TAB 4

DESIGN-BUILD CONTRACT RISK ALLOCATIONS

4A - Risk Concerns Associated with Project's Design-Build Contract

4B - Exhibits

TAB 4A

RISK CONCERNS ASSOCIATED WITH PROJECT'S DESIGN-BUILD CONTRACT

SECTION 4

RISK CONCERNS ASSOCIATED WITH THE PROJECT'S DESIGN-BUILD CONTRACT

The design-build contract between the Airports Authority and DTP ("DB Contract") addresses the Project's risk balance, risk transference and risk mitigation structure. Simply stated:

- DTP has assumed substantial risk under the DB Contract.

- The DB Contract provides the Airports Authority with substantial protection from cost escalations and schedule delays.

Moreover, as FTA is aware, the Airports Authority's determination as to which Project risks were best assumed by DTP was conducted in accordance with best procurement practices – in large measure because of the "open book" process used in negotiating with DTP and adopting a thorough, reasoned and commercially practicable assessment of the pricing ramifications of such risk transfer.

This Section 4 will support the position that the DB Contract is an appropriate contractual arrangement for this Project. Attachment No. 1 provides a synopsis of some of the risks that have been assumed by DTP in the DB Contract. Attachment No. 2 addresses five major risk and contractual concerns that FTA has raised in its communications with the Airports Authority. Before addressing these issues, however, the Airports Authority notes three issues that FTA has seemingly overlooked relative to the overall contracting structure of this Project.

First, unlike virtually every other project considered by FTA under the New Starts program, where the grantee's application is based only on engineering estimates of final design and construction cost, the Airports Authority has already negotiated a complete design-build contract, with a firm fixed price and a schedule guarantee for the vast majority of the work. The only work that is not subject to a firm fixed price is approximately $500 million of certain allowance items under the DB Contract. As we will note in more detail below, and as FTA knows, these items were carved out of the firm fixed price to eliminate unwarranted contingency and provide for a competitive, transparent procurement environment once the design for such items was sufficiently developed to enable subcontractors to bid such work. The Airports Authority viewed the procurement process established for allowance items as accomplishing several important public policy goals.

Second, FTA should consider a critical feature of the DB Contract that directly goes to the issue of cost and schedule "vulnerability." Unlike virtually every other project considered by FTA, the DB Contract has an additional layer of protection against cost and schedule overruns. DTP has contractually assumed full responsibility for all

design and integration efforts between preliminary and final engineering. This protection was derived from the contracting approach used on this project, where DTP was paid to perform the preliminary engineering, enabling the Airports Authority to eliminate one of the major risks to an owner using design-build – as deficiencies or ambiguities in the preliminary design are generally assumed by the owner when the design-builder does not perform the preliminary design. FTA's risk assessment and contract evaluation appears to give no consideration to this substantial benefit and risk shifting feature of the DB Contract.

Finally, in addition to recognizing that considerable commercial risks have been contractually assumed by DTP, the FTA should also recognize the limitations and conditions placed upon DTP to demonstrate cost or schedule relief. Not only is substantial documentary evidence required to demonstrate cause and effect before any adjustment will be provided, there are extensive project controls in place relative to the Project schedule. The controls were established in large measure to avoid schedule surprises and place substantial risk on DTP if it fails to comply with such controls.

Attachment No. 1
Risk Allocation Features of the DB Contract

The following are some of the significant risk allocation aspects of the DB Contract:

1. **Fixed Price**. $1.1 billion of the DB Contract is a lump sum firm fixed price (DB Contract Section 14.1). DTP is responsible for completing the scope of the work in accordance with the contract schedule regardless of its actual cost of the work. The fixed price includes a contingency amount for DTP's design-build scope, except for the initial price of the Allowance Items and for price adjustments (escalation). This Contingency was identified and reviewed as part of the open book negotiations with DRPT and MWAA. DTP also has the performance and execution risk of the Allowance Items and is responsible for the interface between the Allowance Item contractors (DB Contract Section 14.1.6(f)).

2. **Labor**. DTP has the labor risk associated with the Project (DB Contract Sections 13.2 and 14.1.2). This includes labor availability, productivity and labor cost for all self-performed work and subcontracted work under the DB contract. This is a significant risk considering there are approximately 7,000,000 man-hours of work included in the Project.

3. **Schedule.** DTP is responsible for completing the work in accordance with the contract schedule (DB Contract Sections 13.1, 17.1, and 26.1). This includes responsibility for the schedule performance of the Allowance Items Subcontractors after their initial award. DTP pays significant liquidated damages to MWAA (up to $100,000/day) if the schedule is not met.

4. **Scope.** DTP is responsible for any increase in the quantities of commodities, labor, and any other units that evolve as design is advanced from 30% completion to 100% issued for construction (DB Contract Sections 1.3, 1.6, and 2.2.1). DTP is only entitled to a change in price or schedule under very limited circumstances; otherwise DTP bears the cost and schedule risk for the scope of work.

5. **Escalation.** DTP has complete responsibility for the escalation in labor costs over the life of the DB Contract, as well as cost escalation in materials and subcontracts included in the DB Contract, other than the indexed commodity items (DB Contract Sections 13.2 and 14.1.2). The DB Contract does include price adjustments (escalation) for a limited set of specific items defined in the contract (DB Contract Section 14.1.3). The price adjustment to which DTP would be entitled is a pre-established formula stated in the contract and uses actual quantities – without any contingency or fee to DTP.

The adjustments are based on the Producer Price Index for these commodities. The price adjustments can be either additive or deductive to the DB Contract Price.

6. Delays. DTP is responsible for the cost of the first 45 days of Force Majeure delays on the critical path and 2 days of Owner-directed suspensions per year (DB Contract, Section 13.4.3). DTP is also responsible for the first thirty (30) days of delay to the critical path due to the late completion of the utility relocation work for any reason (DB Contract, Section 13.6).

7. Weather Delays. DTP is responsible for sixteen (16) days of weather delays per year, and the schedule contemplates such weather delays (DB Contract, Division 1, Section 01322).

8. Warranty. DTP is responsible for providing a two-year warranty with an additional one year for any work performed under the warranty and five year latent defect warranty for all work performed under the DB Contract, including the Allowance Items. This includes responsibility for all defective work and rework under both the fixed price component of the DB Contract and for the Allowance Items (DB Contract, Article 11).

9. Differing Site Conditions. DTP is responsible for the 50% of the costs of the first $12M of differing site condition costs (DB Contract, Section 5.4.2).

10. Guarantees. DTP provided full corporate guarantees for the project, and is obligated to provide performance and payment bonds in the amount of $250 million (DB Contract, Exhibit 22.6).

The risks assumed by MWAA are reasonable, and were thoughtfully made with a view as to the most efficient manner of transferring risk, particularly given that the fact that the negotiating team was able to see the pricing of such risks in the open book process. MWAA retains responsibility for the cost and schedule impacts of MWAA-directed changes. However, the DB Contract has established rates for DTP's markups (overhead and profit) on changes, to avoid any issues surrounding such changes. MWAA is responsible for handling hazardous material and cost and schedule impacts if they are encountered. MWAA is also responsible for weather delays above 16 days per year, Force Majeure events, or Owner-directed delays above 45 days. The DB Contract has robust project controls for monitoring schedule and change orders.

Attachment No.2
Specific Contractual/Risk Features of the DB Contract

The DB Contract comprehensively addresses all issues associated with the project and provides substantial protections to the Airports Authority. The major commercial risks assumed by DTP and the Airports Authority are discussed in Attachment No. 1. This Attachment No. 2 addresses four specific contractual/risk features of the DB Contract: (1) allowances; (2) schedule; (3) warranty; and (4) the role of the independent engineering/construction inspection team.

1. Allowances.

The DB Contract Price of approximately $1.6 billion is structured into two elements from the perspective of risk transference. The first element is a traditional firm fixed price element of approximately $1.1 billion, and the second element, in the form of structured allowances, in the amount of approximately $500 million. Contrary to the concerns expressed by FTA, the allowances have been carefully structured by the Airports Authority based upon firm scope definition, established durations for performance, full Airport Authority participation and approval in the allowance procurement process, and assumption by DTP of all performance risk for the integrating the allowance work in the overall contract.

The reason for using this allowance process is straightforward. The Airports Authority, after conducting a rigorous evaluation of the subcontractor pricing proposals received by DTP during the estimating process, concluded that it would be inappropriate and cost ineffective to have such items included in the fixed price. The Airports Authority was concerned that the level of design and the lack of a near term horizon for project certainty prevented competitive market forces from working in these areas. This was demonstrated by the differential between estimated costs for these areas – both by DTP and the independent engineers retained by the Airports Authority – and actual pricing. The Airports Authority selected allowance scope areas where engineering judgment indicated that further advancement of the design would improve competition and price certainty at the subcontract level.

Simply stated, the allowance process has the Airports Authority accepting the market risk of procurement for the subcontractors providing the allowance work. Once subcontract award is made, DTP assumes the full execution risk for these subcontractors, including the responsibility to ensure that the subcontractors are integrated, meet the contract performance requirements, and perform in a timely manner. The attached Exhibits from the Contract show the detailed development of the allowances and allowance procurement process.

1. Exhibit 14.1.6(a) List of Allowance Items and Related Computations
2. Exhibit 14.1.6(b) Allowance Item Procurement Procedures
3. Exhibit 14.1.6(c) Scope Descriptions of Allowance Items

What is clear is that the uncertainty with respect to the allowance items is less than the uncertainty associated with most New Starts as the project is considered for entry into final design. In a traditional design-bid-build format, the insertion of a schedule risk would have to put into a project budget because of the need for a multi-prime contract. The DB Contract provides greater certainty and makes DTP responsible for design, integration, and schedule risk of these subcontractors. However, it has also been structured to provide a transparent procurement process, with the intent of affording the Airports Authority the ability to generate pricing improvements based upon competition.

2. <u>Schedule</u>.

The DB Contract not only has robust controls and protection to minimize the risk of schedule overruns, but also has contractual conditions in place that are a predicate to DTP's right to seek recovery for a time extension.

First, as to project controls, Division 1, Section 01322 contains a comprehensive, intensely negotiated, regimen for developing, monitoring and updating the project schedule. The Initial Baseline Schedule, which was attached to the DB Contract, contains over 6,000 activities and is far more detailed than one would normally expect on a project that has only achieved the stage of completion of preliminary engineering. This schedule is required to be refined even further to achieve a Final Baseline Schedule – which was scheduled to be completed three months before commencement of construction. The Final Baseline Schedule is subject to approval by the Airports Authority. This ensures that the overall baseline for monitoring the project's performance was agreed upon by both parties and could properly function as a control tool for performance.

Section 01322 also contains specific and rigid requirements to ensure propriety in the scheduling process. These "rules of the road" mandate best practices in development and use of float, leads and lags, and other scheduling issues that, if misused, can defeat the purposes of scheduling transparency and monitoring. Monthly updates, including the resolution of any schedule delays or slippage, are required. Section 01322 is one of the major tools that the Airports Authority has implemented to avoid schedule surprises and protect itself against unwarranted delay claims by DTP.

The DB Contract also contains protections to the Airports Authority from delay claims by DTP. The time extension provisions (Sections 13.2 and 13.3) require compliance with strict notice requirements, as well as a demonstration that the delay is on the critical path and conducted by a time impact analysis. Under Virginia law, the failure of DTP to comply with such requirements will result in a waiver of DTP's claims. Finally, DTP will be responsible for paying substantial liquidated damages (up to $100,000/day) for failing to meet the Scheduled Substantial Completion Date, with an overall exposure of $60,000,000. This is a significant commercial risk to DTP.

3. Design Adequacy, Constructability and WMATA Acceptance.

Mass transit projects present technical challenges in the development of a comprehensive design that meets current professional engineering standards, constructability issues, and integration into the operating system of a transit property. These challenges frequently lead to performance difficulties as the contractor seeks to meet the standards, to construct consistent within a realistic budget, and to meet user performance acceptability criteria. The Airports Authority has adopted a project delivery method and management system that assures communication of the standards of the user in the development of the design, the construction of the facilities, and the acceptance of the facilities by the transit property. The contractual vehicles that achieve this risk transfer are a design-build contract and an intergovernmental agreement with the transit property.

The DB Contract is based upon preliminary engineering (30%) being completed by the same designer (DTP) who will advance the design to final engineering and become the engineer-of-record. Aside from the clear liability and risk transference (discussed earlier in this Section 4), DTP's role on this project as both the designer of preliminary engineering and final engineering is beneficial from at least three perspectives: (1) DTP is familiar with the user standards from the start; (2) DTP addressed constructability during or as an incident to design; and (3) DTP, in conjunction with the Airports Authority as owner, had, and will continue to have, the ability to address acceptance issues with WMATA personnel.

The end result is that the project delivery system and WMATA's role as technical advisor work together to minimize interpretive problems that frequently result from design evolution without constructability and operability input. Communication problems are further minimized by the Airports Authority's use of an independent engineering/construction inspection team (Carter Burgess). Both the Airports Authority and WMATA have the added assurance of an independent inspection regime to oversee construction.

The DB Contract uses the underlying standards of WMATA as one of the principle foundations for contract interpretation and design evolution. As a result, the design-build delivery system transfers design development risk. In the arrangement at hand, the transfer is enhanced since DTP performed preliminary engineering with WMATA involved throughout. The existence of an intergovernmental agreement to address WMATA staff during design, construction and commissioning provides a solid vehicle to assure early identification of problems that might impede timely acceptance into the operating system.

The following contract references address these matters.

1. Article 1 Acceptance of Preliminary Design and Project Site
2. Article 3 Plans and Specifications
3. Article 4 Section 4.2.1 Owner Oversight
4. Article 17 Time for Completion; Substantial Completion, and Final Acceptance

4. Warranty.

The risk of substandard performance that is not revealed by a robust quality control program is a well-known risk in any construction project. WMATA also identified concerns about latent defects during negotiation. These factors were addressed in three ways by the DB Contract.

The warranty period set for in Section 11.2 is for two (2) years. The length of this period is double what WMATA carries in their standard contract. The protection is important in and of itself, but it also induces a greater sense of responsibility by DTP as it relates to its overall quality program. There was also a concern expressed by WMATA with respect to a systemic problem that is progressive as time proceeds. As a result, the DB Contract provides a provision for a root cause analysis if an alleged defect is suspected. This provision provides a fundamental objective basis for identifying defects, especially latent defects.

Finally, the DB Contract provides a remedy for latent defects independent of the warranty time period. The period for such protection is as established by a subcontract warranty or five years. In addition, the Airports Authority has established a reserve fund to be available to address latent defects for an extended period. This fund has been established in accordance with a flow of funds priority as it relates to toll road revenue collection. WMATA has significant protections against construction defects.

5. Pricing and Escalation.

Under the fixed priced nature of many contract structures, a design-build contractor ordinarily bears the risk of increases in prices for labor and materials over the performance period. This presents substantial risk in volatile markets for labor and material, and when projects are long in duration. In recent years, the AGC and most public agencies have recognized that placing these risks solely on a construction contractor was not good procurement policy. This change in thinking was precipitated by runaway prices for steel, cement, concrete and oil-based products. As a result, contracts were structured to allow for indexing for certain commodities. This adjustment can move in either direction and it is done without any added fee for the contractor.

The DB Contract followed these recent practices to allow for indexing of certain commodities. However, the risk for labor and other commodities was fully taken by the DB Contractor. It should be noted that the PMOC did an extensive review of escalation considerations in the design-build estimate, and concluded that this project is the first

project in which a proposed grantee adequately estimated potential escalation risk. The logic conclusion must follow that the DB Contract structure meets the market realities of today's volatile materials market and sound procurement policy.

TAB 4B

EXHIBITS

Execution Version
June 19, 2007

Exhibit 14.1.6(a)
List of Allowance Items and Related Computations

A. **Allowance Items and Contract Allowance Price:** Set forth below is a list of the Allowance Items and the Contract Allowance Price for each. The Contract Allowance Price includes the estimated Subcontract price. The Contract Allowance Price set forth below is exclusive of any applicable Contractor's fee, worker compensation/general liability insurance, builder's risk insurance, BPOL taxes or sales tax on Equipment and Materials.

No.	Allowance Item	Contract Allowance Price
1.	Trackwork	$ [redacted]
2.	Wiehle Parking Garage	$
3.	Station Finishes and MEP	$
4.	WFCY Sound and Box Platforms	$
5.	Pedestrian Bridges	$
6.	Site development	$
7.	Installation of Public Art	$
8.	Communications and Security	$
9.	Fire Suppression	$
10.	Elevators and Escalators	$
11.	Spare Parts	$
12.	WFCY S&I Building	$
13.	Traction Power Supply	$
14.	ATC Supply	$
15.	Cathodic Protection and Corrosion Control System	$
16.	Contact Rail and Hardware Supply	$
17.	Wiehle Avenue Replacement Parking	$

These redactions are necessary to protect the financial interests of the Airports Authority and Commonwealth of Virginia as well as those of Fairfax and Loudon Counties as local funding partners. The redactions are only in sections that address estimated amounts for individual allowances that could affect bidding strategies of future competitors, insurance cost information, or other information that allows computation of pricing information that is confidential.

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B. **Method of Calculating Actual Price for Allowance Items:** The Actual Allowance Price for each Allowance Item will be the sum of:

1. the evaluated Subcontract price (including any additions or subtractions to such bid price based on pricing of the selection criteria set forth in Section C2 of Exhibit 14.1.6(b)); and
2. amounts for insurance, Contractor's BPOL tax, and Contractor's fee, all calculated according to the following formula:

Where:

AP(A) = Actual Price of Allowance Item
SCP = Subcontract Price (per B1 above)
WC = Workers Compensation Insurance/General Liability
WCC = Workers Compensation Contingency/General Liability
BR = Builder's Risk Insurance
$BPOL_{EST}$ = Estimated BPOL (for calculating BR and FEE)
FEE = Contractor's Fee
BPOL = Business taxes (based on revenue)

Bare Labor Payroll = wages equal to the gross pay of an employee prior to deductions. Generally, the product of the wage rate and number of hours worked.

WC = (Subcontractor's {+ any Sub-Subcontractors} Bare Labor Payroll wages {project based manual and non-manual}) x [redacted]

WCC = WC x 0.10 (i.e., 10%)

$BPOL_{EST}$ = (0.00119 x SCP) + (0.00111 x {WC + WCC})

BR = (SCP + WC + WCC + $BPOL_{EST}$ + FEE) x [redacted]

BPOL = (SCP + WC + WCC + BR + FEE) x 0.0011 (i.e., 0.11%)

FEE = (SCP + $BPOL_{EST}$) x [redacted]

AP(A) = (SCP + WC + WCC + BR + BPOL + FEE),

provided, however, that, if the sum of the SCP + BPOL amounts for all Allowance Items exceeds [redacted] then there shall be no Contractor's Fee on the excess amount.

C. **WC/GL Contingency (WCC); Recordkeeping – Credit Computation**

1. The WC and WCC for all Allowance Items shall be aggregated and referred to as the "Maximum WC/GL Amount". The Owner shall be entitled to a credit in the event the total actual WC/GL insurance premium costs for all Allowance Items are

less than the Maximum WC/GL Amount, with such credit calculated as set forth in Paragraph 4 below. Under no circumstances shall Owner have any obligations for WC/GL costs for Allowance Items in excess of the sum of Maximum WC/GL Amount and Change Order WC/GL Allowance Insurance Costs, and any amounts over such sum shall be Contractor's sole responsibility.

2. The amounts associated with WC/GL premiums costs are based upon the value of on-site labor (Bare Labor Payroll wages) performed by each Allowance Subcontractor. The value of such on-site labor for each Allowance Subcontractor shall be established by Contractor at the time each Allowance Item is converted to a fixed priced or fixed unit price Subcontract. The sum of the preceding values of the on-site labor for all Allowance Items shall be computed and referred to as "Base Aggregate Labor." For change order work on Allowance Items, each change order and resulting contract modification shall include an agreed value of net added on-site labor, the sum of which shall be computed and referred to as "Aggregate Added Change Order Labor."

3. Contractor shall report all on-site labor. The actual on-site labor for Allowance Items shall be segregated and reported in a separate report at Final Completion ("Actual Aggregate Labor for Allowance Items").

4. Computation of Credit. At Final Completion, Contractor shall make the following computations:

a. Contractor shall compute the WC/GL premium insurance costs by using the Actual Aggregate Labor for Allowance Items and the established WC/GL premium insurance cost on the labor value ("Total WC/GL Allowance Insurance Costs").

b. Contractor shall compute the WC/GL premium insurance costs for change orders by using the Aggregate Added Change Order Labor and the established WC/GL cost on the labor value ("Change Order WC/GL Allowance Insurance Costs").

c. Contractor shall compute the sum of the Total WC/GL Allowance Insurance Costs and Change Order WC/GL Allowance Insurance Costs, which amount is defined as the "Actual WC/GL Insurance Premium Costs for Allowance Items."

d. The Contractor shall determine a final price adjustment amount for the WC/GL Insurance Premium Costs and promptly make any adjustments to payment as set forth below:

(i) If the Actual WC/GL Insurance Premium Costs for Allowance Items is greater than the Maximum WC/GL Amount, there is no credit due to Owner.

(ii) If the Actual Insurance WC/GL Insurance Premium Costs for Allowance Items is less than the Maximum WC/GL Amount, Contractor shall

credit Owner with the difference, and shall promptly credit this amount to the Owner in the next scheduled invoice for payment.

5. Except as set forth in Paragraph 1 above, under no circumstances shall the Contractor be entitled to any compensation in excess of the Maximum WC/GL Amount, and the Contractor hereby waives all claims to such compensation in excess of the Maximum. It is expressly understood and agreed that the Contractor shall be required to perform all Allowance Item Work even though performance of such Work would have resulted in additional compensation to Contractor but for the limitation contained in this Exhibit 14.1.6(a).

D. **Scope Description:** The Scope Descriptions for Allowance Items are set forth in Exhibit 14.1.6(c).

Exhibit 14.1.6(b)
Allowance Item Procurement Procedures

It is the intention of the parties to conduct the following procedure in an open and collaborative fashion to ensure that Owner is fully informed on and involved in all matters relative to the procurement of Allowance Items. This will involve, among other things, Contractor providing advance working drafts of bid documents and allowing participation by Owner in the bid evaluation process, with Owner having representative(s) on the technical and commercial teams relative to the procurements and Subcontractor selection. In participating in such process, Owner recognizes the importance of the timetable for this procedure to the timely execution of the Project.

The parties recognize that the following may require modification to reflect the scope and nature of particular work packages, and will work together cooperatively to accomplish their mutual goals.

A. Selection of Bidders

1. Contractor will provide to Owner the finally developed pre-qualification criteria at least ten (10) working days prior to the submission in Paragraph 2 below.

2. Contractor will, to the extent practicable, submit a list of at least three (3) potential bidders for each Allowance Item for Owner's approval.

   a. Each potential bidder shall have satisfied the pre-qualification criteria for potential bidders. Contractor shall develop pre-qualification criteria and provide such criteria for Owner's review and approval at least thirty (30) days prior to the expected submission of the list referenced above.

   b. Contractor agrees to consult and work with Owner to develop approaches which foster enhanced competition, consistent with the best interests of the Project.

3. The Owner shall have ten (10) working days from receipt to review such list. If Contractor does not receive comments from Owner within the time allotted, then Owner shall be deemed to have approved such list. Owner shall have the right to withhold its approval of any potential bidder only on the basis of that bidder's failure to satisfy the pre-qualification criteria stated above.

B. Requests for Proposals

1. Contractor shall prepare the Request for Proposal ("RFP") package for each Allowance Item, including a subcontract in a form substantially

similar to that provided to Owner prior to the Effective Date. If necessary to obtain three (3) potential bidders, as described in Paragraph A2 above, the Contractor shall propose dividing any of the Allowance Items into multiple RFP packages.

2. Contractor shall submit the RFP and evaluation award criteria which it intends to use for each Allowance Item to Owner for review and approval prior to issuance of the RFP to the agreed pre-qualified bidders.

3. Owner shall have ten (10) working days from receipt to review each such RFP and evaluation award criteria. If Contractor does not receive comments from Owner within the time allotted, then Owner shall be deemed to have approved such RFP and evaluation award criteria. The only basis upon which Owner shall have the right to withhold approval would be for non-compliance with the agreed procurement procedures.

C. Evaluation of Proposals and Award

1. Upon receipt of proposals for an Allowance Item, Contractor shall open the bids in the presence of Owner. Contractor shall then review and evaluate each proposal for an Allowance Item and, based upon the established selection criteria, shall determine the bidder to whom Contractor believes the subcontract for each such Allowance Item should be awarded.

2. The criteria for evaluating and awarding a subcontract shall be established at the time of the RFP, but shall be consistent with the scope and schedule requirements defined in the Contract. Key selection criteria will include as appropriate:

   a. Schedule
   b. Evaluated Price
   c. Scope
   d. Commercial Compliance
   e. Technical Expertise
   f. Safety
   g. DBE participation
   h. QA/QC
   i. Key Personnel
   j. Prior Relevant Experience
   k. Performance History
   l. Claims History
   m. Execution Plan

   The assessment of the evaluated price shall involve adding or subtracting amounts to reflect enhancements in a specific bid/proposal and to enable

Contractor and Owner to conduct the evaluation of criteria in addition to price. As appropriate to the scope of a particular Allowance Item, additional factors to be considered in determining the evaluated price may include: quantities, unit prices, sub-subcontractors, equipment, job hours, payment schedule, environmental compliance, forms of security, and effects on other works. The value assigned to these additional factors shall be subject to Owner's acceptance. If the enhancement presented in the bid/proposal benefits the scope or schedule of the Contractor fixed-price work, then the assigned value will be deducted from the evaluated Subcontract price.

3. Contractor shall submit the bids it has received along with the evaluated price and its recommendation for award of each Allowance Item to Owner for Owner's review. The Contractor shall present and discuss the evaluated price detail and recommendation with the Owner. If Contractor has not received Owner's approval of the applicable recommendation within ten (10) working days of the date of discussion with the Owner, Owner shall be deemed to have approved Contractor's recommendation. The only basis upon which Owner shall have the right to withhold its approval shall be if Contractor has not conducted its evaluation in accordance with the procurement procedures set forth herein.

4. Prior to executing the Subcontract, Contractor shall obtain from the Subcontractor the Subcontractor Pricing Documents described in Section 12.2.

D. Procedure For Resolution Of Disagreements About Procurement Process

The parties shall resolve any disagreements regarding the procurement process or bidder selection for Allowance Items through the mechanisms described in Sections 28.1.1 and 28.1.2, modified such that the disagreement must be resolved within seven (7) days of it first being notified by one party to the other.

Exhibit 14.1.6(c)
Scope Descriptions of Allowance Items

C1
Trackwork

Scope of Work

Subcontractor shall furnish all plant, labor, materials, tools, supplies, equipment, transportation, supervision, permits, and services, and perform all operations necessary and required to satisfactorily complete the track installation work for the Project, which shall include, but not be limited to, the following:

A. General

Monuments will be furnished and installed by Contractor to be used by Subcontractor to establish the center line of both the outbound and inbound Main tracks and Yard tracks. All other layout and survey is the responsibility of the Subcontractor. Subcontractor is to perform survey work in accordance with the requirements of the Design-Build Contract, Division 01, Section 01050.

All traction power, signaling and communication conduit stub-ups shall be located prior to track construction by Contractor. Subcontractor shall protect track during construction and re-marked out after construction is complete.

The Contractor-furnished materials are limited to contact rail, cover board insulator assemblies, contact rail end approaches, expansion joints, contact rail anchors and related hardware. The Subcontractor will provide all other materials not specifically excluded and needed for ballasted and DF track construction, including, but not limited to, field welds, emergency guard rails, guard rails, cable troughs, and any miscellaneous track materials.

Subcontractor will construct new tracks to construction tolerance as specified and validate compliance as required.

Subcontractor will perform the following:

- Rail grinding to remove mill scale and rust
- Ultrasonic testing of the completed track
- Geometry car test runs to verify compliance with specifications

The Subcontractor shall provide a full time project Safety person and a full time Quality Control person responsible for the Subcontractor's work and labor force.

Subcontractor will be required to develop specific Work Plans for individual work elements as needed to support the construction plan and scheduling. As part of its Work Plan, Subcontractor shall develop a detailed schedule of work items to be completed during each Track Outage. This

detailed schedule shall include all activities by and interfaces with others necessary to complete the Scope of Work.

Subcontractor will be responsible for on-going maintenance of track during construction for those areas within the test track section (approximately defined by the Orange line tie-in and the Tysons East station).

Subcontractor will be responsible for performing rail-to-earth, rail-to-rail, and insulated-joint resistance testing and correct deficiencies prior to scheduled ATC system and dynamic testing (by others).

The plinth will be approximately 10' long by 4' wide by 6" high and accommodate 3-4 fasteners under each rail at 30" spacing. The specified concrete strength shall be 3500PSI. The Subcontractor shall determine the number of plinths needed based on the length of DF track.

All permanent insulated joints will be installed by the trackwork installer and will be field installed bonded insulated kits. It is estimated to be approximately 220 (not counting insulated joints in special trackwork). The actual number however, is to be verified by the Subcontractor.

The emergency guard rail (EGR) will be installed as Single or Dual EGR per the design drawings.

Bumping posts will be provided on the mainline tail tracks west of Wiehle Ave. and at the end of each yard track.

The scope of work includes coordination of the work with the Contractor and other Subcontractors working on other parts of this Project in the same area (such as tracks, stations, and supporting facilities) and with the government agencies having jurisdiction over the area of work or the roadway. The scope also includes coordination of the work with utility companies installing or relocating utilities to serve the Project.

The contractor must prepare an execution plan for its work and provide input to the overall Project execution plan and as necessary to develop Site Specific Work Plans (SSWP) as required by WMATA.

B. Station 1344+02.98 to STA 726+24.70 IB track (N1) and OB track (N2)

Detail design, engineering, survey, and installation of all main line, yard expansion and Yard line Extension. Supply of special trackwork is included which encompasses wood switch timber for ballasted track and Guideways and Tunnel Direct Fixation special Trackwork.

Construct new track and cable trough from top of sub-ballast for ballasted track or top of invert for Direct Fixation track. This work will include supply and installation of concrete and rebar for plinths in DF track and cable trough in the ballasted track per design drawings and specifications. The Subcontractor will not be responsible for installation of the stirrups in the invert but will be required to maintain the stirrups to ensure they are not damaged during the construction of the Trackwork.

Management, engineering, survey and installation of all track materials, including ties, DF fasteners, rail, ballast, concrete, contact rail, tie extenders and all appurtenances.

Management, engineering, survey and installation of Ballast track and Direct Fixation track including contact rail system and all appurtenances on aerial structures and within tunnels.

Welding rail into continuous welded rail lengths (CWR) and related handling prior to installation. Pre curved rail or pre curved restraining rail when required is the responsibility of the Subcontractor.

Installation of all new tracks within Project limits.

Testing of materials, track inspection and maintenance activities during the Design Build (D/B) and testing phase of the Project to final acceptance.

C. Orange Line Tie-in Area 1: STA 475+50 to STA 498+38.89

In addition to the scope defined in B., above:

1. Develop a detailed installation plan, including sketches for all special trackwork installation, specifically a new No. 10 Double Crossover and two No. 15 turnouts (LH&RH) including switch machines.

2. Construct new vertical alignment in existing tracks 1 & 2 as shown in drawings K56-PP-001 through K56-PP-006.

3. Supply all geotech membrane and materials not specifically excluded.

4. Installation of all new track within the Project limits per design.

5. Removal of existing tracks and ballast for installation of special trackwork including removal of existing rail and installation of new rail for approximately 120 feet of existing tracks 1 and 2 between the crossover and new turnouts and handling all material to storage.

D. Yard Extension Area 2: STA776+18.47(N3) to STA 765+13.92 (N3) and continuing to STA8+78.99(YL3) to STA 0+00 (YL3)

Same as B., above.

E. Yard Storage Track Area 3 : STA 11+11.07 to end STATION of storage tracks 6A through 6H

In addition to the scope defined in B., above, construct new tracks from top of subgrade as shown in drawings K99-PP-001 and K99-PP-002 and K99-PP-004 and K99-PP-005.

F. Open Item WFC-1 for Expanded Maintenance Facility

Open Item WFC-1 has modified the scope to include two new tracks added to serve the expanded Shop Building. These changes have been documented as part of Open Item Package WFC-1, Volume III – Basis of Open Items Pricing (FFP) date February 8, 2007. In addition to the scope defined in B., above:

1. New switches will be provided on ballasted track west of the facility.

2. The track will be embedded beginning at the apron on the west side and extending through the expansion to the apron on the east side.

3. The track and switches on the east side will be rearranged to provide sufficient length to park a married pair outside the building without fouling a switch.

4. The scope includes furnishing and installing the contact rail within the limits of the Shop expansion described above.

Work Not Included

1. Traction power, signaling and communication installation is excluded. Also excluded from the scope of this package is supplying cables, contact rail heaters, clips, bolts and other hardware needed to make cable attachments to the contact rail.

2. Flange lubricators are not included in the Subcontractor's scope.

3. Demolition of existing retaining wall, relocation of cable trough and replacing intrusion redetection fencing in Area 1.

4. Associated design services, except as noted above.

5. Stations, bridges, tunnels and facilities.

Reference Specifications

Unless noted otherwise, the following specifications reflect the versions identified in the Addendum to the WMATA Standard Technical Specifications, 100% PE Design Submittal (February 2006).

Applicable specifications are also included as part of this document:

Spec No	**Specification Title**
02727	Ballast
03200	Concrete Reinforcement

03300	Cast in Place Structural Concrete
03480	Concrete Cross Ties and Fastenings
05091	Rail Welding
05651	General Track Construction
05652	Ballasted Track Construction
05653	Direct Fixation Track Construction
05654	Special Trackwork Construction -Ballasted
05655	Special Trackwork Construction -Direct Fixation
05656 *	Running Rail
05657	Direct Fixation Rail Fasteners
05658	Track Appurtenances and Other Track Material
05659	Special Trackwork
05660	Restraining Rail and Lubricators
05661	Contact Rail and Appurtenance for Traction Power
05662	Embedded Track Construction
05663	Field Rail Welding
06130	Timber Ties
13115	Corrosion Control System Testing
16060	Grounding and Bonding
16127	Contact Rail System Installation
16979	ATC – Surface Trench

* See revised version included in 65% Design Submittal, dated 10/6/06

C2
Wiehle Parking Garage

Scope of Work

The Subcontractor shall design, furnish, and install a new parking garage structure associated with the Wiehle Avenue Station. The basic layout, dimensions, and finishes of the parking garage shall be as shown on the 100% PE drawings. Improvement to the layout may be considered during the design process, subject to Owner approval.

The Subcontractor must obtain permits to design and construct the facility and obtain the Final Occupancy/Use Permit for the facility.

Subcontractor will be provided a cleared and grubbed property up to 5 feet outside the foot print of the outer edge of the structure currently defined in the 100% PE drawings. The Subcontractor will be responsible for all construction activities within the limits of the described property required to provide a complete, turn-key facility, except as described under Work Not Included. Utilities serving the parking garage will be brought (by others) to the edge of the property defined above. The Subcontractor is responsible for the tie-in of all utilities.

The Subcontractor designs shall conform to all applicable federal, state, county, city, local codes, standards, laws, rules, ordinances and regulations of the authorities having jurisdiction over the site and as specified in the contract documents. Submittal requirements include, but are not limited to:

1. Design progress deliverables as described in contract documents.

2. Documentation required for permitting

3. Final design documents.

4. Erection plan and procedures shall be signed and sealed by a Professional Engineer licensed in the Commonwealth of Virginia.

5. Construction Schedule.

6. Record Deliverables in accordance with the requirements of the Design-Build Contract, Division 01.

7. The scope of work includes coordination of the work with the other contractors working in the areas, in the facility and with government agencies having jurisdiction over the area of work.

Work Not Included

The following are not included in the scope:

1. Fare collection system
2. Elevator equipment
3. Escalator equipment
4. Fire suppression system
5. Remote indication and control of facilities
6. Security
7. Fire intrusion / alarm (FIA)
8. Garage Emergency Telephone System (GETS)
9. Public address
10. Carrier Transmission System (CTS)
11. Closed Circuit Television (CCTV)

Specifications

Unless noted otherwise, the following specifications reflect the versions identified in the Addendum to the WMATA Standard Technical Specifications, 100% PE Design Submittal (February 2006).

Spec No.	**Specification Title**
Division 2	
02205	Removal and Restoration of Existing Facilities
02220	Demolition
02230	Site Clearing
02240	Dewatering
02260	Support of Excavation
02270	Maintenance, Support and Restoration of Utility Facilities
02320	Grading, Excavation and Backfilling
02460	Piles
02461	Concrete Drilled Piers
02515	Water Distribution System

02535	Sanitary Sewerage
02585	Underground Electrical and Communications Distribution Systems
02635	Storm Sewer
02765	Pavement Markings
02772	Curbs, Gutters and Walks
02820	Fencing
02920	Topsoil, Seeding and Sodding
02930	Landscaping

Division 3

03100	Concrete Formwork
03200	Concrete Reinforcement
03300	Cast-in-Place Structural Concrete
03331	Cast-in-Place Architectural Concrete
03400	Structural Precast Concrete
03415	Prestressed Concrete
03450	Plant-Architectural Precast Concrete

Division 4

04050	Mortar, Grout and Masonry Accessories
04215*	Brick Masonry
04220	Concrete Unit Masonry

Division 5

05500	Miscellaneous Metal
05511	Metal Stairs
05521*	Handrails and Railings
05705*	Woven Metal Mesh
05810	Expansion Joint Cover Assemblies
05811	Expansion Joint Systems

Division 6

06100	Rough Carpentry

Division 7

07110	Dampproofing
07125	Membrane Waterproofing
07165	Metallic Waterproofing
07180	Traffic Coatings
07210	Building Insulation
07411	Sheet Metal Roofing Systems
07515	Built-up Roofing
07600	Flashing and Sheet Metal
07815	Sprayed Fireproofing
07841	Firestopping
07900	Seals and Sealants

Division 8	
08110	Hollow Metal Doors and Frames
08410	Aluminum Entrances and Storefronts
08710	Finish Hardware
08800	Glass and Glazing
Division 9	
09320	Ceramic Tile
09511	Acoustical Panel Ceilings
09650	Resilient Flooring
09920	Field Painting
Division 10	
10200	Metal Louvers
10430	Specialty Signs
10810	Toilet Accessories
Division 11	
11150	Parking Access and Revenue Control
11156	Electronic Parking Meters
11170	Cashier Control Booth
Division 13	
13125	Parking Control Booth
13905	Fire Protection, Suppression and Alarm
Division 15	
15070	Vibration Isolation
15075	Identification Of Mechanical Equipment And Piping
15080	Insulation
15135	Miscellaneous Pumps
15205	Piping Systems
15410	Plumbing Fixtures
15480	Domestic Water Heaters
15725	Ventilating Units and Heating Equipment
15735	Self-Contained Air Conditioning Units -Packaged
15737	Air-Cooled Split-System Air Conditioning Units -Air Cooled Split System
15765	Heating Equipment
Division 16	
16060	Grounding And Bonding
16120	Wire, Cable And Busways

* See revised version included in 65% Design Submittal, dated 10/6/06

C3
Station Finishes & Mechanical, Electrical, and Plumbing

Scope of Work

Furnish all plant, labor, materials, tools, supplies, equipment, hoisting services, transportation, supervision, and services, and perform all operations necessary and required to satisfactorily complete the work, which shall include, but not be limited to, the activities described below. The basic layout, dimensions, and finishes of the stations, remote buildings, and tunnel/vent structures shall be as shown on the 100% PE drawings and as modified by:

1. Open Item A-02, deleting TPSS #9.

2. Open Item A-19, adding a second elevator at the noted entry pavilions.

3. Open Item A-26g, revising the WMATA lighting criteria.

4. Open Item A-28a, addressing bathroom facilities at stations.

5. Open Item A-29, providing an elevated mezzanine at the Tysons Central 123 station.

6. Open Item A-30, widening the pedestrian bridges.

7. Open Items 55-63, extending the length of the station canopies.

These changes have been documented as part of the Open Items packages, Volume III – Basis of Open Items Pricing (FFP) dated February 8, 2007.

A. General

All of the listed work will be included within this scope. Items to be furnished and installed include:

- Electrical
- Mechanical
- Granite/Concrete paver and ceramic tile
- Masonry
- Structural Steel
- Ornamental metals and miscellaneous metals
- Fireproofing
- Roofing (Metal and SSM roof)
- Roofing (Membrane roof)
- Ceilings
- Overhead doors
- Glass and skylights
- Signage

- Louvers (Vent stacks)
- Painting
- Drywall
- Monorails
- Precast (Architectural concrete panel)
- Ductal cladding(Ultra high performance concrete)
- Site furnishings (Doors, benches and trash cans)

The above listed scope of work includes, but may not be limited to the following items, identified by CSI division:

Division 2
- Bicycle racks
- Bicycle lockers
- Trash cans
- Benches
- Bollards

Division 3
- Precast concrete cladding
- Concrete floor deck (pedestrian bridges)
- Precast concrete walls, parapets, stairways, and coping
- Precast ceiling panels (TPSS rooms)
- Remote buildings -Footing, slabs and all associated reinforcement materials

Division 4
- Masonry block
- Brick
- Granite trim

Division 5
- Roof and floor metal decking
- Steel mezzanine and platform canopies
- Service room roof framing
- Curtain wall support steel
- Pavilion framing
- Bus canopy
- Miscellaneous metals
- Expansion joints
- Aluminum shading fins (pavilions)
- Stainless steel, including platform canopy roof edge , escalator and elevator cladding, woven mesh (scrim – walls, railings, and ceiling), and handrails

Division 6
- Protective covers (for escalators during construction)
- Cabinets

Division 7
- Mezzanine and platform canopy roofing system - densdeck, insulation, metal
- Roofing
- Built up membrane roofing
- Gutters and downspouts
- Caulking
- Pavilion and bus canopy roofing system
- Roof and access hatches
- Fireproofing

Division 8
- Glass / window walls
- Elevator glass
- Skylights
- Glazed screen
- Glass doors
- Hollow metal doors
- Overhead doors
- Soffit screen
- Louvers

Division 9
- Granite flooring
- Ceramic tile
- Porcelain tile
- Vinyl tile
- Suspended acoustical tile ceiling system
- Suspended metal tile ceiling system
- Perforated metal ceiling system
- Painting

Division 10
- Bathroom accessories
- Seating benches
- Signs and identification devices

Division 13
- Station manager kiosks
- Windscreens
- Parking control booths

Division 15

- Fans
- Unit heaters
- Wall heaters
- Ventilation units
- Air conditioning units
- Air conditioning systems
- Dampers
- Drains
- Oil water separators
- Tanks
- Bathroom fixtures
- Water heaters
- Utility sinks
- Kitchen sinks
- Sump pumps
- Floor drains
- Drain piping system
- Eyewash / body spray stations

Division 16

- Temporary (for construction) service and distribution equipment at West Falls Church Yard and twelve remote buildings, wiring for general lighting, relamping, and power for small tools
- Grounding grids and connections to station and remote building.
- Electrical, TPSS, Communication, ATC and trackwork ductbanks within and stubbed 5' outside the footprint of five stations and twelve remote buildings.
- Manhole and handholes within and stubbed 5' outside the footprint of five stations and twelve remote buildings.
- Touchup paint for electrical equipment.
- Access panels.
- Sealing for raceways.
- Starters and disconnect switches (loose).
- AEMS RTU's and interface cabinets for stations, including connecting conduit, wire, and connectors.
- DTS interface cabinets for stations, including conduit, wire, and connectors needed to connect to DTS RTU's.
- Exposed conduit and cable tray.
- Power distribution equipment, except (1) UPS and battery systems for TPSS and TBS and (2) ATC TCR and RTC power distribution normal and emergency power disconnect switches.
- Lighting and controls, except (1) ETS blue lights and associated wiring and (2) Flood lights at track switches.
- Wiring devices.
- Power feeder and single point connection for mechanical equipment.
- Mounting strut in under platform plenums.

- Normal and emergency power feeder to elevator disconnect switch.
- Normal and emergency power feeder to escalator disconnect switch.
- Power feeder to kiosk panel board.
- Automatic Fare Collection under floor duct and associated electrical room panelboards.
- Power feeder and single point connection to piping heat tracing controls
- Power feeder and single point connection to miscellaneous equipment including Lighted signage, windscreens (platform and site), map cases, and lighted handrails

The scope of work includes coordination of the work with the other contractors working in the areas and with the government agencies having jurisdiction over the area of work.

Working sessions with Contractor construction and planning staff to establish constructability and schedule planning. Such discussions shall include interfacing and coordination planning with other work, labor resources, equipment resources, estimated durations for each sequence of work, and exchanging ideas for execution of the work.

B. Stations

The limits of the work area for the stations are defined by the station platform area, including the service room areas (typically located at each end of the platform), the mezzanine areas, the pedestrian bridges and associated entrance pavilions as shown
on the 100% PE drawings.

Architectural finish / structural work:

- Platform and/or mezzanine canopies
- Roof joists
- Miscellaneous metals, including stairs, handrails and railings
- Ornamental metals
- Expansion joint systems
- Roofing and flashing
- Firestops and fireproofing
- Stud walls
- CMU walls
- Windows and associated hardware
- Skylights, glass and glazing
- Doors and associated hardware
- Field Painting and coating
- Ceiling systems
- Tile and floor systems
- Louvers / screens
- Toilet partitions and accessories
- Platform and site furnishings (including Bus kiss-n-ride lots)
- Signage

Mechanical:

- Heating and cooling equipment and systems, including associated ductwork and related systems, including power connection
- Balancing and testing of systems
- Piping, and associated plumbing fixtures
- Clean Agent FM-200 Fire Suppression System for truss area of in-station escalators for all five (5) stations (note modifications defined in Open Item A-26b).

Electrical:

- Electrical and lighting systems
- Embedded conduits within the structures and slabs are part of this scope

C. Remote TPSS, TBS, and TCR Buildings

Furnish complete, to include applicable items listed under Section B (Stations) above. In addition, work to include conduits within the slab or penetrating thru the slab to serve Traction Power and Train Control Rooms are part of this scope. Sites for the remote structures are to be rough graded by others. However, final leveling of the building pad (up to 5' outside the structure) is included in this scope.

D. Tunnel and Vent Structures

- Ventilation finishes complete at the east and west tunnel portals.
- Tunnel mechanical and electrical building systems complete for east and west tunnel portals.
- Tunnel electrical and lighting System (does not include traction power).
- All signage for the associated portals.

E. Submittals

The Subcontractor will provide design review, testing, and inspection submittals in accordance with the requirements of Division 01 of the Contract.

Work Not Included

1. The station and ventilation buildings main structural systems.

2. Supply and installation of fire suppression system equipment.

3. Communication, Security, Automatic Train Control or Traction Power Supply systems.

4. Traction Power and Train Control, including such installation in the remote TPSS and TBS buildings.

5. Fare Collection Equipment

Specifications

Unless noted otherwise, the following specifications reflect the versions identified in the Addendum to the WMATA Standard Technical Specifications, 100% PE Design Submittal (February 2006).

Applicable specifications are listed below:

Spec No	Specification Title
Division 2	
02205	Removal and Restoration of Existing Facilities
02220	Demolition
02230	Site Clearing
02320	Grading, Excavating and Backfilling
02585	Underground Electrical and Communications Distribution Systems
02871	Bicycle Racks and Storage Lockers
Division 3	
03100	Concrete Formwork
03200	Concrete Reinforcement
03300	Cast-in-Place Structural Concrete
03331*	Cast-in-Place Architectural Concrete
03400	Structural Precast Concrete
03415	Prestressed Concrete
03450*	Plant – Architectural Precast Concrete
03455*	Ultra High Performance Concrete
Division 4	
04050	Mortar, Grout And Masonry Accessories
04215*	Brick Masonry
04220	Concrete Unit Masonry
04415	Granite
Division 5	
05120	Structural Steel
05122	Architecturally Exposed Structural Steel
05210	Steel Joists
05310*	Metal Decking
05400*	Cold Formed Steel Framing
05500*	Miscellaneous Metal
05511	Metal Stairs
05521	Handrails And Railings
05531	Gratings And Floor Plates

05581	Formed Metal Fabrications – Station Kiosks
05700*	Ornamental Metals
05705*	Woven Mesh Panels
05725*	Stainless Steel Handrails, Guardrails and Lighted Handrails
05810	Expansion Joint Cover Assemblies
05811	Expansion Joint Systems

Division 6

06075	Wood Preservative Treatment
06100	Rough Carpentry
06402	Interior Architectural Woodwork

Division 7

07110	Damp Proofing
07125	Membrane Waterproofing
07165	Metallic Waterproofing
07180	Traffic Coatings
07210	Building Insulation
07410*	Metal Wall and Roof Panels
07411	Sheet Metal Roofing Systems
07515	Built Up Roofing
07553	Self-Adhering Modified Bituminous Membrane Roofing
07600	Flashing and Sheet Metal
07730	Roof Accessories
07812	Cementitious Fireproofing
07815	Sprayed Fireproofing
07841	Fire Stopping
07900	Seals And Sealants

Division 8

08110*	Hollow Metal Doors And Frames
08305	Access Doors And Frames
08331*	Overhead Coiling Doors
08334	Overhead Coiling Grilles
08410*	Aluminum Entrances And Storefronts
08481	Metal Concave Mandoors
08520*	Aluminum Windows
08625	Metal Framed Skylights
08710*	Finish Hardware
08800*	Glass And Glazing
08900	Aluminum Curtain Wall

Division 9

09205	Furring And Lathing
09215	Plaster Systems
09220	Cement Portland Plaster

09255	Drywall Systems
09320	Ceramic Tile
09340*	Paver Tile
09511	Acoustical Panel Ceilings
09547*	Metal Ceiling Panels
09650	Resilient Flooring
09920	Field Painting
Division 10	
10155	Toilet Partitions, Compartments And Screens
10200	Metal Louvers
10290	Bird Control
10430	Specialty Signs
10431	Site Pylon Signs
10505	Metal Lockers
10605	Wire Mesh Partitions
10810	Toilet Accessories
10815*	Station Furnishings
Division 11	
11010	Roof Anchors
11014	Fall Protection Equipment
Division 13	
13085	Sound and Vibration Isolation Pads
13110	Stray Current and Cathodic Protection
13115	Corrosion Control System Testing
13905	Fire Protection, Suppression and Alarm
Division 14	
14200	Hydraulic Elevators
14220	Holeless Hydraulic Elevators
14240	Traction Elevators
14300	Heavy-Duty Escalator
Division 15	
15070	Vibration Isolation
15075	Identification Of Mechanical Equipment And Piping
15080	Insulation
15125	Piping Conduit
15135	Miscellaneous Pumps
15205	Piping Systems
15410	Plumbing Fixtures
15444	Drainage Pumping System
15445	Sewage Ejectors
15480	Domestic Water Heaters
15725	Ventilating Units And Heating Equipment

15735	Self Contained Air Conditioning Units -Packaged
15736	Kiosk Mechanical Work
15737	Air Cooled Split System Air Conditioning Units -Air Cooled Split System
15765	Heating Equipment
15810	Ductwork
15825	Sound Attenuators
15830	Fans
15850	Outlets And Grilles
15865	Filters
15900	Control Equipment
15950	System Balancing And Testing

Division 16

16060	Grounding and Bonding
16120	Wire, Cable and Busways
16125	Wire Connection Accessories
16130	Raceways, Boxes And Cabinets
16145	Wiring And Control Devices
16220	Emergency Standby Generator System
16225	Motors
16260	Uninterruptible Power System
16270	Transformers
16320	High Voltage Switchgear
16360	Unit Substations
16425	Motor Starters and Control Centers
16435	Low Voltage Switchgear And Switchboard
16440	Circuit Breakers, Panelboards and Load Centers
16441	Drainage and Negative Switchboard
16451	Substation Busway for Traction Power
16525	Lighting Fixtures and Mounting Poles
16565	Flashers And Dimmer Control Systems
16601	Automated Energy Management System (RTU Interfaces)
16704	Communications Standard Specifications -Installation
16705	Communications Standard Specifications – Equipment & Material
16710	Communications Grounding
16715	Communications Electrical Power Distribution
16721	Communications Telephone System
16729	Communications – Passenger Information Display System
16820	Communications – Public Address System
16851	Communications – Passenger Station Closed-Circuit Television System
16866	Interface Criteria and Responsibilities
16941	Basic ATC Electrical and Electronic Component Requirements

* See revised version included in 65% Design Submittal, dated 10/6/06

C4
West Falls Church Yard Sound Cover Box
and Covered Walkway

Scope of Work

The Subcontractor shall design, furnish, and install a sound cover box and covered walkway in the West Falls Church yard. The basic layout, dimensions, and finishes of the cover box and walkway shall be as shown on the 100% PE drawings. Improvement to the layout may be considered during the design process, subject to Contractor approval.

A. General

The Subcontractor shall include the complete design and construction of the structural elements/features of the "sound cover box and covered walkway" associated with the Project at the West Falls Church yard including, but not limited to, the following components:

- Design calculations
- Shop drawings
- Steel Fabrication
- Delivery
- Erection
- Fire Suppression System
- Columns foundation
- Base plates
- Columns, girts and headers
- Steel roof Trusses and bar joists
- Roof Deck
- Shop or Field Painting of metal parts
- Standing seam metal roof
- Metal siding walls
- Access doors and fenestration
- Sound insulation
- Lighting and grounding
- Grading
- Covered Walkways at 8 storage tracks

The Subcontractor shall prepare any drawings and/or documents required for any building permits. The design scope of work shall include, but not be limited to, design engineering services required to produce the following deliverables:

- Preliminary and Final Design Drawings
- Construction Drawings
- Construction Specifications
- Supporting Documents and/or Reports
- Record Deliverables

The Subcontractor designs shall conform to all applicable federal, state, county, city, local codes, standards, laws, rules, ordinances and regulations of the authorities having jurisdiction over the site and as specified in the contract documents.

Covered Walkway at Operations and Field Base Building - Subcontractor is to include the extension of the covered walkway to serve the additional eight storage tracks. This design will match the existing walkway and cover. The walkway space required is as shown on Drawings K99-S-300, 301, and 302

B. Construction

The construction work includes furnishing all permits, plant, labor, materials, tools, supplies, equipment, transportation, supervision, and services (excepting material and equipment identified under Work by Others below), and perform all operations necessary and required to install, where called for on the plans, those elements specified on the final design documents. All work will be in accordance with the requirements in the Design-Build Contract, Division 01.

Work Not Included

Relocation of existing train signals, track heater boxes and light poles
Clearing and backfill leveling to grade elevation of 3 acre area for staging of the construction
Demolition of existing sound walls to make room for the new Sound Cover Box Specifications

Specification

Unless noted otherwise, the following specifications reflect the versions identified in the Addendum to the WMATA Standard Technical Specifications, 100% PE Design Submittal (February 2006).

Applicable specifications are also included as part of this document:

Spec No.	Specification Title
02320	Grading, Excavating and Backfilling
03000	Concrete
03100	Concrete Formwork
03200	Concrete Reinforcement
03300	Cast-in-Place Structural Concrete
05120	Structural Steel
05210	Steel Joists
05310	Metal Decking
07210	Building Insulation
07410	Metal Wall Panels
07600	Flashing and Sheet Metal
07730	Roof Accessories

07900	Seals and Sealants
08110	Hollow Metal Doors and Frames
08710	Finish Hardware
13905	Fire Protection, Suppression and Alarm
16060	Grounding and Bonding
16120	Wire, Cable and Busways
16125	Wire Connection Accessories
16130	Raceways, Boxes and Cabinets
16145	Wiring and Control Devices
16270	Transformers
16440	Circuit Breakers, Panelboards and Load Centers
16525	Lighting Fixtures and Mounting Poles
16701	Definitions of Communications System Terms
16702	Communications Abbreviations
16703	Communications Standard Specifications–Engineering Services
16704	Communications Standard Specifications-Installation
16705	Communications Standard Specifications–Equipment & Material

C5
Pedestrian Bridges

Scope of Work

The Subcontractor shall design, furnish and erect pedestrian bridges of steel construction. The following scope describes the minimum standards for design and construction. The basic layout, architectural and preliminary designs, and dimensions of the bridges shall be as shown on the 100% PE drawings and as modified by:

Open Item A-30, widening the pedestrian bridges.

These changes have been documented as part of the Open Items packages, Volume III – Basis of Open Items Pricing (FFP) dated February 8, 2007.

A. General

The limits of the work area will be defined by the length of the spans at the locations presented on the referenced drawings. The scope of work includes coordination of the work with the other contractors working in the areas and with the government agencies having jurisdiction over the area of work.

The Subcontractor will provide input on constructability and phasing of the work during the detailed design phase of the Project, in an effort to complete the work in a timely manner. The Subcontractor must prepare an execution plan for its work and provide input to the overall Project execution plan.

The Subcontractor will furnish all plant, labor, materials, tools, supplies, equipment, transportation, supervision, and services, and perform all operations necessary and required to satisfactorily complete the work, which shall include, but not be limited to, the following activities for each of the pedestrian bridges:

B. Pedestrian Bridge Components

- Steel Box Truss (including “nodes”)
- Continuous Roof Edge Channels
- Roof Deck
- Floor Deck
- Base plates, Truss to Concrete Support assembly including Expansion Joints as required and Anchor Bolts
- Conduit and piping below floor deck (install only)

C. Construction

- Fabrication
- Delivery
- Erection, including Cranes and Rigging Equipment
- Temporary permits
- MOT for the work performed

D. Submittals

Submittal requirements include, but are not limited to:

- Final design drawings, calculations, shop drawings including schematic drawings and diagrams shall be submitted. Schematic drawings shall include dimensioned cross sections of bridge structure, deck plan and details, support system for metal roof, bearings, anchor bolt reactions and elevations.
- All final design drawings and calculations shall be signed and sealed by a Professional Engineer licensed in the Commonwealth of Virginia.
- Erection plan and procedures
- Record Deliverables

Work Not Included

1. Architectural finishes, including station signage.

2. Mechanical, Electrical, and Plumbing, including supply and installation of fire suppression systems.

3. Foundations.

Specifications

Unless noted otherwise, the following specifications reflect the versions identified in the Addendum to the WMATA Standard Technical Specifications, 100% PE Design Submittal (February 2006). Applicable specifications are also included as part of this document:

Spec No.	**Specification Title**
5120	Structural Steel
5210	Steel Joists
5310*	Metal Decking
5500*	Miscellaneous Metal
5811	Expansion Joint Systems
5840	Bearings
7411	Sheet Metal Roofing Systems
7730	Roof Accessories

7900	Seals and Sealants
9920	Field Painting

* See revised version included in 65% Design Submittal, dated 10/6/06

C6
Site Development

Scope of Work

The scope includes: civil/site (roadwork), street lighting, permanent traffic signals and landscaping. The civil/site work associated with this Allowance Item includes the following areas:

- All roadwork with the exception of restoration and paving of the DIAAH/DCR and DTR;
- Site work and access roads to remote buildings;
- Work along the Route 7 and Route 123 Corridors (to include the station parking lots and access roads);
- Wiehle Avenue Parking lots;
- All site work being performed in the West Falls Church Yard, to include the SWM pond.

The basic configuration of this site development work shall be as shown on the 100% PE drawings and as modified by:

1. Open Item A-02, deleting TPSS #9.

2. Open Item A-07, modifying the requirement for emergency crossings along the DIAAH.

3. Open Item A-08, modifying the horizontal alignment along the DIAAH.

4. Open Item A-11, providing mid-block pedestrian crossings on Route 7.

5. Open Items A-12 and A-16, providing Route 7 streetscaping and lighting.

6. Open Item A-13, widening Spring Hill Road.

7. Open Item A-15, modifying the Wiehle Avenue bus ramp.

8. Open Items A-19, modifying the provisions for elevators at some station pavilions.

9. Open Item A-31, modifying screening for SWM pond, TPSS, and other wayside structures.

10. Open Item DTE 1/O-12, widening sidewalks along Route 123.

11. Open Items VDOT Dev 97 and DCR, modifying the Route 7 median and DCR NB lanes.

These changes have been documented as part of the Open Items packages, Volume III – Basis of Open Items Pricing (FFP) dated February 8, 2007.

The Subcontractors will be required to furnish all plant, labor, materials, tools, supplies, equipment, transportation, supervision, and services, and perform all operations necessary and required to

satisfactorily complete the work in the assigned areas, which shall include, but not be limited to, the following:

- Construction survey and layout of the work (survey monument will be provided)
- Demolition of pavement and structures
- Clearing and grubbing
- Grading and drainage (including Water Quality Inlets and sand filters/BMPs)
- Storm water management during construction
- Sediment and Erosion control measures
- Rough grading
- Replacement of street lighting (including temporary lighting, relocation and new installation)
- Intersection signal lights (temporary and permanent)
- Roadway subgrade preparation
- Temporary and Permanent Pavement (including Roadways, Park & Ride/Kiss & Ride Lots, TPSS/TBS and Station Area Access Roads, Restoration and modifications to existing roads, Bus Bay Areas, and Bus Access Ramps)
- Curb and Gutter including entrances
- Sidewalks
- Pavement Marking
- Earthwork – Mass excavation and mass fill, including hauling, stockpiling and disposal of spoil material
- Temporary and Permanent Road Signage (regulatory, street names and way finding)
- Maintenance of all of the above items during the construction phase
- Temporary traffic barriers (where required)
- Permanent power-operated crossing barriers including power and controls
- Temporary fencing (where needed)
- Landscaping – hardscape: precast pavers, special paving
- Landscaping – planting materials, preparation and installation
- Landscaping – drainage features, rain gardens, drainage rills
- Maintenance of traffic – development of construction sequencing and scheduling associated with the work, and obtaining related permits
- SWM Ponds, drainage structures, related directional boring and outfalls at West Falls Church Yard
- Preparation of construction staging areas associated with the work

The scope of work includes coordination of the work with the other Subcontractors working on other parts of this Project in the same area and with the government agencies having jurisdiction over the area of work or the roadway. The scope also includes coordination of the work with utility companies installing or relocating utilities to serve the Project.

The scope also includes Maintenance of Traffic (MOT) to maintain the flow of existing level of traffic. The MOT work will be limited to that necessitated by the Subcontractor construction activities. In general, the work is being designed and will be constructed to VDOT standards. The scope includes provision for police enforcement of MOT, if required.

Phasing of the work must be planned to maintain traffic movement and access to public and private sites and businesses during construction. MOT plan may require modification to incorporate the construction of tracks, stations and supporting facilities. Phasing and MOT work must consider space for all equipment such as cranes, loaders, delivery trucks and other equipment used in assembling the structures and making material deliveries to the construction area of the tracks and the stations.

All permits for road access, construction, and MOT are part of the scope of this subcontract. Construction phased MOT and intersection signalization submittals for VDOT and Fairfax County review and approval are the part of this scope.

The street lighting is limited to replacement street lights along Route 7 and all other exterior site lighting at stations, West Falls Church yard, remote buildings, and parking areas (as modified by Open Items A-12 and A-16).

The Permanent Traffic Signal subcontract will include all new and replacement traffic signals Project-wide. Similarly, the Landscaping subcontract will apply to all landscape work throughout the Project, to include station areas and guideway segments.

The Subcontractor will provide input on constructability and phasing of the work during the detailed design phase of the Project, in an effort to coordinate and complete the work in a timely manner. The Subcontractor must prepare an execution plan for its work and provide input to the overall Project execution plan.

The scope of work also includes all site development activities in West Falls Church Yard. This includes construction of the detention basin and all site development work extending from the lead track area to the cut & cover tunnel portal to the track storage area and track platform. Specific items include:

- Clearing and grubbing
- Grading, including cut and fill
- Demolition, including fence removal
- Storm drainage system, including abandon, fill and plug, modification, new and jacking, ditches
- Ballast screen inlets
- Roadwork
- Curb and gutter
- Tie-in of existing roads
- Striping and marking
- Traffic signs
- Bollards

Work Not Included

1. Utility relocation – sewers, drain lines, VDOT utilities, concrete ductbanks for electrical and communication services, manholes and handholes, water and fire lines, gas lines and associated facilities, and high voltage lines will be performed by others.

2. Utility feeds – branch lines for water, sewer, electrical or communication lines leading to the stations and facilities will be performed by others.

3. Track, stations and relevant facilities will be constructed by others.

Specifications

Unless noted otherwise, the following specifications reflect the versions identified in the Addendum to the WMATA Standard Technical Specifications, 100% PE Design Submittal (February 2006).

Virginia Department of Transportation, Road and Bridges Specifications of 2002, defined herein as Project specification No. 25071-000-VDOT-SPEC-001, which can be found at the VDOT web site at http://www.virginiadot.org/business/manuals-default.asp, see also attached table of content, will be the basis of the Project specifications.

Additional applicable specifications are also included as part of this document:

Spec No.	Specification Title
02205	Removal and Restoration of Existing Facilities
02220	Demolition
02230	Site Clearing
02260	Support of Excavation
02270	Maintenance, Support and Restoration of Utility Facilities
02320	Grading, Excavating and Backfill
02480	Mechanically Stabilized Earth Walls
02515	Water Distribution
02535	Sanitary Sewers
02585	Underground Electrical and Communications Distribution Systems
02625	Subway Drainage System
02635	Storm Sewer
02765	Pavement Markings
02772	Curbs, Gutters, and Walks
02820	Fencing
02920	Topsoil, Seeding and Sodding
02930	Landscaping

VDOT Roads and Bridge Standards, which can be found at web site http://www.virginiadot.org/business/locdes/road-and-bridge-standards.asp, are considered part of this document.

C7
Installation of Public Art

Scope of Work

In accordance with the guidelines presented in FTA Circular 9400.1A, "Design and Art in Public Transportation Projects". The scope of work is for the installation of artwork provided by others.

Work not Included

The scope excludes the solicitation, selection and awarding commissions to art and design professionals, the artwork, and its delivery to the station locations.

C8
Communication and Security Systems

Scope of Work

The scope of work includes design, furnishing, installation, and testing of the following systems in the Passenger Stations, and/or ancillary facilities, in accordance with the project communications specifications referenced below and the 100% PE drawings and as modified by:

Open Item A-19, modifying the FIA, IIS, Telephone, and CCTV systems.

Open Item DL-2, adding a WMATA LAN/WAN.

These changes have been documented as part of the Open Items packages, Volume III – Basis of Open Items Pricing (FFP) dated February 8, 2007.

General

The Subcontractor will provide a complete operable communications systems meeting all applicable performance and design requirements.

The Subcontractor shall assume total responsibility for the configuration of equipment, parts, interconnecting wiring, software, and other materials and services furnished. The scope of work includes coordination of the work with other Subcontractors working in the vicinity on other parts of this Project and with the government agencies having jurisdiction over the area of work or the existing roadways.

The Subcontractor scope includes:

- Public Address System.
- Closed Circuit Television System for stations and garages.
- Fire and Intrusion Alarm (FIA) System for stations, garages (GETS), ancillary structures, mini communications rooms and all their associated ancillary structures. The Fire and Intrusion System will include the capability to play recorded safety announcements over the Public Address System. A switch will be provided in the Kiosk so that the Station Manager can initiate the automatic announcement(s).
- Telephone System(s) for stations, garages and mini communications rooms. This includes the wayside emergency telephone system (ETS).
- Integrated Intercommunications System (IIS).
- Passenger Information Display (PIDS) System.
- Electrical Power Distribution System.
- Kiosk System.
- Carrier Transmission System (CTS).
- Fiber-Optic System (FOS).
- Mobile Radio System will make use of an Off-The-Air Radio Repeater system to provide Mobile Radio service in the tunnel sections, at stations and the garage.

- SCADA System-covered by the Train Control, Traction Power, Electrical and Mechanical Systems. The Communications Transmission System and Fiber Optics System will be utilized as the backbone for transmission of the data between the field source points and the OCC's (JGB and CTF).
- A 400-line Private Branch Exchange (PBX) (expandable to 1000-lines) is to be installed by the Subcontractor to accommodate the telephone circuits required at the Stations, Ancillary Buildings and the Emergency Trip Stations (ETS) located along the rail right-of-way.

All systems, equipment and services shall perform and be suitable for their intended purpose, in accordance with best commercial practices (as a minimum), and in compliance with all applicable specifications requirements.

Mini-Communications Room Locations

Current design requires seven (7) intermediate "Mini Communications Equipment Rooms" necessary to provide communications circuits for Automatic Train Control Remote Terminal Units and for telephones in ancillary buildings and the Emergency Trip Stations located along the rail right-of-way.

The seven remote "Mini Communications Equipment Rooms" are located at the following locations.

- Next to the Train Control Room K56 (Dulles Junction) Civil Stationing approx. K488+33/N726+60 (N being the new Dulles Route)
- Next to the Train Control Room No. 1 (Plainfield St) Civil Stationing approx. 778+40.
- Next to the Train Control Room No. 2 (Baldwin Drive) Civil Stationing approx. 807+00.
- Next to the Train Control Room No. 9 (Wolf Trap) Civil Stationing approx. 1093+00
- Next to the Train Control Room No. 10 (Chathams Ford Rd.) Civil Stationing approx 1134+00.
- Next to the Train Control Room No. 11 (Hunter Mill Rd.) Civil Stationing approx. 1212+50.
- Next to the Train Control Room No. 12 (Sunset Hill Rd.) Civil Stationing approx. 1250+00.

West Falls Church Yard

The following installation work will be required at the existing West Falls Church Yard:

- Two talk-back stations
- PA speakers for new storage tracks.
- Radiax Antenna for sound cover box. (as required).
- Telephones, FIA and PA Speakers in new Traction Power Substation. Fiber-Optic Cable Installation.
- OC-12 Fiber Optic terminal for CTS channel banks.

Installation of two new 96-Fiber Optical Cables shall be installed from the Wiehle Avenue Passenger Station to the Existing S&I Shop Building Communications Equipment Room and extended to the West Falls Church Passenger Station, using the existing tunnel. At the West Falls Church Station these fibers shall be terminated in two new 96 Fiber-Optic Splice/Patch Panels.

Mobile Radio System Installation

A new mobile radio subsystem will be required to provide and install communications in the tunnel section at Tysons Central 7 Passenger Station. The new mobile radio subsystem will be required to provide for radio communications on 10 WMATA UHF channels, as well as Fairfax County Emergency Services (Fire, Police, and EMS). The mobile radio subsystem will be an "Off-The-Air Radio Repeater System", although alternate solutions could be considered. If testing reveals that the structure has "dead spot" lapses in radio coverage from the existing WMATA simulcast radio system, a similar system may also be required at Stations and the Wiehle Avenue Parking Structure.

Work Not Included

Installation of Fiber-Optic Cable from the West Falls Church Station to the Jackson Graham Building.

Specifications

Unless noted otherwise, the following specifications reflect the versions identified in the Addendum to the WMATA Standard Technical Specifications, 100% PE Design Submittal (February 2006).

Applicable specifications are also included as part of this document:

Spec No.	Specification Title
16700	Communications for Rail Passenger Station Associated Parking Structures
16701	Definitions of Communication System Terms
16702	Communication Abbreviations
16703	Communication Standard Specifications -Engineering Services
16704	Communication Standard Specifications -Installation
16705	Communication Standard Specifications -Equipment and Material
16706	Communication System Submittals and Services
16707	Communications System Quality Assurance and Testing
16708	Correction of Communication Systems Deficiencies
16710	Communications Grounding
16715	Communications Electrical Power Distribution
16721	Communications Telephone System
16728	Communications Integrated Intercommunications System
16729	Communications Passenger Information Display System
16731	Communications Fire and Intrusion Alarm System

16733	Communications Kiosk System
16771	Communications Carrier Transmission System
16774	Local Area Network/Wide Area Network (draft included in DL-2)
16776	Communications Fiber Optic System
16791	Communications Mobile Radio System
16820	Communications Public Address System
16851	Communications Passenger Station Closed Circuit Television System
16866	Interface Criteria and Responsibilities

C9
Fire Suppression System

Scope of Work

Subcontractor shall furnish all plant, labor, materials, tools, supplies, equipment, transportation, supervision, permits, and services, and perform all operations necessary and required to satisfactorily complete the work. The basic layout, dimensions, and finishes of the fire suppression system shall be as shown on the 100% PE drawings and as modified by:

> Open Item A-26b, replacing the FM-200 sprinklers with the dry sprinkler system used by WMATA on escalators.

These changes have been documented as part of the Open Items packages, Volume III – Basis of Open Items Pricing (FFP) dated February 8, 2007.

A. General

The scope of work includes coordination of the work with the other Subcontractors working on other parts of this Project in the same area (such as stations and supporting facilities) and with the government agencies having jurisdiction over the area of work or the roadway. The scope also includes coordination of the work with utility companies installing or relocating utilities to serve the Project.

The Fire Suppression systems, including all Siamese fire-department connections, dry fire line, check valves, automatic air vents, drain valves, angle hose valves, fittings, and signage, shall be in accordance with WMATA Manual of Design Criteria, WMATA Specification 13905, Referenced Drawings, applicable NFPA Standards, including NFPA 130, and local and state Authorities Having Jurisdiction.

The Subcontractor shall provide the following the following:

B. Dry Standpipe System

Provide complete fire suppression system, including final design for the following:

- Station platform areas and fire equipment cabinets located in the five stations, including branches out to the Siamese connections located at station entrances.
- Tunnel between Tysons Central 123 and Tysons Central 7 stations,
- Wiehle Ave parking structure open areas

100% Preliminary Engineering drawings describe the Fire Protection (FP) system as follows:

- FP Riser diagrams show dry standpipe system (w/o depiction of all components).
- FP Plan drawings show dry standpipe system where required. Plan drawings do NOT show branch-off to sprinkler piping. Plans to show Fire extinguisher locations; however

"extinguishers to be furnished and installed by the Authority". The term "Authority" refers to the Washington Metropolitan Area Transit Authority (WMATA).

C. Wet Sprinkler System

Provide complete fire suppression system, including final design for the following:

- Ancillary/service room spaces within the station proper, and
- Wiehle Ave parking structure lower levels (that are sufficiently enclosed along the perimeter wall).

100% Preliminary Engineering Drawings describe the Fire Protection (FP) systems as follows:

- FP Riser diagrams show piping branch-off (from incoming water service) for sprinkler system piping (sprinkler systems not shown in their entirety).
- Rooms requiring sprinkler coverage include the Cleaner's Room; Toilet Rooms and all ancillary rooms used for operational / office areas.

Work not Included

1. Detection and alarming devices and associated devices and appurtenances.

2. Intrusion detection and associated devices and appurtenances (i.e. intrusion of fire equipment cabinet)

3. WFC Yard Track Loop Enclosure and S&I Building Fire Suppression Systems

Specifications

Unless noted otherwise, the following specifications reflect the versions identified in the Addendum to the WMATA Standard Technical Specifications, 100% PE Design Submittal (February 2006).

Applicable specifications are also included as part of this document:

Spec No.	Specification Title
13905	Fire Protection, Suppression and Alarm

C10
Elevators and Escalators

Scope of Work

Furnish all plant, labor, materials, tools, supplies, equipment, hoisting services, transportation, supervision, and services, and perform all operations necessary and required to satisfactorily complete the work, which shall include, but not be limited to, the activities described below. The basic layout, dimensions, and finishes of the elevators and escalators shall be as shown on the 100% PE drawings and as modified by:

1. Open Item A-19, adding a second elevator at the noted entry pavilions to satisfy ADA guidelines.
2. Open Item A-29, providing an elevated mezzanine at the Tysons Central 123 station.

These changes have been documented as part of the Open Items packages, Volume III – Basis of Open Items Pricing (FFP) dated February 8, 2007.

A. General

All QA/QC requirements stated in the specifications are included in this Scope of Work.

The scope of work includes coordination of the work with others working on other parts of this Project in the same area and with the government agencies having jurisdiction over the area of work or the roadway.

Interfacing and coordination planning with other work, labor resources, equipment resources, estimated durations for each sequence of work, and exchanging ideas for execution of the work.

B. Elevators

1. Hydraulic

Design, furnish, and install complete hydraulic passenger elevator systems including elevator cars, hoistway equipment, hydraulic piping, valves, cylinders, machinery, control systems, indicators, signs, elevator pit ladders and finish work in the vicinity of the hoistway doors as shown on the Contract Drawings and as specified.

Note: This specification is applicable for both types of hydraulic elevators, except that there are no jacks and pistons, and related components, for the holeless elevators.

2. Traction

Design, furnish, and install complete traction passenger elevator systems including elevator cars, hoistway equipment, machinery, control systems, indicators, signs, elevator pit ladders and finish work in the vicinity of the hoistway doors as shown on the Contract Drawings and as specified.

C. Escalators

Provide complete design, fabrication, and installation of heavy-duty escalators, designed specifically for heavy rail transit system use. The location, quantity, sizes, and types of escalators to be used, and various other work required, shall be as shown on the Contract Drawings and as specified.

Work Not Included

Elevators

- Earthwork for excavation to accommodate plunger-cylinder assembly (does not apply to Traction Elevators)
- Cast-in-place Concrete for elevator pits and grating sills
- Concrete Formwork for hydraulic elevator cylinder wall casing
- Unit Masonry for masonry hoistway enclosures, building in and grouting hoistway door frames and grouting sills
- Metal Fabrications for divider beams and supports for entrances and guide rails
- Waterproofing for water proofing of elevator pit
- Fire suppression system
- Heating, ventilating and/or air conditioning of elevator machine room.
- Electrical service to elevator equipment, fire alarm systems and communications systems
- Hoist beam
- All remote conduit and cabling for AEMS system, including to the AEMS RTU location
- Grounding buss bars in each machine room and pit
- Disconnect switches for car lights and mainline power, circuit breakers and panelboards, and pit receptacles and lights
- Temporary protection of doorways

Heavy-Duty Escalators

- Cast-in-place Concrete for setting sleeves, inserts and anchorage devices to concrete.
- Structural Steel for attachment plates, angle brackets and other preparation of structural steel to support escalator trusses.
- Access Doors and Frames for wall and ceiling access panels and access doors in escalator enclosures.
- Electrical service to escalators.
- Exterior cladding work on the escalators

- Fire suppression system
- Temporary protective structure and covering for the escalators

Specifications

Unless noted otherwise, the following specifications reflect the versions identified in the Addendum to the WMATA Standard Technical Specifications, 100% PE Design Submittal (February 2006).

Applicable specifications are also included as part of this document:

Spec No.	Specification Title
14200	Hydraulic Elevators
14220	Holeless Elevators
14240	Traction Elevators
14300	Heavy Duty Escalator

NOTE: Elevator and Escalator layouts for Electrical work for Tysons West and Tysons Central 123 stations are similar to Wiehle Avenue station layouts (Drawings N13-E-501 and N13-E-502).

C11
Spare Parts

Scope of Work

The requirements for spare parts are provided in the Design-Build Contract, Division 01, Section 01210.

C12
WFCY-01 Addition to the S&I Building

Scope of Work

During Preliminary Engineering, the S & I Building expansion was eliminated from the Project Scope of Work shortly after issue of the 50% PE plans (composite ~15% of final design). The S&I Building expansion has now been reinstated into the Project scope of work as defined in Open Item Package WFC-01, Volume III – Basis of Open Items Pricing (FFP) dated February 8, 2007.

A. General

The scope of work is to design, furnish, and construct an expansion to the existing WMATA West Falls Church S&I Building. This scope of work describes the design features of the expansion.

B. Mechanical and Equipment

The expansion will add eight 25-ton truck and body hoists for repair of four married pairs of railcars. The hoisting equipment is located in a pit under the operating floor tracks at an elevation which matches the basement of the existing building. One 25 Ton Bridge Crane will serve the building expansion. Five turntables are provided to facilitate the movement of railcar trucks to the repair area in the existing facility. One of these five turntables is located in the existing building.

The building expansion will be heated using electric heaters and will be ventilated similar to the existing facility. The fire suppression system will be extended to cover the partial basement, the tunnel that brings delivery trucks to the basement level at the west end of the facility, and the operating floor. An FM200 system will be provided to serve the AC Switchboard room in the roof level penthouse. The existing compressed air system will be extended into the new expansion area. Plumbing will be provided for roof and floor drains. No new restroom facilities are planned for the expansion.

C. Structural and Architectural

The expansion will abut the existing S&I Building. Two new roll-up doors will be installed where louvers currently exist. In addition, two new personnel doors will also be installed. Other than these doors, the existing exterior wall will be left in tact to allow the facility to continue to operate while construction is going on.

The building will be a 50 foot by 400 foot facility with a partial basement and a penthouse room to house the AC Switchboard equipment. The existing dock in the basement will be maintained for truck deliveries. A ramp and tunnel on the west side of the building will provide access to the dock. Pits will be constructed in the basement to house the hoist equipment. A walkway along the north side of the basement will be provided for personnel and maintenance access.

The exterior of the building will be concrete block with a brick facade to match the existing structure. The roof will be a single ply membrane type roof to match the existing building's recent

reroofing. Skylights will be provided in the expansion roof. Maintenance stairways and ladders will be provided to the roof. There is no plan to retrofit the existing portion of the building for ADA compliance or modernization. No new operator or craft locker rooms, toilet facilities or lunch rooms have been included.

The building will have a cast-in-place concrete basement with a steel frame above the operating floor. The building foundations will be pile supported in order to minimize settlement with the existing building. The current arrangement has track crossing the building joint with the existing building. It is expected that support of the hoist equipment will be integral with the floor and will also have piling for support.

A retaining wall will be provided to allow for the roadway relocation, resulting in extensive grading work. This retaining wall will be approximately 600 feet long and 21 feet high at its tallest point

D. Civil

The expanded building will be constructed in the middle of the existing roadway. This will require relocation of utilities which will be performed by others. The location also requires the relocation of the roadway to the south of the existing roadway, including a sidewalk along the south side of the expanded building and a storm drainage system for the roadway. A portion of an existing storm drain which enters the south side of the WFC Shop & Yard site may need to be relocated to allow the construction of this retaining wall.

The roadway at the west end of the expansion will be modified to allow trucks to turn around to back down the ramp and into the tunnel.

Twelve new parking spaces will be provided adjacent to the Salt Dome for added personnel at the WFC Shop & Yard from the Project.

The current fence will be extended around the new retaining wall on the south side of the property.

E. Trackwork

Two new tracks will be added to serve the expansion. This work is excluded from this scope of work for the Shop Building expansion. It is included with the Addenda to the Trackwork Installation Scope of Work.

F. Traction Power

The new expansion will require DC Traction power to the new track outside the building that will be provided through the yard traction power distribution system, and to the stinger and contactor systems for the purpose of movement and testing/inspect of the rail cars within the expansion. The existing 2MW substation will be replaced with a 3MW substation in the basement of the existing S&I Building and a new DC switchboard will be installed to supply power to the stingers and contactor system. New wiring will be routed to the stinger system and to the DC power outlets on the operating floor of the expansion. The heating system will be provided for two new tracks.

Two DVP manholes will be relocated by others to make room for the new expansion.

G. Electrical

A new AC Switchboard room will be provided in a penthouse on the roof at the west end of the expansion. 34.5 kV service will be fed to this room from the existing AC Switchboard room in the basement of the existing S&I Building. AC power will be fed to the Motor Control Centers that house the starters for the process equipment and the other mechanical equipment. The new expansion will include lighting similar to the existing building and will have AC power outlets per code.

H. ATC / Communications

The expansion will include the modifications to the Automatic Train Control signaling system for the new track switches, signals, snow-melting equipment, and track circuits.

The communications systems such as PA, telephone and fire alarm that serve the existing building will be extended to cover the expansion.

I. Geotech

The Contractor will perform additional soils borings to confirm the soils conditions in the area of the building expansion and the retaining wall. Final design of the foundation systems for both areas will be determined after the results of the soils borings are available.

J. Permits

The Subcontractor shall be responsible for obtaining all permits necessary to complete this scope of work, including but not limited to all construction activities, fire safety, systems permits, and the occupancy permits required to open and operate the facilities.

K. Construction

The construction work includes furnishing all permits, plant, labor, materials, tools, supplies, equipment, transportation, supervision, services, and perform all operations necessary and required to install, where called for on the plans, those elements specified on the final design documents. All work will be in accordance with the requirements in the Design-Build Contract, Division 01.

Work Not Included

1. Relocation of Utilities

2. New Utility Feeds to S&I Building

Specifications

Unless noted otherwise, the following specifications reflect the versions identified in the Addendum to the WMATA Standard Technical Specifications, 100% PE Design Submittal (February 2006).

Spec No	Specification Title
Division 2	
02220	Demolition
02320	Grading, Excavating and Backfilling
02585	Underground Electrical and Communications Distrib. Systems
Division 3	
03000	Concrete
03100	Concrete Formwork
03200	Concrete Reinforcement
03300	Cast-in-Place Structural Concrete
Division 4	
04050	Mortar, Grout & Masonry Accessories
04215	Brick Masonry
04220	Concrete Unit Masonry
Division 5	
05120	Structural Steel
05210	Steel Joists
05310	Metal Decking
05500	Miscellaneous Metals
Division 7	
07210	Building Insulation
07410	Metal Wall Panels
07553	Self Adhering Modified Bituminous Membrane Roofing
07600	Flashing and Sheet Metal
07730	Roof Accessories
07815	Sprayed Fireproofing
07841	Fire Stopping
07900	Seals and Sealants
Division 8	
08110	Hollow Metal Doors and Frames
08331	Overhead Coiling Doors
08360	Upward Acting Sectional Doors
08625	Metal Framed Skylights
08710	Finish Hardware

Division 9
09920 Field Painting

Division 13
13905 Fire Protection, Suppression and Alarm

Division 15
15075 Identification of Mechanical Equipment and Piping
15080 Insulation
15725 Ventilating Units and Heating Equipment
15810 Ductwork
15825 Sound Attenuators
15830 Fans
15900 Control Equipment
15950 System Balancing and Testing

Division 16
16060 Grounding and Bonding
16120 Wire, Cable and Busways
16125 Wire Connection Accessories
16130 Raceways, Boxes and Cabinets
16145 Wiring and Control Devices
16225 Motors
16270 Transformers
16320 High Voltage Switchgear
16425 Motor Starters and Control Centers
16435 Low Voltage Switchgear and Switchboard
16440 Circuit Breakers, Panel boards and Load Centers
16525 Lighting Fixtures and Mounting Poles
16601 Automated Energy Management System (RTU and Interface)

C13
Traction Power Supply

Scope of Work

The scope of work includes responsibility for design, fabrication, supply, delivery and testing of the Traction Power System (TPS) inclusive of 11 (changed to 10 by Open Item A-02) Traction Power Substations (TPSS), 4 (changed to 3 by Open Item XX-6) Tie Breaker Stations (TBS), improvements to an existing TBS and other associated TPS equipment all in compliance with the specifications referenced below and the 100% PE drawings and as modified by:

- Open Item A-02, deleting TPSS #9.
- Open Item A-08, modifying feeder cable length.
- Open Item DL-3, modifying the WMATA DC Switchgear specification (16341).
- Open Item XX-6, relocating the Wiehle Avenue TPSS and deleting TBS #5.

These changes have been documented as part of the Open Items packages, Volume III – Basis of Open Items Pricing (FFP) dated February 8, 2007.

A. General

Scope includes responsibility for fabrication, delivery of equipment, development of detailed handling, and installation procedures per the integrated design and all training, maintenance and operation manuals for the supplied equipment; support to others during installation and testing of the equipment and during the termination of all wiring to the equipment; and on-site technical assistance services for consultation and monitoring of the work for compliance with the approved installation and handling procedures.

Technical assistance services will be required for the following activities:

- TPSS equipment installation
- TBS equipment installation
- Equipment Control Cable terminations and testing

Subcontractor will perform the following tasks:

- Field testing of the equipment
- Commissioning and startup testing

B. Additional Traction Power Scope of Work

Additional Traction Power material and equipment is to be procured by the Contractor under this scope of work. This includes but is not limited to the following bulk materials required for the Traction Power System installation:

- Conduit and cable trays
- Grounding and Bonding
- Wire and Cable
- 2000V Shielded Cable
- Contact Rail Heating System
- Positive/ Negative Cables, Jumper Cables, contact rail heaters, clips, bolts and other hardware needed to make cable and/or other attachments to the contact rail

Work Not Included

The installation and wiring of the equipment on site will be by others per the installation and handling procedures prepared by the Subcontractor.

Specifications

Unless noted otherwise, the following specifications reflect the versions identified in the Addendum to the WMATA Standard Technical Specifications, 100% PE Design Submittal (February 2006). Applicable specifications included as part of this document:

Spec No	Specification Title
16051	Scope Of Services for Traction Power
16052	Basic Material for Traction Power
16053	Operation and Maintenance Training For Traction Power
16260	Uninterruptible Power Supply
16261	Rectifier Transformer Unit for Traction Power
16270	Transformers
16291	Local Annunciator Panel for Traction Power
16293	Mimic Panel for Traction Power-Storage Yard
16322	High Voltage Ac Switchgear (34.5kv) for Traction Power
16341	Metal Enclosed Dc Switchgear for Traction Power
16440	Circuit Breakers, Panel boards and Load Centers
16441	Drainage and Negative Switchboard for Traction Power
16451	Substation Busway for Traction Power
16601	Automated Energy Management System (RTU and Interface)

C14
Automatic Train Control Supply

Scope of Work

The Scope of Work includes the design, equipment supply, witness, testing and integration for the Automatic Train Control Systems. The design shall be based upon the requirements described in the 100% Preliminary Engineering plans, and Technical Specifications as referenced below. The scope includes:

A. Design

The Subcontractor will be responsible for all aspects of the ATC system design, including:

- Block Design
- Track Circuits, Derails, Signal and Marker Coil Layouts for Mainline and Yard
- Switch Machines for Yard
- Speed Command Control and Software-Vital Processor or relay Based with AF Track Circuits
- Interlocking Control & Operation, Routing & Locking and Software – Vital/Non-Vital Processor Based
- Temporary and Final Staging / Cutover plans for the Orange line interface and West Falls Church Yard, including designing the interfaces at West and East Falls Church Stations (A new TCR will be provided for control of the junction).
- Station Control – STAP, Processor Based
- Remote Terminal Units, Non-vital processor based with TCP/IP protocol, Scan Sheets – SCADA /DTS
- Interlocking Local Control Panels and one (1) dispatchers panel to be located at Wiehle Avenue station.
- Wayside Cable Plans
- Track Plans, (double line)
- Software packages, Control room circuit drawings (detailed book of plans), diagrams, equipment layouts, manuals (maintenance and training)
- Training to others
- TCR equipment power requirements (Load Calculations)
- TCR room layouts
- Software equivalents

B. Submittals

In accordance with the requirements of the Design-Build Contract, Division 1, the Subcontractor will provide the specified submittal, including:

- Design drawings/software
- Acceptance Procedures – new equipment to WMATA (as required)
- First Article Configuration Inspection (FACI)

- Factory Test Procedures
- Factory Test (100%) design/software – must be substantially approved prior to onset of Factory Acceptance Tests (FAT).
- Factory Test Results – Marked drawings and data sheets
- As-shipped – to include comments of FAT results.
- Field Test Procedures
- Field Test design/software– must be approved (as marked) for onset of test – to include As-shipped comment resolution.
- Field Test Results – Marked drawings and data sheets
- Record Deliverables (as-built drawings/software.)

C. Equipment

The Subcontractor will provide the hardware and software necessary to implement a fully-functional ATC System, including:

- Wayside equipment – Impedance bonds, Switch machines, Signals, Marker coils, Interlocking Track Circuit Loops. With all appropriate hardware, (i.e., copper connection plates for shunt bars, mounting brackets, mounting plates, nuts & bolts), as required to install the equipment.
- Train Control Room equipment racks and equipment support hardware (brackets, braces, etc.), power supplies, ground fault detectors, Local Control Panels (interlocking locations) wire and inter and intra-rack cabling, terminals/pins for rack wiring and plug couplers, all special tools required to completely install and configure the systems, sub-systems and equipment provided, and all miscellaneous hardware to mount and secure the signaling equipment within the supplied racks.
- Wayside equipment will be assembled as completely as possible based on coordination with the installer. As an example, marker coil assemblies are expected to be shipped complete with the coil and tuning units attached to the ramp enclosure and designated (marked) with their frequency, type, group or sub-group.
- Train Control Rooms will be assembled as completely as possible, or as practical prior to shipment from the factory. Room assembly and tests shall be coordinated, so as to facilitate delivery directly to the field location where the equipment is to be installed. All required rack to rack wire, rack to rack cables and rack to control panel cables in adequate amounts and lengths to be provided and designated with each location. All tagging will be completely verified prior to shipment.
- The Subcontractor will deliver all equipment to the jobsite

D. Test & Integration

The Subcontractor will provide all testing activities, with certified data submittals, as described in the Contract Specifications. Provide on-site, test equipment and tools required (common) to support the testing activities in an efficient manner. Identify and coordinate with Contractor all special test equipment and tools required.

1. Factory Testing and Inspection

- Component, board, module, up to the fully assembled unit level, i.e. bonds, markers signals, switch machines.
- TCR factory test will verify all subsystems, as complete as possible.
- Jobsite Inspection/Quality Assurance – the manufacturer's field signal engineer will participate in the inspection of all equipment upon delivery.

2. Jobsite Testing and Inspection

- Perform testing per the Contract Specifications for Grounding/isolation, Power-off, Power-on, Breakdown, Module level, Room-to-wayside, Interlocking Plant Operation, Room-to-room, Dynamic, Integration tests, through Pre-Revenue activities.
- Identify all support required by others for each type of test on a per location basis.
- Identify the expected number of train sets and consist sizes needed to fulfill the testing requirements.
- Perform preliminary and temporary work to reconfigure the control circuits between West Falls Church and East Falls Church Stations to provide safe revenue operation of WMATA trains while allowing for the heavy construction activities. Assist in the development of detailed sequencing of the work. Early items to be installed will be the crossover, followed by the turnouts and Rt. 66 flyovers. The staging of this work is of prime importance, with the goal to get single tracking reduced from 12,000 ft to 2000 ft. as quickly as possible.
- Responsible for developing a cut-over plan to describe in detail the proposed methods for accomplishing the temporary and permanent integration of the Dulles Junction (N and K lines). Work shall anticipate a minimum of three stages; each with multiple phases The stages consist of the K-line double crossover and the inbound and outbound turnouts to the N-Line.
- The Subcontractor will provide temporary work and detailed staging/cutover plans and procedures as necessary, and develop all necessary ATC-related WMATA Site Specific Work Plans (SSWP).
- Preliminary – install TCR equipment as necessary to safely tie existing line and traffic circuits through K98 Dulles Junction TCR and verify , deliver to site equipment to provide point detection of all six switches, design bonding scheme to allow revenue operations through the area with a minimal impact. Point detection must be provided and certified safe for each switch immediately upon installation with visibility at OCC via the existing DTS.
- Test and obtain certification of double crossover complete and reconfigure to allow operation of K98 as an emergency crossover.
- Provide certified safe point detection for N-Route turnouts immediately upon installation.
- Test interlockings and obtain certification. Based on the time frame, the N-Route interlockings may need to be disabled to only provide the required point detection.
- All track circuits that are located in the Dulles Junction area of control will be controlled from the Fisher Street TCR; this requires transitioning existing bonds to the new TCR.

E. West Falls Church Yard

At West Falls Church Yard, 8 new storage tracks are to be added, along with a new connection track to the N-line. The Scope includes furnishing and testing all the equipment required to modify the Yard as shown on the 100% Preliminary Engineering Drawings including:

- Upgrading the AIRINC/RAILCOMM Yard Interlocking Control System.
- The Yard is in use 24 hours a day 365 days a year and it must be operational to the maximum extent possible during the modifications required by this Contract. The Subcontractor will provide temporary work and detailed staging/cutover plans and procedures as necessary, and develop all ATC related WMATA Site Specific Work Plan (SSWP).
- All work in the West Falls Church Yard is subject to WMATA work restrictions

Work Not Included

1. Installation of the ATC equipment

2. Buildings and facility structures.

Specifications

Unless noted otherwise, the following specifications reflect the versions identified in the Addendum to the WMATA Standard Technical Specifications, 100% PE Design Submittal (February 2006). Applicable specifications are also included as part of this document:

Spec No.	**Specification Title**
16901	DEFINITION OF ATC TERMS
16902	ATC ABBREVIATIONS
16903	ATC-INITIAL METRORAIL SYSTEM
16904	CURRENT AUTOMATIC TRAIN CONTROL SYSTEM
16905	ATC TRANSIT VEHICLE CHARACTERISTICS
16906	DETERMINATION OF PAYMENT FOR ATC WORK
16910	BASIC WAYSIDE ATC REQUIREMENTS
16911	SCOPE OF ATC WORK
16912	ATC SUBMITTAL REQUIREMENTS
16913	ATC BLOCK DESIGN
16914	ATC-ENVIRONMENTAL REQUIREMENTS
16915	BASIC ATC EQUIPMENT REQUIREMENTS
16916	BASIC CIRCUIT REQUIREMENTS
16917	BASIC INTERLOCKING REQUIREMENTS
16918	SPECIAL ATC REQUIREMENTS FOR SPECIFIC LOCATIONS
16919	ATC SYSTEM SAFETY PROGRAM
16921	ATC POWER DISTRIBUTION SYSTEMS

16922	ATC - LIGHTNING/SURGE PROTECTION AND GROUNDING SYSTEMS
16923	ATC MAINTENANCE TELEPHONE SYSTEM
16924	ATC-NON-VITAL ATO&ATS PROCESSOR SYSTEMS
16925	ATC-DATA TRANSMISSION SYSTEM
16926	ATC MICROPROCESSOR SYSTEM FOR NON-VITAL INTERLOCKING FUNCTIONS
16928	ATC-INTERLOCKING VITAL PROCESSOR SYSTEMS
16929	SPEED COMMAND PROCESSOR SYSTEM
16934	AUTOMATIC TRAIN APPROACH WARNING SYSTEM
16941	BASIC ATC ELECTRICAL AND ELECTRONIC COMPONENT REQUIREMENTS
16942	ATC - PRINTED CIRCUIT CARDS
16943	ATC - VITAL RELAYS
16944	ATC - NON-VITAL RELAYS AND TIMERS
16945	ATC - PLUG BOARDS AND CABINETS FOR RELAYS AND PC CARDS
16946	ATC - TRANSFORMERS
16947	ATC - GROUND DETECTORS
16948	ATC - PLUG CONNECTORS
16949	ATC - SIGNAL WIRE AND CABLE
16951	ATC - TRANSFER AND BYPASS EQUIPMENT
16952	ATC – DC POWER SUPPLIES
16953	ATC – ATP TRACK MODULES
16954	ATC – SWITCH AND LOCK MOVEMENTS
16955	ATC – TRACK AND ALARM INDICATION PANELS
16956	ATC – INTERLOCKING CONTROL PANELS
16957	ATC – INTRUSION DETECTION WARNING SYSTEM (IDW)
16961	ATC – AUDIO FREQUENCY TRACK AND LOOP CIRCUIT LAYOUTS
16962	ATC – IMPEDANCE BOND LAYOUTS
16963	ATC – POWER FREQUENCY TRACK CIRCUIT LAYOUTS
16964	ATC – TRACK SWITCH OPERATING LAYOUTS
16965	ATC – SIGNAL LAYOUTS
16966	ATC – WAYSIDE PUSHBUTTON LAYOUTS
16967	ATC – MARKER COIL LAYOUTS
16968	ATC - TRACK BONDING LAYOUTS
16969	ATC – SNOW MELTER LAYOUTS
16971	ATC – RACKS AND CABLE TRAYS
16972	ATC – JUNCTION BOXES
16973	ATC - CONDUIT
16974	ATC – LOCK SAND KEYS
16975	ATC - FOUNDATIONS
16976	ATC – WAYSIDE SIGNS
16977	ATC – TAGGING AND MARKING
16978	ATC – MISCELLANEOUS COMPONENTS AND MATERIALS
16979	ATC – SURFACE TRENCH

16981 BASIC ATC TEST AND INSPECTION REQUIREMENTS
16982 ATC – PRELIMINARY AND INTERLOCKING TESTS (LEVEL A)
16983 ATC – TRAIN SEPARATION TESTS (LEVEL B)
16984 ATC – ATO AND LOCAL ATS TESTS (LEVEL C)
16985 ATC – DTS INTERFACE TESTS (LEVEL D)
16986 ATC – MISCELLANEOUS TESTS (LEVEL E)
16987 ATC – SYSTEM LEVEL TESTS (LEVEL F)
16988 ATC – QUALITY ASSURANCE
16991 ATC – DRAWINGS AND TRACINGS
16992 ATC – INSTRUCTION MANUALS
16993 ATC – TRAINING COURSES

C15
Cathodic Protection
and Corrosion Control Systems

Scope of Work

The scope includes the design, supply and installation of necessary corrosion control and stray current protection system. The design/ engineering and installation shall meet the requirements of the WMATA Manual of Design Criteria (release 6 dated November 2003), and the 100% PE drawings and specifications identified below.

The Subcontractor shall:

Familiarize itself with the proposed line alignment and the type of structures involved the Project including 100% Preliminary Engineering drawings, information regarding the route alignment and the utilities located near and within the Project limits.

Coordinate with the area utilities and operators of underground pipelines to collect information regarding the underground facilities associated with this Project and any measures the utility companies may have in place for protection of these facilities from corrosion and stray currents.

Before the start of track or traction power construction (by others), take measurements of any stray current flowing through the existing structures located near the alignment and the underground facilities of the utility companies for the establishment of base line stray current levels for future reference.

Perform a survey to update the base-line stray current levels to reestablish “bench mark” data regarding various structures/ utilities-to-earth potentials for reference just prior to energization of the Project.

Upon energization of the line and commencement of simulated operations, perform measurements of stray current to confirm that leakage is not occurring at levels above those permitted. Upon completion of the stray current survey, provide a report listing stray current sources, test procedures, utility coordination details, test results, and all data and recordings.

Collect information of all underground facilities being installed under this Project.

Perform necessary soil resistivity and chemical analysis of such locations to determine protective measures that may be necessary to safeguard the underground facilities from corrosion resulting from the soil and atmospheric conditions.

Perform soil resistivity measurements at locations of intended ground mats for traction power substations, tie breaker stations and passenger station AC Switchboard Rooms. This information is required at different soil depths to optimize ground mat designs at each location.

Prepare necessary design drawings, indicating locations for the test boxes for measurement of stray currents, installation of cathodic protection equipment and detail for bonding of underground and all reinforced structure for stray current protection. Note the locations of metallic piles or pile casings and other metallic structures and prepare/implement mitigation measures.

Install the approved stray-current and corrosion-control systems; monitor the bonding of rebar/structures during construction in accordance with the requirements of the Design-Build Contract: and perform necessary testing of the completed Project.

Provide cathodic protection equipment for implementation of the proposed corrosion control and stray current protection systems.

Prepare necessary calculations, construction drawings, and specifications for installation of the proposed stray current and corrosion control protection system for review and approval by Contractor. The calculations, installation drawings, specification must be certified by an approved cathodic protection and corrosion control engineer approved for work in Virginia.

Furnish and install the stray current and corrosion control protection systems and perform necessary testing of the completed system.

Perform rail-to-earth, rail-to-rail, and insulated-joint resistance testing following the final installation of trackwork.

Perform testing for continuity for all Project structures.

Prepare cathodic protection directory for the as-built section designs.

Attend meetings, conferences and/or provide recommendations in response to questions and coordinate with the utility companies.

Perform post operational survey and tests after the traction power system is under revenue operation and submit a report including recommendations to mitigate any situations that may arise after the Installation.

Respond to comments on the submitted report, revise and resubmit a final report.

Elements of the Project requiring cathodic protection/testing/monitoring includes, but not limited to:

- Underground Piping including
- Retaining Walls, Cover Box, S&I Building, Platforms, Tunnels
- Track to Earth Resistance Measurement
- Cut & Cover Tunnel, WFC Yard, East & West Portal Tysons Tunnel
- Cathodic Protection Support-Bridges
- Hydraulic Elevators Matrix
- Expansion Joints in the Mined Tunnels

Specifications and Standard Drawings

The following specifications reflect the versions identified in the Addendum to the WMATA Standard Technical Specifications, 100% PE Design Submittal (February 2006).

Note: Related Work Specifications are available upon request.

Spec No.	Specification Title
13110	Stray Current and Cathodic Protection
13115	Corrosion Control System Testing
16060	Grounding and Bonding

Standard Drawings

ST-S-007
ST-S-021
ST-S-022
ST-S-023
ST-E-301
ST-E-302
ST-E-303
ST-E-304

C16
Contact Rail and Hardware Supply

Scope of Work

The Subcontractor shall furnish and deliver all contact rail, cover board, insulators and related hardware to the Project to be installed by the others. This includes materials, supplies, transportation, supervision, permits, and services, and performance of all operations necessary and required to satisfactorily supply the contact rail and associated hardware, which shall include, but not be limited to, the following:

A. General

Fabricate, supply and deliver materials in compliance with tolerance as specified and validate compliance as required.

Subcontractor shall schedule the supply and delivery of material to meet the Project Schedule. The scope of work includes coordination of the delivery with the Contractor and other Subcontractors working on other parts of this Project in the same area and with the government agencies having jurisdiction over the work.

The Subcontractor shall prepare an execution plan for its work and provide input to the overall Project execution plan.

B. Wiehle Avenue Station 1344+02.98 to STA 726+24.70 IB track (N1) and OB track (N2)

Detail design, engineering, verification, and delivery of all main line, yard expansion and Yard line Extension contact rail, cover board, insulators and related hardware.

Detail design, engineering, verification, and delivery of all main line, yard expansion and Yard line Extension contact rail end approaches, expansion joints, contact rail anchors, and related hardware. The contact rail system and all appurtenances to be coordinated with design drawings and specifications.

All contact rail hardware required for special trackwork installation is included. This encompasses special trackwork wood switch timber on ballasted track and aerial and tunnel direct fixation special trackwork.

Supply bolts and related hardware needed to attach contact rail, cover board, insulators contact rail end approaches, expansion joints, and contact rail anchors to the tie extender or contact rail tie. Tie extenders will be provided by others.

This includes Management, engineering, supply and delivery of contact rail system and all appurtenances for ballast track and direct fixation track including structures and tunnels.

Contact rail system and all appurtenances shall be delivered ready for installation and assembly without welding or other extra ordinary requirements. Pre curved contact rail when required is the responsibility of the supplier.

Factory Testing of materials, inspection and delivery activities are the responsibility of the supplier.

C. Orange Line Tie-in Area 1: STA 475+50 to STA 498+38.89

In addition to the scope defined in B., above:

1. Coordinate with Contractor a detailed supply and delivery plan, including sketches for all special trackwork installation, specifically a new No. 10 Double Crossover and two No. 15 turnouts (LH&RH).

2. Supply all contact rail system and all appurtenances and materials not specifically excluded.

3. Contact rail and appurtenances will be provided for approximately 120 feet of existing tracks 1 and 2 between the crossover and new turnouts and existing tracks Removal and ballast for installation of special trackwork.

D. Yard Extension Area 2 : STA776+18.47(N3) to STA 765+13.92 (N3) and continuing to STA8+78.99(YL3) to STA 0+00 (YL3)

Same as B., above.

E. Storage Track Area 3 : STA 11+11.07(to end STATION of storage tracks 6A through 6H)

Contact rail system and all appurtenances for new tracks as shown in drawings K99-PP-001 and K99-PP-002 and K99-PP-004 and K99-PP-005.

Work Not Included

1. The scope of work does not include installation of the contact rail.

2. The track installer Subcontractor will provide all other materials needed for ballasted and DF track construction, including field welds, emergency guard rails, guard rails and any miscellaneous track materials.

3. Cables, contact rail heaters, clips, bolts and other hardware needed to make cable and/or other attachments to the contact rail are excluded from the scope of this package.

Specifications

Unless noted otherwise, the following specifications reflect the versions identified in the Addendum to the WMATA Standard Technical Specifications, 100% PE Design Submittal (February 2006).

Applicable specifications are also included as part of this document:

Spec No.	Specification Title
03480	Concrete Cross Ties and Fastenings
05651	General Track Construction
05652	Ballasted Track Construction
05653	Direct Fixation Track Construction
05654	Special Trackwork Construction -Ballasted
05655	Special Trackwork Construction -Direct Fixation
05657	Direct Fixation Rail Fasteners
05658	Track Appurtenances and Other Track Material
05659	Special Trackwork
05661	Contact Rail and Appurtenance for Traction Power
06130	Timber Ties
13115	Corrosion Control System Testing
16060	Grounding and Bonding
16127	Contact Rail System Installation

C17
Wiehle Avenue Replacement Parking

Scope of Work

The Contractor shall design and construct replacement parking for spaces lost during the various stages of construction at the existing Wiehle Avenue park-and-ride/kiss-and-ride facility due to construction of the Wiehle Avenue station, bus facilities, kiss-and-ride facilities, parking garage and other facilities at the site.

The specific number and location of the parking spaces will be determined by the Owner.

Work not Included

1. Acquisition of property

2. Requirements for buses and bus operation.