

Purchasing Division Finance Department

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Addendum 1 Solicitation 23-4405

DIA Taxiway C – North Rehabilitation

This addendum serves to notify all bidders of the following changes to the solicitation documents:

DOCUMENT HOLDERS on the above-named project are hereby notified that this document shall be appended to, take precedence over and become part of the original bidding documents dated April 17, 2023 for this work. Bids submitted for the construction of this work shall conform to this document.

This addendum consists of 40 pages including revisions to the instructions to bidders, contract conditions, technical specifications, project drawings, and clarifications to questions received by bidders.

Changes to Bidding Requirements:

- 1. Replace 00 21 13 pages 5 through 7 Instructions to Bidders_ONLINE BIDDING
 - a. Section 13.02 removed a reference to QuestCDN and changed it to Bid Express
 - b. Section 15.02 removed a reference to QuestCDN and changed it to Bid Express
 - c. Section 17.01 updated link for bid results to City of Duluth website.

Changes to Conditions of the Contract:

- 2. Replace page 00 73 00 3 Supplementary Conditions
 - a. Section SC 6.03 removed Contractor's Professional Liability insurance requirement.
 - b. Section SC 6.03 (6) added Braun Intertec to Additional Insured
- 3. Replace page 00 73 00 5 Supplementary Conditions
 - a. Updated SC-8.02

Changes to Specifications:

- 4. Replace 01 25 13 4 Product Substitution Procedures
 - a. Added email address for substitution submittals.
 - b. Removed self-addressed stamped envelope sentence.
- 5. Replace 31 25 10mn Stormwater Management
 - a. Removed unnecessary sections.
- 6. Replace 32 01 16 Mill Pavement Surface
 - a. Removed unnecessary sections.
 - b. Noted that millings shall become property of the airport.

7. Replace Specification P-401 - Asphalt Mix Pavement

a. Contractor Quality Control is required.

b. Added in missing sections in 401-6.1 through 401-6.4

Changes to Drawings:

- 8. Sheet G1.00 stockpile Area A max height is 20 feet.
- 9. Sheet G1.02 updated phasing notes.
- 10. Sheet G2.00 through G2.02 updated notes.
- 11. Sheet G3.02 updated statement of estimated quantities.
- 12. Sheets C3.00 through C3.02 updated pavement marking notes.

Clarifications:

- 13. Question Can MnDOT mix be used?
 - a. Due to the aircraft that are anticipated to use Taxiway C we will be sticking with P-401 as

indicated in the technical specifications.

- 14. Question Can all phases be run concurrently?
 - a. The phases could be run in quick succession, but not concurrently. At no time will both runways be allowed to be closed at the same time.

Note: Receipt of this Addendum No. 1, dated May 5, 2023 shall be acknowledged Bid Express. Failure to do so

will not allow Bidder to submit Bid.

Please acknowledge receipt of this Addendum by checking the acknowledgment box within the <u>www.bidexpress.com</u> solicitation.

Posted: 5/5/23

date for receipt of Bids. Each such request shall comply with the requirements of Paragraphs 7.04 and 7.05 of the General Conditions. The burden of proof of the merit of the proposed item is upon Bidder. Engineer's decision of approval or disapproval of a proposed item will be final. If Engineer approves any such proposed item, such approval will be set forth in an Addendum issued to all prospective Bidders. Bidders shall not rely upon approvals made in any other manner.

11.03 All prices that Bidder sets forth in its Bid shall be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of "or-equal" or substitution requests are made at Bidder's sole risk.

ARTICLE 12 – SUBCONTRACTORS, SUPPLIERS, AND OTHERS

- 12.01 A Bidder shall be prepared to retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of the Work if required by the Bidding Documents (most commonly in the Specifications) to do so. Subcontractors must comply with MN Statute 16C.285 to do work under this project. It is the prospective Bidder's responsibility to verify its proposed subcontractors compliances with the statutes. If a prospective Bidder objects to retaining any such Subcontractor, Supplier, or other individual or entity, and the concern is not relieved by an Addendum, then the prospective Bidder should refrain from submitting a Bid.
- 12.02 Subsequent to the submittal of the Bid, Owner may not require the Successful Bidder or Contractor to retain any Subcontractor, Supplier, or other individual or entity against which Contractor has reasonable objection.
- 12.03 All bidders shall submit to Owner a list of the Proposed Subcontractors and Proposed Suppliers with their bid.

If requested by Owner, such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, or other individual or entity. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder shall submit a substitute, Bidder's Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.

12.04 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers, or other individuals or entities. Declining to make requested substitutions will constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.06 of the General Conditions.

ARTICLE 13 – PREPARATION OF BID

- 13.01 The Bid Form Document 00 41 00 and attachments are included in the Bidding Documents. Photocopies of these documents should be made for the purpose of submitting the Bid.
 - A. All blanks shall be completed by printing in ink or by typewriter and the Bid signed in ink.
- 13.02 A Bid price shall be indicated for each section, Bid Item and unit price item listed on the Bid Express Online Bid Worksheet. The Bid Worksheet is a part of and appurtenant to the Bid Form and Bid.
- 13.03 A Bid by a corporation shall be executed in the corporate name by the president or a vice-president or other corporate officer accompanied by evidence of authority to sign. The corporate seal shall be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown.

- 13.04 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership shall be shown.
- 13.05 A Bid by a limited liability company shall be executed in the name of the firm by a member and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.
- 13.06 A Bid by an individual shall show the Bidder's name and official address.
- 13.07 A Bid by a joint venture shall be executed by each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.
- 13.08 All names shall be typed or printed in ink below the signatures and uploaded.
- 13.09 The Bid shall contain an acknowledgment of receipt of all Addenda.
- 13.10 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.
- 13.11 The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach covenant to the Bid. Bidder's state contractor license number, if any, shall also be shown on the Bid Form.

ARTICLE 14 – BASIS OF BID; EVALUATION OF BIDS

- 14.01 Unit Price
 - A. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the unit price section of the Bid Form.
 - B. The "Bid Price" (sometimes referred to as the extended price) for each unit price Bid item will be the product of the "Estimated Quantity" (which Owner or its representative has set forth in the Bid Form) for the item and the corresponding "Bid Unit Price" offered by the Bidder. The total of all unit price Bid items will be the sum of these "Bid Prices"; such total will be used by Owner for Bid comparison purposes. The final quantities and Contract Price will be determined in accordance with Paragraph 13.03 of the General Conditions.
 - C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

ARTICLE 15 – SUBMITTAL OF BID

- 15.01 The Bid shall be submitted electronically.
 - A. The Bid Form Document 00 41 00 is to be completed and submitted with all the attachments as required to be submitted under the terms of Article 2 of the Bid Form.
 - B. The Bid Worksheet is to be completed and submitted under the terms of Article 3 of the Bid Form.
- 15.02 The Bid shall be submitted no later than the date and time prescribed as indicated in the Advertisement for Bids, unless altered in an issued addendum.
 - A. The official time and date is the time and date displayed in Bid Express Online.
- 15.03 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner will not be accepted nor opened.
- 15.04 The submitted Bid Bond shall be a copy of original signatures and the seal of the Surety. Request of actual copy upon award may be requested.

ARTICLE 16 – MODIFICATION AND WITHDRAWAL OF BID

- 16.01 A Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.
- 16.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 16.01 and submit a new Bid prior to the date and time for the opening of Bids.
- 16.03 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, that Bidder will be disqualified from further bidding on the Work.

ARTICLE 17 – OPENING OF BIDS

17.01 Bids will be opened at the time and place indicated in the Advertisement for Bids and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base bids and major alternates, if any, will be made available to Bidders as soon as practicable after the opening of bids. The abstract can be found by following the link of https://duluthmn.gov/purchasing/bids/-request-for/proposals/ page.

ARTICLE 18 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE

18.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 19 – AWARD OF CONTRACT

- 19.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional bids. Owner will reject the Bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to not be responsible. If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, then the Owner will reject the Bid as nonresponsive. Owner also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate contract terms with the Successful Bidder.
- 19.02 If Owner awards the Contract for the Work, such award shall be to the responsible Bidder submitting the lowest responsive Bid. Owner may also reject the Bid of any bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder.
- 19.03 More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.
- 19.04 Evaluation of Bids
 - A. In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.
 - B. For the determination of the apparent low Bidder when unit price bids are submitted, Bids will be compared on the basis of the total of the products of the estimated quantity of each item and unit price Bid for that item, together with any lump sum items.
- 19.05 In evaluating Bidders, Owner will consider the qualifications of Bidders and may consider the qualifications and experience of Subcontractors, Suppliers, and other individuals or entities proposed for those portions of the Work for which the identity of Subcontractors, Suppliers, and other individuals or entities must be submitted as provided in the Bidding Documents.

2.	. Contractor's Commercial General Liability under Paragraphs 6.03.B and 6.03.C of the General Conditions:		
	a.	General Aggregate	\$1,500,000
	b.	Products - Completed Operations Aggregate	\$1,500,000
	C.	Personal and Advertising Injury	\$1,500,000
	d.	Each Occurrence (Bodily Injury and Property Damage)	\$1,500,000
3.	Aut	tomobile Liability under Paragraph 6.03.C of the General Conditions:	
	a.	Bodily Injury: Each person Each Accident	\$1,500,000 \$1,500,000
4.	b. Exc	Property Damage: Each Accident cess or Umbrella Liability:	\$1,500,000
	a.	General Aggregate	\$1,500,000
	b.	Each Occurrence	\$1,500,000
5.	Co	ntractor's Pollution Liability:	
	a.	Each Occurrence	\$1,500,000
	b.	General Aggregate	\$1,500,000
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- 6. Additional Insureds: In addition to Owner and Short Elliott Hendrickson Inc., include as additional insureds the following:
 - a. Braun Intertec

SC-6.05 Property Losses; Subrogation

Delete Paragraph 6.05.A in its entirety and substitute the following in its place:

- A. Installation Floater: Contractor shall provide and maintain installation floater insurance for property under the care, custody, or control of Contractor. The installation floater insurance shall be a broad form or "all risk" policy providing coverage for all materials, supplies, machinery, fixtures, and equipment that will be incorporated into the Work. Coverage under the Contractor's installation floater will include:
 - 1. any loss to property while in transit,
 - 2. any loss at the Site, and
 - 3. any loss while in storage, both on-site and off-site.

Coverage cannot be contingent on an external cause or risk, or limited to property for which the Contractor is legally liable. The Contractor will be solely responsible for any deductible carried under this coverage and claims on materials, supplies, machinery, fixture, and equipment that will be incorporated into the Work while in transit or in storage. This policy will include a waiver of subrogation applicable to Owner, Contractor, Engineer, all Subcontractors, and the officers, directors, partners, employees, agents and other consultants and subcontractors of any of them.

SC-8.02 Coordination

Delete Paragraph 8.02.A in its entirety and replace with the following:

- A. The Contractor is hereby advised that the Owner intends to contract with others during the Contract Time. The following work may be performed at or adjacent to the Site:
 - 1. Taxiway A Reconstruction (Phase 2 & \$) performed by <u>Shafer Contracting</u>

SC-10.03 Resident Project Representative

Add the following new paragraphs immediately after Paragraph 10.03.B:

- C. The Resident Project Representative (RPR) will be Engineer's employee or agent at the Site, will act as directed by and under the supervision of Engineer, and will confer with Engineer regarding RPR's actions.
 - 1. *General:* RPR's dealings in matters pertaining to the Work in general shall be with Engineer and Contractor. RPR's dealings with Subcontractors shall only be through or with the full knowledge and approval of Contractor. The RPR shall generally communicate with Owner only with the knowledge of and under the direction of Engineer.
 - 2. *Schedules*: Review the progress schedule, schedule of Shop Drawing and Sample submittals, and Schedule of Values prepared by Contractor and consult with Engineer concerning acceptability.
 - 3. *Conferences and Meetings*: Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences and other project-related meetings, and prepare and circulate copies of minutes thereof.
 - 4. Liaison:
 - a. Serve as Engineer's liaison with Contractor, working principally through Contractor's authorized representative or designee, assist in providing information regarding the intent of the Contract Documents.
 - b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.
 - c. Assist in obtaining from Owner additional details or information, when required for proper execution of the Work.
 - 5. *Interpretation of Contract Documents:* Report to Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.
 - 6. Shop Drawings and Samples:
 - a. Record date of receipt of Samples and approved Shop Drawings.
 - b. Receive Samples which are furnished at the Site by Contractor, and notify Engineer of availability of Samples for examination.
 - c. Advise Engineer and Contractor of the commencement of any portion of the Work requiring a Shop Drawing or Sample submittal for which RPR believes that the submittal has not been approved by Engineer.
 - 7. *Modifications:* Consider and evaluate Contractor's suggestions for modifications in Drawings or Specifications and report such suggestions, together with RPR's recommendations, to Engineer. Transmit to Contractor in writing decisions as issued by Engineer.
 - 8. Review of Work and Rejection of Defective Work:
 - a. Conduct on-Site observations of Contractor's work in progress to assist Engineer in determining if the Work is in general proceeding in accordance with the Contract Documents.

SUBSTITUTION REQUEST FORM

TO: Attn: Josh Holbrook, PE jholbrook@sehinc.com Short Elliott Hendrickson Inc. 3535 Vadnais Center Drive St. Paul, MN 55110-5196 651.490.2000

PROJECT: 2023 Taxiway C – North Rehabilitation, Duluth International Airport

SE	CTION NO.	ARTICLE NO.	SPECIFIED	PRODUCT		PRC	POSED) SUBST	TITUTION
A.		stitution affect dimensio		vings?	Yes		No		
В.		stitution affect other tra		10 10	Yes		No		
C.		nufacturer's guarantee o	•		Yes		No		
D.	-	ed "Yes" to Items A, B, o		•	•				
E.	explanation o	her differences betwee n your company letterh duct must comply with	ead. If differences	are not not					
F.	The proposed	I substitution was used	within the last 24 r	months on t	he follow	ing proje	ect:		
	Project Nan	ne							
	Location								
	Engineer								
	Telephone	No							
G.	 G. Has the proposed substitution been used on an SEH project within the last 12 months? Yes No If yes, which project? All questions must be answered. Incomplete forms will not be reviewed. 								
Su	bmitted By:				For Use	by Des	ign Con	sultant	
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SECTION 31 25 10

STORMWATER MANAGEMENT

(MnDOT 2573)

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Temporary measures to control soil erosion and sedimentation.
 - 2. Furnishing, installing and maintaining erosion or sediment control devices.
- B. Related Sections:
- C. Method of Measurement:
 - 1. Silt Fence: Measured along base of fence acceptably provided from outside to outside of end posts.
- D. Basis of Payment:
 - 1. Payment for acceptable quantities of Stormwater Management items shall be at the Contract Unit Price as listed on the Bid Form. All associated Work items shall be considered incidental.

1.02 REFERENCES

- A. MnDOT:
 - 1. 1717 Air, Land, and Water Pollution
 - 2. 2573 Storm Water Management
- B. MnDOT District Vegetation Establishment Recommendations http://www.dot.state.mn.us/environment/erosion/vegetation.html
- C. Minnesota Stormwater Manual https://stormwater.pca.state.mn.us/index.php?title=Temporary construction erosion and sediment control
- D. Protecting Water Quality in Urban Areas Best Management Practices for Minnesota, published by the Minnesota Pollution Control Agency

1.03 DEFINITIONS

- A. BMPs: Best Management Practices
- B. For the NPDES permit process, the operator is defined as the Contractor
- C. SWPPP: Storm Water Pollution Prevention Plan

1.04 SUBMITTALS

- A. An NPDES/SDS Construction Stormwater Permit is not required on this project.
- B. Erosion and sediment control schedule.

1.05 REGULATORY REQUIREMENTS

A. An NPDES/SDS Construction Stormwater Permit is not required on this project.

1.06 QUALITY ASSURANCE

- A. Refer to "Protecting Water Quality in Urban Areas Best Management Practices for Minnesota.
- B. Minnesota Stormwater Manual (as referenced above).
- C. Obtain all necessary permits from responsible regulatory agencies.
- D. Ensure minimum interference with roads, streets, walks, and adjacent occupied or used facilities. Do not close or obstruct without permission from authorities having jurisdiction.

PART 2 PRODUCTS

2.01 MATERIALS

A. Silt Fence MnDOT 3886.

PART 3 EXECUTION

3.01 PREPARATION

- A. Establish sediment control BMPs on all downgradient perimeters of the site and downgradient area of the site that drain to any surface water, including curb and gutter systems.
- B. Preserve a 50 foot natural buffer **OR** If a buffer is infeasible on site, provide redundant (double) perimeter sediment controls when a surface water is located within 50 feet of a project's disturbance limit.
- C. Place erosion control for wetland protection prior to Work on any phase of the Project.
- D. Install safeguards to prevent water pollution from haul roads, work platforms, or other temporary construction facilities.
- E. Minimize sediment from entering surface waters, curb and gutter systems, and storm sewer inlets.
- F. Complete grading, finishing, erosion control and turf establishment on a drainage area basis to prevent excessive soil erosion.
 - 1. Shape exposed soil areas to permit runoff with minimal erosion.
- G. Coordinate erosion control measures with earthwork and turf establishment operations.
- H. Stabilize all exposed soil areas, including stockpiles, when construction activity has ceased or is completed on any portion of the site to limit soil erosion in accordance with section 1.05.B.

3.02 PLACING TEMPORARY EROSION CONTROL ITEMS

- A. Construct items in conformance with MnDOT 2573.3 and the typical sections and elevation controls shown on Drawings.
- B. Silt Fence:
 - 1. Provide in compliance with MnDOT 2573.3.B.
 - 2. Posts: MnDOT 3886.
 - 3. Hand Installed (HI): MnDOT 2573.3.B.3 and MnDOT 3886.
 - 4. Machine Sliced (MS): MnDOT 2573.3.B.2 and MnDOT 3886.
 - 5. Super Duty (SD): MnDOT 2573.3.B.4 and MnDOT 3886.
 - 6. Pre-Assembled (PA): MnDOT 2573.3.B.1 and MnDOT 3886.

3.03 EMERGENCY EROSION CONTROL

- A. Upon written order by Engineer, conduct temporary erosion control Work on an emergency basis.
 - 1. Mobilize with sufficient personnel, equipment, materials, and incidentals within 24 hours of receipt of order.
 - 2. Provide immediate corrective work followed by installation of erosion control measures.

3.04 REPAIR AND MAINTENANCE

- A. Inspect, repair, and maintain all erosion control measures to provide proper function throughout project in compliance with MnDOT 2573.3.P.
- B. Failure to maintain erosion control measures: Owner may hire another firm to maintain erosion control measures. Costs associated with hiring another firm will be deducted from the Contract.
- C. Silt Fence:
 - 1. Inspect immediately after each runoff event and minimum once daily during prolonged rainfall.
 - 2. Make required repairs immediately.
 - 3. When sediment deposits reach approximately one-half the height of the silt fence, remove sediment or install a second silt fence.
 - 4. Dispose of sediment as directed by Engineer.

3.05 FIELD QUALITY CONTROL

- A. Inspections and maintenance prior to final acceptance:
 - 1. Every 7 days.
 - 2. Within 24 hours of 1/2-inch storm or greater.
 - 3. Record and file with SWPPP.

3.06 CLEANUP AND RESTORATION

- A. Remove temporary erosion control items when area is permanently stabilized and upon completion of Work.
- B. Restore all plant, equipment, or other supplementary operation sites to prevent siltation and erosion.
- C. Repair any off-site damage resulting from failure to install or maintain BMPs.
- D. Restore and stabilize areas disturbed during removal of erosion controls.

END OF SECTION

SECTION 32 01 16

MILL PAVEMENT SURFACE (MnDOT 2232)

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes machine (cold) milling of an existing pavement surface preparatory to placement of another course thereon.
- B. Related Sections:
- C. Method of Measurement:
 - 1. Measure by area in square yards.
- D. Basis of Payment:
 - 1. Bid price includes clean-up and on-site stockpiling operations.
 - a. Note that millings shall become property of the airport and stockpiled at the location shown on the plan sheets.
 - 2. Payment for acceptable quantities of pavement milling shall be at the contract unit price as listed on the Bid Form. All associated work items will be considered incidental.

1.02 REFERENCES

A. MnDOT: 2232 - Mill Pavement Surface

PART 2 PRODUCTS

2.01 EQUIPMENT

- A. The milling machine shall have the following features and capabilities:
 - 1. Power operated.
 - 2. Self-propelled.
 - 3. Remove both concrete and bituminous surface materials.
 - 4. Produce uniform surface texture across the pavement surface.
 - 5. Control dust and other particulate matter generated.
 - 6. Automatic Grade Control System:
 - a. Control elevation and cross slope at specified rates.
 - b. Establish profile grades along each edge of the machine within plus or minus 1/8 inch.
 - c. Reference grade control by either of the following:
 - 1) From in-place pavement by means of a ski or matching shoe.
 - 2) Independent control.

PART 3 EXECUTION

3.01 MILLING OPERATIONS

- A. Mill pavement to the depth, width, grade and cross slope indicated on the Drawings.
- B. Establish and maintain grade control as required.
- C. Vary machine speed to produce required surface texture grid pattern.

D. Mill inaccessible areas by hand methods producing required depth and texture.

3.02 CLEANING

- A. Sweep or vacuum all milled surfaces.
- B. Recycle or dispose of resulting debris in accordance with local laws and ordinances.

3.03 PROTECTION

- A. Locate and mark all in-place structures within the pavement surface prior to milling.
- B. Repair or replace in-place structures damaged or disturbed by the milling operations.

END OF SECTION

Item P-401 Asphalt Mix Pavement

DESCRIPTION

401-1.1 This item shall consist of pavement courses composed of mineral aggregate and asphalt binder mixed in a central mixing plant and placed on a prepared base or stabilized course in accordance with these specifications and shall conform to the lines, grades, thicknesses, and typical cross-sections shown on the plans. Each course shall be constructed to the depth, typical section, and elevation required by the plans and shall be rolled, finished, and approved before the placement of the next course.

MATERIALS

401-2.1 Aggregate. Aggregates shall consist of crushed stone, crushed gravel, crushed slag, screenings, natural sand, and mineral filler, as required. The aggregates should have no known history of detrimental pavement staining due to ferrous sulfides, such as pyrite. Coarse aggregate is the material retained on the No. 4 (4.75 mm) sieve. Fine aggregate is the material passing the No. 4 (4.75 mm) sieve.

a. Coarse aggregate. Coarse aggregate shall consist of sound, tough, durable particles, free from films of matter that would prevent thorough coating and bonding with the asphalt material and free from organic matter and other deleterious substances. Coarse aggregate material requirements are given in the table below.

Material Test	Requirement	Standard		
Resistance to Degradation	Loss: 40% maximum	ASTM C131		
Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate	Loss after 5 cycles: 12% maximum using Sodium sulfate - or - 18% maximum using magnesium sulfate	ASTM C88		
Clay lumps and friable particles	0.3% maximum	ASTM C142		
Percentage of Fractured Particles	For pavements designed for aircraft gross weights of 60,000 pounds (27200 kg) or more: Minimum 75% by weight of particles with at least two fractured faces and 85% with at least one fractured face ¹	ASTM D5821		
	For pavements designed for aircraft gross weights less than 60,000 pounds (27200 kg): Minimum 50% by weight of particles with at least two fractured faces and 65% with at least one fractured face ¹			
Flat, Elongated, or Flat and Elongated Particles	8% maximum, by weight, of flat, elongated, or flat and elongated particles at 5:1 ²	ASTM D4791		
Bulk density of slag ³	Weigh not less than 70 pounds per cubic foot (1.12 Mg/cubic meter)	ASTM C29.		

Coarse Aggregate Material Requirements

¹ The area of each face shall be equal to at least 75% of the smallest mid-sectional area of the piece. When two fractured faces are contiguous, the angle between the planes of fractures shall be at least 30 degrees to count as two fractured faces.

² A flat particle is one having a ratio of width to thickness greater than five (5); an elongated particle is one having a ratio of length to width greater than five (5).

³ Only required if slag is specified.

b. Fine aggregate. Fine aggregate shall consist of clean, sound, tough, durable, angular shaped particles produced by crushing stone, slag, or gravel and shall be free from coatings of clay, silt, or other objectionable matter. Natural (non-manufactured) sand may be used to obtain the gradation of the fine aggregate blend or to improve the workability of the mix. Fine aggregate material requirements are listed in the table below.

Material Test	Requirement	Standard
Liquid limit	25 maximum	ASTM D4318
Plasticity Index	4 maximum	ASTM D4318
Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate	Loss after 5 cycles: 10% maximum using Sodium sulfate - or - 15% maximum using magnesium sulfate	ASTM C88
Clay lumps and friable particles	0.3% maximum	ASTM C142
Sand equivalent	45 minimum	ASTM D2419
Natural Sand	0% to 15% maximum by weight of total aggregate	ASTM D1073

Fine Aggregate Material Requirements

c. Sampling. ASTM D75 shall be used in sampling coarse and fine aggregate.

401-2.2 Mineral filler. Mineral filler (baghouse fines) may be added in addition to material naturally present in the aggregate. Mineral filler shall meet the requirements of ASTM D242.

Mineral Filler Requirements

Material Test	Requirement	Standard	
Plasticity Index	4 maximum	ASTM D4318	

401-2.3 Asphalt binder. Asphalt binder shall conform to ASTM D6373 Performance Grade (PG) 58-34.

Asphalt Binder PG Plus Test Requirements

Material Test	Requirement	Standard	
Elastic Recovery	75% minimum	ASTM D6084	

401-2.4 Anti-stripping agent. Any anti-stripping agent or additive (anti-strip) shall be heat stable and shall not change the asphalt binder grade beyond specifications. Anti-strip shall be an approved material of the Department of Transportation of the State in which the project is located.

COMPOSITION

401-3.1 Composition of mixture(s). The asphalt mix shall be composed of a mixture of aggregates, filler and anti-strip agent if required, and asphalt binder. The aggregate fractions shall be sized, handled in separate size groups, and combined in such proportions that the resulting mixture meets the grading requirements of the job mix formula (JMF).

401-3.2 Job mix formula (JMF) laboratory. The laboratory used to develop the JMF shall possess a current certificate of accreditation, listing D3666 from a national accrediting authority and all test methods required for developing the JMF; and be listed on the accrediting authority's website. A copy of

the laboratory's current accreditation and accredited test methods shall be submitted to the Resident Project Representative (RPR) prior to start of construction.

401-3.3 Job mix formula (JMF). No asphalt mixture shall be placed until an acceptable mix design has been submitted to the RPR for review and accepted in writing. The RPR's review shall not relieve the Contractor of the responsibility to select and proportion the materials to comply with this section.

When the project requires asphalt mixtures of differing aggregate gradations and/or binders, a separate JMF shall be submitted for each mix. Add anti-stripping agent to meet tensile strength requirements.

The JMF shall be prepared by an accredited laboratory that meets the requirements of paragraph 401-3.2. The asphalt mixture shall be designed using procedures contained in Asphalt Institute MS-2 Mix Design Manual, 7th Edition. Samples shall be prepared and compacted using the gyratory compactor in accordance with ASTM D6925.

Should a change in sources of materials be made, a new JMF must be submitted to the RPR for review and accepted in writing before the new material is used. After the initial production JMF has been approved by the RPR and a new or modified JMF is required for whatever reason, the subsequent cost of the new or modified JMF, including a new control strip when required by the RPR, will be borne by the Contractor.

The RPR may request samples at any time for testing, prior to and during production, to verify the quality of the materials and to ensure conformance with the applicable specifications.

The JMF shall be submitted in writing by the Contractor at least 21 days prior to the start of paving operations. The JMF shall be developed within the same construction season using aggregates proposed for project use.

The JMF shall be dated, and stamped or sealed by the responsible professional Engineer of the laboratory and shall include the following items as a minimum:

- Manufacturer's Certificate of Analysis (COA) for the asphalt binder used in the JMF in accordance with paragraph 401-2.3. Certificate of asphalt performance grade is with modifier already added, if used and must indicate compliance with ASTM D6373. For plant modified asphalt binder, certified test report indicating grade certification of modified asphalt binder.
- Manufacturer's Certificate of Analysis (COA) for the anti-stripping agent if used in the JMF in accordance with paragraph 401-2.4.
- Certified material test reports for the course and fine aggregate and mineral filler in accordance with paragraphs 401-2.1.
- Percent passing each sieve size for individual gradation of each aggregate cold feed and/or hot bin; percent by weight of each cold feed and/or hot bin used; and the total combined gradation in the JMF.
- Specific Gravity and absorption of each coarse and fine aggregate.
- Percent natural sand.
- Percent fractured faces.
- Percent by weight of flat particles, elongated particles, and flat and elongated particles (and criteria).
- Percent of asphalt.
- Number of blows or gyrations
- Laboratory mixing and compaction temperatures.

- Supplier-recommended field mixing and compaction temperatures.
- Plot of the combined gradation on a 0.45 power gradation curve.
- Graphical plots of air voids, voids in the mineral aggregate (VMA), and unit weight versus asphalt content. To achieve minimum VMA during production, the mix design needs to account for material breakdown during production.
- Tensile Strength Ratio (TSR).
- Type and amount of Anti-strip agent when used.
- Asphalt Pavement Analyzer (APA) results.
- Date the JMF was developed. Mix designs that are not dated or which are from a prior construction season shall not be accepted.

Test Property	Value	Test Method
Number of blows or gyrations	75	
Air voids (%)	3.5	ASTM D3203
Percent voids in mineral aggregate (VMA), minimum	See Table 2	ASTM D6995
Tensile Strength Ratio (TSR) ¹	not less than 80 at a saturation of 70-80%	ASTM D4867
Asphalt Pavement Analyzer (APA) ²	Less than 10 mm @ 4000 passes	AASHTO T340 at 250 psi hose pressure at 64°C test temperature

Table 1. Asphalt Design Criteria

¹ Test specimens for TSR shall be compacted at 7 ± 1.0 % air voids. In areas subject to freeze-thaw, use freeze-thaw conditioning in lieu of moisture conditioning per ASTM D4867.

² AASHTO T340 at 100 psi hose pressure at 64°C test temperature may be used in the interim. If this method is used the required Value shall be less than 5 mm @ 8000 passes

The mineral aggregate shall be of such size that the percentage composition by weight, as determined by laboratory sieves, will conform to the gradation or gradations specified in Table 2 when tested in accordance with ASTM C136 and ASTM C117.

The gradations in Table 2 represent the limits that shall determine the suitability of aggregate for use from the sources of supply; be well graded from coarse to fine and shall not vary from the low limit on one sieve to the high limit on the adjacent sieve, or vice versa.

Sieve Size	Percentage by Weight Passing Sieve		
1 inch (25.0 mm)			
3/4 inch (19.0 mm)	100		
1/2 inch (12.5 mm)	90-100		
3/8 inch (9.5 mm)	72-88		
No. 4 (4.75 mm)	53-73		
No. 8 (2.36 mm)	38-60		
No. 16 (1.18 mm)	26-48		
No. 30 (600 µm)	18-38		
No. 50 (300 µm)	11-27		
No. 100 (150 µm)	6-18		
No. 200 (75 µm)	3-6		
Minimum Voids in Mineral Aggregate (VMA) ¹	15.0		
Asphalt Percent:			
Stone or gravel	5.0-7.5		
Slag	6.5-9.5		
Recommended Minimum Construction Lift Thickness	2 inch		

Table 2. Aggregate -	Asphalt Pavements
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¹To achieve minimum VMA during production, the mix design needs to account for material breakdown during production.

The aggregate gradations shown are based on aggregates of uniform specific gravity. The percentages passing the various sieves shall be corrected when aggregates of varying specific gravities are used, as indicated in the Asphalt Institute MS-2 Mix Design Manual, 7th Edition.

401-3.4 Reclaimed asphalt pavement (RAP). RAP shall not be used.

401-3.5 Control Strip. A control strip is not required.

CONSTRUCTION METHODS

401-4.1 Weather limitations. The asphalt shall not be placed upon a wet surface or when the surface temperature of the underlying course is less than specified in Table 4. The temperature requirements may be waived by the RPR, if requested; however, all other requirements including compaction shall be met.

Mad The law end	Base Temperature (Minimum)		
Mat Thickness	°F	°C	
3 inches (7.5 cm) or greater	40 ⁻¹	4	
Greater than 2 inches (50 mm) but less than 3 inches (7.5 cm)	45	7	

401-4.2 Asphalt plant. Plants used for the preparation of asphalt shall conform to the requirements of American Association of State Highway and Transportation Officials (AASHTO) M156 including the following items.

a. Inspection of plant. The RPR, or RPR's authorized representative, shall have access, at all times, to all areas of the plant for checking adequacy of equipment; inspecting operation of the plant: verifying weights, proportions, and material properties; and checking the temperatures maintained in the preparation of the mixtures.

b. Storage bins and surge bins. The asphalt mixture stored in storage and/or surge bins shall meet the same requirements as asphalt mixture loaded directly into trucks. Asphalt mixture shall not be stored in storage and/or surge bins for a period greater than twelve (12) hours. If the RPR determines there is an excessive heat loss, segregation, or oxidation of the asphalt mixture due to temporary storage, temporary storage shall not be allowed.

401-4.3 Aggregate stockpile management. Aggregate stockpiles shall be constructed in a manner that prevents segregation and intermixing of deleterious materials. Aggregates from different sources shall be stockpiled, weighed and batched separately at the asphalt batch plant. Aggregates that have become segregated or mixed with earth or foreign material shall not be used.

A continuous supply of materials shall be provided to the work to ensure continuous placement.

401-4.4 Hauling equipment. Trucks used for hauling asphalt shall have tight, clean, and smooth metal beds. To prevent the asphalt from sticking to the truck beds, the truck beds shall be lightly coated with a minimum amount of paraffin oil, lime solution, or other material approved by the RPR. Petroleum products shall not be used for coating truck beds. Each truck shall have a suitable cover to protect the mixture from adverse weather. When necessary, to ensure that the mixture will be delivered to the site at the specified temperature, truck beds shall be insulated or heated and covers shall be securely fastened.

401-4.4.1 Material transfer vehicle (MTV). Material transfer vehicles are not required.

401-4.5 Asphalt pavers. Asphalt pavers shall be self-propelled with an activated heated screed, capable of spreading and finishing courses of asphalt that will meet the specified thickness, smoothness, and grade. The paver shall have sufficient power to propel itself and the hauling equipment without adversely affecting the finished surface. The asphalt paver shall be equipped with a control system capable of automatically maintaining the specified screed grade and elevation.

If the spreading and finishing equipment in use leaves tracks or indented areas, or produces other blemishes in the pavement that are not satisfactorily corrected by the scheduled operations, the use of such equipment shall be discontinued.

The paver shall be capable of paving to a minimum width specified in paragraph 401-4.12.

401-4.6 Rollers. The number, type, and weight of rollers shall be sufficient to compact the asphalt to the required density while it is still in a workable condition without crushing of the aggregate, depressions or other damage to the pavement surface. Rollers shall be in good condition, clean, and capable of operating

at slow speeds to avoid displacement of the asphalt. All rollers shall be specifically designed and suitable for compacting asphalt concrete and shall be properly used. Rollers that impair the stability of any layer of a pavement structure or underlying soils shall not be used.

401-4.7 Density device. The Contractor shall have on site a density gauge during all paving operations in order to assist in the determination of the optimum rolling pattern, type of roller and frequencies, as well as to monitor the effect of the rolling operations during production paving. The Contractor shall supply a qualified technician during all paving operations to calibrate the gauge and obtain accurate density readings for all new asphalt. These densities shall be supplied to the RPR upon request at any time during construction. No separate payment will be made for supplying the density gauge and technician.

401-4.8 Preparation of asphalt binder. The asphalt binder shall be heated in a manner that will avoid local overheating and provide a continuous supply of the asphalt binder to the mixer at a uniform temperature. The temperature of unmodified asphalt binder delivered to the mixer shall be sufficient to provide a suitable viscosity for adequate coating of the aggregate particles, but shall not exceed 325°F (160°C) when added to the aggregate. The temperature of modified asphalt binder shall be no more than 350°F (175°C) when added to the aggregate.

401-4.9 Preparation of mineral aggregate. The aggregate for the asphalt shall be heated and dried. The maximum temperature and rate of heating shall be such that no damage occurs to the aggregates. The temperature of the aggregate and mineral filler shall not exceed 350°F (175°C) when the asphalt binder is added. Particular care shall be taken that aggregates high in calcium or magnesium content are not damaged by overheating. The temperature shall not be lower than is required to obtain complete coating and uniform distribution on the aggregate particles and to provide a mixture of satisfactory workability.

401-4.10 Preparation of Asphalt mixture. The aggregates and the asphalt binder shall be weighed or metered and mixed in the amount specified by the JMF. The combined materials shall be mixed until the aggregate obtains a uniform coating of asphalt binder and is thoroughly distributed throughout the mixture. Wet mixing time shall be the shortest time that will produce a satisfactory mixture, but not less than 25 seconds for batch plants. The wet mixing time for all plants shall be established by the Contractor, based on the procedure for determining the percentage of coated particles described in ASTM D2489, for each individual plant and for each type of aggregate used. The wet mixing time will be set to achieve 95% of coated particles. For continuous mix plants, the minimum mixing time shall be determined by dividing the weight of its contents at operating level by the weight of the mixture delivered per second by the mixer. The moisture content of all asphalt upon discharge shall not exceed 0.5%.

401-4.11 Application of Prime and Tack Coat. Immediately before placing the asphalt mixture, the underlying course shall be cleaned of all dust and debris.

A tack coat shall be applied in accordance with Item P-603 to all vertical and horizontal asphalt and concrete surfaces prior to placement of the first and each subsequent lift of asphalt mixture.

401-4.12 Laydown plan, transporting, placing, and finishing. Prior to the placement of the asphalt, the Contractor shall prepare a laydown plan with the sequence of paving lanes and width to minimize the number of cold joints; the location of any temporary ramps; laydown temperature; and estimated time of completion for each portion of the work (milling, paving, rolling, cooling, etc.). The laydown plan and any modifications shall be approved by the RPR.

Deliveries shall be scheduled so that placing and compacting of asphalt is uniform with minimum stopping and starting of the paver. Hauling over freshly placed material shall not be permitted until the material has been compacted, as specified, and allowed to cool to approximately ambient temperature. The Contractor, at their expense, shall be responsible for repair of any damage to the pavement caused by hauling operations.

Contractor shall survey each lift of asphalt surface course and certify to RPR that every lot of each lift meets the grade tolerances of paragraph 401-6.2d before the next lift can be placed.

Edges of existing asphalt pavement abutting the new work shall be saw cut and the cut off material and laitance removed. Apply a tack coat in accordance with P-603 before new asphalt material is placed against it.

The speed of the paver shall be regulated to eliminate pulling and tearing of the asphalt mat. Placement of the asphalt mix shall begin along the centerline of a crowned section or on the high side of areas with a one way slope unless shown otherwise on the laydown plan as accepted by the RPR. The asphalt mix shall be placed in consecutive adjacent lanes having a minimum width of **15** feet except where edge lanes require less width to complete the area. Additional screed sections attached to widen the paver to meet the minimum lane width requirements must include additional auger sections to move the asphalt mixture uniformly along the screed extension.

The longitudinal joint in one course shall offset the longitudinal joint in the course immediately below by at least one foot (30 cm); however, the joint in the surface top course shall be at the centerline of crowned pavements. Transverse joints in one course shall be offset by at least 10 feet (3 m) from transverse joints in the previous course. Transverse joints in adjacent lanes shall be offset a minimum of 10 feet (3 m).On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the asphalt may be spread and luted by hand tools.

The RPR may at any time, reject any batch of asphalt, on the truck or placed in the mat, which is rendered unfit for use due to contamination, segregation, incomplete coating of aggregate, or overheated asphalt mixture. Such rejection may be based on only visual inspection or temperature measurements. In the event of such rejection, the Contractor may take a representative sample of the rejected material in the presence of the RPR, and if it can be demonstrated in the laboratory, in the presence of the RPR, that such material was erroneously rejected, payment will be made for the material at the contract unit price.

Areas of segregation in the surface course, as determined by the RPR, shall be removed and replaced at the Contractor's expense. The area shall be removed by saw cutting and milling a minimum of the construction lift thickness as specified in paragraph 401-3.3, Table 2 for the approved mix design. The area to be removed and replaced shall be a minimum width of the paver and a minimum of 10 feet (3 m) long.

401-4.13 Compaction of asphalt mixture. After placing, the asphalt mixture shall be thoroughly and uniformly compacted by self-propelled rollers. The surface shall be compacted as soon as possible when the asphalt has attained sufficient stability so that the rolling does not cause undue displacement, cracking or shoving. The sequence of rolling operations and the type of rollers used shall be at the discretion of the Contractor. The speed of the roller shall, at all times, be sufficiently slow to avoid displacement of the hot mixture and be effective in compaction. Any surface defects and/or displacement occurring as a result of the roller, or from any other cause, shall be corrected at the Contractor's expense.

Sufficient rollers shall be furnished to handle the output of the plant. Rolling shall continue until the surface is of uniform texture, true to grade and cross-section, and the required field density is obtained. To prevent adhesion of the asphalt to the roller, the wheels shall be equipped with a scraper and kept moistened with water as necessary.

In areas not accessible to the roller, the mixture shall be thoroughly compacted with approved power tampers.

Any asphalt that becomes loose and broken, mixed with dirt, contains check-cracking, or in any way defective shall be removed and replaced with fresh hot mixture and immediately compacted to conform to the surrounding area. This work shall be done at the Contractor's expense. Skin patching shall not be allowed.

401-4.14 Joints. The formation of all joints shall be made to ensure a continuous bond between the courses and obtain the required density. All joints shall have the same texture as other sections of the course and meet the requirements for smoothness and grade.

The roller shall not pass over the unprotected end of the freshly laid asphalt except when necessary to form a transverse joint. When necessary to form a transverse joint, it shall be made by means of placing a bulkhead or by tapering the course. The tapered edge shall be cut back to its full depth and width on a straight line to expose a vertical face prior to placing the adjacent lane. In both methods, all contact surfaces shall be coated with an asphalt tack coat before placing any fresh asphalt against the joint.

Longitudinal joints which have been left exposed for more than four (4) hours; the surface temperature has cooled to less than 175°F (80°C); or are irregular, damaged, uncompacted or otherwise defective shall be cut back with a cutting wheel or pavement saw a maximum of 3 inches (75 mm) to expose a clean, sound, uniform vertical surface for the full depth of the course. All cutback material and any laitance produced from cutting joints shall be removed from the project. Asphalt tack coat in accordance with P-603 shall be applied to the clean, dry joint prior to placing any additional fresh asphalt against the joint. The cost of this work shall be considered incidental to the cost of the asphalt.

401-4.15 Saw-cut grooving. Saw-cut grooving is not required.

401-4.16 Diamond grinding. Diamond grinding shall be completed prior to pavement grooving. Diamond grinding shall be accomplished by sawing with saw blades impregnated with industrial diamond abrasive.

Diamond grinding shall be performed with a machine designed specifically for diamond grinding capable of cutting a path at least 3 feet (0.9 m) wide. The saw blades shall be 1/8-inch (3-mm) wide with a sufficient number of blades to create grooves between 0.090 and 0.130 inches (2 and 3.5 mm) wide; and peaks and ridges approximately 1/32 inch (1 mm) higher than the bottom of the grinding cut. The actual number of blades will be determined by the Contractor and depend on the hardness of the aggregate. Equipment or grinding procedures that cause ravels, aggregate fractures, spalls or disturbance to the pavement will not be permitted. Contractor shall demonstrate to the RPR that the grinding equipment will produce satisfactory results prior to making corrections to surfaces. Grinding will be tapered in all directions to provide smooth transitions to areas not requiring grinding. The slurry resulting from the grinding operation shall be continuously removed and the pavement left in a clean condition. The Contractor shall apply a surface treatment per P-608 to all areas that have been subject to grinding.

401-4.17 Nighttime paving requirements. The Contractor shall provide adequate lighting during any nighttime construction. A lighting plan shall be submitted by the Contractor and approved by the RPR prior to the start of any nighttime work. All work shall be in accordance with the approved CSPP and lighting plan.

CONTRACTOR QUALITY CONTROL (CQC)

401-5.1 General. The Contractor shall develop a Contractor Quality Control Program (CQCP) in accordance with Item C-100. No partial payment will be made for materials without an approved CQCP.

401-5.2 Contractor quality control (QC) facilities. The Contractor shall provide or contract for testing facilities in accordance with Item C-100. The RPR shall be permitted unrestricted access to inspect the Contractor's QC facilities and witness QC activities. The RPR will advise the Contractor in writing of any noted deficiencies concerning the QC facility, equipment, supplies, or testing personnel and procedures. When the deficiencies are serious enough to be adversely affecting the test results, the incorporation of the materials into the work shall be suspended immediately and will not be permitted to resume until the deficiencies are satisfactorily corrected.

401-5.3 Contractor QC testing. The Contractor shall perform all QC tests necessary to control the production and construction processes applicable to these specifications and as set forth in the approved CQCP. The testing program shall include, but not necessarily be limited to, tests for the control of asphalt content, aggregate gradation, temperatures, aggregate moisture, field compaction, and surface smoothness. A QC Testing Plan shall be developed as part of the CQCP.

a. Asphalt content. A minimum of two tests shall be performed per day in accordance with ASTM D6307 or ASTM D2172 for determination of asphalt content. When using ASTM D6307, the correction factor shall be determined as part of the first test performed at the beginning of plant production; and as part of every tenth test performed thereafter. The asphalt content for the day will be determined by averaging the test results.

b. Gradation. Aggregate gradations shall be determined a minimum of twice per day from mechanical analysis of extracted aggregate in accordance with ASTM D5444, ASTM C136, and ASTM C117.

c. Moisture content of aggregate. The moisture content of aggregate used for production shall be determined a minimum of once per day in accordance with ASTM C566.

d. Moisture content of asphalt. The moisture content shall be determined once per day in accordance with AASHTO T329 or ASTM D1461.

e. Temperatures. Temperatures shall be checked, at least four times per day, at necessary locations to determine the temperatures of the dryer, the asphalt binder in the storage tank, the asphalt at the plant, and the asphalt at the job site.

f. In-place density monitoring. The Contractor shall conduct any necessary testing to ensure that the specified density is being achieved. A nuclear gauge may be used to monitor the pavement density in accordance with ASTM D2950.

g. Smoothness for Contractor Quality Control.

The Contractor shall perform smoothness testing in transverse and longitudinal directions daily to verify that the construction processes are producing pavement with variances less than ¼ inch in 12 feet, identifying areas that may pond water which could lead to hydroplaning of aircraft. If the smoothness criteria is not met, appropriate changes and corrections to the construction process shall be made by the Contractor before construction continues

The Contractor may use a 12-foot (3.7 m) straightedge or a rolling inclinometer meeting the requirements of ASTM E2133. Straight-edge testing shall start with one-half the length of the straightedge at the edge of pavement section being tested and then moved ahead one-half the length of the straightedge for each successive measurement. Testing shall be continuous across all joints. The surface irregularity shall be determined by placing the freestanding (unleveled) straightedge on the pavement surface and allowing it to rest upon the two highest spots covered by its length, and measuring the maximum gap between the straightedge and the pavement surface in the area between the two high points. If the rolling inclinometer is used, the data may be evaluated using the FAA profile program, ProFAA, using the 12-foot straightedge simulation function.

Smoothness readings shall not be made across grade changes or cross slope transitions. The transition between new and existing pavement shall be evaluated separately for conformance with the plans.

(1) Transverse measurements. Transverse measurements shall be taken for each day's production placed. Transverse measurements shall be taken perpendicular to the pavement centerline each 50 feet (15 m) or more often as determined by the RPR. The joint between lanes shall be tested separately to facilitate smoothness between lanes.

(2) Longitudinal measurements. Longitudinal measurements shall be taken for each day's production placed. Longitudinal tests shall be parallel to the centerline of paving; at the center of paving lanes when widths of paving lanes are less than 20 feet (6 m); and at the third points of paving lanes when widths of paving lanes are 20 ft (6 m) or greater.

Deviations on the final surface course in either the transverse or longitudinal direction that will trap water greater than 1/4 inch (6 mm) shall be corrected with diamond grinding per paragraph 401-4.16 or by removing and replacing the surface course to full depth. Grinding shall be tapered in all directions to provide smooth transitions to areas not requiring grinding. All areas in which diamond grinding has been performed shall be subject to the final pavement thickness tolerances specified in paragraph 401-6.1d(3). Areas that have been ground shall be sealed with a surface treatment in accordance with Item P-608. To avoid the surface treatment creating any conflict with runway or taxiway markings, it may be necessary to seal a larger area.

Control charts shall be kept to show area of each day's placement and the percentage of corrective grinding required. Corrections to production and placement shall be initiated when corrective grinding is required. If the Contractor's machines and/or methods produce significant areas that need corrective actions in excess of 10 percent of a day's production, production shall be stopped until corrective measures are implemented by the Contractor.

h. Grade. Grade shall be evaluated daily to allow adjustments to paving operations when grade measurements do not meet specifications. As a minimum, grade shall be evaluated prior to and after the placement of the first lift and after placement of the surface lift.

Measurements will be taken at appropriate gradelines (as a minimum at center and edges of paving lane) and longitudinal spacing as shown on cross-sections and plans. The final surface of the pavement will not vary from the gradeline elevations and cross-sections shown on the plans by more than 1/2 inch (12 mm) vertically and 0.1 feet (30 mm) laterally. The documentation will be provided by the Contractor to the RPR within 24 hours.

Areas with humps or depressions that exceed grade or smoothness criteria and that retain water on the surface must be ground off provided the course thickness after grinding is not more than 1/2 inch (12 mm) less than the thickness specified on the plans. Grinding shall be in accordance with paragraph 401-4.16.

The Contractor shall repair low areas or areas that cannot be corrected by grinding by removal of deficient areas to the depth of the final course plus ¹/₂ inch and replacing with new material. Skin patching is not allowed.

401-5.4 Sampling. When directed by the RPR, the Contractor shall sample and test any material that appears inconsistent with similar material being sampled, unless such material is voluntarily removed and replaced or deficiencies corrected by the Contractor. All sampling shall be in accordance with standard procedures specified.

401-5.5 Control charts. The Contractor shall maintain linear control charts for both individual measurements and range (i.e. difference between highest and lowest measurements) for aggregate gradation, asphalt content, and VMA. The VMA for each day will be calculated and monitored by the QC laboratory.

Control charts shall be posted in a location satisfactory to the RPR and kept current. As a minimum, the control charts shall identify the project number, the contract item number, the test number, each test parameter, the Action and Suspension Limits applicable to each test parameter, and the Contractor's test results. The Contractor shall use the control charts as part of a process control system for identifying potential problems and assignable causes before they occur. If the Contractor's projected data during production indicates a problem and the Contractor is not taking satisfactory corrective action, the RPR may suspend production or acceptance of the material.

a. Individual measurements. Control charts for individual measurements shall be established to maintain process control within tolerance for aggregate gradation, asphalt content, and VMA. The control charts shall use the job mix formula target values as indicators of central tendency for the following test parameters with associated Action and Suspension Limits:

Sieve	Action Limit	Suspension Limit
3/4 inch (19.0 mm)	±6%	±9%
1/2 inch (12.5 mm)	±6%	±9%
3/8 inch (9.5 mm)	±6%	±9%
No. 4 (4.75 mm)	±6%	±9%
No. 16 (1.18 mm)	±5%	±7.5%
No. 50 (300 µm)	±3%	±4.5%
No. 200 (75 μm)	±2%	±3%
Asphalt Content	±0.45%	±0.70%
Minimum VMA	-0.5%	-1.0%

Control Chart Limits for Individual Measurements

b. Range. Control charts shall be established to control gradation process variability. The range shall be plotted as the difference between the two test results for each control parameter. The Suspension Limits specified below are based on a sample size of n = 2. Should the Contractor elect to perform more than two tests per lot, the Suspension Limits shall be adjusted by multiplying the Suspension Limit by 1.18 for n = 3 and by 1.27 for n = 4.

Sieve	Suspension Limit
1/2 inch (12.5 mm)	11%
3/8 inch (9.5 mm)	11%
No. 4 (4.75 mm)	11%
No. 16 (1.18 mm)	9%
No. 50 (300 μm)	6%
No. 200 (75 μm)	3.5%
Asphalt Content	0.8%

Control Chart Limits Based on Range

c. Corrective Action. The CQCP shall indicate that appropriate action shall be taken when the process is believed to be out of tolerance. The Plan shall contain rules to gauge when a process is out of control and detail what action will be taken to bring the process into control. As a minimum, a process shall be deemed out of control and production stopped and corrective action taken, if:

(1) One point falls outside the Suspension Limit line for individual measurements or range; or

(2) Two points in a row fall outside the Action Limit line for individual measurements.

401-5.6 QC reports. The Contractor shall maintain records and shall submit reports of QC activities daily, in accordance with Item C-100.

MATERIAL ACCEPTANCE

401-6.1 Acceptance sampling and testing. Unless otherwise specified, all acceptance sampling and testing necessary to determine conformance with the requirements specified in this section will be performed by the RPR at no cost to the Contractor except that coring as required in this section shall be completed and paid for by the Contractor.

a. Quality assurance (QA) testing laboratory. The QA testing laboratory performing these acceptance tests will be accredited in accordance with ASTM D3666. The QA laboratory accreditation will be current and listed on the accrediting authority's website. All test methods required for acceptance sampling and testing will be listed on the lab accreditation.

b. Lot size. A standard lot will be equal to one day's production divided into approximately equal sublots of between 400 to 600 tons. When only one or two sublots are produced in a day's production, the sublots will be combined with the production lot from the previous or next day.

Where more than one plant is simultaneously producing asphalt for the job, the lot sizes will apply separately for each plant.

c. Asphalt air voids. Plant-produced asphalt will be tested for air voids on a sublot basis.

(1) Sampling. Material from each sublot shall be sampled in accordance with ASTM D3665. Samples shall be taken from material deposited into trucks at the plant or at the job site in accordance with ASTM D979. The sample of asphalt may be put in a covered metal tin and placed in an oven for not less than 30 minutes nor more than 60 minutes to maintain the material at or above the compaction temperature as specified in the JMF.

(2) Testing. Air voids will be determined for each sublot in accordance with ASTM D3203 for a set of compacted specimens prepared in accordance with ASTM D6926.

d. In-place asphalt mat and joint density. Each sublot will be tested for in-place mat and joint density as a percentage of the theoretical maximum density (TMD).

(1) Sampling. The Contractor will cut minimum 5 inch (125 mm) diameter samples in accordance with ASTM D5361. The Contractor shall furnish all tools, labor, and materials for cleaning, and filling the cored pavement. Laitance produced by the coring operation shall be removed immediately after coring, and core holes shall be filled within one day after sampling in a manner acceptable to the RPR.

(2) Bond. Each lift of asphalt shall be bonded to the underlying layer. If cores reveal that the surface is not bonded, additional cores shall be taken as directed by the RPR to determine the extent of unbonded areas. Unbonded areas shall be removed by milling and replaced at no additional cost as directed by the RPR.

(3) Thickness. Thickness of each lift of surface course will be evaluated by the RPR for compliance to the requirements shown on the plans after any necessary corrections for grade. Measurements of thickness will be made using the cores extracted for each sublot for density measurement. The maximum allowable deficiency at any point will not be more than 1/4 inch (6 mm) less than the thickness indicated for the lift. Average thickness of lift, or combined lifts, will not be less than the indicated thickness. Where the thickness tolerances are not met, the lot or sublot shall be corrected by the Contractor at his expense by removing the deficient area and replacing with new pavement. The Contractor, at his expense, may take additional cores as approved by the RPR to circumscribe the deficient area.

(4) Mat density. One core shall be taken from each sublot. Core locations will be determined by the RPR in accordance with ASTM D3665. Cores for mat density shall not be taken closer than one foot (30 cm) from a transverse or longitudinal joint. The bulk specific gravity of each cored sample will be

determined in accordance with ASTM D2726. The percent compaction (density) of each sample will be determined by dividing the bulk specific gravity of each sublot sample by the TMD for that sublot.

(5) Joint density. One core centered over the longitudinal joint shall be taken for each sublot that has a longitudinal joint. Core locations will be determined by the RPR in accordance with ASTM D3665. The bulk specific gravity of each core sample will be determined in accordance with ASTM D2726. The percent compaction (density) of each sample will be determined by dividing the bulk specific gravity of each joint density sample by the average TMD for the lot. The TMD used to determine the joint density at joints formed between lots will be the lower of the average TMD values from the adjacent lots.

401-6.2 Acceptance criteria.

a. General. Acceptance will be based on the implementation of the Contractor Quality Control Program (CQCP) and the following characteristics of the asphalt and completed pavements: air voids, mat density, joint density, and grade.

b. Air Voids and Mat density. Acceptance of each lot of plant produced material for mat density and air voids will be based on the percentage of material within specification limits (PWL). If the PWL of the lot equals or exceeds 90%, the lot will be acceptable. Acceptance and payment will be determined in accordance with paragraph 401-8.1.

c. Joint density. Acceptance of each lot of plant produced asphalt for joint density will be based on the PWL. If the PWL of the lot is equal to or exceeds 90%, the lot will be considered acceptable. If the PWL is less than 90%, the Contractor shall evaluate the reason and act accordingly. If the PWL is less than 80%, the Contractor shall cease operations and until the reason for poor compaction has been determined. If the PWL is less than 71%, the pay factor for the lot used to complete the joint will be reduced by five (5) percentage points. This lot pay factor reduction will be incorporated and evaluated in accordance with paragraph 401-8.1.

d. Grade. The final finished surface of the pavement shall be surveyed to verify that the grade elevations and cross-sections shown on the plans do not deviate more than 1/2 inch (12 mm) vertically or 0.1 feet (30 mm) laterally.

Cross-sections of the pavement shall be taken at a minimum 50-foot longitudinal spacing and at all longitudinal grade breaks. Minimum cross-section grade points shall include grade at centerline, ± 10 feet of centerline, and edge of taxiway pavement.

The survey and documentation shall be stamped and signed by a licensed surveyor. Payment for sublots that do not meet grade for over 25% of the sublot shall not be more than 95%.

e. Profilograph roughness for QA Acceptance. Not used.

401-6.3 Percentage of material within specification limits (PWL). The PWL will be determined in accordance with procedures specified in Item C-110. The specification tolerance limits (L) for lower and (U) for upper are contained in Table 5.

Test Property	Pavements Specification Tolerance Limits	
	L	U
Air Voids Total Mix (%)	2.0	5.0
Surface Course Mat Density (%)	92.8	-
Base Course Mat Density (%)	91.8	-
Joint density (%)	90.5	

Table 5. Acce	ptance Limi	ts for Air	Voids and	Density

a. Outliers. All individual tests for mat density and air voids will be checked for outliers (test criterion) in accordance with ASTM E178, at a significance level of 5%. Outliers will be discarded, and the PWL will be determined using the remaining test values. The criteria in Table 5 is based on production processes which have a variability with the following standard deviations: Surface Course Mat Density (%), 1.20; Base Course Mat Density (%), 1.55; Joint Density (%), 1.8.

The Contractor should note that (1) 90 PWL is achieved when consistently producing a surface course with an average mat density of at least 94% with 1.20% or less variability, (2) 90 PWL is achieved when consistently producing a base course with an average mat density of at least 93.5% with 1.8% or less variability, and (3) 90 PWL is achieved when consistently producing joints with an average joint density of at least 91% with 1.8% or less variability.

401-6.4 Resampling pavement for mat density.

a. General. Resampling of a lot of pavement will only be allowed for mat density, and then, only if the Contractor requests same, in writing, within 48 hours after receiving the written test results from the RPR. A retest will consist of all the sampling and testing procedures contained in paragraphs 401-6.1d and 401-6.2b. Only one resampling per lot will be permitted.

(1) A redefined PWL will be calculated for the resampled lot. The number of tests used to calculate the redefined PWL will include the initial tests made for that lot plus the retests.

(2) The cost for resampling and retesting shall be borne by the Contractor.

b. Payment for resampled lots. The redefined PWL for a resampled lot will be used to calculate the payment for that lot in accordance with Table 6.

c. Outliers. Check for outliers in accordance with ASTM E178, at a significance level of 5%.

METHOD OF MEASUREMENT

401-7.1 Measurement. Asphalt shall be measured by the number of tons of asphalt used in the accepted work. Batch weights or truck scale weights will be used to determine the basis for the tonnage.

BASIS OF PAYMENT

401-8.1 Payment. Payment for a lot of asphalt meeting all acceptance criteria as specified in paragraph 401-6.2 shall be made based on results of tests for mat density and air voids. Payment for acceptable lots shall be adjusted according to paragraph 401-8.1c for mat density and air voids; and paragraph 401-6.2c for joint density, subject to the limitation that:

a. The total project payment for plant mix asphalt pavement shall not exceed 100 percent of the product of the contract unit price and the total number of tons (kg) of asphalt used in the accepted work.

b. The price shall be compensation for furnishing all materials, for all preparation, mixing, and placing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

c. Basis of adjusted payment. The pay factor for each individual lot shall be calculated in accordance with Table 6. A pay factor shall be calculated for both mat density and air voids. The lot pay factor shall be the higher of the two values when calculations for both mat density and air voids are 100% or higher. The lot pay factor shall be the product of the two values when only one of the calculations for either mat density or air voids is 100% or higher. The lot pay factor shall be the lower of the two values when calculations for both mat density or air voids is 100% or higher. The lot pay factor shall be the lower of the two values when calculations for both mat density and air voids are less than 100%. If PWL for joint density is less than 71% then the lot pay factor shall be reduced by 5% but be no higher than 95%.

For each lot accepted, the adjusted contract unit price shall be the product of the lot pay factor for the lot and the contract unit price. Payment shall be subject to the total project payment limitation specified in paragraph 401-8.1a. Payment in excess of 100% for accepted lots of asphalt shall be used to offset payment for accepted lots of asphalt pavement that achieve a lot pay factor less than 100%.

Payment for sublots which do not meet grade in accordance with paragraph 401-6.2d after correction for over 25% of the sublot shall be reduced by 5%.

Percentage of material within specification limits (PWL)	Lot pay factor (percent of contract unit price)
96 - 100	106
90 - 95	PWL + 10
75 - 89	0.5 PWL + 55
55 - 74	1.4 PWL – 12
Below 55	Reject ²

Table 6. Price adjustment schedule¹

¹ Although it is theoretically possible to achieve a pay factor of 106% for each lot, actual payment above 100% shall be subject to the total project payment limitation specified in paragraph 401-8.1a.

² The lot shall be removed and replaced. However, the RPR may decide to allow the rejected lot to remain. In that case, if the RPR and Contractor agree in writing that the lot shall not be removed, it shall be paid for at 50% of the contract unit price and the total project payment shall be reduced by the amount withheld for the rejected lot.

d. Profilograph Roughness. Not used.

401-8.1 Payment

Payment will be made under:

Item P-401-8.1 Asphalt Surface Course - per ton

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

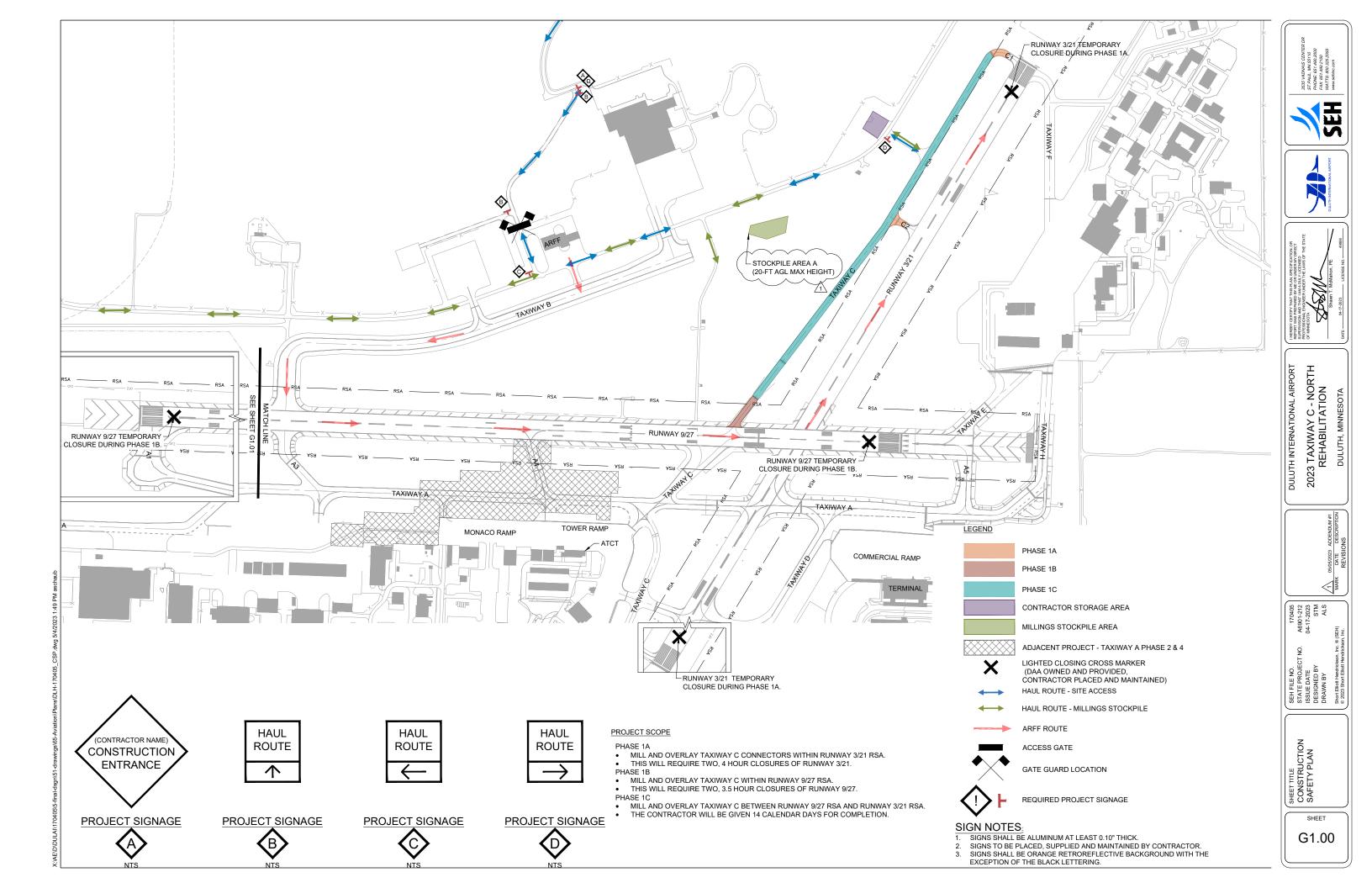
ASTM International (ASTM)

ASTM C29	Standard Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate
ASTM C88	Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C117	Standard Test Method for Materials Finer than 75- μ m (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C127	Standard Test Method for Density, Relative Density (Specific Gravity) and Absorption of Coarse Aggregate
ASTM C131	Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C142	Standard Test Method for Clay Lumps and Friable Particles in Aggregates
ASTM C566	Standard Test Method for Total Evaporable Moisture Content of Aggregate by Drying
ASTM D75	Standard Practice for Sampling Aggregates
ASTM D242	Standard Specification for Mineral Filler for Bituminous Paving Mixtures
ASTM D946	Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction
ASTM D979	Standard Practice for Sampling Asphalt Paving Mixtures
ASTM D1073	Standard Specification for Fine Aggregate for Asphalt Paving Mixtures
ASTM D1188	Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples
ASTM D2172	Standard Test Method for Quantitative Extraction of Bitumen from Asphalt Paving Mixtures
ASTM D1461	Standard Test Method for Moisture or Volatile Distillates in Asphalt Paving Mixtures
ASTM D2041	Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
ASTM D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM D2489	Standard Practice for Estimating Degree of Particle Coating of Bituminous-Aggregate Mixtures
ASTM D2726	Standard Test Method for Bulk Specific Gravity and Density of Non- Absorptive Compacted Bituminous Mixtures
ASTM D2950	Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods

ASTM D3203	Standard Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures
ASTM D3381	Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction
ASTM D3665	Standard Practice for Random Sampling of Construction Materials
ASTM D3666	Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials
ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4552	Standard Practice for Classifying Hot-Mix Recycling Agents
ASTM D4791	Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D4867	Standard Test Method for Effect of Moisture on Asphalt Concrete Paving Mixtures
ASTM D5361	Standard Practice for Sampling Compacted Asphalt Mixtures for Laboratory Testing
ASTM D5444	Standard Test Method for Mechanical Size Analysis of Extracted Aggregate
ASTM D5821	Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate
ASTM D6084	Standard Test Method for Elastic Recovery of Bituminous Materials by Ductilometer
ASTM D6307	Standard Test Method for Asphalt Content of Hot Mix Asphalt by Ignition Method
ASTM D6373	Standard Specification for Performance Graded Asphalt Binder
ASTM D6752	Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Automatic Vacuum Sealing Method
ASTM D6925	Standard Test Method for Preparation and Determination of the Relative Density of Hot Mix Asphalt (HMA) Specimens by Means of the SuperPave Gyratory Compactor.
ASTM D6926	Standard Practice for Preparation of Bituminous Specimens Using Marshall Apparatus
ASTM D6927	Standard Test Method for Marshall Stability and Flow of Bituminous Mixtures
ASTM D6995	Standard Test Method for Determining Field VMA based on the Maximum Specific Gravity of the Mix (Gmm)
ASTM E11	Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves
ASTM E178	Standard Practice for Dealing with Outlying Observations
ASTM E1274	Standard Test Method for Measuring Pavement Roughness Using a Profilograph

A	ASTM E950	Standard Test Method for Measuring the Longitudinal Profile of Traveled Surfaces with an Accelerometer Established Inertial Profiling Reference	
A	ASTM E2133	Standard Test Method for Using a Rolling Inclinometer to Measure Longitudinal and Transverse Profiles of a Traveled Surface	
Americar	n Association of State H	Highway and Transportation Officials (AASHTO)	
A	AASHTO M156	Standard Specification for Requirements for Mixing Plants for Hot- Mixed, Hot-Laid Bituminous Paving Mixtures.	
A	AASHTO T329	Standard Method of Test for Moisture Content of Hot Mix Asphalt (HMA) by Oven Method	
A	AASHTO T324	Standard Method of Test for Hamburg Wheel-Track Testing of Compacted Asphalt Mixtures	
A	AASHTO T 340	Standard Method of Test for Determining the Rutting Susceptibility of Hot Mix Asphalt (APA) Using the Asphalt Pavement Analyzer (APA)	
Asphalt I	nstitute (AI)		
A	Asphalt Institute Handb	ook MS-26, Asphalt Binder	
A	Asphalt Institute MS-2	Mix Design Manual, 7th Edition	
A	AI State Binder Specific	cation Database	
Federal H	eral Highway Administration (FHWA) Long Term Pavement Performance Binder Program		
L			
Advisory	Circulars (AC)		
A	AC 150/5320-6	Airport Pavement Design and Evaluation	
FAA Ord	lers		
5	5300.1	Modifications to Agency Airport Design, Construction, and Equipment Standards	
Software			
F	FAARFIELD		

END OF ITEM P-401



CONSTRUCTION SAFETY & PHASING NOTES:

GENERAL SAFETY NOTES

- ALL CONSTRUCTION SHALL MEET THE MOST CURRENT REQUIREMENTS OF FAA ADVISORY CIRCULARS WHICH ARE AVAILABLE ONLINE AT WWW.FAA.GOV, OR UPON REQUEST TO THE ENGINEER. APPLICABLE ADVISORY CIRCULARS MAY INCLUDE, BUT ARE NOT LIMITED TO, 150/5340-1, 5370-2, 5210-5, AND 70/7460-1.
- 2. THE CONTRACTOR SHALL SUBMIT A DETAILED SCHEDULE OF CONSTRUCTION OPERATIONS AT LEAST 7 DAYS PRIOR TO THE PRE-CONSTRUCTION CONFERENCE. THE PHASING PLAN AND SCHEDULE MUST BE APPROVED BY THE ENGINEER AND THE OWNER PRIOR TO THE BEGINNING OF CONSTRUCTION OPERATIONS.
- THE CONTRACTOR WILL ADVISE THE ENGINEER AND THE AIRPORT MANAGER 72 HOURS IN ADVANCE OF ANY PROPOSED CONSTRUCTION ACTIVITIES ON THE PROJECT. THE AIR OPERATIONS AREA (AOA) CONSISTS OF ALL AREAS OF THE AIRPORT LOCATED WITHIN THE PERIMETER SECURITY FENCE AND INCLUDES RUNWAYS, TAXIWAYS, AIRCRAFT PARKING APRONS, AND OTHER AREAS WHERE AIRCRAFT MAY MOVE UNDER THEIR OWN POWER, AS WELL AS RUNWAY PROTECTION ZONES
- NO WORK SHALL BE ALLOWED WITHIN THE AOA UNTIL THE REQUIRED AIRFIELD CLOSURES HAVE BEEN MADE AND THE REQUIRED CLOSURE MARKERS AND BARRICADES ARE IN PLACE. ALL NECESSARY NOTICE TO AIR MISSIONS (NOTAMS) WILL BE ISSUED BY AIRFIELD OPERATIONS, WHICH SPECIFICALLY DETAIL THE CURRENT STATUS OF THE AIRPORT DURING CONSTRUCTION. COORDINATE WITH ENGINEER TO FACILITATE NOTAMS.
- WORK MAY BE STOPPED AT ANY TIME BY THE AIRPORT MANAGER OR ENGINEER IF IT IS DETERMINED THAT PROPER SAFETY PRECAUTIONS ARE NOT BEING TAKEN. CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH INFORMATION ON THIS SAFETY & PHASING PLAN AND THE SAFETY PLAN COMPLIANCE NARRATIVE CONTAINED IN THE SPECIFICATION.

EQUIPMENT SAFETY REQUIREMENTS

- 8. THE MAXIMUM HEIGHT OF CONSTRUCTION EQUIPMENT TO BE USED ON THE AIRPORT SHALL BE 20 FEET. IF USE OF EQUIPMENT OF GREATER THAN 20 FEET IS NEEDED, THE CONTRACTOR SHALL FILE FAA FORM 7460-1 WITH THE APPROPRIATE FAA OFFICE. FORMS ARE AVAILABLE UPON REQUEST TO THE ENGINEER. FAA FORM 7460-1 SHALL BE SUBMITTED 6 WEEKS PRIOR TO THE ANTICIPATED USE OF EQUIPMENT GREATER THAN 20 FEET.
- ALL AIRPORT AND CONSTRUCTION EQUIPMENT ON THE AIRPORT SHALL BE MARKED, LIGHTED, AND FLAGGED ACCORDING TO FAA ADVISORY CIRCULARS
- 10. STOCKPILED MATERIALS AND EQUIPMENT STORAGE ARE NOT PERMITTED WITHIN THE RUNWAY SAFETY AREA AND OBSTACLE FREE ZONE, AND IF POSSIBLE SHOULD NOT BE PERMITTED WITHIN THE OBJECT FREE AREA (OFA) OF AN OPERATIONAL RUNWAY. STOCKPILING MATERIAL IN THE OFA REQUIRES SUBMITTAL OF A 7460-1 FORM AND JUSTIFICATION PROVIDED TO THE APPROPRIATE FAA AIRPORTS REGIONAL OR DISTRICT OFFICE FOR APPROVAL.
- 11. THE CONTRACTORS PARKED EQUIPMENT OR VEHICLES (INCLUDING PERSONAL VEHICLES) SHALL BE STORED IN THE STORAGE AREA LOCATION ON SHEET G1.00. LARGE EQUIPMENT THAT IS BEING USED EACH WORKING DAY THAT CANNOT BE EASILY MOVED OUT OF THE AOA MAY BE LEFT OVERNIGHT WITHIN THE AOA AT A LOCATION DESIGNATED BY THE ENGINEER AND AIRPORT OPERATIONS.

LOW PROFILE BARRICADES & LIGHTED CLOSING CROSS MARKERS

- 12. THE CONTRACTOR SHALL MAINTAIN LIGHTED LOW PROFILE BARRICADES THROUGHOUT THE DURATION OF THE PROJECT. MAINTAINING & PLACING DEVICES, BATTERY REPLACEMENT, AND MOVEMENT ARE ALL INCIDENTAL TO MOBILIZATION
- 13. BARRICADES SHALL BE PROVIDED BY THE AIRPORT AND PLACED & MAINTAINED BY THE CONTRACTOR. ANY DAMAGE TO THE AIRPORT'S BARRICADES SHALL BE AT THE CONTRACTOR'S EXPENSE
- 14. LOW PROFILE BARRICADES SHALL BE PLACED AT DESIGNATED LOCATIONS DURING RUNWAY AND TAXIWAY CLOSURES
- 15. LIGHTED CLOSING CROSS MARKERS FOR TEMPORARY RUNWAY CLOSURES TO BE PROVIDED BY AIRPORT. CONTRACTOR TO PLACE AND MAINTAIN LIGHTED CROSSES MAINTENANCE INCLUDES LIGHT BULB REPLACEMENT. FUELING, OIL CHANGES, AND ANY ITEMS TO KEEP THE LIGHTING UNITS OPERATIONAL.
- 16. LIGHTED CLOSING CROSS MARKERS SHALL BE PLACED AT DESIGNATED RUNWAY END LOCATIONS DURING RUNWAY CLOSURES AND APPROVED BY AIRPORT OPERATIONS

CONSTRUCTION HAUL ROUTES

- 17. THE CONTRACTOR SHALL ESTABLISH A HAUL ROUTE IN THE GENERAL AREA INDICATED ON THE PLAN. THE EXACT LOCATION OF THE HAUL ROUTE SHALL BE REVIEWED AND APPROVED BY THE ENGINEER AND AIRPORT OPERATIONS. THIS ROUTE SHALL BE USED FOR DELIVERY AND REMOVAL OF ALL CONSTRUCTION EQUIPMENT AND MATERIALS AND ACCESS TO THE SITE FOR ALL PERSONNEL FOR THE DURATION OF THE PROJECT.
- 18. THE CONTRACTOR SHALL KEEP THE ROUTE AND ALL PAVEMENTS CLEAR OF DEBRIS AT ALL TIMES. AT A MINIMUM, THE ROUTE SHALL BE SWEPT AT THE END OF EACH WORKING DAY. ADDITIONAL SWEEPING MAY BE REQUIRED IMMEDIATELY UPON THE NOTIFICATION BY ENGINEER.
- 19. THE ROUTE AND ALL AIRFIELD PAVEMENTS SHALL BE THOROUGHLY CLEANED AND INSPECTED PRIOR TO REOPENING TO AIRCRAFT USE
- 20. ROCK CONSTRUCTION ENTRANCES AND/OR TEMPORARY HAUL ROADS MAY BE REQUIRED AS SHOWN ON THE CONSTRUCTION SAFETY PLAN OR EROSION CONTROL PLAN.

AIRCRAFT RESCUE AND FIRE FIGHTING (ARFF) ACCESS

- 21. ARFF ACCESS WILL REMAIN UNCHANGED FROM NORMAL CONDITIONS. RUNWAYS WILL BE CLOSED DURING CLOSURE PERIODS NOTED.
- 22. COORDINATE WITH ARFF PERSONNEL PRIOR TO CONSTRUCTION TO DEVELOP RUNWAY CLOSURE PROCEDURES AND ACCESS TO AIRFIELD

- 23. ALL EXISTING UTILITIES INDICATED ON THE DRAWINGS ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR LOCATING AND MARKING ANY AND ALL PUBLIC AND PRIVATE UTILITIES PRIOR TO BEGINNING CONSTRUCTION ACTIVITIES. CALL GOPHER STATE ONE CALL AT 800.252.1166 AT LEAST 48 HOURS PRIOR TO COMMENCING CONSTRUCTION.
- 24. IN THE EVENT UTILITIES ARE DAMAGED BY THE CONTRACTOR, THE CONTRACTOR SHALL REPAIR THE DAMAGED UTILITIES TO THE UTILITY OWNER'S REQUIREMENTS AT THE EXPENSE OF THE CONTRACTOR.

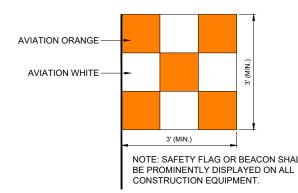
SCHEDULE

25. CONTRACTOR SHALL BE GIVEN 14 CALENDAR DAYS TO ACHIEVE SUBSTANTIAL COMPLETION.

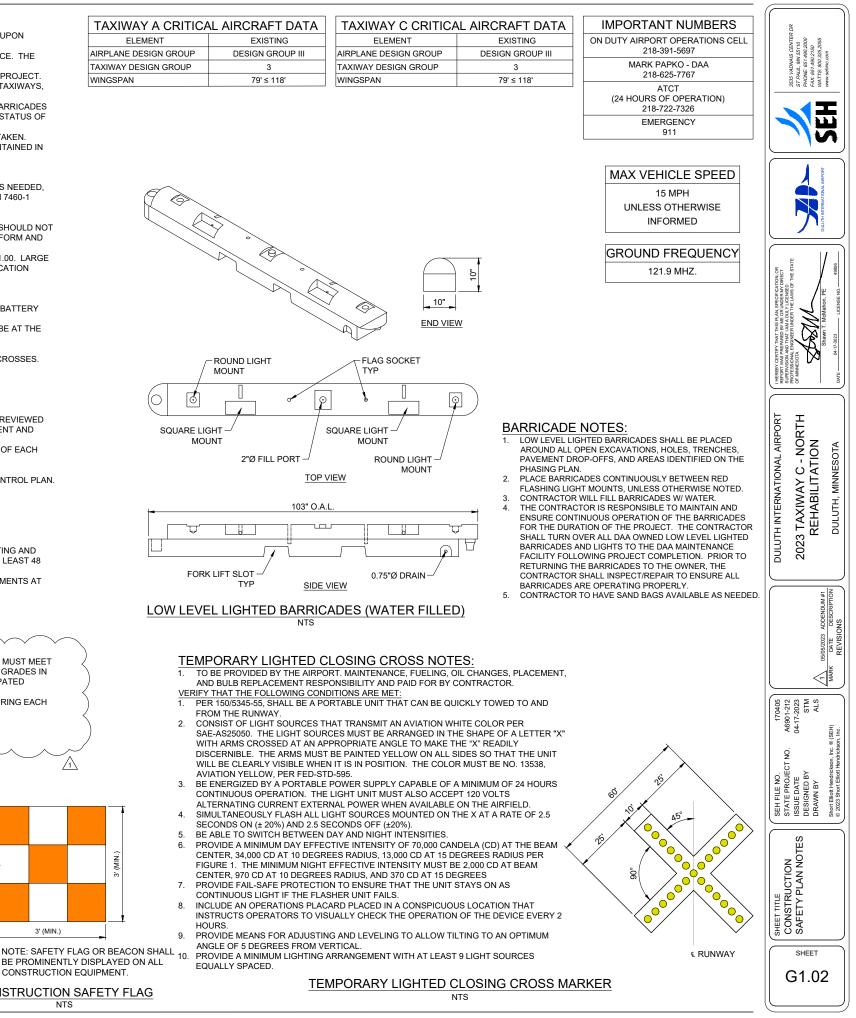
26. THE CONTRACTOR MUST HAVE WORK THROUGH TEMPORARY MARKINGS COMPLETED BY JULY 12, 2023.

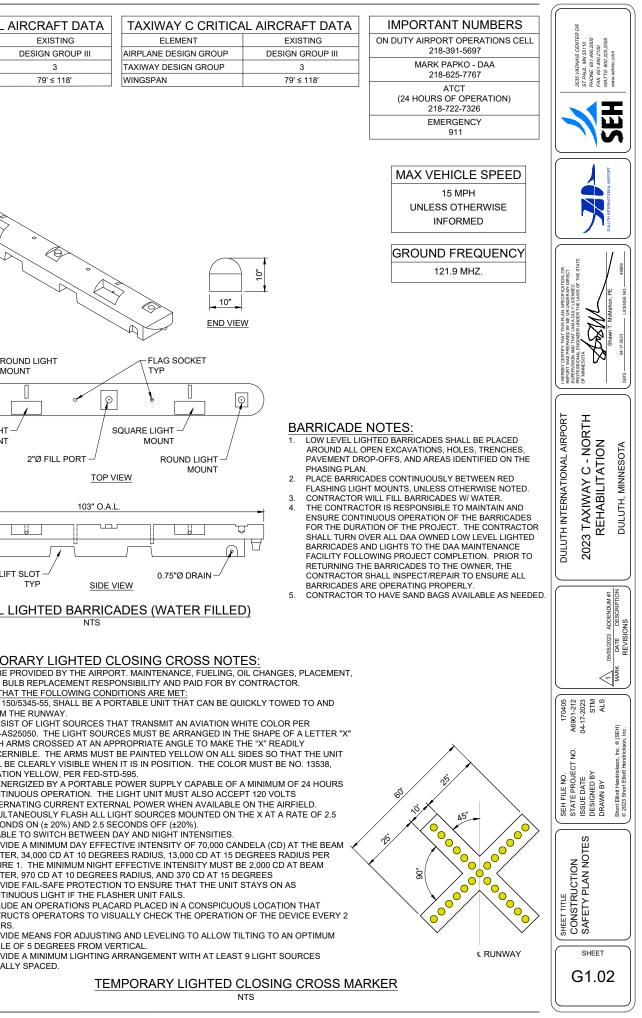
PHASING

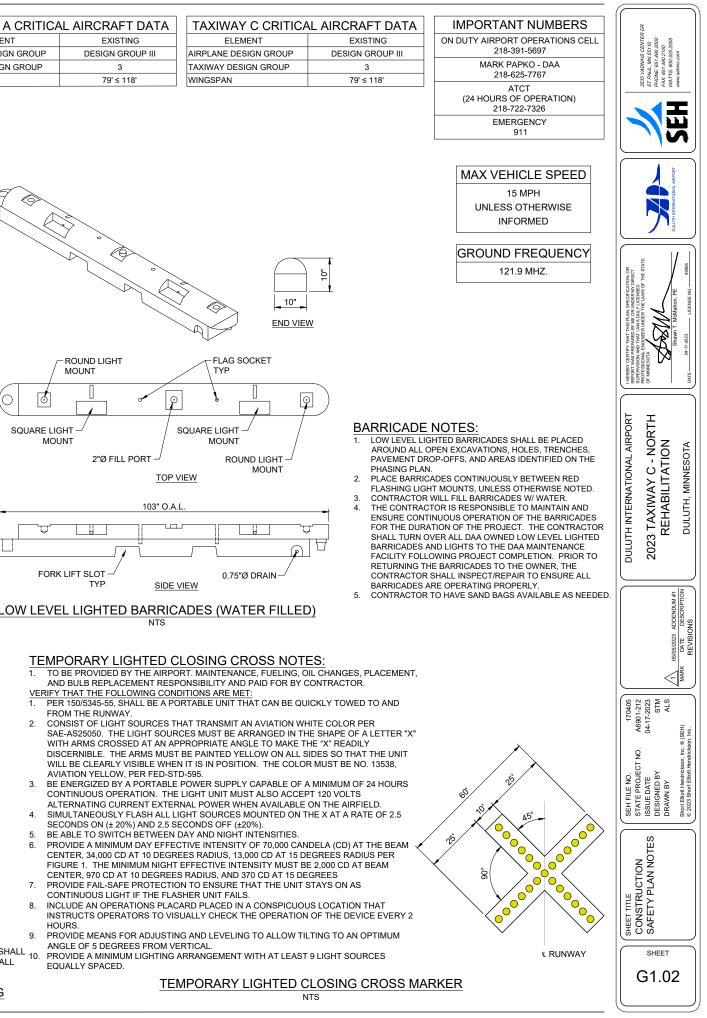
- 27. PRIOR TO REOPENING A CLOSED RUNWAY, THAT PORTION OF THE RUNWAY SAFETY AREA WITHIN 250' OF THE CENTERLINE & 1000' BEYOND END OF RUNWAY MUST MEET FAA CRITERIA. FAA CRITERIA REQUIRES THAT THERE BE NO OPEN EXCAVATIONS OR TRENCHES, THE MAXIMUM PAVEMENT DROP-OFF BE 3 INCHES, AND ALL GRADES IN ANY DIRECTION BE LESS THAN 5 PERCENT. TEMPORARY WEDGING OR GRADING MAY BE REQUIRED TO MEET FAA CRITERIA AND MUST SUPPORT ALL ANTICIPATED AIRCRAFT
- 28. THE CONTRACTOR SHALL PROVIDE ALL FINAL CLEANUP WORK PRIOR TO A FINAL INSPECTION. THE CONTRACTOR SHALL ALSO CONTINUOUSLY CLEAN UP DURING EACH PHASE OF THE PROJECT
- 29. PHASE 1A WILL REQUIRE TWO 4 HOUR CLOSURES OF RUNWAY 3/21. THIS RUNWAY 3/21 CLOSURE SHALL BE COORDINATED WITH THE DAA
- 30. PHASE 1B WILL REQUIRE TWO CLOSURES OF RUNWAY 9/27 BETWEEN 5:30AM 9AM. THIS RUNWAY 9/27 CLOSURE SHALL BE COORDINATED WITH THE DAA
- 31. PHASE 1A AND 1C CAN BE CONSTRUCTED CONCURRENTLY. AT NO TIME SHALL BOTH RUNWAYS BE CLOSED CONCURRENTLY.
- FOREIGN OBJECT DEBRIS
- 32. CONTRACTOR SHALL NOTIFY ON DUTY AIRPORT OPERATIONS OF DAILY WORK STARTING AND SCHEDULE A
- CONSTRUCTION INSPECTION WITH AIRPORT OPERATIONS BEFORE CONCLUDING WORK FOR THE DAY



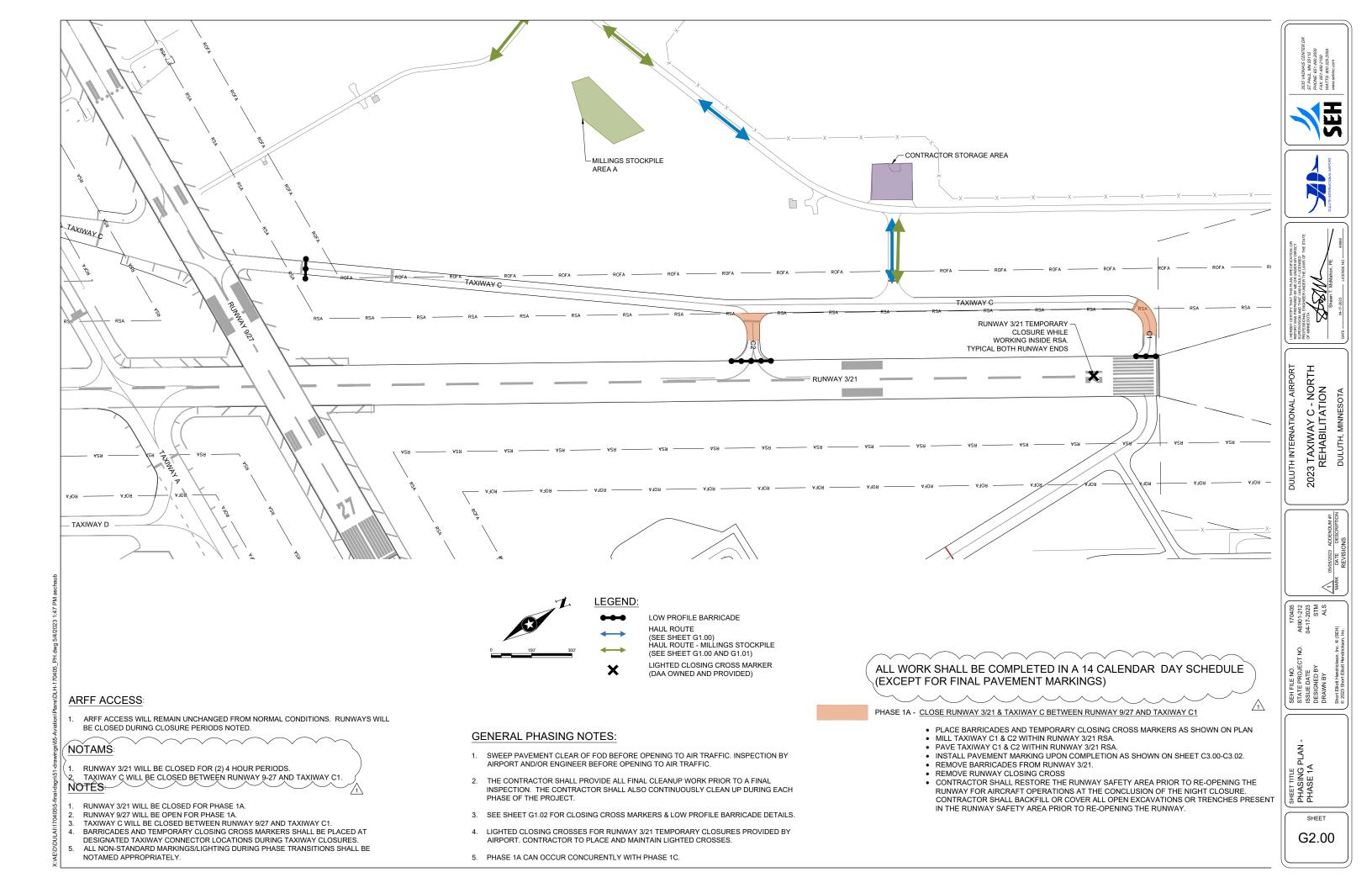
TAXIWAY A CRITICAL AIRCRAFT DATA		TAXIWAY C CRITIC	
	ELEMENT EXISTING		ELEMENT
	AIRPLANE DESIGN GROUP	DESIGN GROUP III	AIRPLANE DESIGN GROUP
	TAXIWAY DESIGN GROUP	3	TAXIWAY DESIGN GROUP
	WINGSPAN	79' ≤ 118'	WINGSPAN

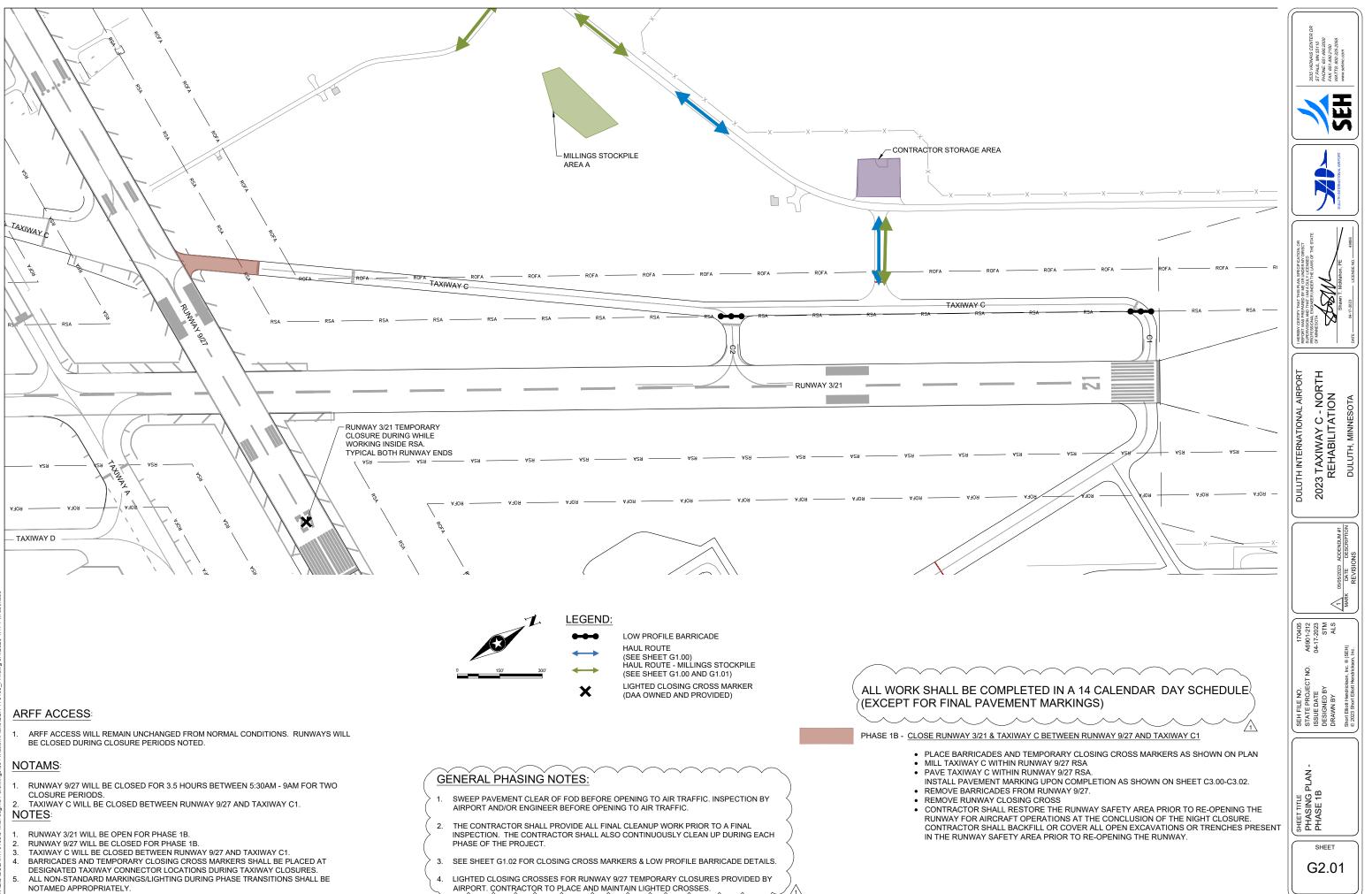


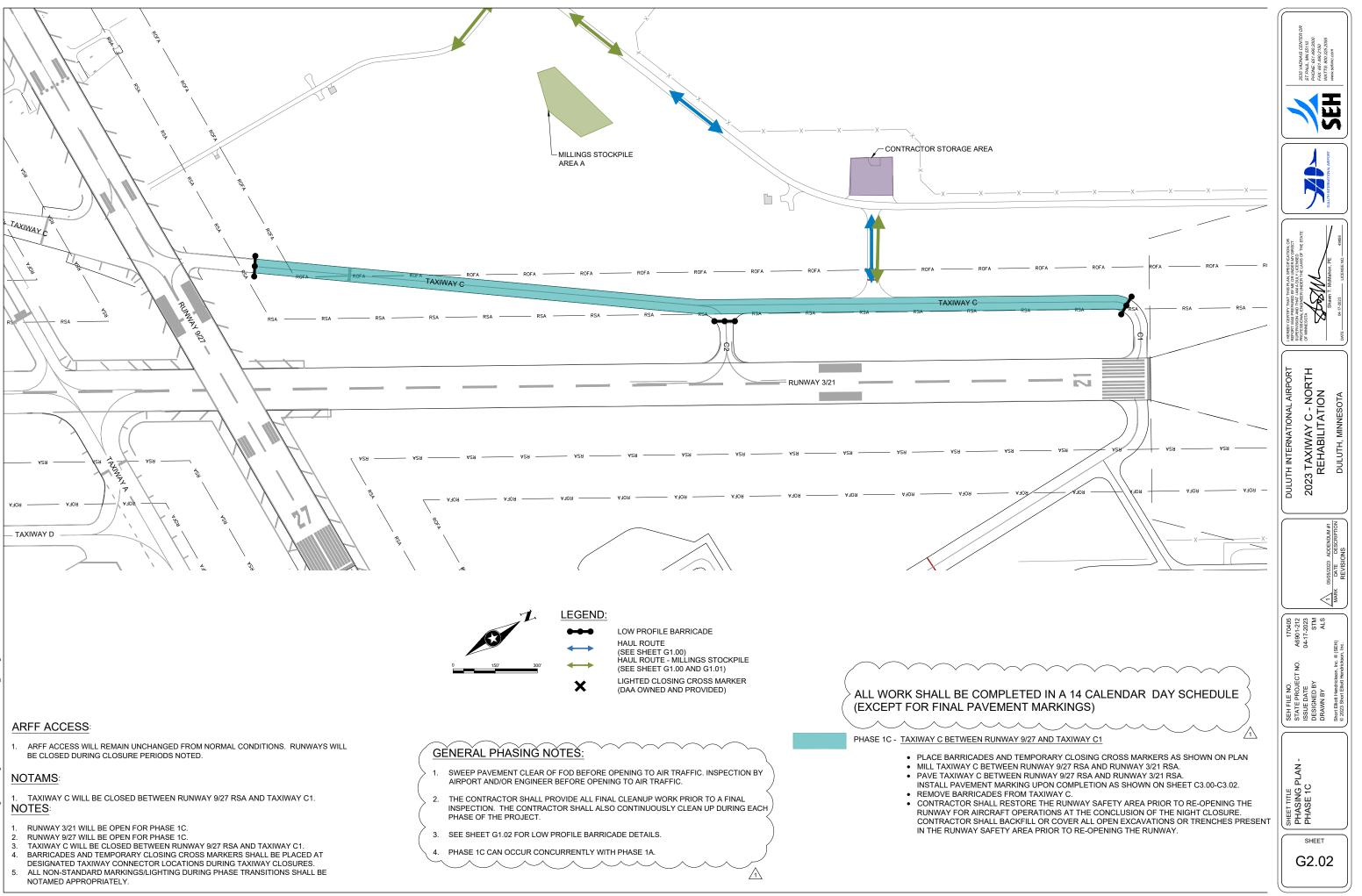




CONSTRUCTION SAFETY FLAG







GENERAL NOTES:

- 1. THE EXISTING UTILITY LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE AND MAY NOT INCLUDE ALL UTILITIES PRESENT. THE CONTRACTOR SHALL BE RESPONSIBLE TO CALL MINNESOTA'S ONE-CALL NOTIFICATION CENTER (GSOC) AT 1-800-252-1166, AND COORDINATE FIELD LOCATIONS OF EXISTING UNDERGROUND UTILITIES PRIOR TO BEGINNING GRADING AND UTILITY WORK. THE CONTRACTOR SHALL IMMEDIATELY REPAIR ANY UTILITIES DAMAGED DURING CONSTRUCTION TO THE SATISFACTION OF THE UTILITY OWNER AT NO COST.
- 2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES AS REQUIRED BY THE CONSTRUCTION COVERED IN THE PLANS.
- 3. ALL WORK SHALL CONFORM TO APPLICABLE LOCAL, STATE, AND FEDERAL LAWS AND REGULATIONS.
- 4. THE CONTRACTOR SHALL CONTACT THE ENGINEER IMMEDIATELY UPON DISCOVERY OF ANY ERRORS OR INCONSISTENCIES.
- 5. ALL ESTIMATES OF QUANTITIES ARE FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR AND SUBCONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING ALL QUANTITIES. THE CONTRACTOR SHALL PROVIDE ALL WORK AND MATERIALS AS SHOWN ON THE PLANS.
- 6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ALL EXISTING AREAS, PAVEMENTS, STRUCTURES, OR OTHER FACILITIES DAMAGED DURING CONSTRUCTION ACTIVITIES TO EQUAL OR BETTER CONDITION AT NO COST TO THE OWNER.
- 7. THE CONTRACTOR SHALL REMOVE ALL DEBRIS RESULTING FROM WORK UNDER THIS CONTRACT TO AN APPROVED OFF-AIRPORT DUMP SITE WITH EXCEPTION OF MILLINGS, WHICH WILL BE DELIVERED TO STOCKPILE.
- 8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE OWNER'S REPRESENTATIVE WITH REDLINED PLANS AND AS-BUILT SURVEYS, CERTIFIED BY A PROFESSIONAL LAND SURVEYOR IN THE STATE OF MINNESOTA.
- 9. CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION STAKING.

SECURITY NOTES:

- 1. <u>GENERAL INTENT:</u> IT IS INTENDED THAT THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF THE AIRPORT SECURITY PLAN AND WITH THE SECURITY REQUIREMENTS SPECIFIED HEREIN BY AIRPORT OPERATIONS. THE CONTRACTOR SHALL DESIGNATE TO THE ENGINEER AND AIRPORT OPERATIONS, IN WRITING, THE NAME OF THEIR "CONTRACTOR SECURITY AND SAFETY OFFICER (CSSO)." THE CSSO SHALL BE AN EMPLOYEE OF THE CONTRACTOR AND REPRESENT THE CONTRACTOR ON THE SECURITY REQUIREMENTS FOR THE CONTRACT.
- 2. <u>CONTRACTOR PERSONNEL SECURITY ORIENTATION:</u> THE CSSO SHALL BE RESPONSIBLE FOR SCHEDULING ALL TRAINING REQUIRED FOR CONTRACTOR AND SUBCONTRACTOR PERSONNEL INTENDING TO WORK ON THE SITE. ALL SECURITY REQUIREMENTS WILL BE INCORPORATED INTO A SECURITY PLAN DEVELOPED BY THE CONTRACTOR AND APPROVED BY AIRPORT OPERATIONS. ALL CONTRACTOR EMPLOYEES SHALL BE BRIEFED ON SECURITY REQUIREMENTS PRIOR TO WORKING IN THE CONSTRUCTION AREA. THE AIRPORT SHALL BRIEF AND/OR TRAIN CONSTRUCTION RELATED VEHICLE EQUIPMENT DRIVERS ON OPERATIONS WITHIN AN AIRPORT/AIRCRAFT ENVIRONMENT. AIRPORT MANAGEMENT SHALL PROVIDE PRINTED MATERIAL TO THE CONTRACTOR THAT DEPICTS HAUL ROUTES, PROHIBITED MOVEMENT AREAS, AND DESCRIBE THE CONSEQUENCES FOR NON-COMPLIANCE WITH ESTABLISHED PROCEDURES. THE AIRPORT HAS IMPLEMENTED A ZERO-TOLERANCE APPROACH TO DRIVING VIOLATIONS.
- 3. <u>PERSONNEL SECURITY FIRM</u>: THE CONTRACTOR IS REQUIRED TO HIRE PROFESSIONAL SECURITY FOR THE PROJECT. THE SECURITY FIRM SHALL PROVIDE GATE GUARDS ANYTIME ACCESS GATES TO THE AIRFIELD ARE UNLOCKED AND IN USE. THE SECURITY FIRM WILL ALSO PERFORM ROUTINE SEARCHES OF DELIVERIES IN ACCORDANCE WITH AIRPORT SECURITY PROCEDURES. THE CONTRACTOR IS REQUIRED TO RECEIVE AIRPORT AUTHORITY APPROVAL ON SELECTION OF SECURITY FIRM.
- IDENTIFICATION EMPLOYEES: CONSTRUCTION PERSONNEL ON SITE FOR MORE THAN 5 DAYS 4 (CONTRACTOR AND SUBCONTRACTORS) ARE REQUIRED TO BE BADGED. THE CSSO SHALL BE RESPONSIBLE FOR COORDINATING AND COMPLETING ALL NECESSARY DOCUMENTATION FOR BADGING AS A REQUIREMENT OF BADGING, EACH EMPLOYEE SHALL ATTEND SAFETY AND SECURITY TRAINING AS CONDUCTED BY OPERATIONS. TRAINING WILL TAKE APPROXIMATELY TWO HOURS. BADGE APPLICATION AND PROCESSING WILL TAKE APPROXIMATELY ONE HOUR. BADGES FOR CONSTRUCTION PERSONNEL REQUIRE A FEE OF \$175 PER BADGE. ALL BADGES MUST BE RETURNED TO THE AIRPORT AFTER PROJECT COMPLETION, FINAL PAYMENT WILL NOT BE MADE TO THE CONTRACTOR UNTIL ALL BADGES HAVE BEEN RETURNED. LOST BADGES RESULT IN A \$200 PENALTY. ALL CONSTRUCTION PERSONNEL SHALL COMPLETE BADGE APPLICATION AND TRAINING AT LEAST SIX WEEKS PRIOR TO NOTICE TO PROCEED. DAILY OPERATIONS SHALL INCLUDE TURNING IN BADGES AT THE END OF THE WORKDAY AND CHECKING OUT THE BADGES AT THE BEGINNING OF THE NEXT WORK DAY. THE PROFESSIONAL SECURITY FIRM SHALL HANDLE THE BADGE CHECK IN/CHECK OUT PROCESS. IN THE RARE EXCEPTION AN EMPLOYEE IS NOT BADGED, THE CONTRACTOR SHALL PROVIDE AN ESCORT FOR THE UNBADGED EMPLOYEE. THE ESCORT CANNOT PERFORM ANY OTHER WORK WHILE ESCORTING AND CAN ESCORT UP TO FIVE PEOPLE MAXIMUM. ESCORT MUST BE WITHIN EARSHOT OF ALL PEOPLE BEING ESCORTED.
- IDENTIFICATION VEHICLES: THE CONTRACTOR, THROUGH THE CSSO, SHALL ESTABLISH AND MAINTAIN A LIST OF CONTRACTOR AND SUBCONTRACTOR VEHICLES AUTHORIZED TO OPERATE ON THE SITE OR DELIVER TO THE SITE. THE LIST MAY BE UPDATED, AS NEEDED, TO ACCOUNT FOR DIFFERENT OPERATIONAL COMPONENTS OF THE WORK.
- 6. <u>SECURE ACCESS TO THE AIRFIELD:</u> CONTRACTOR ACCESS TO THE SITE SHALL BE SHOWN ON THE PLANS. NO OTHER ACCESS POINTS SHALL BE ALLOWED UNLESS APPROVED BY AIRPORT OPERATIONS. ALL CONTRACTOR TRAFFIC AUTHORIZED TO ENTER THE SITE SHALL BE BADGED EMPLOYEES OR ESCORTED BY BADGED CONTRACTOR PERSONNEL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TRAFFIC CONTROL TO AND FROM THE VARIOUS CONSTRUCTION AREAS ON THE SITE. THE SELECTED PROFESSIONAL SECURITY FIRM SHALL BE RESPONSIBLE FOR THE OPERATION AND SECURITY OF THE ACCESS GATES TO THE SITE. NO UNAUTHORIZED CONSTRUCTION PERSONNEL OR TRAFFIC SHALL BE ALLOWED WITHIN THE AIRPORT SECURITY FENCE. ACCESS GATES TO THE SITE SHALL BE LOCKED AND SECURED AT ALL TIMES WHEN NOT ATTENDED BY THE PROFESSIONAL SECURITY FIRM. THE CONTRACTOR IS RESPONSIBLE FOR THE IMMEDIATE CLEANUP OF ANY DEBRIS DEPOSITED ALONG THE ACCESS GATES A RESULT OF CONSTRUCTION TRAFFIC. DIRECTIONAL SIGNING FROM THE ACCESS GATE ALONG THE DELIVERY ROUTE TO THE STORAGE AREA, PLANT SITE, OR WORK SITE SHALL BE AS DIRECTED BY AIRPORT OPERATIONS. CONTRACTOR SHALL PROVIDE VISUAL CUES TO DELINEATE THE WORK AREAS. ADDITIONAL BARRELS/BARRICADES, AND SIGNAGE MAY BE REQUIRED TO CONTAIN

EMPLOYEES WITHIN THE WORK AREA, AT NO ADDITIONAL COST TO THE CONTRACT.

- 7. <u>COSTS ASSOCIATED WITH SECURITY:</u> ALL COSTS ASSOCIATED WITH SECURITY ARE ASSOCIATED WITH THE TRAFFIC PROVISIONS/AIRPORT SECURITY & DEVICES/PHASING ITEM AS A LUMP SUM.
- 8. <u>MATERIAL DELIVERED TO THE SITE:</u> ALL CONTRACTOR'S MATERIAL ORDERS FOR DELIVERY TO THE SITE WILL USE AS A DELIVERY ADDRESS THE STREET NAME ASSIGNED TO THE ACCESS POINT AT THE CONTRACTOR'S STAGING SITE AT THE AIRPORT. THE NAME "DULUTH INTERNATIONAL AIRPORT" SHALL NOT BE USED IN THE DELIVERY ADDRESS AT ANY TIME. THIS WILL PRECLUDE DELIVERY TRUCKS FROM ENTERING INTO THE TERMINAL COMPLEX, OR TAKING SHORT CUTS THROUGH THE PERIMETER GATES AND ENTERING INTO AIRCRAFT OPERATIONAL AREAS INAPPROPRIATELY.
- <u>FINES:</u> PAYMENT OF ALL FINES ASSESSED TO DULUTH INTERNATIONAL AIRPORT DUE TO VIOLATIONS BY THE CONTRACTOR OF FAA, TSA, OR AIRFIELD SECURITY AND SAFETY REQUIREMENTS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
- 9.1. IF THE RESTRICTED AREA GATE IS FOUND TO BE OPEN OR UNLOCKED AND UNATTENDED, AIRPORT SECURITY POLICE AND/OR TSA MAY ISSUE THE CONTRACTOR A CITATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COURT COSTS AND IMPOSED FINES. IN ADDITION, AN UP TO \$10,000.00 CHARGE MAY BE LEVIED BY THE DULUTH AIRPORT AUTHORITY AND/OR TSA FOR EACH VIOLATION SO DOCUMENTED. ALL FINES AND CHARGES SHALL BE DEDUCTED FROM FINAL PAYMENT TO THE CONTRACTOR IF FINES ARE NOT PAID WHEN DUE.
- 9.2. IN THE EVENT THE CONTRACTOR DEVIATED FROM THE IDENTIFIED CONSTRUCTION LIMITS OR DESIGNATED HAUL ROUTES ONTO ACTIVE RUNWAY, TAXIWAY, OR SAFETY AREA, THE CONTRACTOR WILL BE FINED \$1,000.00 PER OCCURRENCE. ALL FINES AND CHARGES SHALL BE DEDUCTED FROM FINAL PAYMENT DUE TO THE CONTRACTOR IF FINES ARE NOT PAID WHEN DUE.

SEQ NOTES (FOR REFERENCE ONLY):

- 1. ALL BITUMINOUS PAVING COURSES CALCULATED AT 115 LB/SY-IN
- 2. ALL BITUMINOUS TACK COAT CALCULATED AT 0.05 GAL/SY
- 3. PAVEMENT MARKING AND REFLECTIVE MEDIA CALCULATED AT 7 LBS/GAL AND 115 SF/GAL RESPECTIVELY.

STATEMENT OF ESTIMATED QUANTITIES

Line No.	Item No.	Item Description	Unit
1	01 71 13	Mobilization	LS
2	2564.501	Traffic Provisions / Airport Security & Devices	LS
3	01 55 15	Maintenance & Restoration of Haul Roads	LS
4	32 01 16	Mill Pavement Surface	SY
5	2574	Silt Fence, Type PA	LF
6	P-401	Asphalt Surface Course	TON
7	P-603	Emulsified Asphalt Tack Coat	GAL
8	P-620-1	Pavement Markings (yellow, including beads)	SF
9	P-620-2	Temporary Taxiway Marking (yellow, no beads)	SF
10	P620-3	Surface Painted Hold Position Signs	EA



