ADDENDUM NO. 1 REVISED

GMIA-Airfield Safety Improvements-2012

PROJECT NO. A123-12005

OFFICIAL NOTICE NO. 6725

GENERAL MITCHELL INTERNATIONAL AIRPORT
Milwaukee County, Wisconsin

Prepared By: MILWAUKEE COUNTY DEPARTMENT OF ADMINISTRATIVE SERVICES
ARCHITECTURE AND ENGINEERING DIVISION
Airport Engineers - Telephone 414-747-5320
5300 South Howell Avenue
Milwaukee, Wisconsin 53207

DATE OF ADDENDUM: May 3, 2012

BIDS CLOSE: 2:00 P.M., WEDNESDAY May 9, 2012

TO ALL BIDDERS:

Each bidder shall read this Addendum in its entirety to determine to what extent his proposal and the contract conditions will be affected. This Addendum to the Contract Documents is issued to modify, explain, or correct the original documents and is hereby made part of the Contract Documents.

RECEIPT - Sign the following receipt and attach to submitted Proposal Form.

Receipt of Addendum No. 1 REVISED, consisting of **twenty two (22)** pages, for **GMIA, Airfield Safety Improvements-2012**, Official Notice No. 6725, at General Mitchell International Airport, Milwaukee, Wisconsin, dated May 3, 2012 is acknowledged.

Date _____ Firm _____

Per _____ Address _____

CHANGES

PLANS

- See enclosed plan sheet Add #1 for proposed thermoplastic runway hold and taxiway enhanced centerline locations. Sheet 2 shows lighted "X", fabric surface "X" and low profile barricade locations. Orange cones will be allowed for thermoplastic signage placement on a daily basis.

SPECIFICATIONS

- See attached specification P-620 for Thermoplastic Signage. In addition the FAA Advisory Circular 150/5340-1K must be consulted for compliance.

TIME FRAME

- The signage installation must be coordinated with the runway 1L/19R closure. Exact application times must be coordinated with airport operations.

- Phase 1-Taxiway R circuit replacement must be completed by August 20th. This replaces the original date of August 30th.

- Phase 3-Runway 1R/19L & 13/31 runway closure can be only for a period of 14 days. The closure details are detailed under the next section. Daily closure(s) after the 14 day time frame will be allowed at the discretion of airport operations.

CLARIFICATION

- No dumping of materials for temporary or permanent storage will be allowed at the contractors designated "lay down" area. This provision can be waived by the project engineer on a case to case basis.

- Four lighted mobile "X"'s will be required to be used when the edge lighting is installed on runway 13/31 and runway 1R/19L. The mobile units will be furnished by General Mitchell International Airport. The contactor must transport/return the unit from the south maintenance yard to the designated runway ends. In addition the contractor must fuel (capacity 50 hrs run time) and change the oil (every 250 hrs run time) for the project duration. This will also include light bulb maintenance.

  The lighted "X"s can be removed when open trenches in the runway safety area are restored. At that point daily closure(s) will be allowed between the hours of 8:00am to 5:00pm to pull cable. Orange cones at the five barricaded locations can be used to isolate the construction area. Cost of item should be placed under the mobilization unit.

- Temporary "Surface X's" must also be installed in two locations during the runway closure. Additional information can be found at www.faa.gov. Advisory Circular 150/5370-2F "Operational Safety on Airports During Construction". The Advisory Circular 150/5370-2E enclosed in the specifications shall be discarded. Cost of item should be placed under the mobilization unit.

- Low profile barricades-approximately 500 feet (see enclosed drawing) must be placed as directed by airport operations in five locations for the Runway 13/31 and 1R/19L closure. The barricades

must be placed end to end across the indicated taxiway or runway. The contractor will be responsible for maintenance. Cost of item should be placed under the mobilization unit.

- No open over night excavations will be allowed for sign pad installations. The open excavation must be plated to allow the runway to be operational.

- The logitrac units that require replacement are on Taxiway E, M & S. Taxiway E was inadvertently missed in the specification. Taxiway closures have to be coordinated thru airport operations. Logitrac unit replacements on Taxiway M can be done during weekend nighttime closures on Sunday or Monday's from 12:001am to 5:00am. Orange cones can be used for daily barricading.

BID SCHEDULE

- Replace "Bid Schedule" with enclosed "Bid Schedule Revised".

Bidders are requested to quote unit prices and make extensions for each item on the following Bid Schedule, in accordance with the proposal conditions, specifications, drawings, exhibits, and standard forms listed herein and made a part hereof. Unit prices so quoted herein shall govern in all cases.

BIDDER'S ATTENTION IS SPECIFICALLY DIRECTED to the fact that the items listed herein constitute one complete bid schedule comprising a single job unit, and the price on all items listed must be quoted in order to qualify as an acceptable bid.

REVISED BID SCHEDULE

Airfield Safety Improvements-2012
Project No. A123-12005

BASE BID

Item No.	Item	Estimated Quantity	Unit	Unit Price	Amount Dollars	Amount Cents
1	Mobilization Item M-1 Lump Sum Price in Writing	1	L.S.			
2	Unclassified Excavation Item P-152 Unit Price per Cubic Yards in Writing	15	CY			
3	Pavement Sawcutting, Full Depth Item P-152 Unit Price per Linear Foot in Writing	1,860	L.F.			
4	17" Concrete Coring Item P-152 Unit Price per Each in Writing	5	EA			
5	Crushed Aggregate Base Course Item P-209 Unit Price per Tons in Writing	22	Ton			
6	Lighting Cable, 5 KVA, No. 8, In Conduit or Duct Item L-108 Unit Price per Linear Foot in Writing	24,250	L.F.			
7	No, 6 Bare Copper Counterpoise Wire Item L-108 Unit Price per Linear Foot in Writing	17,000	L.F.			

REVISED BID SCHEDULE (continued)
Airfield Safety Improvements-2012
Project No. A123-12005

Item No.	Item	Estimated Quantity	Unit	Unit Price	Amount Dollars	Amount Cents
8	Ground Rods Item L-108 Unit Price per Each in Writing	15	EA			
9	PVC Electrical Conduit, 2 Inch, Sch. 40 Item L-110 Unit Price per Linear Foot in Writing	2,300	L.F.			
10	Cable Removal Item L-125A Unit Price per Linear Foot in Writing	24,250	L.F.			
11	Elevated Taxiway Light Removal Item L-125A Unit Price per Each in Writing	187	EA			
12	Elevated Runway Light Removal Item L-125A Unit Price per Each in Writing	9	EA			
13	Inpavement Runway Edge Light Removal Item L-125A Unit Price per Each in Writing	1	EA			
14	Wind Cone Removal Item L-125A Unit Price per Each in Writing	1	EA			
15	Wind Cone Foundaion Removal Item L-125A Unit Price per Each in Writing	1	EA			

Item No.	Item	Estimated Quantity	Unit	Unit Price	Amount Dollars	Amount Cents
16	Elevated LED Taxiway Light Item L-125A Unit Price per Each in Writing	187	EA			
17	Elevated Medium Intensity Runway Edge & Threshold Light Item L-125A Unit Price per Each in Writing	9	EA			
18	Inpavement Medium Intensity Runway Edge Light Item L-125A Unit Price per Each in Writing	5	EA			
19	Concrete Pad, Guidance Sign Item L-125A Unit Price per Linear Foot in Writing	123	L.F.			
20	Airfield Guidance Sign, Two Module Item L-125A Unit Price per Each in Writing	5	EA			
21	Airfield Guidance Sign, Three Module Item L-125A Unit Price per Each in Writing	4	EA			
22	Wind Cone Foundation Item L-125A Unit Price per Each in Writing	1	EA			
23	Solar Power Lighted Wind Cone-Size 1 Supplemental Item L-806 Unit Price per Each in Writing	1	EA			

Item No.	Item	Estimated Quantity	Unit	Unit Price	Amount Dollars	Amount Cents
24	JS-2 Elastomeric Concrete Patch Item JS-2 Unit Price in gallons	1,170	GALS			
25	Seeding (Endophyte Enhanced) and Fertilizer Item T-901 Unit Price per Square Yards in Writing	4,200	S.Y.			
26	Hydro Mulch Item T-908 Unit Price per Square Yards in Writing	4,200	S.Y.			
27	Construction Allowance Lump Sum Price in Writing	1	L.S.	$ 20,000.00	$ 20,000.00	
		Twenty Thousand Dollars and no cents				
	BASE BID GRAND TOTAL IN FIGURES:					
	(IN WORDS)					
	BASE BID GRAND TOTAL IN WRITING:					
	(IN FIGURES)					

ALTERNATE BID(S)

Item No.	Item	Estimated Quantity	Unit	Unit Price	Amount Dollars	Amount Cents
ALT 1	Lighted LED Wind Cone-Size1 Supplemental Item L-806 Unit Price per Each in Writing	1	EA			

Item No.	Item	Estimated Quantity	Unit	Unit Price	Amount Dollars	Amount Cents
ALT 2	Wind Cone Electric Service w/meter socket Item L-806 Lump Sum Price in Writing	1	LS			

REVISED BID SCHEDULE (continued)
Airfield Safety Improvements-2012
Project No. A123-12005

ALTERNATE BID(S)

Item No.	Item	Estimated Quantity	Unit	Unit Price	Amount Dollars	Amount Cents
ALT 3	Concrete Guidance Sign-Snow Pad Item L-125A Unit Price per Lump Square Yard in Writing	38	SY			

Item No.	Item	Estimated Quantity	Unit	Unit Price	Amount Dollars	Amount Cents
ALT 4	Crushed Aggregate Base Course-Snow Pad Item P-209 Unit Price per Tons in Writing	59	TON			

Item No.	Item	Estimated Quantity	Unit	Unit Price	Amount Dollars	Amount Cents
ALT 5	Unclassified Excavation-Snow Pad Item P-152 Unit Price per Cubic Yards in Writing	56	CY			

Item No.	Item	Estimated Quantity	Unit	Unit Price	Amount Dollars	Amount Cents
ALT 6	Airfield Lighting Control & Monitoring System (ALCMS) -Upgrade Item P-125A Lump Sum Price in Writing	1	L.S.			

Item No.	Item	Estimated Quantity	Unit	Unit Price	Amount Dollars	Amount Cents
ALT 7	Pavement Marking Removal-Profile Milling Item P-620 Unit Price per Square Feet in Writing	8265	SF			

Item No.	Item	Estimated Quantity	Unit	Unit Price	Amount Dollars	Amount Cents
ALT 8	Preformed Thermoplastic Runway Hold Position Markings Item P-620 Unit Price per Square Feet in Writing	4590	SF			

REVISED BID SCHEDULE (continued)
Airfield Safety Improvements-2012
Project No. A123-12005

Item No.	Item	Estimated Quantity	Unit	Unit Price	Amount	
					Dollars	Cents
ALT 9	Preformed Thermoplastic Enhanced Centerline Markings Item P-620 Unit Price per Square Feet in Writing	3675	SF			

ITEM P-620 RUNWAY AND TAXIWAY PAINTING

DESCRIPTION

620-1.1 This item shall consist of the painting of numbers, markings, and stripes on the surface of runways, taxiways, and aprons, in accordance with these specifications and at the locations shown on the plans, or as directed by the Engineer.

MATERIALS

620-2.1 MATERIALS ACCEPTANCE. The Contractor shall furnish manufacturer's certified test reports for materials shipped to the project. The certified test reports shall include a statement that the materials meet the specification requirements. The reports can be used for material acceptance or the Engineer may perform verification testing. The reports shall not be interpreted as a basis for payment. The Contractor shall notify the Engineer upon arrival of a shipment of materials to the site.

620-2.2 PAINT. Paint shall be **Preformed Thermoplastic** in accordance with the requirements of paragraph 620-2.2e. Paint shall be furnished in **White – 37925, Red – 31136, Black - 37038** in accordance with Federal Standard No. 595.

a. WATERBORNE. Not Used.

b. EPOXY. Not Used.

c. METHACRYLATE. Not Used.

d. SOLVENT-BASE. Not Used.

e. PREFORMED THERMOPLASTIC AIRPORT PAVEMENT MARKINGS. Markings must be composed of ester modified resins in conjunction with aggregates, pigments, and binders that have been factory produced as a finished product. The material must be impervious to degradation by aviation fuels, motor fuels, and lubricants.

(1) The markings must be able to be applied in temperatures down to 35°F without any special storage, preheating, or treatment of the material before application.

(2) Graded Glass Beads.

(a) The material must contain a minimum of thirty percent (30%) intermixed graded glass beads by weight. The intermixed beads shall conform to **Federal Specification. TT-B-1325D, Type III.**

(b) The material must have factory applied coated surface beads in addition to the intermixed beads at a rate of 1 lb. (± 10%) per 10 sq. ft. These factory applied coated surface beads shall have a minimum of 90% true spheres, minimum refractive index of 1.50, and meet the following gradation.

Size Gradation		Retained, %	Passing, %
US Mesh	µm		
12	1700	0 - 2%	98 - 100%
14	1400	0 - 3.5%	96.5 - 100%
16	1180	2 - 25%	75 - 98%
18	1000	28 - 63%	37 - 72%
20	850	63 - 72%	28 - 37%
30	600	67 - 77%	23 - 33%
50	300	89 - 95%	5 - 11%
80	200	97 - 100%	0 - 3%

(3) Heating Indicators. The top surface of the material (same side as the factory applied surface beads) shall have regularly spaced indents. These indents shall act as a visual cue during application that the material has reached a molten state so satisfactory adhesion and proper bead embedment has been achieved and a post-application visual cue that the installation procedures have been followed.

(4) Pigments. Percent by weight.

(a) White:
Titanium Dioxide, ASTM D 476, type II shall be 10 percent minimum.

(b) Yellow and Colors:
Titanium Dioxide, ASTM D 476, type II shall be 1 percent minimum.
Organic yellow, other colors, and tinting as required to meet color standard.

(5) Prohibited Materials. The manufacturer shall certify that the product does not contain mercury, lead, hexavalent chromium, halogenated solvents, nor any carcinogen as defined in 29 CFR 1910.1200 in amounts exceeding permissible limits as specified in relevant Federal Regulations.

(6) Daylight Directional Reflectance.

(a) White: The daylight directional reflectance of the white paint shall not be less than 75 percent (relative to magnesium oxide), when tested in accordance with Federal Test Method Standard No. 141D/GEN, Method 6121.

(b) Yellow: The daylight directional reflectance of the yellow paint shall not be less than 45 percent (relative to magnesium oxide), when tested in accordance with Federal Test Method Standard No. 141D/GEN. The x and y values shall be consistent with the Federal Hegman yellow color standard chart for traffic yellow standard 33538, or shall be consistent with the tolerance listed below:

x .462	x .470	x .479	x .501
y .438	y .455	y .428	y .452

(7) Skid Resistance. The surface, with properly applied and embedded surface beads, must provide a minimum resistance value of 45 BPN when tested according to ASTM E303.

(8) Thickness. The material must be supplied at a nominal thickness of 65 mils (1.7 mm).

(9) Environmental Resistance. The material must be resistant to deterioration due to exposure to sunlight, water, salt, or adverse weather conditions and impervious to aviation fuels, gasoline, and oil.

(10) Retroreflectivity. The material, when applied in accordance with manufacturer's guidelines, must demonstrate a uniform level of nighttime retroreflection when tested in accordance to ASTM E1710.

(11) Packaging. A protective film around the box must be applied in order to protect the material from rain or premature aging.

(12) Manufacturing Control and ISO Certification. The manufacturer must be ISO 9001:2000 certified and provide proof of current certification. The scope of the certification shall include manufacture of reflective markings.

a. The markings must be a resilient thermoplastic product with uniformly distributed glass beads throughout the entire cross-sectional area. The markings must be resistant to the detrimental effects of aviation fuels, motor fuels and lubricants, hydraulic fluids, de-icers, anti-icers, protective coatings, etc. Lines, legends, and symbols must be capable of being affixed to bituminous and/or Portland cement concrete pavements by the use of a large radiant heater. Colors shall be available as required.

b. The markings must be capable of conforming to pavement contours, breaks, and faults through the action of airport traffic at normal pavement temperatures. The markings must be capable of fully conforming to grooved pavements, including pavement grooving per FAA AC 150/5320-12, current version. The markings shall have resealing characteristics, such that it is capable of fusing with itself and previously applied thermoplastics when heated with a heat source per manufacturer's recommendation.

c. Multicolored markings must consist of interconnected individual pieces of preformed thermoplastic pavement marking material, which through a variety of colors and patterns, make up the desired design. The individual pieces in each large marking segment (typically more than 20 ft. long) must be factory assembled with a compatible material and interconnected so that in the field it is not necessary to assemble the individual pieces within a marking segment. Obtaining multicolored effect by overlaying materials of different colors is not acceptable due to resulting inconsistent marking thickness and inconsistent application temperature in the marking/substrate interface.

e. The marking material must set up rapidly, permitting the access route to be re-opened to traffic a maximum of 15 minutes after application.

f. The marking material shall have an integral color throughout the thickness of the marking material.

620-2.3 REFLECTIVE MEDIA. Glass beads shall meet the requirements for **Federal Specification TT-B-1325D, Type III**. Glass beads shall be treated with all compatible coupling agents recommended by the manufacturers of the paint and reflective media to ensure adhesion and embedment.

CONSTRUCTION METHODS

620-3.1 WEATHER LIMITATIONS. The painting shall be performed only when the surface is dry and when the surface temperature is at least 45°F (7°C) and rising and the pavement surface temperature is at least 5°F (2.7°C) above the dew point. Markings shall not be applied when the pavement temperature is greater than 120°F (49°C).

620-3.2 EQUIPMENT. Equipment shall include the apparatus necessary to properly clean the existing surface, a mechanical marking machine, a bead dispensing machine, and such auxiliary hand-painting equipment as may be necessary to satisfactorily complete the job.

The mechanical marker shall be an atomizing spray-type or airless-type marking machine suitable for application of traffic paint. It shall produce an even and uniform film thickness at the required coverage and shall apply markings of uniform cross-sections and clear-cut edges without running or spattering and without over spray.

620-3.3 PREPARATION OF SURFACE. The area to be marked by preformed markings shall be cleaned by water blasting, shot blasting or other mechanical method to remove all curing materials, fuels, oils, etc.

Surface preparation after marking removal:

Surfaces where markings were removed by high pressure water blasting, grinding, shot blasting or sand blasting should be cleaned using a low pressure wash (3500 psi or less) to remove all loose residual debris. (based on 90 percent removal of existing markings).

620-3.4 LAYOUT OF MARKINGS. The proposed markings shall be laid out in advance of the paint application. All locations of markings shall receive glass beads except the black outline.

620-3.5 APPLICATION. Not Used.

620-3.6 APPLICATION--PREFORMED AIRPORT PAVEMENT MARKINGS.

a. Asphalt and Portland cement To ensure minimum single-pass application time and optimum bond in the marking/substrate interface, the materials must be applied using a variable speed self-propelled mobile heater with an effective heating width of no less than 16 feet (4.88 m) and a free span between supporting wheels of no less than 18 feet (5.49 m). The heater must emit thermal radiation to the marking material in such a manner that the difference in temperature of 2 inch (5.08 cm) wide linear segments in the direction of heater travel must be within 5 percent of the overall average temperature of the heated thermoplastic material as it exits the heater. The material must be able to be applied at ambient and pavement temperatures down to 35°F (2°C) without any preheating of the pavement to a specific temperature. The material must be able to be applied without the use of a thermometer. The pavement shall be clean, dry, and free of debris. A non-VOC sealer with a maximum applied viscosity of 250 centi-Poise (ASTM D 2393) must be applied to the pavement shortly before the markings are applied. The supplier must enclose application instructions with each box/package.

b. Crack and Joint Sealant Considerations:

The following considerations must be made when planning preformed pavement marking applications whenever crack and or joint sealant is present on the pavement **SURFACE**.

These considerations are required because crack sealant used in asphalt repair is typically tar based which will strike through the preformed pavement marking material during heating. Additionally, the long term durability is degraded since this sealant is fairly liquid and mobile allowing the preformed pavement marking material to shift over the asphalt substrate.

While the approved PCC joint sealant will not strikethrough preformed pavement marking material during heating, no bond is possible between these two materials.

1) Any sealant on any substrate **SURFACE** must be removed prior to the application of the preformed pavement marking material utilizing an approved removal technique. One such method requires the applicator to heat the sealant on the **SURFACE** adjacent to the crack, or joint, to its softening point. Then, using a flat edged shovel, scrape the excess sealant off of the **SURFACE**. Once the bulk of the excess sealant has been scraped off of the **SURFACE** use line removing equipment to eradicate the remainder of the sealant. Care must be taken to ensure that the integrity of the sealant in the crack, or joint, is not jeopardized.

2) It is possible to apply over sealant which is **BELOW** the substrate surface as long as the crack or joint width does not exceed 1 in. Concrete joints are prepared ¾ in. wide, however sub-base shifting can cause these joints to expand beyond 1 in. If a joint (or crack) exceeds 1 in. in width then the preformed pavement marking material that falls into these joints during application must

be removed. As mentioned above, since the preformed pavement marking to sealant bond is inadequate, removal is a safety measure against debris generation.

Removal of preformed pavement marking material can be accomplished by running a box cutter or sharp cutting tool along each side of the joint. The cut material can then be lifted out of the joint using a chisel or spatula.

620-3.7 PROTECTION AND CLEANUP. After application of the markings, all markings shall be protected from damage until dry. All surfaces shall be protected from excess moisture and/or rain and from disfiguration by spatter, splashes, spillage, or drippings. The Contractor shall remove from the work area all debris, waste, loose or unadhered reflective media, and by-products generated by the surface preparation and application operations to the satisfaction of the Engineer. The Contractor shall dispose of these wastes in strict compliance with all applicable state, local, and Federal environmental statutes and regulations.

620-3.11 THREE-YEAR WARRANTY – PREFORMED PAVEMENT MARKINGS.
Preformed thermoplastic pavement marking products shall be warranted against material and workmanship defects for a period of Three years from the date of substantial completion of the project. This warranty does not apply to items that have been altered or subjected to misuse or negligence.

Should a product prove to be defective based on bond, nighttime visibility (retro reflectivity) or color (chromaticity) as detailed below, it is understood that the Contractor shall repair the defective product or provide an equivalent quantity of replacement product.

At the end 36-month (Three year) service life, the thermoplastic material shall meet the following thresholds in the areas of bonding, (retroreflectivity) nighttime visibility and (chromaticity) color.

a. <u>BONDING</u>

No more than 1% of the surface area shall become loose from the pavement within the warranty period.

b. <u>RETROREFLECTIVITY</u>

White: Minimum 100 mcd $m^{-2}lx^{-1}$
Yellow: Minimum 70 mcd $m^{-2}lx^{1}$

These values are in compliance with the minimum values documented by the FAA on page 18 of the May 2008 report "DOT/FAA/AR-TN08/22; "Evaluation of Thermoplastic Marking Materials".

Retroreflectivity shall be defined by ASTM E1710 (Standard Test Method for Measurement of Retroreflective Pavement Marking Materials with CEN-Prescribed Geometry Using a Portable Retroreflectometer) Retroreflectivity readings shall be taken with a DELTA LTL-X instrument, or a similar instrument having the same accuracy, repeatability and reproducibility.

The markings being evaluated shall be clean and dry. Per ASTM "Standard Practice for Evaluating Retroreflective Pavement Markings Using Portable Hand-Operated Instruments".

Loose dirt shall be removed by pressure washing, perhaps using soap, brushing or high-pressure air. However, these techniques are usually insufficient to remove dirt that is packed into the marking surface, asphalt oil and rubber skid marks. Evaluation shall be done on areas that are typical of the marking section, avoid areas of paint tracking or contamination. It may be useful to take photographs using a digital camera and a good macro lens to be able to see the contamination

on or between the glass beads.

c. CHROMATICITY

The CIE x, y chromaticity coordinates for white and yellow markings shall be within the CIE in-Service color box established by suing the methodology documented by the FAA on page A-7/A-8 of the March 2003 report "DOT/FAA/AR-TN03/22; Development Methods for Determining Airport Pavement Marking Effectiveness". I.E. the in-service color box for red has been obtained by extending the orange and purple boundary lines of the red color box in Figure A-2 on page A-2 to the line $y = 0.750 - x$. The chromaticity coordinates for this in-service color box are:

1		2		3		4	
x	y	x	y	x	y	x	y
0.6940	0.3100	0.6580	0.3450	0.4159	0.3341	0.4264	0.3236

d. SAMPLING

The sampling procedure for both retroreflectivity and chromaticity shall be consistent with "Retroreflectivity Check" and "Chromaticity Check" respectively, as documented on pages 4 and 5 of the March 2003 report "DOT/FAA/AR-TN03/22; Development Methods for Determining Airport Pavement Marking Effectiveness". However, for warranty purposes the simple average of the chromaticity readings per color shall be the final x, y data point.

Chromaticity shall be defined by ASTM E308 (Standard Practice for Computing the Colors of Objects by Using the CIE System)

Chromaticity readings shall be taken with a BYK Gardner color-guide instrument, or a similar instrument having the same accuracy, repeatability and reproducibility.

Chromaticity readings shall be taken on dry and clean markings as defined in ASTM WK19195 (see above following STM E1164 (Standard Practice for Obtaining Spectrophotometric Data for Object-Color Evaluation).

METHOD OF MEASUREMENT

620-4.1 The quantity of runway and taxiway markings removed by profile milling shall be **the number of square feet** performed in accordance with the specifications and accepted by the Engineer.

620-4.2 The quantity of runway and taxiway markings to be paid for shall be **the number of square feet of preformed markings** performed in accordance with the specifications and accepted by the Engineer.

BASIS OF PAYMENT

620-5.1 Payment shall be made at the contract unit **price per square foot for markings removed by profile milling.** This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item.

620-5.2 Payment shall be made at the contract unit **price per square foot for preformed markings.** This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-620-1	Pavement Marking Removal-Profile Milling - **per square foot**
Item P-620-2	Preformed Thermoplastic Runway Hold Position Markings (include reflective beads) - **per square foot**
Item P-620-3	Preformed Thermoplastic Enhanced Centerline Markings (include reflective beads) - **per square foot**

TESTING REQUIREMENTS

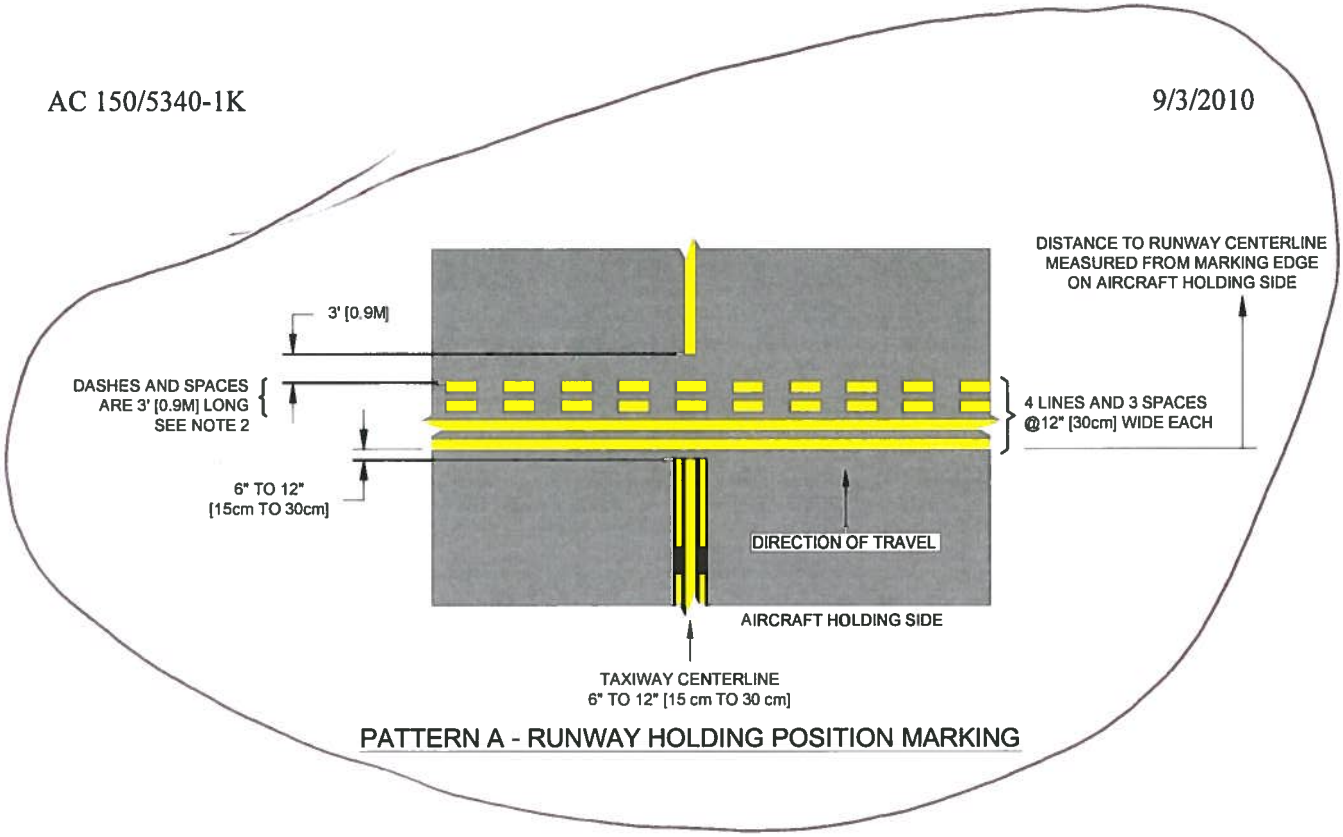
ASTM C 136	Sieve Analysis of Fine and Coarse Aggregates
ASTM C 146	Chemical Analysis of Glass Sand
ASTM C 371	Wire-Cloth Sieve Analysis of Nonplastic Ceramic Powders
ASTM D 92	Test Method for Flash and Fire Points by Cleveland Open Cup
ASTM D 711	No-Pick-Up Time of Traffic Paint
ASTM D 968	Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive
ASTM D 1213-54(1975)	Test Method for Crushing Resistance of Glass Spheres
ASTM D 1652	Test Method for Epoxy Content of Epoxy Resins
ASTM D 2074	Test Method for Total Primary, Secondary, and Tertiary Amine Values of Fatty Amines by Alternative Indicator Method
ASTM D 2240	Test Method for Rubber Products-Durometer Hardness
ASTM G 15453	Operating Light and Water-Exposure Apparatus (Fluorescent Light Apparatus UV-Condensation Type) for Exposure of Nonmetallic Materials.
Federal Test Method Standard No. 141D/GEN	Paint, Varnish, Lacquer and Related Materials; Methods of Inspection, Sampling and Testing

MATERIAL REQUIREMENTS

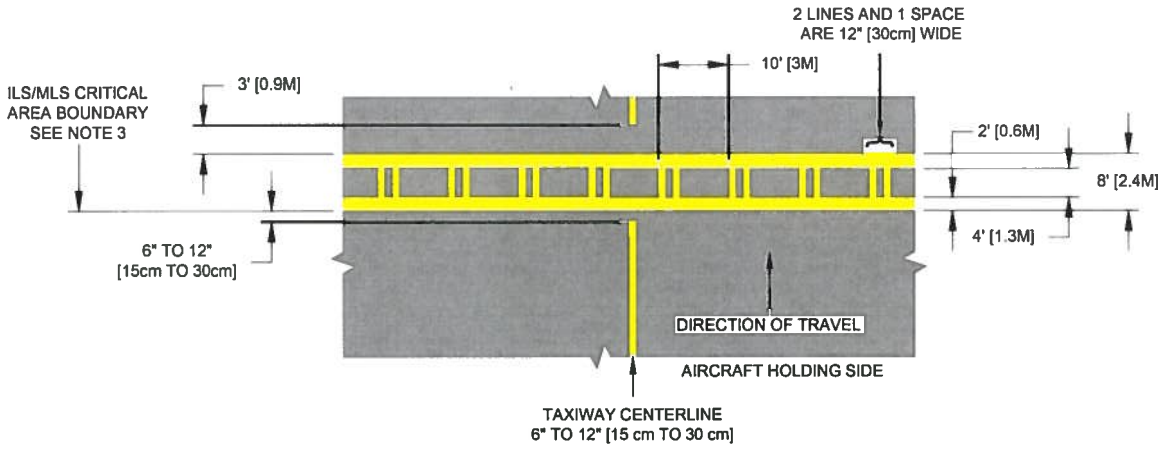
ASTM D 476	Specifications for Dry Pigmentary Titanium Dioxide Pigments Products
Code of Federal Regulations	40 CFR Part 60, Appendix A – Definition of Traverse Point Number and Location
Code of Federal Regulations	29 CFR Part 1910.1200 – Hazard Communications

FED SPEC TT-B-1325D	Beads (Glass Spheres) Retroreflective
AASHTO M 247	Glass Beads Used in Traffic Paints
FED SPEC TT-P-1952E	Paint, Traffic and Airfield Marking, Waterborne
Commercial Item Description (CID) A-A-2886B	Paint, Traffic, Solvent Based
FED STD 595	Colors used in Government Procurement

END OF ITEM P-620



PATTERN A - RUNWAY HOLDING POSITION MARKING



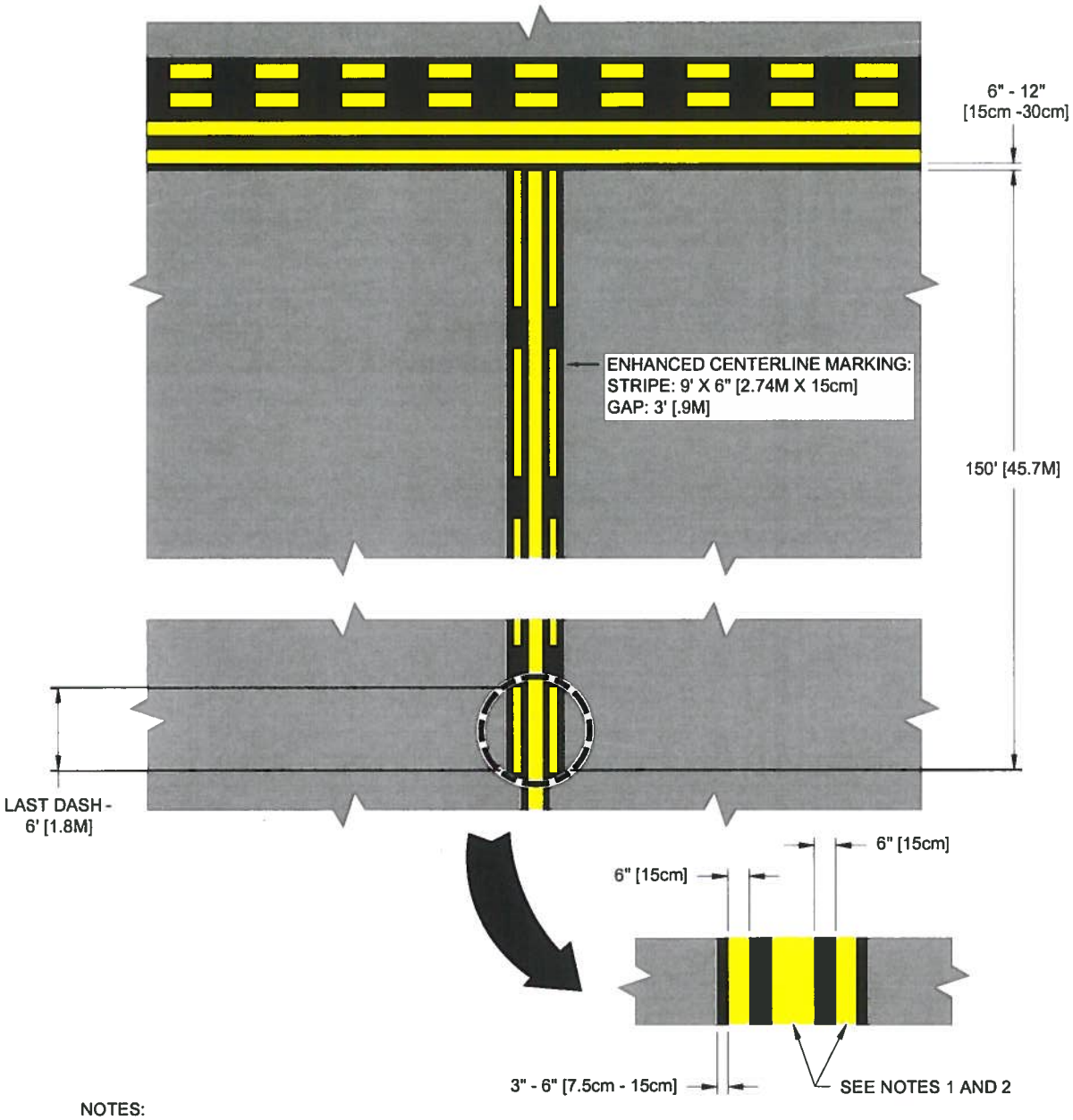
PATTERN B - ILS/MLS HOLDING POSITION MARKING

NOTES:

1. UNLESS OTHERWISE NOTED ALL LINES ARE YELLOW.
2. SEE PARAGRAPH 3.3 FOR REDUCTIONS.
3. SEE PARAGRAPH 3.4 FOR REDUCTIONS.
4. DIMENSIONS SHOWN DO NOT ACCOUNT FOR OUTLINE MARKING IN BLACK PAINT WHEN ON LIGHT-COLORED PAVEMENT. SEE PARAGRAPH 1.4 AND APPENDIX B.

Figure 12. Holding Position Marking Details

3. ENHANCED TAXIWAY CENTERLINE MARKINGS.

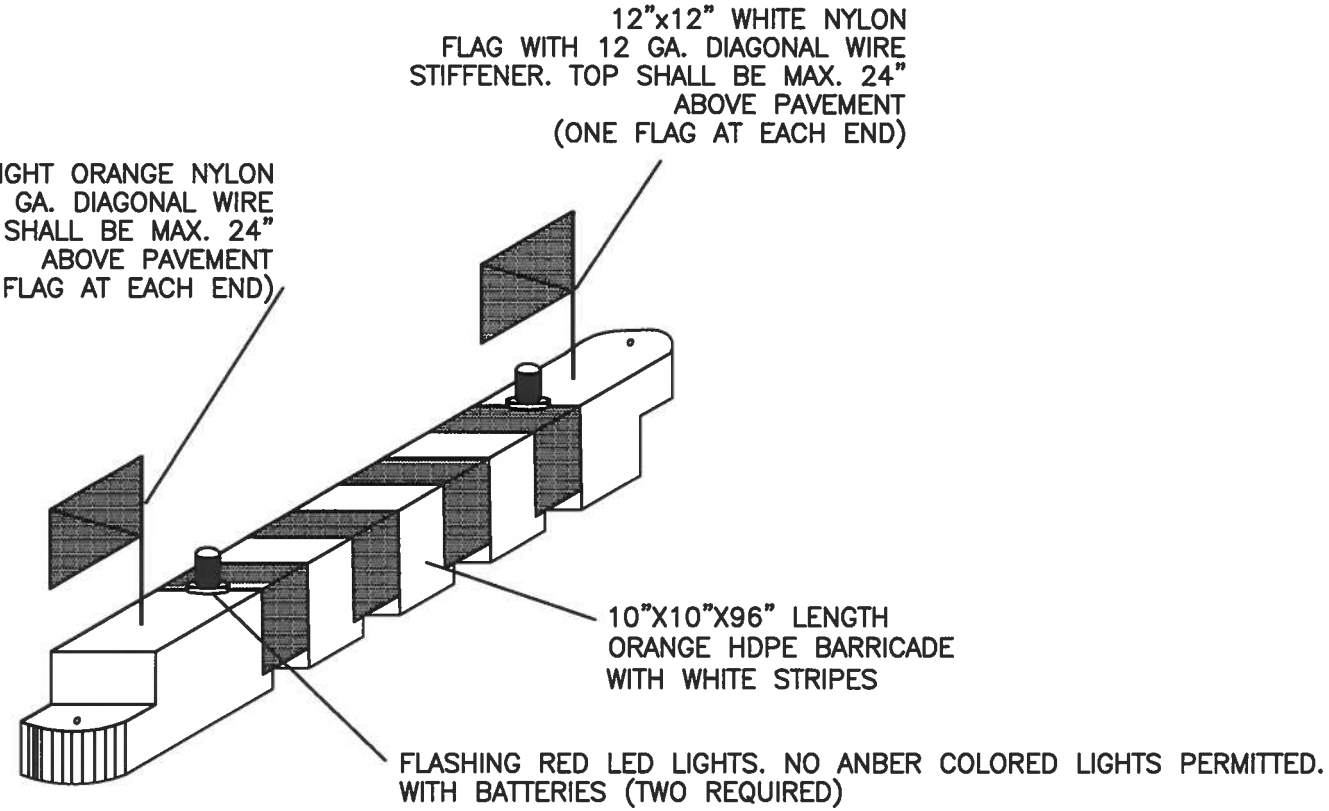


NOTES:

1. DASHED LINES FOR THE ENHANCED TAXIWAY CENTERLINE MARKING ARE 6" [15cm] IN WIDTH AND SEPARATED 6" [15cm] FROM THE TAXIWAY CENTERLINE. THIS APPLIES TO BOTH 6" [15 cm] AND 12" [30 cm] TAXIWAY CENTERLINE MARKINGS.

2. THE TAXIWAY CENTERLINE MARKINGS MAY BE SHIFTED LEFT OR RIGHT TO AVOID INTERFERENCE WITH THE TAXIWAY CENTERLINE LIGHTS.

Figure C - 1. Enhanced Taxiway Centerline Markings



CONSTRUCTION BARRIER DETAIL

NOT TO SCALE

BARRIER NOTES:

1. TYPICAL BARRIER TO BE PLACED ALONG THE LIMITS OF THE PHASES OF WORK, AS SHOWN IN THESE PLANS, TO DELINEATE THE CONTRACTOR'S WORK AREAS.
2. BARRIER SECTIONS SHALL BE WHITE WITH ORANGE STRIPES.
3. ALL BARRIERS SHALL BE CHECKED VISUALLY FOR SIGNS OF WEAR AND TEAR ON A WEEKLY BASIS AND REPLACED AS NEEDED.
4. ALL LIGHT FIXTURES SHALL BE VERIFIED OPERATIONAL BY CONTRACTOR DAILY. CONTRACTOR MUST HAVE A PERSON ON CALL FOR 24 HOURS A DAY FOR EMERGENCY MAINTENANCE OF AIRPORT HAZARD LIGHTING AND BARRICADES.
5. COST OF INSTALLATION AND MAINTENANCE OF BARRIERS SHALL BE INCLUDED IN M-101 MOBILIZATION.
6. BARRIERS SHALL BE PLACED END TO END WITH DESIGNATED GAPS FOR VEHICLE TRAFFIC.
7. NO PART OF THE BARRIER SHALL EXCEED 24" IN HEIGHT FROM THE PAVEMENT.