

## **Appendix B**

*Baltimore/Washington International Thurgood Marshall Airport Service  
Plaza Site Assessment (Draft)*



# Baltimore/Washington International Thurgood Marshall Airport

## Service Plaza Site Assessment

**DRAFT**

July 30, 2015

**AECOM**

**ADCI**  
AIRPORT DESIGN CONSULTANTS INC.



**MAA-AE-14-002  
TASK 019**

Baltimore/Washington International Thurgood Marshall Airport  
Service Plaza Site Assessment  
Table of Contents

*EXECUTIVE SUMMARY* ..... ERROR! BOOKMARK NOT DEFINED.

*1. SERVICE PLAZA SITE ASSESSMENT* ..... 1

    1.1. OPTION 1 – THROUGH NORTHROP GRUMMAN PARKING LOT ..... 1

        1.1.1. OPTION 1A – THROUGH NORTHROP GRUMMAN PARKING LOT TO SS-1 ..... 5

        1.1.2. OPTION 1B – THROUGH NORTHROP GRUMMAN PARKING LOT AND KITTEN BRANCH ..... 5

    1.2. OPTION 2 – UNDER AMTRAK RAIL WITH GRAVITY ALONG OLD STONEY RUN ROAD TO ANNE ARUNDEL COUNTY MANHOLE 9515 (SS-8) ..... 8

        1.2.1. OPTION 2A – TO ANNE ARUNDEL COUNTY MANHOLE 9514 (SS-6) ..... 8

        1.2.2. OPTION 2B – TO ANNE ARUNDEL COUNTY MANHOLE 9513 (SS-7) ..... 11

    1.3. OPTION 3 – AVIATION BOULEVARD ..... 11

    1.4. OPTION 4 – AMTRAK WAY ..... 14

    1.5. ESTIMATED PROGRAM COSTS ..... 16

    1.6. FACILITY EVALUATION ..... 16

        1.6.1. EVALUATION OF COMPATIBILITY WITH CURRENT AIRPORT LAYOUT PLAN (ALP) ..... 16

        1.6.2. GENERAL SITE LOCATION ..... 18

        1.6.3. UTILITY ACCESS ..... 19

        1.6.4. SITE LAYOUT ..... 19

*APPENDIX A – SUPPORTING DOCUMENTATION* ..... 20

*APPENDIX B – COST ESTIMATES* ..... 21

LIST OF EXHIBITS

Exhibit 1: Existing Conditions ..... 2

Exhibit 2: All Options ..... 3

Exhibit 3: Option 1 ..... 4

Exhibit 4: Option 1A ..... 6

Exhibit 5: Option 1B ..... 7

Exhibit 6: Option 2 ..... 9

Exhibit 7: Option 2A ..... 10

Exhibit 8: Option 2B ..... 12

Exhibit 9: Option 3 ..... 13

Exhibit 10: Option 4 ..... 15

LIST OF TABLES

Table 1: Estimated Program Costs ..... 16

LIST OF FIGURES

Figure 1: Current Location on ALP ..... 17

Figure 2: Proposed MTA Yellow Line Extension ..... 18

## *EXECUTIVE SUMMARY*

The purpose of this study was to analyze requirements to provide site utilities to the Maryland Aviation Administration (MAA) owned parcel (P46) and determine if the site was suitable for commercial development. As part of this study, it was determined that water, power, and telecommunications were all in close proximity to the site, but sanitary sewer service may be more complicated. Several alignments for the sanitary sewer were developed and evaluated. The least expensive option (with the assumptions used in the study) for the sewer would have to traverse Amtrak Right of Way, which could be challenging. Another option along Amtrak Way, similar in cost, appears to be the most feasible option. Based on the analysis performed on the site and its proximity to the other site utilities, it was determined the site is suitable for commercial development.



## 1. *Service Plaza Site Assessment*

The Maryland Aviation Administration (MAA) requested that an analysis be performed for a potential service facility at Baltimore/Washington International Thurgood Marshall Airport (BWI Marshall). The study parcel is identified as P-46 on the January 2015, Airport Layout Plan (ALP) and is currently used by MAA as a contractor staging area. Analysis included evaluation of the existing utilities and a facility evaluation for the proposed service station site located adjacent to the Northrop Grumman facilities on Aviation Boulevard (MD. 170). Specifically, the existing sanitary sewer utility was evaluated to determine a feasible connection for the site. Information presented in the study was populated from MAA legacy files, Anne Arundel County Geographic Information System (GIS) database, MAA AirPortal Database, design team files, and visual site inspection (See Appendix A). An official field survey was not conducted as part of this evaluation. Exhibit 1 illustrates the compiled existing conditions. There are a total of four alignment options that were evaluated. Options 1 and 2 have a few sub-options but all alignment options (See Exhibit 2) can be described as follows:

- Option 1 – Northrop Grumman (NG) Alignment
- Option 2 – Amtrak Rail and Stoney Run Road Alignment
- Option 3 – Aviation Boulevard Alignment
- Option 4 – Amtrak Way Alignment

The options listed above, as well as the sub-options, are discussed in additional detail in the following sections.

### 1.1. *Option 1 – Through Northrop Grumman Parking Lot*

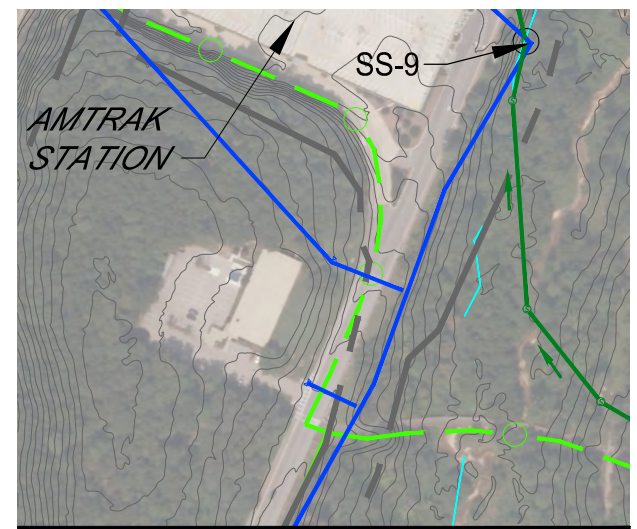
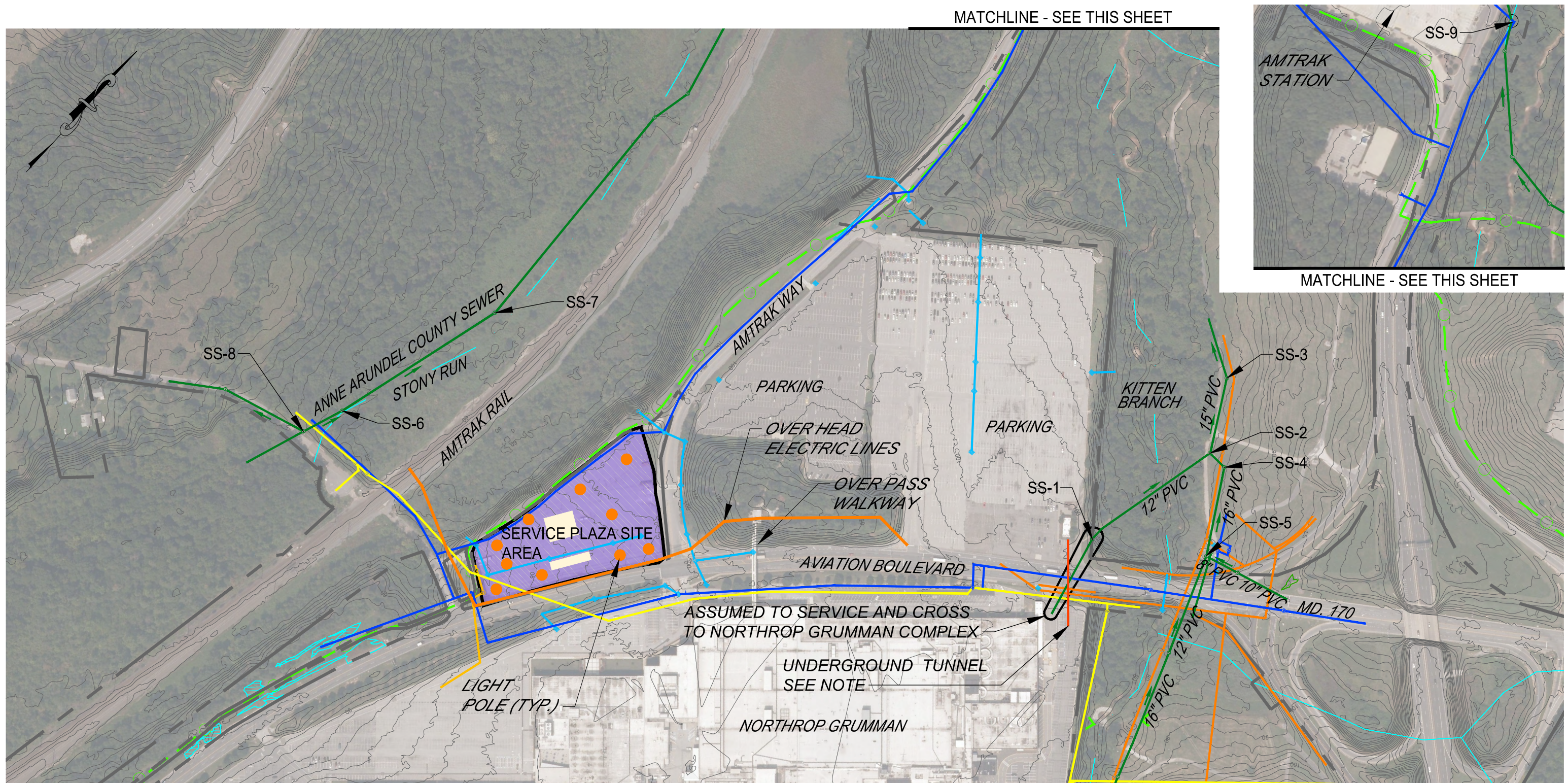
Option 1 includes minimum pavement removal and is shown in Exhibit 3. This option traverses through the Northrop Grumman (NG) property from the northernmost corner of the site and connects to the existing sanitary sewer manhole SS-1. SS-1 appears to be the service connection (12-inch line) for the existing NG facility, but no documentation was found to validate this assumption. This would be proposed as a gravity line but would not be cost effective due to the hill that is located adjacent to the parking lot. A pump station and force main to move effluent up the hill seems to be a possibility but would add additional cost. From that point, gravity would be employed to minimize pump size and maintenance requirements. Further evaluation of projected flows would be necessary to determine size, cost, and ultimately feasibility of a pump station. Also, force mains usually involve more annual maintenance than traditional gravity lines. This option currently depicts a new manhole for tie-in which may require a pump around to make the connection.

Challenges with Option 1 include:

- Traversing property not currently owned by MAA
- Depth of gravity only alignment
- Force main maintenance costs



FILE NAME: P:\Airport\BWI\Projects\2015-2803\CAD\EXHIBITS\C-EB-01.dwg LAYOUT NAME: EX-1 USER: NGoodloe PLOTTED: Tuesday, August 02, 2016 10:26am



**LEGEND:**

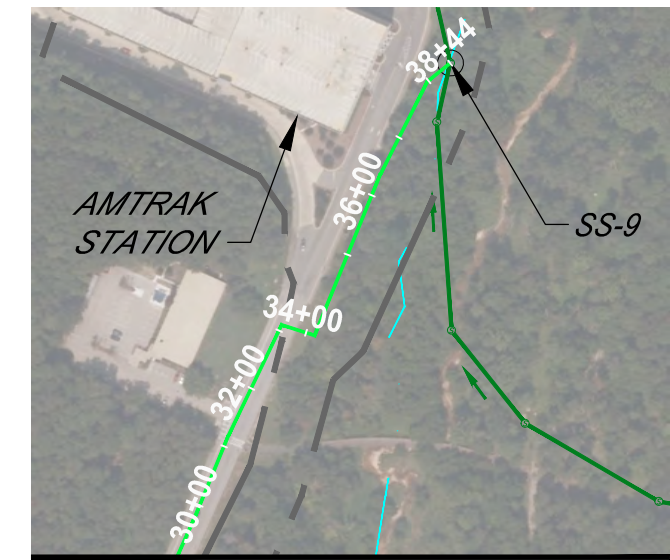
- WATER
- STORM WATER
- SANITARY SEWER
- NATURAL GAS
- ELECTRICAL
- COMMUNICATION
- AIRPORT PROPERTY LINE
- HIKER/BIKER TRAIL
- .-.- STREAM
- SERVICE PLAZA SITE

**NOTE: TUNNEL LOCATION/ELEVATION AND UTILITIES ARE NOT FIELD VERIFIED. VERIFICATION SHOULD BE INCLUDED IN THE DESIGNERS SCOPE OF WORK.**

 	DESIGNED: N.D.C.		 BALTIMORE/WASHINGTON INTERNATIONAL AIRPORT <i>Thurgood Marshall</i>	MARYLAND DEPARTMENT OF TRANSPORTATION MARYLAND AVIATION ADMINISTRATION FACILITIES DEVELOPMENT & ENGINEERING OFFICE OF PLANNING & ENVIRONMENTAL SERVICES BALTIMORE/WASHINGTON INTERNATIONAL AIRPORT	PROJECT TITLE: <b>SERVICE PLAZA UTILITIES</b>	CONTRACT NO.:
	DRAWN: R.E.Z.				SHEET TITLE: <b>EXISTING UTILITY PLAN</b>	SHEET NO.:
CHECKED: K.M.F.					SCALE: 1" = 300'	DATE: JULY 2016
APPROVED: C.A.J.	REVISION NO.:	REVISION DATE:	DESCRIPTION:			<b>EX-1</b>



FILE NAME: P:\Airport\BWI\Projects\2015-2803\CAD\EXHIBITS\C-EB-02.dwg LAYOUT NAME: EX-1 USER: NGoodloe PLOTTED: Tuesday, August 02, 2016 10:29am



OPTION NUMBER	EXHIBIT NUMBER
1	3
1A	4
1B	5
2	6
2A	7
2B	8
3	9
4	10

**LEGEND:**

- EXIST SANITARY SEWER
- PROPOSED SANITARY SEWER
- STREAM
- SERVICE PLAZA SITE

OBJECT ID	STRUCTURE	RIM ELV.	INVERT	CONTRACT ID	DESCRIPTION
SS-1	-	-	-	SAA-CO-86-005	NORTHROP GRUMMAN SEWER MANHOLE
SS-2	401-54-SSM-005	79.65	70.48	MAA-CO-13-016	MAA-SANITARY SEWER MANHOLE
SS-3	401-54-SSM-006	78.33	70.16	-	MAA-SANITARY SEWER MANHOLE
SS-4	401-54-SSM-004	80.17	-	-	MAA-SANITARY SEWER MANHOLE
SS-5	401-54-SSM-001	82.47	72.42   73.0	MAA-CO-10-001	MAA-SANITARY SEWER MANHOLE

OBJECT ID	STRUCTURE	RIM ELV.	INVERT	CONTRACT ID	DESCRIPTION
SS-6	AAC 9514	62.00	50.94   50.96	86-5-6-018	AAC-SANITARY SEWER MANHOLE
SS-7	AAC 9513	58.00	49.20   49.22	86-5-1-018	AAC-SANITARY SEWER MANHOLE
SS-8	AAC 9515	64.00	51.27   51.51	86-5-6-018	AAC-SANITARY SEWER MANHOLE
SS-9	AAC 33554	60.80	50.06   50.16	0819-014-0	AAC-SANITARY SEWER MANHOLE

DESIGNED: N.D.C.			
DRAWN: R.E.Z.			
CHECKED: K.M.F.			
APPROVED: C.A.J.			
REVISION NO.:	REVISION DATE:	DESCRIPTION:	

MARYLAND DEPARTMENT OF TRANSPORTATION  
 MARYLAND AVIATION ADMINISTRATION  
 FACILITIES DEVELOPMENT & ENGINEERING  
 OFFICE OF PLANNING & ENVIRONMENTAL SERVICES  
 BALTIMORE/WASHINGTON INTERNATIONAL AIRPORT

PROJECT TITLE: **SERVICE PLAZA UTILITIES**

SHEET TITLE: **SANITARY SEWER OPTIONS**

SCALE: 1" = 300'

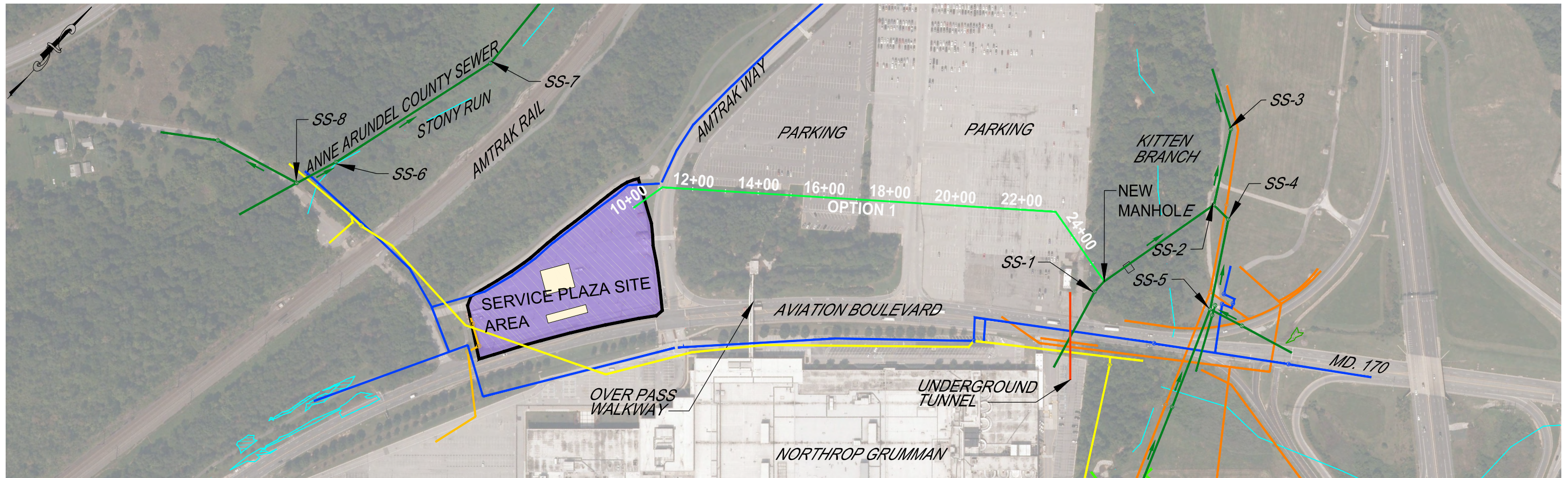
DATE: JULY 2016

CONTRACT NO.:

SHEET NO.: **EX-2**

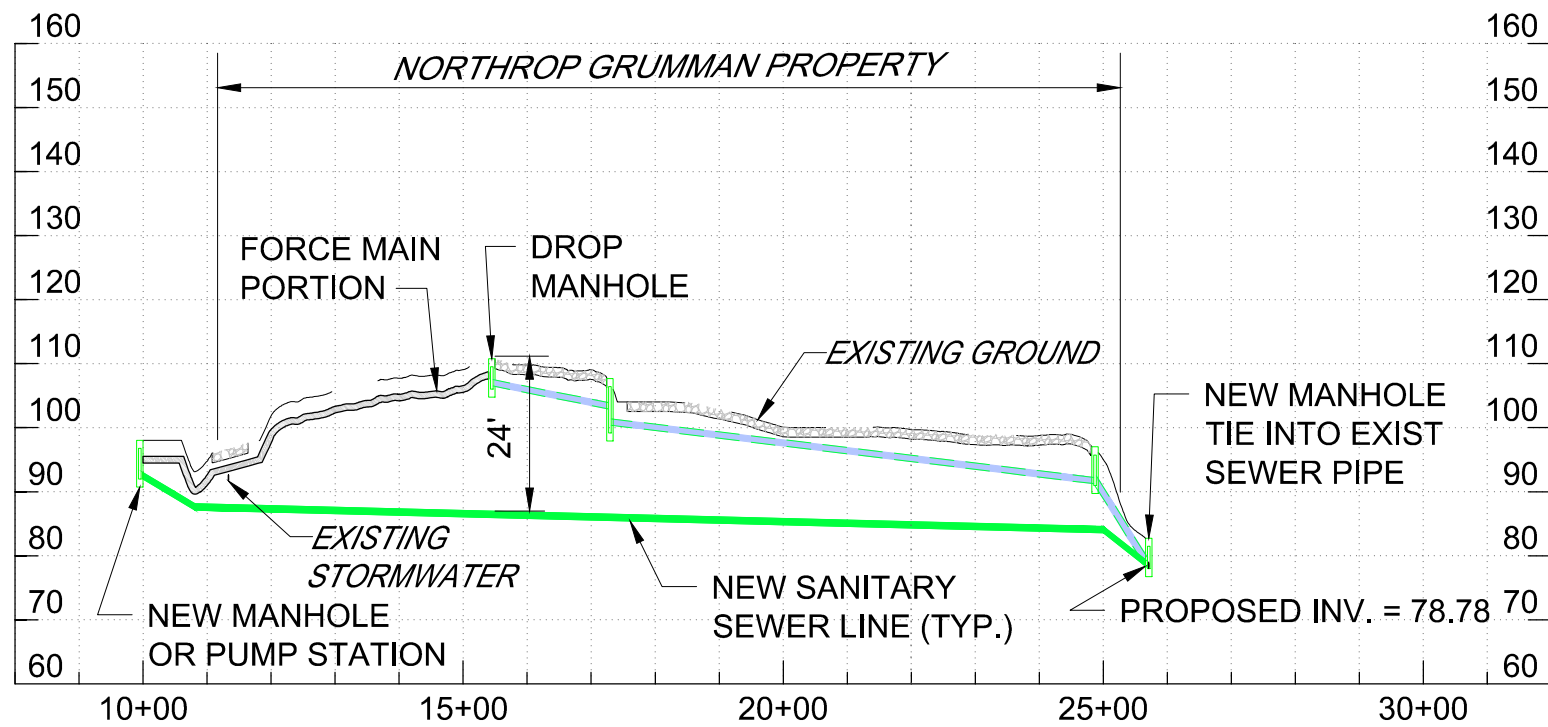


FILE NAME: P:\Airport\BWI\Projects\2015-2803\CAD\EXHIBITS\C-EB-0PT1.dwg LAYOUT NAME: EX-1 USER: NGoodloe PLOTTED: Tuesday, August 02, 2016 10:33am



- LEGEND:**
- EXIST SANITARY SEWER
  - PROPOSED SANITARY SEWER
  - WATER
  - STORM WATER
  - NATURAL GAS
  - ELECTRICAL
  - COMMUNICATION
  - STREAM
  - SERVICE PLAZA SITE

- PROFILE NOTES:**
- 1) ALL MANHOLES NOT SHOWN FOR CLARITY
  - 2) MINIMUM SLOPE OF SEWER ASSUMED AT 0.4%
  - 3) UTILITIES ARE ESTIMATED BASED ON AIRPORTAL AND ANNE ARUNDEL COUNTY GIS INFORMATION



OPTION 1 - THROUGH NORTHROP GRUMMAN PARKING

	DESIGNED: N.D.C.				MARYLAND DEPARTMENT OF TRANSPORTATION MARYLAND AVIATION ADMINISTRATION FACILITIES DEVELOPMENT & ENGINEERING OFFICE OF PLANNING & ENVIRONMENTAL SERVICES BALTIMORE/WASHINGTON INTERNATIONAL AIRPORT	PROJECT TITLE: <b>SERVICE PLAZA UTILITIES</b>	CONTRACT NO.:
	DRAWN: R.E.Z.					SHEET TITLE: <b>SANITARY SEWER - OPTION 1 PLAN AND PROFILE</b>	SHEET NO.:
	CHECKED: K.M.F.					SCALE: 1" = 300'	DATE: JULY 2016
	APPROVED: C.A.J.	REVISION NO.:	REVISION DATE:	DESCRIPTION:			<b>EX-3</b>



### 1.1.1. Option 1A – Through Northrop Grumman Parking Lot to SS-1

Option 1A is shown in Exhibit 4. As an adjustment to Option 1, Option 1A would traverse from the northernmost corner of the site adjacent to the parking lot, tying into existing sewer manhole SS-1. It would be a proposed 8-inch gravity line and would minimize pavement reconstruction as it is aligned with the least amount of parking lot. Similar to Option 1, a force main adjustment would be warranted in the area that traverses through the hill. A pump station would be required for this portion of the alignment (approximately 500 feet).

Challenges for Option 1A include:

- Not currently MAA property (land/easement acquisition)
- Depth of installation for gravity only option
- The age/condition of the line between SS-1 and SS-2 as it is believed to be the old clay pipe (incorrectly shown as PVC on AirPortal) and possibly in poor shape.
- Potential and likely conflict with the underground pedestrian tunnel (depth unknown)

### 1.1.2. Option 1B – Through Northrop Grumman Parking Lot and Kitten Branch

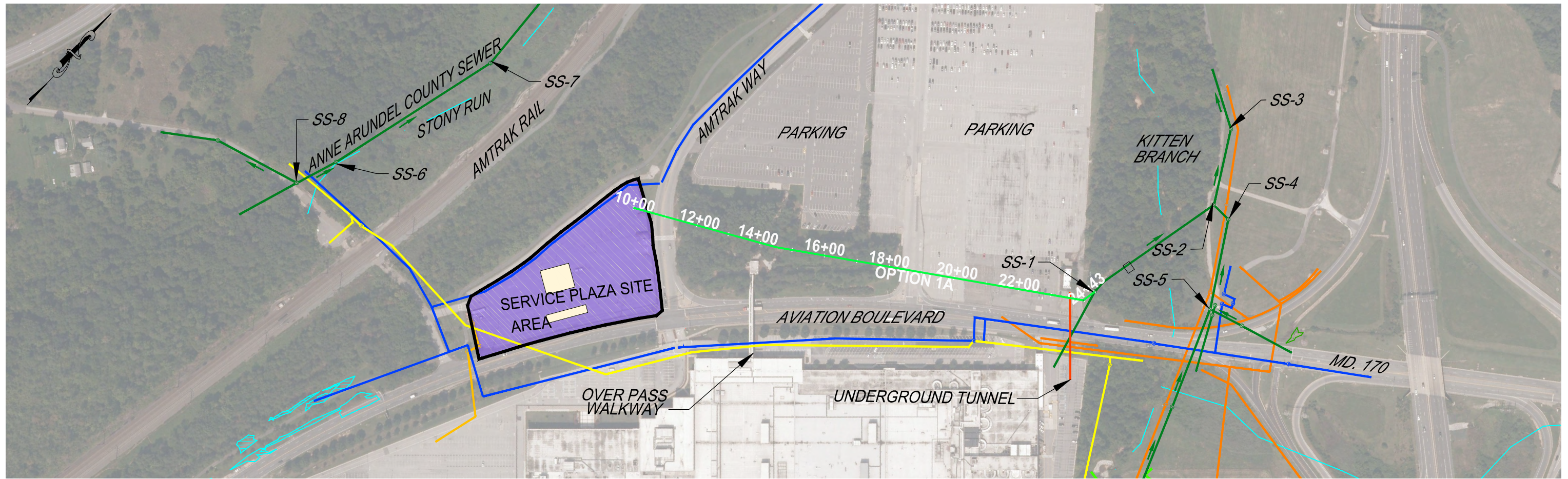
Option 1B is shown in Exhibit 5. This alignment would be similar to Option 1 with the exception to the connection to SS-2, which is an MAA sanitary sewer manhole identified in MAA-CO-13-016. It would be a proposed 8-inch sanitary line. This alignment would require crossing/disturbing the Kitten Branch (Waters of the U.S.) and may require additional work such as a casing to protect the alignment. As a result of the alignment, construction would occur within the Kitten Branch footprint and additional environmental permitting would be required, and would probably render the alignment significantly higher in cost. Further evaluation would be required to determine the feasibility of a 3-inch force main to clear the portion within higher existing elevations. Connecting into the SS-2 location avoids the section of pipe suspected to be in poor shape.

Challenges for Option 1B include:

- Not currently MAA property (land/easement acquisition)
- Traversing and permitting Kitten Branch work



FILE NAME: P:\Airport\BWI\Projects\2015-2803\CAD\EXHIBITS\C-EB-0PT1A.dwg LAYOUT NAME: EX-1 USER: NGoodlee PLOTTED: Tuesday, August 02, 2016 10:35am

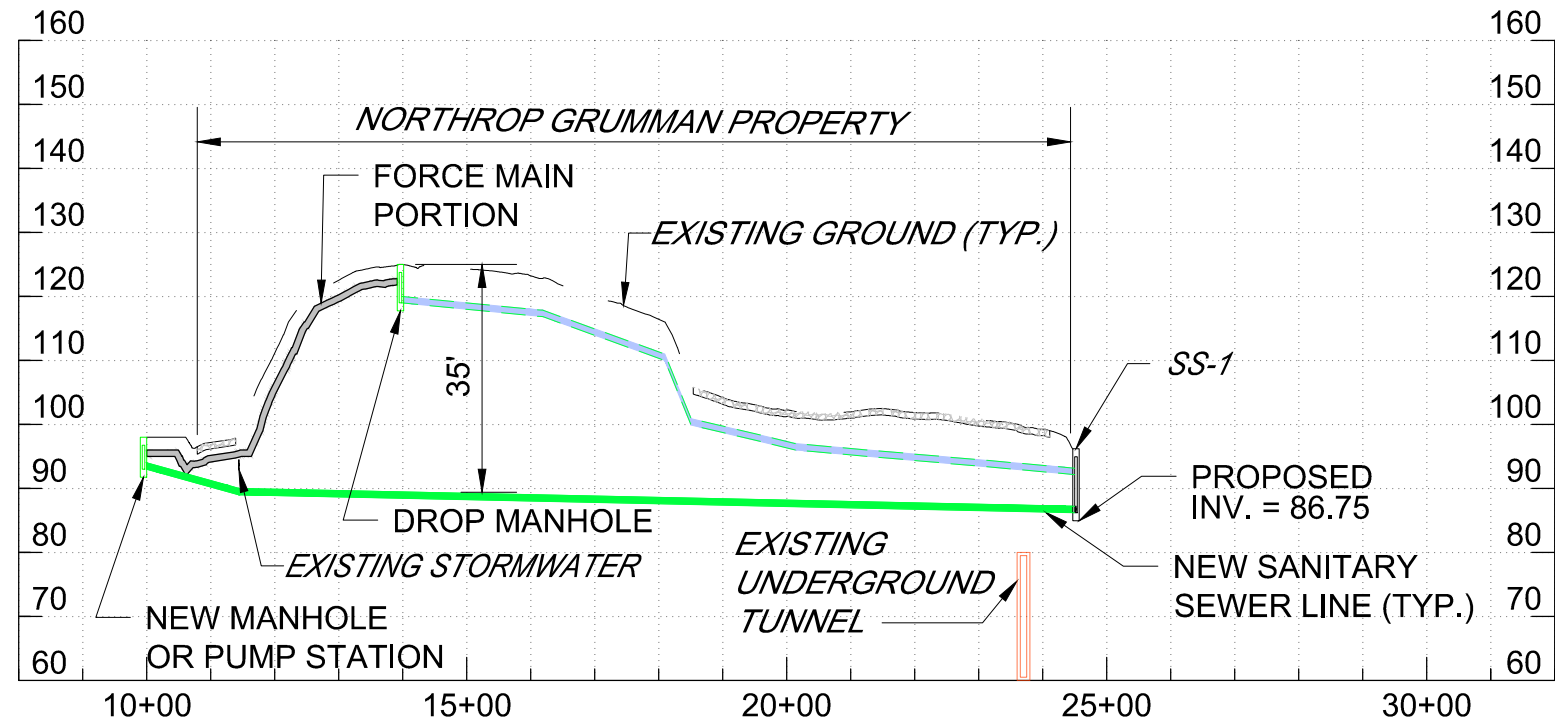


**LEGEND:**

- EXIST SANITARY SEWER
- PROPOSED SANITARY SEWER
- WATER
- STORM WATER
- NATURAL GAS
- ELECTRICAL
- COMMUNICATION
- - - STREAM
- SERVICE PLAZA SITE

**PROFILE NOTES:**

- 1) ALL MANHOLES NOT SHOWN FOR CLARITY
- 2) MINIMUM SLOPE OF SEWER ASSUMED AT 0.4%
- 3) UTILITIES ARE ESTIMATED BASED ON AIRPORTAL AND ANNE ARUNDEL COUNTY GIS INFORMATION

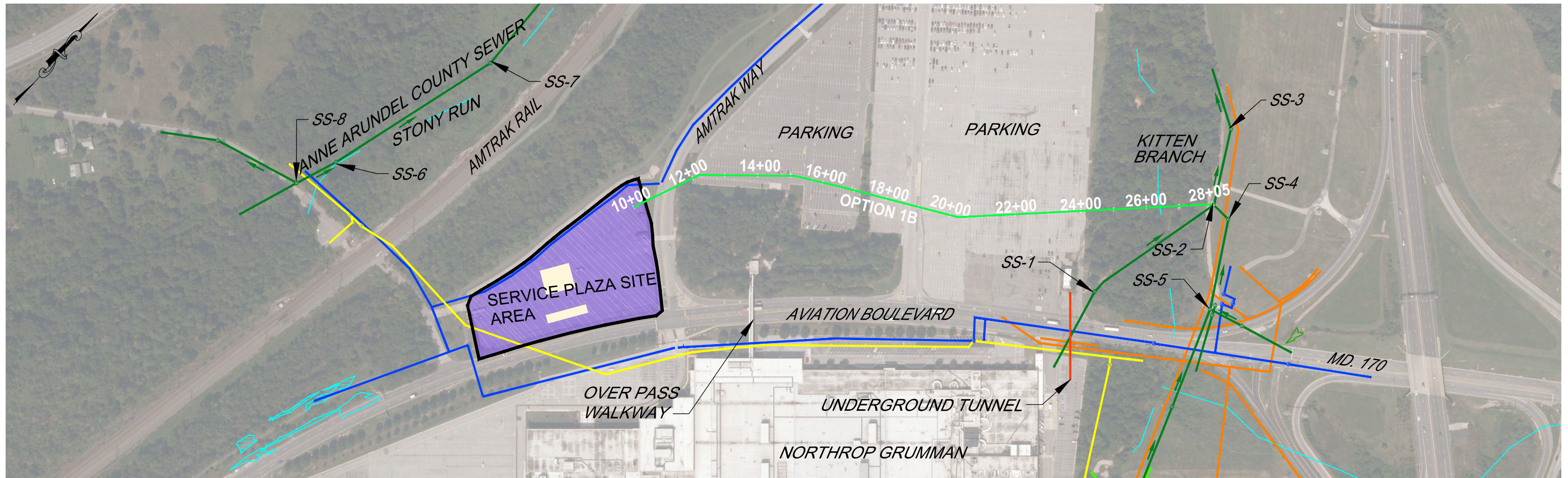


**OPTION 1A - THROUGH NORTHROP GRUMMAN PARKING**

	DESIGNED: N.D.C.			 BALTIMORE/WASHINGTON INTERNATIONAL AIRPORT <i>Thurgood Marshall</i>	MARYLAND DEPARTMENT OF TRANSPORTATION MARYLAND AVIATION ADMINISTRATION FACILITIES DEVELOPMENT & ENGINEERING OFFICE OF PLANNING & ENVIRONMENTAL SERVICES BALTIMORE/WASHINGTON INTERNATIONAL AIRPORT	PROJECT TITLE: <b>SERVICE PLAZA UTILITIES</b>	CONTRACT NO.:
	DRAWN: R.E.Z.					SHEET TITLE: <b>SANITARY SEWER - OPTION 1A PLAN AND PROFILE</b>	SHEET NO.:
CHECKED: K.M.F.						SCALE: 1" = 300'	DATE: JULY 2016
APPROVED: C.A.J.	REVISION NO.:	REVISION DATE:	DESCRIPTION:				EX-4



FILE NAME: P:\Airport\BWI\Projects\2015-2803\CAD\EXHIBITS\C-EB-0PT1B.dwg LAYOUT NAME: EX-1 USER: NGoodloe PLOTTED: Tuesday, August 02, 2016 10:48am

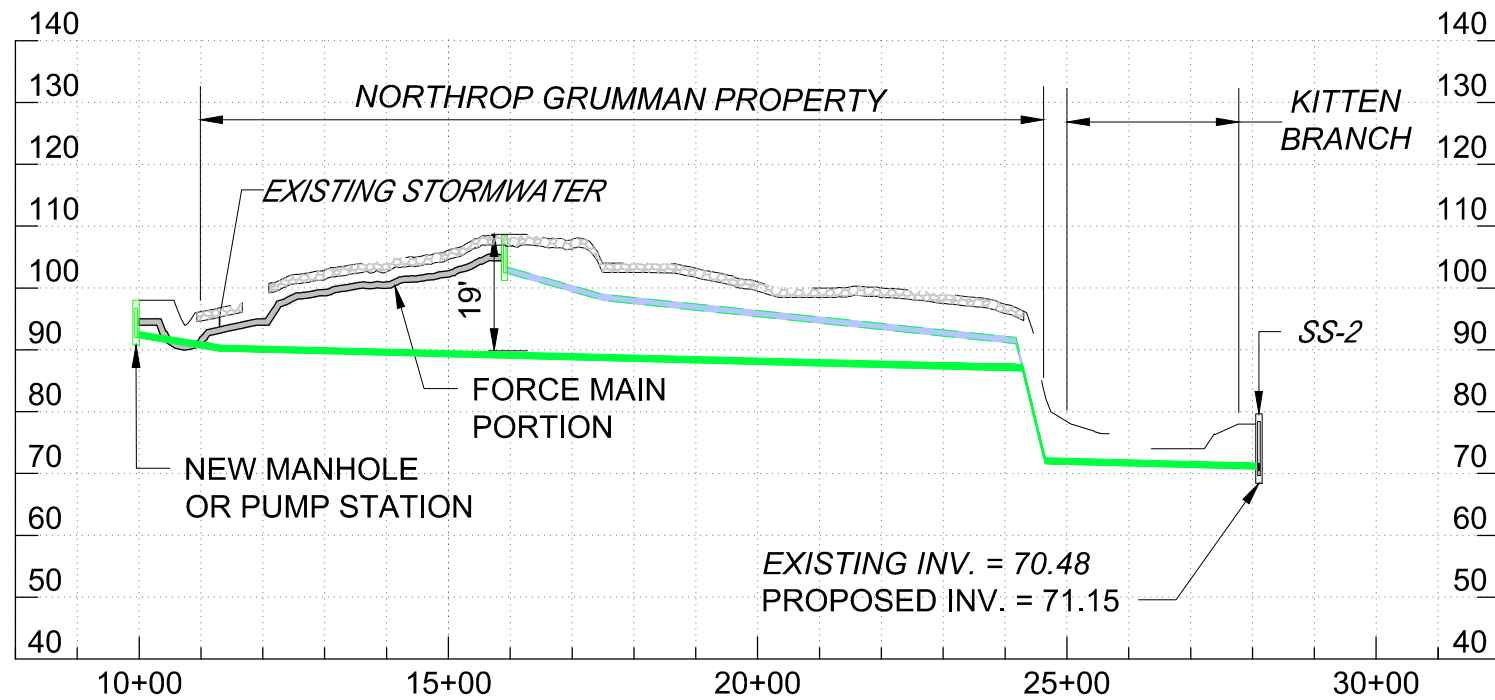


**LEGEND:**

- EXIST SANITARY SEWER
- PROPOSED SANITARY SEWER
- WATER
- STORM WATER
- NATURAL GAS
- ELECTRICAL
- COMMUNICATION
- - - STREAM
- SERVICE PLAZA SITE

**PROFILE NOTES:**

- 1) ALL MANHOLES NOT SHOWN FOR CLARITY
- 2) MINIMUM SLOPE OF SEWER ASSUMED AT 0.4%
- 3) UTILITIES ARE ESTIMATED BASED ON AIRPORTAL AND ANNE ARUNDEL COUNTY GIS INFORMATION



OPTION 1B - THROUGH NORTHROP GRUMMAN PARKING/WATERS OF U.S.

	DESIGNED: N.D.C.											PROJECT TITLE: <b>SERVICE PLAZA UTILITIES</b>	CONTRACT NO.:	
	DRAWN: R.E.Z.											SHEET TITLE: <b>SANITARY SEWER - OPTION 1B PLAN AND PROFILE</b>	SHEET NO.:	
	CHECKED: K.M.F.											SCALE: 1" = 300'	DATE: JULY 2016	EX-5
	APPROVED: C.A.J.	REVISION NO.:	REVISION DATE:	DESCRIPTION:										



MARYLAND DEPARTMENT OF TRANSPORTATION  
MARYLAND AVIATION ADMINISTRATION  
FACILITIES DEVELOPMENT & ENGINEERING  
OFFICE OF PLANNING & ENVIRONMENTAL SERVICES  
BALTIMORE/WASHINGTON INTERNATIONAL AIRPORT



## 1.2. Option 2 – Under Amtrak Rail with Gravity along Old Stoney Run Road to Anne Arundel County Manhole 9515 (SS-8)

Option 2 is shown in Exhibit 6. This alignment extends from the southwestern corner of the site along existing driveway and Old Stoney Run Road to Anne Arundel County (AAC) sanitary sewer manhole SS-8. It requires crossing under the existing Amtrak rail via jack and bore/casing, which was included in the cost estimate. As this alignment is in the western direction, it removes the risk of the anticipated pipe condition at SS-1 and the permitting associated with the NG property and Kitten Branch coordination. Implementation of the alignment may include installation of a utility corridor crossing under Amtrak and Stony Run. The location within the Old Stoney Run Road alignment allows for construction access which improves the construction costs associated with the work.

Challenges for Option 2 include:

- Not currently MAA property (land/easement acquisition)
- Crossing under Amtrak line, although it appears there is sufficient work area available to accomplish this and has been done recently (within 20 years)
- Several utilities to cross under including gas, water, and stormwater
- Requires crossing Stony Run potentially through an existing culvert

### 1.2.1. Option 2A – To Anne Arundel County Manhole 9514 (SS-6)

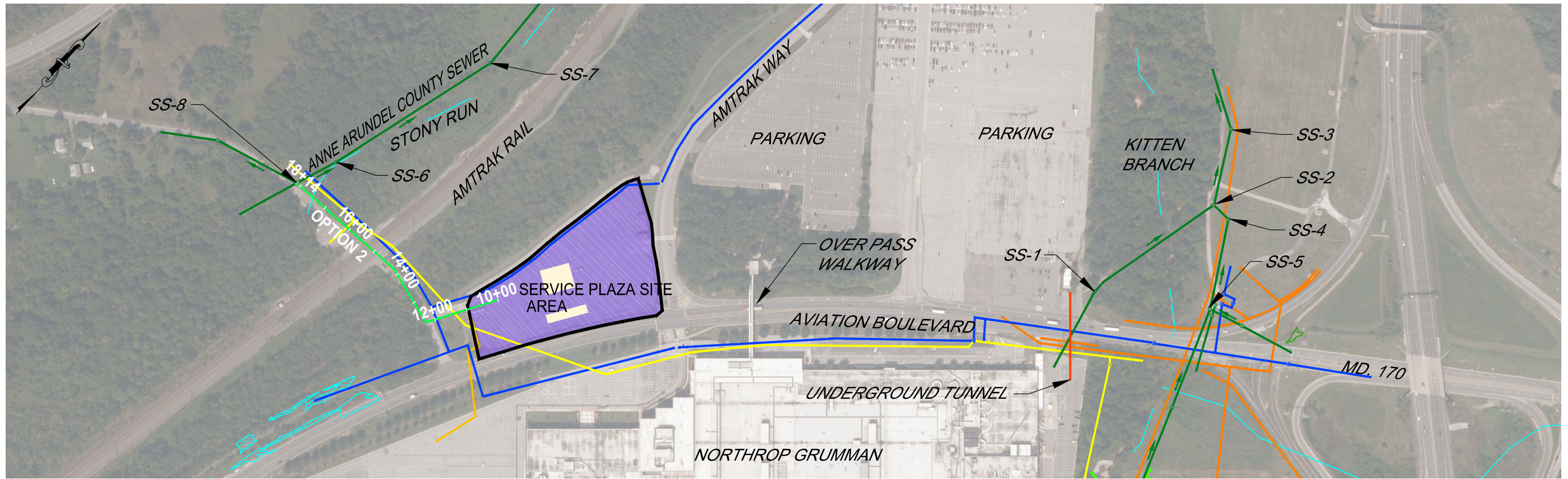
Option 2A is shown in Exhibit 7. This is a similar alignment to Option 2 but will be located further north and it ties into manhole SS-6. Based on a review of as-built documents, there is less utility congestion and a slightly shorter alignment. This alignment would require construction within a wetland which is of special state concern. Similar to Option 2, crossing of Amtrak is required with jack and bore, and Stony Run.

Challenges for Option 2A include:

- Not currently MAA property (land/easement acquisition)
- Crossing Amtrak (permitting and construction)
- Access to the work area since area is located in more wooded terrain than Option 2
- Crossing and permitting work in wetland of special state concern



FILE NAME: P:\Airport\BWI\Projects\2015-2803\CAD\EXHIBITS\C-EB-0P12.dwg LAYOUT NAME: EX-1 USER: NGoodloe PLOTTED: Tuesday, August 02, 2016 10:55am

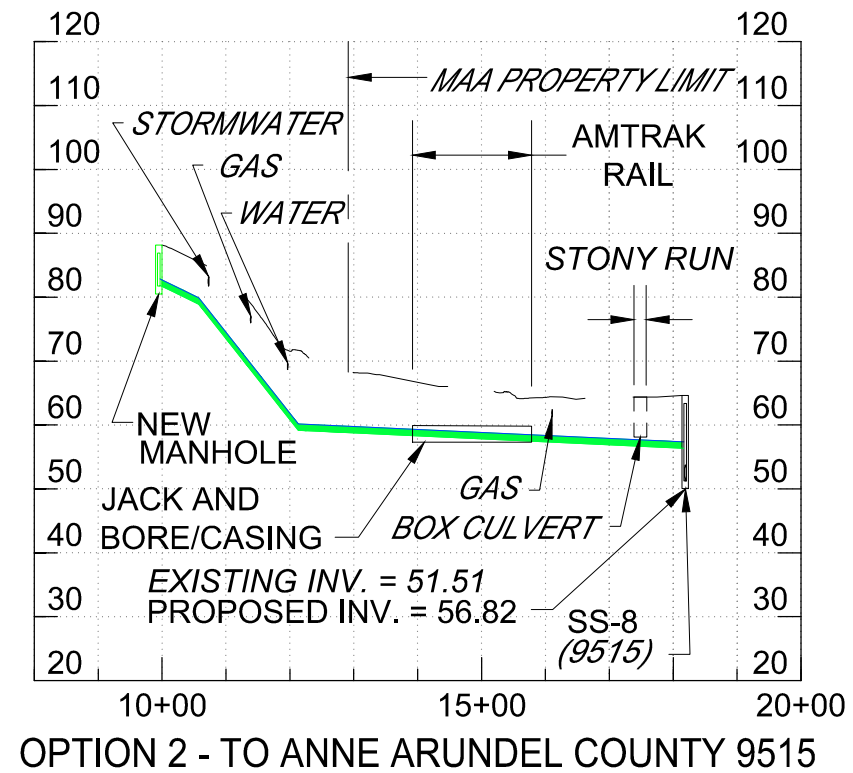


**LEGEND:**

- EXIST SANITARY SEWER
- PROPOSED SANITARY SEWER
- WATER
- STORM WATER
- NATURAL GAS
- ELECTRICAL
- COMMUNICATION
- STREAM
- SERVICE PLAZA SITE

**PROFILE NOTES:**

- 1) ALL MANHOLES NOT SHOWN FOR CLARITY
- 2) MINIMUM SLOPE OF SEWER ASSUMED AT 0.4%
- 3) UTILITIES ARE ESTIMATED BASED ON AIRPORTAL AND ANNE ARUNDEL COUNTY GIS INFORMATION



DESIGNED: N.D.C.			
DRAWN: R.E.Z.			
CHECKED: K.M.F.			
APPROVED: C.A.J.			
REVISION NO.:	REVISION DATE:	DESCRIPTION:	

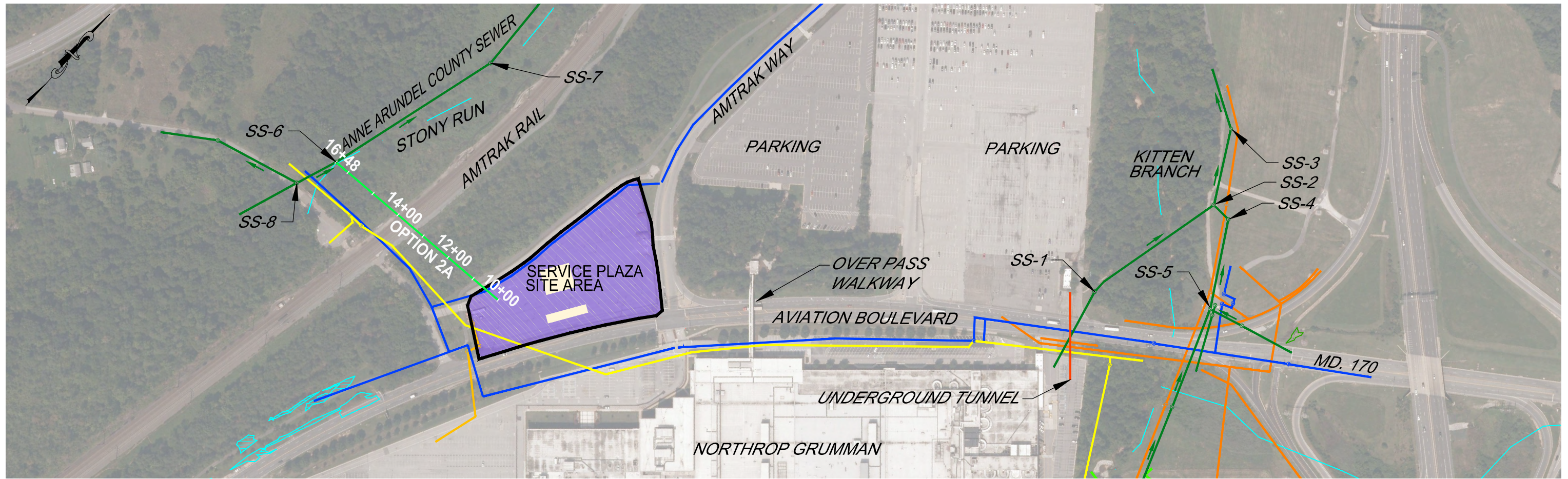
MARYLAND DEPARTMENT OF TRANSPORTATION  
 MARYLAND AVIATION ADMINISTRATION  
 FACILITIES DEVELOPMENT & ENGINEERING  
 OFFICE OF PLANNING & ENVIRONMENTAL SERVICES  
 BALTIMORE/WASHINGTON INTERNATIONAL AIRPORT

PROJECT TITLE: <b>SERVICE PLAZA UTILITIES</b>	CONTRACT NO.:
SHEET TITLE: <b>SANITARY SEWER - OPTION 2 PLAN AND PROFILE</b>	SHEET NO.:
SCALE: 1" = 300'	DATE: JULY 2016

EX-6



FILE NAME: P:\Airport\BWI\Projects\2015-2803\CAD\EXHIBITS\C-EB-0P12A.dwg LAYOUT NAME: EX-1 USER: NGoodlee PLOTTED: Tuesday, August 02, 2016 - 10:58am

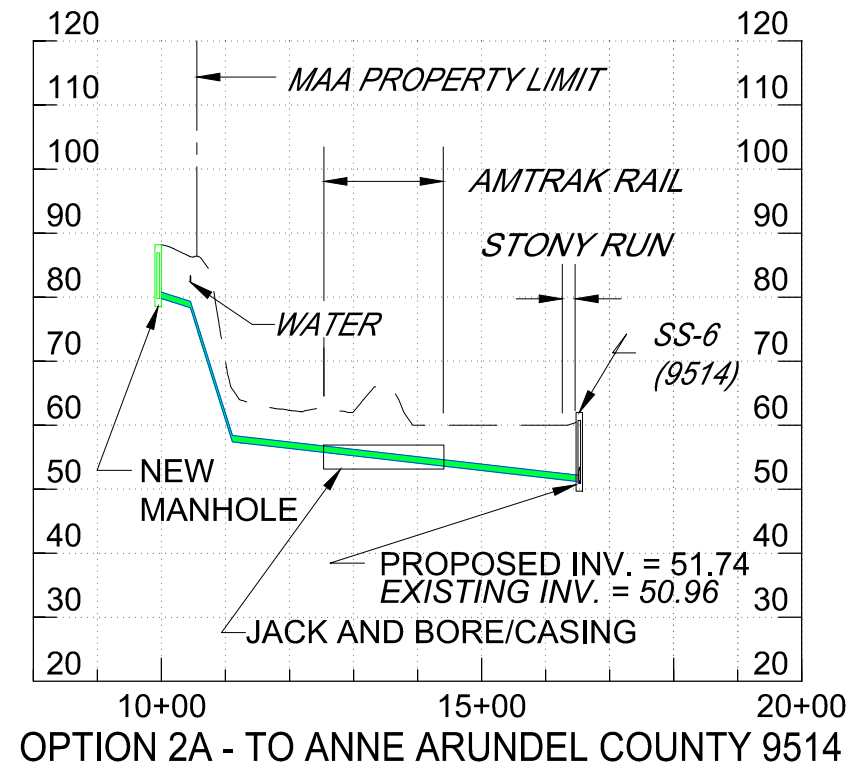


**LEGEND:**

- EXIST SANITARY SEWER
- PROPOSED SANITARY SEWER
- WATER
- STORM WATER
- NATURAL GAS
- ELECTRICAL
- COMMUNICATION
- STREAM
- SERVICE PLAZA SITE

**PROFILE NOTES:**

- 1) ALL MANHOLES NOT SHOWN FOR CLARITY
- 2) MINIMUM SLOPE OF SEWER ASSUMED AT 0.4%
- 3) UTILITIES ARE ESTIMATED BASED ON AIRPORTAL AND ANNE ARUNDEL COUNTY GIS INFORMATION



DESIGNED: N.D.C.			
DRAWN: R.E.Z.			
CHECKED: K.M.F.			
APPROVED: C.A.J.			
REVISION NO.:	REVISION DATE:	DESCRIPTION:	

MARYLAND DEPARTMENT OF TRANSPORTATION  
 MARYLAND AVIATION ADMINISTRATION  
 FACILITIES DEVELOPMENT & ENGINEERING  
 OFFICE OF PLANNING & ENVIRONMENTAL SERVICES  
 BALTIMORE/WASHINGTON INTERNATIONAL AIRPORT

PROJECT TITLE: <b>SERVICE PLAZA UTILITIES</b>	CONTRACT NO.:
SHEET TITLE: <b>SANITARY SEWER - OPTION 2A PLAN AND PROFILE</b>	SHEET NO.:
SCALE: 1" = 300'	DATE: JULY 2016

EX-7



### 1.2.2. Option 2B – To Anne Arundel County Manhole 9513 (SS-7)

Option 2B is shown in Exhibit 8. This final option is similar to Options 2 and 2A with the exception of it being much further north with a slightly shorter alignment that connects in with SS-7. The terrain issues are similar to Option 1B.

Challenges for Option 2B include:

- Not currently MAA property (land/easement acquisition)
- Crossing Amtrak (permitting and construction)
- Access to the work area since area is located in more wooded terrain than Option 2
- Crossing and permitting work in wetland of special state concern.

### 1.3. Option 3 – Aviation Boulevard

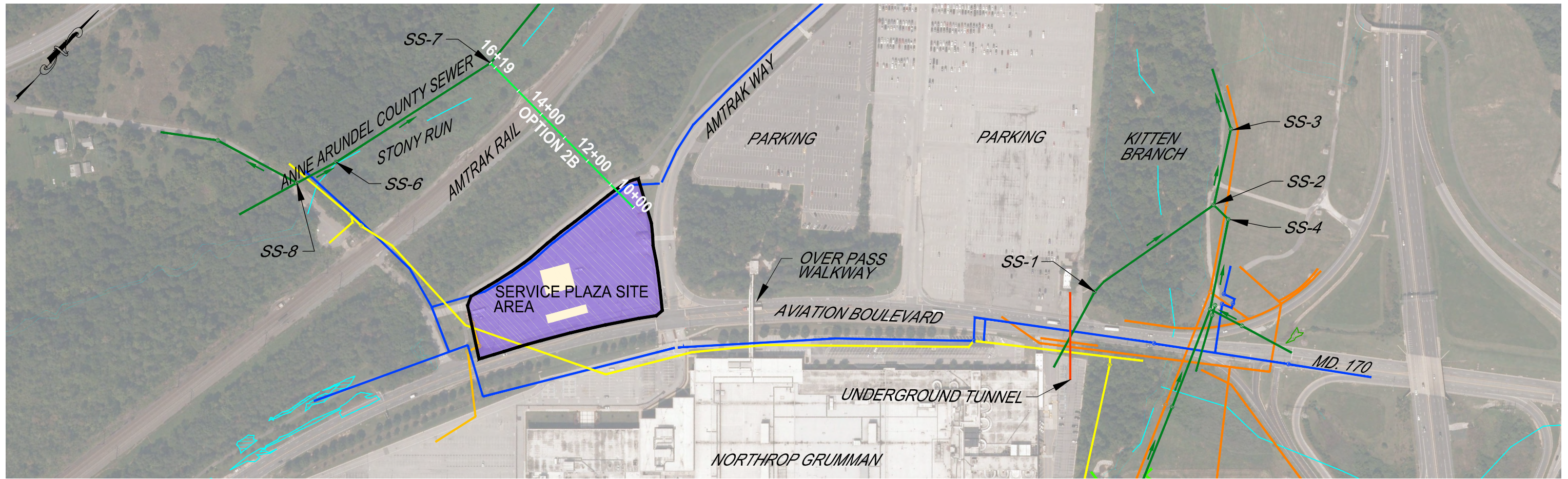
Option 3 is shown in Exhibit 9. This alignment will follow Aviation Boulevard (Route 170) and connect to existing SS-1. It would be located within the Right of Way (ROW) of Aviation Boulevard and would likely require State Highway Administration (SHA) approval. As compared to the other alignments previously described, it is likely that this approval would be obtained in a shorter timeframe than NG, Maryland Department of Environment, or Amtrak based on previous experience.

Challenges for Option 3 include:

- SHA ROW access (construction and permitting)
- Large amount of pavement reconstruction
- Potentially more significant MOT required during construction
- The age/condition of the line between SS-1 and SS-2 as it is believed to be the old clay pipe (incorrectly shown as PVC on AirPortal) and possibly in poor shape
- Potential and likely conflict with the underground pedestrian tunnel (depth unknown)



FILE NAME: P:\Airport\BWI\Projects\2015-2803\CAD\EXHIBITS\C-EB-0P12B.dwg LAYOUT NAME: EX-1 USER: NGoodloe PLOTTED: Tuesday, August 02, 2016 11:05am

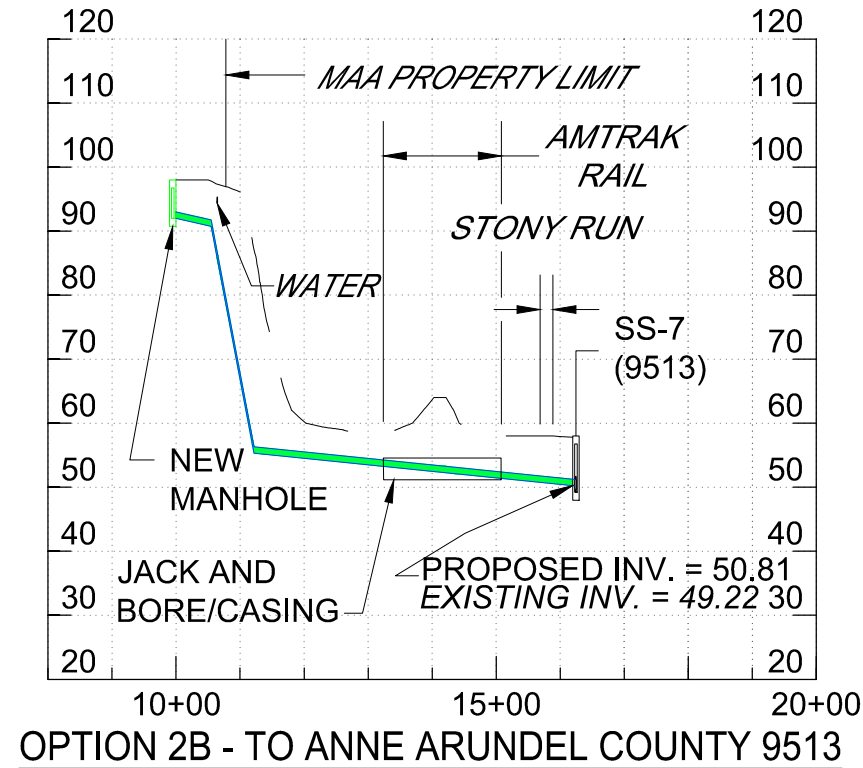


**LEGEND:**

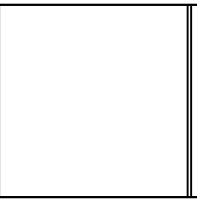
- EXIST SANITARY SEWER
- PROPOSED SANITARY SEWER
- WATER
- STORM WATER
- NATURAL GAS
- ELECTRICAL
- COMMUNICATION
- - - STREAM
- SERVICE PLAZA SITE

**PROFILE NOTES:**

- 1) ALL MANHOLES NOT SHOWN FOR CLARITY
- 2) MINIMUM SLOPE OF SEWER ASSUMED AT 0.4%
- 3) UTILITIES ARE ESTIMATED BASED ON AIRPORTAL AND ANNE ARUNDEL COUNTY GIS INFORMATION



DESIGNED: N.D.C.			
DRAWN: R.E.Z.			
CHECKED: K.M.F.			
APPROVED: C.A.J.			
REVISION NO.:	REVISION DATE:	DESCRIPTION:	



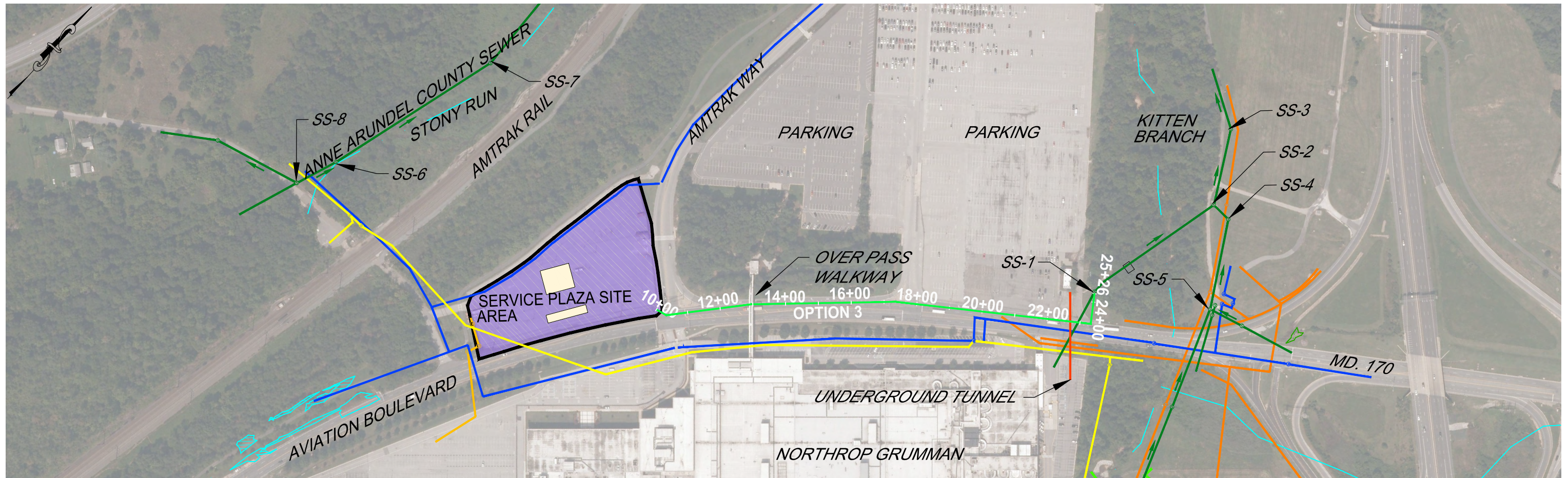
MARYLAND DEPARTMENT OF TRANSPORTATION  
 MARYLAND AVIATION ADMINISTRATION  
 FACILITIES DEVELOPMENT & ENGINEERING  
 OFFICE OF PLANNING & ENVIRONMENTAL SERVICES  
 BALTIMORE/WASHINGTON INTERNATIONAL AIRPORT

PROJECT TITLE: <b>SERVICE PLAZA UTILITIES</b>	CONTRACT NO.:
SHEET TITLE: <b>SANITARY SEWER - OPTION 2B PLAN AND PROFILE</b>	SHEET NO.:
SCALE: 1" = 300'	DATE: JULY 2016

EX-8



FILE NAME: P:\Airport\BWI\Projects\2015-2803\CAD\EXHIBITS\C-EB-0PT3.dwg LAYOUT NAME: EX-1 USER: NGoodloe PLOTTED: Tuesday, August 02, 2016 11:09am

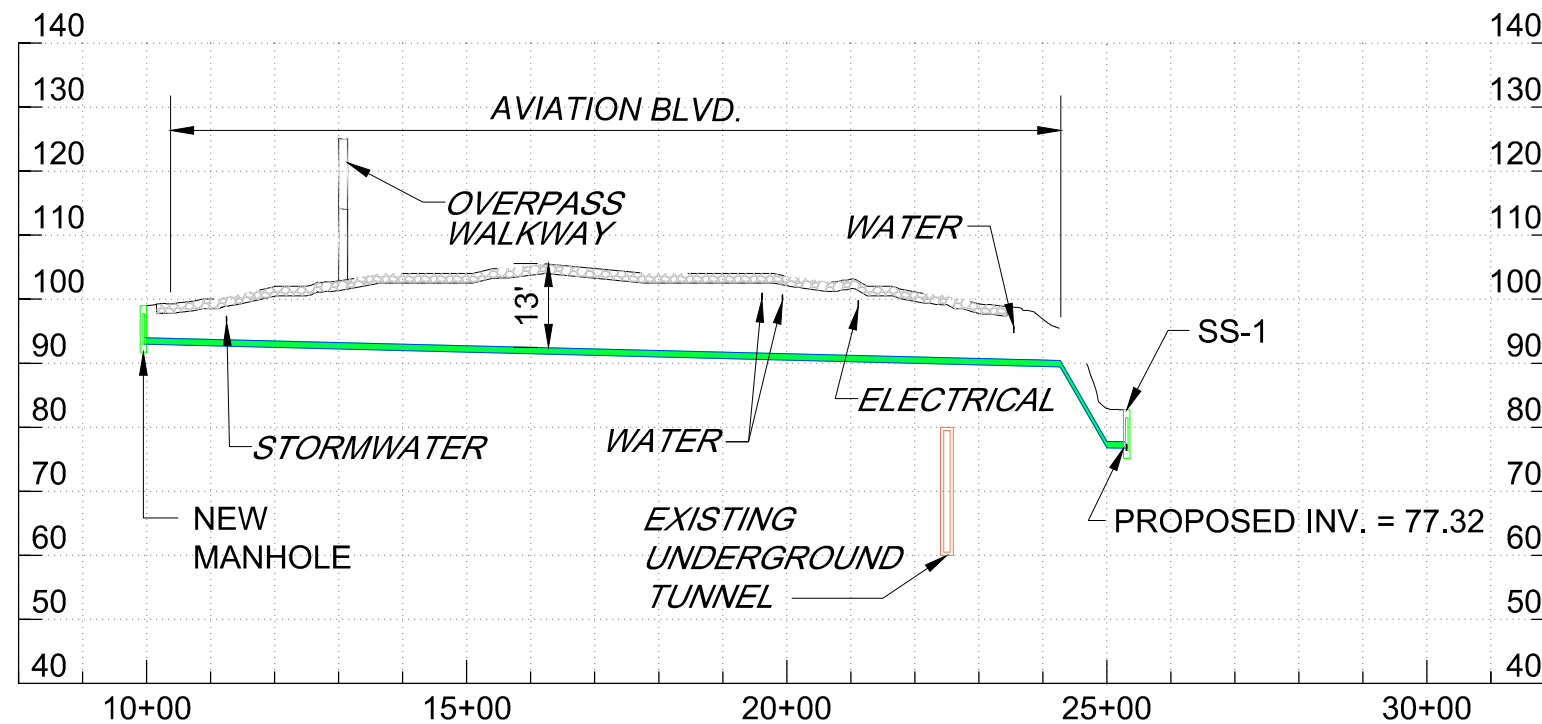


**LEGEND:**

- EXIST SANITARY SEWER
- PROPOSED SANITARY SEWER
- WATER
- STORM WATER
- NATURAL GAS
- ELECTRICAL
- COMMUNICATION
- - - STREAM
- SERVICE PLAZA SITE

**PROFILE NOTES:**

- 1) ALL MANHOLES NOT SHOWN FOR CLARITY
- 2) MINIMUM SLOPE OF SEWER ASSUMED AT 0.4%
- 3) UTILITIES ARE ESTIMATED BASED ON AIRPORTAL AND ANNE ARUNDEL COUNTY GIS INFORMATION



**OPTION 3 - THROUGH AVIATION BOULEVARD**

	DESIGNED: N.D.C.												PROJECT TITLE: <b>SERVICE PLAZA UTILITIES</b>	CONTRACT NO.:	
	DRAWN: R.E.Z.												SHEET TITLE: <b>SANITARY SEWER - OPTION 3 PLAN AND PROFILE</b>	SHEET NO.:	
	CHECKED: K.M.F.												SCALE: 1" = 300'	DATE: JULY 2016	EX-9
	APPROVED: C.A.J.	REVISION NO.:	REVISION DATE:	DESCRIPTION:											



MARYLAND DEPARTMENT OF TRANSPORTATION  
 MARYLAND AVIATION ADMINISTRATION  
 FACILITIES DEVELOPMENT & ENGINEERING  
 OFFICE OF PLANNING & ENVIRONMENTAL SERVICES  
 BALTIMORE/WASHINGTON  
 INTERNATIONAL AIRPORT



#### 1.4. Option 4 – Amtrak Way

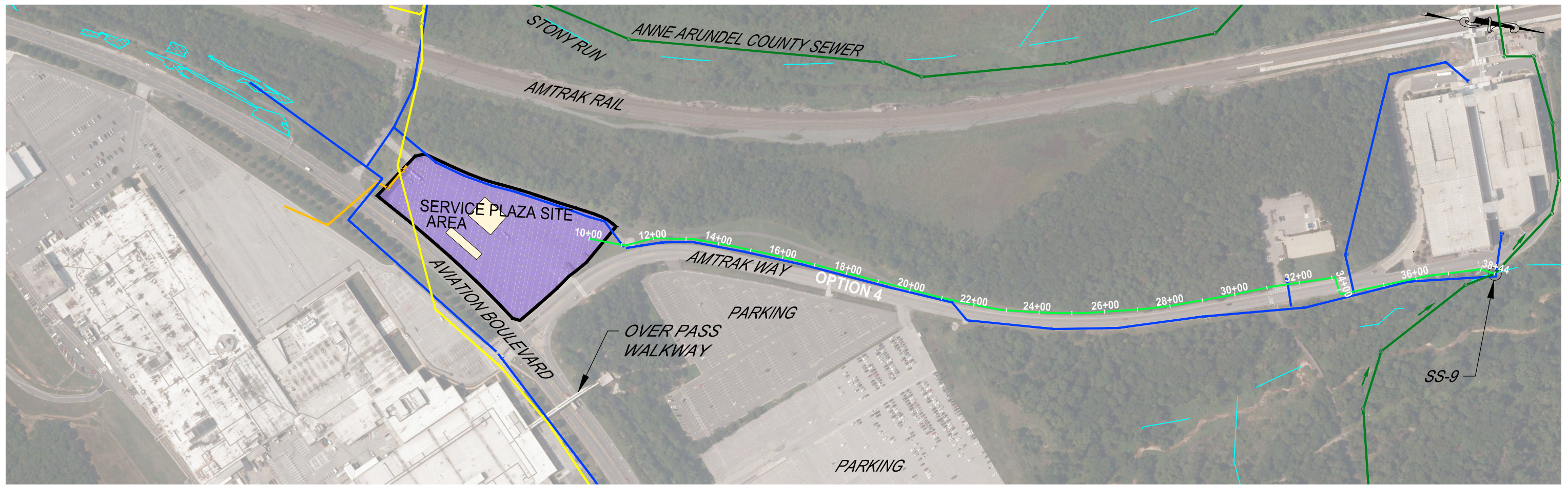
Option 4 is shown in Exhibit 10. The final alignment includes a pipe installation along Amtrak Way that would leave the site from the northernmost corner and connect to existing manhole SS-9. Similar to Option 3, it is located within the ROW for Amtrak Way and would require SHA coordination. As a comparison, this is probably the fastest schedule implemented option with regards to approvals. The terrain allows for the pipe installation as a gravity line that could be relatively shallow. A potential for the alignment to be in grass areas only also exists. However, this alignment has the longest length of pipe installation. As this alignment is to the north, it eliminates all crossings of Amtrak rail, NG property, and floodplains.

Challenges of this option include:

- SHA ROW (assumed)
- Length of run
- Not currently MAA property (land/easement acquisition)
- Potentially more significant MOT for traffic along Amtrak Way

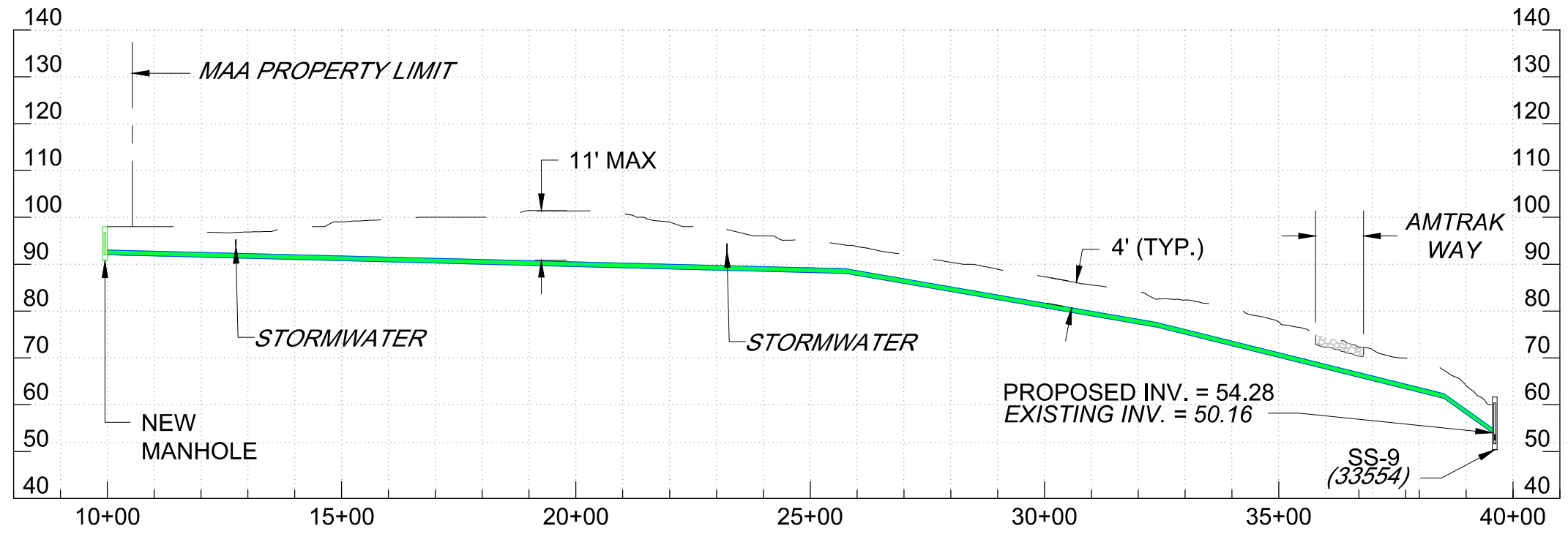


FILE NAME: P:\Airport\BWI\Projects\2015-2803\CAD\EXHIBITS\C-EB-0PT4.dwg LAYOUT NAME: EX-10 USER: NGoodloe PLOTTED: Tuesday, August 02, 2016 11:13am



- LEGEND:**
- EXIST SANITARY SEWER
  - PROPOSED SANITARY SEWER
  - WATER
  - STORM WATER
  - NATURAL GAS
  - ELECTRICAL
  - COMMUNICATION
  - STREAM
  - SERVICE PLAZA SITE

- PROFILE NOTES:**
- 1) ALL MANHOLES NOT SHOWN FOR CLARITY
  - 2) MINIMUM SLOPE OF SEWER ASSUMED AT 0.4%
  - 3) UTILITIES ARE ESTIMATED BASED ON AIRPORTAL AND ANNE ARUNDEL COUNTY GIS INFORMATION



**OPTION 4 - THROUGH AMTRAK WAY**



DESIGNED: N.D.C.			
DRAWN: R.E.Z.			
CHECKED: K.M.F.			
APPROVED: C.A.J.			
REVISION NO.:	REVISION DATE:	DESCRIPTION:	



MARYLAND DEPARTMENT OF TRANSPORTATION  
 MARYLAND AVIATION ADMINISTRATION  
 FACILITIES DEVELOPMENT & ENGINEERING  
 OFFICE OF PLANNING & ENVIRONMENTAL SERVICES  
 BALTIMORE/WASHINGTON INTERNATIONAL AIRPORT

PROJECT TITLE: <b>SERVICE PLAZA UTILITIES</b>	CONTRACT NO.:
SHEET TITLE: <b>SANITARY SEWER - OPTION 4 PLAN AND PROFILE</b>	SHEET NO.:
SCALE: 1" = 300'	DATE: JULY 2016

CONTRACT NO.:  
 SHEET NO.:  
**EX-10**



## 1.5. Estimated Program Costs

As part of this study, cost estimates were developed for the most viable options. A summary is shown below in Table 1. Full cost estimates are provided in Appendix B.

Table 1: Estimated Program Costs

OPTION	ESTIMATED COST
Option 1 (NG Combination)	\$793,200
Option 1 (NG Gravity)	\$1,318,000
Option 2 (Amtrak Rail Gravity)	\$536,200
Option 3 (Aviation Blvd Gravity)	\$744,200
Option 4 (Amtrak Way Gravity)	\$682,400

As Option 2 has the lowest cost, its challenges will be associated with the access, easement agreements, schedule, and approvals required to construct below the Amtrak rail facility. It is believed that Amtrak will permit the construction, but the process is tedious and they have very specific requirements that were attempted to be captured in the construction cost estimate.

Options 1, 2, and 3 all fall within the same range and are seemingly viable options with their own advantages/disadvantages. Options 1 and 3 will likely involve the replacement of the original vitrified clay line between SS-1 and SS-2 (this was included in the cost estimate as it hasn't been verified). The cost of maintenance is also a consideration as force main can have additional costs with pumps, cleanouts, blow-offs, operation, etc. The decision on option could be influenced by the most likely stakeholder to coordinate acceptance and approval.

Option 4, while slightly more expensive, appears to be the cleanest option. The obstacles associated with this alignment seem to be less challenging and the construction seems to involve the least amount of risk.

## 1.6. Facility Evaluation

Included in this study was a site evaluation on the facility itself, some of the preliminary elements identified are described in the following sections.

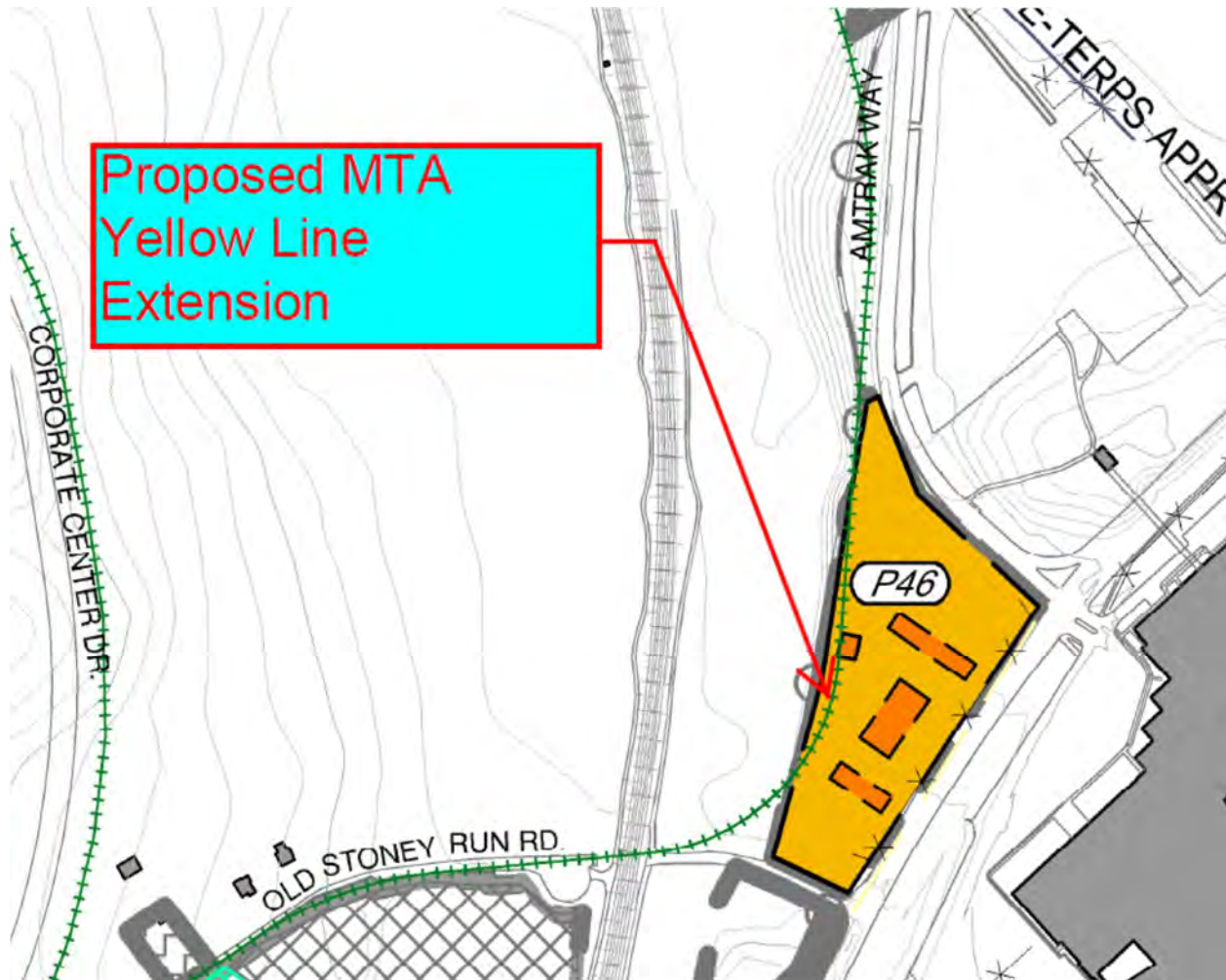
### 1.6.1. Evaluation of Compatibility with Current Airport Layout Plan (ALP)

There are no apparent, immediate impacts with the current ALP as the site (P46 in below image) is located at the midpoint between the approach ends of Runway 15R and Runway 10.





Figure 2: Proposed MTA Yellow Line Extension



Source, January 2015 ALP, Sheet 3

The location is outside all current Runway Protection Zone (RPZ) areas under study at BWI Marshall and the proposed use would not be precluded by any FAA criteria. There doesn't appear to be any concerns/conflicts with ALP or airspace with the proposed development over the next 20 years.

### 1.6.2. General Site Location

Site location would seem to be attractive for development as it is already a paved and graded site, so permitting challenges should not be too intense. The site is located at a signaled intersection with a good deal of traffic from NG and Amtrak. The west side is bound by the airport hiker/biker trail. The employee lot for NG is adjacent and the elevated walkway from the NG facility would provide fairly easy and convenient access for the employees to be able to walk to patronize the businesses.

Vehicular access could potentially come straight in from Aviation Boulevard, Amtrak way or Old Stoney Run Road. The current access is from Old Stoney Run Road and Amtrak Way. The Stoney Run entrance could be built up as it is essentially an access road for Amtrak at this time. This entrance could provide for some additional vehicle queueing and line of sight to easy traffic concerns. Accessing directly from Aviation Boulevard may not be feasible without widening aviation to have turn lane.

### 1.6.3. Utility Access

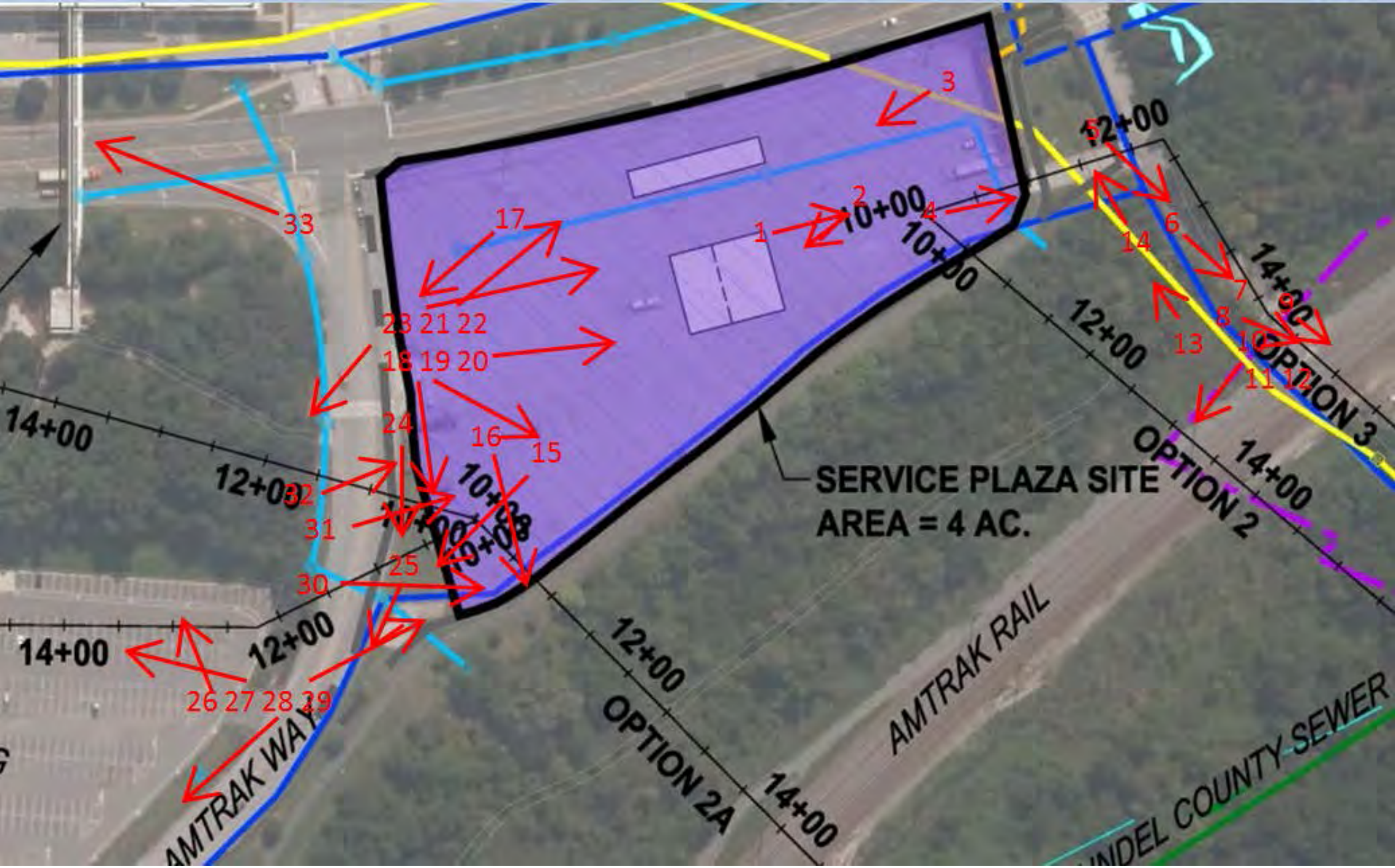
All of the major utilities (aside from sanitary sewer) are easily accessed from the site. Power, water, communications, gas, and closed storm drain systems are all within or immediately adjacent to the site.

### 1.6.4. Site Layout

A detailed site layout was not part of the study scope, but the site generally drains to the southwest. Assuming the developer would largely maintain the existing site grading, this would make placing the sanitary and storm drain collection outfalls in the vicinity of Option 2 more attractive. The other options would still be feasible but more expensive for the developer due to the deeper excavations required to install the sanitary line. The site appears to be of sufficient acreage to accommodate a service station (with car wash) and a fast food restaurant. The actual layout of the site will factor into the preferred utility rough in location(s).

## *Appendix A – Supporting Documentation*









OBJECT ID	STRUCTURE	RIM ELEV.	INVERT	CONTRACT ID	DESCRIPTION
SS-1				3NA-CO-08-00	10"CHD SANITARY SEWER MANHOLE
SS-2	401-54-58A00A	81.17	-		18" SANITARY SEWER MANHOLE
SS-3	401-54-58A00B	79.33	75.18		18" SANITARY SEWER MANHOLE
SS-4	401-54-58A00C	79.85	75.48	3NA-CO-15-016	18" SANITARY SEWER MANHOLE
SS-5	401-54-58A00D	82.47	72.42 / 71.13	3NA-CO-15-021	18" SANITARY SEWER MANHOLE
SS-6	ACC 9115	82.00	80.00 / 80.88	2306A	ACC SANITARY SEWER MANHOLE
SS-7	ACC 9115	88.00	86.20 / 88.20	2306A	ACC SANITARY SEWER MANHOLE
SS-8	ACC 9115	68.00	61.27 / 61.61	2306A	ACC SANITARY SEWER MANHOLE

**LEGEND:**

- WATER
- STORM WATER
- SANITARY SEWER
- NATURAL GAS
- ELECTRICAL
- COMMUNICATION
- METLAND BUFFER
- AIRPORT PROPERTY LINE
- US WATER
- METLAND
- SERVICE PLAZA SITE

SCALE IN FEET: 0 50 100 200 400

**TDCI** **BWI** **PROFESSIONAL ENGINEER**

DATE: 11/22/2018  
 DRAWN: EAP  
 CHECKED: CAJ  
 PROJECT: SERVICE PLAZA UTILITIES  
 SHEET: EXISTING UTILITY PLAN  
 SHEET NO: EX-1





OBJECT ID	STRUCTURE	RIM ELV.	INVERT	CONTRACT ID	DESCRIPTION
SS-1	401-54-58400A	81.17	-	5NA-CO-46-00	50" DIA SANITARY SEWER MANHOLE
SS-2	401-54-58400B	81.17	-	5NA-CO-46-00	50" DIA SANITARY SEWER MANHOLE
SS-3	401-54-58400C	79.33	75.18	-	50" DIA SANITARY SEWER MANHOLE
SS-4	401-54-58400D	79.18	75.03	5NA-CO-15-016	50" DIA SANITARY SEWER MANHOLE
SS-5	401-54-58400E	82.47	72.42 (71.0)	5NA-CO-15-021	50" DIA SANITARY SEWER MANHOLE
SS-6	401-54-58400F	82.00	78.84 (82.88)	2006A	40" DIA SANITARY SEWER MANHOLE
SS-7	401-54-58400G	88.00	84.20 (82.2)	2006A	40" DIA SANITARY SEWER MANHOLE
SS-8	401-54-58400H	88.00	81.27 (81.0)	2006A	40" DIA SANITARY SEWER MANHOLE

LEGEND:	DESCRIPTION
	WATER
	SEWER
	NATURAL GAS
	ELECTRICAL
	COMMUNICATION
	METLAND BUFFER
	PROPERTY LINE
	US WATER
	METLAND
	SERVICE PLAZA SITE

		DATE: 11/22/2023	SCALE: 1" = 40'
PROJECT: SERVICE PLAZA UTILITIES	CLIENT: NORTHROP GRANNAM	DESIGNER: TDCI	DRAWN: JAC
PROJECT NO: 23-001	PROJECT LOCATION: 10000 NORTHROP BLVD, WASHINGTON, DC	DATE: 11/22/2023	SCALE: 1" = 40'
PROJECT NO: 23-001	PROJECT LOCATION: 10000 NORTHROP BLVD, WASHINGTON, DC	DATE: 11/22/2023	SCALE: 1" = 40'





OBJECT ID	STRUCTURE	RIM E.L.V.	INVERT	CONTRACT ID	DESCRIPTION
SS-0				SWA-CO-08-00	NOCTHROP GRAMM SEWER MANHOLE
SS-2	401-54-08A004	81.17	-		MAN SANITARY SEWER MANHOLE
SS-3	401-54-08A006	79.33	75.18		MAN SANITARY SEWER MANHOLE
SS-4	401-54-08A008	79.85	75.68	WMA-CO-15-016	MAN SANITARY SEWER MANHOLE
SS-5	401-54-08A003	82.47	72.42 / 71.13	WMA-CO-15-021	MAN SANITARY SEWER MANHOLE
SS-6	ACC 9115	82.00	80.00-82.00	2306A	ACC SANITARY SEWER MANHOLE
SS-7	ACC 9115	80.00	80.00-82.00	2306A	ACC SANITARY SEWER MANHOLE
SS-8	ACC 9115	68.00	81.07 / 81.01	2306A	ACC SANITARY SEWER MANHOLE



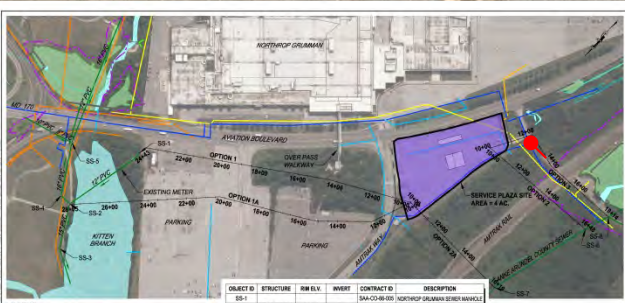


OBJECT ID	STRUCTURE	RIM ELEV.	INVERT	CONTRACT ID	DESCRIPTION
SS-1	401-54-58400A	81.17	-	3NA-CO-48-00	10" DIA SANITARY SEWER MANHOLE
SS-2	401-54-58400B	81.17	-	3NA-CO-48-00	10" DIA SANITARY SEWER MANHOLE
SS-3	401-54-58400C	79.33	75.18	3NA-CO-48-00	10" DIA SANITARY SEWER MANHOLE
SS-4	401-54-58400D	79.18	75.18	3NA-CO-15-116	10" DIA SANITARY SEWER MANHOLE
SS-5	401-54-58400E	82.47	72.42 / 71.13	3NA-CO-15-101	10" DIA SANITARY SEWER MANHOLE
SS-6	401-54-58400F	82.28	78.28 / 82.88	2006A	10" DIA SANITARY SEWER MANHOLE
SS-7	401-54-58400G	82.28	78.28 / 82.88	2006A	10" DIA SANITARY SEWER MANHOLE
SS-8	401-54-58400H	82.28	78.28 / 82.88	2006A	10" DIA SANITARY SEWER MANHOLE







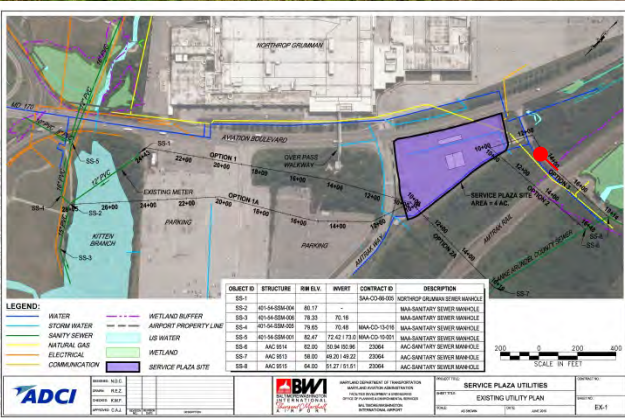


LEGEND:	OBJECT ID	STRUCTURE	RIM ELEV.	INVERT	CONTRACT ID	DESCRIPTION
WATER	SS-1	401-54-08A(04)	80.17	-	3NA-CO-08-00	10"CHP SANITARY SEWER MANHOLE
BROWN WATER	SS-2	401-54-08A(05)	80.17	-	3NA-CO-08-00	10"CHP SANITARY SEWER MANHOLE
SANITY SEWER	SS-3	401-54-08A(06)	79.33	75.18	3NA-CO-08-00	10"CHP SANITARY SEWER MANHOLE
NATURAL GAS	SS-4	401-54-08A(07)	79.85	75.48	3NA-CO-08-00	10"CHP SANITARY SEWER MANHOLE
ELECTRICAL	SS-5	401-54-08A(08)	82.47	72.42 (71.1)	3NA-CO-08-00	10"CHP SANITARY SEWER MANHOLE
COMMUNICATION	SS-6	401-54-08A(09)	82.28	78.28 (80.88)	2306A	4"AC SANITARY SEWER MANHOLE
	SS-7	401-54-08A(10)	88.00	84.20 (81.20)	2306A	4"AC SANITARY SEWER MANHOLE
	SS-8	401-54-08A(11)	68.00	61.27 (61.0)	2306A	4"AC SANITARY SEWER MANHOLE

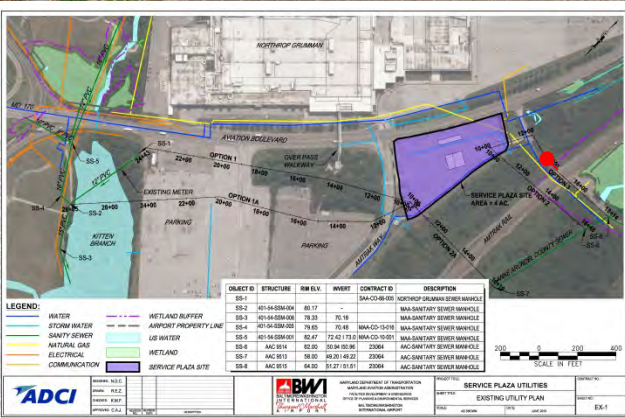
















OBJECT ID	STRUCTURE	RIM ELV.	INVERT	CONTRACT ID	DESCRIPTION
SS-1				3NA-CO-08-00	10" DIA SANITARY SEWER MANHOLE
SS-2	401-54-08A004	81.17	-		10" DIA SANITARY SEWER MANHOLE
SS-3	401-54-08A006	79.33	75.18		10" DIA SANITARY SEWER MANHOLE
SS-4	401-54-08A001	79.85	75.48	3NA-CO-15-016	10" DIA SANITARY SEWER MANHOLE
SS-5	401-54-08A003	82.47	72.42 (71.1)	3NA-CO-15-021	10" DIA SANITARY SEWER MANHOLE
SS-6	ACC-915	82.08	80.04 (80.81)	2306A	ACC SANITARY SEWER MANHOLE
SS-7	ACC-915	88.00	84.20 (84.20)	2306A	ACC SANITARY SEWER MANHOLE
SS-8	ACC-915	68.00	61.27 (61.0)	2306A	ACC SANITARY SEWER MANHOLE

LEGEND:	DESCRIPTION
	WATER
	SEWER
	NATURAL GAS
	ELECTRICAL
	COMMUNICATION
	METLAND BUFFER
	AVIATION PROPERTY LINE
	US WATER
	METLAND
	SERVICE PLAZA SITE

DESIGNED BY: [ ]	DATE: 11.22	PROJECT: SERVICE PLAZA UTILITIES	REVISION:
DRAWN BY: [ ]	DATE: 11.22	PROJECT: SERVICE PLAZA UTILITIES	REVISION:
CHECKED BY: [ ]	DATE: 11.22	PROJECT: SERVICE PLAZA UTILITIES	REVISION:
APPROVED BY: [ ]	DATE: 11.22	PROJECT: SERVICE PLAZA UTILITIES	REVISION:





LEGEND:	OBJECT ID	STRUCTURE	RIM E.L.V.	INVERT	CONTRACT ID	DESCRIPTION
WATER	SS-1	401-54-58A(04)	81.17	-	3NA-CO-08-000	30" DIA. SANITARY SEWER MANHOLE
SEWER	SS-2	401-54-58A(04)	81.17	-	3NA-CO-08-000	30" DIA. SANITARY SEWER MANHOLE
STORM WATER	SS-3	401-54-58A(04)	79.33	75.18	3NA-CO-08-000	30" DIA. SANITARY SEWER MANHOLE
SAFETY SEWER	SS-4	401-54-58A(04)	79.85	75.48	3NA-CO-13-016	30" DIA. SANITARY SEWER MANHOLE
NATURAL GAS	SS-5	401-54-58A(04)	82.47	72.42 (71.1)	3NA-CO-15-021	30" DIA. SANITARY SEWER MANHOLE
ELECTRICAL	SS-6	401-54-58A(04)	82.08	80.34 (80.8)	23064	30" DIA. SANITARY SEWER MANHOLE
COMMUNICATION	SS-7	401-54-58A(04)	82.08	80.34 (80.8)	23064	30" DIA. SANITARY SEWER MANHOLE
	SS-8	401-54-58A(04)	82.08	80.34 (80.8)	23064	30" DIA. SANITARY SEWER MANHOLE
	SS-9	401-54-58A(04)	82.08	80.34 (80.8)	23064	30" DIA. SANITARY SEWER MANHOLE
	SS-10	401-54-58A(04)	82.08	80.34 (80.8)	23064	30" DIA. SANITARY SEWER MANHOLE





LEGEND:	OBJECT ID	STRUCTURE	RIM ELEV.	INVERT	CONTRACT ID	DESCRIPTION
WATER	SS-1	401-54-58400A	81.17	-	50A-CO-48-000	50A SANITARY SEWER MANHOLE
STORM WATER	SS-2	401-54-58400B	81.17	-	50A-CO-48-000	50A SANITARY SEWER MANHOLE
SANITARY SEWER	SS-3	401-54-58400C	79.33	75.18	50A-CO-48-000	50A SANITARY SEWER MANHOLE
NATURAL GAS	SS-4	401-54-58400D	79.85	75.48	50A-CO-15-016	50A SANITARY SEWER MANHOLE
ELECTRICAL	SS-5	401-54-58400E	82.47	72.42 / 71.13	50A-CO-15-021	50A SANITARY SEWER MANHOLE
COMMUNICATION	SS-6	401-54-58400F	82.28	78.28 / 82.81	2306A	40A SANITARY SEWER MANHOLE
	SS-7	401-54-58400G	88.00	84.20 / 84.20	2306A	40A SANITARY SEWER MANHOLE
	SS-8	401-54-58400H	88.00	81.27 / 81.01	2306A	40A SANITARY SEWER MANHOLE



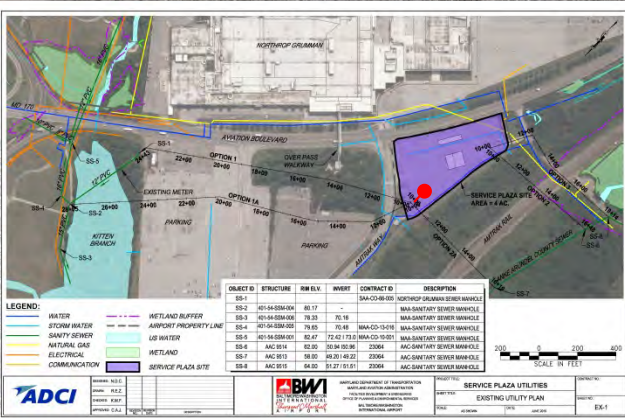




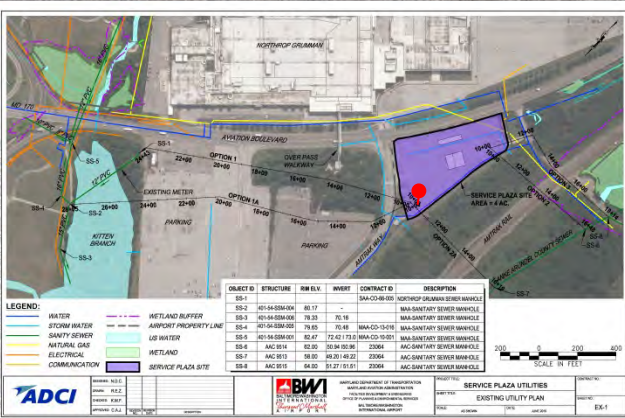


OBJECT ID	STRUCTURE	RIM E.L.V.	INVERT	CONTRACT ID	DESCRIPTION
SS-1	401-54-588-004	81.17	-	3NA-CO-08-001	30" DIA SANITARY SEWER MANHOLE
SS-2	401-54-588-004	81.17	-	3NA-CO-08-001	30" DIA SANITARY SEWER MANHOLE
SS-3	401-54-588-006	79.33	75.18	3NA-CO-08-001	30" DIA SANITARY SEWER MANHOLE
SS-4	401-54-588-001	79.85	75.48	3NA-CO-13-016	30" DIA SANITARY SEWER MANHOLE
SS-5	401-54-588-001	82.47	72.42 (71.1)	3NA-CO-15-021	30" DIA SANITARY SEWER MANHOLE
SS-6	401-54-588-001	82.47	72.42 (71.1)	3NA-CO-15-021	30" DIA SANITARY SEWER MANHOLE
SS-7	401-54-588-001	82.47	72.42 (71.1)	3NA-CO-15-021	30" DIA SANITARY SEWER MANHOLE
SS-8	401-54-588-001	82.47	72.42 (71.1)	3NA-CO-15-021	30" DIA SANITARY SEWER MANHOLE
SS-9	401-54-588-001	82.47	72.42 (71.1)	3NA-CO-15-021	30" DIA SANITARY SEWER MANHOLE
SS-10	401-54-588-001	82.47	72.42 (71.1)	3NA-CO-15-021	30" DIA SANITARY SEWER MANHOLE

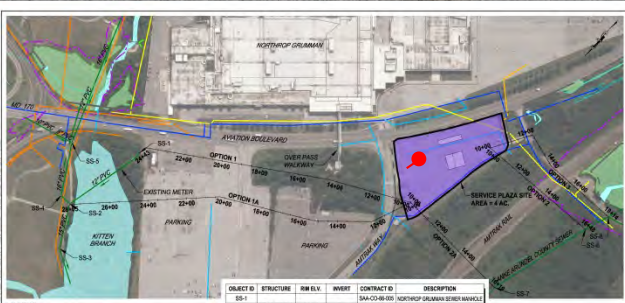












**LEGEND:**

- WATER
- SEWER
- NATURAL GAS
- ELECTRICAL
- COMMUNICATION
- WETLAND BUFFER
- WETLAND PROPERTY LINE
- US WATER
- WETLAND
- SERVICE PLAZA SITE

OBJECT ID	STRUCTURE	RIM E.L.V.	INVERT	CONTRACT ID	DESCRIPTION
SS-1	401-54-58A(00)	81.17	-	5NA-CO-48-00	50" DIA SANITARY SEWER MANHOLE
SS-2	401-54-58B(00)	79.33	75.18	-	36" DIA SANITARY SEWER MANHOLE
SS-3	401-54-58C(00)	79.85	75.48	5NA-CO-15-18	36" DIA SANITARY SEWER MANHOLE
SS-4	401-54-58D(00)	82.47	72.42 / 71.13	5NA-CO-15-01	36" DIA SANITARY SEWER MANHOLE
SS-5	401-54-58E(00)	82.00	80.34 / 80.81	23064	36" DIA SANITARY SEWER MANHOLE
SS-6	401-54-58F(00)	82.00	80.34 / 80.81	23064	36" DIA SANITARY SEWER MANHOLE
SS-7	401-54-58G(00)	82.00	80.34 / 80.81	23064	36" DIA SANITARY SEWER MANHOLE
SS-8	401-54-58H(00)	82.00	80.34 / 80.81	23064	36" DIA SANITARY SEWER MANHOLE

**ADCI** **BW**

PROJECT: SERVICE PLAZA UTILITIES  
 SHEET: EXISTING UTILITY PLAN  
 DATE: 01/20/2024  
 SCALE: AS SHOWN





OBJECT ID	STRUCTURE	RIM E.L.V.	INVERT	CONTRACT ID	DESCRIPTION
SS-1				NA-CO-46-000	NOCTHROP GRAMM SEWER MANHOLE
SS-2	401-54-08A004	60.17	-		MAN SANITARY SEWER MANHOLE
SS-3	401-54-08A006	70.33	70.16		MAN SANITARY SEWER MANHOLE
SS-4	401-54-08A005	78.95	78.48	NA-CO-15-016	MAN SANITARY SEWER MANHOLE
SS-5	401-54-08A003	62.47	72.42 / 71.13	NA-CO-15-021	MAN SANITARY SEWER MANHOLE
SS-6	ACC 9115	62.00	58.94-62.00	2006	ACC SANITARY SEWER MANHOLE
SS-7	ACC 9115	68.00	64.20-68.00	2006	ACC SANITARY SEWER MANHOLE
SS-8	ACC 9115	68.00	61.27-68.00	2006	ACC SANITARY SEWER MANHOLE

LEGEND:	DESCRIPTION
	WATER
	STORM WATER
	SANITARY SEWER
	NATURAL GAS
	ELECTRICAL
	COMMUNICATION
	WETLAND BUFFER
	WETLAND PROPERTY LINE
	US WATER
	WETLAND
	SERVICE PLAZA SITE

		SERVICE PLAZA UTILITIES EXISTING UTILITY PLAN	SHEET NO. 06-1 DATE 06/20/2024
--	--	--	-----------------------------------





OBJECT ID	STRUCTURE	RIM E.V.	INVERT	CONTRACT ID	DESCRIPTION
SS-1	401-54-88A(04)	81.17	-	3NA-CO-48-000	30" DIA SANITARY SEWER MANHOLE
SS-2	401-54-88A(06)	79.33	-	3NA-CO-48-000	30" DIA SANITARY SEWER MANHOLE
SS-3	401-54-88A(08)	79.85	75.18	3NA-CO-15-016	30" DIA SANITARY SEWER MANHOLE
SS-4	401-54-88A(09)	82.47	72.42 / 71.13	3NA-CO-15-021	30" DIA SANITARY SEWER MANHOLE
SS-5	401-54-88A(10)	82.47	72.42 / 71.13	3NA-CO-15-021	30" DIA SANITARY SEWER MANHOLE
SS-6	ACC 9115	82.00	80.00	23064	ACC SANITARY SEWER MANHOLE
SS-7	ACC 9115	80.00	78.00	23064	ACC SANITARY SEWER MANHOLE
SS-8	ACC 9115	68.00	61.07 / 61.01	23064	ACC SANITARY SEWER MANHOLE

LEGEND:	DESCRIPTION
	WATER
	SEWER
	NATURAL GAS
	ELECTRICAL
	COMMUNICATION
	METLAND BUFFER
	AIRPORT PROPERTY LINE
	US WATER
	METLAND
	SERVICE PLAZA SITE

DATE: 10/12/2011	PROJECT: SERVICE PLAZA UTILITIES	SCALE: 1" = 100'
DRAWN: EAP	CHECKED: [Signature]	DATE: 10/12/2011
PROJECT: CA-1	DATE: 10/12/2011	SCALE: 1" = 100'





OBJECT ID	STRUCTURE	RIM ELV.	INVERT	CONTRACT ID	DESCRIPTION
SS-1	401-54-88400A	81.17	-	3NA-CO-48-00	30" DIA SANITARY SEWER MANHOLE
SS-2	401-54-88400B	81.17	-	3NA-CO-48-00	30" DIA SANITARY SEWER MANHOLE
SS-3	401-54-88400C	79.33	75.18	3NA-CO-48-00	30" DIA SANITARY SEWER MANHOLE
SS-4	401-54-88400D	79.85	75.68	3NA-CO-15-016	30" DIA SANITARY SEWER MANHOLE
SS-5	401-54-88400E	82.47	72.42 / 71.13	3NA-CO-15-021	30" DIA SANITARY SEWER MANHOLE
SS-6	ACC 9115	82.00	80.50-80.98	2306A	ACC SANITARY SEWER MANHOLE
SS-7	ACC 9115	88.00	86.50 / 86.25	2306A	ACC SANITARY SEWER MANHOLE
SS-8	ACC 9115	68.00	61.27 / 61.01	2306A	ACC SANITARY SEWER MANHOLE









OBJECT ID	STRUCTURE	RIM ELEV.	INVERT	CONTRACT ID	DESCRIPTION
SS-0				90A-CO-08-001	NOTHING GRABBER SERVICE MANHOLE
SS-2	401-04-08-004	81.17	-		MAN SANITARY SEWER MANHOLE
SS-3	401-04-08-006	78.33	75.18		MAN SANITARY SEWER MANHOLE
SS-4	401-04-08-007	78.85	75.68	90A-CO-13-016	MAN SANITARY SEWER MANHOLE
SS-5	401-04-08-008	82.47	72.42 (71.1)	90A-CO-15-021	MAN SANITARY SEWER MANHOLE
SS-6	ACC 915	82.00	80.30 (80.88)	23064	ACC SANITARY SEWER MANHOLE
SS-7	ACC 915	80.00	78.30 (78.2)	23064	ACC SANITARY SEWER MANHOLE
SS-8	ACC 915	68.00	61.27 (61.6)	23064	ACC SANITARY SEWER MANHOLE

**LEGEND:**

- WATER
- STORM WATER
- SANITARY SEWER
- NATURAL GAS
- ELECTRICAL
- COMMUNICATION
- WETLAND BUFFER
- WETLAND
- ARMPONT PROPERTY LINE
- US WATER
- SERVICE PLAZA SITE

**TDCI**  
 DESIGNER: J.E.C.  
 CHECKER: P.B.P.  
 DATE: 08/11/2024

**BW**  
 375 E 94th St, Suite 100  
 Des Moines, IA 50317  
 Phone: 515-281-8100  
 Fax: 515-281-8101  
 Website: www.bw.com

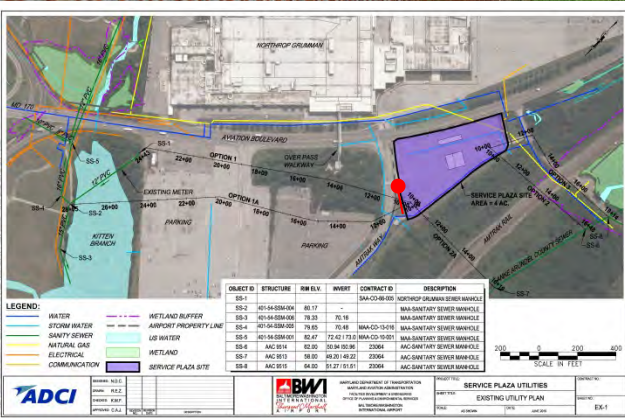
PROJECT: SERVICE PLAZA UTILITIES  
 SHEET: EXISTING UTILITY PLAN  
 DATE: 08/11/2024  
 DRAWN BY: J.E.C.  
 CHECKED BY: P.B.P.



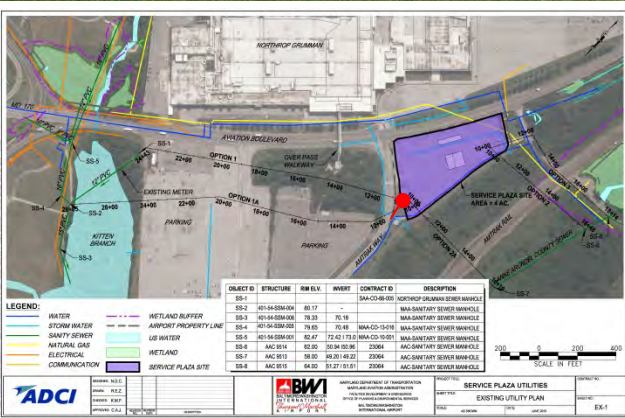


OBJECT ID	STRUCTURE	RIM ELEV.	INVERT	CONTRACT ID	DESCRIPTION
SS-1				3NA-CO-08-00	100% OF GRAMMAN SEWER MANHOLE
SS-2	401-54-08A-004	81.17	-		MAN SANITARY SEWER MANHOLE
SS-3	401-54-08A-006	79.33	75.18		MAN SANITARY SEWER MANHOLE
SS-4	401-54-08A-001	79.85	75.68	3NA-CO-15-016	MAN SANITARY SEWER MANHOLE
SS-5	401-54-08A-001	82.47	72.42 (71.1)	3NA-CO-15-021	MAN SANITARY SEWER MANHOLE
SS-6	ACC 9111	82.00	78.94 (82.88)	23064	ACC SANITARY SEWER MANHOLE
SS-7	ACC 9111	88.00	84.30 (81.21)	23064	ACC SANITARY SEWER MANHOLE
SS-8	ACC 9111	68.00	61.27 (61.01)	23064	ACC SANITARY SEWER MANHOLE

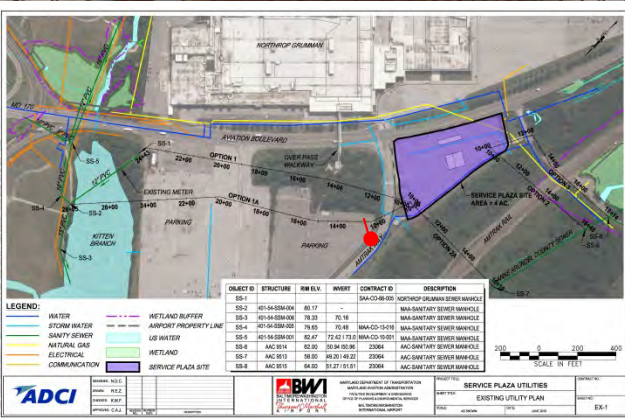
















OBJECT ID	STRUCTURE	RIM ELEV.	INVERT	CONTRACT ID	DESCRIPTION
SS-1				SWA-CO-08-00	10" DIA SANITARY SEWER MANHOLE
SS-2	401-54-08A-004	81.17			18" DIA SANITARY SEWER MANHOLE
SS-3	401-54-08A-006	79.33	75.18		18" DIA SANITARY SEWER MANHOLE
SS-4	401-54-08A-001	79.85	75.48	SWA-CO-15-116	18" DIA SANITARY SEWER MANHOLE
SS-5	401-54-08A-003	82.47	72.42 / 71.13	SWA-CO-15-101	18" DIA SANITARY SEWER MANHOLE
SS-6	ACC-915	68.00	68.00	2306A	ACC SANITARY SEWER MANHOLE
SS-7	ACC-915	68.00	68.00	2306A	ACC SANITARY SEWER MANHOLE
SS-8	ACC-915	68.00	68.00	2306A	ACC SANITARY SEWER MANHOLE

LEGEND:		
WATER	WETLAND BUFFER	OPTION 1
STORM WATER	AIRPORT PROPERTY LINE	OPTION 2A
SANITARY SEWER	US WATER	OPTION 2B
NATURAL GAS	ELECTRICAL	OPTION 2C
ELECTRICAL	WETLAND	OPTION 2D
COMMUNICATION	SERVICE PLAZA SITE	

DATE: 11/2/2011	SCALE: 1" = 40'	PROJECT: SERVICE PLAZA UTILITIES
DRAWN: EBP	CHECKED: [Signature]	DATE PLOTTED: 11/2/2011
PROJECT: CAJ	DATE: 11/2/2011	SCALE: 1" = 40'





**LEGEND:**

- WATER
- STORM WATER
- SANITARY SEWER
- NATURAL GAS
- ELECTRICAL
- COMMUNICATION
- WETLAND BUFFER
- WETLAND
- US WATER
- SERVICE PLAZA SITE

**ADCI** ARCHITECTURAL DESIGN CONSULTANTS, INC.

**BWI** BALTIMORE WASHINGTON INTERNATIONAL AIRPORT

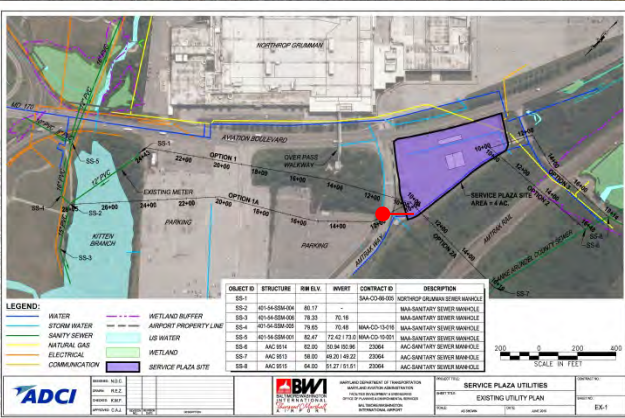
**PROJECT:** SERVICE PLAZA UTILITIES  
**DATE:** 08/11/2011  
**SCALE:** 1" = 40' (AS SHOWN)  
**DESIGNER:** [Signature]  
**CHECKER:** [Signature]  
**DATE:** 08/11/2011  
**SCALE:** 1" = 40' (AS SHOWN)  
**PROJECT:** SERVICE PLAZA UTILITIES  
**DATE:** 08/11/2011  
**SCALE:** 1" = 40' (AS SHOWN)  
**DESIGNER:** [Signature]  
**CHECKER:** [Signature]  
**DATE:** 08/11/2011  
**SCALE:** 1" = 40' (AS SHOWN)





OBJECT ID	STRUCTURE	RIM E.L.V.	INVERT	CONTRACT ID	DESCRIPTION
SS-1	401-54-588400	81.17	-	3NA-CO-16-00	10" DIA SANITARY SEWER MANHOLE
SS-2	401-54-588400	81.17	-	3NA-CO-16-00	10" DIA SANITARY SEWER MANHOLE
SS-3	401-54-588400	79.33	75.18	3NA-CO-16-00	10" DIA SANITARY SEWER MANHOLE
SS-4	401-54-588400	79.85	75.48	3NA-CO-16-00	10" DIA SANITARY SEWER MANHOLE
SS-5	401-54-588400	82.47	72.42 / 71.13	3NA-CO-16-00	10" DIA SANITARY SEWER MANHOLE
SS-6	401-54-588400	82.47	72.42 / 71.13	3NA-CO-16-00	10" DIA SANITARY SEWER MANHOLE
SS-7	401-54-588400	82.47	72.42 / 71.13	3NA-CO-16-00	10" DIA SANITARY SEWER MANHOLE
SS-8	401-54-588400	82.47	72.42 / 71.13	3NA-CO-16-00	10" DIA SANITARY SEWER MANHOLE













**LEGEND:**

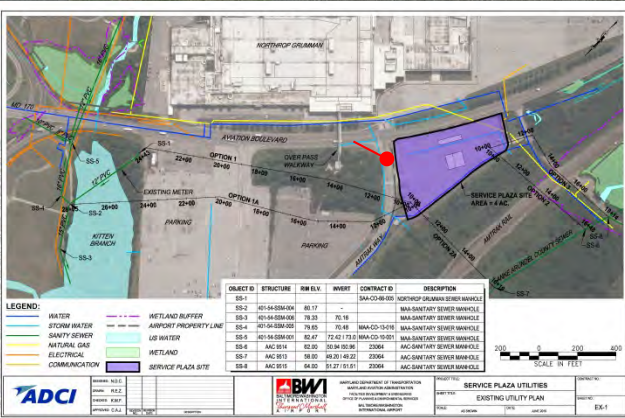
- WATER
- STORM WATER
- SANITARY SEWER
- NATURAL GAS
- ELECTRICAL
- COMMUNICATION
- WETLAND BUFFER
- WETLAND
- US WATER
- ARMPORT PROPERTY LINE
- EXISTING METER
- PARKING
- OPTION 1A
- OPTION 1B
- OPTION 1C
- OPTION 1D
- OPTION 1E
- OPTION 1F
- OPTION 1G
- OPTION 1H
- OPTION 1I
- OPTION 1J
- OPTION 1K
- OPTION 1L
- OPTION 1M
- OPTION 1N
- OPTION 1O
- OPTION 1P
- OPTION 1Q
- OPTION 1R
- OPTION 1S
- OPTION 1T
- OPTION 1U
- OPTION 1V
- OPTION 1W
- OPTION 1X
- OPTION 1Y
- OPTION 1Z
- OPTION 1AA
- OPTION 1AB
- OPTION 1AC
- OPTION 1AD
- OPTION 1AE
- OPTION 1AF
- OPTION 1AG
- OPTION 1AH
- OPTION 1AI
- OPTION 1AJ
- OPTION 1AK
- OPTION 1AL
- OPTION 1AM
- OPTION 1AN
- OPTION 1AO
- OPTION 1AP
- OPTION 1AQ
- OPTION 1AR
- OPTION 1AS
- OPTION 1AT
- OPTION 1AU
- OPTION 1AV
- OPTION 1AW
- OPTION 1AX
- OPTION 1AY
- OPTION 1AZ
- OPTION 1BA
- OPTION 1BB
- OPTION 1BC
- OPTION 1BD
- OPTION 1BE
- OPTION 1BF
- OPTION 1BG
- OPTION 1BH
- OPTION 1BI
- OPTION 1BJ
- OPTION 1BK
- OPTION 1BL
- OPTION 1BM
- OPTION 1BN
- OPTION 1BO
- OPTION 1BP
- OPTION 1BQ
- OPTION 1BR
- OPTION 1BS
- OPTION 1BT
- OPTION 1BU
- OPTION 1BV
- OPTION 1BW
- OPTION 1BX
- OPTION 1BY
- OPTION 1BZ
- OPTION 1CA
- OPTION 1CB
- OPTION 1CC
- OPTION 1CD
- OPTION 1CE
- OPTION 1CF
- OPTION 1CG
- OPTION 1CH
- OPTION 1CI
- OPTION 1CJ
- OPTION 1CK
- OPTION 1CL
- OPTION 1CM
- OPTION 1CN
- OPTION 1CO
- OPTION 1CP
- OPTION 1CQ
- OPTION 1CR
- OPTION 1CS
- OPTION 1CT
- OPTION 1CU
- OPTION 1CV
- OPTION 1CW
- OPTION 1CX
- OPTION 1CY
- OPTION 1CZ
- OPTION 1DA
- OPTION 1DB
- OPTION 1DC
- OPTION 1DD
- OPTION 1DE
- OPTION 1DF
- OPTION 1DG
- OPTION 1DH
- OPTION 1DI
- OPTION 1DJ
- OPTION 1DK
- OPTION 1DL
- OPTION 1DM
- OPTION 1DN
- OPTION 1DO
- OPTION 1DP
- OPTION 1DQ
- OPTION 1DR
- OPTION 1DS
- OPTION 1DT
- OPTION 1DU
- OPTION 1DV
- OPTION 1DW
- OPTION 1DX
- OPTION 1DY
- OPTION 1DZ
- OPTION 1EA
- OPTION 1EB
- OPTION 1EC
- OPTION 1ED
- OPTION 1EE
- OPTION 1EF
- OPTION 1EG
- OPTION 1EH
- OPTION 1EI
- OPTION 1EJ
- OPTION 1EK
- OPTION 1EL
- OPTION 1EM
- OPTION 1EN
- OPTION 1EO
- OPTION 1EP
- OPTION 1EQ
- OPTION 1ER
- OPTION 1ES
- OPTION 1ET
- OPTION 1EU
- OPTION 1EV
- OPTION 1EW
- OPTION 1EX
- OPTION 1EY
- OPTION 1EZ
- OPTION 1FA
- OPTION 1FB
- OPTION 1FC
- OPTION 1FD
- OPTION 1FE
- OPTION 1FF
- OPTION 1FG
- OPTION 1FH
- OPTION 1FI
- OPTION 1FJ
- OPTION 1FK
- OPTION 1FL
- OPTION 1FM
- OPTION 1FN
- OPTION 1FO
- OPTION 1FP
- OPTION 1FQ
- OPTION 1FR
- OPTION 1FS
- OPTION 1FT
- OPTION 1FU
- OPTION 1FV
- OPTION 1FW
- OPTION 1FX
- OPTION 1FY
- OPTION 1FZ
- OPTION 1GA
- OPTION 1GB
- OPTION 1GC
- OPTION 1GD
- OPTION 1GE
- OPTION 1GF
- OPTION 1GG
- OPTION 1GH
- OPTION 1GI
- OPTION 1GJ
- OPTION 1GK
- OPTION 1GL
- OPTION 1GM
- OPTION 1GN
- OPTION 1GO
- OPTION 1GP
- OPTION 1GQ
- OPTION 1GR
- OPTION 1GS
- OPTION 1GT
- OPTION 1GU
- OPTION 1GV
- OPTION 1GW
- OPTION 1GX
- OPTION 1GY
- OPTION 1GZ
- OPTION 1HA
- OPTION 1HB
- OPTION 1HC
- OPTION 1HD
- OPTION 1HE
- OPTION 1HF
- OPTION 1HG
- OPTION 1HH
- OPTION 1HI
- OPTION 1HJ
- OPTION 1HK
- OPTION 1HL
- OPTION 1HM
- OPTION 1HN
- OPTION 1HO
- OPTION 1HP
- OPTION 1HQ
- OPTION 1HR
- OPTION 1HS
- OPTION 1HT
- OPTION 1HU
- OPTION 1HV
- OPTION 1HW
- OPTION 1HX
- OPTION 1HY
- OPTION 1HZ
- OPTION 1IA
- OPTION 1IB
- OPTION 1IC
- OPTION 1ID
- OPTION 1IE
- OPTION 1IF
- OPTION 1IG
- OPTION 1IH
- OPTION 1II
- OPTION 1IJ
- OPTION 1IK
- OPTION 1IL
- OPTION 1IM
- OPTION 1IN
- OPTION 1IO
- OPTION 1IP
- OPTION 1IQ
- OPTION 1IR
- OPTION 1IS
- OPTION 1IT
- OPTION 1IU
- OPTION 1IV
- OPTION 1IW
- OPTION 1IX
- OPTION 1IY
- OPTION 1IZ
- OPTION 1JA
- OPTION 1JB
- OPTION 1JC
- OPTION 1JD
- OPTION 1JE
- OPTION 1JF
- OPTION 1JG
- OPTION 1JH
- OPTION 1JI
- OPTION 1JJ
- OPTION 1JK
- OPTION 1JL
- OPTION 1JM
- OPTION 1JN
- OPTION 1JO
- OPTION 1JP
- OPTION 1JQ
- OPTION 1JR
- OPTION 1JS
- OPTION 1JT
- OPTION 1JU
- OPTION 1JV
- OPTION 1JW
- OPTION 1JX
- OPTION 1JY
- OPTION 1JZ
- OPTION 1KA
- OPTION 1KB
- OPTION 1KC
- OPTION 1KD
- OPTION 1KE
- OPTION 1KF
- OPTION 1KG
- OPTION 1KH
- OPTION 1KI
- OPTION 1KJ
- OPTION 1KK
- OPTION 1KL
- OPTION 1KM
- OPTION 1KN
- OPTION 1KO
- OPTION 1KP
- OPTION 1KQ
- OPTION 1KR
- OPTION 1KS
- OPTION 1KT
- OPTION 1KU
- OPTION 1KV
- OPTION 1KW
- OPTION 1KX
- OPTION 1KY
- OPTION 1KZ
- OPTION 1LA
- OPTION 1LB
- OPTION 1LC
- OPTION 1LD
- OPTION 1LE
- OPTION 1LF
- OPTION 1LG
- OPTION 1LH
- OPTION 1LI
- OPTION 1LJ
- OPTION 1LK
- OPTION 1LL
- OPTION 1LM
- OPTION 1LN
- OPTION 1LO
- OPTION 1LP
- OPTION 1LQ
- OPTION 1LR
- OPTION 1LS
- OPTION 1LT
- OPTION 1LU
- OPTION 1LV
- OPTION 1LW
- OPTION 1LX
- OPTION 1LY
- OPTION 1LZ
- OPTION 1MA
- OPTION 1MB
- OPTION 1MC
- OPTION 1MD
- OPTION 1ME
- OPTION 1MF
- OPTION 1MG
- OPTION 1MH
- OPTION 1MI
- OPTION 1MJ
- OPTION 1MK
- OPTION 1ML
- OPTION 1MN
- OPTION 1MO
- OPTION 1MP
- OPTION 1MQ
- OPTION 1MR
- OPTION 1MS
- OPTION 1MT
- OPTION 1MU
- OPTION 1MV
- OPTION 1MW
- OPTION 1MX
- OPTION 1MY
- OPTION 1MZ
- OPTION 1NA
- OPTION 1NB
- OPTION 1NC
- OPTION 1ND
- OPTION 1NE
- OPTION 1NF
- OPTION 1NG
- OPTION 1NH
- OPTION 1NI
- OPTION 1NJ
- OPTION 1NK
- OPTION 1NL
- OPTION 1NM
- OPTION 1NN
- OPTION 1NO
- OPTION 1NP
- OPTION 1NQ
- OPTION 1NR
- OPTION 1NS
- OPTION 1NT
- OPTION 1NU
- OPTION 1NV
- OPTION 1NW
- OPTION 1NX
- OPTION 1NY
- OPTION 1NZ
- OPTION 1OA
- OPTION 1OB
- OPTION 1OC
- OPTION 1OD
- OPTION 1OE
- OPTION 1OF
- OPTION 1OG
- OPTION 1OH
- OPTION 1OI
- OPTION 1OJ
- OPTION 1OK
- OPTION 1OL
- OPTION 1OM
- OPTION 1ON
- OPTION 1OO
- OPTION 1OP
- OPTION 1OQ
- OPTION 1OR
- OPTION 1OS
- OPTION 1OT
- OPTION 1OU
- OPTION 1OV
- OPTION 1OW
- OPTION 1OX
- OPTION 1OY
- OPTION 1OZ
- OPTION 1PA
- OPTION 1PB
- OPTION 1PC
- OPTION 1PD
- OPTION 1PE
- OPTION 1PF
- OPTION 1PG
- OPTION 1PH
- OPTION 1PI
- OPTION 1PJ
- OPTION 1PK
- OPTION 1PL
- OPTION 1PM
- OPTION 1PN
- OPTION 1PO
- OPTION 1PP
- OPTION 1PQ
- OPTION 1PR
- OPTION 1PS
- OPTION 1PT
- OPTION 1PU
- OPTION 1PV
- OPTION 1PW
- OPTION 1PX
- OPTION 1PY
- OPTION 1PZ
- OPTION 1QA
- OPTION 1QB
- OPTION 1QC
- OPTION 1QD
- OPTION 1QE
- OPTION 1QF
- OPTION 1QG
- OPTION 1QH
- OPTION 1QI
- OPTION 1QJ
- OPTION 1QK
- OPTION 1QL
- OPTION 1QM
- OPTION 1QN
- OPTION 1QO
- OPTION 1QP
- OPTION 1QQ
- OPTION 1QR
- OPTION 1QS
- OPTION 1QT
- OPTION 1QU
- OPTION 1QV
- OPTION 1QW
- OPTION 1QX
- OPTION 1QY
- OPTION 1QZ
- OPTION 1RA
- OPTION 1RB
- OPTION 1RC
- OPTION 1RD
- OPTION 1RE
- OPTION 1RF
- OPTION 1RG
- OPTION 1RH
- OPTION 1RI
- OPTION 1RJ
- OPTION 1RK
- OPTION 1RL
- OPTION 1RM
- OPTION 1RN
- OPTION 1RO
- OPTION 1RP
- OPTION 1RQ
- OPTION 1RR
- OPTION 1RS
- OPTION 1RT
- OPTION 1RU
- OPTION 1RV
- OPTION 1RW
- OPTION 1RX
- OPTION 1RY
- OPTION 1RZ
- OPTION 1SA
- OPTION 1SB
- OPTION 1SC
- OPTION 1SD
- OPTION 1SE
- OPTION 1SF
- OPTION 1SG
- OPTION 1SH
- OPTION 1SI
- OPTION 1SJ
- OPTION 1SK
- OPTION 1SL
- OPTION 1SM
- OPTION 1SN
- OPTION 1SO
- OPTION 1SP
- OPTION 1SQ
- OPTION 1SR
- OPTION 1SS
- OPTION 1ST
- OPTION 1SU
- OPTION 1SV
- OPTION 1SW
- OPTION 1SX
- OPTION 1SY
- OPTION 1SZ
- OPTION 1TA
- OPTION 1TB
- OPTION 1TC
- OPTION 1TD
- OPTION 1TE
- OPTION 1TF
- OPTION 1TG
- OPTION 1TH
- OPTION 1TI
- OPTION 1TJ
- OPTION 1TK
- OPTION 1TL
- OPTION 1TM
- OPTION 1TN
- OPTION 1TO
- OPTION 1TP
- OPTION 1TQ
- OPTION 1TR
- OPTION 1TS
- OPTION 1TT
- OPTION 1TU
- OPTION 1TV
- OPTION 1TW
- OPTION 1TX
- OPTION 1TY
- OPTION 1TZ
- OPTION 1UA
- OPTION 1UB
- OPTION 1UC
- OPTION 1UD
- OPTION 1UE
- OPTION 1UF
- OPTION 1UG
- OPTION 1UH
- OPTION 1UI
- OPTION 1UJ
- OPTION 1UK
- OPTION 1UL
- OPTION 1UM
- OPTION 1UN
- OPTION 1UO
- OPTION 1UP
- OPTION 1UQ
- OPTION 1UR
- OPTION 1US
- OPTION 1UT
- OPTION 1UU
- OPTION 1UV
- OPTION 1UW
- OPTION 1UX
- OPTION 1UY
- OPTION 1UZ
- OPTION 1VA
- OPTION 1VB
- OPTION 1VC
- OPTION 1VD
- OPTION 1VE
- OPTION 1VF
- OPTION 1VG
- OPTION 1VH
- OPTION 1VI
- OPTION 1VJ
- OPTION 1VK
- OPTION 1VL
- OPTION 1VM
- OPTION 1VN
- OPTION 1VO
- OPTION 1VP
- OPTION 1VQ
- OPTION 1VR
- OPTION 1VS
- OPTION 1VT
- OPTION 1VU
- OPTION 1VV
- OPTION 1VW
- OPTION 1VX
- OPTION 1VY
- OPTION 1VZ
- OPTION 1WA
- OPTION 1WB
- OPTION 1WC
- OPTION 1WD
- OPTION 1WE
- OPTION 1WF
- OPTION 1WG
- OPTION 1WH
- OPTION 1WI
- OPTION 1WJ
- OPTION 1WK
- OPTION 1WL
- OPTION 1WM
- OPTION 1WN
- OPTION 1WO
- OPTION 1WP
- OPTION 1WQ
- OPTION 1WR
- OPTION 1WS
- OPTION 1WT
- OPTION 1WU
- OPTION 1WV
- OPTION 1WW
- OPTION 1WX
- OPTION 1WY
- OPTION 1WZ
- OPTION 1XA
- OPTION 1XB
- OPTION 1XC
- OPTION 1XD
- OPTION 1XE
- OPTION 1XF
- OPTION 1XG
- OPTION 1XH
- OPTION 1XI
- OPTION 1XJ
- OPTION 1XK
- OPTION 1XL
- OPTION 1XM
- OPTION 1XN
- OPTION 1XO
- OPTION 1XP
- OPTION 1XQ
- OPTION 1XR
- OPTION 1XS
- OPTION 1XT
- OPTION 1XU
- OPTION 1XV
- OPTION 1XW
- OPTION 1XX
- OPTION 1XY
- OPTION 1XZ
- OPTION 1YA
- OPTION 1YB
- OPTION 1YC
- OPTION 1YD
- OPTION 1YE
- OPTION 1YF
- OPTION 1YG
- OPTION 1YH
- OPTION 1YI
- OPTION 1YJ
- OPTION 1YK
- OPTION 1YL
- OPTION 1YM
- OPTION 1YN
- OPTION 1YO
- OPTION 1YP
- OPTION 1YQ
- OPTION 1YR
- OPTION 1YS
- OPTION 1YT
- OPTION 1YU
- OPTION 1YV
- OPTION 1YW
- OPTION 1YX
- OPTION 1YY
- OPTION 1YZ
- OPTION 1ZA
- OPTION 1ZB
- OPTION 1ZC
- OPTION 1ZD
- OPTION 1ZE
- OPTION 1ZF
- OPTION 1ZG
- OPTION 1ZH
- OPTION 1ZI
- OPTION 1ZJ
- OPTION 1ZK
- OPTION 1ZL
- OPTION 1ZM
- OPTION 1ZN
- OPTION 1ZO
- OPTION 1ZP
- OPTION 1ZQ
- OPTION 1ZR
- OPTION 1ZS
- OPTION 1ZT
- OPTION 1ZU
- OPTION 1ZV
- OPTION 1ZW
- OPTION 1ZX
- OPTION 1ZY
- OPTION 1ZZ

**ADCI** CONSULTING ENGINEERS  
 10000 W. 10th Ave., Suite 100, Denver, CO 80202  
 PHONE: 303.755.1000 FAX: 303.755.1001  
 WWW: www.adci.com

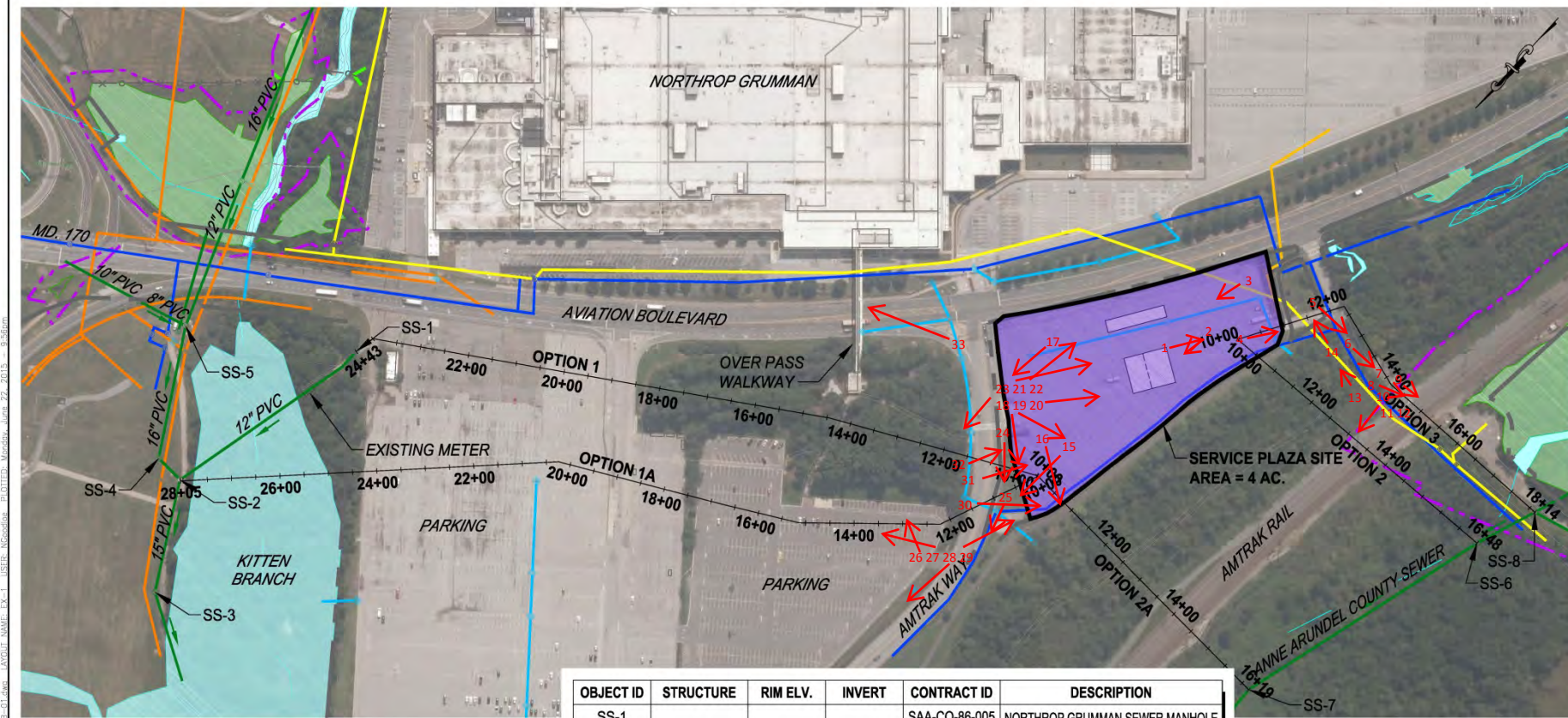
**BWV** CONSULTING ENGINEERS  
 10000 W. 10th Ave., Suite 100, Denver, CO 80202  
 PHONE: 303.755.1000 FAX: 303.755.1001  
 WWW: www.bwv.com

PROJECT: SERVICE PLAZA UTILITIES  
 SHEET: EXISTING UTILITY PLAN  
 DATE: 01/20/2018  
 DRAWN: JLM  
 CHECKED: JLM  
 SCALE: AS SHOWN



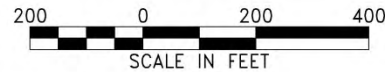






- LEGEND:**
- WATER
  - STORM WATER
  - SANITY SEWER
  - NATURAL GAS
  - ELECTRICAL
  - COMMUNICATION
  - WETLAND BUFFER
  - AIRPORT PROPERTY LINE
  - US WATER
  - WETLAND
  - SERVICE PLAZA SITE

OBJECT ID	STRUCTURE	RIM ELV.	INVERT	CONTRACT ID	DESCRIPTION
SS-1				SAA-CO-86-005	NORTHROP GRUMMAN SEWER MANHOLE
SS-2	401-54-SSM-004	80.17	-		MAA-SANITARY SEWER MANHOLE
SS-3	401-54-SSM-006	78.33	70.16		MAA-SANITARY SEWER MANHOLE
SS-4	401-54-SSM-005	79.65	70.48	MAA-CO-13-016	MAA-SANITARY SEWER MANHOLE
SS-5	401-54-SSM-001	82.47	72.42   73.0	MAA-CO-10-001	MAA-SANITARY SEWER MANHOLE
SS-6	AAC 9514	62.00	50.94   50.96	23064	AAC-SANITARY SEWER MANHOLE
SS-7	AAC 9513	58.00	49.20   49.22	23064	AAC-SANITARY SEWER MANHOLE
SS-8	AAC 9515	64.00	51.27   51.51	23064	AAC-SANITARY SEWER MANHOLE



	DESIGNED: N.D.C.	<table border="1" style="width: 100%;"> <tr> <th>REVISION NO.</th> <th>REVISION DATE</th> <th>DESCRIPTION</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	REVISION NO.	REVISION DATE	DESCRIPTION					MARYLAND DEPARTMENT OF TRANSPORTATION MARYLAND AVIATION ADMINISTRATION FACILITIES DEVELOPMENT & ENGINEERING OFFICE OF PLANNING & ENVIRONMENTAL SERVICES BALTIMORE/WASHINGTON INTERNATIONAL AIRPORT	PROJECT TITLE: <b>SERVICE PLAZA UTILITIES</b>		CONTRACT NO.:
	REVISION NO.		REVISION DATE	DESCRIPTION									
DRAWN: R.E.Z.	SHEET TITLE: <b>EXISTING UTILITY PLAN</b>		SHEET NO.:										
CHECKED: K.M.F.					SCALE: AS SHOWN	DATE: JUNE 2015	EX-1						
APPROVED: C.A.J.													



## *Appendix B – Cost Estimates*



ALIGNMENT / OPTION	DESCRIPTION	MAA Property	AMTRAK IMPACTS	CONSTRUCTION COST	PROGRAM COST	REMARKS
1	Force Main Combination	NO	NO	\$ 448,200	\$ 793,200	Force Main to a point where gravity is cost effective
1	Gravity to new Manhole	NO	NO	\$ 744,700	\$ 1,318,000	Maximizes grass and gravity location
1A	Gravity through Hill	NO	NO	*	*	Gravity not cost effective due to the hill.
1B	Gravity through parking lot and Kitten Branch	NO	NO	*	*	Gravity works but need to traverse Kitten Branch
2	Gravity Along Old Stoney Run to Manhole SS-8 (AAC 9515)	NO	TBD	\$ 303,000	\$ 536,200	Current utility corridor and crossing under AMTRAK. Jack and Bore required under AMTRAK
2A	Gravity to Manhole SS-6 (AAC 9514)	NO	TBD	*	*	Less existing utility congestion. Jack and Bore and steep slopes, harder access.
2B	Gravity to Manhole SS-7 (AAC 9513)	NO	TBD	*	*	Less existing utility congestion. Jack and Bore and steep slopes, more difficult access.
3	Gravity Along Aviation	NO	NO	\$ 420,500	\$ 744,200	In the ROW of Aviation Boulevard, little deeper than nominal excavation required.
4	Gravity Along Amtrak Way	NO	NO	\$ 385,600	\$ 682,400	In the ROW of Amtrak Way

\* Not estimated at this time, see remarks.

Assumptions:

Gravity Sewer at .4% minimum slope

Gravity Sewer at 4' minimum cover

Amtrak agreement attainable

Land Acquisition Costs not included

Tenant Costs not included

Meter Costs not included

Normal excavation (no rock or extraordinary measures)

NG Meter Station can be reused for options that replace SS-1 and SS-2 (1 and 3)

2015 dollars



















