K-14-1960

ALABAMA DEPARTMENT

OF TRANSPORTATION

STANDARD SPECIFICATIONS

2012

CONTRACT FORMS

PROJECT NO(s). NH-0006(551)

SPECIFICATIONS, PROPOSAL, CONTRACT AND BOND FOR CONSTRUCTION OF:

0.501 MILE ADDITIONAL TURN LANES AND EXTENSIONS (WIDENING, SIDEWALKS, LIGHTING, SIGNALS, BRIDGE CULVERT EXTENSION AND UNDERGROUND STORAGE TANK REMOVAL)

KNOWN AS FEDERAL AID PROJECT NO(s) NH-0006(551)

LOCATED: ON SR-6 (US-82) FROM EAST (SOUTH) OF 15TH STREET (VETERANS MEMORIAL PARKWAY) TO WEST (NORTH) OF 13TH STREET IN TUSCALOOSA

IN: TUSCALOOSA COUNTY

TYPE: ADDITIONAL TURN LANES AND EXTENSIONS (WIDENING, SIDEWALKS, LIGHTING, SIGNALS, BRIDGE CULVERT EXTENSION AND UNDERGROUND STORAGE TANK REMOVAL)

I HEREBY CERTIFY THAT THIS IS A TRUE AND CORRECT COPY OF THE ORIGINAL CONTRACT NOW ON FILE IN THE OFFICE OF THE ALABAMA DEPARTMENT OF TRANSPORTATION IN MONTGOMERY, ALABAMA

ALABAMA DEPARTMENT OF TRANSPORTATION

BY: _____

OFFICE ENGINEER

D58

ALABAMA DEPARTMENT OF TRANSPORTATION

MONTGOMERY, ALABAMA

THE AWARDING AUTHORITY, ALABAMA DEPARTMENT OF TRANSPORTATION, IN ACCORDANCE WITH § 39-5-1(b), CODE OF ALABAMA, 1975, DOES HEREBY CERTIFY THAT THE CONTRACT TO BE AWARDED ON PROJECT NO. NH-0006(551), TUSCALOOSA COUNTY : 0.501 MILES FOR CONSTRUCTING THE ADDITIONAL TURN LANES AND EXTENSIONS (WIDENING, SIDEWALKS, LIGHTING, SIGNALS, BRIDGE CULVERT EXTENSION, AND UNDERGROUND STORAGE TANK REMOVAL) ON SR-6 (US-82) FROM EAST (SOUTH) OF 15TH STREET (VETERANS MEMORIAL PARKWAY) TO WEST (NORTH) OF 13TH STREET IN TUSCALOOSA IS LET IN COMPLIANCE WITH TITLE 39, CODE OF ALABAMA 1975, AS AMENDED, AND ALL OTHER APPLICABLE PROVISIONS OF LAW.

TO THE BEST OF MY KNOWLEDGE, THIS CONTRACT COMPLIES WITH ALL APPLICABLE LAWS, RULES AND REGULATIONS OF THE STATE OF ALABAMA.

FUNDING FOR THIS PROJECT HAS BEEN APPROVED AND OBLIGATED.

ALABAMA DEPARTMENT OF TRANSPORTATION

JOHN R. COOPER, TRANSPORTATION DIRECTOR

BY: CLAY P. MCBRIEN, P.E.
STATE OFFICE ENGINEER

DATE: JULY 30, 2014

ALABAMA DEPARTMENT OF

TRANSPORTATION

MONTGOMERY, ALABAMA 36110

DATE: JULY 25, 2014

MEMORANDUM

TO: IKAROS, LLC
CONTRACTOR

FROM: ALABAMA DEPARTMENT OF TRANSPORTATION

RE: PUBLIC EMPLOYMENT AGENCY

The Alabama State Employment Service is the Public Employment Agency that will be glad to serve you if you wish them to help by furnishing labor on:

PROJECT NO(s). NH-0006(551)

TUSCALOOSA COUNTY

The name and address of the local employment office that will serve you on this project is listed below:

BRENDA TRUELOVE, MANAGER
ALABAMA STATE EMPLOYMENT SERVICE
202 SKYLAND DRIVE
TUSCALOOSA, AL 35405
205-758-7591

PROPOSAL NO. 8

FOR THE CONSTRUCTION OF FEDERAL AID
PROJECT NO. NH-0006(551)
TUSCALOOSA COUNTY, ALABAMA

CONTRACT ID: 20140725058

NON-TRANSFERABLE

Proposal of
Contractor Name: IKAROS, LLC

Of (City, State): NORTHPORT, AL

ALDOT Contractor Identification Number: 09028

Alabama General Contractors License Number: 48850

for constructing the Additional Turn Lanes and Extensions (Widening, Sidewalks, Lighting, Signals, Bridge Culvert Extension, and Underground Storage Tank Removal) on SR-6 (US-82) from east (south) of 15th Street (Veterans Memorial Parkway) to west (north) of 13th Street in Tuscaloosa. Length - 0.501 mi. In the County(s) of TUSCALOOSA, State of Alabama.

The plans are composed of the drawings identified as follows:

FEDERAL AID PROJECT NO. NH-0006(551)

The specifications are hereto attached.

In order to be considered, proposals must be received at the location and time shown below:

Alabama Department of Transportation
Bureau of Office Engineer Room E-108
1409 Coliseum Boulevard, Montgomery, AL 36110-2060
Phone Number: (334)242-6444

BEFORE: 10:00 AM ON: July 25, 2014

PROJECT NO. NH-0006(551)
TUSCALOOSA COUNTY, ALABAMA

CONTRACT ID: 20140725058

TO THE ALABAMA DEPARTMENT OF TRANSPORTATION DIRECTOR:

SIR: The following proposal is made on behalf of the undersigned and no others. Evidence of authority to submit the proposal is herewith furnished.

The undersigned has carefully examined the plans for this project, the Alabama Department of Transportation Standard Specifications for Highway Construction, 2012 Edition, including the special provisions hereto attached, and has also personally examined the site of work. On the basis of the specifications and plans, the undersigned proposes to furnish all necessary machinery, tools, apparatus and other means of construction, and do all the work and furnish all material in the manner specified.

The undersigned further agrees to complete the entire project in Two Hundred Fifty (250) working days. A(n) 8.00% DBE Contract Obligation is required. **(See Special Provision No. 12-0102)**

The undersigned understands that the quantities below are approximate only and are subject to either increase or decrease and hereby proposes to perform any increased or decreased quantities of work in accordance with said Specifications. The undersigned further understands and specifically agrees that in making this proposal, in case of error in the extension of prices in the bid, the unit price will govern.

By signing this contract, the contracting parties affirm, for the duration of the agreement, that they will not violate federal immigration law or knowingly employ, hire for employment, or continue to employ an unauthorized alien within the State of Alabama. Furthermore, a contracting party found to be in violation of this provision shall be deemed in breach of the agreement and shall be responsible for all damages resulting therefrom.

CONTRACT ID: 20140725058 PROJECT(S):NH-0006(551)

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
SECTION 0001 Total						
0010	201A002 Clearing & Grubbing (Maximum Allowable Bid $ $4000.00 Per Acre) (Approx 5 Acres)	LUMP	LUMP		20,000.00	
0020	206C000 Removing Concrete Sidewalk	2,919.000 SQYD	10.00000		29,190.00	
0030	206C001 Removing Concrete Pavement	1,966.000 SQYD	10.00000		19,660.00	
0040	206C002 Removing Concrete Slope Paving	1,903.000 SQYD	10.00000		19,030.00	
0050	206C010 Removing Concrete Driveway	1,748.000 SQYD	10.00000		17,480.00	
0060	206D000 Removing Pipe	1,013.000 LF	15.00000		15,195.00	
0070	206D001 Removing Guardrail	88.000 LF	5.88000		517.44	
0080	206D002 Removing Curb	5,538.000 LF	10.00000		55,380.00	
0090	206D003 Removing Curb And Gutter	4,933.000 LF	10.00000		49,330.00	
0100	206D005 Removing Gutter	1,493.000 LF	10.00000		14,930.00	

CONTRACT ID: 20140725058 PROJECT(S):NH-0006(551)

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0110	206D008 Removing Retaining Wall	90.000 LF	100.00000		9,000.00	
0120	206D010 Removing Safety Barrier	808.000 LF	100.00000		80,800.00	
0130	206D016 Removing Existing Bridge Handrail	80.000 LF	10.00000		800.00	
0140	206E000 Removing Headwalls	2.000 EACH	750.00000		1,500.00	
0150	206E001 Removing Inlets	22.000 EACH	1,000.00000		22,000.00	
0160	206E002 Removing Junction Boxes	3.000 EACH	1,000.00000		3,000.00	
0170	206E003 Removing Manholes	1.000 EACH	1,500.00000		1,500.00	
0180	206E008 Removing Guardrail End Anchor (All Type)	1.000 EACH	588.20000		588.20	
0190	206E041 Removing Impact Attenuators	5.000 EACH	1,000.00000		5,000.00	
0200	206E042 Removing Inlets (Partial)	1.000 EACH	1,000.00000		1,000.00	
0210	210A000 Unclassified Excavation	7,295.000 CUYD	35.00000		255,325.00	

CONTRACT ID: 20140725058 PROJECT(S):NH-0006(551)

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS		UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0220	210D011 Borrow Excavation (A-4 Or Better)	2,500.000	CUYD	35.00000		87,500.00	
0230	214A000 Structure Excavation	2,828.000	CUYD	14.00000		39,592.00	
0240	214B001 Foundation Backfill, Commercial	434.000	CUYD	50.00000		21,700.00	
0250	250B002 Disposal Of Hydrocarbon Contaminated Soil (Specialty Item)	1,300.000	CUYD	125.00000		162,500.00	
0260	250C000 Underground Storage Tank Removal (Specialty Item)	3.000	EACH	15,632.74000		46,898.22	
0270	250N001 Removing And Disposing Tank Contents (Sludge) (Specialty Item)	1,500.000	GAL	2.50000		3,750.00	
0280	260A001 Cement Mortar Flowable Backfill, Mix 2	4.000	CUYD	300.00000		1,200.00	
0290	305B071 Coarse Aggregate, Section 801, For Miscellaneous Use	733.000	TON	40.00000		29,320.00	
0300	305B077 Crushed Aggregate, Section 825, For Miscellaneous Use	1,100.000	TON	40.00000		44,000.00	
0310	401B100 Bituminous Treatment E (With Polymer Additive)	57,230.000	SQYD	3.05000		174,551.50	
0320	405A000 Tack Coat	7,778.000	GAL	4.65000		36,167.70	

CONTRACT ID: 20140725058 PROJECT(S):NH-0006(551)

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0330	407B000 Joint Sealant For Hot Mix Asphalt Pavement	6.000 MILE	407.69000		2,446.14	
0340	408A052 Planing Existing Pavement (Approximately 1.10" Thru 2.0" Thick)	46,430.000 SQYD	2.19000		101,681.70	
0350	424A280 Superpave Bituminous Concrete Wearing Surface Layer, 1/2" Maximum Aggregate Size Mix, ESAL Range E	3,807.000 TON	117.27000		446,446.89	
0360	424A360 Superpave Bituminous Concrete Wearing Surface Layer, 1/2" Maximum Aggregate Size Mix, ESAL Range C/D	2,467.000 TON	105.35000		259,898.45	
0370	424B651 Superpave Bituminous Concrete Upper Binder Layer, 1" Maximum Aggregate Size Mix, ESAL Range C/D	158.000 TON	118.07000		18,655.06	
0380	424B657 Superpave Bituminous Concrete Upper Binder Layer, Leveling, 1/2" Maximum Aggregate Size Mix, ESAL Range C/D	150.000 TON	133.81000		20,071.50	
0390	424B662 Superpave Bituminous Concrete Upper Binder Layer, Widening, 1" Maximum Aggregate Size Mix, ESAL Range C/D	1,219.000 TON	107.82000		131,432.58	

CONTRACT ID: 20140725058 PROJECT(S):NH-0006(551)

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0400	424B685 Superpave Bituminous Concrete Lower Binder Layer, Patching, 1" Maximum Aggregate Size Mix, ESAL Range C/D	100.000 TON	134.67000		13,467.00	
0410	424B692 Superpave Bituminous Concrete Lower Binder Layer, Widening, 1" Maximum Aggregate Size Mix, ESAL Range C/D	1,705.000 TON	107.82000		183,833.10	
0420	424C360 Superpave Bituminous Concrete Base Layer, 1" Maximum Aggregate Size Mix, ESAL Range C/D	207.000 TON	116.34000		24,082.38	
0430	424C370 Superpave Bituminous Concrete Base Layer, Widening, 1" Maximum Aggregate Size Mix, ESAL Range C/D	2,082.000 TON	107.40000		223,606.80	
0440	502A000 Steel Reinforcement	12,906.000 LB	1.00000		12,906.00	
0450	517D000 Sidewalk Handrail	196.000 LF	250.00000		49,000.00	
0460	524B011 Culvert Concrete Extension (Cast In Place)	82.000 CUYD	850.00000		69,700.00	
0470	529A010 Retaining Wall	200.000 SQFT	81.50000		16,300.00	
0480	530A000 15" Roadway Pipe (Class 3 R.C.)	31.000 LF	102.00000		3,162.00	

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0490	530A001 18" Roadway Pipe (Class 3 R.C.)	702.000 LF	61.50000		43,173.00	
0500	530A002 24" Roadway Pipe (Class 3 R.C.)	821.000 LF	56.50000		46,386.50	
0510	530A003 30" Roadway Pipe (Class 3 R.C.)	253.000 LF	71.00000		17,963.00	
0520	530A004 36" Roadway Pipe (Class 3 R.C.)	271.000 LF	84.00000		22,764.00	
0530	530B002 29" Span, 18" Rise Roadway Pipe (Class 3 R.C.)	48.000 LF	63.00000		3,024.00	
0540	530C004 36" Roadway Pipe, Jacked Installation (Smooth Steel)	227.000 LF	425.00000		96,475.00	
0550	534E001 Cleaning Existing Pipe (Less Than Or Equal To 48" Horizontal Opening)	223.000 LF	125.00000		27,875.00	
0560	534F000 Cleaning Existing Culvert (Greater Than 48" Horizontal Opening)	122.000 LF	160.00000		19,520.00	
0570	600A000 Mobilization	LUMP	LUMP		242,760.36	
0580	602A000 Right Of Way Markers	22.000 EACH	515.00000		11,330.00	
0590	608A000 Separation Geotextile	8,000.000 SQYD	3.00000		24,000.00	

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0600	614A000 Slope Paving	905.000 CUYD	325.00000		294,125.00	
0610	618A000 Concrete Sidewalk, 4" Thick	3,868.000 SQYD	46.50000		179,862.00	
0620	618B004 Concrete Driveway, 8" Thick	677.000 SQYD	70.00000		47,390.00	
0630	619A002 18" Roadway Pipe End Treatment, Class 1	2.000 EACH	911.79000		1,823.58	
0640	619A003 24" Roadway Pipe End Treatment, Class 1	1.000 EACH	1,052.97000		1,052.97	
0650	619A055 36" Roadway Pipe End Treatment, Class 2	1.000 EACH	2,941.25000		2,941.25	
0660	619A228 30" Roadway Pipe End Treatment, Class 2 (Double Line)	1.000 EACH	3,235.38000		3,235.38	
0670	620A000 Minor Structure Concrete	5.000 CUYD	1,447.10000		7,235.50	
0680	621A009 Junction Boxes, Type 2P	2.000 EACH	3,499.79000		6,999.58	
0690	621A011 Junction Boxes, Type 1 Or 1P	10.000 EACH	2,941.00000		29,410.00	
0700	621B011 Junction Box Units, Type 1 Or 1P	2.000 EACH	794.07000		1,588.14	

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0710	621C008 Inlets, Type E	4.000 EACH	5,323.21000		21,292.84	
0720	621C015 Inlets, Type S1 Or S3 (1 Wing)	12.000 EACH	3,235.10000		38,821.20	
0730	621C017 Inlets, Type S1 Or S3 (2 Wing)	3.000 EACH	3,493.91000		10,481.73	
0740	621C056 Inlets, Type S3 (1 Wing) (Partial)	1.000 EACH	2,999.82000		2,999.82	
0750	621C109 Inlets, Type PD	1.000 EACH	5,999.64000		5,999.64	
0760	621C111 Inlets, Type PB	1.000 EACH	3,411.56000		3,411.56	
0770	621D037 Inlet Units, Type PB	1.000 EACH	911.71000		911.71	
0780	623A001 Concrete Gutter (Valley)	627.000 LF	35.23000		22,089.21	
0790	623B000 Concrete Curb, Type N	678.000 LF	18.23000		12,359.94	
0800	623C000 Combination Curb & Gutter, Type C	5,984.000 LF	19.94000		119,320.96	
0810	629A021 Concrete Median Or Safety Barrier, Type 1	44.000 LF	300.00000		13,200.00	

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0820	629C002 Concrete Median Or Safety Barrier End Section (Type TES)	1.000 EACH	3,500.00000		3,500.00	
0830	630A001 Steel Beam Guardrail, Class A, Type 2	144.000 LF	54.11000		7,791.84	
0840	630C001 Guardrail End Anchor, Type 8	1.000 EACH	882.30000		882.30	
0850	630C050 Guardrail End Anchor, Type 20 Series	2.000 EACH	3,646.84000		7,293.68	
0860	637A001 Fence Reset (Includes All Types)	105.000 LF	35.00000		3,675.00	
0870	641S500 Valve Box Reset	25.000 EACH	325.00000		8,125.00	
0880	650A000 Topsoil	380.000 CUYD	50.00000		19,000.00	
0890	654A000 Solid Sodding	3,416.000 SQYD	4.71000		16,089.36	
0900	659C001 Erosion Control Product, Type S3	150.000 SQYD	2.35000		352.50	
0910	665A000 Temporary Seeding	2.000 ACRE	705.84000		1,411.68	
0920	665B001 Temporary Mulching	6.000 TON	470.56000		2,823.36	

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0930	665G000 Sand Bags	134.000 EACH	5.88000		787.92	
0940	665J002 Silt Fence	6,135.000 LF	3.53000		21,656.55	
0950	665N000 Temporary Coarse Aggregate,ALDOT Number 1	300.000 TON	45.00000		13,500.00	
0960	665O001 Silt Fence Removal	6,135.000 LF	1.18000		7,239.30	
0970	665Q002 Wattle	1,530.000 LF	8.23000		12,591.90	
0980	666A001 Pest Control Treatment	2.000 ACRE	29.41000		58.82	
0990	674A000 Construction Safety Fence	2,000.000 LF	2.00000		4,000.00	
1000	680A001 Geometric Controls	LUMP	LUMP		75,000.00	
1010	698A000 Construction Fuel (Maximum Bid Limited to $ 286,000.00)	LUMP	LUMP		286,000.00	
1020	701A227 Solid White, Class 2, Type A Traffic Stripe (5" Wide)	2.000 MILE	3,252.25000		6,504.50	
1030	701A230 Solid Yellow, Class 2, Type A Traffic Stripe (5" Wide)	2.000 MILE	3,252.25000		6,504.50	

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1040	701A239 Broken White, Class 2, Type A Traffic Stripe (5" Wide)	4.000 MILE	2,001.39000		8,005.56	
1050	701B062 Dotted, Class 2, Type A Traffic Stripe(Lane Drop 8" Wide)	954.000 LF	0.75000		715.50	
1060	701B207 Dotted, Class 2, Type A Traffic Stripe (5" Wide)	2,771.000 LF	0.63000		1,745.73	
1070	701C000 Broken Temporary Traffic Stripe	4.000 MILE	750.52000		3,002.08	
1080	701C001 Solid Temporary Traffic Stripe	2.000 MILE	750.52000		1,501.04	
1090	701D007 Solid Traffic Stripe Removed (Paint)	1.000 MILE	3,502.43000		3,502.43	
1100	701D014 Broken Traffic Stripe Removed (Paint)	4.000 MILE	1,751.21000		7,004.84	
1110	701G014 Solid White, Class 1, Type B Traffic Stripe	312.000 LF	0.44000		137.28	
1120	701G023 Broken Yellow, Class 1, Type B Traffic Stripe	4,130.000 LF	0.31000		1,280.30	
1130	701H010 Dotted Traffic Stripe Removed (Paint)	1,259.000 LF	0.63000		793.17	
1140	703A002 Traffic Control Markings, Class 2, Type A	9,124.000 SQFT	4.38000		39,963.12	

CONTRACT ID: 20140725058 PROJECT(S):NH-0006(551)

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1150	703B002 Traffic Control Legends, Class 2, Type A	1,169.000 SQFT	5.00000		5,845.00	
1160	703C001 Removal Of Existing Traffic Control Markings Or Legends (Plastic)	2,053.000 SQFT	1.25000		2,566.25	
1170	703D001 Temporary Traffic Control Markings	1,667.000 SQFT	0.63000		1,050.21	
1180	705A030 Pavement Markers, Class A-H, Type 2-C	424.000 EACH	5.00000		2,120.00	
1190	705A031 Pavement Markers, Class A-H, Type 1-A	341.000 EACH	5.00000		1,705.00	
1200	705A037 Pavement Markers, Class A-H, Type 2-D	8.000 EACH	5.00000		40.00	
1210	710A115 Class 4, Aluminum Flat Sign Panels 0.08" Thick Or Steel Flat Sign Panels 14 Gauge (Type III Or Type IV Background)	116.000 SQFT	20.01000		2,321.16	
1220	710A126 Class 8, Aluminum Flat Sign Panels 0.08" Thick Or Steel Flat Sign Panels 14 Gauge (Type IX Background)	80.000 SQFT	22.52000		1,801.60	
1230	710B021 Roadway Sign Post (#3 U Channel, Galvanized Steel or 2 ", 14 Ga Square Tubular Steel)	154.000 LF	12.51000		1,926.54	

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1240	720A025 Vehicular Impact Attenuator Assembly (Unidirectional,TL-3)	1.000 EACH	44,703.20000		44,703.20	
1250	730A000 Removal Of Existing Traffic Control Unit (At The Intersection Of SR-6 (US-82) And 15th Street E)	LUMP	LUMP		4,606.01	
1260	730A001 Removal Of Existing Traffic Control Unit (At The Intersection Of SR-6 (US-82) And 13th Street E)	LUMP	LUMP		3,719.25	
1270	730C000 Furnishing And Installing Traffic Control Unit (At The Intersection Of SR-6 (US-82) And 15th Street E)	LUMP	LUMP		10,639.19	
1280	730C001 Furnishing And Installing Traffic Control Unit (At The Intersection Of SR-6 (US-82) And 13th Street E)	LUMP	LUMP		8,699.63	
1290	730C002 Furnishing And Installing Traffic Control Unit (At The Intersection Of Veterans Memorial Parkway And Eastwood Ave)	LUMP	LUMP		5,820.81	
1300	730E000 Metal Traffic Signal Pole Foundation	12.000 EACH	3,697.54000		44,370.48	

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LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1310	730G001 Metal Traffic Signal Strain Pole	12.000 EACH	5,923.89000		71,086.68	
1320	730H001 Loop Wire	13,528.000 LF	2.67000		36,119.76	
1330	730I001 Loop Detector Lead-In-Cable	17,225.000 LF	1.54000		26,526.50	
1340	730K000 Traffic Signal Junction Box	11.000 EACH	267.42000		2,941.62	
1350	730L005 2", Non-Metallic, Conduit	223.000 LF	6.71000		1,496.33	
1360	730P022 Vehicular Signal Head, 12 Inch, 3 Section, Type LED	32.000 EACH	667.30000		21,353.60	
1370	730P024 Vehicular Signal Head, 12 Inch, 5 Section, Type LED	5.000 EACH	1,164.63000		5,823.15	
1380	730Q011 Pedestrian Signal Head, Type LED	14.000 EACH	1,429.81000		20,017.34	
1390	730R022 Controller Assembly, Type III, 8 Phase	3.000 EACH	15,418.31000		46,254.93	
1400	734A001 Cable OSP, Loose Tube, 12F MM	2,410.000 LF	1.94000		4,675.40	
1410	734A013 Cable OSP, Loose Tube, 48F SM	415.000 LF	5.64000		2,340.60	

CONTRACT ID: 20140725058 PROJECT(S):NH-0006(551)

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS		UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1420	734A017 Cable OSP, Loose Tube, 144F SM	2,310.000	LF	3.08000		7,114.80	
1430	734A029 Cable OSP, Loose Tube, 12MM X 48SM HY	1,885.000	LF	4.22000		7,954.70	
1440	734A100 Messenger Wire	1,705.000	LF	1.24000		2,114.20	
1450	734B003 Drop Cable OSP 12F MM Central Core	130.000	LF	0.83000		107.90	
1460	734E000 Detectable Tape System	2,578.000	LF	0.41000		1,056.98	
1470	734E021 Buried Duct HDPE SDR11 2 Inch	240.000	LF	8.23000		1,975.20	
1480	734E023 Buried Duct HDPE SDR11 3 Inch	2,115.000	LF	10.14000		21,446.10	
1490	734E028 Conduit PVC Schedule 40 1 Inch	45.000	LF	7.57000		340.65	
1500	734E031 Conduit PVC Schedule 40 2 Inch	1,518.000	LF	6.92000		10,504.56	
1510	734F002 Distribution Hardware SFDU 12 Fiber	2.000	EACH	242.91000		485.82	
1520	734G000 Connector ST Termination MM	10.000	EACH	44.18000		441.80	

CONTRACT ID: 20140725058 PROJECT(S):NH-0006(551)

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1530	734G005 Splice Closure, Aerial With Trays	1.000 EACH	746.26000		746.26	
1540	734G009 Splicing, Fusion	892.000 EACH	94.64000		84,418.88	
1550	734G100 Splice Closure, Undergrade, 12 Fiber	4.000 EACH	571.05000		2,284.20	
1560	734G104 Splice Closure, Undergrade, 60 Fiber	1.000 EACH	746.26000		746.26	
1570	734G120 Splice Closure, Undergrade, 72 Fiber	2.000 EACH	746.26000		1,492.52	
1580	734G140 Splice Closure, Undergrade, 144 Fiber	5.000 EACH	746.26000		3,731.30	
1590	734H020 Patch Cord Duplex MM ST 1 Meter	3.000 EACH	21.39000		64.17	
1600	734H071 Fanout Kit, MM	4.000 EACH	147.85000		591.40	
1610	734I950 ITS Cabinet,Pole Mount,Removal	1.000 EACH	305.14000		305.14	
1620	734J000 Commbox F1	7.000 EACH	1,463.94000		10,247.58	
1630	734J001 Commbox F2	5.000 EACH	1,703.94000		8,519.70	

CONTRACT ID: 20140725058 PROJECT(S):NH-0006(551)

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1640	734M000 Riser Assembly	8.000 EACH	666.48000		5,331.84	
1650	734S000 Fiber Storage Rack (Aerial)	1.000 EACH	305.14000		305.14	
1660	738D001 CCTV Camera, Relocate	1.000 EACH	800.79000		800.79	
1670	740B000 Construction Signs	1,235.000 SQFT	6.88000		8,496.80	
1680	740D000 Channelizing Drums	181.000 EACH	47.27000		8,555.87	
1690	740E000 Cones (36 Inches High)	50.000 EACH	22.52000		1,126.00	
1700	740F002 Barricades, Type III	12.000 EACH	225.16000		2,701.92	
1710	740I002 Warning Lights, Type B	6.000 EACH	81.31000		487.86	
1720	740M001 Ballast For Cone	50.000 EACH	12.51000		625.50	
1730	740N000 Tubular Marker	13.000 EACH	156.36000		2,032.68	
1740	741C010 Portable Sequential Arrow And Chevron Sign Unit	2.000 EACH	2,751.91000		5,503.82	

CONTRACT ID: 20140725058 PROJECT(S):NH-0006(551)

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1750	742A001 Portable Changeable Message Sign, Type 2	2.000 EACH	5,941.61000		11,883.22	
1760	745A000 Uniformed Police Officer	240.000 HOUR	62.50000		15,000.00	
1770	750B602 Roadway Luminaire Assembly with One, LED, 400 Watt Equivilant Luminaire	28.000 EACH	8,397.00000		235,116.00	
1780	750C010 Pole Foundation, Roadway	28.000 EACH	2,352.34000		65,865.52	
1790	750D200 Electrical Junction Box,Type 1	35.000 EACH	491.22000		17,192.70	
1800	750G010 Combined Duct And Cable,2 #6 AWG/ 1 #6 AWG GND	5,420.000 LF	6.03000		32,682.60	
1810	750G012 Combined Duct And Cable, 4 #6 AWG/ 1 #6 AWG GND	120.000 LF	7.49000		898.80	
1820	751F000 Renumber Luminaire Poles	28.000 EACH	195.85000		5,483.80	
1830	751G019 Remove & Store Transformer Base	24.000 EACH	130.75000		3,138.00	
1840	751J006 Remove Luminaire Pole Foundation, Concrete	24.000 EACH	596.09000		14,306.16	
1850	751L025 Remove Roadway Luminaire Assembly	24.000 EACH	931.48000		22,355.52	

CONTRACT ID: 20140725058 PROJECT(S):NH-0006(551)

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
1860	751M002 Remove Conductors and Conduits	LUMP	LUMP		1,938.94	
1870	756A006 4" Electrical Conduit, 1 Line, Type 1 Installation	649.000 LF	18.51000		12,012.99	
1880	756A022 4" Electrical Conduit, 1 Line, Type 5 Installation	860.000 LF	51.96000		44,685.60	
1890	756A027 6" Electrical Conduit, 1 Line, Type 1 Installation	32.000 LF	20.74000		663.68	
1900	756A028 6" Electrical Conduit, 1 Line, Type 5 Installation	240.000 LF	65.45000		15,708.00	
1910	756A040 6" Electrical Conduit, 1 Line, Type 4 Installation	70.000 LF	41.53000		2,907.10	
1920	770L005 Bollard,Complete In Place	25.000 EACH	600.00000		15,000.00	
1930	999 000 Trainee Hours At 80 Cents Per Hour	720.000 HOUR	0.80000		576.00	
	TOTAL BID				5,900,000.00	

FEDERAL-AID FUNDED PROJECTS

PLEASE READ AND COMPLETE SECTIONS A AND B. THE EXECUTION HEREINAFTER MADE ALSO CONSTITUTES THE EXECUTION OF THE PROPOSAL AND REPRESENTS THE AGREEMENT OF THE CONTRACTOR TO COMPLY WITH ALL DOCUMENTS CONTAINED IN THE PROPOSAL AND THOSE REFERRED TO THEREIN. FAILURE TO SUBMIT THE SWORN CERTIFICATION THROUGH PAGE 6 OF THIS NOTICE WILL BE CONSIDERED A NON-RESPONSIVE BID. BID BOND MUST BE SEPARATELY EXECUTED BY CONTRACTOR AND SURETY.

The contractor, subrecipient, or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of USDOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in termination of this contract or such other remedy as the recipient deems appropriate.

The Statement Required To Be Submitted By Proposed Contractor Pursuant To Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity (Executive Order 11246) and Regulations in 41 CFR Part 60-4 On All Federal and Federally-Assisted Contracts In Excess of $10,000 Will Be Included In the Award of Your Contract and Should Be Returned With Your Executed Contract.

The undersigned agrees that the terms and commitments contained herein shall not be constituted as a debt of the State of Alabama in violation of Article 11, Section 213 of the Constitution of Alabama, 1901, as amended by Amendment Number 26. It is further agreed that if any provision of this contract shall contravene any statute or Constitutional provision or amendment, either now in effect or which may, during the course of this contract, be enacted, then that conflicting provision in the contract shall be null and void.

The undersigned understands that in the event the term of this contract includes more than one fiscal year, said contract is subject to termination should funds not be appropriated for the continued payment of the contract in subsequent fiscal years.

The undersigned understands that in the event of the proration of the fund from which payment under this contract is to be made, the contract will be subject to termination.

Section A: The Alabama Department of Transportation is obligated on every Federal-aid project to implement, to the extent practical, 49CFR26,"Participation by Disadvantaged Business Enterprises (DBE) in U.S. DOT Financial Programs". This participation can be achieved by race neutral and/or race conscious means.

When race conscious means are used the contract goal for DBE participation will be indicated on Page Two of the Proposal Cover Sheet and in Section 111 of the Alabama Department of Transportation Standard Specifications for Highway Construction. Race neutral participation occurs when the contractor exceeds the indicated contract goal, or in the absence of a contract goal, obtains participation from a certified DBE that meets the CREDIT TOWARD PARTICIPATION portion of Section 111 of the Alabama Department of Transportation Standard Specifications for Highway Construction.

If the Department has determined that this project has sufficient opportunities for MBE/DBE participation the goal for this contract will be listed on Page Two of the Proposal Cover Sheet.

All bidders must complete form HR-DBE, "BIDDERS LIST OF QUOTERS FOR THE DISADVANTAGED BUSINESS ENTERPRISE (DBE) PROGRAM."

If the contractor is low bidder for the project, it is understood the contractor will provide a DBE Utilization Plan which outlines the proposed percentage of DBE Utilization within ten (10) calendar days after notification by the Department of intent to award, along with documentation of the contractor's "Good Faith" efforts to utilize DBE firms if the proposed percentage of utilization is less than the designated project goal. The contractor's good faith efforts will fully comply with and meet all requirements, provisions and criteria of Title 49, Code of Federal Regulations, Part 26, including the criteria set forth in 49 CFR, Part 26, Appendix A and will comply with and meet the requirements, provisions and criteria set forth in Section 111 of the Alabama Department of Transportation

Standard Specifications for Highway Construction as all of such foregoing requirements, provisions and criteria are applicable to Disadvantaged Business Enterprises, all of which the contractor represents that he is familiar. The contractor understands that the good faith efforts of the contractor will be reviewed by the Department in keeping with all such requirements, provisions and criteria.

NOTE

The Department will advise the low bidder of his status as soon as possible after the opening of bids. A copy of the Department's DBE Utilization form has been attached to this proposal for use in complying with the Requirement.

Failure by the successful bidder to provide an acceptable DBE Utilization plan within the time frame required or failure of the successful bidder to make and document Good Faith Efforts, when applicable, will result in non-award of the contract to that bidder. If the contract is awarded to the next low bidder, the original low bidder will be prohibited from doing any work on the contract, either as subcontractor or in any other capacity. The original low bidder will also be prohibited from bidding on the project if it is re-advertised for letting. These restrictions shall apply to any other name under which the same person, individual, partnership, company, firm, corporation, association, co-operative or other legal entity that may be operating in which the principal owner(s) is involved.

Section B: CONTRACTOR'S CERTIFICATION

The contractor proposes to perform all "Force Account of Extra Work" that may be required on the basis provided in the Specifications hereto attached, and to give such work personal attention in order to see that it is economically performed.

The contractor further proposes to execute the Contract Agreement in a form to be attached as soon as the work is awarded to the contractor and to begin and complete the work within the respective time limit provided for in the Specifications hereto attached.

The contractor also proposes to furnish a Performance Bond, acceptable to the State, in an amount equal to the total amount of the contract. This bond shall serve not only to guarantee the completion of the work but also to guarantee the excellence of both workmanship and materials until the work is finally accepted. The contractor will also furnish a materialsman bond, acceptable to the State, equal to the amount of the contract.

The contractor encloses a cashier's check or bid bond for five percent (5%) of the bid, maximum $10,000.00, and hereby agrees that in case of failure to execute a contract and furnish bonds within fifteen (15) days after notice of award, the awarding authority shall retain from the proposal guaranty, if it is a cashier's check, or recover from the principal and/or the sureties, if the guaranty is a bid bond, the difference between the amount of the Contract as awarded and the amount of the proposal of the next lowest acceptable bidder, which amount shall not exceed $10,000.00.

If no other bids are received, the full amount of the proposal guaranty shall be so retained and/or recovered as Liquidated Damages for such default. It is understood that in case the work is not awarded to the contractor, the proposal guaranty, if a cashier's check, will be returned as provided in the Alabama Department of Transportation Standard Specifications for Highway Construction.

1. DISADVANTAGED BUSINESS ENTERPRISES

The contractor intends to comply with the contract documents to utilize Disadvantaged Business Enterprises (hereinafter referred to at times as (DBE)) to the extent practical and when, under Section A herein above, the contract documents specify a minimum monetary amount to be expended with Disadvantaged Business Enterprises, to equal or exceed said amount through subcontracting and/or by purchases of materials and services on the project.

It is understood that failure to submit a Disadvantaged Business Enterprise Plan, when such is required by the contract within the time frame so specified, will be cause for assessment of penalties as provided in the contract.

It is further understood that failure to comply with the contract relating to Disadvantaged Business Enterprises, when such are applicable, will be cause for the assessment of penalties as provided in the contract.

2. REQUIREMENT BY THE EQUAL EMPLOYMENT OPPORTUNITY REGULATIONS OF THE SECRETARY OF LABOR (41 CFR 60-1.7(b) (1))

THE CONTRACTOR MUST CHECK THE APPROPRIATE BOX BELOW:

The contractor submitting this proposal certifies that such contractor

HAS /_____/ HAS NOT /✓/

participated in a previous contract or subcontract subject to the Equal Opportunity Clause, as required by Executive Orders 10925, 1114 or 11246.

If the contractor checked the "HAS" box above, the following statement must be completed. The contractor submitting this proposal certifies that such contractor

HAS /_____/ HAS NOT /_____/

filed with the Joint Reporting Committee, the director of OFCC, any Federal Agency or the former President's Committee on Equal Employment Opportunity all reports due under the applicable filing requirements of those organizations. All reports due are considered to be those requested by one of these committees or agencies.

Concurrently, Standard Form 100 (EEO-1) is the only report required by the Executive Orders or their implementing regulations.

Proposed prime contractors and subcontractors who have participated in a previous contract or subcontract subject to the Executive Orders and who have not filed the required reports should note that 41 CFR 60-1.7(b)(1) prevents the award of contracts and subcontracts unless such contractor submits a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the director, Office of Federal Contract Compliance, U. S. Department of Labor.

3. COLLUSION

It is further certified that neither the person, firm, partnership or corporation submitting this bid, nor any of their officers, have directly or indirectly entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this contract.

4. SUSPENSION/DEBARMENT

A. Certification Regarding Debarment, Suspension and Other Responsibility Matters - Primary Covered Transactions

Instructions for Certification

By signing and submitting this proposal, the prospective primary participant is providing the certification set out below.

The inability of a person to provide the certification required below will not necessarily result in denial of participation in this covered transaction. The prospective participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective primary participant to furnish a certification or an explanation shall disqualify such person from participation in this transaction.

The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause of default.

The prospective primary participant shall provide immediate written notice to the department or agency to whom this proposal is submitted if at any time the prospective primary participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

The terms "covered transaction", "debarred", "suspended", "ineligible", "lower-tier covered transaction", participant", "person", "primary covered transaction", "principal", "proposal" and "voluntarily excluded" as used in this clause, have the meanings set out in the Definitions and Coverage sections of the rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is being submitted for assistance in obtaining a copy of those regulations.

The prospective primary participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower-tier covered transaction with a person who is debarred, suspended, declared ineligible or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

The prospective primary participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion/Lower-Tier Covered Transactions," provided by the department or agency entering into this covered transaction, without modification, in all lower-tier covered transactions and in all solicitations for lower-tier covered transactions.

A participant in a covered transaction may rely upon a certification of a prospective participant in a lower-tier covered transaction that it is not debarred, suspended, ineligible or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.

Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

Except for transactions authorized under these instructions, if a participant in a covered transaction knowingly enters into a lower-tier covered transaction with a person who is suspended, debarred, ineligible or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

Certification Regarding Debarment Suspension and Other Responsibility Matters - Primary Covered Transactions

The prospective primary participant certifies, to the best of its knowledge and belief, that it and its principals:

Are not presently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from covered transactions by any Federal department or agency;

Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements or receiving stolen property;

Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in the preceding paragraph of this

certification; and have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

B. For Lower-Tier Requirements, see Section XI of "Required Contract Provisions Federal-Aid Construction Contracts" located in the proposal.

Exceptions to the above are to be submitted on a separate sheet with the bid proposal. For any exception noted, indicate to whom it applies, initiating agency and dates of action. Providing false information may result in criminal prosecution or administrative sanctions.

5. LOBBYING RESTRICTIONS

These restrictions were established by Section 319 of Public Law 101-121 Department of the Interior and Related Agencies Appropriations Act for Fiscal Year 1990).

The contractor certifies to the best of his/her knowledge and belief that:

A. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement and the extension, continuation, renewal, amendment or modification of any Federal contract grant, loan or cooperative agreement.

B. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of congress, an officer or employee of Congress or an employee of a Member of congress in connection with this Federal contract, grant, loan or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file this required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

The contractor also agrees by submitting this proposal that he/she shall require that the language of this certification be included in all lower-tier subcontracts which exceed $100,000 and that all such subrecipients shall certify and disclose accordingly.

I further certify that I am a properly authorized individual or corporate official, as applicable, to make this certification that the above is true and correct; and that I recognize, by signing this certification, I am also signing the contract proposal on behalf of the contractor in whose name the proposal is made, whether individual, partnership, or corporation as might be applicable.

NOTE: PROVIDED THE BID BOND ON THE FOLLOWING TWO PAGES IS PROPERLY EXECUTED IN THE CONTRACTOR'S NAME, SIGNED BY AN AUTHORIZED OFFICER OF THE CONTRACTOR CORPORATION (OR INDIVIDUAL OR PARTNER, WHEN NOT A CORPORATION), THE SAME MAY MAKE THE FOREGOING CERTIFICATIONS BY SIGNING BEFORE A PROPERLY SWORN NOTARY PUBLIC. THE CERTIFICATIONS MUST BE PROPERLY SWORN TO, SIGNED AND NOTARIZED BELOW.

Signature of Contractor. If the contractor is an INDIVIDUAL, signature of the individual is required; if contractor is a CORPORATION, signature of proper corporate officer is required; if contractor is a PARTNERSHIP, signature of partner is required; if contractor is JOINT VENTURE, appropriate signatures of all contractors are required.

Legal name of Contractor:

IKAROS LLC.

(Partnership, Joint Venture, Corporation or Individual)

By: _____

(Signature of Officer or Individual, as applicable)

By: _____

IF JOINT VENTURE (Signature of Officers or Individual, as applicable)

The foregoing certifications are sworn to and subscribed before me on this 21st day of July, 2014.

CHRISTOPHER M. POLING NOTARY PUBLIC ALABAMA STATE AT LARGE

_____

NOTARY PUBLIC

AWARD WILL NOT BE CONFERRED UNLESS THIS FORM IS COMPLETED AND SIGNED AND WITNESSED BY A NOTARY.

Revised 6/1/2010

FORM OF BID BOND

KNOW ALL BY THESE PRESENTS: that the contractor, as Principal, and the Surety are held and firmly bound unto the

STATE OF ALABAMA DEPARTMENT OF TRANSPORTATION

as Obligee, in the full and just sum of five percent (5%) of amount bid (Maximum amount - $10,000.00), lawful money of the United States, for the payment of which su well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally firmly by these presents.

WHEREAS, the said Principal is herewith submitting its proposal for Project Number(s) NH-0006(551)

Tuscaloosa County/Counties

The condition of this obligation is such that: If the aforesaid Principal shall be awarded the contract and said Principal will, within the time required, enter into a formal contract and give a good and sufficient bond to secure the performance of the terms and conditions of the contract, then this obligation will be void: otherwise, the Principal and the Surety will pay unto the Obligee the difference in money between the amount of the contract as awarded and the amount of the proposal of the next lowest acceptable bidder, but not to exceed the total amount of the proposal guaranty. If no other bids are received, the full amount of the proposal guaranty shall be retained and/or recovered as liquidated damages for such default.

Witness our hands and seals this 25th day of July, 2014

IKAROS, LLC
Name of Business, Corporation, Partnership, or Joint Venture (Contractor)

Alabama
State of Charter or Incorporation

By: _____
(Signature of Individual Bidder or Officer Authorized to Sign Bids and Contracts for the Firm)

managing member
Position or Title

By: _____
(Signature of Individual Bidder or Officer Authorized to Sign Bids and Contracts for the Firm)

Position or Title

Hartford Fire Insurance Company
(Name of Surety)

BY: Christina Krout
Christina Krout (Attorney in Fact)

Hartford Plaza, Hartford, CT 06115
(Address of Surety)

PROPOSAL WILL NOT BE ACCEPTED UNLESS THIS FORM OF BID BOND IS COMPLETED AND SIGNED BY PRINCIPAL AND SURETY OR A CASHIER'S CHECK (DRAWN ON AN ALABAMA BANK) IN THE PROPER AMOUNT IS FURNISHED. PLEASE LEAVE ATTACHED IN YOUR BID PROPOSAL. BID BOND MUST BE INCLUDED IN THE SEALED BID PACKAGE AND PRESENTED PRIOR TO THE TIME SET FOR BID OPENING.

SPECIAL PROVISIONS
PROJECT NO. NH-0006(551)
TUSCALOOSA COUNTY, AL

REVISED
July 24, 2014

The Following Special Provisions are supplementary requirements and amendments to the Standard Specifications for Highway Construction. The requirements and amendments given in these Special Provisions take precedence over the requirements given in the Standard Specifications.

S.P. CODE	SPECIAL PROVISIONS DESCRIPTION
005/12	Form FHWA-1273 Required Contract Provisions Federal-Aid Construction Projects
12-0096	Special Training Responsibilities of EEO Requirements
12-0097	Required Contract Provision for All Federal Aid Projects for EEO
12-0100-3	Highway Construction Wage Rates in Blount, Calhoun, Etowah, Shelby, St. Clair and Tuscaloosa Counties
12-0102	Procurement Time
12-0104	Cross Slope on HMA Pavements (NHS)
12-0107	Waterstop Materials
12-0182(3)	Water Line
12-0198	Combination Bids
12-0220	Roadway Signs
12-0263(3)	Asphalt Pavement
12-0268	Roadway Lighting
12-0292	Fencing Materials
12-0321(2)	Traffic Signals
12-0325	Working Drawings
12-0335	Treated Wood
12-0351	Steel Reinforcement
12-0352(3)	Structural Steel, Fasteners, and Miscellaneous Metals
12-0353	Bridge and Sidewalk Handrail
12-0354	Sieves for Testing Materials
12-0355	Mineral Filler, Hydrated Lime, Calcium Chloride, Brick, and Blocks
12-0356	Concrete Curing Materials
12-0358	Pipe Culvert Joint Sealers
12-0359	Coatings, Paints, Enamels, and Varnishes
12-0399(2)	Temporary Soil Erosion and Sediment Control
12-0426	Liquidated Damages
12-0434	Slope Paving
12-0521	Definition of Terms
12-0530	Preparation of Proposals
12-0599	Asphalt Materials
12-0604	Extension of Contract Time
12-0607	Contractor's Advertisement of Completion
12-0676	Structural Portland Cement Concrete
12-0737	Structures for Traffic Control Devices and Highway Lighting
12-0769	Extra and Force Account Work
12-0798	Structural Materials for Traffic Control Devices and Highway Lighting
12-0988	Cooperation With Utility Companies
12-1044	Fiber Optic Systems
12-1045	Closed Circuit Television (CCTV) Camera
12-1051	Rehabilitation of Roadway Lighting System
12-1052	Bollards
12-1121	Jacking (Boring) of Roadway Pipe

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding $10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under

applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurance Required by 49 CFR 26.13(b):

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor

will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b.(1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g. , the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division Web site at http://www.dol.gov/esa/whd/forms/wh347instr.htm or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of $100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contacting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.
2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost $25,000 or more – as defined in 2 CFR Parts 180 and 1200.

1. **Instructions for Certification – First Tier Participants:**

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.

department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed $100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed $100,000 and that all such recipients shall certify and disclose accordingly.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: November 10, 2011 Special Provision No. 12-0096

EFFECTIVE DATE: January 1, 2012

SUBJECT: Special Training Responsibilities of Equal Employment Opportunity Requirements

Alabama Standard Specifications, 2012 Edition, are hereby amended to include the following:

This Training Special Provision is an implementation of 23 USC 140(a).

As part of the contractor's equal opportunity affirmative action program training shall be provided as follows:

> The contractor shall provide on-the-job training aimed at developing full journeymen in the type of trade or job classification involved. The number of trainee hours under this contract will be as indicated in the bidding proposal and on the plans. In the event that a contractor subcontracts a portion of the contract work, he shall determine how many, if any, of the trainee hours are to be subcontracted, provided, however, that the contractor shall retain the primary provision. The contractor shall also insure that this training special provision is made applicable to such subcontract. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

The number of trainees shall be distributed among the work classifications on the basis of the contractor's needs and the availability of journeymen in the various classifications within a reasonable area of recruitment. Prior to commencing construction, the contractor shall submit to the Alabama Department of Transportation for approval the number of trainees to be trained in each selected classification and training to be used. Furthermore, the contractor shall specify the starting time for training in each of the classifications. The contractor will be credited for each trainee employed by him on the contract work that is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees as provided hereinafter.

Training and upgrading of minorities and women toward journeyman status is a primary objective of this Training Special Provision. Accordingly, the contractor shall make every effort to enroll minority trainees and women (e.g. by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees) to the extent that such persons are available within a reasonable area of recruitment. The contractor will be responsible for demonstrating the steps that he has taken in pursuant thereof, prior to a determination as to whether the contractor is in compliance with this Training Special Provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed an a trainee in any classification in which he has successfully completed a training course leading to journeyman status or in which he has been employed as a journeyman. The contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used the contractor's records should document the findings in each case.

The minimum length and type of training for each classification will be as established in the training program selected by the contractor and approved by the Alabama Department of Transportation and the Federal Highway Administration. The Alabama Department of Transportation and the Federal Highway Administration shall approve a program if it is reasonably calculated to meet the equal employment opportunity obligations of the contractor and to qualify the average trainee for journeyman status in the

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: November 10, 2011 Special Provision No. 12-0097

EFFECTIVE DATE: January 1, 2012

SUBJECT: Required Contract Provision for all Federal Aid Projects for Equal Employment Opportunity

Alabama Standard Specifications, 2012 Edition, are hereby amended to include the following:

In compliance with Executive Order 11246, the following Standard Federal Equal Opportunity Construction Contract Specifications shall apply:

General Requirements
(41 CFR 60-4.3)

1. As used in these specifications:
   a. "Covered area" means the geographical area described in the solicitation from which this contract resulted;
   b. "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;
   c. "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return. U.S. Treasury Department Form 941;
   d. "Minority" includes:
      (i) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
      (ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
      (iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent or the Pacific islands); and
      (iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).
2. Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract, in excess of $10,000, the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.
3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.
4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7a through 7p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered construction contractors performing

h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.

i. Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures and tests to be used in the selection process.

j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's workforce.

k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.

l. Conduct at least annually an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

m. Ensure that seniority practices, job classifications, work assignments and other personnel practices do not have a discriminatory effect by continually monitoring all personnel and employment-related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.

n. Ensure that all facilities and company activities are nonsegregated, except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

p. Conduct a review, at least annually, of all supervisors, adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

8. Contractors are encouraged to participate in voluntary associations that assist in fulfilling one or more of their affirmative action obligations (7a through 7p). The efforts of a contractor association, joint contractor-union, contractor-community or other similar group of which the Contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through 7p of these Specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contract may be in violation of the Executive Order if a specific minority group of women is under-utilized).

10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex or national origin.

11. The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of the Federal Contract Compliance Programs. Any

(41 CFR 60-4.2)

(d) The following notice shall be included in, and shall be a part of, all solicitations for offers and bids on all Federal and federally assisted construction contracts or subcontracts in excess of $10,000 to be performed in geographical areas designated by the Director pursuant to §60-4.6 of this part (see 41 CFR-4.2 (a)):

Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity (Executive Order 11246)

1. The Offerer's or Bidder's attention is called to the "Equal opportunity Clause" and the "Standard Federal Equal Employment Specifications" set forth herein.
2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as shown on Attachment No. 1.
   These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the contractor also is subject to the goals for both its federally-involved and nonfederally involved construction.
   The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Employment Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CPR Part 60-4. Compliance with the goals will be measured against the total work hours performed.
3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of $10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed.
4. As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is that shown on Attachment No. 1.

Show Cause Notice
(41 CFR 60-4.8)

If an investigation or compliance review reveals that a construction contractor or subcontractor has violated the Executive Order, any contract clause, specifications or the regulations in this chapter and if administrative enforcement is contemplated, the Director shall issue to the contractor or subcontractor a notice to show cause which shall contain the items specified in (i) - (iv) of 41 CFR 60-2.2 (c)(1) - If the Contractor does not show good cause within 30 days, or, in the alternative, fails to enter an acceptable conciliation agreement which includes where appropriate, make-up goals and timetables, back pay, and seniority relief for affected class members, the compliance agency shall follow the procedure in 41 CFR 60-1.26(b) : Provided that where a conciliation agreement has been violated, no show cause notice is required prior to the initiation of enforcement proceedings.

STATE OF ALABAMA
DEPARTMENT OF TRANSPORTATION

DATE: November 14, 2011 **SPECIAL PROVISIONS NO.: 12-0100-3**

SUBJECT: Highway Construction Wage Rates in **BLOUNT, CALHOUN, ETOWAH, SHELBY, ST. CLAIR AND TUSCALOOSA** Counties.

HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects & railroad construction; bascule, suspension & spandrel arch bridges designed for commercial navigation, bridges involving marine construction; and other major bridges).

Schedule of minimum wage rates contained in **Wage Determination Decision No. AL20100002** dated **May 27, 2011**, of the Secretary of Labor is hereby made a part of the Proposal Contract. Minimum wage rates established under this decision are as follows:

CLASSIFICATION		RATES	FRINGES
CARPENTER	$	13.88	
CONCRETE FINISHER		13.26	
ELECTRICIAN		19.73	
LABORERS:			
Asphalt Raker		11.23	
Concrete		10.84	
Grade Checker		12.58	
Guardrail Erector		12.47	
Pipe layer		12.58	
Side Rail/Form Setter		11.97	
Traffic Control Specialist		11.27	
Unskilled		9.84	
POWER EQUIPMENT OPERATORS:			
Aggregate Spreader		14.17	
Asphalt Distributor		14.27	
Asphalt Paver		11.85	
Asphalt Spreader		13.65	
Backhoe, Clamshell, Dragline, and Shovel		15.87	
Broom (Sweeper)		11.68	
Bulldozer		14.73	

DATE: November 14, 2011 **SPECIAL PROVISIONS NO.: 12-0100-3**

SUBJECT: Highway Construction Wage Rates in BLOUNT, CALHOUN, ETOWAH, SHELBY, ST. CLAIR AND TUSCALOOSA Counties.

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 Determination
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, D.C. 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 Ave., N.W.
Washington, D.C. 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.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: October 31, 2011 Special Provision No. 12-0102

EFFECTIVE DATE: January 1, 2012

SUBJECT: Procurement Time.

Alabama Standard Specifications, 2012 Edition, SECTION 108 shall be amended as follows:

SECTION 108
PROSECUTION AND PROGRESS

108.02 Notice To Proceed.

This Article (108.02) shall be amended by deleting Subarticle (b) as written and substituting the following in lieu thereof:

(b) Time of Beginning Work.

Unless otherwise directed in writing by the Engineer, the Contractor will be expected to begin work within **180 calendar days** after issuance of the notice to proceed. This extended period of time is to allow ample time for engineering, design, submittal data processing, fabrication, and procurement of required materials.

108.08 Determination Of Contract Time.

This Article (108.08) shall be amended by deleting Subarticle (b) and substituting the following in lieu thereof:

(b) Beginning and End of Contract Time.

Contract time charges shall begin when the Contractor begins work on a pay item or incidental work that will interfere with traffic, but in no case later than **180 calendar days** after date of issuance of the notice to proceed. Time charges shall end upon satisfactory completion of all pay items in the contract.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: October 31, 2011 Special Provision No. 12-0104

EFFECTIVE DATE: January 1, 2012

SUBJECT: Cross Slope on HMA Pavements (NHS).

Alabama Standard Specifications, 2012 Edition, Section 410, shall be amended as follows:

SECTION 410
HOT MIX ASPHALT PAVEMENTS

410.03 Construction Requirements.

(a) EQUIPMENT.

4. HOT MIX ASPHALT PAVERS OR SPREADERS.

The fourth paragraph of this Item (410.03(a)4.) shall be replaced by the following:

All hot and warm mix asphalt paving machines shall be operated with automatic grade and slope controls unless otherwise directed by the Engineer. (The Engineer will not require operation with automatic slope controls when the requirement for "Match Existing" is given on the plans for the required finished cross slope.) The automatic grade controls shall be a contact ski, a mobile stringline, or non-contact sonic averaging sensors. The effective length of these controls shall be a minimum of 24 feet {7.3 m}. In the event of a malfunction of the automatic control system, the spreading operation shall be discontinued after one hour until the equipment is repaired.

410.05 Surface and Edge Requirements.

(a) SURFACE SMOOTHNESS REQUIREMENTS.

2. PERPENDICULAR TO CENTERLINE OF ROADWAY.

This Item (410.05(a)2.) shall be replaced by the following:

2. PERPENDICULAR TO CENTERLINE OF ROADWAY.

The finished surface of all base, binder, and wearing surface layers shall not vary more than 1/4 of an inch {6 mm} from a 10 foot {3.0 m} straightedge placed perpendicular (at a right angle) to the centerline of the roadway anywhere on the surface.

The required cross slope on tangent sections will be shown as either "Match Existing" or "n %". "Match Existing" shall be the placement of pavement layers without the need for making adjustments to the rates of placement to change the cross slope or superelevation that exists at the time of placement. The letter "n" will be the cross slope in percent. The cross slope "n" will usually be 2 %.

If "n %" is shown, corrections will be required utilizing milling and/or leveling to bring the cross slopes to n %. Upon completion of the corrective work and paving operations, the resulting cross slopes shall be within a tolerance of plus or minus 0.3 % of the required slope unless shown otherwise on the plans.

When superelevation rates for curves are shown on the plans, the resulting cross slopes shall be within a tolerance of plus or minus 0.3 % of the required slope unless shown otherwise on the plans.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: November 8, 2011 Special Provision No. 12-0107

EFFECTIVE DATE: January 1, 2012

SUBJECT: Waterstop Materials.

Alabama Standard Specifications, 2012 Edition, shall be amended by modifying Section 832 as follows:

SECTION 832
CONCRETE JOINT FILLERS, JOINT AND CRACK SEALANTS, AND WATERSTOP MATERIALS

832.05 Waterstop Materials.

(a) DESCRIPTION.

Waterstops shall be of the size and shape shown on the plans. The material may be either neoprene, polyvinylchloride or strip applied expandable waterstop meeting the requirements given in this Section.

(b) NEOPRENE.

Physical Requirements.

1. Tensile Strength, Method A using die C - 2000 psi {13.78 MPa} Min., ASTM D 412.
2. Ultimate Elongation, Method A using die C - 360 % Min., ASTM D 412.
3. Type A Shore Durometer Hardness - 65 ± 5, ASTM D 2240.
4. Change in Type A Durometer Hardness, 70 hrs. heat aged @ 158 °F {70 °C} + 15 points Max., ASTM D 2240.
5. Compression Set, Method B, Max permissible change after 22 hrs. heat aged @ 158 °F {70 °C} 30%, ASTM D 395.

(c) POLYVINYLCHLORIDE.

Physical Requirements.

1. Tensile Strength, Method A using die C - 1750 psi {12.17 MPa} Min., ASTM D 412.
2. Ultimate Elongation, Method A using die C - 300 % Min., ASTM D 412.
3. Type A Shore Durometer Hardness 80 ± 5 ASTM D 2240.
4. Change in Type A Durometer Hardness, 70 hrs. heat aged @ 158 °F {70 °C} + 15 points Max., ASTM D 2240.

(d) STRIP APPLIED EXPANDABLE WATERSTOP.

Physical Requirements.

1. Specific Gravity - 130-160 , ASTM D 71.
2. Penetration - cone at 77 °F, 150 gm, 5 sec, 40 mm ± 5, ASTM D 217.
3. Volatile Matter - 1 % Max., ASTM D 6.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: October 21, 2013 Special Provision No. 12-0182(3)

EFFECTIVE DATE: January 1, 2014

SUBJECT: Water Line.

Alabama Standard Specifications, 2012 Edition, SECTION 641 and SECTION 863 shall be modified as follows:

SECTION 641
WATER LINE

641.03 Construction Requirements.

(a) GENERAL.

2. HYDRANT.

This Item [641.03(a)2] shall be amended by adding the following paragraph thereto:

Each fire hydrant unit shall include 3 feet of piping to attach to the water line. Fire Hydrant Extensions shall be installed to connect the standard fire hydrant unit as shown on the plans to the water line when the line is deeper than the standard 3 foot fire hydrant piping attachment.

(e) BACKFILLING.

This Subarticle [641.03(e)] shall be replaced with the following:

(e) BACKFILLING.

Backfilling shall be performed immediately after inspection as directed by the Engineer to secure the pipe position prior to proceeding to the next section.

The backfill material shall be carefully deposited equally on both sides of the pipe in uniform layers not to exceed 6 inches {150 mm} in compacted thickness to a density of not less than 95 percent of AASHTO T 99 maximum density. Backfill that is not under roadbeds shall be compacted as directed by the Engineer to be consistent with surrounding materials.

Where roadways and other crossings are disturbed, the Contractor shall restore them to their original condition and shall replace all surface material and all paving, sidewalks, sod, or other disturbed surfaces, by furnishing all necessary new materials without extra compensation.

All pipe shall be pressure tested as noted in this Section before complete backfilling of the pipe will be permitted.

All trenches and excavations shall be backfilled with approved natural soil unless shown otherwise on the plans.

After completing the backfill, the Contractor shall promptly remove all surplus material, rubbish, and all equipment, leaving the site and adjacent areas in a neat and presentable condition.

641.05 Basis of Payment.

(a) UNIT PRICE COVERAGE.

Items 641.05(a)2. and 3. shall be replaced with the following:

2. WATER MAIN.

The accepted quantity of water main laid or re-laid will be paid for at the contract unit price per linear foot {meter}, complete in place, which shall be payment in full for furnishing and installing pipe; including joint material, polyethylene sheathing when required, fittings for PVC and HDPE pipe, restrained joint when specified, making necessary pipe connections, pigging, flushing,

SECTION 863
WATER PIPE, FIRE HYDRANTS, VALVES, AND APPURTENANCES

863.01 Ductile Iron Water Pipe.

Ductile Iron pipe shall meet the requirements of AWWA C151 with a minimum working pressure of 150 psi {1030 kPa}. The pipe shall have an inner cement mortar lining meeting AWWA C104 and an outer bituminous coating. The push-on joints shall meet the requirements of AWWA C111. Restrained joints shall meet the requirements of AWWA C110. Lock joint pipe shall meet the requirements of AWWA C151. The pipe length shall be a minimum of 18 feet {5.5 m}.

863.02 Ductile Iron Fittings.

Ductile Iron fittings shall meet the requirements of AWWA C110, AWWA C153, or AWWA C151 when approved by the Engineer. Fittings shall have an inner cement mortar lining meeting AWWA C104 and an outer bituminous coating. Fittings shall have a minimum pressure rating equal to the adjoining pipe installed. For fittings sizes 4 inch {100 mm} through 12 inch {300 mm}, the minimum pressure rating shall be 250 psi {1720 kPa}.

863.03 Copper Water Pipe.

Pipe and fittings shall meet the requirements of ASTM B88 Type K.

863.04 Poly (Vinyl Chloride) (PVC) Plastic Pipe.

Pipe sizes 4 inch {100 mm} to 12 inch {300 mm} shall meet the requirements of AWWA C900 Class 235, DR 18 or heavier. Pipe sizes 14 inch {350 mm} to 48 inch {1200 mm} shall meet the requirements of AWWA C905 Pressure Class 235, DR 18 or heavier. Pipe and fittings sizes smaller than 4 inch {100 mm} shall meet the requirements of PVC 1120, PVC 1220, or PVC 2120 with a minimum cell classification 12454-B for ASTM D2241, SDR 26 or heavier or ASTM 1785 Schedule 40, 80, or 120.

Joints and gasket material shall be as recommended by the pipe manufacturer. Solvent welding of field joints shall only be allowed for pipes 1.5 inches {38 mm} in diameter and smaller.

863.05 Polyethylene (PE) Tubing.

Pipe and fittings 2 inches {50 mm} and smaller shall be made of PE3408 meeting the requirements of ASTM D 2239, minimum SIDR 7, ASTM D3350 and AWWA C901.

863.06 High Density Polyethylene(HDPE) Pipe.

HDPE pipe and bends shall meet the requirements of ASTM D1248, ASTM D3350(PE 3408), and ASTM F714. The HDPE pipe shall have a minimum wall thickness determined by the pressure rating required for use.

863.07 Cross-Linked Polyethylene (PEX Type A) Pipe.

Pipe 2 inches {50 mm} and smaller shall meet the requirements of AWWA C 904, Standard Dimension Ratio (SDR) 9, and standard Copper Tube Sizes (CTS). Fittings shall meet the requirements of AWWA C800 and for brass compression sleeve fittings. The pipe shall only be used below ground.

863.08 Gate Valve.

Gate valves shall meet the requirements of AWWA C509. Gate valves shall have o-ring seals. Gate valves shall have a non-rising stem that opens counterclockwise with a 2 inch {50 mm} square nut. Gate valves shall have mechanical joints meeting the requirements of AWWA C-111. The disc shall be SBR coated and the valve body shall be fusion bonded epoxy inside and out. Valves shall be furnished complete with necessary gaskets, bolts, and nuts as needed for mechanical joint ends. Gate valves shall be selected from the Utilities' approved material/manufacturer list.

863.09 Butterfly Valve.

Butterfly valves shall be rubber seated and meet the requirements of AWWA C504. The valve body shall meet the requirements of ASTM A126, Class B or ASTM A48, Class 40. Butterfly valves shall open counterclockwise with a 2 inch {50 mm} square nut. Butterfly valves shall have mechanical joints meeting the requirements of AWWA C-111. The disc shall meet the requirements of ASTM A536 or ASTM A48, Class 40. The rubber mating seat shall be stainless steel. All butterfly valves shall be provided with o-ring seals, nonadjustable stuffing boxes and shall be self-sealing or self-adjusting to allow for

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: February 29, 2012 Special Provision No. 12-0198

EFFECTIVE DATE: April 1, 2012

SUBJECT: Combination Bids.

Alabama Standard Specifications, 2012 Edition, SECTION 102 shall be revised as follows:

SECTION 102
PROPOSAL REQUIREMENTS AND CONDITIONS

102.08 Combination Bids.

(b) COUNTY FINANCED PROJECTS.

This Subarticle (102.08(b)) shall be replaced by the following:

(b) CITY AND COUNTY FINANCED PROJECTS.

Combination bids will not be accepted on any project or projects wholly or partially financed by a city unless all of the projects in the combination bid are city financed projects located in the same city.

Combination bids will not be accepted on any project or projects wholly or partially financed by a county unless all of the projects in the combination bid are county financed projects located in the same county.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: August 7, 2012 Special Provision No. 12-0220

EFFECTIVE DATE: November 1, 2012

SUBJECT: Roadway Signs.

Alabama Standard Specifications, 2012 Edition, Section 710 and Section 880 shall be amended as follows:

SECTION 710
ROADWAY SIGNS

710.01 Description

This Article (710.01) shall be replaced by the following:

710.01 Description

This Section shall cover the work of furnishing and erecting roadway signs of the various types, sizes, wording, marking, etc., detailed by the plans in accordance with the latest edition of the MUTCD except as modified herein or by the plan details. The type and number of signs, sign supports, backing frames when required, foundations and reflectorization to be furnished and installed shall be as detailed on the plans. Concrete foundations, when required, shall be constructed as shown on the plans or as directed by the Engineer.

The items of work for Roadway Signs will indicate whether the sign is of a reflectorized or non-reflectorized type, and the kind of backing material.

Sheeting used in the fabrication of sign faces shall be one of the following types unless required otherwise on the plans or in the proposal:

TYPES AND DESCRIPTIONS OF SIGN SHEETING	
Type I	Medium-intensity retroreflective sheeting, "engineering grade"
Type I-N	Non-reflective sheeting
Type II	Medium-high-intensity retroreflective sheeting, "super engineering grade"
Type III	High-intensity retroreflective sheeting
Type IV	High-intensity retroreflective sheeting, "microprismatic"
Type V	Super-high-intensity retroreflective sheeting, "microprismatic"
Type VI	Elastomeric high-intensity retroreflective sheeting without adhesive, "microprismatic"
Type VII	Sheeting previously classified as Type VII has been reclassified as Type VIII. The designation of Type VII has been discontinued. (ASTM D 4956-09)
Type VIII	Super-high-intensity retroreflective sheeting (ASTM D 4956 Table 2) , "microprismatic"
Type IX	Very-high-intensity retroreflective sheeting, "microprismatic"
Type X	Sheeting previously classified as Type X has been reclassified as Type VIII. The designation of Type X has been discontinued. (ASTM D 4956-09)
Type XI	Super-high-intensity unmetalized cube corner microprismatic retroreflective sheeting. (ASTM D 4956-09, Table 10)

Aluminum Laminated Panels.

These sign face panels shall consist of sheet aluminum laminated to a honeycomb core, sealed completely around the perimeter with an extruded aluminum frame to form a surface of the length, width and depth required.

Aluminum Louvered Panels.

These sign face panels shall consist of aluminum louvers assembled in such a manner as to provide a rigid sign panel which will have a wind loading normal to the face of the sign of at least 50 percent less than that of a solid panel of the same size and yet provide an opaque background when viewed from an angle of 10° or less below the horizontal line of sight.

710.05 Basis of Payment.

(b) PAYMENT WILL BE MADE UNDER ITEM NO.:

Subarticle 710.05(b) shall be replaced by the following:

(b) PAYMENT WILL BE MADE UNDER ITEM NO.:

710-A Class __*__, __**__ Sign Panels __***__ - per square foot {square meter}
710-B Roadway Sign Post (Description & Size) - per linear foot {meter}
710-C Removal of Existing Roadway Signs - per lump sum

* Appropriate Class
** Aluminum Flat
Steel Flat
Aluminum Multiple Flat
Aluminum Multiple Extruded
Steel Multiple Flat
Aluminum Laminated
Aluminum Louvered
*** Approximate thickness of panel material desired.

SECTION 880
SIGN MATERIALS

880.04 Sign Supports.

(a) GROUND MOUNTED SIGN SUPPORTS.

2. STEEL POSTS.

d. Post Finish.

Subitem 880.04(a)2d shall be replaced with the following:

d. Post Finish.

Standard posts shall be hot dipped zinc galvanized after fabrication in accordance with ASTM A 123 for beam shape and ASTM A 53 for tubular shape.

Light weight {mass} or bendaway posts shall be zinc galvanized in accordance with the following:

"U" Channel Section - ASTM A 123 after fabrication.

Tubular Section - ASTM A 653, Grade G90 or better. An alternate coating may be an in-line hot dip galvanized zinc coating per ASTM B 6, followed by a chromate conversion coating and cross-linked polyurethane acrylic exterior coating, with the inside surface given a double in-line application of a full zinc-based organic coating.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: May 13, 2014 Special Provision No. 12-0263(3)

EFFECTIVE DATE: June 1, 2014

SUBJECT: Asphalt Pavement.

Alabama Standard Specifications, 2012 Edition, shall be amended by modifying Section 106 and by replacing Sections 410, 420, 423, and 424 as follows:

SECTION 106
CONTROL OF MATERIALS

106.09 Quality Control and Quality Assurance (QC/QA) Requirements for Hot Mix Asphalt (HMA) Pavement.

Article 106.09 shall be replaced with the following:

106.09 Quality Control and Quality Assurance (QC/QA) Requirements for Hot Mix Asphalt (HMA) Pavement.

(a) GENERAL.

The following modifications apply only to the materials and work performed under Sections 327, 410, 420, 423 and 424.

In all cases, the Department's testing will be separate from the Contractor's testing and both shall be conducted by certified technicians.

All **Quality Control** aspects of this provision shall be the responsibility of the Contractor. Quality Control is defined as the activities that are related to the production of Hot Mix Asphalt Pavement which meet all the requirements of the Specifications, including mix design, process control testing, sampling and acceptance testing (when so designated by the Department) for determination of Pay Factors, and necessary adjustments to the production process.

All **Quality Assurance** aspects of this provision shall be the responsibility of the Department and will be accomplished in the following ways:

1. By conducting assurance/verification testing, on a random basis, of independent samples obtained by the Department, at a frequency of one or more per day;
2. By periodically observing tests performed by the Contractor;
3. By monitoring required Contractor control charts exhibiting test results of control parameters.

All Superpave Gyratory Compactors shall have their angle of gyration verified by the Engineer following the procedure in AASHTO T 344, "Standard Method of Test for Evaluation of Superpave Gyratory Compactor (SGC) Internal Angle of Gyration Using Simulated Loading". This includes all design, quality control, and quality assurance SGCs. The compactors shall tilt the specimen molds at an average internal angle of 20.2 ± 0.35 mrad (1.16± 0.02 degrees).

(b) QUALITY CONTROL.

The Contractor shall provide and maintain a quality control system that will provide reasonable assurance that all materials, products, and completed construction submitted for acceptance conform to contract requirements whether manufactured or processed by the Contractor or procured from subcontractors or vendors. Quality control managers, laboratory technicians and roadway technicians will be certified by the Department as outlined in ALDOT-374, "Certification Requirements for Hot Mix Asphalt Technicians". This quality control system shall conform to ALDOT-375, "Contractor Quality Control System for Hot Mix Asphalt".

TABLE I (*CONT'D.*) SECTION 423 MIXES (*STONE MATRIX ASPHALT*)
SAMPLING AND TESTING REQUIREMENTS FOR QC/QA PROJECTS

Control Parameter	Sample Size	Sampling Methods	Sampling Location	Testing Methods	ALDOT Testing Frequency	Contractor Testing Frequency
1. Asphalt Content *	ALDOT Sample = 90 lb {40 kg} Split into 2 equal samples Contractor Sample = 90 lb {40 kg} Split into 2 equal samples	AASHTO T 168 & ALDOT-210	+Loaded Truck	ALDOT-354 or AASHTO T 308 ++++	1 per day per LOT	++ 1 per 700 tons
2. Maximum Specific Gravity *		AASHTO T 168 & ALDOT-210	+Loaded Truck	AASHTO T 209 (Flask determination with dry back)	1 per day per LOT	++ 1 per 700 tons
3. Air Void Content & VMA *		AASHTO T 168 & ALDOT-210	+Loaded Truck	ALDOT-353 & ALDOT-307	1 per day per LOT	++ 1 per 700 tons
4. Mixture Gradation * **		AASHTO T 168 & ALDOT-210	+Loaded Truck	ALDOT-371 AASHTO T 308	1 per day per LOT	++ 1 per 700 tons
5. Retained Tensile Strength Note: The TSR test is not required for any pay item less than a full lot.	25 lb {12 kg}	AASHTO T 168 & ALDOT-210	+Loaded Truck	ALDOT-361	1 set of 6 for the first full lot (2,800 tons {2,800 metric tons}) and 1 set of 6 for the next 10,000 tons {10,000 metric tons} and 1 set of 6 for each additional 20,000 tons {20,000 metric tons} or portion thereafter	1 set of 6 for the first full lot (2,800 tons {2,800 metric tons}) and 1 set of 6 for the next 10,000 tons {10,000 metric tons} and 1 set of 6 for each additional 20,000 tons {20,000 metric tons} or portion thereafter
6. Mat Density *		ALDOT-210	Roadway	ALDOT-222 & ALDOT-350		As per Contractor's QC plan (ALDOT-375)
				ALDOT-403 AASHTO T 166 Method A AASHTO T 275 AASHTO T 331	** 1/3000 lane feet/lift {1/900 lane m/lift	
7. Clay Content	Adequate Quantity	AASHTO T 2	Aggregate Stockpiles	AASHTO T 176	As required	As required
8. Asphalt Draindown	12 lb {5 kg}	AASHTO T 168 & ALDOT-210	+Loaded Truck	AASHTO T 305	As Required	As Required

* See ALDOT-353 Determining H.M.A. Laboratory Quality Control / Assurance Parameters.

** If the test results are out of specification tolerance on two consecutive tests for the same size sieve, production shall cease until proper plant adjustments are made.

** Cores shall be taken by the Contractor and the density will be determined by the Department.

\+ Beginning each production day, no sample for acceptance purposes shall be taken prior to the production of 50 tons. If the random number selected falls within the first 50 tons, the sample shall be taken from the first loaded truck following the truck containing the fiftieth ton produced.

++ The sample shall be one set of three Marshall samples or one set of two gyratory samples +++.
Note: The testing increment shall have a 150 ton buffer between each increment.

+++ When slag is used as an aggregate in the mixture, four Marshall samples or three gyratory samples shall be compacted. The test result the furthest away from the average of the four test results shall be discarded and the remaining three test results shall be averaged for use in the computation of air voids.

++++ Under AASHTO T 308, mixture calibration shall be used. The ignition furnace shall be equipped with an internal weighing system with microprocessor control where sample weight {mass} and percent weight {mass} loss is computed and produced on hard-copy output.

TABLE I (*CONT'D.*) SECTION 424 MIXES (*SUPERPAVE*) SAMPLING AND TESTING REQUIREMENTS FOR QC/QA PROJECTS
* See ALDOT-353 Determining H.M.A. Laboratory Quality Control / Assurance Parameters. ** In virgin mixes, the sample may be taken from the cold feed conveyor. *** If the test results are out of specification tolerance on two consecutive tests for the same size sieve, production shall cease until proper plant adjustments are made. ** Cores shall be taken by the Contractor and the density will be determined by the Department. + Beginning each production day, no sample for acceptance purposes shall be taken prior to the production of 50 tons. If the random number selected falls within the first 50 tons, the sample shall be taken from the first loaded truck following the truck containing the fiftieth ton produced. ++ The sample shall be one set of two gyratory samples+++. Note: The testing increment shall have a 150 ton buffer between each increment. +++ When slag is used as an aggregate in the mixture, three gyratory samples shall be compacted. The test result the furthest away from the average of the three test results shall be discarded and the remaining two test results shall be averaged for use in the computation of air voids. ++++ Under AASHTO T 308, mixture calibration shall be used. The ignition furnace shall be equipped with an internal weighing system with microprocessor control where sample weight {mass} and percent weight {mass} loss is computed and produced on hard-copy output.

(c) QUALITY ASSURANCE.

1. ACCEPTANCE PROCEDURES.

All materials will be evaluated for acceptance and payment through the Department's Acceptance Procedures specified herein. The Department will be responsible for determining the acceptability and pay factor of the construction and materials incorporated therein.

The Department will utilize the Contractor's QC System test results for liquid asphalt binder content and laboratory compacted air void content for pay purposes except where:

a. The Department's Quality Assurance testing, as described in Item 3 below and Subarticle 410.08, does not validate the quality of the material.

b. QC sampling and testing was not performed in accordance with specified procedures.

The Department will determine the sample locations.

The sampling and testing frequencies shall conform to the requirements given in Table 1 for a pay item when the accumulated amount of asphalt mix placed for that pay item exceeds 250 tons {250 metric tons}. The accumulated amount of asphalt mix shall be the current total amount of asphalt mix that has been placed beginning from the start of construction. The sampling and testing frequencies given in Table 1 may be waived by the Division Materials Engineer and the asphalt mix may be accepted by visual observation for a maximum accumulated asphalt mix placement quantity of 250 tons {250 metric tons} or less for any individual pay item. The Engineer will record the results of the acceptance of the asphalt mix on form BMT-16 if sampling and testing is not required.

All conforming and nonconforming inspections and test results will be monitored in accordance with ALDOT-353 and ALDOT-370 and shall be recorded on approved forms and charts which shall be kept up to date and complete and shall be available at all times to the Department during the performance of the work. Only those tests designated by the Department in advance as acceptance tests will be utilized in the computation of pay factors. Test properties shall be charted on forms that are in accordance with the applicable requirements of the Department. A copy of each chart and form to be used by the Contractor will be furnished by the Department. The Contractor shall furnish his own supply of the charts and forms. The Contractor or Producer may design their own forms and charts; however, these must be approved by the Engineer prior to their use.

A LOT is normally defined as 2,800 tons {metric tons} for Section 327, 423 and 424 mixes, and 2,000 tons {metric tons} for Section 420 mixes, consisting of four QC test sets of laboratory tests (liquid asphalt binder content and laboratory air voids or gradation), unless specifically stated otherwise in this item or elsewhere in the specifications. A LOT will usually consist of at least four density tests; however, a LOT may have fewer than four density tests. The Engineer will round a testing increment or a LOT to the nearest truckload of material.

A LOT lasting longer than thirty calendar days or a LOT with inactivity for longer than 30 calendar days will be terminated. Mix produced after the completion of the last full LOT, a terminated LOT, and small production projects will be evaluated and pay factors computed and may be accepted on the basis of less than four laboratory tests (liquid asphalt binder content and laboratory air voids or gradation).

tolerances listed in Tables V or VI, Section 410, for each parameter, no further testing and analysis will be necessary and the Contractor's test values will be used in the computation of the appropriate LOT pay factor.

If the Contractor's air voids do not compare with the Department's test results, the Contractor shall re-compute test results using the individual maximum specific gravity for that particular testing increment and re-compare with the verification test result. If the results compare within the tolerances in Table V, Section 410, using the individual maximum specific gravities, no further testing will be required and the Contractor's running average of the last four maximum specific gravities will be used to compute air voids for pay factor determination.

Also, if the Contractor's air voids do not compare with the Department's test results, and the Contractor is using slag as an aggregate, the Contractor shall re-compute test results using the individual bulk specific gravity for that particular testing increment and re-compare with the verification test result. If the results compare within the tolerances in Table V, Section 410, using the individual bulk specific gravity, no further testing will be required and the Contractor's running average of the last four bulk specific gravities will be used to compute air voids for pay factor determination.

If the results of the Department's verification test and the Contractor's test do not compare within the tolerances in Tables V or VI, Section 410, but yield the same pay factor for the LOT when the Department's result is substituted for the Contractor's result, no further testing will be required. Where the Contractor's test results and the Department's test results do not compare and cannot be resolved by the above mentioned methods but the pay factor dispute is between 1.00 and 1.02 the Contractor may elect to accept the 1.00 pay factor and waive referee testing.

When differences between test results of the verification samples are not within the tolerances listed in Tables V or VI, Section 410, and cannot be resolved by the above mentioned methods, referee testing will be required.

All referee samples will be tested by the Bureau of Materials and Tests, Central Laboratory, 3704 Fairground Road, Montgomery, AL 36110. The Bureau of Materials and Tests Central Laboratory is an AASHTO accredited laboratory (see AASHTO R 18, Recommended Practice for Establishing and Implementing a Quality System for Construction Materials Testing Laboratories).

5. REFEREE TESTING

Laboratory:

All testing increments of the referee samples for the entire LOT shall be tested in the Bureau of Materials and Tests Hot Mix Laboratory for the pay factor parameter(s) (liquid asphalt binder content, laboratory compacted air voids, or gradation) in question. The Contractor's results (using the individual air voids and maximum specific gravities) will be compared to the Bureau of Materials and Tests results (using Materials and Tests individual bulk and maximum specific gravities) for each testing increment in the LOT. When the Contractor's results and the Bureau of Materials and Tests results are within the tolerances listed in Tables V or VI, Section 410, the Contractor's results will be used. When the Contractor's results are not within the tolerances listed in Tables V or VI, Section 410, the Bureau of Materials and Tests Central Laboratory results will be used for final pay factors. The Bureau of Materials and Tests Central Laboratory will record the Contractor's field results and the Central Laboratory's results of the parameter(s) in question on form BMT-135.

For each testing increment these results, either the Contractor's or the Bureau of Materials and Tests', will be used in the computation of the appropriate LOT pay factor.

Should differences between test results, that are not within the tolerances listed in Table V or VI, Section 410, for liquid asphalt binder content, air voids, or gradation continue for two consecutive days, operations shall be halted until testing discrepancies can be resolved. The Bureau of Materials and Tests will monitor testing procedures by Department and Contractor technicians until consistent test results are achieved.

Table IV in Section 410, a second test strip consisting of 200 tons {200 metric tons} shall be constructed. If a pay factor of less than 1.00 is obtained using the one test row of Table II, Table III and Table VI, and using the four test row of Table IV in Section 410 in the second test strip, additional 200 ton {200 metric ton} test strips shall be constructed until pay factors are equal to 1.00, at which time production can begin. A test strip is determined to be complete when the results of the tests are known.

The Engineer may require any test strip to be removed and replaced at no cost to the Department if the pay factor determined from the four test row for mat density and the one test row for other tests is 0.80. For actual payment purposes, a pay factor of 1.00 will be used for all first and second test strips allowed to remain in place. Pay factors will be applied to the third and all subsequent 200 ton test strips at the average of the computed rate (using the one test row) and 1.00.

SECTION 410
ASPHALT PAVEMENTS

410.01 Description.

The work under this Section covers the general requirements that are applicable to all types of hot and warm mix asphalt pavements of the plant mix type. Deviations from these general requirements will be indicated in the specific requirements for various types of mixes noted in the following sections of these Specifications.

This work shall consist of one or more courses of hot and warm mix asphalt plant mix constructed in accordance with these specifications and the specific requirements of the type of mixture required and in reasonably close conformity with the lines, grades, thicknesses, and typical cross sections shown on the plans or established by the Engineer. The Contractor may use either hot mix or warm mix for all Superpave ESAL Range mixes in Section 424. Warm mix asphalt shall be defined as the use of an approved warm mix technology in the plant mix at the time of production.

This work shall also include the preparation of the underlying surface on which the plant mix is to be placed, including patching and/or leveling as shown on the plans or directed.

In addition, this work shall also include the placing of widening at locations shown on the plans and/or directed by the Engineer. In general, widening shall consist of (1) narrow width build-ups, three feet or less {one meter or less}, required for widening existing pavement, (2) paving for turn-outs beyond three feet {one meter} from the edge of pavement, (3) pavement crossovers, and (4) turning lanes of less than 200 feet {60 m} for crossovers. Paving used on turn-outs for intersecting paved roads and shoulder paving will not be considered as widening unless shown on the plans.

Surface layers and wearing layers are defined as those layers where the pay item contains the wording "Wearing Surface".

All ALDOT procedures referenced are applicable to both hot and warm mix asphalt.

410.02 Materials.

(a) APPLICABLE SECTIONS OF SPECIFICATIONS.

Materials shall conform to requirements given in Sections 327, 420, 423 and 424.

(b) PRODUCTS AND PROCESSES FOR THE PRODUCTION OF WARM MIX ASPHALT.

Warm Mix Asphalt products and processes shall be selected from List II-27, "Warm Mix Asphalt Products and Processes" of the Department's manual titled "Materials, Sources, and Devices with Special Acceptance Requirements". Information concerning this list is given in Subarticle 106.01(f) and ALDOT-355.

(c) ANTI-STRIPPING AGENTS.

All warm mix asphalt mixtures shall include an anti-stripping agent. The warm mix additive supplier may certify that an anti-stripping agent is an integral part of the warm mix additive.

All hot mix asphalt mixtures except 327 and 420 shall be tested during design to determine if an anti-stripping agent is needed. During design and production, all other mixes shall have a tensile strength ratio (TSR) of at least 0.80 when tested in accordance with AASHTO T 283 as modified by ALDOT-361. If any TSR value falls below the minimum specified above, plant operations shall cease

4. APPROVAL OF JOB MIX FORMULA BY MATERIALS AND TESTS ENGINEER.

The Contractor shall submit to the Materials and Tests Engineer, for approval, a Job Mix Formula (JMF) for each mixture to be supplied from a specific plant. The Contractor shall allow at least four weeks for the evaluation and approval of the job mix formula.

The submitted formula shall include any additive by type and trade name and be accompanied by samples from the material sources he proposes to use in producing the mix. The job-mix formula for each mixture shall establish a single percentage of aggregate passing each required sieve size, a single percentage of liquid asphalt binder to be added to the aggregate, a single percentage of any additive, and a mixing temperature range suitable for the type, grade, etc. of liquid asphalt binder to be used in the mix. Each job-mix formula shall be accompanied by a test report from an approved laboratory certifying that all current Departmental design test parameters have been met (copies of the Departmental current design test parameters may be obtained from the office of the Materials and Tests Engineer). There will be no charge for the Department's checking of the Contractor's job-mix formula.

The approved job-mix formula for each mixture shall be in effect for a maximum of four years from the approval date on the JMF or until the Materials and Tests Engineer withdraws approval by written order.

5. APPROVAL OF JOB MIX FORMULA BY DIVISION MATERIALS ENGINEER.

At least two full working days prior to beginning the production of asphalt mix for a specific project, the Contractor shall submit a mix design (approved by the Materials and Tests Engineer) to the Division Materials Engineer. The project number shall be inserted on the approved job mix formula. The Division Materials Engineer will review the mix design to determine if the job mix formula is appropriate for the specific project. If the job mix formula is appropriate for the project, the Division Materials Engineer will sign the mix design as being approved, will note the date of approval, and will distribute copies for inspection of the asphalt production.

A copy of this approved job mix formula with the Materials and Tests Engineer's approval and the Division Materials Engineer's approval (with the date of approval) shall be available at the plant any time material is being delivered to the State.

6. ESTABLISHMENT OF DELIVERY TEMPERATURE.

The Engineer will check and record the temperature of the mixture upon delivery to the project site. The minimum delivery temperature for warm mix asphalt shall be 220 °F {104 °C}. The minimum delivery temperature for hot mix asphalt shall be 250 °F {121 °C}. The Engineer should monitor the work to ensure that there is not high variability in the delivery temperatures or isolated loads of temperature differentials that appear extreme. For pay items that do not require density as a pay factor (patching, widening, etc.) and / or for mixes that do not require density as a pay factor (OGFC, PATB, etc) the Contractor shall provide a + /- 25 °F {11 °C} delivery temperature range.

No loads will be accepted at a temperature greater than 350 °F {177 °C} for hot mix or warm mix asphalt.

7. CONFORMANCE TO APPROVED JOB MIX FORMULA.

All mixtures furnished for use on the project shall conform to the approved job-mix formulas within the following ranges of tolerances:

All liquid asphalt binders used shall meet the requirements given in Section 804. See appropriate pay factor table for liquid asphalt binder content requirements.

The mixing temperature shall not exceed 350 °F {177 °C}.

Tolerances for 327, 420 and 424 mixes:

- Plus or minus 7 % for the #4 {4.75 mm} and larger sieve requirements.
- Plus or minus 4 % for the #8 through #100 {2.36 mm through 150 μm} sieve requirements.
- Plus or minus 2.0 % for the #200 {75 μm} sieve requirement.

See Section 423 for gradation requirements for 423 mixes.

The initial setting of the controls for all materials shall be those amounts shown on the job-mix formula. The above tolerances are provided for slight variations inherent in job control applications. The Contractor shall make changes as necessary in order that the mixture will run as close as practical to the job-mix formula.

In addition to the requirements set forth in ALDOT-372, RAP stockpiles utilized for JMF's with RAP content greater than 25 % shall also meet the following requirements.

ADDITIONAL RAP STOCKPILE REQUIREMENTS FOR RAP USED IN A JOB MIX FORMULA WITH INCREASED RAP CONTENT	
Control Parameter	Standard Deviation*
Asphalt Content	0.5 %
% Passing #200 Sieve	1.5 %
Sieve with 50 % RAP Passing	5.0 %
*Based on a minimum of 10 tests	

Testing for RAP stockpile shall be included as part of the design JMF submittal.

(f) LIQUID ASPHALT BINDER DRAINDOWN.

1. FIBER STABILIZER.

A fiber stabilizer is required for some mix types (Section 420, 423, etc). A fiber stabilizer may be used on other mix types where asphalt binder cement draindown is a problem. Where RAS is included in the JMF, fiber stabilizer shall not be required provided the draindown requirements of 0.30% or less are met when tested in accordance with AASHTO T305 at 325°F {163°C} and 350°F {176°C}.

When fiber is used, the dosage rate shall produce a maximum liquid asphalt binder cement draindown of 0.30 % or less when tested in accordance with AASHTO T305 at 325°F {163°C} and 350°F {176°C}. When fiber is used, the sampling and testing frequency for all mixes for both Contractor and Department testing during production shall be one test for each 5000 tons {metric tons} or portion thereof. The fiber shall be listed on List II-23, Fibers for use in Hot Mix Asphalt (from the Materials, Sources, and Devices with Special Acceptance Requirements (MSDSAR) manual). If pelletized fibers are used, the fiber within the pellet shall be listed on List II-23. All fibers listed on List II-23 shall meet the requirements of either Item 2, 3, or 4 of this Subarticle.

2. CELLULOSE FIBERS.

The maximum length of the fiber shall be 0.25 inches {6.35 mm}. A representative 3 gram sample, when heated in a crucible between 1100 and 1200 °F {595 and 650 °C} for at least 2 hours, shall show between 13 % and 23 % non-volatiles. A representative 5 gram sample, when stirred into 100 ml of distilled water, shall have a pH between 6.5 and 8.5 after sitting for 30 minutes. A representative 5 gram sample, when saturated with mineral spirits for 5 minutes and then sieved for 10 minutes on a No. 40 {425 µm} sieve, shall absorb between 4 % and 6 % its own weight of mineral spirits. A representative 10 gram sample, when weighed and placed into a 250 °F {121 °C} oven for two hours, shall lose less than 5 % by weight when weighed immediately upon removal from the oven.

Sieve analysis of the cellulose fiber shall be either of the following methods:

- Using an Alpine Air Jet Sieve (Type LS), a representative 5 gram sample of the fiber is sieved for 14 minutes at a controlled vacuum of 11 psi {75.8 kPa}. The fibers remaining on the screen are weighed. The results of this analysis shall indicate that 60 % to 80 % of the fiber passes the No. 100 {150 µm} sieve. Or:

- Using a Mesh Screen Analysis, a representative 10 gram sample of the fiber is sieved using a shaker with two nylon brushes on each screen. The results of this analysis shall indicate that the fiber has the following amounts passing the specified screens: 75 % to 95 % on the No. 20 {850 µm} sieve, 55 % to 75 % on the No. 40 {425 µm} sieve, and 20 % to 40 % on the No. 140 {100 µm} sieve.

3. MINERAL FIBERS.

When tested according to the Bauer-McNett fractionation, the fiber length shall have a maximum mean test value of 0.25 inches {6.35 mm}. By using a phase contrast microscope, and a representative test sample of at least 200 fibers, the fiber diameter shall have a maximum mean test value of 0.0002 inches {5.1 µm}. The shot content passing the No. 60 {285 µm} sieve shall be 85% to 95%. The shot content passing the No. 230 {65 µm} sieve shall be 60 % to 80 %. This is a measure of non-fibrous material determined on vibrating sieves (for further information see ASTM C 612).

410.03 Construction Requirements.

(a) EQUIPMENT.

In general, choice of equipment will be left to the Contractor and it shall be his responsibility to provide proper sized and amounts of equipment that will produce, deliver to the roadbed, spread, and compact the plant mixed material in sufficient quantities for the continuous movement of the spreaders under normal operating conditions.

The mixing plant, hauling, spreading, and compaction equipment shall meet the requirements listed below; however, other equipment that will produce equally satisfactory results, such as electronically or automatically controlled devices of proven performance, will be considered for use in lieu thereof.

The Contractor shall secure approval of all equipment prior to beginning work and any equipment found unsatisfactory shall be promptly replaced or supplemented.

1. REQUIREMENTS FOR ALL PLANTS.

Mixing plants shall comply with the requirements of AASHTO M 156 as modified by ALDOT-324, Mixing Plant Requirements for Hot-Mixed, Hot-Laid Asphalt Paving Mixtures. In addition to the above, if a recycled/reclaimed mix is used, the mixing plant shall be modified as necessary to accommodate the use of the reclaimed material and necessary additives. Mixing plants shall be inspected at least annually to insure compliance with the requirements of AASHTO M 156 and ALDOT-324. The Contractor/Vendor will be charged a fee as specified by ALDOT-355, General Information Concerning Materials, Sources, and Devices with Special Acceptance Requirements. If the plant is relocated or substantially modified in any way within a year of the last inspection, an additional inspection and related fee will be required.

The plant shall be equipped with a dust collector constructed to waste or store and later return uniformly to the aggregate mixture all or any part of the material collected.

2. SCALES.

A digital recorder shall be installed as part of the platform truck scales. The recorder shall produce a printed digital record on a ticket of the gross and tare weights {masses} of the delivery trucks along with a time and date print for each ticket. Provisions shall be made so that scales may not be manually manipulated during the printing process, and so interlocked as to allow printing only when the scale has come to rest. The scales and recorder shall be of sufficient capacity and size to accurately determine the weight {mass} of the heaviest loaded truck or tractor trailers that are used for the delivery of the hot and warm mix asphalt from that plant.

In lieu of plant and truck scales, the Contractor may provide either (1) an approved automatic printer system which will print the weights {masses} of the material delivered (evidenced by a weight {mass} ticket for each load), provided the system is used in conjunction with an approved automatic batching and control system, or (2) an electronic load cell weight {mass} determination system with associated computer hardware and automated printing system.

The Contractor may provide a "weigh {mass} batcher" system utilizing a weigh {mass} hopper equipped with load cells that determine the net amount of mix delivered from the weight {mass} hopper. An automated weigh {mass} printing system shall be provided to accurately print the weight {mass} of material delivered, the time, and the date for each ticket.

All scales which determine the weight {mass} of the mix for pay purposes shall meet the requirements of Subarticle 109.01(h).

3. HAULING AND REMIXING EQUIPMENT.

a. Load Limitations.

Reference is made to Article 105.12 concerning load limitations on hauling equipment.

Wherever a Material Remixing Device is used, the following restrictions shall apply:

- The device shall be empty while on a bridge.
- The device shall be moved across a bridge without any other vehicles or equipment being on the bridge.
- The device shall be moved on a bridge only within the limits of a lane and shall not be moved on the shoulder of a bridge.

When laying mixtures, the paver shall be capable of being operated at forward speeds consistent with satisfactory laying of the mixture, providing a finished surface of the required evenness and texture without tearing, gouging, or shoving of the mixture.

All hot and warm mix asphalt paving machines shall be operated with automatic grade and slope controls unless otherwise directed by the Engineer. The automatic grade controls shall be a contact ski, a mobile stringline, or non-contact sonic averaging sensors. The effective length of these controls shall be a minimum of 24 feet {7.3 m}. In the event of a malfunction of the automatic control system, the spreading operation shall be discontinued after one hour until the equipment is repaired.

If shown to be required on the plans, special attachments to the pavers and spreaders will be required to shape and finish the pavement.

5. COMPACTION EQUIPMENT.

Compaction equipment shall be capable of compacting the mixture to the required density throughout the depth of the layer while it is still in a workable condition without damage to the material. The Contractor shall be responsible for the selection of the types and number of rollers to be used.

(b) DAYLIGHT, WET WEATHER AND TEMPERATURE LIMITATIONS.

1. OPERATIONS IN DAYLIGHT.

Placement and compaction operations shall be performed during daylight hours unless noted otherwise on the plans or directed otherwise by the Engineer. (The requirements for lighting for nighttime work are given in Article 104.04(a)).

2. WET WEATHER.

The mixture shall be laid only upon an approved underlying course, which is dry, and only when weather conditions are suitable. The Engineer may, however, permit work of this character to continue when overtaken by sudden rains, up to the amount which may be in transit from the plant at the time, provided the surface just ahead of the placing is swept clear of water and the mixture is within the allowable temperature tolerances. The layer placed under such conditions shall be at the Contractor's risk and shall be removed and replaced by the Contractor without extra compensation should it prove unsatisfactory.

3. COLD WEATHER RESTRICTIONS.

Hot mix asphalt (HMA) layers of 200 pounds per square yard {110 kg/m^2} or less shall not be placed when the surface or air temperature is below 40 °F {4 °C}; air temperature shall be 40 °F {4 °C} before the spreading operation is started. Spreading operations shall be stopped when the air temperature is below 45 °F {7 °C} and falling. For HMA layers over 200 pounds per square yard {110 kg/m^2}, the above temperature may be lowered 5 °F {2 °C}. Unless otherwise stated in the plans and specifications, polymer modified HMA layers of 200 pounds per square yard {110 kg/m^2} or less shall not be placed when the surface or air temperature is below 60 °F {15 °C}; for layers over 200 pounds per square yard {110 kg/m^2}, the above temperature may be lowered 10 °F {5 °C}.

Warm mix asphalt (WMA) layers of 200 pounds per square yard {110 kg/m^2} or less shall not be placed when the surface or air temperature is below 32 °F {0 °C}; air temperature shall be 32 °F {0 °C} before the spreading operation is started. Spreading operations shall be stopped when the air temperature is below 35 °F {2 °C} and falling. For WMA layers over 200 pounds per square yard {110 kg/m^2}, the above temperature may be lowered 5 °F {2 °C}. Unless otherwise stated in the plans and specifications, polymer modified WMA layers of 200 pounds per square yard {110 kg/m^2} or less shall not be placed when the surface or air temperature is below 50 °F {10 °C}; for layers over 200 pounds per square yard {110 kg/m^2}, the above temperature may be lowered 10 °F {5 °C}.

With the exception of Section 420 "Polymer Modified Open Graded Friction Course" layers, the Contractor may place HMA and WMA layers at temperatures lower than the cold weather limits. The Contractor is warned that other factors such as wind speed and percent humidity may increase the heat loss from the HMA and WMA layers. All other requirements for the installation and quality of the HMA and WMA layers shall be applicable to the work even when the restrictions against placement of the HMA and WMA during cold weather are not followed. The layers placed under such conditions shall be at the Contractor's risk and shall be removed and replaced without extra compensation if they are unacceptable. There will be no direct payment for additional costs associated with the placement of HMA and WMA during cold weather.

3. MIXING.

a. Mixing Temperature.

The mixing temperature of HMA and WMA shall be in accordance with the refineries' recommendations, based upon the temperature-viscosity curve, and shall be adequate to produce a mixture in accordance with the specification requirements. The mixing temperature shall not exceed 350 °F {177 °C}.

The mixing temperature for HMA and WMA shall be continuously recorded and delivered to the Engineer on the next working day.

b. Batch Mixing.

The dried mineral aggregate, and measured mineral filler when used, prepared as prescribed above, shall be combined in uniform batches by determining the weight {mass} of and conveying into the mixer the proportionate amounts of each aggregate required to meet the job-mix formula. The largest size aggregate shall be introduced first, then smaller sizes progressively, with mineral filler last, or all mineral components may be added simultaneously. The mineral components shall be thoroughly mixed. The required quantity of liquid asphalt binder material for each batch shall be measured by weight {mass} using scales or a liquid asphalt binder material metering device attached to the liquid asphalt binder material bucket.

After the mineral components have been mixed, the liquid asphalt binder material shall be added and the mixing continued for a period of at least 45 seconds, or longer if necessary to produce a homogeneous mixture. However, if a check by ASTM D 2489 (Ross Method) shows that 95% plus coating is obtained, a shorter mixing time will suffice. The Engineer may then give written permission for a change. Each batch must be kept separate throughout the weight {mass} determining and mixing operations.

The mixture shall be uniform in composition, free from lumps or balls of material containing an excess quantity of asphalt, or from pockets deficient in asphalt.

c. Continuous Mixing.

Components shall be introduced and proportioned volumetrically by continuous methods utilizing equipment specified herein for continuous plants. Amounts of aggregate and liquid asphalt binder material entering the mixer, and the rate of travel through the mixer, shall be so coordinated that a uniform mixture of specified gradation and liquid asphalt binder content will be produced.

d. Dryer-Drum Mixing.

Components shall be proportioned by weight {mass} as noted herein in Item 410.03(a)1 for this method of mixing. Amounts of aggregate and liquid asphalt binder material entering the mixer, and the rate of travel through the mixer, shall be so coordinated that a uniform mixture of specified gradation and liquid asphalt binder content will be produced. An anti-stripping agent may be required to insure adequate coating of the aggregates, if so directed by the Engineer.

4. RECYCLED MIXTURES.

a. New Aggregate Temperature.

The temperature of the new aggregate shall be super-heated to the point where, when combined with the reclaimed material, the specified discharge is produced; however, in no case shall the temperature of the new aggregate exceed 600 °F {315 °C}.

b. Mixing.

The plant shall be designed and operated so that heat transfer will take place in the mixing unit without damage to, or vaporization of, the liquid asphalt binder material. For batch type plants, a minimum dry mixing cycle of 15 seconds shall be required for the new aggregate and reclaimed material before introduction of the new liquid asphalt binder material. All environmental regulations shall be met as required by Article 107.22.

(e) TRANSPORTING MIXTURE.

The mixture shall be transported in approved equipment in accordance with Item 410.03(a)3. The equipment shall be in sufficient numbers to deliver the material to the roadbed without delay in the quantity required. Loads shall not be delivered too late in the day to be spread, compacted, and finished during daylight hours, unless nighttime work is allowed as shown on the plans or directed by the Engineer. Loads shall not be delivered at a temperature greater than 350 °F {177 °C} , or less than 220 °F {105 °C} without written permission of the State Materials and Tests Engineer.

shall be cause for the Engineer to stop the work until the Contractor evaluates the cause of the stoppage and has provided a definite action plan for correction of the interruptions. Any interruption will require the thorough check of the area immediately under the spreader and any variances shall be corrected immediately or the material removed and replaced, as directed, without additional compensation.

Material placed in the spreader shall be immediately spread and screeded to such uniform depth that the average rate of the mixture required is secured. Alignment of the outside edges of the pavement shall be controlled by preset control lines, and shall be finished in conformity with these controls.

Any spreading operation, which cannot produce acceptable joints within the surface tolerances and density requirements, shall be cause for requiring the Contractor to modify his operations to include additional spreading equipment.

b. Spreading by Motor Grader.

For areas of a hot and warm mix asphalt plant mix surface inaccessible to the mechanical spreader, patching of pot holes and correcting failures in existing pavement, the plant mix may be dumped in low areas in the amounts directed, windrowed, spread, and compacted to bring the elevation and section to the desired level.

If shown on the plans, the Contractor shall use a motor grader or a motor grader equipped with a dragbox to perform the spreading for the leveling operation. The motor grader shall be equipped with smooth faced tires. The dragbox, when required, shall be of sufficient size and weight {mass} to effectively shape and level the plant mix and shall be approved by the Engineer prior to use.

c. Spreading by Hand.

For areas inaccessible to mechanical spreading equipment, and when patching potholes and minor pavement failures, hand spreading of the hot and warm mix asphalt mixture may be permitted. The mixture shall be distributed immediately into place by means of suitable tools and spread in a uniformly loose layer.

(g) COMPACTING.

As soon as the mixture has been spread and has set sufficiently to prevent undue cracking or shoving, rolling shall begin. A delay in the initial rolling will not be tolerated and the initial or breakdown rolling should in general be performed by rolling longitudinally, beginning at the sides and proceeding toward the center of the surface.

The Contractor as part of his QC plan shall establish a rolling pattern when initially constructing any leveling layers using the nondestructive testing devices approved in Section 306 of the Specifications. The device shall either be calibrated to roadway cores or gage counts and shall be used to determine the rolling pattern producing maximum density. Contractor QC personnel shall be on site throughout each day to perform periodic checks and verify that the rolling pattern continually produces the maximum density that is achievable.

When paving abuts a previously placed lane, the longitudinal joint shall be rolled in the first pass. On superelevated curves rolling shall begin at the low side and progress toward the high side.

If any displacement occurs during rolling, it shall be corrected at once. To prevent adhesion of surface mixture to the rollers, the wheels shall be kept adequately moistened with water and a non-foaming detergent, but an excess of water will not be permitted.

Adequate precaution shall be taken to prevent dropping of gasoline or oil on the pavement. In places inaccessible to a roller, compaction shall be obtained with hand or mechanical tampers that produce adequate pressure to obtain the required density.

When the roller is in contact with a bridge deck, vibratory mode shall be turned off and the roller shall operate in static mode only.

Throughout the process of compacting, tests for surface smoothness as required by Article 410.05 and density as required by Section 306 shall be made continuously.

(h) JOINTS.

1. GENERAL.

Placing of hot and warm mix asphalt paving layers shall be as continuous as possible. All joints shall be made in a careful manner in such a way as to provide a smooth, well-bonded, and sealed joint meeting the density and surface requirements of Articles 410.04 and 410.05. Failure to meet

behind the placement operation, to form an approximately 1:1 slope as a preventative measure against cracking and bulging during the rolling process. This procedure shall also be required on the initial edge of a longitudinal cold joint. These edges shall be neatly shaped to line behind the breakdown roller and shall be trimmed as necessary after final rolling, to an accurately lined string or wire providing a maximum tolerance of 2 inches {50 mm} outside the theoretical edge of pavement, with a maximum variation from a true line of 1/2 of an inch {12 mm} in 10 feet {3 m} and a slope not flatter than 1:1. Edges that are distorted by rolling shall be corrected promptly.

(c) RIDEABILITY REQUIREMENTS.

The rideability requirements covered in this Subarticle shall apply only when either Item 410-A, 410-B, or 410-C is included on the plans or in the proposal.

1. TESTING DEVICE.

a. Description.

The testing device shall be a longitudinal profilograph including all accessories and chart paper herein described. The chart paper containing the log of the smoothness index shall become the property of the Department at the time the measurements are taken. The following categories cover the furnishing and disposition of the profilograph:

Pay Item 410-A - The furnishing, by the Contractor, of a new profilograph, including chart paper, and its reconditioning, if deemed necessary by the Engineer, and title transfer to the Department upon completion of its use on the project.

Pay Item 410-B - The furnishing, by the Department, of a profilograph for use on the project. The Contractor shall furnish the chart paper.

Pay Item 410-C - The furnishing, by the Contractor, of a new or acceptable used profilograph, including chart paper, for use on the project with the Contractor retaining ownership of the profilograph.

b. Equipment Requirements.

The profilograph shall be a California type profilograph, completely equipped with all necessary accessories. The profilograph shall be hand-propelled and shall have multiple averaging wheels.

When the profilograph is required to be furnished by the Contractor, the Contractor shall calibrate the profilograph prior to delivery to the project and shall maintain the profilograph during the time its use is required on the project. When the profilograph is furnished by the State, the Department will calibrate and maintain the profilograph.

Chart paper for the profilograph shall be furnished in sufficient quantities for all calibration, test runs, and actual tests deemed necessary by the Engineer.

c. Equipment Delivery.

The profilograph shall be delivered to the project a minimum of two weeks before the beginning of the paving operation of the pavement layer to be tested to allow time for checking the profilograph.

2. TESTING PROCEDURE.

a. Description.

Unless shown otherwise by the plans, the following surfaces will be subject to the requirements of this Subarticle if one of the pay items listed in Subitem 410.05(c)1.a. is included in the proposal:

- Actual wearing surfaces including Polymer Modified Open Graded Friction Course (Section 420);

- The surface of the layer directly beneath the Polymer Modified Open Graded Friction Course.

The actual testing procedure shall be as outlined in ALDOT-335, a copy of which may be obtained from the Department's webpage. The Engineer reserves the right to make minor modifications to this procedure if he deems such will produce better results.

The profilograph test shall be performed as soon as practical after the pavement has been rolled and compacted sufficiently to prevent damage to the surface but no later than the next work day after placement of the pavement, unless otherwise authorized by the Engineer. The

Asphalt Pavement." The location of all cores taken for segregation evaluation will be determined by the Department. All coring and traffic control required by ALDOT-389 shall be conducted/supplied by the Contractor at no cost to the Department; however, the Contractor will be reimbursed $500.00 per core when core results are within tolerances and the coring operations require additional traffic control.

At any time that segregation is determined to be unacceptable, work shall be automatically suspended if positive corrective action is not taken by the Contractor to prevent further segregation in the mat. Upon suspension, the Contractor shall place a test section not to exceed 500 tons {500 metric tons} of the affected mixture for evaluation by the Engineer. However, if after a few loads it is apparent that the corrective actions were not adequate, work shall again be suspended and the segregated areas evaluated in accordance with ALDOT-389. Likewise, if after 500 tons {500 metric tons} it is apparent that the problem has been solved, work will be allowed to continue.

When correcting subsurface mixtures (base and binder layers), the removal and replacement may be limited to the actual defective areas or the full mat width within the limits of individual defective areas as directed by the Engineer. Removal and replacement of hot and warm mix asphalt wearing surface layers shall be a minimum of the full mat width and 10 feet {3 m} in length. All surface tolerance requirements shall apply to the corrected areas for both subsurface and surface mixes.

Areas found deficient in density shall be removed and replaced or immediately re-rolled until density is acceptable.

All work specified in this Article shall be performed without additional compensation.

410.07 Maintenance and Protection.

Sections of newly finished work shall be protected from all traffic until they become properly hardened. Maintenance shall include immediate repairs of any defects that may occur on the work; such repairs shall be repeated as often as necessary to maintain the work in a continuously satisfactory condition. The Contractor shall be responsible for the protection of the work and protection of any traffic using the work. No extra compensation will be paid for maintenance and protection.

410.08 Method of Measurement.

(a) GENERAL.

The accepted quantity of hot and warm mix asphalt plant mix used as directed will be measured in tons of 2000 pounds {metric tons} in accordance with the following:

When the laboratory compacted density as determined in the job-mix formula design exceeds 158 pounds per cubic foot {2530 kg/m^3}, the actual total tonnage {metric tonnage} of mix placed will be adjusted for pay purposes in accordance with the following formula (this shall not apply to Section 327 PATB and Section 420 OGFC):

$y = 158\ c / a$ { $y = 2530\ c / a$}, where

y = total tonnage {metric tonnage} of plant mix for pay purposes;

c = actual tonnage {metric tonnage} of plant mix measured and placed, except items subject to pay factor adjustment under the QC/QA provisions. On items subject to pay factor adjustment, the adjusted tonnage {metric tonnage} (after pay factor adjustment) will be used;

a = laboratory compacted mix unit weight in pounds per cubic foot {density in kilograms per cubic meter} as shown in the job-mix formula.

No adjustments to the actual total tonnage {metric tonnage} placed will be made where the laboratory compacted mix density is below 158 pounds per cubic foot {2530 kg/m^3}.

No adjustments to the actual tonnage {metric tonnage} placed will be made when the use of lightweight aggregate (expanded clay or shale) is designated.

For determining weight {mass}, each load of hot and warm mix asphalt mixture shall have its weight {mass} determined on approved certified scales, as specified in Article 109.01, furnished by the Contractor without direct compensation.

The weight {mass} measurement shall include all components of the mixture. No deductions will be made for any of the components, including the liquid asphalt binder material, contained in the mixture.

The laboratory compacted density requirements for OGFC are given in Section 420. Section 327 PATB does not have a laboratory compacted density requirement because a layer thickness (typically 4 inches {100 mm}) is required instead of a rate of placement.

(d) ACCEPTANCE SCHEDULE OF PAYMENT FOR ASPHALT PLANT MIX CHARACTERISTICS.

TABLE II						
SECTION 327 MIXES** SECTION 420 MIXES (OPEN GRADED FRICTION COURSE)** SECTION 423 MIXES (STONE MATRIX ASPHALT)						
ACCEPTANCE SCHEDULE OF PAYMENT FOR ASPHALT PLANT MIX CHARACTERISTICS						
Arithmetic Average of the Absolute Values of Deviations of the LOT Acceptance Tests From Job Mix Formula Values						
Asphalt Content						
LOT Pay Factor ->	1.02	1.00	0.98	0.95	0.90	0.80*
1 Test	-	0.00-0.48	0.49-0.51	0.52-0.57	0.58-0.66	Over 0.66
2 Tests	-	0.00-0.34	0.35-0.36	0.37-0.40	0.41-0.47	Over 0.47
3 Tests	-	0.00-0.28	0.29-0.29	0.30-0.33	0.34-0.38	Over 0.38
4 Tests	0.00-0.14	0.15-0.24	0.25-0.26	0.27-0.28	0.29-0.33	Over 0.33
Voids in Total Mix (Lab. Compacted Samples)						
LOT Pay Factor ->	1.02	1.00	0.98	0.95	0.90	0.80*
1 Test	-	0.00-1.50	1.51-1.62	1.63-1.80	1.81-2.10	Over 2.10
2 Tests	-	0.00-1.06	1.07-1.15	1.16-1.27	1.28-1.48	Over 1.48
3 Tests	-	0.00-0.87	0.88-0.94	0.95-1.04	1.05-1.21	Over 1.21
4 Tests	0.00-0.45	0.46-0.75	0.76-0.81	0.82-0.90	0.91-1.05	Over 1.05
* If approved by the Department, the Contractor may accept the indicated LOT partial pay. The Department may require removal and replacement. If the LOT pay factor is greater than 0.80, the Contractor has the option to remove at no cost to the Department and to replace at contract unit bid price rather than accepting the reduced LOT payment. ** The Acceptance Schedule of Payment for "Voids in Total Mix" will not apply to the 327 and 420 mixes						

TABLE III						
SECTION 424 MIXES (SUPERPAVE)						
ACCEPTANCE SCHEDULE OF PAYMENT FOR ASPHALT PLANT MIX CHARACTERISTICS						
Arithmetic Average of the Absolute Values of Deviations of the LOT Acceptance Tests From Job Mix Formula Values						
Asphalt Content						
LOT Pay Factor ->	1.02	1.00	0.98	0.95	0.90	0.80*
1 Test	-	0.00-0.62	0.63-0.68	0.69-0.75	0.76-0.88	Over 0.88
2 Tests	-	0.00-0.44	0.45-0.48	0.49-0.53	0.54-0.62	Over 0.62
3 Tests	-	0.00-0.36	0.37-0.39	0.40-0.43	0.44-0.51	Over 0.51
4 Tests	0.00-0.19	0.20-0.31	0.32-0.34	0.35-0.38	0.39-0.44	Over 0.44
Voids in Total Mix (Lab. Compacted Samples)						
LOT Pay Factor ->	1.02	1.00	0.98	0.95	0.90	0.80*
1 Test	-	0.00-2.50	2.51-2.70	2.71-3.00	3.01-3.50	Over 3.50
2 Tests	-	0.00-1.77	1.78-1.91	1.92-2.12	2.13-2.47	Over 2.47
3 Tests	-	0.00-1.44	1.45-1.56	1.57-1.73	1.74-2.02	Over 2.02
4 Tests	0.00-0.75	0.76-1.25	1.26-1.35	1.36-1.50	1.51-1.75	Over 1.75
* If approved by the Department, the Contractor may accept the indicated LOT partial pay. The Department may require removal and replacement. If the LOT pay factor is greater than 0.80, the Contractor has the option to remove at no cost to the Department and to replace at contract unit bid price rather than accepting the reduced LOT payment.						

{8100 m} LOT would be divided into two 12,000 foot {3600 m} SUBLOTS and one 3000 foot {900 m} SUBLOT.

The in-place density will be expressed as a percentage of the theoretical maximum mix density with the following relationship:

$$\%\ TMD = \frac{\text{In-place Density}}{\text{Maximum Mix Density}} \times 100$$

Maximum mix density is equated to maximum mix specific gravity as measured with AASHTO T 209, Flask determination with dry back. The maximum mix specific gravity used will be the average of the values from the four most recent determinations using Contractor data.

The appropriate pay factor for each SUBLOT will be determined from Table IV for the appropriate number of test results. The pay factor for the LOT will be determined by computing the weighted average of the SUBLOTS:

$$\text{LOT Pay Factor (PF)} = \frac{\text{PF SUBLOT 1 (Length SUBLOT 1)} + \text{PF SUBLOT 2 (Length SUBLOT 2)} + \ldots}{\text{Length SUBLOT 1} + \text{Length SUBLOT 2} + \ldots}$$

Calculations for the acceptance test results for in-place density will be carried to the hundredths (0.01) and rounded to the nearest tenth (0.1). LOT and SUBLOT pay factor calculations will be carried to the thousandths (0.001) and rounded to the nearest hundredth (0.01) in accordance with AASHTO R 11 rules of rounding.

The low rates of placement at which minimum density does not apply are given in Section 306. Density pay factors will not be applied to pavement layers placed at these rates.

(h) PROFILOGRAPH.

The number of profilographs measured for payment will be the actual number of units ordered and accepted.

(i) MATERIAL REMIXING DEVICE.

The number of material remixing devices measured for payment will be the number of units approved by the Engineer for use. These devices will be measured per each device.

410.09 Basis of Payment.

(a) UNIT PRICE COVERAGE.

Compensation for plant mix material, measured as provided above, will be made on a tonnage {metric tonnage} basis and the contract unit price per ton {metric ton} for each individual item shall be full compensation for construction of the hot and warm mix asphalt plant mix layer complete in place on the roadbed as indicated or directed, including all materials, procurement, handling, hauling, and processing cost, and includes all equipment, tools, labor, and incidentals required to complete the work.

Unless otherwise covered by a separate pay item, the cost of excavation for patching and widening, compacting the subgrade, backfilling, spreading, or disposing of excess excavated material, removal and disposal of old pavement, removal and resetting of roadway signs and mailboxes, and removal and disposal of pavement markers shall be subsidiary obligations of the associated plant mix pay item, and no additional payment will be made for performing the work.

No payment will be made for unacceptable material; for material needed to overlay layers deficient in thickness; for material used in replacing defective or condemned construction; for material wasted in handling, hauling, or otherwise; or for maintaining the work.

When the average rate of placement is found to exceed the tolerance given in Item 410.03(f)1., the tonnage {metric tonnage} placed above the specified rate in that unit will be paid for at 50 percent of the contract unit price. This reduction will not be applied to patching, leveling, and widening.

The ordered and accepted profilographs, measured as noted above, will be paid for at the contract unit price bid which shall be full compensation for furnishing the unit and includes all equipment, tools, labor, calibration, maintenance, services, supplies, chart paper, and incidentals necessary to complete these items of work.

The number of approved remixing devices, measured as noted above, will be paid for at the contract unit bid price. This price shall be full compensation for furnishing the vehicles and shall include all equipment, tools, labor, calibration, maintenance, services, operator, and all other items necessary to furnish and operate the vehicles.

(b) PAYMENT WILL BE MADE UNDER ITEM NO.:

See Appropriate Section for Type of Plant Mix Involved.
410-A Profilograph - per Each
410-B State Furnished Profilograph - per Each
410-C Contractor Retained Profilograph - per Each
410-H Material Remixing Device - per Each

SECTION 420
POLYMER MODIFIED OPEN GRADED FRICTION COURSE

420.01 Description.

The work covered by this Section shall consist of constructing a hot mixed, hot laid polymer modified open graded friction course wearing layer generally placed on an existing pavement. The typical cross section and the average weight per square yard will be shown on the plans. Requirements for all hot mix asphalt pavements as specified in Section 410 are applicable to this Section, subject to any exceptions contained herein. Quality Control/Quality Assurance (QC/QA) requirements as specified in Section 106 are applicable to this Section, subject to any exceptions contained herein.

CQS-1hp MODIFIED ASPHALT EMULSION			
TEST OF EMULSION			
Parameter	Test Method	Value	
Viscosity @ 77° F, SF	AASHTO T 59	20 Min.	150 Max.
Sieve Test, %	AASHTO T 59	-	0.1 Max.[1]
24-Hour Storage Stability, %	AASHTO T 59	-	1.0 Max.[2]
Residue By Distillation	AASHTO T 59	60 Min.	-
Oil Distillate, by Volume of Emulsion, %	AASHTO T 59	-	-
Particle Charge	AASHTO T 59	Positive[3]	
TEST OF RESIDUE FROM EMULSION			
Solubility in TCE, %	AASHTO T 44[4]	97.5 Min.	-
Elastic Recovery @ 50 °F	AASHTO T 301	60.0 Min.	-
Penetration @ 77 °F	AASHTO T 49	60 Min.	110 Max.
Ductility @ 77.0 °F	AASHTO T 51	40 Min.	-

1. Sieve test may be waived based on successful application in the field.
2. After standing undisturbed for 24 hours, the surface shall show no white, milky-colored substance, but shall be a smooth homogeneous color throughout the sample.
3. If the Particle Charge Test is inconclusive, a pH test (AASHTO T 200) shall be used with a maximum of 6.7 allowable.
4. ASTM D 5546 may be used when polymers block the filter during the test.

The original "PG Asphalt for Trackless Tack" (no RTFO or PAV testing) shall conform to the physical requirements shown in the following table:

SPECIFICATIONS FOR PG ASPHALT FOR TRACKLESS TACK		
Parameter	Specification	Test Method
Rotational Viscosity	Maximum 3 Pa•s @ 135 °C	AASHTO T 316
Penetration	Maximum 25 @ 77 °F {25 °C}, 100 g. 5s	AASHTO T49
Softening Point (°C)	Minimum 70	AASHTO T 53
Dynamic Shear, G*/sin δ	Minimum 1.0 kPa @ 82 °C	AASHTO T 315

420.03 Design

The Open Graded Friction Course shall be designed with a minimum air void content of 12% according to ALDOT-259, OPEN GRADED ASPHALT CONCRETE FRICTION COURSE DESIGN METHOD. The contractor shall have the responsibility for the design of Section 420 mixes. The laboratory compacted density as determined in the job-mix formula design shall not exceed 150 pounds per cubic foot {2400 kg/m^3}; this corresponds with a maximum specific gravity value of 2.837 or a bulk specific gravity of 2.411.

The work will be accepted on a LOT by LOT basis in accordance with the applicable requirements. Pay factors for air voids and density shall not apply.

420.04 Construction Requirements.

(a) GENERAL.

The requirements of Articles 410.03 through 410.07 shall apply except as modified hereinafter in this Article.

(b) RATE OF PLACEMENT OF TACK COAT.

The rate of application of the tack coat on the asphalt surface shall be 0.13 to 0.18 gallons per square yard within a tolerance of -0.02 and +0.02 gallons per square yard for the PG Asphalt for Trackless Tack. CQS-1hP asphalt emulsion shall be applied at a rate of 0.18 - 0.23 gallons per square yard within a tolerance of -0.02 and +0.02 gallons per square yard. A uniform distribution of tack coat across the mat shall be enforced and streaked tack shots shall not be accepted.

SECTION 423
STONE MATRIX ASPHALT (SMA)(FIBER STABILIZED ASPHALT CONCRETE)

423.01 Description.

The work covered by this Section shall consist of constructing a hot mix asphalt layer of fiber stabilized stone matrix asphalt pavement on a prepared surface in accordance with these specifications and in conformity with the lines, grades, typical cross section, and the placement rate shown on the plans or as directed. The plant, equipment, and construction requirements for this pavement are specified in Sections 106 and 410, subject to any exceptions herein. All 423 mixes shall be designed and produced in accordance with the requirements given in this Section and ALDOT-395, SMA Mix Design.

423.02 Materials.

(a) AGGREGATES.

1. PROCEDURE FOR ACCEPTANCE OF COARSE AND FINE AGGREGATES.

All fine and coarse aggregate furnished shall come from an approved producer who is participating in and meeting the requirements of ALDOT-249, *Procedure for Acceptance of Coarse and Fine Aggregates*. The producer's name shall be listed in the Department's *Materials, Sources, and Devices with Special Acceptance Requirements Manual*, List I-1. The Department has established a list of qualified producers of fine and coarse aggregates. Refer to Subarticle 106.01(f) and ALDOT-355 concerning this list.

2. TYPES OF ACCEPTABLE COARSE AGGREGATES FOR SMA.

Coarse aggregate shall be aggregate retained on the No. 4 {4.75 mm} sieve. The virgin coarse aggregate shall be 100% crushed granite, quarried quartzite, limestone, sandstone, slag, or other 100% crushed manufactured stone meeting the requirements given in Section 801.

3. FLAT AND ELONGATED PARTICLES IN COARSE AGGREGATES FOR SMA.

The maximum amount of flat and elongated particles in coarse aggregate for SMA is given in the following table.

PERCENT OF FLAT AND ELONGATED PARTICLES IN COARSE AGGREGATE FOR SMA		
Test Method		Maximum
Flat & Elongated % by Count 3:1 (max to min)	ASTM D 4791 Section 8.4	20 %
Flat & Elongated % by Count 5:1 (max to min)	ASTM D 4791 Section 8.4	5 %

4. COARSE AGGREGATE SOUNDNESS FOR SMA.

The percent degradation of the source aggregate by the sodium sulfate soundness test (AASHTO T 104, Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate) after five cycles of testing shall not exceed 10 %.

5. DELETERIOUS MATERIALS AND ABSORPTION IN COARSE AGGREGATE FOR SMA.

The amount of deleterious substances and absorption in the coarse aggregate shall not exceed the limits given in the following table.

DELETERIOUS MATERIALS AND ABSORPTION IN COARSE AGGREGATE FOR SMA	
Coal and Lignite (Visual)	0.25 %
Clay Lumps and Friable Particles (AASHTO T 112)	0.25 %
Other local deleterious substances (Shale, Mica, Marcasite, etc.) (Visual)	2.0 %
Absorption (Absorption on the material passing the 3/4 inch {19.0 mm} sieve and retained on the No. 4 {4.75 mm} sieve) (AASHTO T 85 *). Applies to gravel aggregates only.	2.0 %
* Section 8.1 of AASHTO T 85 modified to require a 15 minute vacuum saturation period as per Section 6.3 of AASHTO T 209 prior to the required 15-19 hour soaking period.	

6. LOS ANGELES ABRASION CRITERIA FOR COARSE AGGREGATE FOR SMA.

The percent loss of the coarse aggregate by the LA Abrasion test (AASHTO T 96, Resistance to Abrasion of Small Size Aggregate by use of the Los Angeles Machine) shall not exceed 48 % except that, for Sandstone and Blast Furnace Slag, the LA Abrasion shall not exceed 55 %.

PERCENT PASSING BY VOLUME OF AGGREGATE FOR SMA										
	1.5 inch {37.5 mm} Maximum Aggregate Size		1 inch {25.0 mm} Maximum Aggregate Size		3/4 inch {19.0 mm} Maximum Aggregate Size		1/2 inch {12.5 mm} Maximum Aggregate Size		3/8 inch {9.5 mm} Maximum Aggregate Size	
Sieve Size	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit
1.5 inch {37.5 mm}	100	100								
1 inch {25.0 mm}	90	100	100	100						
3/4 inch {19.0 mm}	30	86	90	100	100	100				
1/2 inch {12.5 mm}	26	63	50	74	90	100	100	100		
3/8 inch {9.5 mm}	24	52	25	60	26	78	90	100	100	100
# 4 {4.75 mm}	20	28	20	28	20	28	26	60	90	100
# 8 {2.36 mm}	16	24	16	24	16	24	20	28	28	65
# 16 {1.18 mm}	13	21	13	21	13	21	13	21	22	36
# 30 {600 µm}	12	18	12	18	12	18	12	18	18	28
# 50 {300 µm}	12	15	12	15	12	15	12	15	15	22
# 200 {75 µm}	8	10	8	10	8	10	8	10	12	15

An example of how to blend aggregate based upon volume can be found in ALDOT-395, SMA Mix Design. The production tolerances for the above gradation bands are as specified in Item 410.02(d)7, except that the tolerance for the No. 4 {4.75 mm} sieve is +/- 4% and for the 3/8 inch {9.5 mm} sieve is +/- 6%.

Aggregates that tend to polish under traffic, such as limestone, dolomite, or marble, shall be permitted only in widening as defined by Article 410.01, shoulder paving, underlying layers, and layers that are to be covered by Polymer Modified Open Graded Friction Course (Section 420) mix in this contract, except as noted in the following table.

ALLOWABLE CARBONATE STONE CRITERIA FOR SMA	
BPN 9 Value Of Aggregate Source *	Maximum Allowable Percentage Of Carbonate Stone
≤ 25	30
26 through 28	35
29 through 31	40
32 through 34	45
≥ 35	50
* This value, BPN 9, is made using the British Pendulum Tester on aggregate source specimen polished for 9 hours on an accelerated polishing machine known as the British Wheel as per ASTM D 3319, ASTM E 303 and BMTP-382.	

In no case shall the total amount of virgin carbonate stone in the combined mixture used as actual wearing surface layers exceed the percentage shown in Table 4. When parts of the carbonate stone used in the mix are from differing strata of material or coming from multiple sources that are represented by different BPN 9 values, the lowest BPN 9 value will be used.

423.05 Construction Requirements.

(a) GENERAL.

Construction requirements shall be the same as specified in Articles 410.03 through 410.07 except as noted in this Article.

(b) WEATHER AND TEMPERATURE LIMITATIONS.

The weather, air and surface temperature limitations for (polymerized) HMA mixes are found in Subarticle 410.03(b).

(c) SURFACE PREPARATION.

A thin tack coat meeting the requirements of Section 405 shall be applied to ensure uniform and complete adherence of the overlay.

(d) COMPACTION.

Due to the nature of stone matrix asphalt mixture, the surface shall be rolled immediately. Rollers shall move at a uniform speed, not to exceed 3 miles per hour {5 km/hr}, with the drive roller nearest the paver. Rolling shall be continued until all roller marks are eliminated and the required density has been obtained. The Contractor shall monitor density during the compaction process using the nondestructive testing devices approved in Section 306 of the Specifications to ensure that the required density is being obtained. The device shall either be calibrated to roadway cores or gage counts and shall be used to determine the rolling pattern producing maximum density. If vibratory compaction causes aggregate breakdown or forces liquid asphalt binder to the surface, the vibratory mode shall be turned off and the roller shall operate in static mode only.

To prevent adhesion of the mixture to the rollers, it shall be necessary to keep the wheels properly moistened with water mixed with very small quantities of detergent or other approved material.

423.06 Method of Measurement.

The accepted quantities of stone matrix asphalt binder layer and stone matrix asphalt wearing layer will be measured as provided in Article 410.08. The SMA mix shall be evaluated for liquid asphalt binder content, laboratory compacted air voids, and in-place density; pay factors will be applied.

423.07 Basis of Payment.

(a) UNIT PRICE COVERAGE.

Stone Matrix Asphalt Binder Layer and Stone Matrix Asphalt Wearing Layer, measured as noted above, will be paid for at the contract unit price bid in accordance with Article 410.09.

(b) PAYMENT WILL BE MADE UNDER ITEM NO.:

423-A Stone Matrix Asphalt Wearing Layer, ___* Maximum Aggregate Size
- per ton {metric ton}

423-B Stone Matrix Asphalt Binder Layer, ___* Maximum Aggregate Size
- per ton {metric ton}

* Specify Maximum Aggregate Size, either 1.5, 1, 3/4, 1/2 or 3/8 inches {37.5 mm, 25 mm, 19 mm, 12.5 mm, or 9.5 mm}

SECTION 424
SUPERPAVE BITUMINOUS CONCRETE BASE, BINDER, AND WEARING SURFACE LAYERS

424.01 Description

The work covered by this Section shall consist of a hot or warm bituminous plant mixed pavement layer placed on a prepared surface in accordance with these specifications and in reasonably close conformity with the lines, grades, typical cross section, and the approximate placement rate shown on the plans or as directed.

The Contractor may use either hot mix or warm mix for all Superpave ESAL Range mixes in Section 424.

The fine aggregate shall be non-plastic when tested in accordance with AASHTO T 89, as modified by ALDOT-232, and AASHTO T 90 and shall have a maximum of 1.0 % clay lumps and friable particles as determined by AASHTO T 112. It shall consist of hard, tough grain, free of injurious amounts of clay, loam, or other deleterious substances.

8. CLAY CONTENT FOR SUPERPAVE.

The amount of clay material, as indicated by the sand equivalent, measured on the aggregate passing the No. 4 {4.75 mm} sieve as determined by AASHTO T 176, Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test, shall be no less than the values defined in the following table according to the total design traffic in equivalent single axle loads (ESALs).

CLAY CONTENT CRITERIA FOR SUPERPAVE		
ESAL Range	Traffic (ESALs)	Sand Equivalent
A/B	ESALs $< 1.0 \times 10^6$	$\geq$ 40.0
C/D	$1.0 \times 10^6 \leq$ ESALs $< 1.0 \times 10^7$	$\geq$ 45.0
E	$1.0 \times 10^7 \leq$ ESALs $< 3.0 \times 10^7$	$\geq$ 45.0

9. MINERAL FILLER FOR SUPERPAVE.

Mineral filler shall consist of finely divided mineral matter such as rock dust, slag dust, hydrated lime, hydraulic cement, or fly ash meeting the requirements of Section 805.

The introduction of mineral filler shall be in accordance with AASHTO M 156, Section 3.3, as specified in ALDOT-324, with the additional requirement that accurate proportioning shall be accomplished by means of pneumatic or mechanical metering.

(b) RECYCLED ASPHALT PAVEMENT (RAP) & RECLAIMED ASPHALT SHINGLES (RAS).

The requirements for allowing the use of RAP and RAS are given in Article 410.02.

(c) BLEND OF AGGREGATES.

1. GRADATIONS FOR BLEND OF AGGREGATES.

The coarse and fine aggregates, mineral filler, and recycled material shall be combined in a total blend that will produce an acceptable job mix within the gradation limits determined by the maximum and minimum control points as shown in the following tables. Maximum particle size is defined as the sieve size that is two sizes larger than the first sieve to retain more than 10 % of the material. The sequence of sieve sizes to be used in determining maximum particle size is given in the following tables. Gradation charts illustrating gradation requirements are given in Article 424.03.

The required mix will be shown on the plans. Also, all ESAL range "E" mixes shall exhibit 4.50 mm or less rutting when tested according to ALDOT-401, Rutting Susceptibility Determination of Asphalt Paving Mixtures Using the Asphalt Pavement Analyzer.

AGGREGATE GRADATION CONTROL POINTS FOR SUPERPAVE 1 1/2 inch {37.5 mm} Maximum Aggregate Size Mix		
	Control Point (Percent Passing)	
Sieve Size	Minimum	Maximum
No. 200 {75 µm}	1	7
No. 8 {2.36 mm}	19	45
3/4" {19 mm}	19	90
1" {25 mm} Nominal	90	100
1.5" {37.5 mm} Maximum	100	-

COARSE AGGREGATE ANGULARITY REQUIREMENTS FOR SUPERPAVE			
ESAL Range	Traffic (ESALs)	Wearing Surface & Binder Layers	Base Layers
A/B	ESALs < $1.0x10^6$	75 / -	50 / -
C/D	$1.0x10^6 \leq$ ESALs < $1.0x10^7$	85 / 80	60 / -
E	$1.0x10^7 \leq$ ESALs < $3.0x10^7$	95 / 90	80 / 75
Note: "85 / 80" denotes that 85 % of the coarse aggregate has at least one fractured face and 80 % has two or more fractured faces.			

3. FINE AGGREGATE ANGULARITY FOR BLEND OF AGGREGATES.

The percent air voids in loosely compacted fine aggregate, measured according to AASHTO T 304, Method "A", or ASTM C 1252, Method "A", *Uncompacted Void Content of Fine Aggregate (as Influenced by Particle Shape, Surface Texture, and Grading)* shall be no less than the values in the following table.

FINE AGGREGATE ANGULARITY REQUIREMENTS FOR SUPERPAVE			
ESAL Range	Traffic (ESALs)	Minimum % Air Void	
		Base	Binder & Surface
A/B	ESALs < $1.0x10^6$	43	43
C/D	$1.0x10^6 \leq$ ESALs < $1.0x10^7$	43	45
E	$1.0x10^7 \leq$ ESALs < $3.0x10^7$	43	45

4. RESTRICTIONS IN THE USE OF CARBONATE STONE FOR BLEND OF AGGREGATES.

The restrictions for the use of carbonate stone are given in the following table. These restrictions do not apply to widening as defined in Article 410. 01, shoulder paving, underlying layers, and layers that are to be covered by Polymer Modified Open Graded Friction Course (Section 420) mix in this contract.

CRITERIA FOR THE USE OF CARBONATE STONE IN SUPERPAVE	
BPN 9 Value Of Aggregate Source *	Maximum Allowable Percentage Of Carbonate Stone
≤ 25	30
26 through 28	35
29 through 31	40
32 through 34	45
≥ 35	50
* This value, BPN 9, is made using the British Pendulum Tester on aggregate source specimen polished for 9 hours on an accelerated polishing machine known as the British Wheel as per ASTM D 3319, ASTM E 303 and ALDOT-382.	

In no case shall the total amount of virgin carbonate stone in the combined mixture used as actual wearing surface layers that are exposed to traffic exceed the percentage shown in the above table. When parts of the carbonate stone used in the mix are from differing strata of material or coming from multiple sources that are represented by different BPN 9 values, the lowest BPN 9 value will be used.

(d) LIQUID ASPHALT BINDER.

Liquid asphalt binders shall come from an approved producer who is participating in and meeting the requirements of ALDOT-243, *Acceptance Program For Asphalt Materials*. The producer's name shall be listed in the Department's *Materials, Sources, and Devices With Special Acceptance Requirements* Manual, List I-4. The Department has established a list of qualified producers of asphalt materials. Refer to Subarticle 106.01(f) and ALDOT-355 concerning this list. Unless shown otherwise on the plans or in the proposal, liquid asphalt binder for use in all mixes shall meet the requirements of AASHTO M 320, *Standard Specification For Performance Graded Asphalt Binder*, as modified by the requirements given in the following table and Section 804.

LIQUID ASPHALT BINDER CONTENT (Pb) CRITERIA FOR SUPERPAVE			
Maximum Aggregate Size* (inches) {mm}	Nominal Aggregate Size (inches) {mm}	Minimum Liquid Asphalt Binder Content (Pb) by Percent of Total Mix**	Minimum Liquid Asphalt Binder Content (Pb) for mixes containing RAS by Percent of Total Mix**
3/8 {9.5 }	No. 4 {4.75}	5.90	6.1
1/2 {12.5 }	3/8 {9.5}	5.50	5.7
3/4 {19.0 }	1/2 {12.5}	5.10	5.3
1 {25.0 }	3/4 {19.0}	4.40	4.6
1.5 {37.5 }	1 {25.0}	4.20	4.4
* As defined in Subarticle 424.02(d) ** Nd = 60			

4. DUST PROPORTION (D/Pbe).

The ratio of the percent by weight {mass} of aggregate passing the 75 µm sieve to the effective asphalt content expressed as percent by weight {mass} of the total mix shall be between 0.60 and 1.4. All 3/8 inch {9.5 mm} mixes shall have a dust to effective asphalt ratio range of 0.90 to 2.00. These ratio limits apply to both the design and production phases. Effective asphalt content is that liquid asphalt binder not absorbed into the aggregate pore structure and is determined in accordance with Section 4.09 of the Asphalt Institute's, MS-2, *Mix Design Methods for Asphalt Concrete*.

5. LIQUID ASPHALT BINDER DRAINDOWN.

A fiber stabilizer meeting the requirements given in Section 410 may be incorporated into the mix to reduce draindown. The fiber shall be blended into the mix in accordance with the requirements given in Section 410.

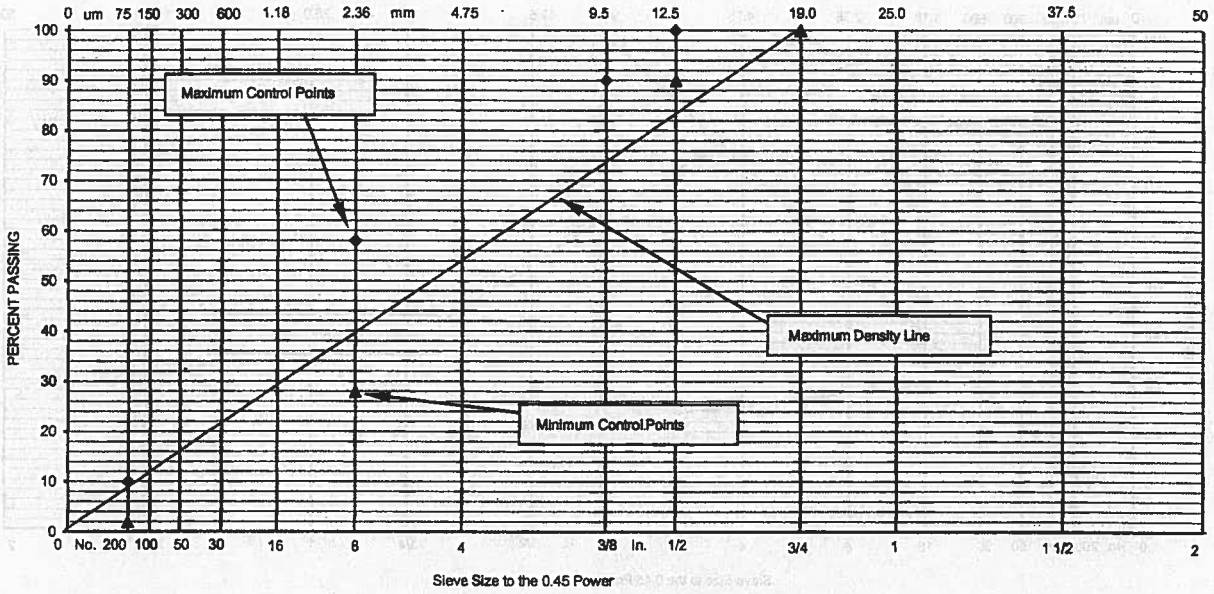
6. RESISTANCE TO MOISTURE-INDUCED DAMAGE.

All mixes shall be designed and produced to have a tensile strength ratio (TSR) of at least 0.80 when compacted according to ALDOT-384 at 7.0 % air voids and tested in accordance with AASHTO T 283 as modified by ALDOT-361, except the specimen shall be 6.00" {150 mm} in diameter and 3.75" {95 mm} in height.

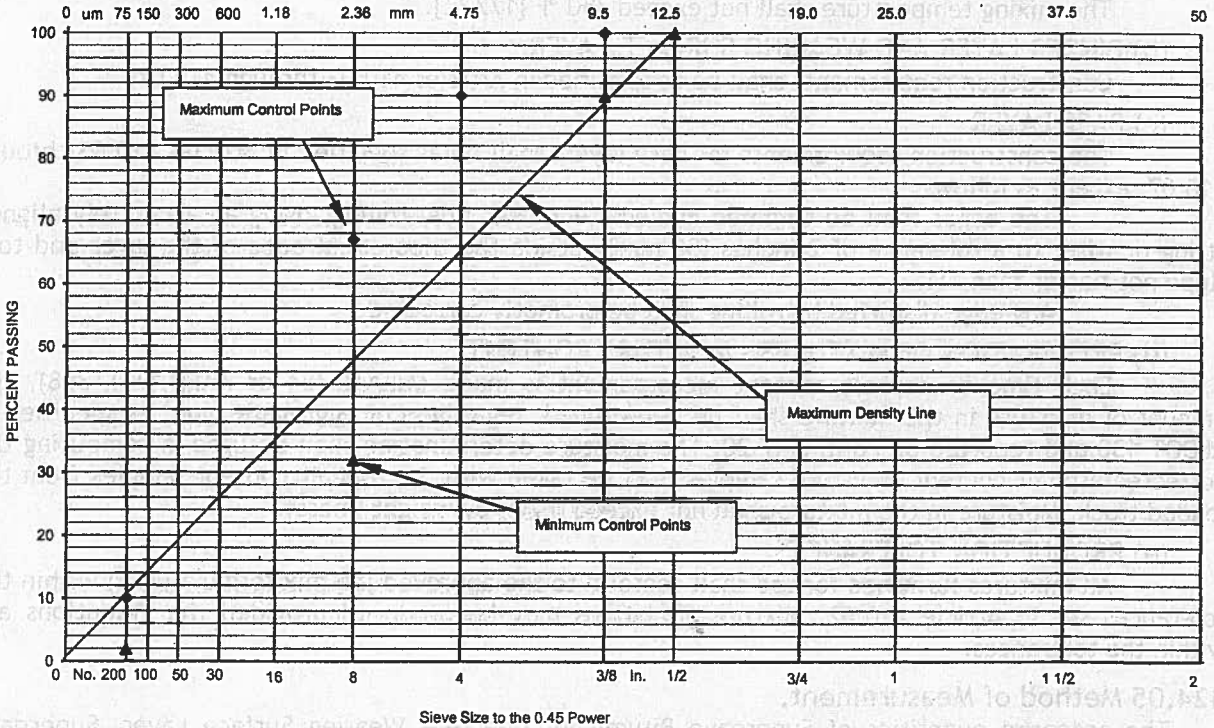
(f) DESIGN PROCEDURE.

All Superpave mixes with 100 % virgin aggregate shall be designed in accordance with ALDOT-384, *Mix Design Procedure for Superpave Level I*. All other Superpave mixes containing RAP shall be designed in accordance with ALDOT-388, *Superpave Volumetric Mix Design Procedure Using Recycled Asphalt Pavement*. All Superpave Gyratory Compactors shall have their angle of gyration verified by the Engineer following the procedure in AASHTO T 344, Standard Method of Test for Evaluation of Superpave Gyratory Compactor (SGC) Internal Angle of Gyration Using Simulated Loading. This includes all design, quality control, and quality assurance SGCs. The compactors shall tilt the specimen molds at an average internal angle of 20.2 ± 0.35 mrad (1.16± 0.02 degrees).

GRADATION CHART FOR 3/4 inch (19 mm) MAXIMUM SIZE AGGREGATE



GRADATION CHART FOR 1/2 inch (12.5 mm) MAXIMUM SIZE AGGREGATE



424.06 Basis of Payment.

(a) UNIT PRICE COVERAGE.

Superpave Bituminous Concrete Wearing Surface Layer, Superpave Bituminous Concrete Binder Layer, and Superpave Bituminous Concrete Base Layer will be paid for at the contract unit price bid in accordance with Article 410.09, subject to any exceptions contained herein.

(b) PAYMENT WILL BE MADE UNDER ITEM NO.:

424-A Superpave Bituminous Concrete Wearing Surface Layer, ____ ,
____ Maximum Aggregate Size Mix, ESAL Range _____ - per ton {metric ton}

424-B Superpave Bituminous Concrete ____ Binder Layer, ____ ,
____ Maximum Aggregate Size Mix, ESAL Range _____ - per ton {metric ton}

424-C Superpave Bituminous Concrete Base Layer, ____ ,
____ Maximum Aggregate Size Mix, ESAL Range _____ - per ton {metric ton}

* Specify either "Upper" or "Lower".

** Specify "Patching", "Leveling", "Widening", etc. only when required.

*** Specify Maximum Aggregate Size: 3/8", 1/2", 3/4", 1", or 1.5" {9.5 mm, 12.5 mm, 19.0 mm, 25.0 mm, or 37.5 mm}.

**** Specify "A/B", "C/D", or "E".

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: July 2, 2012 Special Provision No. 12-0268

EFFECTIVE DATE: November 1, 2012

SUBJECT: Roadway Lighting.

Alabama Standard Specifications, 2012 Edition, shall be amended by replacing SECTION 750 and modifying SECTION 889 as follows:

SECTION 750
ROADWAY LIGHTING

750.01 Description.

This work shall consist of furnishing and installing roadway lighting systems, or the modification of roadway lighting.

The structural requirements (design and materials) for roadway lighting are addressed in Section 718.

750.02 Materials.

Materials shall meet the requirements given in Section 889.

Prior to purchasing materials, and within 30 days after the issuance of the "Notice to Proceed", the Contractor shall submit seven copies of a complete descriptive list of all materials (wiring, conduits, boxes, mounting hardware, power control devices, luminaires, luminaire poles, etc.) to the Engineer for approval. (The requirement for the submittal of structural designs and details is given in Section 718.) This information shall be submitted on the Department's Material Submittal Form furnished to the Contractor for this purpose. The submittal shall also include seven copies of "catalog cutouts" or published data sheets for each item on the list. Incomplete or inaccurate submittals will be returned to the Contractor for revision and resubmittal. Partial lists may be considered if prior approval for the submittal of a partial list is approved in writing by the Engineer.

Materials shall not be installed prior to approval. The Department will not be liable for materials purchased, work performed, or any delay incurred due to the failure of the Contractor to secure prior approval.

Failure of the Engineer to note unsatisfactory material as received at the job site will not relieve the Contractor of the responsibility of furnishing the required material.

750.03 Construction Requirements.

(a) CODE.

All work shall be done in accordance with the requirements given in the current edition of the National Fire Protection Association "NFPA 70, "National Electrical Code" (NEC) and the regulations and standards of the power company providing service.

(b) LICENSE.

The Contractor responsible for the performance of the work shall be licensed as a General Contractor authorized to perform electrical work by the Alabama State Licensing Board for General Contractors

At least one out of every three persons in each work crew shall be a Journeyman licensed by the Alabama Electrical Contractors Board. Journeymen shall be present and shall have direct involvement with all work required for the installation and operational testing of electrical materials and equipment. The Journeymen shall also possess an IMSA (International Municipal Signal Association) Roadway Lighting Level 1 Certification.

(e) JUNCTION BOXES.

The types of junction box shall be:

TYPE	INSTALLATION LOCATION	BOX MATERIAL
Type 1	Installed flush with grade.	Non-Metallic
Type 2	Installed on the surface of a structure.	Metal
Type 3	Installed flush with surface of a structure.	Non-Metallic
Type 4	As Shown on the Plans	As Shown on the Plans

(f) NONMETALLIC UNDERGROUND CONDUIT WITH CONDUCTORS.

Nonmetallic Underground Conduit with Conductors (NUCC) shall be installed in accordance with the manufacturer's recommendations.

If plowing is proposed for the installation of the NUCC, the manufacturer's recommended installation practices shall be submitted to the Engineer prior to beginning the installation. If the Engineer is not satisfied with the Contractor's performance and knowledge once installation begins, the Contractor shall arrange for a manufacturer's representative experienced in plowing methods to be at the jobsite until the Engineer determines that the Contractor is capable of properly installing the NUCC. If rock or other obstructions hinder plowing operations, the Engineer may require that conductor routes be pre-ripped to locate rock or hidden obstructions. Obstructions may be removed or the conductors routed around them as approved by the Engineer.

If the "Plow Pulling" method is used, the plow operator shall have an acceptable method to insure that the manufacturer's recommended maximum tensile force on the NUCC is not exceeded.

If at any time the Engineer determines the installation is not in full compliance with the intent of the manufacturer's recommended practices, the operation shall stop until a manufacturer's representative can further instruct the Contractor's personnel in the deficient areas.

If the "Chute Plowing" method is used, special attention shall be given to the conductor feed chute dimensions.

(g) CONDUCTOR INSTALLATION.

1. SPLICES AND TAPS IN CONDUCTORS.

Splices and taps in conductors shall only be made in junction boxes and pole bases. They shall be made with solderless split bolt connectors.

Splices and taps shall be protected in sealed in silicone gel filled enclosures to provide a waterproof connection and to ensure the required electrical insulation.

Silicone gel filled enclosures shall be re-enterable; shall be UV resistant, listed for temperatures from -40 °C to 90 °C; and shall be impact and abrasion resistant. The enclosure shall be sized as shown in the following table:

Conductor Size	Gel Enclosure Size
#4 AWG and smaller	#2
#2 AWG	#2.5 or Miniwedge
Larger than #2 AWG	#3

2. PULLING CONDUCTORS INTO CONDUIT.

Conductors shall not be pulled into a conduit until the installation of the conduit is complete. Conductors in conduits shall be carefully pulled into place using approved methods so that the conductors will not be damaged. Powdered soapstone, talc, or other inert lubricant specifically designed for the purpose shall be used when pulling conductors through the conduit. All conductors within a single conduit shall be pulled at the same time and shall be handled and installed in such a manner as to prevent kinks, bends or other distortion which could damage the conductor and outer covering. When conductors are pulled through hand holes, pole shafts, etc., a pad of firm rubber or other suitable materials shall be placed between the conductors and the edges of the opening to prevent damage to the conductors.

(h) GROUNDING.

All metal poles and metal enclosures containing electric wires and/or equipment shall be grounded. Exothermic welds or other approved connectors shall be used to connect the grounding conductor to the ground rods.

(n) GROUND RESISTANCE TESTING.

The resistance to ground will be tested by the Engineer at each lighting control center . The test will be conducted using a null balance earth tester with auxiliary ground rods placed 50 feet {15.24 m} and 100 feet {30.48 m}, respectively, from the tested ground rod. A reading of 25 ohms or less is satisfactory. Any reading over 25 ohms will require the installation of additional ground rods to be placed in a pattern as directed by the Engineer. The Engineer may conduct additional ground resistance testing after the completion of the operational testing.

(o) TESTING LUMINAIRE LOWERING DEVICES.

The Contractor shall perform a functional test on all luminaire lowering devices. Tests shall be performed in the presence of the Engineer. The test shall be performed on the final completed lighting assembly with all luminaires and other components installed. The test shall be performed as follows:

- Start with the device in the latched position on top of the pole.
- Unlatch and lower the device support to ground level for inspection.
- Raise device to top and latch.
- Unlatch and lower the device 5 to 10 feet {1.53 to 3.05 m}.
- Raise the device and confirm that secure latching has occurred.
- Repeat unlatching, lowering, raising and latching three times.

If latching or unlatching failures occur, or if any other problems occur during the test, the Contractor shall make corrections and repeat the complete test in the presence of the Engineer.

(p) OPERATIONAL TESTING OF THE SYSTEM.

The Contractor shall perform full operational testing of the completed lighting system after the completion of the installation of all equipment and materials, including all miscellaneous items of work required for the complete lighting system. The operational testing will not begin until the testing of the insulation, resistance to ground, and luminaire lowering devices has been completed and accepted by the Engineer.

The Engineer will set the date that the operational testing will begin. The Contractor shall provide all installation and operational instructions for all lowering devices before the operational testing of the system will be allowed to begin.

An operational test shall be the full operation of all components of the lighting system for a period of 30 calendar days. During this test period the Contractor shall perform all necessary adjustments (including re-aiming of luminaires) and replace all malfunctioning parts of the equipment required to place the system in a fully operational condition. Extra compensation will not be given for adjustments, maintenance, repairs and replacements during the test period. The initial test period will be suspended as directed by the Engineer during the time that the entire lighting system is not in full operation. The 30 calendar day operational test period shall be restarted or repeated if required by the Engineer due to repeated failure of the lighting system.

The Engineer will perform a final inspection of the lighting system at the completion of the operational testing. If all items of work in the contract have been completed, the Engineer will suspend contract time charges during the operational testing.

Upon completion of the operational testing, field tests may be conducted by the Engineer to verify that the required lighting levels and uniformity ratios are being provided. Any adjustments to the lighting system necessary to meet the design criteria shall be done at the Contractor's expense.

(q) WARRANTIES, GUARANTEE AND MAINTENANCE.

The State shall be protected from any defect in the lighting system by the following:

- The Contractor shall provide the manufacturer's warranties to the State for all electrical and mechanical equipment and;

- The Contractor warrants equipment and guarantees workmanship for satisfactory in-service operation of the electrical and mechanical equipment and related components for a period of one year following the date of completion of the operational check period. ,

- Maintenance repair work may be required for long duration contracts. In the case of long duration contracts the Contractor shall perform maintenance repair work on the lighting system (equipment, devices, structures and hardware) from the end of the one year warranty period until the

- 3'-0" {910 mm} Diameter: The compensation for 3'-0" {910 mm} diameter foundation shall be increased by $100 for each foot {$100.00 for each 300 mm} of depth that the foundation increases from what is shown on the plans.

- 4'-0" {1.22 m} Diameter: The compensation for 4"-0" {1.22 m} diameter foundation shall be increased by $200 for each foot {$200.00 for each 300 mm} of depth that the foundation increases from what is shown on the plans.

- Reinforcing Steel: The adjustments to compensation because of changes in foundation depth shall also cover compensation for providing the reinforcing steel shown on the plans for the deeper foundations. The number and size of longitudinal reinforcing steel and the size and spacing of hoops will be the same regardless of any change in depth.

Item 750-D: Electrical Junction Box. An electrical junction box shall be the junction box, concrete, and mounting hardware.

Item 750-E: Conduit. Conduit (RMC, LFMC, LFNC, or RNC) shall be the conduit tubing including fittings, trenching, backfilling, attachment to structure and miscellaneous hardware.

Item 750-F: Conductor. This shall be individual conductors and includes pulling, splicing, terminating, testing and miscellaneous hardware.

Item 750-G: Combined Duct and Conductors: Combined duct and conductors (NUCC) shall be the complete assembly of polyethylene duct and the size and number of required conductors. It shall include fittings, trenching, backfilling, splicing, terminating, testing and all miscellaneous hardware.

Item 750-H: Service Pole. A service pole shall consist of the pole, switch, fuses, ground rod, one-spool clevis, down guy and guy rod (if required) and miscellaneous hardware.

Item 750-I: Lighting Control Center. A lighting control center shall include switches, circuit breakers, contactors, fuses, enclosures, photocontrols, ground rods, incoming service conductors and conduit, concrete slab, anchor bolts, and miscellaneous hardware.

Item 750-J: Preparation Work for Utility Company Equipment. This work shall include the installation of concrete pads, pull boxes, conduit, grounding equipment, conductor vaults, and other equipment and materials as shown on the plans.

Item 750-K: Modification of Roadway Lighting. The modification of roadway lighting shall consist of the work shown on the plans to be included in this pay item. It may include any kind and amount of preparation, restoration, relocation, rehabilitation, demolition and salvage work detailed on the plans.

Item 750-L: Landscape Luminaire Assembly. Landscape luminaire assemblies shall be furnished and installed by the Contractor in accordance with the details shown on the plans. Each landscape luminaire shall be connected to the electrical power service to become a fully functional part of the required lighting system.

Item 750-Z: Roadway Lighting. Roadway Lighting (lump sum) shall include all equipment, materials, tools, labor, and miscellaneous items required for roadway lighting as shown to be required on the plans. This shall include all excavation, foundations, conduits, conductors, pole assemblies, luminaires, junction boxes, lighting control centers, power service equipment and materials, and all miscellaneous items required to complete the work shown on the plans that is included in this item of work.

(b) PAYMENT WILL BE MADE UNDER ITEM NO.:

750-A High Mast Luminaire Assembly with ___* - per each
750-B Roadway Luminaire Assembly with ___* - per each
750-C Pole Foundation, ____** - per each
750-D Electrical Junction Box, Type ____ - per each
750-E Conduit, _____*** - per linear foot {meter}
750-F Conductor, _____**** - per linear foot {meter}
750-G Combined Duct and Conductors, _____***** - per linear foot {meter}
750-H Service Pole - per each
750-I Lighting Control Center - per each
750-J Preparation Work for Utility Company Equipment - per lump sum
750-K Modification of Roadway Lighting - per lump sum
750-L Landscape Luminaire Assembly, _____****** - per each

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: May 10, 2012 Special Provision No. 12-0292

EFFECTIVE DATE: September 1, 2012

SUBJECT: Fencing Materials.

Alabama Standard Specifications, 2012 Edition, SECTION 871 shall be replaced by the following:

SECTION 871
FENCING MATERIALS

871.01 Chain Link Fence.

Materials for chain link fence unless specified otherwise on the plans shall conform to the following:

(a) FABRIC.

Fence fabric shall meet the requirements of AASHTO M 181 using 2 inch uniform square mesh made from 0.148 inch (9 gage) {3.75 mm} wire with either a Type I, Class D (zinc coated steel); or Type II (Aluminum coated steel) finish. When a polyvinyl chloride coating is specified either a Class A or a Class B coating will be acceptable.

(b) SUPPORTS.

Supports shall meet the requirements of AASHTO M 181 and be either metallic coated steel Grade 1 or Grade 2, or Aluminum. Minimum sizes and weights of posts, rails and framing for all steel elements shall be as follows:

Steel Fence Supports & Framing	
Line Post 3-6 ft. {1 - 2 m} high fence	1.90" O.D. Grade 1 Pipe @ 2.72 #/ft. {48 mm O.D. Grade 1 Pipe @ 4.05 kg/m}
	1.90" O.D. Grade 2 Pipe @ 2.28#/ft. {48 mm O.D. Grade 2 Pipe @ 3.39 kg/m}
	1.875" x 1.625" x .105" "C" Section @ 1.85 #/ft. {47 mm x 41 mm x 2.5 mm "C" Section @ 2.75 kg/m}
Line Post 7-12 ft. {2.1 - 4 m} high fence	2.375" O.D. Grade 1 Pipe @ 3.65 #/ft. {60 mm O.D. Grade 1 Pipe @ 5.43 kg/m}
	2.375" O.D. Grade 2 Pipe @ 3.12 #/ft. {60 mm O.D. Grade 2 Pipe @ 4.64 kg/m}
	2.25" x 1.70" x .121" "C" Section @ 2.64 #/ft. {57 mm x 43 mm x 3 mm "C" Section @ 3.93 kg/m}
	2.25" x 1.70" x .143" "H" Section @ 3.26 #/ft. {57 mm x 43 mm x 3.5 mm "H" Section @ 4.85 kg/m}
Corner & Pull Posts 3-6 ft. {1 - 2 m} high fence	2.375" O.D. Grade 1 Pipe @ 3.65 #/ft. {60 mm O.D. Grade 1 Pipe @ 5.43 kg/m}
	2.375" O.D. Grade 2 Pipe @ 3.12 #/ft. {60 mm O.D. Grade 2 Pipe @ 4.64 kg/m}
	2.5" x 2.5" Sq. Tubing @ 5.70 #/ft. {63 mm x 63 mm Sq. Tubing @ 8.48 kg/m}
Corner & Pull Posts 7-12 ft. {2.1 - 4 m} high fence	2.875" O.D. Grade 1 Pipe @ 5.79 #/ft. 73 mm O.D. Grade 1 Pipe @ 8.62 kg/m
	2.875" O.D. Grade 2 Pipe @ 4.64 #/ft. {73 mm O.D. Grade 2 Pipe @ 6.90 kg/m}
	3" x 3" Sq. Tubing @ 9.10 #/ft. {75 mm x 75 mm Sq. Tubing @ 13.54 kg/m}

Minimum sizes and weights {masses} of posts, rails and framing for all aluminum elements shall be as follows:

Aluminum Fence Supports & Framing	
Line Post 3-6 ft. {1 - 2 m} high fence	2.375" O.D. Pipe @ 1.25 #/ft. {60 mm O.D. Pipe @ 1.86 kg/m}
	2.25" x 1.95" "H" Section @ 1.25 #/ft. {57 mm x 49 mm "H" Section @ 1.86 kg/m}
Line Post 7-12 ft. {2.1 - 4 m} high fence	2.875" O.D. Pipe @ 2.00 #/ft. {73 mm O.D. Pipe @ 2.98 kg/m}
	2.5" x 2.5" Sq. Tubing @ 1.25 #/ft. {63 mm x 63 mm Sq. Tubing @ 1.86 kg/m}
Corner & Pull Posts 3-6 ft. {1 - 2 m} high fence	3.0" O.D. Pipe @ 2.62 #/ft. {75 mm O.D. Pipe @ 3.90 kg/m}
Corner & Pull Posts 7-12 ft. {2.1 - 4 m} high fence	3.0" O.D. Pipe @ 3.00 #/ft. {75 mm O.D. Pipe @ 4.46 kg/m}
Gate Post for Gate Leaf Width 6 ft. {2 m} and less	3.0" O.D. Pipe @ 2.62 #/ft. {75 mm O.D. Pipe @ 3.90 kg/m}
	3.0" x 3.0" Sq. Tubing @ 2.0 #/ft. {75 mm x 75 mm Sq. Tubing @ 2.98 kg/m}

Aluminum Fence Supports & Framing (continued)	
Gate Post for Gate Leaf Width Over 6 ft. to 13 ft. {2 m to 4 m}	4.0" O.D. Pipe @ 3.0 #/ft. {100 mm O.D. Pipe @ 4.46 kg/m}
Gate Post for Gate Leaf Width Over 13 ft. to 18 ft. {4 m to 6 m}	6.625" O.D. Pipe @ 7.0 #/ft. {168 mm O.D. Pipe @ 10.42 kg/m}
Gate Top & Middle Rail	1.660" O.D. Pipe @ 0.786 #/ft. {42 mm O.D. Pipe @ 1.17 kg/m}
Gate Frames	1.660" O.D. Pipe @ 0.786 #/ft. 42 mm O.D. Pipe @ 1.17 kg/m
	1.5" x 1.5" Sq. Tubing @ 0.684 #/ft. {38 mm x 38 mm Sq. Tubing @ 1.02 kg/m}

(c) HARDWARE AND FITTINGS.

Hardware and fittings shall meet the requirements of AASHTO M 181 and be either metallic coated steel or Aluminum.

(d) MISCELLANEOUS WIRE.

Tension wire shall be metallic coated steel or aluminum as per AASHTO M 181. Wire used for tying shall be either No. 11 gage {3 mm} metallic coated steel or aluminum.

871.02 Woven Wire Fence.

Materials for woven wire fence unless specified otherwise on the plans shall conform to the following:

(a) FABRIC.

Fence fabric shall meet the requirements of ASTM A 116, Zinc Coated Steel Woven Wire Fabric, 1047-6-9, Grade 60, Class 3, or ASTM A 584, Aluminum Coated Steel Woven Wire Fabric, 1047-6-9.

When so designated on the plans for replacement of farm fencing, or fencing placed as a right-of-way consideration, etc., the Contractor may at his option use fabric as listed above or zinc coated steel wire, ASTM A 116, 1047-6-12 ½, Class 1 coating unless otherwise noted on the plans.

1 inch in 5 feet {25 mm in 1.5 m}. The length and sizes of wood posts shall be as detailed on the plans within the following tolerances.

When so designated on the plans for replacement of farm fencing, the Contractor may at his option use posts as listed above or wood posts purchased from local dealers, unless otherwise noted on the plans.

a. Round Posts.

The furnished posts may include posts from the minimum diameter specified up to, but not to include, those 1 inch {25 mm} or larger than the minimum diameter designated. When tapered posts are furnished, the diameter at the butt end should not be more than one and one-half inches larger than the diameter measured at the tip end.

b. Sawed Posts.

The furnished posts shall be of the dimensions shown on the plans, plus 1/2 inch { 12 mm} or minus 1/4 inch {6 mm}.

c. Lengths.

The furnished posts shall not measure over one inch less than specified on the plans. Lengths greater than those shown on plans may be acceptable at the discretion of the Engineer, if not detrimental to the appearance of the fence.

All posts shall be pressure treated in accordance with the provisions of Section 833. All job cuts shall be painted with three coats of hot preservative composed of 60 percent Creosote Oil and 40 percent roofing pitch.

The Contractor shall have the choice of selecting one of the types of treated timber posts shown on the plans. Once a choice is made and erection begun, the Contractor will not be permitted to change to another type without the written permission of the Engineer.

(c) FASTENERS.

Fasteners for attaching fencing fabric and wire to wooden posts shall be staples formed from 0.148 inch (9 gage) {3.75 mm} diameter galvanized wire, approximately 1.5 inches {38 mm} long. Fasteners for attaching wire to steel posts shall be as designated in Subarticle 871.01(d).

871.03 Barbed Wire Fence.

Materials for Barbed Wire Fence shall be as follows, except as modified by plan details:

(a) BARBED WIRE.

Barbed wire shall meet the requirements of AASHTO M 280 with a Class 3 galvanized coating, or Aluminum coated steel barbed wire, Type I (Standard), ASTM A 585.

When so designated on the plans for replacement of farm fencing, or fencing placed as a right-of-way consideration, etc., the Contractor may at his option use wire as listed above or substitute wire meeting AASHTO M 280, with a Class 1 coating unless otherwise noted on the plans.

(b) SUPPORTS AND FRAMING.

Supports and framing shall meet the requirements of Item 871.02(b)2.

(c) FASTENERS.

Fasteners shall meet the requirements of Subarticle 871.02(c).

871.04 Gates.

Gates, where required, shall be swing gates as detailed or specified on the plans. The gate frames shall be the height of the top of the posts and covered with the same wire and fabric used on the fence. The frames shall be formed from tubular shapes meeting the requirements noted in Subarticle 871.01(b) complying with plan details, with all joints welded, or otherwise constructed, to form a rigid unit.

Gates for woven wire fencing of another acceptable design may be permitted provided that the gates are so constructed that they will not sag and the design has been approved in writing.

All gates shall be furnished complete with approved (tamper-proof) hinges, latches, auxiliary braces, and all other necessary fittings, including a heavy padlock with two keys and one master key for each gate furnished.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: June 12, 2013 Special Provision No. 12-0321(2)

EFFECTIVE DATE: September 1, 2013

SUBJECT: Traffic Signals.

Alabama Standard Specifications, 2012 Edition, shall be amended by replacing Section 730 and Section 890 as follows:

SECTION 730
TRAFFIC SIGNALS

730.01 Description.

This Section shall cover the work of furnishing and installing of traffic signal control equipment. These requirements may be supplemented or amended by the requirements given elsewhere in the specifications, or on the plans and Special and Standard Highway Drawings.

Descriptions and definitions of the equipment, words and terminology used in the furnishing and installing of traffic signal control equipment are given in the Manual of Uniform Traffic Control Devices (MUTCD) publications of the Institute of Transportation Engineers (ITE), the National Electrical Manufactures Association (NEMA), the National Electrical Code (NEC), and the International Municipal Signal Association (IMSA).

730.02 Materials.

All materials furnished for use shall conform to the requirements given in Section 890 and the requirements shown on the plans. All furnished materials and equipment shall be new and free from defects. Existing equipment shall only be used if shown on the plans to be re-used.

730.03 Construction.

(a) DESIGN AND CONSTRUCTION CODES AND COORDINATION OF THE WORK.

1. CODES.

All installations shall comply with the regulations of the latest edition of the National Electrical Code and the latest edition of the National Electrical Safety Code, and with the service rules of the Utility Company providing the electricity.

2. STRUCTURE DESIGN AND CONSTRUCTION.

Structures for the support of traffic signal control equipment shall be designed, furnished and installed in accordance with the requirements given in Sections 718 and 891.

3. COORDINATION OF THE WORK.

Coordination of the work with roadway and bridge work will be of prime importance to prevent undue damage to completed items of work and existing facilities. Any damage to existing facilities caused by the installation of the material or equipment required under this Section shall be repaired by the Contractor at no additional cost to the Department.

4. ELECTRICAL POWER.

The entity that will be responsible for the eventual operation and maintenance of the traffic signal unit and intersection lighting will make application for electrical service upon notification that power service will be required. The Contractor shall inform the Engineer when power service is required at least 30 calendar days prior to the need of the power service. This same entity will be responsible for the cost of the service connection and the monthly service billings thereafter. Power shall be single phase, 240 Volt, provided through a transformer that is not tapped to provide power to any other equipment.

the production runs for use in evaluation of these items. Title 32, Chapter 5A, Subsection 36 of the Code of Alabama states that all traffic control devices shall be approved by the Transportation Director before they can be used, sold, or offered for sale. Approved devices are shown on the Department's Approved Traffic Control Devices and Materials list. Information concerning this list is given in Subarticle 106.01(f) and ALDOT-355 concerning this list.

(f) AS-BUILT DRAWINGS.

After all equipment has been installed and the operational check has been instigated, the Contractor shall submit a set of plans showing in detail all changes on construction from the original plan details with special notation given to conduit location and elevation and schematic circuit diagrams.

(g) OPERATIONAL MANUALS.

Operation manuals and as-built wiring diagrams shall be furnished for all equipment and accessories required in the controller cabinet. These manuals and wiring diagrams shall be mounted to the cabinet in an appropriate manner. In addition, two copies of these manuals and wiring diagrams shall be transmitted to the Department's Division Traffic Engineer.

(h) PRE-INSTALLATION TEST AND ACCESSORY TEST.

Before the installation of the traffic control system(s) or unit(s), the Contractor shall perform a pre-installation test. This test shall include the bench testing of all controllers, signals, detectors, etc., under signal load conditions during a 14 consecutive day "burn period".

The Contractor shall secure an acceptable site, approved by the Engineer, for the bench test and shall perform all work required in the performance of the test. The Contractor shall notify the Engineer of the date that the test is to begin a minimum of seven days before that date. The Engineer will schedule an inspection of the equipment with the Maintenance Engineer. The 14 calendar day burn period shall not begin until the Engineer has notified the Contractor that the Maintenance Engineer has approved for this test to begin.

None of the equipment shall be installed on the project until the bench test has been completed and the Contractor has submitted a letter to the Engineer certifying that the equipment performed satisfactorily during the test. The Engineer may shorten the length of time required for the bench testing. There will be no direct payment to the Contractor for the cost of the pre-installation test including the cost of a suitable test site and the setting up of equipment for the test.

(i) REMOVAL OF EQUIPMENT.

All equipment designated or directed to be removed shall be removed in such a manner that the removed equipment will not be damaged. Any damage due to negligence on the part of the Contractor because of lack of proper care of equipment shall be cause for the Engineer to order its replacement. The cost of replacement shall be borne fully by the Contractor. Any equipment or materials not authorized by the Engineer for re-use into a new facility shall be stored by the Contractor until the Engineer directs that they be delivered by the Contractor to the Department at the time and location designated by the Engineer. Storage facilities shall be provided so that the equipment will be protected from the elements and damage by vandalism.

(j) CONCRETE FOUNDATIONS.

The Engineer will inform the Contractor of the exact diameter and depth of concrete foundation required at each signal pole foundation. The Engineer will also inform the Contractor of any changes that are required to the size and number of reinforcing bars required at each signal pole foundation. This information will be given to the Contractor at the completion of the review of the Contractor's submittal of designs and details of the signal pole structures.

All conduit systems, elbows, etc., shall be installed securely and inspected by the Project Manager before concrete is poured.

The Contractor shall contact the utility companies to determine the location of underground utilities in the area where the foundations are to be located and shall be responsible for repairing, to the satisfaction of the utility company, any damaged utilities.

(o) VEHICULAR AND PEDESTRIAN SIGNAL HEADS.

Traffic or pedestrian signal heads shall not be installed until all other signal equipment, including the controller, is in place and ready for operation except that signal heads may be installed if no face of the head is directed toward traffic or if the entire assembly is hooded.

Each signal face shall be so adjusted vertically and horizontally in order that its beams will be of maximum effectiveness to the approaching traffic for which it is intended.

(p) TRAFFIC DETECTION SYSTEMS.

1. WIRE LOOP.

a. Installation of Loop Wire.

Before cutting required loops into the pavement, any existing loops that are not quadrupole loops shall be sawed in two locations and quadrupole loops shall be sawed in three locations on the long side to prevent false readings when the required loops are placed into the pavement. Loop wire outside the sawcut shall be twisted 3 turns per foot.

Loop wire shall be one continuous run without splices.

Loop wire shall be pushed to the bottom of the saw cut with a non-metallic tool that will not damage the insulation.

Each loop wire shall be placed in its own individual sawcut to the edge of pavement.

No portion of the loop shall be located within 3 feet {1 m} of any conductive material in the pavement such as manhole covers, water valves, and grates, etc.

After installation of the loops, the slots shall be sealed with an approved sealant manufactured specifically for embedding loop detector wire in concrete or bituminous pavements.

All loop connectors shall be connected to a shielded home-run cable located in junction box or when so directed or shown on plans at base of traffic signal strain pole.

b. Sawcuts for Loops.

Slots for installing the loops shall be formed by sawing with approved equipment designed for sawing pavement, to the width and depth indicated by the plan details or directed.

The slot shall be cleaned of all foreign loose debris using compressed air or other approved means before installation of the loop wires.

Sawcut corners shall be cut at a diagonal. No sharp bends shall be accepted.

Loops shall be tested prior to sealing sawcuts. Loop sealant shall be placed in sawcuts in accordance with manufacturer's recommendations.

Loop sealant will not be permitted when there is moisture on the surface, the air temperature is below 40 °F {4.4 °C}, or other conditions exist that in the opinion of the Engineer would affect the bonding of the material.

c. Loop Detector Lead-In.

A separate run of shielded home-run cable shall be provided for each loop unless otherwise directed.

Lead-in cable installed underground shall be in conduit. The lead-in shall be one continuous run from controller to loop connection with no splices.

d. Testing Loops.

The Contractor shall perform a leakage to ground test on all loops using a MEG-OHM meter with 500 V applied. The loops shall also be tested after the lead-ins are pulled to the amplifier to detect any damage done during installation. A State Inspector will perform this same test to check for leakage. Any loop failing to read 100 MEGS or better shall be replaced by the Contractor at no additional cost to the project.

2. VIDEO DETECTION SYSTEM (VDS).

The Contractor shall furnish and install all equipment, materials, software and other miscellaneous items that are required to provide a fully functional Video Detection System for the control of vehicular and pedestrian traffic signals.

The Contractor shall establish the configuration of the required traffic detection zones within each controller cabinet up to a maximum of 26 detection zones per controller. The Contractor shall notify the Engineer prior to software configuration and detector zone setup in ample time to

permission to open cut a trench in lieu of jacking or boring. This request shall also include detailed proposed sequence of excavating, backfilling, method of handling traffic, etc. for the Engineer's consideration. No such work shall be performed without written permission of the Engineer.

All conduit systems shall be completely installed before the conductors are installed.

(r) LUMINAIRES.

The light control surfaces and glassware shall be cleaned after installation.

Cleaning shall be performed in accordance with luminaire manufacture's recommendations.

Luminaires shall be leveled, plumbed, and installed as per the manufacturer's recommendations and as directed by the Engineer to achieve the most suitable light pattern.

(s) WIRING INSTALLATION REQUIREMENTS.

Wiring within junction boxes shall be neatly arranged and laced.

Powdered soapstone, talc, or other approved lubricant may be used in pulling cable in conduit.

All cables within a single conduit shall be pulled at the same time.

All ends of cable shall be taped to exclude moisture and shall be so kept until splices are made and terminal appliances attached.

The ends of spare conductors shall be taped.

All conductor splices that will be direct buried in earth and all loop detection conductor splices shall be soldered and encased in an approved splicing kit and with sealing tape.

All other signal conductor splices shall be spliced using a twisted connection made by a suitable wire nut or crimp and then properly covered by insulating tape or other insulating materials.

(t) GROUNDING ENCLOSURES.

All metal enclosures containing electric wires and/or equipment shall be bonded to the chassis ground.

Ground rods shall be installed at all service equipment and traffic signal pole foundations.

Single ground rods shall be driven vertically until the top of the rod is at least 12 inches {305 mm} below the finished grade.

Where a grounding conductor passes through a metal conduit, a suitable grounding bushing shall be placed on each end of the conduit and connected to a ground wire.

Each messenger cable shall be attached to the supporting structure with separate span wire clamps.

(u) EXCAVATING AND BACKFILLING.

All excavation required for the installation and placement of conduits, foundations, junction boxes, poles and other appliances shall be performed in such manner as to cause the least possible injury to pavement, curbs or other improvements. All conduits required under pavement, sidewalks, etc. shall be in place prior to commencing of base and paving operations. The trenches shall not be excavated wider than necessary for the proper installation of the electrical appliance and foundations. Excavating shall not be performed until immediately before installation of conduit and other appliances. The material from the excavation shall be placed in a position where the least interference with the surface drainage will occur.

Should large rocks be encountered in conduit trenches, they shall be removed to a depth of 3 inches {75 mm} below the proposed elevation and replaced with a 3 inch {75 mm} layer of suitable material. All suitable material removed from the conduit trenches shall be used in backfilling of the trenches; however, no stone larger than 3 inches {75 mm} shall be in contact with any conduit.

All surplus excavated material shall be removed from and disposed of by the Contractor, as directed by the Engineer.

Excavations, after backfilling, shall be kept well filled and maintained in a smooth and well-drained condition until permanent repairs are made.

Compaction shall be accomplished to the extent necessary to prevent future settlement of the backfill.

The Contractor will be required to restore any areas disturbed by his work to their original condition without additional cost to the State.

(b) FURNISHING AND INSTALLING TRAFFIC CONTROL UNIT.

Where separate pay items are not listed for the traffic control equipment required at a single intersection or other location designated on the plans, all of the traffic control equipment, including the electrical power service equipment, will be measured for payment as a Lump Sum, Furnishing and Installing Traffic Control Unit.

(c) SUMMARY OF TRAFFIC CONTROL EQUIPMENT PAY ITEMS.

Traffic control items of work will be measured for payment in accordance with the following:

Pay items 730-A, C, S, U and Y will be measured per lump sum.

Pay items 730-D, E, F, G, J, K, N, O, P, Q, R, and T will be measured per each.

Pay items 730-H, I, L, and M will be measured per linear foot {meter}.

730.05 Basis of Payment.

(a) UNIT PRICE COVERAGE.

Item 730-A. The accepted work for the removal of existing traffic control units will be paid for at the contract unit price which shall be full compensation for the satisfactory removal and storage of the equipment and materials ordered removed, and shall include all equipment, tools, labor, services, storage facilities and incidentals necessary to complete the work.

Item 730-C. The furnishing and installing the traffic control unit will be paid for at the contract unit price, which shall be full compensation for the furnishing of the equipment, installation in accordance with these Specifications, plans, proposal, and details, and for all tools, equipment, labor, materials, operational facility connected to the local utility.

Item 730-D. LEDs installed to replace incandescent lamps in existing traffic signals will be paid for at the contract unit price which shall be full compensation for the furnishing all materials, equipment, testing, tools, and labor required to install a fully functional LED in an existing traffic signal head.

Item 730-E. A Metal Traffic Signal Pole Foundation will be paid for at the contract unit price (adjusted to account for changes in size and reinforcement) which shall be full compensation for excavation, backfilling, forming, concrete, reinforcing steel, anchor bolts, ground rods, seeding and mulching of disturbed areas, disposal of debris and for all materials, labor, equipment, tools, testing, services and incidentals necessary to complete this item of work.

The bid price shall be for a 3'-0" {910 mm} diameter by 10'-0" {3.05 m} deep foundation. A larger foundation may be required. The reinforcing steel required for a larger foundation is shown on the plans. Compensation for a larger foundation will be made in accordance with the following cost adjustments.

COST ADJUSTMENT MADE TO BID PRICE FOR CHANGE IN FOUNDATION SIZE *
("+" plus figures are price increases)

	Foundation Diameter		
Foundation Depth	3'-0" {910 mm}	3'-6" { 1.07 m}	4'-0" {1.22 m}
10'-0" {3.05 m}	$0	+$450	+$1200
11'-0" {3.35 m}	+$100	+$600	+$1400
12'-0" {3.66 m}	+$200	+$750	+$1600
13'-0" {3.96 m}	+$300	+$900	+$1800
14'-0" {4.27 m}	+$400	+$1050	+$2000
15'-0" {4.57 m}	+$500	+$1200	+$2200
16'-0" {4.88 m}	+$600	+$1350	+$2400
17'-0" {5.18 m}	+$700	+$1500	+$2600
18'-0" {5.49 m}	+$800	+$1650	+$2800

* Adjustments include compensation for changes to the reinforcing steel that are shown on the plans for larger foundations.

The bid price adjustment shown above includes compensation for all work and materials (including reinforcing steel) necessary to construct the required foundation in accordance with the plan details. The Engineer may increase the amount of reinforcing steel from what is shown in the plan details. When the amount of reinforcing steel is increased from what is shown in the plan details, the

mounting and wiring of controller assembly, and for all materials, labor, equipment, tools, testing, and incidentals necessary for a complete and operational controller assembly.

Item 730-S. Traffic Signal Preemption will be paid for at the contract lump sum price which shall be full compensation for furnishing and installing all mounting hardware, wiring, detection sensors, signal control devices, software (when required), testing and miscellaneous materials required to provide a fully functional priority control system for traffic signal preemption. If software and training is required it will be shown in the pay item description. Payment for training shall be full compensation for training personnel, supplies, equipment, materials, user manuals, handouts, travel, and subsistence necessary to conduct the training.

Item 730-T. A Wood Pole will be paid for at the contract unit price which shall be full compensation for furnishing and installing the wood pole, excavating, backfilling, attachment hardware, grounding, weatherhead, guy wire, and for all materials, labor, equipment, tools, and incidentals necessary to complete this item of work.

Item 730-U. A Video Detection System will be paid for at the contract unit price which shall be full compensation for the camera, lens, enclosure, mounting brackets, video and power cabling, power supply, lightning protection; manuals and documentation and for all labor, materials, tools, equipment, transportation and incidentals necessary for a complete and operational vehicle detection system. The contract unit price shall also be full compensation for furnishing and installing the vehicle detection system processor, video interface panel, and for all integration (including software setup and programming and adjusting detection zones).

Item 730-Y. Pedestal Pole and Foundation will be paid for at the contract unit price which shall be full compensation for the following:

1. Installation. Furnishing, fabricating, galvanizing, assembling and erecting a complete and operational roadside flashing beacon or a complete and operational illuminated school zone sign; including sign and vehicular signal head or illuminated school zone sign, installing foundations, furnishing and placing anchor bolts, and hardware; controller; wiring, power source; connection to local utility and equipment, materials, labor, tools and incidentals to provide a complete and operational flashing beacon or illuminated school zone sign assembly.

2. Relocation. Removing the flashing beacon assembly or illuminated school zone assembly, removing existing foundations, installing new foundations; furnishing and placing anchors; hardware; excavation and surface placement; furnishing, fabricating, and installing new components as required and replacing the assembly on its new foundation with all manipulations and electrical work; controller; power source; connection to local utility; loading and hauling; and equipment, materials, labor, tools, and incidentals.

3. Removal. Removing the roadside assembly components including the power service equipment; removing the foundations; storing the component to be reused or salvaged; backfilling and surface placement; loading and hauling, and equipment, materials, tools, labor, and incidentals.

(b) PAYMENT WILL BE MADE UNDER ITEM NO.

730-A Removal of Existing Traffic Control Unit (1) - per lump sum
730-A Removal of Existing Traffic Control Unit (Partial) (1) - per lump sum
730-A Removal of Existing Traffic Control Unit (Temporary) (1) - per lump sum
730-C Furnishing and Installing Traffic Control Unit (1) - per lump sum
730-D LED Replacement Lamp - per each
730-E Metal Traffic Signal Pole Foundation - per each
730-F Metal Traffic Signal Pole with (2) Mast Arm Assembly - per each
730-G (3) Traffic Signal Strain Pole - per each
730-H Loop Wire - per linear foot {meter}
730-I Loop Detector Lead-In Cable - per linear foot {meter}
730-J Vehicle Loop Detector - per each
730-K Traffic Signal Junction Box - per each
730-L (4) , (5) , Conduit - per linear foot {meter}
730-M Interconnect Cable, (6), (7) AWG, (8), (9) - per linear foot {meter}
730-N Luminaire Extension Assembly, (10) feet {meters} - per each
730-O Illuminated School Zone Speed Limit Sign - per each
730-P Vehicular Signal Head, (11) Inch {mm}, (12) Section, Type (13) - per each

A	Amps
AC	Alternating Current
ANSI	American National Standards Institute
ASTM	American Society for Testing Materials
AWG	American Wire Gage
DC	Direct Current
Hz	Hertz
IMSA	International Municipal Signal Association
ITE	Institute of Transportation Engineers
LED	Light Emitting Diode
MUTCD	Manual on Uniform Traffic Control Devices
NEC	National Electrical Code
NEMA	National Electrical Manufactures Association
NESC	National Electrical Safety Code
UL	Underwriters Laboratories
V	Volts
VA	Volt Amps
W	Watts

Descriptions and definitions of the equipment, words, and terminology used in these specifications are given in the MUTCD, the NEMA TS 1-1989 Standards Publication, ITE publications, and the NEC.

890.02 Controller Assembly.

(a) DESCRIPTION.

A controller assembly shall consist of a controller unit, conflict monitor, auxiliary devices, electrical devices and other equipment as specified in these specifications, plans, or proposal mounted and wired into a cabinet to make a complete operational traffic controller assembly.

(b) CABINET DESIGN.

The cabinet shall be an approved weatherproof enclosure. It shall be designed for base mount or pole mount as shown on the plans. The cabinet shall be clean-cut in design and appearance.

1. FABRICATION MATERIAL.

The cabinet shall be fabricated from cast aluminum or shaped sheet aluminum.

2. CABINET DIMENSIONS.

The cabinet shall be large enough to provide ample space to house the controller unit, conflict monitor, auxiliary devices, electrical devices, and other equipment as specified in these specifications, plans or proposal. The cabinet shall accommodate the largest controller dimensions for the specific number of phases required by the plans or proposal.

The minimum size of pole mounted controller cabinet shall be 41 inches {1025 mm} in height, 28 inches {700 mm} in width, and 16 inches {400 mm} in depth.

The minimum size of base mounted controller cabinet shall be 54 inches {1350 mm} in height, 38 inches {950 mm} in width, and 16 inches {600 mm} in depth.

3. DOORS.

When closed, the doors shall fit closely to gasketing, making the cabinet weather-resistant and dust-tight. Door hinges, bolts, and pins shall be of stainless steel or equivalent corrosion resistant material.

Main Cabinet Door: A hinged main cabinet door shall be provided permitting complete access to the interior of the cabinet. When opened, this door shall be provided with a device designed to hold the door in an opened position.

Auxiliary Cabinet Door: A small, hinged, auxiliary door (police compartment door) shall be provided on the outside of the main cabinet door. The auxiliary door shall permit access to a switch panel, but shall not allow entrance to the controller mechanism nor to exposed electrical terminals.

Time Base Coordinator Model Number (If applicable)
Time Base Coordinator Serial Number (If applicable)
Communication Unit Model Number (If applicable)
Communication Unit Serial Number (if applicable)
Master Model Number (If applicable)
Master Serial Number (If applicable)
Time Clocks Model Number (If applicable)
Time Clocks Serial Number (If applicable)
Project Number or Transportation Department P.O. Number.

(c) AUXILIARY DEVICES.

1. GENERAL.

Auxiliary devices shall conform to the requirements of NEMA Standard Publication No. TS 2-1992, "Traffic Controller Assemblies".

2. SOLID STATE FLASHERS.

The flasher shall be jack mounted.

3. FLASH TRANSFER RELAY.

The flash transfer relay shall be a heavy-duty relay designed for continuous duty. It shall mount on an eight pin spade plug base.

4. SOLID STATE LOAD SWITCH.

The signal load switches and signal load base plate shall be furnished and wired in place for each phase provided.

Load switches shall be triple signal, NEMA input light indicating, rated for 10 A at 165 °F {75 °C}. The actual switching component shall have a minimum 500 V PIV rating.

5. DETECTOR TEST SWITHCES.

When specified, detector test switches shall be furnished to check all detector control circuits.

6. MERCURY CONTACTOR.

A mercury contactor input power relay shall be a 40 A relay for 2 phase and 4 phase controllers and a 60 A relay for 8 phase controllers.

(d) TERMINALS AND FACILITIES.

1. GENERAL.

The following define the performance and construction requirements of cabinet terminals and facilities that are considered to be of the attached or nonplug-in type. These additional specifications cover the physical requirements, electrical requirements, interface, cabling, supporting terminal facilities, and labeling.

2. OPENINGS.

The cabinet shall be provided with necessary openings for mounting and connection as specified.

3. ARRANGEMENT OF DEVICES.

The controller equipment and terminal blocks shall be so arranged within the cabinet that they will not upset the entrance, training, and connection of the incoming conductors.

4. TERMINAL AND PANEL WIRING.

No printed circuit boards will be allowed in the cabinet wiring facility, every panel and terminal shall be hardwired.

Each controller assembly is to be furnished with panels in the cabinet mounted in such a way as to provide visibility and accessibility.

All panel wiring shall be neat, firm, and hardwired.

5.TERMINAL PANEL.

As a minimum, the panel shall be provided with the following terminal blocks:
Terminal block to provide connections for the circuit breaker and power supply line.
Terminal block unfused, for neutral side of power supply line.

14. GROUNDING.

All logic ground, AC neutral, and chassis ground within the equipment and cabinet shall be isolated, split with separate ground buses being required for AC neutral and earth ground.

All lightning protection shall be grounded to the chassis ground. Lightning protection shall be installed before the power service to the cabinet is turned on.

All neutral conductors shall be grounded at the controller and at each terminal point.

15. LINE FILTERS.

Line filters shall be furnished to protect the controller from line voltage surges. Line filters for two phase controllers shall be rated at 25 A and four phase controllers shall be rated at 30 A through eight phase shall be rated at 45 A.

16. RADIO INTERFERENCE SUPPRESSION.

Each cabinet shall be equipped with a radio interference suppressor installed. The suppressor shall be connected to filter interference completely from the controller and associated equipment.

17. CONVENIENCE RECEPTACLE.

A convenience outlet shall be provided as part of the terminals and facilities. The convenience receptacle shall be a duplex, three prong, NEMA Type 5 - 15R grounding type outlet and shall have independent ground fault circuit protection.

18. LIGHT FIXTURE.

Each cabinet shall be provided with a florescent lighting fixture mounted on the inside top of the cabinet near the front edge. The fixture shall be provided with an F15T8 cool - white lamp operated from a normal power factor UL or ETL listed ballast.

19. DOOR ACTUATED LIGHT SWITCH.

A cabinet door actuated switch that turns the light off when the door is closed shall be provided.

20. POLICE PANEL SWITCHES.

The police door switch panel shall contain only two switches, a power ON/OFF switch, and a flash ON/OFF switch.

The power ON/OFF switch shall be an equipment power and not an AC power for the cabinet.

The flash ON/OFF switch shall apply a flash mode to the flasher relay and shall not interrupt the controller power. The flash ON/OFF switch shall not interrupt the controller cycling.

21. MAINTENANCE PANEL SWITCHES.

The maintenance panel shall contain a power ON/OFF switch, controller power ON/OFF switch, a flash ON/OFF switch, and a signal ON/OFF switch.

The flash ON/OFF switch shall place the flash relay in flash mode and allow the controller to continue cycling.

22. MAIN CIRCUIT BREAKERS.

A circuit breaker shall be furnished. Circuit breakers shall be rated at 20 A for two phase controllers, shall be rated at 30 A for three and four phase controllers, and shall be rated at 40 A for five through eight phase controllers.

The main circuit breaker shall turn off all power to the cabinet and shall not be used for the power switch, which is located in the service panel.

23. CONTROLLER CABINET POWER SUPPLY.

Unless otherwise specified the controller unit and associated equipment shall operate reliably on 115 V; 60 Hz single phase alternating current.

Any internal DC voltages required to satisfactorily operate a controller assembly shall be from a regulated power supply designed to generate all DC voltages required, constructed as an integral part of the controller assembly.

The grounded side of the power supply shall be carried throughout the controller in a continuous circuit.

Load switch failure;
Log all faults with time and date.

11. EXTENDED MONITORING.

The unit shall have the following extended monitoring:
Dual indication monitoring per channel;
Short vehicle clearance detection.

12. DISPLAY OF INTERSECTION STATUS.

The unit shall be capable of displaying intersection status.

13. READBACK.

The unit shall have program card readback.

14. TERMINATION OF UNUSED INPUTS.

All unused inputs will be brought out and terminated on a terminal strip.

15. MONITOR INPUT WIRING.

Monitor inputs shall be wired to field output terminals.

(f) WIRING DIAGRAM.

Three copies of cabinet wiring diagram shall be supplied as well as copies of the following:
Three each of:
Controller circuit diagrams and schematics;
Controller Operations Manual;
Conflict Monitor diagrams and schematics.
Two each of:
Flasher diagrams and schematics;
Load Relay diagrams and schematics;
Diagrams and schematics of any external hardware supplied;
Template of Base Mounting if base mounted.

Cabinet prints shall include flash color change instructions for all phases and all overlaps.

Cabinet print shall be keyed to show every input and every output from every terminal. If prints use multiple ground and neutral busses, busses shall be numbered. All grounds and neutrals shall be keyed to the busses that they are connected to.

Cabinet prints shall show every connector.

(g) CONTROLLER UNIT.

1. TYPE.

The phase requirements required on the plans will indicate the physical and electrical construction of the controllers; however, controller unit shall conform to NEMA requirements.

Controller units shall be classified in the following categories:
Type II: Solid State Pre-timed
Type III: Traffic Actuated Solid State Modular (NEMA)

For Type III controller units, controller indicators as outlined in NEMA Standards Publication No. TS 1-1989, Section 14.3.05 shall contain information which shall be displayed simultaneously for both rings in a dual ring controller.

Unless otherwise described in these specifications, or required by the plans or the proposal, the following requirements are applicable to all controller units.

2. CONTROL LOGIC.

Unless otherwise required by the plans or proposal, all control functions shall be performed by microprocessor logic

3. OVERLAPS.

All overlaps shall be internally generated, available, and programmable.

4. INTERCONNECTION AND COORDINATION.

The controller shall be capable of being interconnected and coordinated in accordance with requirements of the plans or proposal. Any phase shall be capable of being coordinated.

(b) MASTER CONTROLLER UNIT.

1. GENERAL.

The master controller for an interconnected traffic control signal system shall be the apparatus required to provide supervisory functions under normal operation as described for interconnected controllers.

2. MOTOR.

The master controller shall be driven by a synchronous motor or be provided with a synchronous control mechanism which will maintain a constant time cycle; however, when it is not necessary to keep a traffic control signal system in step with adjacent systems or adjacent non-interconnected controllers, an induction motor driven master controller may be specified.

3. SUPERVISORY FUNCTIONS.

Means for automatically establishing offset time relations of local controllers.

Hand operated switch for turning off completely all traffic control signal lights at interconnected local controllers.

Hand operated switch for transfer of traffic control signal lights at each local controller to give flashing indications.

Hand operated switch for selecting offset at which all interconnected local controllers shall operate in accordance with three distinct timing plans.

Hand operated switch for selecting two or three interval setups on which each of the interconnected local controllers shall operate.

The above requirements of shall be obtainable when specified, by means of an automatic time switch, in which case the automatic switching schedule shall be required.

4. TIME CYCLE.

The variation of the time cycle settings of all interconnected local controllers shall be accomplished by a simple adjustment at the master controller. There shall be at all times an accurate visual indication of the time cycle at which the traffic control signal system is operating.

It shall be possible to accurately set or adjust the time cycle between the limits of 30 and 120 seconds with accurate and definite settings within this range in 5 second steps up to 90 seconds and 10 seconds steps above 90 seconds.

890.04 Surge Protection for Controller Assembly.

(a) PROTECTION OF CONTROLLER ASSEMBLY CABINET.

All controller assembly cabinets shall be furnished with a surge protector on the AC service input, which meets or exceeds the following performance requirements.

Unit shall be capable of withstanding repeated 20,000 A surges a minimum of 25 times.

Unit shall have internal follow-current limiters (resistive elements).

Unit shall contain a minimum of three active clamping stages.

Unit shall self-extinguish within 8.3 milliseconds after the trailing edge of surge.

Parallel impedance of limiters shall be less than 0.15 ohms.

Unit voltage shall be to the circuit breaker before cabinet voltage filters.

Electrical connections on the unit shall be durable enough to accommodate a No. 6 AWG {4.25 mm} wire.

The unit shall have a mounting plate for easy removal and replacement and shall be mounted in a neat workmanlike manner in the controller cabinet with as short a run as possible from the power input to the circuit breaker.

(b) PROTECTION OF SIGNAL LOAD SWITCHES.

Each load switch shall be furnished with a gas tube or metal-oxide varistor, Type 150LA20A.

Unit shall have an impulse breakdown of less than 1000 V in less than 0.1 microsecond at 10 kV per microsecond.

Unit shall be capable of withstanding 20 A AC for 1 second applied 10 times at 3 minute intervals on either section.

Unit shall have a current rating of 20,000 A (8/impulse) one time.

Unit shall have a striking voltage of 300 to 500 V DC.

Unit shall have a minimum holdover of 155 V DC.

Unit shall withstand repeated surges.

Unit and loop terminals to be physically mounted approximately 6 inches {150 mm} from bottom of cabinet.

890.05 Vehicular Loop Detector.

(a) GENERAL.

Vehicular detectors shall be capable of providing reliable detection of all vehicles present when the inductance shift of the loop is 0.05 percent of the total inductance of the loop and lead-in when operating in the high sensitivity mode of the detector. Sensitivity of the detector shall remain constant over the operating temperature of -35 °F to +165 °F {-37 °C to 74 °C}.

Vehicular detector operation shall not be affected by changes in the inductance of the loop resulting from environmental changes encountered in the State, nor shall the sensitivity be markedly affected.

Vehicular detector shall have a self-contained power supply, capable of furnishing all necessary power, operate from a 115 V, 60 Hz source.

Vehicular detector shall have a built-in lightning protection device and shall have a built-in fail-safe relay to require a detector call to the controller upon failure of the detector.

Vehicular detector shall have the ability of being connected to multiple loops of various sizes and shall detect vehicles of various sizes with the capability of continuously registering the presence of a conventional passenger car on a 6 foot x 50 foot {2 m x 15 m} two-turn loop for a minimum time of ten minutes when in the presence mode.

Vehicular detector shall operate on loops of various sizes located up to 750 feet {225 m} from the loop.

Vehicular detector circuit boards and power supply shall consist of printed circuit design on a G10 grade or equivalent fiberglass epoxy with 2 ounces {57 g} copper track and coated with protective finish to minimize oxidation.

Vehicular detector boards and power supply shall consist of flow or wavesoldered copper connections, including fixed components.

Vehicular detector shall operate on an electronic tuned resonant circuit composed of lumped capacity and inductance provided by the loop embedded in the roadway. The detector shall provide detection by phase comparison means with accuracy of better than 99 percent of all vehicles passing over the loop at speeds of 1 mile per hour to 80 miles per hour {1 km/hr through 130 km/hr}. The voltage across the loop combination reflecting any change shall be used as a signal for relay operation.

Tuning capacitors shall be ceramic enclosed and epoxy filled.

Vehicular detector shall have the capability to function when loops are shorted or leaking to ground at one point.

Detection indication shall be provided in the form of indicator lamps on the face of the unit.

(b) SINGLE CHANNEL VEHICULAR LOOP DETECTOR.

Single channel vehicular loop detectors shall conform to the following additional requirements.

The loop detector shall be a digital solid state unit with the capability of automatic tracking of environmental changes after automatic or manual initial tuning. The unit shall have pulse and presence modes all, which are activated by, wire loops embedded in the roadway. Loop influence shall be adjustable so as not to extend beyond the sawcut more than 12 inches {300 mm}.

The loop detector shall have a minimum of two sensitivity modes, two presence modes and two operating frequencies that will enable the detector to accommodate the usual configuration of loops and lead-ins.

Total power consumption shall not exceed 5 W.

The loop detector shall have a tuning inductance range of at least 75 to 400 μHz.

A Type MS-3102A-18-1P with ten male contacts shall be provided. The pin functions of the connector shall be assigned as follows:

A Type MS-3102A-22-14P connector with nineteen male contacts shall be provided.

890.06 Interconnect Cable.

(a) DESCRIPTION.

Interconnect cable shall be used to transmit information between intersections or other control points in a traffic control system.

(b) MATERIALS.

Interconnect cable shall conform to the requirements of this specification unless otherwise specified on the plans or in the proposal. If in such case that the plans designate fiber optic cable material be used for the interconnect cable then Section 734 shall apply.

(c) UNDERGROUND INTERCONNECT CABLE.

Underground interconnect cable, for closed loop systems, shall be shielded and conform to the requirements of Rural Electrification Administration (R.E.A.) Specification PE- 39, filled telephone cable, No. 19 AWG, 6 pair.

Underground interconnect cable for time base coordination shall conform to the requirements of IMSA 20-1 No. 14 AWG, 9 conductors.

(d) AERIAL INTERCONNECT CABLE.

Self-supporting aerial interconnect cable, for closed loop systems, shall be shielded and conform to the requirements of Rural Electrification Administration (R.E.A.) Specification PE- 38, No. 19 AWG, 6 pair.

Standard aerial interconnect cable, for closed loop systems, attached to a messenger strand in the field, shall conform to the requirements of Rural Electrification Administration (R.E.A.) Specification PE- 22, No. 19 AWG, 6 pair.

Self-supporting aerial interconnect cable, for time base coordination, shall conform to the requirements of IMSA 20-3, No. 14 AWG, 9 conductors.

Standard aerial interconnect cable, for time base coordination, attached to a messenger strand in the field, shall conform to the requirements of IMSA 20-1, No. 14 AWG, 9 conductors.

(e) INTERCONNECT CABLE SUPPORT WIRE.

A support cable, whether separate or integral to aerial interconnect cable, having a minimum diameter of 0.25 inch {6.35 mm} shall be provided for interconnect cable that is not self-supporting.

Support cable shall be steel wire strand Class A (double galvanized) and conform to the requirements of ASTM Standards Publication No. A 475-89, "Standard Specifications for Zinc-Coated Wire Strand".

(f) CABLE ATTACHMENT HARDWARE.

Attachment hardware shall be stainless steel or non-corrosive material and shall be provided with tensile strength adequate for application.

890.07 Electrical Power Service Assembly.

(a) DESCRIPTION.

Electrical power service assembly shall consist of equipment to provide a pole attached raceway and disconnect switch for use with power cable routed from the service entrance to the controller cabinet and nearest supporting structure with luminaire. The electrical power service assembly shall include a weatherhead, conduit and fittings, a disconnect switch with enclosure, and attachment clamps.

Electrical power service shall be in accordance with these specifications, NEC requirements, local utility codes, and on the details shown in the Special and Standard Highway Drawings.

(b) MATERIALS.

Materials shall be tested and approved by a nationally recognized testing laboratory and shall meet the following requirements.

1.SERVICE POLE (WOOD POLE).

Service pole shall be southern yellow pine treated in accordance with the latest American Wood-Preserver's Association (AWPA) standards and shall conform with the requirements given in Section 833.

- be calibrated for a "Turn-on" setting of 2.6 footcandles and a "Turn-off" setting not exceeding 0.6 times the "Turn-on" setting;
- have a control housing that is UV resistant.

The photoelectric control shall have a cadium-sulfide light sensitive element. The base shall have an integral, locking type, brass 3 prong plug according to NEMA SH16-1962 and a neoprene gasket that meets IEEE/NEMA publications.

Photoelectric control units shall be installed facing north; however, if obstructions are such that this is not possible then they shall be installed facing south.

890.08 Span Wire Assembly.

(a) DESCRIPTION.

Messenger cable shall be attached to supporting structures to support traffic signal heads, signs, and electrical cables.

(b) MATERIALS.

1. STEEL WIRE STRAND.

Steel wire strand shall be Class A (double galvanized) and shall conform to the requirements of ASTM A 475-89.

2. MESSENGER CABLE.

Messenger cable used to support signal heads shall be 3/8 inch {9.5 mm} nominal diameter, 7 wires twisted into a single strand.

Messenger cable shall be extra high-strength grade with a minimum breaking strength of 15,400 pounds {68.4 kN}.

3. TETHER CABLE.

Tether cable attached to the bottom of signal heads shall be 1/4 inch {6.4 mm} nominal diameter, 3 wires twisted into a single strand.

Tether cable shall be utilities grade with a minimum breaking strength of 3,150 pounds {14.0 kN}.

890.09 Vehicular Signal Heads.

(a) ITE STANDARD PUBLICATIONS.

All signal heads shall conform to the requirements given in the ITE Standards Publications "Adjustable Face Vehicular Traffic Control Signal Heads" and "Vehicle Traffic Control Heads" and the following, assembled in accordance with the latest edition of the MUTCD.

(b) SEPARATE ILLUMINATION.

Each lens of a signal head shall be illuminated by a separate optical unit.

(c) HOUSING, DOOR, and VISOR.

1. HOUSING.

The housing shall be constructed of cast corrosion-resistant, copper free non-ferrous metal of not less than 17,000 psi {117 MPa} with all parts clean, smooth and free from flaws, cracks, blow holes and other imperfections.

The housing shall be of unitized sectional construction of as many sections as are optical levels, rigidly and securely fastened together into one watertight assembly.

Each housing shall be arranged with round openings in the top and bottom so as to be capable of being rotated about a vertical line between the waterproof supporting brackets or trunnions and of being securely fastened at increments of not more than 7 inches {175 mm} of rotation.

2. DOOR.

The door shall also be cast units from similar material to that used for the main section housing suitably hinged and shall be forced tightly against the gasket on the body of the housing by simple stainless steel locking devices.

All other exterior hardware, such as hinge pins, lens, clips, etc., shall be of stainless steel.

The Contractor shall submit the proposed method of attaching a cover over the signal head to the Engineer for approval.

(i) PROGRAMMED VEHICULAR SIGNAL HEAD.

Programmed vehicular signal heads shall provide an optical system of such design that will permit the required visibility zone of the indication to be determined optically. The projected signal may be visible or selectively veiled anywhere within 15° of the optical axis. Indication shall not result from external illumination nor shall one indication illuminate a second.

The optical system shall provide an imaging surface, at focus on the optical axis for objects 900 feet to 1200 feet {275 m to 365 m} in distance and permit an effective veiling system to be variously applied as determined by the desired visibility zone.

Lamps shall be nominal 150 W, 120 V AC, three prongs, sealed beam type with integral reflector having a rated life of 6000 hours.

The objective lens may be glass or hermetically sealed plastic within a flat lamination of weather-resistant acrylic. The lens shall be symmetrical in outline allowing rotation to any 90° orientation about the optical axis.

The limiter and/or diffuser shall be provided with a positive means of indexing and shall be formed of heat resistant material.

Signal intensity controls shall be provided for each signal indication (color).

All other components of the Programmed Vehicular signal heads shall conform to the requirements specified in this Article.

(j) OPTICAL UNIT FOR INCANDESCENT LAMPS.

1. LAMPS.

Lamps used in traffic signal heads shall conform to the standards set forth in the ITE latest Standard for Traffic Signal Lamps, not smaller than 125 V, 8000+ hour rated life clear bulb in accordance with the following:

12 inch	{300 mm}	Red lens	150 or 165 W	3 inch light center length
12 inch	{300 mm}	Yellow lens	69 W	3 inch light center length
12 inch	{300 mm}	Green lens	116 W	3 inch light center length

2. WIRING.

Each lamp receptacle shall be provided with coded No. 18 AWG {1.06 mm} or larger wires type TEW, 600 V, securely fastened to the socket.

A suitable terminal block for connection of the wires from the socket and the incoming wires to the traffic signal head shall be provided in the signal housing.

3. REFLECTORS.

Reflectors shall be specular Alzak finished aluminum or an approved equal.

Reflectors shall be mounted in a cast aluminum reflector support attached to the housing, or shall be an integral reflector and support of formed sheet aluminum.

The reflector assembly shall be pivoted to the housing, and shall be designed so that it can be swung out or easily removed without the use of any tools.

The method of mounting and fastening reflectors shall be sufficiently rigid to secure proper alignment between the lens and reflector when the door is closed.

The construction of the signal head and its components shall be such that the fit between the reflector and the lens will eliminate all possibility of false indicators.

Reflectors shall have an opening in the back for the lamp socket.

4. LENSES.

Lenses shall be of glass; the quality and processing of which shall be the best for the purpose. The composition must be durable on prolonged exposure to weather; all lenses shall be uniformly colored throughout the body, true to size and form, and free from any streaks, wrinkles, chips, or bubbles that in any way detract from their efficiency or use.

Each lens shall have pressed on its flange the word "TOP" to indicate the proper positioning of the lens in the door for obtaining the light distribution required, together with the diameter and other designations including the name or trademark of the manufacturer needed for proper application and help in purchasing replacements.

27.5D												

Arrow indications shall be the light intensity shown in the following table.

ARROW INDICATION LIGH INTENSITY (IN CANDELLAS PER SQUARE METER)			
	Red	Yellow	Green
Arrow Indication	5500	11000	11000

LEDs for arrow indications shall be spread evenly across the illuminated portion of the arrow area.

The chromaticity of LED signal modules shall conform to the requirements given in the following table, for a minimum period of 60 months, over an operating temperature range of -40°C to +74°C. Each LED traffic signal lamp unit shall meet the minimum requirements for light output for the entire range of voltage from 80 to 135 volts.

CHROMATICITY REQUIREMENTS*	
Red	Y: greater than 0.280 and less than 0.308 for Y = 0.998 - X
Yellow	Y: greater than 0.411 and less than 0.452 for Y = 0.995 - X
Green	Y: greater than 0.506 - 0.519X (0<X<=0.2243) and greater than 0.150 + 1.068X (0.2243<=X<=0.2804) and less than 0.730 - X (0<X<=0.2804)
* Taken from the ITE VTCSH Standard, Chapter 2, Paragraph 8.02, Figure 1.	

3. LED PRODUCTION TESTING REQUIREMENTS.

Each new LED traffic signal lamp unit shall be energized for a minimum of 24 hours at operating voltage and at a temperature of +60 °C in order to cause any electronic infant mortality to occur, and to ensure electronic component reliability prior to shipment. Each LED traffic signal lamp unit shall be tested for initial luminous intensity at rated operating voltage.

4. QUALITY ASSURANCE.

LED signal modules tested or submitted for testing shall be representative of typical production units. Optical testing shall be performed with LED signal modules mounted in standard traffic signal sections without visors or hoods attached to the signal sections.

After burn-in, LED signal modules shall be tested for rated initial luminous intensity in conformance with the preceding photometric requirements. Before measurement, LED signal modules shall be energized at rated voltage, with 100 percent on-time duty cycle, for a time period of 30 minutes. The current, voltage, total harmonic distortion (THD) and power factor (PF) associated with each measurement shall be recorded and made available for future reference.

Photometrics, luminous intensity, and color measurements for yellow LED signal modules shall be taken immediately after the modules are energized. The ambient temperature for these measurements shall be 25 °C. The current, voltage, total harmonic distortion (THD) and power factor (PF) associated with each measurement shall be recorded and made available for future reference.

5. PHYSICAL AND MECHANICAL REQUIREMENTS.

The assembly and manufacturing process for the LED traffic signal lamp unit assembly shall be configured to assure all internal LED and electronic components are adequately supported to withstand mechanical shock and vibration from high winds and other sources.

Each LED traffic signal lamp unit shall comprise a UV stabilized polymeric outer shell, multiple LED light sources, and a regulated power supply.

6. ELECTRICAL.

Each unit shall incorporate a regulated power supply engineered to electrically protect the LEDs and maintain a safe and reliable operation. The power supply shall provide capacitor filtered, DC regulated current to the LEDs per the LED manufacturer's specification. Design of the power supply shall be such that the failure of an individual component or any combination of components cannot cause the signal to be illuminated after AC power is removed. Any deviation without prior testing and approval from the Department, shall be grounds for removal from the Materials, Sources, and Devices with Special Acceptance Requirements Listing.

The LED traffic signal lamp unit shall operate on a 60 Hz AC line voltage ranging from 80 volts RMS to 135 volts RMS. The circuitry shall prevent flickering over this voltage range. Nominal rated voltage for all measurements shall be 117 volts RMS.

- Complete and accurate installation wiring guide;
- Contact name, address, and telephone for the representative, manufacturer, or distributor for warranty repair;
-Schematics for all electronics.

The Contractor shall submit a copy of a test report certified by an independent laboratory (Intertek Testing Services ETL Semko) that the LED traffic signal lamp model submitted meets ITE Standard for light distribution, chromaticity, and power (consumption, power factor, and harmonic distortion). In addition, the independent lab report shall specify the drive current being supplied to individual LEDs within the unit. Designs which require LEDs to be operated at currents greater than the LED manufacturer's recommended drive current will not be allowed.

(n) DUAL INDICATION SIGNAL HEAD.

The dual indication signal shall provide a dynamic means of selectively displaying two separate colored indications from the same section during different intervals of the signal cycle.

The dual indication signal Heads shall conform to the applicable requirements for Programmed Vehicular Signal Heads including exterior finish and ITE Standards Publication "Adjustable Face Traffic Control Signal Heads".

No indication shall result from external illumination nor shall one light unit illuminate a second and only one indication shall be apparent to any viewer at one time.

890.10 Pedestrian Signal Heads.

(a) GENERAL.

All pedestrian signal heads shall conform to the requirements of the ITE Standards Publication "Adjustable Face Pedestrian Signal Heads" and the following, assembled in accordance with the latest edition of the MUTCD.

(b) INCANDESCENT PEDESTRIAN SIGNALS.

1. HOUSING, DOOR, and VISOR.

Housing: Housing shall be rectangular and constructed of lightweight die cast aluminum. The housing assembly shall form a dust tight and moisture resistant compartment.

The top and bottom of the signal shall be provided with two holes suitable for entrance of 1.5 inch {38 mm} conduit. Surrounding each hole shall be cast aluminum serration containing 72 teeth at 5° on center by 0.062 inches {1.57 mm} deep. The overall dimension of the pedestrian signal shall be 17.5 inches horizontal x 16.875 inches vertically x 9.875 inches front to back { 445 mm horizontal x 429 mm vertically x 251 mm front to back} including the visor. A door hinge is provided at the bottom of the case and two upset flanges at the top, to enable draw bolts to adequately draw down the door against the case. A neoprene gasket shall be fitted around the front edge of the case to provide a waterproof compartment when the door is closed.

Door: The door shall contain an offset upon which an endless neoprene gasket will seat, for the purpose of holding the lens, and causing a watertight fit of door to housing.

All components shall be readily and easily accessible from the door.

Two hinge lugs shall be cast at the bottom of the door, which shall mesh with two pairs of hinge lugs cast in the bottom of the housing. Stainless steel drive pins shall connect these hinges to permit the door to rotate downward. Two reinforced lugs, each with a vertical slot (open at the top) shall be cast integrally in the top of the door. The top of the front of these lugs shall be slightly offset to prevent the hinge bolts from sliding out of the slots. Two pairs of lugs shall be cast integrally with the top of the housing compartment. Two stainless steel hinge bolts with captive stainless steel wing nuts and plain washers shall be attached to the housing lugs with the use of a stainless steel 0.25 inch {6.5 mm} drive pin.

Visor: A single unit sun shield eggcrate type visor shall be attached to the cast door without the use of any screws and be capable of being removed only when the door is opened. The visor shall sit directly on the door. The visor shall consist of 15 vertical 0.30 inch {7.6 mm} thick polycarbonate strips and 26 horizontal 0.030 inch {0.76 mm} polycarbonate strips. The strips shall be slotted such that they fit together in cross hatch fashion. The polycarbonate strips when assembled shall be bordered by an extruded 0.040 inch {1.0 mm} aluminum channel that shall be pop riveted together to provide a solid support for the polycarbonate strips. The visor shall have two horizontal

Where a push button is attached to a pole, the housing shall be shaped to fit the curvature of the pole and secured to provide a rigid installation. Saddles shall be provided to make a neat fit when required.

Where a push button is to be mounted on top of a post, the housing shall be provided with a slip-fitter fitting and screws for securing rigidly to the post.

(c) HARDWARE.

Hardware and fittings shall be constructed of galvanized steel or non-corrosive metal.

890.12 Signal Cable.

(a) DESCRIPTION.

Signal cable shall be used to supply electrical power to vehicle and pedestrian signal heads, lane control signals, electrically powered signs, and pedestrian detectors.

(b) MATERIALS.

Signal cable shall conform to the requirements of IMSA Specification No. 20-1, polyethylene insulated, polyethylene jacketed communication cable.

Unless otherwise noted on the plans, signal cable conductors shall be solid copper, No. 14 AWG. The number of conductors shall be provided as follows:

Pedestrian Push Button Assembly	2 Conductors
Pedestrian Signal Head	3 Conductors
Flashing Beacon	3 Conductors
3 - Section Signal Head	4 Conductors
5 - Section Signal Head	7 Conductors

890.13 Loop Detector Wire.

(a) DESCRIPTION.

Loop detector wire shall be used to provide a zone of detection (sensor loop) where the passage or presence of a vehicle in the zone causes a decrease in the inductance of the loop.

(b) MATERIALS.

1. WIRE.

Wire shall be Type USE-2, Type RHH, or Type RHW-2 XLP, 600 V cross-link polyethylene insulated cable. All loop wire shall have an insulation thickness of 0.045" (45 mils).

Wire shall be No. 12AWG.

Wire shall have a single conductor that is soft annealed stranded wire of not less than 98 percent conductivity; seven strands shall make up this single conductor.

The outer jacket shall be surface printed indicating the manufacturer, national research testing laboratory listing, maximum rated voltage, AWG size, the proper type letter or letters for the type of wire or the IMSA specification number every two feet {0.6 m} or less.

2. LOOP SEALANT.

Proposed loop sealant shall be included in the proposed material submittal as required in Section 730.

890.14 Loop Detector Lead-In Cable.

(a) DESCRIPTION.

Loop detector lead-in cable shall be used to connect the sensor loop to the input of the loop detector unit.

(b) MATERIALS.

Loop detector lead-in cable shall conform to the requirements of IMSA Specification No. 50-2, polyethylene insulated, polyethylene jacketed shielded, loop detector lead-in cable.

The cable shall have stranded tinned copper conductors, No. 12 AWG.

The cable shall have two conductors individually insulated in a twisted pair configuration.

When painting of the supporting structure is specified by the plans or proposal, the supporting structure shall have two primer coats applied at the factory or point of fabrication and two additional coats of high-grade exterior grade enamel applied in the field.

Paints shall conform to the applicable portions of Section 855.

(c) TIMBER POLES.

Timber poles shall be southern yellow pine treated in accordance with the latest American Wood-Preserver's Association (AWPA) standards and conform to the requirements of Section 833.

Unless otherwise noted on the plans, timber poles used for supporting traffic signals shall be Class 5 and shall conform to the requirements of ANSI Standards Publication No. 05.1-1992. The poles shall not have more than 180 degrees of twist in grain over the full length and the sweep shall be no more than 4 inches {100 mm}.

When required, guy wires shall be provided of adequate strength and shall meet the requirements of ASTM A 475-89. Guy wire anchors shall be expanding or screw type with a minimum guy tension of 8000 pounds {35 kN}.

890.18 Luminaire Extension Assembly.

(a) DESCRIPTION.

Luminaire extension assembly shall consist of an extension arm, housing, reflector, a refractor or lens, a lamp socket, an integral ballast, a terminal strip, and a lamp shall conform to the requirements of this specification unless otherwise specified on the plans, in the proposal, and on the details in the Special and Standard Highway Drawings.

(b) GENERAL.

The luminaire shall be of the horizontal type for IES Type III medium cutoff distributing an asymmetrical light pattern.

(c) MATERIALS.

1. LUMINAIRE EXTENSION ARM.

Unless otherwise shown on the plans, the extension arm shall be 12 feet {3.7 m} in length. Stud mounting bolts and brackets shall be provided.

2. PHOTOELECTRIC CONTROL UNIT.

A photoelectric control unit shall be provided and conform to the requirements of the Institute of Electrical and Electronic Engineers (IEEE) and NEMA.

3. HOUSING.

The housing shall be fabricated from die-cast aluminum.

If the housing is provided with a hole for the receptacle, the hole shall be closed, covered, and sealed with weatherproof material, in a permanent manner.
The housing shall be weather-tight and shall be gasketed.

All hinges, bolts, nuts, washers, screws and miscellaneous hardware shall be stainless steel.

4. LENS.

The lens shall be a pressed borosilicate glass refractor to provide the IES lighting pattern indicated.

5. BALLAST.

The ballast shall be a CWA Type.

6. LAMP.

Each luminaire shall have clear high-pressure sodium (HPS) lamp of the required wattage. Average lamp life shall be 24,000 hours. Initial lumen output shall be 27,500 lumens for 250 W and 50,000 lumens for 400 W.

7. FIELD WIRES.

Field wires connected to the luminaire shall terminate on a barrier type terminal block secured to the housing.

An ultra violet resistant No. 10 AWG cable shall be provided. Phase or current carrying conductors shall be of the Type RHH, RHW, USE, or XHHW and shall be identified by a continuous black

- all connections shall have liquid tight fittings.

(e) PROCESSOR.

The processor shall be rack or shelf mounted in a controller cabinet and shall have a RS232 serial port.

The processor shall provide video output (BNC) for connecting a television monitor for testing purposes and for connection to video transmitter provided by others. The video output (BNC) shall be located at the front of the processor.

The processor shall be plugged into a NEMA-5-15R receptacle located in the controller cabinet.

The processor shall be capable of detecting vehicle presence in 8 user-defined detection zones. When the vehicle is in the detection zone, the detection zone shall change color or intensify on the screen to verify proper operation of the detectable system.

(f) VIDEO INTERFACE PANEL AND CABLES.

The video interface panel shall provide facilities to protect against damage from lightning and to isolate the ground of the cables from that of the video detection system.

Coaxial cable and power cable shall meet the requirements of vehicle detection manufacturer.

(g) TWO CHANNEL AND FOUR CHANNEL DETECTOR UNIT.

All detector units shall be card rack units, suitable for mounting in a detector unit as specified in NEMA Standard Publication TS-2-1992.

890.22 Priority Control System, Traffic Signal Preemption.

(a) PRIORITY CONTROL SYSTEMS.

The priority control system shall be either acoustically (sound) activated, optically activated, or GPS (Global Positioning System) activated. All equipment and components shall meet or exceed all National Electrical Manufacturers Association (NEMA) TS1 and TS2, as well as, Type 170 and Type 2070 weather exposure durability requirements.

(b) OPERATIONAL REQUIREMENTS.

The priority control system shall be capable of providing preemption information to the standard NEMA TS1, NEMA TS2, Type 170, and Type 2070 traffic controllers used by the ALDOT. The priority control system shall be capable of setting time limits for how long a call can be held, when the call is dropped after a vehicle passes, or if the call is lost.

Acoustically activated systems shall be able to detect and respond to a preemption call from an emergency or priority vehicle at a minimum of 1000 feet {300 meters} from a roadway intersection. All other systems shall be able to detect and respond to a preemption call from an emergency or priority vehicle at a minimum of 2500 feet {760 meters} from a roadway intersection.

Setup and programming of the priority control system shall be accomplished through the use of the current ALDOT computer operating software.

(c) LOG FILE.

The priority control system shall maintain a log file of at least 2000 of the most recent priority calls. This log file shall be downloadable in a standard ASCII, delimited format. Each call record for all systems shall contain the following four items:

- Time & Date: shall indicate the time and date the call was made;
- Direction: indicates the direction from which the call was made;
- ID: identifies what vehicle or device made the request;
- Duration: indicates the total amount of time the call was active.

The following are additional requirements for optical and GPS activated systems:

- User: what department or agency that used the system;
- Level: shows what priority level was used.

(d) SOFTWARE.

The manufacturer's software shall be provided for the operation of the system. One software package shall be provided for each detection system. Software updates and revisions shall be provided

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: June 18, 2012 Special Provision No. 12-0325

EFFECTIVE DATE: September 1, 2012

SUBJECT: Working Drawings.

Alabama Standard Specifications, 2012 Edition, Section 105, shall be amended as follows:

SECTION 105
CONTROL OF WORK

105.02 Plans and Drawings.

(c) WORKING DRAWINGS.

2. SUBMITTAL.

This Item (105.02(c)2.) shall be replaced by the following:

2. SUBMITTAL.

Six copies of working drawings and design calculations shall be submitted by the Contractor to the Construction Engineer. The drawings and calculations shall be submitted well in advance of the point in time when the work will be performed.

Working drawings for work on or over the railroad right-of-way must have the approval of the railroad company before the work will be allowed to begin. The Contractor shall submit four extra sets of drawings and design calculations for use by the Construction Engineer in obtaining a review by the railroad company. The Contractor shall make the submittal far enough in advance of the need for the work to begin so that the railroad company will have ample time to review the drawings and design calculations.

Working drawings and design calculations that have been submitted and distributed to ALDOT construction personnel by the Construction Engineer may be resubmitted for another project provided all requirements are identical in nature to the previous project. The resubmittal of working drawings and calculations shall be signed, sealed and dated again by the Professional Engineer that originally sealed the drawings. The Professional Engineer shall clearly indicate on the drawings and calculations that the resubmittal is applicable to the new work.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: June 26, 2012 Special Provision No. 12-0335

EFFECTIVE DATE: November 1, 2012

SUBJECT: Treated Wood.

Alabama Standard Specifications, 2012 Edition, shall be amended as follows:

SECTION 509
UNTREATED AND TREATED TIMBER

509.02 Materials.

This Article (509.02) shall be replaced by the following:

509.02 Materials.

All materials shall conform to the appropriate provisions of Division 800, Materials. Specific reference is made to Section 833, Lumber and Timber, Untreated and Treated.

SECTION 816
TIMBER PRESERVATIVES

This Section shall be deleted from the Standard Specifications.

SECTION 833
LUMBER AND TIMBER - UNTREATED AND TREATED

This Section shall be replaced by the following:

SECTION 833
LUMBER AND TIMBER - UNTREATED AND TREATED

833.01 Structural Lumber and Timber.

Structural lumber and timber shall be Southern Yellow Pine, unless otherwise noted on the plans or in the proposal, meeting the requirements of AASHTO M 168 "Standard Specification for Wood Products". The grade of structural wood shall be as shown on the plans.

833.02 Preservative Treatment.

Preservatives for treated wood shall meet the requirements of AASHTO M 133 "Preservatives and Pressure Treatment Processes for Timber".

full end dimensions shown on the plans. Holes shall be drilled slightly smaller than the designated bolt size so as to provide a driving fit.

All timber shall be Southern Yellow pine, Grade No. 1SR or better, in accordance with the Southern Yellow Pine Inspection Bureau's grading system. Post and blockout treatment shall be in accordance with AWPA-U-1 as applicable to guardrail posts. The preservative shall be one recommended under AWPA-U-1 except that within a contract only one type will be permitted unless otherwise permitted in writing by the Engineer. All timber posts and blockouts should be fabricated and holes drilled before treatment, but where field modifications of necessity are made after treatment, the new surfaces shall be given a preservative treatment in accordance with the provisions of AWPA-M-4 using a method approved by the Engineer.

(b) METAL POSTS.

Steel posts, including block-outs for guardrail, shall comply with the requirements of ASTM A 36, modified to waive the maximum tensile strength. All material shall be new and of the size, shape, etc. noted by the plan details, hot-dip galvanized after fabrication.

Metal posts for barrier rails shall be steel meeting the requirements noted in paragraph one above or when aluminum barrier rail is used, aluminum posts conforming to the requirements of ASTM B 221, Alloy 6351-T4 or 6061-T4 of the size, shape, etc. noted by plan details.

864.03 Anchors.

Concrete for anchors shall be constructed of Class "A" Concrete in conformity with the detailed requirements of Section 501 with attention directed to Item 501.03(k)2. All surfaces shall be given a Class 1 finish with all exposed surface given a Class 2 surface finish.

Metal parts used in anchors shall comply with the appropriate requirements for metals noted elsewhere in this Section or other portions of these Specifications.

Wire rope (cable) for anchors shall be 3/4 inch {19 mm} nominal diameter meeting the requirements of AASHTO M 30, Type II, having a Class A galvanization coating.

864.04 Galvanization.

All metal required by the plans or specifications to be galvanized shall be galvanized after fabrication in accordance with AASHTO M 111 amended to cover the weight {mass} of the zinc coating specified in Article 864.01. Shop fabrication shall be considered to include all work necessary to prepare the unit for immediate and complete installation. No punching, cutting, burning, or welding will be permitted in the field except for special details in exceptional cases as may be directed by the Engineer; however, in such cases, holes shall be drilled and cutting done by sawing and the area treated as provided in Subarticle 630.03(c).

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: July 12, 2012 Special Provision No. 12-0351

EFFECTIVE DATE: November 1, 2012

SUBJECT: Steel Reinforcement.

Alabama Standard Specifications, 2012 Edition, SECTION 502 shall be amended as follows:

SECTION 502
STEEL REINFORCEMENT

502.03 Construction Requirements.

(d) SPLICING AND LAPPING STEEL REINFORCEMENT.

4. BUTT SPLICING.

This Item [502.03(d)4] shall be replaced by the following:

4. BUTT SPLICING.

Reinforcing bars shall be butt spliced only when shown on the plans. The butt splice shall be a mechanical coupling splice.

The mechanical coupling shall be made with a coupler that can develop, in tension, at least 125 percent of the specified yield strength (fy) of the bar. The Contractor shall prepare three test splices using the proposed method of splicing and reinforcing bars obtained from the supplier of the reinforcing steel. These test splices and two unspliced bars will be tested by the Alabama Department of Transportation's Bureau of Materials and Tests. The tension tests will be performed on full cross section specimens in accordance with ASTM E 8 {E 8M}, using a gage length that spans the extremities of the connector. Complete details of the mechanical splice and the methods and equipment proposed for use in making the splice shall be submitted to the Department for approval.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: August 26, 2013 Special Provision No. 12-0352(3)

EFFECTIVE DATE: January 1, 2014

SUBJECT: Structural Steel, Fasteners, and Miscellaneous Metals.

Alabama Standard Specifications, 2012 Edition, SECTION 508 and SECTION 836 shall be amended as follows:

SECTION 508
STRUCTURAL STEEL AND MISCELLANEOUS METALS

508.02 Materials.

Subarticle 508.02(g) shall be replaced with the following:

(g) Materials for bridge deck drainage systems shall conform to the requirements shown on the plans. Galvanizing, if required, shall conform to ASTM A 120 for pipe, AASHTO M 111 for forgings, shapes, etc., AASHTO M 232 for miscellaneous hardware and anchor bolt assemblies (anchor bolts, nuts, and washers), and ASTM B 695 Class 50 for bolt assemblies (bolts, nuts, and washers).

508.03 Construction Requirements.

(d) ERECTION.

6. HIGH STRENGTH BOLTING.

d. Installation.

In Subitem 508.03(d) 6 d, Table 1 shall be replaced by the following:

1. The weight {mass} of steel shall be assumed at 0.2833 pounds per cubic inch {7850 kg/m³}. The weight {mass} of cast iron shall be assumed at 0.26 pounds per cubic inch {7200 kg/m³}. The weight {mass} of bronze shall be assumed at 0.315 pounds per cubic inch {8150 kg/m³}.

2. The weights {masses} of rolled shapes in the completed structure, shall be calculated on the basis of their theoretical weights {masses} and dimensions given in the handbooks of the mills rolling the various sections and shapes. The weights {masses} of steel plates shall be computed on the basis of their detailed dimensions as shown on the approved shop drawings. Weights shown on the approved shop drawings shall not be used for payment purposes.

3. The weight {mass} of castings shall be calculated from the detail dimensions shown on the approved shop drawings, with an addition of 10 percent for fillets, overrun and finishing.

4. Only the weight {mass} of materials used in the completed, permanent work will be measured for payment.

5. No allowance in weight {mass} will be made for shop or field paint.

6. For the purpose of measurement and payment, incidentals such as bearing plates, pedestals, and other minor metal parts shall, unless otherwise provided, be considered as structural steel even though made of other materials except the bronze bearing plates and the PTFE coated bearing plates will be paid for under Item 508-C.

7. For purposes of measurement and payment when payment is on a per pound {kilogram} basis, required welded shear connection studs will be included in the quantity of structural steel.

SECTION 836
STRUCTURAL STEEL, FASTENERS AND MISCELLANEOUS METALS

836.01 General.

(a) MARKING OF STEELS.

This Subarticle [836.01(a)] shall be modified by replacing the first paragraph with the following:

Steels, when received from the mill shall be identified in accordance with ASTM A 6 {A 6M}. On steel piling the heat number and section size shall be legibly marked on each piece by stamp, paint, tag, sticker or other industry accepted method. Any piece that cannot be properly identified at time of use will be rejected.

(b) GENERAL REQUIREMENTS.

5. High strength and alloy steel shall be in accordance with the following.

Subitem 836.01(b)5b shall be replaced with the following:

b. High strength structural steel for bolted and welded construction shall conform to AASHTO M 270 of the Grade as shown on the contract plans (Grade 50 or Grade 50W). AASHTO M 270 Grade 50 {Grade 345} steel shall be limited to structural shapes in groups 1, 2 and 3 in ASTM A 6 {A 6M} and to plates and bars in thicknesses through 4 inches {102 mm}. Plates and bars over 3/4 inch {19 mm} through 4 inches {102 mm} in thickness shall be "killed-fine grain practice."

836.17 Handling, Storage And Transporting Of Materials.

This Article [836.17] shall be modified by replacing the third paragraph with the following:

All structural materials shall be examined by shop personnel and/or quality control, at the earliest possible time for evidence of any defects. If pitting or other defects are plainly visible during early stages of fabrication prior to any required surface preparation (sand or shot blasting), evaluation shall be required. Information regarding actual material thickness, amount of area affected and end use of material being evaluated will be submitted to the Engineer for acceptability. Any required conditioning will be allowed only when in compliance with ASTM A 6 {A 6M}.

from the nearest end of the beam or girder divided by 10 {+/- 3 mm times the number of millimeters from the nearest end of the beam or girder divided by 3000}.

The horizontal alignment of the sweep of the top and bottom flanges at any point along welded beam or girder shall be within 3/8 inch {10 mm).

(e) SURFACE PROFILE AT THE CENTERLINE OF STRUCTURAL STEEL FINGER JOINTS.

This Subarticle [836.19(e)] shall be replaced with the following:

(e) SURFACE PROFILE AT THE CENTERLINE OF STRUCTURAL STEEL FINGER JOINTS.

The profile of the surface of a structural steel finger joint, measured along the centerline of the finger plate sections of the finger joint (transverse to the centerline of the roadway) shall be within a plus and minus tolerance. The tolerance shall be + 1/16 inch and - 0 inches per foot times the number of feet from the nearest end of the joint divided by 10 {+ 2 mm and - 0 mm times the number of millimeters from the nearest end of the joint divided by 3000}. When all fabrication is completed the flat surfaces of each finger plate section shall be straight edged for flatness and any area found exceeding 1/8 inch in 10 feet {3 mm in 3 m} shall be marked and corrected by approved methods. A 10 foot {3 m} straight-edge shall be used and lapped at least 5 feet {1.5 m} over the prior 10 foot {3 m} check.

836.33 High Strength Fasteners.

This Article [836.33] shall be replaced with the following:

836.33 High Strength Fasteners.

The components of high strength bolt assemblies shall meet the requirements of the following:

ASTM A 325 {A 325M} - Bolts
ASTM A 563 {A 563M} - Nuts
ASTM F 436 {F 436M} - Washers
ASTM F 959 - Direct Tension Indicators

Unless otherwise noted by plan details, or approved by the Engineer, Type 1 bolts shall be used for standard construction and Type 3 bolts shall be used with weathering steel.

Galvanization, where required shall be in accordance with the provisions of ASTM B 695 Class 50. When an Inorganic Zinc Paint Primer is specified on the contract plans, all bolts shall be galvanized.

The producer, supplier and distributor shall submit the documentation required to certify that the bolt assembly components are in compliance with these specifications.

These requirements shall be modified or supplemented as follows:

(a) QUALITY ASSURANCE.

Acceptance of bolts, nuts, washers and direct tension indicator washers shall be based on the "Production Lot Method" of identification and quality assurance. A production lot is a group of bolts, nuts, washers or load indicator washers that are the same nominal size, are produced from the same heat of steel and are processed together through all operations to the shipping container. The manufacturer shall identify and maintain the integrity of each production lot from raw-material selection through all processing operations and treatments to final packing and shipment.

(b) MANUFACTURING.

1. BOLTS.

Bolts shall meet the hardness requirements given in ASTM A 325 {A 325M}.

2. NUTS.

Nuts to be galvanized shall be heat treated grade DH.

Plain (ungalvanized) nuts shall be grades C, D or C3 with a minimum Rockwell hardness of 89 HRB (or Brinell hardness 180 HB), or heat treated grades DH or DH3. (The hardness requirements for grades C, D and C3 exceed the current AASHTO/ASTM requirements).

Nuts that are to be galvanized shall be tapped oversize the minimum amount required for proper assembly. The amount of overtap in the nut shall be such that the nut will turn freely on the bolt in the coated condition. Galvanized nuts shall meet the mechanical requirements of ASTM A 563 {A

g. The tension reached at the above rotation shall be equal to or greater than 1.15 times the required installation tension. The installation tension and the tension for the turn test are shown below:

Diameter (in.)	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2
Req. Installation Tension (kips)	12	19	28	39	51	56	71	85	103
Turn Test Tension (kips)	14	22	32	45	59	64	82	98	118

Diameter {mm}	16	20	22	24	27	30	36
Req. Installation Tension {kN}	94.2	147	182	212	275	337	490
Turn Test Tension {kN}	108.3	169.1	209.3	243.8	316.3	387.6	563.5

h. After the required installation tension listed above has been exceeded, one reading of tension and torque shall be taken and recorded. The torque value shall conform to the following:

$$\text{Torque} \leq 0.25\,PD$$

Where: Torque = measured torque (foot-pounds); P = measured bolt tension (pounds) and D = bolt diameter (feet).

i. Bolts that are too short to test in a Skidmore-Wilhelm Calibrator may be tested in a steel joint. The tension requirement of Subitem 836.33(c)4.g. need not apply. The maximum torque requirement of Subitem 836.33(c)4.h. shall be computed using a value of P equal to the turn test tension shown in the table in Subitem 836.33(c)4.g.

5. REPORTING.

The results of all tests (including zinc coating thickness) required herein and in the appropriate AASHTO specifications shall be recorded.

The location where tests are performed and the date of tests shall be recorded.

(d) DOCUMENTATION.

1. MILL TEST REPORT(S) (MTR).

An MTR shall be furnished for all mill steel used in the manufacture of the bolts, nuts, and washers.

The place where the material was melted and manufactured shall be shown on the MTR.

2. MANUFACTURER CERTIFIED TEST REPORT(S) (MCTR).

The manufacturer of the bolts, nuts and washers shall furnish test reports (MCTR) for the item furnished.

Each MCTR shall show the relevant information required in accordance with Item 836.33(c)5.

The manufacturer performing the rotational-capacity test shall include on the MCTR:

a. The lot number of each of the items tested.
b. The rotational-capacity lot number as required in Subitem 836.33(c)4.c.
c. The results of the tests required in Item 836.33(c)4.
d. The pertinent information required in Item 836.33(c)5.
e. A statement that MCTR for the items are in conformance to this specification and the appropriate AASHTO specifications.
f. The location where the bolt assembly components were manufactured.

3. DISTRIBUTOR CERTIFIED TEST REPORT(S) (DCTR).

The DCTR shall include MCTR above for the various bolt assembly components.

The rotational-capacity test may be performed by a distributor (in lieu of a manufacturer) and reported on the DCTR.

The results of the tests required in Item 836.33(c)4. shall be shown on the DCTR.

The pertinent information required in Item 836.33(c)5. shall be shown on the DCTR.

The rotational-capacity lot number as required in Subitem 836.33(c)4.c. shall be shown on the DCTR.

The DCTR shall contain a statement that the MCTR are in conformance to this specification and the appropriate AASHTO specifications.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: July 13, 2012 Special Provision No. 12-0353

EFFECTIVE DATE: November 1, 2012

SUBJECT: Bridge and Sidewalk Handrail.

Alabama Standard Specifications, 2012 Edition, SECTION 517 shall be amended as follows:

SECTION 517
BRIDGE AND SIDEWALK HANDRAIL

517.02 Materials.

This Article [517.02] shall be replaced by the following:

517.02 Materials.

Materials used in fabrication and installation shall conform to the applicable Section of the Specifications that the structure to which the railing is to be attached was constructed, the details shown on the plans, and the following:

Galvanized Steel Pipe Handrail. Galvanized steel pipe shall meet the requirements of ASTM A 53, Grade B; this grade of pipe to include rail elements and post.

Steel shapes, plates, and accessories shall be structural or alloy steel galvanized in accordance with AASHTO M 111.

Bolts, nuts, washers, and other fasteners shall be galvanized in accordance with AASHTO M 232, Class C, with nuts tapped after galvanization in accordance with ASTM A 563 {A 563M}.

Galvanized Steel Handrail. Galvanized steel shall be structural or alloy steel, hot dipped galvanized after fabrication in accordance with AASHTO M 111.

Bolts, nuts, washers, and other fasteners shall be galvanized in accordance with AASHTO M 232, Class C, with nuts tapped after galvanization in accordance with ASTM A 563 {A 563M}.

Beam Type Handrail. Beam type handrail shall meet the requirements for beam guardrail as provided in Sections 630 and 864.

Aluminum or Galvanized Steel Sidewalk Handrail. Material for use in aluminum or galvanized steel sidewalk handrail shall meet the requirements specified on the plans.

Concrete Handrail. Concrete handrail shall be cast-in-place type conforming to the appropriate requirements of Section 501 and the details shown on the plans.

Posts for Beam Type Handrail. Steel posts shall meet the requirements of Sections 836 and 864.

Timber posts shall be treated in accordance with Section 833.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: July 13, 2012 Special Provision No. 12-0354

EFFECTIVE DATE: November 1, 2012

SUBJECT: Sieves for Testing Materials.

Alabama Standard Specifications, 2012 Edition, SECTION 800 shall be amended as follows:

SECTION 800
MATERIALS

800.03 Testing, General.

The fourth paragraph of this Article [800.03] shall be replaced with the following:

The sieves used for testing materials shall be woven wire cloth conforming to ASTM E 11.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: July 13, 2012 Special Provision No. 12-0355

EFFECTIVE DATE: November 1, 2012

SUBJECT: Mineral Filler, Hydrated Lime, Calcium Chloride, Brick, and Blocks.

Alabama Standard Specifications, 2012 Edition, SECTION 805 shall be replaced by the following:

SECTION 805
MINERAL FILLER, HYDRATED LIME,CALCIUM CHLORIDE, BRICK, AND BLOCKS

805.01 Mineral Filler, Hydrated Lime, Calcium Chloride, Brick, and Blocks.

These minerals shall meet the following requirements:

Mineral Filler	AASHTO M 17
Hydrated Lime	ASTM C 207, Type N.
Calcium Chloride	AASHTO M 144, Type S or L
Sewer Brick	AASHTO M 91, Grade S.M. or M.M.
Building Brick (Clay or Shale)	ASTM C 62, Grade S.W. or M.W.
Concrete Brick (Manholes, etc)	ASTM C 55, Type 11, Grade S
Concrete Brick (Buildings)	ASTM C 55, Type 1, Grade N-I or N-II
Concrete Block (Hollow Load Bearing)	ASTM C 90, Grade N, Type I or II

805.02 Mineral Filler for Hot Mix Asphalt.

These minerals shall consist of finely divided mineral matter such as crusher fines, rock dust, slag dust, hydrated lime, hydraulic cement, Portland cement, loess or Class "F" fly ash meeting the requirements of AASHTO M 17. Any lime based product shall meet the requirements of AASHTO M 303.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: July 13, 2012 Special Provision No. 12-0356

EFFECTIVE DATE: November 1, 2012

SUBJECT: Concrete Curing Materials.

Alabama Standard Specifications, 2012 Edition, SECTION 830 shall be amended as follows:

SECTION 830
CONCRETE CURING MATERIALS

830.01 Burlap Cloth and Waterproof Covering Material.

(b) TYPES OF COVERING MATERIAL.

This Subarticle [830.01(b)] shall be replaced with the following:

(b) TYPES OF COVERING MATERIAL.

1. Burlap cloth shall conform to the requirements of AASHTO M 182 for Class 4 burlap.
2. White Waterproof Paper shall conform to the requirements of ASTM C 171.
3. Polyethylene sheeting (film) shall be white opaque conforming to the requirements of ASTM C 171 modified to omit the elongation requirements when the sheeting is internally reinforced with a cord net having a cord spacing of 1/4 to 1/2 of an inch {6 to 13 mm}. (Net may be nylon or other approved material.)
4. White Burlap Polyethylene sheet shall conform to the requirements of ASTM C 171.

830.02 Impervious Membrane.

This Article [830.02] shall be replaced with the following:

830.02 Impervious Membrane.

Impervious membrane compounds shall meet the requirements of ASTM C 309, Class A. Type 2 white pigmented shall be used on concrete pavement. Other types may be used on other concrete.

Membrane liquid shall be applied under pressure with spray nozzles in such a manner as to cover the area being treated with a uniform film. For concrete pavement the rate of application shall be 1 gallon {4 L} to not more than 135 square feet {13 m^2}, applied in two applications. For sidewalks the rate of application shall be 1 gallon {4 L} to not more than 200 square feet {19 m^2}.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: July 13, 2012 Special Provision No. 12-0358

EFFECTIVE DATE: November 1, 2012

SUBJECT: Pipe Culvert Joint Sealers.

Alabama Standard Specifications, 2012 Edition, SECTION 846 shall be amended as follows:

SECTION 846
PIPE CULVERT JOINT SEALERS

846.01 Rigid Pipes.

(d) RUBBER GASKETS.

This Subarticle [846.01(d)] shall be replaced by the following:

(d) RUBBER GASKETS.

Rubber gaskets, meeting the requirements of ASTM C 990, shall be used only on joints specifically designed for the use with this type gasket. Special conditions, where noted on the plans, may require the use of this type gasket exclusively; under this condition pipe joints shall comply with the requirements of ASTM C 990 except that for pipe to be used in culvert construction the exfilteration or infilteration test will not be required.

When rubber type gaskets are used, the pipe and/or gasket manufacturer shall furnish the Engineer with a certification showing the physical properties of the gasket and results of hydrostatic tests of the gasket and pipe to be used in the work.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: July 13, 2012 Special Provision No. 12-0359

EFFECTIVE DATE: November 1, 2012

SUBJECT: Coatings, Paints, Enamels, and Varnishes.

Alabama Standard Specifications, 2012 Edition, SECTION 855 shall be amended as follows:

SECTION 855
COATINGS, PAINTS, ENAMELS, AND VARNISHES FOR METAL AND WOOD STRUCTURES

855.03 Identification and Certification.

Subarticle 855.03(c) shall be replaced with the following:

(c) Each system of inorganic zinc primer used on bolted connection surfaces (faying) shall be qualified in accordance with "Testing Method to Determine The Slip Coefficient For Coatings Used In Bolted Joints" as adopted by the Research Council On Structural Connections. This qualification is required for the systems shown on List III-1 in the Materials Sources and Devices with Special Acceptance Requirements manual. See Appendix A of Allowable Stress Design Specification For Structural Joints Using ASTM A 325 {A 325M} or ASTM A 490 {A 490M}Bolts published by the Research Council On Structural Connections. All inorganic zinc primers shall have a minimum slip coefficient of 0.33 unless shown otherwise on the bridge plans.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: April 10, 2013 Special Provision No. 12-0399(2)

EFFECTIVE DATE: August 1, 2013

SUBJECT: Temporary Soil Erosion and Sediment Control.

Alabama Standard Specifications, 2012 Edition, SECTION 665, shall be replaced by the following:

SECTION 665
TEMPORARY SOIL EROSION AND SEDIMENT CONTROL

665.01 Description.

This Section shall cover, but not limit, those items of temporary soil erosion and sediment control necessary for the management of construction stormwater discharge quality. The Contractor shall provide and maintain temporary soil erosion and sediment controls designed to protect the project site from soil erosion and adjacent property and waters from damage by sediment transport and deposition during construction. These temporary soil erosion and sediment controls shall be referred to as "Best Management Practices" (BMPs). A BMP is any procedure, process, technique, plan or device that can be utilized to enhance the control of soil erosion and sediment transport.

665.02 Materials.

(a) TEMPORARY SEEDING.

Seeds shall be furnished in accordance with the requirements given in Item 860.01(a)1. Seed mixes used for temporary seeding shall be in accordance with the following table:

TEMPORARY SEEDING	
September through December	
Annual Ryegrass	25 pounds per acre {28 kg per hectare}
Kentucky 31 Fescue	30 pounds per acre {34 kg per hectare}
Reseeding Crimson Clover	10 pounds per acre {11 kg per hectare}
January through April 15	
Kentucky 31 Fescue	30 pounds per acre {34 kg per hectare}
Reseeding Crimson Clover	30 pounds per acre {34 kg per hectare}
Annual Ryegrass	15 pounds per acre {18 kg per hectare}
April 16 through August	
Brown Top Millet	30 pounds per acre {34 kg per hectare}
Kentucky 31 Fescue	30 pounds per acre {34 kg per hectare}
Hulled Bermuda Grass	10 pounds per acre {11 kg per hectare}

(b) TEMPORARY MULCHING.

Temporary mulching materials shall conform to the requirements given in Article 860.03 for Mulching Material.

(c) TEMPORARY PIPE.

Temporary pipe may be constructed of any type of material that will be suitable for the required work. The inside diameter of the pipe shall be selected by the Contractor based on expected flows and shall be a minimum of 12 inches {300 mm} or as shown on the plans. End treatments, joint sections, and tees shall also be of materials and sizes that are suitable for the required work. Anchors shall be installed when required to keep the pipe in place.

(j) WATTLES.

A wattle shall be a tubular shaped product specifically manufactured for erosion and sediment control. Biodegradable wattles shall be manufactured using interwoven biodegradable plant material such as straw, coir, or wood shavings in biodegradable or photodegradable netting that is of sufficient strength to resist damage during handling, installation and use. Wattles manufactured using non-biodegradable materials shall be completely removed from the project when no longer required or useful. Disposal shall be in accordance with recommendations from the wattle manufacturer.

The required minimum diameter of the wattle shall be determined based upon its intended application and shall be as follows unless shown otherwise on the plans. When installed for the purposes of slowing sheet flow or by interrupting the lengths of longer slopes (slopes longer than 50 feet {15 m}), the minimum diameter of the wattle shall be 9 inches {230 mm}. For all other applications including perimeter sediment barriers the minimum diameter of the wattle shall be 20 inches {500 mm}. Wattles of smaller than required diameter may be provided as a stacked installation in accordance with manufacturer recommendations for stacking if the total height of the installation is at least 20 inches {500 mm}. The diameter or height will be verified by measuring the wattle after installation. Wattles installed in a ditch check application shall have a geotextile underlayment that shall meet the requirements of AASHTO M288 for Permanent Erosion Control Geotextile, Class 1. A list of geotextile materials acceptable for use in this application (List II-3 "GEOTEXTILES") is given in the ALDOT manual titled "Materials, Sources, and Devices with Special Acceptance Requirements". A geotextile underlayment is not required if the ditch is otherwise lined with materials such as rolled erosion control product, sod, or established permanent vegetation.

A list of acceptable manufactured wattle products (LIST II-24 "TEMPORARY EROSION AND SEDIMENT CONTROL PRODUCTS") is given in the ALDOT manual titled "Materials, Sources, and Devices with Special Acceptance Requirements".

(k) SILT DIKES.

Silt dikes shall be a triangular shaped cross section with a height of at least 8" {200 mm} in the center with equal length sides and a 16" to 20" {400 mm to 500 mm) base. The triangular shape shall be urethane foam. The outer cover shall be a woven geotextile fabric placed around the urethane foam. The geotextile shall also extend beyond both sides of the triangle at least 2 feet {600 mm}. Dikes shall be attached to the ground with wire staples in accordance with the silt dike manufacturer's recommendations.

(l) BRUSH BARRIER.

Brush Barriers shall be constructed of selected brush, limbs and small trees from the clearing operations. The geotextile used for both underlayment and as a choker shall meet the requirements of AASHTO M288 for Permanent Erosion Control Geotextile, Class 1. A list of geotextile materials acceptable for use in this application (LIST II-3 "GEOTEXTILES") is given in the ALDOT manual titled "Materials, Sources, and Devices with Special Acceptance Requirements".

(m) MANUFACTURED INLET PROTECTION DEVICE.

Manufactured Inlet Protection Devices shall be provided in accordance with requirements shown on the plans. Manufactured inlet protection devices shall consist of filter fabric held in place by a rigid frame. The frame shall be strong enough to support the stormwater flow and weight of any sediment that accumulates on the filter. The manufactured inlet protection device shall have an overflow feature to allow the passage of water during high flow conditions. The filter fabric shall have the following properties:

- Minimum Tensile Strength (Machine Direction) of 80 pounds {355 Newtons} (ASTM D 4632);
- Minimum Permittivity of 0.05 sec^{-1} (ASTM D 4491);
- Maximum Apparent Opening Size of US Std #30 sieve {0.60 mm} (ASTM D 4751);
- Minimum UV Stability of 70% (ASTM D 4355 at 500 hours).

A list of acceptable manufactured inlet protection devices (LIST II-24 "TEMPORARY EROSION AND SEDIMENT CONTROL PRODUCTS") is given in the ALDOT manual titled "Materials, Sources, and Devices with Special Acceptance Requirements".

(n) FLOATING BASIN BOOM.

Floating basin booms shall consist of a reinforced fabric attached on the upper side to floatation members and ballasted on the lower side with chains or weights to form a bottom-tensioned

must be maintained shall be bladed smooth. All debris in these areas shall be removed to allow mowing.

Application of 1000 pounds {1120 kg} of 8-8-8 fertilizer per acre {hectare} shall be applied by either hydraulic or conventional methods. Seeding and mulching shall also be applied by either hydraulic or conventional methods at a rate of no less than 2.0 tons per acre, separately or concurrently with fertilizer.

d. Anchoring of Temporary Mulching near Traffic and Streams.

Temporary mulch within 10 feet {3 meters} of traffic or live streams shall be anchored by either crimping, the application of a tackifier adhesive, or the installation of a mulch control netting in accordance with the requirements given in Section 656.

e. Acceptance of Temporary Seeding and Mulching.

Full payment for Temporary Mulching will be made after application of the mulch in accordance with the requirements given in Section 656. Payment for Temporary Seeding will be made in full upon satisfactory application. Acceptance of the Temporary Seeding item requires a cover of living plants capable of effectively preventing soil erosion until such time that permanent soil erosion prevention measures can be installed.

2. POLYETHELENE.

Polyethylene sheets shall be placed to eliminate soil erosion on the surfaces of slopes, berms, ditches, and at other locations shown on the plans, accepted SWMP, or as directed by the Engineer. The sheets shall be installed flat and securely anchored to the ground after the ground has been cleared of all objects that may tear the sheets. Upstream sheets shall overlap downstream sheets a minimum of 6 inches {150 mm}. Anchors are considered incidental to this work.

3. TEMPORARY EARTH BERMS.

Temporary earth berms shall be constructed at the top of cut or fill sections and at other locations where the diversion of water is required. Stream diversion is addressed in Sections 107 and 524. Temporary earth berms shall be constructed at locations shown on the plans, the approved SWMP or as directed by the Engineer. Temporary earth berms may be plated with polyethylene or aggregate. The height of the berms shall be a minimum of 2 feet {600 mm} after compaction. The width of the top of the berm shall be 2 feet {600 mm} with 2:1 side slopes. The construction of berms is encouraged and berms of a very temporary nature may be constructed by the windrowing of material. There will be no direct payment for berms not meeting requirements given in this Section and the requirements shown in the plans. If Pay Item 665-T is not included in the contract, the cost of constructing Temporary Earth Berms will be considered incidental to the grading operation.

4. TEMPORARY PIPE.

Temporary Pipe shall be sized to carry the anticipated volumes of flow and shall be installed as permitted by the Engineer or as shown on the plans. The length shall be as determined by the Engineer. Temporary pipes may be placed without the bedding requirements required for the installation of permanent pipe. Pipes shall be securely anchored. Any required tees or joint sections are considered incidental to the work. End treatments shall be installed in a manner to allow the pipe to function effectively.

5. STABILIZED CONSTRUCTION ENTRANCE.

Stabilized construction entrances shall be constructed of materials, at the locations, and to the dimensions shown on the plans, as modified in the accepted SWMP or as directed by the Engineer. The Contractor shall be responsible for maintaining the construction entrance to prevent sediment tracking.

6. DUST CONTROL.

The contractor shall prevent visible dust from leaving the project site by the use of water, dust control agents, or other effective means as approved and directed by the Engineer. Dust control shall be considered ineffective where dust creates a potentially unsafe condition, public nuisance or condition endangering the value, utility or appearance of any property. There will be no direct compensation for dust control.

7. SLOPE TRACKING.

Slope tracking or the surface roughening of slopes shall be accomplished by the walking of tracked equipment upslope and downslope (not along the slope) over the entire erodible area. Slope

shall be used as a barrier across the surface 20 feet {6.1 m} from the inlet. Stage 4 Protection will only be required where there is surrounding impervious surfaces that may receive sediment laden runoff.

All inlet protection installations shall be constructed to ensure that runoff does not bypass the inlet. Components of inlet protection may be reused on future installations provided the condition meets the material requirements given in this Section.

6. OUTLET PROTECTION.

Outlet protection required by the plans or directed by the Engineer shall be installed in accordance with the details shown on the plans as soon as practicable after the completion of the drainage structures.

7. DRAINAGE SUMPS.

Temporary drainage sumps shall be constructed as shown on the plans and in locations directed or permitted by the Engineer using the Erosion and Sediment Control Plan (ESCP) as guidance for the location. In general, the shape should be rectangular at the surface with the longer dimension parallel to the flow of water. The minimum volume shall be that shown on the plans. Sumps may be constructed with larger volumes as directed and permitted by the Engineer.

Construction of the sumps shall be accomplished by methods and equipment suitable for the purpose and acceptable to the Engineer. The sump may be supplemented by the use of a ditch check, temporary pipe, polyethylene or other temporary items shown on the plans or approved by the Engineer.

When the sump is deemed of no further use, it shall be backfilled with suitable material and compacted as directed and the area dressed and shaped to blend with the adjacent natural ground.

8. SEDIMENTATION BASINS.

Sedimentation basins shall be constructed in accordance with the details shown on the plans and at the locations shown on the plans or as directed by the Engineer. Sedimentation basins shall be constructed prior to beginning grading operations in the contributing drainage area. Where sedimentation basins are to be constructed in locations where permanent ditches are required, the required ditch lines and grades shall be utilized for the construction of the sedimentation basins. During removal of the sedimentation basin, aggregate used to construct the sedimentation basin may remain in the ditch as a permanent lining. Sedimentation basins are designed to allow the removal of sediment and turbidity from stormwater runoff by the flocculation and settlement of suspended particles. The removal of sediment and turbidity shall be accomplished by the retention of stormwater runoff in the basin for a period of time before completely draining. In no case shall sediment be allowed to exceed one third of the height of the forebay or drainage sump adjacent to the inlet of the basin.

Access roads to facilitate maintenance efforts shall be constructed of materials, at the locations, and to the dimensions shown on the plans, as modified in the accepted SWMP or as directed by the Engineer. The Contractor shall be responsible for maintaining the access road until directed by the Engineer to perform basin removal or retrofit. The Contractor shall take care during removal of accumulated sediment to not puncture the basin liner. The Contractor shall also take care during removal or retrofit of the sedimentation basin to not excavate past the original basin bottom elevation unless otherwise directed by the Engineer.

9. FLOW BAFFLES.

Flow Baffles shall be installed in sedimentation basins or ditch applications as required by the plans to reduce the velocity of stormwater runoff. They shall be installed in accordance with the details shown on the plans.

10. BASIN DEWATERING DEVICES.

Basin Dewatering Devices shall be installed in sedimentation basins in accordance with the details shown on the plans. Each device shall be capable of dewatering the full capacity of the basin over a period of 72 hours unless otherwise specified in the plans. Each device shall have a shutoff valve on the outlet pipe that should remain closed until discharges meet state water quality standards and the requirements of the ADEM NPDES General Permit.

stone used for choking shall be measured separately and paid in accordance with the appropriate pay item.

(h) HAY BALES.

Hay Bales (Item 665-F) will be measured per each bale unless used in Stage 4 Inlet Protection.

(i) SAND BAGS.

Sand Bags (Item 665-G) will be measured per each bag unless used in Stage 3 or 4 Inlet Protection.

(j) SILT FENCE AND SILT FENCE REMOVAL.

Silt Fence (Item 665-J) and Silt Fence Removal (Item 665-O) will be measured along the top of the fence fabric in linear feet {meters} to the nearest foot {0.1 m}.

(k) WATTLES.

Wattles (Item 665-Q) will be measured after installation in linear feet {meters} to the nearest 0.1 foot {0.01 meter} with measurements taken along the top of the wattle installation unless used in Stage 3 or 4 Inlet Protection. Wattles installed as sediment barriers or ditch checks shall have a diameter of 20 inches {500 mm} verified by measurement of the circumference anywhere along the length of the wattle which shall be at least 56 inches {1.42 m}. Payment for stacked wattles will be made at the contract price for a single 20 inch {500 mm} diameter wattle. Wattles installed as slope interrupters shall have a diameter of 9 inches {230 mm} verified by measurement of the circumference anywhere along the length of the wattle which shall be at least 25 inches {0.64 m}. Field measurements will be used to verify lengths shown on shipping documentation. The lesser of the two lengths will be used for payment. Geotextile installed as underlayment for wattle ditch checks shall be measured separately and payment made in accordance with the requirements given in Section 610.

(l) SILT DIKES.

Silt Dikes (Item 665-R) will be measured in linear feet {meters} to the nearest 0.1 foot {0.01 meter} with measurements taken along the top of the dike.

(m) BRUSH BARRIERS.

Brush Barriers (Item 665-S) will be measured in linear feet {meters} to the nearest foot {0.1 meter} with measurements taken along the top of the barrier. Geotextile installed both as underlayment and as a choker will be measured separately and payment made in accordance with the requirements given in Section 610.

(n) INLET PROTECTION.

Materials used to construct Stage 1 and 2 Inlet Protection will be measured for payment as appropriate for items such as silt fence, wattles, hay bales, etc. This also applies to curb inlet protection necessary beyond Stage 2.

Stages 3 and 4 Inlet Protection (Item 665-P) for drop inlets will be measured per each stage of each inlet protected if protected in accordance with the details shown on the plans.

(o) DRAINAGE SUMP EXCAVATION.

Drainage Sump Excavation (Item 665-K) will be measured in cubic yards {cubic meters} computed from dimensions of the sump size and depth approved by the Engineer. Material removed during sump maintenance operations will be measured for payment as Drainage Sump Excavation to the nearest cubic yard {0.1 cubic meter}. No measurement will be made for material used as backfill when the sump is closed.

Removal of sediment collected by sedimentation basins, sediment retention barriers, ditch checks and inlet protection will be measured as drainage sump excavation if soil erosion is being prevented to the maximum extent practicable.

If the proposal does not contain this item, measurement and payment will be made under the Item of Unclassified Excavation. Material removed will not be paid as muck excavation regardless of the consistency.

Payment will not be made for any temporary erosion or sediment control measures installed due to the methods chosen by the Contractor to perform the required work. Measures include those utilized for convenience, for access to the work (work bridges or platforms, stream crossings, access roads, haul roads), those utilized for treating or handling water in order to assist the Contractor in the execution of the work (diversions, dewatering, conveyances) or those utilized for protecting the Contractor's work or staging areas. Payment will also not be made for measures installed outside of the right of way or easements such as material pits, haul or access roads, plant sites, and staging areas.

(b) PAYMENT WILL BE MADE UNDER ITEM NO.:

665-A Temporary Seeding - per acre {hectare}
665-B Temporary Mulching - per ton {metric ton}
665-C Temporary Pipe - per linear foot {meter}
665-D Temporary Pipe End Treatment - per each
665-E Polyethylene - per square yard {square meter}
665-F Hay Bales - per each
665-G Sand Bags - per each
665-H Flow Baffle - per linear foot {meter}
665-I Temporary Riprap, Class ____ - per ton {metric ton}
665-J Silt Fence - per linear foot {meter}
665-K Drainage Sump Excavation - per cubic yard {cubic meter}
665-L Floating Basin Boom - per linear foot {meter}
665-N Temporary Coarse Aggregate, ALDOT Number ____ - per ton {metric ton}
665-O Silt Fence Removal - per linear foot {meter}
665-P Inlet Protection, Stage 3 or 4 - per each
665-Q Wattle - per linear foot {meter}
665-R Silt Dike - per linear foot {meter}
665-S Brush Barrier - per linear foot {meter}
665-T Temporary Earth Berm - per linear foot {meter}
665-X Basin Dewatering Device - per each

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: September 24, 2012 Special Provision No. 12-0426

EFFECTIVE DATE: January 1, 2013

SUBJECT: Liquidated Damages.

Alabama Standard Specifications, 2012 Edition, SECTION 108 shall be amended as follows:

SECTION 108
PROSECUTION AND PROGRESS

108.11 Schedule of Liquidated Damages.

This Article (108.11) shall be replaced by the following:

108.11 Schedule of Liquidated Damages.

Original Contract Amount		Liquidated Damages Daily Charge	
More Than	To and Including	Calendar Day or Fixed Date	Work Day
$ 0	$ 100,000	$ 150	$ 300
100,000	500,000	600	1200
500,000	1,000,000	1150	2300
1,000,000	2,000,000	1750	3500
2,000,000	----------	1950	3900

When the contract time is on the calendar day or date basis, the schedule for calendar days shall be used. When the contract time is on a work day basis, the schedule for work days shall be used.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: February 25, 2013 Special Provision No. 12-0434

EFFECTIVE DATE: July 1, 2013

SUBJECT: Slope Paving

Alabama Standard Specifications, 2012 Edition, SECTION 614 shall be modified as follows:

SECTION 614
SLOPE PAVING

614.02 Materials.

This Article (614.02) shall be replaced with the following:

614.02 Materials.

The concrete shall meet the requirements of Section 501. Consideration will be given to the use of local or manufactured fine aggregate meeting the requirements of Section 826; if approved, the aggregate proportions shall be varied as directed.

Steel reinforcement shall meet the appropriate requirements of Section 835.

Joint filler and sealers shall meet the appropriate requirements of Section 832.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: December 18, 2012 Special Provision No. 12-0521

EFFECTIVE DATE: March 1, 2013

SUBJECT: Definition of Terms.

Alabama Standard Specifications, 2012 Edition, SECTION 101 shall be revised as follows:

SECTION 101
DEFINITION OF TERMS

101.01 Definitions.
This Article (101.01) is revised by replacing the definition of "Engineer" with the following:

Engineer. A qualified Department staff member designated by the Director, acting either directly or through his authorized assistants or representatives, who is responsible for engineering supervision of construction activities.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: January 3, 2013 Special Provision No. 12-0530

EFFECTIVE DATE: August 1, 2013

SUBJECT: Preparation of Proposals

Alabama Standard Specifications, 2012 Edition, SECTION 102 shall be revised as follows:

SECTION 102
PROPOSAL REQUIREMENTS AND CONDITIONS

102.06 Preparation of Proposal.

(b) DETAILS.

The first paragraph of Subarticle 102.06 (b) shall be replaced with the following:

All bids shall be submitted using a computer bid system prescribed by the Department, via either bidder furnished digital storage media (CD-ROM, DVD-ROM, or USB flash drive), or the Department's approved Internet Bidding Service Provider. Bids submitted using any other form, format, or means will be rejected. The digital storage media used to submit the bid shall become the property of the State of Alabama.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: April 8, 2013 Special Provision No. 12-0599

EFFECTIVE DATE: June 1, 2013

SUBJECT: Asphalt Materials

Alabama Standard Specifications, 2012 Edition, shall be revised by replacing SECTION 405, SECTION 407, and SECTION 804 with the following:

SECTION 405
TACK COAT

405.01 Description.

The work under this Section shall cover the furnishing and placing of a bituminous tack coat on an existing surface which is to be covered by a bituminous plant mix material in accordance with these specifications and in reasonably close conformity with the lines shown on the plans or directed by the Engineer.

The work shall include the cleaning of the existing surface prior to application of the tack coat.

The area of treatment and the rate of application of a tack coat shall be based on the plans and specifications after evaluating the actual surface condition on which the plant mix overlay is to be placed.

405.02 Materials.

Bituminous material for tack coat shall be Emulsified Asphalt or one of the Performance Graded Asphalt Binders shown in Article 804.07. The cationic grades CRS-1h, CRS-2, CRS-2h, CMS-1hp, CSS-1, CSS-1h, CQS-1h, CQS-1hp, CRS-2p, CRS-2l, CNTT-1hs or the anionic grade NTSS-1HM shall be used. If Emulsified Asphalt is used, the emulsion shall not be diluted prior to application.

Unless shown otherwise on the plans, the contractor shall have the option of using any of the allowable bituminous materials, subject to other limitations of these specifications. In making the selection of materials, the Contractor shall take into consideration seasonal, weather, temperature, and other placement conditions, while keeping in mind that SS stands for slow setting, RS stands for rapid setting, and QS stands for quick setting (QS is the faster setting or breaking emulsion). Low temperatures and humid or damp conditions will retard the breaking or setting of all emulsions. The mixing of a cationic and an anionic emulsion will result in failure of emulsion materials.

All materials shall meet the requirements of Section 804.

405.03 Construction Requirements.

(a) EQUIPMENT.

In general it shall be the Contractor's responsibility to select the proper size and amount of equipment to provide the desired results. Equipment furnished shall meet the requirements of Subarticle 401.03(a).

(b) SEASONAL, NIGHTTIME, WEATHER, AND TEMPERATURE LIMITATIONS.

1. SEASONAL LIMITATIONS FOR THE PLACEMENT OF TACK.

Grades CSS-1, CSS-1h Emulsified Asphalts shall not be placed between the dates of October 1 and May 1 in North Alabama and between the dates of November 1 and April 1 in South Alabama regardless of weather conditions. For the purpose of identification, South Alabama shall be referred to for projects lying partly or wholly in the area of the State lying south of latitude 33 °N and with North Alabama encompassing the remaining or northern portion of the State. These seasonal limitations shall not apply to the placement of other bituminous materials for tack allowed by Article

SECTION 407
JOINT SEALANT FOR HMA PAVEMENT

407.01 Description.

This Section shall cover the sealing of longitudinal joints in hot mix asphalt pavements by the spraying or rolling of joint sealant on the vertical face of the joint in front of the asphalt spreader. Joint sealant application shall be a separate construction operation from the tack coat application

Joint sealant shall not be applied to the joints between HMA pavement and paved shoulders unless shown otherwise on the plans. Joint sealant shall not be applied to the joints between HMA pavement and curbs unless shown otherwise on the plans.

407.02 Materials.

A sample of the sealant will be taken by the Engineer and tested in accordance with the requirements established by the Department for sampling and testing Bituminous Surface Treatments given in Section 401.

The Contractor shall have the option of using the following materials for the joint sealant:

- PG 64-22 performance graded asphalt binder;
- PG 67-22 performance graded asphalt binder
- CRS-1H emulsified asphalt
- CMS-1HP emulsified asphalt
- CQS-1HP emulsified asphalt;
- NTSS-1HM emulsified asphalt;
- Pavon™;
- Crafco™ Pavement Joint Adhesive Part No. 34524.

PG 64-22 shall meet the material requirements given in Table 2 of Section 804.

PG 67-22 shall meet the material requirements given in Table 3 of Section 804.

NTSS-1HM, CQS-1HP, CMS-1HP, and CRS-1H shall meet the requirements given in Table 5 of Section 804.

CQS-1HP shall be a cationic emulsion blended with a minimum of 1.2 % polymer meeting the requirements given in Article 811.03 and the requirements given in the following tables. Pavon™ is a proprietary product that shall also meet the requirements given in the following tables.

REQUIRED PROPERTIES FROM THE TESTING OF Pavon™			
Parameter	Test Method	Value	
Residue % By Distillation	ALDOT 415	60 % Min.	-
Viscosity, SF @ 77 °F, sec.	AASHTO T 59	20 SF Min.	100 SF Max.
Sieve Test, %	AASHTO T 59	-	0.1 % Max.
Particle Charge	AASHTO T 59	Positive	

REQUIRED PROPERTIES FROM THE TESTING OF DISTILLATION RESIDUE FROM Pavon™			
Parameter	Test Method	Value	
Penetration, 100 g, 5 secs. @ 77 °F	AASHTO T 49	60 mm Min.	130 mm Max.
Ductility, cms., @ 39.2 °F	AASHTO T-51	40 cms Min.	-
Elastic Recovery @ 50 °F, %	AASHTO T-301	50 % Min.	-

SECTION 804
ASPHALT MATERIALS

804.01 General.

The asphalt materials furnished shall be of approved quality and shall meet the requirements shown under its respective type in the following tables and referenced specifications for the kind of material furnished. For any contract, the material furnished shall show uniform test results. Where more than one grade of material is permitted for any item of work, the Engineer shall specify the grade . In all cases, the Engineer will specify the consistency limits for the grade of material shown on the plans and/or proposal. The Contractor may, without extra compensation, supply asphalt material containing approved additives for producing non-stripping characteristics. For such materials, an adjustment in the total asphalt requirements of this subdivision will be made as deemed necessary. Other additives shall not be added to the asphalt material unless expressly authorized in writing by the Materials and Tests Engineer. The use of any unauthorized additive will be cause for rejection of the asphalt material.

Sampling of tank cars, tank trucks, distributor trucks, or recirculating storage tanks shall be by the use of a sampling valve, as prescribed in Figure 3 of AASHTO T 40, installed in the tanks.

All products furnished for use shall be from an approved producer who is participating in and meeting the requirements of ALDOT-243, ACCEPTANCE PROGRAM FOR ASPHALT MATERIALS, and listed on List I-4, PRODUCERS OF ASPHALT PRODUCTS, of the Department's "Materials, Sources, and Devices With Special Acceptance Requirements" Manual. Refer to Subarticle 106.01(f) and ALDOT-355 concerning this list.

804.02 Performance Graded Asphalt Binders (PGAB).

The material supplied under this Article shall be asphalt prepared by the refining of asphaltic petroleum. No air-blown or oxidized asphalt will be allowed. The refined asphalt binder shall be homogeneous, free of water and shall not foam when heated at 347 °F {175 °C}.

The PG 58-22, PG 64-22, and PG 76-22 binders shall conform to the requirements given in AASHTO M-320 as shown in Tables 1, 2 and 4 in Article 804.07. The PG 67-22 binder (not shown in AASHTO M-320) shall conform to the requirements given in AASHTO M-320 and the requirements given in Table 3 of Article 804.07.

Shipping temperature of the asphalt from the refinery shall not exceed 356 °F {180 °C} for unmodified binders. For polymer modified binders, shipping temperatures in excess of 356 °F {180 °C} may be allowed with the approval of the Materials and Tests Engineer. At the time of use, the asphalt temperature shall comply with the requirements of Item 401.03(d)2. or Subarticle 410.02(b) whichever is applicable.

804.03 Cutback Asphalt.

The materials supplied under this Article shall be made from liquid asphalt binder and naphtha solvent, so proportioned and mixed that the finished product shall be homogeneous and conform to the requirements of AASHTO M 81 for rapid curing cutback and AASHTO M 82 for medium curing cutback.

804.04 Emulsified Asphalt.

The materials supplied under this Article shall be homogeneous emulsification of asphalt and shall show no separation of asphalt or objectionable change in viscosity within three months after delivery. Separation at any time caused by freezing or contamination shall be cause for rejection. Emulsified asphalt shall conform to the requirements as shown in Asphalt Materials Table No. 5 in Article 804.07.

804.05 Emulsified Petroleum Resin.

The material supplied under this Article shall be a homogeneous emulsification of petroleum resin. The emulsified petroleum resin shall be supplied from the producer in the form in which it shall be placed. No dilution of the product will be allowed after the product has left the supplier's facility. Emulsified petroleum resin shall conform to the requirements as shown in Asphalt Materials Table No. 6. in Article 804.07.

The binder shown in Table No. 2 shall be made by adding polymer to a refined grade of PG 58-22 or shall be blended from PG 76-22 using an ALDOT approved blending procedure at the refinery. Air blown and oxidized asphalt shall not be used.

All PG 64-22 shall contain a minimum of 1.5 %, by weight, polymer solids.

A sample and infrared scan (Fourier Transform Infrared, FTIR) using the ALDOT 408 test method to determine the styrene and butadiene peaks and polymer percentage at the appropriate polymer loading shall be submitted to the Materials and Tests Engineer for laboratory evaluation prior to use.

All polymers shall conform to Section 811 for polymer additives.

All Polymer Modified Asphalt Binder manufacturers shall submit the information required in Article 811.01 annually or upon request by the Department.

(c) ASPHALT MATERIALS TABLE NUMBER 3, GRADE PG 67-22.

ASPHALT MATERIALS TABLE NO. 3 SPECIFICATIONS FOR PERFORMANCE GRADED ASPHALT BINDERS (NOT SHOWN IN AASHTO M-320)		
Property	Grade PG 67-22	
	Specification	Test Method
Original Binder		
Flash Point Temperature	Minimum 230 °C	AASHTO T 48
Rotational Viscosity	Maximum 3 Pa•s @ 135 °C	AASHTO T 316
Dynamic Shear, G*/sin δ	Minimum 1.00 kPa @ 67 °C	AASHTO T 315
Rolling Thin Film Oven Residue (AASHTO T 240)		
Mass Loss (RTFO)	Maximum 1.00 %	AASHTO T 240
Dynamic Shear, G*/sin δ	Minimum 2.20 kPa @ 67 °C	AASHTO T 315
Pressure Aging Vessel Residue (AASHTO R 28)		
Dynamic Shear, G*•sin δ	Maximum 5000 kPa @ 26.5 °C	AASHTO T 315
Creep Stiffness, S	Maximum 300 MPa @ -12 °C	AASHTO T 313
m-value	Minimum 0.300 @ -12 °C	AASHTO T 313

(d) ASPHALT MATERIALS TABLE NUMBER 4, GRADE PG 76-22.

ASPHALT MATERIALS TABLE NO. 4 SPECIFICATIONS FOR PERFORMANCE GRADED ASPHALT BINDER		
Property	Grade PG 76-22	
	Specification	Test Method
Original Binder		
Flash Point Temperature	Minimum 230 °C	AASHTO T 48
Rotational Viscosity	Maximum 3 Pa•s @ 135 °C	AASHTO T 316
Dynamic Shear, G*/sin δ	Minimum 1.00 kPa @ 76°C	AASHTO T 315
Rolling Thin Film Oven Residue (AASHTO T 240)		
Mass Loss (RTFO)	Maximum 1.00 %	AASHTO T 240
Dynamic Shear, G*/sin δ	Minimum 2.20 kPa @ 76 °C	AASHTO T 315
Elastic Recovery	Minimum 50 %@ 10°C	AASHTO T 301[1]
Pressure Aging Vessel Residue (AASHTO R 28)		
Dynamic Shear, G*•sin δ	Maximum 5000 kPa @ 26.5 °C	AASHTO T 315
Creep Stiffness, S	Maximum 300 MPa @ -12 °C	AASHTO T 313
m-value	Minimum 0.300 @ -12 °C	AASHTO T 313

[1]The following exceptions shall be made to the requirements given in AASHTO T 301: The statement given in Section 4.5 that reads "Attach the clips to the pins or hooks of the force adapter and the testing machine..." shall be disregarded. The mold shall be in accordance with the requirements given in ASTM D 6084 with dimensions noted in this method. All Elastic Recovery failures will be subject to FTIR scans for acceptability.

All binders used in Table 4 shall be made by the addition of polymer to refined grades of PG 67-22 without using air blown or oxidized asphalt.

All PG 76-22 shall contain a minimum of 2.5 %, by weight, polymer solids.

(f) ASPHALT MATERIALS TABLE NUMBER 5, EMULSIFIED ASPHALTS.

ASPHALT MATERIALS TABLE NO. 5
SPECIFICATIONS FOR EMULSIFIED ASPHALTS

	VISCOSITY GRADE								
	NTSS-1HM Min-Max	CMS-2, CMS-2h, CSS-1, CSS-1h, CRS-2 CRS-2p* CRS-2l* Min-Max	AE-P Min-Max	CMS-1hp Min-Max	CRS-1h Min-Max	CRS-2h CRS-2hp* Min-Max	CQS-1h CQS-1hp* Min-Max	CNTT-1hs Min-Max	AASHTO TESTS
AASHTO M 208		Meet							T 59
Elastic Recovery Minimum 50 % @ 50°F {10°C}	- -	50 % for CRS-2p and CRS-2l	- -	50%		50% for CRS-2hp	50% for CQS-1hp	- -	T 301 **
Viscosity, Saybolt Furol: @ 77 °F {25 °C}, Sec @ 122 °F {50 °C}, Sec	25 500 - -	- - - -	10 50 - - - -	30 400 - - - -	15-100	200 500	20 150 - - - -	0 100	T 59 T 59 *See Note #4
Settlement, 5 days, %	- - 5	- -	- - 5		- - - -	- - - -	- - - -		T 59
Storage Stability Test 24 hr., %	- - 1.0	- -	- - - -	- - 1.0	- - 1.0	- - 1.0	- - 1.0	1.0	T 59
Demulsibility, 35 m/0.8% Sod. Dioctyl Sulfosucinate, %	- -	- -	- - - -	- -	- - -	60 - -	- - - -	- - - -	T 59
Classification Test	- -	- -	- - - -	- - - -		Passes	- - - -		T 59
Particle Charge	Negative	- -	- - - -	Positive	Positive	Positive	Positive	Positive	T 59
Sieve Test, %	- -	- -	- - 0.1	- - 0.10	- - 0.10	- - 0.10	- - 0.10	0.10	T 59
Distillation: Oil Distillate or Naphtha, by Volume of Emulsion, % Residue by Distillation, %	- - 1.0 35 - -	- - - -	- - 12 45 - -	- - 3.0 50 - -	- - 3.0 55 - -	- - 3.0 65 - -	- - - - 60 - -	3.0 50 - -	T 59 T 59
Stone Coating Test, % Coated	- -	- -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	See Note #1
Modified Sand Coating	- -	- -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	See Note #2
Tests on Residue from Distillation: Float Test @ 140 °F {60 °C}, Sec. Solubility in CLCH:CCL2, % Ductility @ 77 °F {25 °C}, cm Ash, % by Mass Specific Gravity, 77 °F/ 77 °F {25 °C/25 °C} Softening Point	- - - - - - - - - - 65°C - -	- - - - - - - - - - - -	20 - - 97.5 - - - - - - - - - - - - - - - - - -	40°C -	49°C - -	- - - - 97.5 - - 60 - - - - - - - - - - - - - -	- - - - 97.5 - - 40 - - - - - - - - - - - - - -	- - - - - - - - - - - - - - - 49°C - -	See Note #3 T 44 T 51 T 111 T 228 T 53
Penetration 77 °F {25 °C}, 100 g. 5s	- - 20	- -	- - - -	45-90	40 90	70 100	60 110	40 90	T 49

* All CRS-2p, CRS-2hp, CRS-2l, and CQS-1hp shall contain a minimum of 3.0 % polymer by volume. CRS-2p shall meet the requirements given in AASHTO M 316 with the exception of polymer content. All polymers shall conform to the requirements given in Section 811. All Elastic Recovery failures will be subject to FTIR scans for acceptability.

** The following exceptions shall be made to the requirements given in AASHTO 301: The statement given in Section 4.5 that reads "Attach the clips to the pins or hooks of the force adapter and the testing machine..." shall be disregarded. The mold shall be in accordance with the requirements given in ASTM D 6084 with dimensions noted in this method.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: March 14, 2013 Special Provision No. 12-0604

EFFECTIVE DATE: July 1, 2013

SUBJECT: Extension of Contract Time.

Alabama Standard Specifications, 2012 Edition, SECTION 108 shall be amended as follows:

SECTION 108
PROSECUTION AND PROGRESS

108.09 Extension of Contract Time.

(a) GENERAL.

This Subarticle [108.09(a)] shall be replaced by the following:

(a) GENERAL.

An extension of contract time will be granted in the event the total cost of the completed work exceeds the total contract bid price. For the purpose of this item, the following costs will be excluded from the computation for total cost:

- supplemental agreements, regardless of whether or not time extensions are allowed on the agreements ;
- bituminous material price adjustments;
- adjustments due to the cost of construction fuel for HMA production;
- liquidated damages;
- incentive or disincentive payments;
- price adjustments for pavement rideability;
- compensation for delay claims.

The extension of contract time shall be in the same ratio as the increase in the total cost.

If the Contractor finds it impossible for reasons beyond his control to complete the work within the contract time as specified or as extended in accordance with the provisions of this Article, he may at any time prior to the expiration of the contract time as extended, make a written request to the Engineer for an extension of time setting forth therein the reasons which he believes will justify the granting of his request. The Contractor's plea that insufficient time was specified is not a valid reason for extension of time. If the Engineer finds that the work was delayed because of conditions beyond the control and without the fault of the Contractor, he may extend the time for completion in such amount as the conditions justify. The extended time for completion shall then be in full force and effect the same as though it were the original time for completion. If the Contractor disagrees with the decision of the Engineer, he may appeal directly, in writing, to the Director. The Director shall have final authority to approve or disapprove the request for an extension of time. The Director may, at his discretion, refer the appeal to the Claims Committee for a recommendation before making his decision. Reference is made to Section 110, Claims. Time extension requests will not be referred to the Claims Appeal Board.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: March 18, 2013 Special Provision No. 12-0607

EFFECTIVE DATE: July 1, 2013

SUBJECT: Contractor's Advertisement of Completion.

Alabama Standard Specifications, 2012 Edition, SECTION 105 shall be amended as follows:

SECTION 105
CONTROL OF WORK

105.15 Acceptance.

(c) FINAL ACCEPTANCE.

5. CONTRACTOR'S ADVERTISEMENT OF COMPLETION.

This Item [105.15(c)5] shall be replaced by the following:

5. CONTRACTOR'S ADVERTISEMENT OF COMPLETION.

The Contractor, immediately after receiving Notice of Acceptance for Maintenance, shall give notice of said completion by an advertisement for a period of four successive weeks in some newspaper in general circulation published within the county in which the project is located. If the project is located in more than one county, an advertisement shall be given in a newspaper of general circulation published within each county in which the project is located. Proof of publication of said notice shall be made by the Contractor to the Director, by affidavit of the publisher. If a newspaper is not published in a county where work is done, the notice may be given by posting at the Court House for 30 days and proof of same shall be made by the Probate Judge or Sheriff and the Contractor.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: June 18, 2013 Special Provision No. 12-0676

EFFECTIVE DATE: September 1, 2013

SUBJECT: Structural Portland Cement Concrete.

Alabama Standard Specifications, 2012 Edition, shall be modified by replacing SECTION 501 and SECTION 815 with the following:

SECTION 501
STRUCTURAL PORTLAND CEMENT CONCRETE

501.01 Description.

The work under this Section shall cover the furnishing of portland cement concrete to be used in constructing concrete structures. Structures shall include but are not limited to bridges of all types, box culverts, headwalls, retaining walls, and other miscellaneous structures.

501.02 Materials.

(a) GENERAL.

Handling, storage, and control of materials shall comply with appropriate portions of Section 106. All materials shall conform to the requirements set forth in Division 800, Materials. Specific reference is made to applicable portions of the following Sections:

Section 801 - Coarse Aggregate
Section 802 - Fine Aggregates
Section 806 - Mineral Admixtures
Section 807 - Water
Section 808 - Air Entraining Admixtures for Concrete
Section 809 - Chemical Admixtures for Concrete
Section 815 - Cement
Section 830 - Concrete Curing Material
Section 832 - Concrete Joint Fillers, Sealers and Waterstop Material
Section 835 - Steel Reinforcement

(b) SPECIAL REQUIREMENTS.

Aggregates from different sources, which are to be used for concrete Class A and Class C as specified in Item 501.02(c)2, may be stockpiled together provided material from each source meets the requirements of Section 801 and the specific gravity of the aggregates from each source does not vary more than plus or minus 0.05.

In the event the coarse aggregate shows a tendency to segregate in the stockpile, the Engineer may order the coarse aggregate be furnished and batched in two fractions from two separate stockpiles.

The Contractor may be required to adjust the size of coarse aggregate for the concrete used around steel reinforcement of heavily reinforced members.

(c) PROPORTIONING MATERIALS.

1. MIXTURE DESIGN.

The Contractor's concrete producer shall establish the proportion of materials for each class of concrete following the guidelines described in ALDOT-170, "Method of Controlling Concrete Operations for Structural Portland Cement Concrete". It shall be the responsibility of the concrete producer to request approval of concrete mixture design(s) for use in Department's projects. The Contractor shall submit the proposed concrete mixture no later than 65 Calendar Days after the date of

If requested in writing and approved by the Materials and Tests Engineer, the use of No. 357 or No. 467 aggregates may be permitted in Class D mixtures.

5. MIXTURE DESIGN PREQUALIFICATION TESTS.

For concrete mixtures using portland cement only, the concrete producer shall submit data showing that the total alkali contribution from the cement in the concrete does not exceed 4.00 lb/yd^3 when calculated as follows:

$$lb\ of\ alkali\ per\ Yd^3 = \frac{(lb\ of\ cement\ per\ Yd^3) \times (\%\ Na_2O\ equivalent\ in\ cement)}{100}$$

Permeability tests shall be performed in accordance with the requirements given in AASHTO T 277, "Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration", using a moist-curing period of 56 days.

The 28-day shrinkage test shall be performed in accordance with the requirements given in AASHTO T 160, "Length Change of Hardened Hydraulic Cement Mortar and Concrete", using concrete prisms exposed to drying at a concrete age of 7 days. Three concrete prisms that are 3 x 3 x 11.25 inches {75 x 75 x 286 mm} in size shall be used. The initial reading for drying shrinkage calculations shall be the reading taken at the start of drying at a concrete age of 7 days ± 0.5 hours.

Compressive strength testing shall be performed in accordance with the requirements given in AASHTO T 22, "Compressive Strength of Cylindrical Concrete Specimens", using 6 x 12 inch {152 x 305 mm} cylinders.

Total air content shall be performed in accordance with the requirements given in AASHTO T 152, "Air Content of Freshly Mixed Concrete by the Pressure Method", using a Type "B" meter.

Slump test shall be performed in accordance with the requirements given in AASHTO T 119, "Slump of Hydraulic Cement Concrete".

6. CHEMICAL ADMIXTURES FOR CONCRETE.

Any chemical admixture used in the concrete mixture shall be included in the mixture design proposal. Only approved chemical admixtures listed in List II-1, "Chemical Admixtures for Portland Cement Concrete", of the MSDSAR manual shall be used in Department concrete mixtures. The dosage of chemical admixtures may be adjusted in the field to obtain the desired results, provided the manufacturer's recommended dosage is not exceeded. The use of calcium chloride will not be permitted.

7. AIR-ENTRAINING ADMIXTURES FOR CONCRETE.

Approved air entraining admixtures are listed in the MSDSAR manual, List II-1, "Chemical Admixtures for Portland Cement Concrete". The total air content shall be within the range of 2.5% to 6.0 % at the point of delivery.

Air content less than 2.5 % will be acceptable for structures that are completely embedded below the ground line or mud line.

The total air content of freshly mixed concrete shall be measured in accordance with the requirements given in AASHTO T 152 using a Type "B" pressure meter. All pressure meters used for measuring the total air content shall be calibrated prior to the beginning of concrete placement. The calibration of pressure meters shall be verified at least twice a week and anytime a questionable result is obtained.

8. MINERAL ADMIXTURES FOR CONCRETE.

Mineral admixtures may be used in any mixture design except where noted to be prohibited elsewhere. Substitution percentages are calculated by weight.

The maximum substitution of portland cement with mineral admixtures shall not exceed 50 percent. The following table shows the maximum substitution of portland cement with any one mineral admixture substitution.

MAXIMUM PERCENT MINERAL ADMIXTURE SUBSTITUTION FOR PORTLAND CEMENT (substitution by weight)	
MINERAL ADMIXTURE	PERCENTAGE SUBSTITUTION
Class C or Class F Fly Ash (See Note 1)	30 %

batching plant and to make further tests as needed as the basis for continued acceptance of the materials.

The Contractor shall furnish, without extra compensation, samples of the materials and the concrete mixture for making tests and test specimens as required to comply with the Department's Testing Manual. Additional testing may be required if deemed necessary by the Engineer.

The Contractor shall furnish, without extra compensation, a protected environment for all concrete test cylinders produced incidental to any placement of concrete. This shall be accomplished by supplying a cylinder curing box with a minimum capacity of 22 test cylinders 6" X 12" {150 mm X 300 mm} in size, equipped with heating/cooling capabilities, automatic temperature control, and a maximum/minimum (high/low) temperature readout. The protective environment shall be capable of protecting all specimens within the following specification requirements and it shall be available at each site when concrete is placed and then maintained until such time that all specimens have been transported from the project to the testing facility. The Engineer, prior to beginning any concrete placement, shall approve each protective environment.

Immediately after being struck off, the concrete test specimens shall be moved to the protective environment where they shall remain for an initial curing period of not less than 24 hours or more than 48 hours. During the initial curing period, the specimens shall be stored in a moist environment at a temperature range between 60 °F to 80 °F {16 °C to 27 °C}, preventing any loss of moisture for up to 48 hours. At all times the temperature in and between concrete specimens shall be controlled by shielding the specimens from cooling/heating devices and direct rays of the sun.

A temperature record of the specimens shall be established by means of maximum/minimum (high/low) thermometers supplied by the Contractor. Only plastic molds shall be used for concrete specimens to be immersed in water.

Concrete specimens that are to be transported to the laboratory for standard curing within 48 hours shall remain in the molds in a moist environment, until they are received in the laboratory, removed from molds, and placed in standard curing.

Concrete specimens that are not transported to the laboratory for standard curing within 48 hours shall be removed from the molds within 24 ± 8 hours and standard curing used until transported to the laboratory. During the standard curing period, the specimens shall be stored at a temperature of 73 ± 3 °F {23 ± 2 °C} using the cylinder curing box defined above. Standard curing shall comply with AASHTO T 23 "Making and Curing Concrete Test Specimens in the Field", Standard Curing section.

501.03 Construction Requirements.

(a) GENERAL.

All materials, labor, equipment, tools, and machinery necessary for forming, mixing, placing, finishing, and curing shall be available as required and all necessary equipment for the proper construction and completion of any section of the work shall be in satisfactory working condition before the Contractor will be permitted to start placing concrete.

All concrete batching plants supplying concrete shall be on List I-7, "Portland Cement Concrete Producers", of the MSDSAR manual. The concrete producer shall submit a valid BMT-75 and proof of NRMCA certification to the Division Materials Engineer prior to batching concrete.

All batching plants shall meet the requirements of the Specifications and ALDOT-352. Producers who request that their batching plants be placed on the list of evaluated ready-mix concrete plants will be charged a fee as specified by ALDOT-355, "General Information Concerning Materials, Sources, and Devices With Special Acceptance Requirements".

(b) EQUIPMENT.

1. GENERAL.

The Contractor shall furnish equipment capable of producing concrete meeting the requirements noted in this Section in sufficient quantities to provide for orderly construction of the project. All equipment must be in good working order and so maintained throughout the requirement for its use.

Specific requirements for certain types of equipment are designated in subsequent items of this Subarticle.

2. MIXING AND TRANSPORTING EQUIPMENT.

Concrete for all major structure work (bridges, culverts, retaining walls, etc.) shall be "ready-mixed" concrete. Ready-mixed concrete is defined as portland cement concrete manufactured for delivery and delivered to the work site in accordance with AASHTO M 157 "Ready-Mixed Concrete"

available can be prorated to the known amount of concrete in the truck mixer. (3) The water-cementitious ratio is not exceeded.

Tests for slump, total air content, temperature, and compressive strength shall be run after the addition of water at the jobsite regardless of any previous testing.

(d) TIME, LIGHT AND WEATHER LIMITATIONS.

1. TIME OF HAULING AND PLACING CONCRETE.

The delivery and placement of ready-mixed concrete shall be completed within the time frames listed in the following table. These times are measured from the time at which water is added to the cement until the time at which placement of the load is completed.

TIME LIMITATIONS FOR THE DELIVERY AND PLACMENT OF CONCRETE		
Temperature of the Concrete	Mixtures without Retarding Admixtures	Mixtures with Retarding Admixtures
Less than 85 °F {30 °C}	1 Hour	1 Hour and 45 Minutes
85 °F {30 °C} or More	45 Minutes	1 Hour and 15 Minutes

If Type III portland cement is used, the time limits shall be reduced by 15 minutes. If requested, and approved in writing by the Materials and Tests Engineer, a hydration stabilizer can be used to extend the retardation of set time of concrete.

The Materials and Tests Engineer may permit mixing and the adding of the cement and additives at the work site in truck mixers, in order to meet the time limitation requirements.

When a ready-mixed truck is used for concrete delivery, the concrete shall be completely discharged from the mixing drum before the truck mixer has completed 300 revolutions and or before the above time limitations for placement have been exceeded; whichever happens first.

2. LIGHT.

All concrete shall be placed and finished during daylight hours, unless written permission to the contrary is given. Such permission will not be given unless an adequate approved lighting system is available for all operations after sundown.

3. WEATHER.

a. General.

The temperature of the concrete, at the time of placing in the forms shall not be less than 50 °F {10 °C} nor more than 95 °F {35 °C}, except that for bridge deck slabs the temperature of the concrete at the time of placing shall not be more than 90 °F {32 °C }, unless otherwise provided or directed.

b. Cold Weather Operations.

No concrete shall be placed when the ambient air temperature is below 40 °F {5 °C} without written permission of the Engineer. If the Contractor proposes to place concrete during seasons when there is a probability of temperatures lower than 40 °F {5 °C}, the Contractor shall have available on the project such suitable approved equipment and materials as necessary to enclose the uncured concrete and keep the air temperature inside the enclosure within the following ranges and for the minimum times noted hereinafter.

If there are indications there will be temperatures below 40 °F {5 °C} during the first three days after placement of concrete, it shall be protected from cold temperatures by keeping the surface at a temperature above 50 °F {10 °C} for the first 72 hours after placement and above 32 °F {0 °C} an additional 72 hours. However, the protective covering shall be retained in place until the temperature inside the protective covering reaches that of the surrounding atmosphere.

When the Contractor is permitted to place concrete at temperatures below 40 °F {5 °C}, the aggregates and/or mixing water shall be heated as necessary to keep the temperature of the plastic concrete above 50 °F {10 °C} from the time of placement to the time of initial set; however, in no case shall the materials be heated in excess of 150 °F {65 °C}, nor shall aggregates from frozen stockpiles be incorporated into the mixture. Materials entering the mixer shall be free from ice, snow, or frozen lumps. Salts, chemicals, or other materials shall not be incorporated in the concrete to prevent freezing. Care shall be taken to heat all materials uniformly and avoid hot spots that will burn or overheat the materials.

The use of aluminum pipes, chutes, or other devices made of aluminum that come into direct contact with the concrete shall not be utilized in the handling and placing operations.

a. Use of Chutes, Pipes or Belts.

Concrete shall not be dropped a distance of more than 5 feet {1.5 m} unless confined in an approved mortar tight downspout of not less than 4 inches {100 mm} in diameter. Downspouts shall be equipped with suitable hoppers at their inlet end and shall be provided in sectional lengths that will permit adjustment of the level of the outlet during placement.

The number of downspouts furnished shall be sufficient to ensure the concrete placement in horizontal layers. Depositing large quantities of concrete at one point in the form and running, flowing, or working the concrete along the forms will not be permitted.

In wall sections where a 4 inch {100 mm} downspout cannot be utilized without displacing the reinforcing steel, the concrete may be dropped in excess of the 5 feet {1.5 m} previously noted, provided such does not displace the reinforcing steel nor produce segregation of the concrete.

(1) Chutes, pipes, or power belts may be used to convey concrete from the concrete mixer or transporting vehicle to the forms, and they shall convey it to its final position without segregation and without displacing the reinforcing steel. If the use of this equipment results in honeycombed or otherwise substandard concrete, the Engineer will require it to be changed or its use discontinued.

(2) Chutes, pipes, and power belts shall be flushed with water after each run and this water shall be discharged free of the freshly placed concrete. All hardened concrete shall be promptly removed.

b. Pumping.

Direct placement of concrete by an approved pumping device will be permitted. The equipment shall be so arranged that no vibration result that might damage freshly placed concrete. The operation of the pump shall be such that a continuous stream of concrete without air pockets is produced. When pumping is completed, the concrete remaining in the pipeline, if it is to be used, shall be ejected in such a manner that there will be no contamination of the concrete or separation of the ingredients. After each placement the equipment shall be cleaned to prevent improper results on subsequent operations.

c. Compacting and Vibrating.

Concrete, except underwater concrete, shall be thoroughly compacted by mechanical vibration applied internally, during, and immediately after depositing.

The application of a vibrator or vibrators shall be at points uniformly spaced and not farther apart than twice the radius over which the vibration is visibly effective. Vibrators shall be manipulated so as to thoroughly work the concrete around the reinforcement and embedded fixtures and into the corners and angles of the forms. Vibration shall be supplemented by as much spading as is necessary to ensure smooth surfaces and dense concrete.

The vibrators shall be methodically inserted and withdrawn from the concrete. The vibration shall be of sufficient duration and intensity to thoroughly compact the concrete, but vibrators shall be withdrawn before segregation and localized areas of grout result.

Vibration shall not be applied directly or through reinforcement to sections or layers of concrete that have hardened to the degree that the concrete ceases to be plastic under vibration. Vibrators shall not be used to make concrete flow in the forms over distances so great as to cause segregation.

2. CULVERTS.

See Section 524 for specific details not covered in this Section.

3. RETAINING WALLS.

See Section 529 for specific details not covered in this Section.

4. BRIDGES.

See Section 510 for specific details not covered in this Section.

5. DEPOSITING CONCRETE UNDER WATER.

a. General.

Concrete shall not be deposited in water unless provided for on the plans, or authorized as provided in Subarticle 503.03(g). Concrete placed under water shall be placed as hereinafter provided.

b. Control.

MSDSAR manual, List II-7, "Epoxy Resin Systems for Use with Portland Cement Concrete", shall be placed for bonding freshly mixed concrete to hardened concrete. Keyways and dowels shall be placed as shown on the plans or directed.

5. WATER STOPS.

Water stops shall be furnished and placed as required by the plans. They shall form continuous watertight joints.

(g) EXPANSION JOINTS.

All joints shall be constructed according to details shown on the plans, providing the design width designated for the expansion joint. The insertion and removal of joint forming material shall be accomplished without chipping or breaking the corners of the concrete. Expansion material, when required, shall be placed as shown on the plans.

(h) FORMS.

1. GENERAL.

Reference is made to Article 105.02 concerning working drawings and other details that require submission.

Forms shall be substantial and unyielding and so designed and constructed that the finished concrete will conform to the plan dimensions and contours within tolerances listed in other portions of these Specifications.

Basic bridge plan design is for removable forms and plan concrete quantities computed accordingly. Hence, removable forms are to be used unless stay-in-place forms are allowed by contract plan notes and details. When shown by contract plan details, the Contractor will be allowed the option of using permanent steel forms under deck slabs between girders, beams or stringers provided the cost of extra concrete and materials required by this type of form is at the Contractor's expense.

2. DESIGN.

a. Removable Forms.

All removable forms shall be designed so that they may be removed without damage to the concrete. Forms shall be so constructed that portions where finishing is required can be removed for that purpose without loosening supports or disturbing portions of forms that must still remain in place.

b. Permanent Steel Bridge Deck Forms.

The forms and supports shall be zinc coated (Galvanized) steel conforming to ASTM A 653 with coating Class of G165 according to ASTM A 525 and shall otherwise meet all requirements relevant to permanent steel forms and the placing of concrete as specified herein and as noted on the plans. Miscellaneous fastener hardware (bolts, nuts, metal screws, and washers) shall be common stock hardware items galvanized to provide a zinc coating equal to or better than that required by ASTM B 633.

The following criteria shall govern the design of permanent steel bridge deck forms:

(1) The steel forms shall be designed on the basis of dead load of form, reinforcement, and plastic concrete plus 50 pounds per square foot {2.4 kN/m^2} for construction loads. The unit working stress in the steel shall not be more than 0.725 of the specified minimum yield strength of the material furnished, but not to exceed 36,000 pounds per square inch {250 MPa}. The uncoated thickness of the forms shall not be thinner than 0.0359 inch {0.9 mm}.

(2) Deflection under the weight {mass} of the forms, the plastic concrete, and reinforcement shall not exceed 1/180 of the form span or 0.5 inches {13 mm}, whichever is less, but in no case shall this loading be less than 120 pounds per square foot {5.7 kN/m^2} total.

The permissible form camber shall be based on the actual dead load condition. Camber shall not be used to compensate for deflection in excess of the foregoing limits.

(3) The design span of the form sheets shall be the clear span of the form plus 2 inches {50 mm} measured parallel to the form flutes.

(4) Physical design properties shall be computed in accordance with requirements of the American Iron and Steel Institute Specification for the Design of Cold Formed Steel Structural Members, latest published edition.

(5) The plan dimensions of both layers of primary deck reinforcement from the top surface of the concrete deck shall be maintained. A minimum concrete cover of 1 inch {25 mm} shall be maintained for the bottom slab steel.

(4) Transverse construction joints shall be located at the bottom of a flute and 0.375 inch {10 mm} weep holes shall be field drilled at not more than 12 inches {300 mm} apart along the line of the joint. If a bridge is on a skew, or in a curve, a weep hole shall be drilled in the bottom of each flute the joint crosses.

(i) FALSEWORK.

1. DESIGN AND CONSTRUCTION.

a. General.

For the purpose of this specification, falsework shall be divided into two classes as follows:

Class 1 - Common or simple falsework such as temporary bracing to provide stability for bridge girders, permanent steel bridge deck forms, deck overhang supports, screed rail support systems, or substructure supports attached to permanent parts of the structure (i.e. drilled shafts, columns, caps, etc.).

Class 2 - Unique or complex falsework such as that required for box girder construction, RCDG construction, structural cofferdams, or any falsework used in connection with steel erection.

The Contractor shall be responsible for designing and constructing safe and adequate falsework which provides the necessary strength and rigidity, supports all loads imposed, and produces a finished structure with lines and grades shown on the plans. Falsework shall be designed and constructed to withstand all imposed loads during erection, construction, usage, and removal.

The Contractor shall submit to the Construction Engineer working drawings and design calculations for falsework in accordance with Article 105.02.

For both classes of falsework drawings, the Construction Engineer will verify that the licensed Professional Engineer signature and stamp requirements of Subarticle 105.02(d) are met. Class 1 drawings will be stamped for distribution and then distributed. Class 2 drawings will be forwarded to the Bridge Engineer for review to determine if the results of the licensed Professional Engineer's calculations are in compliance with design criteria. If the design criteria are met, the submittal will be returned to the Construction Engineer to be stamped for distribution and then distributed.

All falsework will be inspected by the Project Manager using the distributed drawings. For all Class 2 falsework, the licensed Professional Engineer who signed the falsework submittal shall verify that the falsework as constructed meets all design criteria prior to any load being placed thereon. A signed statement from the licensed Professional Engineer covering the verification shall be furnished to the Project Manager by the Contractor.

When falsework of either class is to be used over highway, pedestrian, or railroad traffic, additional details will be required to provide for special protection to prevent debris from falling on the traffic below. These additional details will be required for both removal and construction work.

All falsework drawings shall include a description and size of all members, connections, and miscellaneous hardware. When pre-manufactured assemblies are used, all parts shall be easily identified as those shown on the drawings.

All falsework shall be designed and constructed to provide the necessary rigidity and to support the loads without appreciable settlement or deformation. Screw jacks and/or hardwood wedges shall be used to take up any settlement in the formwork either before or during the placing of concrete.

Any part of the permanent structure to which falsework will be attached shall attain a minimum compressive strength of 2400 psi {17 MPa} from cylinders prepared in conformity with AASHTO T 23 prior to the attachment.

Falsework that cannot be founded on a satisfactory footing shall be supported on piling, which shall be spaced, driven, and removed in an approved manner.

All spans shall be given a temporary camber to allow for deflection, shrinkage, and settlement. Bridges shall have a permanent camber only where so shown on the plans or directed.

b. Design Criteria.

Falsework shall be designed to withstand all imposed loads during erection, construction, usage, and removal. Designs shall be based on minimum loads, maximum stresses and deflections, and conditions in the following paragraphs. Allowable stresses are based on use of

and r is the radius of gyration of the member. E, modulus of elasticity, used for timber shall be 1.6×10^6 psi {11 GPa} and for steel shall be 30×10^6 psi {200 GPa}.

Any additional design criteria, which may be needed, shall be developed by the Contractor's licensed Professional Engineer designer and included with the calculations of the falsework submittal.

Falsework over or adjacent to roadways or railroads which are open to traffic during construction shall be designed and constructed such that it is stable if subjected to vehicular impact or features shall be provided to protect falsework supports from vehicular impact. Protection shall be designed such that it does not present a hazard to vehicular traffic.

Design criteria for permanent steel bridge deck forms shall be as shown elsewhere in this Section.

2. REMOVAL OF FALSEWORK.

No falsework supporting concrete shall be removed or wedges loosened without the consent of the Engineer.

If adequate test cylinders have been made, falsework may be removed when the cylinders indicate that the concrete has developed a minimum compressive strength of 2400 psi {17 MPa}, otherwise falsework shall be removed according to the following time limitations.

Falsework may be removed after expiration of 14 days exclusive of days when for four hours or more the temperature is below 40 °F {5 °C}. Falsework under slabs of less than 6 foot {2 m} span may be removed after seven days with the same temperature limitations.

Falsework shall be gradually and uniformly released in such a manner as to avoid injurious stresses in any part of the structure. Wedges shall be removed first under slabs and transverse beams, starting at the center of the span and working both ways; then wedges under longitudinal girders and beams shall be removed also starting at the center of the span and working both ways simultaneously.

All falsework piles, at the time of removal or cleanup, shall be pulled out or cut off at an elevation not more than 6 inches {150 mm} above the bed of the stream. Piles not in water shall be removed or cut off flush with or below the ground surface of stream bed. Piles within roadbed limits shall be cut off at least 3 feet {1 m} below subgrade elevation. Other piles within roadway limits shall be cut off at least 12 inches {300 mm} below the finished surface of the front slope, ditch, or backslope.

(j) CURING CONCRETE.

1. EXPOSED SURFACES.

Whenever the Engineer determines that weather conditions are such that evaporation from the surface may cause shrinkage cracking, a fog or mist spray may be required at intervals as needed during and after finishing until curing material can be applied so that the surface will be at all times damp but not excessively wet.

The Contractor shall give careful attention to the proper curing of the concrete. All surfaces not covered by forms shall be protected with an approved membrane curing compound, from List II-30 of the MSDSAR manual, dampened burlap, Polyethylene Film* (White Opaque), White Burlap - Polyethylene Sheet*, cotton mats, or wetted sand, as soon after placing the concrete as possible without marring the surface, except for bridge deck slabs which shall be treated as noted in Item 2 below. Immediately upon removal of forms, other surfaces shall be treated by one of the approved curing methods.

Unless membrane curing compound is used, all curing materials shall be kept wet and shall remain in place for seven days, except that small portions may be temporarily removed during actual finishing operations.

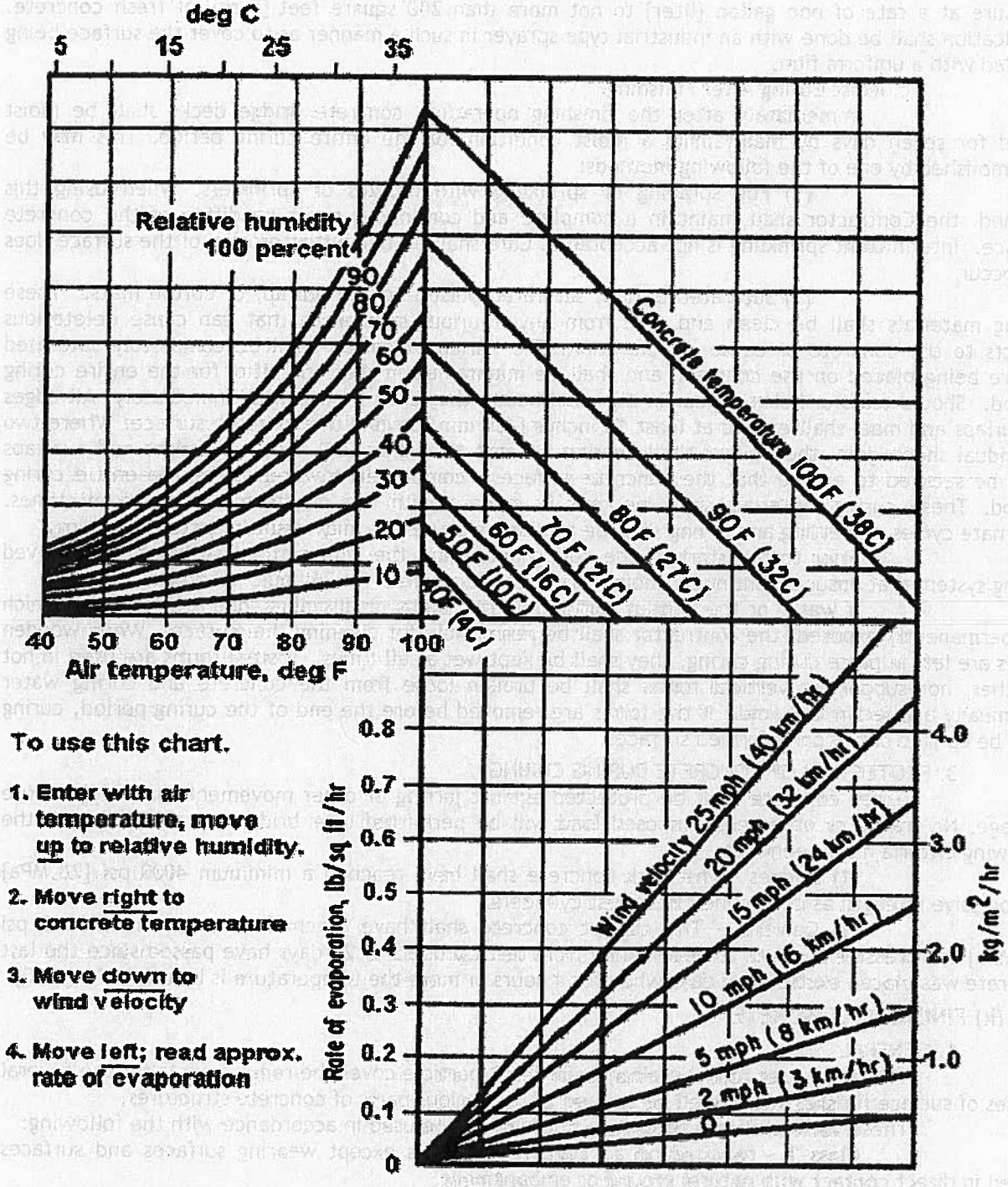
*NOTE: When polyethylene film or white burlap-polyethylene sheeting is used, it shall be installed and maintained in such a manner that a complete, moisture-tight enclosure over the surface to be cured will be provided. These materials shall meet the requirements noted in Section 830.

2. BRIDGE DECK SLABS.

a. General.

Prior to placing a bridge deck slab, the evaporation rate shall be determined by use of the graph in Figure 1, "Evaporation Rate of Surface Moisture", and recorded on form BMT-171, *"Evaporation Rate Record"*. The Contractor shall furnish the equipment necessary to measure the air temperature (ambient), wind velocity, and humidity. The equipment or a manufacturer's certificate of calibration showing the equipment's model number and serial number shall be submitted to the

FIGURE 1. Evaporation Rate of Surface Moisture



b. Evaporation Control After Screeding.

Continuous fogging or an evaporation barrier (monomolecular) material shall be used for all bridge deck curing beginning immediately after the screeding operations have been completed for sections of the deck not to exceed five feet from the starting location.

If fogging is to be used, a continuous fog or mist spray shall be maintained until the moist curing procedures described elsewhere in this Section begin. Intermittent fogging is not acceptable if there is drying of the concrete surface. If water begins to pond on the deck, the Contractor shall adjust the rate of fogging to minimize the ponding of water.

If an evaporation barrier material is to be used, it shall be applied immediately behind the screeding operation and in accordance with the manufacturer's recommendations. The

2. CLASS 1 FINISH (ORDINARY SURFACE FINISH).

This class finish will require the concrete surface to be free from objectionable projections, swells, fins, ridges, depressions, waves, holes, and other defects. This will require that immediately after the forms are removed, metal ties shall be removed for a minimum depth of 1 inch {25 mm} from the face of the concrete. All cavities or depressions resulting from this removal, or from other causes, shall be carefully filled and pointed with a mortar of sand and cement, and the surface left smooth and even. The proportion of cement to sand, measured by volume, shall be one to two unless otherwise specified. The surface film of all pointed areas shall be carefully removed before setting occurs. Any fins, ridges, or projections shall be struck off smooth with the surface of the concrete. Particular care shall be taken throughout the progress of this operation to use one of the curing methods covered elsewhere in this Section.

If a Coated Surface Finish is to be applied in a later finishing operation, the coating material may be used in lieu of mortar to fill small air holes in the concrete surface; however, this must be given time to take a set prior to applying the Coated Surface Finish.

3. CLASS 2 SURFACE FINISH.

a. General.

This class surface finish requires that, in addition to a Class 1 finish, the exposed surfaces of bridges, culverts, headwalls, inlets, etc. as defined in the Subitem d. below, receive an additional surface finish in accordance with the following:

If only one brand and type of cement from the same mill is used in a structure or unit (substructure or superstructure), the Contractor may elect to either apply a Rubbed Surface Finish or apply an approved coated Surface Finish.

If more than one brand of cement is used in a structure, the Contractor shall apply a Coated Surface Finish.

The same type of surface finish shall be used throughout the entire structure unless otherwise authorized in writing by the Engineer.

b. Rubbed Surface Finish.

As soon as the Class 1 surface finish has been completed and the pointing has set sufficiently to permit it, the entire surface except chamfers shall be wetted with a brush and rubbed with a No. 16 carborundum stone or an abrasive of equal quality, bringing the surface to a paste. The rubbing shall be continued sufficiently to remove all form marks and projections, producing a smooth dense surface without pits or irregularities. The material, which in the above process has been ground to a paste, shall then be carefully spread or brushed uniformly over the entire surface and allowed to take a reset. Curing shall continue on this surface as noted to be required elsewhere in this Section.

The final finish shall be obtained by a complete rubbing with a No. 30 carborundum stone or an abrasive of equal quality. This rubbing shall continue until the entire surface is of a smooth texture and uniform in color.

c. Coated Surface Finish.

Only Departmental approved coated finishing materials may be used. The coating material shall be one of the coating materials shown on List III-3, "Surface Coatings for Portland Cement Concrete". This list is given in the Department's Manual, "Materials, Sources, and Devices with Special Acceptance Requirements".

The application of the coating shall be in an approved manner (normally in accordance with the manufacturer's recommendations) by competent and experienced personnel. The overall coated finish shall be uniform in coverage, texture, and color after the coating material has taken set and cured. Failure to obtain uniformity of coverage, texture, and color shall be cause for the Engineer to require such remedial action as deemed necessary to obtain the desired results.

The following actions shall be taken before the application of any coated finish:

A Class 1 surface finish applied and all pointing completely set.

Surface clean and free from foreign matter.

If membrane curing compound was used to cure the concrete, the curing compound shall have weathered for a minimum time period of six weeks. Special care shall be taken to ensure that areas not to be treated are protected to prevent treatment from overlapping onto these designated areas.

d. Exposed Surfaces.

Exposed surfaces for this class finish is defined as all surfaces, including bottom chamfers and fillets except (1) the wearing surface of roadway slabs and sidewalks, (2) those surfaces having immediate contact with embankment or excavation, (3) those surfaces below low water level

501.05 Acceptance of Concrete.

(a) GENERAL.

Certified Concrete Technicians, as required by the Department, shall perform all concrete inspections and testing. Procedures for technician certifications and laboratory qualifications are described in ALDOT-405, "Certification and Qualification Program for Concrete Technicians and Concrete Laboratories".

Fresh concrete will be accepted on the basis of slump, total air content, and temperature meeting the requirements specified for the Class of concrete.

Hardened concrete shall be accepted on the basis of compressive strength meeting the requirements specified in Item 501.02(c)2 for that Class of concrete.

Compressive strength from concrete cylinders will be accepted when the average of two consecutive cylinder test results, obtained at the same age, equals or exceeds the specified 28-day compressive strength, and neither cylinder test result is below 95% of the specified 28-day compressive strength.

(b) SUBSTANDARD CONCRETE.

1. GENERAL.

The Department will investigate any concrete not meeting the acceptance requirements outlined in Subarticle 501.05(a). Concrete investigations will be used to determine the suitability of potentially substandard concrete. This investigation may include any or all of the procedures outlined in ALDOT-170.

The combined results of the Department's investigations will be used to assess the acceptability or rejection of potentially substandard concrete.

If the investigation results show that the concrete fails to meet the contract requirements, the Contractor shall be responsible for the cost of the investigation to include, but not limited, to per-diem, travel expenses, and sampling and testing.

2. IN-PLACE COMPRESSIVE STRENGTH.

If the Department deems it necessary to evaluate only the in-place compressive strength of substandard concrete, a core investigation as described in ALDOT-170 will be performed.

Price adjustments will be applied to the applicable pay item for the number of cubic yards represented by the low cylinder breaks and will be determined as follows.

If the average compressive strength of the cores is equal to or greater than 100% of the specified 28-day compressive strength, the concrete will be accepted with no price adjustment.

If the average compressive strength of the cores is 85% or greater but less than 100% of the specified 28-day compressive strength, and the Bridge Engineer deems the concrete to be structurally acceptable, the concrete will be accepted with a price adjustment. The price adjustment will be applied to the applicable pay item for the number of cubic yards represented by the low breaks. The price adjustment shall be determined from the following formula:

$$\text{Price Adjustment (In Percent)} = 100 \times (1.0 - [\,(f'c - fc\ AVG)\,/\,(0.30\,f'c)\,])$$

f'c = Required 28-day Compressive Strength (psi) {MPa};
fc AVG = Average Compressive Strength of Test Cores (psi) {MPa};
The price adjustment shall be rounded to the nearest tenth of a percent;
The price adjustment is valid where: 50% ≥ Price Adjustment < 100%.

SECTION 815
CEMENT

815.01 Type I Portland Cement.

Type I Portland Cement shall meet the requirements of AASHTO M 85 and the additional requirements shown below.

815.02 Type II Portland Cement.

Type II Portland Cement shall meet the requirements of AASHTO M 85 and the additional requirements shown below.

Engineer at the close of each day's work or 8 hour run, in such form as he may require, showing the quantity used during the day or run at each part of the work.

(b) CARE AND HANDLING.

1. The Contractor shall provide suitable means for storing and protecting the cement against dampness. Cement not for immediate use shall be stored in suitable weather proof buildings. Buildings shall be placed in approved locations. Provisions for storage shall be ample and the shipment of cement as received shall be separately stored in such a manner as to provide easy access for identification and inspection of each shipment. On small structures, storage in the open may be permitted by authorization, in which case a raised platform and ample waterproof covering shall be provided. Stored cement shall meet the test requirements at any time after storage when a retest is ordered.

2. Cement of different types, even if tested and approved, shall be stored separately and shall not be mixed.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: August 21, 2013 Special Provision No. 12-0737

EFFECTIVE DATE: January 1, 2014

SUBJECT: Structures for Traffic Control Devices and Highway Lighting.

Alabama Standard Specifications, 2012 Edition, SECTION 718 shall be revised as follows:

SECTION 718
STRUCTURES FOR TRAFFIC CONTROL DEVICES AND HIGHWAY LIGHTING

718.03 Design.

(a) GENERAL.

The Third Paragraph of Subarticle 718.03(a) shall be replaced with the following:

All structures shall be designed in accordance with the requirements given in the AASHTO *Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals, 2009 Edition*, and the requirements given in this Section.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: November 26, 2013 Special Provision No. 12-0769

EFFECTIVE DATE: April 1, 2014.

SUBJECT: Extra and Force Account Work.

Alabama Standard Specifications, 2012 Edition, SECTION 109 shall be revised as follows:

SECTION 109
MEASUREMENT AND PAYMENT

109.04 Extra and Force Account Work.

(a) GENERAL.

The Contractor will receive and accept payment for work performed under his contract either as contract items of work or as extra work. Contract items of work will be paid for at the unit prices stipulated in the contract. Extra work will be paid for at the unit prices or lump sum stipulated in supplemental agreement, or on a force account basis. Supplemental agreements shall be executed in accordance with Subarticle 104.03(b). When prices are negotiated for payment by supplemental agreement, satisfactory proof of administrative markups for profit, overhead, and other costs may be required by the engineer. Extra work performed on a force account basis will be compensated for in the following manner.

(b) FORCE ACCOUNT BASIS.

1. LABOR.

For all labor, foremen, and superintendents, employed on the force account work, the Contractor shall receive the agreed hourly wages or scale for the number of hours the said laborers, foremen, and superintendents were actually engaging in or directly supervising such work. No allowance will be made for general superintendence. Hourly wages for salaried employees will be based on a 40-hour work week. The wages or scale shall be comparable to the wages or scale paid by the Contractor for work of a like nature on his contract pay items and shall be agreed upon in writing by the Contractor and Engineer before the said force account work is begun.

To this sum shall be added an amount equal to 25 percent thereof.

No additional pay beyond the agreed hourly scale will be allowed for "overtime work" unless such overtime work is authorized in writing by the Engineer.

Labor costs will be allowed for travel time to and from the jobsite when that travel is specifically for the purpose of accomplishing force account work. Travel time shall be established and approved by the Engineer prior to beginning of the work. Travel time costs shall be validated with certified payrolls.

Per diem or daily subsistence will be allowed when those costs are directly related to force account work and a part of the Contractor's usual and customary expenses. An additional 5 percent will be added to the per diem or daily subsistence costs.

2. BOND, INSURANCE AND TAX.

For public liability and property damage insurance and workmen's compensation insurance premiums, increased bond premiums, unemployment insurance contributions and social security taxes, the Contractor shall receive the actual cost, to which no percent shall be added; in addition on projects which the State Gross Receipt Tax is applicable, may include said tax. The Contractor shall furnish satisfactory evidence of the rates paid for such bond, insurance, and tax.

3. MATERIALS.

For materials accepted by the Engineer and used, the Contractor shall receive the actual cost of such materials delivered on the work (exclusive of machinery rentals as herein set forth) to which cost 15 percent will be added.

work whether performed by the Prime Contractor or an approved subcontractor. At the end of each day, the Contractor's representative and the Inspector shall compare records of the cost of work done as ordered on a force account basis.

9. STATEMENTS.

No payment will be made for work performed on a force account basis until the Contractor has furnished to the Engineer duplicate itemized statements of the cost of such force account work, detailed as to the following:

a. Name, classification, date, daily hours, total hours, rate, and extension for each laborer and foreman.

b. Designation, dates, daily hours, total hours, rental rate and extension for each truck and other unit of machinery and equipment.

c. Quantities of materials, prices, and extensions.

d. Transportation of materials.

e. Travel time for equipment.

f. Cost of public liability and property damage insurance and workmen's compensation insurance premiums, increased bond premiums, unemployment insurance contributions, and social security tax.

Statements shall be accompanied and supported by original receipted invoices for all materials used and transportation charges, provided that, if materials used on the force account work are not specifically purchased for such work but are taken from the Contractor's stock, then in lieu of the original invoices the statements shall contain or be accompanied by an affidavit of the Contractor certifying that such materials were taken from his stock, that the quantity claimed was actually used, and that the price and transportation claimed represent the actual cost to the Contractor.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: November 26, 2013 Special Provision No. 12-0798

EFFECTIVE DATE: April 1, 2014

SUBJECT: Structural Materials for Traffic Control Devices and Highway Lighting.

Alabama Standard Specifications, 2012 Edition, SECTION 102 shall be revised as follows:

SECTION 891
STRUCTURAL MATERIALS FOR TRAFFIC CONTROL DEVICES AND HIGHWAY LIGHTING

891.01 General.

All materials used in the fabrication of overhead roadway sign, traffic signal, luminaire and traffic surveillance structural supports shall meet the requirements of the AASHTO *Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 2009 Edition* (hereinafter referred to as the AASHTO Sign Specifications). AASHTO material specifications shall govern in lieu of ASTM material specifications when an AASHTO equivalent specification exists for all references within any referenced specification.

891.02 Steel.

(a) GENERAL.

All grades of steel listed in the AASHTO *Standard Specifications for Highway Bridges* are applicable for welded structural supports for overhead roadway signs, luminaries, traffic signals and traffic surveillance and shall have a specified yield strength not less than 35 ksi {241 MPa}, unless otherwise specified on the contract plans, or within this Section. The specifications for steels other than ASTM and AASHTO shall be submitted to the Bridge Engineer for approval, prior to design. The contractor shall supply the Bridge Engineer with a copy of the steel specification corresponding to the steel that is being used if the steel is not covered by ASTM or AASHTO specifications.

(b) FABRICATION.

Within 30 days after the award of the contract, the Contractor shall notify the Bridge Engineer in writing of the name and address of the fabricator of the structural steel. The notification shall include the fabricator's proposed fabrication schedule. Evidence of the fabricator's qualifications and experience shall be furnished if requested by the Bridge Engineer.

No material shall be fabricated before the Department has been notified where the fabrication order has been placed and the shop drawings have been reviewed and approved for distribution. The Fabricator is responsible for notifying the Bridge Engineer of any fabrication work to be done outside of their facility, the name and address of the outside fabricator, and the proposed fabrication schedule.

The Fabricator of the structures shall give the Bridge Engineer at least 30 days notice by submittal of a BBF-11 Form (Notice of Intent to Begin Fabrication) prior to the beginning of fabrication to allow time for arrangements to be made for an ALDOT inspector to be present during fabrication.

All steel structures shall be fabricated in a plant certified by the American Institute for Steel Construction for "Standard for Bridge and Highway Metal Component Manufactures (CPT)".

Welding of steel members shall be in accordance with the AWS D1.1/ D1.1M-2008 Structural Welding Code (hereinafter referred to as the AWS Steel Welding Code). Welders shall be certified in accordance with the AWS Steel Welding Code. All welds shall be visually inspected and be free of cracking and undercutting. High Mast lighting assembly pole to base plate welds shall be magnetic

used on the project. Any master tape found damaged or with a certification over two years old shall be replaced or recalibrated.

A Certified Welding Inspector (CWI) shall be present on all shifts where welding is ongoing.

3. HANDLING, TRANSPORTATION AND STORAGE OF MATERIALS

The handling and storing of materials, during and after fabrication, shall be done in such a manner that the metal or galvanized finish is not damaged. Damaged material may be a cause for rejection. Material shall be stored off the ground and properly drained. Loose members and fasteners shall be stored in boxes, crates, kegs or barrels and kept dry.

4. WORKMANSHIP, FINISH AND DETAILING.

All work shall be performed in a neat workmanlike manner.

A buffer and/or shield shall be utilized during fitting operations to protect base metals from damage caused by fitting tools or devices. Any damage incurred may be cause for rejection of the material.

Heat straightening or hot bending is allowable provided the metal is not heated above 1100 °F {590 °C}. The maximum heat applied shall be controlled by the use of heat crayons or other approved means. After straightening or bending, the metal shall not be artificially cooled until the temperature of the metal reaches 600 °F {315 °C} or less. Water or spray misting shall not be used as a means of artificial cooling. Heat cambering will only be permitted when making minor adjustments to the actual camber in a member.

Steel may be thermal cut, provided a smooth surface is secured by the use of a mechanical guide. Thermal cutting by hand shall be done only when approved. The surface shall be smoothed by planing, chipping or grinding. Other methods of cutting steel may be considered for use.

Sheared edges of plates more than 5/8 inch {16 mm} in thickness shall be planed to a depth of 1/4 inch {6 mm}. Plates 5/8 inch {16 mm} in thickness, or less, shall be ground to remove sharp corners and edges.

Vent holes, if required, shall be cylindrical, without ragged or torn edges or corners. If vent holes are installed with a thermal cutting process, they shall be reamed.

5. ACCURACY OF REAMED OR DRILLED HOLES.

- Reamed or drilled holes shall be cylindrical and perpendicular to the member.
- Holes may be punched with a full-size die provided the thickness of the material is not greater than the nominal diameter of the fasteners being used nor greater than 3/4 inch {20 mm} for carbon steel, 5/8 inch {16 mm} for high strength steel, nor 1/2 inch {12 mm} for quenched and tempered alloy steel. Holes shall be clean cut and free of torn or ragged edges. Plug welding of any holes that are too large or slightly off location is prohibited. Completed holes shall be 1/16 inch {1.6 mm} larger than the nominal diameter of the fastener being used.
- All holes may be oversized or slotted by 1/32 inch {0.8 mm}, maximum. In any connection, no more than ten percent of all holes may be oversized or slotted 1/16 inch {1.6 mm}.
- Edge distances of fasteners shall be as shown below.

The minimum distance from the center of any fastener to a sheared or flame cut edge shall be: 1" Fastener: 1-3/4" {45 mm}; 7/8" Fastener: 1-1/2" {38 mm}; 3/4" Fastener: 1-1/4" {32 mm}; 5/8" Fastener: 1-1/8" {29 mm}.

The minimum distance from the center of any fastener to a rolled or planed edge, except in flanges of beams and channels, shall be: 1" Fastener: 1-1/2" {38 mm}; 7/8" Fastener: 1-1/4" {32 mm}; 3/4" Fastener: 1-1/8" {29 mm}; 5/8" Fastener: 1" {25 mm}.

In the flanges of beams and channels the minimum distance from the center of the fastener to a edge shall be: 1" Fastener: 1-1/4" {32 mm}; 7/8" Fastener: 1-1/8" {29 mm}; 3/4" Fastener: 1" {25 mm}; 5/8" Fastener: 7/8" {22 mm}.

- The distance between the edges of adjacent holes that are enlarged or slotted shall not be less than three times the diameter of the fastener minus the nominal diameter of the hole. The edge distance shall not be less than that given for Minimum Edge Distance minus one half the nominal diameter of the hole.

wall thickness of the pole. The finish of the pole shall be smooth. A 1-1/2 mil dry film thickness of weather resistant polyurethane shall be coated to the surface of the pole for additional ultra-violet protection.

Direct burial poles shall have a 4 inch by 6 inch {102 mm by 153 mm} hand hole with a non-aluminum cover provided at 18 inches {458 mm} above the ground line. The conductor entrance shall be two each 2 inch by 6 inch {51 mm by 51 mm} entrance holes located 2 feet {610 mm} below the ground line and one hundred and eighty degrees apart.

The poles shall be delivered pre-drilled to accommodate luminaires and lowering devices. Pole top tenons shall be permanently bonded to the shaft and shall be aluminum or hot dipped galvanized steel.

891.04 Aluminum.

Aluminum material shall meet the requirements of the AASHTO Sign Specifications, Section 5.

Welding shall be in accordance with the provisions of Section 5 of the AASHTO Sign Specifications.

The shaft of aluminum poles shall be one piece seamless round tapered tube full length heat-treated after welding on the base flange to produce the T6 temper. The base shall be one-piece cast aluminum. All nuts, bolts and washers used shall be stainless steel Grade 18-8 or stronger, and shall meet the requirements of ASTM F 593. Each pole will have an internal grounding lug. A pole vibration damper shall be provided.

The contractor shall furnish copies of certified mill test reports attesting to the fact that the aluminum material submitted for approval meets the contract requirements. These reports shall include chemical determinations and physical characteristics.

891.05 Prestressed Concrete Poles.

Concrete, reinforcing steel and prestressing steel for prestressed concrete poles shall meet the requirements given in Section 513. The concrete shall have a minimum 28 day compressive strength of 5000 psi {35 MPa} or as shown on the plans.

The prestressed concrete pole manufacturing plant shall follow the applicable requirements in ALDOT-367, Section 2, except that plant certification by the Precast/Prestressed Concrete Institute Plant Certification Program will not be required.

Within 30 days after the award of the contract, the Contractor shall notify the Materials and Tests Engineer in writing of the name and address of the fabricator of the poles.

Fabrication will not be allowed to begin until two weeks after the Materials and Tests Engineer has all of the approved details and submittals that are required for a representative of the Department to adequately inspect the fabrication of the poles. The Contractor shall arrange for a representative of the Department to conduct an inspection of the plant facilities and review the plant's Quality Control/Quality Assurance manual during this two week time period.

891.06 Breakaway Supports.

A Federal Highway Administration approved breakaway support shall be installed on each luminaire assembly when indicated on the plans. The pole shall meet the 1985 AASHTO breakaway requirements and FHWA certification of testing must be submitted. The Contractor shall assure the compatibility of the pole base, breakaway support and foundation.

Transformer bases shall be used only as a replacement of a like item on an existing installation unless specifically shown otherwise on the plans.

891.07 Mast Arms.

Mast arms shall be fabricated from steel tubes (except for aluminum poles, which shall have aluminum mast arms) to the lengths specified on the plans and approved shop drawings. Mast arm shafts shall be of one continuous piece without intermediate splices or couplings, provided with rain-tight connections to the shaft of the pole and designed to rotate three hundred and sixty degrees in the horizontal plane.

A two piece section, slip joint shaft mast arm will be permitted when plans or proposal require mast arms longer than the manufacturer's length capability.

All hardware, except split pole clamps, shall be stainless steel or anodized aluminum. The end of the arm shall be furnished with the type of fitting required by the plans.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: June 3, 2014 Special Provision No. 12-0988

SUBJECT: Cooperation With Utility Companies, NH-0006 (551), Tuscaloosa County.

Alabama Standard Specifications, 2012 Edition, are hereby amended as follows:

SECTION 105
CONTROL OF WORK

105.05 Cooperation With Utilities and Non-Highway Public Facilities.

This Article (105.05) amended by deleting paragraph two and substituting the following in lieu thereof:

The Contractor's attention is directed to the various utilities that are involved on this project as designated on the plans. It shall be the Contractor's responsibility to contact the various utility owners and determine the exact location of all existing utilities on the project, whether shown on the plans or not.

The relocation, adjustment, or retention of all utilities have been authorized, but the nature or conditions on the project are such that it will, or may be, necessary for various utility forces to work on the project while construction of the project is underway. The Contractor shall cooperate with the utility owners and their forces at all times which may require the Contractor to delay or interrupt his work at some locations, shift his forces from one location to another, and exercise such other reasonable means as may be directed to cooperate with the utility forces and prosecute construction of the project at the same time.

Listed below are the utility companies that will be relocating or adjusting their facilities prior to and/or during the construction of this project and the estimated date for the beginning and completion of their work.

ALABAMA POWER COMPANY (DISTRIBUTION)

The relocation work will be done by their forces. The work is expected to begin after notice to proceed and be completed by July 31, 2014.

The relocation work will be done by their forces. The work is expected to begin after notice to proceed and be completed by July 31, 2014.

ALABAMA POWER COMPANY (TRANSMISSION)

The relocation work will be done by their forces. The work is expected to begin after notice to proceed and be completed by July 31, 2014.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: May 30, 2014 Special Provision No. 12-1044

SUBJECT: Fiber Optic Systems
Project No. NH-0006(551), Tuscaloosa County

Alabama Standard Specifications 2012 Edition shall be amended by the addition of SECTION 734 as follows:

SECTION 734
FIBER OPTIC SYSTEMS

734.01 Description.

This Section shall cover the work of furnishing, installing, and testing fiber optic cable and associated equipment and materials. These requirements may be supplemented or amended by the requirements given elsewhere in the Specifications, or on the Plans and Special and Standard Highway Drawings.

Descriptions and definitions of the equipment, words and terminology used in the furnishing and installing of fiber optic systems are given in the publications of the National Electrical Code (NEC) and the National Electrical Manufacturers Association (NEMA).

734.02 Materials.

Materials shall conform to the requirements given in these Specifications and the requirements shown on the Plans. All materials and equipment furnished shall be new, except when the plans specifically provide for the re-use of existing equipment.

All materials and equipment furnished shall conform to the applicable requirements of the Underwriter's Laboratory Incorporated (UL), the Electronic Industries Association (EIA), the National Electric Code (NEC), the American Society of Testing and Materials (ASTM), the American National Standards Institute (ANSI), International Municipal Signal Association (IMSA), the National Electrical Manufacturers Association (NEMA), and the applicable standards, specifications, and regulations of the Alabama Department of Transportation (ALDOT).

(a) FIBER OPTIC CABLE.

1. MANUFACTURER STANDARDS AND REQUIREMENTS.

Each fiber optic cable shall meet all the following criteria:

1. Manufacturer shall be Certified ISO-9001, certification date on or before January 1, 1997.
2. Each cable shall meet the requirements of 7 CFR 1755.900.
3. Manufacturer shall produce "Proof of Compliance" with Bellcore GR-20-CORE.

If re-marking is required during manufacturing, the following method for re-marking is allowed: completely remove the defective marking and re-mark with white characters. Only one re-marking per cable permitted.

3. COLOR CODING.

Buffer tubes and individual optical fibers within those buffer tubes shall adhere to ANSI/TIA-598-C *"Optical Fiber Cable Color Coding"*.

1=Blue	5=Slate	9=Yellow
2=Orange	6=White	10=Violet
3=Green	7=Red	11=Rose
4=Brown	8=Black	12=Aqua

4. QUALITY ASSURANCE AND PACKING.

All optical fibers within each and every cable shall be usable and shall be 100% attenuation tested by the manufacturer. These attenuation testing results shall be provided with each cable reel and affixed within the reel wrapping; and, an additional copy of the test documentation shall be provided to the Engineer under separate cover, who is to forward a copy to ALDOT Construction Bureau for fiber optic database storage.

The cable shall be packaged wound on spools or reels. Each package shall contain only one continuous length of cable. The packaging shall be constructed so as to prevent damage to the cable during shipping and handling.

When the cable length creates a reel weight exceeding 800 lbs. {362.87 kg} the manufacturer shall be required to supply the cable on a large wooden reel, the reel shall be lagged with wooden staves. The cable shall be covered with a thermal wrap. The outer end of the cable shall be securely fastened to the reel head so as to prevent the cable from becoming loose in transit. The inner end of the cable shall project a minimum of ten feet into a slot in the side of the reel or into housing on the inner slot of the drum, in such a manner to make it available for testing. An arbor hole of 1 1/2 inch {1.57 cm} minimum is required.

Test tails shall be at least 6.5 feet {6.58 m}. The inner end shall be fastened so as to prevent the cable from becoming loose during shipping and installation. End seals shall be applied to each end of the cable to prevent moisture from entering the cable. Reels shall be permanently marked with an identification number that can be used by the manufacturer to trace the manufacturing history of the cable and the fiber.

Each reel shall be plainly marked to indicate the direction in which it should be rolled to prevent loosening of the cable on the reel.

Documentation shall accompany each reel. The documentation shall indicate the attenuation of each cable fiber in dB/km. The attenuation shall be measured at: 1310 nm and 1550 nm for singlemode fiber; and, 850 nm and 1300 nm for multimode fiber.

Each reel shall have stenciled on the reel or a weatherproof reel tag firmly attached identifying following:

- Number of Fibers
- Type Fiber Optic Cable
- Name of Cable Manufacturer and Address
- Length of Cable (ft/m)
- Reel Number
- Direction of Rotation

b. Bare Fiber Length not more than 1.18 inches (30 mm) or 2 inches (51 mm) (based on length of sleeve)

c. Shrink Temperature Single-Fiber Sleeve: 248°F (120°C);

d. Heating Time Single-Fiber Sleeve as recommended by the manufacturers.

(b) OPTICAL FIBER CHARACTERISTICS.

1. GENERAL.

The following optical fiber types shall be utilized in the manufacture of all cable as shown on the Plans:

Dispersion unshifted SingleMode (SM) fiber	(EIA/TIA 492-BA000, Class 4a)
MultiMode (MM) fiber	(EIA/TIA 492-AAAA, Class 1a)

Each optical fiber shall be glass and consist of a doped silica core surrounded by concentric silica cladding. All fibers shall be sufficiently free of surface imperfections and inclusions to meet the optical, mechanical and environmental requirements of these Specifications.

The optical fiber shall comply with all optical and mechanical requirements over an operating temperature range of -4°F to 158°F (-20°C to +70°C).

2. OPTICAL FIBER TENSILE STRENGTH.

All optical fibers shall have a tensile strength of 100 kpsi (100 Pa). The coating shall be dual layered, ultraviolet (UV) cured acrylite. The coating shall be mechanically or chemically strippable without damaging the fiber.

The required optical fiber grade shall reflect the maximum individual fiber attenuation, to guarantee the required performance of every fiber in the cable.

3. OPTICAL FIBER MANUFACTURER.

The optical fiber shall be produced by Corning or other U.S. Manufacturer. If a cable manufacturer chooses to utilize optical fiber other than Corning, the Contractor shall submit with the Material Submittal the optical fiber manufacturer's cut sheet for approval. Basis of approval shall consist of splice compatibility between said U.S. Manufacturer and Corning. These tests and their data are to be performed and compiled by an independent laboratory that is approved by the Engineer. The laboratory shall demonstrate a three year history of the performance of such tests.

4. OPTICAL FIBER SPECIFICATION TABLE.

PARAMETERS	SINGLEMODE	MULTIMODE
Type	Step Index	Graded Index
Core Diameter	8.3µm (Nominal)	62.5µm ± 3.0µm
Cladding Diameter	125µm ± 1µm	125µm ± 1µm
Core to Cladding Offset	≤ 0.8µm	≤ 3.0µm
Coating Diameter (OSP)	250µm ± 15µm	250µm ± 15µm
Cladding Non-circularity	≤ 1.0%	≤ 1.0%
Proof Tensile Test	100 kpsi (0.7 GN/m²)	100 kpsi (0.7 GN/m²)
Attenuation:		
@ 850nm (MM)	n/a	≤ 3.5 dB/km
@1300nm (MM)	n/a	≤ 1.0 dB/km
@1310nm (SM)	≤ 0.4 dB/km	n/a
@1550nm (SM)	≤ 0.3 dB/km	n/a

3. FANOUT KIT.

Fanout kits shall be used on all loose tube and central core fiber optic cable at each terminal end when cable end is to be connectorized. The fanout kit can be an individual buffer tube kit, a multiple buffer tube kit, or spider design kit. All fanout kits shall have a minimum of 24 inch (241 cm) of tubing, measured from cable end to the back of the connector body, covering each fiber when installation is complete.

Only one type of fanout kit may be used on any one project.

(d) FIBER OPTIC CONNECTORS.

1. GENERAL.

Fiber optic connectors shall be field installed ST compatible for either singlemode applications or multimode applications unless otherwise shown on the Plans.

Connectors shall be ceramic ferrule, nickel plated zinc connector body, (composite connector body for corrosive atmospheres), 125μm diameter fiber, with the fiber permanently secured within the ferrule with epoxy, (heat epoxy cured or air dried), as specified by the connector and/or the epoxy manufacturer. When connectors are installed outside of a controlled environmental location, the operating temperature shall be between -40°F to +158°F (40°C to +70°C). For those applications within a controlled environmental location (including ventilated traffic cabinets), the operating temperature shall be between -40°F to +140°F (-40°C to +60°C).

In accordance with TIA-568-C.3 *"Optical Fiber Cabling Components Standard"*, the color coding requirements for fiber optic connector and adapter plug bodies are based upon fiber type as follows:

Fiber Type	Color Code
Singlemode	Blue
Multimode	Beige

2. ACCEPTABLE INSERTION LOSS.

Fiber Optic Connectors shall not exceed the following losses:

Connector Type	Installation	Max. Loss	Return Loss
ST Singlemode	Field	0.30 dB	40 dB
ST Singlemode	Factory	0.25 dB	45 dB
ST Multimode	Field	0.30 dB	n/a
ST Multimode	Factory	0.25 dB	n/a
FC Singlemode	Factory	0.25 dB	45 dB
LC Singlemode	Factory	0.20 dB	50 dB

(e) FIBER DISTRIBUTION EQUIPMENT.

The following distribution equipment specifications cover installations of distribution units from the headend and hub, primary fiber distribution units (PFDU) to secondary fiber distribution units (SFDU) which are utilized within the individual cabinets and communications closets within buildings.

1. PRIMARY FIBER DISTRIBUTION UNIT.

Primary fiber distribution unit shall be utilized within the primary hub and headend that is in support of the hub distribution system and the primary network. This point in the system allows the distribution of signals directly to the network electronics via a jumper/patch cord cable management system.

a. The PFDU is characterized by a modular, medium density construction.

TEST	PROCEDURE	RESULTS
Environmental:		
UV Resistance	ASTM G-26 for 740 hours	No loss in material strength.
Fungus Resistance	ASTM G-21	Zero rating.
Water Immersion	20 foot (6.10 m) depth for 7 days	No water intrusion.
Freeze/Thaw	Ten 28 hour freeze/thaw cycles from -40°F to 158°F (-40°C to 70°C)	No loss in material strength.
Salt Fog	30 days	No damage to metallic parts.
Acidified Saltwater	90 days in a salt/sulfuric acid bath (sulfuric acid, 0.2N sodium hydroxide)	No damage to metallic parts.
Chemical Immersion	24 hours at 100°F (37.78°C) in kerosene	No loss in material strength (Closure Body Material)
Gasket Material	sulfuric acid, 0.2N sodium hydroxide, gasoline, wasp spray	Weight change less than 10%
Compression Set	212°F (100°C) for 22 hours	<22%
Mechanical:		
Impact	100 ft-lbf at 104°F (40°C) and 0°F (-18°C)	No mechanical damage.
Torsion	10 twists at 104°F (40°C) and 0°F (-18°C)	No mechanical damage or loss of seal.
Bending	25 bends at 104°F (40°C) and 0°F (-18°C)	No mechanical damage or loss of seal.
Drop	drop from 30 inches at 104°F (40°C) and 0°F (-18°C)	No mechanical damage.
Compression	300 lbf for 15 min. at 104°F (40°C) and 0°F (-18°C)	No mechanical damage.
Cable Pullout	100 lbf for 30 min.	No cable movement.
Electrical:		
Current Surge	300 amps/10 secs.	No damage to bonding hardware.
Bond Clamp Retention	20 lbf for 1 min.	No bond clamp movement.

The Contractor shall use splice closures that seal around cables with mechanical processes. The splice closure shall have flexible thermoplastic rubber end seals with pre-template cable ports.

All splice closures shall be totally re-enterable without damage to fiber optics or their jackets. The splice closure end cap shall be capable of accepting additional cables without removal of the sheath retention or strength member clamping hardware on previously installed cables or disturbing existing splices. The optical fiber splice closure shall provide a clamping mechanism to prevent piston movement of the central member or strength members and to prevent cable sheath slip or pullout.

The splice closure housing shall be a high density polyethylene body design. The splice closure shall have corrosion resistant aluminum or stainless steel hardware. It shall be resistant to solvents, stress cracking, and creep. The housing materials shall also be compatible with chemicals and other materials to which they might be exposed in normal applications.

The installation of the splice closure shall not require specialized tools or equipment, other than those normally carried by installation crews.

(g) MESSENGER WIRE AND DOWN GUY.

The Contractor shall furnish and install messenger wire, down guy, mounting hardware, and all other materials as necessary to provide a support for fiber optic cable, in accordance with the provisions of the Section and the details included on the Plans.

Messenger wire shall consist of a 7-wire stranded cable manufactured and provided with a Class A zinc coating in accordance with ASTM-A475. Messenger wire shall be extra high-strength grade steel (EHS) with a 1/4 inch {6.4 mm} nominal diameter and a minimum breaking strength of 3,136 pounds {14.0 kN}..

All cable attachment hardware and materials shall be new and galvanized. Cable attachment hardware and materials shall include, but not limited to: pole attachment hardware, cable ties and straps, lashing, extension arms, and pole extensions. Re-use of existing cable attachment hardware shall not be permitted.

Cable attachment hardware shall be in general conformance to the details shown on the Plans.

(h) CONDUIT AND BURIED DUCT.

1. CONDUIT.

Conduit furnished shall be metallic or non-metallic, of the size shown on the plans. All conduits shall be homogeneous and shall have no visible cracks or holes. Conduit and fittings shall carry a UL label (Conduit -on each 10 foot length; Fittings -stamped or molded on each fitting).

All work shall be done in a workmanlike manner to meet the highest industry standards all in accordance with the requirements of the latest editions of the National Electrical Code (NEC) and National Electrical Safety Code.

a. Non-Metallic Conduit (Exposed)

All non-metallic conduit installed exposed (above ground) shall be Schedule 80 polyvinyl chloride (PVC) and comply with National Electrical Manufacturers Association (NEMA) Standards Publication No. TC-2. All polyvinyl chloride (PVC) conduit and fittings shall conform to UL Standard Publication No. 651-1995, *"Schedule 80 Rigid PVC Conduit"* and ANSI Standard Publication ANSI/NEMA TC 2-1983, *"Electrical Plastic Tubing (EPT) and Conduit (EPC-80)"* TC-3 for fittings.

Maximum spacing between supports and spacing between expansion fittings shall be as shown on the Plans or, if not shown, according to the manufacturer's recommendations.

b. Non-Metallic Conduit (Underground)

All non-metallic conduit installed underground shall be Schedule 40 polyvinyl chloride (PVC) and comply with National Electrical Manufacturers Association (NEMA) Standards Publication No. TC-2; or black high density polyethylene (HDPE) Type III, Grade 34, Class C, Category 5 formed to Schedule 40 dimensions for diameter, wall thickness and weight per thousand feet to meet NEMA TC-2.

All polyvinyl chloride (PVC) conduit and fittings shall conform to UL Standard Publication No. 651-1995, *"Schedule 40 Rigid PVC Conduit"* and ANSI Standard Publication ANSI/NEMA TC 2-1983, *"Electrical Plastic Tubing (EPT) and Conduit (EPC-40)"* TC-3 for fittings.

Maximum spacing between supports and spacing between expansion fittings shall be as shown on the Plans or, if not shown, according to the manufacturer's recommendations.

c. Metallic Conduit

All metallic conduits shall be galvanized rigid steel, thick wall, unless otherwise shown on the Plans. All galvanized rigid conduit shall conform to UL specification No. 6-2000, *"Standard for Rigid Metallic Conduit"*, and ANSI Standard Publication No. C80-1-1977, *"Rigid Steel Conduit Zinc - Coated (GRC)"*. All metal accessories and fitting used with the conduit shall be compatible and shall meet the galvanization requirements of the State of Alabama Standard Construction Specifications.

TEST METHOD	TEST SPECIFICATION	TEST VALUE/UNITS
Standard Weight	ASTM-D2103	20 lbs/100 feet
Thickness-overall	ASTM-D2103	4 mil
3 in. Tensile Break-MD	ASTM-D882	35 lbs/ft
3 in. Tensile Strength-MD	ASTM-D882	4 kpsi
3 in. Tensile Break-TD	ASTM-D882	38 lbs/ft
3 in. Tensile Strength-TD	ASTM-882	5 kpsi
Elongation-MD	ASTM-882	530%
Elongation-TD	ASTM-882	660%
Tear Strength	ASTM-D2261	1.5 lbs/ft

2. "TONE WIRE".

The detectable "tone wire" shall be made of No. 14 AWG solid copper, jacketed ground wire.

(k) COMMBOX.

1. CommBox.

CommBoxes shall have the following properties: lightweight, high strength, resistance to sunlight, resistant to petrochemicals, unaffected by freeze/thaw cycles, straight sided, flush fit with sidewalk or grass, no grounding required, and be capable of anchor inserts to allow for mounting rail attachment. All CommBoxes shall be of one (1) piece box construction, no stacking of box sections allowed. ALDOT approved CommBoxes for use in a fiber optic environment are as follows:

TYPE	NOMINAL SIZE	ADDITIONAL REQUIREMENTS
F1 CommBox	24 in. x 36 in. x 30 in. deep {61cm x 91 cm x 76 cm}	open bottomed one-piece box with cover
F2 CommBox	30 in. x 48 in. x 36 in. deep {76 cm x 122 cm x 91 cm}	open bottomed one-piece box with cover

CommBoxes shall be manufactured of a composite mixture of polymer and concrete and reinforced by a heavy-weave fiberglass creating a material compressive strength of no less than 110 psi. Each CommBox shall have a minimum enclosure vertical design load of 22,500 lbs. {10,206 kg} and test load of 33,750 lbs. {15,309 kg} over a 10 inch by 10 inch {254 mm by 254 mm} area and be designed and tested to temperatures of -50°F {-46°C}.

CommBoxes shall include manufacturer recommended cable rack for storage of cable slack and splice closures. The cable rack shall be hot dipped galvanized, stainless steel or other approved non-corrosive metallic material. The Contractor shall submit, for Engineer approval, the cable rack shop drawings/cut-sheets of the materials and installation.

2. Cover (Top).

All CommBoxes shall be supplied with a heavy duty cover having a minimum elastic design load of 15,000 lbs. {6803 kg} tested to 22,000 lbs. {8423 kg} over a 10 inch by 10 inch {254 mm by 254 mm} area. All covers shall be produced to the AASHTO H-10 Cover Rating and meet (ASTM C857) load test, 22,000 lbs. {8423 kg} performed as stated in AASHTO T280-87, *"Standard Method of testing for concrete pipe, section, or tile"*, Section 5. (Also, reference ASTM C497.)

All covers shall be supplied with a minimum of two (2) stainless steel hex head bolts with stainless steel washers used to secure the cover to the CommBox.

adjustable shelves. A drawer that opens or is capable of sliding in and out should be provided at all ITS Cabinets for placing a notebook/laptop computer.

Two position bar stops should be provided on top and bottom of each door.

The Contractor shall provide ITS Cabinets with fully wired back and side panels with all necessary terminal boards, wiring harnesses, connectors, and attachment hardware for each ITS Cabinet location. All equipment shall be shelf-mounted. All terminals and panel facilities shall be placed on the lower portion of the field cabinet walls below all shelves.

The Contractor shall provide two (2) ground fault interrupt 15A duplex receptacles (NEMA 5-15R) in each ITS Cabinet. Mounted power strip outlets shall be provided near the top of each ITS Cabinet. The power strip shall incorporate eight (8) NEMA 5-15R receptacles. The power strip receptacle shall face the back of the cabinet and shall be recessed within the cabinet rack to provide a minimum spacing of three (3) inches between the outlet's face and the cabinet door when the door is closed.

A plastic documentation pouch to store the ITS Cabinet and equipment documentation shall be provided. Pouch shall be side-opening, reseal-able, opaque, and of a heavy-duty plastic material. Pouch shall have metal or hard-plastic reinforced holes for hanging from hooks included on the cabinet door. The pouch shall be of the size and strength to easily hold all wiring diagrams, equipment documentation and the maintenance logbook.

Only circuit breakers that are UL approved and plainly marked with trip and frame sizes and ampere rating shall be used. All circuit breakers shall be quick-make, quick-break on either automatic or manual operation. Ensure that contacts are silver alloy and enclosed in an arc-quenching chamber.

Overload tripping shall not be influenced by an ambient air temperature range from -0.5°F to +122°F {-18°C to 50°C}. Minimum interrupting capacity shall be 5,000 amperes RMS.

Use only circuit breakers that are standard panel-mount or channel-mount devices. Use bussbars fabricated from a copper alloy material compatible with copper wire. Only use bussbars for termination of ground or neutral conductors.

The earth ground bussbar shall have at least two positions capable of terminating a No. 6 AWG conductor. If using more than one ground bussbar in the cabinet, they shall be interconnected with a minimum of a No. 10 AWG conductor. These conductors shall meet the Electrical Cable requirements within these Specifications.

Use terminal blocks and strips with voltage and current ratings greater than the voltage and current ratings of the wires that are terminated on the blocks or strips. Make the terminal block for the 120 VAC cabinet service entrance (SE) a tubular clamp compression device that is fully insulated (Marathon 1103P or approved equivalent). Terminal blocks for 120 VAC power wiring (TB1, TB2) shall be on dual-screen barrier type terminal blocks with 9/16 in. {14.3 mm} spacing using nickel-plated brass 8-32 phillips slot screw and fork terminal lugs (Cinch 142 or approved equivalent). TB1 shall have at least eight (8) terminal positions. TB2 shall have a minimum of eight (8) terminal positions. Do not use compression-type or tubular clamp terminal blocks except for service entrance block. Spade lug terminals for any terminal block shall not be used.

(n) ELECTRICAL POWER SERVICE ASSEMBLY.

Electrical power service assembly shall consist of equipment to provide a pole attached raceway and disconnect switch for use with power cable routed from the service entrance to the cabinet. The electrical power service assembly shall include a weather head, conduit and fittings, a disconnect switch with enclosure, and attachment clamps.

734.03 Construction.

(a) GENERAL.

All installations shall comply with the regulations of the latest edition of the National Electrical Code and the latest edition of the National Electrical Safety Code (NESC) and local utility regulations.

Coordination with roadway work and with bridgework shall be of prime importance to prevent undue damage to completed items of work and to existing facilities. Any damage to existing facilities caused by the installation of the material or equipment required under this **Section 734** shall be repaired by the Contractor at no additional cost to the Department.

(b) DRAWINGS AND SPECIFICATIONS.

Omissions from the plans and specifications or the misdescription of details of work which are evidently necessary to carry out the intent of the plans and specifications or which are customarily performed, shall not relieve the Contractor from performing such omissions and details of work. In any case of discrepancy in descriptions on the plans or in these Specifications, the matter shall be promptly submitted to the Engineer, who will make a determination in writing. Any adjustments in the plans, details, specifications, and proposal by the Contractor without written permission of the Engineer shall be at the Contractor's own risk and expense

(c) MATERIAL AND EQUIPMENT LISTS, SHOP DRAWING APPROVAL.

Material and equipment listings shall be submitted to the Design Bureau's Traffic Section for approval within thirty (30) calendar days after the issuance of the "Notice to Proceed". Partial listings and shop drawings will not be accepted for consideration and shall be returned for correction without review.

Five (5) copies of each submittal shall be furnished for review. Material and equipment lists shall include catalog cutouts or published data sheets and shall be completed on the Department's Material Submittal Form. The submittal form shall have each item sequentially numbered, a reference to the Specification Section and/or plan sheet, and a description of the material. The description shall include the type, model number, catalog number, and manufacturer, and shall include a legible manufacturer's catalog cut sheet with each item being submitted clearly identified. All individual components of assembled equipment shall be itemized on the submittal form. Submittals shall be clear and complete. Pay Items are not to be referenced on the form.

Unacceptable items on the submittal form will be returned for corrective action. A copy of the approved material and equipment listings will be returned to the Contractor.

Any changes to the approved material and equipment lists must be requested in writing through proper channels.

If requested by the Engineer, the Contractor shall submit for inspection and approval samples of both the specified and proposed substitute items at no cost to the Department. The Department will not be liable for any materials purchased or work done or any delay incurred before such approval. Failure of the Engineer to note unsatisfactory material as received will not relieve the Contractor from responsibility. Manufacturers' warranties and guaranties furnished on equipment used in the work shall be delivered to the Engineer; likewise, instruction sheets and parts lists shall be delivered to the Engineer upon receipt of the equipment.

Throughout the entire project, the same manufacturer shall make all units of any one item, such as poles, cables, distribution hardware, splice closures, CommBoxes, pull boxes, ethernet switches, etc.

(d) FIBER OPTIC TECHNICIAN QUALIFICATIONS.

The Fiber Optic Technician qualifications shall be submitted with the Material Submittal package for approval. The Contractor shall have the Engineer's approval of the Fiber Optic Technician's qualifications prior

It shall be the Contractor's responsibility to protect reeled cable from vandals or other sources of possible damage while unattended. The sections of cable intended for duct installation are produced to meet specific length requirements. Any damage to the cable sections may require replacement of the entire section, at the discretion of the Engineer.

The Contractor shall be responsible for damage to the cable during handling and placing, and responsible for all cost to replace damaged fiber optic cable.

Whenever unreeled cable is placed on the pavement or surface above a manhole, the contractor shall provide barricades or other means of preventing vehicular or pedestrian traffic through the area.

The "figure-eight" configuration shall be used. Fiber optic cable should not be coiled in a continuous direction except for lengths of 100 feet {30.48 m} or less. The preferred size for the "figure-eight" is about 25 feet {7.62 m} in length, with each loop 9 feet {2.74 m} to 14 feet {4.27 m} in diameter. Traffic cones spaced 10 feet {3.05 m) apart are useful as guides during "figure-eighting". When "figure-eighting" long lengths of cable, care should be taken to relieve pressure on the cable at the crossover of the eight.

2. BEND RADIUS.

When under tension during pulling the minimum bend radius is twenty (20) times the diameter of the cable.

When not under tension, the minimum recommended long term bend radius is ten (10) times the cable diameter, unless manufacturer's recommendations differ, in which case the manufacturer recommendations shall be used.

3. INSTALLATION STANDARD OPERATION PLAN (SOP).

a. MANUFACTURER'S SOP.

The Contractor shall submit the manufacturer's Standard Operating and Installation Procedures (SOP) with the Material Submittal for all fiber optic cable installed as part of project.

b. CONTRACTOR'S INSTALLATION PLAN.

The Contractor shall submit to the Engineer for approval a detailed installation plan for all fiber optic cable installed as part of this project. The Contractor shall have the Engineer's written approval prior to commencing any fiber optic cable installation.

This installation plan shall include all proposed end-to-end cable splice points. The Contractor will be required to limit the amount of splice points within the network and maximize the length of each cable run. Reel lengths shall be submitted by the Contractor and approved by the Engineer prior to the ordering of the fiber optic cable.

4. DESIGNATED CABLE SLACK (MAINTENANCE COIL).

Throughout the fiber optic cable installation the Contractor shall be required to pull and store excess cable slack at designated intervals. The following lengths of slack cable shall be minimums used unless otherwise shown on the Plans:

CommBox F1	50 ft {15.3 m}
CommBox F2	100 ft. {30.5 m}
Pull Box	50 ft. {15.3 m}
Controller Cabinet	50 ft. {15.3 m}
Hub Building	100 ft. {30.5 m}
TMC/TCC (OSP Entrance)	100 ft. {30.5 m}

5. SLACK STORAGE.

The Contractor shall not leave slack cable lying free on the ground, bottom of a CommBox, bottom of a pull box, or floor of a Hub/TMC/TCC. Only during the actual pulling process will this be allowed.

b. Manufacturer/Model of fusion splicer.

c. Form of splice protection.

The Contractor shall only splice fibers at locations as shown on the Plans unless otherwise approved by the Engineer.

All splices shall be protected and stored in fiber optic splice units or integrated fiber optic splice and termination units that are housed in field cabinets, pull boxes, CommBoxes, hubs, and other buildings.

The Contractor shall document all splice and terminations on forms provided by the Engineer. No payment for splices or terminations shall be made unless forms have been accurately completed by the Contractor and approved by the Engineer.

12. FIBER CLEANING.

The Contractor shall remove all water blocking gel from each exposed fiber and/or buffer tube prior to the placement of fanout kits, the splicing, or the termination of fiber. The solvent chosen for this task shall dissolve the gel and allow for a complete removal of all solvent residues. The solvent shall not remove any of the color from the individual fiber or buffer tubes and shall not prove harmful to the outer PE jacket of the cable itself. The cable manufacturer's recommendations shall be followed concerning the solvent required to clean the coated fibers.

13. LABELING.

The Contractor shall label with a unique identification all fiber optic cabling in a permanent and consistent manner that is approved by the Engineer prior to installing fiber cable. The Engineer shall provide the Contractor with the identifications to be used.

All tags shall be of a material designed for long term permanent labeling of fiber optic cables and shall be marked with permanent ink on non-metal types or embossed lettering on metal tags. Metal tags shall be constructed of stainless steel. Non-metal label materials shall be approved by the Engineer. Labels shall be affixed to the cable per the manufacturer's recommendations; and, shall be affixed in a manner which will not cause damage to the fiber. Handwritten labels shall not be allowed.

(g) DETECTABLE TAPE SYSTEM INSTALLATION.

The Contractor shall place the tone wire within the same ground cut/ditch as the conduit as shown on the Plans. The tone wire shall be placed directly on top of the conduit. The tone wire shall begin within a Commbox, leaving 10 feet {3m} of slack within said Commbox and continuing unbroken to the next Commbox where there shall be left 10 feet {3m} of slack. The cut shall then be backfilled as shown on the Plans. The cut/ditch shall be completely filled in and prepared to its original state or as specified by the Engineer.

Splicing is only allowed at CommBoxes.

Tone wire splices shall be waterproof butt splices.

Where multiple pulls of fiber optic communications cable are required in the same ground cut/ditch, only one tone wire is required.

NOTE 1: All splices of tone wire shall be visually inspected by the Engineer prior to the covering of the tone wire.

NOTE 2: Payment shall be authorized only after successful toning of the completed duct segment by the Contractor in the presence of the Engineer. No payment shall be authorized for trench, conduit or detectable tape marking system for any segment that cannot be successfully toned.

1. Prepare the excavation a minimum of 18 inches deeper than the depth of the CommBox. Add a minimum 18 inch of crushed rock (ALDOT #57) for drainage as required to bring the top of the box to finished grade level.
2. Place CommBox in hole and top of the CommBox flush with the surrounding grade or set at the planned finished grade.
3. While CommBox cover is in place, fill and compact soil to grade level.
4. If grade level is raised later, the CommBox can be pulled up and bricked at the bottom with one brick per side (four). The cavity produced by this raising shall be eliminated by the addition of crushed rock (ALDOT #57).

Holes drilled in CommBox must not be more than 1/4 inch {6.35 mm} larger than conduit diameter. Seal conduit ends inside all non-metallic junction boxes with at least 2 inches {51 mm} thick duct caulking after wires are installed.

(k) EXCAVATING AND BACKFILLING.

All excavation required for the installation and placement of conduits, foundations, CommBoxes, poles and other appliance shall be performed in such manner as to cause the least possible injury to pavement, curbs or other improvements.

Trenches shall not be excavated wider than necessary for the proper installation of wires and fiber optic cables. Excavating shall not be performed until immediately before installation of conduit and other appliances. The material from the excavation shall be placed in a position where the least interference with the surface drainage will occur.

All surplus excavated material shall be removed from and disposed of by the Contractor, as directed by the Engineer.

Compaction shall be accomplished to the extent necessary to prevent future settlement of the backfill.

The Contractor shall be required to restore any areas disturbed by his work to their original condition without additional cost to the Department.

(l) WIRING INSTALLATION REQUIREMENTS.

Wiring within pull boxes, junction boxes and CommBoxes shall be neatly arranged and laced.

All ends of hardwire shall be taped to exclude moisture and shall be so kept until splices are made and terminal appliances attached.

The ends of spare conductors shall be taped. End of fiber optic cables shall be protected from moisture by methods as shown on the Plans or as approved by the Engineer.

(m) ELECTRICAL POWER SERVICE SUPPLY.

The entity that will be responsible for the eventual operation and maintenance of the ITS equipment will make application for electrical service upon notification that power service will be required. The Contractor shall inform the Engineer when power service is required at least 30 calendar days prior to the need of the power service. This same entity will be responsible for the cost of the service connection and the monthly service billings thereafter.

The location of the utility service point and power source shown on the Plans is approximate. The Contractor shall determine the exact location, voltage, procedure, and materials required by the utility company.

When the service equipment is to be installed on a utility-owned pole, the Contractor shall furnish and install conduit, conductors, and other necessary material to complete the installation of the service. The position of the riser and equipment will be determined by the utility company.

foundation. The ITS cabinet should be mounted as shown on the Plans or as directed by the Engineer. Furnish and install the equipment cabinet assembly to include all devices/components, assembly, wiring and materials.

2. CABINET ASSEMBLY INSTALLATION.

The Contractor shall install the ITS cabinet assembly as shown on the Plans. The Contractor shall provide the ITS cabinet assembly with a ground. The Contractor shall measure the resistance to ground at each ITS cabinet location in the presence of the Engineer. This resistance to ground test for ITS cabinet installations shall not exceed 10 ohms, instead of the below referenced value of 25 ohms. The Contractor shall not splice the ground conductor between the cabinet grounding terminal and the ground rod. The Contractor shall isolate and insulate the ground conductor from any utility grounding equipment. The Contractor shall completely isolate the cabinet assembly grounding system from any other grounding system, including the support pole grounding system, such that there is no electrical bond between any equipment and any other grounding system.

The Contractor shall enclose all cabling and wiring entering the cabinet housing in conduit. The Contractor shall securely and neatly dress all cabling and wiring inside the cabinet, including field wiring. The Contractor shall provide sufficient slack, minimum 2 feet {600 mm}, for cabinet equipment maintenance and re-termination of the field wiring. The Contractor shall route fiber drop cables into the cabinet to provide as much physical protection as possible; secure these drop cables through-out the cabinet; and, strain-relieve these drop cables within the fiber termination unit.

3. WIRING, CONDUCTORS AND TERMINAL BLOCKS.

The Contractor shall use stranded copper for all conductors, including those in jacketed cables, except for earth ground conductors, which may be solid copper. Neatly arrange all wiring, firmly lace or bundle it, and mechanically secure the wiring without the use of adhesive fasteners. All wiring and cabling shall be routed and secured to avoid sharp edges and to avoid conflicts with other equipment or cabling. Terminate all wiring on a terminal block, strip, bussbar, or device clamp or lug; do not splice any wiring. Use a minimum No. 12 AWG for all conductors of 120 Volts AC circuits.

4. SURGE SUPPRESSION.

Protect all copper wiring and cabling entering the cabinet housing, except for the earth ground conductor by surge suppression devices. Terminate all wiring between cabinet devices and the transient surge suppressors, except for the video signal coaxial feed, on terminal strips. Use a minimum No. 16 AWG grounding of each surge suppression device, or larger if recommended by the surge suppression device manufacturer. Insulated green wire and connected the ground wire directly to the ground bussbar. Do not "daisy chain" with the grounding wires of other devices including other surge suppressors. Dress and route grounding wires separately from all other cabinet wiring. Install grounding wires with the absolute minimum length possible between the suppressor and the ground bussbar. Label all surge suppressors with silk-screened lettering on the mounting panel.

Use minimum No. 18 AWG insulated black wiring between the surge suppression device sockets and the terminal blocks for the protected circuits.

5. COMPONENT INSTALLATION.

All components/devices of the ITS cabinet assembly shall be rack mounted with Phillips-head machine screws. Install screws into tapped and threaded holes in the panels. These components/devices include but are not limited to terminal blocks, bussbars, panel and socket mounted surge suppressors, circuit breakers, accessory and equipment outlets, RVD interface, video encoders, fiber distribution units

4; ASTM-D1603; ASTM-D3895; ASTM-D4565; GR-20-CORE, Table 6 MDPE; FOTP-3; FOTP-25; FOTP-33; FOTP-37; FOTP-41; FOTP-61, FOTP-81; FOTP-82; FOTP-85; FOTP-98; FOTP-104; and EIA/TIA-455-181.

2. GENERAL RECEIVING TEST.

The Contractor shall provide the Engineer the fiber cable manufacturer's Optical Time Domain Reflectometer (OTDR) test results prior to installation of fiber optic cable.

The Contractor shall test the fiber optic cable before beginning any installation. The test shall be done in the Contractor's yard in the presence of the Engineer. One strand per buffer tube shall be tested with the OTDR. The OTDR should be calibrated to show anomalies of 0.2 dB minimum. The Contractor shall provide the Engineer documentation verifying calibration of the OTDR. When there is evidence of physical damage or when any damaged strand is found the Contractor shall test every strand.

The fiber optic cable shall be tested for continuity while on the reel using a visible light "fiber optic tracer" or "pocket visual fault locator". A typical Power/Light Meter Test consists of the following steps/conditions:

a. Connect the light source to the connectorized fiber at the location identified by the Engineer. Connect a power meter to the other end of the fiber at the location identified by the Engineer. Record the results in accordance to standard industry practice and submit the test report to the Engineer.
b. Use the light frequencies of 1310 nm and 1550 nm for single-mode unless otherwise directed by the Engineer.
c. Use the light frequencies of 850 nm and 1300 nm for multimode unless otherwise directed by the Engineer.
d. Perform the test bi-directional.
e. A Department Inspector shall witness and approve the results before final approval by the Engineer.

The Contractor and Engineer shall jointly inspect and test all reels of cable for damage prior to installation.

The fiber optic cable shall meet the following factory attenuation criteria:

a. Cable attenuation of singlemode fiber at 1310 nm shall be 0.4 dB/km or less.
b. Cable attenuation of singlemode fiber at 1550 nm shall be 0.3 dB/km or less.
c. Cable attenuation of multimode fiber at 850 nm shall be 3.5 dB/km or less.
d. Cable attenuation of multimode fiber at 1300 nm shall be 1.0 dB/km or less.
e. Strand lengths are consistent.
f. Launch Transition < 0.6 dB.
g. No event > 0.10 dB.

The Contractor and the Engineer will sign the manufacture's packing slip after testing and inspection has successfully been completed. No fiber optic cable shall be installed prior to the receiving test and the signature of the Engineer.

3. INSTALLATION TESTING OF REQUIRED FIBER OPTIC CABLE.

Upon completion of the installation of fiber cables, drop cables, splices, and prior to splicing existing cable ends, each and all fibers within each section of the required cable shall be tested.

The Contractor shall test all newly installed (required) fiber cable within this project. The test shall be conducted at: 1310nm and 1550nm singlemode; and, 850nm and 1300nm multmode light frequencies. This test is to be performed with an Optical Time Domain Reflectometer (OTDR) by the certified Fiber Optic Technician. From these tests a graphic representations shall be produced of the fibers, known as "traces". The traces shall demonstrate dB/km loss not to exceed +3% of the factory test documentation that came with that reel of fiber or

letter setting forth the dates of the guarantee giving a telephone number and a person to contact for any required warrantee service.

734.04 Method of Measurement.

The Fiber Optic Systems shall be measured for payment by the appropriate items complete, in place, acceptably installed and operational in accordance with the following:

Item 734-A:

Accepted Fiber Optic Cable (Outside Plant) Loose Tube with number and type of fibers indicated shall be measured in linear foot {meter} to the nearest foot {meter}.

Accepted Messenger Wire shall be measured in linear foot {meter} to the nearest foot {meter}.

Item 734-B:

Accepted Fiber Optic Drop Cable (Outside Plant) Central Core with number and type of fibers indicated shall be measured in linear foot {meter} to the nearest foot {meter}.

Item 734-E:

Accepted Buried Duct, High-Density Polyethylene (HDPE) SDR11 Conduit with number and size of conduit indicated shall be measured in linear foot {meter} to the nearest foot {meter}.

Accepted PVC Conduit with number and size of conduit indicated shall be measured in linear foot {meter} to the nearest foot {meter}.

Accepted Detectable Tape System shall be measured in linear foot {meter} to the nearest foot {meter}.

Items 734-F:

Accepted Distribution Hardware of the type indicated shall be measured by each unit installed.

Items 734-G:

Accepted Splicing, Fusion shall be measured by the actual number of splices made. Fiber optic splices associated with the use of factory-connectorized patch cords will not be measured separately for payment.

Accepted Connector of the type indicated shall be measured by each unit installed.

Accepted Splice Closure of the type indicated shall be measured by each unit installed.

Items 734-H:

Accepted Patch Cord Duplex of the type indicated shall be measured by each unit installed.

Accepted Fanout Kit of the type indicated shall be measured by each unit installed.

Items 734-I:

(Messenger cable and conduit are separate pay items.)

Fiber Optic Drop Cable (Outside Plant) Central Core shall be paid for:

1. 40% the contract unit price upon successful completion of Section 734, GENERAL RECEIVING TEST.
2. Additional 30% of the contract unit price upon completion of the INSTALLATION TESTING OF REQUIRED FIBER OPTIC CABLE and accepted in writing by the Engineer.
3. Final 30% of the contract unit price upon completion of the Acceptance Test according to these Specifications.

Item 734-E. Buried Duct HDPE SDR11 Conduit, measured as noted above, will be paid for at the contract bid price, which shall be full compensation for furnishing and installing, as indicated on the Plans, complete with all necessary brackets, coupling, conduit lubricant, accessories, supports, attachment hardware, hardware, fittings, trenching, placing, joining, attaching to structure, backfilling, seeding and mulching of disturbed areas, disposal of debris, and all materials, labor, equipment, tools and incidentals to complete this item of work.

Buried Duct HDPE SDR11 shall be paid for:

1. 40% the contract unit price upon receipt of materials.
2. Additional 30% of the contract unit price upon completion of the INSTALLATION TESTING OF REQUIRED FIBER OPTIC CABLE and accepted in writing by the Engineer.
3. Final 30% of the contract unit price upon completion of the Acceptance Test according to these Specifications.

Item 734-E. Conduit PVC, measured as noted above, will be paid for at the contract bid price, which shall be full compensation for furnishing and installing, as indicated on the Plans, complete with all necessary brackets, coupling, conduit lubricant, accessories, supports, bridge attachment hardware, hardware, fittings, trenching, placing, joining, attaching to structure, backfilling, seeding and mulching of disturbed areas, disposal of debris, and all materials, labor, equipment, tools and incidentals to complete this item of work.

Conduit PVC shall be paid for:

1. 40% the contract unit price upon receipt of materials.
2. Additional 30% of the contract unit price upon completion of the INSTALLATION TESTING OF REQUIRED FIBER OPTIC CABLE and accepted in writing by the Engineer.
3. Final 30% of the contract unit price upon completion of the Acceptance Test according to these Specifications.

Item 734-E. Detectable Tape System, measured as noted above, will be paid for at the contract bid price, which shall be full compensation for furnishing and installing, as indicated on the Plans with materials, tone wire, labor, equipment, tools and incidentals to complete this item of work.

3. Final 30% of the contract unit price upon completion of the Acceptance Test according to these Specifications.

Item 734-G. Splice Closure, measured as noted above, will be paid for at the contract bid price, as indicated on the Plans, which shall be full compensation for furnishing and installing complete in place, all hardware, splice organizer, splice trays, mounting brackets, accessories, labor, equipment, materials, tools and incidentals necessary to complete this item of work.

Splicing Closure shall be paid for:

1. 70% the contract unit price upon receipt of materials.
2. Final 30% of the contract unit price upon completion of the Acceptance Test according to these Specifications.

Item 734-H. Patch Cord Duplex, measured as noted above, will be paid for at the contract bid price which shall be full compensation for furnishing and installing complete in place, as indicated on the Plans, of functional length required to connect the associated equipment and FDUs, and for all materials, labor, tools, equipment, transportation, and incidentals required to complete this item of work.

Patch Cord Duplex shall be paid for:

1. 70% the contract unit price upon receipt of materials.
2. Final 30% of the contract unit price upon completion of the Acceptance Test according to these Specifications.

Item 734-H. Fanout Kit, measured as noted above, will be paid for at the contract bid price, which shall be full compensation for furnishing and installing complete in place, as indicated on the Plans, of functional length required to connect the associated equipment and for all labor, tools, equipment, materials, transportation, and incidentals required to complete this item of work.

Fanout Kit shall be paid for:

1. 70% the contract unit price upon receipt of materials.
2. Final 30% of the contract unit price upon completion of the Acceptance Test according to these Specifications.

Item 734-I. ITS Cabinet, Pole Mount, Removal measured as noted above, will be paid for at the contract bid price, which shall be full compensation for removing existing ITS cabinet as shown on the plans, and for all labor, tools, equipment, materials, transportation, and incidentals required to complete this item of work.

ITS Cabinet, Pole Mount, Removal shall be paid for:

1. 70% the contract unit price upon receipt of materials.

734-B Drop Cable OSP (_4_)F (_2_) Central Core – per linear foot {meter}

734-E Buried Duct HDPE SDR11 (_5_) Inch – per linear foot {meter}

Conduit PVC Schedule 40 (_5_) Inch – per linear foot {meter}

Detectable Tape System – per linear foot {meter}

734-F Distribution Hardware SFDU (_1_) Fiber – per each

734-G Splicing, Fusion – per each

Connector (_6_) Termination (_2_) – per each

Splice Closure, (_7_), (_1_) Fiber – per each

734-H Patch Cord Duplex (_2_) ST (_8_) – per each

Fanout Kit, (_2_) – per each

734-I ITS Cabinet, (_9_) Mount, Removal – per each

734-J CommBox, (_10_) – per each

734-M Riser Assembly – per each

734-S Fiber Storage Rack (Aerial) – per each

(1) Specify Fiber Count [6, 12, 18, 24, 36, 48, 60, 72, 96, or 144]
(2) Specify Fiber Type [SM or MM]
(3) Specify Fiber Hybrid Count and Type [12MM x 48SM]
(4) Specify Fiber Count [6 or 12]
(5) Specify Conduit Size [1, 1 1/4, 1 1/2, 2, 2 1/2, 3, 4, 6, 2 X 2]
(6) Specify Type [ST or FC]
(7) Specify Type [Aerial or Undergrade]
(8) Specify Length [1 Meter, 2 Meter, 3 Meter, 9 Meter]
(9) Specify Mount Option [Pole or Base]
(10) Specify Type [F1 or F2]

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: May 30, 2014 Special Provision No.: 12-1045

SUBJECT: Closed Circuit Television (CCTV) Camera.
Project No. NH-0006(551), Tuscaloosa County

Alabama Standard Specifications, 2012 Edition, shall be amended by the addition of Section 738 as follows:

SECTION 738
CLOSED CIRCUIT TELEVISION (CCTV) CAMERA

738.01 Description.

This Section shall cover the required work of removing, relocating, testing, and making operational an existing Closed-Circuit Television (CCTV) camera installation. This work shall be as shown on the Plans.

738.02 Materials.

All furnished materials and equipment shall be new and free from defects. Existing equipment shall only be used if shown on the Plans to be re-used. If cable is required for the reinstallation of the CCTV camera, it shall be of the type required by the manufacturer of the reinstalled CCTV camera.

All newly furnished CCTV camera mounting hardware shall be galvanized or non-corrosive material.

All cable attachment hardware and materials shall be new and galvanized. Cable attachment hardware and materials shall include: pole attachment hardware, cable ties and straps, extension arms, and pole extensions. Re-use of existing cable attachment hardware shall not be permitted.

All power cables and wiring shall conform to the requirements of the NEC.

738.03 Construction.

(a) GENERAL.

All installations shall comply with the regulations of the latest edition of the National Electrical Code (NEC) and the latest edition of the National Electrical Safety Code (NESC), and with the service rules of the utility company providing the electricity.

Coordination with roadway work and bridge work will be of prime importance to prevent undue damage to completed items of work and to existing facilities. Any damage to existing facilities caused by the installation of the material or equipment required under this Section shall be repaired by the Contractor at no additional cost to the Department.

The entity that will be responsible for the eventual operation and maintenance of the CCTV camera will make application for electrical service upon notification that power service will be required. The Contractor shall inform the Project Engineer when electrical power service is required at least thirty (30) calendar days prior to the need of the power service. This same entity will be responsible for the cost of the service connection and the monthly service billings thereafter.

(b) DRAWINGS AND OMISSIONS.

determines there are deficiencies that require repair, prior to the Contractor commencing the work, it will be the responsibility of the City to correct the deficiencies at no cost to the Contractor.

At least thirty (30) days prior to commencing work, the Contractor shall submit a written work schedule to the Project Engineer for approval. The plan should detail the methods and time sequence to be used in performing the work of this item. The CCTV camera site specified for relocation shall be out of service for the minimum time duration possible, and no more than three (3) calendar days once the Project Engineer directs the Contractor to reinstall the CCTV camera.

The Contractor shall reinstall the CCTV camera at locations as shown on the Plans. The Contractor shall mount the CCTV camera to provide full coverage within the project limits including mainline travel lanes, intersecting streets/roadways, and shoulders. The Contractor shall ensure that the installed camera provides unobstructed video of the roadway, traffic, and other current conditions around the roadside CCTV camera field site; that it responds to camera control signals from an operator of the system; and that the video images can be transmitted to remote locations interfaced to the system for observation.

Immediately following installation of the CCTV camera, the camera shall be tested to insure that it operates as accepted by the Project Engineer prior to removal. These tests shall be conducted in the presence of the Project Engineer. Any of these tests conducted without the Project Engineer present will be repeated at no cost to the project. If the Project Engineer determines that the equipment does not operate as prior to removal due to Contractor's neglect, the Contractor shall be liable for any repairs or equipment replacement as directed by the Project Engineer at no cost to the Department or City.

The Contractor shall reconnect all video and power cables to the CCTV camera, install new cable as shown on the Plans, and make connections in the cabinet such that the CCTV camera is operational. If directed by the Project Engineer, the Contractor shall make additional adjustments to the position of the camera once reinstalled.

All wiring shall be firmly laced or bundled, neatly arranged and mechanically secure without the use of adhesive fasteners. All wiring and cabling shall be routed and secured to avoid sharp edges. Cable, shield or conductor used for video, control, power supply, or grounding shall not be spliced.

The Contractor shall exercise extreme care to avoid damaging all equipment during the removal, storage, and reinstallation. Any damage to the equipment shall be repaired in a neat and workmanlike manner so that the equipment is restored to the original condition. If, in the judgment of the Project Engineer, the equipment cannot be restored back to its original condition, the Contractor shall be responsible for replacing the damaged equipment, in kind with new equipment at no additional cost to the Department or City.

(f) GROUNDING AND GROUND RESISTANCE TESTING.

The CCTV camera shall not be reinstalled until ground rods and wiring has been installed and ready for connectivity to the CCTV camera.

The Contractor shall install a minimum size of 5/8 inch x 10 foot {16 mm x 3.0 m} ground rod(s) at the base of the pole where CCTV camera is to be relocated and exothermically weld the ground wire to the ground rod. Bond the messenger cable to the ground wire using a clamp.

All metal enclosures containing electrical wires and equipment shall be grounded.

Single ground rods shall be driven vertically until the top of the rod is at least 12 inches {305 mm} below the finished grade.

Where a grounding conductor passes through a metal conduit, a suitable grounding bushing shall be placed on each end of the conduit and connected to a ground wire.

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: May 29, 2014 Special Provision No. 12-1051

SUBJECT: Rehabilitation of Roadway Lighting System,
Project Number NH-0006(551), Tuscaloosa County.

Alabama Standard Specifications, 2012 Edition, shall be amended by the addition of a new SECTION 751 as follows:

SECTION 751
REHABILITATION OF ROADWAY LIGHTING SYSTEM

751.01 Description.

This work shall consist of furnishing and installing all labor, materials, tools, equipment, and appurtenances for rehabilitating existing roadway lighting systems or to the extent indicated on the plans. All work shall be performed with the requirements of Article 751.02 hereinafter set forth.

The structural requirements (design and materials) for roadway lighting are addressed in Section 718.

751.02 Materials.

Materials shall meet the requirements given in Section 889.

Prior to purchasing materials, and within 30 days after the issuance of the "Notice to Proceed", the Contractor shall submit seven copies of a complete descriptive list of all materials (wiring, conduits, boxes, mounting hardware, power control devices, luminaires, luminaire poles, etc.) to the Engineer for approval. (The requirement for the submittal of structural designs and details is given in Section 718.) This information shall be submitted on the Department's Material Submittal Form furnished to the Contractor for this purpose. The submittal shall also include seven copies of "catalog cutouts" or published data sheets for each item on the list. Incomplete or inaccurate submittals will be returned to the Contractor for revision and resubmittal. Partial lists may be considered if prior approval for the submittal of a partial list is approved in writing by the Engineer.

Materials shall not be installed prior to approval. The Department will not be liable for materials purchased, work performed, or any delay incurred due to the failure of the Contractor to secure prior approval.

Failure of the Engineer to note unsatisfactory material as received at the job site will not relieve the Contractor of the responsibility of furnishing the required material.

751.03 Construction Requirements.

(a) CODE.

All work shall be done in accordance with the requirements given in the current edition of the National Fire Protection Association "NFPA 70, "National Electrical Code" (NEC) and the regulations and standards of the power company providing service.

(b) LICENSE.

The person responsible for the performance of the work shall be licensed as an Electrical Contractor by the Alabama Board of Electrical Contractors. The contractor shall submit a copy of the Electrical Contractor license to the Engineer as a part of the submittal of the list of materials proposed for installation.

At least one out of every three persons in each work crew shall be a licensed Journeyman Electrician. Journeyman Electricians shall be present and shall have direct involvement with all work required for the installation and operational testing of electrical materials and equipment. Journeyman Electricians shall be licensed by the Alabama Electrical Contractor's Board. The Journeyman

(e) JUNCTION BOXES.

The types of junction box shall be:

TYPE	INSTALLATION LOCATION	BOX MATERIAL
Type 1	Installed flush with grade.	Non-Metallic
Type 2	Installed on the surface of a structure.	Metal
Type 3	Installed flush with surface of a structure.	Non-Metallic
Type 4	As Shown on the Plans	As Shown on the Plans

(f) NONMETALLIC UNDERGROUND CONDUIT WITH CONDUCTORS.

Nonmetallic Underground Conduit with Conductors (NUCC) shall be installed in accordance with the manufacturer's recommendations.

If plowing is proposed for the installation of the NUCC, the manufacturer's recommended installation practices shall be submitted to the Engineer prior to beginning the installation. If the Engineer is not satisfied with the Contractor's performance and knowledge once installation begins, the Contractor shall arrange for a manufacturer's representative experienced in plowing methods to be at the jobsite until the Engineer determines that the Contractor is capable of properly installing the NUCC. If rock or other obstructions hinder plowing operations, the Engineer may require that conductor routes be pre-ripped to locate rock or hidden obstructions. Obstructions may be removed or the conductors routed around them as approved by the Engineer.

If the "Plow Pulling" method is used, the plow operator shall have an acceptable method to insure that the manufacturer's recommended maximum tensile force on the NUCC is not exceeded.

If at any time the Engineer determines the installation is not in full compliance with the intent of the manufacturer's recommended practices, the operation shall stop until a manufacturer's representative can further instruct the Contractor's personnel in the deficient areas.

If the "Chute Plowing" method is used, special attention shall be given to the conductor feed chute dimensions.

(g) CONDUCTOR INSTALLATION.

1. SPLICES AND TAPS IN CONDUCTORS.

Splices and taps in conductors shall only be made in junction boxes and pole bases. They shall be made with solderless split bolt connectors.

Splices and taps shall be protected in sealed in silicone gel filled enclosures to provide a waterproof connection and to ensure the required electrical insulation.

Silicone gel filled enclosures shall be re-enterable . The enclosure shall be sized for the number, size, and type of conductors contained in the enclosure. The enclosure shall be UV resistant, listed for temperatures from -40 °C to 90 °C, and shall be impact and abrasion resistant.

2. PULLING CONDUCTORS INTO CONDUIT.

Conductors shall not be pulled into a conduit until the installation of the conduit is complete. Conductors in conduits shall be carefully pulled into place using approved methods so that the conductors will not be damaged. Powdered soapstone, talc, or other inert lubricant specifically designed for the purpose shall be used when pulling conductors through the conduit. All conductors within a single conduit shall be pulled at the same time and shall be handled and installed in such a manner as to prevent kinks, bends or other distortion which could damage the conductor and outer covering. When conductors are pulled through hand holes, pole shafts, etc., a pad of firm rubber or other suitable materials shall be placed between the conductors and the edges of the opening to prevent damage to the conductors.

(h) GROUNDING.

All metal poles and metal enclosures containing electric wires and/or equipment shall be grounded. Exothermic welds or other approved connectors shall be used to connect the grounding conductor to the ground rods.

A continuous grounding conductor, either bare or having a green colored insulation, shall be extended from the service ground to all equipment and shall be used for grounding purposes only.

(i) LIGHTNING PROTECTION.

Lightning protection shall be installed as shown on the plans at all poles greater than or equal to 75 feet {22.8 m} in height.

(o) GROUND RESISTANCE TESTING.

The resistance to ground will be tested by the Engineer at each lighting control center . The test will be conducted using a null balance earth tester with auxiliary ground rods placed 50 feet {15.24 m} and 100 feet {30.48 m}, respectively, from the tested ground rod. A reading of 25 ohms or less is satisfactory. Any reading over 25 ohms will require the installation of additional ground rods to be placed in a pattern as directed by the Engineer. The Engineer may conduct additional ground resistance testing after the completion of the operational testing.

(p) TESTING LUMINAIRE LOWERING DEVICES.

The Contractor shall perform a functional test on all luminaire lowering devices. Tests shall be performed in the presence of the Engineer. The test shall be performed on the final completed lighting assembly with all luminaires and other components installed. The test shall be performed as follows:

- Start with the device in the latched position on top of the pole.
- Unlatch and lower the device support to ground level for inspection.
- Raise device to top and latch.
- Unlatch and lower the device 5 to 10 feet {1.53 to 3.05 m}.
- Raise the device and confirm that secure latching has occurred.
- Repeat unlatching, lowering, raising and latching three times.

If latching or unlatching failures occur, or if any other problems occur during the test, the Contractor shall make corrections and repeat the complete test in the presence of the Engineer.

(q) OPERATIONAL TESTING OF THE SYSTEM.

The Contractor shall perform full operational testing of the completed lighting system after the completion of the installation of all equipment and materials, including all miscellaneous items of work required for the complete lighting system. The operational testing will not begin until the testing of the insulation, resistance to ground, and luminaire lowering devices has been completed and accepted by the Engineer.

The Engineer will set the date that the operational testing will begin. The Contractor shall provide all installation and operational instructions for all lowering devices before the operational testing of the system will be allowed to begin.

An operational test shall be the full operation of all components of the lighting system for a period of 30 calendar days. During this test period the Contractor shall perform all necessary adjustments (including re-aiming of luminaires) and replace all malfunctioning parts of the equipment required to place the system in a fully operational condition. Extra compensation will not be given for adjustments, maintenance, repairs and replacements during the test period. The initial test period will be suspended as directed by the Engineer during the time that the entire lighting system is not in full operation. The 30 calendar day operational test period shall be restarted or repeated if required by the Engineer due to repeated failure of the lighting system.

The Engineer will perform a final inspection of the lighting system at the completion of the operational testing. If all items of work in the contract have been completed, the Engineer will suspend contract time charges during the operational testing.

Upon completion of the operational testing, field tests may be conducted by the Engineer to verify that the required lighting levels and uniformity ratios are being provided. Any adjustments to the lighting system necessary to meet the design criteria shall be done at the Contractor's expense.

(r) WARRANTIES, GUARANTEE AND MAINTENANCE.

The State shall be protected from any defect in the lighting system by the following:

- The Contractor shall provide the manufacturer's warranties to the State for all electrical and mechanical equipment and;

- The Contractor warrants equipment and guarantees workmanship for satisfactory in-service operation of the electrical and mechanical equipment and related components for a period of one year following the date of completion of the operational check period. ,

- Maintenance repair work may be required for long duration contracts. In the case of long duration contracts the Contractor shall perform maintenance repair work on the lighting system (equipment, devices, structures and hardware) from the end of the one year warranty period until the

arms, high mast, roadway luminaire or individual lowering devices, pole base breakaway devices, lamps, pole wiring cables and connectors and miscellaneous hardware.

Item 751-J: Remove Luminaire Pole Foundation. A luminaire pole foundation shall be a reinforced concrete foundation or an augerbase with drilling and backfilling, concrete pad, reinforcing steel, conduit and elbows, anchor bolts, and mulching and seeding the disturbed ground.

Item 751-K: Replace Luminaire. A luminaire shall be a complete high mast, offset, cobra head or other manufactured single luminaire unit, and shall include any hardware required to mount the luminaire to the pole or lowering device.

Item 751-L: Remove State Lighting System Equipment. This is State property and shall include loading, transporting, unloading, and uninstalling poles, luminaires, luminaire support arms, pole base breakaway devices, lighting control centers, high mast lowering devices, roadway luminaire lowering devices, individual lowering devices, surge arresters, ballasts, igniters, lamps, fuse holders, fuses, pole wiring cables and connectors, or miscellaneous hardware owned by the State.

Item 751-M: Remove Conductors and/or Conduits. Remove and dispose of unused or abandoned electrical conductors and/or conduits including wire, splices, couplings and terminations as indicated on the plans, including labor, equipment, services, transportation and all appurtenances.

The compensation for an item or work that includes the construction of a reinforced concrete pole foundation may be adjusted if the size of the foundation is required to be changed. Bid prices shall be given for the construction of a foundation to the depth and at the diameter shown in the ALDOT Special & Standards Highway Drawings Book. A deeper foundation may be required based on the results of the Department's review of the Contractor's submittal of the design of the pole structure.

The compensation for a foundation will be adjusted if changes are required to be made to the depth of the foundation, or depth of the augerbase. The adjustments shall be in accordance with the following requirements:

- 2'-0" {600 mm} Diameter: The compensation for 2'-0" {600 mm} diameter foundation shall be increased or decreased by $50 for each foot {$50.00 for each 300 mm} of depth that the foundation increases or decreases from what is shown in the ALDOT Special & Standards Highway Drawings Book .
- 2'-6" {760 mm} Diameter: The compensation for 2'-6" {760 mm} diameter foundation shall be increased or decreased by $75 for each foot {$75.00 for each 300 mm} of depth that the foundation increases or decreases from what is shown in the ALDOT Special & Standards Highway Drawings Book .
- 3'-0" {910 mm} Diameter: The compensation for 3'-0" {910 mm} diameter foundation shall be increased or decreased by $100 for each foot {$100.00 for each 300 mm} of depth that the foundation increases or decreases from what is shown in the ALDOT Special & Standards Highway Drawings Book .
- 4'-0" {1.22 m} Diameter: The compensation for 4"-0" {1.22 m} diameter foundation shall be increased or decreased by $200 for each foot {$200.00 for each 300 mm} of depth that the foundation increases or decreases from what is shown in the ALDOT Special & Standards Highway Drawings Book .
- Reinforcing Steel: The adjustments to compensation because of changes in foundation depth shall also cover compensation for providing the reinforcing steel shown in the ALDOT Special & Standards Highway Drawings Book for the deeper foundations.
- Augerbase: The compensation for an augerbase foundation shall be increased by $100 for each foot {$100.00 for each 300 mm} of depth that the foundation increases from what is shown on the plans.

(b) PAYMENT WILL BE MADE UNDER ITEM NO.:

751-A Relocate Existing Lighting Control Center (1) - per each
751-B Replace (3) - per each
751-C Testing Circuit Insulation - per each
751-D Replace (4) - per each
751-E Replace High Mast (5) - per each
751-F Renumber Luminaire Poles - per each
751-G Remove and Store (6) - per each
751-H Install State Property (6) - per each
751-I Install State (7) - per each
751-J Remove Luminaire Pole Foundation, (2) - per each
751-K Replace Required (8) - per each

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: May 29, 2014 Special Provision No...12-1052

SUBJECT: Bollards, Project No. NH-0006(551), Tuscaloosa County

Alabama Standard Specifications, 2012 Edition, shall be amended by the addition of a new SECTION 770 as follows:

SECTION 770
BOLLARDS

792.01 Description.

This Section shall cover the work of furnishing and installing Bollards in accordance with the details shown on the plans.

792.02 Materials and Design

The materials shall meet the requirements of Division 800 and the plans.

792.03 Construction Requirements

Bollards shall be constructed in accordance with the requirements shown on the plans. Shop drawings are not required.

792.04 Method of Measurement

Bollards shall be measured per each.

792.05 Basis of Payment

(a) UNIT PRICE COVERAGE.

Payment for bollards shall include all labor, materials, and incidentals for the complete in-place bollards as specified in the plans

(b) PAYMENT WILL BE MADE UNDER ITEM NO:

770-L Bollards, Complete in Place - per each

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: June 19, 2014 Special Provision No. 12-1121

SUBJECT: Jacking (Boring) of Roadway Pipe, Project No. NH-0006 (551) Tuscaloosa County.

Alabama Standard Specifications, 2012 Edition, SECTION 530, shall be amended as follows:

SECTION 530
ROADWAY PIPE CULVERTS

530.01 Description.

This Article (530.01) shall be amended by the addition of the following paragraph thereto:

This Section shall also cover the work of furnishing and installing pipe culverts by the jacking (boring) method of construction. Unless specifically authorized in writing by the Engineer, this method of construction shall be used only at the locations shown on the plans. This type of pipe installation will be paid for under Pay Item 530-C.

530.02 Materials.

This Article (530.02) shall be amended by the addition of the following:

Concrete pipes furnished for jacking (boring) shall be smooth pipes without bells.

Unless shown otherwise on the plans, smooth steel pipe furnished for jacking (boring) shall be manufactured from steel having a minimum yield strength of 36,000 psi {250 MPa}. The pipe shall be fabricated in sections for welded field joints. The Contractor shall select the wall thickness of the pipe consistent with his operation; however, the minimum wall thicknesses shall be as follows:

30 inch {750 mm} and smaller diameter	3/8 inch {9.5 mm}
36 inch to 42 inch {900 mm to 1050 mm} diameter	1/2 inch {12.7 mm}
48 inch {1200 mm} and larger diameter	5/8 inch {15.8 mm}

The pipe shall be coated inside and outside with at least one shop coat of an approved primer paint and one shop coat of asphaltum paint. Other approved protection material may be used if approved by the Department.

530.03 Construction Requirements.

This Article (530.03) shall be amended by the addition of a new Subarticle (f) as follows:

(f) JACKING (BORING) PIPE.

For pipe sizes less than 42 inches {1050 mm} in diameter, the tunneling equipment used in the jacking (boring) operation shall have a steerable cutting head equipped with a grade indicator. For pipe sizes 42 inches {1050 mm} in diameter and greater, the tunneling equipment used in the jacking (boring) operation shall be a laser-guided tunnel boring machine (TBM). The use of unguided auger-type boring equipment will not be permitted. The tunneling equipment shall also be equipped with a closed-face cutting head or otherwise equipped to prevent unstable soils from entering the tunnel.

The tolerance for grade control shall be plus or minus 0.020 feet per 100 feet {20 mm per 100 m} of length. The tolerance for line shall be 0.20 feet per 100 feet {200 mm per 100 m} of length.

Smooth steel pipe shall be continuously welded at joints to form a rigid, watertight installation. Any coating disturbed during the welding procedure shall be repaired, both inside and outside, in a manner acceptable to the Engineer.

END OF PROPOSAL

CONTRACT

THIS AGREEMENT made and entered into this 4th day of September Two Thousand 14, by and between the STATE OF ALABAMA, party of the first part (hereinafter called the State) and IKAROS, LLC, NORTHPORT, ALABAMA, party of the second part (hereinafter called Contractor), WITNESSETH:

WHEREAS, the State desires the improvement and construction of a certain road hereinafter more particularly described and the Contractor desires to furnish and deliver all the material and to do and perform all the work and labor for the said purpose;

NOW, THEREFORE, in consideration of the premises, the mutual covenants herein contained and the sum of one dollar ($1.00) by each of the parties to the other in hand paid, the receipt whereof is hereby acknowledged, the parties hereto agree as follows:

1. The Contractor promises and agrees to furnish and deliver all the material and to do and perform all the work and labor required to be furnished and delivered, done and performed in and about the improvement and construction of a road in, TUSCALOOSA COUNTY, Known as FEDERAL AID PROJECT NUMBER(s) NH-0006(551) Same to be FOR THE ADDITIONAL TURN LANES AND EXTENSIONS (WIDENING, SIDEWALKS, LIGHTING, SIGNALS, BRIDGE CULVERT EXTENSION AND UNDERGROUND STORAGE TANK REMOVAL) ON SR-6 (US-82) FROM EAST (SOUTH) OF 15TH STREET (VETERANS MEMORIAL PARKWAY) TO WEST (NORTH) OF 13TH STREET IN TUSCALOOSA: 0.501 MILE of road in strict and entire conformity with the provisions of the Contract, and the Notice to Contractors and the Proposal, and the Plans and Specifications (including Special Provisions) prepared (or approved) by the State Transportation Director (or an Assistant Engineer), the originals of which are on file in the Office of the State Transportation Department, and which said Plans and Specifications and the Notice to Contractors and the Proposal are hereby made a part of this Agreement as fully and to the same effect as if the same had been set forth at length in the body of this Agreement.

2. The State agrees and promises to pay to the Contractor for said Work, when completed in accordance with the Provisions of this Contract, the price as set forth in the said Proposal amounting approximately to FIVE MILLION NINE HUNDRED THOUSAND & 00/100 DOLLARS, ($5,900,000.00), payments made as provided in said Specifications upon presentation of the proper certificates of the State Transportation Director or his representatives and upon the terms set forth in the said Specifications and pursuant to the terms of this Contract.

3. The said work shall be done in accordance with the laws of the State of Alabama under the direct supervision, and to the entire satisfaction of the State Transportation Director, subject at all times to the inspection and approval of the Unites States Secretary of Transportation, or his agents, and in accordance with the rules and regulations made pursuant to the Federal Highway Act and Acts of the Federal Congress, amendatory and/or supplementary thereto.

4. The decision of said State Transportation Director upon any question connected with the execution of this Agreement or any failure or delay in the prosecution of the Work by the said Contractor shall be final and conclusive.

PAGE TWO OF CONTRACT

IN WITNESS WHEREOF, THE STATE OF ALABAMA has caused these presence to be executed by JOHN R. COOPER, TRANSPORTATION DIRECTOR and IKAROS, LLC, THE CONTRACTOR, has hereto sat his hand and seal this day and year above written.

STATE OF ALABAMA,

REVIEWED, As to Legal Form

Jim R. Ippolito Jr. (con)
By/For: JIM R. IPPOLITO, JR.
Chief Counsel, Transportation Department

BY: John R. Cooper
JOHN R. COOPER, Director
Transportation Department

CONTRACTOR,

(X) IKAROS LLC.
CONTRACTOR FIRM

(X) 48850
AL. CONTRACTOR'S LICENSE NUMBER

Signed, sealed and delivered in the presence of

(X) [signature]
WITNESS

CHARLES M. STRAWBRIDGE
PRINT NAME

BY (X) [signature]
MEMBER OF FIRM

Keith Andrews
PRINT NAME

Managing member
TITLE

The within and foregoing contract is hereby approved on this the 16th day of September, 2014.

Robert Bentley
ROBERT BENTLEY
GOVERNOR OF ALABAMA

BONL OR PERFORMANCE OF TH. WORK

STATE OF ALABAMA
MONTGOMERY COUNTY

KNOW ALL MEN BY THESE PRESENTS: That we, IKAROS, LLC, NORTHPORT, ALABAMA, as

Principal and Hartford Fire Insurance Company, as Surety, are held and firmly bound unto the State of Alabama in the penal sum of FIVE MILLION NINE HUNDRED THOUSAND & 00/100 DOLLARS, ($ 5,900,000.00) for the payment of which well and truly to be made, we hereby bind ourselves, our heirs, executors, administrators, successors and assigns.

IN WITNESS WHEREOF, we have hereunto set our hands and affixed our seals, this 4th day of September, 20 14.

PROVIDED, HOWEVER, that the condition of this obligation is such that whereas the above bound IKAROS, LLC have this day entered into a Contract with the State of Alabama, FOR THE ADDITIONAL TURN LANES AND EXTENSIONS (WIDENING, SIDEWALKS, LIGHTING, SIGNALS, BRIDGE CULVERT EXTENSION AND UNDERGROUND STORAGE TANK REMOVAL) of 0.501 MILE of road in TUSCALOOSA COUNTY to-wit: known as FEDERAL AID Project No(s). NH-0006(551), located ON SR-6 (US-82) FROM EAST (SOUTH) OF 15TH STREET (VETERANS MEMORIAL PARKWAY) TO WEST (NORTH) OF 13TH STREET IN TUSCALOOSA, a copy of which said Contract is hereto attached.

NOW, THEREFORE, In the event the said IKAROS, LLC as such Contractor shall faithfully and promptly perform said contract and all the conditions and requirements thereof, then this obligation shall be null and void and of no effect, otherwise to remain and be in full force and effect.

PROVIDED, further, that upon the failure of the said IKAROS, LLC to promptly and efficiently prosecute said work, in any respect, in accordance with the contract, the above bound

Hartford Fire Insurance Company

as surety, shall take charge of said work and complete the contract at their own expense, pursuant to its terms, receiving, however, any balance of the funds in the hands of said State due under said contract. Said Surety may, if they so elect, by written direction given to the Alabama Department of Transportation Director authorize the Alabama Department of Transportation Director to advertise for bids to complete the said contract at the expense of said Surety, and such Surety hereby agree and bind themselves to pay the expense of the completion of such work, less any funds in the hands of the State remaining due to above bound Contractor.

For any notice, claim or dispute regarding this contract, the Surety shall notify the Alabama Department of Transportation at the address below:

Alabama Department of Transportation
ATTN: CONSTRUCTION BUREAU
1409 Coliseum Blvd.
Montgomery, AL 36110

In the event said Principal shall fail or delay the prosecution and completion of said work and said Surety shall also fail to act promptly as herein before provided, then said Alabama Department of Transportation Director may cause ten days notice of such failure to be given, either to said Principal or Surety and at the expiration of said ten days, if said Principal or Surety does not proceed promptly to execute said contract, the State of Alabama shall have the authority to cause said work to be done, and when the same is completed and the cost thereof estimated, the said principal and sureties shall and hereby agree to pay any excess in the cost of said work above the agreed price to be paid under said contract.

Upon the completion of said Contract pursuant to its terms, if any funds remain due on said Contract, the same shall be paid to said Principal or Surety.

The said Principal and Surety further agree as part of this obligation to pay all such damages of any kind to person or property that may result from a failure in any respect to perform and complete said Contract.

The decision of said Alabama Department of Transportation Director upon any question connected with the execution of said Contract, or any failure or delay in the prosecution of the Work by said Principal or Surety shall be final and conclusive.

The Proposal, Specifications and the Contract, herein before referred to, and the Bond for the Payment of Labor, Materials, Feed-stuffs or Supplies executed under the provisions of Section 39-1-1, Code of Alabama, 1975, as amended, are made a part of this obligation, and this instrument is to be construed in connection therewith.

Witness our hands and seals, this 4th day of September, 20 14.

_____ (L.S.)
WITNESS

_____ (L.S.)
CONTRACTOR'S SIGNATURE

Hartford Fire Insurance Company
NAME OF SURETY

BY: _____
ATTORNEY-IN-FACT
J. David Fitts

SURETY CLAIMS DEPARTMENT ADDRESS AND TELEPHONE NUMBER

One Hartford Plaza, T-4-47
Hartford, CT 06155
860-547-5000

Managing member
TITLE

IKAROS LLC.
LEGAL NAME OF CONTRACTOR

700 Energy Centre Blvd.
Suite 400
Northport AL 354
ADDRESS

SURETY COMPANY BOND NUMBER(S)

21BCSGQ2626

Countersigned by Alabama Licensed Insurance Producer for Surety, if Applicable: NAME & LICENSE NUMBER

ADDRESS

NOTICE TO INSURANCE PRODUCER
Please print or write legibly your name and complete address below, including PRODUCER'S COMPANY

BOND FOR PAYMENT

OF LABOR, MATERIALS, FEED-STUFFS OR SUPPLIES

STATE OF ALABAMA
MONTGOMERY COUNTY

KNOW ALL MEN BY THESE PRESENTS: That we, IKAROS, LLC, NORTHPORT, ALABAMA, as

Principal, and Hartford Fire Insurance Company as Surety, are held and firmly bound unto the State of Alabama, in the penal sum of FIVE MILLION NINE HUNDRED THOUSAND & 00/100 DOLLARS, ($5,900,000.00), for the payment of which sum well and truly to be made, we hereby bind ourselves, our heirs, executors, administrators, successors and assigns.

IN WITNESS WHEREOF, we have hereunto set our hands and affixed our seals this 4th day of September, 20 14.

PROVIDED, HOWEVER, that the condition of this obligation is such that whereas the above bound IKAROS, LLC have this day entered into a Contract with the STATE OF ALABAMA, FOR THE ADDITIONAL TURN LANES AND EXTENSIONS (WIDENING, SIDEWALKS, LIGHTING, SIGNALS, BRIDGE CULVERT EXTENSION AND UNDERGROUND STORAGE TANK REMOVAL) of 0.501 MILE of road in TUSCALOOSA COUNTY, known as FEDERAL AID, Project No(s). NH-0006(551), located ON SR-6 (US-82) FROM EAST (SOUTH) OF 15TH STREET (VETERANS MEMORIAL PARKWAY) TO WEST (NORTH) OF 13TH STREET IN TUSCALOOSA, a copy of which said Contract is hereto attached.

NOW, THEREFORE, in the event that said IKAROS, LLC as such Contractor shall promptly make payment to all persons supplying him or them with labor, material, feed-stuffs, or supplies for or in the prosecution of the Work provided for in said Contract, that this obligation shall be null and void and of no effect, otherwise to remain and be in full force and effect.

PROVIDED, further, in the event that the said IKAROS, LLC, as such Contractor shall fail to make prompt payment to all persons supplying him or them with labor, materials, feed-stuffs, or supplies for or in the prosecution of the work provided for in such Contract, the above bound

Hartford Fire Insurance Company as Surety shall be liable for the payment of such labor, materials, feed-stuffs or supplies and for the payment of reasonable attorney's fees incurred by successful claimants or plaintiffs in suits on said bond as provided in Section 39-1-1, Code of Alabama, 1975, as amended.

For any notice, claim or dispute regarding this contract, the Surety shall notify the Alabama Department of Transportation at the address below:

Alabama Department of Transportation
ATTN: CONSTRUCTION BUREAU
1409 Coliseum Blvd.
Montgomery, AL 36110

PAGE TWO OF PAYM. NT OF LABOR, MATERIALS, FEEL TUFFS OR SUPPLIES

PROVIDED, FURTHER, that said Contractor and Surety hereby agree and bind themselves to the mode of service described in Section 39-1-1, Code of Alabama, 1975, as amended, and consent that such service shall be the same as personal service on said Contractor or Surety.

UPON the completion of said Contract pursuant to its terms, if any funds remain due on said Contract, the same shall be paid to said Principal or Surety.

The decision of said Alabama Department of Transportation Director upon any question connected with the execution of said Contract, or any failure or delay in the prosecution of the Work by said Principal or Surety shall be final and conclusive.

The Proposal, Specifications and the Contract herein before referred to and the Bond For Performance Of The Work executed under the provisions of Section 39-1-1, Code of Alabama, 1975, as amended, are made a part of this obligation, and this instrument is to be construed in connection therewith.

WITNESS our hands and seals, this 4TH day of September, 2014

_____ (L.S.)
WITNESS

_____ (L.S.)
CONTRACTOR'S SIGNATURE

Hartford Fire Insurance Company
NAME OF SURETY

managing member
TITLE

BY: _____
ATTORNEY-IN-FACT

IKAROS LLC.
LEGAL NAME OF CONTRACTOR

J.David Fitts
SURETY CLAIMS DEPARTMENT ADDRESS AND TELEPHONE NUMBER

700 Energy Center BLVD. Ste
Northport, Al 35473
ADDRESS

One Hartford Plaza, T-4-47

Hartford, CT 06155

860-547-5000

NOTICE TO INSURANCE PRODUCER
Please print or write legibly your name and complete address below, including PRODUCER'S COMPANY

SURETY COMPANY BOND NUMBER(S)

21BCSGQ2626

Countersigned by Alabama Licensed Insurance Producer for Surety, if Applicable. Name and License Number

ADDRESS

POWER OF ATTORNEY

Direct Inquiries/Claims to:
THE HARTFORD
BOND, T-4
P.O. BOX 2103, 690 ASYLUM AVENUE
HARTFORD, CONNECTICUT 06115
call: **888-266-3488** *or fax:* **860-757-5835**

Agency Code: 21-250417

KNOW ALL PERSONS BY THESE PRESENTS THAT:

- [X] **Hartford Fire Insurance Company**, a corporation duly organized under the laws of the State of Connecticut
- [X] **Hartford Casualty Insurance Company**, a corporation duly organized under the laws of the State of Indiana
- [X] **Hartford Accident and Indemnity Company**, a corporation duly organized under the laws of the State of Connecticut
- [ ] **Hartford Underwriters Insurance Company**, a corporation duly organized under the laws of the State of Connecticut
- [ ] **Twin City Fire Insurance Company**, a corporation duly organized under the laws of the State of Indiana
- [ ] **Hartford Insurance Company of Illinois**, a corporation duly organized under the laws of the State of Illinois
- [ ] **Hartford Insurance Company of the Midwest**, a corporation duly organized under the laws of the State of Indiana
- [ ] **Hartford Insurance Company of the Southeast**, a corporation duly organized under the laws of the State of Florida

having their home office in Hartford, Connecticut, (hereinafter collectively referred to as the "Companies") do hereby make, constitute and appoint, ***up to the amount of unlimited:***

R. Forrest Fitts, T. Gary Fitts, J. David Fitts, Charles F. Horton, Jr., Cheryl Camak, Christina Krout
of
Tuscaloosa, AL

their true and lawful Attorney(s)-in-Fact, each in their separate capacity if more than one is named above, to sign its name as surety(ies) only as delineated above by ☒, and to execute, seal and acknowledge any and all bonds, undertakings, contracts and other written instruments in the nature thereof, on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

In Witness Whereof, and as authorized by a Resolution of the Board of Directors of the Companies on January 22, 2004 the Companies have caused these presents to be signed by its Assistant Vice President and its corporate seals to be hereto affixed, duly attested by its Assistant Secretary. Further, pursuant to Resolution of the Board of Directors of the Companies, the Companies hereby unambiguously affirm that they are and will be bound by any mechanically applied signatures applied to this Power of Attorney.

Scott Sadowsky, Assistant Secretary

M. Ross Fisher, Assistant Vice President

STATE OF CONNECTICUT }
COUNTY OF HARTFORD } ss. Hartford

On this 3rd day of March, 2008, before me personally came M. Ross Fisher, to me known, who being by me duly sworn, did depose and say: that he resides in the County of Hartford, State of Connecticut; that he is the Assistant Vice President of the Companies, the corporations described in and which executed the above instrument; that he knows the seals of the said corporations; that the seals affixed to the said instrument are such corporate seals; that they were so affixed by authority of the Boards of Directors of said corporations and that he signed his name thereto by like authority.

Scott E. Pascka
Notary Public
My Commission Expires October 31, 2012

CERTIFICATE

I, the undersigned, Assistant Vice President of the Companies, DO HEREBY CERTIFY that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which is still in full force effective as of , 2014

Signed and sealed at the City of Hartford.

Gary W. Stumper, Assistant Vice President

POWER OF ATTORNEY

Direct Inquiries/Claims to:
THE HARTFORD
BOND, T-4
P.O. BOX 2103, 690 ASYLUM AVENUE
HARTFORD, CONNECTICUT 06115
call: **888-266-3488** *or fax:* **860-757-5835**

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- [X] **Hartford Accident and Indemnity Company**, a corporation duly organized under the laws of the State of Connecticut
- [ ] **Hartford Underwriters Insurance Company**, a corporation duly organized under the laws of the State of Connecticut
- [ ] **Twin City Fire Insurance Company**, a corporation duly organized under the laws of the State of Indiana
- [ ] **Hartford Insurance Company of Illinois**, a corporation duly organized under the laws of the State of Illinois
- [ ] **Hartford Insurance Company of the Midwest**, a corporation duly organized under the laws of the State of Indiana
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having their home office in Hartford, Connecticut, (hereinafter collectively referred to as the "Companies") do hereby make, constitute and appoint, ***up to the amount of unlimited:***

R. Forrest Fitts, T. Gary Fitts, J. David Fitts, Charles E. Horton, Jr., Cheryl Camak, Christina Krout
of
Tuscaloosa, AL

their true and lawful Attorney(s)-in-Fact, each in their separate capacity if more than one is named above, to sign its name as surety(ies) only as delineated above by ☒, and to execute, seal and acknowledge any and all bonds, undertakings, contracts and other written instruments in the nature thereof, on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

In Witness Whereof, and as authorized by a Resolution of the Board of Directors of the Companies on January 22, 2004 the Companies have caused these presents to be signed by its Assistant Vice President and its corporate seals to be hereto affixed, duly attested by its Assistant Secretary. Further, pursuant to Resolution of the Board of Directors of the Companies, the Companies hereby unambiguously affirm that they are and will be bound by any mechanically applied signatures applied to this Power of Attorney.

Scott Sadowsky, Assistant Secretary

M. Ross Fisher, Assistant Vice President

STATE OF CONNECTICUT }
COUNTY OF HARTFORD } ss. Hartford

On this 3rd day of March, 2008, before me personally came M. Ross Fisher, to me known, who being by me duly sworn, did depose and say: that he resides in the County of Hartford, State of Connecticut; that he is the Assistant Vice President of the Companies, the corporations described in and which executed the above instrument; that he knows the seals of the said corporations; that the seals affixed to the said instrument are such corporate seals; that they were so affixed by authority of the Boards of Directors of said corporations and that he signed his name thereto by like authority.

CERTIFICATE

Scott E. Pascka
Notary Public
My Commission Expires October 31, 2012

I, the undersigned, Assistant Vice President of the Companies, DO HEREBY CERTIFY that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which is still in full force effective as of Sep 4th 2014

Signed and sealed at the City of Hartford.

Gary W. Stumper, Assistant Vice President