21	Permitting Allowance	18	1	Allow	$50,000	$50,000
22	Utility Allowance	19	1	Allow	$250,000	$250,000
# 23	Not Used					#

Total Base Price $_____

Elevator Proposal Schedule

(Proposer shall provide pricing for both types. Owner will select one type for incorporation in the project).

Item #	Description	Note #	Est. Qty.	Unit	Unit Price	Total Amount
1	Hydraulic Elevators			LS	$_____	$_____
2	Gearless Traction Elevators			LS	$_____	$_____

Alternates Schedule

(Proposer shall provide pricing as add alternates).

Item #	Description	Note #	Est. Qty.	Unit	Unit Price	Total Amount
1	ADD ALTERNATE: Conduit, Cable Troughs & Duct Bank	20	1	LS	$_____	$_____
2	ADD ALTERNATE: Enclosure of Pedestrian Bridge	21	1	LS	$_____	$_____

Notes to Proposers

(1) The Mobilization costs shall include the premium costs for payment and performance bonds. The remaining mobilization costs shall be paid in six equal installments over the first six payment requests.

(2) Contractor shall provide a quotation for all cost elements that make up General Conditions. General Conditions costs shall not be included with any other cost elements proposed under items 1 and 3 through 24 above.

(3) Contractor shall provide a quotation for all work below station platform level, which includes, but is not limited to:

- earthwork
- retaining walls
- demolition
- grading and drainage
- stormwater management
- erosion and sediment control
- pavement, striping
- signage
- utilities
- perimeter fence
- treatment of contaminated water
- track work

All soil shall be assumed to be contaminated with arsenic above background concentrations. Quote shall include the cost of characterization, removal, transportation, and disposal.

(4) DELETED

(5) DELETED

(6) Contractor shall provide a quotation for the demolition and restoration of the Potomac Greens Drive traffic circle, the demolition and restoration of Old Town Greens tot lots and tennis courts removed for construction access and temporary relocation of tot lot. Old Town Greens tot lot shall be relocated to a site within Old Town Greens HOA.

(7) Contractor shall provide a quotation for all station structure work at and above the platform level, including platforms, mezzanines, and vertical transportation.

(8) Contractor shall provide a quotation for station finishes, which include, but are not limited to:

- paver tiles
- kiosks
- light fixtures
- platform edge
- platform lighting
- bathrooms
- benches

(9) Contractor shall provide a quotation for all costs related to the construction of off-site AC room and access road as well as all electrical equipment, ductbanks, conduit, and connections. Equipment costs include, but are not limited to design, installation, testing, and commissioning.

(10) DELETED.

(11) Contractor shall provide a quotation for the north pedestrian bridge and Entry Pavilion, connecting to the future North Potomac Yard development.

(12) Traction Power, Automatic Train Control, and Communications: Contactor shall provide a quotation for # equipment costs which include, but are not limited to design, supply, installation, and testing. Costs for this # item exclude the work described under Note (20)

(13) Hazardous Waste: The contractor shall provide a quotation for the removal and disposal of hazardous waste from the site. For inclusion in this category, soil must fail the toxicity characteristic leaching procedure. Soil in this category shall be assumed to be contaminated with other constituents, including, but not limited to, arsenic, petroleum, and benzene, toluene, ethyl benzene, and xylenes (BTEX). Quote shall include the cost of characterization, removal, transportation, and disposal.

(14) PCB-Contaminated Soil: The contractor shall provide a quotation for the removal and disposal of PCB-contaminated soil from the site. For inclusion in this category, concentration of PCBs shall exceed 1 mg/kg. Soil in this category shall be assumed to be contaminated with other constituents, including, but not limited to, arsenic, petroleum, and BTEX. Quote shall include the cost of characterization, removal, transportation, and disposal.

(15) Petroleum Contaminated Soil 1: The contractor shall provide a quotation for the removal and disposal of petroleum-contaminated soil from the site. For inclusion in this category, soils shall have a concentration of petroleum hydrocarbons (TPH) equal to or greater than 500 mg/kg, and/or of BTEX equal to or greater than 10 mg/kg. Soils in this category shall be assumed to be contaminated with arsenic above background. Quote shall include the cost of characterization, removal, transportation, and disposal.

(16) Petroleum Contaminated Soil 2: The contractor shall provide a quotation for the removal and disposal of petroleum-contaminated soil from the site. For inclusion in this category, soils shall have a concentration of petroleum hydrocarbons (TPH) equal to or greater than 50 mg/kg, and less than 500 mg/kg, and total BTEX less than 10 mg/kg. Soils in this category shall be assumed to be contaminated with arsenic above background. Quote shall include the cost of characterization, removal, transportation, and disposal.

(17) NOT USED

(18) The City of Alexandria shall waive all fees associated with obtaining City of Alexandria Permits. Fee schedules for all other permits required for the Potomac Yard Station, including, but not limited to, National Park Service, Virginia Department of Transportation, Corps of Engineers, and any other State or Federal permit required shall be the responsibility of the Design Builder.

Contractor shall provide a quotation for an allowance to cover costs associated with permit fees for any permit fees not expressly waived by the City of Alexandria.

(19) Contractor shall provide an invoice for an allowance applicable to the cost incurred by the Design Builder which is paid directly to the utility companies for fees. Allowance will cover Design Builder costs such as tap and connection fees, applications, and inspections fees. Other utility cost including, but not limited to, design and utility installation do not apply to this allowance and shall be included in the Site Work Bid Item in the Design Builder's proposal.

(20) Contractor costs to provide empty conduit, cable troughs and duct banks for Traction Power, Automatic Train Control, and Communications along the existing alignment in cases where existing facilities do not provide adequate capacity for new cabling. Costs covered under this Item include, but are not limited to, design engineering, maintenance of traffic, demolition, material procurement, installation and testing. Costs for conduit, cable troughs and duct bank along the new alignment are not covered under this Item, and shall be included in Items 13, 14 or 15.

(21) Contractor costs to revise provide a fully-glazed, floor-to-ceiling enclosure in lieu of woven metal mesh at the North Pedestrian Bridge, including modified mechanical and life safety systems as required.

General Decision Number: VA180035 01/05/2018 VA35

Superseded General Decision Number: VA20170035

State: Virginia

Construction Types: Heavy (Heavy and Sewer and Water Line)

Counties: Alexandria*, Arlington, Clarke, Culpeper, Frederick, Fredericksburg*, Spotsylvania and Winchester* Counties in Virginia.

*INDEPENDENT CITIES

HEAVY CONSTRUCTION PROJECTS (Including Sewer and Water Lines)

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.35 for calendar year 2018 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.35 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2018. The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/05/2018

BRVA0001-003 04/30/2017

	Rates	Fringes
MASON - STONE.....	$ 36.91	16.55

CARP0177-012 05/01/2017

	Rates	Fringes
CARPENTER, Includes Form Work....	$ 28.36	11.53

ELEC0026-023 06/05/2017

ARLINGTON COUNTY, Cities of Alexandria and Fredericksburg

	Rates	Fringes

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ELECTRICIAN.....$ 44.65 16.74+a

a. PAID HOLIDAYS: New Year's Day, Inauguration Day, Martin Luther King Jr.'s Birthday, Memorial Day, Independence Day, Labor Day, Veterans' Day, Thaksgiving Day, the day after Thanksgiving and Christmas Day.

ELEC0026-024 06/05/2017

CLARKE, CULPEPER, FREDERICK COUNTIES, SPOTSYLVANIA COUNTY (Excluding the City of Fredericksburg), City of Winchester

	Rates	Fringes
ELECTRICIAN.....	$ 30.44	16.11+a

a. PAID HOLIDAYS: New Year's Day, Inauguration Day, Martin Luther King Jr.'s Birthday, Memorial Day, Independence Day, Labor Day, Veterans' Day, Thaksgiving Day, the day after Thanksgiving and Christmas Day.

ENGI0077-019 05/01/2013

	Rates	Fringes
POWER EQUIPMENT OPERATOR:		
35 ton Cranes and Above.....	$ 32.89	8.45+a
Cranes Below 35 tons.....	$ 32.40	8.45+a
Mechanic.....	$ 34.34	8.45+a
Tower and Climbing Cranes...	$ 32.89	8.45+a
Tower Cranes and Cranes 100 tons and Over.....	$ 33.96	8.45+a

a.PAID HOLIDAYS: New Year's Day, Inaugural Day, Decoration Day, Independence Day, Labor Day, Martin Luther King's Birthday, Veterans' Day, Thanksgiving Day, Friday after Thanksgiving and Christmas Day.

b. PREMIUM PAY:
Tower crane and cranes 100-ton and over to receive $1.00 per hour premium.

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* LABO0011-010 06/01/2017

	Rates	Fringes
LABORER: Pipelayer.....	$ 25.14	8.04

PAIN0051-014 06/01/2017

	Rates	Fringes
GLAZIER		
Glazing Contracts $2 million and under.....	$ 25.74	11.55
Glazing Contracts over $2		

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million	$ 29.87	11.55

PLAS0891-006 02/01/2017

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER	$ 27.65	10.08

SUVA2010-036 09/01/2010

	Rates	Fringes
DIVER TENDER	$ 22.53	3.98
DIVER	$ 23.73	4.21
IRONWORKER, REINFORCING	$ 22.45	11.85
IRONWORKER, STRUCTURAL	$ 20.55	8.25
LABORERS		
Common or General	$ 11.24	1.32
Flagger	$ 7.39	0.20
Landscape	$ 10.00	
POWER EQUIPMENT OPERATOR:		
Backhoe	$ 18.47	0.75
Bobcat/Skid Loader	$ 11.40	
Bulldozer	$ 17.54	
Excavator	$ 17.79	
Loader	$ 18.99	0.75
Trackhoe	$ 12.75	1.24
Tugboat	$ 19.00	
TRUCK DRIVER, Includes All Dump Trucks	$ 12.14	0.75

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

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Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the

interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

Public restroom facilities shall be included in the paid areas of the stations. The Design-Builder shall provide the minimum number of plumbing fixtures per VUSBC requirements based on the NFPA 130 station occupant load.

4. Pedestrian Bridge: The station pedestrian bridge provides passenger access from the entrance pavilion to the station. Required features include:
    - The general configuration (elevation and cross section), finishes, dimensions, and aesthetic elements shown in the Project Requirements and General Plans using materials, finishes, configuration, and dimension;
    - CSX minimum clearance requirements of 23'-3" above railway;
    - 12 foot minimum clear walkway between handrails for the North Pedestrian Bridge;
    - Horizontal walking slopes that do not exceed ADA or WMATA requirements;
    - Utility chases, CCTV cameras, public address speakers, lighting fixtures and signage maintaining all required minimum clearances and unobstructed views;
    - Provision for future maintenance or replacement of bearings supporting the pedestrian bridges;
    - Design of the structures, including superstructure, bearings, substructure and foundations, shall be designed in accordance with AASHTO LRFD Bridge Design Specifications;
    - Provision for maintenance access to the roof of the bridge;
    - Finishes including mesh, glazing and railings;
    - Branches at nodes where bridge changes plan direction; and
    - Roofing, gutters and downspout, and drainage provisions per WMATA Criteria and the requirements of the City of Alexandria.

5. Entrance Pavilion: The station entrance pavilion provides passenger access from the neighborhood streets and parks to the station. The pavilion includes two escalators, two elevators, a single stair, a bike station, and ancillary spaces. Required features include:
    - General configuration and aesthetic elements shown in the Project Requirements and General Plans using materials, finishes, configuration, and dimensions;
    - Adaptation to the site-specific conditions and grades and coordination of final grades with adjacent development;
    - A canopy/roof design that conforms to the Project Requirements and General Plans and incorporates internal roof gutters and downspout drainage system that discharges to grade or a closed system per the Design-Builder's required approval for drainage design and subsequent approval by the City of Alexandria;
    - A roof/ceiling design that incorporates all required CCTV cameras, public address speakers, lighting fixtures, and signage, while maintaining all required minimum clearances and unobstructed views;
    - All necessary utility connections including water, sanitary sewer, electric and systemwide communications; and
    - Emergency phone at the lower elevator landing.

6. Potomac Greens Park

a. The Potomac Greens Park DSUP#2016 – 0005 and the PY Metro Station DSUP#2016 – 0004 shall be amended by the design builder, and both DSUP amendments will be processed in parallel. Both will require amendments based on the design revisions. This process is detailed in Volume 10, page 2 of the City Process Guidelines [AM-4].

b. For DSUP#2016 – 0005 (Potomac Greens Park), the Design Builder shall design, permit and construct the following:

(1) Vegetative screening along the western side of the MVMH/GWMP and along the GSAE, in a manner consistent with the recommendations in the 2009 Cultural Landscape Report, The Vegetation of the George Washington Memorial Parkway, Central Section: Alexandria to Arlington Memorial Bridge. This vegetative screening design will be completed in coordination with and review by the NPS and city of

Alexandria. For reference purposes, DSUP#2016 – 0005 (Potomac Greens Park) provides a conceptual vegetative screening plan which was presented in coordination with NPS review.

(2) Restoration of temporarily impacted wetland areas which are disturbed during construction (per the NPS ROD). This will be completed in coordination and compliance with the USACE permit. It should be noted, if an area is not disturbed, it does not need to be restored.

(3) Restoration of natural areas which are disturbed during construction (per the NPS ROD)

(4) Restoration of cultural landscape elements (per the NPS ROD)

(5) No work shall occur outside the approved limits of disturbance. Any plantings shown in DSUP #2106-005 (drawing No. LP-102), which are outside the LOD are not required and shall not be completed.

(6) On DSUP #2016-005 (drawing No. LP-102) the "ponds" shown are not part of the PYMS Project, and shall not be incorporated in the Project's Storm Water management design.

c. The Design Builder shall complete an invasive species management plan (per the NPS ROD)

d. The design builder shall design, permit and construct the temporary relocation of the Potomac Greens playground to be sited elsewhere within the Potomac Greens Neighborhood Association, and the playground restoration in kind at the existing location at the conclusion of the project. Scope of playground temporary relocation and restoration includes surfacing, site furnishings, and playground equipment (from DSUP#2016-004). It should be noted, if the design builder does not impact the existing playground, it does not need to be relocated and restored.

e. If disturbed during construction, the design builder shall restore in-kind the public walkway / pathway north of the Potomac Greens Park.

f. The design builder shall design, permit and construct a paved walkway from Potomac Greens Drive/Carpenter Road to the East side public station entrance, including lighting and perimeter fencing. Paved width shall be 12' minimum. Pavement shall be non-permeable, and proposers are not bound to the locations of permeable surfacing shown on Drawings C04 and C05. The final designer has discretion to develop alternate SWM solutions to reflect the redesign of the station entrances.

7. DELETED

8. Tree Conservation and Protection Program (TCPP): A TCPP will be developed per the City of Alexandria Landscape Guidelines and to the satisfaction of the Directors of P&Z and RPCA and the National Park Service (NPS). All proposed tree protection details shall be depicted on the final site plan and early site preparation permit plans. Such tree protection measures shall be installed prior to any site or utility work and be maintained throughout the construction period. The tree preservation measures shall be inspected by the City Arborist prior to any construction, demolition, grading or utility work for the site.

9. DELETED

10. Site Lighting: All Site Lighting shall be in accordance with the City of Alexandria standards. The lighting plan and lighting details will be consistent with the approved Potomac Yard Urban Design Guidelines that allow minimum light leakage, particularly around the perimeter of the site in order to minimize the obtrusion to the George Washington Memorial Parkway.

In addition, the Design-Builder shall provide all Site work including site clearing, site and wetland restoration, site and wetland mitigation, site utilities, construction access roads required during construction, landscaping, graphics and signage required for the complete project.

11. Old Town Greens Tennis Courts and Playground: The Project will require the use of the property known as the Old Town Greens Neighborhood Association Tennis Courts and Playground for construction related access. The Design Builder will be required to demolish two tennis courts and a playground.

    Tennis Courts: The complete removal of tennis court pavement, fencing, walls, and any other appurtenance related to the tennis courts such as lighting, seating, site furniture, and nets shall be required.

    Playground: The Design Builder is responsible for providing a replacement playground for the residents of Old Town Greens. The existing playground equipment, seating, site furniture, and trash receptacles, shall be removed and new playground equipment, seating, site furniture, and trash receptacles, shall be supplied and installed by the Design Builder, to an area within Old Town Greens Neighborhood Association. The Design Builder shall provide new playground equipment equal in size, quantity and quality, to the temporary playground. The temporary playground area shall be fenced and secured including gates, signage, as provided and installed by the Design Builder.

    Any utilities that serve the existing tennis court and playground areas shall be caped, relocated, or removed as required to provide construction access.

    Upon completion of the project, the Design Builder is required to restore the Old Town Greens Park. All elements of the tennis courts and playground including pavement, fencing, walls, nets, security fencing and gates, and playground equipment, as well as any other appurtenance related to the tennis courts and playground such as lighting, seating, site furniture, signage, and landscaping shall be supplied and installed by the Design Builder. Type, size, quantity and quality of the tennis and playground equipment shall be approved by the City of Alexandria and the Old Town Greens Home Owners Association.

    Upon completion of the restored Old Town Greens Park, the Design Builder shall remove the temporary playground equipment and all temporary appurtenances associated with the temporary playground, and restore the site of the temporary playground to its original condition.

12. Potomac Greens Drive Traffic Circle: To facilitate the turning movement of large construction equipment and materials, the removal of the traffic circle at the intersection of Potomac Greens Drive and Carpenter Road will be required. The Design Builder shall remove brick paving, site lighting, trash receptacles, raised planter, site furniture, concrete curbs, landscaping and irrigation systems. The traffic circle shall then be paved with full depth capable of withstanding the loads and turning movement of construction equipment. The full depth asphalt shall be maintained by the Design Builder throughout the duration of the project.

    Once paved, the Design Builder shall provide Maintenance of Traffic (MOT) at the intersection while providing an expanded turning radius for construction equipment and materials.

    The Design Builder shall provide an MOT Plan to the City of Alexandria for approval and permit prior to the demolition of the existing traffic circle.

    The haul route is subject to City approval. Design Builder is required obtain a permit per City requirements, when five (5) or more loads of waste materials of any type, building or construction supplies, materials or equipment of any type, or dirt, debris or fill of any type will be hauled into or out of a site within any consecutive thirty (30) day period. No dirt, mud or debris shall be tracked/spilled onto the public right-of-way. The design Builder shall submit its

request for an approved haul route for permit and approval. Permit Application for Hauling Permit is available at:

https://www.formrouter.net/form01@COAVA/TES_hauling_app.pdf

Upon completion of the project, the Design Builder is required to restore the Traffic Circle and any other local road impacted by construction of the Potomac Yard Station project. The Design Builder shall design and construct all elements of the Traffic Circle including brick paving, site lighting, trash receptacles, raised planter, site furniture, concrete curbs, landscaping, irrigation systems, as well as any other appurtenance related to the Traffic Circle. Type, size, quantity and quality of the Traffic Circle elements to be designed and installed by the Design Builder shall be approved by the City of Alexandria and the Potomac Greens Home Owners Association.

13. Potomac Greens Drive, and Carpenter Road: In addition to the requirements included in Section 01 73 10 CUTTING AND PATCHING and Section 00 73 06, PROTECTION OF EXISTING VEGETATION, STRUCTURES, UTILITIES AND IMPROVEMENTS, the Design Builder shall keep Potomac Greens Drive and Carpenter Road in a state of good repair throughout the duration of the Contract. Any damages to, but not limited to pavement, concrete curb, brick sidewalks, landscaping, irrigation systems, fences, drainage structures, utilities, or signage to, or adjacent to, Potomac Greens Drive and/or Carpenter Road that is the direct result of the use of these roads for construction related traffic, shall be the responsibility of the Design Builder to repair and/or replace at the time the damage occurs.

    Complete restoration of Potomac Greens Drive and Carpenter Road shall be the responsibly of the Design Builder at Contract completion. All road restoration activities, including design, maintenance of traffic, materials, and advanced community notices, shall receive the approval of the City of Alexandria prior to the commencement of the restoration work.

14. Archaeologically sensitive areas are known to be present near the work zone and shall be avoided.

    a. A professional Archaeologist shall supervise the installation of protective fencing in the area between the project Limits of Disturbance (LOD) and the boundaries of 44AX0221 and 44AX0222. Due to shallow depths of archaeological deposits in these areas (0 – 11 centimeters), the use of jersey barriers or a footed fence shall be used. If such barriers are used, protective surface matting shall be laid beneath these types of barriers. The protective barriers shall be installed prior to construction and maintained in place during the entirety of the construction project.

    b. A professional Archaeologist meeting 36 CFR Part 61 qualifications will be present to monitor any ground disturbing activities in the vicinity of the archaeological sites 44AX0221 and 44AX0222. Construction activities with the potential to impact subsurfaces include, but are not limited to, excavation, grading, or the removal of the root system of vegetation. In the event that any archaeological remains may be encountered in the monitoring zone, the protocol established for unanticipated discoveries will be followed.

    c. A professional Archaeologist will review the design drawings for excavation within fifty feet of soil borings B-101, B-102, B-103, B-14 and B-107 as shown in the Geotechnical Data and Site Investigation reports, to confirm the construction impacts do not exceed ten (10) feet beneath the current grade in those areas. If construction impacts exceed ten (10) feet beneath the current grade in those areas, additional archaeological monitoring shall be required.

C. The Project shall function as an integral part of and be fully compatible with the existing WMATA system.

D. It is the responsibility of the Design-Builder to gather all data necessary for the performance of the Work under this Contract that are needed in addition to Authority-furnished Contract Documents and to develop a complete and final design.

1.02 DAYS/HOURS OF WORK

A. The standard work week for the Contract will be 5 consecutive 8-hour days Monday-Friday, with the work scheduled as defined in Section 01 14 10, ACCESS TO SITE.

B. Provide Contracting Officer Representative 7 Days advance notice prior to changing shift hours and 48 hours advance notice for planned work shifts outside the established work week and work day.

1.03 LOCATION

A. The Project is located in Alexandria, Virginia. The Project Site is bounded by the Potomac Avenue to the west, George Washington Memorial Parkway to the East, and Potomac Greens community via Carpenter Road to the south.

1.04 SITE LOGISTICS

A. Access and Egress to and from the construction Site shall be from Route 1, Slaters Lane, Massey Lane, Potomac Greens Drive and Carpenter Road. Construction traffic shall not use the George Washington Memorial Parkway (GWMP) or Potomac Greens Drive north of the intersection of Carpenter Road.

B. Construction equipment and materials will not be staged within Authority Right-of Way.

1. Construction operations will be required to be staged as shown in the RFP Documents..

2. Staging shall be prohibited on any public Right of Way including but not limited to, Route 1, Slaters Lane, Massey Lane, Potomac Greens Drive and Carpenter Road.

3. WMATA will not provide contractor or contractor employees parking.

4. Design-Builder parking is prohibited on city streets in and around the project site.

C. Constraints on Construction

1. Work Sequence NOT USED

2. Special Events

a. Minimize risks to the public during special community events that are located in close proximity to the Project Site. Construction activities shall be coordinated with the event and the Authority when working to reduce construction impacts during events.

b. Maintain a Special Community Event List in coordination with the Authority for the duration of the Contract. The list shall identify local special holidays, parades, festivals, and other similar events that are within the proximity of the Project construction area and operations. The list shall include the following information:

(1) Name and general description of the event

(2) Date, time of day, and duration

(3) Location(s)

D. Work performed by Others: NOT USED

E. Coordination of Work with Others: Coordinate Work through the Contracting Officer Representative with the following:

1. Utilities and jurisdictional authorities affected by or having jurisdiction over the Project.

   A. Dominion Virginia Power - upgrade of equipment at the existing switching station on E. Abingdon Drive in Alexandria, and connect it to the Glebe Substation on S. Glebe Road in Arlington. Additional information may be viewed at the City of Alexandria website https://www.alexandriava.gov/dvp/

   B. North Potomac Yard Development - The North Entry pavilion will be located on property conveyed to WMATA by the Developer of the North Potomac Yard (Developer), as set forth in Section 32 05 10 SITING OF NORTH PAVILION AND ENTRANCE BRIDGE, and in coordination with the City of Alexandria. The Design Builder is required to coordinate construction activities, utility connections, construction laydown areas, and access, in the area of the North Potomac Yard development and the North Entry Pavilion with the Developer and the City of Alexandria.

2. Other Contracting Officer Representatives, Authority consultants, and contractors associated with adjacent projects or properties.

F. Survey Work: Perform as needed to execute the Project as specified in Section 01 72 10, LAYOUT OF WORK AND FIELD ENGINEERING.

G. Geotechnical and Environmental Investigations: Perform additional investigations as needed to complete the Project.

H. Permits: Obtain permits from Utilities and Jurisdictional Authorities as needed. The Authority will not be responsible for any delays or damages incurred by the Design Builder or the Design Builder's Third Party Permit Expeditor or similar third party consultant, in obtaining all necessary permits.

I. Design and Design Services during Construction: Perform as described in Section 01 11 20, DESIGN AND PROGRAM REQUIREMENTS.

J. Systems Integration: Develop a Systems Integration Plan as part of design development and perform and manage Systems Integration for the project in accordance with Section 01 11 30, SYSTEMS INTEGRATION

K. Safety: Establish and manage Project safety in accordance with Section 01 11 40, SAFETY/ ENVIRONMENTAL REQUIREMENTS and Section 01 11 50, SAFETY AND SECURITY CERTIFICATION.

L. Quality: Establish and manage a Quality System Section in accordance with Section 01 47 00, QUALITY MANAGEMENT SYSTEM.

M. Inspection and Testing

1. Inspect the Work to ensure that construction is being performed in accordance with Issued for Construction Drawings, Issued for Construction Specifications, and applicable submittals. Maintain Inspectors Daily Reports and submit to the Contracting Officer Representative weekly.

2. Establish and perform component testing and system integration testing as specified in various specification sections and in accordance with Section 01 47 00, QUALITY MANAGEMENT SYSTEM. Develop and implement a testing plan based on WMATA Testing Program Plan

3. Provide and manage the services of an independent testing agency that shall conduct material testing.

4. Provide and manage the services of independent inspectors for those disciplines required by jurisdictional authorities. Independent inspectors shall perform third party inspections necessary to certify that construction has been performed in accordance with Issued for Construction Drawings and Issued for Construction Specifications. Independent inspectors shall have the qualifications required by jurisdiction authorities.

5. The independent testing agency and independent inspectors may be provided through a single entity.

N. As-Built Documents: Maintain a hard copy drawing and specification record of as-built conditions during construction phase, and provide As-Built Drawings and As-Built Specifications at the completion of the Project in accordance with Section 01 77 50, CLOSEOUT.

O. Training: Provide training to WMATA staff as indicated in Section 01 82 00, DEMONSTRATION AND TRAINING for requirements.

P. Salvaging of Materials and Equipment

1. Maintain property control records for materials or equipment to be salvaged. The Design-Builder shall be responsible for the storage and protection of salvaged materials and equipment and shall replace salvage materials and equipment, which are broken or damaged during salvage operations as the result of negligence or while in the Design-Builder's care.

2. Salvaged material not specified for reuse shall become the property of the Design-Builder and shall be removed from the Site.

PART 2 – PRODUCTS (not used)

PART 3 – EXECUTION (not used)

END OF SECTION

such as switchgear and bus ducts, in which there are internal space heaters, the space heaters shall be kept energized. If permanent power for the space heaters is not available, the Design Builder shall provide the necessary temporary power.

H. The Design Builder shall evaluate and upgrade SCADA for replaced or new equipment related to the Potomac Yard Metrorail Station.

1.05 SUBMITTALS

A. Submit the following for approval in accordance with Division 01 and with the additional requirements as specified for each WMATA Standard Specifications.

1. Shop drawings:

a. Arrangement Drawings: The contractor shall submit equipment arrangement drawings within 90 days after Notice-to-Proceed for all substations and tie breaker stations. Contractor's equipment shall be designed to fit within the existing building dimensions and with the minimum required clearances required for placement, service, and operation of equipment. The Authority reserves the right to require different arrangements than proposed, provided such changes do not add material or equipment in excess of that covered by the Contract.

b. Within 40 days after receipt of NTP, submit a schedule of shop drawings.

c. For equipment furnished in this contract, provide complete shop drawings and documentation as specified elsewhere in this specification.

d. Update equipment interconnection wiring diagrams provided by equipment manufacturers to include panel board circuit designations for control power, connections to ETS and DTS cabinets, connections to annunciator from UPS, battery, control and interlock wiring between equipment, and similar conditions. Develop and submit composite interconnection diagrams showing terminal blocks, cable type, size and routing, appropriate cross-reference at both ends of cable termination, to the Engineer for approval.

e. Submit a complete drawing index for each substation and tie-breaker station.

f. Submit five (5) sets of shop drawings and relay settings for [13.8 kV], [34.5 KV] ac Switchgear including elementary and interconnection wiring diagrams to the Engineer for Power Company coordination and approval.

g. In addition submit to the Engineer five (5) sets of shop drawings for complete substation and Tie Breaker Station equipment, including bus duct, control cable tray, elementary wiring and interconnection diagrams for approval.

B. Electrical Calculations:

1. The Design Builder shall provide short circuit calculations for the purpose of setting protection relays for AC and DC feeder breakers, and Utility substation circuits, at all new or modified facilities. These calculations shall include settings for all protective relays in the substations being modified, and protective relays for the corresponding tracks at one substation beyond the substations listed herein. The Design Builder shall submit a Short-Circuit and Protection Settings Report (SCPSR) for approval for all electrical service connections. This report shall determine and verify overcurrent, short-circuit, and (if applicable to the Design Builder's design) dI/dt and delta I protection settings for AC, downstream circuit breakers and fuses and DC traction power circuit breakers. The SCPSR shall include; calculation of local and remote short-circuit levels; calculation of

circuit breaker steady and peak load currents, drawn from the SCPSR; and protection coordination curves, including applicable equipment ratings and utility short circuit levels and protection settings.

2. WMATA stipulates that the short circuit currents the track feeder breakers will be called upon to interrupt do not exceed 200,000 amperes.
3. The Design Builder shall provide composite coordination curves and study demonstrating proper protection of the equipment. Composite coordination curves shall demonstrate that the setting of the protection devices are adequate to protect medium voltage cable supplying rectifier-transformer and rectifier diodes under the maximum short circuit conditions and allowing the equipment to supply the specified overloads, and shall show that protective devices are set so as to provide the required protection while not creating nuisance trippings.
4. Provide calculation to support selection of Battery and the UPS system.
5. Provide calculations in support of the grounding system design. The Design Builder shall incorporate into the Project, measures to protect against stray dc traction power current. Such measures shall include grounding and bonding, isolation, insulation, cathodic protection, and other means to contain and mitigate stray current as specified in the Corrosion Control specification section.
6. Stray current impact and mitigation measures shall include as a minimum; track work, track bed and bonding. The Design Builder shall also coordinate and cooperate with utility companies and other affected parties along the alignment to ensure that mitigation and protection measures are incorporated.
   a. Field test plan and documentation:
      1) Submit field test plan 60 days prior to testing of equipment, with accompanying documentation in the form of test data recording sheets and list of proposed test equipment for approval by the Engineer.
      2) The approved test plan will be used for field-testing after installation is completed.
      3) Indicate in scope of test plan how equipment will be tested to ensure safe and orderly transition from installation, through initial energizing, to specified field testing.
      4) Accompanying documentation to include standard data recording sheets as used in manufacturer's in-plant testing of equipment and devices or as used by major utilities or large industrial users of specified equipment.
      5) Submit certified copies of test data, indexed by facility within ten days after completion of testing.
         a) Include oscillograph recordings of currents with dc switchgear protective device characteristics superimposed in the test reports.
         b) Verify schematic diagrams for interconnecting wiring, device labeling and proper operation.
         c) Submit one complete set of certified schematics at time of initial energizing of equipment.

C. Design Submittals:

1. The overall design submittal shall include but not be limited to: site plans, floor plans, equipment placement, equipment schematics, duct bank routing, manhole placement conduit and grounding plans, high voltage feeder details, traction power feeder details, elevations, sections, and cable schedules in sufficient detail and clarity that they may be used for construction. Design of pre-fabricated tie-breaker facilities, including shipping splits and all electrical and mechanical systems shall be included. Plans showing the demolition and removal of existing structures and equipment, where applicable, shall be included.

D. Operation and Maintenance Manuals: In accordance with Special Conditions; include final relay and trip device settings.

1.06 QUALITY ASSURANCE

A. Qualifications: Select manufacturers and subcontractors who are regularly engaged in production and installation of similar equipment and have demonstrated a successful record of providing and installing equipment of equal type and rating for extra heavy duty traction service for at least five similar projects.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver and handle equipment as specified in Contract Documents.

B. Store all equipment in secure and dry storage facility before installation at no additional cost to the Owner.

PART 2 - PRODUCTS

2.01 EQUIPMENT

A. The Design Builder shall design, furnish, install, connect, energize and test all material and equipment, providing transportation, handling, storage, construction equipment, labor, tools and all other incidentals necessary for providing all traction power system components including, but not limited to the following:

1. Enlarged or additional medium voltage ac services. Design-builder shall coordinate with utility provider
2. Metal-clad AC switchgear and breakers
3. Transformer-rectifier sets
4. Metal-Enclosed DC Switchgear and breakers
5. Protective relays (AC and DC)
6. Substation busways
7. Local annunciator panel/HMI
8. Wire and Cable
9. Electrical Service
10. Battery Systems
11. Uninterruptible Power System (UPS)
12. Composite Contact (Third) Rail
13. Contact-rail heating system
14. Remote terminal unit (AEMS RTU) including connection from DC switchgear transducers and AEMS interface panels
15. Miscellaneous materials including conduit, cable tray, support hardware, ETS cabinet, ETS lights, ETS enclosures, remote monitoring and wiring system, subfloor pouring/finishing, floor finishing and insulating topping, panelboards, grounding, etc., as shown and specified in WMATA Standard Specification Section 16052
16. Grounding and bonding as shown and specified in WMATA Standard Specification Section 16060

B. Work includes the furnishing and delivering to the job site 700 Volt DC output transformer-rectifier units, metal-enclosed DC switchgear assemblies, DC negative switchboards, DC bus ducts, annunciators and other auxiliary equipment for the traction substations and tie breaker stations on the WMATA system. The equipment shall be delivered as completely engineered, fabricated, assembled units, inspected and tested

ready for installation and connection to external circuits.

C. The arrangements shall provide minimum space requirements for the substations and tie breaker stations, adequate clearances and accessibility and suitability of arrangement with other equipment. Components, design and construction shall be chosen to provide a pleasing and homogeneous appearance. Units shall be as low in profile as possible. Units of the same type and rating shall be identical and interchangeable.

D. The Design Builder shall be responsible for providing all required support from equipment manufacturers during field-assembly, installation, testing and start-up of each traction power facility. This effort will include, but not be limited to, the following:

1. Provide shop-drawings and test-plans.
2. Provide manufacturer's field-engineering assistance during installation, field-testing and initial energizing. The services of qualified manufacturer's engineering representative shall be made available in phases, during the entire life of the installation contract.
3. Provide services of manufacturer's engineering representative during initial energization for verification of all equipment functions during train operation.
4. Make all changes on the equipment which may result from manufacturing discrepancies noted during equipment installation at no additional cost to the Authority.
5. Manufacturer's engineering representative shall be provided during Operation and Maintenance Training specified in WMATA Standard Specification Section 16053. The exact schedule and location shall be coordinated with the Authority and the Design Builder.

PART 3 - EXECUTION

3.01 INSTALLATION

A. The Design Builder shall install all required equipment. The work shall be in accordance with the Specifications included in this contract and equipment vendor drawings provided during the course of the contract. New equipment that is installed at the existing traction power facilities shall be compatible with the existing equipment, shall utilize existing available space while maintaining clearances required by local or other applicable standards and present a homogeneous appearance.

B. The Design Builder shall provide wall and floor openings or enlarge openings as required to accommodate bus duct, cable tray or conduit furnished. All unused conduit, sleeves, openings around bus ducts, cable trays etc. shall be sealed using fireproof material to meet occupancy jurisdictional codes for the room.

C. Switchgear shipping sections shall be assembled for proper alignment, leveling, and bonding of adjacent sections. Electrical connections between shipping breaks shall be made according to manufacturer's drawings. Pull boxes and cables for traction power shall not be exposed to view from public areas, including views pedestrians on public roadways and sidewalks wherever possible.

D. The Design Builder shall include all necessary operational and safety signage and equipment in accordance with WMATA, OSHA and other relevant requirements and in accordance with these Contract Documents.

E. The Design Builder shall remove and dispose of all excess material from the jobsite after project completion.

3.02 FIELD QUALITY CONTROL

A. Field Testing and Inspection:

1. General requirements:
   a. Conduct field testing and inspection at each station to ensure proper operation of equipment provided.
   b. Correct any deficiencies found during field testing and retest at no additional cost to the Authority.
   c. Relays and trip device setting: Set protective relays and trip devices in accordance with approved coordination study and their calibration for proper operation during field testing.
      1) Initial operation is expected to be six-car trains at two-minute headway; vehicles are being designed so that each six-car train when accelerating will draw a peak current of 9,675 amperes for approximately 17 seconds. Future operation is expected to be eight-car trains at two-minute headway; each eight-car train, when accelerating will draw a peak current of 12,900 amperes for approximately 17 seconds.

2. Field Inspection
   a. Prior to field testing, check equipment installation in accordance with manufacturer's recommendations and IEEE 141 as applicable including, but not limited to, verification of the following:
      1) Integrity of bus insulation.
      2) Tightness of connections.
      3) Adequate support of bus bars.
      4) Correct grounding, anchoring and alignment of switchgear in accordance with manufacturer's drawings. Correct insulation of rectifier and dc switchgear from ground.
      5) Ease of racking draw out breakers in and out of cubicle
      6) Physical interchangeability of similar circuit breakers.
      7) Adjustment of circuit breaker main and secondary contacts.
      8) Functioning of interlock and closing of safety shutter with breaker in disconnect or withdrawn position.
      9) Verify mechanical clearances and proper operation of disconnecting and grounding devices associated with potential transformers.
      10) Tightness of bolted bus joints by calibrated-torque-wrench method, based on manufacturers recommended values.
      11) Verify proper mounting and capacitive coupling of neon glow rube in A.C. switchgear for proper indication upon energization, make adjustment as required.

3. Field Testing:
   a. The Contractor shall coordinate with the Engineer to establish the specific testing schedule for each facility. Notify the Engineer one week in advance of each test. Conduct test in presence of engineer.
   b. Furnish test equipment, labor and services of manufacturers' engineering representative to perform specified tests.
   c. Submit certified test reports within ten days of substantial completion inspection. For each item, submit for approval and perform approved tests but not limited to those specified.
   d. Perform insulation resistance test of 60-second duration on all equipment in accordance with the following requirements:
   e. Test voltage:
      1) <u>Voltage Rating</u>

	Test Voltage
a) 150-600V	1,000V, dc

b) 601-5,000V 2,500V, dc
c) Above 5,000V 5,000V, dc

2) Insulation resistance: kV rating plus one megohm but not less than minimum value recommended by manufacturer.
3) Ensure insulation resistance is equal to or greater than minimum value specified before performing dielectric withstand test.

f. Perform functional and set-up tests on metering, control, interlocking, blocking and supervisory circuits, including verification of interconnections between equipment and interface points. Verification of these tests to be substantiated by lined-in schematics, signed by the Contractor and the Engineer.

g. For high-voltage ac switchgear:
1) Perform insulation resistance test between phase-to-phase and phase-to-ground.
2) Test grounding conductors and enclosures for continuity to station ground bus.
3) Test protective relays and trip devices in accordance with IEEE 141 procedures, modified as necessary, for compliance with approved coordination study.
4) Test operation of each circuit and control in accordance with approved sequence.
5) Test interlock system as follows:
a) Make closure attempt on locked open devices.
b) Make opening attempt on locked closed devices.
6) Dielectric withstand tests: Perform dielectric withstand test of 60-second duration on entire assembled and erected switchgear lineup using 60 Hertz voltage level as specified. During this test, electronic equipment may be isolated from the circuit. Perform tests in accordance with reference standards as follows:
a) 13.8 KV switchgear: 27,000 volts rms.
b) 34.5 KV switchgear: 60, 000 volts rms.
c) Control wiring: 1,500 volts rms.
7) Test current transformer circuits for polarity, ratio and protective device operation by primary injection method.
8) Test potential transformer ratio and polarity.

h. Rectifier Transformer:
1) Perform insulation resistance test between winding-to-winding and winding-to-ground. Correct resistance value to temperature.
2) Perform ac high-voltage test between high-voltage winding and ground and low-voltage winding and ground. Perform test at 75 percent of factory test voltage for 60-second duration.
3) Test voltage ratio for full winding and taps. Test result not to deviate more than 0.5 percent from calculated ratio. Set transformer tap as necessary.
4) Check polarity or phase relation.
5) Check contacts of dial-type thermometer for indicating normal and over temperature condition of transformers at remote location and to initiate tripping of associated rectifier-transformer feeder breaker under abnormal temperature conditions. Set thermometer contacts as recommended by manufacturer.
6) Test all alarm indications and protective devices for proper operation.
7) Transformer for outdoor use (oil-filled type) :

a) Inspect transformer for oil leaks.
b) Test samples of insulating liquid from top and bottom of tank.
c) Test dielectric strength in accordance with ANSI C57.12 to verify the minimum breakdown voltage is not less than 34kV for 13.8kV service and 70 kV for 34.5kV service.

i. Silicon Rectifier
1) Perform insulation resistance test between phase to phase and phase to ground.
2) Check contacts of 1st stage rectifier over temperature device to initiate alarm upon excessive temperature increase. Make temperature settings as recommended by the manufacturer.
3) Check contacts of 2nd stage rectifier over temperature condition (higher than the 1st stage), to initiate alarm and tripping of rectifier transformer ac circuit breaker and the rectifier cathode breaker via lock-out relay. Make temperature settings as recommended by the manufacturer.
4) Check contacts of diode failure device for alarm initiation with the loss of one diode and tripping of ac rectifier-transformer feeder circuit breaker and rectifier cathode breaker via lock-out relay with second diode failure.
5) Check the operation of enclosure ground detection system to initiate alarm for grounding of the metal enclosure and to initiate alarm and tripping of cathode circuit breaker, rectifier-transformer feeder ac circuit breaker and rectifier transformer lockout relay under structure energized condition.
6) Check the operation of door interlock to trip and prevent closing of the rectifier-transformer feeder breaker and cathode breaker when the enclosure door is open.
7) Test rectifier enclosure insulation to demonstrate proper enclosure insulation from ground. Test at 2500 volts, 60 Hertz from enclosure to ground for a duration of one minute, with the enclosure ground detection relaying disconnected.

j. Substation bus ways: AC bus ducts, positive dc bus ducts and negative dc bus ducts.
1) Test resistance of all bus way connections. Resistance not to exceed value recommended by manufacturer.
2) Test insulation resistance from bus bars to ground and between insulated bus bar.
3) Perform dielectric withstand test of one minute duration at 75 percent of specified factory test value.
4) Test cathode bus duct enclosure insulation to demonstrate proper enclosure insulation from rectifier, dc switchgear and ground. Test at 2500 volts, 60 Hertz from enclosure to ground for a duration of one minute. Remove bonding jumper between bus duct enclosure and rectifier or switchgear during test.

k. Metal-enclosed dc switchgear:
1) Test protective devices/relays in accordance with IEEE 141 procedures, modified as necessary, for compliance with approved coordination study.
2) Test operation of each circuit and control in accordance with approved sequence.
3) Test interlock system as follows:
a) Make closure attempt on locked-open devices.
b) Make opening attempt on locked-closed devices.
4) Perform dielectric withstand test of one minute duration on entire

assembled and erected switchgear. Test at a voltage of 2775 volts, rms, 60 Hertz or 3900 volts dc on live parts and 1500 volts, rms, 60 Hertz on control wiring. Isolate all electronic timers and devices during the test.

l. Test switchgear enclosure insulation to demonstrate proper enclosure insulation from ground. Test at 2500 volts, 60 Hertz from enclosure to ground for a duration of one minute. Disconnect enclosure ground detection relaying during the test.

m. Short-Circuit Test on DC Bus: At each substation, perform a short-circuit test to insure capability of transformer-rectifier units to withstand a bolted fault at the dc switchgear bus and to verify coordination of cathode circuit breaker and ac circuit breakers in ac switchgear. Test with all ac circuit breakers closed except ac bus tie breaker, all dc cathode circuit breakers closed and all dc feeder circuit breakers connected and open. Apply a bolted fault to the dc switchgear at the line terminals of one dc feeder circuit breaker. Record current at each affected breaker with an oscillograph.

n. Short-Circuit on DC Feeder:

1) Perform short-circuit tests in the vicinity of each substation to ensure capability of dc feeder breaker to trip and interrupt a close-in fault under maximum short-circuit conditions and to coordinate with cathode breaker forward trip. Apply a bolted fault at the tracks in the immediate vicinity of the substation between inbound contact rail and a running rail. Demonstrate that the instantaneous trip element of the feeder breaker nearest to the fault in the substation initiate breaker tripping and rate of rise relay associated with the remote feeder breaker in the tie breaker station initiate breaker tripping and the cathode breaker and AC breakers and the other DC feeder breaker does not trip improperly. Test with all rectifiers in operation and all interconnecting dc feeder breakers closed. As part of the test, record the trip device which operates affected dc feeder breakers. Record current at each affected breaker with an oscillograph.

a) Provide any additional relays, other than those shown on the one line diagram, which are considered to be necessary to achieve the above protective relaying coordination.

2) Remote Short-Circuit on Feeder: Perform a remote short-circuit test on the remote end of the same section of inbound contact rail midway between Substations, but located as specified. Demonstrate capability to detect and clear a remote fault with settings made on the protective relays, that only the two feeder breakers (one in the substation and one in the tie breaker station) nearest to the faulted section of contact rail trip and that the cathode breaker, and ac breakers and other dc feeder breakers do not trip. Demonstrate that the feeder breakers at the adjacent substations or tie breakers stations do not trip. As part of the test, record the trip device which operates affected dc feeder breakers. Record current at each affected breaker with an oscillograph.

3) Automatic Reclose Field Tests: Test the automatic reclose system for both the near short-circuit test for the remote short-circuit test for on dc feeder and for proper operation under both short-circuit conditions and normal operating conditions.

4) Station prior to short-circuit test on dc feeder, remote short-circuit test on dc feeder and automatic reclose field test. Test with two twelve-car trains, without passengers one inbound and one outbound, starting at the passenger station simultaneously. Demonstrate relays and trip devices, as set; do not respond improperly to train starting. Demonstrate that the relay and trip settings required to meet the required short circuit test will not respond improperly when starting a twelve-car train at a passenger station close to a substation. Record current at each affected feeder breaker with an oscillograph.

o. Reverse Current Test on Cathode Breaker: Perform a primary current injection test on a cathode breaker to verify proper operation of reverse current protection.

p. Test ETS system for proper operation in conjunction with Installation Contractor.

q. Graph/record harmonic noise and content of harmonic current on feeder cables and on surrounding ATC equipment. Meet utility and manufacturer standards.

B. Field Testing Personnel:

1. Provide services of qualified engineering representatives of the equipment manufacturers to conduct specified field testing program.
2. When more than one representative is involved, the Contractor is responsible for coordination of testing effort.

C. The short circuit tests shall be planned for minimum interference with Authority's train testing or other track use, and shall be totally accomplished, including all instrumentation and removal, in a total period of three (3) days or less per facility. The actual period shall be coordinated with and established by the Authority.

D. Authority Tests:

1. The Authority reserves the right to require the Contractor to conduct acceptance tests of voltage regulation and sound level on each transformer-rectifier unit at each substation and a train start test at each passenger station within one year after installation.
2. In order to perform sound level test, the Contractor may recreate test conditions of applicable standards to the extent possible without disturbing existing structure or installed equipment and materials.

E. Submit five (5) copies of certified test reports within 10 days of Substantial Completion (SCI) for each station.

TABLE 01 11 70-I

SCHEDULE OF SHOP DRAWING REQUIREMENTS

Item	Description	To Be Furnished Within Calendar Days
A	Outline dimensions, including weights and foundation requirements for all equipment furnished	60 after Award
B	Front views, floor plans, and mounting details for all equipment furnished	60 after Award
C	One line diagrams	90 after Award
D	List of standard symbols and nomenclature	90 after Award
E	Elementary and control schematic diagrams and description of operation	90 after Award
F	Interconnection wiring diagrams	120 after Award
G	Wiring diagrams, showing internal wiring of all equipment furnished	120 after Award
H	Wiring diagram, showing interconnection between shipping breaks	120 after Award
I	Cross sections showing internal construction of equipment	60 after Award
J	Physical details of 13.8kV or 34.5 kV connections to transformers	90 after Award
K	Physical details of all ac and both dc positive and negative bus ducts and bus connections	60 after Award
L	Certified Design and Field Test Reports	10 after Test Completion
M	Rectifier Transformer Data, including: 1. Excitation Current 2. Impedance, percent based on rated kVA 3. Reactance, percent based on rated kVA 4. Resistance, percent based on rated kVA 5. Weights: Core and coils Tank and fittings Insulating oil Total	60 after Award
N	Rectifier Data, including: 1. Diode Ratings:	45 after Award

TABLE 01 11 70-I (Continued)

SCHEDULE OF SHOP DRAWING REQUIREMENTS

Item	Description	To Be Furnished Within Calendar Days
	Voltage, Peak Reverse Voltage, Current, Temperature Limit 2. Arrangement of Components	
O	Dc Switchgear Data, including: 1. Duty cycles before required maintenance: No-load Full-load Rated fault current interruptions 2. Weight of circuit breaker only 3. Certified Design Test Reports	45 after Award
P	AC Switchgear Data, including: 1. Duty cycles before required maintenance: No-load Full-load Rated fault current interruptions 2. Weight of circuit breaker only 3. Certified Design Test Reports	45 after Award
Q	Annunciator Panel	45 after Award
R	Control Power Data for each substation including: 1. Continuous 125-Volt dc load 2. Continuous 115-Volt ac load 3. Closing and Tripping loads of: a. 700-Volt dc circuit breakers, for each rating b. 13.8kV or 34.5 kV circuit breakers	60 after Award
S	Technical Description of Equipment Operation, Control and Protective Functions	90 after Award
T	Bill of Material, with reference to all components indicating part numbers and manufacturer name	90 after Award
U	Equipment Arrangement Drawing; Plan and Elevation for each substation and tie breaker station including bus duct sizes and elevation and cable tray plan and elevation for space coordination purposes.	90 after Award
V	Wire and Cable.	45 after NTP.

TABLE 01 11 70-I (Continued)

SCHEDULE OF SHOP DRAWING REQUIREMENTS

Item	Description	To Be Furnished Within Calendar Days
W	Uninterruptible power system.	In accordance with table 34 24 17-1.
X	Basic materials and methods: Cable trays and mounting details, DTS cabinet, ETS enclosures, ETS relay cabinet, ETS system schematic diagram, ETS light fixture and remote ballast, Panel board, steel panels, plastic barrier/fire stops.	45 after NTP.
Y	Remote terminal unit, including schematic diagram, connection diagram, layout drawing of control wiring and Internal component, enclosure details.	60 after NTP.
Z	Certified factory test reports.	30 after test completion.
AA	Certificates from manufacturers verifying that products conform to specified requirements.	45 after NTP.
BB	Manufacturers' catalog cuts and literature.	45 after NTP.

listed below, single track RSAs will be permitted between 2200 Friday and 0400 Tuesday and complete shutdown RSAs will be permitted between 0300 Saturday and 0400 Tuesday.

1. Martin Luther King Day
2. President's Day
3. Memorial Day
4. Columbus Day
5. Labor Day

G. The Hours of Work associated with non-revenue and RSAs and the frequency that these Hours of Work will be available to the Design-Builder are noted below.

1. Non-revenue (0100 to 0400) – 2 of 5 weeknights

2. Weekend RSAs as indicated below. Weekend RSAs will not be permitted on back-to-back weekends. 3-day weekend RSAs will be limited to federal holiday weekends indicated in Article 1.04F herein:

   a. 2-day weekend single tracking (2200 Friday to 0400 Monday)
   b. 3-day weekend single tracking (2200 Friday to 0400 Tuesday)
   c. 2-day weekend shutdown (0300 Saturday to 0400 Monday)
   d. 3-day weekend shutdown (0300 Saturday to 0400 Tuesday)

3. A double track outage will be granted for up to two consecutive weeks between National Airport and Braddock Road stations, commencing no sooner than 6:00 AM Saturday July 10, 2021 and ending no later than 12:01 AM on September 7, 2021. Examples of a two week outage are as follows:

   a. Start 6:00 AM 07/10/21 end 12:01 AM 07/26/21
   b. Start 6:00 AM 08/21/21 and 12:01 AM 09/07/21

H. RSAs will not be permitted during the following periods in any calendar year:

1. March 12 through April 21
2. The first Saturday of June (Race for the Cure)
3. The week containing July 4 including the preceding and succeeding weekends.
4. The 4th Sunday of October (Marine Corps Marathon)
5. Thanksgiving eve through the following Monday

6. The 3rd Saturday of December

7. Christmas eve and Christmas day
8. New Year's eve and New Year's day

I. Many times during a calendar year there are large events scheduled in the Washington DC area that require special attention by WMATA. These events are typically scheduled no sooner than 90 Days in advance of their occurrence. Plan no more than three such events in any calendar

year. WMATA will notify the Design-Builder of the scheduling of these events as soon as they become known. If the event conflicts with a scheduled RSA, then the Design-Builder RSAs will need to be advanced or delayed 1 week unless there is conflict with the black-out periods listed above.

J. There shall be no early endings of the working days on nights of regularly scheduled sporting events such as baseball, basketball, hockey, or soccer.

K. Emergencies, excluding Acts of God, arise during the course of Metrorail operations that could cause the cancellation of a scheduled RSA. Anticipate no more than four cancellations within a calendar year. If an emergency occurs, then the Design-Builder RSAs will need to be delayed 1 week unless it conflicts with the black-out periods listed above.

L. Construction of the Potomac Yard Metrorail Station and its facilities will require the operation of heavy equipment adjacent to the active WMATA railroad. Equipment operations that pose a threat to the railroad right-of-way cannot occur during revenue rush hour operations but can occur, on a limited basis, during non-rush hour operations with the presence of a WMATA flagperson. A flagperson will only be supplied with a 1-week notice from the Design-Builder. An example of restricted equipment operations would be a crane positioned such that its load or the crane itself would breach the railroad right-of-way in the event of a failure or accident. Positioning or operating equipment that eliminates this risk would permit operation to proceed without restrictions.

M. Construction of the Potomac Yard Metrorail Station and its facilities will require the operation of heavy equipment adjacent to the active CSX railroad. The Design Builder shall coordinate all activities with CSX and any operations that pose a threat to the CSX railroad right-of-way cannot occur without the expressed written permission of CSX and the presence of a CSX flagperson.

PART 2 – PRODUCTS (not used)

PART 3 – EXECUTION (not used)

END OF SECTION