ADDENDUM NO. 1

GMIA – AIRFIELD PAVEMENT REPLACEMENT 2015 - GRE

PROJECT NO. A203-15007

OFFICIAL NOTICE NO. 7000

GENERAL MITCHELL INTERNATIONAL AIRPORT
Milwaukee County, Wisconsin

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

DATE OF ADDENDUM: April 17, 2015

BIDS CLOSE: 2:00 P.M., WEDNESDAY April 22, 2015

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, consisting of twenty one (21) pages, for **GMIA – AIRFIELD PAVEMENT REPLACEMENT 2015- GRE,** Official Notice No. 7000, at General Mitchell International Airport, Milwaukee, Wisconsin, dated April 17, 2015 is acknowledged.

Date _____ Firm _____

Per _____ Address _____

CHANGES

SPECIFICATIONS

- Insert “Breaker Run Subbase P-154” enclosed.
- Insert “Geotextile Fabric, Type SR P-635” enclosed.

BID SCHEDULE

- Remove Bid Schedule use attached “Bid Schedule-Revised”.

PLAN SHEET

- Remove plan sheet 3 & 4. Replace with sheet 3 Revised & 4 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 quality as an acceptable bid.

BASE BID SCHEDULE-REVISED

GMIA-Airfield Pavement Replacement 2015-GRE

Project No. A203-15007

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	Concrete Sawcutting-24 inch Item P-152 Unit Price per Linear Foot in Writing	1,300	LF			
3	Concrete Pavement Removal-24 inch Item P-152 Unit Price per Square Yard in Writing	2,785	SY			
4	Undercut Excavation Item P-152 Unit Price per Cubic Yard in Writing	625	CY			
5	Concrete Coring - 6 Inch Item P-152 Unit Price per each in Writing	2	EA			
6	Crushed Aggregate Base Course Item P-209 Unit Price per Ton in Writing	917	Ton			
7	Breaker Run Subbase Item P-154 Unit Price per Ton in Writing	30	Ton			

BASE BID SCHEDULE-REVISED
GMIA-Airfield Pavement Replacement 2015 - GRE
Project No. A203-15007

Item No.	Item	Estimated Quantity	Unit	Unit Price	Amount Dollars	Amount Cents
8	Geotextile Fabric, Type SR Item P-635 Unit Price per Square Yard in Writing	2,800	SY			
9	Econocrete-6 Inch Item P-306 Unit Price per Square Yard in Writing	2,785	SY			
10	PCC Pavement-18 Inch Item P-501 Unit Price per Square Yard in Writing	2,785	SY			
11	Concrete Joint Sealing Item P-605 Unit Price per Lineal Foot in Writing	2,325	LF			
12	Perforated Drain Tile-6 Inch Item D-705 Unit Price per Lineal Foot in Writing	402	LF			
13	Construction Allowance Lump Sum Price in Writing	1	LS		30,000	
		Thirty Thousand and no cents				
	BASE BID GRAND TOTAL IN FIGURES					
	BASE BID GRAND TOTAL IN WRITING					

ITEM P-154 SUBBASE COURSE

1. DESCRIPTION

154-1.1 This item shall consist of a subbase course composed of granular materials constructed on a prepared subgrade or underlying course in accordance with these specifications, and in conformity with the dimensions and typical cross section shown on the plans.

1. MATERIALS

154-2.1 MATERIALS. The subbase material shall consist of hard durable particles or fragments of granular aggregates. This material will be mixed or blended with fine sand, clay, stone dust, or other similar binding or filler materials produced from approved sources. This mixture must be uniform and shall comply with the requirements of these specifications as to gradation, soil constants, and shall be capable of being compacted into a dense and stable subbase. The material shall be free from vegetable matter, lumps or excessive amounts of clay, and other objectionable or foreign substances. Pit-run material may be used, provided the material meets the requirements specified.

TABLE 1. SUBBASE GRADATION REQUIREMENTS

Sieve designation (square openings) as per ASTM C 136 and ASTM D 422	Percentage by weight passing sieves
3 inch (75.0 mm)	100
No. 10 (2.0 mm)	20-100
No. 40 (0.450 mm)	5-60
No. 200 (0.075 mm)	0-8

The portion of the material passing the No. 40 (0.450 mm) sieve shall have a liquid limit of not more than 25 and a plasticity index of not more than 6 when tested in accordance with ASTM D 4318.

The maximum amount of material finer than 0.02 mm in diameter shall be less than 3%.

TABLE 2. BREAKER RUN SUBBASE GRADATION REQUIREMENTS

Sieve designation (square openings) as per ASTM C 136 and ASTM D 422	Percentage by weight passing sieves
4 inch	100
3 inch	90-100
1 1/2"	35-75
¾"	10-40
No. 4	0-15

Furnish subbase material and breaker run subbase material for preliminary testing 14 days prior to start of construction. Initial tests on material submittals necessary to determine compliance with the specification requirements will be made by Engineer at no expense to the Contractor.

Furnish samples of subbase material and breaker run subbase material for initial tests and at intervals during construction. The Engineer will designate sampling points and intervals.

2. CONSTRUCTION METHODS

154-3.1 GENERAL. The subbase course shall be placed where designated on the plans or as directed by the Engineer. The material shall be shaped and thoroughly compacted within the tolerances specified.

Granular subbases which, due to grain sizes or shapes, are not sufficiently stable to support without movement the construction equipment, shall be mechanically stabilized to the depth necessary to provide such stability as directed by the Engineer. The mechanical stabilization shall principally include the addition of a fine-grained medium to bind the particles of the subbase material sufficiently to furnish a bearing strength, so that the course will not deform under the traffic of the construction equipment. The addition of the binding medium to the subbase material shall not increase the soil constants of that material above the limits specified.

154-3.2 OPERATION IN PITS. All work involved in clearing and stripping pits and handling unsuitable material encountered shall be performed by the Contractor at his/her own expense. The subbase material shall be obtained from pits or sources that have been approved. The material in the pits shall be excavated and handled in such manner that a uniform and satisfactory product can be secured.

154-3.3 PREPARING UNDERLYING COURSE. Before any subbase material is placed, the underlying course shall be prepared and conditioned as specified. The course shall be checked and accepted by the Engineer before placing and spreading operations are started.

To protect the subgrade and to ensure proper drainage, the spreading of the subbase shall begin along the centerline of the pavement on a crowned section or on the high side of pavements with a one-way slope.

154-3.4 MATERIALS ACCEPTANCE IN EXISTING CONDITION. When the entire subbase material is secured in a uniform and satisfactory condition and contains approximately the required moisture, such approved material may be moved directly to the spreading equipment for placing. The material may be obtained from gravel pits, stockpiles, or may be produced from a crushing and screening plant with the proper blending. The materials from these sources shall meet the requirements for gradation, quality, and consistency. It is the intent of this section of the specifications to secure materials that will not require further mixing. The moisture content of the material shall be approximately that required to obtain maximum density. Any minor deficiency or excess of moisture may be corrected by surface sprinkling or by aeration. In such instances, some mixing or manipulation may be required, immediately preceding the rolling, to obtain the required moisture content. The final operation shall be blading or dragging, if necessary, to obtain a smooth uniform surface true to line and grade.

154-3.5 PLANT MIXING. When materials from several sources are to be blended and mixed, the subbase material shall be processed in a central or travel mixing plant. The subbase material, together with any blended material, shall be thoroughly mixed with the required amount of water. After the mixing is complete, the material shall be transported to and spread on the underlying course without undue loss of the moisture content.

154-3.5.1 MIXED IN PLACE. When materials from different sources are to be proportioned and mixed or blended in place, the relative proportions of the components of the mixture shall be as designated by the Engineer.

The subbase material shall be deposited and spread evenly to a uniform thickness and width. Then the binder, filler or other material shall be deposited and spread evenly over the first layer. There shall be as many layers of materials added as the Engineer may direct to obtain the required subbase mixture.

When the required amount of materials have been placed, they shall be thoroughly mixed and blended by means of graders, discs, harrows, rotary tillers, supplemented by other suitable equipment if necessary. The mixing shall continue until the mixture is uniform throughout. Areas of segregated material shall be corrected by the addition of binder or filler material and by thorough remixing. Water in the amount and as directed by the Engineer shall be uniformly applied prior to and during the mixing operations, if necessary, to maintain the material at its required moisture content. When the mixing and blending has been completed, the material shall be spread in a uniform layer which, when compacted, will meet the requirements of thickness and typical cross section.

154-3.6 GENERAL METHODS FOR PLACING. The subbase course shall be constructed in layers. Any layer shall be not less than 3 inches (75 mm) nor more than 8 inches (200 mm) of compacted thickness. The subbase material shall be deposited and spread evenly to a uniform thickness and width. The material, as spread, shall be of uniform gradation with no pockets of fine or coarse materials. The subbase, unless otherwise permitted by the Engineer, shall not be spread more than 2,000 square yards (1700 square meters) in advance of the rolling. Any necessary sprinkling shall be kept within this limit. No material shall be placed in snow or on a soft, muddy, or frozen course.

When more than one layer is required, the construction procedure described herein shall apply similarly to each layer.

During the placing and spreading, sufficient caution shall be exercised to prevent the incorporation of subgrade, shoulder, or foreign material in the subbase course mixture.

154-3.7 FINISHING AND COMPACTING. After spreading or mixing, the subbase material shall be thoroughly compacted by rolling and sprinkling, when necessary. Sufficient rollers shall be furnished to adequately handle the rate of placing and spreading of the subbase course.

The field density of the compacted material shall be at least 100 percent of the maximum density of laboratory specimens prepared from samples of the subbase material delivered to the jobsite. The laboratory specimens shall be compacted and tested in accordance with ASTM D 1557. The in-place field density shall be determined in accordance with ASTM D 1556 or ASTM D 2922. The moisture content of the material at the start of compaction shall not be below nor more than 2 percentage points above the optimum moisture content.

> **Include testing frequencies per square yard or cubic yard for density and moisture acceptance tests.**
>
> **AASHTO T99 or T-180 (Moisture-Density) should be specified for soils that are expected to have more than 30% retained on the 3/4-inch sieve. The moisture-density relationship test procedures ASTM D 698 and D1557 are not applicable for materials with greater than 30 retained on the 3/4-inch sieve. A replacement procedure (ASTM D 4718) for the coarse material (greater than 3/4-inch) is used with ASTM methods but only until up to 30 percent is retained. Maximum density testing (ASTM D 4253) may be used but it also limits the material retained on the 1-1/2-inch sieve to 30 percent. The AASHTO T-99 and T-180 are similar to ASTM D 698 and D 1557, except they do not limit the replacement of the coarse material.**

When nuclear density gages are to be used for density determination, testing shall be in accordance with Section 120.

The course shall not be rolled when the underlying course is soft or yielding or when the rolling causes undulation in the subbase. When the rolling develops irregularities that exceed 1/2 inch (12 mm) when tested with a 16-foot (4.8 m) straightedge, the irregular surface shall be loosened and then refilled with the same kind of material as that used in constructing the course and again rolled as required above.

Along places inaccessible to rollers, the subbase material shall be tamped thoroughly with mechanical or hand tampers.

Sprinkling during rolling, if necessary, shall be in the amount and by equipment approved by the Engineer. Water shall not be added in such a manner or quantity that free water will reach the underlying layer and cause it to become soft.

For breaker run subbase, place material at the locations indicated on the plans or as otherwise directed by the engineer. For locations where material will be placed over subgrade stabilization fabric, place breaker run in a back dumped manner to protect the prepared subgrade and fabric from rutting, tearing or other damage that might result from the weight of trucks or other construction equipment. Compact breaker run subbase until there is no appreciable displacement, either laterally or longitudinally, under the compaction equipment. Route hauling equipment uniformly over previously placed breaker subbase. Compact each layer before placing a subsequent layer.

154-3.8 SURFACE TEST. After the course is completely compacted, the surface shall be tested for smoothness and accuracy of grade and crown; any portion found to lack the required smoothness or to fail in accuracy of grade or crown shall be scarified, reshaped, recompacted, and otherwise manipulated as the Engineer may direct until the required smoothness and accuracy re obtained. The finished surface shall not vary more than 1/2 inch (12 mm) when tested with a 16-foot (4.8 m) straightedge applied parallel with, and at right angles to, the centerline.

154-3.9 THICKNESS. The thickness of the completed subbase course shall be determined by depth tests or sample holes taken at intervals so each test shall represent no more than 500 square yards (420 square meters). When the deficiency in thickness is more than 1/2 inch (12 mm), the Contractor shall correct such areas by scarifying, adding satisfactory mixture, rolling, sprinkling, reshaping, and finishing in accordance with these specifications. The Contractor shall replace at his/her expense the subbase material where borings are taken for test purposes.

154-3.10 PROTECTION. Work on subbase course shall not be conducted during freezing temperature nor when the subgrade is wet. When the subbase material contains frozen material or when the underlying course is frozen, the construction shall be stopped.

154-3.11 MAINTENANCE. Following the final shaping of the material, the subbase shall be maintained throughout its entire length by the use of standard motor graders and rollers until, in the judgment of the Engineer, the subbase meets all requirements and is acceptable for the construction of the next course.

4. METHOD OF MEASUREMENT

154-4.1 The yardage of subbase course to be paid for shall be the number of cubic yards of subbase course material placed, compacted, and accepted in the completed course. The quantity of subbase course material shall be measured in final position based upon depth tests or cores taken as directed by the Engineer, or at the rate of 1 depth test for each 500 square yards (420 square meters) of subbase course, or by means of average end areas on the complete work computed from elevations to the nearest 0.01 foot (3 mm). On individual depth measurements, thicknesses more than 1/2 inch (12 mm) in excess of that shown on the plans shall be considered as the specified thickness plus 1/2 inch (12 mm) in computing the yardage for payment. Subbase materials shall not be included in any other excavation

quantities.

154-4.2 Breaker Run Subbase will be measured by the ton, acceptably completed.

5. BASIS OF PAYMENT

154-5.1 Payment for subbase course shall be made at the contract unit price per cubic yard. Payment for breaker run subbase shall be made at the contract unit price, per ton. This price shall be full compensation for furnishing all materials; for all preparation, hauling, and placing of these materials; and for all labor, equipment, tools, and incidentals necessary to complete the items.

Payment will be made under:

Item P154-5.1	Breaker Run Subbase	- per ton

TESTING REQUIREMENTS

ASTM C 136	Sieve Analysis of Fine and Coarse Aggregates
ASTM D 422	Particle Size Analysis of Soils
ASTM D 698	Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5 lb (2.49 kg) Rammer and 12-in (305 mm) Drop
ASTM D 1556	Density of Soil in Place by the Sand-Cone Method
ASTM D 1557	Test for Laboratory Compaction Characteristics of Soil Using Modified Effort
ASTM D 2922	Density of Soil in Place by the Nuclear Density Method
ASTM D 4318	Liquid Limit, Plastic Limit, and Plasticity Index of Soils

END OF SECTION

STANDARD SPECIFICATIONS

ITEM P-635 GEOTEXTILE FABRICS

635–1.1 DESCRIPTION. This Work consists of furnishing and installing geotextile fabrics for subgrade separation and stabilization, drainage filtration, subgrade reinforcement, and under culverts and riprap in accordance with the Contract Documents.

1. MATERIALS

635–2.1 GENERAL. The geotextile fabric shall consist of either woven or nonwoven polyester, polypropylene, stabilized nylon, polyethylene or polyvinylidene chloride. All fabric shall have the minimum strength values in the weakest principle direction. Nonwoven fabric may be needle punched, heat bonded, resin bonded, or combinations thereof.

The geotextile fabric shall be insect, rodent, mildew, and rot resistant.

Furnish the geotextile fabric in a wrapping that will protect the fabric from ultraviolet radiation and from abrasion due to shipping and hauling. The geotextile is to be kept dry until installed.

Clearly mark the geotextile fabric rolls showing the type of fabric.

Samples of fabric for testing may be obtained from the job site as specified herein or as determined by the Engineer.

If sewn seams are used, furnish a field sewn seam sample produced from the geotextile fabric and thread and with the equipment to be used on the project, prior to its incorporation into the Work.

Minimum values when not specified herein shall be as specified in the Special Provisions.

In the following tables, numerical values (1) represent minimum/maximum average roll values (i.e., the average of minimum test results on rolls in a lot should meet or exceed the minimum specified values).

635–2.2 GEOTEXTILE FABRIC, TYPE SAS (Subgrade Aggregate Separation). The fabric shall comply with the following physical properties

TABLE 1. GEOTEXTILE FABRIC, TYPE SAS

Test	*Method*	*Value(1)*
Grab Tensile Strength, N	ASTM D–4632	750 minimum
Puncture Strength, N	ASTM D 4833	300 minimum
Apparent Opening Size, μm (U.S. Standard Sieve)	ASTM D 4751	212 maximum
Permittivity, S-1	ASTM D 4491	0.35 minimum

For quantities over 20,000 square yards (17,000 m^2), furnish to the Engineer at least 10 days prior to use in the Work a manufacturer's Certified Report of Test or Analysis that the geotextile fabric delivered for use in the Work meets the above requirements. The delivered geotextile fabric shall bear markings to clearly identify it with the applicable test report furnished to the Engineer. Samples of fabric for testing will be

obtained from the job site for each 20,000 square yards (17,000 m^2) or portion thereof used in the Work.

635–2.3 GEOTEXTILE FABRIC, TYPE MS (Marsh Stabilization). The following test methods will be used to confirm the values shown in the Special Provisions or shown on the Plans.

TABLE 2. GEOTEXTILE FABRIC, TYPE MS

Test	*Method*	*Value(1)*
Tensile Strength (N/m) machine direction	ASTM D 4595	___ minimum
Tensile Strength (N/m) cross direction	ASTM D 4595	___ minimum
Elongation at Required Strength (%)	ASTM D 4595	___maximum
Puncture, (N)	ASTM D 4833	___ minimum
Apparent Opening Size, µm	ASTM D 4751	____maximum
Permittivity, S-1	ASTM D 4491	___ minimum

Deliver to the Engineer a sample of the geotextile material at least 15 days prior to its incorporation into the Work. At the same time, also furnish a sewn seam sample using the same geotextile fabric, thread, seam spacing and number, and overlap distance as are intended or required for use in the Work.

Furnish to the Engineer at least 15 days prior to use in the Work a Manufacturer's Certified Report of Test or Analysis that the geotextile fabric delivered for use in the Work meets the above requirements. The delivered geotextile fabric shall bear markings to clearly identify it with the applicable test report furnished to the Engineer. Samples of fabric for testing will be obtained from the job site for each 10,000 square yards (8500 m^2) or portion thereof used on the Contract.

635–2.4 GEOTEXTILE FABRIC, TYPE DF (Drainage Filtration). The fabric shall comply with the physical requirements of Table 3A unless Table 3B (Schedule B) is indicated on the Plans or in the Special Provisions.

TABLE 3A. GEOTEXTILE FABRIC, TYPE DF, SCHEDULE A

Test	*Method*	*Value(1)*
Grab Tensile Strength, N	ASTM D 4632	500 minimum
Puncture Strength, N	ASTM D 4833	200 minimum
Apparent Breaking Elongation (%)	ASTM D 4632	30 minimum
Apparent Opening Size, µm	ASTM D 4751	300 maximum
Permittivity, S-1	ASTM D 4491	0.72 minimum

TABLE 3B. GEOTEXTILE FABRIC, TYPE DF, SCHEDULE B

Test	*Method*	*Value(1)*
Grab Tensile Strength, N	ASTM D 4632	800 minimum
Puncture Strength, N	ASTM D 4833	300 minimum
Apparent Breaking Elongation (%)	ASTM D 4632	30 minimum
Apparent Opening Size, μm	ASTM D 4751	300 maximum
Permittivity, S-1	ASTM D 4491	1.35 minimum

Slit film woven fabric shall not be used for this Work.

For quantities over 2,000 square yards (1700 m^2), furnish to the Engineer at least 10 days prior to use in the Work a manufacturer's Certified Report of Test or Analysis that the geotextile fabric delivered for use in the Work meets the above requirements. The delivered geotextile fabric shall bear markings to clearly identify it with the applicable test report furnished to the Engineer. Samples of fabric for testing will be obtained from the job site for each 2,000 square yards (1700 m^2) or portion thereof used in the Work.

635–2.5 GEOTEXTILE FABRIC, TYPE SR (Subgrade Reinforcement). The following test methods will be used to confirm the values shown in the Special Provisions or shown on the Plans.

TABLE 4. GEOTEXTILE FABRIC, TYPE SR

Test	*Method*	*Value(1)*
Tensile Strength, lb/ft	ASTM D 4595	4,800 x 4,800 lb/ft minimum
Puncture Strength, lb	ASTM D 4833	160 lb minimum
Elongation at Required Strength (%)	ASTM D 4595	9 x 9% maximum
Apparent Opening Size, μm	ASTM D 4751	30 US Std. Sieve maximum
Permittivity, S-1	ASTM D 4491	0.60 sec^{-1} minimum

For quantities over 10,000 square yards (8500 m^2), furnish to the Engineer at least 10 days prior to use in the Work a Manufacturer's Certified Report of Test or Analysis that the geotextile fabric delivered for use in the Work meets the above requirements. The delivered geotextile fabric shall bear markings to clearly identify it with the applicable test report furnished to the Engineer. Samples of fabric for testing will be obtained from the job site for each 10,000 square yards (8500 m^2) or portion thereof used on this Contract.

635–2.6 GEOTEXTILE FABRIC, TYPE R (Riprap). The fabric shall comply with the following physical properties:

TABLE 5. GEOTEXTILE FABRIC, TYPE R

Test	*Method*	*Value(1)*
Grab Tensile Strength, N	ASTM D 4632	900 minimum
Puncture Strength, N	ASTM D 4833	350 minimum
Apparent Breaking Elongation (%)	ASTM D 4632	20 minimum
Apparent Opening Size, μm	ASTM D 4751	600 maximum
Permittivity, S-1	ASTM D 4491	0.12 minimum

635–2.7 GEOTEXTILE FABRIC, TYPE HR (Heavy Riprap). The fabric shall comply with the following physical properties:

TABLE 6. GEOTEXTILE FABRIC, TYPE HR

Test	*Method*	*Value(1)*
Grab Tensile Strength, N	ASTM D 4632	1350 minimum
Puncture Strength, N	ASTM D 4833	450 minimum
Apparent Breaking Elongation (%)	ASTM D 4632	20 minimum
Apparent Opening Size, μm	ASTM D 4751	600 maximum
Permittivity, S-1	ASTM D 4491	0.40 minimum

635–2.8 GEOTEXTILE FABRIC, TYPE C (Modified SAS). The fabric shall comply with the following physical properties:

TABLE 7. GEOTEXTILE FABRIC, TYPE C

Test	*Method*	*Value(1)*
Grab Tensile Strength, N	ASTM D 4632	900 minimum
Puncture Strength, N	ASTM D 4833	300 minimum
Apparent Opening Size, μm	ASTM D 4751	300 maximum
Permittivity, S-1	ASTM D 4491	0.12 minimum

635–2.9 GEOTEXTILE FABRIC, TYPE ES (Embankment Stabilization). The following test methods shall be used to confirm the values required in the Contract Document..

TABLE 8. GEOTEXTILE FABRIC, TYPE ES

Test	*Method*	*Value(1)*
Tensile Strength, N/m Machine Direction	ASTM D 4595	___ minimum
Tensile Strength, N/m Cross Direction	ASTM D 4595	___ minimum
Elongation at Required Strength, Percent	ASTM D 4595	___ maximum
Apparent Opening Size, μm	ASTM D 4751	___ maximum
Permittivity, S-1	ASTM D 4491	___ minimum

Deliver to the Engineer a sample of the geotextile material at least 15 days prior to its incorporation into the Work. At the same time, also furnish a sewn seam sample using the same geotextile fabric, thread, seam spacing and number, and overlap distance as are intended or required for use in the Work.

Furnish to the Engineer at least 15 days prior to use in the Work a manufacturer's Certified Report of Test or Analysis that the geotextile fabric delivered for use in the Work meets the above requirements. The delivered geotextile fabric shall bear markings to clearly identify it with the applicable test report furnished to the Engineer. Samples of fabric for testing will be obtained from the job site for each 10,000 m^2 or portion thereof used on the Contract.

2. CONSTRUCTION METHODS

635–3.1 SEWING. Sew all factory and field seams with a thread having the same or greater durability as the material in the fabric. Use a 401 stitch conforming to Federal Standard No. 751a for all seams. All seams should develop a tensile strength equal to or greater than 60 percent of the specified grab tensile strength of the fabric, unless otherwise specified.

635–3.2 GEOTEXTILE FABRIC, TYPE SAS. Smooth, shape, and compact the subgrade to the required grade, section, and density prior to the placement of the geotextile fabric. After the fabric has been placed on the subgrade area, no traffic or construction equipment will be permitted to travel directly on the fabric.

Roll out the fabric on the subgrade and pull taut manually to remove wrinkles. Join separate pieces of fabric by overlapping or sewing. Place the fabric in the overlapped joints with a minimum overlap of 18 inches (460 mm).

Weight or pins may be required to prevent lifting of the fabric by wind.

After placement, expose the fabric no longer than 48 hours prior to covering.

Place the base course material over the fabric by back dumping with trucks and leveling with a crawler dozer. Construction equipment shall be such that ruts do not exceed 3 inches in depth. Fill all ruts with additional material. The smoothing of ruts without adding additional material will not be permitted. Cover damaged areas with a patch of fabric using a 3 foot (0.9 m) overlap in all directions.

635–3.3 GEOTEXTILE FABRIC, TYPE MS. Complete clearing operations prior to placement of the fabric.

Within the area to be covered by fabric, cut off level with the ground surface all stumps and sharp objects. Do not remove sod, grass, and roots that extend beneath the ground surface. Carefully place the geotextile fabric on the existing ground using hand methods to avoid disturbing the existing root mat and vegetation. Roll out the fabric as smoothly as possible and pull taut manually to remove wrinkles. Weight or pins may be required to prevent lifting of the fabric by wind. After placement, expose the fabric no longer than 48 hours prior to covering. If defects are observed, replace the section of the fabric containing the defect with a new section of fabric containing no defects.

Place the geotextile fabric with the machine direction of fabric perpendicular to the centerline alignment. Sew all seams with a minimum lap of 3 inches (75 mm) using two parallel stitch lines. The parallel stitching should be spaced no more than 1 inch apart. Orient all seams perpendicular to the centerline alignment and shall be placed facing upward. The seams shall develop at least 80 percent of the specified cross direction tensile strength of the fabric, as determined by the same testing methods. No butt splices between individual roll ends will be allowed. Do not cross stitch lines. Repair all breaks or faults in any seam as directed by the Engineer.

Carefully bend, dump, and push on to the fabric, the i0nitial fill layer to a nominal 2-foot depth (610 mm) depth. Construction equipment will be such that ruts do not exceed 3 inches (75 mm) in depth and excessive deformation of the marsh surface does not occur. Do not allow vehicles to drive on the fabric. Complete the initial 2 foot (610 mm) lift and install all instrumentation before any additional material is placed. After the initial 2 foot (610 mm) lift, all subsequent lifts shall be of a nominal 1 foot (305 mm) depth. Do not start a lift until the preceding lift is completed and approval of the Engineer is obtained. Conduct spreading operations so that damage to the fabric does not occur. Unless otherwise directed by the Engineer, place and spread lifts by expanding outward from the center line of the fill. If the fabric is damaged during fill placement, remove the fill material around the damaged area and cover that area with a patch of fabric having a 3 foot (0.9 m) overlap in all directions.

635–3.4 GEOTEXTILE FABRIC, TYPE DF. Before placement of the geotextile fabric in trench drains, bring the trench to the grades and dimensions shown on the Plans. Remove protruding stones and other items that may damage the geotextile fabric from the trench walls and base prior to placement of the fabric. Place the geotextile fabric in the trench in such a manner as to conform to the trench walls and remain in proper position during drain construction and backfilling. Separate pieces of fabric may be joined by overlapping or sewing. Place the fabric in overlap joints with a minimum overlap of 1.5 feet (450 mm) in the direction of drain flow. Correct misaligned fabric. Damaged fabric areas shall be treated as directed by the Engineer, by either:

a. Placing an additional section of fabric extending at least 2.0 feet (600 mm) beyond any point of the damaged area and positioned between the trench walls and the damaged fabric; or

b. Removing the section of fabric containing the damaged area and replacing it with a new section of fabric. After placement, the fabric shall remain exposed no longer than 48 hours prior to covering.

For applications other than trench drains, bring to the grades and dimension shown on the Plan the surface upon which the fabric is to be located. Prepare the application surface by removing or covering all objects that may damage the fabric. Carefully place the fabric to prevent damage and secure it in position. Conduct backfilling or covering operations in such a manner so as to prevent damage or misalignment of the fabric. Treat damage or misalignment of the fabric as described previously in this Subsection. After placement, expose the fabric no longer than 48 hours prior to covering or backfilling.

635–3.5 GEOTEXTILE FABRIC, TYPE SR. Prior to placement of the fabric, smooth and shape the earth grade to the required grade and section, and when required, compact it to the specified density. After the fabric has been placed on the earth grade, no traffic or construction equipment will be permitted to travel directly on the fabric.

Roll the fabric out on the earth and pull it taut manually to remove wrinkles. Join parallel strips of fabric by overlapping or sewing. Sewn seams shall comply with the requirements of Subsection 635-3.1, but shall

develop a tensile strength equal to or greater than 60 percent of the specified directional tensile strength of the fabric. Place the fabric in the overlapped joints with a minimum overlap of 24 inches (610 mm). Lapp butt splices between fabric rolls a minimum of 36 inches (0.9 m). After the fabric has been placed on the prepared surface, make provisions to prevent the fabric from being lifted or moved by the wind.

Cover tears, holes, or rips in the fabric with a patch of fabric overlapping the defect 3 feet (0.9 m) in all directions.

Cover all fabric within 72 hours of the time of placement.

Place the backfill material with an initial lift of 12 inches (305 mm). Do not exceed 12 inches (305 mm) in thickness for subsequent lifts. Spread each lift with a crawler type tractor and compact it with suitable compaction equipment. Do not exceed 4 inches for the maximum wheel or tread rut depth caused by the operation of construction equipment on backfill lifts. No turning movements for hauling or spreading equipment will be allowed over the fabric until at least two lifts of backfill with a minimum total depth of 18 inches (460 mm) have been placed and compacted. Subsequent lifts may not be started until at least 1,000 feet (305 m) of the previous lift has been spread and compacted. A 1,000 foot (305 m) interval shall be maintained between subsequent lifts until each lift is completed. If ruts greater than 4 inches (100 mm) develop during construction operations, the Engineer reserves the right to require the Contractor to use lighter equipment, equipment with lower contact pressure, or smaller loads on existing equipment.

Fill all ruts in the surface of each lift of backfill with additional material. Smoothing of ruts without adding additional backfill will not be permitted.

635–3.6 GEOTEXTILE FABRIC, TYPE R. Grade the area smooth and remove all stones, roots, sticks, or other foreign material that would interfere with the fabric being completely in contact with the soil prior to placing the fabric.

Place the fabric loosely and lay it parallel to the direction of water movement. Pinning or stapling may be required to hold the geotextile in place. Join separate pieces of fabric by overlapping or sewing. Place the fabric in the overlapped joints with a minimum overlap of 24 inches (610 mm) in the direction of flow. After placement, do not expose the fabric longer than 48 hours prior to covering.

Cover damaged areas with a patch of fabric using a 3 foot (0.9 m) overlap in all directions.

Placement of riprap shall be from the base of the slope upward. Height of freefall of riprap shall be determined by the Engineer but in no case shall this height exceed 1 foot (305 mm).

635–3.7 GEOTEXTILE FABRIC, TYPE HR. The construction methods for Type HR fabric shall conform to the requirements of Subsection 635–3.6, except that the height of freefall of riprap shall not exceed 6 inches (150 mm).

635–3.8 GEOTEXTILE FABRIC, TYPE C. Prior to the placement of geotextile fabric, grade the earth smooth and shape it to the required grade and section. After the fabric has been placed, no traffic or construction equipment will be permitted to travel directly on the fabric.

Roll out the fabric on the excavation and manually pull it taut to remove wrinkles. Join separate pieces of fabric by overlapping or sewing. Place the fabric in the overlapped joints with a minimum overlap of 18 inches (460 mm). Weights or pins may be required to prevent lifting of the fabric by wind.

After placement, do not expose the fabric longer than 48 hours prior to covering.

Place the granular material over the fabric. Construction equipment shall be such that ruts do not exceed 3 inches (75 mm) in depth. Fill all ruts with additional material. The smoothing of ruts without adding additional material will not be permitted.

Cover damaged areas with a patch of fabric using a 3 foot (0.9 m) overlap in all directions.

635-3.9 GEOTEXTILE FABRIC, TYPE ES. Prior to placing the geotextile fabric, bring the embankment to the required elevation and make the surface nominally smooth and level. Place the fabric on the prepared surface to the limits shown on the Plan with the machine direction of the fabric oriented in the direction or directions shown on the Plan. Roll out the fabric as smoothly as possible and manually pull it taut to remove wrinkles. Restrain the fabric as needed to prevent lifting and displacement due to wind. After placement, expose the fabric no longer than 48 hours prior to covering. If defects or damage to the fabric are observed, remove the section of fabric containing the defect or damage and replace it with a new section of fabric without defects or damage.

Sew all seams between fabric strips with two parallel stitch lines spaced no more than 25 mm apart in accordance with the details shown on the Plan. Orient all seams parallel to the roadway alignment and face upward. Sew all seams with a thread having the same or greater durability as the material in the fabric. Use a 401 stitch conforming to Federal Standard No 751a for all seams. All seams shall develop a tensile strength equal to or greater than 50 percent of the specified cross direction tensile strength of the fabric. Repair all sewing defects in any seam as directed by the Engineer. Butt splices between individual roll ends will not be allowed.

The initial fill layer over fabric layers shall not be less than 8 inches (200 mm) or more than 12 inches (300 mm). Carefully end dump and push this lift on to the fabric. Spreading operations and equipment shall not cause displacement and damage to the fabric. Sharp turning movements are not permitted while placing the initial lift over individual fabric layers. Vehicles are not allowed to drive on the fabric. No lift may be started until the preceding lift is completed. Place and compact additional lifts in accordance with Section P-152 of the Standard Specifications.

Unless otherwise specified, all fill material placed in the zone from at least 8 inches (200 mm) below to at least 8 inches (200 mm) above any single or multiple layer geotextile installation shall be a granular material meeting the requirements as presented in the Plans and Special Provisions of the project.

3. METHOD OF MEASUREMENT

635–4.1 METHOD OF MEASUREMENT. Geotextile Fabric, Type SAS; Geotextile Fabric, Type MS; Geotextile Fabric, Type DF; Geotextile Fabric, Type SR; Geotextile Fabric, Type R; Geotextile Fabric, Type HR; and Geotextile Fabric, Type C; will each be measured by the square yard of surface area upon which the fabric has been placed and accepted in accordance with the Contract.

4. BASIS OF PAYMENT

635–5.1 BASIS OF PAYMENT. Geotextile Fabric, Type SAS; Geotextile Fabric, Type DF; and Geotextile Fabric, Type SR; and Geotextile Fabric, Type C; measured as provided above, will each be paid for at the Contract unit price per square yard, which price will be full compensation for furnishing, transporting, and installing the fabric; and for furnishing all labor, tools and equipment necessary to complete the Work.

Geotextile Fabric, Type MS; Geotextile Fabric, Type ES: Geotextile Fabric, Type R; and Geotextile Fabric, Type HR, measured as provided above, will each be paid for at the Contract unit price per square yard, which price will be full compensation for preparing the marsh area or foundation; for furnishing, transporting, and placing the fabric; and for furnishing all labor, tools and equipment necessary to complete the Work.

Standard Pay Items for Work covered by this Specification are as follows:

Pay Item P635-5.1	Geotextile Fabric, Type SR, per square yard

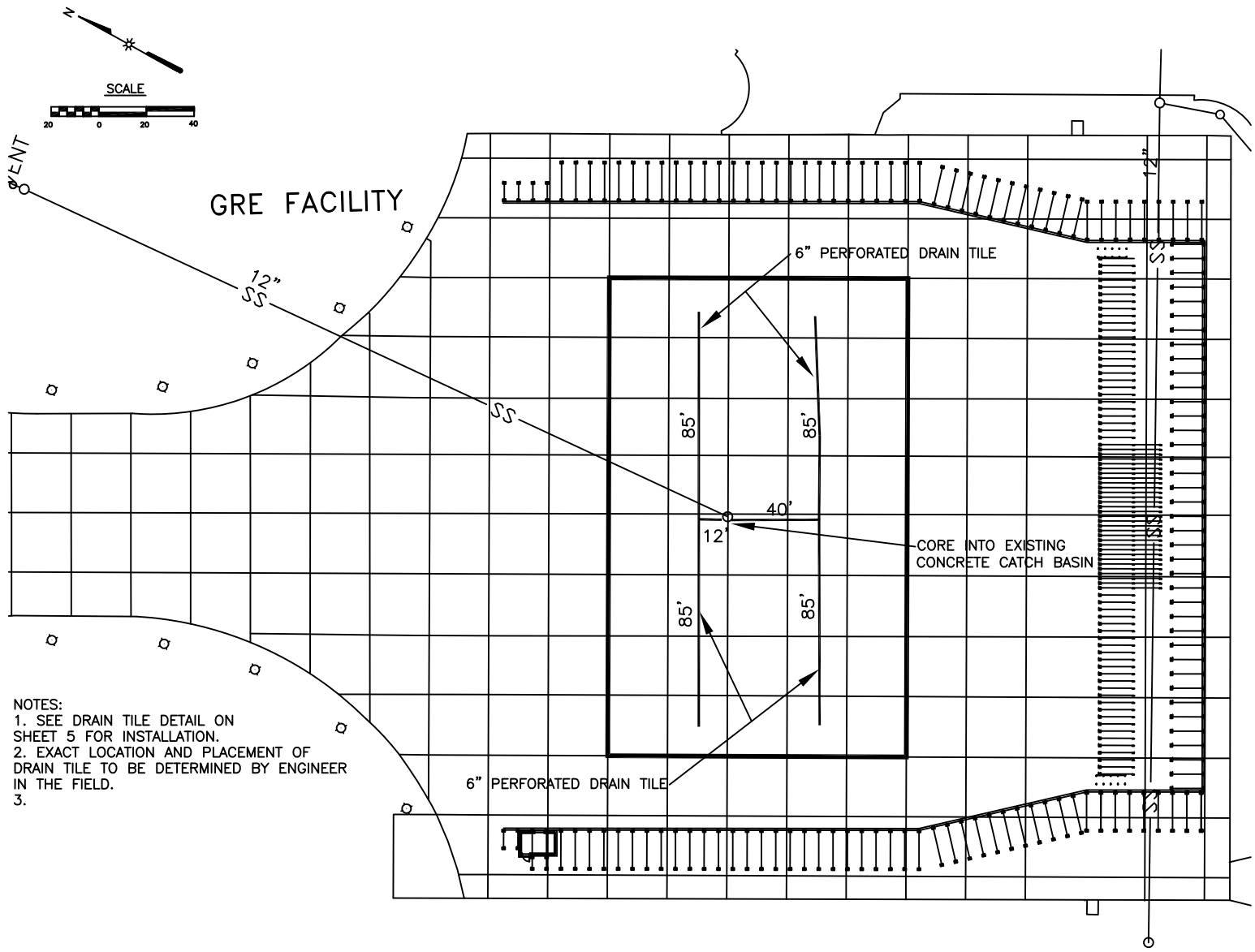
Measurement and Payment will only be made for Pay Items included in the Schedule of Prices. The cost of

all Work required by the Contract Documents will be included in the Pay Items contained in the Schedule of Prices.

TESTING REQUIREMENTS

ASTM D 4595	Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method
ASTM D 4632	Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
ASTM D 4491	Standard Test Methods for Water Permeability of Geotextiles by Permittivity
ASTM D 4751	Standard Test Method for Determining Apparent Opening Size of a Geotextile
ASTM D 4833	

END OF SECTION



NOTES:
1. SEE DRAIN TILE DETAIL ON SHEET 5 FOR INSTALLATION.
2. EXACT LOCATION AND PLACEMENT OF DRAIN TILE TO BE DETERMINED BY ENGINEER IN THE FIELD.
3.

TO OBTAIN LOCATION OF PARTICIPANTS' UNDERGROUND FACILITIES BEFORE YOU DIG
CALL DIGGERS HOTLINE
800-242-8511
TOLL FREE 1-800-242-8511
TELEFAX 414-259-0847
WWW.DIGGERSHOTLINE.COM

WISCONSIN STATUTE 182.0175 (1974) REQUIRES MINIMUM OF 3 WORKING DAYS NOTICE BEFORE YOU EXCAVATE

REVISED

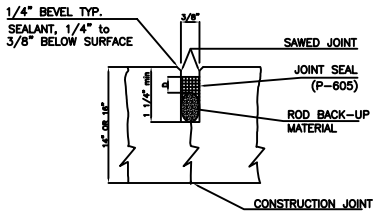
GRE - DRAINAGE CONSTRUCTION PLAN

General Mitchell International Airport
Airfield Pavement Replacement 2015 - GRE

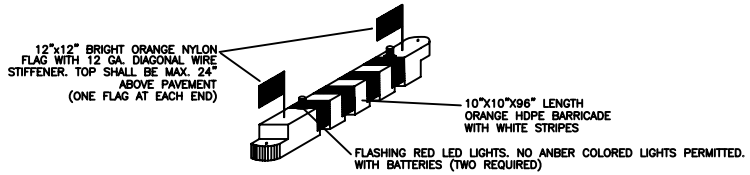
MILWAUKEE COUNTY DEPARTMENT OF ADMINISTRATIVE SERVICES
AIRPORT ENGINEERING: 5300 S. HOWELL AVE. MILWAUKEE, WI 53207

REVISIONS:

DATE: MARCH 2015
PROJECT: A203-15007
SITE NO: 290
BUILDING NO: N/A
FILE NO: 18-109
SHEET NO:
3 of 5

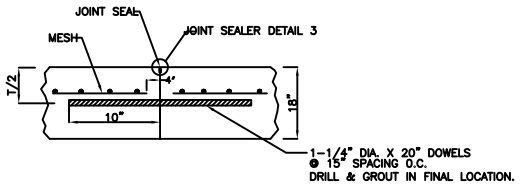


JOINT SEALER DETAIL
(CONSTRUCTION JOINTS)

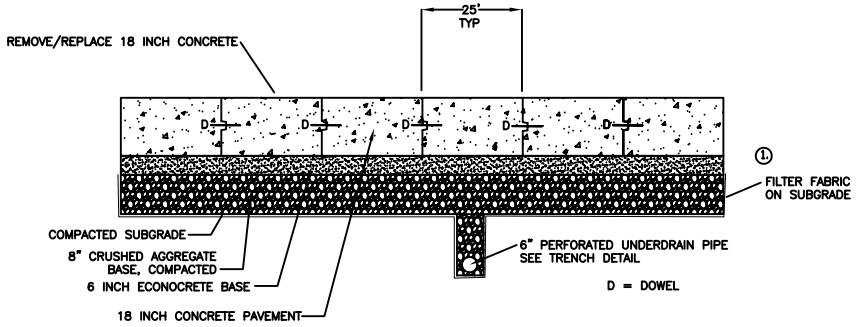


CONSTRUCTION BARRICADE DETAIL
NOT TO SCALE

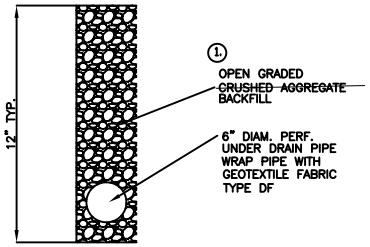
NOTES:
1. TYPICAL BARRIER TO BE PLACED ALONG THE LIMITS OF THE PHASES OF WORK, AS SHOWN IN THESE PLANS, TO DELINEATE THE CONTRACTOR'S WORK AREAS.
2. BARRIER SECTIONS SHALL BE WHITE WITH ORANGE STRIPES.
3. ALL BARRIERS SHALL BE CHECKED VISUALLY FOR SIGNS OF WEAR AND TEAR ON A WEEKLY BASIS AND REPLACED 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.



DOWELED CONSTRUCTION JOINT



TYPICAL 24 INCH GRE PAVEMENT SECTION



UNDERDRAIN TRENCH DETAIL
NOT TO SCALE

REVISED

General Mitchell International Airport
Airfield Pavement Replacement 2015 - GRE

MILWAUKEE COUNTY DEPARTMENT OF ADMINISTRATIVE SERVICES
AIRPORT ENGINEERING 5300 S. HOWELL AVE. MILWAUKEE, WI 53207

REVISIONS:
1. CHANGE ORDER, APRIL 17,2015

DATE: MARCH 2015
PROJECT: A203-15007
SITE NO: 290
BUILDING NO: N/A
FILE NO: 18-112
SHEET NO:
4 of 4