

SANITARY SEWER REPAIR PROJECT

Arlington National Cemetery
Arlington, Virginia

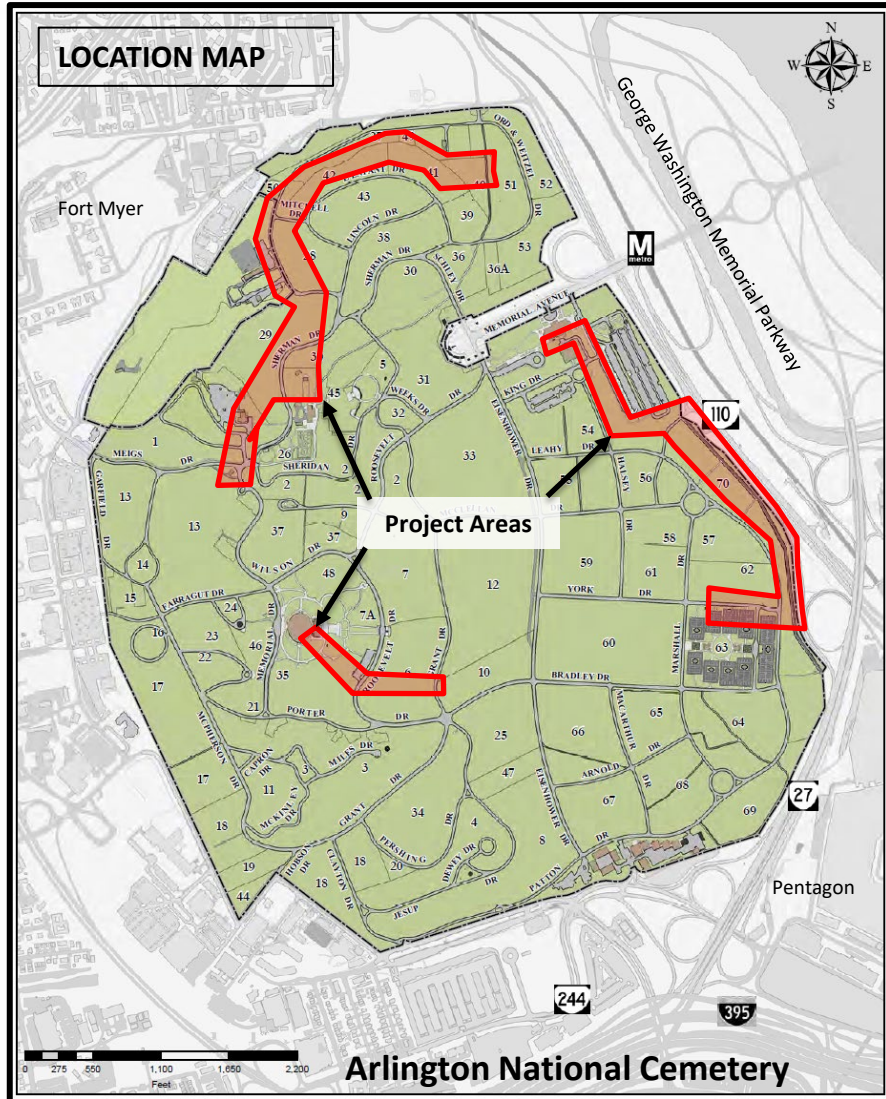
PROJECT DESCRIPTION, AREA OF POTENTIAL EFFECTS, & ASSESSMENT OF EFFECTS

ANC Project Point of Contact:

Steven Crawford
Architect/ Project Manager
Engineering, Design & Construction

Caitlin Smith
Cultural Resources Program Manager
Engineering, Planning & Resources

September 28, 2022



PROJECT DESCRIPTION

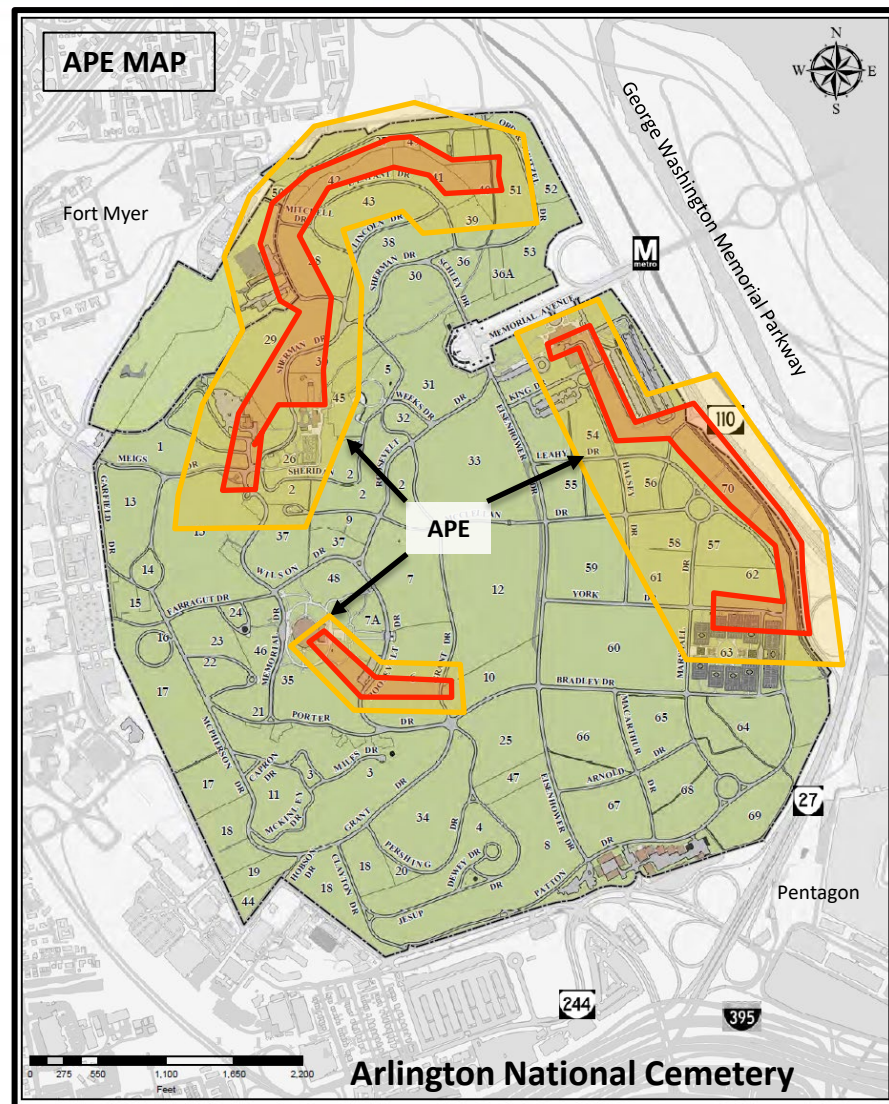
Arlington National Cemetery (ANC) proposes repairs to existing sanitary sewer lines. The work includes rehabilitation, cleaning, repair, and replacement of lines identified for remediation. The target sanitary sewer lines vary in diameter, segment length, proximity to manhole connections, and physical location within ANC. Other work includes restoration of existing manholes and installation of new manholes.

The sanitary sewer system at ANC is made up of various materials such as clay, polyvinyl chloride (PVC), and high-density polyethylene (HDPE) and is of varying ages. The 9800 linear foot system is made up of six-inch, eight-inch, 10-inch, and 12-inch diameter piping and associated manholes. Some of the system resides outside the cemetery's boundaries.

ANC experienced several sanitary sewer failures despite some of the lines having been cleaned between 1995 and 2000. To prevent future system failures and to prolong the life of the system, ANC seeks to have the sanitary system cleaned and repaired.

A study performed in 2016-2017 included a CCTV investigation of the sewer lines. This study captured elevations at manholes and documented the pipe conditions, materials, and locations. Based on that report, USACE developed plans and specifications to have the sewer system repaired and cleaned. In 2020-2021, the "ANC Utility Systems Modeling" project inspected areas of the sanitary sewer system that had been noted to be clay-lined and slated for pipe lining, PVC and slated for cleaning only, or DI and slated for pipe bursting with 8" HDPE; however, not all areas associated with this project were included in the "ANC Utility Systems Modeling" project. A few areas were not covered by either study. Utilizing this earlier work, ANC proposed an FY23 project to repair the sanitary sewer lines. The project will mainly utilize trench-less technologies, such as pipe bursting and Cured-In-Place Pipe (CIPP) lining services, to repair existing pipes. There will be excavation in sections 41 and 49.

AREA OF POTENTIAL EFFECTS



AREA OF POTENTIAL EFFECTS

The Area of Potential Effects (APE) for the proposed Sanitary Sewer Repair Project is outlined in yellow on the map to the left. The APE includes locations where the project may be visible and/or audible. The area is the boundary from which one can see the repair work. Once all work completes, there will be minimal visible changes to the historic landscape beyond the addition of new manhole covers. The project involves ground disturbing activities in previously disturbed areas.

The project areas are located in Arlington National Cemetery Historic District (Virginia Department of Historic Resources [VDHR] #000-0042).

NATIONAL REGISTER PROPERTIES IN THE APE

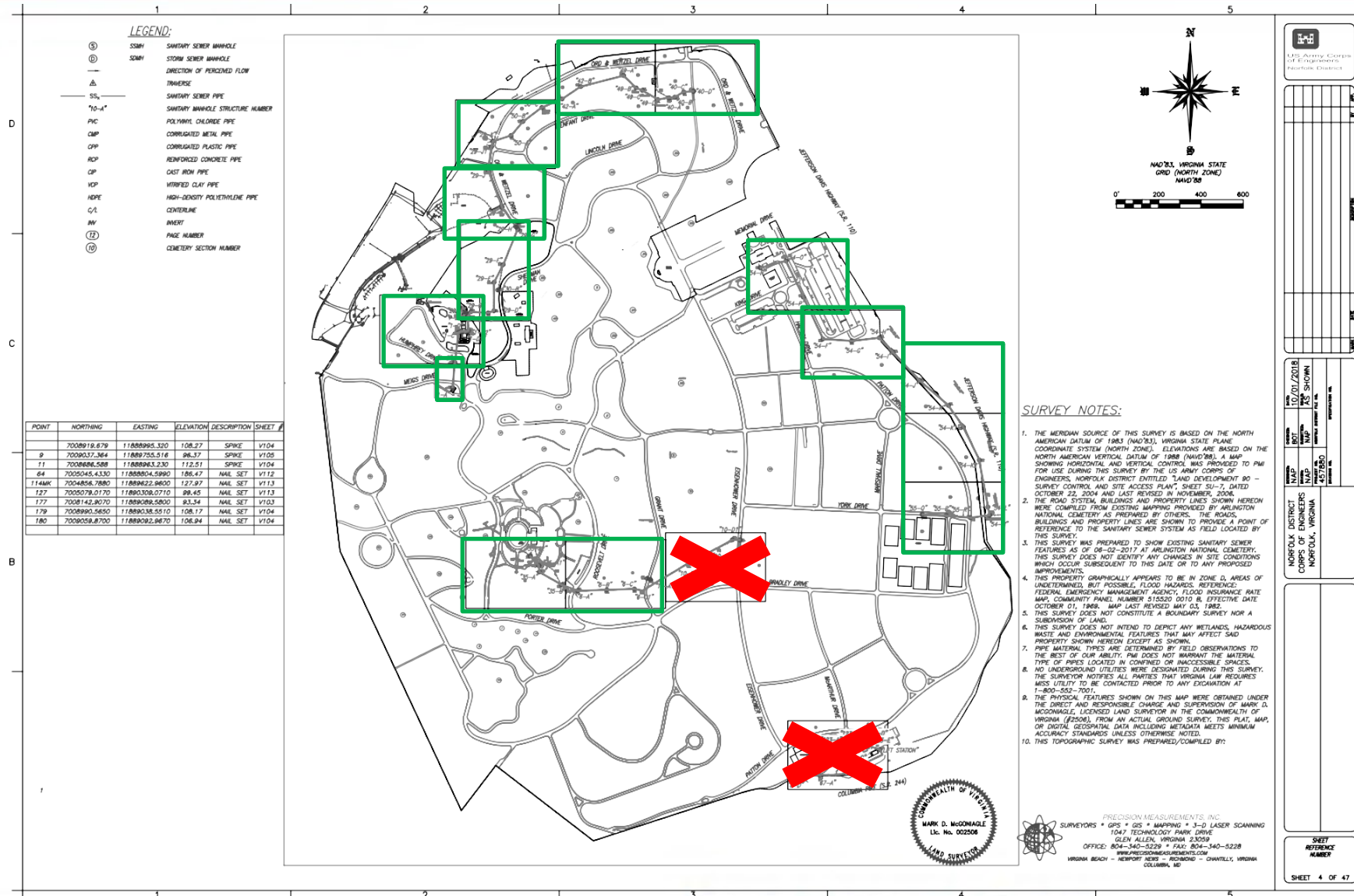
Following is a list of historic structures and features contributing to Arlington National Cemetery's and Arlington House's historic districts, which are located within/adjacent to the APE.

- Arlington National Cemetery Historic District (DHR #000-0042)
- Arlington Memorial Bridge Historic District (DHR #000-0014)
- Arlington House Historic District (DHR # 000-0001)
- Arlington House Cultural Landscape (CLI #600049)
- Headstones and Grave Markers (DHR #000-0042-0021)
- Columbarium Courts (DHR # 000-0042-0016)
- Headstones and Grave Markers (DHR #000-0042-0021)
- Burial Sections
- Superintendent's House, Lodge #1 (DHR ID#: 000-0042-0001)

Map of Project Areas

APE outlined in **YELLOW**.

Proposed project locations in **RED**.



QUANTITY OF EXCAVATION DISTURBANCE

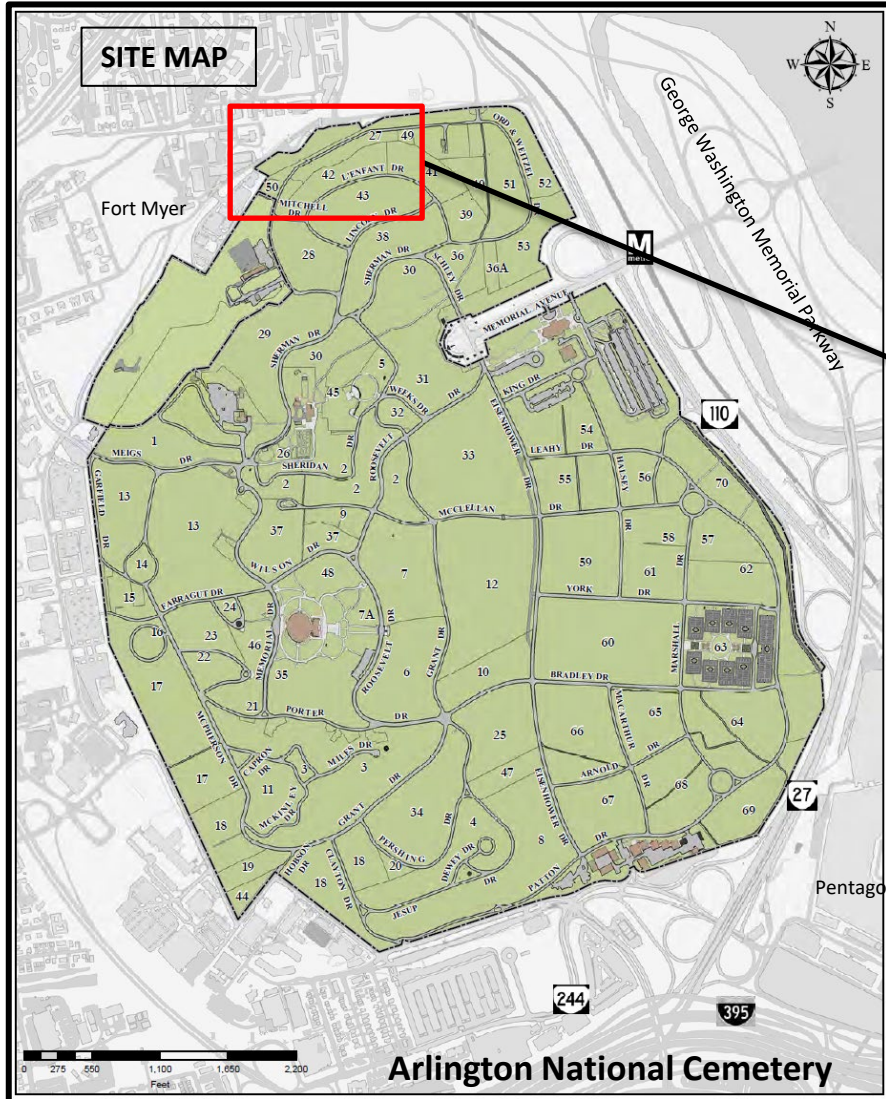
SHEET	LOCATION	L	W	AREA	DEPTH	VOLUME
CU101						
	SSMH#1-B	6	6	36	4	144
				0		0
CU103				0		0
	SSMH#29-H	40	4	160	2	320
	SSMH#29-I	80	4	320	2	640
				0		0
CU104	POTENTIAL NEW PIPE IN SECTION 42-41			0		0
	SSMH#30	40	4	160	8	1280
	SSMH#31	260	4	1040	5	5200
	SSMH#32	140	4	560	5	2800
	SSMH#50-C	6	6	36	5	180
CU105				0		0
	SSMH#49-A1	200	4	800	5	4000
	DEMO MANHOLE	4	4	16	8	128
	SSMH#49-A2	280	4	1120	5	5600
	DEMO MANHOLE	4	4	16	5	80
				0		0
CU106				0		0
	SSMH#49-A3	280	4	1120	6	6720
	DEMO MANHOLE	4	4	16	3	48
	DEMO MANHOLE	4	4	16	4	64
	DEMO MANHOLE	4	4	16	8	128
				0		0
CU107				0		0
	SSMH#54-N1	6	6	36	18	648
				0		0
CU109				0		0
	SSMH#54-J1	124	4	496	8	3968
	MANHOLE	4	4	16	8	128
CU112				0		0
	SSMH#35-A3	6	6	36	3	108
	SSMH#35-B	6	6	36	6	216
	SSMH#35-A	6	6	36	4	144
CU113				0		0
	SSMH#6-A	6	6	36	6	216
	SSMH#6-B	6	6	36	4	144
	SSMH#6-C	6	6	36	3	108
	TOTAL AREA			6196SF		
	TOTAL VOLUME					33012CF

Length of Sewer Line Repair by Type

Pipe Cleaning	4290	ft
Pipe Lining (CIPP)	2658	ft
Pipe Splitting (Bursting)	1518	ft
Pipe Removal and Installation	1250	ft

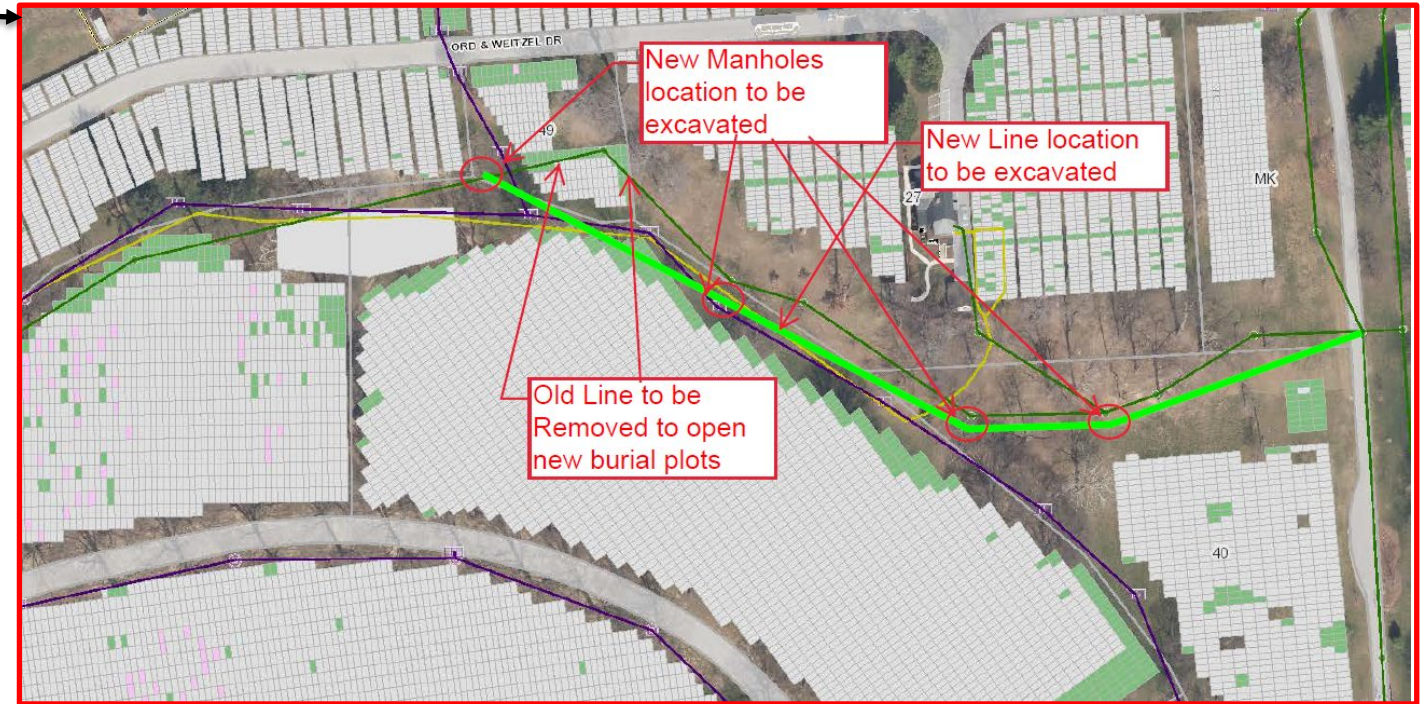
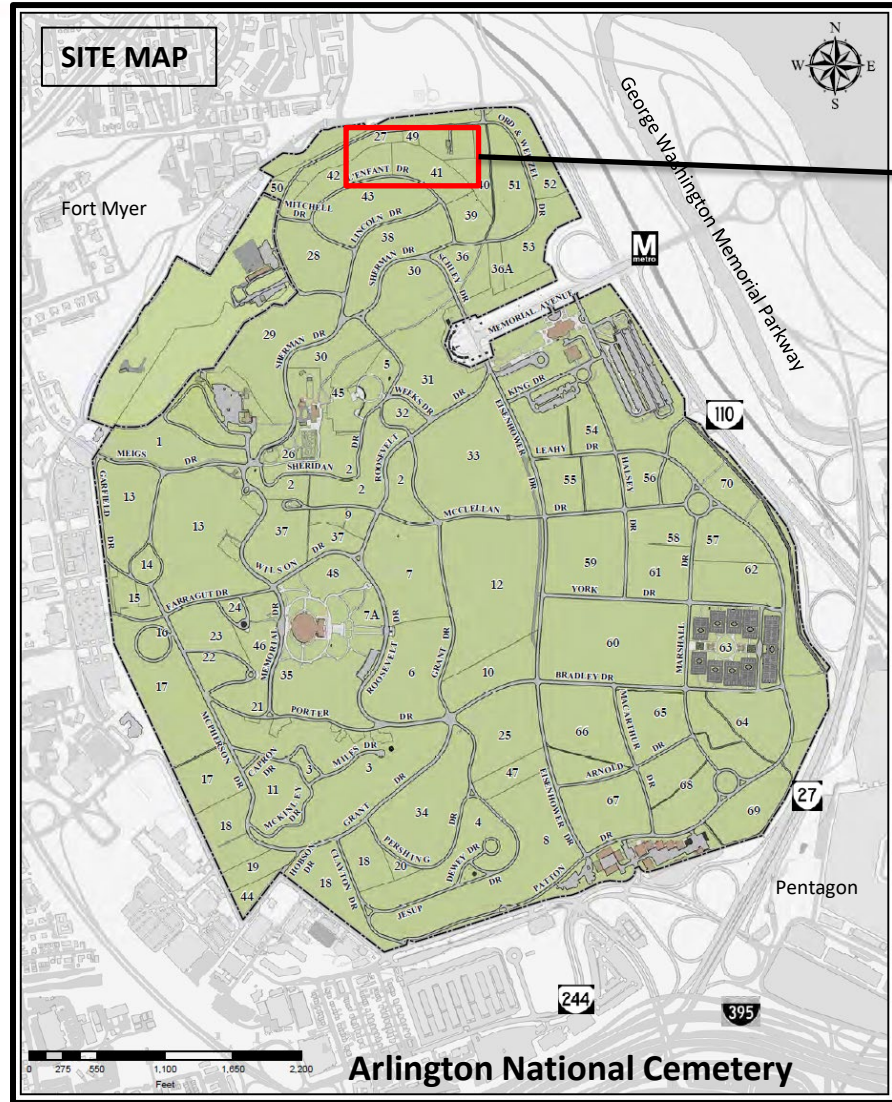
Total Project Area

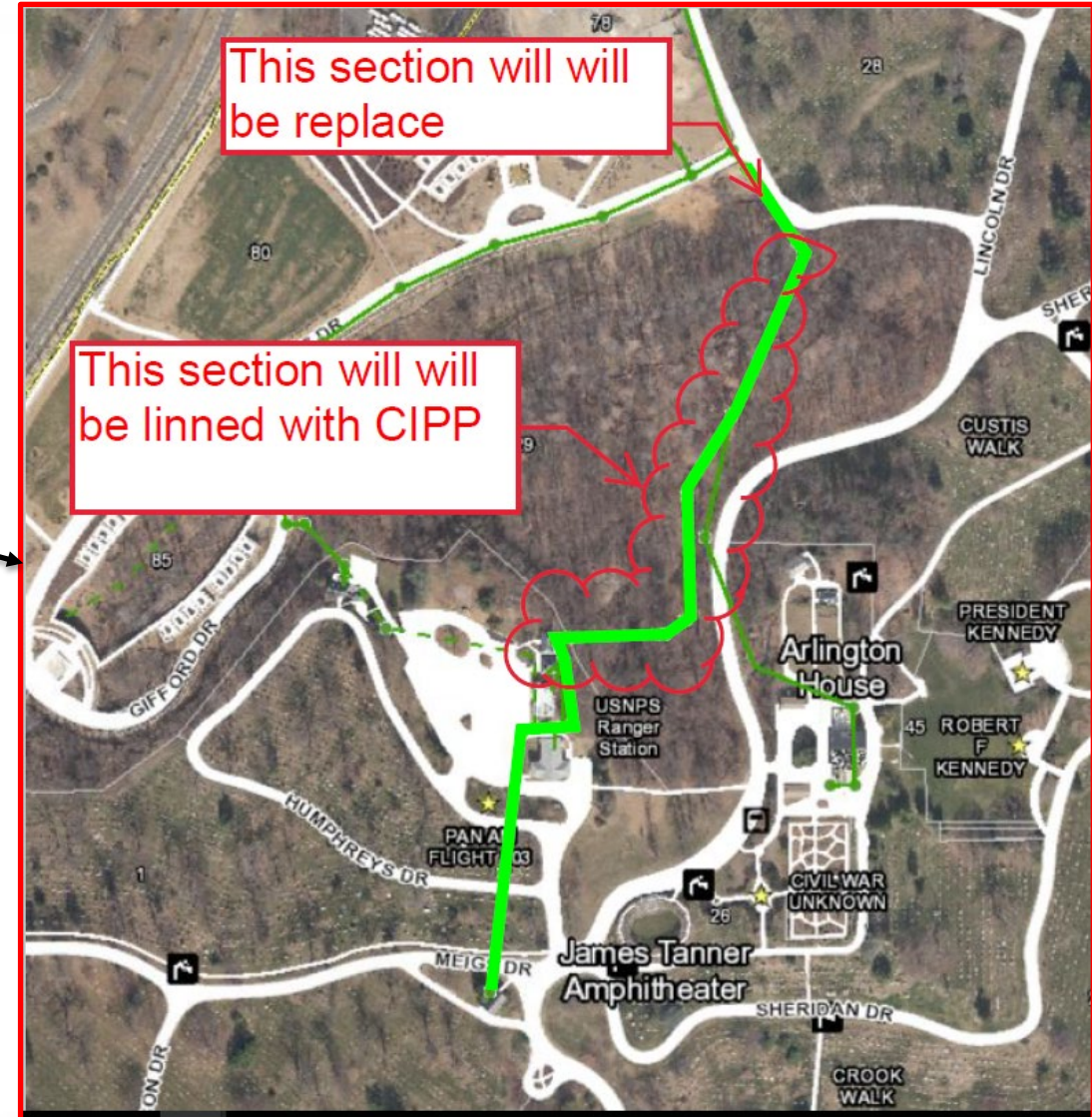
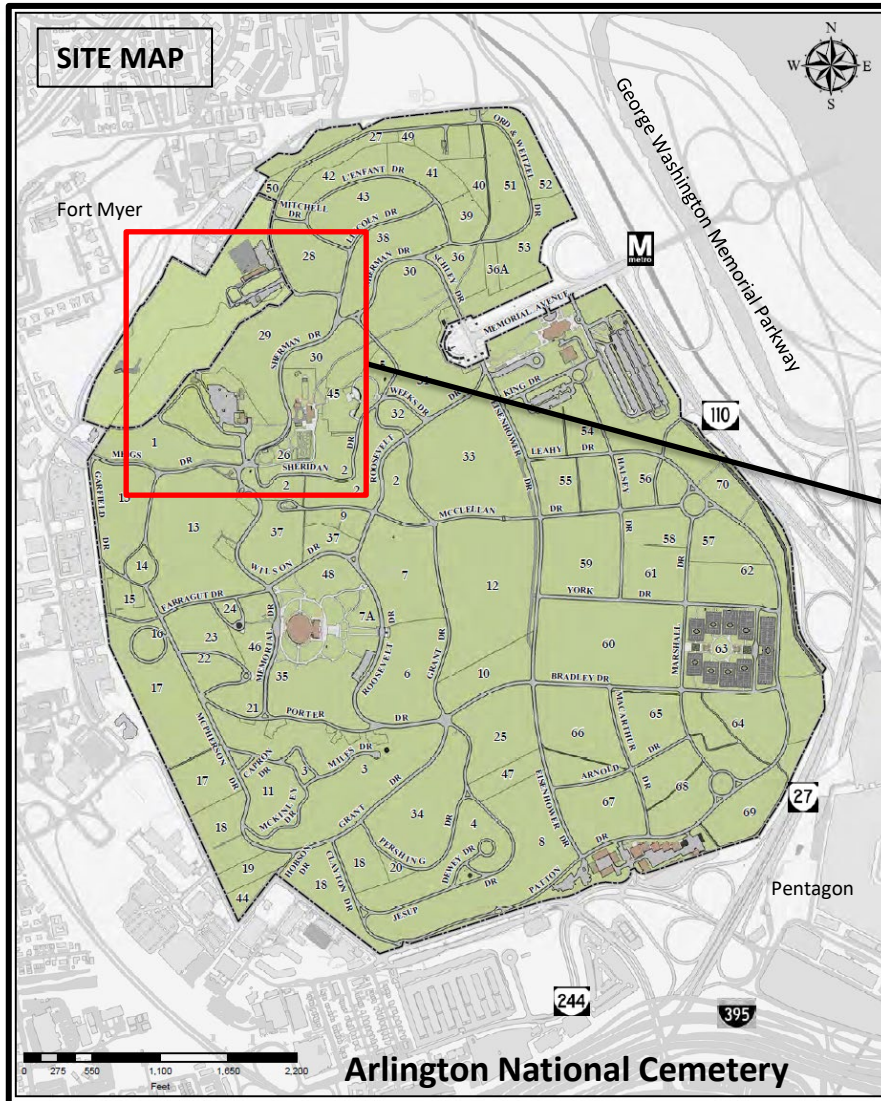
96,000	SF
2.2	ACRES

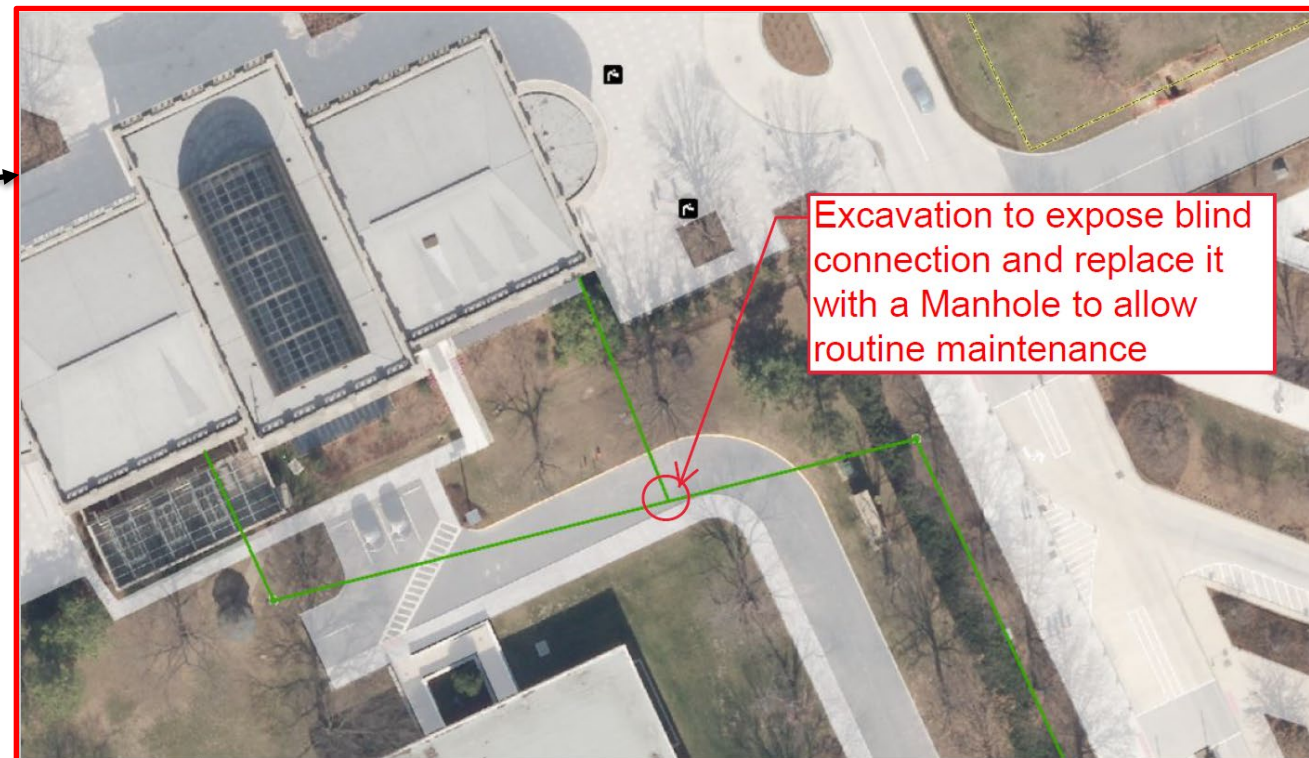
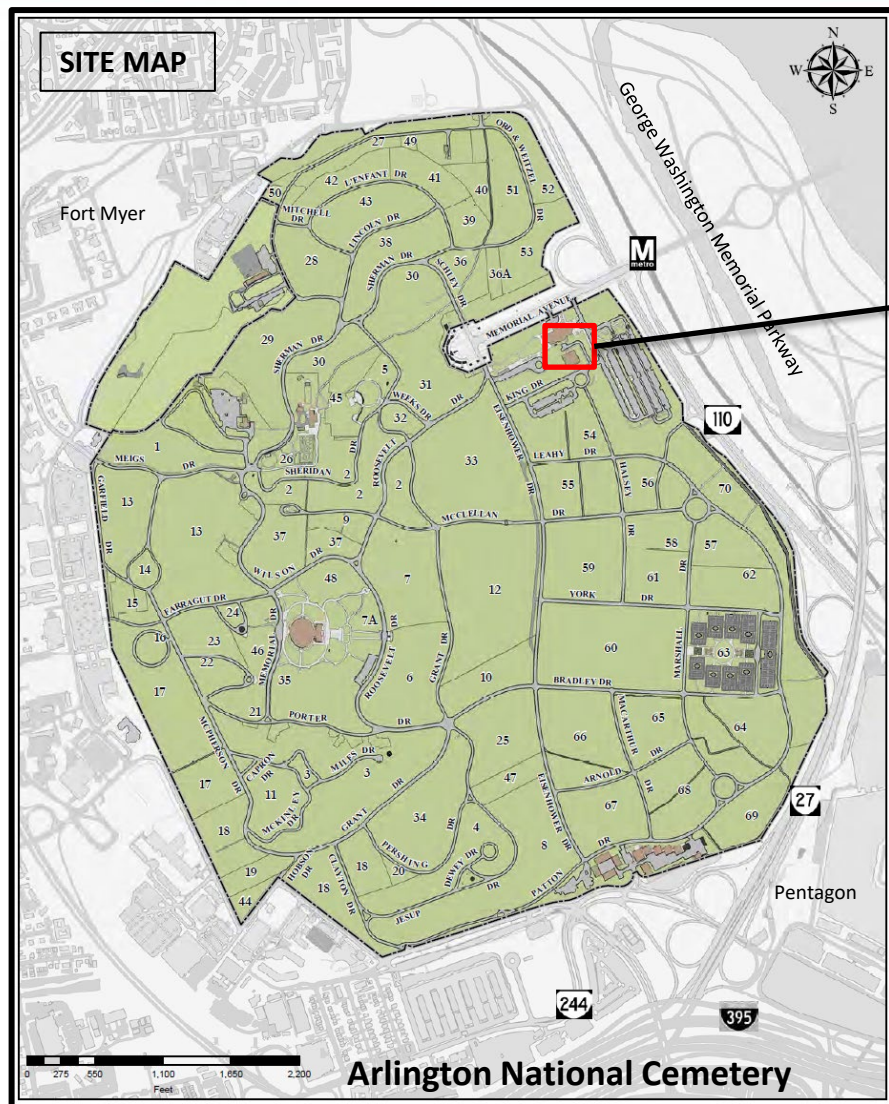


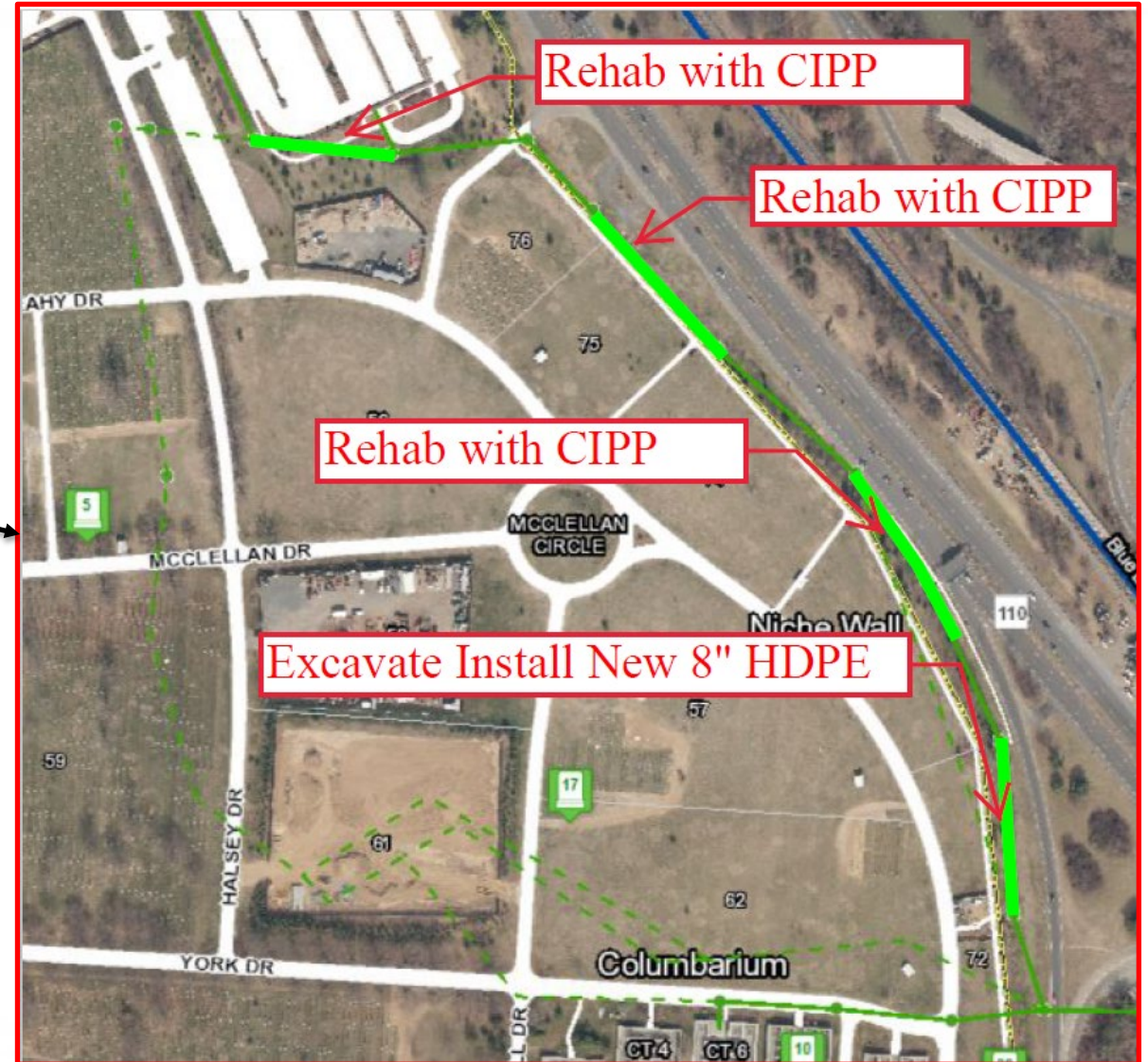
ANC proposes shifting the sanitary sewer lines in Section 42 into alignment with other existing utilities in the corridor, thereby freeing up at least 20 new gravesite plots.

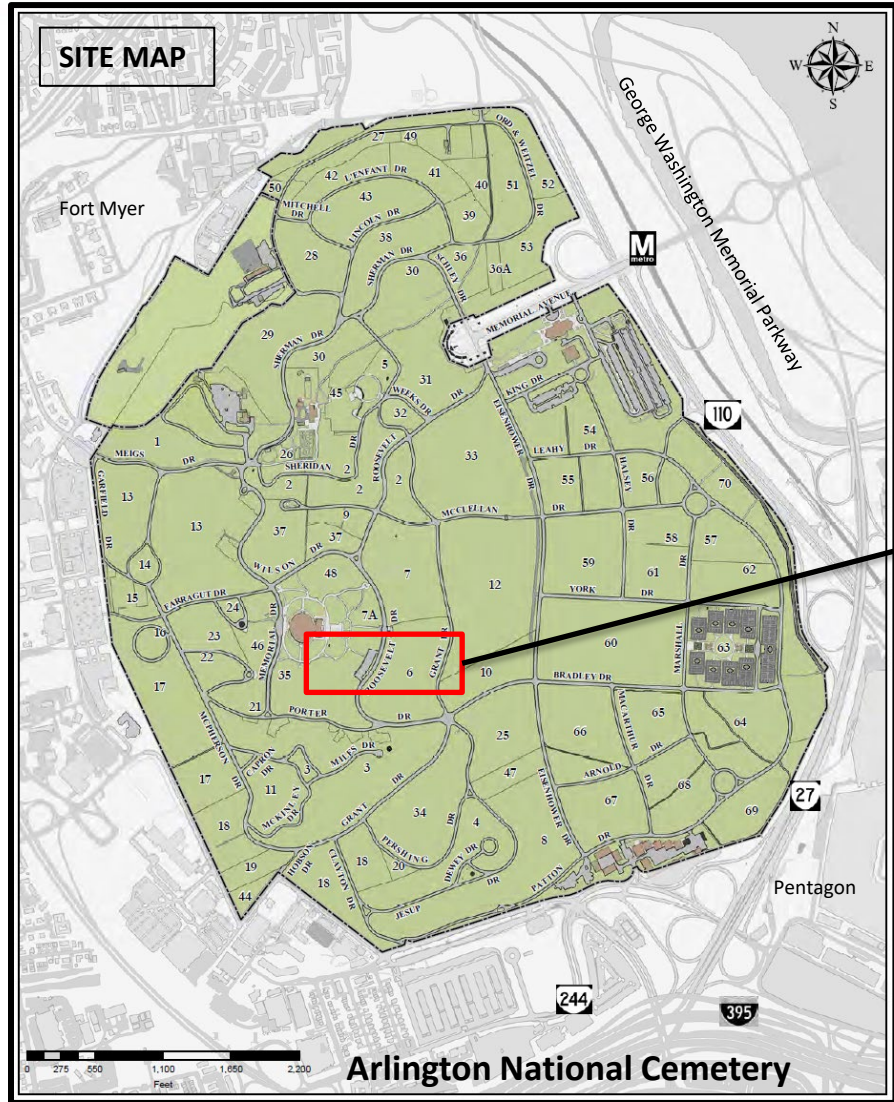
PROS	CONS
<ul style="list-style-type: none"> - At least, 20 new gravesite plots will be enabled. 	<ul style="list-style-type: none"> - At least, 5 trees may need to be removed and/or relocated. - Need 2-4 new manholes, to enable diversion of existing line's straight path.













1
CU103C505

DOWNSTREAM OF SSMH 29-H



2
CU103C505

DOWNSTREAM OF SSMH 29-H



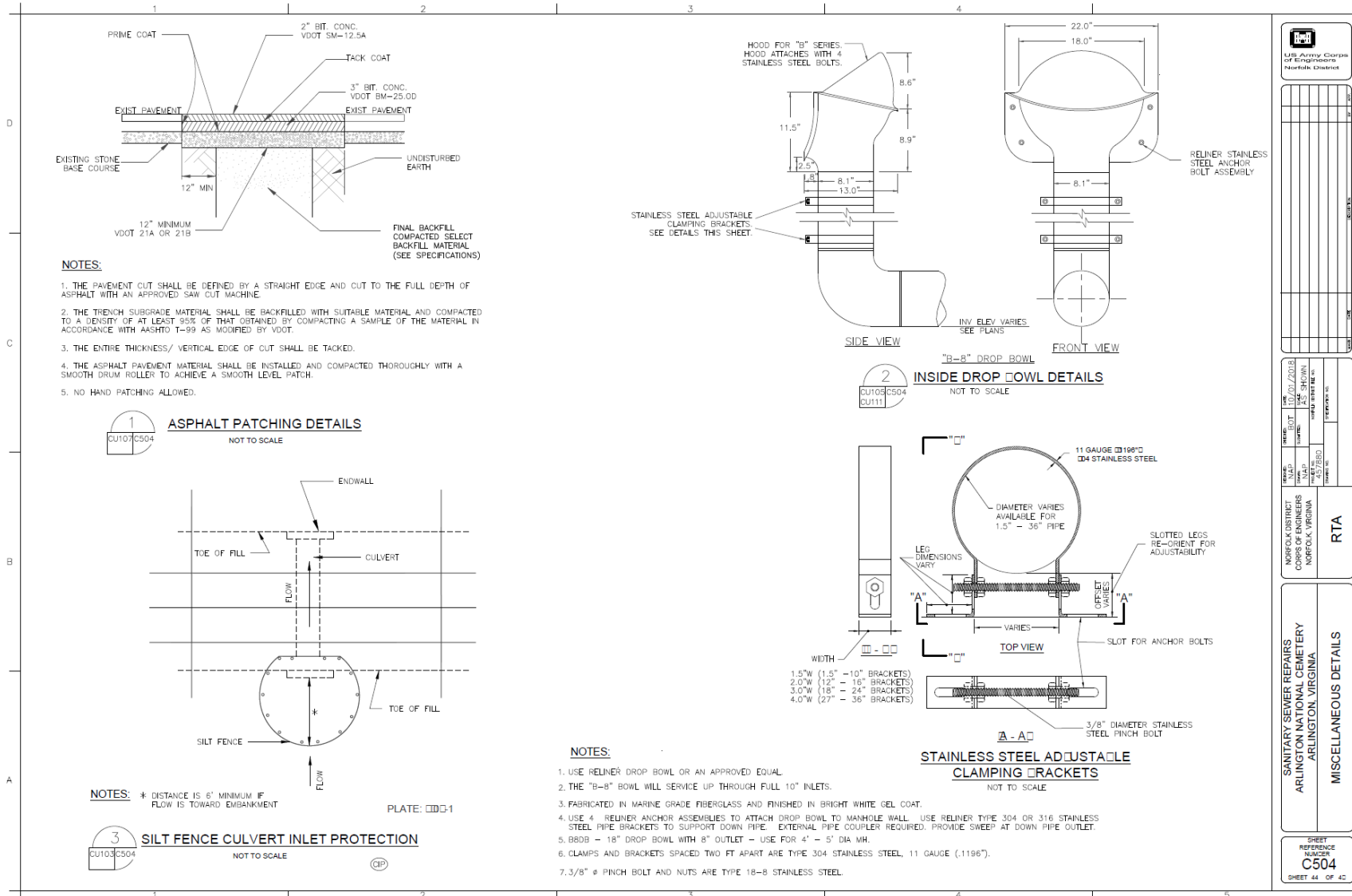
3
CU103C505

DOWNSTREAM OF SSMH 29-H



4
CU103C505

DOWNSTREAM OF SSMH 29-H



DETERMINATION OF EFFECTS

I assessed the effects of the proposed sanitary sewer repair project. I determined the undertaking will have **no adverse effect** on the characteristics which qualify the Arlington National Cemetery (ANC) or Arlington House Historic Districts for inclusion on the National Register of Historic Places.

ANC retains the historic views and vistas within the cemetery after construction of the proposed project. The historic location and elements within the districts are maintained. There are no irreversible changes to historic properties. Headstones and circulation patterns remain unchanged. The cemetery continues to convey its historic significance as a military cemetery, and for its landscape architecture and architecture. There are no changes to the integrity of location, workmanship, feeling or associations of Arlington National Cemetery's or Arlington House's National Register districts.

All sanitary sewer repairs are underground, with only the manholes and the Section 29 pipe being visible above ground. In addition, most repairs are inside of existing sewer lines. The one location where ANC proposes moving the sewer lines (Section 42), the proposed work would move the lines into an existing utility corridor.

The proposed undertaking would have **no adverse effect to archaeological resources**. All construction would be in areas of the APE that have been severely disturbed through prior development of the cemetery or adjacent infrastructure (reference "Archaeological Potential & Past Ground Disturbance Map from Attachment D, Application of National Register of Historic Places Criteria"). It is not expected that undiscovered cultural resources would be found during implementation of the undertaking. In the event of an unanticipated discovery, all work would cease, and the Cultural Resources Manager (CRM) would be contacted. The CRM would notify the Virginia Department of Historic Resources and other appropriate agencies, and standard procedures would be followed to protect the artifacts and determine their significance.

All work adheres to the Secretary of the Interior's Standards for the Treatment of Historic Properties. The project team selected materials and sited the utilities in a manner to avoid and minimize effects. I find the design avoids and/ or minimizes the direct, indirect, and cumulative effects to above- and below-ground historic properties and contributing elements in the Arlington National Cemetery and Arlington House Historic Districts.

Caitlin Smith, AIC PA
Cultural Resources Manager
Arlington National Cemetery