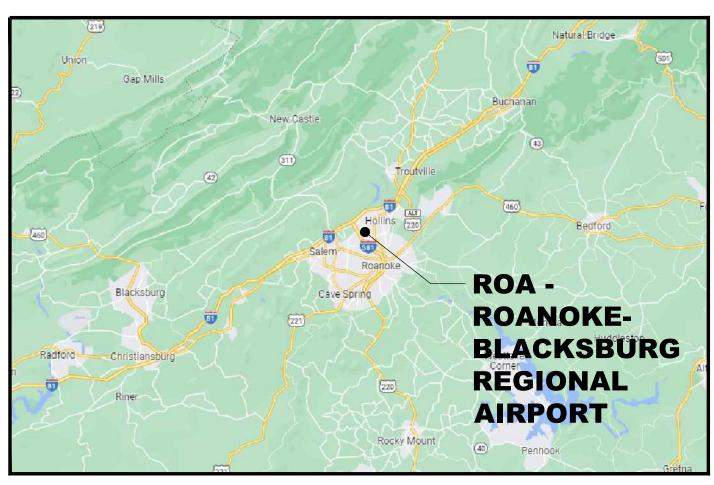
ROANOKE-BLACKSBURG REGIONAL AIRPORT - ROA ROANOKE REGIONAL AIRPORT COMMISSION RUNWAY 16-34 EMAS REPLACEMENT

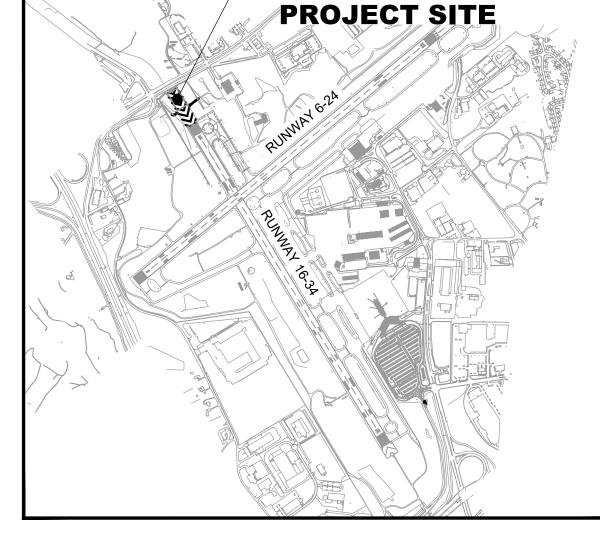
BID SUBMITTAL CIVIL DESIGN DRAWINGS

ITB NUMBER: 24-07 RS&H PROJECT NUMBER: 1022-0071-003



LOCATION MAP N.T.S.

RUNWAY 16-34 EMAS REPLACEMENT NAME OF DEVELOPMENT AM AWARE OF THE SITE DESIGN REQUIREMENTS IMPOSED BY THIS SITE ROANOKE-BLACKSBURG REGIONAL AIRPORT (ROA) DEVELOPMENT PLAN, ALL REVISIONS THEREOF, AND OTHER APPLICABLE ROANOKE COUNTY CODES AND ORDINANCES MAGISTERIAL DISTRICT(S) CITY OF ROANOKE HEREBY CERTIFY THAT LAGREE TO COMPLY WITH THESE REQUIREMENTS SHOW ROANOKE REGIONAL AIRPORT COMMISSION 5202 AVIATION DRIVE, NW ROANOKE, VA 24012 540-362-1999 ROANOKE REGIONAL AIRPORT COMMISSION DEVELOPER ROANOKE, VA 24012 (540) 362-1999 1861 PRATT DR., SUITE 1100 2600 PARK TOWER DR SUITE 101 ENGINEER, ARCHITECT OR SURVEYOR BLACKSBURG, VA 24060 VIENNA, VA 22180 703-549-2472 TAX MAP NO(S) TAX ID: 6590101



RUNWAY 16-34 EMAS

VICINITY MAP SCALE 1" = 1,500'

NOTICE: ALL LANDOWNERS, DEVELOPERS AND CONTRACTORS

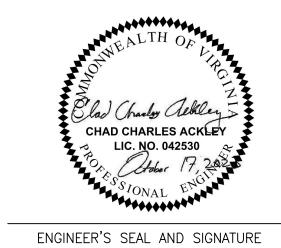
FAILURE TO COMPLY WITH THE CONSTRUCTION PROCEDURE REQUIREMENTS LISTED BELOW MAY RESULT IN THE COSTLY REMOVAL OF STRUCTURES, TIME DELAYS OR THE ISSUANCE OF STOP WORK ORDER.

CONSTRUCTION PROCEDURE REQUIREMENTS

- 1. RIGHT-OF-WAY EXCAVATION PERMIT PRIOR TO THE COMMENCEMENT OF ANY DIGGING, ALTERATION OR CONSTRUCTION WITHIN THE PUBLIC RIGHT -OF-WAY (STREETS, ALLEYS, PUBLIC EASEMENTS), A RIGHT-OF-WAY EXCAVATION PERMIT SHALL BE APPLIED FOR AND OBTAINED BY THE CONTRACTOR FROM THE CITY OF ROANOKE.
- 2. LAND DISTURBANCE PERMIT AN APPROVED EROSION AND SEDIMENT CONTROL PLAN FOR ANY BORROW/FILL SITES ASSOCIATED WITH THE PROJECT MUST BE SUBMITTED PRIOR TO THE ISSUANCE OF A LAND DISTURBANCE PERMIT.
- 3. PLANS AND PERMITS A COPY OF THE PLANS AS APPROVED BY THE CITY (SIGNED BY THE PROPER CITY OFFICIALS) AND ALL PERMITS ISSUED BY THE CITY SHALL BE AVAILABLE AT THE CONSTRUCTION SITE AT ALL TIMES OF ONGOING CONSTRUCTION.
- 4. LOCATION OF UTILITIES THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION.
- 5. CONSTRUCTION ENTRANCE THE CONTRACTOR SHALL INSTALL AN ADEQUATE CONSTRUCTION ENTRANCE FOR ALL CONSTRUCTION RELATED EGRESS FROM THE SITE. SIZE AND COMPOSITION OF CONSTRUCTION ENTRANCE SHALL BE AS SHOWN OF THE PLANS.
- 6. STREETS TO REMAIN CLEAN IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO INSURE THAT THE PUBLIC STREET ADJACENT TO THE CONSTRUCTION ENTRANCE REMAINS FREE OF MUD, DIRT, AND/OR ANY TYPE OF CONSTRUCTION MATERIALS OF LITTER AT ALL TIMES.
- 7. BARRICADES/DITCHES THE CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF ALL EXCAVATED DITCHES AND SHALL SHALL FURNISH AND ENSURE THAT ALL BARRICADES PROPER AND NECESSARY FOR THE SAFETY OF THE PUBLIC ARE IN PLACE.
- 8. SEWER AND PAVEMENT REPLACEMENT CONSTRUCTION OF SANITARY SEWERS AND THE REPLACEMENT OF PAVEMENT SHALL BE IN ACCORDANCE WITH APPROVED STANDARDS AND SPECIFICATIONS OF THE CITY OF ROANOKE AND THE WESTERN WATER AUTHORITY.

- 9. APPROVED PLANS/CONSTRUCTION CHANGES ANY CHANGE OR VARIATION FROM CONSTRUCTION DESIGN AS SHOWN ON THE OFFICIALLY APPROVED PLANS SHALL BE APPROVED BY THE EROSION AND SEDIMENT CONTROL AGENT PRIOR TO SAID CHANGES OR VARIATION IN CONSTRUCTION BEING MADE.
- 10. FINAL ACCEPTANCE/CITY THE OWNER OR DEVELOPER SHALL FURNISH THE CITY OF ROANOKE'S PLANNING BUILDING AND DEVELOPMENT DEPARTMENT WITH A FIELD SURVEYED FINAL CORRECT SET OF AS-BUILT PLANS OF THE NEWLY CONSTRUCTED STORM DRAIN AND/OR STORMWATER MANAGEMENT FACILITIES PRIOR TO FINAL ACCEPTANCE AND ISSUANCE OF A CERTIFICATE OF OCCUPANCY BY THE CITY. AS-BUILT PLANS SHALL BE PROVIDED IN THE STATE PLANE VIRGINIA SOUTH COORDINATE SYSTEM, NAD 1983, FIPS 4502 FEET, US SURVEY FEET, DATUM NA 83, IN THE FORM OF 1 PAPER COPY AND DIGITAL AUTOCAD FILE.

October 17, 2023 BID SUBMITTAL



RSSH

Reynolds Smith and Hills, Inc. 2600 Park Tower Dr., Suite 101, VIENNA, VA 22180 www.rsandh.com

QUANTITY INDEX

ITEM NO.	SPEC REFER.	WORK ITEM DESCRIPTION	UNIT	QUANTITY
1	X-102-10.1	SAFETY AND SECURITY	LSUM	1
2	C-100-14.1	CONTRACTOR QUALITY CONTROL PROGRAM (CQCP)	LSUM	1
3	C-102-5.1a	SILT FENCE	LF	675
4	C-102-5.1b	ROCK CONSTRUCTION ENTRANCE	EA	2
5	C-104-5.1	PROJECT SURVEY AND STAKEOUT	LSUM	1
6	C-105-6.1	MOBILIZATION	LSUM	1
7	P-101-5.1a	ASPHALT ACCESS ROAD REMOVAL (FULL DEPTH)	SY	200
8	P-101-5.1b	AGGREGATE ACCESS ROAD REMOVAL (FULL DEPTH)	SY	70
9	P-101-5.1c	AGGREGATE ACCESS ROAD TRIMMING	SY	110
10	P-101-5.1d	AGGREGATE BASE MATERIAL REMOVAL (THREE-INCH DEPTH)	SY	3,030
11	P-101-5.2	ASPHALT CRACK REPAIR	LF	5,000
12	P-101-5.4	SPALLED AND FAILED ASPHALT PAVEMENT REPAIR (UNDISTRIBUTED)	SY	500
13	P-101-5.6a	COLD MILLING - 2"	SY	10,460
14	P-101-5.6b	COLD MILLING - 5"	SY	3,030
15	P-101-5.7	REMOVE EXISTING EMAS REFLECTORS	LSUM	1
16	P-152-4.1	UNCLASSIFIED EXCAVATION	CY	300
17	P-209-5.1	CRUSHED AGGREGATE BASE COURSE - VDOT 21A	CY	220
18	P-403-8.1	SM-12.5D VARIABLE DEPTH ASPHALT SURFACE COURSE	TON	2,890
19	P-403-8.2	IM-19.0D BITUMINOUS INTERMEDIATE COURSE	TON	750
20	P-555-1	INSTALL EMAS BED	LSUM	1
21	P-555-2	REMOVAL OF EXISTING EMAS BED	LSUM	1
22	P-555-3	INSTALL ANCHOR BEAM	LSUM	1
23	P-555-4	REMOVAL OF EXISTING ANCHOR BEAM	LSUM	1
24	P-602-5.1	EMULSIFIED ASPHALT PRIME COAT	GAL	1,200
25	P-603-5.1	EMULSIFIED ASPHALT TACK COAT	GAL	1,600
26	T-901-5.1	SEEDING	SY	300
27	T-908-5.1	MULCHING	SY	300
28	P-620-5.1	FULL APPLICATION, MARKINGS (WHITE AND YELLOW), WITH REFLECTIVE MEDIA	SF	5,520
29	P-620-5.2	FULL APPLICATION, MARKINGS (BLACK) WITHOUT REFLECTIVE MEDIA	SF	1,850
30	P-620-5.3	HALF APPLICATION, MARKINGS (WHITE AND YELLOW)	SF	5,520
31	P-621-5.1	GROOVING	SY	2,400
32	L-125-5.1	FURNISH AND INSTALL YELLOW/RED L-853 RETROREFLECTIVE MARKERS, TYPE II, 14-INCH HEIGHT	EA	172

SHEET INDEX

RAWING NO.	SHEET NO.	SHEET TITLE				
G001	1	TITLE SHEET				
G002	2	QUANTITY ESTIMATE, SHEET INDEX, AND ABBREVIATIONS				
G003	3	PROJECT LAYOUT PLAN				
G004	4	EXISTING TOPOGRAPHIC SURVEY - 1				
G005	5	EXISTING TOPOGRAPHIC SURVEY - 2				
G006	6	BORING LOCATION PLAN				
G007	7	BORING LOGS AND PAVEMENT CORE PHOTOS				
G008	8	PAVEMENT CORE PHOTOS				
G009	9	HORIZONTAL CONTROL PLAN				
G101	10	CONSTRUCTION SAFETY AND PHASING NOTES				
G102	11	CONSTRUCTION SAFETY AND PHASING DETAILS				
G103	12	CONSTRUCTION SAFETY AND PHASING OVERVIEW PLAN				
G104	13	MAXIMUM EQUIPMENT HEIGHT PLAN				
C101	14	EROSION AND SEDIMENT CONTROL PLAN				
C110	15	EROSION AND SEDIMENT CONTROL DETAILS				
C111	16	EROSION AND SEDIMENT CONTROL NOTES				
C201	17	DEMOLITION PLAN				
C210	18	PAVEMENT REPAIR DETAILS				
C301	19	GEOMETRY AND PAVING PLAN				
C310	20	TYPICAL PAVEMENT SECTIONS (LONGITUDINAL)				
C401	21	EMAS GRADING PLAN AND PROFILE				
C402	22	FINAL SURFACE SPOT ELEVATION PLAN				
C501	23	GROOVING PLAN AND DETAILS				
CM101	24	PAVEMENT MARKING PLAN				
CM201	25	PAVEMENT MARKING DETAILS				
CM301	26	RETROREFLECTIVE MARKER PLAN AND DETAILS				
QS101	27	EMASMAX PLAN LAYOUT				
QS501-1	28	EMASMAX PROFILE AND SECTION				
QS501-2	29	EMASMAX PROFILE AND SECTION				
QS502	30	ANCHOR BEAM DETAILS				
QS503	31	EMASMAX DETAILS				

ABBREVIATIONS

DIP - DUCTILE IRON PIPE

DIA - DIAMETER

DIAG. - DIAGONAL

DWG - DRAWING E - EASTING

EA - EACH

ABC - AGGREGATE BASE COURSE

AC/ACP - ASPHALTIC CONCRETE PAVEMENT ACI - AMERICAN CONCRETE INSTITUTE ADG - AIRPLANE DESIGN GROUP AIP - AIRPORT IMPROVEMENT PROGRAM **AOA - AIRCRAFT OPERATIONS AREA** APPROX. - APPROXIMATE ASIG - AIRCRAFT SERVICE INTERNATIONAL GROUP ASR- AIRPORT SURVEILLANCE RADAR ASTM - AMERICAN SOCIETY FOR TESTING AND MATERIALS ATCT - AIR TRAFFIC CONTROL TOWER BLDG - BUILDING BO - BOTTOM OF B.O.B. - BOTTOM OF BANK BOP - BOTTOM OF PIPE BOD - BOTTOM OF DUCT BODWP - BOTTOM OF DOUBLE WALL PIPE BOTT. - BOTTOM **CL- CENTERLINE** C - CONDUIT CBR - CALIFORNIA BEARING RATIO CLR - CLEARANCE COM - COMMUNICATION CONC - CONCRETE CONN - CONNECTION CONT - CONTINUOUS CS - CARBON STEEL CSSO - CONTRACTOR SAFETY AND SECURITY OFFICER DBL - DOUBLE **DETL - DETAIL**

EMAS - ENGINEERED MATERIAL ARRESTING SYSTEM EOP - EDGE OF PAVEMENT EX/EXST/EXIST - EXISTING FAA - FEDERAL AVIATION ADMINISTRATION FH - FIRE HYDRANT FO - FIBER OPTIC FOD - FOREIGN OBJECT DEBRIS **FAR - FEDERAL AVIATION REGULATIONS** GALV - GALVANIZED GND. - GROUND GNE - GROUNDWATER NOT ENCOUNTERED GRS - GALVANIZED RIGID STEEL GSE - GROUND SERVICE EQUIPMENT GV - GAS VALVE **GWL - GROUND WATER LEVEL HORT - HORIZONTAL** HP - HYDRANT PIT **HPV - HIGH POINT VENT ID - IDENTIFICATION** I.D. - INNER DIAMETER IE/INV - INVERT ELEVATION / INVERT I.F. - INSULATING FLANGE ISO - ISOLATION IVP - ISOLATION VALVE PIT KIP - 1,000 LBS L - LIGHTING LB - POUND LEO - LAW ENFORCEMENT OFFICER LF - LINEAR FEET LOD - LIMITS OF GRADING LPD - LOW POINT DRAIN

EG - EXISTING GROUND

EL/ELEV - ELEVATION

ELEC - ELECTRICAL

ELL - ELBOW

LT - LEFT

MAX - MAXIMUM **MECH - MECHANICAL** MH - MANHOLE MIN - MINIMUM MON - MONITORING (WELL) MSL - MEAN SEA LEVEL N - NORTHING OR NO. OF BLOWS NAD - NORTH AMERICAN DATUM NAVAIDS - NAVIGATIONAL AIDS NGVD - NATIONAL GEODETIC VERTICAL DATUM NO - NUMBER NOTAM - NOTICE TO AIRMEN NPDES - NAT'L POLLUTANT DISCHARGE ELIMINATION SYSTEM NTP - NOTICE TO PROCEED NTS - NOT TO SCALE OC - ON CENTER OD - OUTER DIAMETER OFA - OBJECT FREE AREA O/S - OUTSIDE OZ - OUNCE PAPI - PRECISION APPROACH PATH INDICATOR SYSTEM PAVT - PAVEMENT PC - POINT OF CURVATURE PCC - PORTLAND CEMENT CONCRETE PCSMP - POST CONSTRUCTION STORMWATER MANAGEMENT PLAN SPT - STANDARD PENETRATION TEST PERF - PERFORATED PF - PLIDCO FLANGE PG - PRESSURE GAUGE PG - PROPOSED GRADE PK - PEAK PKG - PARKING

P.O.T. - POINT OF TANGENT

PT - POINT OF TANGENCY

PSF - POUNDS PER SQUARE FOOT

PSI - POUNDS PER SQUARE INCH

PS - PIPE SUPPORT

PVC - POLYVINYL CHLORIDE PVI - POINT OF VERTICAL INTERSECTION RCP - REINFORCED CONCRETE PIPE RED - REDUCER REF - REFERENCE REIL - RUNWAY END IDENTIFIER LIGHT SYSTEM REINF - REINFORCED REQ/REQ'D - REQUIRED RF - RAISED FACE **RIM - RIM ELEVATION** RLD - RESPONSIBLE LAND DISTURBER **ROFZ - RUNWAY OBJECT FREE ZONE** RPR - RESIDENT PROJECT REPRESENTATIVE RPZ - RUNWAY PROTECTION ZONE RSA - RUNWAY SAFETY AREA RT - RIGHT RW - RUNWAY S/SAN - SANITARY SC - SECONDARY CONTAINMENT SCH/SCHED - SCHEDULE SD - STORM DRAIN SIDA - SECURITY IDENTIFICATION DISPLAY AREA SF - SQUARE FOOT SF/GAL - SQUARE FEET PER GALLON SS - STAINLESS STEEL STA - STATION STD - STANDARD STL - STEEL STRUCT - STRUCTURE SW - SINGLE WALL SWM - STORMWATER MANAGEMENT TBR - TO BE REMOVED TDZ - TOUCHDOWN ZONE TEL - TELEPHONE

TEMP - TEMPORARY

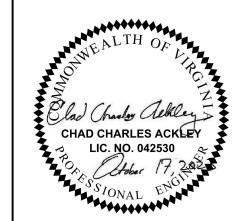
THD - THREADED THK - THICK T/L - TAXILANE T.O. - TOP OF T.O.B. - TOP OF BANK TOC - TOP OF CONCRETE TOD - TOP OF DUCT TOFA - TAXIWAY OBJECT FREE AREA TSA - TAXIWAY SAFETY AREA T/W - TAXIWAY TYP - TYPICAL UD - UNDERDRAIN UG - UNDERGROUND **UMH - UNIDENTIFIED MANHOLE** U.N.O - UNLESS NOTED OTHERWISE VAC - VACUUM VDOT - VIRGINIA DEPARTMENT OF TRANSPORTATION VERT - VERTICAL W - WATER WTR - WATER W/ - WITH WM - WATER MAIN WP - WEATHER PROOF WV - WATER VALVE

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> **ROANOKE-BLACKSBURG** REGIONAL **AIRPORT** (ROA)



RUNWAY 16-34 EMAS REPLACEMENT



REVISIONS NO. DESCRIPTION DATE ISSUED: OCTOBER 17, 2023 REVIEWED BY: CCA DRAWN BY: LSB/JB RSY DESIGNED BY: RS&H PROJECT NUMBER

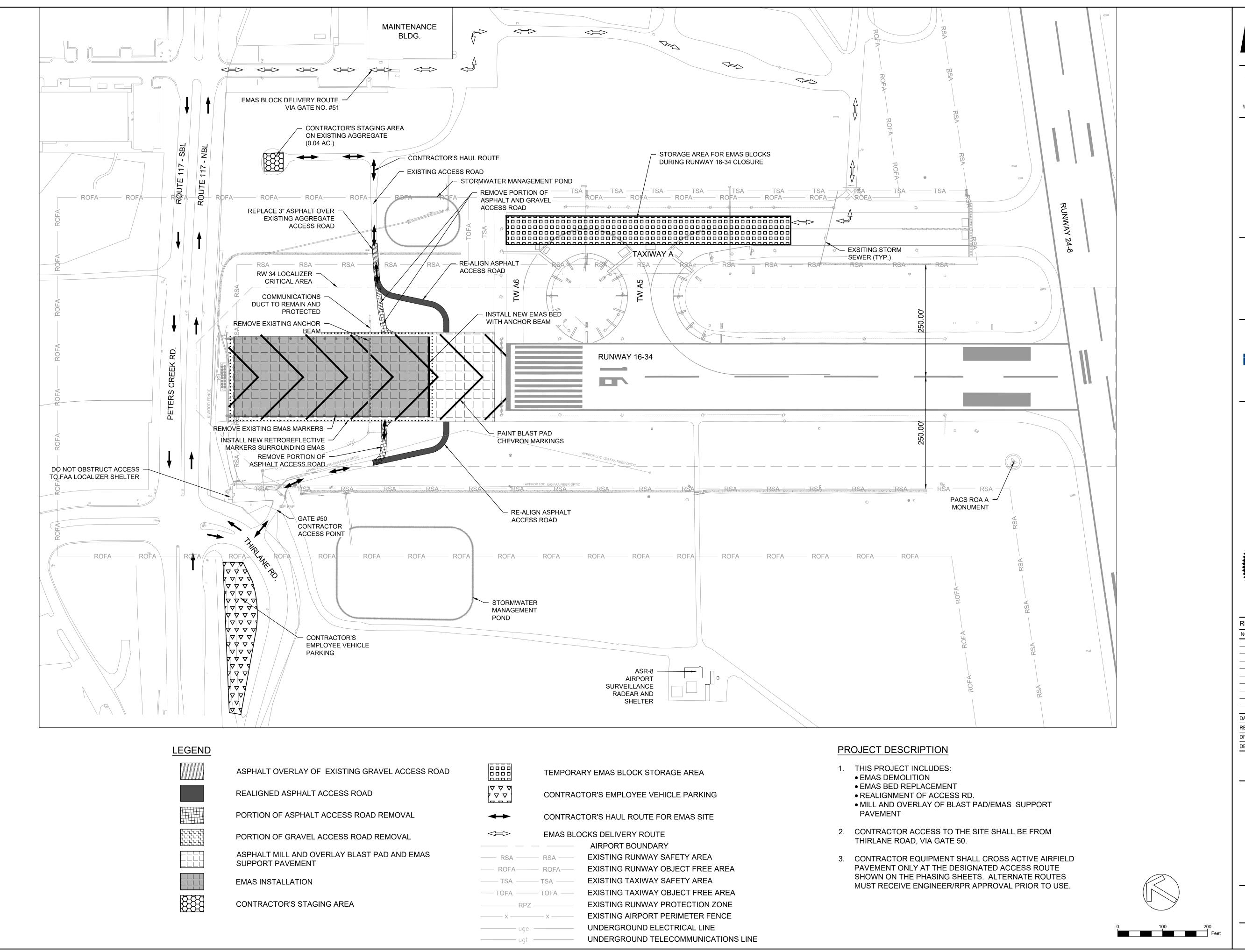
1022-0071-003

SHEET TITLE

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QUANTITY ESTIMATE, SHEET INDEX **ABBREVIATIONS**

SHEET 2 OF 31



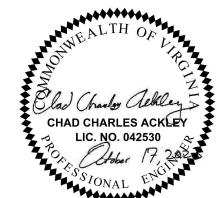
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> ROANOKE-BLACKSBURG REGIONAL AIRPORT (ROA)



RUNWAY 16-34 EMAS REPLACEMENT



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NO.	DESC	RIPTION	DATE
DATE	ISSUED:	OCTOBER 1	17, 2023
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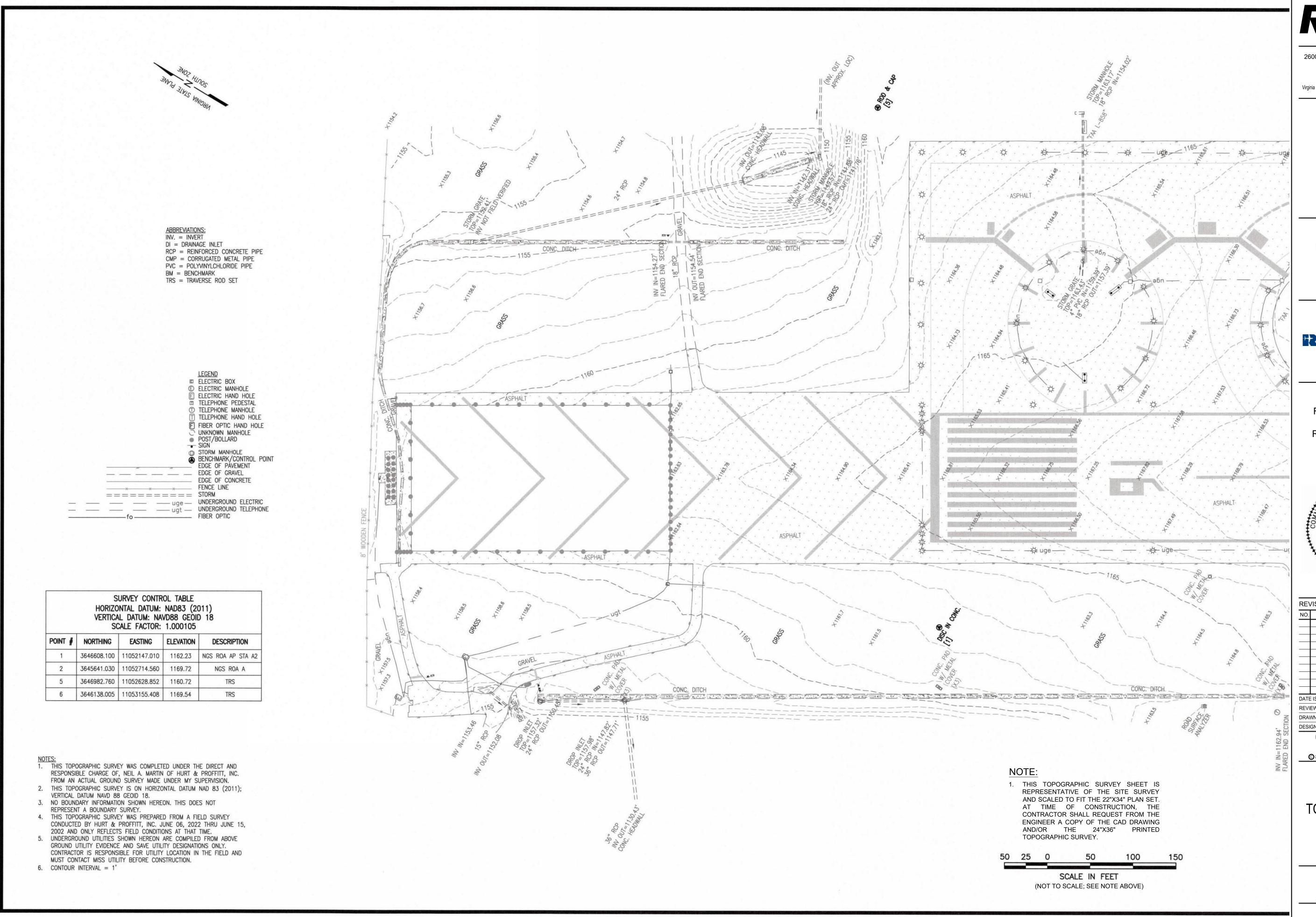
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SHEET TITLE

PROJECT LAYOUT PLAN

SHEET NUMBER
G003
SHEET 3 OF 31



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> ROANOKE-BLACKSBURG REGIONAL AIRPORT (ROA)

ROANOKE-BLACKSBURG
REGIONAL AIRPORT

RUNWAY 16-34 EMAS REPLACEMENT

OI/12/2023 Z

OI/12/2023 Z

NEIL AVERY MARTIN

Lic. No. 2454

REVISIONS

NO. DESCRIPTION DATE

DATE ISSUED: OCTOBER 17, 2023

REVIEWED BY: CCA

DRAWN BY: LSB/JB

DESIGNED BY: DSY

DESIGNED BY: RSY

RS&H PROJECT NUMBER

1022-0071-003

1022-0071-003

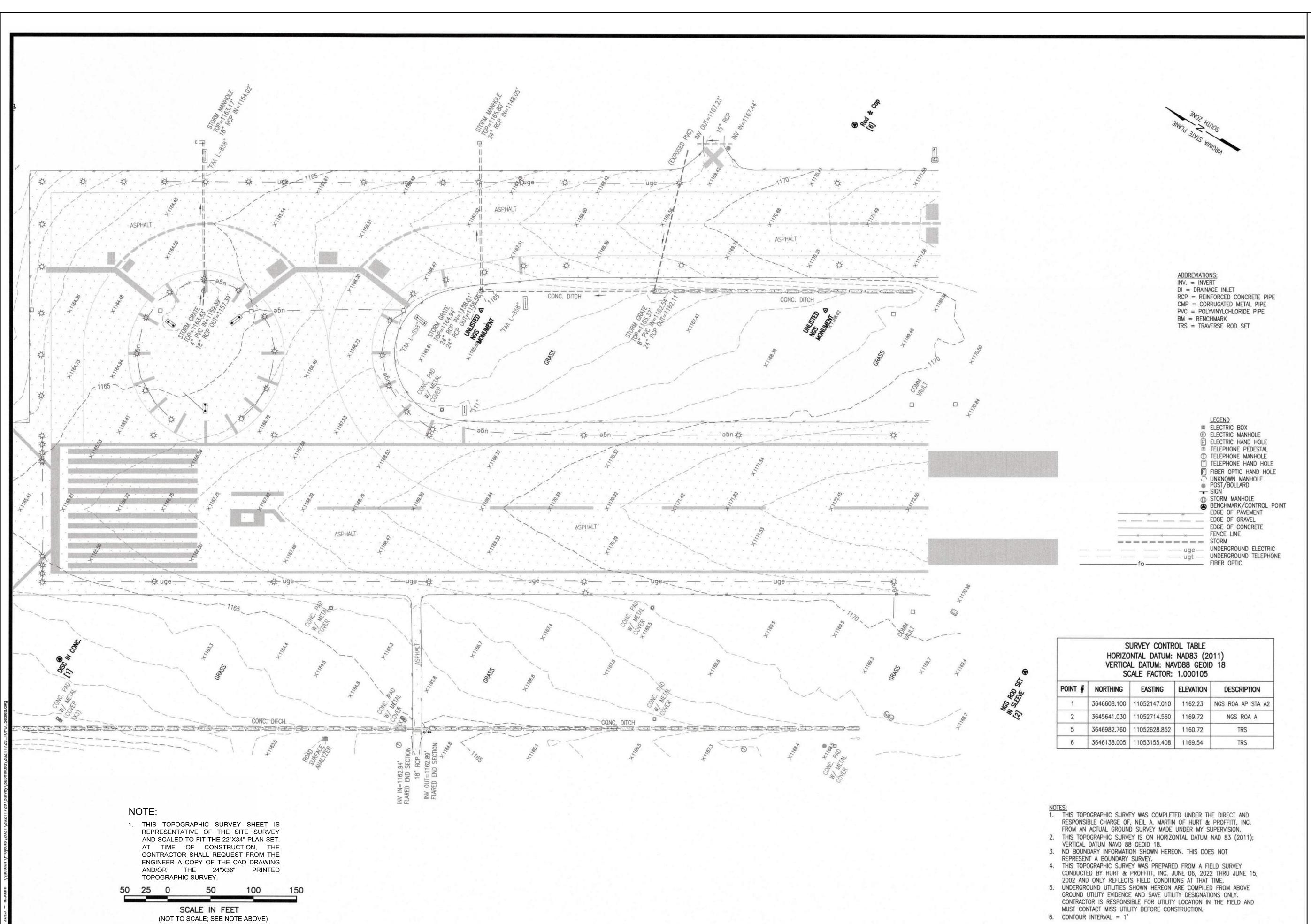
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EXISTING

SHEET TITLE

TOPOGRAPHIC SURVEY - 1

G004
SHEET 4 OF 31



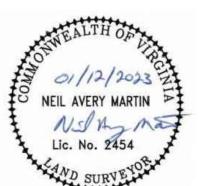
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> ROANOKE-BLACKSBURG REGIONAL AIRPORT (ROA)

ROANOKE-BLACKSBURG
REGIONAL AIRPORT

RUNWAY 16-34 EMAS REPLACEMENT



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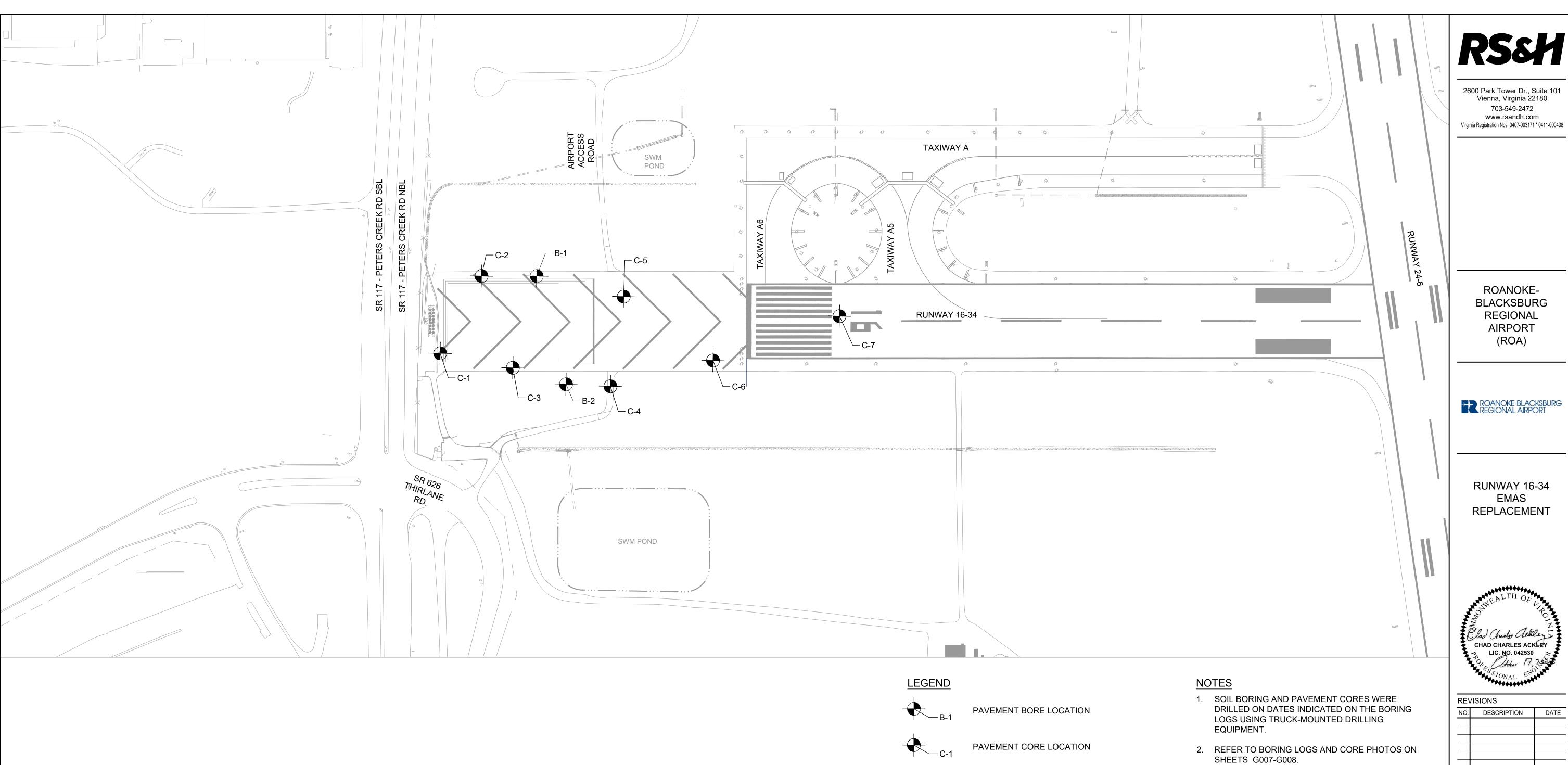
1022-0071-003

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SHEET TITLE

EXISTING TOPOGRAPHIC SURVEY - 2

SHEET NUMBER
G005
SHEET 5 OF 31



	POINT TABLE								
POINT #	NORTHING	EASTING	LATITUDE	LONGITUDE					
C-1	3647198.21	11051919.06	N37° 19' 48.96"	W79° 58' 57.03"					
C-2	3647207.47	11052094.21	N37° 19' 49.08"	W79° 58' 54.86"					
C-3	3647058.73	11051969.52	N37° 19' 47.59"	W79° 58' 56.38"					
C-4	3646872.54	11052038.99	N37° 19' 45.76"	W79° 58' 55.48"					
C-5	3646942.75	11052206.41	N37° 19' 46.48"	W79° 58' 53.42"					
C-6	3646723.59	11052189.50	N37° 19' 44.31"	W79° 58' 53.59"					
C-7	3646552.97	11052396.45	N37° 19' 42.66"	W79° 58' 50.99"					
B-1	3647113.00	11052151.28	N37° 19' 48.16"	W79° 58' 54.14"					
B-2	3646950.70	11051996.45	N37° 19' 46.53"	W79° 58' 56.02"					

- 3. SOIL BORING AND PAVEMENT CORE LOCATIONS ARE APPROXIMATE AND NOT INTENDED FOR CONSTRUCTION STAKEOUT.
- 4. SEE GEOTECHNICAL REPORT FOR ADDITIONAL INFORMATION.

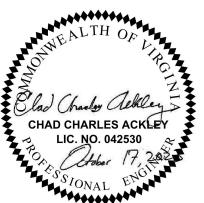


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ROANOKE-BLACKSBURG

REGIONAL AIRPORT (ROA)

RUNWAY 16-34 EMAS REPLACEMENT



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DESI	GNED BY:	RSY						

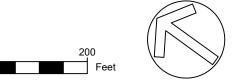
RS&H PROJECT NUMBER

1022-0071-003 2023 REYNOLDS, SMITH AND HILLS INC. SHEET TITLE

> **BORING** LOCATION

PLAN

SHEET NUMBER G006 SHEET 6 OF 31





CLASSIFICATION OF SOILS FO ASTM Designa (Based on the Unified So	FROEHLING & ROBERTSON, INC. Engineering Stability Since 1881					
			1		Soi	l Classification
Criteria for Assigning Gro	; Laboratory Test	s ^A	Group Symbol	Group Name ^B		
COARSE-GRAINED SOILS	Gravels	Clean gravels	$Cu \ge 4$ and $1 \le Cc \le 3^D$		GW	Well-graded gravel ^E
	(More than 50%	(Less than 5% fines ^C)	Cu < 4 and/or [Cc < 1 c	or Cc > 3] ^D	GP	Poorly graded gravel ^E
	of coarse fraction retained on No. 4	Gravels with fines	Fines classify as ML or	МН	GM	Silty gravel ^{E,F,G}
NA	sieve)	(More than 12% fines ^C)	Fines classify as CL or	СН	GC	Clayey gravel ^{E,F,G}
More than 50% retained on the No. 200 sieve		Clean Sands	$Cu \ge 6$ and $1 \le Cc \le 3^D$		SW	Well-graded sand
	Sands (50% or more of	(Less than 5% fines ^H)	Cu < 6 and/or [Cc < 1 c	or Cc > 3] ^D	SP	Poorly graded sand
	coarse fraction	Sands with fines	Fines classify as ML or	МН	SM	Silty sand ^{F,G,I}
	passes No. 4 sieve)	(More than 12% fines ^H)	Fines classify as CL or	СН	SC	Clayey sand ^{F,G,I}
FINE-GRAINED SOILS			PI > 7 and plots on or	above "A" line ^J	CL	Lean clay ^{K,L,M}
	Silts and Clays	Inorganic	PI < 4 or plots below "	A" line ^J	ML	Silt ^{K,L,M}
	Liquid limit less than 50		Liquid limit – oven dried Liquid limit – not dried < 0.75			Organic clay ^{K,L,M,N}
		Organic			OL	Organic silt ^{K,L,M,O}
50% or more passes the No. 200 sieve	Silts and Clays Liquid limit 50 or more		PI plots on or above "A" line		СН	Fat clay ^{K,L,M}
		Inorganic	PI plots below "A" line		МН	Elastic silt ^{K,L,M}
			Liquid limit – oven dri			Organic clay ^{K,L,M,P}
		Organic	Liquid limit – oven o Liquid limit – not d	ried < 0.75	ОН	Organic silt ^{K,L,M,Q}
HIGHLY ORGANIC SOILS	Primarily orgainic ma	atter, dark in color, and organ	c in odor		PT	Peat
A Based on the material passing the 3-in. (75 B If field sample contained cobbles or boulde add "with cobbles or boulders, or both" to C Gravels with 5 to 12 % fines require dual sy GW-GM well-graded gravel with silt GW-GC well-graded gravel with clay GP-GM poorly graded gravel with silt GP-GC poorly graded gravel with clay Cu = $\frac{D_{00}}{D_{10}}$ Cc = $\frac{(D_{30})^2}{D_{10} \times D_{00}}$ E If soil contains ≥ 15 % sand, add "with sand to group name. F If fines classify as CL-ML, use dual symbol Cor SC-SM.	ers, or both, group name. vmbols:	G If fines are organic, add fines" to group name. H Sands with 5 to 12 % fin symbols: SW-SM well-graded sand SW-SC well-graded sand SP-SC poorly graded sand SP-SC poorly graded sand If soil contains ≥ 15 % grader to group name. J If Atterburg limits plot in soil is a CL-ML, silty clay.	es require dual d with silt with clay nd with silt d with clay avel, add "with		r "with grav s ≥ 30 % plu y sand, add s ≥ 30 % plu y gravel add ts on or abc below "A" above "A" I	"sandy" to s No. 200, d "gravelly" to ove "A" line. line.
	PLASTICITY INDEX (PI)	and fine-grained fro soils. Equation of "A" - line Horizontal at PI=4 then PI=0.73 (LL Equation of "U"-line Vertical at LL=16	of fine-grained soils action of coarse-grained to LL=25.5, -20)		ОН	



KEY TO BORING LOG SOIL CLASSIFICATION

Particle Size and Proportion

Visual descriptions are assigned to each soil sample or stratum based on estimates of the particle size of each component of the soil and the percentage of each component of the soil.

Boulder		Cobble	Gra	ivel		Sand	1	Silt	Clav
	Boulder Cobbie		Coarse	Fine	Coarse	Medium	Fine	0	L. C.C.Y
Pass		12 in.	3 in.	3/4 in.	#4 M	#10 M	#40 M	#200 M	#200 M
Retained	12 in.	3 in.	3/4 in.	#4 M	#10 M	#40 M	#200 M		

U.S. Standard Sieve Sizes

1.) Particle size is designated by 2.) Because of the small size of the split-spoon sampler relative to the size of gravel, the true percentage of gravel may not be accurately estimated.

	< 50% Fines (-200 I	Mesh)	> 50% Fines (-200 Mesh)				
	Descriptive Terr	ms	Descriptive Terms				
Comp.	Term	Percentage	Comp.	Term	Percentage		
Major	Uppercase Letters (GRAVEL, SAND)	% Gravel > % Sand	Major	Uppercase Letters (CLAY, SILT)	% Clay > % Silt		
Secondary	With sand/gravel	≥ 15% Sand/Gravel	Secondary		≥ 30% Coarse		
	Adjective (Clayey, Silty)	≥ 15% Fines		Adjective (Sandy, Gravely)	% Sand > % Gravel		
Minor	With clay/silt	10% Fines		With gravel/sand	Rem. Coarse > 15%		
	Do Not Note	≤ 5% Fines	Minor	With gravel/sand	15% -25% Coarse		
				Do Not Note	<15% Coarse		

Density or Consistency

The standard penetration resistance values (N-values) are used to describe the density of coarse-grained soils (GRAVEL, SAND) or the consistency of fine-grained soils (SILT, CLAY). Sandy silts of very low plasticity may be assigned a density instead of a consistency.

DENSI	TY	CONSISTENCY		
Term	N-Value	Term	N-Value	
Very Loose	0 - 4	Very Soft	0 - 1	
Loose	5 - 10	Soft	2 - 4	
Medium Dense	11- 30	Firm	5 - 8	
Dense	31 - 50	Stiff	9 - 15	
Very Dense	> 50	Very Stiff	16 - 30	
		Hard	>30	

1. The N-value is the number of blows of a 140 lb. Hammer freely falling 30 inches required to drive a standard split-spoon sampler (2.0 in. O.D., 1-3/8 in. I.D.) 12 inches into the soil after properly seating the sampler 6 inches. 2. When encountered, gravel may increase the N-value of the standard penetration test and may not accurately represent the in-situ density or consistency of the soil sampled.

F:\Branch 62\GEOWORD\REPORTS\keyblsc.enc.doc

SOIL CLASSIFICATION CHART

	A 100 00 "C"		SYMI	BOLS	TYPICAL
M	AJOR DIVISI	ONS	GRAPH	LETTER	DESCRIPTIONS
	GRAVEL AND	CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVEL SAND MIXTURES, LITTLE OR NO FINES
	GRAVELLY SOILS	(LITTLE OR NO FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
COARSE GRAINED SOILS	MORE THAN 50% OF COARSE	GRAVELS WITH FINES		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
	FRACTION RETAINED ON NO. 4 SIEVE	(APPRECIABLE AMOUNT OF FINES)		GC	CLAYEY GRAVELS, GRAVEL - SAND CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS	SAND AND	CLEAN SANDS		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
LARGER THAN NO. 200 SIEVE SIZE	SANDY SOILS	(LITTLE OR NO FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES		SM	SILTY SANDS, SAND - SILT MIXTURES
		(APPRECIABLE AMOUNT OF FINES)		sc	CLAYEY SANDS, SAND - CLAY MIXTURES
				ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
00120				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE				МН	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		СН	INORGANIC CLAYS OF HIGH PLASTICITY
				ОН	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
	EXISTING FILL	-		FILL	EXISTING FILL MATERIALS

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> **ROANOKE-**BLACKSBURG REGIONAL **AIRPORT** (ROA)

ROANOKE-BLACKSBURG REGIONAL AIRPORT

RUNWAY 16-34 EMAS REPLACEMENT



Project No: 62A-0073

Project: Runway 16-34 EMAS Replacement

Client: RS&H

BORING LOG Boring: B-1 (1 of 1)

Drilling Method: 2.25" ID HSA Total Depth: 10.0' Hammer Type: Automatic **Boring Location:** See Boring Location Plan Hammer Efficiency: 1.54

0.5 - 1.2 - 1.2	Description of Materials (Classification) 5.5" Asphalt 9" Base Stone	Blows	Sample Depth (feet)	N-Value (blows/ft)	Remarks No subsurface water was
	9" Base Stone			1	No cubcurtace water wa
					encountered immediatel
1.2					upon completion of drilling.
-	<u>FILL:</u> Sampled as firm, mottled tan and gray, moist, fine to medium, sandy, LEAN CLAY (CL)				
M	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	10-2-3	2.0		
				5	
3.5		2.1.4	3.5		
-	Sampled as firm, mottled gray, brown, and red-brown, moist, fine to medium, sandy, FAT CLAY (CH) with rock fragments	2-1-4		5	
			5.0		
			6.0		
6.0	Sampled as very loose, mottled gray and orange-tan, moist, fine to medium, CLAYEY SAND (SC) with rock fragments	4-1-2	6.0	3	
			7.5		
8.0	RESIDUUM: Firm, tan and gray, moist, FAT CLAY				Cave-in at 8'.
	(CH)	1-3-3	8.5	6	
10.0	Boring Terminated at 10'		10.0		
	Borning Terriminated at 10				
	8.0 —	Sampled as firm, mottled gray, brown, and red-brown, moist, fine to medium, sandy, FAT CLAY (CH) with rock fragments Sampled as very loose, mottled gray and orange-tan, moist, fine to medium, CLAYEY SAND (SC) with rock fragments 8.0 RESIDUUM: Firm, tan and gray, moist, FAT CLAY (CH) Boring Terminated at 10' blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.3	Sampled as firm, mottled gray, brown, and red-brown, moist, fine to medium, sandy, FAT CLAY (CH) with rock fragments Sampled as very loose, mottled gray and orange-tan, moist, fine to medium, CLAYEY SAND (SC) with rock fragments RESIDUUM: Firm, tan and gray, moist, FAT CLAY (CH) Boring Terminated at 10' Boring Terminated at 10'	Sampled as firm, mottled gray, brown, and red-brown, moist, fine to medium, sandy, FAT CLAY (CH) with rock fragments 5.0 Sampled as very loose, mottled gray and orange-tan, moist, fine to medium, CLAYEY SAND (SC) with rock fragments 7.5 RESIDUUM: Firm, tan and gray, moist, FAT CLAY (CH) Boring Terminated at 10' Boring Terminated at 10' 10.0	Sampled as firm, mottled gray, brown, and red-brown, moist, fine to medium, sandy, FAT CLAY (CH) with rock fragments 5.0 Sampled as very loose, mottled gray and orange-tan, moist, fine to medium, CLAYEY SAND (SC) with rock fragments 7.5 8.0 RESIDUUM: Firm, tan and gray, moist, FAT CLAY (CH) 1-3-3 6

LIQUID LIMIT (LL)



Boring: B-2 (1 of 1)

BORING LOG

Drilling Method: 2.25" ID HSA Project No: 62A-0073 Total Depth: 15.0' Hammer Type: Automatic Client: RS&H Project: Runway 16-34 EMAS Replacement Boring Location: See Boring Location Plan Hammer Efficiency: 1.54 Date Drilled: 6/9/22 Latitude: Driller: C. Ingo City/State: Roanoke, Virginia Longitude:

Elevation	Depth	Description of Materials (Classification)	* Sample Blows	Sample Depth (feet)	N-Value (blows/ft)	Remarks
_	0.3	3" Surficial Soil	5-7-2	0.0		
	-	FILL: Sampled as loose, dark-gray, moist, fine to coarse, POORLY-GRADED SAND (SP) with gravel, trace clay		1.5	9	
-	2.0	Sampled as firm, tan, gray, and red-brown, moist, LEAN CLAY (CL) with fine to medium sand	2-2-3	2.0	5	
-	3.5	Sampled as soft, orange-tan and burgundy, moist, LEAN CLAY (CL), trace fine to medium sand	1-1-2	3.5	3	
	_			5.0		
-	¥ 6.0 −	Sampled as soft, brown and red-brown, moist,				Subsurface water was
	-8	FAT CLAY (CH)	1-1-1	6.5		encountered at a dep 6' immediately upon
	_		1-1-1		2	completion of drilling
	8.0			8.0		
	0.0	POSSIBLE RESIDUUM: Soft, gray, moist, FAT				
		CLAY (CH)	1-1-2	8.5		
					3	
				10.0		
_	12.0					
		PARTIALLY WEATHERED ROCK: Sampled as very dense, gray, moist, POORLY-GRADED GRAVEL				
		(GP) with silt, trace clay				
	- K (Cave-in at 13'.
	— — — — — — — — — — — — — — — — — — —	W	50/4	13.5		
	−N ∩		,	13.8	100+	
-	15.0	Boring Terminated at 15'				
						hes in three 6" incremen



PAVEMENT SECTION COMPOSITION AND DESCRIPTION

Runway 16-34 EMAS Replacement Date of Extraction: Project Name: Roanoke, Virginia **Location Information** Boring/Core Identification: General Location: Runway 16-34

6 in. Void Underlying Pavement: no (yes/no)

14.0 in. Void Depth Below Pavement: N/A in. Aggregate Base Material:

Welded Wire Fabric (WWF) or Rebar WWF/Rebar/Both

Embedment Depths from Top of Core Welded Wire Fabric:

Vapor Barrier or Geotextile Fabric: Description of Vapor Barrier or Geotextile:





REVISIONS NO. DESCRIPTION DATE ISSUED: OCTOBER 17, 2023 REVIEWED BY: CCA DRAWN BY: LSB/JB RSY DESIGNED BY: RS&H PROJECT NUMBER

BORING LOGS PAVEMENT CORE PHOTOS

1022-0071-003 2023 REYNOLDS, SMITH AND HILLS INC.

G007 SHEET 7 OF 31



PAVEMENT SECTION COMPOSITION AND DESCRIPTION

Project Name:	Runway 16-34	EMAS Repla	cement	_ Date of Extraction:	6/9/2022	
F&R Project Number:	62A-0073			Project Location:	Roanoke, Virginia	
Boring/Core Identification:	C-2		_	Location Information Station: Lane: General Location:	Runway 16	-34
Pavement Section Compositi	on					
Asphalt:		6	_in.	Void Underlying Pavement:	no	(yes/no)
Aggregate Base	Material:	8.0	_in.	Void Depth Below Pavement:	N/A	in.
Concrete:		N/A	_ in.			
Welded Wire Fabric (WWF) o	r Rebar					
WWF/Rebar/Bo	th	N/A	_in.			
Embedment Depths from To	o of Core					
Rebar:		N/A	in.			
Welded Wire I	abric:	N/A	 in.			
Vapor Barrier or Geotextile F	abric:	no	_ (yes/no))		
Description of Vapor Barrier or Geotextile:		N/A				





PAVEMENT SECTION COMPOSITION AND DESCRIPTION

Project Name: F&R Project Number:	Runway 16-34 62A-0073	EMAS Replac		Date of Extraction: Project Location:	6/9/2022 Roanoke, Vi	rginia
Boring/Core Identification:	<u>C-3</u>		-	Location Information Station: Lane: General Location:	Runway 16-	34
Pavement Section Composit	ion					
Asphalt:		5.5	in.	Void Underlying Pavement:	no	_(yes/no)
Aggregate Base	Material:	2.0	in.	Void Depth Below Pavement:	N/A	_in.
Concrete:		N/A	in.			
Welded Wire Fabric (WWF)	or Rebar					
WWF/Rebar/Bo	oth .	N/A	_in.			
Embedment Depths from To	p of Core					
Rebar:		N/A	in.			
Welded Wire	Fabric:	N/A	_ _in			
Vapor Barrier or Geotextile F	abric:	no	_(yes/no)			
Description of Vapor Barrier	or Geotextile:	N/A				
Notes: Concrete core of	liameter = 6.0"					





PAVEMENT SECTION COMPOSITION AND DESCRIPTION

Project Name:	Runway 16-34	EMAS Replac	ement	Date of Extraction:	6/9/2022	
F&R Project Number:	62A-0073		-	Project Location:	Roanoke, V	/irginia
Boring/Core Identification:	C-4			Location Information		
				Station:		
				Lane:		
				General Location:	Runway 16	-34
Pavement Section Composit	ion					
Asphalt:		3	in.	Void Underlying Pavement:	no	(yes/no)
Aggregate Base	Material:	12.0	in.	Void Depth Below Pavement:	N/A	in.
Concrete:		N/A	in.			
Welded Wire Fabric (WWF)	or Rebar					
WWF/Rebar/Bo	oth	N/A	in.			
Embedment Depths from To	p of Core					
Rebar:		N/A	in.			
Welded Wire	Fabric:	N/A	in.			
Vapor Barrier or Geotextile I	Fabric:	no	(yes/no)			
Description of Vapor Barrier	or Geotextile:	N/A				
Notes: Concrete core of	diameter = 6.0"					





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> ROANOKE-BLACKSBURG REGIONAL AIRPORT (ROA)



RUNWAY 16-34 EMAS REPLACEMENT



PAVEMENT SECTION COMPOSITION AND DESCRIPTION

•	Runway 16-34 EN 62A-0073	1AS Replac		Date of Extraction: Project Location:	6/9/2022 Roanoke, Virginia	_
Boring/Core Identification:	C-5		-	Location Information Station: Lane: General Location:	Runway 16-34	_ _ _
Pavement Section Composition	n					
Asphalt:		6.5	in.	Void Underlying Pavement:	no (yes/no)	
Aggregate Base N	∕Iaterial:	8.0	in.	Void Depth Below Pavement:	N/A in.	
Concrete:	_	N/A	in.			
Welded Wire Fabric (WWF) or	Rebar					
WWF/Rebar/Bot	h	N/A	in.			
Embedment Depths from Top	of Core					
Rebar:		N/A	in.			
Welded Wire Fa	abric:	N/A	in.			
Vapor Barrier or Geotextile Fa	bric:	no	_(yes/no)			
Description of Vapor Barrier o	r Geotextile:	N/A				
Notes: Concrete core dia	ameter = 6.0"					





PAVEMENT SECTION COMPOSITION AND DESCRIPTION

Project Name:	Runway 16-34 E	4 EMAS Replacement		Date of Extraction:	6/9/2022		
F&R Project Number:	62A-0073		_	Project Location:	Roanoke, Virginia		
Boring/Core Identification:	C-6		_	Location Information Station:			
				Lane:			
				General Location:	Runway 16	5-34	
Pavement Section Compositi	on						
Asphalt:		5	in.	Void Underlying Pavement:	no	(yes/no)	
Aggregate Base	Material:	13.0	in.	Void Depth Below Pavement:	N/A	in.	
Concrete:	_	N/A	in.				
Welded Wire Fabric (WWF) o	r Rebar						
WWF/Rebar/Bo	th _	N/A	_ in.				
Embedment Depths from To	o of Core						
Rebar:		N/A	in.				
Welded Wire F	abric:	N/A	in.				
Vapor Barrier or Geotextile F	abric:	no	_ (yes/no)	1			
Description of Vapor Barrier	or Geotextile:	N/A					

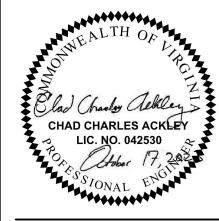




PAVEMENT SECTION COMPOSITION AND DESCRIPTION

Project Name:	Runway 16-34 E	MAS Repla	cement	Date of Extraction:	6/9/2022		
F&R Project Number:	62A-0073		_	Project Location:	Roanoke, V	irginia	
Boring/Core Identificatio	n : <u>C-7</u>		_	Location Information			
				Station:			
				Lane:			
				General Location:	Runway 16	34	
Pavement Section Compo	osition						
Asphalt:		24	in.	Void Underlying Pavement:	no	(yes/no)	
Aggregate B	ase Material:	8.0	in.	Void Depth Below Pavement:	N/A	in.	
Concrete:	-	N/A	in.				
Welded Wire Fabric (WW	'F) or Rebar						
WWF/Rebai	-/Both	N/A	in.				
Embedment Depths from	Top of Core						
Rebar:		N/A	in.				
Welded W	re Fabric:	N/A	in.				
Vapor Barrier or Geotext	ile Fabric:	no	(yes/no)			
Description of Vapor Bar	rier or Geotextile:	N/A					
Embedment Depths from Rebar: Welded W Vapor Barrier or Geotext	Top of Core ire Fabric:	N/A N/A no	in. in.)			





RE\	/ISIONS								
NO.	DESC	CRIPTION	DATE						
DATE	ISSUED:	OCTOBER 1	7, 2023						
REVI	EWED BY:	CCA							
DRAV	NN BY:	LSB/JE	3						
DESI	GNED BY:	RSY							

PAVEMENT CORE

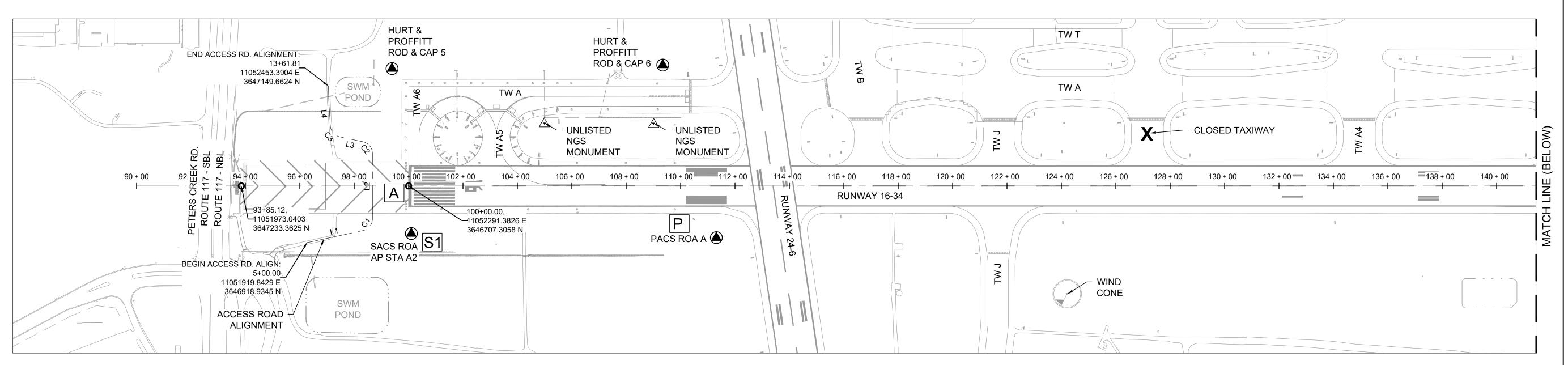
PHOTOS

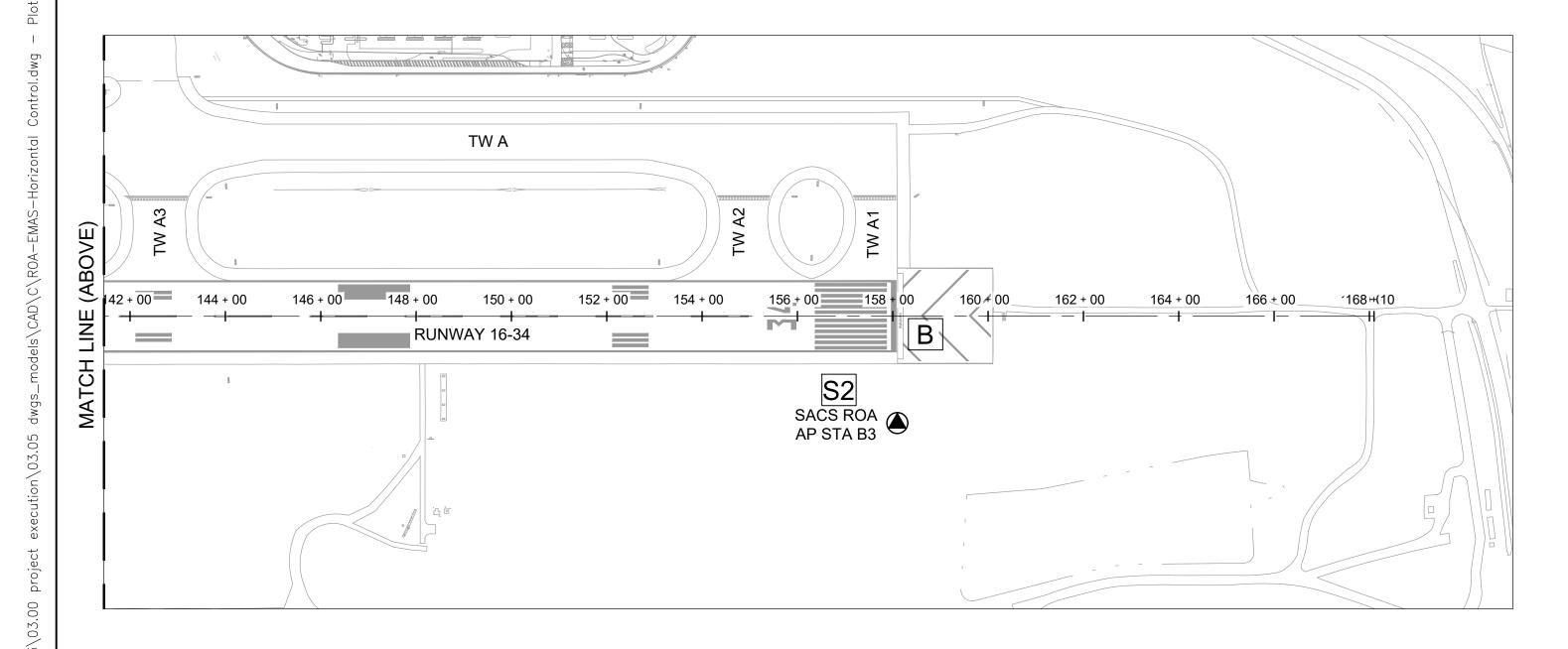
RS&H PROJECT NUMBER

1022-0071-003

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G008
SHEET 8 OF 31





ACCESS ROAD ALIGNMENT LINE TABLE									
LINE NO.	LENGTH	DIRECTION	EASTING/NORTHING	EASTING/NORTHING					
L1	210.694	S43° 22' 11.12"E	(11051919.8429,3646918.9345)	(11052064.5273,3646765.7732)					
L2	240.195	N58° 49' 11.45"E	(11052119.2927,3646758.3443)	(11052324.7900,3646882.7006)					
L3	87.114	N19° 11' 07.24"W	(11052343.5661,3646934.8040)	(11052314.9383,3647017.0796)					
L4	92.259	N55° 11' 50.44"E	(11052331.3815,3647067.6685)	(11052407.1375,3647120.3255)					

ACCESS ROAD ALIGNMENT CURVE DATA TABLE									
CURVE NO.	RADIUS	LENGTH	CHORD DIRECTION	EASTING/NORTHING	EASTING/NORTHING				
C1	44.000	59.754	S82° 16' 29.84"E	(11052064.5273,3646765.7732)	(11052119.2927,3646758.3443)				
C2	44.000	59.904	N19° 49' 02.11"E	(11052324.7900,3646882.7006)	(11052343.5661,3646934.8040)				
C3	44.000	57.122	N18° 00' 21.60"E	(11052314.9383,3647017.0796)	(11052331.3815,3647067.6685)				

AIRPORT PACS AND SACS (SEE NOTE 7)

PACS - ROA A
ELEV=1169.6
EASTING=11052714.56
NORTHING=3645641.03

SACS - ROA AP STA A2 ELEV=1162.2 EASTING=11052147.01 NORTHING=3646608.10

> SACS - ROA AP STA B3 ELEV=1138.9 EASTING=11055107.25 NORTHING=3641620.94

EXISTING CONTROL POINT SCHEDULE (SEE NOTE 5)

RUNWAY 16 THRESHOLD EASTING=11052291.38 NORTHING=3646707.31 ELEVATION = 1165.68'

RUNWAY 34 THRESHOLD EASTING=11055299.39 NORTHING=3641736.61 ELEVATION = 1142.9' (AIRNAV)

LEGEND

CONTROL POINTS

NOTES

- 1. THE EXISTING CONDITIONS SHOWN ON THE DRAWING ARE DERIVED FROM AERIAL, FIELD SURVEY AND ASBUILT RECORD DATA. AT LEAST SEVEN (7) DAYS PRIOR TO THE START OF CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES IN THE EXISTING INFORMATION REFLECTED IN THE PLANS. FAILURE TO NOTIFY THE ENGINEER OF DISCREPANCIES CONSTITUTES THE CONTRACTOR'S ACCEPTANCE OF THIS SURVEY.
- 2. ADDITIONAL CONTROL POINTS PROVIDED ON SURVEY BY HURT & PROFFITT COMPLETED IN JUNE 2022.
- 3. THE BASIS OF BEARINGS FOR THIS SURVEY IS VIRGINIA STATE PLANE, SOUTH ZONE NAD83 (2011).
- 4. VERTICAL DATUM IS NAVD 88 GEOID 18.
- 5. CONTRACTOR SHALL REESTABLISH CONTROL IF DAMAGED DURING CONSTRUCTION.
- 6. CONTRACTOR SHALL RESET CONTROL POINTS AFTER PAVING AND NOTE LOCATION AND ELEVATION ON AS-BUILTS. ALL WORK ASSOCIATED WITH RESETTING OF CONTROL POINTS SHALL BE INCIDENTAL TO C-104-5.1 PROJECT SURVEY & STAKEOUT.
- 7. THE TOPOGRAPHIC FIELD SURVEY WAS COMPLETED IN JUNE 2022 BY HURT & PROFFITT, INC.
- 8. AIRPORT PACS AND SACS ARE SHOWN FOR REFERENCE ONLY AND ARE PUBLISHED ON THE NATIONAL GEODETIC SURVEY (NGS) DATABASE.
- 9. RUNWAY THRESHOLD COORDINATES TAKEN FROM DELTA AIRPORT CONSULTANTS, INC. RECORD DRAWINGS: SEALCOAT AND MARKING PLANS, DATED MAY 22, 2020.

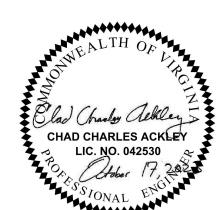


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> ROANOKE-BLACKSBURG REGIONAL AIRPORT (ROA)

ROANOKE-BLACKSBURG REGIONAL AIRPORT

> RUNWAY 16-34 EMAS REPLACEMENT



REV	REVISIONS							
NO.	DESC	CRIPTION	DATE					
\dashv								
\dashv								
-								
DATE	ISSUED:	OCTOBER	17, 2023					

DATE ISSUED: OCTOBER 17, 2023

REVIEWED BY: CCA

DRAWN BY: LSB/JB

RS&H PROJECT NUMBER

1022-0071-003
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SHEET TITLE

HORIZONTAL

CONTROL PLAN

SHEET NUMBER
G009
SHEET 9 OF 31



SAFETY/PHASING NOTES AND REQUIREMENTS:

- THIS CONSTRUCTION SAFETY AND PHASING PLAN IS A GENERAL DESCRIPTION OF WORK TO BE PERFORMED. A DETAILED SEQUENCE OF WORK SHALL BE DEVELOPED BY THE CONTRACTOR AND SUBMITTED FOR APPROVAL. THE CONTRACTOR SHALL NOT DEVIATE FROM THE APPROVED SEQUENCE OF WORK WITHOUT THE PRIOR WRITTEN APPROVAL OF THE RPR.
- 2. SECONDARY STAGING AREAS MAY BE LOCATED INSIDE THE WORK LIMITS. FINAL LOCATION SUBJECT TO RPR APPROVAL/AIRSPACE LIMITATIONS.
- 3. THE CONTRACTOR SHALL NOTE THAT OTHER CONSTRUCTION PROJECTS MAY BE ONGOING WITHIN OR ADJACENT TO THE LIMITS OF THIS CONTRACT AT THE TIME THE NOTICE TO PROCEED (NTP) IS ISSUED. THE CONTRACTOR SHALL COORDINATE PROJECT WORK LIMITS AND SITE ACCESS WITH OTHER CONTRACTORS THROUGH THE RPR.
- 4. THE CONTRACTOR MAY POTENTIALLY UTILIZE THE SAME INGRESS/EGRESS GATES AS OTHER CONCURRENT PROJECTS.
- 5. THE CONTRACTOR SHALL FOLLOW THE APPROVED EROSION & SEDIMENTATION CONTROL PLAN. SEE SHEET C101.
- 6. THE CONTRACTOR SHALL SUBMIT A TWO-WEEK WORK SCHEDULE AT LEAST ONE WEEK PRIOR TO COMMENCEMENT OF ANY WORK. THE CONTRACTOR SHALL COORDINATE THE WORK SCHEDULE THROUGH THE RPR, WITH THE FEDERAL AVIATION ADMINISTRATION (FAA), ROA OPERATIONS, AND OTHER WORK ON THE AOA REQUIRING THE ISSUING OF A NOTICE TO AIR MISSIONS (NOTAM) BY THE AIRPORT. INFORM ELECTRIC SHOP PERSONNEL A WEEK IN ADVANCE TO ALLOW ADJUSTMENTS IN THEIR SCHEDULE.
- 7. THE CONTRACTOR SHALL COORDINATE RUNWAY OR TAXIWAY CLOSURES WITH THE RPR A MINIMUM OF TWO WEEKS PRIOR TO WORK BEGINNING IN THOSE AREAS, PROVIDING SUFFICIENT TIME FOR FAA AND ROA OPERATIONS COMMENTS AND APPROVALS.
- 8. FOR ACCESS TO THE SITE, VEHICULAR & EQUIPMENT TRAVEL ON AIRPORT, AND AIRPORT SECURITY, THE CONTRACTOR MUST ADHERE TO ANY SPECIAL PROVISIONS IN CONTRACT DOCUMENTS
- 9. AS OUTLINED IN FAA AC 150/5370-2G, PARA 2.14, THE CONTRACTOR SHALL CONDUCT INSPECTIONS DAILY, BUT MORE FREQUENTLY IF NECESSARY TO ENSURE CONFORMANCE WITH THE CONSTRUCTION SAFETY AND PHASING PLAN (CSPP).
- 10. THE CONTRACTOR SHALL SUPPLY AND PLACE LOW PROFILE BARRICADES AS SHOWN ON THE PLANS AND AS DIRECTED BY THE RPR. BARRICADES SHALL BE PLACED AT ALL LOCATIONS WHERE PROPOSED WORK AREAS ADJOIN ACTIVE TAXIWAYS OR RUNWAYS AND WHERE EXCAVATIONS ON THE AIRFIELD ARE GREATER THAN 3 INCHES IN DEPTH. EXCAVATIONS WITHIN SAFETY AREAS MUST BE FILLED TO WITHIN 3 INCHES OF THE PAVEMENT SURFACE PRIOR TO OPENING THE ADJACENT PAVEMENT TO TRAFFIC.
- 11. THE CONTRACTOR SHALL DELINEATE THE PERIMETER OF WORK AREA WITH LIGHTED BARRICADES OR OTHER METHODS AS APPROVED BY RPR. ON PAVEMENT, TAXIWAY SAFETY AREA (TSA) AND RUNWAY SAFETY AREA (RSA) SHALL BE DELINEATED WITH LOW PROFILE BARRICADES. OFF PAVEMENT, TSA AND RSA SHALL BE DELINEATED BY SURVEY STAKES, AS APPROVED BY THE RPR.
- 12. THE CONTRACTOR SHALL ACQUAINT THEIR SUPERVISORS AND EMPLOYEES WITH THE AIRPORT ACTIVITY AND OPERATIONS THAT ARE INHERENT TO ROA AND SHALL CONDUCT THEIR CONSTRUCTION ACTIVITIES TO CONFORM TO ALL ROUTINE AND EMERGENCY AIR TRAFFIC REQUIREMENTS AND GUIDELINES FOR SAFETY SPECIFIED HEREIN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL SAFETY DEVICES AS REQUIRED FOR THE PROTECTION OF THEIR PERSONNEL.
- 13. PROTECTION OF ALL PERSONS SHALL BE PROVIDED THROUGHOUT THE PROGRESS OF THE WORK. THE WORK SHALL PROCEED IN SUCH A MANNER AS TO PROVIDE SAFE CONDITIONS FOR ALL WORKERS AND AIRPORT PERSONNEL. THE SEQUENCE OF OPERATION SHALL BE SUCH THAT MAXIMUM PROTECTION IS AFFORDED TO CONSTRUCTION AND NON-CONSTRUCTION PERSONNEL. TO ENSURE THAT PERSONNEL AND WORKERS IN THE AREA ARE PROTECTED, THE CONTRACTOR MUST PROVIDE SAFETY MEASURES TO GUARD AGAINST INJURY.
- 14. DURING PERFORMANCE OF THIS CONTRACT, THE AIRPORT RUNWAYS, TAXIWAYS AND AIRCRAFT HOLDING APRONS SHALL REMAIN OPEN FOR USE BY AIRCRAFT TO THE MAXIMUM EXTENT POSSIBLE. ALL AIRCRAFT TRAFFIC IN THESE AREAS SHALL HAVE PRIORITY OVER CONTRACTOR'S TRAFFIC. THE OWNER RESERVES THE RIGHT TO ORDER THE CONTRACTOR, AT ANY TIME, TO VACATE ANY AREA NECESSARY TO MAINTAIN SAFE AIRCRAFT OPERATIONS. USE OF AREAS NEAR THE CONTRACTOR'S WORK WILL BE CONTROLLED TO MINIMIZE DISTURBANCE TO THE CONTRACTOR'S OPERATION. THE CONTRACTOR SHALL NOT ALLOW UNAUTHORIZED PERSONS TO ENTER OR REMAIN IN ANY AIRPORT AREA WHICH WOULD BE HAZARDOUS TO PERSONS OR TO AIRCRAFT OPERATIONS.
- 15. ALL WORK IS TO BE COORDINATED TO KEEP RUNWAY AND TAXIWAY INTERSECTIONS OPEN FOR TAXING TO AND FROM AIRPORT SUPPORT AREAS. CAREFUL COORDINATION AND COMMUNICATION MUST BE MAINTAINED WITH TOWER AND ROA OPERATIONS VIA THE RPR, AS TO WHEN EACH RUNWAY AND TAXIWAY IS OPEN OR CLOSED.
- 16. WHEN WORK IS REQUIRED TO CROSS THE HOLD BAR (280' FROM RUNWAY CENTERLINE), THE CONTRACTOR MUST COORDINATE WITH RPR 2 WEEKS IN ADVANCE SO THE AREA CAN BE CLEARED FROM THE AIRPORT MONITORED RADAR AREA. ONCE CLEARED, ACCESS MAY BE PERMITTED BY RPR. ACCESS BEFORE CLEARING AREA WILL TRIGGER AN ALARM IN THE ATCT.
- 17. WORK WITHIN AN OBJECT FREE AREA (OFA) MAY NOT PROCEED, NOR MAY VEHICLES ENCROACH WITHIN THIS AREA, UNTIL THE APPROPRIATE NOTAMS HAVE BEEN ISSUED.
- 18. ALL CONSTRUCTION VEHICLES THAT ROUTINELY OPERATE ON THE AIRPORT AIRSIDE SHALL BE MARKED AND LIGHTED IN ACCORDANCE WITH THE REQUIREMENTS OF FAA AC 150/5370-2 (CURRENT VERSION). ALL VEHICLES MUST HAVE COMPANY NAME PERMANENTLY AFFIXED ON DOORS AND BE PROPERLY INSURED AS PER THIS CONTRACT'S LIMITS. ANY VEHICLE OPERATING IN THE ACTIVE AIRPORT OPERATIONS AREA (AOA) DURING THE HOURS OF DARKNESS, TIMES OF LOW VISIBILITY, OR IN THE RUNWAY SAFETY AREA AT ANY TIME, SHALL BE EQUIPPED WITH A FLASHING YELLOW DOME TYPE LIGHT MOUNTED ON TOP OF THE VEHICLE AND OF SUCH INTENSITY TO CONFORM WITH FAA REQUIREMENTS. NO PERSONAL VEHICLES ARE PERMITTED WITHIN THE AOA. ALL VEHICLES USED ON THE AIRPORT DURING CONSTRUCTION SHALL HAVE REQUIRED SIGNAGE, SAFETY FLAGS, AND BEACON AS SET FORTH IN THE SPECIFICATIONS. ANY PERSON NOT ADHERING TO THE PROPER OPERATION OF A VEHICLE OR NOT OPERATING WITHIN THE DESIGNATED AREA ON THE AIRPORT SHALL BE IMMEDIATELY REMOVED FROM THE SITE AND NOT ALLOWED TO CONTINUE WORK ON THE PROJECT.
- 19. DURING TIMES WHEN SAFETY OF FLIGHT OPERATIONS COULD BE IMPAIRED, OR WHEN EQUIPMENT IS IDLE, ALL CONTRACTOR'S BOOMS, TOWERS, AND OTHER MOVABLE APPENDAGES SHALL BE LOWERED TO THE MAXIMUM EXTENT AND PARKED OFFSITE OR IN A LOCATION DIRECTED BY THE
- 20. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO BRIEF ALL OF THE CONTRACTOR'S AND SUBCONTRACTOR'S EMPLOYEES ON THE FAA OPERATING AND SAFETY REQUIREMENTS. THE SAFETY PLAN FOR THIS SPECIFIC PROJECT MUST INCLUDE ALL ITEMS SPECIFIED IN THE ADVISORY CIRCULARS REFERENCED IN THE SAFETY NOTES (FAA AC 150/5370-2G, CURRENT VERSION, FAA AC 150/5300-13, CURRENT VERSION). THE CONTRACTOR MUST SUBMIT FOUR COPIES OF THE "SAFETY PLAN COMPLIANCE DOCUMENT (SPCD)" TO THE RPR FOR APPROVAL AT LEAST 10 DAYS PRIOR TO MOBILIZING ON THE JOB. THE APPROVED SPCD MAY CONTAIN DEVIATIONS FROM THE CRITERIA OUTLINED IN FAA AC 150/5370-2 (CURRENT VERSION) SO LONG AS THEY ARE BASED UPON A COMMITMENT BY AIRPORT OPERATOR AND USERS TO PROVIDE THE MAXIMUM CONSTRUCTION CLEARANCES POSSIBLE BETWEEN CONSTRUCTION ACTIVITIES AND AIRCRAFT WITHIN THE LIMITS IMPOSED BY LOCAL CONDITIONS.
- 21. THE CONTRACTOR SHALL RESPOND IMMEDIATELY (WITHIN 15 MINUTES) TO DIRECTION FROM ROA, FAA, OR THE RPR REGARDING AIRSIDE OPERATIONS.
- 22. THE CONTRACTOR SHALL COORDINATE PLANNED DAILY CONSTRUCTION OPERATION WITH THE RPR EACH DAY PRIOR TO BEGINNING WORK.
- 23. THE CONTRACTOR SHALL PREVENT ANY MATERIAL ASSOCIATED WITH THE CONTRACTOR'S OPERATIONS FROM BLOWING, SPILLING, OR BEING TRANSPORTED ONTO ACTIVE PAVEMENT AND ADJACENT AREAS (PAVEMENT OPEN TO AIRCRAFT TRAFFIC) WHERE IT CAN POSE A FOREIGN OBJECT DEBRIS (FOD) HAZARD TO AIRCRAFT. THE CONTRACTOR SHALL IMMEDIATELY REMOVE ANY FOD MATERIAL RESULTING FROM THEIR ACTIVITIES, FROM ACTIVE OPERATIONAL PAVEMENT AND ADJACENT AND SHALL BE RESPONSIBLE FOR ANY DAMAGE WHICH RESULTS. IN ADDITION, ALL PAVEMENTS ADJACENT TO CONTRACTOR WORK AREAS WILL BE SWEPT CLEAN BEFORE OPENING TO AIRCRAFT TRAFFIC. THE CONTRACTOR SHALL MONITOR WIND DIRECTION AND PREVENT DUST FROM BEING BLOWN INTO ADJACENT OPERATIONAL AREAS. CONTRACTOR REQUIRED TO MAINTAIN CLEAN AIRFIELD PAVEMENTS AT CROSSING LOCATIONS. FLAGMEN REQUIRED TO PERFORM VISUAL INSPECTION OF AIRFIELD PAVEMENTS AT CROSSING LOCATIONS AFTER EACH CROSSING. AT A MINIMUM, ONE SELF-PROPELLED, STREET TYPE, VACUUM SWEEPER TRUCK (NO METAL BRISTLES),

- IN GOOD OPERATING CONDITION (OR OTHER APPROVED METHOD FOR KEEPING PAVEMENT FREE OF DEBRIS), SHALL BE ON SITE AT ALL TIMES DURING PAVING OPERATIONS.
- 24. CONTRACTOR IS RESPONSIBLE FOR FLAGGERS AND CONTROL OF HIS WORKFORCE ON THE AIRFIELD. CONTRACTOR WILL BE REQUIRED TO FOLLOW THE DESIGNATED ROUTE UNDER THE CONTROL OF ROA-APPROVED FLAGGERS.
- 25. THE MAXIMUM CONSTRUCTION TRAFFIC SPEED ON ALL AIRPORT PROPERTY SHALL BE 15 MPH UNLESS POSTED OTHERWISE.
- 26. EMERGENCY VEHICLE ACCESS SHALL BE MAINTAINED AT ALL TIMES ON THE EXISTING PAVEMENT ON THE AIR OPERATIONS AREA SIDE OF THE SECURITY FENCE. MAINTAIN ALL EXISTING MEANS OF EGRESS FREE FROM OBSTRUCTIONS INCLUDING BUT NOT LIMITED TO TEMPORARY OR PERMANENT CONSTRUCTION, STAGED MATERIALS, TOOLS AND EQUIPMENT AT ALL TIMES.
- 27. ALL CONSTRUCTION TRAFFIC MUST REMAIN ON THE VEHICLE SERVICE ROAD (VSR), OR DESIGNATED HAUL ROUTES, MAINTAINING A DISTANCE OF AT LEAST 25 FEET FROM ANY PARKED AIRCRAFT AT ALL TIMES. IF ANY AIRCRAFT PAVEMENT USED FOR HAUL ROUTE, CONTRACTOR VEHICLES SHALL USE SHOULDER/EDGE OF PAVEMENT ONLY UNLESS OTHERWISE APPROVED BY
- 28. FAA ADVISORY CIRCULARS (AC), ORDERS, AND REGULATIONS. THE FOLLOWING PUBLICATIONS CONTAIN DEFINITIONS/DESCRIPTIONS OF CRITICAL AIR OPERATING AREAS. THE AREAS DEFINED BELOW PERTAIN TO AIRFIELD SAFETY REQUIREMENTS AND ARE REFERENCED THROUGHOUT THE CONTRACT DOCUMENTS. COPIES OF THESE PUBLICATIONS ARE AVAILABLE THROUGH THE FAA:
 - A. AC 150/5370-2G, "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION", CURRENT EDITION AT TIME OF BID, SETS FORTH GUIDELINES TO ASSIST AIRPORT OPERATORS IN COMPLYING WITH CFR PART 139, "CERTIFICATION AND OPERATION: LAND AIRPORTS SERVING CERTAIN AIR CARRIERS" AND WITH THE REQUIREMENTS OF FEDERALLY FUNDED CONSTRUCTION PROJECTS.
 - B. CODE OF FEDERAL REGULATION (CFR) PART 77 "SAFE EFFICIENT USE AND PRESERVATION OF NAVIGABLE AIRSPACE", CURRENT EDITION:
 - 1. ESTABLISHES STANDARDS FOR DETERMINING OBSTRUCTIONS TO NAVIGABLE AIRSPACE. CIVIL AIRPORT IMAGINARY SURFACES ARE DEFINED IN THE PUBLICATION AND ARE SHOWN ON DRAWING G104.
 - 2. SETS FORTH REQUIREMENTS FOR NOTICE OF CERTAIN PROPOSED CONSTRUCTION OR ALTERATION. NOTICE OF CONSTRUCTION PROVIDES A BASIS FOR RECOMMENDATIONS FOR IDENTIFYING THE CONSTRUCTION OF ALTERATION IN ACCORDANCE WITH AC 70/7460-1L "OBSTRUCTION MARKING AND LIGHTING", CURRENT EDITION AT TIME OF BID.
 - C. AC 150/5300-13 B "AIRPORT DESIGN", CURRENT EDITION AT TIME OF BID, ESTABLISHES DESIGN, OPERATIONAL, AND MAINTENANCE STANDARDS FOR AIRPORTS. STANDARD TERMS USED IN THE CONTRACT PLANS AND SPECIFICATIONS ARE DEFINED BELOW:
 - 1. OBSTACLE FREE ZONE (OFZ) THE OFZ IS A VOLUME OF SPACE WHICH IS FREE OF ALL FIXED OBJECTS AND CLEAR OF VEHICLES IN THE PROXIMITY OF AN AIRPLANE CONDUCTING AN APPROACH, MISSED APPROACH, LANDING, TAKEOFF, OR DEPARTURE.
 - 2. RUNWAY PROTECTION ZONE (RPZ) A TRAPEZOIDAL AREA CENTERED ON THE RUNWAY BEGINNING AT A POINT 200 FEET BEYOND THE END OF THE AREA USEABLE FOR TAKE OFF OR LANDING.
 - 3. OBJECT FREE AREA (OFA) A TWO-DIMENSIONAL GROUND AREA SURROUNDING RUNWAYS, TAXIWAYS, AND TAXILANES, WHICH IS CLEAR OF OBJECTS EXCEPT FOR OBJECTS WHOSE LOCATION IS FIXED BY FUNCTION.
 - 4. SAFETY AREA THE SURFACE ADJACENT TO RUNWAYS, TAXIWAYS, AND TAXILANES OVER WHICH AIRCRAFT SHOULD, IN DRY WEATHER, BE ABLE TO CROSS AT NORMAL SPEEDS WITHOUT INCURRING SIGNIFICANT DAMAGE. A SAFETY AREA IS GRADED, DRAINED AND COMPACTED. IT IS FREE OF ANY HOLES, TRENCHES, BUMPS OR OTHER SIGNIFICANT SURFACE VARIATIONS OR OBJECTS OTHER THAN THOSE WHICH MUST BE THERE BECAUSE OF THEIR ESSENTIAL AERONAUTICAL FUNCTION. THE SAFETY AREA REQUIRES THE CAPABILITY OF SUPPORTING MAINTENANCE VEHICLES AND AIRCRAFT RESCUE AND FIRE FIGHTING (ARFF) VEHICLES UNDER NORMAL (DRY) CONDITIONS.
- 29. THE CONTRACTOR SHALL ALLOW TIME IN THEIR SCHEDULE FOR COORDINATION OF WORK WITH THE FAA AND OTHER WORK ON THE AOA REQUIRING THE ISSUING OF NOTICE TO AIR MISSIONS (NOTAM) BY THE AIRPORT. THE CONTRACTOR SHALL SEND ADVANCED WRITTEN NOTIFICATION OF THE NEED FOR NOTAMS A MINIMUM OF 7 CALENDAR DAYS IN ORDER TO RECEIVE RRAC OPERATIONAL REVIEW OF THIS REQUEST. REQUESTS SENT LESS THAN 7 CALENDAR DAYS SHALL BE DENIED AND RETURNED WITHOUT REVIEW.
- 30. ALL TRUCKS HAULING DEBRIS FROM THE AIRPORT OR MATERIAL TO THE PROJECT SHALL BE EQUIPPED WITH TAILGATES AND COVER TARPS WHICH CLOSE TIGHTLY AND DO NOT PERMIT DEBRIS TO SPILL FROM THE TRUCK. TRUCK BEDS SHALL BE SWEPT CLEAN AT THE TAILGATE BEFORE ENTERING THE AOA OR LEAVING THE WORK AREA. SIDEBOARDS SHALL BE KEPT IN GOOD REPAIR. UNDER NO CIRCUMSTANCES WILL TRUCKS BE PERMITTED TO BE LOADED GREATER THAN THE LEGAL LIMIT OR HIGHER THAN THE SIDEBOARDS. TRUCKS NOT MEETING THESE REQUIREMENTS OR THAT ALLOW MATERIAL TO BE WINDBLOWN OR TO ESCAPE THEIR CONTAINMENT BEDS ONTO THE ROADWAYS OR AIRCRAFT PAVEMENTS WILL BE REMOVED FROM THE PROJECT AT THE RPR'S DIRECTION. THE RPR WILL MONITOR CONTRACTOR ACTIVITIES ACCORDINGLY.
- 31. ALL CONTRACTOR PERSONNEL WORKING ON THE AIRFIELD AT NIGHT SHALL WEAR LIGHTED SAFETY VESTS.
- 32. OPEN FLAME, WELDING OR TORCH-CUTTING OPERATIONS, ARE PROHIBITED. NO DEBRIS BURNING WILL BE ALLOWED. BLASTING CAPS SHALL BE PROHIBITED WITHIN 1,000 FEET OF AIRPORT PROPERTY.
- 33. THE CONTRACTOR SHALL MAINTAIN A CLEAN CONSTRUCTION AREA. NO TRASH, FOOD OR ANY OTHER MATERIAL THAT MAY ATTRACT WILDLIFE SHALL BE LEFT IN THE CONSTRUCTION/STOCKPILE AREAS.
- 34. IF NECESSARY FOR CONSTRUCTION, COORDINATE ACCEPTABLE TIMES FOR BORING/TUNNELING/DRILLING PROPOSED UTILITIES UNDER EXISTING PAVEMENTS WITH RPR.
- 35. CONTRACT DURATION, MILESTONES AND LIQUIDATED DAMAGES ARE OUTLINED IN THE PROJECT MANUAL AND PHASING PLANS.
- 36. AIRPORT NAVAIDS OPERATIONS SHALL NOT BE IMPACTED BY CONTRACTOR OPERATIONS, UNLESS ALLOWED BY BID DOCUMENTS.
- 37. CONTRACTOR MUST BE AWARE OF JET BLAST AND TAKE PRECAUTIONS TO PROTECT HIS WORKERS IN ACCORDANCE WITH HIS APPROVED SAFETY PLAN. JET BLAST IS NOT ONLY THE WIND, BUT ALSO ITEMS THAT MAY BE CARRIED BY THE WIND.

AIRSIDE SECURITY NOTES:

- 1. GENERAL INTENT: IT IS INTENDED THAT THE CONTRACTOR SHALL COMPLY WITH ALL SECURITY REQUIREMENTS SPECIFIED HEREIN. THE CONTRACTOR SHALL DESIGNATE TO THE ROANOKE REGIONAL ARIPORT COMMISSION (RRAC) IN WRITING THE NAME OF THEIR AIRSIDE SECURITY OFFICER (ASO). THE ASO SHALL REPRESENT THE CONTRACTOR ON THE SECURITY REQUIREMENTS OF THE CONTRACT. THE ASO SHALL BE A RESPONSIBLE PERSON.
- 2. THE CONTRACTOR SHALL HAVE A GATE AGREEMENT THROUGH ROA SECURITY (SEE PROJECT MANUAL). ANY PERSONNEL PERMITTED ENTRANCE BY THE CONTRACTOR THROUGH THAT PARTICULAR GATE SHALL BE LISTED ON THE CONTRACTOR'S GATE ACCESS LIST. ALL VEHICLES SHALL BE INSPECTED AT THE AOA ACCESS POINT. COORDINATION AND PAYMENT FOR GATE GUARDS SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
- 3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PAYMENT OF ANY FINES ASSESSED TO THE RRAC DUE TO THE CONTRACTOR'S VIOLATIONS OF FAA AND/OR TRANSPORATION SECURITY ADMINISTRATION (TSA) OPERATING, SAFETY, OR SECURITY REQUIREMENTS.
- 4. ALL CONTRACTOR EMPLOYEES SHALL BE BADGED IN ACCORDANCE WITH THE REQUIREMENTS OF AIRPORT OPERATIONS. THE CONTRACTOR SHALL MAKE ARRANGEMENTS WITH AIRPORT OPERATOR TO SCHEDULE TESTING AND BADGING OF THE CONTRACTOR EMPLOYEES. NON-MOVEMENT AREA DRIVER TRAINING WILL BE PROVIDED BY ROA OPERATIONS, AS ONLY RRAC PERSONNEL ARE ALLOWED TO ESCORT IN MOVEMENT AREAS. MOVEMENT AREA DRIVER TRAINING WILL NOT BE PROVIDED.

- 5. CONSTRUCTION VEHICLES SHALL HAVE REQUIRED SIGNAGE, SAFETY FLAGS, AND BEACONS,
- 6. ALL MATERIALS OR EQUIPMENT TAKEN INTO OR LEAVING THE AOA SHALL BE APPROVED BY THE RPR.

CONSTRUCTION AND FACITIES MAINTENANCE:

THE CONTRACTOR SHALL BE AWARE OF AND MITIGATE THE FOLLOWING TYPES OF SAFETY PROBLEMS AND/OR HAZARDS:

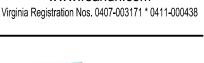
- 1. TRENCHES, HOLES, OR EXCAVATION ON OR ADJACENT TO ANY ACTIVE RUNWAY OR IN SAFETY
- 2. UNMARKED/UNLIT HOLES OR EXCAVATION.
- 3. MOUNDS OR PILES OF EARTH, CONSTRUCTION MATERIALS, TEMPORARY STRUCTURES, OR OTHER OBJECTS WITHIN THE OFA OF ANY ACTIVE RUNWAY, TAXIWAY, TAXILANE, OR IN ANY RELATED SAFETY, APPROACH, OR DEPARTURE AREA.
- VEHICLES OR EQUIPMENT, WHETHER OPERATING OR IDLE, OR PERSONNEL ON ANY ACTIVE RUNWAY, TAXIWAY, TAXILANE, OR IN ANY RELATED SAFETY, OBJECT FREE, APPROACH, OR DEPARTURE AREA.

SITE ACCESS:

- 1. CONTRACTOR IS REQUIRED TO ESCORT HIS PERSONNEL/DELIVERIES TO/FROM AOA GATE TO THE JOB SITE USING DESIGNATED HAUL ROUTE WITH APPROVED FLAGGER LOCATIONS.
- 2. GATE GUARDS SHALL BE PROVIDED BY THE CONTRACTOR IN ACCORDANCE WITH ROA REQUIREMENTS.
- 3. ALL CONTRACTOR PERSONNEL ENTERING THE AOA MUST BE BADGED OR ESCORTED BY APPROPRIATELY BADGED PERSONNEL. REFER TO CURRENT RRAC SECURITY STANDARDS FOR MAXIMUM ALLOWABLE ESCORTED PERSONNEL PER BADGE. ESCORTS MUST REMAIN IN DIRECT CONTROL OF ALL UNBADGED PERSONNEL AT ALL TIMES.
- 4. CONTRACTOR IS NOT PERMITTED TO COMMUNICATE WITH THE ATCT (RADIO), ALL RADIO COMMUNICATION WILL BE THROUGH THE RPR OR RRAC OPERATIONS. CONTRACTOR IS ONLY PERMITTED TO LISTEN WITH THE ATCT, EXCEPT IN CASE OF AN EMERGENCY.

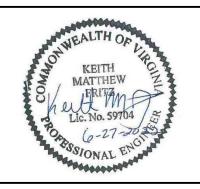


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ROANOKE-BLACKSBURG REGIONAL AIRPORT (ROA)



RUNWAY 16-34 EMAS REPLACEMENT

REVISIONS

NO. DESCRIPTION DATE

DATE ISSUED: OCTOBER 17, 2023

REVIEWED BY: KMF

DRAWN BY: AJB

CONSTRUCTION SAFETY AND PHASING

RS&H PROJECT NUMBER

1022-0071-003

SHEET TITLE

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CFM

DESIGNED BY:

SHEET NUMBER
G101
SHEET 10 OF 31

2. FABRIC PORTABLE RUNWAY CLOSURE MARKER TRANSPORT AND STORAGE IS THE RESPONSIBILITY OF THE

4. FABRIC X RUNWAY CLOSURE SHALL BE SECURED BY A GROUND ANCHOR DEVICE. ANCHORING DEVICES SHOULD BE DESIGNED TO MINIMIZE DAMAGE TO PAVEMENT, AND ANY DAMAGE SHOULD BE REPAIRED

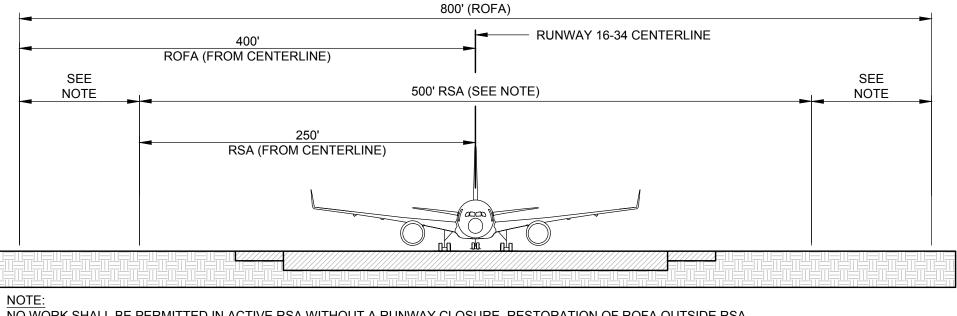
6. FABRIC CLOSURE MARKERS SHALL BE PROVIDED BY THE CONTRACTOR. CONTRACTOR TO MAINTAIN

NOT BE PERMITTED WITHOUT PROPER CLOSURE MARKERS. CLOSURE MARKERS SHALL REMAIN THE

5. FABRIC X RUNWAY CLOSURE MARKERS SHALL MEET THE REQUIREMENTS DESCRIBED IN FAA AC 150/5340-1M

MARKERS AS REQUIRED IN ORDER TO ADHERE TO CONSTRUCTION SCHEDULE. RUNWAY CLOSURES SHALL

CONTRACTOR WILL BE ESCORTED TO THE RUNWAY ENDS BY THE RPR WHEN PLACEMENT/REMOVAL/ACCESS



NO WORK SHALL BE PERMITTED IN ACTIVE RSA WITHOUT A RUNWAY CLOSURE. RESTORATION OF ROFA OUTSIDE RSA NOT REQUIRED TO OPEN RUNWAY TO TRAFFIC.

RUNWAY SAFETY AREA (RSA) RUNWAY OBJECT FREE AREAS (ROFA) G102 SCALE: N.T.S.

— TAXIWAY CENTERLINE SEE SEE NOTE NOTE

NO WORK SHALL BE PERMITTED IN ACTIVE TSA. WORK WITHIN ACTIVE TOFA SHALL REQUIRE "CONSTRUCTION AHEAD" SIGNS AND FLAGPERSON. EQUIPMENT/PERSONNEL SHALL BE MOVED OUTSIDE TOFA IF 36' CLEARANCE TO WINGTIP CANNOT BE MAINTAINED. RESTORATION OF TOFA OUTSIDE TSA NOT REQUIRED TO OPEN TAXIWAY TO TRAFFIC, AS SHOWN IN DETAIL 3 ON THIS SHEET. CONTRACTOR SHALL COORDINATE ANY WORK WITHIN AN ACTIVE OFA WITH ROA OPERATIONS AND INCLUDE COORDINATION IN THE APPROVED MOT PLAN IF APPLICABLE.

TSA

[B]

171'

TSA FROM

CENTERLINE

[C]

85.5'

TOFA FROM

CENTERLINE

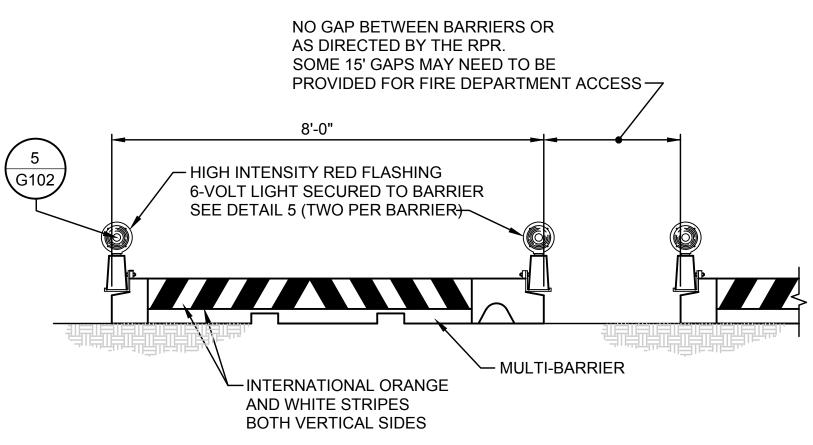
[E]

121.5'

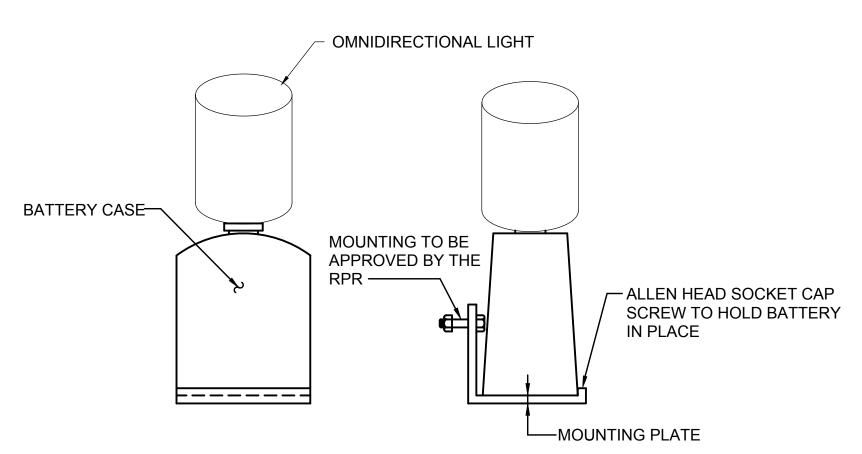
G102

TOFA

243'



POLYETHYLENE CONSTRUCTION BARRIERS G102 SCALE: N.T.S.



POLYETHYLENE CONSTRUCTION BARRIER LIGHT DETAIL

3. FABRIC X RUNWAY CLOSURE MARKERS SHALL BE PLACED ON TOP OF RUNWAY DESIGNATION NUMERALS FOR

GROUP

IV

TAXIWAY

AIRCRAFT

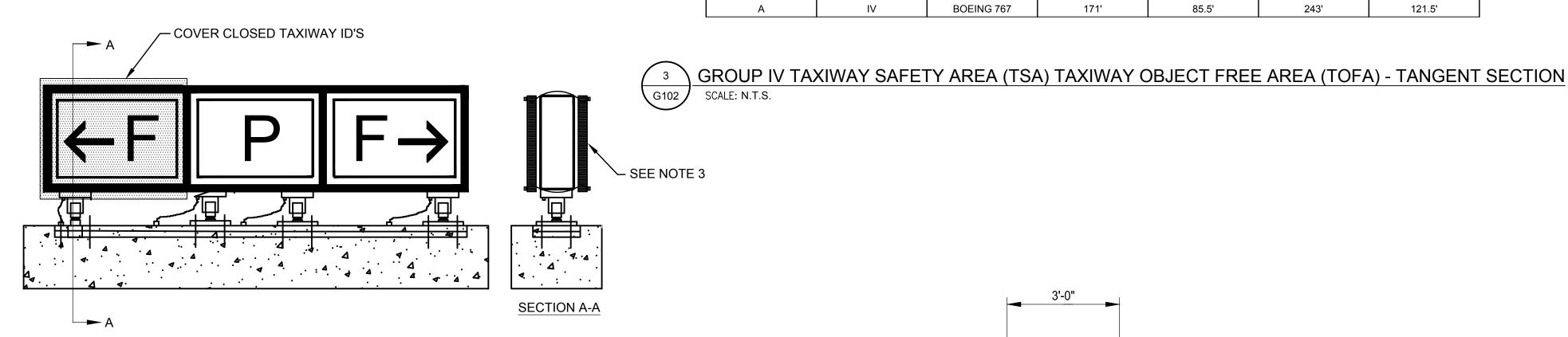
BOEING 767



CLOSED RUNWAY CLOSURE MARKINGS SHALL BE AVIATION YELLOW.

BEFORE THE RUNWAY IS OPENED TO AIRCRAFT TRAFFIC

PROPERTY OF THE CONTRACTOR UPON PROJECT COMPLETION.



NOTES:

NOTES:

CONTRACTOR.

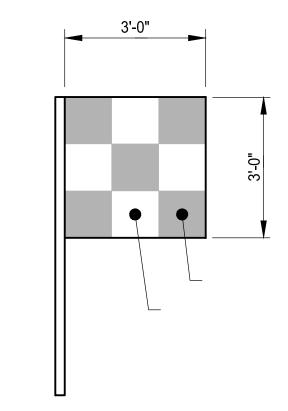
EACH RUNWAY BEING CLOSED.

SPECIFICATION, CHAPTER 5.7.1.2.

- 1. COVER ONLY TAXIWAYS CLOSED TO AIRCRAFT TRAFFIC AS SHOWN ON PHASING PLANS
- 3. METHOD OF COVERING SHALL BE SUBMITTED FOR APPROVAL OF RPR. NO BAGS OR TAPE WILL BE PERMITTED.

FOR COSTS ASSOCIATED WITH TEMPORARY CONSTRUCTION FEATURES SEE TEMPORARY CONSTRUCTION ITEMS.

AS WORK PROGRESSES, COVER ANY NEW OR EXISTING MESSAGES THAT DO NOT APPLY OR LEAD INTO NEW WORK AREAS NOT READY FOR TRAFFIC. NO SIGNAGE MAY BE DISCONNECTED OR COVERED WITHOUT APPROVAL BY THE CONSTRUCTION MANAGER.





- OR DIRECTED BY THE RPR.
- 2. FASTEN TO WITHSTAND 80 MPH WINDS.

MAINTAIN EXISTING SIGNAGE OR PROVIDE TEMPORARY SIGNAGE DURING DURATION OF PROJECT

SIGN COVERING DETAIL SCALE: N.T.S.

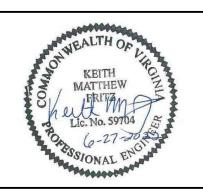
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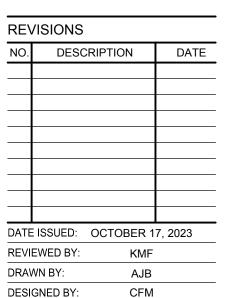
ROANOKE-BLACKSBURG REGIONAL

AIRPORT

(ROA)



RUNWAY 16-34 EMAS REPLACEMENT



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CONSTRUCTION SAFETY AND PHASING **DETAILS**

SHEET 11 OF 31



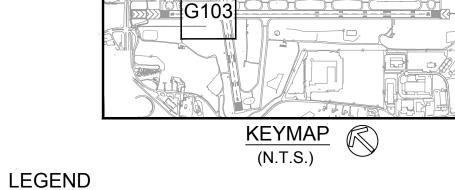
- 1. FOR SAFETY, PHASING, AND SECURITY NOTES AND DETAILS, SEE SHEETS G101 TO G102.
- 2. LOCATION OF HAUL ROUTES ON THE AIRPORT SITE SHALL BE AS SHOWN ON THIS PLAN OR COORDINATED WITH RPR. ON-SITE HAUL ROUTES SHALL BE MAINTAINED BY THE CONTRACTOR AND SHALL BE RESTORED TO THEIR PRE-CONSTRUCTION CONDITION OR TO THE SATISFACTION OF THE RPR UPON COMPLETION OF BEING USED AS A HAUL ROUTE. THE BEFORE AND AFTER CONDITION OF THE ON-SITE HAUL ROUTES SHALL BE JOINTLY INSPECTED, DETERMINED, AND DOCUMENTED BY THE CONTRACTOR AND RPR. MISCELLANEOUS CONSTRUCTION AND RESTORATION REQUIRED TO CONSTRUCT TEMPORARY HAUL ROUTES OR ACCESS POINTS ON THE AIRPORT WILL BE THE CONTRACTOR'S TOTAL RESPONSIBILITY, AND SHALL BE SEPARATE DIRECT PAYMENT FOR MISCELLANEOUS CONSTRUCTION, MAINTENANCE, REPAIR, OR RESTORATION OF HAUL ROUTES.
- 3. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE OFF-SITE HAUL ROUTES WITH THE APPROPRIATE OWNERS WHO HAVE JURISDICTION OVER THE AFFECTED ROUTE. PUBLIC STREETS SHALL REMAIN CLEAN. THE CONTRACTOR SHALL COORDINATE AND MEET THE CLEANING AND REPAIR REQUIREMENTS SET BY THE AUTHORITY HAVING JURISDICTION FOR USE OF THEIR ROADS FOR CONSTRUCTION RELATED WORK.
- 4. CONTRACTOR ACCESS ALONG HAUL ROUTES CROSSING ACTIVE OPERATIONAL PAVEMENT WILL BE SUBJECT TO DELAYS DUE TO AIRPORT OPERATIONS. THE CONTRACTOR'S USE OF THE HAUL ROADS SHALL IN NO WAY HINDER THE SAFE AND UNOBSTRUCTED FLOW OF AIRPORT TRAFFIC. AIRCRAFT SHALL HAVE THE RIGHT OF WAY AT ALL TIMES. ALL WORK OR HAULING ON THE AIR OPERATIONS AREA (AOA) SHALL BE COORDINATED AND SCHEDULED WITH THE RESIDENT PROJECT REPRESENTATIVE (RPR) SO AS TO MINIMIZE THE TIME THAT ANY RUNWAY OR TAXIWAY IS CLOSED TO AIR TRAFFIC. DEPARTMENT OF AVIATION AIRPORT OPERATIONS PERSONNEL CONTROL ALL RUNWAY AND TAXIWAY CLOSURES AND CROSSINGS.
- 5. NO CONTRACTOR'S VEHICLES, PERSONNEL, OR OPERATION WILL BE ALLOWED TO CROSS, ENTER, OR OBSTRUCT ANY ACTIVE RUNWAY OR TAXIWAY WITHOUT APPROVAL FROM THE RPR. INCURSIONS ONTO OR ACROSS ANY ACTIVE RUNWAY OR TAXIWAY WITHOUT PRIOR APPROVAL IS A SERIOUS VIOLATION THAT WILL SUBJECT THE CONTRACTOR TO THE MAXIMUM FINE ALLOWED BY THE FAA.
- 6. THE CONTRACTOR SHALL PROVIDE FLAGGERS WHO ARE RESPONSIBLE FOR THE CONTROL OF MOVEMENT OF THE CONTRACTOR'S EQUIPMENT AND PERSONNEL ACROSS ACTIVE TAXIWAYS, INSTRUMENT LANDING SYSTEM (ILS) CRITICAL AREAS, GLIDE SLOPE CRITICAL AREAS, AND ANY OTHER CRITICAL AREAS AS DETERMINED BY RPR. ANY CLEARANCE GRANTED BY THE RPR MUST BE CONFIRMED BY THE DRIVER'S PERSONAL OBSERVATION AT ALL TIMES TO KEEP ANY AND ALL ACTIVE PAVEMENT CROSSINGS CLEAN AND TO ASSURE NO AIRCRAFT IS APPROACHING THEIR POSITION.

- PAVEMENT DUE TO CONSTRUCTION ACTIVITIES SHALL BE REMOVED IMMEDIATELY. THE OPERATIONAL AREA OF THE AIRPORT PAVEMENT MUST BE FREE OF FOREIGN OBJECT DEBRIS (FOD) AT ALL TIMES.
- 8. WHEN REQUESTED, NO LESS THAN ONE SELF-PROPELLED, STREET TYPE, VACUUM SWEEPER TRUCKS IN GOOD OPERATING CONDITION SHALL BE AVAILABLE ON SITE AT ALL TIMES. THE CONTRACTOR SHALL MAINTAIN ONGOING PAVEMENT VACUUMING OPERATIONS DURING ALL WORKING HOURS WITHIN AND ADJACENT TO THE CONSTRUCTION SITE AREAS AS DETERMINED BY THE RPR.
- APPROVED BY THE RPR PRIOR TO THE START OF WORK. THERE WILL BE NO 9. THE CONTRACTOR SHALL CONTROL CONSTRUCTION AREA GENERATED DUST ON A 24-HOUR BASIS. ONE WATER TRUCK IN GOOD OPERATING CONDITION SHALL BE AVAILABLE AT ALL TIMES. ALL TRUCK BEDS SHALL BE COVERED DURING HAULING OPERATIONS. DURING WINDY OR DRY PERIOD A SECOND HAUL ROUTE MAY BE REQUIRED. THE RPR MAY ALSO IMPOSE ADDITIONAL DUST CONTROL REQUIREMENTS AS NECESSARY THROUGHOUT CONSTRUCTION.
 - CONTRACTOR THROUGHOUT THE WORK SHIFT AND AT THE END OF THE SHIFT. CLEANUP EQUIPMENT (SWEEPERS, WATER TRUCKS, ETC.) AND OPERATORS SHALL REMAIN AT THE SITE UNTIL THE AREA IS ACCEPTED BY THE RPR AND AIRPORT OPERATIONS FOR START OF AIRCRAFT OPERATIONS.
 - 11. DURING THE PERIODS OF TIME THAT THERE IS NO CONSTRUCTION ACTIVITY (BETWEEN WORK SHIFTS), THE SWEEPERS AND WATER TRUCKS MUST BE READY AND ON-SITE WITH CONTRACTOR'S PERSONNEL AVAILABLE BY PHONE TO RESPOND IMMEDIATELY TO A DUST OR DEBRIS PROBLEM AS IDENTIFIED BY THE RPR. AT NO TIME SHALL THERE BE MORE THAN A 10 MINUTE RESPONSE TIME TO CALLS CONCERNING DUST OR DEBRIS PROBLEMS DURING WORK HOURS, AND A 90-MINUTE RESPONSE TIME AT ALL OTHER TIMES ON A 24-HOUR BASIS.
 - 12. LIMITS OF WORK SHALL BE VERIFIED BY THE CONTRACTOR AND THE RPR PRIOR TO BEGINNING WORK. THE CONTRACTOR'S VEHICLES AND EQUIPMENT SHALL BE RESTRICTED TO THE CONSTRUCTION AREA LIMITS ONLY. UNLESS TRAVELING TO OR FROM THE SITE VIA APPROVED HAUL ROUTES. UNDER NO CIRCUMSTANCES SHALL VEHICLES BE PARKED OR EQUIPMENT/MATERIALS BE STORED OUTSIDE OF THESE AREAS.
 - 13. MAXIMUM CONSTRUCTION TRAFFIC SPEED ON THE CONSTRUCTION ZONE AND HAUL ROUTE SHALL BE 15 MPH UNLESS POSTED OTHERWISE.
 - 14. SOME PORTIONS OF THE HAUL ROAD MAY REQUIRE TWO-WAY TRAFFIC ON A SINGLE LANE ROAD. THE CONTRACTOR SHALL PROVIDE THEIR OWN TRAFFIC CONTROL ON THESE PORTIONS OF THE HAUL ROUTE.

- 15. IF REQUIRED BY RPR, STOP SIGNS SHALL CONFORM TO AC 150/5370-2 (CURRENT EDITION)
- 16. TRACK DRIVEN VEHICLES MUST BE DELIVERED TO THE WORK AREA. METAL TRACK VEHICLES ARE NOT PERMITTED TO OPERATE ON PAVEMENT SURFACES THAT ARE TO REMAIN.
- 17. PARKING OF EMPLOYEE'S PRIVATE VEHICLES IS RESTRICTED TO PARKING AREAS OFF THE AOA. NO EMPLOYEE VEHICLES OR FOOD VENDORS WILL BE PERMITTED ON THE AOA. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFE TRANSPORT OF EMPLOYEES TO/FROM WORK AREAS CONSISTENT WITH 21. ALL VEHICLES UTILIZED WILL BE INSPECTED AT ACCESS GATES BY AIRPORT STANDARD PRACTICES.
- 18. EQUIPMENT OPERATING ON ALL ROADS WITHIN THE AIRFIELD SHALL CONFORM TO LEGAL LOAD LIMITS FOR PUBLIC HIGHWAYS. ROAD SURFACES SHALL BE SMOOTH (NON-MILLED) AND DEBRIS FREE AT ALL TIMES
- 19. UNLESS OTHERWISE DIRECTED BY THE RPR, WHEN USING RUNWAYS OR TAXIWAYS AS HAUL ROUTES, CONSTRUCTION VEHICLES SHALL USE THE OUTER 25 FEET ON ONE SIDE OF THE RUNWAY OR TAXIWAY.
- 10. HAUL ROUTES SHALL BE CONTINUOUSLY MAINTAINED AND CLEARED BY THE 20. ACCESS TO THE AOA WILL BE LIMITED TO ACCESS-CONTROLLED GATES 50 AND 51 ONLY. ACCESS THROUGH ANY OTHER GATE WILL NOT BE ALLOWED UNLESS APPROVED BY THE RPR.

MOBILIZATION

TOTAL



⊗	SIGN COVERING DETIAL (SEE DETAIL 6, SHEET G102)
RSA	RUNWAY SAFETY AREA
ROFA	RUNWAY OBJECT FREE AREA
ROFZ —	RUNWAY OBJECT FREE ZONE
TOFA	TAXIWAY OBJECT FREE AREA
TSA	TAXIWAY SAFETY AREA
	PROJECT AREA
	LOW PROFILE BARRICADES

HAUL ROUTE

PROPOSED STAGING AREA (STAGING IS **AVAILABLE ON 16 NUMERALS WHEN**

RUNWAY 16-34 IS CLOSED)

AIRFIELD IMPACTS:

- 1. TAXIWAY A CLOSURE WEST OF RUNWAY 6-24. THIS TAXIWAY WILL NEED ITS LIGHTING SYSTEMS TURNED OFF FOR DURATION OF PHASE 1 AND SIGNS COVERED.
- 2. WORK IN RUNWAY 34 LOCALIZER CRITICAL AREA
- 3. 30 DAY CLOSURE OF RUNWAY 16-34 FOR PHASE 1 AND NIGHTLY CLOSURE FOR PHASE 2.

OPERATIONAL IMPACTS:

1.TAXIWAY DECLARED DISTANCE.

PHASING NOTES

- "DAYS" SHOWN ON CONSTRUCTION SCHEDULE REFERS TO CONSECUTIVE CALENDAR DAYS
- CONCEPTUAL CONSTRUCTION SCHEDULES ARE SHOWN FOR REFERENCE ONLY AND MAY NOT REFLECT THE ACTUAL AVAILABILITY OF EACH WORK AREA AT THE TIME OF CONSTRUCTION CONTRACTOR SHALL PREPARE AND SUBMIT A BASELINE SCHEDULE, WHICH MUST BE APPROVED BY

THE RPR PRIOR TO CONSTRUCTION

WORK HOURS:

1. NIGHTLY (11PM TO 7AM) FOR PHASE 2 WORK. 2. FULL CLOSURE OF RUNWAY 16-34 FOR PHASE 1

CONTRACTOR-SUPPLIED GATE GUARDS. CONTRACTOR SHALL ENSURE THAT EACH GUARD WHO WILL MONITOR ACCESS TO THE AOA THROUGH APPROVED CONTRACTOR GATES HAS A VALID ROA ID BADGE PROMINENTLY DISPLAYED ABOVE WAIST LEVEL AND ON THEIR OUTERMOST GARMENT AT ALL TIMES AT ROA, HAS COMPLETED ROA GUARD ORIENTATION, AND HAS SIGNED AN ROA GUARD ACKNOWLEDGEMENT FORM THAT IS ON FILE WITH THE AIRPORT SECURITY. THE CONTRACTOR IS ADVISED TO EXPECT DELAYS AT GATE ENTRANCES AND TO PLAN ACTIVITIES ACCORDINGLY. THE CONTRACTOR WILL NOT BE ALLOWED UNESCORTED INSIDE THE MOVEMENT AREA.

ADCI

RS&H

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ROANOKE-BLACKSBURG REGIONAL **AIRPORT** (ROA)



RUNWAY 16-34 EMAS REPLACEMENT

REVISIONS NO. DESCRIPTION DATE DATE ISSUED: OCTOBER 17, 2023 REVIEWED BY: DRAWN BY AJB

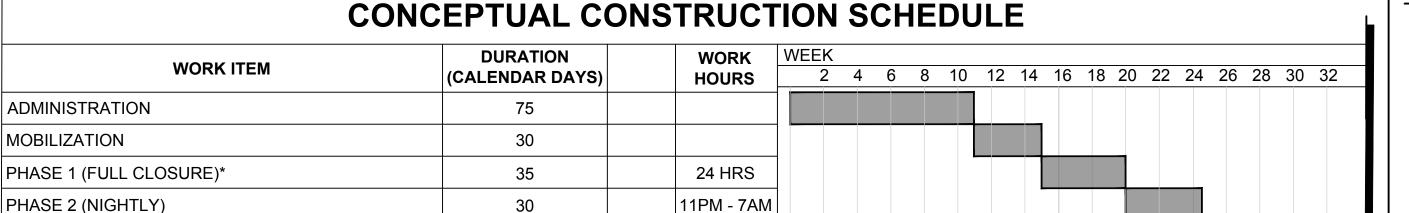
DESIGNED BY: CFM RS&H PROJECT NUMBER 1022-0071-003 (C) 2023 REYNOLDS, SMITH AND HILLS IN

SHEET TITLE

CONSTRUCTION SAFETY AND **PHASING OVERVIEW PLAN**

SHEET NUMBER SHEET 12 OF 31

BID SUBMITTAL



* RUNWAY CLOSURE PERIOD INCLUDES 5 DAYS OF WEATHER FOR IMPACTS TO CRITICAL PATH ITEMS ANY WEATHER DAYS IN EXCESS OF 5 DAYS (ON CRITICAL PATH ITEMS) WILL BE CONSIDERED A NON-COMPENSABLE TIME EXTENSION.

170

Feet

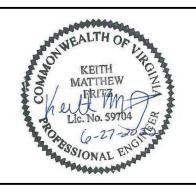
	FAR PART 77 POINT TABLE							
POINT NO.	NORTHING	EASTING	LATITUDE (N)	LONGITUDE (W)	SITE ELEV.	EQUIPMENT HEIGHT	FAR PART 77 ELEV.	EQUIPMENT CLEARANCE
1	3646892.38	11052598.58	N037° 19' 46.12"	W079° 58' 48.29"	1162.39	1182.39	1285.700	123.307
2	3646349.48	11052926.54	N037° 19' 40.80"	W079° 58' 44.12"	1168.49	1188.49	1196.030	27.541
3	3646859.63	11052544.46	N037° 19' 45.79"	W079° 58' 48.95"	1163.38	1183.38	1286.990	123.611
4	3646316.74	11052872.43	N037° 19' 40.47"	W079° 58' 44.78"	1168.38	1188.38	1197.310	28.927



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ROANOKE-BLACKSBURG REGIONAL AIRPORT (ROA)



RUNWAY 16-34 EMAS REPLACEMENT

REVI	SIONS			
NO.	DESC	RIPTION	1	DATE
-				
DATE I	SSUED:	ОСТОВ	ER 1	7, 2023
REVIEWED BY:			KMF	
DRAWN BY:			AJB	

DESIGNED BY:

MAXIMUM **EQUIPMENT HEIGHT PLAN**

RS&H PROJECT NUMBER 1022-0071-003 2023 REYNOLDS, SMITH AND HILLS INC.

G104 SHEET 13 OF 31

BID SUBMITTAL



OR MORE.

CLARITY.

CONSTRUCTION EQUIPMENT.

TRAFFIC CONTROL TOWER.

DURING CONSTRUCTION.

SUBJECT TO FAR PART 77 RESTRICTIONS.

EMAS BLOCK STAGING AREA

EXISTING GROUND CONTOUR

ANY BOOMS AND CONSTRUCTION EQUIPMENT SHALL BE LOWERED TO THE RESPECTIVE EQUIPMENT MINIMUM HEIGHT

WHEN NOT IN USE AND/OR AT THE END OF EACH WORK SHIFT. NOT IN USE IS DEFINED AS NO OPERATOR BEING AVAILABLE TO MOVE A PARTICULAR PIECE OF EQUIPMENT FOR 15 MINUTES

ARE INDICATED FOR THE CONTRACTOR AND REFERS TO ALL

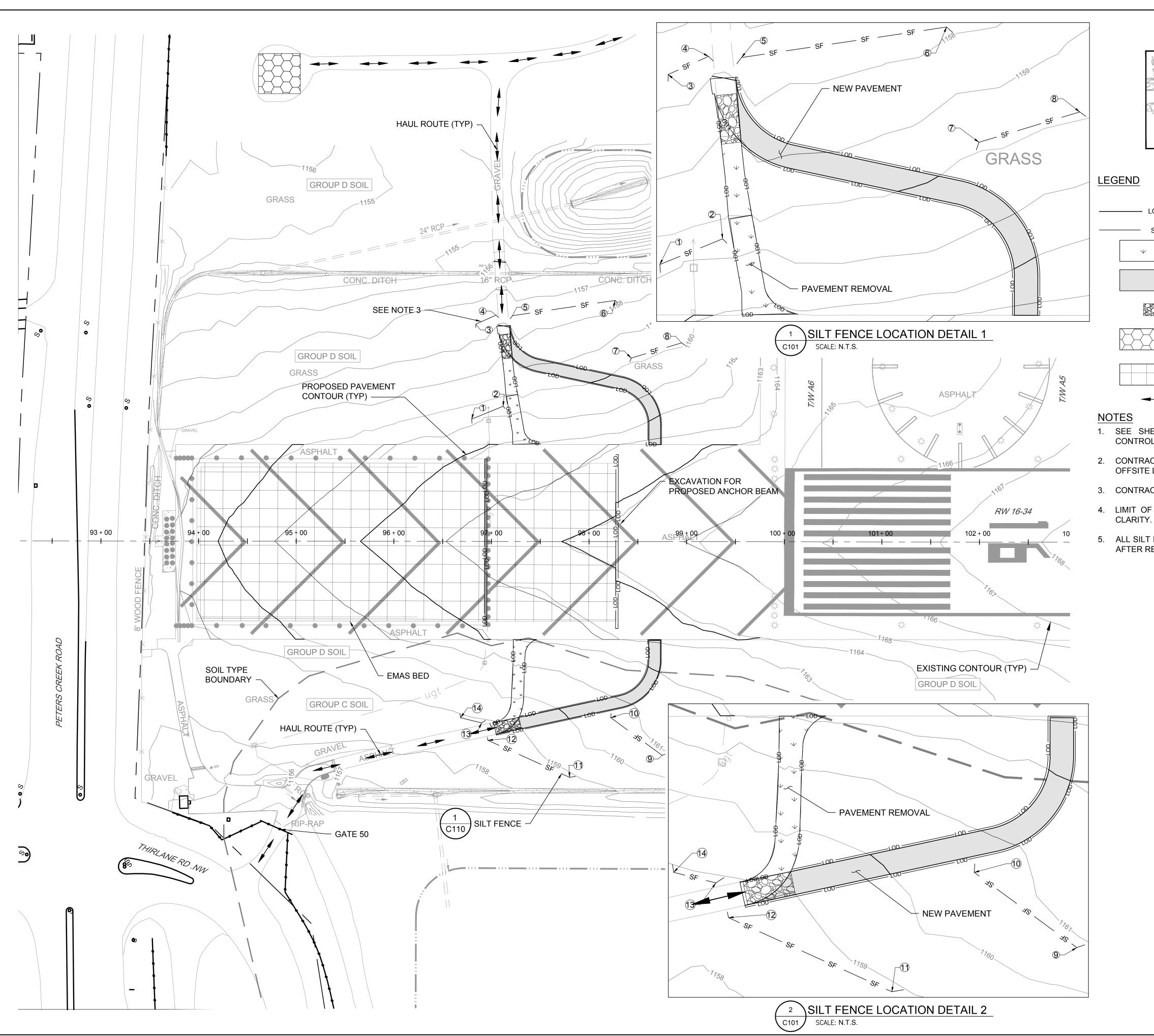
ACTIVE CONSTRUCTION ACTIVITIES WILL BE SUBJECT TO OFZ RESTRICTIONS ONLY. PERMANENT OBSTRUCTIONS

(EQUIPMENT NOT IN USE, STOCKPILES, BOOMS, ETC.) SHALL BE

CONTRACTOR SHALL NOTIFY THE RPR 7 DAYS PRIOR TO USING ANY EQUIPMENT OVER 20 FEET IN HEIGHT OR EQUIPMENT THAT VIOLATES MAXIMUM ALLOWABLE EQUIPMENT HEIGHT FOR COORDINATION WITH ROA OPERATIONS AND THE AIR

PART 77 SURFACE ONLY, AS RUNWAY 16-34 WILL BE CLOSED

FAR PART 77 SURFACE CONTOUR





KEYMAP (N.T.S.)

AIRPORT ACCESS ROAD REMOVAL AND SEEDING

ACCESS ROAD PAVING

STONE CONSTRUCTION ENTRANCE

STAGING AREA

EMAS BED

HAUL ROUTE

- 1. SEE SHEETS C110 AND C111 FOR EROSION AND SEDIMENT CONTROL NOTES AND DETAILS.
- 2. CONTRACTOR TO HAUL ANY EXCESS MATERIAL TO AN APPROVED OFFSITE LOCATION.
- 3. CONTRACTOR TO INSTALL SILT FENCE PARALLEL TO CONTOURS.
- 4. LIMIT OF DISTURBANCE AROUND SILT FENCE NOT SHOWN FOR
- 5. ALL SILT FENCE SHALL BE REMOVED PRIOR TO OPENING RW 16-34 AFTER RECEIVING APPROVAL OF RPR.

SILT FENCE POINT TABLE				
POINT NO.	NORTHING	EASTING		
1	3647046.23	11052232.66		
2	3647025.58	11052260.62		
3	3647093.09	11052318.10		
4	3647080.20	11052336.75		
5	3647065.51	11052345.00		
6	3646983.78	11052412.83		
7	3646938.96	11052370.98		
8	3646902.92	11052411.04		
9	3646700.85	11052039.47		
10	3646765.70	11052045.12		
11	3646770.03	11051971.00		
12	3646861.30	11051960.03		
13	3646876.04	11051971.92		
14	3646897.33	11051965.28		



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ROANOKE-BLACKSBURG REGIONAL AIRPORT

> ROANOKE-BLACKSBURG REGIONAL AIRPORT (ROA)



RUNWAY 16-34 EMAS REPLACEMENT

REVISIONS

NO. DESCRIPTION DATE

DATE ISSUED: OCTOBER 17, 2023

REVIEWED BY: KMF

DRAWN BY: AJB

DESIGNED BY: CFM

EROSION AND SEDIMENT CONTROL PLAN

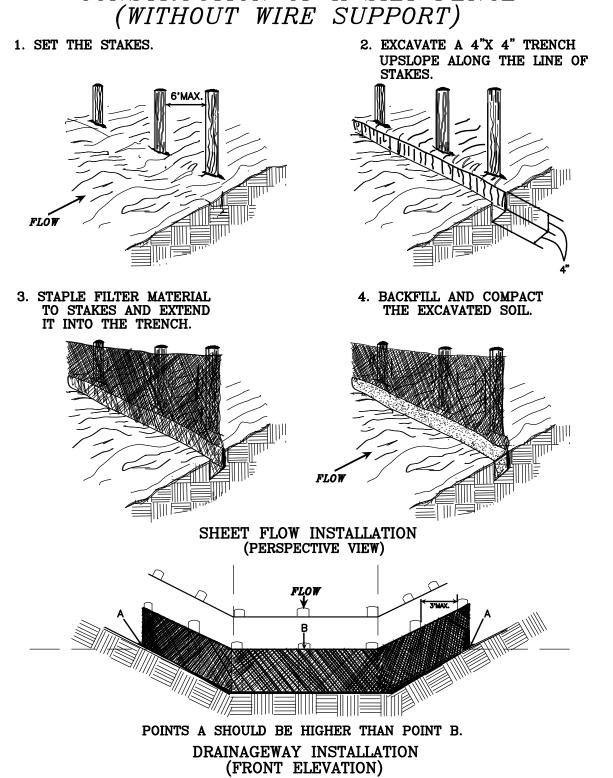
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1022-0071-003

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SHEET NUMBER
C101
SHEET 14 OF 31





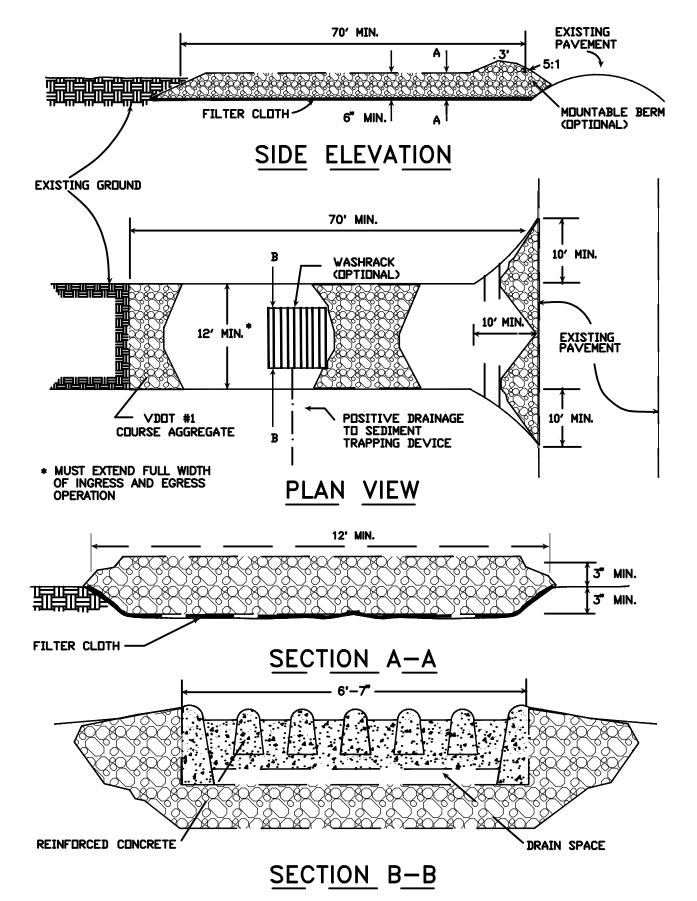
SOURCE: Adapted from <u>Installation of Straw and Fabric Filter Barriers for Sediment Control</u>, VA. DSWC Sherwood and Wyant

\SILT FENCE (WITHOUT WIRE SUPPORT)

PLATE. 3.05-2

APPROPRIATELY SIZED SILT SOCK APPROVED BY THE RPR CAN BE USED AS AN ALTERNATIVE TO SILT FENCE WHERE APPLICABLE.

STONE CONSTRUCTION ENTRANCE



SOURCE: ADAPTED from 1983 Maryland Standards for Soil erosion and Sediment Control, and Va. DSWC

Plate 3.02-1



NOTES:

1. ALTERNATIVE ROCK CONSTRUCTION ENTRANCES (FODS, MATTING, ETC) APPROVED BY THE RPR CAN BE USED AS AN ALTERNATIVE WHERE APPLICABLE.

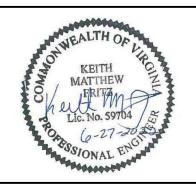


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ROANOKE-BLACKSBURG REGIONAL AIRPORT

ROANOKE-BLACKSBURG REGIONAL AIRPORT (ROA)



RUNWAY 16-34 EMAS REPLACEMENT

REVISIONS NO. DESCRIPTION DATE ISSUED: OCTOBER 17, 2023 REVIEWED BY: DRAWN BY: DESIGNED BY: RS&H PROJECT NUMBER

1022-0071-003 2023 REYNOLDS, SMITH AND HILLS INC.

EROSION AND SEDIMENT CONTROL **DETAILS**

SHEET NUMBER SHEET 15 OF 31

GENERAL EROSION AND SEDIMENT CONTROL NOTES

- 1. ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES WILL BE CONSTRUCTED AND MAINTAINED ACCORDING TO MINIMUM STANDARDS AND SPECIFICATIONS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK AND VIRGINIA REGULATIONS 4VAC50-30-40 EROSION AND SEDIMENT CONTROL REGULATIONS.
- 2. THE PLAN APPROVING AUTHORITY (CITY OF ROANOKE) MUST BE NOTIFIED ONE WEEK PRIOR TO THE PRE-CONSTRUCTION CONFERENCE, ONE WEEK PRIOR TO THE COMMENCEMENT OF LAND DISTURBING ACTIVITY, AND ONE WEEK PRIOR TO THE FINAL INSPECTION.
- 3. ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE PLACED PRIOR TO OR AS THE FIRST STEP IN CLEARING.
- 4. A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN SHALL BE MAINTAINED ON THE SITE AT ALL TIMES.
- 5. PRIOR TO COMMENCING LAND DISTURBING ACTIVITIES IN AREAS OTHER THAN INDICATED ON THESE PLANS (INCLUDING, BUT NOT LIMITED TO OFF-SITE BORROW OR WASTE AREAS), THE CONTRACTOR SHALL SUBMIT A SUPPLEMENTARY EROSION CONTROL PLAN TO THE OWNER FOR REVIEW AND APPROVAL BY THE PLAN APPROVING AUTHORITY.
- 6. THE CONTRACTOR WILL BE RESPONSIBLE FOR INSTALLATION OF ANY ADDITIONAL EROSION CONTROL MEASURES NECESSARY TO PREVENT EROSION AND SEDIMENTATION AS DETERMINED BY THE PLAN APPROVING AUTHORITY. THIS WILL BE CONSIDERED ADDITIONAL WORK IF NOT SHOWN.
- 8. ALL DISTURBED AREAS ARE TO DRAIN TO APPROVED SEDIMENT CONTROL MEASURES AT ALL TIMES DURING LAND DISTURBING ACTIVITIES AND DURING SITE DEVELOPMENT UNTIL FINAL STABILIZATION IS ACHIEVED.
- 9. DURING DEWATERING OPERATIONS, WATER WILL BE PUMPED INTO AN APPROVED FILTERING DEVICE.
- 10. THE CONTRACTOR WILL BE RESPONSIBLE FOR INSPECTING ALL EROSION CONTROL MEASURES PERIODICALLY AND AFTER EACH RUNOFF-PRODUCING RAINFALL EVENT. ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES SHALL BE MADE IMMEDIATELY.

GENERAL EROSION AND SEDIMENT CONTROL NARRATIVE

PROJECT DESCRIPTION

THE PURPOSE OF THIS PROJECT IS TO REMOVE THE EXISTING EMAS STRUCTURE IN THE RUNWAY 16 SAFETY AREA, AND REPLACE IT WITH A NEW EMAS BED ON THE EXISTING PAVED AREA. THERE WILL ALSO BE RELOCATION OF THE EXISTING VEHICLE SERVICE ROAD AS A RESULT OF THE NEW EMAS BED.

2. EXISTING SITE CONDITIONS

THE SITE IS AN AREA OF LEVEL TERRAIN WITH MILD SLOPES AT THE END OF THE EXISTING RUNWAY. THE AREAS THAT WILL REMAIN UNDISTURBED IN THE AREA ARE EITHER AVERAGE TO DENSE GRASS OR PAVED COVER.

3. ADJACENT PROPERTY

THE AIRPORT IS BORDERED BY PETERS CREEK ROAD AND US ROUTE 117 TO THE NORTH, US ROUTE 118 TO THE EAST, HERSHBERGER ROAD TO THE SOUTH AND THIRLANE ROAD TO THE WEST.

4. SOILS

SEQUOIA SILT LOAM - 7 TO 15 PERCENT SLOPES UDORTHENTS-URBAN LAND COMPLEX (SOIL TYPES SHOWN ON PLAN).

5: CRITICAL EROSION AREAS

THERE ARE NO CRITICAL EROSION AREAS ASSOCIATED WITH THIS PROJECT

6. STRUCTURAL PRACTICES

TEMPORARY CONSTRUCTION STONE ENTRANCE

A TEMPORARY CONSTRUCTION STONE ENTRANCE WILL BE USED AT THE AREAS SHOWN ON THE PROPSOED PLAN, WHERE THE TRUCKS WILL BE ENTERING THE LIMIT OF DISTURBANCE FOR DEMOLITION/PAVING OPERATIONS.

SILT FENCE OR APPROVED SILT SOCK

SILT FENCE SHALL BE INSTALLED ACCORDING TO THE POINT TABLE SHOWN ON THE PROPOSED PLANS, OR IN ANY ADDITIONAL AREAS AS ORDERED BY THE RPR.

7. MANAGEMENT STRATEGIES

- 1. CONSTRUCTION SHOULD BE SEQUENCED THAT GRADING OPERATIONS CAN BEGIN AND END AS QUICKLY AS POSSIBLE.
- 2. TEMPORARY SEEDING OR OTHER STABILIZATION SHALL FOLLOW IMMEDIATELY AFTER GRADING.
- 3. AREAS WHICH ARE NOT TO BE DISTURBED ARE TO BE CLEARLY MARKED BY FLAGS, SIGNS, ETC.
- 4. THE JOB SUPERINTENDENT SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL PRACTICES.

8. PERMANENT STABILIZATION

ALL AREAS DISTURBED BY CONSTRUCTION SHALL BE STABILIZED WITH PERMANENT SEEDING IMMEDIATELY FOLLOWING FINISHED GRADING. PERMANENT STABILIZATION SHALL BE IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS:

REGULAR SEEDING (T-901)

9. STORMWATER MANAGEMENT

PER VIRGINIA DEQ CODE, THERE IS NO STORMWATER MANAGEMENT DESIGN REQUIRED FOR PROJECTS WITH LESS THAN 10,000 SF OF TOTAL EARTH DISTURBANCE. THIS PROJECT IS JUST UNDER THE LIMIT (9,500 SF).

10. MAINTENANCE

IN GENERAL, ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE CHECKED WEEKLY AND AFTER EACH SIGNIFICANT RAINFALL. THE FOLLOWING ITEMS SHALL BE CHECKED IN PARTICULAR.

THE SILT FENCE BARRIERS SHALL BE CHECKED REGULARLY FOR UNDERMINING OR DETERIORATION.

ALL SEEDED AREAS SHALL BE CHECKED REGULARLY TO SEE THAT A GOOD STAND OF GRASS IS MAINTAINED. AREAS SHOULD BE REPAIRED AND RESEEDED AS NECESSARY.

SUGGESTED SEQUENCE OF CONSTRUCTION

PHASE:

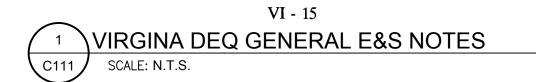
- 1 NOTIFY CITY OF ROANOKE FOR START OF CONSTRUCTION.
- 1 INSTALL PERIMETER AND E&S CONTROLS OF PROJECT
- 1 CONSTRUCTION OF PROPOSED UTILITIES, MILLING OF EXISTING PAVEMENT AND DEMOLITION OF EXISTING ANCHOR BEAM.
- 1 INSTALL NEW ANCHOR BEAM
- 1 REMOVAL OF EXISTING ROAD PAVEMENT TO BE DEMOLISHED, INSTALLATION OF NEW ROAD.
- 1 FINAL GRADING/STABILIZATION OF GRASS AREAS WITHIN LIMIT OF DISTRUBANCE.
- 1 NOTIFICATION OF APPROPRIATE AGENCIES AT THE CONCLUSION OF DISTURBANCE ACTIVITIES.
- 1 EMAS BED INSTALLTION
- *2 FINAL MARKING AND GROOVING
- *2 DEMOBILIZATION UPON PROJECT COMPLETION.
- * PHASE 2 FOLLOWS THE FULL CLOSURE OF THE RUNWAY AND WILL NOT INVOLVE ANY EARTH DISTURBANCE ACTIVITIES.

1992

TABLE 6-1

GENERAL EROSION AND SEDIMENT CONTROL NOTES

- ES-1: Unless otherwise indicated, all vegetative and structural erosion and sediment control practices will be constructed and maintained according to minimum standards and specifications of the <u>Virginia Erosion and Sediment Control Handbook</u> and Virginia Regulations 4VAC50-30 Erosion and Sediment Control Regulations.
- ES-2: The plan approving authority must be notified one week prior to the preconstruction conference, one week prior to the commencement of land disturbing activity, and one week prior to the final inspection.
- ES-3: All erosion and sediment control measures are to be placed prior to or as the first step in clearing.
- ES-4: A copy of the approved erosion and sediment control plan shall be maintained on the site at all times.
- ES-5: Prior to commencing land disturbing activities in areas other than indicated on these plans (including, but not limited to, off-site borrow or waste areas), the contractor shall submit a supplementary erosion control plan to the owner for review and approval by the plan approving authority.
- ES-6: The contractor is responsible for installation of any additional erosion control measures necessary to prevent erosion and sedimentation as determined by the plan approving authority.
- ES-7: All disturbed areas are to drain to approved sediment control measures at all times during land disturbing activities and during site development until final stabilization is achieved.
- ES-8: During dewatering operations, water will be pumped into an approved filtering device.
- ES-9: The contractor shall inspect all erosion control measures periodically and after each runoff-producing rainfall event. Any necessary repairs or cleanup to maintain the effectiveness of the erosion control devices shall be made immediately.

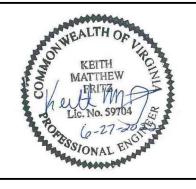




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ROANOKE-BLACKSBURG REGIONAL AIRPORT (ROA)



RUNWAY 16-34 EMAS REPLACEMENT

REVISIONS

NO. DESCRIPTION DATE

DATE ISSUED: OCTOBER 17, 2023

REVIEWED BY: KMF

RS&H PROJECT NUMBER
1022-0071-003
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SHEET TITLE

AJB

DRAWN BY:

DESIGNED BY:

EROSION AND SEDIMENT CONTROL NOTES

SHEET NUMBER

C111

SHEET 16 OF 31



 $\frac{\mathsf{KEYMAP}}{(\mathsf{N.T.S.})}$

<u>LEGEND</u>

RSA RUNWAY SAFETY AREA
ROFA RUNWAY OBJECT FREE AREA
TOFA TAXIWAY OBJECT FREE AREA
TAXIWAY SAFETY AREA

PAVEMENT MILLING 2"

EMAS BLOCK REMOVAL AND

FULL DEPTH PAVEMENT REMOVAL FOR EXISTING ANCHOR BEAM

PAVEMENT MILLING 2"

PAVEMENT MILLING 5"

PORTION OF GRAVEL ACCESS ROAD REMOVAL

PORTION OF ASPHALT ACCESS ROAD REMOVAL

PORTION OF ASPHALT ACCESS
ROAD REMOVAL

EXISTING EMAS REFLECTOR
 POST REMOVAL

NOTES

- 1. REFER TO SHEET C310 FOR LONGITUDINAL TYPICAL SECTION.
- 2. ASPHALT MILLING DEPTHS VARY APPROXIMATELY 2 INCHES TO 5 INCHES. MILLING DEPTHS ARE APPROXIMATE AND ARE ESTIMATED BASED ON BORING AND CORE INFORMATION.
- 3. SURVEY OF MILLED SURFACE IS REQUIRED FOR RPR REVIEW PRIOR TO PAVING. ADJUSTMENTS TO FINAL SURFACE GRADES MAY BE REQUIRED PRIOR TO PAVING BY RPR.
- 4. DEMOLITION OF PAVEMENTS SHALL FOLLOW THE APPROPRIATE PHASE OF CONSTRUCTION AND SHALL BE COORDINATED WITH THE RPR PRIOR TO DEMOLITION.
- 5. SAWCUTTING SHALL BE DONE ALONG ALL THE DEMOLITION PAVEMENT LIMITS PRIOR TO PAVEMENT MILLING. MILLING ALONG THE DEMOLITION PAVEMENT LIMITS PRIOR TO THE SAW CUT IS NOT ACCEPTABLE.
- 6. MILLINGS SHALL BECOME PROPERTY OF THE CONTRACTOR AND RESPONSIBLY DISPOSED OFF AIRPORT PROPERTY.
- 7. DEMOLITION ITEMS NOT SPECIFICALLY NOTED WITH A PAY ITEM SHALL BE CONSIDERED INCIDENTAL TO THE SPECIFICATION P-101 PAY ITEMS.
- 8. CALL MISS UTILITY AT 1-800-552-7001 BEFORE DIGGING.
- THE CONTRACTOR IS RESPONSIBLE FOR THE IMMEDIATE CLEANUP OF ANY DEBRIS DEPOSITED ALONG THE ACCESS ROUTE AS A RESULT OF CONSTRUCTION TRAFFIC.
- 10. DUST CONTROL MEASURES/EQUIPMENT MUST BE READILY AVAILABLE ON SITE FOR THE ENTIRE CONSTRUCTION DURATION.
- 11. APPROXIMATE LOCATION OF UNDERGROUND EXISTING TELECOMM LINE TO BE PROTECTED. LOCATE IN FIELD PRIOR TO ANY LAND DISTURBANCE ACTIVITIES.
- 12. PRIOR TO ACCESS ROAD REMOVAL AND CONSTRUCTION, CONTRACTOR TO VERIFY THERE ARE NO UTILITIES WITHIN THE EXISTING / PROPOSED ACCESS ROAD FOOTPRINT. UTILITY LOCATES SHALL BE INCIDENTAL TO ITEM C-104-5.1 PROJECT SURVEY AND STAKEOUT.
- 13. FOLLOWING MILLING, ANY REMAINING CRACKS WITHIN ASPHALT GREATER THAN 1/4-INCH SHALL BE PREPARED PER ASTM D6690 AND AS SHOWN IN DETAIL 1 ON SHEET C210.



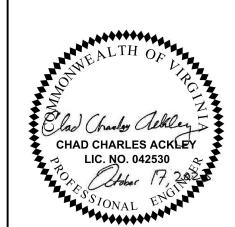
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> ROANOKE-BLACKSBURG REGIONAL AIRPORT (ROA)



RUNWAY 16-34 EMAS REPLACEMENT



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DEMOLITION PLAN

RS&H PROJECT NUMBER

1022-0071-003

SHEET TITLE

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SHEET NUMBER
C201
SHEET 17 OF 31

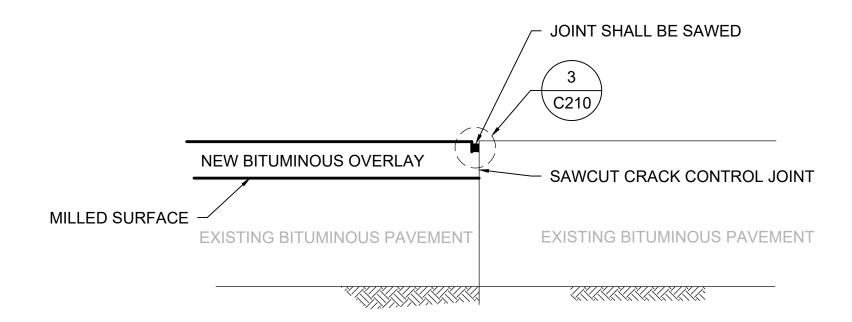
CRACKS 1/4" WIDE - MINIMUM

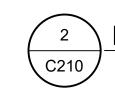


NOTES:

(WHITE IN COLOR)

- 1. CRACKS TO BE SEALED USING THIS DETAIL SHALL BE IDENTIFIED AND AGREED TO BY RPR AND CONTRACTOR. THIS APPLIES ONLY TO CRACKS IN MILLED ASPHALT.
- 2. THE REPAIRS MADE USING THIS DETAIL SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE PER LINEAR FOOT UNDER PAY ITEM P-101-5.2.
- 3. CLEAN AND DRY EXISTING CRACK BY SANDBLASTING OR AIR BLASTING. CRACK SHALL BE DUST-FREE PRIOR TO INSTALLATION OF SEALANT.
- 4. CRACKS ARE NOT TO BE FILLED PRIOR TO INSPECTION BY ENGINEER/RPR.
- 5. RECESS SEALANT BELOW THE SURFACE BY 1/4" WITH NO OVERBANDING. CONTRACTOR TO ENSURE SEALANT DOES NOT BLEED INTO MILLED SURFACE.

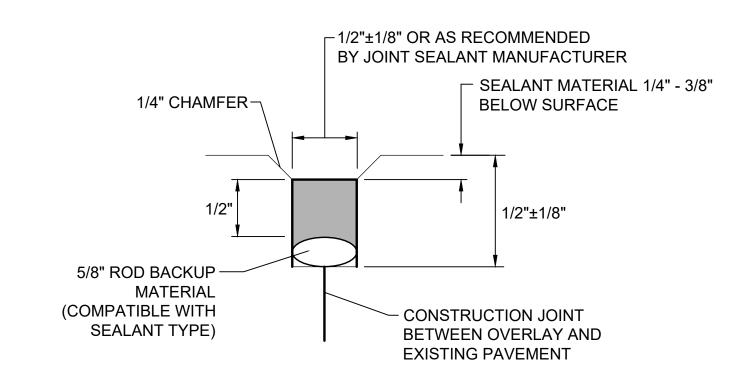




BITUMINOUS - BITUMINOUS PAVEMENT JOINT SCALE: N.T.S.

NOTES:

- 1. REFER TO SPECIFICATION P-605.
- 2. JOINT SHALL BE INCIDENTAL TO THE P-403 PAY ITEMS.



3 BITUMINOUS JOINT RESERVOIR SCALE: N.T.S.

NOTES:

1. JOINT SHALL BE INCIDENTAL TO THE P-403 PAY ITEMS.

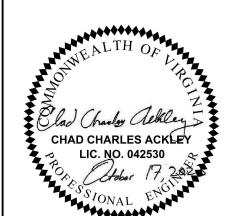
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> ROANOKE-BLACKSBURG REGIONAL AIRPORT (ROA)



RUNWAY 16-34 EMAS REPLACEMENT



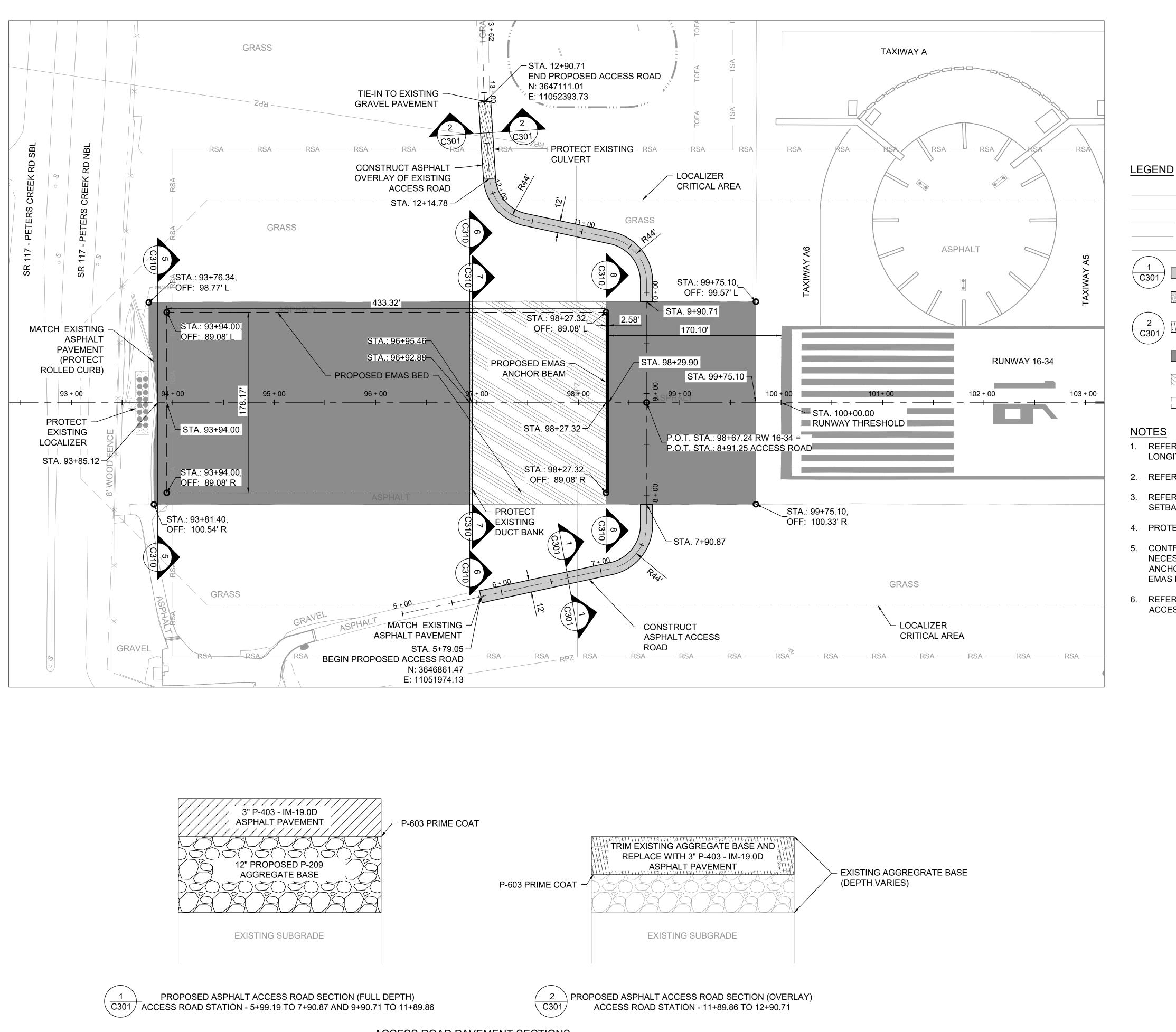
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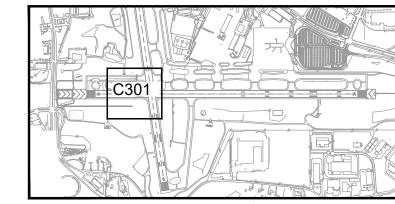
PAVEMENT REPAIR DETAILS

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C210
SHEET 18 OF 31







KEYMAP (N.T.S.)

RUNWAY SAFETY AREA RUNWAY OBJECT FREE AREA RUNWAY OBJECT FREE ZONE TAXIWAY OBJECT FREE AREA TAXIWAY SAFETY AREA FULL DEPTH ASPHALT ACCESS ROAD FULL DEPTH PAVEMENT AT EXISTING ANCHOR BEAM ASPHALT OVERLAY OVER EXISTING AGGREGATE VARIABLE DEPTH P-403 ASPHALT OVERLAY - 2"-3" NOMINAL DEPTH

VARIABLE DEPTH P-403 ASPHALT - 5"

NOMINAL DEPTH

PROPOSED EMAS BED

- 1. REFER TO SHEETS C310 FOR EXISTING AND PROPOSED LONGITUDINAL EMAS PAVEMENT SECTIONS.
- 2. REFER TO SHEETS C401 FOR EMAS BED PLAN AND PROFILES.
- 3. REFER TO SHEET QS101 EMASMAX PLAN LAYOUT FOR SETBACK AND EMASMAX SYSTEM GEOMETRIC LAYOUT
- 4. PROTECT LOCALIZER.

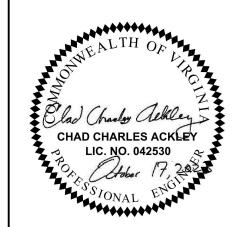
- 5. CONTRACTOR SHALL PROVIDE ALL MATERIALS, TOOLS, LABOR NECESSARY TO INSTALL THE EMAS ANCHOR BEAM. THE ANCHOR BEAM SHALL BE INCLUDED IN ITEM P-555-1. REFER TO EMAS DETAILS SHEET QS502 FOR FURTHER INFORMATION.
- REFER TO SHEET G009 HORIZONTAL CONTROL PLAN FOR ACCESS ROAD ALIGNMENT.

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> **ROANOKE-**BLACKSBURG REGIONAL **AIRPORT** (ROA)

ROANOKE-BLACKSBURG REGIONAL AIRPORT

RUNWAY 16-34 EMAS REPLACEMENT



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GEOMETRY AND **PAVING** PLAN

1022-0071-003

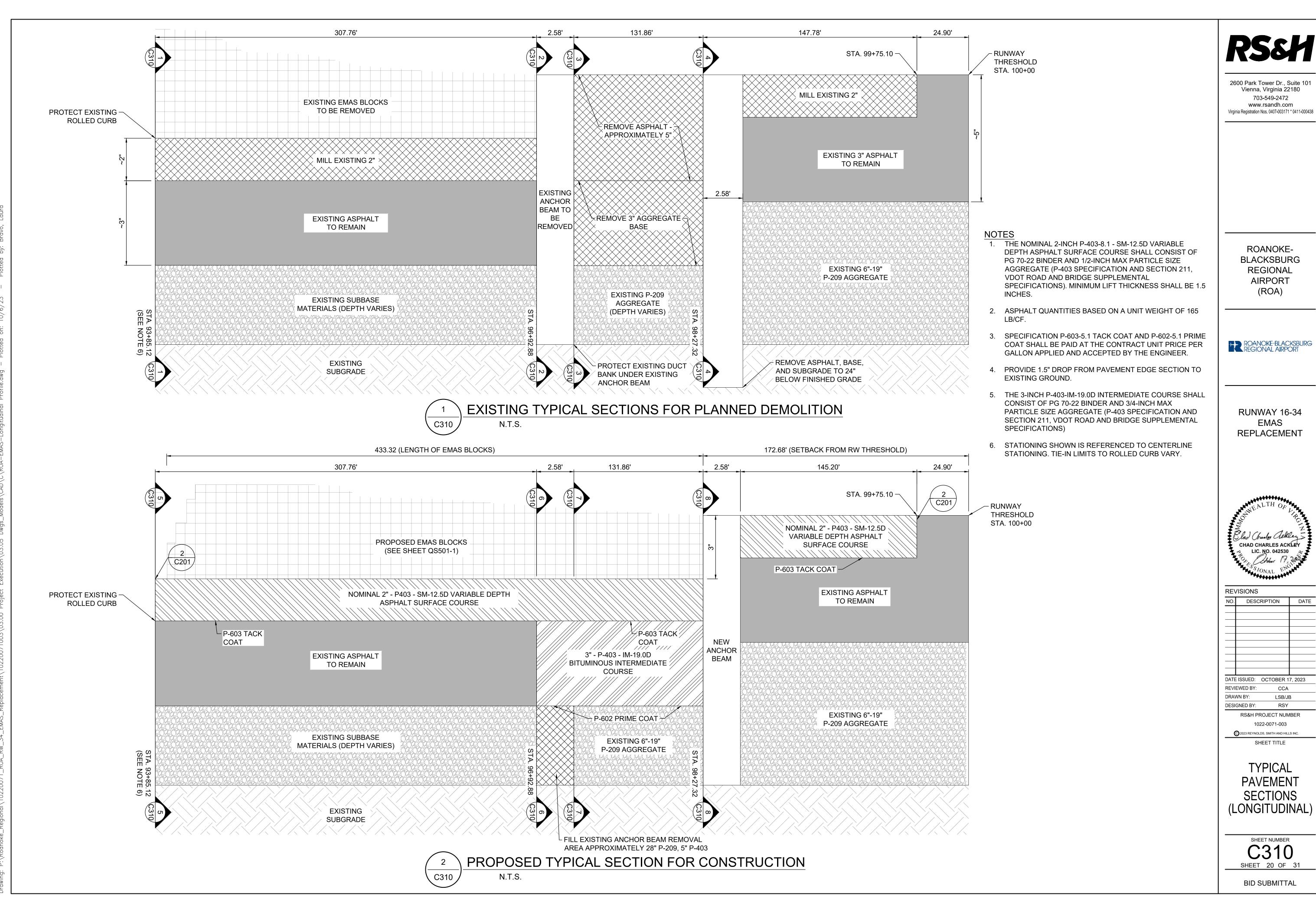
SHEET TITLE

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SHEET NUMBER C301 SHEET 19 OF 31

BID SUBMITTAL

HORZ SCALE IN FEET



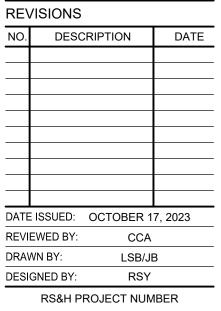
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> **ROANOKE-**BLACKSBURG REGIONAL **AIRPORT** (ROA)

ROANOKE-BLACKSBURG REGIONAL AIRPORT

RUNWAY 16-34 EMAS REPLACEMENT

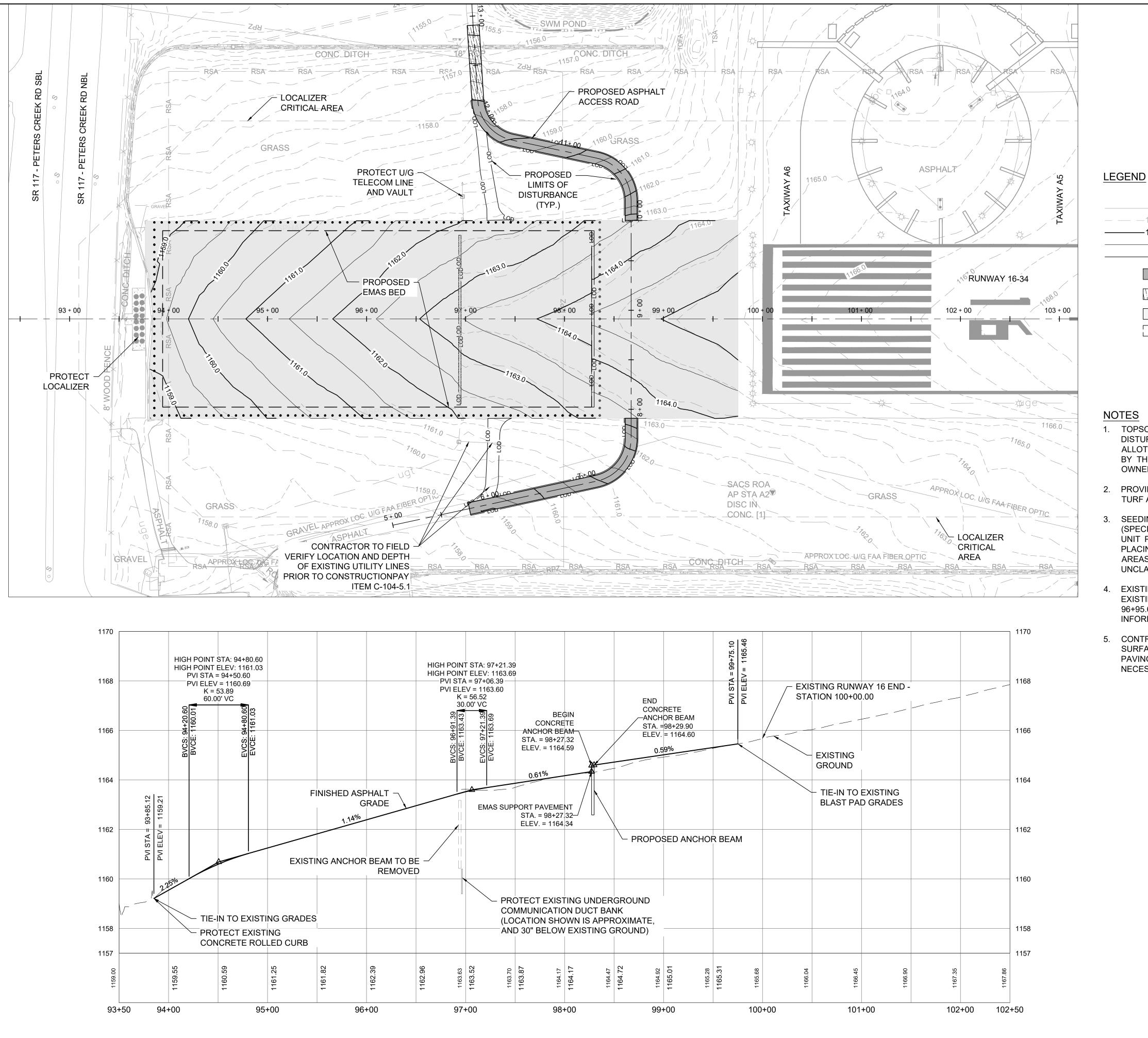
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LIC. NO. 042530

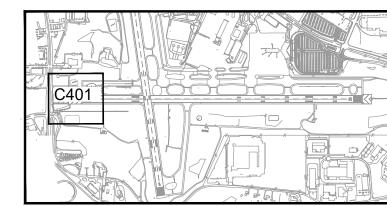


TYPICAL PAVEMENT SECTIONS (LONGITUDINAL)

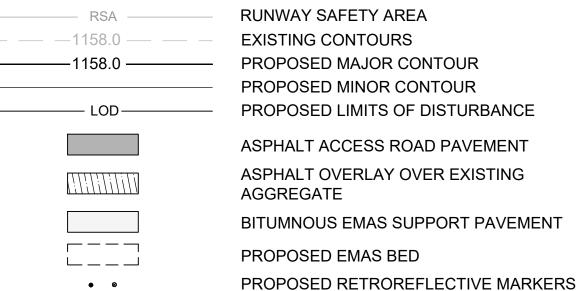
1022-0071-003

SHEET NUMBER C310 SHEET 20 OF 31





KEYMAP (N.T.S.)



- 1. TOPSOIL, SEED, AND MULCH ALL AREAS OF GROUND DISTURBANCE. ANY SOIL DISTURBANCE BEYOND THE ALLOTMENT IDENTIFIED ON THIS SHEET SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE OWNER.
- 2. PROVIDE 1.5-INCH DROP FROM ALL PAVED SURFACES INTO TURF AREAS.
- SEEDING (SPECIFICATION T-901) AND MULCHING (SPECIFICATION T-908) SHALL BE PAID USING THE RESPECTIVE UNIT PRICES. CONTRACTOR TO ENSURE SEED GROWTH BY PLACING A MAXIMUM OF 4-INCHES OF TOPSOIL IN DISTURBED AREAS. TOPSOILING IS INCIDENTAL TO P-152-5.1 -UNCLASSIFIED EXCAVATION.
- 4. EXISTING TOPOGRAPHIC INFORMATION NOT AVAILABLE UNDER EXISTING EMAS BED BETWEEN STATION 93+94.07 AND 96+95.67. PROPOSED GRADES ARE BASED ON AS-BUILT INFORMATION FROM FEBRUARY 2004.
- 5. CONTRACTOR SHALL COMPLETE SURVEY OF THE MILLED SURFACE AND PROVIDE TO ENGINEER 72 HOURS PRIOR TO PAVING. ENGINEER WILL PROVIDE UPDATED GRADING PLAN IF NECESSARY.

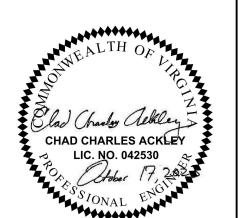


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> **ROANOKE-BLACKSBURG** REGIONAL AIRPORT (ROA)

ROANOKE-BLACKSBURG REGIONAL AIRPORT

RUNWAY 16-34 EMAS REPLACEMENT



REVISIONS NO. DESCRIPTION DATE ISSUED: OCTOBER 17, 2023 REVIEWED BY: CCA DRAWN BY: LSB/JB DESIGNED BY: RSY RS&H PROJECT NUMBER

> **EMAS GRADING PLAN AND** PROFILE

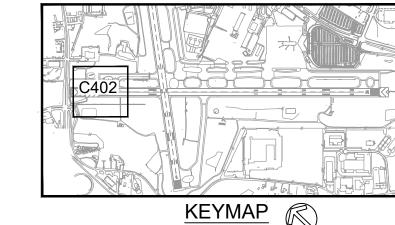
1022-0071-003 2023 REYNOLDS, SMITH AND HILLS INC.

SHEET TITLE

SHEET NUMBER C401 SHEET 21 OF 31

BID SUBMITTAL

Feet HORZ SCALE IN FEET VERT SCALE IN FEET



LEGEND

ASPHALT ACCESS ROAD PAVEMENT BITUMNOUS EMAS SUPPORT PAVEMENT PROPOSED EMAS BED

> FINAL SURFACE SPOT ELEVATION PROPOSED CONCRETE ANCHOR BEAM

NOTES

- TO THE GRADING AND DRAINAGE PLANS. THE CONTRACTOR SHALL PAVE SUCH THAT THE PAVEMENT AREAS DRAIN AS DEPICTED IN THE GRADING PLANS.
- 2. ALL PROPOSED PAVEMENT SHALL TIE INTO EXISTING GRADES
- CONSTRUCTION UPON FINAL SURVEY OF MILLED SURFACE. EXISTING PAVEMENT SURFACE GRADES UNDER EXISTING EMAS BLOCKS ARE UNKNOWN.

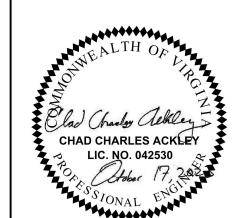


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> **ROANOKE-**BLACKSBURG REGIONAL AIRPORT (ROA)

ROANOKE-BLACKSBURG REGIONAL AIRPORT

RUNWAY 16-34 EMAS REPLACEMENT

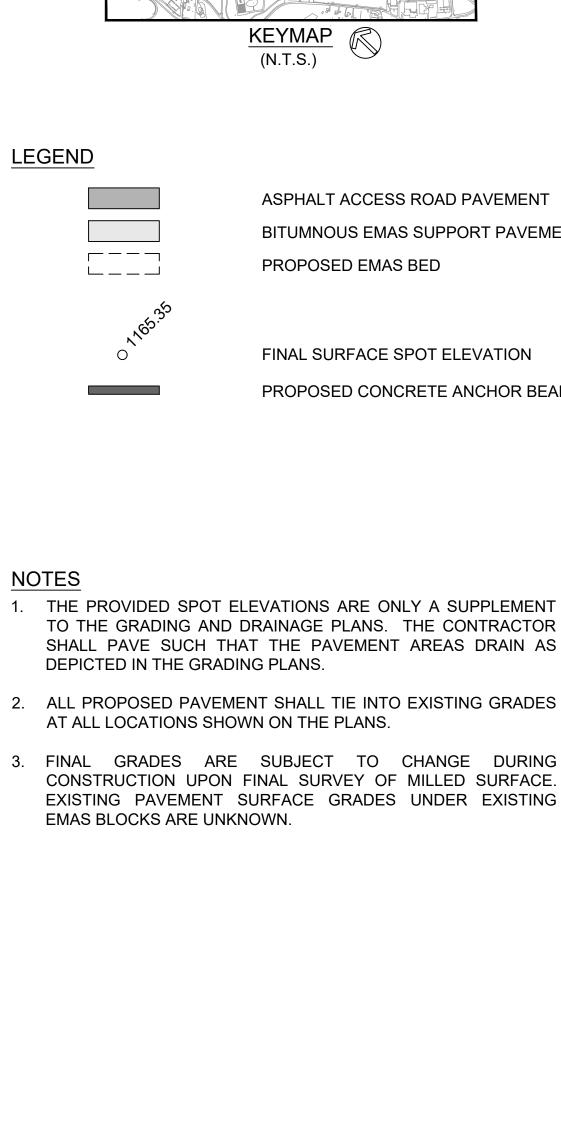


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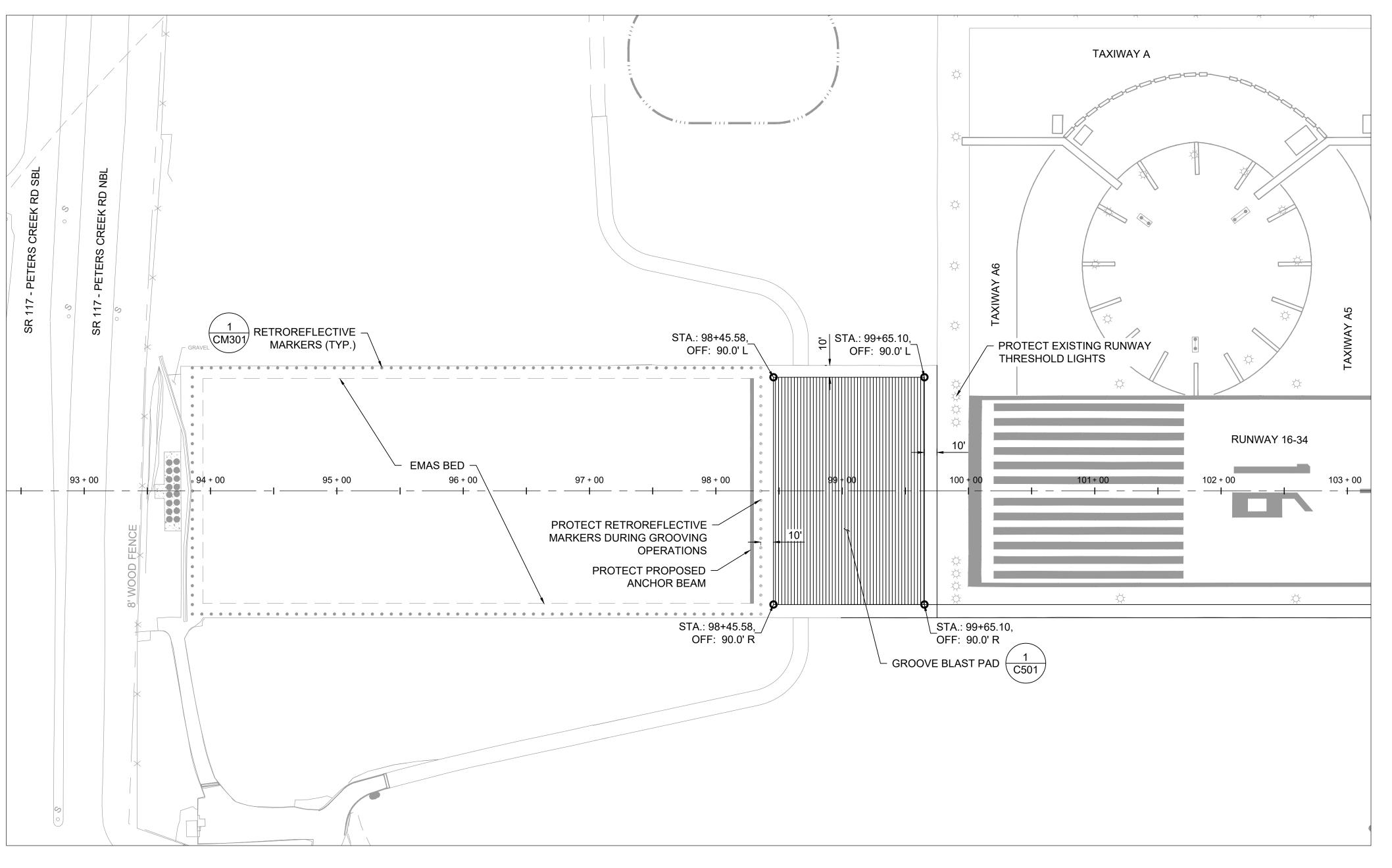
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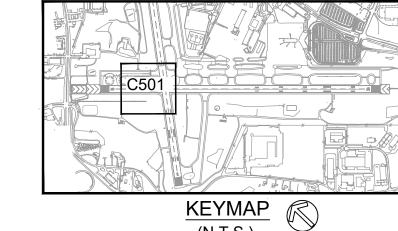
FINAL SURFACE SPOT **ELEVATION** PLAN

BID SUBMITTAL



HORZ SCALE IN FEET





LEGEND

• ⊗

PROPOSED EMAS BED PROPOSED RETROREFLECTIVE MARKERS

NOTES

- 1. GROOVE TO THE LIMITS AS SHOWN ON THIS SHEET. GROOVES SHALL BE PARALLEL TO THE ANCHOR BEAM AND RUNWAY THRESHOLD MARKING. TERMINATE GROOVING 10-FEET FROM THE EDGE OF THE PAVEMENT AS SHOWN ON THE PLAN.
- 2. GROOVES ARE TO BE SAW CUT AT 90° TO THE CENTERLINE OF THE RUNWAY AND SHALL BE AS SHOWN ON DETAILS BELOW. GROOVE LENGTH SHALL BE AS SHOWN ON THE PLANS.
- 3. ALL GROOVES SHALL BE SAW CUT AND NOT PLASTIC FORMED.
- 4. CONTRACTOR IS RESPONSIBLE FOR CONTINUOUS CLEANUP OF ALL WASTE MATERIAL GENERATED FROM GROOVING ACTIVITIES. WASTE MATERIAL SHALL BE DISPOSED OF BY EITHER SWEEPING OR VACUUMING. GROOVING WASTE SHALL NOT BE DISPOSED OF ON AIRPORT PROPERTY.
- 5. WASTE MATERIAL SHALL NOT BE FLUSHED INTO THE AIRPORT UNDERDRAIN OR STORM SYSTEM. WASTE MATERIAL SHALL NOT BE ALLOWED TO DRAIN ONTO THE GRASS ADJACENT TO THE RUNWAY OR LEFT ON THE RUNWAY SURFACE OR SHOULDERS.
- 6. ALL GROOVES SHALL BE CLEAN AND FREE OF DEBRIS, DIRT, LAITANCE, OR OTHER FOREIGN MATERIALS FOR ACCEPTANCE. CONTRACTOR SHALL INSPECT SITE WITH RPR TO ENSURE WASTE CLEANUP IS SATISFACTORY.
- 7. SAW CUT GROOVING SHALL BE PAID UNDER SECTION P-621. SAW CUT GROOVING SHALL BE MEASURED AROUND THE OUTER EXTENT OF ACTUAL GROOVED AREA.
- 8. GROOVING THROUGH LONGITUDINAL OR DIAGONAL SAW KERFS WHERE LIGHTING CABLES ARE INSTALLED WILL NOT BE ALLOWED.
- 9. GROOVES SHALL BE CUT BY A GANG SAW CAPABLE OF CUTTING A MINIMUM
- WIDTH OF 2 FEET IN ONE PASS.
- 10. GROOVING SHALL NOT COMMENCE UNTIL THE BITUMINOUS PAVEMENT HAS SUFFICIENTLY CURED (TO PREVENT DISPLACEMENT OF THE AGGREGATE, USUALLY 30 DAYS).
- 11. GROOVING OPERATIONS MUST BE COMPLETE BEFORE THE FINAL PAINTING OF CHEVRONS ON THE EMAS SUPPORT PAVEMENT MAY COMMENCE.

(N.T.S.)

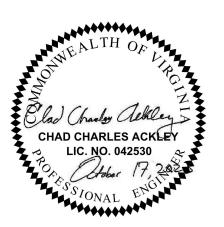
BLACKSBURG REGIONAL AIRPORT (ROA)

ROANOKE-

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ROANOKE-BLACKSBURG REGIONAL AIRPORT

RUNWAY 16-34 EMAS REPLACEMENT



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1022-0071-003 2023 REYNOLDS, SMITH AND HILLS INC. SHEET TITLE

GROOVING PLAN DETAILS

SHEET 23 OF 31

BID SUBMITTAL

1/4"± 1/16" ─ BLAST PAD

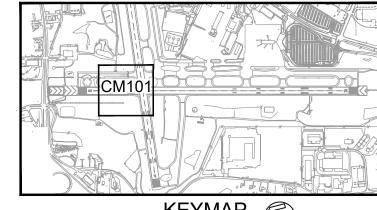


1-1/2"; -1/8"+0"

1/4"+/- 1/16" (TYPICAL)







KEYMAP (N.T.S.)

LEGEND

PROPOSED EMAS BED

RUNWAY SAFETY AREA

NOTES

- 1. CHEVRON MARKING ENDS SHALL NOT EXCEED 5' FROM THE PAVEMENT EDGE.
- 2. SEE SHEET CM201 FOR PAVEMENT MARKING DETAILS.
- 3. SURFACE CONDITION AND ALL MARKING LAYOUTS SHALL BE VERIFIED BY THE RPR PRIOR TO PAINTING. REFER TO SECTIONS 620-3.3 THROUGH 620-3.5 IN THE P-620 SPECIFICATION.
- 4. REFER TO SECTION 620-3.1 IN THE P-620 SPECIFICATION FOR PAINTING WEATHER LIMITATIONS.
- 5. ALL INITIAL MARKINGS SHALL BE APPLIED AT HALF THE APPLICATION RATE (SPECIFICATION P-620-5.2) AS DESCRIBED IN P-620 AND WITHOUT THE REFLECTIVE MEDIA (GLASS BEADS). ONLY THE FINAL MARKINGS (SPECIFICATION P-620-5.2) SHALL BE APPLIED AT THE FULL APPLICATION RATE AND WITH THE REFLECTIVE MEDIA (GLASS BEADS, P-620-5.3).
- 6. FINAL PAVEMENT MARKING APPLICATION SHALL BE APPLIED 30 DAYS AFTER PAVEMENT HAS CURED.
- 7. ALL MARKINGS DESIGNATED TO BE INSTALLED ON EMASMAX BLOCKS MAY BE APPLIED WITH A WALK BEHIND APPLICATOR OF SUCH WEIGHT THAT IT WILL NOT DAMAGE THE EMAS MATERIAL. PAYMENT FOR MARKING ON EMAS SHALL BE THE SAME AS ASPHALT MARKING.
- ANY MARKINGS DAMAGED BY CONTRACTOR SHALL BE REMARKED AT NO EXPENSE TO THE OWNER.

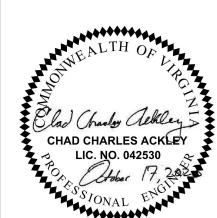


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> ROANOKE-BLACKSBURG REGIONAL AIRPORT (ROA)

ROANOKE-BLACKSBURG REGIONAL AIRPORT

RUNWAY 16-34 EMAS REPLACEMENT



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PAVEMENT MARKING PLAN

1022-0071-003

SHEET TITLE

2023 REYNOLDS, SMITH AND HILLS INC.

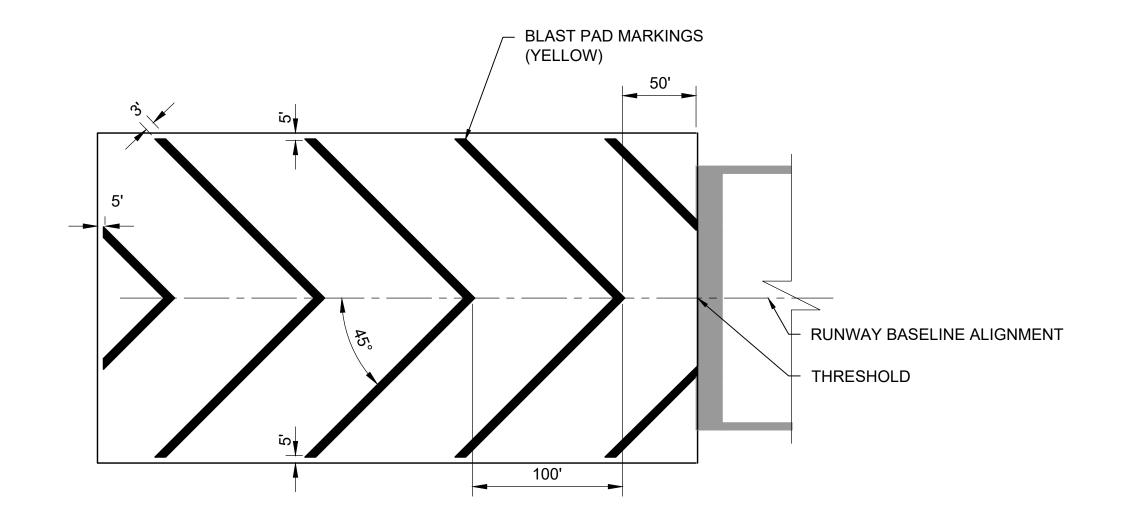
SHEET NUMBER

CM101

SHEET 24 OF 31

BID SUBMITTAL

30 60 Feet





NOTES:

- 1. ALL RUNWAY MARKINGS SHALL COMPLY WITH THE FAA AC 150/5340-1M, OR LATEST REVISION. ALL ROADWAY MARKINGS SHALL COMPLY WITH THE U.S. DEPARTMENT OF TRANSPORTATION'S MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
- 2. REFLECTORIZED (TYPE III GLASS BEADS) PAINT SHALL BE USED FOR ALL PERMANENT PAVEMENT MARKINGS AT THE RATE DESIGNATED IN THE P-620 SPECIFICATION EXCEPT FOR BLACK OUTLINE.
- 3. SEE PAVEMENT MARKING PLAN, SHEET CM101 FOR HORIZONTAL CONTROL.
- 4. BLAST PAD CHEVRONS MARKINGS ARE YELLOW.
- 5. IMMEDIATELY PRIOR TO THE APPLICATION OF PAINT, ALL SURFACES SHALL BE DRY AND FREE FROM DIRT, GREASE, OIL, LAITANCE, RUBBER, OR OTHER FOREIGN MATERIAL WHICH WOULD REDUCE THE BOND BETWEEN THE PAINT AND THE PAVEMENT. THIS SHALL INCLUDE EXISTING PAINTED AREAS. REFER TO SPECIFICATION P-620.
- 6. ALL AIRFIELD LIGHT FIXTURES SHALL BE PROTECTED FROM OVERSPRAY.
- 7. EXISTING PAVEMENT MARKINGS OUTSIDE THE LIMITS OF MARKING SHOWN ON PLAN SHEETS WHICH ARE REMOVED OR WORN DUE TO CONSTRUCTION ACTIVITY SHALL BE REPAINTED, AS DIRECTED BY ENGINEER/RPR.
- 8. ALL FINAL RUNWAY PAINT MARKINGS SHALL BE OUTLINED WITH A 6" BLACK BORDER AND SHALL BE PAID PER SPECIFICATION P-620. FINAL ROADWAY MARKINGS DO NOT REQUIRE BLACK BORDER.
- 9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE APPLICATION ORDER FOR THE BLACK OUTLINE AROUND FINAL PAINT MARKINGS.
- 10. IF THE CONTRACTOR CHOOSES TO INSTALL BLACK MARKING FIRST, PRIOR TO WHITE/YELLOW MARKINGS INSTALLATION, CONTRACTOR SHALL ONLY BE PAID FOR WIDTH OF THE BLACK ENHANCEMENT.
- 11. IF CONTRACTOR CHOOSES TO PAINT BLACK MARKINGS AFTER WHITE/YELLOW HAS BEEN INSTALLED, CONTRACTOR SHALL NOT ALLOW BLACK PAINT OVERSPRAY ONTO THE WHITE/YELLOW MARKINGS AS THERE MUST BE CLEAN STRAIGHT LINES FOR ALL MARKINGS.
- 12. ALL MARKING OPERATIONS ON EMAS BLOCKS SHALL BE COMPLETED PER NOTE 7 ON SHEET CM101.

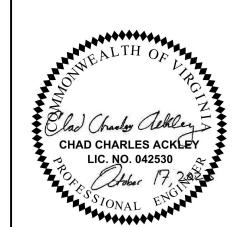


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> ROANOKE-BLACKSBURG REGIONAL AIRPORT (ROA)



RUNWAY 16-34 EMAS REPLACEMENT



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PAVEMENT MARKING DETAILS

RS&H PROJECT NUMBER 1022-0071-003

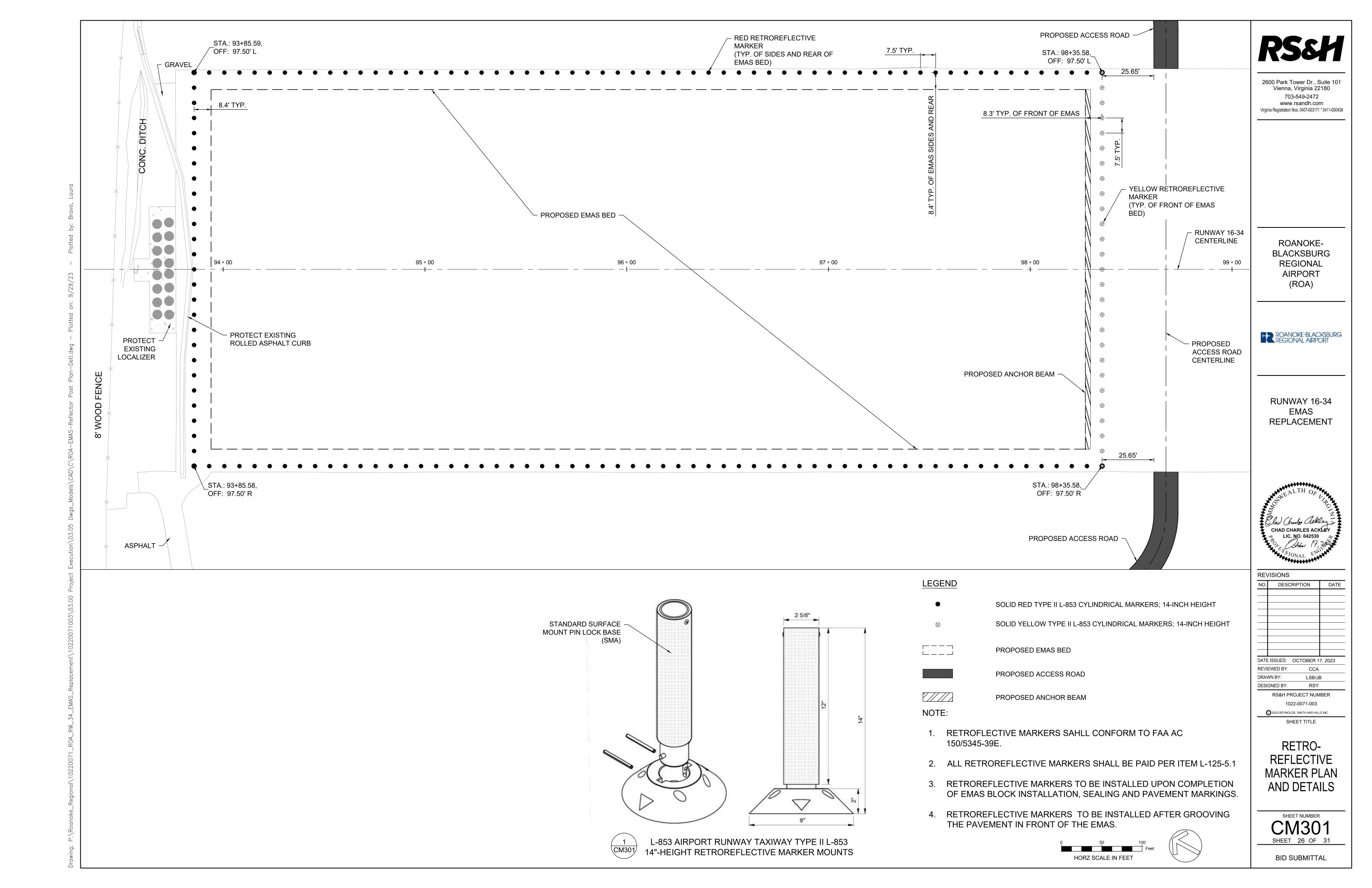
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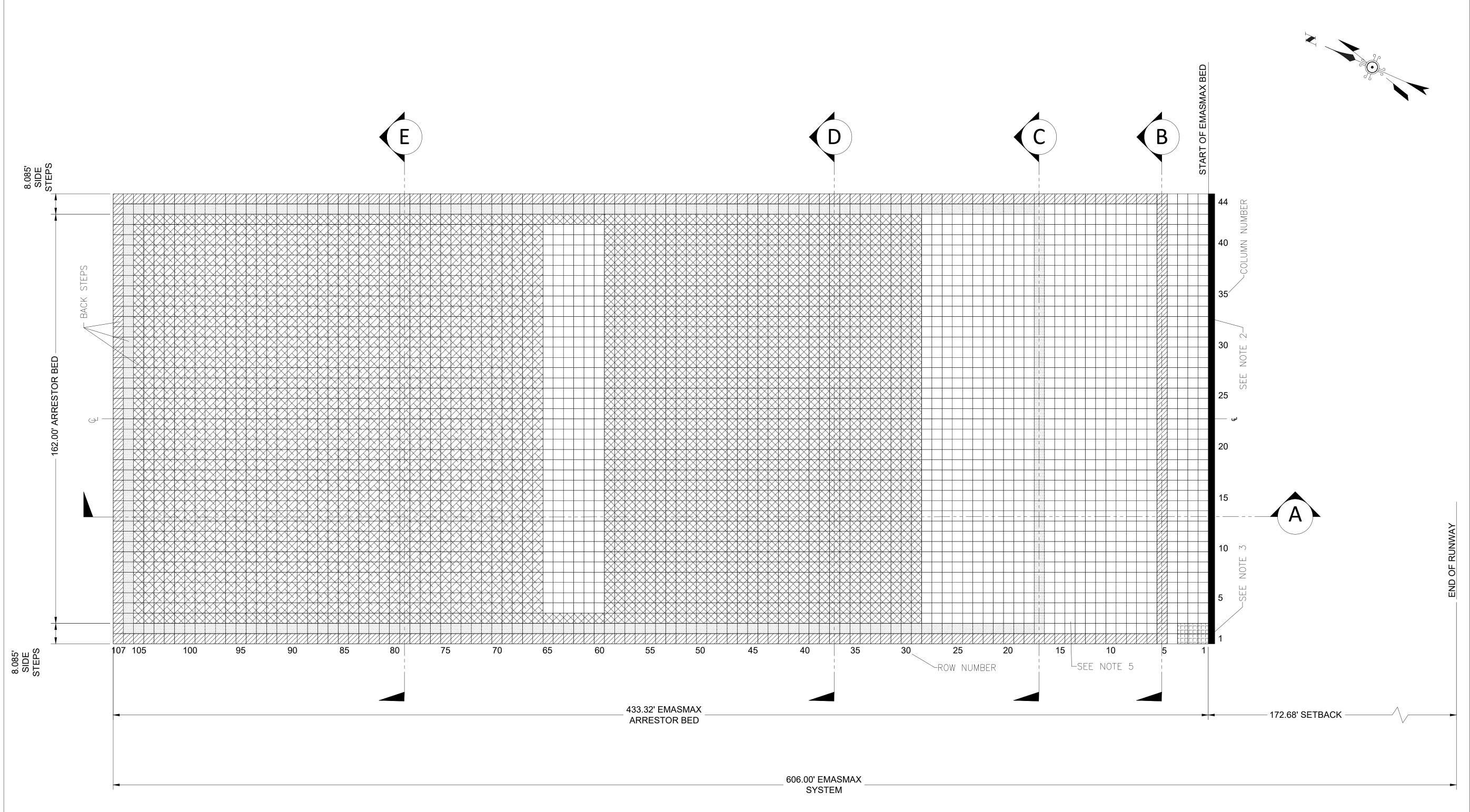
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SHEET NUMBER

CM201

SHEET 25 OF 31

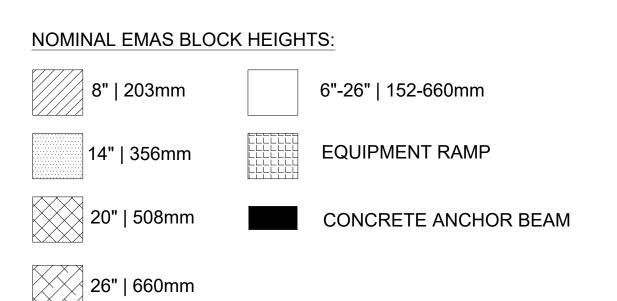




EMASMAX LAYOUT PLAN FOR RUNWAY 34 DEPARTURE END

NOTES:

- 1. INSTALL EMASMAX SYSTEM IN ACCORDANCE WITH SPECIFICATION P-555 AND AS DIRECTED AND SUPERVISED BY ON-SITE EMASMAX MANUFACTURER REPRESENTATIVES.
- 2. DEBRIS DEFLECTOR ASSEMBLY SHALL BE INSTALLED ON TOP OF THE CONCRETE ANCHOR BEAM PRIOR TO BLOCK INSTALLATION. SEE DETAILS 1, 2, 3 & 4.
- 3. DEBRIS DEFLECTOR ASSEMBLY IS NOT TO BE INSTALLED IN FRONT OF EQUIPMENT RAMP. BLOCKS WILL RISE FROM FLUSH WITH THE BACK OF THE ANCHOR BEAM 6" TO 8" OVER THE 8' EQUIPMENT RAMP.
- 4. WITH EXCEPTION OF THE FIRST ROW, ALL EMASMAX BLOCKS SHALL BE INSTALLED WITH A 0.05' (≈1/2") GAP FROM ADJACENT BLOCKS.
- 5. ALL EMASMAX BLOCKS ARE 4.0' X 4.0' AND VARY IN HEIGHT. FOR BLOCK HEIGHTS SEE PROFILE "A" ON EMASMAX PROFILE SHEET AND EMASMAX SECTION SHEET FOR SECTION B.
- 6. IF APPROACH LIGHTS EXIST WITHIN THE EMAS BED, THE EMASMAX MANUFACTURER WILL SUPPLY WATERPROOF BOOTS TO BE INSTALLED WITH APPROACH LIGHT SUPPORTS UNDER DIRECTION AND SUPERVISION OF THE ON-SITE EMASMAX MANUFACTURER REPRESENTATIVES.
- 7. ALL MARKINGS DESIGNATED TO BE INSTALLED ON EMASMAX BLOCKS MAY BE APPLIED WITH A WALK BEHIND APPLICATOR OF SUCH WEIGHT THAT IT WILL NOT DAMAGE THE EMAS MATERIAL.
- 8. IF NOT GROOVED YET, PAVEMENT GROOVING IS RECOMMENDED IN FRONT OF EMAS ARRESTOR BED (TOWARDS RUNWAY).



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RUNWAY SAFE

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> > AIRPORT (ROA)

ROANOKE-BLACKSBURG REGIONAL AIRPORT

RUNWAY 16-34 EMAS REPLACEMENT

REVISIONS

NO. DESCRIPTION DATE

1 TEXT EDIT 10/04/23

DATE ISSUED: JUNE 29, 2023

REVIEWED BY:
DRAWN BY: OAR

DESIGNED BY: RWS

EMASMAX PLAN LAYOUT

(C) 2023 REYNOLDS, SMITH AND HILLS IN

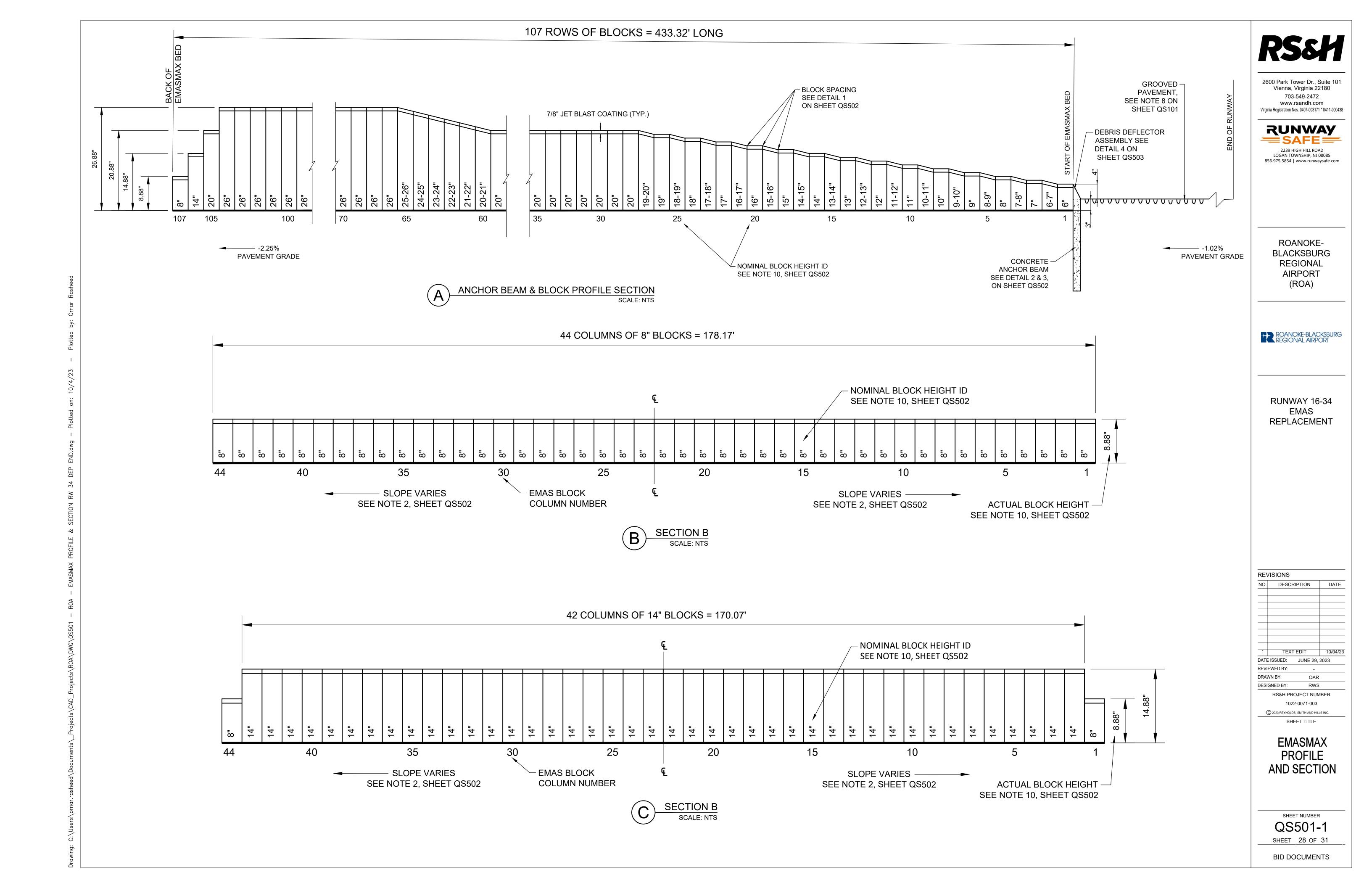
RS&H PROJECT NUMBER 1022-0071-003

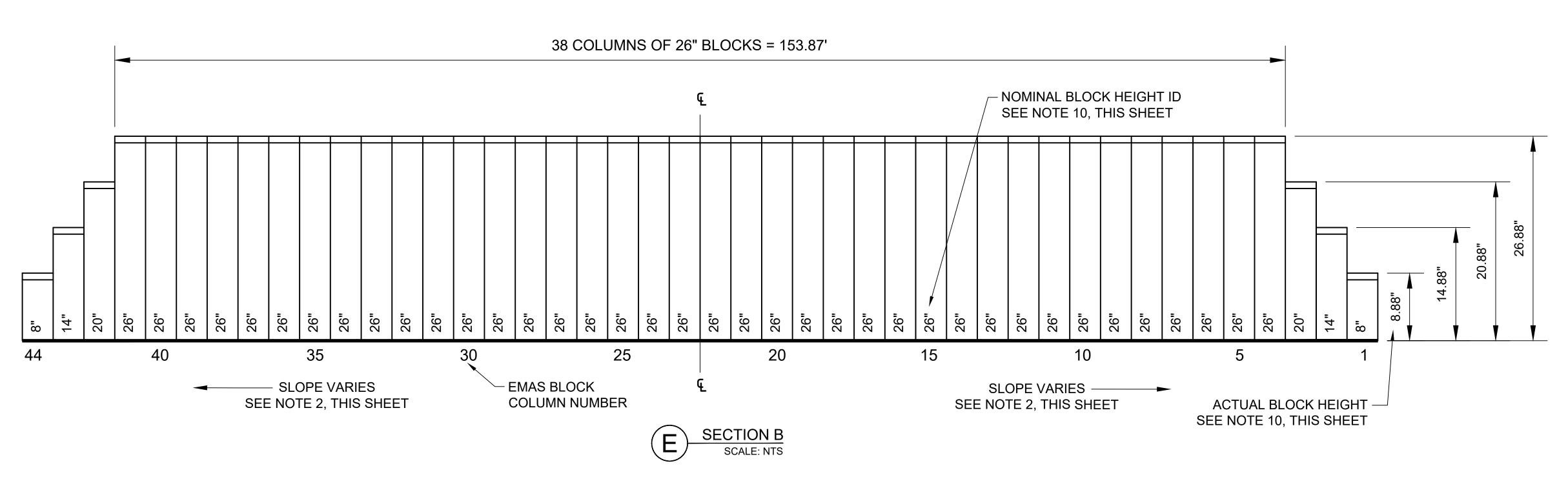
SHEET NUMBER

QS101

BID DOCUMENTS

SHEET 27 OF 31





EMAS GENERAL NOTES:

- 1. THE LONGITUDINAL GRADING CHANGE SHOULD BE FINALIZED AT THE EMAS BLOCK JOINTS.
- 2. THE TRANSVERSAL SLOPE OF THE TOP SURFACE OF THE FINISHED EMAS BED SHOULD FOLLOW PAVEMENT SLOPE. REFER TO THE CIVIL DRAWINGS FOR THE SLOPE.
- 3. THE EMAS CONTRACTOR SHALL COORDINATE WITH EMASMAX MANUFACTURER TO SCHEDULE AND ACCEPT DELIVERY OF THE EMASMAX BLOCKS.
- 4. THE EMASMAX CONTRACTOR SHALL BEGIN BLOCK INSTALLATION BY ABUTTING THE FIRST ROW OF BLOCKS AGAINST THE PROPOSED CONCRETE ANCHOR BEAM.
- 5. AT THE CONCLUSION OF EACH DAY THE EMAS CONTRACTOR SHALL HAVE ALL SURFACE JOINTS SEALED, UNLESS STATED BY EMASMAX

MANUFACTURER REPRESENTATIVE SEE DETAIL 5, EMASMAX DETAILS SHEET QS503.

- 6. DEBRIS DEFLECTOR ASSEMBLY AND ANCHOR BOLTS WILL BE PROVIDED BY EMAS MANUFACTURER.
- 7. EMAS BED LENGTH TOLERANCE IS -0.1% TO +0.1%.
- 8. EMAS BED HEIGHT TOLERANCE IS -0.25" TO +0.75"
- 9. EMAS BED ALIGNMENT TOLERANCE IS ± 1/8" OVER A 20.25' SPAN.
- 10. ALL BLOCKS ARE 4.0' X 4.0' X THICKNESS SHOWN. A JET BLAST COATING IS APPLIED PRIOR TO SHIPPING. FOR EASE OF IDENTIFYING BLOCKS DURING CONSTRUCTION, NOMINAL VALUES ARE USED.

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RUNWAY 16-34 EMAS REPLACEMENT

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EMASMAX PROFILE AND SECTION

RS&H PROJECT NUMBER

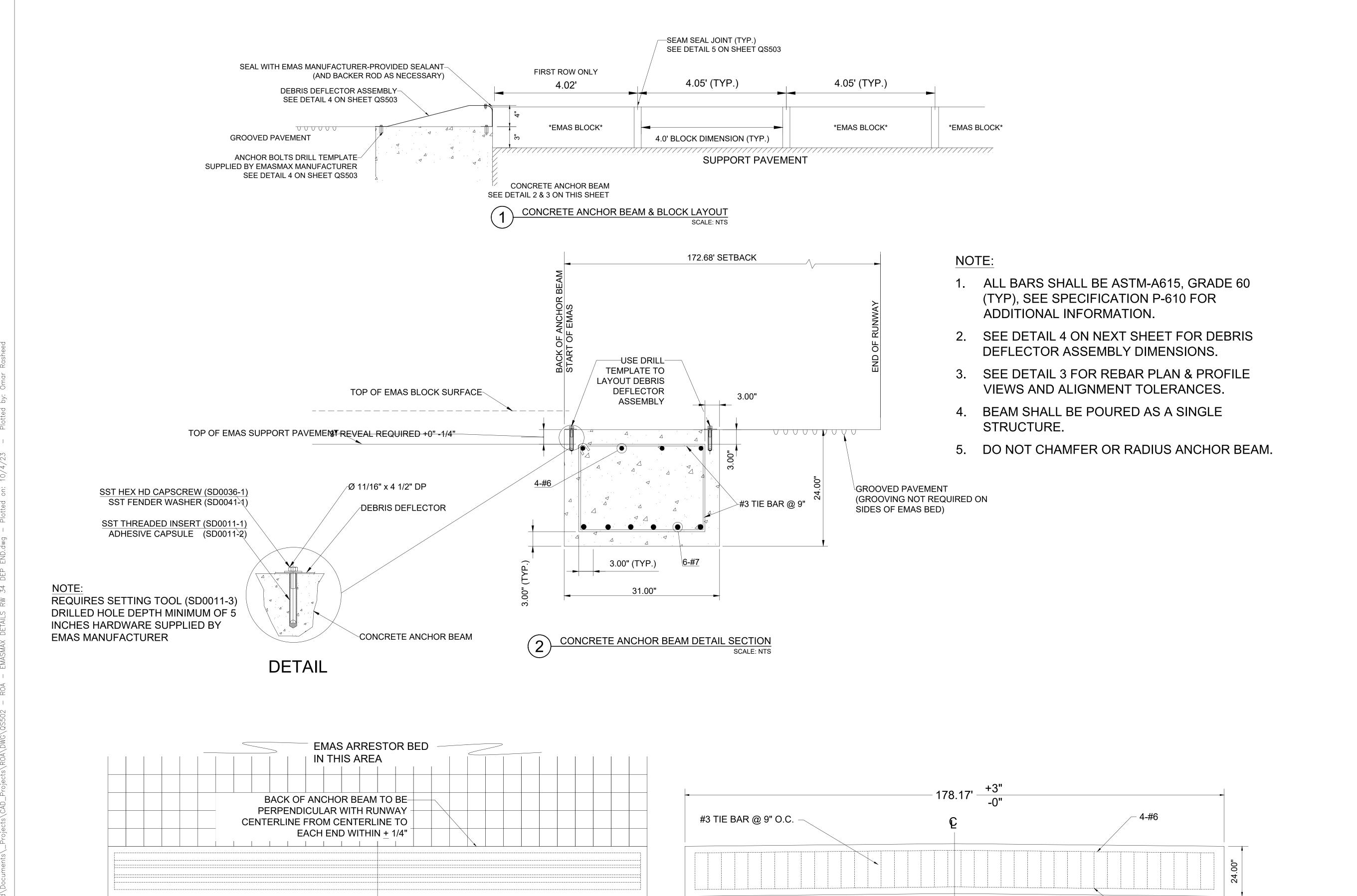
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SHEET NUMBER QS501-2

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CONCRETE ANCHOR BEAM REBAR DETAIL

PROFILE VIEW

© RUNWAY SAFETY AREA

PLAN VIEW

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ANCHOR BEAM DETAILS

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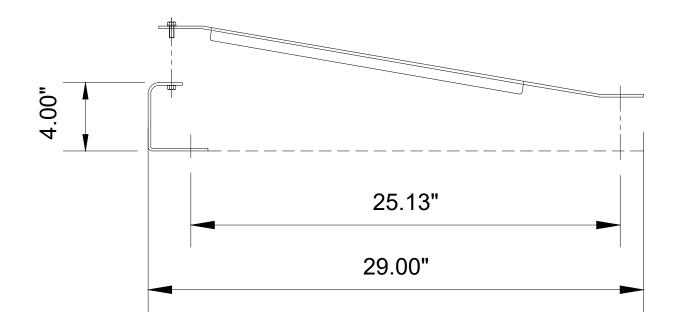
SHEET NUMBER

QS503

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TOP VIEW

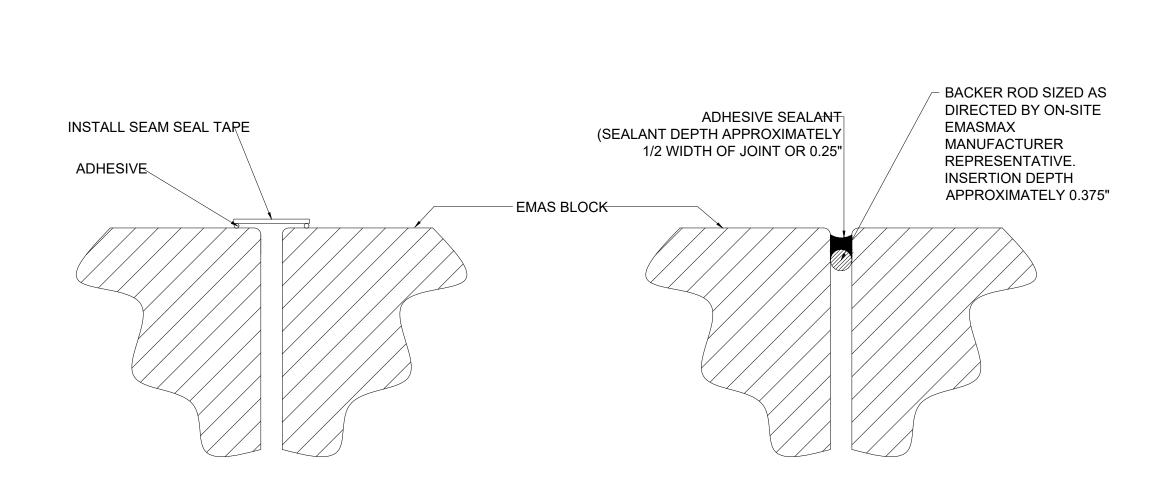


SIDE VIEW

TYPICAL DEBRIS DEFLECTOR ASSEMBLY

NOTE:

- 1. DEBRIS DEFLECTOR ASSEMBLY, DRILL TEMPLATE, & HARDWARE PROVIDED BY EMAS MANUFACTURER.
- 2. FINAL LOCATION OF BACK OF DEBRIS DEFLECTOR ASSEMBLY DEPENDS ON STRAIGHTNESS OF BEAM. SEE DETAIL 3, SHEET QS503, FOR ANCHOR BEAM STRAIGHTNESS TOLERANCE.



NOTES:

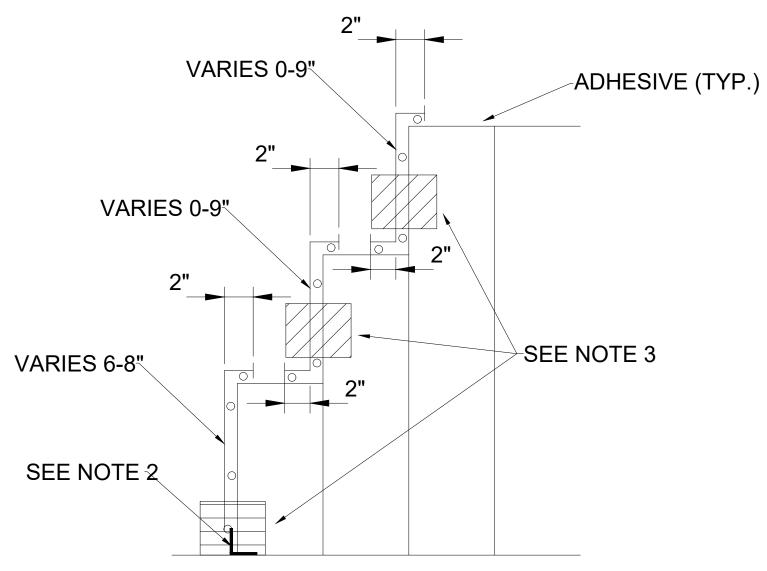
TYPICAL JOINT SEAL - TYPE 1

1. EMASMAX MANUFACTURER SHALL SELECT JOINT SEAL TYPE PRIOR TO STARTING INSTALLATION OF EMA

TYPICAL JOINT SEAL - TYPE 2

2. EMAS BLOCK SURFACES SHALL BE CLEAN IMMEDIATELY PRIOR TO JOINT SEALING.





NOTES:

- 1. PLASTIC RIGHT ANGLE PIECE APPLIED TO SIDES AND BACK OF EMAS AS SHOWN.
- 2. EMAS MANUFACTURER WILL SUPPLY SIDE COATING MATERIAL, ADHESIVES, VENTS, & PLASTIC RIGHT ANGLE PIECES.
- 3. VENTS TO BE INSTALLED AT BLOCKS GAPS AS DIRECTED BY ON-SITE EMAS MANUFACTURER REPRESENTATIVE.





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EMASMAX DETAILS

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