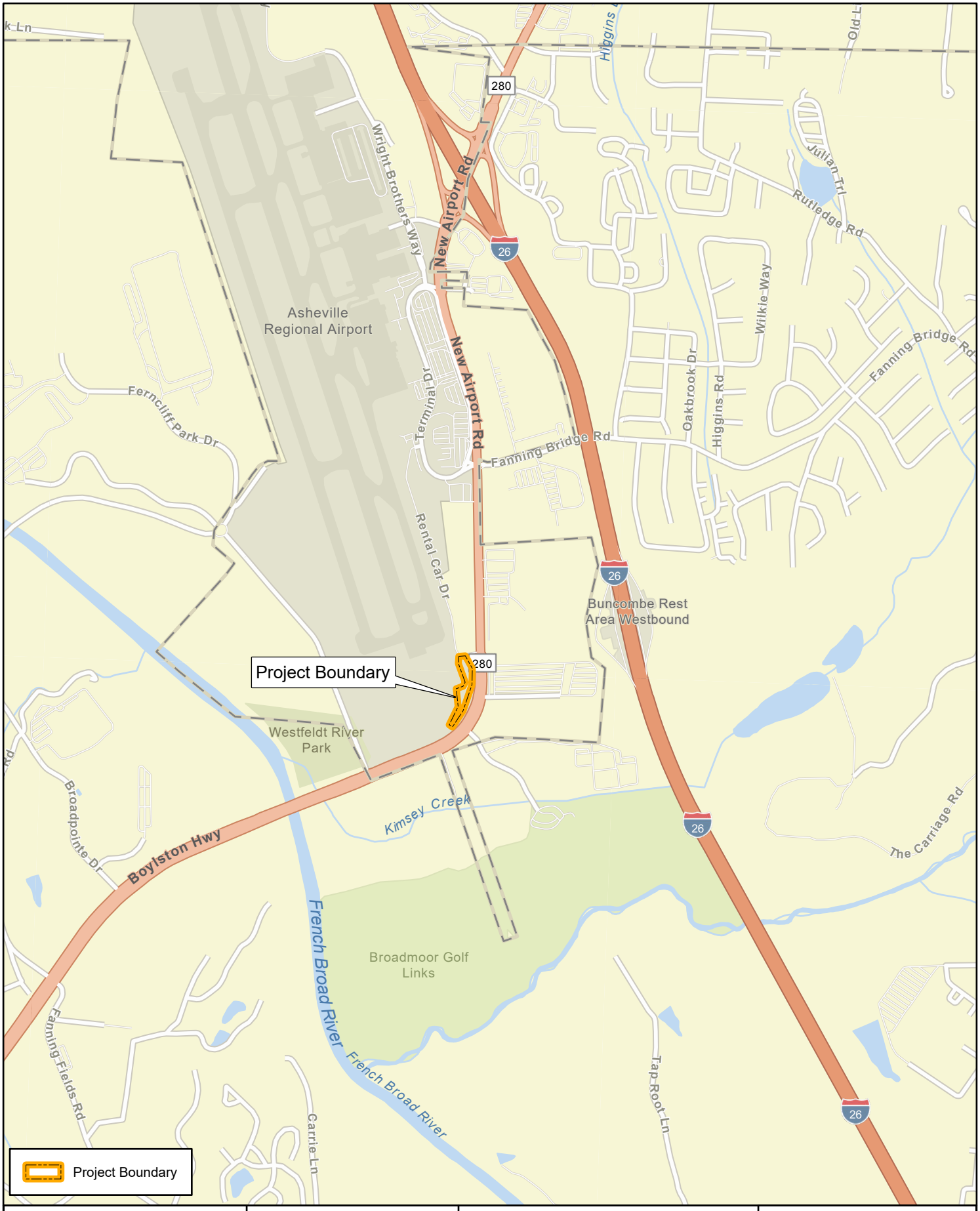


Vicinity Map
Figure 1

AVL Southside ROFA
(+/- 1.85 Ac)
Buncombe County, NC.

0 0.05 0.1 0.2 0.3 0.4 Miles
0 0.25 0.5 Kilometers

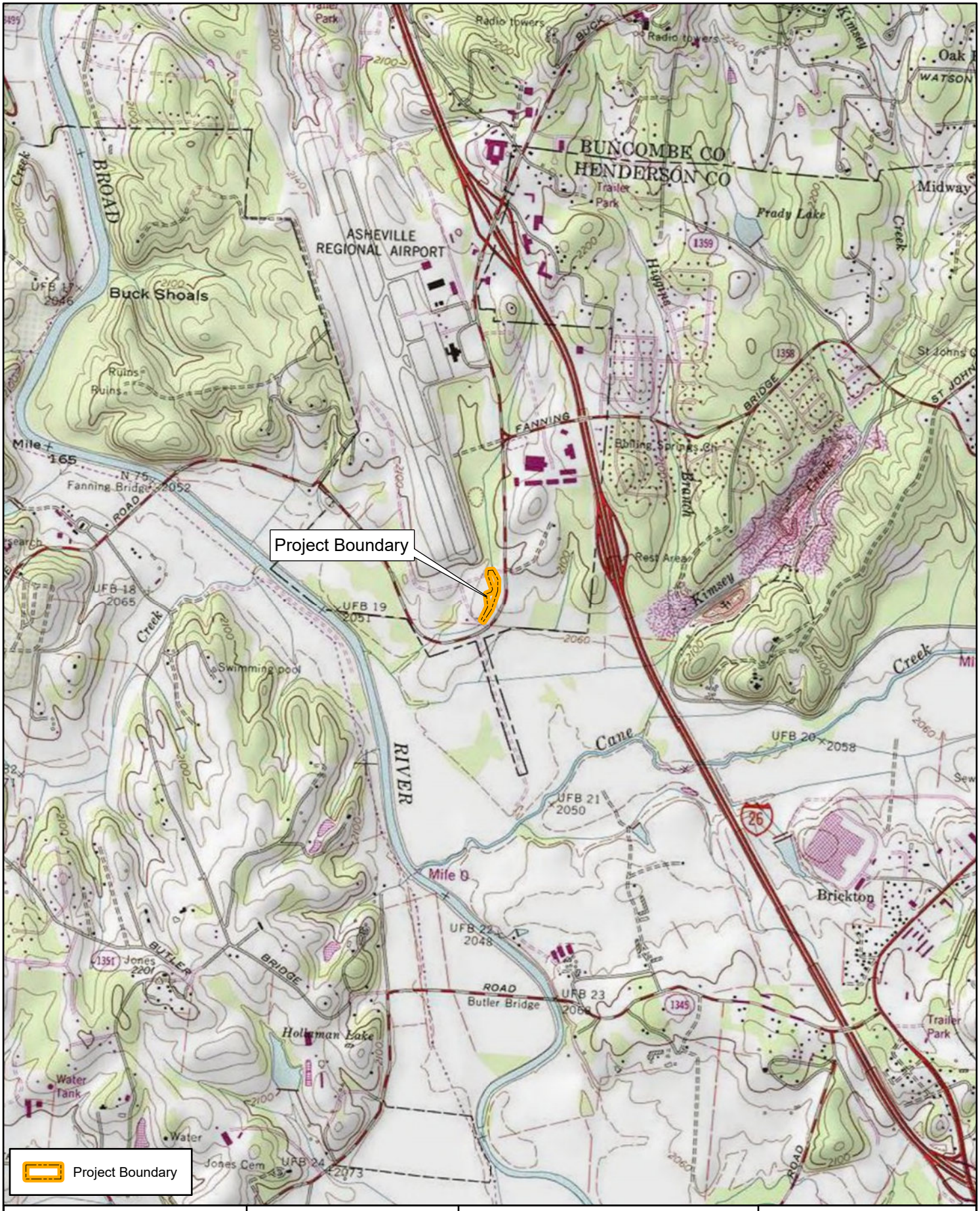
N

ClearWater
An EnviroScience Company

Basemap courtesy of Esri.

Author: EP Date: 4/19/2024 Project #: 18844

NAD 1983 2011 StatePlane North Carolina FIPS 3200 Ft US



USGS Topographic Map
1:24K Scale Quad: Asheville
Figure 2

AVL Southside ROFA
(+/- 1.85 Ac)
Buncombe County, NC.

0 500 1,000 2,000 Feet
0 100 200 400 600 Meters

N

ClearWater
An EnviroScience Company

Basemap courtesy of National Geographic Society (2013).

Author: EP Date: 4/19/2024 Project #: 18844

NAD 1983 2011 StatePlane North Carolina FIPS 3200 Ft US

Aerial Imagery Map
NC OneMap (2022)
Figure 3

AVL Southside ROFA
(+/- 1.85 Ac)
Buncombe County, NC.

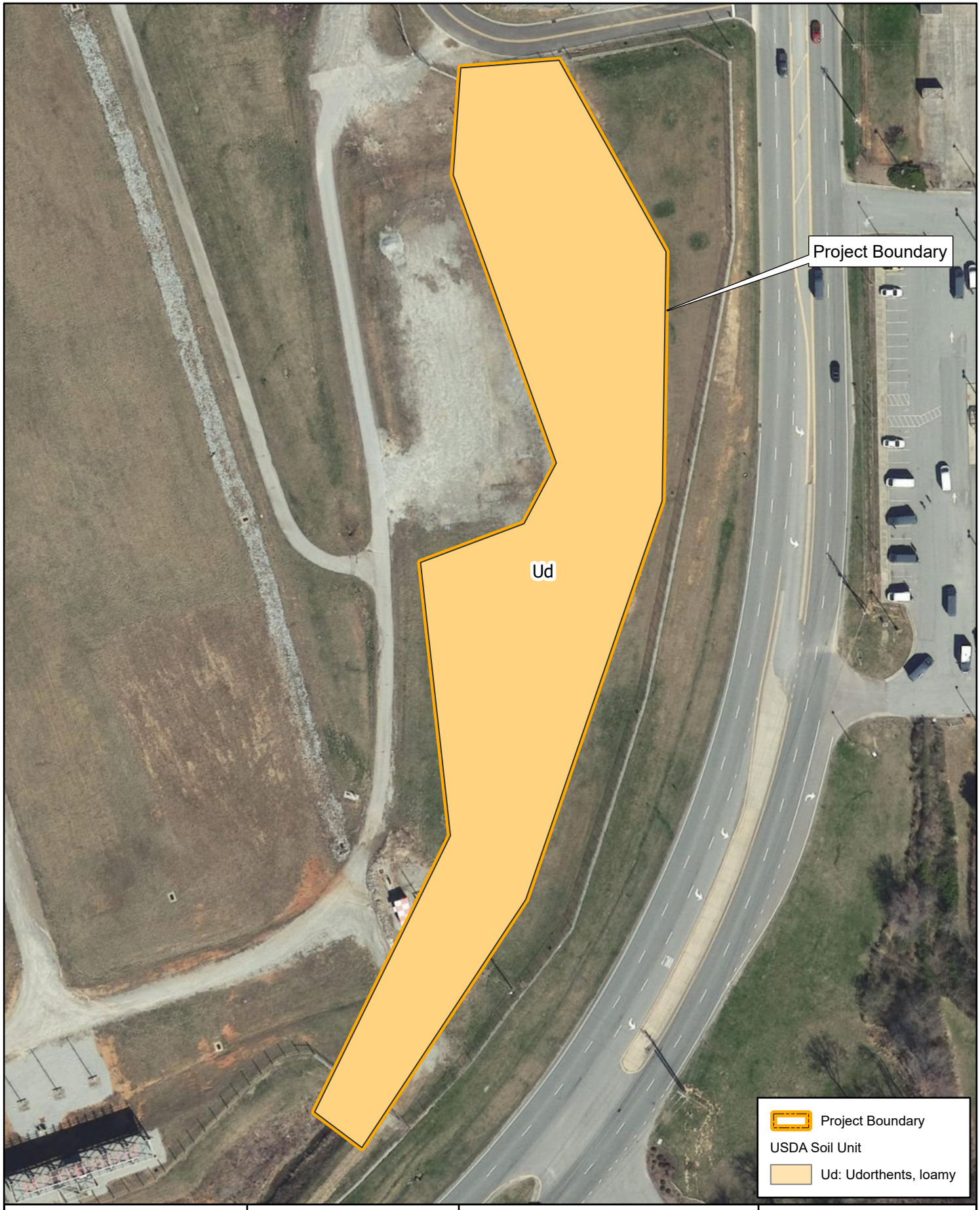
0 20 40 80 120 160 Feet
0 20 40 Meters
N

ClearWater
An EnviroScience Company

Basemap courtesy of NC OneMap (2019).

Author: EP Date: 4/19/2024 Project #: 18844

NAD 1983 2011 StatePlane North Carolina FIPS 3200 Ft US



USDA Soils Map
NRCS Web Soil Survey
Figure 4

AVL Southside ROFA
(+/- 1.85 Ac)
Buncombe County, NC.

0 25 50 100 150 Feet
0 10 20 40 Meters

N

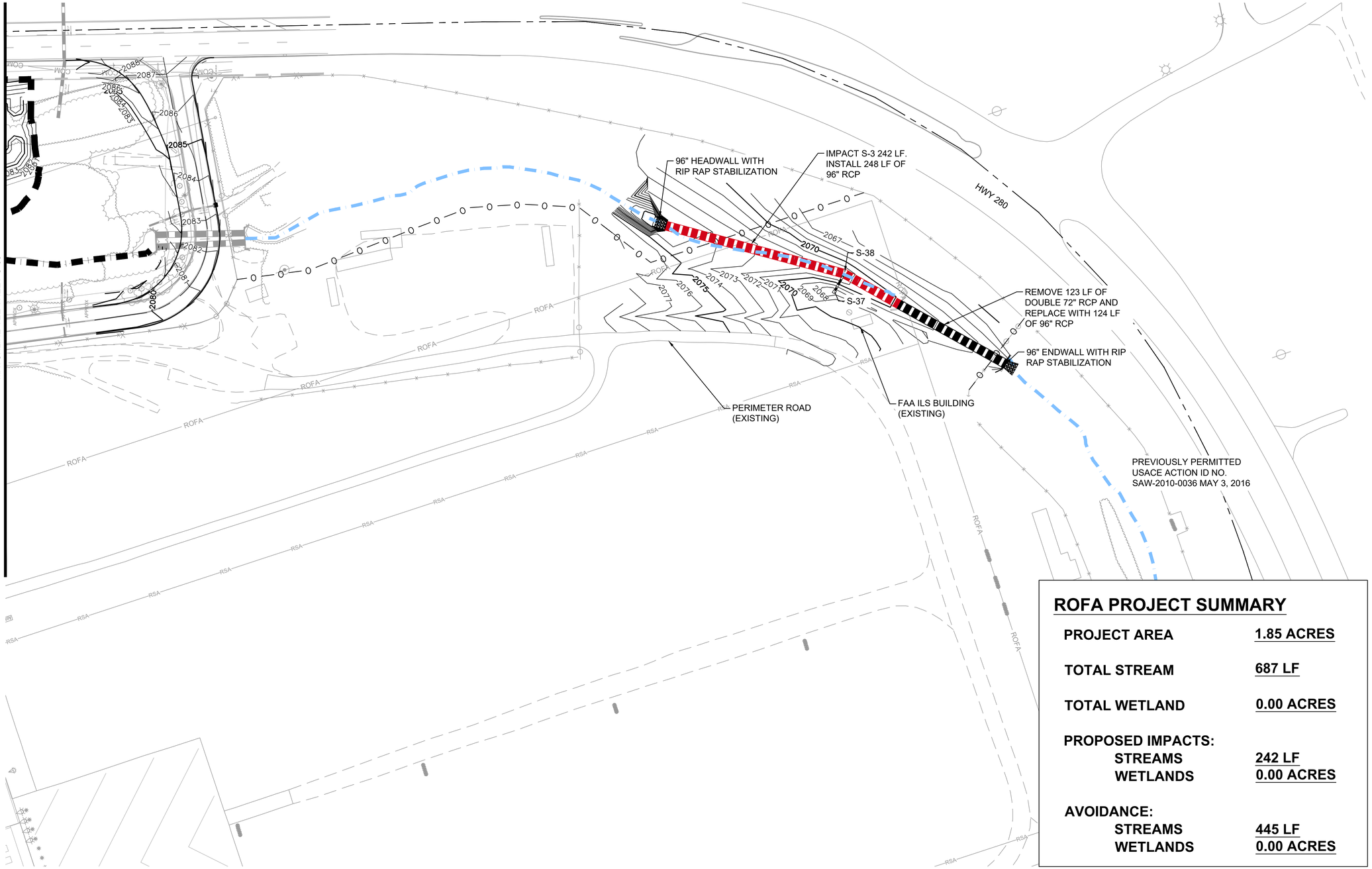
ClearWater
An EnviroScience Company

Basemap courtesy of NC OneMap (2019). Soil data courtesy of SSURGO.

Author: EP Date: 4/19/2024 Project #: 18844

NAD 1983 2011 StatePlane North Carolina FIPS 3200 Ft US

MATCHLINE SEE SHEET G-08



ROFA PROJECT SUMMARY

PROJECT AREA	1.85 ACRES
TOTAL STREAM	687 LF
TOTAL WETLAND	0.00 ACRES
PROPOSED IMPACTS:	
STREAMS	242 LF
WETLANDS	0.00 ACRES
AVOIDANCE:	
STREAMS	445 LF
WETLANDS	0.00 ACRES

LEGEND

- STREAMS
- PROPOSED PIPE (STREAM IMPACT)
- PROPOSED PIPE (NO STREAM IMPACT)
- PROPERTY LINE

0' 25' 50' 100'
GRAPHIC SCALE IN FEET

North

P:\2022\2022.0157.02 - AVL - SOUTH PARKING AREA\SOUTH PARKING AREA\02B 2022.0157.02 ENGINEERING\CADD\EXHIBITS\STREAM AND WETLAND IMPACTS - ROFA PROJECT AREA - SOUTH PARKING AREA - EXHIBIT 3.DWG 1/18/2024

Asheville REGIONAL AIRPORT

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ASHEVILLE REGIONAL AIRPORT FLETCHER NORTH CAROLINA

KEY PLAN

SOUTH PARKING AREA

STREAM AND WETLAND IMPACTS - ROFA PROJECT AREA

SCALE: AS NOTED

REVISIONS:

NO.	DATE	BY	DESCRIPTION

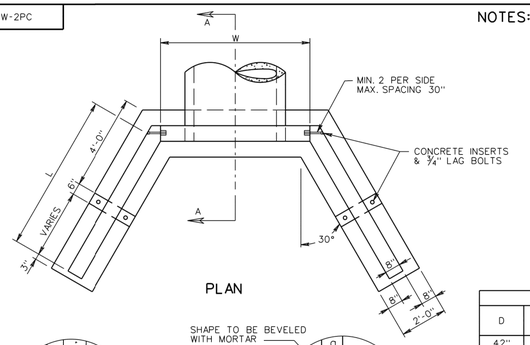
DESIGNED BY: K.W.B
DRAWN BY: K.W.B.
CHECKED BY: J.M.M.
APPROVED BY: J.M.M.
DATE: JANUARY 2024

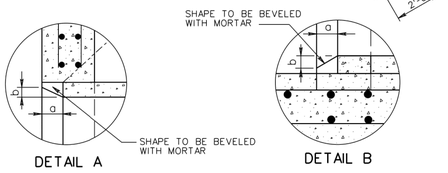
STATE LICENSE # N.C. C-2450
PROJECT NO. 2022.0157.02B

SHEET NUMBER
FIG-5.1

2016 ROAD & BRIDGE STANDARDS

EW-2PC



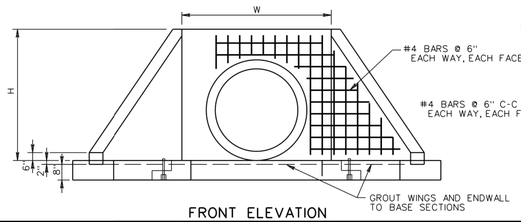


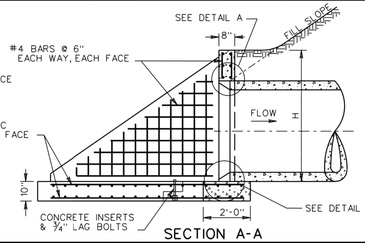
NOTES:

1. CONCRETE TO BE 4000 PSI MINIMUM COMPRESSIVE STRENGTH.
2. IF PIPE IS TO BE SKEWED, THE OPENING WILL BE ADJUSTED TO ACCOMMODATE ANGLES UP TO 15°.
3. REINFORCING STEEL IN ACCORDANCE WITH ASTM A-615 (REINFORCING BARS).
4. PIPE OPENINGS IN PRECAST DRAINAGE UNITS SHALL NOT EXCEED 4 INCHES AT ANY GIVEN POINT BETWEEN THE PIPE AND THE PRECASTUNIT.
5. DIMENSIONS SHOWN ARE MINIMUM. ACTUAL MEASUREMENTS MAY VARY WITH MANUFACTURER'S TOLERANCES.
6. IN NO CASE SHALL TOP OF ENDWALL PROTRUDE ABOVE FILL SLOPE, DITCH SLOPE, OR SHOULDER.
7. HEADWALL TO BE BEVELED IN ALL AREAS EXCEPT WHERE A CONFLICT WITH INVERT OR WINGWALL OCCUR.
8. BEVEL EDGE AS REQUIRED ON THE HEADWALL AT THE INLET END OF THE CULVERT (WHERE THE FLOW ENTERS THE CULVERT).
9. HEADWALL AT THE OUTLET END OF THE CULVERT MAY BE EITHER SQUARE EDGE OR BEVEL EDGE.
10. ¾" CHAMFER MAY BE PROVIDED ON ALL EDGES AT MANUFACTURER'S OPTION.

DIMENSIONS

D	H	W	L 1½:1 SLOPE	L 2:1 SLOPE	a	b
42"	5'-6"	6'-3"	6'-7½"	8'-8"	0'-4½"	0'-3½"
48"	6'-0"	6'-10"	7'-6"	9'-10"	0'-5"	0'-4"
54"	6'-6"	7'-5"	8'-4½"	11'-0"	0'-5¾"	0'-4½"
60"	7'-0"	8'-0"	9'-3"	12'-1½"	0'-6¼"	0'-5"
66"	7'-7"	8'-8½"	10'-1½"	13'-3½"	0'-7"	0'-5½"
72"	8'-2"	9'-3½"	11'-0"	14'-5½"	0'-7"	0'-5½"
78"	8'-8½"	9'-10"	11'-10"	15'-7"	0'-7"	0'-5½"
84"	9'-3"	10'-4"	12'-8½"	16'-9"	0'-7"	0'-5½"
90"	9'-11"	11'-1"	13'-7"	17'-11"	0'-7"	0'-5½"
96"	10'-7"	11'-8"	14'-6"	19'-1"	0'-7"	0'-5½"



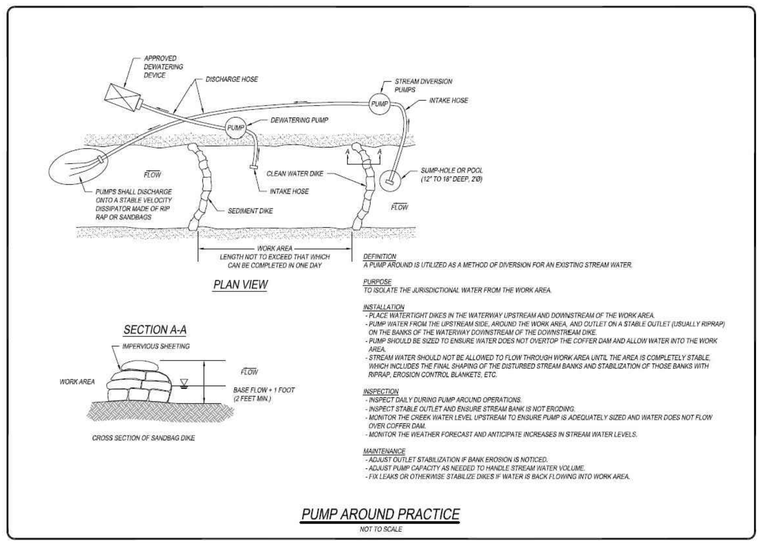


VDOT ROAD AND BRIDGE STANDARDS	PRECAST ENDWALL FOR PIPE CULVERTS	SPECIFICATION REFERENCE
SHEET 1 OF 1	42" - 96" CIRCULAR PIPE	105
101.06	VIRGINIA DEPARTMENT OF TRANSPORTATION	302

2016 ROAD & BRIDGE STANDARDS

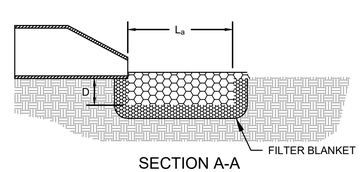
96" END WALL DETAIL

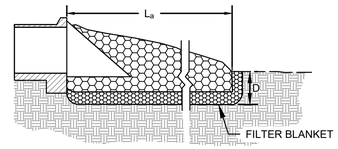
N.T.S.

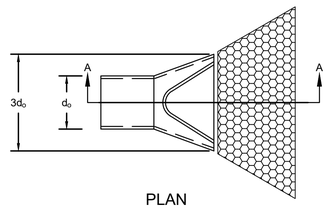


PUMP AROUND/WORK-IN-THE-DRY DETAIL

N.T.S.







NOTES:

1. La IS THE LENGTH OF THE RIPRAP APRON.
2. D = 1.5 TIMES THE MAXIMUM STONE DIAMETER BUT NOT LESS THAN 6".
3. IN A WELL DEFINED CHANNEL, EXTEND THE APRON UP THE CHANNEL BANKS TO AN ELEVATION OF 6" ABOVE THE MAXIMUM TAILWATER DEPTH OR TO THE TOP OF THE BANK, WHICHEVER IS LESS.
4. A FILTER BLANKET, OR FILTER FABRIC, SHOULD BE INSTALLED BETWEEN THE RIPRAP AND SOIL FOUNDATION.

RIPRAP OUTLET PROTECTION

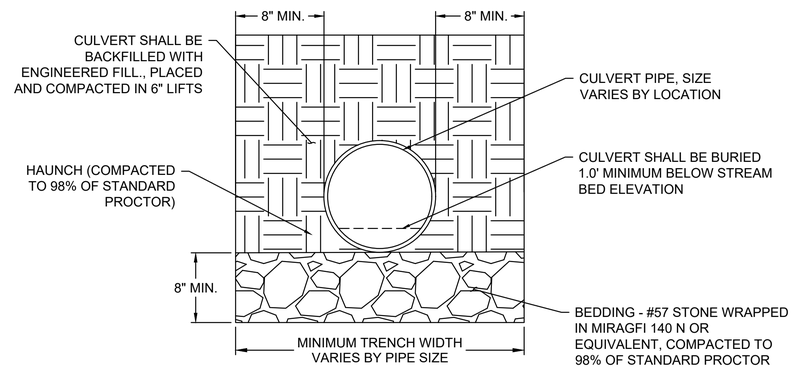
NOT TO SCALE

RIPRAP OUTLET PROTECTION CONSTRUCTION SPECIFICATIONS

1. ENSURE THAT THE SUBGRADE FOR THE FILTER AND RIPRAP FOLLOWS THE REQUIRED LINES AND GRADES SHOWN IN THE PLAN. COMPACT ANY FILL REQUIRED IN THE SUBGRADE TO THE DENSITY OF THE SURROUNDING UNDISTURBED MATERIAL. LOW AREAS IN THE SUBGRADE ON UNDISTURBED SOIL MAY ALSO BE FILLED BY INCREASING THE RIPRAP THICKNESS.
2. THE RIPRAP AND GRAVEL FILTER MUST CONFORM TO THE SPECIFIED GRADING LIMITS SHOWN ON THE PLANS.
3. FILTER CLOTH, WHEN USED, MUST MEET DESIGN REQUIREMENTS AND BE PROPERLY PROTECTED FROM PUNCHING OR TEARING DURING INSTALLATION. REPAIR ANY DAMAGE BY REMOVING THE RIPRAP AND PLACING ANOTHER PIECE OF FILTER CLOTH OVER THE DAMAGED AREA. ALL CONNECTING JOINTS SHOULD OVERLAP A MINIMUM OF 1 FT. IF THE DAMAGE IS EXTENSIVE, REPLACE THE ENTIRE FILTER CLOTH.
4. RIPRAP MAY BE PLACED BY EQUIPMENT. CARE SHOULD BE TAKEN TO AVOID DAMAGING THE FILTER FABRIC.
5. THE MINIMUM THICKNESS OF THE RIPRAP SHOULD BE 1.5 TIMES THE MAXIMUM STONE DIAMETER.
6. RIPRAP MAY BE FIELD STONE OR ROUGH QUARRY STONE. IT SHOULD BE HARD, ANGULAR, HIGHLY WEATHER–RESISTANT AND WELL GRADED.
7. CONSTRUCT THE APRON GRADE AS SHOWN ON PLAN WITH NO OVERFALL AT THE END. MAKE THE TOP OF THE RIPRAP AT THE DOWNSTREAM END LEVEL WITH THE RECEIVING AREA OR SLIGHTLY BELOW IT.
8. ENSURE THAT THE APRON IS PROPERLY ALIGNED WITH THE RECEIVING STREAM AND PREFERABLY STRAIGHT THROUGHOUT ITS LENGTH. IF A CURVE IS NEEDED TO FIT SITE CONDITIONS, PLACE IT IN THE UPPER SECTION OF THE APRON.
9. IMMEDIATELY AFTER CONSTRUCTION, STABILIZE ALL DISTURBED AREAS WITH VEGETATION. MAINTENANCE INSPECT RIPRAP OUTLET STRUCTURES AFTER HEAVY RAINS TO SEE IF ANY EROSION AROUND OR BELOW THE RIPRAP HAS TAKEN PLACE OR IF STONES HAVE BEEN DISLODGED. IMMEDIATELY MAKE ALL NEEDED REPAIRS TO PREVENT FURTHER DAMAGE.
10. EXISTING FLARED END SECTIONS SHOWN ON THE PLANS SHALL HAVE THE EXISTING OUTLET OR INLET PROTECTION MAINTAINED THROUGHOUT THE ENTIRE DURATION OF THE PROJECT. AT THE BEGINNING OF THE PROJECT, IF THE EXISTING OUTLET OR INLET PROTECTION IS IN SATISFACTORY CONDITION, THE OUTLET AND INLET PROTECTION SHALL BE MONITORED. IF THE EXISTING OUTLET OR INLET PROTECTION IS NOT IN SATISFACTORY CONDITION OR NEEDS TO BE ADDRESSED TO MEET NCDEQ REQUIREMENTS, THE CONTRACTOR SHALL ADD THE REQUIRED RIPRAP TO MEET THE REQUIREMENTS.

RIPRAP CHART

OUTLET DESCRIPTION	PIPE SIZE (IN)	RIPRAP CLASS	RIPRAP DEPTH (D) (IN)	La (FT)	W (FT)	RIPRAP d50
96" HEADWALL	96	2	36	51	59.0	1.65
96" ENDWALL	96	2	36	51	59.0	1.65



CULVERT INSTALLATION DETAIL

N.T.S.

Asheville REGIONAL AIRPORT

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ENGINEERS & PLANNERS
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140 HUNTERSVILLE, NC 28078
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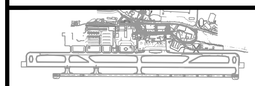
ASHEVILLE REGIONAL AIRPORT FLETCHER NORTH CAROLINA



KEY PLAN

SOUTH PARKING AREA

STREAM AND WETLAND IMPACTS - ROFA PROJECT AREA

SCALE: AS NOTED

REVISIONS:

NO.	DATE	BY	DESCRIPTION

DESIGNED BY:	K.W.B.
DRAWN BY:	K.W.B.
CHECKED BY:	J.M.M.
APPROVED BY:	J.M.M.
DATE:	JANUARY 2024
STATE LICENSE #	N.C. C-2450
PROJECT NO.	2022.0157.02B

SHEET NUMBER

FIG-5.2

P:\2022\2022.0157.02 - AVL - SOUTH PARKING AREA\SOUTH PARKING AREA\02B 2022.0157.02 ENGINEERING\CADD\EXHIBITS\STREAM AND WETLANDS\2022.0157.02-EXHIBIT 3.DWG 1/19/2024

FEMA Flood Zone Map
FIRM Panel: 3700964200K
(Eff. 1/6/2010)
Figure 6

AVL Southside ROFA
(+/- 1.85 Ac)
Buncombe County, NC.

0 250 500 Feet
0 75 150 Meters

N

ClearWater
An EnviroScience Company

Basemap courtesy of NC OneMap (2019). Flood data courtesy of FEMA.

Author: EP Date: 4/19/2024 Project #: 18844

NAD 1983 2011 StatePlane North Carolina FIPS 3200 Ft US

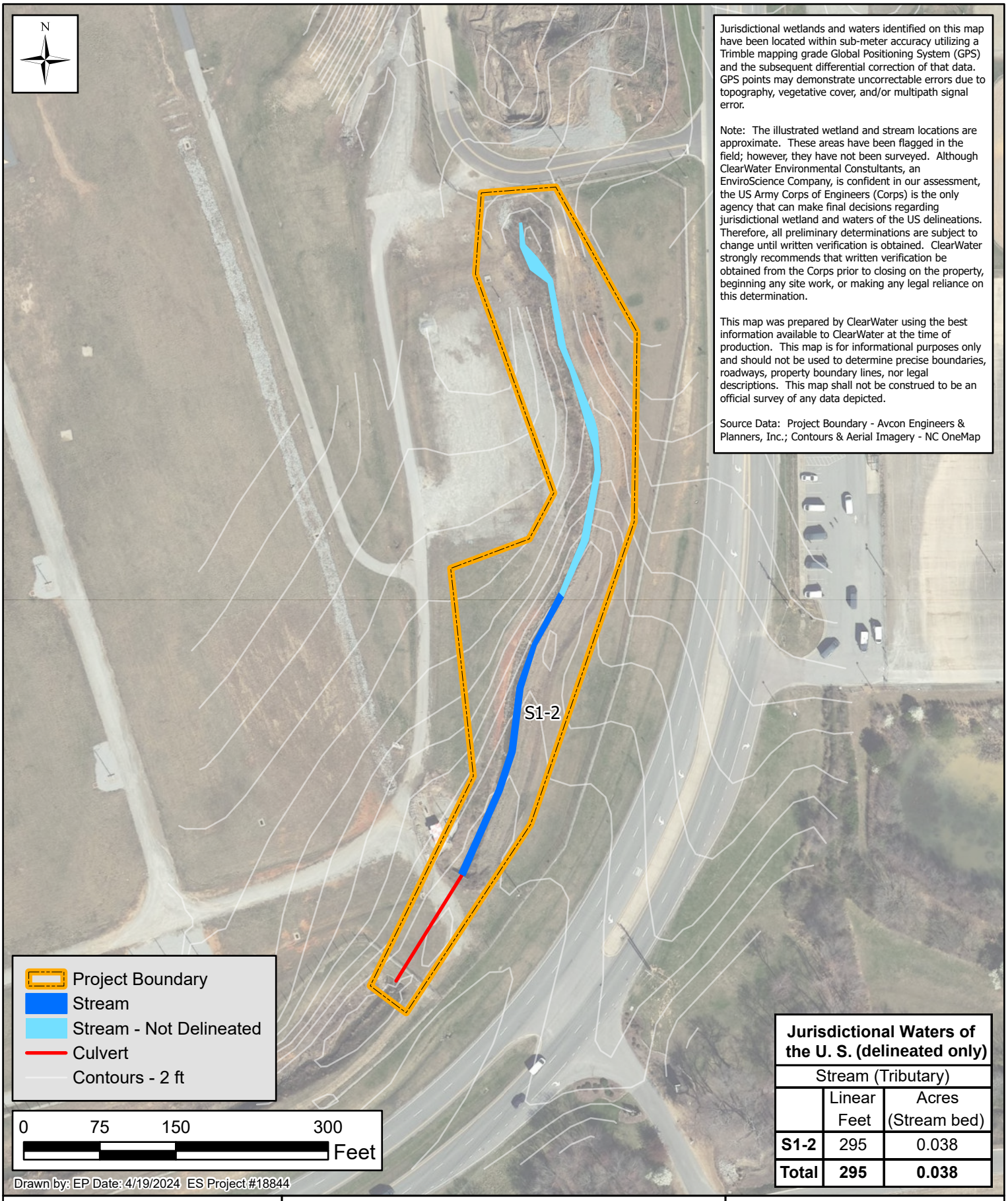
Photo 1. Upstream end of existing culvert

Photo 2. Flooding resulting from clogged culvert grate

Photo 3. Land uses upstream of existing culvert (facing upstream).

Photo 4. Land uses upstream of existing culvert (facing downstream).

AVL Southside Improvements (+/- 1.85 Ac)



Jurisdictional wetlands and waters identified on this map have been located within sub-meter accuracy utilizing a Trimble mapping grade Global Positioning System (GPS) and the subsequent differential correction of that data. GPS points may demonstrate uncorrectable errors due to topography, vegetative cover, and/or multipath signal error.

Note: The illustrated wetland and stream locations are approximate. These areas have been flagged in the field; however, they have not been surveyed. Although ClearWater Environmental Constultants, an EnviroScience Company, is confident in our assessment, the US Army Corps of Engineers (Corps) is the only agency that can make final decisions regarding jurisdictional wetland and waters of the US delineations. Therefore, all preliminary determinations are subject to change until written verification is obtained. ClearWater strongly recommends that written verification be obtained from the Corps prior to closing on the property, beginning any site work, or making any legal reliance on this determination.

This map was prepared by ClearWater using the best information available to ClearWater at the time of production. This map is for informational purposes only and should not be used to determine precise boundaries, roadways, property boundary lines, nor legal descriptions. This map shall not be construed to be an official survey of any data depicted.

Source Data: Project Boundary - Avcon Engineers & Planners, Inc.; Contours & Aerial Imagery - NC OneMap

Jurisdictional Waters of the U. S. (delineated only)		
Stream (Tributary)		
	Linear Feet	Acres (Stream bed)
S1-2	295	0.038
Total	**295**	**0.038**

Buncombe County, North Carolina

ClearWater
An EnviroScience Company
145 7th Ave West, Suite B
Hendersonville, North Carolina 28792

Wetland and Stream Map
Delineated February 6, 2022
Figure 5