National Transportation Safety Board

Washington, D.C. 20594

March 12, 2014

Airport Factual Report

A. Event

Location:	Macon, Georgia
Date:	September 18, 2012
Aircraft:	Beech 400
Registration:	N428JD
Operator:	Private
NTSB Number:	ERA12FA567

B. SUMMARY

On September 18, 2012 about 1003 Eastern Daylight Time (EDT), a Beech 400, N428JD, was substantially damaged when it overran runway 28 during landing at Macon Downtown Airport (MAC), Macon Georgia. The airplane had departed from Charleston Air Force Base/International Airport (CHS), Charleston, South Carolina about 0930. Visual meteorological conditions prevailed and an instrument flight rules (IFR) flight plan had been filed. Both Airline Transport Pilots (ATP) and one passenger sustained minor injuries. The airplane was owned by Dewberry, LLC and operated by The Aviation Department. The corporate flight was conducted under the provisions of Title 14 Code of Federal Regulations (CFR) Part 91.

C. DETAILS OF INVESTIGATION

Macon Downtown Airport (MAC) was located about 3 miles southeast of the city of Macon at an elevation of 437 feet above mean sea level. The airport had two runways designated as 10/28 and 15/33, as shown in photo 1. MAC was a federally funded airport and was obligated, as when a project is funded by a Federal Airport Improvement Program grant agreement, to meet

all specific standards for airport geometric and design criteria as designated by the Federal Aviation Administration (FAA). However, runway 10/28 rehabilitation project used federal funding only for the runway lighting rehabilitation segment. The runway paving segment was funded with state and local funding.

Runway 10/28, was originally 4694-feet-long and 150-feet-wide; however, following the rehabilitation project the usable runway width was reduced to 100 feet.[1] It was equipped with a 4-light precision approach path indicator (PAPI) at the approach ends. The PAPI was located on the right side of the runway for an approach to runway 10 and to the left side of the runway for an approach to runway 28. Both runways had non-precision markings that were listed in "good condition" at the time of the accident. Runway 10/28 was not subject to requirements of 14 Code of Federal Regulations Part 139.[2] Runway 10 was equipped with a localizer that had a distance measuring equipment (LOC/DME) instrument approach. Runway 28 was equipped with an RNAV(GPS) instrument approach. The airport also was served by two VOR approaches; one approach was titled VOR/DME-B and the other was VOR-A. No other approaches were published for the airport at the time of the accident.

Runway 15/33, was 2614-feet-long and 75-feet-wide. It had no approach lights and the non-precision markings and pavement condition were listed in "fair condition."

[1] According to pavement resurfacing documentation the width was narrowed to 100 feet during pavement resurfacing in 2009.

[2] Title 14 Code of Federal Regulations Part 139 established minimum standards for airports that conduct U.S. air carrier operations. These standards include runway and runway safety area dimensions, airport lighting and markings, airport signage, and emergency response capabilities.

Photo 1: Google Earth Picture of MAC

In 2009, the resurfacing of runway 10/28 was accomplished.[3] After resurfacing the runway, it was comprised of the existing subgrade, the existing asphalt pavement approximately 4 inches in thickness, a 2 inch thick recycled asphaltic concrete with 12.5 millimeter "Superpave", and the top coat was a single surface treatment including bituminous tack coat and #7 stone. The resurfacing plan also included removal of 25 feet of pavement on each side of the runway surface, which reduced the width of runway 10/28 to 100-feet.

In June 2011, the airport was inspected by a representative from Southern Illinois University Carbondale, under contract with the Georgia Department of Transportation. In a letter dated July 29, 2011, some obstructions and violations were noted. Below is an excerpted list of those affecting runway 10/28:[4]

- Runway 10 – Meets minimum state licensing requirements, but fails to meet federal requirements for a 34:1 obstruction-free non-precision approach. Trees 415' from the threshold and 215' left of the centerline provide only a 15:1 approach slope.
- Runway 28 – Meets minimum state licensing requirements but fails to meet federal requirements for a 34:1 obstruction-free non-precision approach surface. Trees 510' from

[3] For engineering reports for the resurfacing project reference Appendix A "2009 Resurfacing" attached to this report

[4] For the entire letter of the inspection reference Appendix B "2011 Inspection Letter" attached to this report

the threshold and 200' left of the extended runway centerline provide only a 14:1 approach slope.

- Primary Surface Violations – The primary Surface for runway 10/28 is an imaginary surface longitudinally centered on the runway and is 500 feet wide, extending 200 feet off each end. The elevation of any point on the primary surface should be the same elevation as the nearest point on the runway centerline and should be free of any obstructions. Trees and brush are located within this area on the north side of Runway 10 approximately 193' left of the centerline near the approach and along the bank. In addition, there are trees and brush located on the south side of Runway 29 approximately 250' from the centerline near the approach and along the bank. These areas should be cleared to provide a clear areas 250 feet each side of the runway centerline to 200 feet of each runway end.

According to the accident pilots, shortly after activating the runway lights, the PAPI lights ceased operation and were no longer illuminated. During the accident sequence, after touchdown and brake application, the airplane began to hydroplane. Photographs provided by the operator taken a few hours after the accident and immediately following another rain shower revealed ponding of water on the runway, as shown in photograph 2.

Photo 2: Ponding Following a Rain shower Looking West on Runway 28 (Courtesy of the Operator)

On January 11, 2013, a Vehicle Performance Engineer from the National Transportation Safety Board conducted a survey of runway 10/28. Coarsely sampled pavement macrotexture and transverse slope measurements were accomplished at 500-foot longitudinal increments,

yielding 10 stations of sampling along the runway length. The samples were evaluated by the FAA Southern Region, Airports Division, and compared against the FAA Advisory Circular 150/5300-13A, which required transverse grades of 1.0% to 2.0% for all runway design codes of B-II. Only one of the ten stations met the above requirement, and the samples revealed an average cross slope of 0.7%. The findings were sent to the Georgia Department of Transportation and a formal engineering report of the "nonstandard runway condition" was recommended.[5]

On February 25, 2013, runway laser scan data was collected by a private company commissioned by the airport authority. Noted from the survey was that the contour for runway 10/28 had no crown section, most of the transverse grades on the 100-foot-wide runway sloped in one direction, and several areas indicated little to no slope. It was further noted in the FAA advisory circular standards that transverse slopes should be adequate to prevent the accumulation of water on the surface. Water will pond in flat areas and in some areas with transverse grades of less than 1.0%.[6]

On September 20, 2012, as a result of the accident, a notice to airmen (NOTAM) was issued that the PAPI lights were not operational. Subsequent investigation of the lights revealed a blown circuit breaker. Four days following the accident the circuit breaker was repaired and the PAPI lights were considered operational.

The 5010 Master Record for MAC was updated to reflect a note stating "Potential for standing water on runway 10/28 during and after heavy rain events." This note will be included in the May 2014 publication cycle.

An airport project, at the time of this writing, was underway to remark or move the threshold for 10/28 to allow for additional runway safety area of 300 feet at both ends of runway 10/28.

At the time of this writing, the Georgia Department of Transportation (GDOT) has requested additional survey data from the city of Macon and Bibb county in order to assess the existing condition relative to transverse grades.

[5] For further information on NTSB Macrotexture and transverse slope survey reference Appendix C of this report

[6] For Engineering reports of the runway laser survey reference Appendix D "TGER Technologies, Inc., Runway Laser Survey" of this report.

Appendix A

2009 Resurfacing

CONSTRUCTION PLANS FOR:

AS-BUILT

1. REDUCING PAVEMENT WIDTH FROM 150' TO 100'
2. RESURFACING
3. MARKING & STRIPING

FOR RUNWAY 10-28

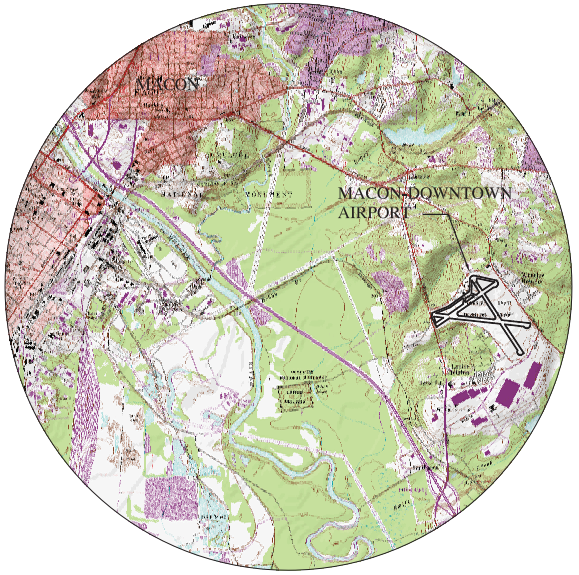
AT

MACON-DOWNTOWN AIRPORT
MACON, GEORGIA

AIP No. 3-13-0078-07-2008, DESIGN
GDOT No. AP090-9000-28(021) BIBB COUNTY, CONSTRUCTION
RAC PROJECT No. 08016-20

SUMMARY OF QUANTITIES

FAA Item No.	GDOT/ RAC Item No.	Description	Approx. Quantity	Unit
	163	Temporary Grass	5	AC
	210	Grading Complete	1	Lump Sum
	402	Recycled Asphaltic Concrete, 12.5mm, 2" Thick	6,250	TN
	424	Single Surface Treatment Stone #7 with Bituminous Material	52,200	SY
	432	Mill Asphaltic Concrete Pavement, 2" Thick	930	SY
	610	Pavement Removal	23,150	SY
	652	Painting Traffic Stripe, Type 1, Class "A"	6,940	SY
	652	Painting Traffic Stripe, Type 2, Class "A"	85	SY
	656	Obliteration of Pavement Marking	80	SY
	700	Grassing	5	AC



LOCATION MAP

DRAWING INDEX

C-001	COVER SHEET
C-101	SAFETY PLAN
C-102	DEMOLITION PLAN
C-103	RESURFACING PLAN
C-104	MARKING AND STRIPING PLAN
C-501	CONSTRUCTION DETAILS

Robert and Company
Engineers, Architects, Planners
Atlanta Georgia 30305-1500

SYMBOL	DATE	BY	REVISION
1	08/08/08	MLS	REVISED PER ADDENDUM #3

SEAL

CLIENT: MACON-DOWNTOWN AIRPORT

PROJECT: CONSTRUCTION PLANS FOR:
1. REDUCING PAVEMENT WIDTH FROM 150' TO 100'
2. RESURFACING
3. MARKING AND STRIPING
FOR RUNWAY 10-28

DESIGNED: MLS | DRAWN: MLS | CHECKED: NMB | DATE: 07/18/08 | SCALE: AS SHOWN | PROJECT NO.: 08016-20

DRAWING TITLE: COVER SHEET

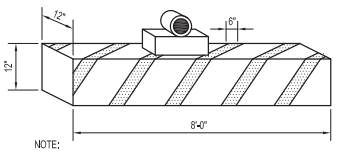
DRAWING NO.: C-001

SHEET 1 OF 6

07/18/08

Released For Construction

AS-BUILT



NOTE:

BARRIER SHALL BE A 12"x12"x8' TIMBER, TO BE PAINTED SOLID WHITE WITH 6" WIDE YELLOW STRIPES EVERY 8'. PAINT SHALL CONTAIN GLASS BEADS OR OTHER ACCEPTABLE REFLECTOR MATERIAL. BARRIER SHALL HAVE A FLASHING RED BEACON SECURELY MOUNTED ON TOP. FLASHER SHALL BE BATTERY OPERATED. BARRIERS SHALL BE PLACED AT A MAXIMUM SPACING OF 25'. CONTRACTOR SHALL MAINTAIN LIGHTS AND BARRICADE.

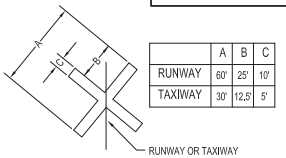
OPTION 1

NOTE:

5 GALLON BUCKET WITH SAND (SECURED IN A PLASTIC BAG) & LIGHT MOUNTED. PLACE REFLECTIVE TAPE OUTSIDE OF BUCKET.

OPTION 2

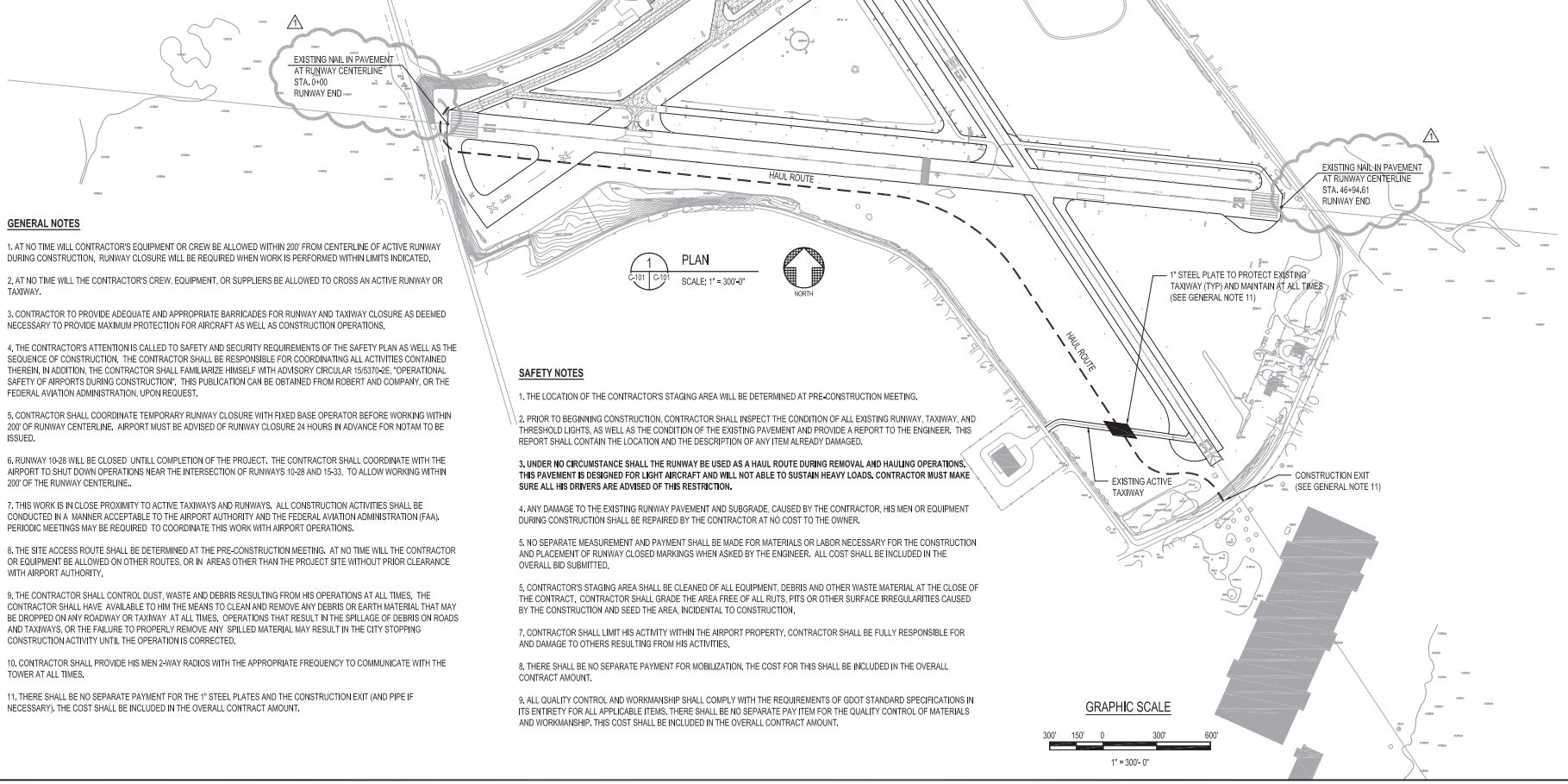
3 C-101 C-101 SAFETY BARRICADES
NTS



	A	B	C
RUNWAY	60'	25'	10'
TAXIWAY	30'	12.5'	5'

NOTE: CROSSES TO BE CONSTRUCTED OF MATERIAL APPROVED BY THE ENGINEER (I.E. FABRIC, PLYWOOD, OR SIMILAR MATERIAL) AND SHALL BE COLORED AVIATION YELLOW.

2 C-101 C-101 CLOSED RUNWAY OR TAXIWAY
NTS



1 C-101 C-101 PLAN
SCALE: 1" = 300'-0"

NORTH

GENERAL NOTES

1. AT NO TIME WILL CONTRACTOR'S EQUIPMENT OR CREW BE ALLOWED WITHIN 200' FROM CENTERLINE OF ACTIVE RUNWAY DURING CONSTRUCTION. RUNWAY CLOSURE WILL BE REQUIRED WHEN WORK IS PERFORMED WITHIN LIMITS INDICATED.

2. AT NO TIME WILL THE CONTRACTOR'S CREW, EQUIPMENT, OR SUPPLIERS BE ALLOWED TO CROSS AN ACTIVE RUNWAY OR TAXIWAY.

3. CONTRACTOR TO PROVIDE ADEQUATE AND APPROPRIATE BARRICADES FOR RUNWAY AND TAXIWAY CLOSURE AS DEEMED NECESSARY TO PROVIDE MAXIMUM PROTECTION FOR AIRCRAFT AS WELL AS CONSTRUCTION OPERATIONS.

4. THE CONTRACTOR'S ATTENTION IS CALLED TO SAFETY AND SECURITY REQUIREMENTS OF THE SAFETY PLAN AS WELL AS THE SEQUENCE OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL ACTIVITIES CONTAINED THEREIN. IN ADDITION, THE CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH ADVISORY CIRCULAR 150/5370-2E, "OPERATIONAL SAFETY OF AIRPORTS DURING CONSTRUCTION". THIS PUBLICATION CAN BE OBTAINED FROM ROBERT AND COMPANY, OR THE FEDERAL AVIATION ADMINISTRATION, UPON REQUEST.

5. CONTRACTOR SHALL COORDINATE TEMPORARY RUNWAY CLOSURE WITH FIXED BASE OPERATOR BEFORE WORKING WITHIN 200' OF RUNWAY CENTERLINE. AIRPORT MUST BE ADVISED OF RUNWAY CLOSURE 24 HOURS IN ADVANCE FOR NOTAM TO BE ISSUED.

6. RUNWAY 10-28 WILL BE CLOSED UNTILL COMPLETION OF THE PROJECT. THE CONTRACTOR SHALL COORDINATE WITH THE AIRPORT TO SHUT DOWN OPERATIONS NEAR THE INTERSECTION OF RUNWAYS 10-28 AND 15-33. TO ALLOW WORKING WITHIN 200' OF THE RUNWAY CENTERLINE..

7. THIS WORK IS IN CLOSE PROXIMITY TO ACTIVE TAXIWAYS AND RUNWAYS. ALL CONSTRUCTION ACTIVITIES SHALL BE CONDUCTED IN A MANNER ACCEPTABLE TO THE AIRPORT AUTHORITY AND THE FEDERAL AVIATION ADMINISTRATION (FAA). PERIODIC MEETINGS MAY BE REQUIRED TO COORDINATE THIS WORK WITH AIRPORT OPERATIONS.

8. THE SITE ACCESS ROUTE SHALL BE DETERMINED AT THE PRE-CONSTRUCTION MEETING. AT NO TIME WILL THE CONTRACTOR OR EQUIPMENT BE ALLOWED ON OTHER ROUTES, OR IN AREAS OTHER THAN THE PROJECT SITE WITHOUT PRIOR CLEARANCE WITH AIRPORT AUTHORITY.

9. THE CONTRACTOR SHALL CONTROL DUST, WASTE AND DEBRIS RESULTING FROM HIS OPERATIONS AT ALL TIMES. THE CONTRACTOR SHALL HAVE AVAILABLE TO HIM THE MEANS TO CLEAN AND REMOVE ANY DEBRIS OR EARTH MATERIAL THAT MAY BE DROPPED ON ANY ROADWAY OR TAXIWAY AT ALL TIMES. OPERATIONS THAT RESULT IN THE SPILLAGE OF DEBRIS ON ROADS AND TAXIWAYS, OR THE FAILURE TO PROPERLY REMOVE ANY SPILLED MATERIAL MAY RESULT IN THE CITY STOPPING CONSTRUCTION ACTIVITY UNTIL THE OPERATION IS CORRECTED.

10. CONTRACTOR SHALL PROVIDE HIS MEN 2-WAY RADIOS WITH THE APPROPRIATE FREQUENCY TO COMMUNICATE WITH THE TOWER AT ALL TIMES.

11. THERE SHALL BE NO SEPARATE PAYMENT FOR THE 1" STEEL PLATES AND THE CONSTRUCTION EXIT (AND PIPE IF NECESSARY), THE COST SHALL BE INCLUDED IN THE OVERALL CONTRACT AMOUNT.

SAFETY NOTES

1. THE LOCATION OF THE CONTRACTOR'S STAGING AREA WILL BE DETERMINED AT PRE-CONSTRUCTION MEETING.

2. PRIOR TO BEGINNING CONSTRUCTION, CONTRACTOR SHALL INSPECT THE CONDITION OF ALL EXISTING RUNWAY, TAXIWAY, AND THRESHOLD LIGHTS, AS WELL AS THE CONDITION OF THE EXISTING PAVEMENT AND PROVIDE A REPORT TO THE ENGINEER. THIS REPORT SHALL CONTAIN THE LOCATION AND THE DESCRIPTION OF ANY ITEM ALREADY DAMAGED.

3. UNDER NO CIRCUMSTANCE SHALL THE RUNWAY BE USED AS A HAUL ROUTE DURING REMOVAL AND HAULING OPERATIONS. THIS PAVEMENT IS DESIGNED FOR LIGHT AIRCRAFT AND WILL NOT ABLE TO SUSTAIN HEAVY LOADS. CONTRACTOR MUST MAKE SURE ALL HIS DRIVERS ARE ADVISED OF THIS RESTRICTION.

4. ANY DAMAGE TO THE EXISTING RUNWAY PAVEMENT AND SUBGRADE, CAUSED BY THE CONTRACTOR, HIS MEN OR EQUIPMENT DURING CONSTRUCTION SHALL BE REPAIRED BY THE CONTRACTOR AT NO COST TO THE OWNER.

5. NO SEPARATE MEASUREMENT AND PAYMENT SHALL BE MADE FOR MATERIALS OR LABOR NECESSARY FOR THE CONSTRUCTION AND PLACEMENT OF RUNWAY CLOSED MARKINGS WHEN ASKED BY THE ENGINEER. ALL COST SHALL BE INCLUDED IN THE OVERALL BID SUBMITTED.

5. CONTRACTOR'S STAGING AREA SHALL BE CLEANED OF ALL EQUIPMENT, DEBRIS AND OTHER WASTE MATERIAL AT THE CLOSE OF THE CONTRACT. CONTRACTOR SHALL GRADE THE AREA FREE OF ALL RUTS, PITS OR OTHER SURFACE IRREGULARITIES CAUSED BY THE CONSTRUCTION AND SEED THE AREA, INCIDENTAL TO CONSTRUCTION.

7. CONTRACTOR SHALL LIMIT HIS ACTIVITY WITHIN THE AIRPORT PROPERTY. CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR AND DAMAGE TO OTHERS RESULTING FROM HIS ACTIVITIES.

8. THERE SHALL BE NO SEPARATE PAYMENT FOR MOBILIZATION. THE COST FOR THIS SHALL BE INCLUDED IN THE OVERALL CONTRACT AMOUNT.

9. ALL QUALITY CONTROL AND WORKMANSHIP SHALL COMPLY WITH THE REQUIREMENTS OF GDOT STANDARD SPECIFICATIONS IN ITS ENTIRETY FOR ALL APPLICABLE ITEMS. THERE SHALL BE NO SEPARATE PAY ITEM FOR THE QUALITY CONTROL OF MATERIALS AND WORKMANSHIP. THIS COST SHALL BE INCLUDED IN THE OVERALL CONTRACT AMOUNT.

GRAPHIC SCALE

300' 150' 0 300' 600'

1" = 300'- 0"

Robert and Company
Engineers, Architects, Planners
ATLANTA GEORGIA AUGUSTA 30309

SYMBOL	DATE	BY	REMARKS
1	08/08/08	MLS	REVISED PER ADDENDUM #3

SEAL

CLIENT: MACON-DOWNTOWN AIRPORT

PROJECT: CONSTRUCTION PLANS FOR:
1. RELOCATE RUNWAY MIDPOINT WIDTH FROM 150' TO 100'
2. RESURFACING
3. MARKING AND STRIPING
FOR RUNWAY 10-28

DESIGNED: MLS
DRAWN: MLS
CHECKED: NMB
DATE: 07/18/08
SCALE: AS SHOWN
PROJECT NO.: 08016-20

DRAWING TITLE: SAFETY PLAN

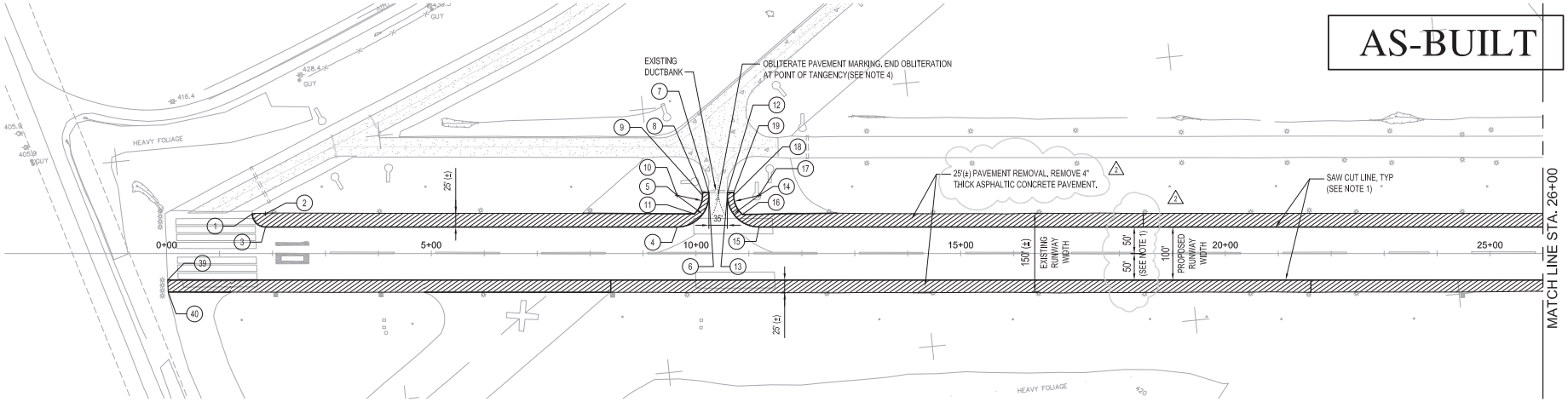
DRAWING NO.: C-101

SHEET 2 OF 6

07/18/08

Released For Construction

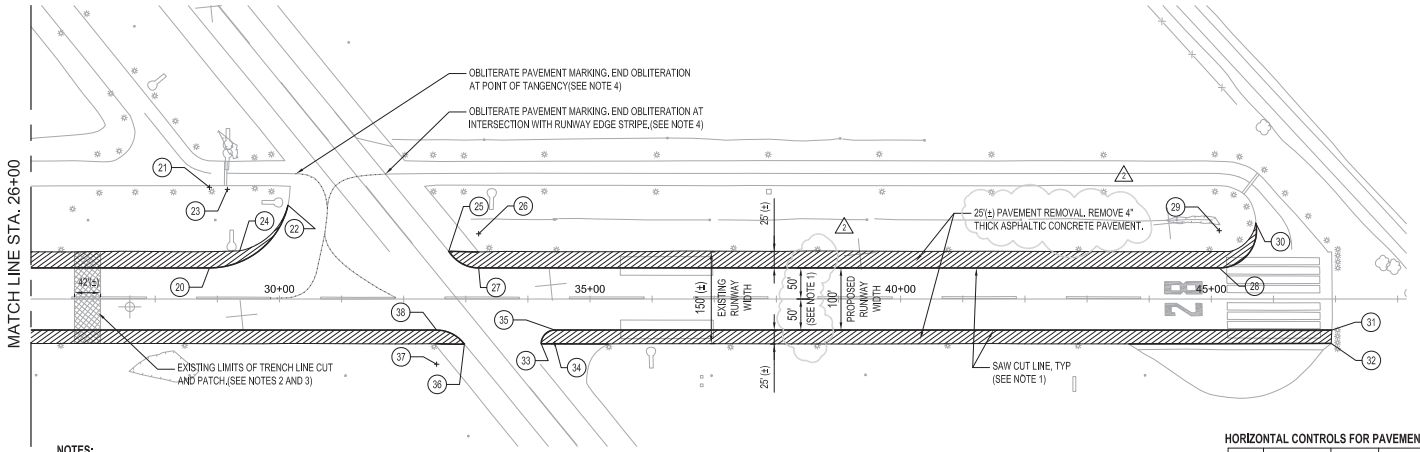
AS-BUILT



1 C-102 | C-102 DEMOLITION PLAN

SCALE: 1" = 100'-0"

NORTH



NOTES:

1. CONTRACTOR TO PROVIDE NEAT EDGE WHEN SAW CUTTING PAVEMENT. THE SAW CUT LINE SHALL BE FOR THE FULL DEPTH OF THE PAVEMENT. THE SAW CUT LINE SHALL BE ESTABLISHED USING THE RUNWAY CENTERLINE. THE RUNWAY CENTERLINE SHALL BE SURVEYED AS A STRAIGHT LINE CONNECTING 2 PK NAILS AT RUNWAY ENDS. UNDER NO CIRCUMSTANCE SHALL THE RUNWAY CENTERLINE MARKING BE USED IN THE DETERMINATION OF THE SAW CUT LINE.

   THERE SHALL BE NO SEPARATE PAYMENT FOR THIS WORK. THE COST SHALL BE INCLUDED IN THE COST FOR PAVEMENT REMOVAL.

2. CONTRACTOR IS CAUTIONED TO THE PRESENCE OF A DEPRESSED OR SETTLED PAVEMENT DUE TO INSTALLATION OF SEWER LINE.

3. CONTRACTOR IS REQUIRED TO INSTALL A PRE-LEVELING $\frac{3}{4}$" ASPHALTIC COURSE PRIOR TO FINAL PAVEMENT OVERLAY (1 $\frac{1}{4}$"). THIS AND THE REQUIRED TACK COAT FOR PRE-LEVELING COURSE SHALL BE PAID FOR UNDER THE UNIT PRICE OF RECYCLED ASPHALT. 2 3

4. PAVEMENT MARKINGS SHOULD BE REMOVED BY SAND OR WATER BLASTING, CHEMICAL REMOVAL OR OTHER MEANS.

LEGEND

PAVEMENT REMOVAL

SAW CUT LINE

2 C-102 | C-102 DEMOLITION PLAN

SCALE: 1" = 100'-0"

NORTH

GRAPHIC SCALE

100' 50' 0 100' 200'

1" = 100'- 0"

HORIZONTAL CONTROLS FOR PAVEMENT REMOVAL

POINT	DESCRIPTION	STATION	OFFSET	RADIUS
1	PC	1+61.92	75' LEFT	
2	CC	1+86.92	75' LEFT	25'
3	PT	1+86.92	50' LEFT	
4	PC	9+64.39	50' LEFT	
5	CC	9+64.39	110' LEFT	60'
6	PT	10+24.39	110' LEFT	
7	CORNER	10+24.39	115.43' LEFT	
8	CORNER	10+12.39	115.43' LEFT	
9	PC	10+12.39	110' LEFT	
10	CC	9+64.39	110' LEFT	48'
11	PT	9+97.11	74.88' LEFT	
12	CORNER	10+59.39	115.43' LEFT	
13	PC	10+59.39	110' LEFT	
14	CC	11+19.39	110' LEFT	60'
15	PT	11+19.39	50' LEFT	
16	PC	10+87.86	73.8' LEFT	
17	CC	11+19.39	110' LEFT	48'
18	PT	10+71.39	110' LEFT	
19	CORNER	10+71.39	115.43' LEFT	
20	PC	28+87.29	50' LEFT	
21	CC	28+87.38	179.73 LEFT	130'
22	PT	30+13.89	151' LEFT	
23	CC	29+16.24	176.39 LEFT	101'
24	PC	29+36	77.44 LEFT	
25	PC	32+72.57	76.80 LEFT	
26	CC	33+20.60	105' LEFT	55'
27	PT	33+20.60	50' LEFT	
28	PC	45+12.82	50' LEFT	
29	CC	45+12.82	110' LEFT	60'
30	PT	45+71.55	122.3' LEFT	

HORIZONTAL CONTROLS FOR PAVEMENT REMOVAL

POINT	DESCRIPTION	STATION	OFFSET	RADIUS
31	CORNER	RWY END	50' RIGHT	
32	CORNER	RWY END	71.5' RIGHT	
33	PC	34+21.34	72' RIGHT	
34	CC	34+43.34	72' RIGHT	
35	PT	34+43.34	50' RIGHT	
36	PC	32+97.76	72.75' RIGHT	
37	CC	32+53.06	105' RIGHT	55'
38	PT	32+53.06	50' RIGHT	
39	CORNER	RWY END	50' RIGHT	
40	CORNER	RWY END	72.75' RIGHT	

Robert and Company
Engineers Architects Planners
[redacted]

SYMBOL	DATE	BY	REVISION
1	12/04/09	SMV	AS-BUILTS
2	09/09/08	MLS	REVISED PER ADDENDUM #3
3	07/31/08	SMV	CHANGES PER ADDENDUM #1

SEAL

CLIENT: MACON-DOWNTOWN AIRPORT

PROJECT: CONSTRUCTION PLANS FOR:
1. RESURFACING RUNWAY WIDTH FROM 100' TO 150'
2. RESURFACING
3. MARKING AND STRIPING
FOR RUNWAY 10-28

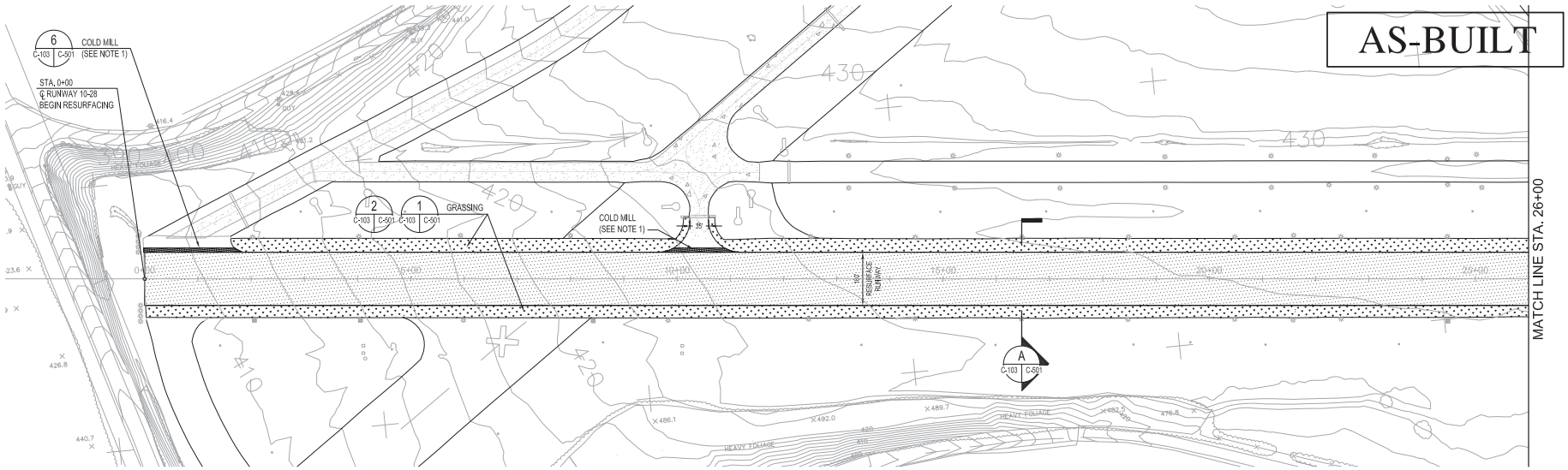
DESIGNED: MLS
DRAWN: MLS
CHECKED: NMB
DATE: 07/16/08
SCALE: AS SHOWN
PROJECT NO.: 08016-20
DRAWING TITLE: DEMOLITION PLAN

DRAWING NO.: **C-102**

SHEET 3 OF 6

Released For Construction 07/18/08

AS-BUILT

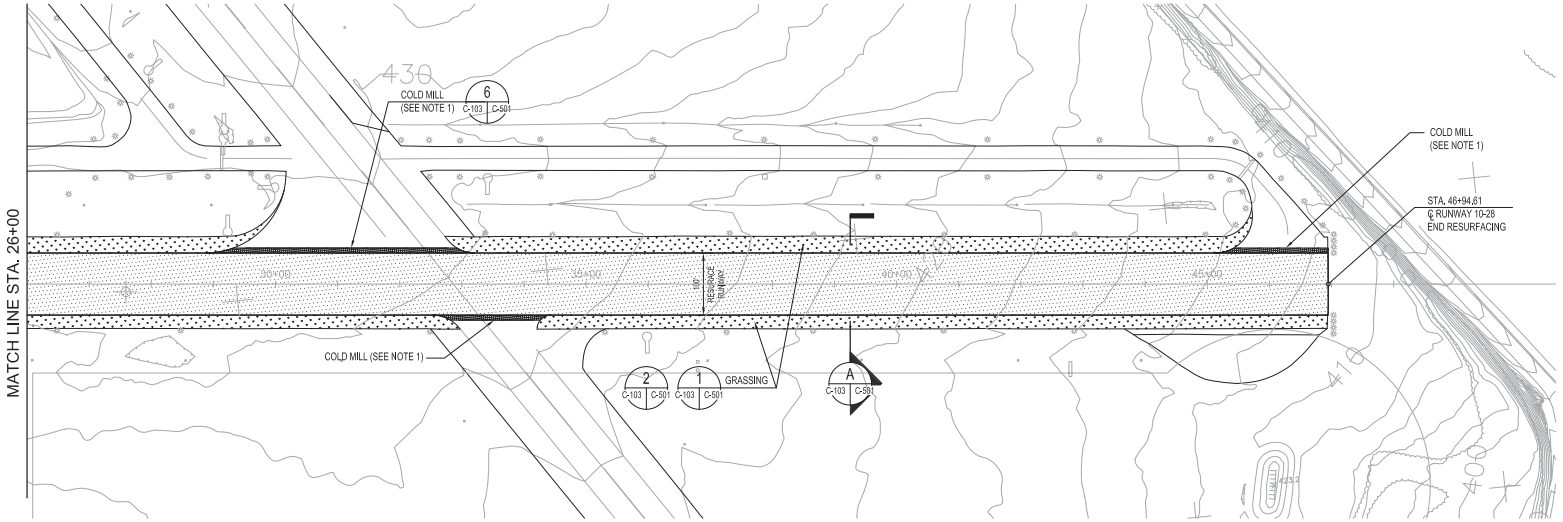


NOTES:

1. EXACT COLD MILL WIDTH SHALL BE EXAMINED IN THE FIELD.

1 C-103 C-103 RESURFACING PLAN
SCALE: 1" = 100'-0"

NORTH



2 C-103 C-103 RESURFACING PLAN
SCALE: 1" = 100'-0"

NORTH

LEGEND

- COLD MILL
- GRASSING
- RESURFACING

GRAPHIC SCALE

100' 50' 0 100' 200'

1" = 100'- 0"

Robert and Company
Engineers, Architects, Planners
ATLANTA GEORGIA ARCHITECTURE

NO.	SYMBOL	DATE	BY	REMARKS

SEAL

CLIENT: MACON-DOWNTOWN AIRPORT

PROJECT: CONSTRUCTION PLANS FOR:
1. RESURFACING RUNWAY WIDTH FROM 100' TO 150'
2. RESURFACING
3. MARKING AND STRIPING
FOR RUNWAY 10-28

DESIGNED	DRAWN	CHECKED	DATE
MLS	MLS	NMB	07/18/08

PROJECT NO. 08016-20 | SCALE: AS SHOWN

DRAWING TITLE: RESURFACING PLAN

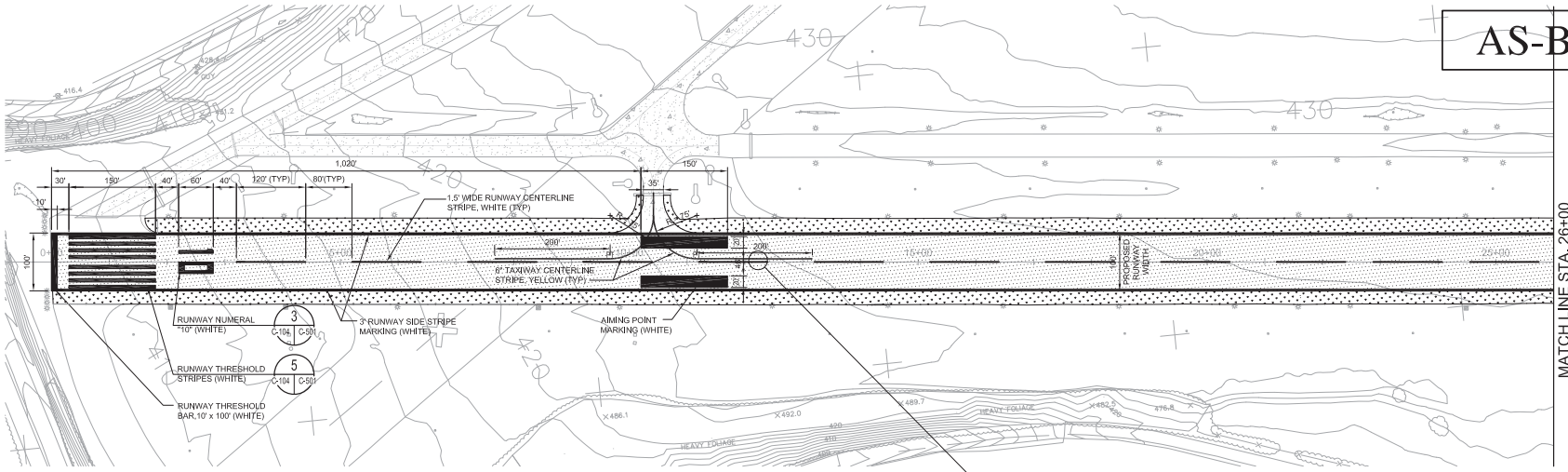
DRAWING NO.: C-103

SHEET 4 OF 6

07/18/08

Released For Construction

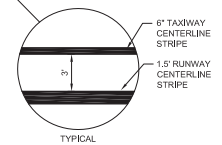
AS-BUILT

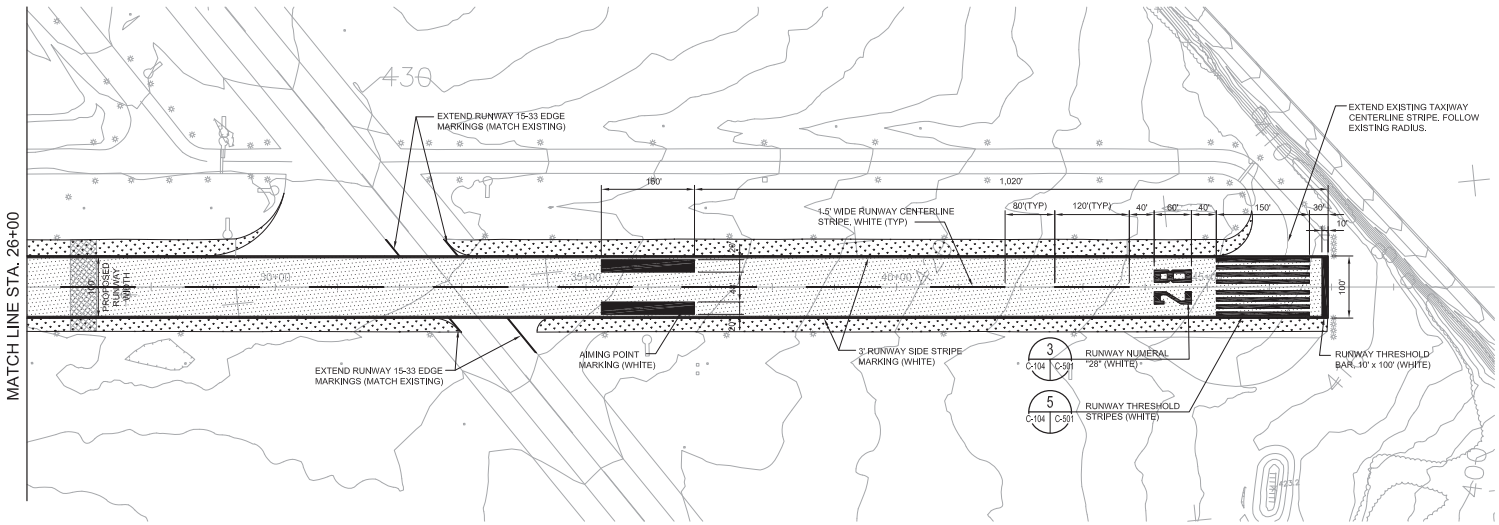


1 C-103 | C-103 MARKING AND STRIPING PLAN

SCALE: 1" = 100'-0"

NORTH





2 C-103 | C-103 MARKING AND STRIPING PLAN

SCALE: 1" = 100'-0"

NORTH

GRAPHIC SCALE

100' 50' 0 100' 200'

1" = 100'-0"

Robert and Company

Engineers, Architects, Planners

ATLANTA GEORGIA 30303-1636

NO.	SYMBOL	DATE	BY	REVISION

SEAL

CLIENT: MACON-DOWNTOWN AIRPORT

PROJECT: CONSTRUCTION PLANS FOR:
1. RELOCATE RUNWAY 15-33 APPROACH WIDTH FROM 150' TO 100'
2. RESURFACING
3. MARKING AND STRIPING
FOR RUNWAY 10-28

DESIGNED	MLS	DATE	07/18/08
DRAWN	MLS	SCALE	AS SHOWN
CHECKED	NMB		
PROJECT NO.	08016-20		

DRAWING TITLE: MARKING AND STRIPING PLAN

DRAWING NO. C-104

SHEET 5 OF 6

07/18/08

Released For Construction

AS-BUILT

PERMANENT PLANT SPECIES, SEEDING RATES, AND PLANTING DATES

SPECIES	RATES PER ACRE	RATES PER 1,000 sq. ft.	PLANTING DATES BY REGION M - L	P	C	REMARKS
BAHA, PENSACOLA ALONE OR WITH TEMPORARY COVER	60 Lbs.	1.4 Lbs.	-	4/1-5/31	3/1-5/31	LOW GROWING SOD PRODUCING; WILL SPREAD INTO BERMUDA LAWNS.
WITH OTHER PERENNIALS	30 Lbs.	0.7 Lbs.				
BAHA, WILMINGTON ALONE OR WITH TEMPORARY COVER	60 Lbs.	1.4 Lbs.	3/15-5/31	3/1-5/31	-	SAME AS ABOVE.
WITH OTHER PERENNIALS	30 Lbs.	0.7 Lbs.				
BERMUDA, COMMON (HULLED SEED) ALONE	10 Lbs.	0.2 Lbs.	-	4/1-5/31	3/1-5/31	QUICK COVER; LOW GROWING; SOD FORMING; NEEDS FULL SUN.
WITH OTHER PERENNIALS	6 Lbs.	0.1 Lbs.				
BERMUDA, COMMON (UNHULLED SEED) WITH TEMPORARY COVER	10 Lbs.	0.2 Lbs.	-	10/15-2/28	11/1-1/31	PLANT WITH WINTER ANNUALS. PLANT WITH TALL FESCUE.
WITH OTHER PERENNIALS	6 Lbs.	0.1 Lbs.				
BERMUDA, SPRIGS COMMON LAWN AND FORAGE HYBRIDS	40 cu. ft.	0.9 cu. ft.	4/15-6/15	4/1-6/15	4/1-5/31	1 cu. ft. = 650 SPRIGS 1 lbs. = 3.25 cu. ft. OR 800 SPRIGS.
	SOD PLUGS 3' X 3'					
CROWN VETCH WITH WINTER ANNUALS OR COOL SEASON GRASSES	15 Lbs.	0.3 Lbs.	9/1-10/15	10/15-2/28	-	MIX WITH 30 Lbs. TALL FESCUE OR 15 Lbs. RYE; INOCULATE SEED; PLANT ONLY NORTH OF ATLANTA.
FESCUE, TALL ALONE	50 Lbs.	1.1 Lbs.	3/1-4/1 OR 8/15-9/30	8/15-10/15 OR 2/15-4/15	-	MIX WITH PERENNIAL LESPEDEZAS OR CROWN VETCH; NOT FOR DROUGHTY SOILS OR HEAVY USE AREAS.
WITH OTHER PERENNIALS	30 Lbs.	0.7 Lbs.				
LESPEDEZA, SERICEA SCARIFIED	60 Lbs.	1.4 Lbs.	4/1-5/31	3/15-5/31	3/1-5/15	WIDELY ADAPTED AND LOW MAINTENANCE; TAKES 2-3 YEARS TO ESTABLISH; INOCULATE SEED WITH EL INOCULATE; MIX WITH WEEPING LOVEGRASS, COMMON BURMUDA, BAHA OR TALL FESCUE.
UNSCARIFIED	75 Lbs.	1.7 Lbs.	9/1-2/28	9/1-2/28	9/1-2/28	MIX WITH TALL FESCUA OR WINTER ANNUALS.
SEED-BEARING HAY	3 TONS	138 Lbs.	10/1-2/1	10/1-2/28	9/15-1/15	CUT WHEN SEED IS MATURE BUT BEFORE IT SHATTERS; ADD TALL FESCUE OF WINTER ANNUALS.
LESPEDEZA, AMBRO VIRGATA OR APPALOW SCARIFIED	60 Lbs.	1.4 Lbs.	4/1-5/31	3/15-5/31	3/1-5/15	SREADING GROWTH WITH HEIGHT OF 15'-24'; GOOD IN URBAN AREAS; SLOW TO DEVELOP GOOD STANDS; MIX WITH WEEPING LOVEGRASS, COMMONBERMUDA, BAHIA TALL FESCUE OR WINTER ANNUALS; DO NOT MIX WITH SERICEA LESPEDEZA; INOCULATE SEED WITH EL INOCULANT.
UNSCARIFIED	75 Lbs.	1.7 Lbs.	9/1-2/28	9/1-2/28	9/1-2/28	
LESPEDEZA, SHRUB (LESPEDEZA BICOLOR OR LESPEDEZA THUMBERGII PLANTS	3' X 3' SPACING		11/1-3/31	11/1-3/31	11/15-2/28	PLANT IN SMALL CLUMPS FOR WILDLIFE FOOD AND COVER.
LOVE GRASS, WEEPING ALONE	4 Lbs.	0.1 Lbs.	4/1-5/31	3/15-5/31	3/1-5/31	QUICK COVER; DROUGHT TOLERANT; GROWS WELL WITH SERICEA LESPEDEZA ON ROAD-BANKS AND OTHER STEEP SLOPES; SHORT LIVED.
WITH OTHER PERENNIALS	2 Lbs.	0.05 Lbs.				
MAIDENCANE SPRIGS	2' X 3' SPACING		2/1-3/31	2/1-3/31	2/1-3/31	FOR VERY WET SITES SUCH AS RIVERBANKS AND SHORELINES; DIG SPRIGS LOCALLY.
PANICGRASS, ATLANTIC COASTAL	20 Lbs.	0.5 Lbs.	-	3/1-4/30	3/1-4/30	GROWS WELL ON COASTAL SAND DUNES; MIX WITH SERICEA LESPEDEZA, BUT NOT ON SAND DUNES.
REED CANARY GRASS ALONE	50 Lbs.	1.1 Lbs.	4/1-5/31	3/15-5/31	3/1-5/31	GROWS SIMILAR TO TALL FESCUE; FOR WET SITES.
WITH OTHER PERENNIALS	30 Lbs.	0.7 Lbs.				
SUNFLOWER, AZTEC MAXIMILIAN	10 Lbs.	0.2 Lbs.	4/15-5/31	4/15-5/31	4/15-5/31	MIX WITH WEEPING LOVEGRASS OR OTHER LOW GROWING GRASSES OR LEGUMES.
SWITCHGRASS	20 Lbs.	0.4 Lbs.	4/1-5/31	4/1-5/31	4/1-5/31	FOR STREAMBANKS PLANTINGS, DRAINAGE DITCHES, AND WET AREAS.

1. RATES FOR BROADCASTED SEED, IF A SEED DRILL IS USED, REDUCE THE RATE BY ONE-HALF.
2. PLS IS AN ABBREVIATION FOR PURE LIVE SEED. REFER TO THE GLOSSARY FOR AN EXPLANATION OF THIS TERM.
3. REGIONS ARE DEFINED IN THE " MANUAL FOR EROSION AND SEDIMENT CONTROL IN GEORGIA."

FERTILIZER REQUIREMENTS FOR PERMANENT VEGETATION

TYPES OR SPECIES	PLANTING YEAR	FERTILIZER (N-P-K)	RATES (LBS./ACRE)	N TOP DRESSING RATE (LBS/ACRE)
COOL SEASON GRASSES	FIRST	6-12-12	1500	50-100
	SECOND	6-12-12	1000	-
	MAINTENANCE	10-10-10	400	30
COOL SEASON GRASSES & LEGUMES	FIRST	6-12-12	1500	0-50
	SECOND	0-10-10	1000	-
	MAINTENANCE	0-10-10	400	-
WARM SEASON GRASSES	FIRST	6-12-12	1500	50-100
	SECOND	6-12-12	800	50-100
	MAINTENANCE	10-10-10	400	30
WARM SEASON GRASSES & LEGUMES	FIRST	6-12-12	1500	50
	SECOND	0-10-10	1000	-
	MAINTENANCE	0-10-10	400	-

1 C-106 C-501 PERMANENT SEEDING SCHEDULE
NTS

SOME TEMPORARY PLANT SPECIES, SEEDING RATES AND PLANTING DATES

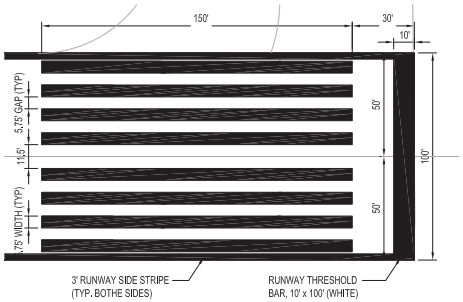
SPECIES	RATES PER 1,000 SQ. FT.	RATES PER ACRE	PLANTING DATES BY REGION M - L	P	C
RYE (GRAIN)	3.9 LBS.	3 BU.	8/15-11/19	9/15-10/1 3/1-4/1	10/1-1/11
RYEGRASS	0.9 LBS.	40 LBS.	8/15-12/15	9/1-12/15	9/15-1/1
RYE AND ANNUAL LESPEDEZA	0.8 LBS. 0.6 LBS.	0.5 BU. 24 LBS.	3/1-4/1	3/1-4/1	2/1-3/1
WEEPING LOVEGRASS	0.1 LBS.	4 LBS.	4/1-5/31	4/1-5/31	3/1-5/31
SUDANGRASS	1 LBS.	60 LBS.	5/1-8/1	5/1-8/1	4/1-8/1
WHEAT	4.1 LBS.	3 BU.	9/15-12/1	10/1-12/15	10/15-1/1

1. UNUSUAL SITE CONDITIONS MAY REQUIRE HEAVIER SEEDING RATES.
2. SEEDING DATES MAY NEED TO BE ALTERED TO FIT TEMPERATURE VARIATIONS AND LOCAL CONDITIONS.

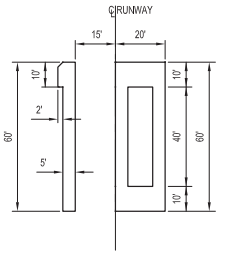
FERTILIZER REQUIREMENTS FOR TEMPORARY VEGETATION

TYPES OR SPECIES	PLANTING YEAR	FERTILIZER (N-P-K)	RATES (LBS./ACRE)	N TOP DRESSING RATE (LBS/ACRE)
COOL SEASON GRASSES	FIRST	6-12-12	1500	50-100
	SECOND	6-12-12	1000	-
	MAINTENANCE	10-10-10	400	30
COOL SEASON GRASSES & LEGUMES	FIRST	6-12-12	1500	0-50
	SECOND	0-10-10	1000	-
	MAINTENANCE	0-10-10	400	-
TEMP. COVER CROPS SEEDED ALONE	FIRST	10-10-10	500	30
WARM SEASON GRASSES	FIRST	6-12-12	1500	50-100
	SECOND	6-12-12	800	50-100
	MAINTENANCE	10-10-10	400	30

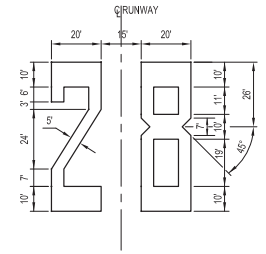
2 C-106 C-501 TEMPORARY SEEDING SCHEDULE
NTS



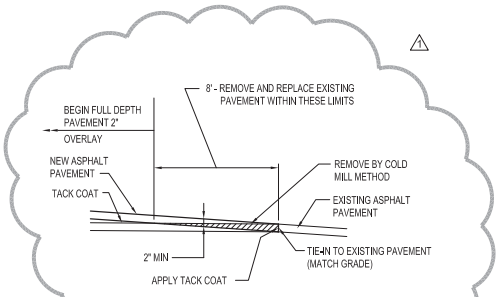
5 C-104 C-501 RUNWAY THRESHOLD STRIPES (WHITE)
SCALE: 1" = 30'-0"



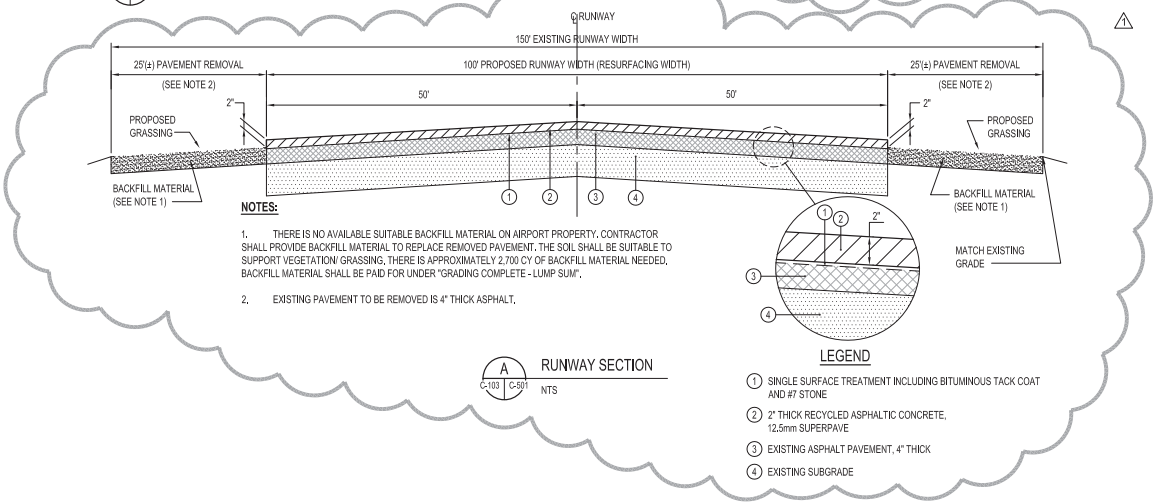
3 C-104 C-501 RUNWAY NUMERAL "10" (WHITE)
NTS



4 C-104 C-501 RUNWAY NUMERAL "28" (WHITE)
NTS



6 C-103 C-501 BUTT JOINT DETAIL FOR TIE-IN TO FLEXIBLE PAVEMENT (COLD MILL)
NTS



A C-103 C-501 RUNWAY SECTION
NTS

Robert and Company
Engineers, Architects, Planners
[redacted]

SYMBOL	DATE	BY	REMARKS
1	08/08/08	MLS	REVISED PER ADDENDUM #3

SEAL

CLIENT: MACON-DOWNTOWN AIRPORT

PROJECT: CONSTRUCTION PLANS FOR:
1. RESURFACE RUNWAY WIDTH FROM 100' TO 150'
2. RESURFACING
3. MARKING AND STRIPING
FOR RUNWAY 10-28

DATE: 07/18/08
SCALE: AS SHOWN
CHECKED: NMB
DRAWN: MLS
DESIGNED: MLS
PROJECT NO.: 08016-20

DRAWING TITLE: CONSTRUCTION DETAILS

DRAWING NO.: C-501

SHEET 6 OF 6

07/18/08

Released For Construction

Appendix B

2011 Inspection Letter

Vance C. Smith, Jr., Commissioner

GEORGIA DEPARTMENT OF TRANSPORTATION
[redacted]
Atlanta, Georgia 30308
Telephone: [redacted]

July 29, 2011

Mr. Scott Coffman, Manager
Macon Downtown Airport
[redacted]
Macon, GA 31297

Re: Macon Downtown Airport Inspection

Dear Mr. Coffman:

The Official Code of Georgia Annotated 32-9-8 requires our office to inspect and license your airport. The airport owner must secure a Georgia Airport License prior to operation of the facility, and the issuance of a Georgia Airport License is contingent upon compliance with the requirements set out in Georgia Department of Transportation's Rules and Regulations for Licensing of Certain Open–to–the–Public Airports, Chapter 672-9. In addition, contractual agreements require that we also conduct an airport inspection for the Federal Aviation Administration's (FAA) Airport Safety Data Program. In accordance with these provisions, James Bildilli of Southern Illinois University Carbondale, under contract with GDOT, inspected the Macon Downtown Airport on June 10, 2011.

The obstructions and other items observed during the inspection are listed below and photographs depicting these observations are attached. Please note obstructions left or right of the runway centerline are from the pilot's perspective on approach to the runway end.

- **Runway 10** – Meets minimum state licensing requirements, but fails to meet federal requirements for a 34:1 obstruction-free non-precision approach. Trees 415' from the threshold and 215' left of the centerline provide only a 15:1 approach slope.

- **Runway 28** – Meets minimum state licensing requirements and but fails to meet federal requirements for a 34:1 obstruction-free non-precision approach surface. Trees 510' from the threshold and 200' left of the extended runway centerline provide only a 14:1 approach slope.

- **Runway 15** – Meets minimum state licensing requirements, but fails to meet federal requirements for a 20:1 obstruction free visual approach. Trees 1130' from the runway and 220' left of the centerline provide only an 11:1 approach slope to the runway end and a 25:1 approach slope to the displaced threshold.

- **Runway 33** – Meets both state and federal minimum state licensing requirements for a visual approach slope of 20:1.

- **Primary Surface Violations** – The Primary Surface for Runway 10/28 is an imaginary surface longitudinally centered on the runway and is 500 feet wide, extending 200 feet off each runway end. The elevation of any point on the primary surface should be the same elevation as the nearest point on the runway centerline and should be free of any obstructions. Trees and brush are located within this area on the north side of Runway 10 approximately 193' left of the centerline near the approach and along the bank. In addition, there are trees and brush located on the south side of Runway 28 approximately 250' from the centerline near the approach and along the bank. These areas should be cleared to provide a clear area 250 feet each side of the runway centerline to 200 feet off each runway end. The Primary Surface for Runway 15/33 is 250' wide extending 200' off of each runway end. There is some brush and trees that are beginning to encroach on the west side of the approach to runway 33. These areas should be cleared to provide a clear area 250 feet each side of the runway centerline to 200 feet off each runway end.

- **General Comments** – Runway 15/33 is showing signs of environmental distress. There are numerous cracks that need to be cleaned and filled. The grass in the cracks should be sterilized before filling. The markings on Runway 15-33 are faded and should be remarked.

This letter is to inform the airport sponsor of any items that may compromise safety, do not meet federal design criteria, or do not meet the State of Georgia licensing requirements. You are encouraged to comply with those standards in order to be in compliance with your federal grant agreements and state licensing standards. The corrective actions that may be prescribed in this inspection report do not relieve the airport owner from compliance with any other federal, state, or local laws, ordinances, or regulations that may be applicable. It is the responsibility of the airport owner to be aware of and obey all Federal, State, or local laws, ordinances, or regulations that may have a bearing on corrective actions that may be specified in this report.

We encourage you to work with your project manager and airport consultant to fully identify all obstructions, and to remove the obstructions as soon as possible, but not later than October 31, 2011. Please contact Amanda J. Hill, our Aviation Planner, at (404) 505-4864 to discuss these inspection findings and to answer any questions concerning the inspection.

As always, thanks for your attention to this matter.

Sincerely,

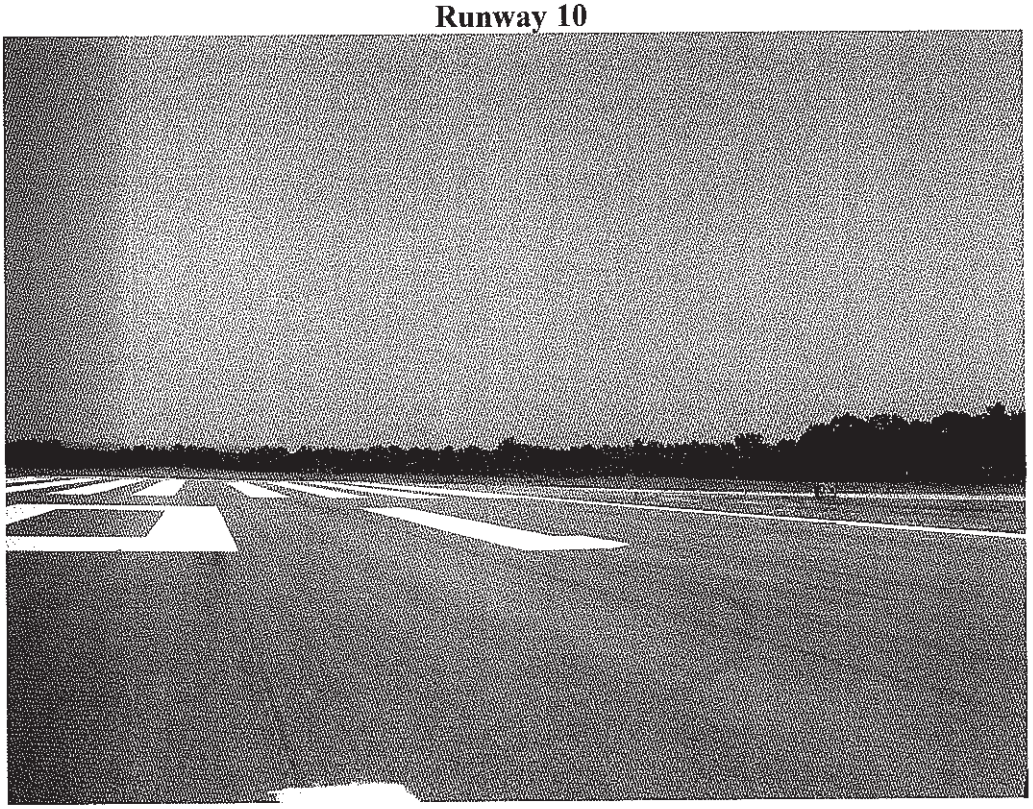
Carol L. Comer, Acting Director
Division of Intermodal

CLC:AJH

cc: Michael Thomas, Wilbur Smith Associates
Scott Seritt, FAA-Atlanta ADO

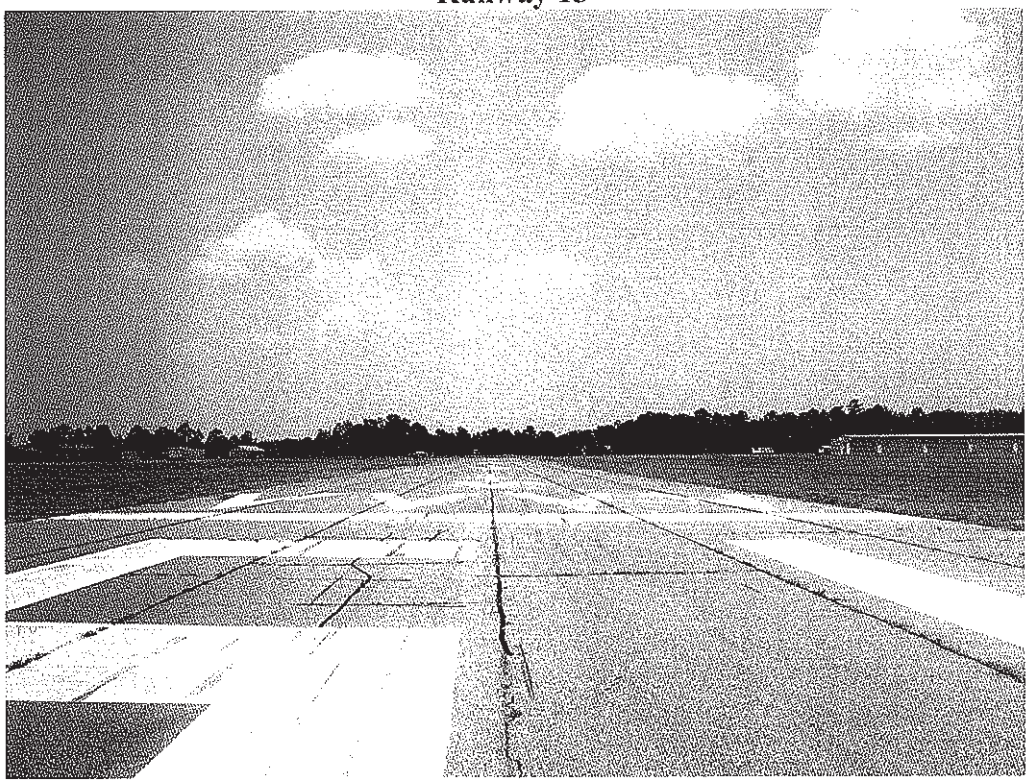
Macon Downtown Airport Inspection Photos

Runway 10

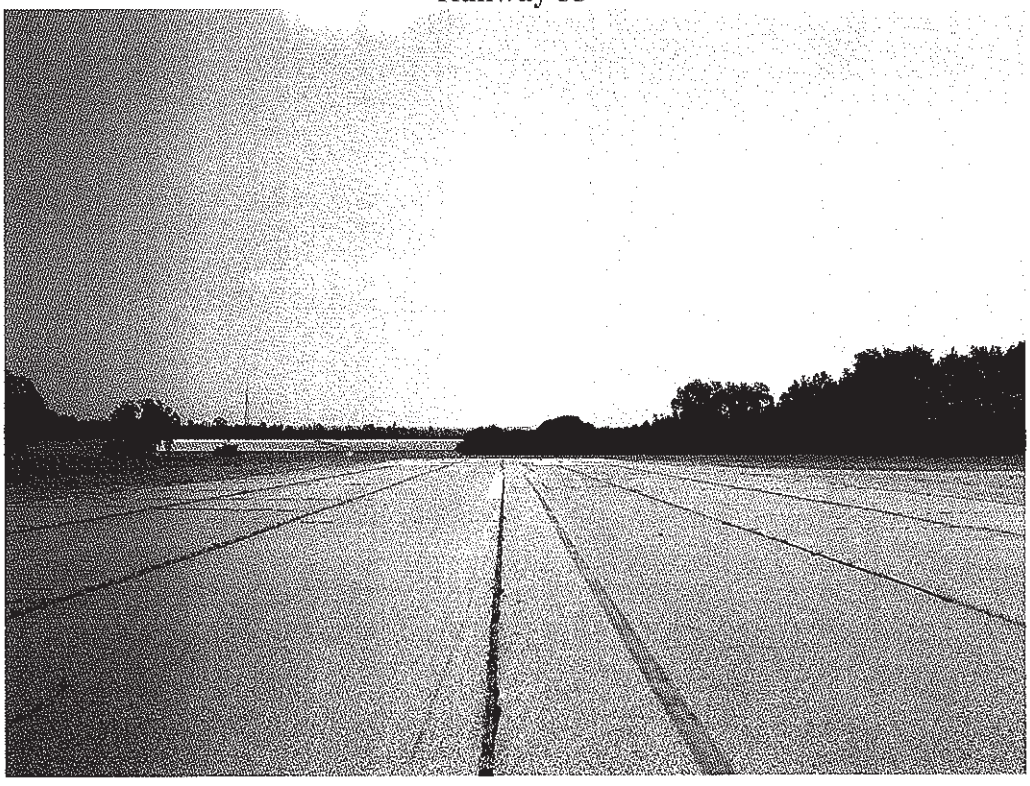


Runway 28

Runway 15



Runway 33



Appendix C

Memorandum of Record

Transverse Slope Measurements for Runway 10/28

NTSB Collected Data

MEMORANDUM OF RECORD

Shawn Etcher
Air Safety Investigator
Eastern Region Aviation

January 15, 2013

Subject: ERA12FA567 – Transverse Slope Measurements from Runway 10/28 collected by NTSB personnel on January 11, 2013

Location [i]	20 feet left of centerline	4 feet left of centerline	4 feet right of centerline	20 feet right of centerline
28 Threshold	0.4 acl	0.5 acl	0.6 tcl	0.5 tcl
4500 feet remaining	0.4 acl	0.3 acl	0.2 tcl	0.5 tcl
4000 feet remaining	0.4 acl	0.6 acl	0.3 acl	0.7 tcl
3500 feet remaining	0.7 acl	0.4 acl	0.1 acl	0.6 tcl
3000 feet remaining	0.2 acl	0.3 acl	0.0 -	0.7 tcl
2500 feet remaining	0.7 acl	0.2 acl	0.0 -	0.4 tcl
2000 feet remaining	0.5 acl	0.4 acl	0.4 acl	0.3 tcl
1500 feet remaining	0.4 acl	0.1 acl	0.1 acl	0.3 tcl
1000 feet remaining	0.5 acl	0.3 acl	0.1 tcl	0.7 tcl
500 feet remaining	0.3 acl	0.3 acl	0.1 acl	0.7 tcl
Prior to Threshold[ii]	0.3 acl	0.2 acl	0.2 acl	0.5 tcl

Notes

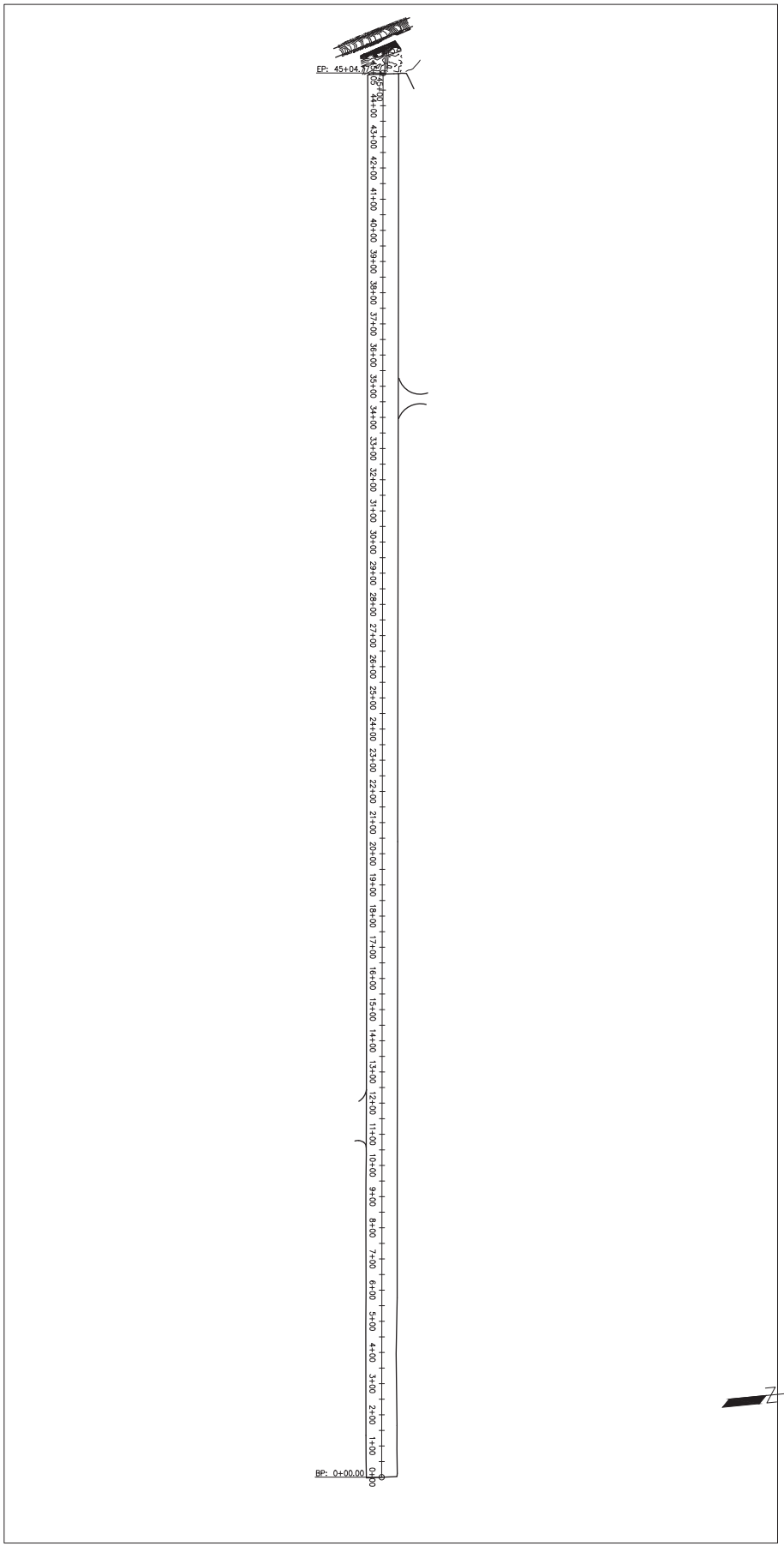
- 'acl' means slope/drainage that is away from centerline and is in degrees
- 'tcl' means slope/drainage that is towards the centerline and is in degrees
- The measured runway length was 4,700 feet

[i] Distance is in feet as measured from the threshold of runway 28 (also the landing runway)

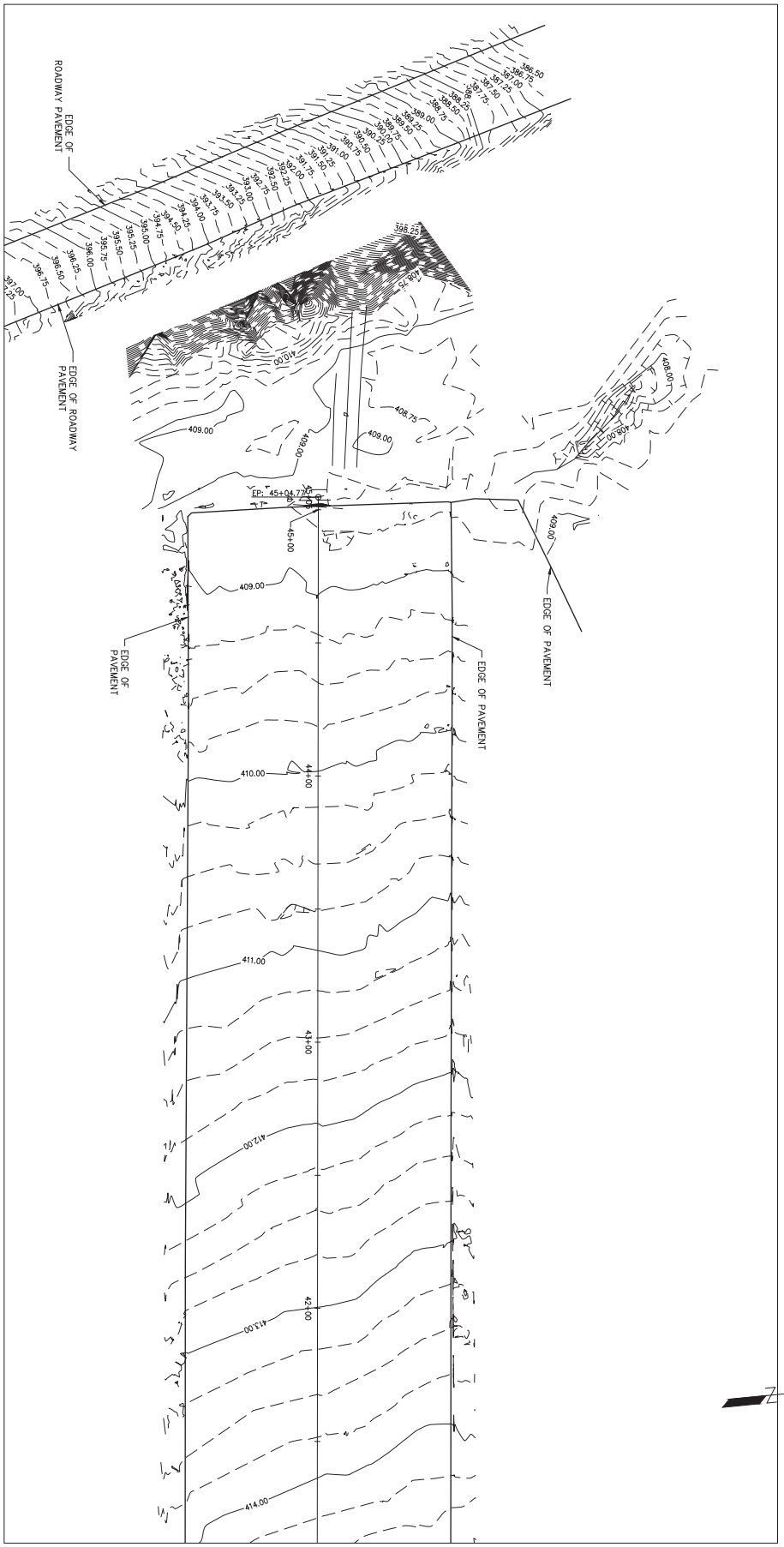
[ii] This measurement was taken between the painted '10' and the stripes prior to the threshold

Appendix D

TGER Technologies, Inc., Runway Laser Survey



DRAWING NUMBER 1	DATE 2/25/13	TGER TECHNOLOGIES INC. MACON AIRPORT RUNWAY LASER SCAN PLAN WITH STATIONING	TGER Technologies, Inc.	REVISION DATE / DESCRIPTION / APRVD



TGER TECHNOLOGIES INC.

MACON AIRPORT RUNWAY LASER SCAN

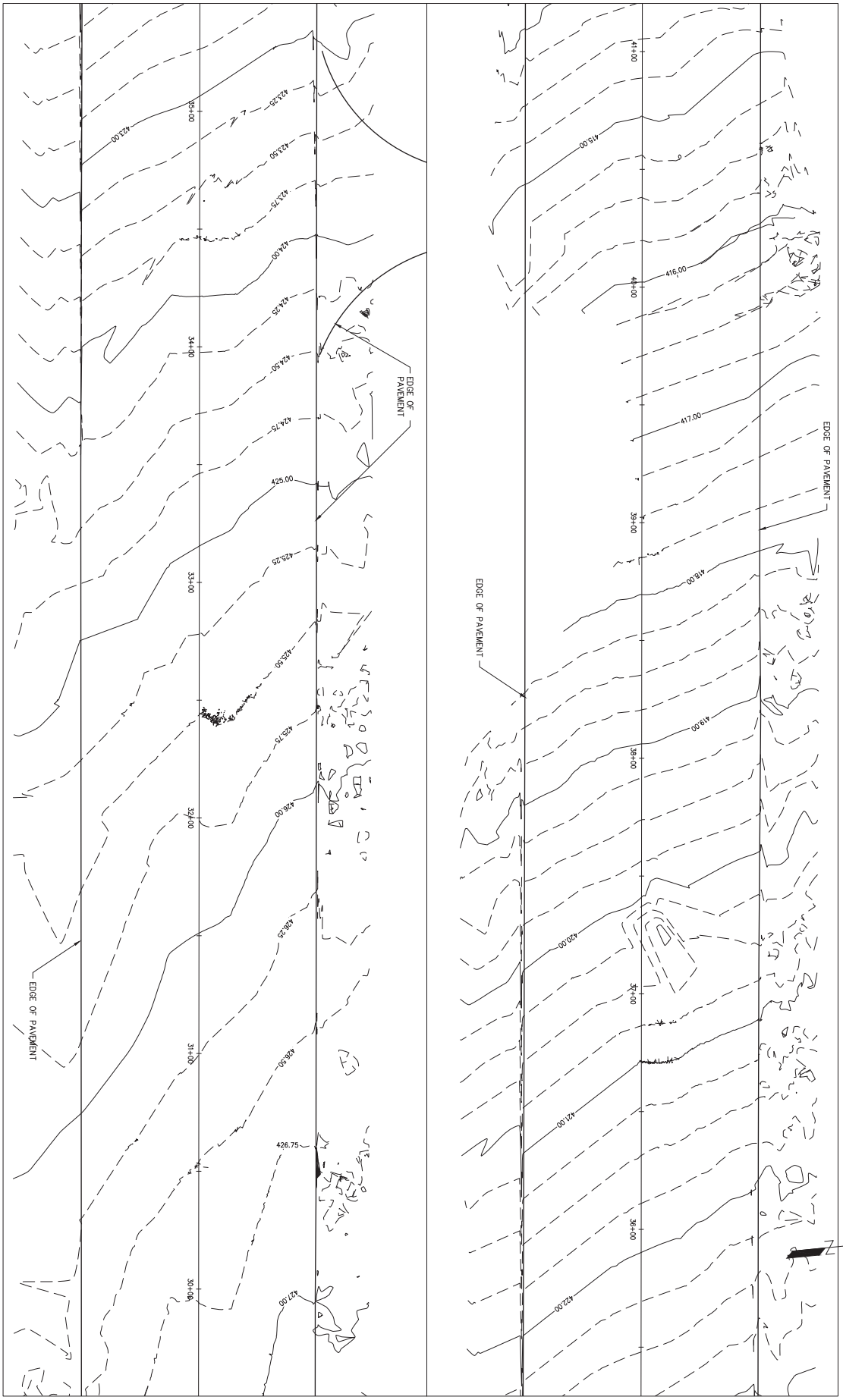
STA 41+17 TO STA 45+00

TGER Technologies, Inc.

REVISION		
DATE	DESCRIPTION	APRVD

DRAWING NUMBER 2

DATE 2/25/13



DRAWING NUMBER 3	DATE 2/25/13	TGER TECHNOLOGIES INC. MACON AIRPORT RUNWAY LASER SCAN STA 29+60 TO STA 41+17	TGER Technologies, Inc.	REVISION DATE / DESCRIPTION / APRVD

REVISION		
DATE	DESCRIPTION	APRVD

TGER Technologies, Inc.

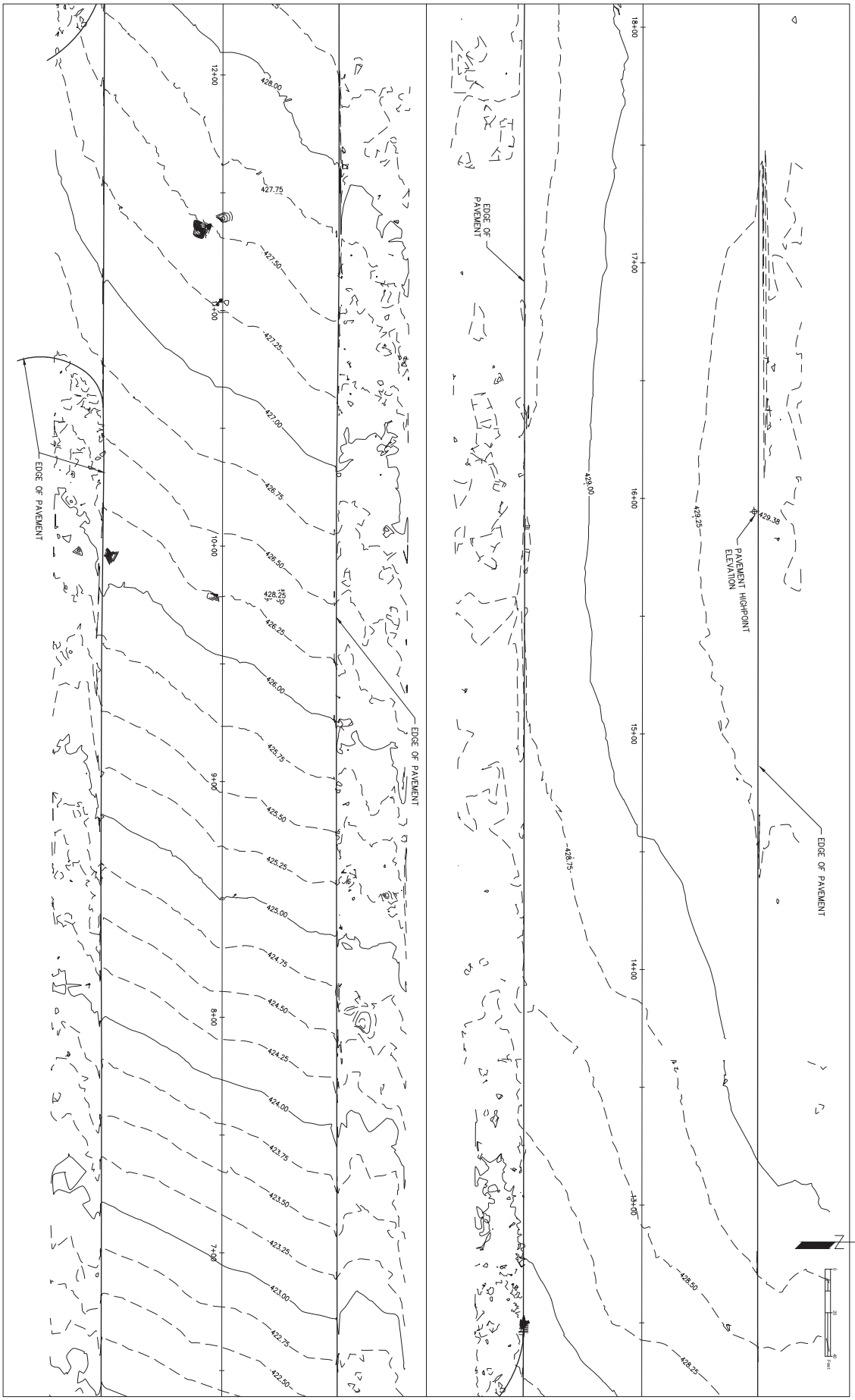
TGER TECHNOLOGIES INC.

MACON AIRPORT RUNWAY LASER SCAN

STA 18+00 TO STA 29+60

DATE 2/25/13

DRAWING NUMBER 4



TGER TECHNOLOGIES INC.

MACON AIRPORT RUNWAY LASER SCAN

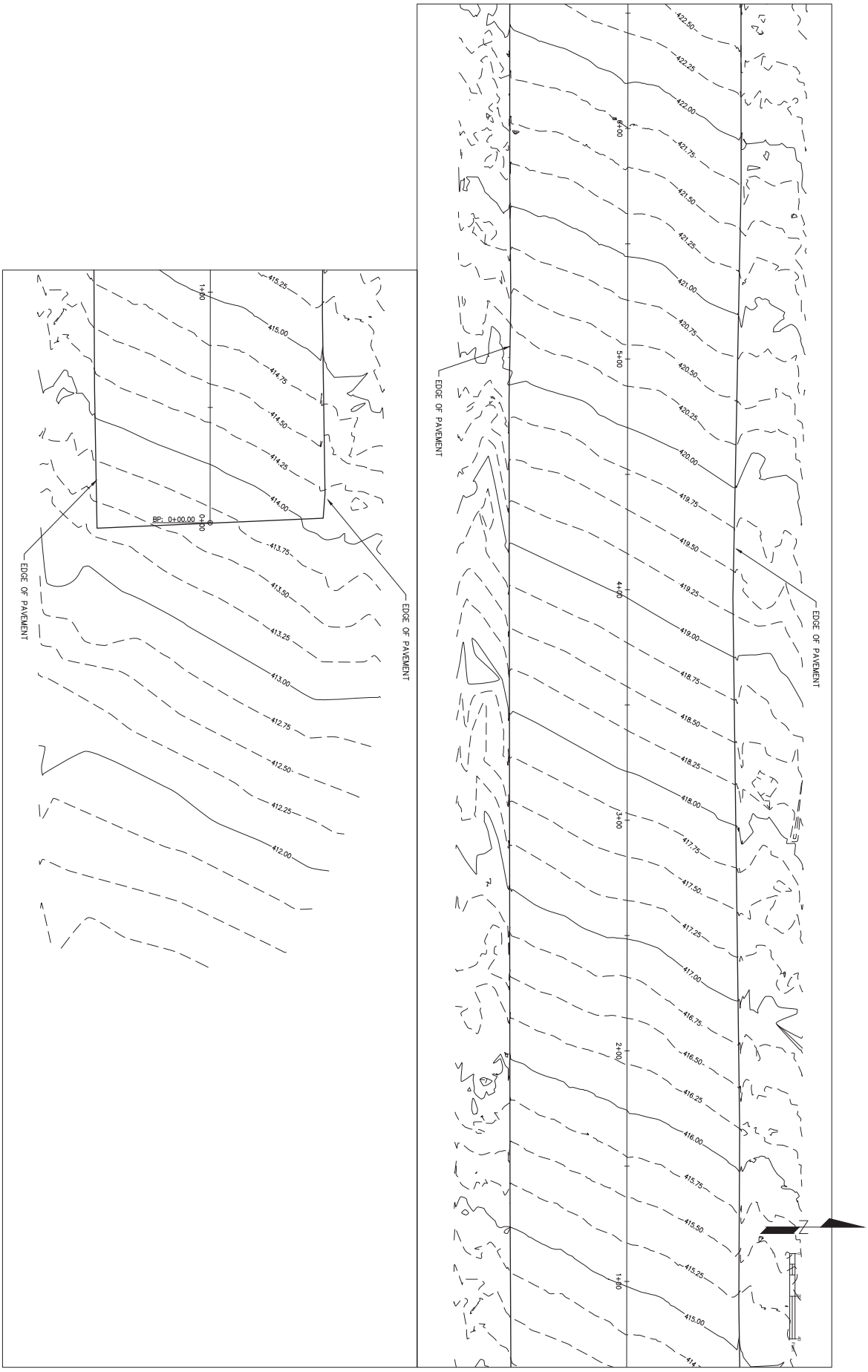
STA 6+40 TO STA 18+00

TGER Technologies, Inc.

REVISION		
DATE	DESCRIPTION	APRVD

DATE 2/25/13

DRAWING NUMBER 5



9	DRAWING NUMBER	DATE 2/25/13	TGER TECHNOLOGIES INC. MACON AIRPORT RUNWAY LASER SCAN STA 0+00 TO 6+40

TGER Technologies, Inc.

REVISION		
DATE	DESCRIPTION	APRVD