



CITY OF ATLANTA

SUITE 1900
55 TRINITY AVENUE, SW
ATLANTA, GA 30303
(404) 330-6204 Fax: (404) 658-7705
Internet Home Page: www.atlantaga.gov

DEPARTMENT OF PROCUREMENT
Adam L. Smith, Esq., CPPO, CPPB, CPPM, CPP,
CIPC, CISCC, CIGPM, CPPC
Chief Procurement Officer
asmith@atlantaga.gov

Kasim Reed
Mayor

June 7, 2016

Dear Potential Bidders:

**Re: FC-8807, Emergency On-Call Repairs and Maintenance For Atlanta
Streetcar Overhead Contact System and Traction Power Substations**

Attached is one (1) copy of **Addendum No. 7**, which is hereby made a part of the above-referenced project.

For additional information, please contact Elvis G. Gibbs, Business and Federal Transit Administration Procurement Manager, at (404)-865-8704, or by email at eggibbs@atlantaga.gov.

Sincerely,


Adam L. Smith

ALS/egg



ADDENDUM NO. 7

This Addendum No. 7 forms a part of the Invitation To Bid and modifies the original solicitation package and any prior Addenda as noted below and is issued to incorporate the following:

1. Revision of Exhibit A, Scope of Services/Work

Exhibit A, Scope of Services/Work is hereby removed and replaced with a revised Exhibit A, Scope of Services/Work dated 6/7/16 attached hereto as Attachment No. 1.

Addendum No. 7 for FC-8807, Emergency On-Call Repairs and Maintenance For Atlanta Streetcar Overhead Contact System and Traction Power Substations is available for pick-up in the Plan Room: City Hall, 55 Trinity Avenue, Suite 1900.

The Bid due date HAS NOT been modified and Bids are due on Tuesday, June 21, 2016 and should be time stamped in no later than 2:00 P.M. EDT and delivered to the address listed below:

Adam L. Smith, Esq., CPPO, CPPB, CPPM,
CPP, CIPC, CISCC, CIGPM, CPPC
Chief Procurement Officer
Department of Procurement
55 Trinity Avenue, S. W.
City Hall South, Suite 1900
Atlanta, Georgia 30303

**** All other pertinent information is to remain unchanged****

Acknowledgment of Addendum No. 7

Bidders must sign below and return this form with your bid to the Department of Procurement, 55 Trinity Avenue, City Hall South, Suite 1900, Atlanta, Georgia 30303, as acknowledgment of receipt of this Addendum.

This is to acknowledge receipt of **Addendum No. 7, FC-8807, Emergency On-Call Repairs and Maintenance for Atlanta Streetcar Overhead Contact System and Traction Power** on this the _____ day of _____, 201__.

Legal Company Name of Bidder

Signature of Authorized Representative

Printed Name

Title

Date

Attachment No. 1

EXHIBIT A, SCOPE OF SERVICES/WORK

SCOPE OF WORK

Emergency On-Call Repairs and Maintenance for Atlanta Streetcar Overhead Contact System and Traction Power Substations

A. Atlanta Streetcar Overhead Contact System and Traction Power Substations

1. System Overview

The power required to operate electric rail vehicles over Atlanta Streetcar (ASC) system is delivered through a network of electrical distribution lines and facilities. ASC's traction power distribution system uses various protective devices to ensure high level of reliability, and includes many safeguards and controls to ensure that operations and maintenance employees can work safely and confidently in its vicinity. The ASC running vehicle power is provided by a network of overhead contact system poles and wires.

1.1 Rail System Stations and Services

The Atlanta Streetcar System consists of four (4) Siemens S-70 light rail vehicles, twelve (12) stops, and 2.7 miles of embedded track comprised solely of at-grade rail sections. The Streetcar's alignment is located in the roadway Right-of-Way and shares travel space with automotive, bicycle and pedestrian traffic. Powered by an overhead contact system (OCS), Streetcars will operate at speeds of up to 35 miles per hour on standard fifteen-minute headways. Additional service may also be provided where chartered or in response to special events.

Each of the twelve streetcar stops consists of a raised platform located in the sidewalk area and one in the median of Edgewood Avenue. Streetcar stops are low, concrete platforms that allow for level boarding of the rail vehicles. Streetcar stops are configured with a simple railing and modern amenities, including a shelter, bench, fare collection equipment, lighting and signage.

The City of Atlanta is the sole owner of all streetcar stops and right-of way on which the ASC operates, and does not share track with any other passenger or freight rail system.

1.2 Vehicle Maintenance Facility

The ASC's Vehicle Maintenance Facility (VMF) is located on Auburn Avenue under the I-75/85 overpass. From this location, the ASC stores all four rail vehicles. The VMF supports rail vehicles with periodic safety inspection, routine and heavy maintenance, and repair services.

1.3 Traction Power System Elements

The Traction Power System is comprised of two functional subsystems; the Traction Power Substations (TPSS) and the Overhead Contact System (OCS). The TPSS contains all of the necessary equipment to receive electric power from utilities and deliver it in usable form to the OCS. The major elements of the TPSS include high-voltage AC switchgear, transformers, rectifiers, DC switchgear, and DC feeders and auxiliary equipment.

SCOPE OF WORK

Emergency On-Call Repairs and Maintenance for Atlanta Streetcar Overhead Contact System and Traction Power Substations

The OCS contains all of the elements required for the delivery of power from the TPSS to the rail vehicles along the alignment. These major elements include the trolley wires, hangers, and jumpers, all in span-components, supporting structures, poles, and grounding system. Two (2) TPSS units are located at the Vehicle Maintenance Facility (VMF). One (1) TPSS unit is located at the MARTA Peachtree Center Rail Station and access is controlled by MARTA.

2. Training

Persons assigned to manage, supervise, inspect, maintain, calibrate and/or test ASC electrical power distribution equipment must be qualified personnel trained on the equipment they will be required to maintain as defined under the guidelines of American Public Transportation Association RT-FS-S-006-03 rev-1 as shown in **Appendix F**, and OSHA 1910.269 as provided in

https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9868.

3. Responsibilities

3.1 Contractor's Responsibilities

Managers, Supervisors and System Maintainers will be responsible for knowing and implementing applicable industry safety rules and regulations and taking action to provide for the safety of the personnel and operations they supervise. This includes taking positive action to identify and reduce hazards; instructing all employees in safe work methods and associated safety requirements; and allowing only qualified employees to perform work. They will be responsible for the safety of all employees under their supervision and shall enforce all rules designed to mitigate hazards or hazardous conditions.

Managers and Supervisors will be responsible to ensure employees receive instruction in emergency response techniques, such as CPR, first aid, pole top rescue, and confined space rescue.

3.2 Atlanta Streetcar Responsibilities

ASC will ensure the implementation of applicable industry safety rules and regulations and take action to provide for the safety of the personnel and operations. The City shall ensure that all employees and contractors work in safe environment allowing only those employees that are qualified to perform work. The City will enforce all rules designed to mitigate hazards or hazardous conditions.

SCOPE OF WORK

Emergency On-Call Repairs and Maintenance for Atlanta Streetcar Overhead Contact System and Traction Power Substations

Atlanta Streetcar shall provide maintenance personnel to advise the Contractor at all time to assist at a minimum with:

- Lock-Out Tag-Out
- Manufacturer specifications
- Operating and Maintenance Manuals
- As-Built Construction Drawings, and/or
- Record Drawings

3.3 Mobilization and Equipment Staging

The Bidder's price for mobilization and equipment staging shall be expressly for the purpose of reimbursing the Contractor for temporary or long-term expenses which he has incurred, and will incur, by accumulating and staging tools, apparatus, equipment, materials, and supplies, manning the work, and exercising expeditious and extraordinary effort to promote imminent prosecution and completion of emergency work activities should they occur.

For each Base and Option Year term, the City will reimburse for expenses incurred for accumulating and staging tools, apparatus, equipment, materials, and personnel, and manning the emergency work. Payment will be made every month and may be subject to the City's opinion that quantities of accumulated tools, apparatus, equipment, materials, and supplies are insufficient to prosecute the emergency work should they occur.

4. Electric Traction System

Electrical power for the Atlanta Streetcar traction power system is provided by Georgia Power. Power is distributed to three ASC substations, where it is transformed and rectified to 750 VDC output. Cables from the substations feed a system of overhead contact wires to supply power to the streetcar. A negative return system utilizes the running rail and negative return cables to bring current back to the substation, thus completing the circuit.

The strategy of maintaining the electric traction power distribution system is focused on conducting preventive maintenance to avoid failures that could interrupt ASC service. Reaching this goal requires an effective program of inspection, the anticipation of failures caused by age and wear, and preemptive corrective action.

All ASC maintenance practices for traction power distribution equipment are in accordance with APTA and OSHA standards, original equipment manufacturers recommendations, and City of Atlanta electrical code provisions.

SCOPE OF WORK

Emergency On-Call Repairs and Maintenance for Atlanta Streetcar Overhead Contact System and Traction Power Substations

5. Documentation Control

All traction power substations and overhead contact system preventive maintenance, inspection, repair, testing calibration, adjustment and corrective action will be documented in hard copy and electronic digital format. All records will be made available to ASC at any time for maintenance and inspection verification and transmitted to ASC system managers on a monthly basis.

SCOPE OF WORK

Emergency On-Call Repairs and Maintenance for Atlanta Streetcar Overhead Contact System and Traction Power Substations

B. Scope of Services To Be Provided

1. Overhead Contact Systems

The Contractor shall supply the City of Atlanta Contract Administrator or his designee telephone numbers where emergency personnel can be contacted after normal hours, nights, holidays and week-ends.

The operating hours of the Atlanta Streetcar Overhead Contact System (OCS) will be as illustrated below:

REFERENCE CHART FOR NIGHTLY ALLOWABLE RANGE OF ATLANTA STREETCAR OCS OUTAGE

DAY OF OPERATION	RECOMMENDED STREETCAR HOURS	PRE-OP & POST OP BUFFER	RANGE ALLOWED FOR OCS OUTAGE
MONDAY	6:00 AM <u>until</u> 11:00 PM	4:30 AM to 6:00 AM and 11:00 PM to 12:30 AM	12:30 AM Tue – 4:30 AM Tue
TUESDAY	6:00 AM <u>until</u> 11:00 PM	4:30 AM to 6:00 AM and 11:00 PM to 12:30 AM	12:30 AM Wed – 4:30 AM Wed
WEDNESDAY	6:00 AM <u>until</u> 11:00 PM	4:30 AM to 6:00 AM and 11:00 PM to 12:30 AM	12:30 AM Thu – 4:30 AM Thu
THURSDAY	6:00 AM <u>until</u> 11:00 PM	4:30 AM to 6:00 AM and 11:00 PM to 12:30 AM	12:30 AM Fri – 4:30 AM Fri
FRIDAY	6:00 AM <u>until</u> 1:00 AM	4:30 AM to 6:00 AM and 1:00 AM to 2:30 AM	2:30 AM Sat – 7:00 AM Sat
SATURDAY	8:30 AM <u>until</u> 1:00 AM	7:00 AM to 8:30 AM and 1:00 AM to 2:30 AM	2:30 AM Sun – 7:30 AM Sun
SUNDAY	9:00 AM <u>until</u> 11:00 PM	7:30 AM to 9:00 AM and 11:00 PM to 12:30 AM	12:30 AM Mon – 4:30 AM Mon
HOLIDAY SCHED* PRECEDING MON-FRI	9:00 AM <u>until</u> 11:00 PM	7:30 AM to 9:00 AM and 11:00 PM to 12:30 AM	12:30 AM Holiday – 4:30 AM Mon-Fri

SCOPE OF WORK

Emergency On-Call Repairs and Maintenance for Atlanta Streetcar Overhead Contact System and Traction Power Substations

1.1 On-Call Emergency Repair

An emergency repair is considered as any repair of a known condition that is necessary to restore the system to a normal operation. The Contractor shall return the OCS to within 10% of the As-Built Construction Drawings and/or Record Drawings. If As-Built specification cannot be met due to time constraints etc., the build requirements will be met. (for example, 9 inches plus or minus 2" on the straight and up to 18 inches in the curve plus or minus 2" for the stagger).

The Contractor shall respond by phone within two (2) hours of being notified. The Contractor shall be onsite within twenty-four (24) hours of being notified and shall be ready to perform emergency repairs on the OCS. In accordance with manufacturer specifications, operation and maintenance manuals, As-Built Drawings, Record Drawings and Construction Drawings as listed in Exhibit A; the Contractor shall perform emergency repairs of all authorized work on the entire OCS to address corrective actions for any deviations from manufacturer specification, damages, irregularities, mal-adjustments.

The Contractor shall furnish labor, equipment and specialty tools at its sole expense, required in performing the emergency repair services under this Contract. All of the services required hereunder shall be performed by Contractor and under the Contractor's supervision and all personnel engaged in the emergency repair services shall be fully qualified to perform the work.

1.2 Seasonal Adjustment

Twice annually, in anticipation of winter and summer seasonal temperature extremes, the Contractor shall inspect fixed-tension segments and support systems of the OCS and adjust as needed.

1.3 Preventive Maintenance Annual Inspection

The Contractor shall coordinate the preventive maintenance annual inspection with the Contract Administrator or designee to prevent any service delays from occurring as a result of the inspection.

In accordance with ASC OCS Inspection Procedure, the Contractor shall complete preventive maintenance, which includes annual inspections, repairs and calibration to the trolley wire infrastructure that includes poles, hangers, surge suppressors, grounds, jumpers switches, section insulators and the trolley wire tension system. The OCS trolley wire span shall be also measured for height and stagger alignment on every pole.

SCOPE OF WORK

Emergency On-Call Repairs and Maintenance for Atlanta Streetcar Overhead Contact System and Traction Power Substations

The Contractor shall be required to perform annual OCS preventive maintenance according to the frequencies described below. The completion of scheduled maintenance will be within 90% of the set date.

The required maintenance practices for traction power distribution equipment will be in accordance with American Public Transportation Association (APTA) and OSHA standards, original equipment manufacturers recommendations and the City of Atlanta Electrical code.

Any defect and/or deficiencies noted by the Contractor that is considered hazardous shall be corrected. Upon the completion of the inspections of OCS, the Contractor shall provide the Contract Administrator or designee with a list of all items that require repair. The Contract Administrator or designee and the Contractor shall jointly deliberate and decide corrective actions to be taken for each item that need repair. As part of the inspection, the Contractor shall submit the following:

- A. Recommendation and Deficiency Reports;
- B. Recommended Repair List;
- C. Summary of work for the recommended repairs; and
- D. Itemized repairs cost estimate

Inspection Schedule, Contractor shall follow this task list per periodic inspection:

ANNUAL

The Contractor shall inspect at minimum the following:

Jumper Inspection

INSPECTION ITEM

- Inspect wire jumpers for leaning movement.
- Torque all nuts and bolts and mark each bolt and/or jamb nut with a torque mark.
- If cable requires replacement, provide recommendation to replace cable and clamps.

Balance Weight Inspection

INSPECTION ITEM

- Inspect bolts, wires, brackets, and wire grips.
- Inspect weight for freedom of movement.
- Inspect wheels and pulleys for freedom of movement and signs of binding. Lubricate as needed.
- Verify balance weight position with regards to corresponding temperature and adjust if incorrect.
- Verify the termination spans are proper and all fasteners in place. Provide recommendation to replace all missing components.

SCOPE OF WORK

Emergency On-Call Repairs and Maintenance for Atlanta Streetcar Overhead Contact System and Traction Power Substations

Section Insulators

INSPECTION ITEM

- Inspect for excessive wear, burns, fatigue, loose hardware, and proper pantograph transition.
- Inspect and gauge trolley wire at the entering and leaving end of the section insulators for damages. Monitor for excessive wear.
- Once the inspection is completed, clean section insulators.
- Provide recommendation to place damaged runners as needed.
- Clean, check and adjust all section isolators to the manufacturer's specifications. and as built drawings; check the torques and apply torque stripe.

DC Power Switch Inspection

INSPECTION ITEM

- Inspect switches for signs of high resistance, proper movement, and hardware torque. Check the torques and apply torque stripe.
- Clean insulators with denatured alcohol.
- Ensure feeder wire is secured to the Cantilever.

Wire Gauge Inspection

INSPECTION ITEM

- Using a micrometer, measure the gauge of the contact/trolley wire at pre-determined locations of high-wear – including transitions in wire elevation and in curves – along the alignment. If wire gauge is found to be less than 20% of original size (350 MCM or 50.748 mm), provide recommendation to replace and inspect other high-wear area points.
- Inspect Contact wire for damage and measure any damaged location, if below 20% of the As-Built Drawings, provide recommendation for repairs.
- Locate all areas along the alignment that cause arcing of the Pantograph and recommend to pair the locations.
- Check the torque of the Feeder clamps and Jumper clamps. Check for overheating and provide recommendation to replace if damaged. Torque-stripe the bolts for ease of inspection.
- Check the torque of all fixed terminations and apply torque stripe repair if damaged.

Pole, Grounds and Surge Arrestors

INSPECTION ITEM

- Inspect poles, grounds, and surge arrestors for loose hardware, severe bending movement, and general condition.
- Inspect all surge arrestors for arcing and wire connections.

SCOPE OF WORK

Emergency On-Call Repairs and Maintenance for Atlanta Streetcar Overhead Contact System and Traction Power Substations

VFM Door Break Assemblies and Shop Inspection

INSPECTION ITEM

- Inspect door break assemblies for loose bolts, nuts, and burnt or damaged insulation.

Tension Spring Inspection

INSPECTION ITEM

- Inspect dead-end sleeves, mounting hardware, nuts, bolts, pins, and cotter pins for security.
- Inspect tension springs for proper function and clean with a dry cloth.
- Lubricate extension rod protruding from the spring with silicon spray.

Aerial OCS Inspection

INSPECTION ITEM

- Inspect for any unusual occurrences or conditions, such as broken bolts, wires, or excessively worn items.
- Inspect each hanger for tightness and vertical alignment.
- Inspect all cantilever hardware for proper torque, check the torques and apply torque stripe.
- Inspect registration arms for pantograph clearance.
- Inspect equalizer taps for tightness and signs of wire fatigue. Overlaps shall be checked for proper transition of the pantograph, ensuring a parallel area of approximately 10 feet.
- Inspect feeder connections for tightness and signs of fatigue.
- Inspect trolley wire for “pitting” or signs of arcing.
- Inspect insulators for signs of fatigue or cracking.
- Inspect trolley wire bridges for tightness, signs of fatigue, and proper location.
- Utilizing approved measuring device, check height and stagger of the OCS and compare and adjust to As-Built Drawings or better. Document findings.
- Check bridle tension and configuration and adjust to manufacturer’s specification.
- Inspect steady arms for proper configuration and adjust to manufacturer’s specifications.
- Inspect Drop Brackets.
- Verify and adjust the tension on fixed terminations equipment.
- All fixed tension applications shall be checked and verified to be within original manufacturer’s specification, or in accordance with As-Built drawings.

SCOPE OF WORK

Emergency On-Call Repairs and Maintenance for Atlanta Streetcar Overhead Contact System and Traction Power Substations

2. Traction Power Substations

The Contractor shall supply the City of Atlanta Contract Administrator or his designee telephone numbers where emergency personnel can be contacted after normal hours, nights, holidays and week-ends.

The operating hours of the Atlanta Streetcar Traction Power Substation (TPSS) will be as illustrated below:

REFERENCE CHART FOR NIGHTLY ALLOWABLE RANGE OF ATLANTA STREETCAR TPSS OUTAGE:

DAY OF OPERATION	RECOMMENDED STREETCAR HOURS	PRE-OP & POST OP BUFFER	RANGE ALLOWED FOR TPSS OUTAGE
MONDAY	6:00 AM <u>until</u> 11:00 PM	4:30 AM to 6:00 AM and 11:00 PM to 12:30 AM	12:30 AM Tue – 4:30 AM Tue
TUESDAY	6:00 AM <u>until</u> 11:00 PM	4:30 AM to 6:00 AM and 11:00 PM to 12:30 AM	12:30 AM Wed – 4:30 AM Wed
WEDNESDAY	6:00 AM <u>until</u> 11:00 PM	4:30 AM to 6:00 AM and 11:00 PM to 12:30 AM	12:30 AM Thu – 4:30 AM Thu
THURSDAY	6:00 AM <u>until</u> 11:00 PM	4:30 AM to 6:00 AM and 11:00 PM to 12:30 AM	12:30 AM Fri – 4:30 AM Fri
FRIDAY	6:00 AM <u>until</u> 1:00 AM	4:30 AM to 6:00 AM and 1:00 AM to 2:30 AM	2:30 AM Sat – 7:00 AM Sat
SATURDAY	8:30 AM <u>until</u> 1:00 AM	7:00 AM to 8:30 AM and 1:00 AM to 2:30 AM	2:30 AM Sun – 7:30 AM Sun
SUNDAY	9:00 AM <u>until</u> 11:00 PM	7:30 AM to 9:00 AM and 11:00 PM to 12:30 AM	12:30 AM Mon – 4:30 AM Mon
HOLIDAY SCHED* PRECEDING MON-FRI	9:00 AM <u>until</u> 11:00 PM	7:30 AM to 9:00 AM and 11:00 PM to 12:30 AM	12:30 AM Holiday – 4:30 AM Mon-Fri

SCOPE OF WORK

Emergency On-Call Repairs and Maintenance for Atlanta Streetcar Overhead Contact System and Traction Power Substations

2.1 On-Call Emergency Repair

The Contractor shall respond by phone within two (2) hours of being notified. The Contractor will be onsite within twenty-four (24) hours of being notified and will be ready to perform emergency repairs on the City's traction power substations. The Contractor shall furnish labor, tools and equipment, at its sole expense, required in performing the services under this Contract. All of the services required hereunder shall be performed by Contractor and under the Contractor's supervision and all personnel engaged in the services shall be fully qualified. The Contractor shall supply the Contract Administrator telephone numbers where emergency personnel can be contacted after normal hours, nights, holidays and weekends.

Maintenance practices for traction power distribution equipment will be within accordance with APTA and OSHA standards, original equipment manufacturers recommendations and the City of Atlanta Electrical code. The Contractor shall be required to perform Annual TPSS maintenance according to Annual frequencies as described in paragraph 1.2.

2.2 On-Call Service Repair

The Contractor shall be onsite within twenty-four (24) hours of being notified, seven days per week, 24 hours per day, and be ready to perform repairs on the City's traction power substations. The Contractor shall furnish labor, tools and equipment, at its sole expense, required in performing the services under this Contract. All of the services required hereunder shall be performed by Contractor and under the Contractor's supervision and all personnel engaged in the services shall be fully qualified. The Contractor shall supply the Contract Administrator telephone numbers where emergency personnel can be contacted after normal hours, nights, holidays and weekends.

Maintenance practices for traction power distribution equipment will be within accordance with APTA and OSHA standards, original equipment manufacturers recommendations and the City of Atlanta Electrical code. The Contractor shall be required to perform Annual TPSS maintenance according to Annual frequencies as describe in paragraph 1.2.

SCOPE OF WORK

Emergency On-Call Repairs and Maintenance for Atlanta Streetcar Overhead Contact System and Traction Power Substations

2.3 Preventive Maintenance Annual Inspection

The Contractor shall be required to perform an annual Traction Power Substation (TPSS) maintenance inspection according to frequencies as described below. Scheduled maintenance will be completed within a variance of + / - 10% of the set date. The required maintenance practices for traction power distribution equipment will be in accordance with APTA and OSHA standards, original equipment manufacturers recommendations and the City of Atlanta Electrical code.

Upon the completion of the annual TPSS maintenance inspections, the Contractor shall provide the Contract Administrator or designee with a list of all items that need repair. The Contract Administrator or designee and the Contractor shall jointly deliberate and decide corrective actions to be taken for each item that need repair.

As part of the inspection, the Contractor shall submit the following:

- A. Recommendation and Deficiency Reports;
- B. Recommended Repair List;
- C. Summary of work for the recommended repairs; and
- D. Itemized repairs cost estimate

Once per year, each TPSS will undergo a comprehensive program of tests and procedures to thoroughly check the condition of all major equipment. During the annual TPSS maintenance inspection, the substation will be thoroughly cleaned throughout. Prior to any test being performed, all insulators shall be cleaned and inspected. Check all buss bar insulators for cracks, overheating, corrosion, voltage tracking and other abnormal conditions, and replace as needed.

Any component found to have discoloration due to overheating or arc marks, shall be Hi-Pot tested. Complete function tests of all alarms must be performed, including the fire alarm system. An analysis of the fault logs shall be performed annually. A comprehensive parts list will be provided by the Contractor. Recertification must be issued on all substations after inspection and testing is completed. The Annual Inspection will focus on the following components:

- Transformers
- High Voltage Switchgear
- Power Rectifier
- DC Switchgear

The transformer testing will consist of the following:

- Hi-Pot testing of the primary windings according to manufacturer's specification and industry standard first year test, every subsequent five (5) years.
- Meg all the secondary windings.
- Vacuum the transformer coils and blow the coils out with nitrogen gas.

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Emergency On-Call Repairs and Maintenance for Atlanta Streetcar Overhead Contact System and Traction Power Substations

The high voltage switchgear annual testing:

- Inspect all control devices such as control switches, meters, lights, and relays for any damage.
- Inspect all terminal strips for secure wiring.
- Inspect all protective devices for proper current ratings.
- Re-torque the power buss; inspect the buss insulators, hardware, and bushings for damage.
- Inspect breaker for any damage or malfunction.
- Mechanically operate the breaker.
- Check for proper racking operation.
- Check for correct operation of kirk keying.
- Check the insulation properties of the AC breaker (Meg, hi-pot), first year test, and every subsequent five (5) years.
- Check the insulation properties of the buss insulators, bushings, and cables from the transformer secondary to the rectifier (Meg, hi-pot), first year test, every subsequent five (5) years.
- Meg/hi-pot the auxiliary transformer primary and secondary circuits according to the manufacturer's specifications and industry standards, first year test, every subsequent five (5) years.
- Verify the remote control of the AC breaker (only on TPSS-3).
- Check and clean breaker fingers as necessary.
- Insure that the heating system is operational.

The Power Rectifier annual testing:

- Inspect and clean buss insulators.
- Verify and torque all heat sinks in the rectifier enclosure.
- Inspect and torque all power connections and buss splices.
- Inspect all internal, external, and site installed wiring.
- Test the thermal switches associated protective devices.
- Meg the AC buss, DC buss, and rectifier enclosure.
- Check the operation of the negative disconnect switch, clean and lubricate.

The DC Switchgear annual testing will:

- Inspect the DC breaker.
- Inspect all buss insulators for condition.
- Inspect and torque all buss splices, connections, and insulators.
- Inspect internal, external, and site connections.
- Meg the main DC buss, first year test, every subsequent five (5) years.
- Meg the DC feeder buss, first year test, every subsequent five (5) years.
- Meg the DC feeder breakers, first year test, every subsequent five (5) years.
- Meg the DC switchgear enclosure, first year test, every subsequent five (5) years.
- Test the associated protective devices: DC ammeters, load measuring relays etc.

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Emergency On-Call Repairs and Maintenance for Atlanta Streetcar Overhead Contact System and Traction Power Substations

- Verify the control sequence of the DC feeder breakers and the related cell controls.
- Verify remote control of all DC breakers.
- Inspect arc chutes.
- Measure contact width.
- Meg the insulated floor (first year test, subsequent test every 5 years).
- Check integrity of the K0 K1 and K2 relay.
- Check main contacts for damage, and repair or replace if necessary.

Upon completion of the annual TPSS maintenance inspection, the substation will be brought back on-line to regular service.

2.4 Substation Locations and Characteristics

There are three substations in the ASC system:

Traction Substation	Power	Location	Support
TPSS No. 1 - VMF		Vehicle Maintenance Facility	Main Shop and Yard
TPSS No. 2 - EDG		Vehicle Maintenance Facility	East Alignment
TPSS No. 3 - PCH		Peachtree Center	West Alignment

All interior substation equipment shall be cleaned, lubricated, inspected, repaired, and adjusted to original equipment manufacturers.

There are three line breakers and main transformer breakers inside the AC switchgear. These devices protect ASC equipment and cables from any surges or overloads originating from Georgia Power or from internal substation equipment failures. Every two (2) years, these breakers shall be inspected, cleaned, calibrated and repaired as needed. All arc chutes shall be cleaned, the main and secondary contacts shall be checked for wear or deterioration, and necessary breaker adjustments shall be performed.

The breaker cubicles and controls shall be inspected, cleaned and repaired on the same timeframes described above, including any secondary disconnects, shutters, truck interlocks, wiring, and control relays. Also, every two years overcurrent relays shall be calibrated.