-Production Meeting. The Contractor will provide a laboratory mixture sample to the QA Acceptance Laboratory to establish the correction factor for each mix. This sample must be provided to the Engineer 14 calendar days prior to production.

Method 2. Asphalt binder content based on vacuum extraction by *MTM 325* and the "Checklist for HMA Mixture Analysis Vacuum Extraction", of the *HMA Production Manual*. Gradation (*ASTM D 5444*) and Crushed particle content (*MTM 117*) based on extracted aggregate from *MTM 325*.

The determination of which method will be used for each mix will be made by the Contractor at the pre-production meeting. The method selected cannot be changed during mix production without submitting a new mix design to the MDOT Construction Field Services HMA Laboratory for verification.

5. In-Place Density Quality Assurance Sampling. The Engineer will locate and mark all QA core locations. All QA coring operations will be completed by the Contractor including dispute resolution and subplot retest coring. The Engineer will test all QA cores. If, for any reason, a core is damaged or determined not to be representative at the time of coring, the Engineer will evaluate and document the problem and determine if re-coring is necessary.

Core sample locations will be marked after final rolling. Core sample locations will be marked at the completion of a subplot and cores will be taken, prior to traffic staging changes, or at another time that is independent of paving operations. Any exceptions must be approved by the Engineer. The Engineer will identify four core sample locations for each subplot based on longitudinal and transverse measurements. The Contractor will provide and pay for traffic control as required in the special provision for maintaining traffic for all coring procedures including dispute resolution and subplot retest coring.

The Engineer will mark each core location with a 2 inch diameter paint dot, paint marker, or keel, which represents the center of the core. When sampling behind the paver, cores will not be taken from 5 feet before the loose mixture sampling area through 5 feet after the loose mixture sampling area. If the random core location falls within these areas, new longitudinal and transverse random numbers will be selected and the core sample site moved to the new location. If the center of the core is less than 5 inches from either edge of pavement, another transverse random number will be selected and the core sample site moved to the new location.

Notify the Engineer in advance of coring to ensure that MDOT has a representative to witness the coring operation and take immediate possession of the cores. Drill a core sample approximately 6 inches in diameter at each core location. Do not damage cores during removal from the roadway. Measure cores at the time they are extracted from pavement.

Any core disqualified based on the minimum thickness criteria will be discarded and a new core location will be selected by the Engineer. If more than 50 percent of the cores in a lot are disqualified, production must stop. Production will not be allowed to continue until the Engineer has confirmed that the paving operation is meeting the contract application rate. All previous pavement, base aggregate or bond coat material will be sawed off the bottom of the core samples by the Engineer.

The minimum core thickness for each mixture type is:

Hot Mix Asphalt <u>Mixture No.</u>	Minimum Core <u>Thickness</u>
2	3 inch
3	2¼inch
4	1½inch
5	1¼inch
LVSP	1¼inch

A. Alternate Acceptance In-Place Density Method. Density acceptance for Hand Patching, Joint Repairs, Driveways, Scratch Course, and Widening/Tapers/Gores of less than or equal to 5 feet will be as follows. Density acceptance for these processes will be by density gauge. Establish the compaction effort for each pavement layer to achieve the required in place density values. After the final rolling, the Engineer will use a density gauge using the G_{mm} from the JMF for acceptance. A minimum of six random locations per subplot will be tested for density. If the average of the density values is equal to or greater than 92.00 percent of the G_{mm} , the pavement density will be accepted. If the average of the subplot density tests are less than 92.00 percent of the G_{mm} , the Contractor must take corrective action to achieve a minimum average of 92.00 of the G_{mm} . Density values will not be used in the PWL spread sheet; the alternate density application in the

drop-down of the PWL spread sheet should be selected.

Sampling will be in accordance with *MTM 313*, Sampling HMA Loose Mix from Mini-stockpile.

6. In-Place Density Quality Assurance Testing. Pavement In-Place Density acceptance testing will be completed by the Engineer within 4 calendar days after the Engineer has taken possession of the cores at the project site. Testing will be in accordance with *MTM 315*. The Engineer and Contractor will mutually agree to use either vacuum dry or oven dry method as outlined in *MTM 315*. This agreement will be documented at the Pre-production meeting. The Engineer's test results on the compacted HMA will be used as a basis of acceptance and payment.

At the completion of lot testing all individual tests for In-Place Density will be checked for apparent outliers in accordance with *ASTM E 178* at a significance level of 5 percent (following the example in subsection 6.2 of that standard). If a test result is determined to be an apparent outlier the doubtful value will be investigated.

This investigation will include, but may not be limited to, visual and physical examination of the core (i.e. short core, core damaged during transport or during laboratory handling); and a careful review of the sampling and testing procedure including data entry and calculations (i.e. was raw data transposed or incorrectly entered into test calculations). If no documentable reason is found for the apparent outlier, the value will remain as part of the In-Place Density PF calculations. If a documentable reason is found for the apparent outlier, the value will be discarded and the remaining test results will be used to calculate the In-Place Density PF.

7. Quality Assurance Stop Production Criteria. The Engineer may issue a Notice of Non-Compliance with Contract Requirements (Form 1165), if the Contractor has not suspended operations and taken corrective action. HMA production must stop when any one or more of the following criteria are met or exceeded:

A. The QA Suspension Quality Limits in Table 4 Col. IV is exceeded for consecutive QA tests for fines to effective binder or is exceeded for the lot average for effective specific gravity.

B. One or more of the QA Sublot Rejectable Quality Limits in Table 4 Col. V is exceeded for a single QA test.

C. The PWL for VMA, Air Voids, Binder Content or In-Place Density is below 50 when calculated according to section k of this special provision.

D. The HMA-QC Plan is not followed.

Resume production only after making all necessary adjustments to bring the mixture into conformance with all applicable specifications; documenting these adjustments as discussed in the HMA-QC Plan; and receiving a Notice to Resume Work (Form 1165) from the Engineer.

8. Sublot Removal and Replacement Criteria. Exceeding one or more of the QA Sublot Rejectable Quality Limits in Table 4 Col. V may result in removal and replacement of the associated sublot of material.

9. Single Test Acceptance (STA) Criteria. STA (for Density use the average of four cores) applies to specific mixtures between 500 and 5000 tons, and the following applications regardless of tonnage: Hand Patching, Joint Repairs, Driveways, Scratch Course, and Widening of less than or equal to 5 feet. The STA subplot size must not exceed 1000 tons. If a days production is less than 1000 tons the days tonnage will be considered a subplot. If a days production exceeds 1000 tons the tonnage will be divided into approximately equal subplot sizes. For hand patching with daily quantities of less than 200 tons, obtain 1 random STA sample for each day of production for up to 5 days of paving. One of the daily samples will be randomly selected and tested for acceptance. If the QA results are not subject to a negative price adjustment per section k, the test result may represent multiple days of paving (up to 5 days) at the discretion of the Engineer. The Engineer reserves the right to test the additional daily samples. All tested samples will have payment calculated according to section k. If the QA results are subject to a negative price adjustment per section k, all random STA samples will be tested and payment calculated in accordance with section k. For individual mix quantities of 500 tons or less, Visual Inspection (*Materials Quality Assurance Procedures Manual* Section 1.07) may be used in lieu of STA. Sampling will be in accordance with *MTM 324* or *MTM 313*, Sampling HMA Loose Mix from Mini-stockpile. The IPL requirements of section e of this special provision will not apply to STA. Table 4 will not apply to STA. Dispute Claim Process will be in accordance with sections g and h of this special provision. All QA sampling and testing procedures and acceptance criteria described in this special provision will apply. Payment will be in accordance with section l of this specification.

Sampling will be in accordance with the provisions stated herein or *MTM 313* where applicable.

g. Dispute Resolution Process for Plant Produced Material (Mixture).

1. Lot Dispute Resolution.

A. Lot Dispute Resolution Criteria. The QA results for a lot, including an initial production lot, may be eligible for Dispute Resolution only if the PF for Air Voids, Binder Content, or VMA based on the QC test results is larger than the corresponding PF for Air Voids, Binder Content, or VMA based on the QA test results. Only independent random QC test results from the corresponding sublots in the lot under Dispute Resolution will be used by the Engineer when processing the Dispute Resolution request. The QC testing and sampling used for Dispute Resolution must be conducted in the same manner as the QA testing. The Dispute Resolution test results will replace the QA test results and the PF for Air Voids, Binder Content, VMA and In-Place Density will be recomputed based on the Dispute Resolution sample test results.

B. Dispute Resolution Schedule.

(1) Request for Mixture Dispute Resolution testing must be submitted in writing within 2 working days of receipt of the lot Mixture test results.

(2) The request for Dispute Resolution must include the QC test results for the lot. A signed statement certifying that the QC test results are true and accurate must accompany the request for Dispute Resolution.

(3) The Engineer will document receipt of the request for Dispute Resolution and will deliver the Dispute Resolution samples to the MDOT Construction Field Services HMA Laboratory within 2 working days of the receipt of the request.

(4) The MDOT Construction Field Services HMA Laboratory will complete all Dispute Resolution testing and return test results to the Engineer within 13 calendar days upon receiving the Dispute Resolution samples.

C. Dispute Resolution Testing Process.

(1) All subplot dispute resolution samples will be tested for all mix properties. Binder Content will be determined using the method specified by the Contractor for the specific mix.

(2) All dispute resolution results will replace original QA test results.

(3) The OLPF and the lot pay adjustment for the lot under Dispute Resolution will be recalculated.

(4) If the recalculated OLPF is less than or equal to the original QA OLPF, all costs associated with completing the Dispute Resolution sample testing will be borne by the Contractor.

(5) If the recalculated OLPF is greater than the original QA OLPF, all costs (excluding traffic control) associated with completing the Dispute Resolution sample testing will be borne by the Department.

2. Sublot Retest. If any one or more QA subplot RQL (Table 4 Column V) is exceeded, the Engineer will direct the corresponding subplot Dispute Resolution sample to be tested and the results will be substituted for the QA results for Air Voids, Binder Content and VMA. The PFs for Air Voids, VMA, Binder Content and Density will be recomputed. Sublot Retest can be waived if the QA test results are agreed upon by the Engineer and Contractor. All costs associated with completing the Sublot Retest testing will be borne by the Department.

3. Single Test Acceptance Dispute Resolution

A. Single Test Acceptance Dispute Resolution Criteria. The QA results for a STA subplot, may be eligible for Dispute Resolution only if the OSPF from independent random QC test results from the corresponding subplot is 5 percent or larger than the OSPF for QA results. The PFs for Air Voids, VMA, Binder Content and Density will be recomputed based on the results of the dispute sample. If the recalculated OSPF is greater than the original QA OSPF, all costs (excluding traffic control) associated with completing the Dispute Resolution sample testing will be borne by the Department.

B. Dispute Resolution Schedule.

(1) Request for Mixture Dispute Resolution testing must be submitted in writing within 2 working days of receipt of the lot Mixture test results.

(2) The request for Dispute Resolution must include the QC test results for the lot. A signed statement certifying that the QC test results are true and accurate must accompany the request for Dispute Resolution.

(3) The Engineer will document receipt of the request for Dispute Resolution and will deliver the Dispute Resolution samples to the MDOT Construction Field Services HMA Laboratory within 2 working days of the receipt of the request.

(4) The MDOT Construction Field Services HMA Laboratory will complete all Dispute Resolution testing and return test results to the Engineer within 13 calendar days upon receiving the Dispute Resolution samples.

C. Dispute Resolution Testing Process.

(1) Sublot dispute resolution samples will be tested for all mix properties. Binder Content will be determined using the method specified by the Contractor for the specific mix.

(2) All dispute resolution results will replace original QA test results.

(3) The OSPF for the sublot under Dispute Resolution will be recalculated.

h. Dispute Resolution Process for In-Place Density

1. Lot Dispute Resolution.

A. Lot Dispute Resolution Criteria. The QA In-Place Density results for a lot, including an initial production lot, may be eligible for Dispute Resolution if the lot PF for In-Place Density based on the QC test results is larger than the corresponding PF based on the QA test results. Only independent random QC test results (minimum of two random sublot cores from each sublot) from the corresponding lot under Dispute Resolution will be used by the Engineer when processing the Dispute Resolution request. The Dispute Resolution test results will replace the QA test results and the lot PF for In-Place Density will be recomputed based on the Dispute Resolution sample test results.

B. Dispute Resolution Schedule.

(1) Request for In-Place Density Dispute Resolution testing must be submitted in writing within 2 working days of receipt of the lot In-Place Density test results.

(2) The request for Dispute Resolution must include the QC test results for the lot. A signed statement certifying that the QC test results are true and accurate must accompany the request for Dispute Resolution.

(3) The Engineer will document receipt of the request for Dispute Resolution.

(4) The Engineer will check the lot In-Place Density test results for data entry and mathematical errors. If there are errors, the lot PF for In-Place Density will be recomputed on the recalculated test results.

(5) If the Vacuum Dry method is used, the Engineer will re-test the original cores at the QA Lab and report out test results within 2 working days. All test values will replace the original QA results. The PF for Density will be recomputed.

If the conditions of subsection h.1.A of this special provision, are still met for dispute testing, Sublot Dispute Resolution cores will be sampled and tested in accordance with this section and the results will be substituted for the QA results. The PF for Density will be recomputed.

(6) The Engineer will locate and mark new random Dispute Resolution core locations in accordance with subsection f.1 of this special provision. Dispute Resolution coring will be completed within 5 calendar days of the receipt of the request for Dispute Resolution for the oven dry method and within 3 calendar days of retest results for the vacuum dry method.

(7) The MDOT Construction Field Services HMA Laboratory will complete all Dispute Resolution testing and return test results to the Engineer within 7 calendar days upon receiving the Dispute Resolution samples. If there is a Dispute Resolution in process for Air Voids, Binder Content, or VMA, MDOT Construction Field Services HMA Laboratory will complete all Dispute Resolution testing and return test results within 13 calendar days upon receiving the Dispute Resolution samples.

C. Dispute Resolution Testing Process.

(1) Dispute Resolution Cores. If it is determined that the test discrepancy has not been resolved, the Engineer will locate and mark new random Dispute Resolution core locations in accordance with subsection f.1 of this special provision. The Engineer will take possession of the cores when cut and extracted by the Contractor and submit them to MDOT Construction Field Services HMA Laboratory for testing. The Dispute Resolution density cores will be tested in accordance with MTM 315 and in the same manner as the original QA cores. The G_{mm} from the original QA test results will be used to calculate the new In-Place Density values. If volumetric properties are in Dispute Resolution for the same lot, the new G_{mm} value will be used to calculate the new Dispute Resolution In-Place Density values.

(2) All lot Dispute Resolution core samples will be tested.

(3) All lot Dispute Resolution core results will replace original QA test results.

(4) The OLPF and the lot pay adjustment for the lot under Dispute Resolution will be recalculated.

(5) If the recalculated OLPF is less than or equal to the original QA OLPF, all costs associated with completing the Dispute Resolution sample testing will be borne by the Contractor.

(6) If the recalculated OLPF is greater than the original QA OLPF, all costs (excluding traffic control) associated with completing the Dispute Resolution sample testing will be borne by the Department.

2. Sublot Retest. If any one or more QA Density subplot RQL (Table 4 Column V) is exceeded, the Engineer will direct the corresponding action:

A. Vacuum Dry. The Engineer will re-test the original cores at the QA Lab. All test values will replace the original QA results. The PF for Density will be recomputed. If the test results still exceed QA Density subplot RQL (Table 4 Column V), Sublot Dispute Resolution cores will be sampled and tested in accordance with this subsection and the results will be substituted for the QA results. The PF for Density will be recomputed

B. Oven Dry. Since using this method destroys the original cores new Sublot Dispute Resolution cores will be sampled and tested in accordance with this subsection and the results will be substituted for the QA results. The PF for Density will be recomputed.

All costs (excluding traffic control) associated with completing the Sublot Retest testing will be borne by the Department.

Sublot Retest can be waived if the QA test results are agreed upon by the Engineer and Contractor.

3. Single Test Acceptance (STA) Dispute Resolution.

A. Single Test Acceptance (STA) Dispute Resolution Criteria. The QA results for a STA subplot, may be eligible for Dispute Resolution only if the OSPF from independent random QC test results from the corresponding subplot is 5 percent or larger than the OSPF for QA results. The Dispute Resolution test results will replace the QA test results and the lot PF for In-Place Density will be recomputed based on the Dispute Resolution sample test results.

B. Dispute Resolution Schedule

(1) Request for Dispute Resolution testing must be submitted in writing within 2 working days of receipt of the QA subplot test results.

(2) The request for Dispute Resolution must include the QC test results for the lot. A signed statement certifying that the QC test results are true and accurate must accompany the request for Dispute Resolution.

(3) The Engineer will document receipt of the request for Dispute Resolution.

(4) The Engineer will check the subplot test results for data entry and mathematical errors. If there are errors, the OSPF will be recomputed on the recalculated test result.

(5) If the Vacuum Dry method is used the Engineer will re-test the original cores at the QA Lab and report out test results within 2 working days. All test values will replace the original QA results. The PF for Density will be recomputed. If the conditions of subsection h.1.A of this special provision, are still met for dispute testing, Sublot Dispute Resolution cores will be sampled and tested in accordance with this subsection and the results will be substituted for the QA results. The PF for Density will be recomputed.

(6) The Engineer will locate and mark new random Dispute Resolution core locations in accordance with subsection f.1 of this special provision. Dispute Resolution coring will be completed within 5 calendar days of the receipt of the request for Dispute Resolution for the oven dry method and within 3 calendar days of retest results for the vacuum dry method.

(7) The MDOT Construction Field Services HMA Laboratory will complete all Dispute Resolution testing and return test results to the Engineer within 7 calendar days upon receiving the Dispute Resolution samples. If there is a Dispute Resolution in process for Air Voids, Binder Content, or VMA, MDOT Construction Field Services HMA Laboratory will complete all Dispute Resolution testing and return test results within 13 calendar days upon receiving the Dispute Resolution samples.

C. Dispute Resolution Testing Process

(1) Dispute resolution Cores. If it is determined that the test discrepancy has not been resolved, the Engineer will locate and mark new random Dispute Resolution core locations in accordance with subsection f.1 of this special provision. The Engineer will take possession of the cores when cut and extracted by the Contractor and submit them to MDOT Construction Field Services HMA Laboratory for testing. The Dispute Resolution density cores will be tested in accordance with MTM 315. The G_{mm} from the original QA test results will be used to calculate the new In-Place Density values. If volumetric properties are in Dispute Resolution for the same lot, the new G_{mm} value will be used to calculate the new Dispute Resolution In-Place Density values.

(2) All subplot Dispute Resolution core samples will be tested.

(3) All subplot Dispute Resolution core results will replace original QA test results.

(4) The OSPF and the lot pay adjustment for the lot under Dispute Resolution will be recalculated.

(5) If the recalculated OLPF is less than or equal to the original QA OSPF, all costs associated with completing the Dispute Resolution sample testing will be borne by the Contractor.

(6) If the recalculated OSPF is greater than the original QA OSPF, all costs (excluding traffic control) associated with completing the Dispute Resolution sample testing will be borne by the Department.

i. Documentation. The following documentation must be current and available for review as stated herein.

1. Quality Control Records. Maintain a complete record of all QC tests and inspections. Make these records available at the laboratory facility at all times for the Engineer to review. Update all records within 24 hours of test completion. Failure to keep the required documentation updated constitutes a violation of the HMA-QC Plan. Furnish copies of individual records to the Engineer upon request and all records within 7 working days of completion of the project. Report all sampling and testing on MDOT approved forms. The records must contain, as a minimum, the accepted HMA-QC Plan, signed originals of all QC

test results and raw data, random numbers used and resulting calculations made for QC sampling locations if applicable, control charts, and summaries of all test results.

2. **Quality Assurance Records.** The Engineer will maintain a complete record of all QA tests and inspections. Records will be updated within 1 working day of test completion. Copies of individual records, random numbers and associated field calculations for completed sublots will be furnished to the Contractor upon request. The records will contain, as a minimum, the HMA-QA Plan, signed originals of all QA test results and raw data, random numbers used and resulting calculations made for QA sampling locations if applicable, and summaries of all test results. QA results will not be provided to the Contractor until corresponding QC results are submitted to the Engineer. If production is truncated and the random QC sample has not been obtained then the QA results will be provided to the contractor.

j. PWL - Quality Index Analysis. The Engineer's QA test results for HMA (mixture) and In-Place Density will be evaluated according to the MDOT PWL Worksheet. The upper and lower specification limits used in the quality index analysis are shown in Table 3. The Engineer will calculate PWL, PF and payment for all HMA material covered by this special provision using the MDOT PWL Worksheet. All values of PWL and OLPF in these formulae are percents not decimals. All values of PWL are rounded to whole numbers. All values of PF are rounded to two decimal places.

1. Pay Factor for Air Voids (PF_{AV}).

A. If PWL for Air Voids (PWL_{AV}) is between 100 and 71 inclusive, use the following formula to determine PF_{AV} .

$$PF_{AV} = 55 + (0.5 \times PWL_{AV})$$

B. If PWL_{AV} is between 70 and 50 inclusive, use the following equation to determine PF_{AV} .

$$PF_{AV} = 37.5 + (0.75 \times PWL_{AV})$$

C. If PWL_{AV} is less than 50, the Engineer may elect to do one of the following:

(1) Require removal and replacement of the entire lot with new QA sampling and testing and repeat the evaluation procedure.

(2) Allow the lot to remain in place and apply an OLPF of 50.

(3) Allow submittal of a corrective action plan for the Engineer's approval. The corrective action plan may include removal and replacement of one or more sublots. If one or more sublots are replaced, the subplot(s) will be retested and the OLPF will be recalculated according to this special provision. If the Engineer does not approve the plan for corrective action, subsections (1) or (2) above will be applied.

2. Pay Factor for Binder Content (PF_{BINDER})

A. If PWL for Binder Content (PWL_{BINDER}) is between 100 and 71 inclusive, use the following formula to determine PF_{BINDER} .

$$PF_{\text{BINDER}} = 55 + (0.5 \times PWL_{\text{BINDER}})$$

B. If PWL_{BINDER} is between 70 and 50 inclusive, use the following equation to determine PF_{BINDER} .

$$PF_{\text{BINDER}} = 37.5 + (0.75 \times PWL_{\text{BINDER}})$$

C. If PWL_{BINDER} is less than 50, the Engineer may elect to take one of the actions specified in subsection j.1.C above.

3. Pay Factor for VMA (PF_{VMA}).

A. If PWL for VMA (PWL_{VMA}) is between 100 and 71 inclusive, use the following formula to determine PF_{VMA} .

$$PF_{\text{VMA}} = 55 + (0.5 \times PWL_{\text{VMA}})$$

B. If PWL_{VMA} is between 70 and 50 inclusive, use the following equation to determine PF_{VMA} .

$$PF_{\text{VMA}} = 37.5 + (0.75 \times PWL_{\text{VMA}})$$

C. If PWL_{VMA} is less than 50, the Engineer may elect to take one of the actions specified in subsection j.1.C above.

4. Pay Factor for In-Place Density (PF_{D}).

A. If PWL for In-Place Density (PWL_{D}) is between 100 and 71 inclusive, use the following formula to determine PF_{D} .

$$PF_{\text{D}} = 55 + (0.5 \times PWL_{\text{D}})$$

B. If PWL_{D} is between 70 and 50 inclusive, use the following equation to determine PF_{D} .

$$PF_{\text{D}} = 37.5 + (0.75 \times PWL_{\text{D}})$$

C. If PWL_{D} is less than 50; the Engineer may elect to take one of the actions specified in subsection j.1.C above.

5. Overall Lot Pay Factor (OLPF). Round the value of the OLPF to whole numbers.

$$OLPF = (0.40 \times PF_{\text{D}}) + (0.30 \times PF_{\text{AV}}) + (0.15 \times PF_{\text{BINDER}}) + (0.15 \times PF_{\text{VMA}})$$

k. Single Test Acceptance (STA). The Engineer's QA test results for plant produced material (mixture) and In-Place Density will be evaluated according to the MDOT STA Worksheet. The Engineer will calculate PF and payment for all Non-PWL HMA material covered by this special provision using the MDOT STA Worksheet. All values of PF in these formulae are percents not decimals. All values of PF are rounded to two decimal places as shown in the MDOT STA Worksheet.

1. Pay Factor for Air Voids (PF_{AV}).

A. If the single test deviation for Air Voids is less than or equal to 1.00, use the following formula to determine PF_{AV} .

$$PF_{AV} = 105 - (5 \times \text{Deviation from Target})$$

B. If the single test deviation for Air Voids is between 1.01 and 2.00 inclusive, use the following formula to determine PF_{AV} .

$$PF_{AV} = 140 - (40 \times \text{Deviation from Target})$$

C. If the single test deviation from the target for Air Voids is greater than 2.00 the Engineer may elect to do one of the following:

(1) Require removal and replacement of the entire subplot with new QA sampling and testing and repeat the evaluation procedure.

(2) Allow the subplot to remain in place and apply an OSPF Pay Factor of 50.

(3) Allow submittal of a corrective action plan for the Engineer's approval. The corrective action plan may include removal and replacement of the subplot.

2. Pay Factor for Binder Content (PF_{BINDER})

A. If the single test deviation for Binder Content is less than or equal to 0.45, use the following formula to determine PF_{BINDER} .

$$PF_{BINDER} = 105 - (11.1111 \times \text{Deviation from Target})$$

B. If the single test deviation for Binder Content is between 0.46 and 1.00 inclusive, use the following formula to determine PF_{BINDER} .

$$PF_{BINDER} = 181.8181 - (181.8181 \times \text{Deviation from Target})$$

C. If the single test deviation from the target for Binder Content is greater than 1.00 the Engineer may elect to take one of the actions specified in subsection k.1.C above.

3. Pay Factor for VMA (PF_{VMA}).

A. If the single test deviation from the target for VMA is less than or equal to 1.00, use the following formula to determine PF_{VMA} .

$$PF_{VMA} = 105 - (5 \times \text{Deviation from Target})$$

B. If the single test deviation for VMA is between 1.01 and 2.00 inclusive, use the following formula to determine PF_{VMA} .

$$PF_{VMA} = 168 - (69 \times \text{Deviation from Target})$$

C. If the single test deviation from the target for VMA is greater than 2.00 the Engineer may elect to take one of the actions specified in subsection k.1.C above.

4. Pay Factor for In-Place Density (PF_D).

A. If the test result for In-Place Density is greater than 94.00 the In-Place Density (PF_D) = 105

B. If the test result for In-Place Density is between 92.00 and 94.00 inclusive, use the following formula to determine In-Place Density (PF_D).

$$PF_D = (2.5 \times \text{Density}) - 130$$

C. If the test result for In-Place Density is less than 92.00 but greater than or equal to 90 use the following formula to determine PF_D .

$$PF_D = (10 \times \text{Density}) - 820$$

D. If the single test result for In-Place Density is less than 90.00 the Engineer may elect to take one of the actions specified in subsection k.1.C above.

5. Overall Sublot Pay Factor (OSPF). Round the value of the OSPF to the whole number.

$$OSPF = (0.40 \times PF_D) + (0.30 \times PF_{AV}) + (0.15 \times PF_{BINDER}) + (0.15 \times PF_{VMA})$$

If the OSPF result for a sublot is less than 50 the Engineer may elect to do one of the following:

A. Require removal and replacement of the entire sublot with new QA sampling and testing and repeat the evaluation procedure.

B. Allow the sublot to remain in place at the calculated OSPF.

C. Allow submittal of a corrective action plan for the Engineer's approval. The corrective action plan may include removal and replacement of the sublot

I. Measurement and Payment. Separate payment will not be made for providing and maintaining an effective HMA QC program as specified by this special provision. All costs associated with the work described in this special provision will be included in the applicable unit prices for the related HMA mixtures. HMA, (type) will be measured as specified in subsection 501.04 of the Standard Specification for Construction and the contract. If HMA Quality Initiative is not included in the contract as a pay item, there will be no positive pay adjustment for the HMA pay items.

HMA Pay Adjustment (PWL) - Payment for HMA pay items will be based on the contract prices for the completed items of work as adjusted according to this special provision. Adjusted payment for HMA, (type) will be calculated on a lot-by-lot basis.

The OLPF will be used to determine the lot pay adjustment as follows:

$$\text{Lot Payment Adjustment} = (\text{OLPF} - 100) / 100 \times (\text{Contract Base Price}) \times (\text{Lot Quantity}).$$

HMA Pay Adjustment (Non-PWL) - Payment for HMA pay items will be based on the contract prices for the completed items of work as adjusted according to this special provision. Adjusted payment for HMA, (type) will be calculated on a subplot-by-subplot basis.

The OSPF will be used to determine the subplot pay adjustment as follows:

$$\text{Sublot Payment Adjustment} = (\text{OSPF}-100)/100 \times (\text{Contract Base Price}) \times (\text{Sublot Quantity}).$$

Pay Item

Pay Unit

HMA Quality Initiative Dollar

Table 1: Minimum Quality Control Sampling and Testing Requirements

Quality Characteristic	Test Method	Minimum Test Frequency	Sampling Location	Sampling Method
Aggregate Gradation (optional)	As defined in HMA-QC Plan	As defined in HMA-QC Plan	As defined in HMA-QC Plan	Random AASHTO T 2
Aggregate Moisture	As defined in HMA-QC Plan	As defined in HMA-QC Plan		
PG Binder Content	As defined in HMA-QC Plan	1 per day	As defined in HMA-QC Plan	Random AASHTO T 168
Combined Mixture Gradation	As defined in HMA-QC Plan	1 per day	As defined in HMA-QC Plan	Random AASHTO T 168
Maximum Theoretical Specific Gravity	MTM 314	1 per day	As defined in HMA-QC Plan	Random MTM 313
Bulk Specific Gravity	As defined in HMA-QC Plan	1 per day	As defined in HMA-QC Plan	Random AASHTO T 168
Volumetrics: Air Voids	As defined in HMA-QC Plan	1 per day	As defined in HMA-QC Plan	Random AASHTO T 168
Volumetrics: VMA	As defined in HMA-QC Plan	1 per day	As defined in HMA-QC Plan	Random AASHTO T 168
Fines to Effective Binder	As defined in HMA-QC Plan	1 per day	As defined in HMA-QC Plan	Random AASHTO T 168
In-Place Density(a)	As defined in HMA-QC Plan	1 per day	From compacted HMA	Random AASHTO T 168
a. A maximum of 15 cores per lot of material will be allowed.				

Table 2: Action and Suspension Limits for Combined Gradation (from JMF)

Sieve Size	HMA Mixture									
	5		4 & GGSP		3		2		LVSP	
	QC Action	QC Suspension	QC Action	QC Suspension	QC Action	QC Suspension	QC Action	QC Suspension	QC Action	QC Suspension
3/4 inch	Defined		Defined		Defined	± 10	Defined	± 10	Defined	
1/2 inch	In the		In the	± 10	In the	± 10	In the	± 10	In the	± 10
3/8 inch	HMA-QC	± 10	HMA-QC	± 10	HMA-QC	± 10	HMA-QC	± 10	HMA-QC	± 10
No. 4	Plan	± 8	Plan	± 8	Plan	± 8	Plan	± 8	Plan	± 8
No. 8		± 8		± 8		± 8		± 8		± 8
No. 30		± 6		± 6		± 6		± 6		± 6
No. 200		± 2		± 2		± 2		± 2		± 2

a. The gradation must be maintained within the control points (superpave final aggregate blend percent passing criteria). If the Contractor's test results for three consecutive single tests on the same sieve are outside of the control points, the Contractor must correct the gradation to maintain results within the control points and immediately notify the Engineer. If the corrections do not result in gradations inside the control points within the next three consecutive single tests, then production must stop.

Table 3: PWL - HMA Quality Index Parameter Specification Limits

Quality Index Parameter	Specification Limits
Air Voids, (%@ N_{des})(a)	Target Air Voids ± 0.90 (c)
VMA	Target VMA ± 0.90 (d)
	VMA Targets
LVSP	15.00
2	13.00
3	14.00
4	15.00
5	16.00
GGSP (Gap SMA)	18.00
Binder Content (b)	JMF ± 0.35
Mat Density, % G_{mm}	92.50% minimum
<p>a. Unless noted otherwise on the plans, all mixtures must be designed to 96.0% of Maximum Specific Gravity (%G_{mm}) at the design number of gyrations, (N_d). During field production Percent of Maximum Specific Gravity (%G_{mm}) at the design number of gyrations, (N_d) will be increased to 97.0%. Regression of mixes must be done with liquid asphalt cement unless otherwise noted on plans.</p> <p>b. The Binder Content used as the target will be the value on form 1911.</p> <p>c. Target air voids for GGSP: ± 1.20</p> <p>d. Target VMA for GGSP: ± 1.00</p>	

Table 4: Quality Control and Quality Assurance Limits

Col. I - Quality Characteristic	Col. II - QC Action Limits (a)	Col. III - QC Suspension Limits (b)	Col. IV - QA Suspension Limits Form 1165	Col. V - Sublot RQL Form 1165 (c)	Col. VI - Lot AQL (d)	Col. VII - Lot RQL (d)
Aggregate Gradation (optional)						
Aggregate Moisture						
Binder Content	± 0.50 JMF	± 0.75 JMF			PWL _{BINDER} ≥ 90 For any lot	PWL _{BINDER} < 50 For any lot
Combined Mixture Gradation	Defined in the HMA-QC Plan	Refer to Table 2				
Maximum Theoretical Specific Gravity	± 0.013 JMF	± 0.020 JMF				
Effective Specific Gravity	Defined In the HMA-QC Plan	± 0.020 JMF(g)	± 0.020 JMF(g)			
Bulk Specific Gravity						
Volumetrics: Air Voids	Defined In the HMA-QC Plan	± 0.90 of Target Air Voids (e)		+ 2.00, -1.50 of Target Air voids	PWL _{AV} ≥ 90 For any lot	PWL _{AV} < 50 For any lot
Volumetrics: VMA	Defined In the HMA-QC Plan	± 0.90 of VMA Targets in Table 3 (f)		± 2.00 of VMA Targets in Table 3	PWL _{VMA} ≥ 90 For any lot	PWL _{VMA} < 50 For any lot
Fines to Effective Binder	Defined In the HMA-QC Plan	0.60 – 1.40 (a)	0.60 – 1.40(a)			
In-Place Density	Defined in the HMA-QC Plan	Defined in the HMA-QC Plan		Average Sublot Value < 90.00%	PWL _D ≥ 90 For any lot	PWL _D < 50 For any lot

a. Limits apply to two consecutive QC or QA tests.

b. Limits apply to single QC tests.

c. Specified. Limits apply to a single QA subplot Air Void or VMA test or on the subplot average In-Place Density.

d. Specified. Limits apply on a lot-by-lot basis. Based on QA results for the lot.

e. QC suspension limits for GGSP: ±1.20 target air voids.

f. QC suspension limits for GGSP: ±1.00 target VMA.

g. Limits apply on a lot-by-lot basis (including Initial Production Lots) by averaging the value from each subplot.

NOTICE TO BIDDERS
LETTING OF JANUARY 10, 2020
ADDENDUM "C"

This Addendum changes the terms of the Bid Proposal and/or plans associated with the project indicated below. By submitting a bid, any and all changes included in this Addendum are made a part of the contract.

ITEM NUMBERS: 014, 022, 023, 025, 027, 028, 029, 031, 032, 034, 035, 036, 037, 038, 041, and 042

CHANGES TO PROPOSAL OR PLANS (e-PROPOSAL)

In this addendum, page numbers refer to the electronic proposal and/or plans (if separate) published on the MDOT e-Proposal website. (www.michigan.gov/mdot-eprop)

When instructions are for additions, deletions or revisions are made to a non-bid item (e.g., progress clause, unique special provision, plan sheet detail), revised page(s) will be included in the issued Addendum and MUST be considered in developing a bid.

CHANGES TO ELECTRONIC BID (EXPEDITE BID)

If an electronic addendum (e.g., .001, .002, etc.) is issued to warrant changes that occur to the Schedule of Items page(s) referenced by this addendum, apply the electronic addendum to the electronic proposal (EBS proposal file). NOTE: Bids cannot be electronically submitted without applying any and all numeric type electronic addenda issued for this project item.

Acknowledge any and all addendums (both alpha and numeric type) in the Addendum Acknowledgement folder prior to submitting the electronic bid.

FAILURE TO CARRY OUT THE INSTRUCTIONS IN THIS ADDENDUM MAY RESULT IN THE REJECTION OF YOUR BID.

Prospective bidders of the above-referenced item numbers are hereby advised of the following:

Proposal

1. **REPLACE** 12SP-501V-09, titled "SPECIAL PROVISION FOR SUPERPAVE HOT MIX ASPHALT PERCENT WITHIN LIMITS FOR CAPITAL PREVENTIVE MAINTENANCE MILL & RESURFACE PROJECTS AND CAPITAL PREVENTIVE MAINTENANCE ONE COURSE OVERLAY PROJECTS", dated 06-14-19, **WITH REVISED** 12SP-501V-10, titled "SPECIAL PROVISION FOR SUPERPAVE HOT MIX ASPHALT PERCENT WITHIN LIMITS FOR CAPITAL PREVENTIVE MAINTENANCE MILL & RESURFACE PROJECTS AND CAPITAL PREVENTIVE MAINTENANCE ONE COURSE OVERLAY PROJECTS", dated 12-13-19.

This change was requested by Construction Field Services.

Paul C. Ajegba, Director
Michigan Department of Transportation

Lansing, Michigan
Date: 12/26/2019

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
**SUPERPAVE HOT MIX ASPHALT PERCENT WITHIN LIMITS FOR CAPITAL
PREVENTIVE MAINTENANCE MILL & RESURFACE PROJECTS AND CAPITAL
PREVENTIVE MAINTENANCE ONE COURSE OVERLAY PROJECTS**

CFS:KPK

1 of 26

APPR:CJB:DBP:12-13-19
FHWA APPR:12-13-19

a. Description. This special provision sets forth the quality control (QC) and quality assurance (QA) procedures that will be followed for acceptance of and payment for Superpave Hot Mix Asphalt (HMA) used on Capital Preventative Maintenance (CPM) Mill & Resurface Projects and CPM One Course Overlay Projects. Except as explicitly modified by this special provision, all materials and HMA mixture requirements of the standard specifications and the contract apply.

Delete subsection 501.03.N.2.b of the Standard Specifications for Construction.

1. Terminology.

Alternate Density Acceptance. Density acceptance criteria for applications where standard coring cannot be performed due to core thickness requirements. Alternate density acceptance applies to Hand Patching, Joint Repairs, Driveways, Gores, and Widening less than or equal to 5 feet. Scratch Course density is accepted using Alternate Acceptance In-Place Density Method if the application rate does not meet the minimum core thickness per section f.5 of this special provision.

Base Price. Price established by the Department to be used in calculating incentives or adjustments to pay items and shown in the contract.

Binder Content. The percent by weight of asphalt cement in the total mixture.

Bulk Specific Gravity of Aggregate (Gsb). The ratio of the oven dry weight in air of a unit volume of an aggregate at a stated temperature to the weight of an equal volume of water at a stated temperature.

Effective Specific Gravity (Gse). The ratio of the oven dry weight in air of a unit volume of an aggregate (excluding voids permeable to asphalt) at a stated temperature to the weight of an equal volume of water at a stated temperature.

HMA Design. The selection and proportioning of aggregate(s), mineral filler (if required), reclaimed asphalt pavement (RAP), and asphalt binder to meet mixture design criteria.

Job Mix Formula (JMF). An HMA Design for a specific project. This may include adjustments to the mix design to optimize the field application.

Lot. A lot is made up of a discrete tonnage of one mixture. Each lot is typically made up of

five sublots.

Maximum Specific Gravity of Mixture (Gmm). The ratio of the weight in air of a unit volume of an un-compacted HMA at a stated temperature to the weight of an equal volume of water at a stated temperature.

Outlier. A value identified by the PWL program that deviates markedly from test results for other samples from the same lot which will be investigated. Outlier applies only to core density evaluation.

Overall Lot Pay Factor (OLPF). Value to be used to determine the lot pay adjustment.

Overall Sublot Pay Factor (OSPF). Value to be used to determine the sublot pay adjustment when Single Test Acceptance (STA) is used.

Percent Within Limits (PWL). The percentage of material within the specification limits or tolerance for a given quality index parameter.

Quality Assurance (QA). All activities dealing with acceptance of the product, including but not limited to materials sampling, testing, construction inspection, and review of Contractor QC documentation. The Engineer's HMA QA procedures are contained in HMA Production Manual and in the HMA-QA Plan.

QA Lot Acceptable Quality Limits (AQL) (Table 4 Col. VI). PWL value for an individual quality index parameter that will still result in a PF of 100 for that quality index parameter. AQLs are specified in Table 4.

QA Lot Rejectable Quality Limits (RQL) (Table 4 Col. VII). PWL value for an individual quality index parameter that will result in either a PF = 50; remove and replace or corrective action plan. RQLs are specified in Table 4. Any lot subject to RQL shall be reviewed with Construction Field Services - HMA Operations prior to removal and replacement.

QA Sublot Rejectable Quality Limits (RQL) (Table 4 Col. V). A range of values defined in Table 4 that, if exceeded on a single QA test may result in the Engineer issuing a Notice of Non-Compliance with Contract Requirements (Form 1165).

QA Suspension Limits (Table 4 Col. IV). A range of values defined in Table 4 that, if exceeded, may result in the Engineer issuing a Notice of Non-Compliance with Contract Requirements (Form 1165).

Quality Characteristic (Table 4 Col. I). The material and mixture characteristics of HMA that are deemed to have direct bearing on the quality and performance of the HMA pavement and for which specification limits have been established.

Quality Control (QC). All activities dealing with process control to ensure quality, including but not limited to training, materials sampling, testing, project oversight and documentation. The Contractor's HMA QC procedures are contained in the HMA-QC Plan.

QC Action Limits (Table 4 Col. II). A range of values established by the Contractor in the HMA-QC Plan or specified in Table 4 that, if exceeded on two consecutive QC tests,

requires that the Contractor take corrective action to bring the mixture produced into conformance with the specifications.

QC Suspension Limits (Table 4 Col. III). A range of values established by the Contractor in the HMA-QC Plan or specified in Table 4 that, if exceeded on a single QC test, requires that the Contractor suspend operations and determine, document and correct the cause before continuing production.

Quality Index Parameter. The HMA quality characteristics that are evaluated under the Department's QA Acceptance Program and on which payment for HMA material is based. The Quality Index Parameters for this project are VMA, Air Voids, Binder Content, and In-Place Density.

Rounding of Numbers and Significant Figures. Rounding of numerical data will follow the Rounding Method as described in the HMA Production Manual and the associated MTMs.

Single Test Acceptance(STA). Acceptance criteria for non-PWL applications as outlined in section f.9 of this special provision.

Sublot. A portion of a lot or an individual sample that is represented by a complete set of QA tests. Sublots will be approximately equal size of 1000 tons. The Contractor and the Engineer may agree to reduce the typical 1000 ton sublots based on project staging or other project conditions.

Target Value. A JMF parameter value which may be adjusted, if approved by the Engineer, to account for changes in the physical properties of the mixture.

Unlimited Daily HMA Production. Unrestricted daily HMA production tonnage.

Vibratory Exclusion Areas. An area of inadequate base condition shown on the plans; or identified by the Contractor and Engineer prior to or during the paving operation; or an area having conditions that are sensitive to vibration as determined by the Engineer. In these areas, during field production Percent of Maximum Specific Gravity (%Gmm) at the design number of gyrations, (Nd) will be increased to 97.5 percent. The area, if limited, will be accepted using the STA methodology. If the area is large enough to constitute a Lot, it will be accepted using standard PWL acceptance criteria. The contract requirements for density still apply. Any additional asphalt cement required for regression will be included in the unit price bid for that particular mix if the areas are identified on the plans. For areas not identified on the plans there will be no compensation for the additional asphalt if the total tonnage for vibratory exclusion areas are under 1000 tons. Oscillatory rollers are allowed in vibratory exclusion areas as long as the vibratory mode is turned off.

Voids in Mineral Aggregate (VMA). The volume of void space between the aggregate particles of a compacted paving mixture that includes the air voids and the asphalt binder not absorbed into the aggregate, expressed as a percent of the total volume of mixture.

2. Partnering Sessions. The Engineer will schedule a pre-production meeting 3 to 28 calendar days prior to the start of production. The Engineer will provide written notification to all parties a minimum of 14 calendar days prior to the meeting.

Discussion at the pre-production meeting will cover the following:

- The HMA-QC Plan
- The HMA-QA Plan
- The roles and responsibilities of all parties involved in the work covered by this special provision
- The elected binder content procedure.

Notify the Engineer in writing a minimum of 7 calendar days prior to production which method per mix design is selected for binder content determination: ignition method or vacuum extraction. For each mix, the method approved will be used exclusively throughout the project for QA acceptance, including Dispute Resolution.

Department personnel attending the meetings will include the following:

- MDOT Project or Resident Engineer
- Field inspector for the project
- All Traveling Mix Inspectors [TMI(s)] with responsibility for this project
- Any consultant involved in any part of the HMA sampling or testing on this project

Contractor personnel attending the partnering meetings will include the following:

- Project Superintendent
- HMA-QC Plan Administrator
- Any subcontractor involved in any part of the HMA QC sampling or testing on this project

b. Contractor Quality Control. Be responsible for the quality of the HMA produced and placed on this project and perform QC sampling and testing, provide inspection, and exercise management control to ensure that work conforms to the contract requirements. Perform all testing in accordance with the accepted HMA-QC Plan. Provide the Engineer the opportunity to observe sampling and testing. Sample, test, and evaluate all HMA mixtures in accordance with the requirements of this special provision.

Develop and follow an HMA-QC Plan for HMA production and placement as required by the *HMA Production Manual* and herein. Utilize personnel and testing equipment capable of providing a product that conforms to contract requirements. Do not start work on the subject items without an accepted HMA-QC Plan.

Perform QC sampling, testing, and inspection during all phases of the work at the minimum guidelines specified for that item or at an increased frequency sufficient to ensure that the work conforms to the contract requirements. Continual production of nonconforming material at a reduced price in lieu of making adjustments to bring material into conformance is prohibited.

The Engineer will not sample or test for QC or assist in controlling the HMA production and placement operations. The results of department QA testing may not be available for use in QC activities and should not be included in the HMA-QC Plan discussion.

1. HMA-Quality Control Plan. Develop and follow an HMA-QC Plan that addresses personnel; sampling and testing equipment and calibration records; supplies and facilities for obtaining samples, performing tests, and documenting results; and other activities to control the quality of the product to meet contract requirements. Include methodology for addressing material that appears to be inconsistent with similar material being sampled. Perform all QC sampling and testing according to the *HMA Production Manual* and herein unless specifically documented in the HMA-QC Plan and discussed at the pre-production meeting.

A. Plan Submittal. Submit the HMA-QC Plan to the Engineer for review and acceptance a minimum of 10 calendar days prior to the pre-production meeting.

B. Plan Acceptance. Revisions to the HMA-QC Plan may be required by the Engineer prior to its acceptance. The Engineer will request plan revisions in writing prior to or the day of the pre-production meeting. If revisions are required by the Engineer, these revisions must be made and the HMA-QC Plan accepted before HMA production or placement commences.

Acceptance of the HMA-QC Plan does not imply any warranty by the Engineer that the HMA-QC Plan will result in production of HMA that complies with all contract requirements. It remains the responsibility of the Contractor to demonstrate such compliance.

C. Plan Modification. The HMA-QC Plan may be refined or modified as work progresses. Such refinements or modifications are subject to review and acceptance by the Engineer.

2. HMA-Quality Control Plan Contents. Include the following specific items in the HMA-QC Plan.

A. Quality Control Organization. Include an organization chart showing key personnel involved in production, placement, compaction, and QC for this project. Provide the names of the HMA-QC Plan Administrator and Quality Control Technician(s) [QCT(s)]. Clearly identify all subcontractor personnel involved in HMA QC.

Maintain consistency in the QC organization throughout the life of the project to the extent practicable. Substitution of qualified personnel is allowed provided that the names are forwarded to the Engineer and approved by the Engineer prior to the substitution.

B. Quality Control Personnel Qualifications and Responsibilities. Provide the qualifications of each individual or position listed on the organization chart and a brief narrative of their area of responsibilities. Describe the coordination of the activities of the Plan Administrator and the QCT(s).

(1) Plan Administrator. This individual will be responsible for administering the HMA-QC Plan and will institute any actions necessary to successfully implement the HMA-QC Plan.

(2) Quality Control Technicians (Plant). All equipment calibration; QC sampling and testing; and QC documentation must be performed by qualified technicians. Document the certification of all QCT(s) through the Michigan Bituminous QC/QA Technician Certification Program or other approved program.

(3) Placement Personnel. Identify the personnel that will be responsible for inspecting all transport, lay down and compaction equipment to ensure it is operating properly and for verifying that all lay down and compaction conforms to the contract requirements.

C. HMA Mix Design. Provide the approval status and a copy of the HMA mix design for all HMA mixtures to be produced for this contract and the plant location for production

of each mixture.

D. Quality Control Sampling and Testing. Develop and include the schedule of QC testing for the quality characteristics shown in Table 1. For each quality characteristic listed, define test method; minimum sampling and testing frequency; when the sampling and testing will be performed in relationship to production; and sampling location. Describe the random sampling method used.

Minimum QC sampling locations must be determined independently from QA sampling locations. In addition to the minimum QC sampling required by Table 1, additional non-random QC testing may be included in the HMA-QC Plan, except as otherwise specified.

E. Quality Control Laboratory Facilities. Provide the location of the testing facilities and include a copy of the plant certification. All laboratories that are used to prepare HMA mix designs or perform QC testing of HMA materials must demonstrate that they are equipped, staffed, and managed so as to be capable of mixing and testing HMA in accordance with the applicable test methods.

F. Corrective Action. Tables 2 and 4 specify the action limits and/or list the quality characteristics for which action limits must be defined in the HMA-QC Plan. Complete and include Tables 2 and 4 with the QC Action Limits defined as indicated. Describe the procedures that will be followed to ensure that test results are properly reviewed and that corrective action, based on the test results, is taken and documented when necessary to control HMA quality.

G. Suspension of Production. Table 4 specifies the QC Suspension Limits. Discuss the steps to be taken when any suspension criteria is met. Steps must include notifying the Engineer and making all necessary corrections whenever production is suspended. Include discussion of the following suspension criteria, as a minimum.

- (1) QC Suspension limits specified in Table 4 Col. III for any of the quality characteristics that are exceeded.
- (2) The PWL for VMA, Air Voids, Binder Content, or In-Place Density is below 50 for any lot.
- (3) The HMA-QC Plan is not followed.
- (4) Visible pavement distress occurs such as segregation or flushing.
- (5) Additional QC suspension criteria may be included.

H. Control Charts. Discuss the use of control charts for all quality characteristics listed in Table 1. Include examples of the control charts to be used. As a minimum, the control charts must identify the project number, the pay item code, the test number, test parameter, the specification limits, the action limits, suspension limits, and the test results. Keep the control charts current and available in an accessible location at the laboratory facility.

I. Plant Reports. At the request of the Engineer, provide copies of plant certification and electronic daily cumulative project tonnage report.

c. Quality Control Sampling and Testing During Production.

1. Fifteen cores approximately 6 inches in diameter will be allowed per lot of material for QC of In-Place Density.

2. At the time any QA or QC cores are taken, remove free standing water from the core hole; apply tack coat to the interior of the core hole, fill with hot mixture, and compact. Obtain and document approval for the type of mix to be used for filling holes and for obtaining compaction at the pre-production meeting.

3. At the time any QA or QC sample is collected from behind the paver, provide and place loose mixture according to MTM 324 or as directed by the Engineer.

4. In addition to maintaining test reports and control charts, enter all QC data into the PWL Program that can be downloaded from the Construction and Technology web site, provide the results to the Engineer as they become available. QA results will not be provided to the Contractor until corresponding QC results are submitted to the Engineer. If production is truncated and the random QC sample has not been obtained then the QA results will be provided to the Contractor.

5. Sample and test the plant produced material in accordance with the approved HMA-QC Plan.

d. HMA-Quality Assurance Plan. The Engineer will develop and follow an HMA-QA Plan. The Engineer will submit the HMA-QA Plan to the HMA-QC Plan Administrator a minimum of 7 calendar days prior to the pre-production meeting. The HMA-QA Plan will be reviewed at the pre-production meeting and any proposed changes will be documented.

All QA sampling and testing will be performed according to the HMA Production Manual and herein unless specifically documented in the HMA-QA Plan and discussed at the pre-production meeting. The Engineer will provide the Contractor the opportunity to observe QA sampling and testing. The following specific items will be included in the HMA-QA Plan.

1. **Quality Assurance Organization.** Key personnel involved in sampling, testing, construction inspection, review of QC, and QA management will be identified. The names of the Engineer, support staff, and Quality Assurance Technician(s) [QAT(s)] involved in HMA QA for this project will be included along with phone numbers, fax numbers, and e-mail addresses. The Engineer will notify the HMA-QC Plan Administrator of any deletions or additions to the HMA QA team.

2. **Quality Assurance Personnel Qualifications and Responsibilities.** The HMA-QA Plan will include a brief narrative of the area of responsibilities of each HMA QA team member and will describe the coordination of the activities of the Engineer, support staff and the QAT(s).

A. **HMA-Quality Assurance Plan Administrator.** The Engineer will be responsible for administering the HMA-QA Plan and will institute any actions necessary to successfully implement the HMA-QA Plan.

B. **Quality Assurance Technicians.** All QA testing and QA documentation will be performed by qualified technicians, as defined in the *HMA Production Manual*. All QAT(s)

will be certified through the Michigan Bituminous QC/QA Technician Certification Program or other approved program. Certifications required for QAT(s) will be included in the project files.

C. Construction Personnel. The personnel responsible for field inspection and for obtaining QA samples will be identified. Certifications/qualifications required for individuals collecting QA samples will be included in the project files.

D. Laboratory Facilities. The testing facilities with responsibility for QA testing on this project will be identified. All laboratories that perform QA testing of HMA materials must demonstrate that they are equipped, staffed, and managed so as to be capable of testing HMA in accordance with the applicable test methods.

e. Initial Quality Control/Quality Assurance Correlation. In order to verify test results, procedures, and equipment used are capable of generating QC test results that agree with QA results to within acceptable tolerances the Engineer and Contractor may agree to perform correlation testing.

For purposes of correlation the Engineer will collect one 45,000 gram split subplot sample and provide the Contractor with splits, for testing of all quality characteristics listed in Table 1. These split sample test results will be evaluated using the current lab correlation procedure found in the *HMA Production Manual*. The Department's split portion will be used as the QA acceptance test.

If the split subplot sample test results do not correlate, the Contractor and the Engineer will jointly review the results, check equipment and review the test procedures for all testing laboratories to determine if there is an identifiable cause for the discrepancy; recalibrate equipment; and arrange for independent assurance sampling and testing reviews for the QAT(s) and QCT(s), if necessary, before continuing with production or conducting tests on a subsequent subplot. If the vacuum extraction process is used to determine the asphalt binder content, the Engineer and Contractor will communicate the number of washes used.

If mutually agreed upon by the Engineer and Contractor, split sampling frequency can be modified or waived.

1. JMF Adjustment Requests. JMF adjustments may be requested based on test data submitted from previous use of the approved mix designs. The previous usage may be on commercial, local agency, or state construction projects.

f. Quality Assurance Sampling and Testing. Acceptance of HMA is the responsibility of the Engineer and will be accomplished by conducting QA sampling and testing, monitoring the Contractor's adherence to the HMA-QC Plan, and inspection of field placed material (see section 104 of the Standard Specifications for Construction). The Engineer will notify the Contractor prior to conducting QA sampling. This notification will be done in a manner that allows the Contractor to witness the sampling but does not provide for the opportunity for the Contractor to alter their production in anticipation of a sample being taken.

1. Random Sampling. Except as modified herein, QA sample locations will be determined as outlined in Section 1.06 of the *Materials Quality Assurance Procedures Manual*.

A. Prior to the pre-production meeting, the Engineer will generate three columns of

random numbers using a computer spreadsheet program or a calculator. The random numbers will be used for the longitudinal and the transverse measurement for determining the core location.

For HMA mixture sample location, use the random number from the third column, then multiply it by subplot tonnage. An excess amount of random numbers will be generated to take into account overruns or any situation where another random number is required.

B. At the pre-production meeting, each page that lists random numbers, with the numbers covered by a separate sheet of paper, will be presented to be signed by the HMA-QC Plan Administrator and the Engineer.

C. The original signed list will be placed in the project file and a copy will be provided to the field inspector for the project.

D. Random numbers and associated field calculations for completed sublots will be provided to the Contractor upon request.

2. Production Lot size. Each lot will be divided into sublots of approximately equal size but not greater than 1000 tons.

If only one or two sublots remain at the end of production of a mixture, the test results for these sublots will be combined with the previous lot for evaluation of PWL and PF.

3. Plant Produced Material (Mixture) Quality Assurance Sampling. Location of QA sample sites within each subplot will be by a random process managed by the Engineer. Immediately after the Engineer acquires the samples, fill the voids with HMA in accordance with MTM 324.

The Engineer will sample the mixture in accordance with MTM 324 or MTM 313, Sampling HMA Loose Mix from Mini-stockpile, collecting two separate 20,000 gram samples at each sample site. These are the QA and dispute resolution samples. The Engineer will assign an identifier to each sample consisting of contract ID, mixture, lot and subplot and deliver the samples to the testing facility identified in the HMA-QA Plan where one will be tested and the other retained for possible Dispute Resolution testing.

Sampling for wedging operations will be in accordance with MTM 313, Sampling HMA Loose Mix from Mini-stockpile.

4. Plant Produced Material (Mixture) Quality Assurance Testing. Plant produced material acceptance testing will be completed by the Engineer within 4 calendar days after the Engineer has taken the samples from the project site. The Engineer will conduct the following tests.

- A. Maximum Specific Gravity, Gmm (MTM 314)
- B. Bulk Compacted Density, Ndes (AASHTO T312-08)
- C. Air Voids, Nini*, Ndes, (AASHTO R35-04) (* for information only)
- D. Voids in Mineral Aggregate, VMA (AASHTO R35-04)

- E. Voids Filled with Asphalt, VFA* (AASHTO R35-04) (* for information only)
- F. Ratio of Fines to Effective Asphalt Binder, P#200/Pbe
- G. Composition of the Mixture (Using one of the following methods)

Method 1. Asphalt binder content based on ignition method (MTM 319). Gradation (ASTM D 5444) and Crushed particle content (MTM 117) based on aggregate from MTM 319. If method 1 is selected, the incineration temperature will be established at the Pre-Production Meeting. The Contractor will provide a laboratory mixture sample to the QA Acceptance Laboratory to establish the correction factor for each mix. This sample must be provided to the Engineer 14 calendar days prior to production.

Method 2. Asphalt binder content based on vacuum extraction by MTM 325 and the "Checklist for HMA Mixture Analysis Vacuum Extraction", of the *HMA Production Manual*. Gradation (ASTM D 5444) and Crushed particle content (MTM 117) based on extracted aggregate from MTM 325.

The determination of which method will be used for each mix will be made by the Contractor at the pre-production meeting. The method selected cannot be changed during mix production without submitting a new mix design to the MDOT Construction Field Services (CFS) Central Laboratory for verification.

5. In-Place Density Quality Assurance Sampling. The Engineer will locate and mark all QA core locations. All QA coring operations will be completed by the Contractor including dispute resolution and subplot retest coring. The Engineer will test all QA cores. If, for any reason, a core is damaged or determined not to be representative at the time of coring, the Engineer will evaluate and document the problem and determine if re-coring is necessary.

Core sample locations will be marked after final rolling. Core sample locations will be marked at the completion of a subplot and cores will be taken, prior to traffic staging changes, or at another time that is independent of paving operations. Any exceptions must be approved by the Engineer. The Engineer will identify four core sample locations for each subplot based on longitudinal and transverse measurements. The Contractor will provide and pay for traffic control as required in the special provision for maintaining traffic for all coring procedures including dispute resolution and subplot retest coring.

The Engineer will mark each core location with a 2 inch diameter paint dot, paint marker, or keel, which represents the center of the core. When sampling behind the paver, cores will not be taken from 5 feet before the loose mixture sampling area through 5 feet after the loose mixture sampling area. If the random core location falls within these areas, new longitudinal and transverse random numbers will be selected and the core sample site moved to the new location. If the center of the core is less than 5 inches from either edge of pavement, another transverse random number will be selected and the core sample site moved to the new location.

Notify the Engineer in advance of coring to ensure that MDOT has a representative to witness the coring operation and take immediate possession of the cores. Drill a core sample approximately 6 inches in diameter at each core location. Do not damage cores during removal from the roadway. Measure cores at the time they are extracted from pavement.

Any core disqualified based on the minimum thickness criteria will be discarded and a new core location will be selected by the Engineer. If more than 50 percent of the cores in a lot are disqualified, production must stop. Production will not be allowed to continue until the Engineer has confirmed that the paving operation is meeting the contract application rate. All previous pavement, base aggregate or bond coat material will be sawed off the bottom of the core samples by the Engineer.

The minimum core thickness for each mixture type is:

Hot Mix Asphalt Mixture No.	Minimum Core Thickness
2	3 inch
3	2¼ inch
4	1½ inch
5	1⅞ inch
LVSP	1¼ inch

A. Alternate Acceptance In-Place Density Method. Density acceptance for Hand Patching, Joint Repairs, Driveways, Scratch Course, and Widening/Tapers/Gores of less than or equal to 5 feet will be as follows. Density acceptance for these processes will be by density gauge. Establish the compaction effort for each pavement layer to achieve the required in place density values. After the final rolling, the Engineer will use a density gauge using the Gmm from the JMF for acceptance. A minimum of six random locations per subplot will be tested for density. If the average of the density values is equal to or greater than 92.00 percent of the Gmm, the pavement density will be accepted. If the average of the subplot density tests are less than 92.00 percent of the Gmm, the Contractor must take corrective action to achieve a minimum average of 92.00 of the Gmm. Density values will not be used in the PWL spread sheet; the alternate density application in the drop-down of the PWL spread sheet should be selected.

Sampling will be in accordance with MTM 313, Sampling HMA Loose Mix from Mini-stockpile.

6. In-Place Density Quality Assurance Testing. Pavement In-Place Density acceptance testing will be completed by the Engineer within 4 calendar days after the Engineer has taken possession of the cores at the project site. Testing will be in accordance with MTM 315. The Engineer and Contractor will mutually agree to use either vacuum dry or oven dry method as outlined in MTM 315. This agreement will be documented at the Pre-production meeting. The Engineer's test results on the compacted HMA will be used as a basis of acceptance and payment.

At the completion of lot testing all individual tests for In-Place Density will be checked for apparent outliers in accordance with *ASTM E 178* at a significance level of 5 percent (following the example in subsection 6.2 of that standard). If a test result is determined to be an apparent outlier the doubtful value will be investigated.

This investigation will include, but may not be limited to, visual and physical examination of the core (i.e. short core, core damaged during transport or during laboratory handling); and a careful review of the sampling and testing procedure including data entry and calculations (i.e. was raw data transposed or incorrectly entered into test calculations). If no documentable

reason is found for the apparent outlier, the value will remain as part of the In-Place Density PF calculations. If a documentable reason is found for the apparent outlier, the value will be discarded and the remaining test results will be used to calculate the In-Place Density PF.

7. Quality Assurance Stop Production Criteria. The Engineer may issue a Notice of Non-Compliance with Contract Requirements (Form 1165), if the Contractor has not suspended operations and taken corrective action. HMA production must stop when any one or more of the following criteria are met or exceeded:

A. The QA Suspension Quality Limits in Table 4 Col. IV is exceeded for consecutive QA tests for fines to effective binder or is exceeded for the lot average for effective specific gravity.

B. One or more of the QA Sublot Rejectable Quality Limits in Table 4 Col. V is exceeded for a single QA test.

C. The PWL for VMA, Air Voids, Binder Content or In-Place Density is below 50 when calculated according to section k of this special provision.

D. The HMA-QC Plan is not followed.

Resume production only after making all necessary adjustments to bring the mixture into conformance with all applicable specifications; documenting these adjustments as discussed in the HMA-QC Plan; and receiving a Notice to Resume Work (Form 1165) from the Engineer.

8. Sublot Removal and Replacement Criteria. Exceeding one or more of the QA Sublot Rejectable Quality Limits in Table 4 Col. V may result in removal and replacement of the associated sublot of material.

9. Single Test Acceptance (STA) Criteria. STA (for Density use the average of four cores) applies to specific mixtures between 500 and 5000 tons, and the following applications regardless of tonnage: Hand Patching, Joint Repairs, Driveways, Scratch Course, and Widening of less than or equal to 5 feet. The STA sublot size must not exceed 1000 tons. If a days production is less than 1000 tons the days tonnage will be considered a sublot. If a days production exceeds 1000 tons the tonnage will be divided into approximately equal sublot sizes. For hand patching with daily quantities of less than 200 tons, obtain 1 random STA sample for each day of production for up to 5 days of paving. One of the daily samples will be randomly selected and tested for acceptance. If the QA results are not subject to a negative price adjustment per section k, the test result may represent multiple days of paving (up to 5 days) at the discretion of the Engineer. The Engineer reserves the right to test the additional daily samples. All tested samples will have payment calculated according to section k. If the QA results are subject to a negative price adjustment per section k, all random STA samples will be tested and payment calculated in accordance with section k. For individual mix quantities of 500 tons or less, Visual Inspection (*Materials Quality Assurance Procedures Manual* Section 1.07) may be used in lieu of STA. Sampling will be in accordance with MTM 324 or MTM 313, Sampling HMA Loose Mix from Mini-stockpile. Table 4 will not apply to STA. Dispute Claim Process will be in accordance with sections g and h of this special provision. All QA sampling and testing procedures and acceptance criteria described in this special provision will apply. Payment will be in accordance with section l of this specification.

Sampling will be in accordance with the provisions stated herein or MTM 313 where

applicable.

g. Dispute Resolution Process for Plant Produced Material (Mixture).

1. Lot Dispute Resolution.

A. Lot Dispute Resolution Criteria. The QA results for a lot, including an initial production lot, may be eligible for Dispute Resolution only if the PF for Air Voids, Binder Content, or VMA based on the QC test results is larger than the corresponding PF for Air Voids, Binder Content, or VMA based on the QA test results. Only independent random QC test results from the corresponding sublots in the lot under Dispute Resolution will be used by the Engineer when processing the Dispute Resolution request. The QC testing and sampling used for Dispute Resolution must be conducted in the same manner as the QA testing. The Dispute Resolution test results will replace the QA test results and the PF for Air Voids, Binder Content, VMA and In-Place Density will be recomputed based on the Dispute Resolution sample test results.

B. Dispute Resolution Schedule.

(1) Request for Mixture Dispute Resolution testing must be submitted in writing within 2 working days of receipt of the lot Mixture test results.

(2) The request for Dispute Resolution must include the QC test results for the lot. A signed statement certifying that the QC test results are true and accurate must accompany the request for Dispute Resolution.

(3) The Engineer will document receipt of the request for Dispute Resolution and will deliver the Dispute Resolution samples to the MDOT CFS Central Laboratory within 2 working days of the receipt of the request.

(4) The MDOT CFS Central Laboratory will complete all Dispute Resolution testing and return test results to the Engineer within 13 calendar days upon receiving the Dispute Resolution samples.

C. Dispute Resolution Testing Process.

(1) All subplot dispute resolution samples will be tested for all mix properties. Binder Content will be determined using the method specified by the Contractor for the specific mix.

(2) All dispute resolution results will replace original QA test results.

(3) The OLPF and the lot pay adjustment for the lot under Dispute Resolution will be recalculated.

(4) If the recalculated OLPF is less than or equal to the original QA OLPF, all costs associated with completing the Dispute Resolution sample testing will be borne by the Contractor.

(5) If the recalculated OLPF is greater than the original QA OLPF, all costs (excluding traffic control) associated with completing the Dispute Resolution sample

testing will be borne by the Department.

2. Sublot Retest. If any one or more QA subplot RQL (Table 4 Column V) is exceeded, the Engineer will direct the corresponding subplot Dispute Resolution sample to be tested and the results will be substituted for the QA results for Air Voids, Binder Content and VMA. The PFs for Air Voids, VMA, Binder Content and Density will be recomputed. Sublot Retest can be waived if the QA test results are agreed upon by the Engineer and Contractor. All costs associated with completing the Sublot Retest testing will be borne by the Department.

3. Single Test Acceptance Dispute Resolution

A. Single Test Acceptance Dispute Resolution Criteria. The QA results for a STA subplot, may be eligible for Dispute Resolution only if the OSPF from independent random QC test results from the corresponding subplot is 5 percent or larger than the OSPF for QA results. The PFs for Air Voids, VMA, Binder Content and Density will be recomputed based on the results of the dispute sample. If the recalculated OSPF is greater than the original QA OSPF, all costs (excluding traffic control) associated with completing the Dispute Resolution sample testing will be borne by the Department.

B. Dispute Resolution Schedule.

(1) Request for Mixture Dispute Resolution testing must be submitted in writing within 2 working days of receipt of the lot Mixture test results.

(2) The request for Dispute Resolution must include the QC test results for the lot. A signed statement certifying that the QC test results are true and accurate must accompany the request for Dispute Resolution.

(3) The Engineer will document receipt of the request for Dispute Resolution and will deliver the Dispute Resolution samples to the MDOT CFS Central Laboratory within 2 working days of the receipt of the request.

(4) The MDOT CFS Central Laboratory will complete all Dispute Resolution testing and return test results to the Engineer within 13 calendar days upon receiving the Dispute Resolution samples.

C. Dispute Resolution Testing Process.

(1) Sublot dispute resolution samples will be tested for all mix properties. Binder Content will be determined using the method specified by the Contractor for the specific mix.

(2) All dispute resolution results will replace original QA test results.

(3) The OSPF for the subplot under Dispute Resolution will be recalculated.

h. Dispute Resolution Process for In-Place Density.

1. Lot Dispute Resolution.

A. Lot Dispute Resolution Criteria. The QA In-Place Density results for a lot, including

an initial production lot, may be eligible for Dispute Resolution if the lot PF for In-Place Density based on the QC test results is larger than the corresponding PF based on the QA test results. Only independent random QC test results (minimum of two random subplot cores from each subplot) from the corresponding lot under Dispute Resolution will be used by the Engineer when processing the Dispute Resolution request. The Dispute Resolution test results will replace the QA test results and the lot PF for In-Place Density will be recomputed based on the Dispute Resolution sample test results.

B. Dispute Resolution Schedule.

(1) Request for In-Place Density Dispute Resolution testing must be submitted in writing within 2 working days of receipt of the lot In-Place Density test results.

(2) The request for Dispute Resolution must include the QC test results for the lot. A signed statement certifying that the QC test results are true and accurate must accompany the request for Dispute Resolution.

(3) The Engineer will document receipt of the request for Dispute Resolution.

(4) The Engineer will check the lot In-Place Density test results for data entry and mathematical errors. If there are errors, the lot PF for In-Place Density will be recomputed on the recalculated test results.

(5) If the Vacuum Dry method is used, the Engineer will re-test the original cores at the QA Lab and report out test results within 2 working days. All test values will replace the original QA results. The PF for Density will be recomputed.

If the conditions of subsection h.1.A of this special provision, are still met for dispute testing, Sublot Dispute Resolution cores will be sampled and tested in accordance with this section and the results will be substituted for the QA results. The PF for Density will be recomputed.

(6) The Engineer will locate and mark new random Dispute Resolution core locations in accordance with subsection f.1 of this special provision. Dispute Resolution coring will be completed within 5 calendar days of the receipt of the request for Dispute Resolution for the oven dry method and within 3 calendar days of retest results for the vacuum dry method.

(7) The MDOT CFS Central Laboratory will complete all Dispute Resolution testing and return test results to the Engineer within 7 calendar days upon receiving the Dispute Resolution samples. If there is a Dispute Resolution in process for Air Voids, Binder Content, or VMA, MDOT CFS Central Laboratory will complete all Dispute Resolution testing and return test results within 13 calendar days upon receiving the Dispute Resolution samples.

C. Dispute Resolution Testing Process.

(1) Dispute Resolution Cores. If it is determined that the test discrepancy has not been resolved, the Engineer will locate and mark new random Dispute Resolution core locations in accordance with subsection f.1 of this special provision. The Engineer will take possession of the cores when cut and extracted by the Contractor and submit

them to MDOT CFS Central Laboratory for testing. The Dispute Resolution density cores will be tested in accordance with MTM 315 and in the same manner as the original QA cores. The Gmm from the original QA test results will be used to calculate the new In-Place Density values. If volumetric properties are in Dispute Resolution for the same lot, the new Gmm value will be used to calculate the new Dispute Resolution In-Place Density values.

(2) All lot Dispute Resolution core samples will be tested.

(3) All lot Dispute Resolution core results will replace original QA test results.

(4) The OLPF and the lot pay adjustment for the lot under Dispute Resolution will be recalculated.

(5) If the recalculated OLPF is less than or equal to the original QA OLPF, all costs associated with completing the Dispute Resolution sample testing will be borne by the Contractor.

(6) If the recalculated OLPF is greater than the original QA OLPF, all costs (excluding traffic control) associated with completing the Dispute Resolution sample testing will be borne by the Department.

2. Sublot Retest. If any one or more QA Density subplot RQL (Table 4 Column V) is exceeded, the Engineer will direct the corresponding action:

A. Vacuum Dry. The Engineer will re-test the original cores at the QA Lab. All test values will replace the original QA results. The PF for Density will be recomputed. If the test results still exceed QA Density subplot RQL (Table 4 Column V), Sublot Dispute Resolution cores will be sampled and tested in accordance with this subsection and the results will be substituted for the QA results. The PF for Density will be recomputed

B. Oven Dry. Since using this method destroys the original cores new Sublot Dispute Resolution cores will be sampled and tested in accordance with this subsection and the results will be substituted for the QA results. The PF for Density will be recomputed.

All costs (excluding traffic control) associated with completing the Sublot Retest testing will be borne by the Department.

Sublot Retest can be waived if the QA test results are agreed upon by the Engineer and Contractor.

3. Single Test Acceptance (STA) Dispute Resolution.

A. Single Test Acceptance (STA) Dispute Resolution Criteria. The QA results for a STA subplot, may be eligible for Dispute Resolution only if the OSPF from independent random QC test results from the corresponding subplot is 5 percent or larger than the OSPF for QA results. The Dispute Resolution test results will replace the QA test results and the lot PF for In-Place Density will be recomputed based on the Dispute Resolution sample test results.

B. Dispute Resolution Schedule

(1) Request for Dispute Resolution testing must be submitted in writing within 2 working days of receipt of the QA subplot test results.

(2) The request for Dispute Resolution must include the QC test results for the lot. A signed statement certifying that the QC test results are true and accurate must accompany the request for Dispute Resolution.

(3) The Engineer will document receipt of the request for Dispute Resolution.

(4) The Engineer will check the subplot test results for data entry and mathematical errors. If there are errors, the OSPF will be recomputed on the recalculated test result.

(5) If the Vacuum Dry method is used the Engineer will re-test the original cores at the QA Lab and report out test results within 2 working days. All test values will replace the original QA results. The PF for Density will be recomputed. If the conditions of subsection h.1.A of this special provision, are still met for dispute testing, Sublot Dispute Resolution cores will be sampled and tested in accordance with this subsection and the results will be substituted for the QA results. The PF for Density will be recomputed.

(6) The Engineer will locate and mark new random Dispute Resolution core locations in accordance with subsection f.1 of this special provision. Dispute Resolution coring will be completed within 5 calendar days of the receipt of the request for Dispute Resolution for the oven dry method and within 3 calendar days of retest results for the vacuum dry method.

(7) The MDOT CFS Central Laboratory will complete all Dispute Resolution testing and return test results to the Engineer within 7 calendar days upon receiving the Dispute Resolution samples. If there is a Dispute Resolution in process for Air Voids, Binder Content, or VMA, MDOT CFS Central Laboratory will complete all Dispute Resolution testing and return test results within 13 calendar days upon receiving the Dispute Resolution samples.

C. Dispute Resolution Testing Process

(1) Dispute resolution Cores. If it is determined that the test discrepancy has not been resolved, the Engineer will locate and mark new random Dispute Resolution core locations in accordance with subsection f.1 of this special provision. The Engineer will take possession of the cores when cut and extracted by the Contractor and submit them to MDOT CFS Central Laboratory for testing. The Dispute Resolution density cores will be tested in accordance with MTM 315. The G_{mm} from the original QA test results will be used to calculate the new In-Place Density values. If volumetric properties are in Dispute Resolution for the same lot, the new G_{mm} value will be used to calculate the new Dispute Resolution In-Place Density values.

(2) All subplot Dispute Resolution core samples will be tested.

(3) All subplot Dispute Resolution core results will replace original QA test results.

(4) The OSPF and the lot pay adjustment for the lot under Dispute Resolution will

be recalculated.

(5) If the recalculated OLPF is less than or equal to the original QA OSPF, all costs associated with completing the Dispute Resolution sample testing will be borne by the Contractor.

(6) If the recalculated OSPF is greater than the original QA OSPF, all costs (excluding traffic control) associated with completing the Dispute Resolution sample testing will be borne by the Department.

i. Documentation. The following documentation must be current and available for review as stated herein.

1. **Quality Control Records.** Maintain a complete record of all QC tests and inspections. Make these records available at the laboratory facility at all times for the Engineer to review. Update all records within 24 hours of test completion. Failure to keep the required documentation updated constitutes a violation of the HMA-QC Plan. Furnish copies of individual records to the Engineer upon request and all records within 7 working days of completion of the project. Report all sampling and testing on MDOT approved forms. The records must contain, as a minimum, the accepted HMA-QC Plan, signed originals of all QC test results and raw data, random numbers used and resulting calculations made for QC sampling locations if applicable, control charts, and summaries of all test results.

2. **Quality Assurance Records.** The Engineer will maintain a complete record of all QA tests and inspections. Records will be updated within 1 working day of test completion. Copies of individual records, random numbers and associated field calculations for completed sublots will be furnished to the Contractor upon request. The records will contain, as a minimum, the HMA-QA Plan, signed originals of all QA test results and raw data, random numbers used and resulting calculations made for QA sampling locations if applicable, and summaries of all test results. QA results will not be provided to the Contractor until corresponding QC results are submitted to the Engineer. If production is truncated and the random QC sample has not been obtained then the QA results will be provided to the contractor.

j. PWL - Quality Index Analysis. The Engineer's QA test results for HMA (mixture) and In-Place Density will be evaluated according to the MDOT PWL Worksheet. The upper and lower specification limits used in the quality index analysis are shown in Table 3. The Engineer will calculate PWL, PF and payment for all HMA material covered by this special provision using the MDOT PWL Worksheet. All values of PWL and OLPF in these formulae are percents not decimals. All values of PWL are rounded to whole numbers. All values of PF are rounded to two decimal places.

1. Pay Factor for Air Voids (PF_{AV}).

A. If PWL for Air Voids (PWL_{AV}) is between 100 and 71 inclusive, use the following formula to determine PF_{AV} .

$$PF_{AV} = 55 + (0.5 \times PWL_{AV})$$

B. If PWL_{AV} is between 70 and 50 inclusive, use the following equation to determine PF_{AV} .

$$PF_{AV} = 37.5 + (0.75 \times PWL_{AV})$$

C. If PWL_{AV} is less than 50, the Engineer may elect to do one of the following:

(1) Require removal and replacement of the entire lot with new QA sampling and testing and repeat the evaluation procedure. Any lot subject to RQL shall be reviewed with Construction Field Services - HMA Operations prior to removal and replacement.

(2) Allow the lot to remain in place and apply an OLPF of 50.

(3) Allow submittal of a corrective action plan for the Engineer's approval. The corrective action plan may include removal and replacement of one or more sublots. If one or more sublots are replaced, the subplot(s) will be retested and the OLPF will be recalculated according to this special provision. If the Engineer does not approve the plan for corrective action, subsections (1) or (2) above will be applied.

2. Pay Factor for Binder Content (PF_{BINDER})

A. If PWL for Binder Content (PWL_{BINDER}) is between 100 and 71 inclusive, use the following formula to determine PF_{BINDER} .

$$PF_{BINDER} = 55 + (0.5 \times PWL_{BINDER})$$

B. If PWL_{BINDER} is between 70 and 50 inclusive, use the following equation to determine PF_{BINDER} .

$$PF_{BINDER} = 37.5 + (0.75 \times PWL_{BINDER})$$

C. If PWL_{BINDER} is less than 50, the Engineer may elect to take one of the actions specified in subsection j.1.C above.

3. Pay Factor for VMA (PF_{VMA}).

A. If PWL for VMA (PWL_{VMA}) is between 100 and 71 inclusive, use the following formula to determine PF_{VMA} .

$$PF_{VMA} = 55 + (0.5 \times PWL_{VMA})$$

B. If PWL_{VMA} is between 70 and 50 inclusive, use the following equation to determine PF_{VMA} .

$$PF_{VMA} = 37.5 + (0.75 \times PWL_{VMA})$$

C. If PWL_{VMA} is less than 50, the Engineer may elect to take one of the actions specified in subsection j.1.C above.

4. Pay Factor for In-Place Density (PF_D).

A. If PWL for In-Place Density (PWL_D) is between 100 and 71 inclusive, use the following formula to determine PF_D .

$$PF_D = 55 + (0.5 \times PWL_D)$$

B. If PWL_D is between 70 and 50 inclusive, use the following equation to determine PF_D .

$$PF_D = 37.5 + (0.75 \times PWL_D)$$

C. If PWL_D is less than 50; the Engineer may elect to take one of the actions specified in subsection j.1.C above.

5. Overall Lot Pay Factor (OLPF). Round the value of the OLPF to whole numbers.

$$OLPF = (0.40 \times PF_D) + (0.30 \times PF_{AV}) + (0.15 \times PF_{BINDER}) + (0.15 \times PF_{VMA})$$

k. Single Test Acceptance (STA). The Engineer's QA test results for plant produced material (mixture) and In-Place Density will be evaluated according to the MDOT STA Worksheet. The Engineer will calculate PF and payment for all Non-PWL HMA material covered by this special provision using the MDOT STA Worksheet. All values of PF in these formulae are percents not decimals. All values of PF are rounded to two decimal places as shown in the MDOT STA Worksheet.

1. Pay Factor for Air Voids (PF_{AV}).

A. If the single test deviation for Air Voids is less than or equal to 1.00, use the following formula to determine PF_{AV} .

$$PF_{AV} = 105 - (5 \times \text{Deviation from Target})$$

B. If the single test deviation for Air Voids is between 1.01 and 2.00 inclusive, use the following formula to determine PF_{AV} .

$$PF_{AV} = 140 - (40 \times \text{Deviation from Target})$$

C. If the single test deviation from the target for Air Voids is greater than 2.00 the Engineer may elect to do one of the following:

(1) Require removal and replacement of the entire subplot with new QA sampling and testing and repeat the evaluation procedure.

(2) Allow the subplot to remain in place and apply an OSPF Pay Factor of 50.

(3) Allow submittal of a corrective action plan for the Engineer's approval. The corrective action plan may include removal and replacement of the subplot.

2. Pay Factor for Binder Content (PF_{BINDER})

A. If the single test deviation for Binder Content is less than or equal to 0.45, use the following formula to determine PF_{BINDER} .

$$PF_{BINDER} = 105 - (11.1111 \times \text{Deviation from Target})$$

B. If the single test deviation for Binder Content is between 0.46 and 1.00 inclusive, use the following formula to determine PF_{BINDER} .

$$PF_{\text{BINDER}} = 181.8181 - (181.8181 \times \text{Deviation from Target})$$

C. If the single test deviation from the target for Binder Content is greater than 1.00 the Engineer may elect to take one of the actions specified in subsection k.1.C above.

3. Pay Factor for VMA (PF_{VMA}).

A. If the single test deviation from the target for VMA is less than or equal to 1.00, use the following formula to determine PF_{VMA} .

$$PF_{\text{VMA}} = 105 - (5 \times \text{Deviation from Target})$$

B. If the single test deviation for VMA is between 1.01 and 2.43 inclusive, use the following formula to determine PF_{VMA} .

$$PF_{\text{VMA}} = 168 - (69 \times \text{Deviation from Target})$$

C. If the single test deviation from the target for VMA is greater than 2.43 the Engineer may elect to take one of the actions specified in subsection k.1.C above.

4. Pay Factor for In-Place Density (PF_{D}).

A. If the test result for In-Place Density is greater than 94.00 the In-Place Density (PF_{D}) = 105

B. If the test result for In-Place Density is between 92.00 and 94.00 inclusive, use the following formula to determine In-Place Density (PF_{D}).

$$PF_{\text{D}} = (2.5 \times \text{Density}) - 130$$

C. If the test result for In-Place Density is less than 92.00 but greater than or equal to 90 use the following formula to determine PF_{D} .

$$PF_{\text{D}} = (10 \times \text{Density}) - 820$$

D. If the single test result for In-Place Density is less than 90.00 the Engineer may elect to take one of the actions specified in subsection k.1.C above.

5. Overall Sublot Pay Factor (OSPF). Round the value of the OSPF to the whole number.

$$\text{OSPF} = (0.40 \times PF_{\text{D}}) + (0.30 \times PF_{\text{AV}}) + (0.15 \times PF_{\text{BINDER}}) + (0.15 \times PF_{\text{VMA}})$$

If the OSPF result for a sublot is less than 50 the Engineer may elect to do one of the following:

A. Require removal and replacement of the entire sublot with new QA sampling and testing and repeat the evaluation procedure.

B. Allow the subplot to remain in place at the calculated OSPF.

C. Allow submittal of a corrective action plan for the Engineer's approval. The corrective action plan may include removal and replacement of the subplot

I. Measurement and Payment. Separate payment will not be made for providing and maintaining an effective HMA QC program as specified by this special provision. All costs associated with the work described in this special provision will be included in the applicable unit prices for the related HMA mixtures. HMA, (type) will be measured as specified in subsection 501.04 of the Standard Specification for Construction and the contract. If HMA Quality Initiative is not included in the contract as a pay item, there will be no positive pay adjustment for the HMA pay items.

HMA Pay Adjustment (PWL) - Payment for HMA pay items will be based on the contract prices for the completed items of work as adjusted according to this special provision. Adjusted payment for HMA, (type) will be calculated on a lot-by-lot basis.

The OLPF will be used to determine the lot pay adjustment as follows:

$$\text{Lot Payment Adjustment} = (\text{OLPF}-100)/100 \times (\text{Contract Base Price}) \times (\text{Lot Quantity}).$$

HMA Pay Adjustment (Non-PWL) - Payment for HMA pay items will be based on the contract prices for the completed items of work as adjusted according to this special provision. Adjusted payment for HMA, (type) will be calculated on a subplot-by-subplot basis.

The OSPF will be used to determine the subplot pay adjustment as follows:

$$\text{Sublot Payment Adjustment} = (\text{OSPF}-100)/100 \times (\text{Contract Base Price}) \times (\text{Sublot Quantity}).$$

Pay Item	Pay Unit
HMA Quality Initiative	Dollar

Table 1: Minimum Quality Control Sampling and Testing Requirements

Quality Characteristic	Test Method	Minimum Test Frequency	Sampling Location	Sampling Method
Aggregate Gradation (optional)	As defined in HMA-QC Plan	As defined in HMA-QC Plan	As defined in HMA-QC Plan	Random <i>AASHTO T 2</i>
Aggregate Moisture	As defined in HMA-QC Plan	As defined in HMA-QC Plan		
PG Binder Content	As defined in HMA-QC Plan	1 per day	As defined in HMA-QC Plan	Random <i>AASHTO T 168</i>
Combined Mixture Gradation	As defined in HMA-QC Plan	1 per day	As defined in HMA-QC Plan	Random <i>AASHTO T 168</i>
Maximum Theoretical Specific Gravity	MTM 314	1 per day	As defined in HMA-QC Plan	Random MTM 313
Bulk Specific Gravity	As defined in HMA-QC Plan	1 per day	As defined in HMA-QC Plan	Random <i>AASHTO T 168</i>
Volumetrics: Air Voids	As defined in HMA-QC Plan	1 per day	As defined in HMA-QC Plan	Random <i>AASHTO T 168</i>
Volumetrics: VMA	As defined in HMA-QC Plan	1 per day	As defined in HMA-QC Plan	Random <i>AASHTO T 168</i>
Fines to Effective Binder	As defined in HMA-QC Plan	1 per day	As defined in HMA-QC Plan	Random <i>AASHTO T 168</i>
In-Place Density(a)	As defined in HMA-QC Plan	1 per day	From compacted HMA	Random <i>AASHTO T 168</i>
a. A maximum of 15 cores per lot of material will be allowed.				

Table 2: Action and Suspension Limits for Combined Gradation (from JMF)

Sieve Size	HMA Mixture									
	5		4 & GGSP		3		2		LVSP	
	QC Action	QC Suspension	QC Action	QC Suspension	QC Action	QC Suspension	QC Action	QC Suspension	QC Action	QC Suspension
3/4 inch	Defined		Defined		Defined	±10	Defined	±10	Defined	
1/2 inch	In the		In the	±10	In the	±10	In the	±10	In the	±10
3/8 inch	HMA-QC	±10	HMA-QC	±10	HMA-QC	±10	HMA-QC	±10	HMA-QC	±10
No. 4	Plan	±8	Plan	±8	Plan	±8	Plan	±8	Plan	±8
No. 8		±8		±8		±8		±8		±8
No. 30		±6		±6		±6		±6		±6
No. 200		±2		±2		±2		±2		±2

- a. Maintain gradation within the control points (superpave final aggregate blend percent passing criteria). If the Contractor's test results for three consecutive single tests on the same sieve are outside of the control points, the Contractor must correct the gradation to maintain results within the control points and immediately notify the Engineer. If the corrections do not result in gradations inside the control points within the next three consecutive single tests, stop production.

Table 3: PWL - HMA Quality Index Parameter Specification Limits

Quality Index Parameter	Specification Limits
Air Voids, (%@ Ndes)(a)	Target Air Voids ± 0.90 (c)
VMA	Target VMA ± 0.90 (d)
	VMA Targets
LVSP	15.00
2	13.00
3	14.00
4	15.00
5	16.00
GGSP (Gap SMA)	18.00
Binder Content (b)	JMF ± 0.35
Mat Density, %Gmm	92.50% minimum
<p>a. Unless noted otherwise on the plans, all mixtures must be designed to 96.0% of Maximum Specific Gravity (%Gmm) at the design number of gyrations, (Nd). During field production Percent of Maximum Specific Gravity (%Gmm) at the design number of gyrations, (Nd) will be increased to 97.0%. Regress mixes with liquid asphalt cement unless otherwise noted on plans.</p> <p>b. The Binder Content used as the target will be the value on form 1911.</p> <p>c. Target air voids for GGSP: ± 1.20</p> <p>d. Target VMA for GGSP: ± 1.00</p>	

Table 4: Quality Control and Quality Assurance Limits

Col. I - Quality Characteristic	Col. II - QC Action Limits (a)	Col. III - QC Suspension Limits (b)	Col. IV - QA Suspension Limits Form 1165	Col. V - Sublot RQL Form 1165 (c)	Col. VI - Lot AQL (d)	Col. VII - Lot RQL (d)
Aggregate Gradation (optional)						
Aggregate Moisture						
Binder Content	±0.50 JMF	±0.75 JMF			PWL _{BINDER} ≥ 90 For any lot	PWL _{BINDER} < 50 For any lot
Combined Mixture Gradation	Defined in the HMA-QC Plan	Refer to Table 2				
Maximum Theoretical Specific Gravity	±0.013 JMF	±0.020 JMF				
Effective Specific Gravity	Defined In the HMA-QC Plan	± 0.020 JMF(g)	± 0.020 JMF(g)			
Bulk Specific Gravity						
Volumetrics: Air Voids	Defined In the HMA-QC Plan	±0.90 of Target Air Voids (e)		+2.00, -1.50 of Target Air voids	PWL _{AV} ≥ 90 For any lot	PWL _{AV} < 50 For any lot
Volumetrics: VMA	Defined In the HMA-QC Plan	±0.90 of VMA Targets in Table 3 (f)		±2.00 of VMA Targets in Table 3	PWL _{VMA} ≥ 90 For any lot	PWL _{VMA} < 50 For any lot
Fines to Effective Binder	Defined In the HMA-QC Plan	0.60 – 1.40 (a)	0.60 – 1.40(a)			
In-Place Density	Defined in the HMA-QC Plan	Defined in the HMA-QC Plan		Average Sublot Value < 90.00%	PWL _D ≥ 90 For any lot	PWL _D < 50 For any lot

a. Limits apply to two consecutive QC or QA tests.

b. Limits apply to single QC tests.

c. Specified. Limits apply to a single QA sublot Air Void or VMA test or on the sublot average In-Place Density.

d. Specified. Limits apply on a lot-by-lot basis. Based on QA results for the lot.

e. QC suspension limits for GGSP: ±1.20 target air voids.

f. QC suspension limits for GGSP: ±1.00 target VMA.

g. Limits apply on a lot-by-lot basis (including Initial Production Lots) by averaging the value from each sublot.