

Report of Findings



City of New York

East Side Coastal Resiliency Elevated Park Alternative Feasibility Analysis April 24-26, 2018





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City of New York Office of Management and Budget 255 Greenwich Street, 8th Floor New York, NY 10007

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SECTION 1

SUMMARY OF FINDINGS



Section 1 Summary of Findings

On April 24-26, 2018, a collaborative effort among East Side Coastal Resiliency project stakeholders ORR, DPR, DOT, DEP, OMB, DDC, and Law convened along with the AKRF/KSE Joint Venture and members of the value engineering team. The purpose of the working group was to review the feasibility of the alternative to elevate East River Park in lieu of the baseline approach of building a floodwall along the FDR, and to facilitate a more-detailed comparison between the two schemes. This Narrative will summarize the results of that effort.

Flood Protection

The proposed alternative elevates and protects much of East River Park, which is made possible by significant changes to three key project constraints: reconstructing the esplanade, installing a floodwall inshore of the esplanade, and reconstructing portions of the Park previously required to remain as existing. A structural flood protection intervention is required along the eastern edge in order to maintain Park program and accessibility – including both universal access for pedestrians and vehicular access for maintenance and emergencies. The western edge of the park is raised adjacent to the shared use path and would remain elevated to the flood protection structure inshore of the esplanade. The Park would meet existing grades and the flood protection would tie into the baseline alignment at the northern and southern limits of the Park. At the northern limit, a new swing gate will probably be required for this transition, while at the southern limit there would be an earthen berm with a clay core and sheet pile wall to transition to the area near the amphitheater site.

The flood protection would be achieved by driving a new steel sheet pile floodwall adjacent to, and inshore of, the existing esplanade structure (minimum of approximately 40 feet from east edge of the esplanade). In addition to providing flood protection, this wall would serve as a retaining structure for the park grading and would act as a seepage barrier. The floodwall may protrude above grade in some locations (exposed height varies). This wall would be integrated into Park landscaping features.

Access

The shared use path is to remain at grade at its existing alignment in order to leave the Con Edison lines in place. With this alternative, design energy would have to be focused on the shared use path experience to ensure that this highly-used bicycle and pedestrian facility is a positive experience. The Delancey Street and East 10th Street Bridges would be replaced as proposed in the baseline design, though the span would be extended an additional 45 feet to span the at-grade shared use path and land in the elevated park area. New 45-foot span structures would also be



introduced at the Houston Street overpass to cross the at-grade shared use path and at the Cherry Street Bridge if the amphitheater is to be reconstructed. Maintenance vehicles will be able to travel on the reconstructed esplanade as well as the shared use path. Vehicular access across the park and connecting these two paths will be provided by a series of sloped paths between ball fields and program areas similar to the baseline proposal.

Constraints

Active participation from the various City stakeholders enabled the group to challenge and obtain concurrence to modify certain baseline constraints. The following constraints were changed:

- The Esplanade was allowed to be modified
- The piers under the Williamsburg Bridge may be buried with fill as necessary
- The 6th Street Track & Field Facility may be demolished and reconstructed
- The Tennis House may be demolished and reconstructed
- The LESEC Composting Facility may be re-designed and constructed after ESCR
- The Con Edison lines will be left in place with no tunnel constructed, which requires the shared use path to be left at grade and in the current alignment.

The following constraints were maintained:

- The East River Park program will be the same as in the baseline alternative
- The Flood protection design criteria remains unchanged el. 16.5' design height
- The Flood protection vegetation offset is required at a distance of 15' clear from trees/woody vegetation on either side of floodwall
- The Pier 42 project is assumed to remain in place and will be constructed before ESCR, which requires a floodwall along the FDR Drive-side of the Pier 42 project
- The project will tie into the existing grades at the north end of East River Park

Adjustments to Buildings

To be replaced as part of Alternative:

- Tennis house 1250 SF. Function: houses tennis manager (required for permitted access to tennis courts) and restrooms.
- Track Facility 4400 SF. Function: East River Park maintenance operations headquarters, storage, and restrooms.



Grading

In general, the low point of the park will be the shared use path along the FDR Drive. Moving west to east, the park elevation would then be raised with two 3-foot retaining walls to a varying height, typically ranging between el. 14.5' to 18.5'. The park remains raised across its width, meeting the flood protection elevation of 16.5' inshore of the esplanade. The esplanade grade will vary between 14.5' and 16.5' along its length.

Proposed Refinements to the Bulkhead and Esplanade

Proposed Sheetpile Flood Protection Wall

The Elevated Park would raise the grade of the Park from about El. 8.5 to about El.16.5. Consequently, the Elevated Park adjustments include a steel sheetpile wall to retain the new fill. The sheetpile wall would actually serve three functions:

- Retains the new fill
- Provides a deep seepage cutoff wall
- Provides flood and wave protection

The sheet pile wall would be below grade and as such, it is not subject to corrosion from wave action during flood events.

At this time, it is not clear whether the function of a deep seepage cutoff is actually needed. Additional geotechnical analyses should be conducted to determine if there is truly a risk of seepage during the design flood event. Considering the width of the park (of 200 to 400 feet) the risk of seepage seems quite small.

For preliminary cost estimating purposes, the proposed steel sheetpile wall would have tip elevations of about EL-35 to EL-40 feet. Its length is about 6,000 lineal feet. The sheet size is AZ-36, although a smaller size can probably be used subject to further design. The sheetpile can be designed as a cantilever structure.

The existing esplanade consists of two structure types. The outboard structure is a concrete deck supported on steel pipe piles. The outboard structure is reportedly 10 to 12 years old. The inboard structure is an older, timber-pile relieving platform. This inboard structure is scheduled for rehabilitation to repair voids and encase the piles in concrete.

The outboard structure was designed for a live load of 300 psf and a vehicular load of HS-20 which would allow access by various maintenance trucks and emergency vehicles. It is recommended that the new elevated outboard esplanade be designed to carry similar loads as the original.

Partial Structural Reconstruction of Esplanade

In addition to the sheetpile flood protection wall, the Alternative would include raising the level of the esplanade to el. 16.5' by reconstructing a new deck on new



girders in order to meet the park elevation and maintain the same program area of the Park.

Existing 24 inch diameter pipe piles and existing concrete pile caps can be maintained. Following local removal of the existing deck slab and hollow core planks, new deep AASHTO concrete girders would be installed in alignment with the existing piles. A new concrete deck would span from girder to girder, perpendicular to the River. The existing soldier pile-supported retaining wall would be increased in height. A new steel sheetpile wall, deadman and integral flood barrier would be installed. The pile caps would be connected to a new deadman with tie rods.

This would allow 100 to 200 psf of pedestrian load, as well as HS 20 vehicle. No other significant loading or planting would be recommended. The length of the bulkhead is about 5000 to 6000 LF of reconstructed structure.

Utilities and Electrical

The original concept is to replace only portions of existing NYC DEP branch interceptor sewers beneath East River Park with fill over them, retaining most of the existing sewers and all existing regulators, which were only to be hardened.

The alternative concept is to retain existing NYC DEP branch interceptor sewers within the park using lightweight fill, raising sewer manholes to proposed grades and replacing or modifying regulators to meet proposed grades. Allowances have been added for replacement of damaged sewer pipe sections, and for guniting or lining of significant length of sewers.

Some advantages of this alternative concept include retaining the existing NYC DEP sewers by using lightweight fill. This will not increase loading on sewers. Also, lining of pipes will extend service life and avoid expense of full replacement of sewers in this project.

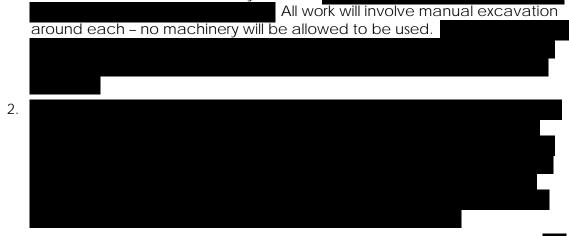
Electrical Utilities

Under the Baseline and the Elevated Park Alternative, electrical utilities infrastructure work will be similar, except that in the Elevated Park, it will not need to be hardened to withstand a prolonged submerged condition. Additional light poles will be needed for the elevated esplanade.

Risk Comparison

Con Edison Tunnel

The Elevated East River Park Proposal was generated in response to concerns regarding the level of risk posed by the inclusion of the Con Edison utility tunnel in the baseline design. The Con Edison tunnel presents the most significant risk to the project. This risk could result in significant project cost and a prolonged construction schedule. The VE Team believed that this cost is not sufficiently reflected in either the baseline schedule or the cost estimate. They saw the risks as follows: 1. Under normal circumstances a tunnel for the high-tension transmission lines would be built first and the transmission cables and auxiliary pipes installation would follow, not the other way around.



- 3. Based on the tunnel cross section information included in the 40% plans, each pipe may need an individual support structure – possibly as close as every 5 feet.
- 4. Special attention should be given to positioning the new tunnel around the Con Edison transmission lines in order to maintain a safe passage through the tunnel by the repair/maintenance personnel.



Adoption of the proposed alternative would avoid the risks involved in shielding the Con Edison high tension lines in East River Park.

FDR Drive

Impacts to the FDR Drive would be dramatically reduced by adoption of the Elevated Park Alternative. Night construction in four-hour increments would no longer be necessary, dramatically shortening the construction of the flood protection and lessening community impacts. With the Elevated Park Alternative, all flood protection components occur within the Park.





Fill Sourcing

The quantity of fill is higher in the Alternative proposal than it is in the Baseline design, which increases the risk that fill will be difficult to source.

Permitting

The Elevated Park Proposal will require DEC permitting for the elevated bulkhead. This is a known process for Parks and other agencies, and the process can be started shortly after the decision is made.

Impacts on Design Schedule

Redesign is required to bring the concept of the Elevated Park to the current level of design. Preparation of the EIS will be the critical path for the design schedule. The expenditure of the HUD funding, whether partial or in full, requires certification of the EIS.

Recommended Plan to Encumber the HUD Funding

To accelerate the design and construction of the project, the following approach could be adopted:



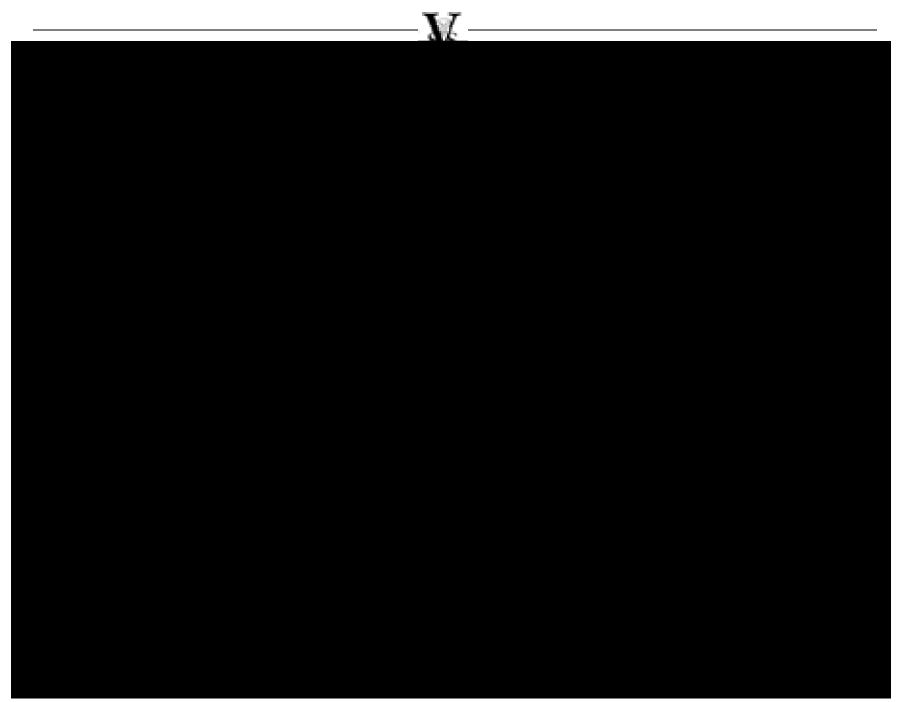
Conclusion

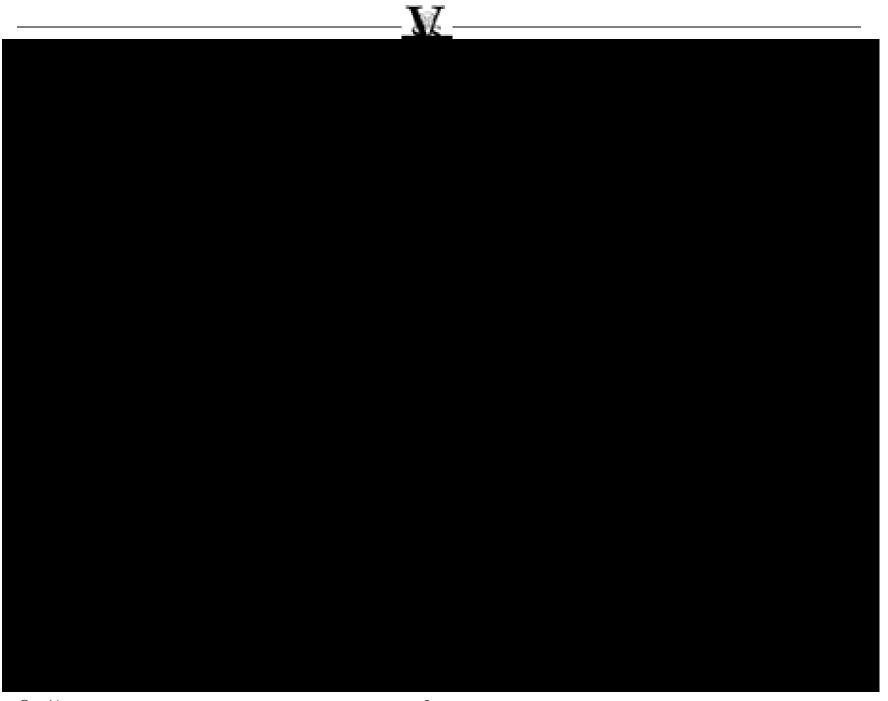
The assembled working group of city agency representatives, design team and VE team members collectively examined the feasibility of the Elevated Park Alternative, and determined that, with some adjustments to assumptions, it is achievable.

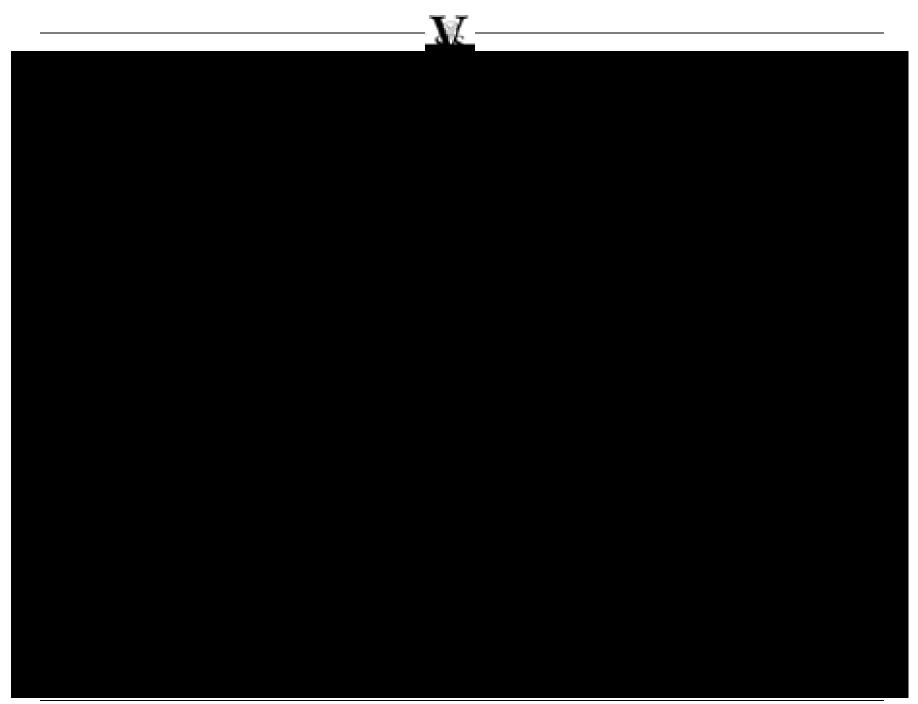
The additional cost for the Alternative is allocated to Park longevity and reduction of risk to the Project.

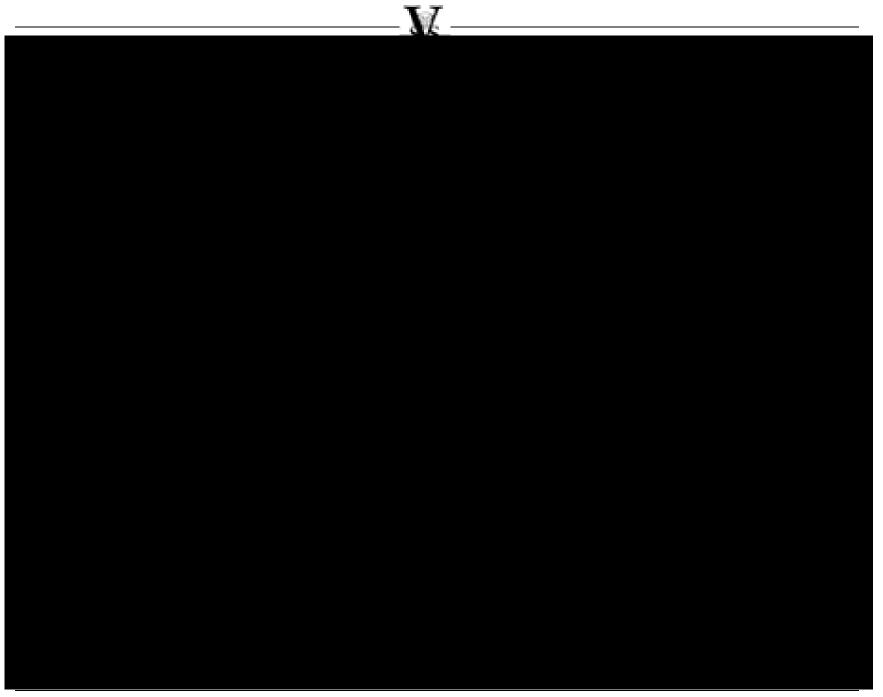
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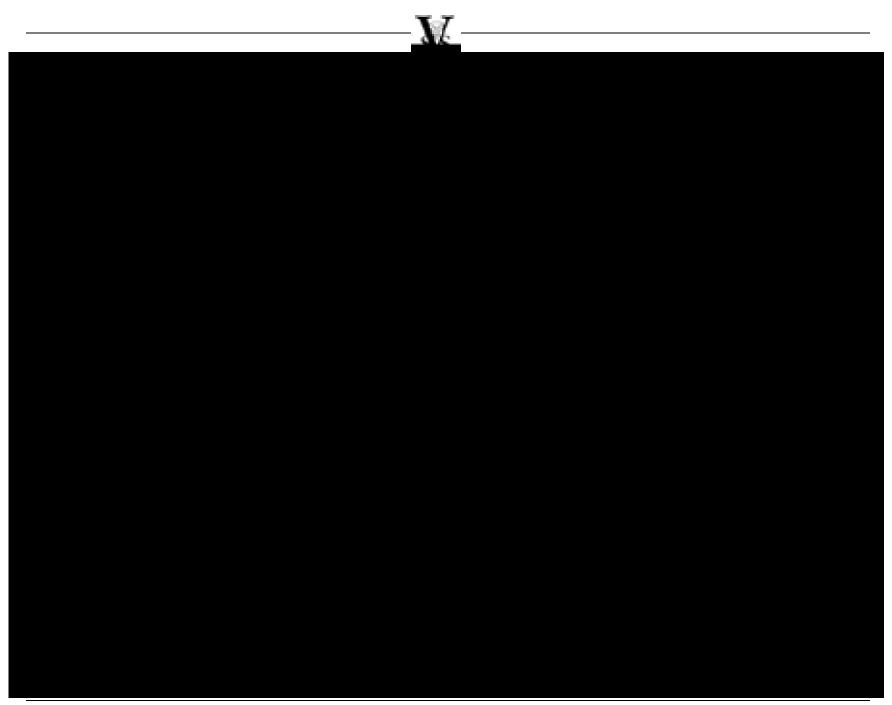
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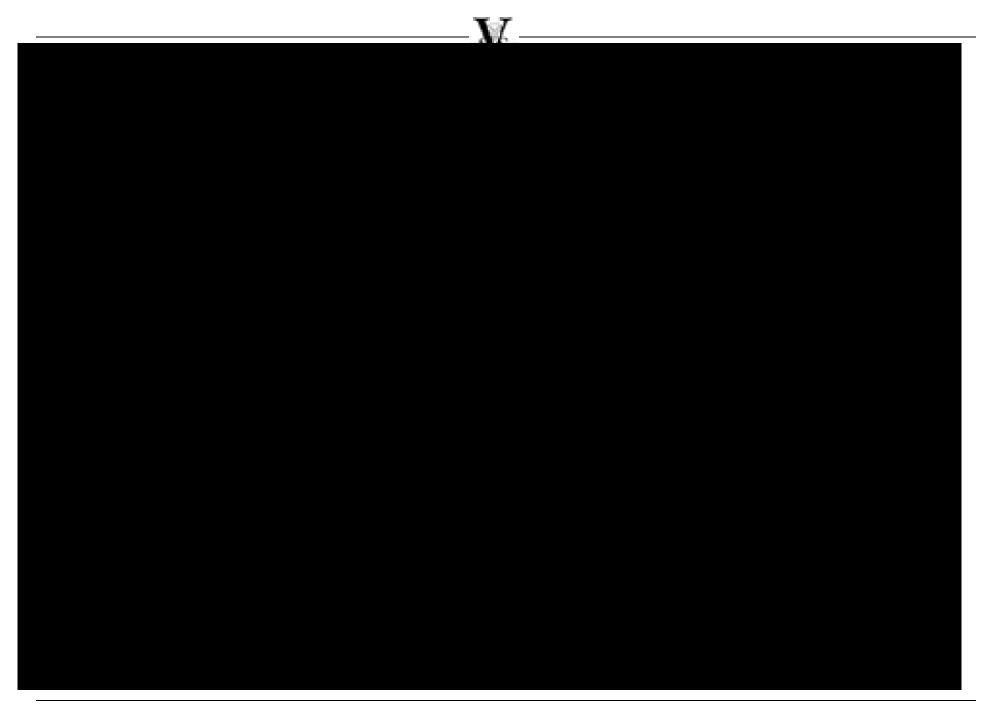


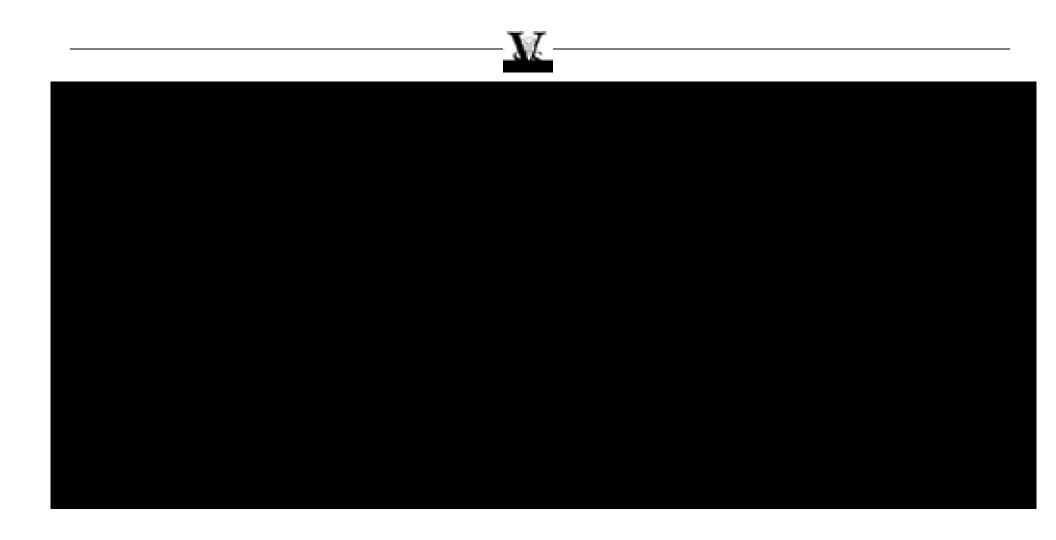


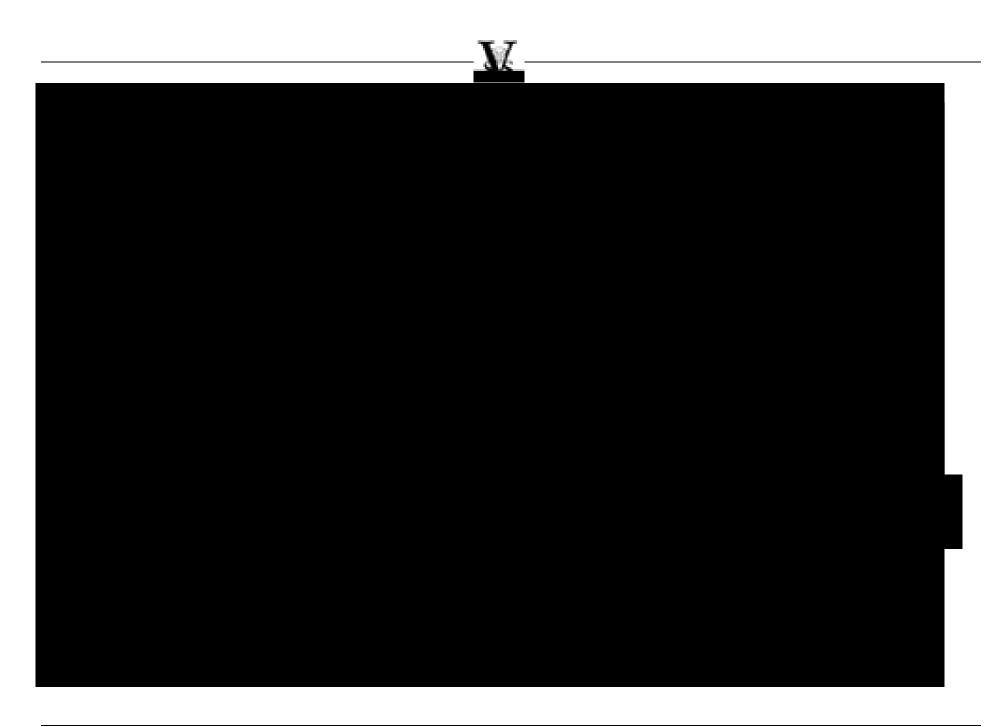












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ESTIMATED COST COMPARISON



SECTION 3 ESTIMATED COST COMPARISON

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Contingency	126,303,003	150,657,856
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Escalation 3.34 year x 4%	76,350,165	91,072,674
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GC General Conditions	62,366,318	74,392,338
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Overhead & Profit (10%85%)	102,904,425	122,747,358
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Contractor Bond & Insurance	15,778,678	18,821,262
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SECTION 4

ATTENDEES



SECTION 4 ATTENDEES

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SVS DATE: Wednesday, April 25th, 2018

LOCATION

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VETC	SVS, Inc.	
LOCATION	OMB, 255 Greenwich Street,	7th Floor, Conference Room E-10
STUDY	ESCR Proposal Review	DATE: Thursday, April 26th, 2018
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LOCATION OMB, 2	55 Greenwich Street, 7 th Floor	, Conference Room E-10
STUDY ESCR	roposal Review DATE:	Thursday, April 26 th , 2018
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LOCATION OMB, 2	55 Greenwich Street, 7th Floor	Conference Room E-10
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