REQUEST FOR PROPOSALS FOR

Magnetic Stripe Toll Ticket Production Verifier

ISSUING OFFICE
Pennsylvania Turnpike Commission
Fare Collection Department

RFP NUMBER
05-200-3187

DATE OF ISSUANCE
September 7, 2005
REQUEST FOR PROPOSALS FOR
Magnetic Stripe Toll Ticket Production Verifier – RFP 05-200-3187

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PART I

GENERAL INFORMATION FOR CONTRACTORS

I-1. Purpose. This request for proposals (RFP) provides interested contractors with sufficient information to enable them to prepare and submit proposals for consideration by the Pennsylvania Turnpike Commission (Commission) to satisfy a need for a toll ticket production verifier.

I-2. Issuing Office. This RFP is issued for the Commission by the Fare Collection Department. The Issuing Office is the sole point of contact in the Commission for this RFP.

   Contact: Richard DiPiero  
   Phone: 717-939-9551, extension 5690  
   Email: rdipiero@paturnpike.com

I-3. Scope. This RFP contains instructions governing the proposals to be submitted and the material to be included therein; a description of the service to be provided; requirements which must be met to be eligible for consideration; general evaluation criteria; and other requirements to be met by each proposal.

I-4. Problem Statement. The Commission is interested in obtaining the services of a firm to pre-qualify vendors capable of providing magnetic stripe toll tickets in accordance with current Commission specifications. This will also include identifying prospective vendors and after selection, assist in the testing and monitoring of ticket production. It is important to note that the current contract with the toll ticket manufacturer expires in March 2006; therefore time is of the essence. A more detailed work statement has been provided in Part IV of this RFP.

I-5. Type of Contract. It is proposed that if a contract is entered into as a result of this RFP, it will be a fixed price agreement and will contain the Standard Contract Terms and Conditions shown in Appendix A. The Commission may in its sole discretion undertake negotiations with contractors whose proposals as to price and other factors show them to be qualified, responsible, and capable of performing the work.

I-6. Rejection of Proposals. The Commission reserves the right to reject any and all proposals received as a result of this request, or to negotiate separately with competing contractors.

I-7. Subcontracting. Any use of subcontractors by a contractor must be identified in the quote. During the contract period use of any subcontractors by the selected contractor, that were not previously identified in the quote, must be approved in writing by the Commission prior to any work being done.

A firm that responds to this solicitation as a prime may not be included as a designated sub consultant to another firm that responds to the same solicitation. **Multiple responses under any of the foregoing situations may cause the rejection of all responses of the firm or firms involved.** This does not preclude a firm from being set forth as a designated sub consultant to more than one prime consultant responding to the project advertisement.

I-8. Incurring Costs. The Commission is not liable for any costs incurred by contractors prior to issuance of a contract.
I-9. **Questions and Answers.** Written questions may be submitted to clarify any points in the RFP, which may not have been clearly understood. Questions should be forwarded to the Issuing Office at the above email address or by fax to (717) 986-8773. All questions must be received by **September 21, 2005.** All questions and written answers will be issued as an addendum to and become part of this RFP.

I-10. **Addenda to the RFP.** If it becomes necessary to revise any part of this RFP before the proposal response date, addenda will be posted to the web site under the original RFP document.

The Commission may revise a published advertisement. If the Commission revises a published advertisement less than ten days before the RFP due date, the due date will be extended to maintain the minimum ten-day advertisement duration if the revision alters the project scope or selection criteria. Firms are responsible to monitor advertisements/addenda to assure the submitted proposal complies with any changes in the published advertisement.

I-11. **Response.** To be considered, proposals must be delivered to the Pennsylvania Turnpike Commission’s **Contract Administration Department, Attention: George Hatalowich,** on or before **October 12, 2005.** The Pennsylvania Turnpike Commission is located at **700 South Eisenhower Blvd., Middletown, PA 17057.** Please note that use of U.S. Mail delivery does not guarantee delivery to this address by the above-listed time for submission. Proposers mailing proposals should allow sufficient delivery time to ensure timely receipt of their proposals. If the Commission office location to which proposals are to be delivered is closed on the proposal response date, due to inclement weather, natural disaster, or any other cause, the deadline for submission shall be automatically extended until the next Commission business day on which the office is open. Unless the contractors are otherwise notified by the Commission, the time for submission of proposals shall remain the same.

I-12. **Proposals.** To be considered, contractors should submit a complete response to this RFP, using the format provided in PART II. Each proposal should be submitted in **eight (8) copies** to the Contract Administration Department. No other distribution of proposals will be made by the contractor. Each proposal page should be numbered for ease of reference. Proposals must be signed by an official authorized to bind the contractor to its provisions and include the contractor’s Federal Identification Number. For this RFP, the proposal must remain valid for at least 90 days. Moreover, the contents of the proposal of the selected contractor will become contractual obligations if a contract is entered into.

Each and every contractor submitting a proposal specifically waives any right to withdraw or modify it, except as hereinafter provided. Proposals may be withdrawn by written or telefax notice received at the Commission’s address for proposal delivery prior to the exact hour and date specified for proposal receipt. However, if the contractor chooses to attempt to provide such written notice by telefax transmission, the Commission shall not be responsible or liable for errors in telefax transmission. A proposal may also be withdrawn in person by a contractor or its authorized representative, provided its identity is made known and it signs a receipt for the proposal, but only if the withdrawal is made prior to the exact hour and date set for proposal receipt. A proposal may only be modified by the submission of a new sealed proposal or submission of a sealed modification which complies with the requirements of this RFP.

I-13. **Economy of Preparation.** Proposals should be prepared simply and economically, providing a straightforward, concise description of the contractor’s ability to meet the requirements of the RFP.
I-14. **Discussions for Clarification.** Contractors who submit proposals may be required to make an oral or written clarification of their proposals to the Commission to ensure thorough mutual understanding and contractor responsiveness to the solicitation requirements. The Issuing Office will initiate requests for clarification.

I-15. **Best and Final Offers.** To obtain best and final offers from contractors whose proposals are determined by the Commission, in its sole discretion, to be reasonably susceptible of being selected for award, the Commission may (a) enter into discussions; (b) schedule oral presentations; and (c) request revised proposals.

I-16. **Prime Contractor Responsibilities.** The selected contractor will be required to assume responsibility for all services offered in its proposal whether or not it produces them. Further, the Commission will consider the selected contractor to be the sole point of contact with regard to contractual matters.

I-17. **Proposal Contents.** Proposals will be held in confidence and will not be revealed or discussed with competitors, unless disclosure is required to be made (i) under the provisions of any Commonwealth or United States statute or regulation; or (ii) by rule or order of any court of competent jurisdiction. If a contract is executed, however, the successful proposal submitted in response to this RFP shall be subject to disclosure. All material submitted with the proposal becomes the property of the Pennsylvania Turnpike Commission and may be returned only at the Commission’s option. Proposals submitted to the Commission may be reviewed and evaluated by any person other than competing contractors at the discretion of the Commission. The Commission has the right to use any or all ideas presented in any proposal. Selection or rejection of the proposal does not affect this right.

I-18. **Debriefing Conferences.** Contractors whose proposals are not selected will be notified of the name of the selected contractor and will be given the opportunity to be debriefed, at the Contractor’s request. The Issuing Office will schedule the time and location of the debriefing. The contractor will not be compared with other contractors, other than the position of its proposal in relation to all other proposals for each criterion for selection.

I-19. **News Releases.** News releases pertaining to this project will not be made without prior Commission approval, and then only in coordination with the Issuing Office.

I-20. **Commission Participation.** Unless specifically noted in this section, contractors must provide all services to complete the identified work.

I-21. **Cost Submittal.** The cost submittal shall be placed in a separately sealed envelope within the sealed proposal and kept separate from the technical submittal. **Failure to meet this requirement may result in disqualification of the proposal.**

I-22. **Term of Contract.** The term of the contract will commence on the Effective Date (as defined below) and will end five years from that date. The Commission shall fix the Effective Date after the contract has been fully executed by the Contractor and by the Commission and all approvals required by Commission contracting procedures have been obtained.

I-23. **Contractor’s Representations and Authorizations.** Each contractor by submitting its proposal understands, represents, and acknowledges that:
a. All information provided by, and representations made by, the contractor in the proposal are material and important and will be relied upon by the Issuing Office in awarding the contract(s). Any misstatement shall be treated as fraudulent concealment from the Issuing Office of the true facts relating to the submission of this proposal. A misrepresentation shall be punishable under 18 Pa. C.S. 4904.

b. The price(s) and amount of this proposal have been arrived at independently and without consultation, communication or agreement with any other contractor or potential contractor.

c. Neither the price(s) nor the amount of the proposal, and neither the approximate price(s) nor the approximate amount of this proposal, have been disclosed to any other firm or person who is a contractor or potential contractor, and they will not be disclosed on or before the proposal submission deadline specified in the cover letter to this RFP.

d. No attempt has been made or will be made to induce any firm or person to refrain from submitting a proposal on this contract, or to submit a proposal higher than this proposal, or to submit any intentionally high or noncompetitive proposal or other form of complementary proposal.

e. The proposal is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or other noncompetitive proposal.

f. To the best knowledge of the person signing the proposal for the contractor, the contractor, its affiliates, subsidiaries, officers, directors, and employees are not currently under investigation by any governmental agency and have not in the last four (4) years been convicted or found liable for any act prohibited by State or Federal law in any jurisdiction, involving conspiracy or collusion with respect to bidding or proposing on any public contract, except as disclosed by the contractor in its proposal.

g. To the best of the knowledge of the person signing the proposal for the contractor and except as otherwise disclosed by the contractor in its proposal, the contractor has no outstanding, delinquent obligations to the Commonwealth including, but not limited to, any state tax liability not being contested on appeal or other obligation of the contractor that is owed to the Commonwealth.

h. The contractor is not currently under suspension or debarment by the Commonwealth, or any other state, or the federal government, and if the contractor cannot certify, then it shall submit along with the proposal a written explanation of why such certification cannot be made.

i. The contractor has not, under separate contract with the Issuing Office, made any recommendations to the Issuing Office concerning the need for the services described in the proposal or the specifications for the services described in the proposal.

j. Each contractor, by submitting its proposal, authorizes all Commonwealth agencies to release to the Commission information related to liabilities to the Commonwealth.
PART II

INFORMATION REQUIRED FROM CONTRACTORS

Contractor proposals must be submitted in the format, including heading descriptions, outlined below. To be considered, the proposal must respond to all requirements in this part of the RFP. Any other information thought to be relevant, but not applicable to the enumerated categories, should be provided as an appendix to the proposal. Each proposal shall consist of two (2) separately sealed submittals. The submittals are as follows: (i) Technical Submittal, in response to Sections II-1 through II-8 hereof; (ii) Cost Submittal, in response to Section II-9 hereof.

The Commission reserves the right to request additional information which, in the Commission’s opinion, is necessary to assure that the contractor’s competence, number of qualified employees, business organization, and financial resources are adequate to perform according to the contract.

The Commission may make such investigations as deemed necessary to determine the ability of the contractor to perform the work, and the contractor shall furnish to the Commission all such information and data for this purpose as requested by the Commission. The Commission reserves the right to reject any proposal if the evidence submitted by, or investigation of, such contractor fails to satisfy the Commission that such contractor is properly qualified to carry out the obligations of the agreement and to complete the work specified.

II-1. Statement of the Problem. State in succinct terms your understanding of the problem presented or the service required by this RFP.

II-2. Management Summary. Include a narrative description of the proposed effort and a list of the items to be delivered or services to be provided.

II-3. Work Plan. Describe in narrative form your technical plan for accomplishing the work. Use the task descriptions in Part IV of this RFP as your reference point. Include a timetable, in chart or graph form, detailing timeframes expected for each task and expected dates for deliverables. Modifications of the task descriptions are permitted; however, reasons for changes should be fully explained. Indicate the number of personhours allocated to each task.

II-4. Prior Experience. Include experience in the manufacture and usage of magnetic stripe tickets. Experience shown should be work done by individuals who will be assigned to this project as well as that of your company. Studies or projects referred to should be identified and the name of the customer shown, including the name, address, and telephone number of the responsible official of the customer, company, or agency who may be contacted.

II-5. Personnel. Include the number, and names where practicable, of executive and professional personnel, analysts, auditors, researchers, programmers, consultants, etc., who will be engaged in the work. Show where these personnel will be physically located during the time they are engaged in the work. Include through a resume or similar document education and experience relative to the required tasks outlined in Part IV. Indicate the responsibilities each will have in this project and how long each has been with your company. Identify subcontractors you intend to use and the services they will perform.
II-6. Training. Indicate recommended training of Commission personnel. Include the personnel to be trained, the number to be trained, duration of the program, place of training, curricula, training materials to be used, number and frequency of sessions, and number and level of instructors.

II-7. Objections and Additions to Standard Contract Terms and Conditions. Contractor will identify which, if any, of the terms and conditions contained in Appendix A it objects to and what additional terms and conditions contractor requires. Contractor’s failure to object or to request additions will result in its waiving its right to do so later, but the Commission may consider late objections and additional requests if it is in the best interest of the Commission to do so.

II-8. MWDBE/SERB Participation. Prime Contractors are encouraged to utilize SERB vendor participation in their proposed solution. The Commission, however, will not be applying any additional advantage to contractors, who submit proposals, who are either qualified SERB vendors or who utilize a SERB vendor as a subcontractor for this RFP.

II-9. Cost Submittal. The information requested in this section shall constitute your cost submittal. Please include in this section: Cost for the initial work described in Part IV-4. Tasks 1 through 9, and a separate itemized cost for work described in Part IV-4. Task 10.

This portion of the proposal should be bound and sealed separately from the remainder of the proposal. The total cost you are proposing must be broken down into the following components:

a. **Direct Labor Costs.** Itemize so as to show the following for each category of personnel with a different rate per hour:
   (1) Category: e.g., project manager, analyst, senior auditor, research associate.
   (2) Estimated hours.
   (3) Rate per hour.
   (4) Total cost for each category and for all direct labor costs.

b. **Labor Overhead.** Specify what is included and rate used.

c. **Travel and Subsistence.** Itemize transportation, lodging and meals per diem costs separately.

d. **Consultant Costs.** Itemize as in (a) above.

e. **Subcontract Costs.** Itemize as in (a) above.

f. **Cost of Supplies and Materials.** Itemize.

g. **Other Direct Costs.** Itemize.

h. **General Overhead Costs.** Specify what is included and rate used.

i. **Total Cost.**

Only work satisfactorily performed after execution of a written contract, after the contractor’s receipt of a notice to proceed from the Commission and after the contract term has begun will be reimbursed.
PART III

CRITERIA FOR SELECTION

III-1. Mandatory Responsiveness Requirements. To be eligible for selection, a proposal should be (a) timely received from a contractor; (b) properly signed by the contractor; and (c) formatted such that all cost data is kept separate from and not included in the Technical Submittal.

III-2. Proposals will be reviewed and evaluated by a committee of qualified personnel selected by the Commission. This committee will recommend for selection the proposal that most closely meets the requirements of the RFP and satisfies Commission needs. Award will only be made to a contractor determined to be responsible in accordance with Commonwealth Management Directive 215.9, Contractor Responsibility Program.

III-3. The following areas of consideration will be used in making the selection:

a. Understanding the Problem. This refers to the contractor’s understanding of the Commission needs that generated the RFP, of the Commission’s objectives in asking for the services or and of the nature and scope of the work involved.

b. Contractor Qualifications. This refers to the ability of the contractor to meet the terms of the RFP, especially the time constraint and the quality, relevancy, and recency of studies and projects completed by the contractor. This also includes the contractor’s financial ability to undertake a project of this size.

c. Personnel Qualifications. This refers to the competence of professional personnel who would be assigned to the job by the contractor. Qualifications of professional personnel will be measured by experience and education, with particular reference to experience on studies/services similar to that described in the RFP. Particular emphasis is placed on the qualifications of the project manager.

d. Soundness of Approach. Emphasis here is on the techniques for collecting and analyzing data, sequence and relationships of major steps, and methods for managing the service. Of equal importance is whether the technical approach is completely responsive to all written specifications and requirements contained in the RFP and if it appears to meet Commission objectives.

e. Cost. While this area may be weighted heavily, it will not normally be the deciding factor in the selection process. The Commission reserves the right to select a proposal based upon all the factors listed above, and will not necessarily choose the firm offering the best price. The Commission will select the firm with the proposal that best meets its needs, at the sole discretion of the Commission.
PART IV

WORK STATEMENT

IV-1. Objectives.

a. General. To assist the Commission in obtaining magnetic stripe toll tickets for use on its toll system.

b. Specific. To help the Commission in establishing a bidders list of qualified toll ticket vendors and to assure the compatibility of the manufactured tickets with the Commission’s “Magnetic Stripe Toll Tickets Technical Requirements and Specifications” document (attached). The current contract to supply the magnetic stripe tickets to the Commission expires March 2006.

IV-2. Nature and Scope of the Project. The Consultant shall prepare and submit to the Commission a list of magnetic stripe toll ticket manufacturers including prospective vendors from the Commission’s Vendor File identified by Consultant. The Consultant will prepare and send out an “Invitation to Qualify to Supply Magnetic Toll Tickets” from the approved Consultant’s list. Manufacturers must become qualified in accordance with the Commission’s “Vendor Qualification Requirements Specification”.

The Consultant shall perform the qualification tests on the submitted test ticket rolls in accordance with the Commission’s “Magnetic Stripe Toll Tickets Technical Requirements and Specifications” document. The Consultant shall grade each responding manufacturer as “Qualified” or “Not Qualified” and submit the graded list to the Commission.

The Commission will prepare and distribute a “Request For Quote ” from the Consultant’s approved list of qualified manufacturers.

Upon award of the magnetic ticket contract to the successful bidder, the Consultant shall perform on-site witnessing of the manufacturer’s in-process inspections and testing in accordance with the Commission’s “Magnetic Stripe Toll Tickets Technical Requirements and Specifications” document and final inspection and testing of the tickets, including periodic future testing and inspection for the duration of the award period to the manufacturer, in accordance with the Commission’s then current “Magnetic Stripe Toll Tickets Technical Requirements and Specifications” document.

The Commission may require the Consultant to train appointed Commission staff. The Consultant shall submit a training plan with its response to this request for proposals.

IV-3. Requirements

The Consultant shall have available for its use all of the tools and appliances necessary to perform the required tests. The Consultant may use a third party for testing certain parameters required by the Commission’s “Magnetic Stripe Toll Tickets Technical Requirements and Specifications” document. Use of a third party does not relieve the Consultant in any way from the responsibility of successfully performing the work.

Time is of the essence when an order for tickets is released to the manufacturer. The Consultant shall be able to meet the manufacturer’s timetable for in-process inspections and testing.
The Consultant shall be able to perform the final inspections and testing punctually so that shipment to the Commission of manufactured magnetic stripe tickets is not delayed.

The Consultant shall possess at a minimum the following:

- Experience and understanding of the mechanics of toll systems and how tickets are processed.
- Knowledge and technical expertise, including an understanding of the workings, with physical/electrical characteristics, of magnetic striping.
- Knowledge and background in Quality Assurance, specifically in results of random sampling.
- Expertise in compiling analytical reports based on testing of manufacturers for pre-qualification.
- Experience in program outlining and planning to ensure the technical requirements of the Commission are met.

**IV-4. Tasks**

1. The Consultant shall become familiar with the Commission’s “Magnetic Stripe Toll Tickets Technical Requirements and Specifications” document (attached) and submit to the Commission a list of magnetic ticket manufacturers it believes could meet the requirements including vendors identified from the Commission’s Vendor File.

2. The Consultant shall prepare and submit for the Commission’s approval an inspection and test chart using the Commission’s “Magnetic Stripe Toll Tickets Technical Requirements and Specifications” document. This chart can be used for both the qualification process and the manufacturing and delivery processes.

3. The Consultant shall prepare and submit for Commission approval a “Vendor Qualification Requirements Specification” identifying minimum standards prospective vendors must meet to qualify to receive the RFQ.

4. The Consultant shall prepare and distribute the “Invitation to Qualify to Supply Magnetic Toll Tickets” (ITQ) to all approved vendors.

5. The Consultant shall review and evaluate all responses received in response to the ITQ to verify vendor qualifications in accordance with the Vendor Qualification Requirements Specification.

6. The Commission will issue a Request for Quote to all qualified vendors and determine the lowest responsible bidder.

7. The Consultant shall prepare an on-site facility visit plan in accordance with the successful bidder’s manufacturing plan in order to witness the in-process inspections and testing.
8. The Consultant shall be required to perform the on-site visits in accordance with the manufacturer’s flow chart of his manufacturing process in order to ensure compliance with the Commission’s “Magnetic Stripe Toll Tickets Technical Requirements and Specifications” document.

9. The Consultant shall train designated Commission staff as required.

10. The Consultant shall be required to perform final inspection and testing of all shipments (approximately three per year) during the duration of the manufacturing contract.

IV-5 Reports

1. The Consultant shall prepare and submit to the Commission a list of manufacturers.

2. The Consultant shall prepare and submit to the Commission qualification results for each bidder and a graded list of manufacturers after the qualification process is complete.

3. The Consultant shall prepare and submit to the Commission a trip report for each on-site visit. The Consultant shall prepare and submit for Commission approval the format it intends to use for these reports.

4. The Consultant shall prepare and submit to the Commission final inspection and test results for each shipment. The Consultant shall submit a recommendation for or against the release of the shipment to the Commission based on the results of this final inspection and test.
PENNSYLVANIA TURNPIKE MAGNETIC STRIPE TOLL TICKETS TECHNICAL REQUIREMENTS AND SPECIFICATIONS

Specification No. FCS-201-2005

Revision 11
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1.00 GENERAL REQUIREMENTS

These specifications define the ticket paper quality, magnetic stripe properties, recording properties, durability, adhesion, chemical and physical properties, and quality of the non-encoded magnetic stripe toll tickets to be used in the Fare Collection System (FCS) on the Pennsylvania Turnpike System. The magnetic stripe toll tickets are to be furnished in rolls of three thousand two hundred (3,200) tickets each.

The magnetic stripe toll tickets shall be of sufficient quality to be used in the year-round environmental conditions prevailing along the Pennsylvania Turnpike.

For reference purposes in this specification, the side of the ticket which has the magnetic stripe shall be identified as the front with the reverse side being identified as the back.

2.00 APPLICABLE REFERENCE DOCUMENTS

The following reference documents form a part of these specifications to the extent specified. The most recent issue of these documents shall be in effect on the date of the award of contract:


2) ISO standard 7811-2.


6) TAPPI Standard T410 OS-61, Thickness of Paper.


3.00 FCS EQUIPMENT REFERENCE CHARACTERISTICS

The magnetic stripe toll tickets will be processed through the FCS equipment manufactured by Compagnie Generale d'Automatisme (CGA) of Bretigny, France, and ALTA Technology of
Shelton, Connecticut. The Characteristics of the ALTA ticket transport are as follows: (Refer to Appendix A for magnetic head detail)

Ticket Transport Speed ........................................................................................................ 19.055 Inches/Sec. (484 MM/Sec.)
Magnetic Read/Write Head Brush Industries, Inc. ............................................................... Model No. 901989-030
Encoding Data Density ........................................................................................................ 75 bits per inch - F2F
Magnetic Head Gap Width .................................................................................................... .002 in
Write Current ....................................................................................................................... Min. 8mA, P-P e 400% ISAT
................................................................................................................................................ Max. 18mA, P-P e 400% ISAT
DC Erase Current ................................................................................................................. Min. 2 mA
................................................................................................................................................ Max. 18 mA +/- 10%
Magnetic Head Pressure ....................................................................................................... 110 Grams + 20/-30

4.00 ENVIRONMENTAL REQUIREMENTS

The quality of the tickets shall be sufficient to withstand the environmental climate of the tollbooth and toll equipment environment of -30 degrees C (-22 degrees F) to +50 degrees C (122 degrees F) with a relative humidity of 15 to 95 percent noncondensing. The tickets shall also meet these quality requirements following storage for up to eight hours, in temperatures as encountered in a parked motor vehicle.

The ticket storage environmental requirements shall be 0 degrees C (32 degrees F) to +50 degrees C (122 degrees F) with a relative humidity of 40 to 80 percent as encountered in the toll plaza utility building rooms or other Pennsylvania Turnpike Commission (“the Commission”) storage areas.

The vendor shall sign the applicable line in Table 1, "Vendor Certification of Attributes," to certify his compliance with these requirements.

All tests done pursuant to this specification will be performed on ticket samples conditioned at 10 degrees C, 80% RH, 10 degrees C, 0% RH, 40 degrees C, 0% RH and 40 degrees C, 80% RH for a period of 24 hours. Measurements will be performed within 30 minutes of removal from the environmental chamber.

5.00 SAFETY - TOXIC REQUIREMENTS

No component of the ticket including the paper stock, magnetic stripe material or printing ink shall be capable of causing bodily harm by contact, inhalation or ingestion in the normal course
of usage by patrons or toll collection personnel. Certify compliance for the production lot in Table 1.

6.00 TICKET PAPER STOCK REQUIREMENTS

The paper stock shall meet or exceed the requirements of 99 pound tab index per ANSI X3.11-1969 with the exception of Section 1 (Scope), Section 2.1.2 (Straightness), Section 2.1.3 (Parallelism), Section 2.1.4 (Squareness), Section 2.2 (Dimensions), Section 2.3.1 (Diagonal Corner Cut), Section 2.7 (Curl), Section 3.3 (Thickness) and Section 3.10 (Friction).

6.01 Ticket Thickness

Ticket paper stock shall be 0.0070 inches thick +/- 0.0004 inches. Paper stock thickness shall be determined by TAPPI method T410 OS-61 (calipers). Certify compliance for the production lot in Table 1.

6.02 Ticket Color

The tickets shall be made from natural colored base material paper stock unless specified otherwise in a specific procurement or purchase order. The vendor shall assign a "ticket color block" on each ticket facsimile drawing submitted so that the ticket color can be specified by the Commission. Ticket color will conform to ISO Standard R 1831-1980 or equivalent.

6.03 Paper Opacity

The ticket opacity shall be a minimum of 80 percent as defined in TAPPI-T425 (Opacity of Paper) or equivalent. Certify compliance for the production lot in Table 1.

6.04 Paper Reflectance

Paper must have a mean reflectance greater than 70 percent as defined by ISO R 1831, articles 3 to 3.2.1.2, index 1971, and for wavelengths from B 425 to B 900 mm. Reflectance variations must have a standard deviation lower than 5 percent as defined by ISO R 1831, article 3.2.2 for wavelengths from B 425 to B 900 mm. Certify compliance for the production lot in Table 1.

7.00 TICKET PROPERTIES

The tickets shall meet the following specific requirements:
7.01 Ticket Size

Tickets shall meet the dimensions as shown in Figure 1 when conditioned at 60 percent +/- 2 percent humidity and 73 degrees F +/- 3.5 degrees F (23 degrees C +/- 2 degrees C).

7.02 Ticket Grain

The grain of the paper stock shall be in the direction of the magnetic stripe on the ticket and shall conform to ANSI X33.11-1969. Certify compliance for the production lot in Table 1.

7.03 Defects

The tickets shall be free from splices, holes, electrically conducting particles, organic residue or brittle areas and shall not contain residual chemicals, fuzz or loose dust.

7.04 Creasing

There shall be no creasing of the tickets on the ticket roll which is visually evident or measurable with a dial gauge.

8.00 MAGNETIC STRIPE REQUIREMENTS

The location and width of the magnetic stripe shall be located on the front side of the ticket roll and shall extend the full length of the ticket roll as shown in Figures 1 and 2.

8.01 Application

The magnetic stripe ferromagnetic material shall be applied to the ticket roll in the form of a magnetic inking process or a magnetic tape process which provides a magnetic stripe in compliance with all requirements of these specifications.

8.02 Magnetic Stripe Color

The color of the magnetic stripe shall be dark brown or black.
8.03 Roughness

The peak to peak surface irregularity (roughness) of the magnetic stripe reading surface shall not exceed 70 microinches, arithmetic average, when measured in both the longitudinal and transverse directions of the stripe using a profilometer with a cut-off wavelength of 0.030 inch. Values shall be computed by averaging three measurements at random locations on the stripe. Certify compliance for the production lot in Table 1.

8.04 Magnetic Stripe Surface Height

The maximum height of the magnetic stripe shall not exceed 0.0005 inches (500 microinches) above the surface of the ticket. The combined thickness of the paper and the magnetic material shall not be less than 0.0066 inches and shall not exceed 0.0079 inches. Certify compliance for the production lot in Table 1.

8.05 Signal Amplitude Requirements For Unused Tickets

The magnetic stripe shall be capable of producing peak read signal amplitude of not less than 80 percent nor more than 120 percent of the reference head voltage when written with any current between 350 percent and 500 percent of the write current referenced to a secondary standard RM 7811/2 calibration card. Certify compliance for the production lot of all signal amplitude requirements defined in Table 1A.

Table 1A — Signal amplitude requirements for unused unencoded cards

<table>
<thead>
<tr>
<th>Description</th>
<th>Density ft/mm (ftpi)</th>
<th>Test recording current</th>
<th>Signal amplitude result</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal amplitude</td>
<td>8 (200)</td>
<td>Imin</td>
<td>UA1</td>
<td>0,8 UR ≤ UA1 ≤ 1,2 UR</td>
</tr>
<tr>
<td>Signal amplitude</td>
<td>8 (200)</td>
<td>Imin</td>
<td>U1</td>
<td>U1 ≤ 1,28 UR</td>
</tr>
<tr>
<td>Signal amplitude</td>
<td>8 (200)</td>
<td>Imax</td>
<td>UA2</td>
<td>UA1 ≥ UA2 ≥ 0,78 UR</td>
</tr>
<tr>
<td>Signal amplitude</td>
<td>20 (500)</td>
<td>Imax</td>
<td>U2</td>
<td>U2 ≥ 0,50 UR</td>
</tr>
<tr>
<td>Resolution</td>
<td>20 (500)</td>
<td>Imax</td>
<td>UA3</td>
<td>UA3 ≥ 0,7 UA2</td>
</tr>
<tr>
<td>Erasure</td>
<td>0</td>
<td>Imin, DC</td>
<td>UA4</td>
<td>UA4 ≤ 0,03 UR</td>
</tr>
<tr>
<td>Extra pulse</td>
<td>0</td>
<td>Imin, DC</td>
<td>U4</td>
<td>U4 ≤ 0,09 UR</td>
</tr>
</tbody>
</table>

The slope of the saturation curve shall never be positive between Imin and Imax.
8.06 Effective Coercivity

The effective coercive force required to erase a ticket, which has previously been encoded to saturation, shall be 300 +/- 45 Oersted. Certify compliance for the production lot in Table 1.

8.07 Magnetic Stripe Resistance to Wear

Mechanical characteristics of the magnetic stripe shall be such that, after 25 repetitive cycles (reading followed by rereading) using a MAG 3 magnetic stripe analyzer or equivalent test equipment, signal voltage attenuation will be less than or equal to 20 percent. Certify compliance for the production lot in Table 1.

8.08 Magnetic Stripe Width

The magnetic stripe width shall not be less than 2.49 mm nor more than 2.75 mm.

9.0 PRINTING REQUIREMENTS

The printing shall be legible, without excess ink, and shall cause no embossment or distortion of the ticket. The ink shall be nonabrasive, nonmagnetic and nonblackening when dry. The ink shall not readily transfer to patrons or toll collector's hands or clothes, to other tickets, hoppers, ticket transport rollers and other machine components and shall not readily smudge or smear when stored or handled in the specified operational environments. See Figure 3 for location of pre-printed areas.
9.01 Eye Spot Absorption

The eye spot printed on the front of the tickets defines the cut ticket length. The eye spot must have a maximum reflectance lower than 10 percent for wavelengths from B 425 to B 900 mm as defined by ISO R 1831 or equivalent. Certify compliance in Table 1.

The "point contrast signal", as defined by ISO R 1831 or equivalent, Section 4.7.1 and 4.7.2, must not be less than 0.69:

\[
\frac{RS - RT}{RS} > 0.69
\]

where:
- RS = minimum mean reflectance of paper
- RT = maximum reflectance of eye spot
- PCS = point contrast signal

Printing quality shall be such that when the eye spot is reached, 90 percent of PCS (point contrast signal) should be reached in less than 0.02 mm of longitudinal movement on the spot.

9.02 Eye Spot Locations

Eye spot locations will be as shown on Fig. 1.

9.03 Embossment

Embossment of the ticket surface, either side or edge, shall not be greater than 0.00006 inches. Certify compliance for the production lot in Table 1.

10.00 TICKET RELIABILITY REQUIREMENTS

The magnetic stripe toll tickets shall be suitable for not less than six (6) passages or uses in the FCS equipment. These uses include the initial issuing of the ticket at an entry point on the Turnpike, at least two (2) passes of the ticket at an exit point on the Turnpike and at least two (2) uses of the ticket through a batch ticket machine. The ticket uses will consist of up to five (5) writing, reading and erasure cycles for the ticket. The online write-read-erase cycle shall not be considered one (1) of the six (6) ticket uses for reliability purposes. Certify compliance for the production lot in Table 1.
11.00 TICKET ROLL REQUIREMENTS

After coating and application of the magnetic stripe, the band shall be coiled on a winding core and formed into a roll.

11.01 Ticket Roll

Winding of ticket rolls must be done without causing defects, such as joining, folding or over thickness. The magnetic stripe must not stick to, nor leave traces on the neighboring stripe. The coils of the rolls must be snugly wound without weaving; no distortion of the rolls should be seen when a light pressure is exerted on one of the sides. The edges of each roll must be clean-cut, without ragged edges, with no residue or dust between the coils caused by the cutting process.

Width control shall be performed using a template through which the roll shall pass freely rolling on its edge. The template width shall be 2.16 inches (+ 0.01 inches, - 0.00 inches) (54.8 mm [+ 0.3 mm, -0.0 mm]) and the height shall be 12.8 inches (+ 0.0 inches, -0.1 inches) (325 mm [+ 0.0 mm, -2 mm]). See Figure 5.

11.02 Winding

The roll must be correctly placed on the winding core. The first coils shall be sufficiently tight to avoid any slippage of the winding core. The interior end of the roll must be attached to the core either by .75 inch wide removable tape (3M Scotch Part No. 811 or equivalent), by inserting the end in a core slot or by gluing to the core.

The winding is defined by the position of the magnetic stripe in the coils of the roll, conforming to Figure 2.

The band comprising each roll shall be of uniform length, each roll containing three thousand two hundred (3,200) tickets. It must be free of any splice joining, folds or over thickness.

The free end of the roll shall be kept clamped by a .75 inch wide removable tape (3M Scotch Part No. 811 or equivalent), long enough to prevent unwinding during shipment or storage. At both ends, the roll will be cut perpendicular to the stripe.
### 11.03 Dimensions

<table>
<thead>
<tr>
<th>Dimension of the band</th>
<th>Inches + Tolerance</th>
<th>Metric + Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>2.126 + 0.000 in.</td>
<td>54mm +0.0 mm</td>
</tr>
<tr>
<td></td>
<td>- 0.02 in.</td>
<td>-0.5 mm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dimension of the roll</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>2.142 in. max.</td>
<td>54.4 mm max.</td>
</tr>
<tr>
<td>Exterior Diameter</td>
<td>12.8 in. max.</td>
<td>325 mm max.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dimension of the Core</th>
<th>Inches + Tolerance</th>
<th>Metric + Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>2.126 + 0.00 in.</td>
<td>54 mm + 0.0 mm</td>
</tr>
<tr>
<td></td>
<td>- 0.01 in.</td>
<td>- 0.25 mm</td>
</tr>
<tr>
<td>Interior Diameter</td>
<td>2.756 + 0.04 in.</td>
<td>70.00 + 1.00 mm</td>
</tr>
<tr>
<td></td>
<td>- 0.01 in.</td>
<td>- 0.25 mm</td>
</tr>
<tr>
<td>Exterior Diameter</td>
<td>4.13 +/- .01 in</td>
<td>104.90 +/- .25 mm</td>
</tr>
</tbody>
</table>

### 11.04 Roll Tightness (or Diameter)

Roll tightness shall be controlled by the following method and as shown in Figure 6.

A weight of 5 kg shall be placed gently (without shock) on the winding core without contact to the tickets themselves.

The weight shall be left in this position for one (1) minute. No residual deformation shall be visible after removing the weight and the roll shall pass freely through the ticket roll width template (Figure 5).
12.00 QUALITY ASSURANCE - TESTING REQUIREMENTS

Tickets provided in accordance with this specification must be subjected to the following vendor inspections and/or tests as a minimum unless a written waiver is submitted to and approved by the Commission:

1) ONLINE QUALITY CONTROL TO VERIFY AND MONITOR THE QUALITY OF THE MAGNETIC STRIPE (with optional witnessing by the Commission) in accordance with Sections 8 and 12.01.

2) IN PROCESS INSPECTION AND/OR TESTING (with optional witnessing by the Commission) in accordance with Sections 4.0 through 11.00 and 12.02.

3) FINAL INSPECTION AND/OR TESTING. This will be performed at either Source or Destination at the Commission's option in accordance with Section 12.05. (The inspection/testing will be performed by the contractor and witnessed by the Commission in either case).

Each of these inspection/test requirements are described in more detail in Sections 12.01 through 12.05.

12.01 Witnessing by the Commission

The Commission reserves the unrestricted right to witness the manufacturing process used by the vendor on the tickets. The commission also reserves the unrestricted right to require testing by an independent laboratory of the finished tickets using a MAG3 magnetic stripe analyzer. The testing can be conducted anytime during the manufacturing process, and at the time of ticket delivery. The MAG3 magnetic stripe analyzer will be used in Final Inspection and Testing. Use of the MAG3 magnetic stripe analyzer by itself does not imply product acceptance.

The eye spot will be checked per dimensions in figure 1.

12.02 Vendor Pre-Production Plans

Prior to commencing production work, the vendor shall inform the Commission of the online/in-process inspection and tests he will perform, including method, frequency, and record keeping. He shall also provide the Commission with a flow chart of his ticket manufacturing process identifying the location of the inspections/tests in the process.
12.03 Online Quality Control

The application of the magnetic stripe material, either magnetic ink or magnetic tape, to the ticket stock shall be controlled and monitored as an integral part of the manufacturing process.

The online/or off-line test equipment shall produce a continuous square wave at a frequency not less than 100 percent of the FRPI frequency of the encoding data density of the ticket transport specified in Section 3.00 FCS Equipment Reference Characteristics of these specifications. This data shall be written on the magnetic stripe prior to the cutting of the ticket stock, or on test samples prepared after cutting to the Commission for inspection.

A read head, designed for the specified track width, shall read the magnetic stripe immediately downstream of the online test equipment write head. The online test equipment shall completely erase all encoded data after reading.

The Vendor may propose an alternate method to ensure online quality control if the Vendor does not have online test equipment as part of the normal manufacturing process. The alternate method shall include a means to produce hardcopy or machine readable documents that will document the alternate tests method as a permanent record.

12.04 In Process Inspection and/or Testing

During the manufacturing process, the vendor shall perform inspections and tests necessary to assure that the tickets and ticket rolls are being produced in accordance with the requirements of this specification. These inspections/tests shall be performed at routine intervals during the manufacturing process, such as the start and end of each new mill roll, or each new production shift.

The intervals must be frequent enough so that any discrepancies in the production process can be detected early to prevent large quantities of defective tickets from being produced. Results of all in-process inspections and tests, including identity of product checked and the person doing the checking, shall be kept in a log that will be available for review by the Commission.

12.05 Final Inspection and Testing

Before acceptance of the tickets by the Commission, final inspections and/or tests must be performed by the vendor. Testing and measurements shall be taken within the ambient temperature and humidity ranges specified as reference environment in Section 4.00 Environmental Requirements of these specifications.
Testing and measurements may be taken at any other ambient temperature and humidity ranges outside of the specified reference environment if the Vendor provides the Commission the calibration adjustment(s) for each measurement to be taken outside the specified reference environment. The Commission must approve the calibration adjustment(s) prior to the tests.

Acceptance or rejection of the tickets shall be determined by inspection according to the following sampling plan, based upon MIL-STD-105D, normal inspection, level II for an AQL of 1.0. The vendor shall test and inspect the required number of sample rolls as specified by the chart and record the inspection results. The entire ticket lot will be accepted or rejected on the basis of the performance of this sample.

<table>
<thead>
<tr>
<th>Lot Size</th>
<th>Sample Size</th>
<th>Number of Defective Rolls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Rolls</td>
<td>Number of Rolls</td>
<td>AQL = 1.0</td>
</tr>
<tr>
<td>150 or less</td>
<td>20% min.</td>
<td>0</td>
</tr>
<tr>
<td>151 to 500</td>
<td>50</td>
<td>1</td>
</tr>
<tr>
<td>501 to 1200</td>
<td>80</td>
<td>2</td>
</tr>
<tr>
<td>1201 to 3200</td>
<td>125</td>
<td>3</td>
</tr>
<tr>
<td>3201 to 10000</td>
<td>200</td>
<td>5</td>
</tr>
<tr>
<td>100001 to 35000</td>
<td>315</td>
<td>7</td>
</tr>
</tbody>
</table>

The Vendor may, with Commission approval, use three AQLs for inspection of the critical, major, and minor attributes designated in Section 12.05 as follows:

**Critical Attributes AQL = 1.0**

**Major Attributes AQL = 2.5**

**Minor Attributes AQL = 4.0**

If the number of critical attribute rejects is equal to or less than the AQL 1.0 acceptance criterion, those rejects shall be added to the number of major attribute rejects for comparison with AQL 2.5 criteria. Similarly, if the resulting number of major and critical attribute rejects is equal to or less than the AQL 2.5 acceptance criteria, those rejects shall be added to the number of minor attribute rejects for comparison to AQL 4.0 criteria. The entire lot is to be rejected if the criterion is reached for any of the three AQLs.

To obtain the required sample size in a random manner, the Vendor shall submit a plan for random selection of ticket rolls from the production lot based on MIL-STD-105D or other widely recognized source.
Lot size is defined as the number of ticket rolls with the source lot identification number. This lot number is a unique number assigned by the Vendor to all the ticket rolls produced in a production lot, shipped and presented for Final Inspection and Testing in accordance with the sampling plan. The lot number shall provide traceability to records of in-process and on-line inspections and tests for the production lot.

If, with Commission agreement, Final Inspection and Testing is to be at Source, the Vendor shall provide the Commission five (5) working days notice (ten [10] days if overseas) of his intent to begin.

The lot size, sample selection plan, and the lot certifications required by this specification shall be submitted at the time of notification.

If, with Commission agreement, Final Inspection and Testing is to be at Destination, the Vendor shall provide the Commission three (3) working days notice (7 days if overseas) of his intent to ship. The lot size and packing configuration shall be provided with the notification. The sample selection plan and the lot certifications (Table 1) required by this specification shall be submitted at the time of notification.

The Vendor shall select the specified number of rolls from the lot in accordance with the random selection plan. Each ticket roll will then be tested and/or inspected as defined below. For the majority of these tests, the tickets do not have to be cut from the roll. However, any tickets that are cut from the roll for testing, or any tickets that are damaged by the testing, shall be retained and attached to the final inspection report (See 12.06).

If the number of defective rolls in the sample is less than or equal to the acceptance criterion, the lot of tickets will be considered acceptable. However, the defective rolls shall not be included in the shipment. If the number of defective rolls in the sample is equal to or greater than the rejection criterion the entire lot of tickets will be considered rejected.

If the disposition of the entire lot based on the sample results is to reject the lot, the vendor may perform a 100 percent inspection of the entire lot. The purpose of this 100 percent inspection is to check every ticket roll and identify all nonconforming rolls and remove them from the lot. If the Vendor chooses to perform a 100 percent inspection, he must notify the Commission of his intent. Complete results of the inspection must be documented and submitted to the Commission before approval of the shipment will be granted. The Commission, at their option, may witness this inspection.

Final Inspections/Tests shall not begin until a satisfactory inventory has been taken and the Commission has accepted the Vendor's sample selection plan and certification (in Table 1) of ticket roll attributes. Inspection/Tests to be performed or to be accepted on the basis of Vendor's certification (with Commission's agreement) are as follows:
12.05.01 General Procedure

Use Table 2 to verify and record the data for these inspections/tests. Where acceptance by certification is allowed and is properly provided, check only the "Certified column"; leave "Pass/Fail" blank. Attributes are designated as "Critical", "Major", or "Minor" for use in the event the Commission approves use of three corresponding AQLs as described in Section 12.05.

Inspection and testing should follow the sequence of the following paragraphs.

12.05.02 General Attribute

Defects not foreseen in the following sections may become apparent to the Inspector during the course of Final Inspection/Testing. Defects could occur, for example, in ticket or ticket roll size or shape, graphics, content, or roll winding direction. The Inspector shall reject any ticket roll containing obvious defects that could affect reliable FCS ticket use (critical attribute).

12.05.03 Ticket Roll

Check for roll tightness by the following method and as shown in Figure 6.

A weight of 5 kg shall be placed gently (without shock) on the winding core without contact to the tickets themselves. The weight shall be left in this position for 1 minute. No residual deformation shall be visible after removing the weight and the roll shall pass freely through the ticket roll width template (Figure 5). The roll should have no tendency to unravel during handling. Reject the roll should it fail to meet these requirements (minor attribute).

12.05.04 Adhesion

Unwind the first 40 tickets from the roll. Set aside the first ten (10). Reject the roll if any winding sticks to its adjacent winding during unrolling (critical attribute).

12.05.05 Printing

Visually inspect the printing on the first five (5) tickets of the strip of thirty (30). Check orientation of the printing for agreement with Figure 1 and 4. Check that the printing is completely legible and without excess ink (major attribute). The
printing will also be checked for dark to light printing/eyespot (i.e. to catch inadequate inking for printing).

12.05.06 Smudging

Rub the printed area and the magnetic stripe once lengthwise back and forth on one of the unwound sample tickets with a piece of white tissue paper. Reject the ticket roll if the printing or the magnetic stripe becomes smudged or if any ink is transferred to the tissue paper (major attribute).

12.05.07 Edges and Sides

Verify that the ticket roll edges and magnetic stripe ends are smooth and free from burrs (major attribute).

12.05.08 Magnetic Stripe Adhesion

To test the adhesion strength of the magnetic material, apply pressure sensitive tape, Scotch Brand 600 or equivalent, along the magnetic stripe of three (3) tickets cut from each sample roll. Peel the tape from the magnetic stripe. Reject the ticket roll if any magnetic stripe material removed with the tape does not pull paper fibers with it and is not fully covered with paper (major attribute).

12.05.09 Grain

The grain of the paper shall be in the direction of the magnetic stripe or length of the ticket/receipt as specified in Section 7.02 Ticket Grain of these specifications (minor attribute). Vendor's certification in lieu of final inspection is acceptable with the Commission's agreement.

12.05.10 Defects

Visually inspect for any paper defects. The ticket shall be free from splices, holes, electrically conducting particles, organic residue, or brittle areas and may not contain residual chemicals, fuzz or loose dust (major attribute).
12.05.11 Thickness

Paper stock thickness shall be in accordance with the requirements in Section 6.01 Ticket Thickness of these specifications (minor attribute). Vendor's certification in lieu of final inspection is acceptable with the Commission's agreement.

12.05.12 Magnetic Stripe Surface Heights

The magnetic material minimum height above the top of the ticket surface shall be 75 microinches and a maximum height of 500 microinches (minor attribute). Vendor's certification in lieu of final inspection is acceptable with the Commission's agreement.

12.05.13 Magnetic Stripe Width

The magnetic stripe shall be 2.49 mm minimum and 2.75 mm maximum (critical attribute). Vendor certification in lieu of final inspection is acceptable with the Commission's agreement.

12.05.14 Embossment

The embossment of the ticket surface, either side or edge, shall not be greater than 0.00006 inches (minor attribute). Vendor's certification in lieu of final inspection is acceptable with the Commission's agreement.

12.05.15 Creasing

Creasing of the tickets shall be avoided to the maximum extent possible. When 0.04 percent of the tickets of a production lot have been creased, that production lot shall be considered as failed (major attribute).

12.05.16 Ticket Processing for stripe analysis on a MAG3

Unwind and cut a strip of 25 tickets, set aside the first five (5) and retain the next 15. Test the 15 cut tickets using the MAG3. Refer to clause 8.05, table 1A and Figure 1A for MAG3 test setup. If one out the fifteen tickets fails any of the seven requirements in table 1A, the ticket batch will be rejected.
12.05.17 Ticket Width

Measure the width of the first and last of the 15 cut tickets processed by the certifier. Bend the ticket end-to-end to form a loop or arc and apply dial calipers to the curved portion of the loop or arc to read the width. Use the flat portion of the caliper jaws; using the knife edge portion may indent the ticket edge and give false data. An alternate method of measuring may be used (e.g., profilometer or go/no-go template) if it provides the necessary precision and is calibrated traceable to primary standards of the National Bureau of Standards. Required ticket width is 54.00 + 0.0, -.50 mm (2.126 + 0.0, -0.020 inches). Reject the roll if any measurement exceeds these limits (critical attribute).

12.05.18 Ticket Fails in MAG3 or Ticket Transport

The following inspections shall be performed to investigate conditions that may be involved in ticket failure to pass any of the Table 1A tests in the MAG3 or failure to function in a ticket transport. The Vendor shall make any other investigative measurements/tests as necessary to determine why the tickets failed. These inspections/tests by themselves do not change ticket reject status.

Visually inspect the magnetic stripe for irregularities, rough edges, skips, and blobs.

Check the stripe location and width per Figures 1 and 3.

Check eye spot sharpness of boundary, size, and location per Figure 1.

Check eye spot-to-eye spot distance; use a linear scale spanning at least three (3) tickets. Divide by the number of tickets spanned to obtain an average distance. Distance should be 120 +/- 0.8 mm.

The Vendor shall report the results of these investigations and provide a proposed plan of action to resolve the situation to the Commission for approval.

12.05.19 Ticket Testing Criteria

If the Vendor achieves a proven quality history of ticket rolls, the Commission may at its discretion reduce the inspection and testing requirements for subsequent orders. The reduction plan will be as follows:
<table>
<thead>
<tr>
<th>Lot Size</th>
<th>Sample Size</th>
<th>Number of Defective Rolls</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of Rolls</td>
<td>AQL = 1.0</td>
</tr>
<tr>
<td>151 to 500</td>
<td>20</td>
<td>0</td>
</tr>
<tr>
<td>501 to 1200</td>
<td>32</td>
<td>1</td>
</tr>
<tr>
<td>1201 to 3200</td>
<td>50</td>
<td>1</td>
</tr>
<tr>
<td>3201 to 10000</td>
<td>80</td>
<td>2</td>
</tr>
<tr>
<td>10001 to 35000</td>
<td>125</td>
<td>3</td>
</tr>
</tbody>
</table>

See paragraph 12.05 instructions for use of three (3) AQLs during normal inspection; the instructions also apply to reduced inspection. If the accept criterion number is exceeded, but the reject criterion number is not reached, the lot may be accepted but the normal sampling plan defined in 12.05 is reinstated. If the reject criterion is exceeded, the lot is rejected and normal sampling (12.05) is reinstated.

12.06 Inspection and Test Reports

The Vendor shall submit appropriate Inspection and Test Reports, together with all test tickets for each ticket lot to the Commission. If the inspection is performed at the vendor's facility, this report shall be submitted not less than three (3) days prior to shipment of the tickets to the Commission. The Inspection and Test Report shall be submitted for the review and approval by the Commission prior to starting any additional production orders.

13.00 TICKET GRAPHICS

The Vendor shall submit for the Commission's review and approval printing proofs for all ticket graphics and artwork.

The graphics for the magnetic stripe toll tickets will consist of separate graphics for the front and back of each ticket for each of the 39 toll plazas. A sample graphic artwork layout is shown in Figure 4.

14.00 PACKAGING

All ticket rolls shall be packaged in accordance with the following requirements:
14.01 Wrapping

Ticket rolls shall be wrapped in plastic and sealed against dust and moisture. Rolls may be individually shrink-wrapped or all of the rolls in the box may be enclosed in a single sealed plastic bag.

14.02 Ticket Boxes

The ticket rolls shall be packaged four (4) or five (5) to a box. Cartons shall be of sufficient weight to permit stacking five high without damage to the tickets or boxes during storage for a period up to 24 months in the environment as specified in Section 4.00 Environment Requirements of these specifications.

Each box shall be identified with the Plate Number, Purchase Order or Contract number, date of delivery, description of tickets, with a sample ticket securely attached to the box.
TABLE 1

PTC-FCS MAGNETIC STRIPE TOLL TICKETS

Vendor __________________

On-Line/In-Process Inspection and Testing   Lot #_____________________

Specification FCS 210-94 describes the requirements and accept/reject criteria in the referenced sections. The Vendor's QA representative shall certify compliance, based upon on-line/in-process inspections/tests, in the space provided.

<table>
<thead>
<tr>
<th>SECTION</th>
<th>DESCRIPTION</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.0</td>
<td>Ticket quality adequate to meet environmental requirements</td>
<td>SIGN__________</td>
</tr>
<tr>
<td>5.0</td>
<td>Ticket components meet safety-toxic requirements</td>
<td>SIGN__________</td>
</tr>
<tr>
<td>6.01</td>
<td>Required thickness 0.0070 +/- 0.0004. Measured range:</td>
<td>LO____ HI____</td>
</tr>
<tr>
<td>6.03</td>
<td>Paper opacity at least 80%</td>
<td>YES____ NO____</td>
</tr>
<tr>
<td>6.04</td>
<td>Reflectance exceeds 70% deviation less than 5%</td>
<td>YES____ NO____</td>
</tr>
<tr>
<td>7.02</td>
<td>Ticket grain in direction of magnetic stripe</td>
<td>YES_____ NO____</td>
</tr>
<tr>
<td>8.03</td>
<td>Magnetic stripe roughness &lt;= 55 microinches. Measured range:</td>
<td>LO____ HI____</td>
</tr>
<tr>
<td>8.04</td>
<td>Magnetic stripe height not over 0.0005 in. Measured range:</td>
<td>LO____ HI____</td>
</tr>
<tr>
<td>8.04</td>
<td>Stripe &amp; paper thickness 0.0066 to 0.0079 in. Measured range:</td>
<td>LO____ HI____</td>
</tr>
<tr>
<td>8.05</td>
<td>Pass Signal Amplitude Requirements for Unused Tickets</td>
<td>YES_____ NO____</td>
</tr>
<tr>
<td>8.08</td>
<td>Coercive force to erase 300 +/- 45 oersted</td>
<td>YES_____ NO____</td>
</tr>
<tr>
<td>8.09</td>
<td>Resistance to wear. Attenuation 20% or less</td>
<td>YES_____ NO____</td>
</tr>
<tr>
<td>9.01</td>
<td>Eye spot reflectance less than 10%</td>
<td>YES_____ NO____</td>
</tr>
<tr>
<td>9.02</td>
<td>Embossment of ticket surface is not more than 0.00006 in.</td>
<td>YES_____ NO____</td>
</tr>
<tr>
<td>10.00</td>
<td>Tickets suitable to meet reliability requirements</td>
<td>SIGN______</td>
</tr>
</tbody>
</table>

Vendor QA representative: ________________________________(Signature)
Date: ______________   Name (Printed) _________________________________
**TABLE 2**

Final Inspection/Test Data Sheet - FCS Ticket Rolls

Vendor _________________________ Lot Number_______________ Date of Inspection
Sample Ticket Roll Identification______________________

<table>
<thead>
<tr>
<th>SECTION</th>
<th>REQUIREMENTS (See Related Section)</th>
<th>VENDOR CERTIFICATION</th>
<th>PASS</th>
<th>FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.05.02</td>
<td>No ticket defects obvious to Inspector</td>
<td>CRIT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.05.03</td>
<td>Roll easily passes through template after checking for roll tightness. Mounting spindle fits into core easily; roll fits into certifier - clearance visible, no tendency to unravel during handling</td>
<td>MIN.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.05.04</td>
<td>No adhesion winding to winding</td>
<td>CRIT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.05.05</td>
<td>Printing is correct, legible, no excess ink or lack of ink</td>
<td>MAJ.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.05.06</td>
<td>Magnetic stripe and printing do not smudge</td>
<td>MAJ.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.05.07</td>
<td>Edges are smooth, no burrs</td>
<td>MAJ.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.05.08</td>
<td>Magnetic tape adheres or lifts covered with paper</td>
<td>MAJ.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.05.09</td>
<td>Grain is in direction of magnetic stripe or length of ticket/receipt</td>
<td>MIN.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.05.10</td>
<td>No visible foreign materials, paper defects</td>
<td>MAJ.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.05.11</td>
<td>Thickness is 0.0070 +/- 0.0004 inch</td>
<td>MIN.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.05.12</td>
<td>Magnetic stripe height is 75-500 microinches</td>
<td>MIN.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.05.13</td>
<td>Magnetic stripe width is 2.49 to 2.75 mm</td>
<td>CRIT.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.05.14</td>
<td>Embossment is not more than 0.00006 inch</td>
<td>MIN.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.05.15</td>
<td>No creasing is observed</td>
<td>MAJ.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.05.16</td>
<td>Tickets processed, encode/read correctly</td>
<td>CRIT.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.05.17</td>
<td>Ticket widths: _______ _____ (Circle: inches/millimeters)</td>
<td>CRIT.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**TABLE 2 (continued)**

SECTION REQUIREMENTS (See Related Section)

**REQUIRED FOR SECTION 12.05.18 FAILURE ONLY**

<table>
<thead>
<tr>
<th>VENDOR CERTIFICATION</th>
<th>PASS</th>
<th>FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnetic stripe shows no irregularities</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>Stripe location/orientation correct width</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>Eye spot size/location correct</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>Eye-spot-to-eye-spot distance 120 +/- 0.8 mm</td>
<td>_____</td>
<td>_____</td>
</tr>
</tbody>
</table>

Comments:

Sign______________________________________ Vendor QA Rep.

Sign______________________________________ PTC Witness
MAGNETIC STRIPE TOLL TICKETS
TECHNICAL REQUIREMENTS AND SPECIFICATIONS

FIGURE 2
WINDING OF THE ROLL

LOADING POSITION DEFINED WITH RESPECT TO TICKET ISSUING MACHINE

WINDING DIRECTION FOR FRONT LOADING

- MAGNETIC STRIPE
- INTERCHANGE NUMBER SIDE
- CORE
Figure 3
Technical Requirements and Specifications
Magnetic Stripe Full Tickets

Estimating Purposes
Pre-Printing Areas For

Front Roll Magnetic Stripe Side

(Back)

All Dimensions in Millimeters
MAGNETIC STRIPE TOLL TICKETS
TECHNICAL REQUIREMENTS AND SPECIFICATIONS

FIGURE 4
SAMPLE GRAPHIC ARTWORK LAYOUT

INTERCHANGE NUMBER

YELLOW HIGHLIGHTED AREAS

INTERCHANGE NAME

FRONT VIEW

EDGE OF TICKET

LEAVE AREA BLANK

BACK VIEW

TOLL AMOUNT FOR EACH CLASS AND INTERCHANGE

ALL DIMENSIONS IN MILLIMETERS
MAGNETIC STRIPE TOLL TICKETS
TECHNICAL REQUIREMENTS AND SPECIFICATIONS

FIGURE 5

TEMPLATE FOR ROLL WIDTH CONTROL

DIRECTION OF PAPER ROLL
PROCEEDING THE TICKET
TRANSPORT TEMPLATE

TICKET ROLL

ALL DIMENSIONS IN MILLIMETERS
MAGNETIC STRIPE TOLL TICKETS
TECHNICAL REQUIREMENTS AND SPECIFICATIONS

FIGURE 6

TECHNIQUE TO VERIFY ROLL TIGHTNESS

FORCE IS THAT OF 5KG WEIGHT PLACED CAREFULLY ON CENTER OF ROLL TICKET

5KG WEIGHT

MINIMUM THICKNESS 9

SUPPORT WIDTH

2 PARALLEL SUPPORTS

TICKET ROLL

ALL DIMENSIONS ARE IN MILLIMETERS
APPENDIX A

AGREEMENT

This AGREEMENT is made this ______________ day of ______________________, 2005, between the Pennsylvania Turnpike Commission (“COMMISSION”), an instrumentality of the Commonwealth of Pennsylvania, with principal offices at Middletown, Pennsylvania (mailing address: P. O. Box 67676, Harrisburg, PA 17106-7676; physical address: 700 Eisenhower Blvd, Middletown, PA 17057),

AND

_____________ (“CONTRACTOR”), [insert the legal status of CONTRACTOR such as a Pennsylvania (or foreign) corporation (or partnership, LLC, LLP, etc.)], with its principal office at [insert address]

WITNESSETH:

WHEREAS, the COMMISSION desires to . . . [describe the specific PTC purposes, goals, assumptions, underlying facts, or contractor's representations that are the basis of the bargain, etc.]

WHEREAS, by Act No. 211 of the General Assembly of the Commonwealth of Pennsylvania, approved May 21, 1937, and its amendments, the COMMISSION is authorized and empowered to enter into a contract with CONTRACTOR;

WHEREAS, the COMMISSION desires to retain the services of CONTRACTOR upon the following terms; and

NOW, THEREFORE, in consideration of these mutual covenants, and intending to be legally bound, the parties agree as follows:

Definitions

[This section is for terms that have a special meaning for this agreement or that are used in a way different from everyday or common usage.]

Contractor’s Scope of Work

[There should be a document that specifies what we expect from the Contractor (such as deliverables; schedules and deadlines; representations or warranties; conditions or covenants; location of the work; use of specific persons; standards of performance; insurance requirements). This document must be made part of the Agreement (either as an exhibit which is attached or by referring to it in the Agreement without attaching it)].

The CONTRACTOR will perform the work described in [identify the document/RFP#] dated [date], titled [title] and the CONTRACTOR’S proposal dated [date]. This document is [SELECT ONE: attached as Exhibit _ and made a part of this Agreement OR made part of this Agreement by reference].
Commission’s Responsibilities

The COMMISSION shall furnish the CONTRACTOR access to key personnel, relevant documents, and adequate workspace for completing the work.

Compensation

For the work, services, and material as defined in this Agreement, the CONTRACTOR shall be paid __________________and __/100 DOLLARS ($________). [Specify whether the compensation method is hourly, cost reimbursement, lump sum, etc.]

Duration of Agreement [and Renewal]

The term of this Agreement is [term]. The term may be extended for [number] additional years by a writing signed by both parties. [or The term may be extended by the COMMISSION in the form of a letter signed by the Chief Executive Officer, which will become part of this agreement.]

Termination

Either party may terminate this agreement at any time upon thirty- (30) calendar days written notice. If this notice is given, the CONTRACTOR shall be paid only for the services already rendered upon the date of the notice and for the services rendered to the date of termination, subject to all provisions of this agreement. The notice will be effective on the date of receipt. The right to cancel may be exercised as to the entire project, or as to any particular phase or phases, part or parts, and upon one or upon several occasions, but any termination may not be revoked except upon written consent of the parties through a supplemental agreement to this agreement.

Assignment and Delegation

The CONTRACTOR may not transfer, assign, or delegate any terms of this contract, in whole or in part, without prior written permission from the COMMISSION. The CONTRACTOR shall not engage the services of any person or persons now employed by the Commission except with the COMMISSION's approval.

Governing Law

This agreement will be interpreted according to the laws of the Commonwealth of Pennsylvania.
Observance of Laws

The CONTRACTOR agrees to observe all relevant federal, state, and local laws and to obtain in its name all necessary permits and licenses.

Work for Hire

Except for hardware, third party licensed software, and software previously developed by CONTRACTOR, all Deliverables, including but not limited to source code, software, specifications, plans, designs and engineering, drawings, data, information or other written, recorded, photographic, or visual materials, trademarks, service marks, copyrights or other Deliverables produced by CONTRACTOR or any supplier in the performance of the contract shall be deemed "Work Product". All Work Product shall be considered services for hire. Accordingly, except as set forth earlier in this paragraph, all Work Product shall be the exclusive property of the COMMISSION.

The CONTRACTOR agrees to notify the COMMISSION in writing before using any of CONTRACTOR’s previously developed software for services provided under this Agreement. The CONTRACTOR and the COMMISSION will honor all applicable preexisting licenses, copyrights, trademarks, service marks, and patents. If as part of an expense item under this Agreement, the CONTRACTOR purchases the right to any license, the agreements for the use or ownership of such license will be placed in the name of the COMMISSION along with all other rights and obligations. In addition, the CONTRACTOR will mark all Turnpike content or previously unprotected work product designated by the COMMISSION with a notice as follows: "Pennsylvania Turnpike Commission, (Year)".

Audit/Retention of Records

CONTRACTOR and its subcontractors shall maintain books and records related to performance of this contract or subcontract and necessary to support amounts charged to the COMMISSION in accordance with applicable law, terms and conditions of this contract, and generally accepted accounting practice. CONTRACTOR shall maintain these books and records for a minimum of three (3) years after the completion of the contract, final payment, or completion of any contract, audit or litigation, whichever is later. All books and records shall be available for review or audit by the COMMISSION, its representatives, and other governmental entities with monitoring authority upon reasonable notice and during normal business hours. CONTRACTOR agrees to cooperate fully with any such review or audit. If any audit indicates overpayment to CONTRACTOR, or subcontractor, the COMMISSION shall adjust future or final payments otherwise due. If no payments are due and owing to CONTRACTOR, or if the overpayment exceeds the amount otherwise due, CONTRACTOR shall immediately refund all amounts which may be due to the COMMISSION. Failure to maintain the books and records required by this Section shall establish a presumption in favor of the COMMISSION for the recovery of any funds paid by the COMMISSION under the contract for which adequate books and records are not available to support the purported disbursement.
Dispute Resolution

All questions or disputes regarding any matter involving this contract or its breach shall be referred to the Board of Claims as provided in 72 P.S. § 4651. If the Board of Claims either refuses or lacks jurisdiction, these questions or disputes shall proceed as provided in 42 C.S.A. § 7301 et seq. (Statutory Arbitration). The panel of arbitrators will consist of a representative of each of the parties and a third party chosen by the representatives, or if the representatives are unable to choose, by the American Arbitration Association.

Indemnification

The CONTRACTOR shall be responsible for all damage to life and property due to negligence or other tortious acts, errors, and omissions arising from or related to the work of this Agreement. The CONTRACTOR shall indemnify and hold harmless the COMMISSION, the COMMISSION’s officers, and the COMMISSION’s employees from any claim or liability of any type or nature arising from or related to the work of the CONTRACTOR or that of the CONTRACTOR's employees or subcontractors or the presence of these persons or individuals on the COMMISSION's premises.

Contractor Provisions

The Contractor Integrity and Contractor Responsibility Provisions are attached as an exhibit and made a part of this agreement.

Entire Agreement

This Agreement, together with any writings either attached as exhibits or incorporated by reference, constitutes the entire understanding between the parties and there are no other oral or extrinsic understandings of any kind between the parties.

Modification

This agreement may be modified only by a writing signed by both parties.
IN WITNESS WHEREOF, the Pennsylvania Turnpike Commission and [Contractor’s Name] have executed this Agreement by their duly authorized officers and affixed their respective official and corporate seals on the date written above.

ATTEST: PENNSYLVANIA TURNPIKE COMMISSION

________________________________________________________
Ann Louise Edmunds Mitchell Rubin
Assistant Secretary-Treasurer Chairman

APPROVED AS TO FORM AND LEGALITY:

________________________________________________________
Albert C. Peters II Assistant Chief Counsel

ATTEST: [CONTRACTOR’S NAME]

Signature________________________________________
Name________________________________________
Title________________________________________
Federal Tax ID. No. ____________________________