

Bradley International Airport  
Taxiway Rehabilitation and Service Road  
Stormwater Pollution Control Plan (SWPCP)

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Hoyle, Tanner Project Number: 306802



Prepared for:  
Connecticut Airport Authority  
Windsor Locks, Connecticut

April 2014

Prepared by:

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## **Attachments**

- A. Project Location USGS Map
- B. Site Plans\*
- C. Temporary Air and Water Pollution, Soil Erosion, and Siltation Control Plan
- D. NRCS Soils Map
- E. FEMA Maps
- F. Seeding Plan
- G. Phasing Plan
- H. Erosion Plan
- I. Wetland Report
- J. Outfall Map of Bradley Airport, 2005
- K. CTDEEP Wildlife Division Correspondence

\*at the request of CTDEEP staff, a full set of site plans has not been attached, only those pages of the site plan that are pertinent to the application and SWPCP

## 1. INTRODUCTION

The Connecticut Airport Authority (CAA) hereby submits this information to satisfy the requirements for a General Permit for Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities (DEEP-WPED-GP-015) for proposed changes to Bradley International Airport (BDL). Hoyle, Tanner & Associates, Inc. is submitting this SWPCP on behalf of CAA.

The project has been designed according to best engineering practices and adherence to the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control and the 2004 Connecticut Stormwater Quality Manual. As such, and due to the nature of the project work areas being surrounded by several million square feet of existing impervious area, the project will cause insignificant and immeasurable increases in amount and velocity of water that flows off-site.

The total site acreage of the project area is approximately 73 acres. Approximately 3.42 acres of ground surface would occur, as broken out as follows: 1.84 acres for work at Taxiway E, 1.05 acres for work on the service road, and 0.53 acres for work to Taxiway W.

The airport includes over 13 million square feet of impervious area. New impervious area will include approximately 19,115 square feet in drainage area 13, located at the north end of Taxiway E. The impervious area draining into areas 2, for the south end of Taxiway E, and area 9, for Taxiway W, will decrease by 1900 sq ft and 1285 sq ft, respectively.

## 2. PROJECT DETAILS

The Airport is proposing this project to improve the safety and operational reliability of the Airport by rehabilitating portions of the Taxiway system. Taxiway E was reconstructed in 1989/1990, and certain portions have been recently reconstructed, at each end where this taxiway tied into other recent projects, however approximately 3250' is currently in need of rehabilitation. A new vehicle service road is needed in order to provide for efficient and safe movement of maintenance and auxiliary vehicles to the maintenance facility without entering Aircraft operating areas. Taxiway W will be realigned to meet current FAA standards.

The project will include the following actions:

1) Pavement repair- Fatigued pavement will be removed and new pavement installed. Areas affected include the south end of Taxiway E to the north end of Taxiway E, including a portion of stub Taxiway F, and a portion of the UPS ramp. Much of the work will take place in the existing footprint, however, per AC 150/5300-13A - Change 1, issued February 2014, some areas will require slightly new geometry and wider shoulders (5 additional feet).

2) A portion of stub Taxiway W's alignment will also be reconfigured, including pavement removal, re-grading and re-paving, to terminate at the threshold of Runway 15. Pavement will also be re-marked, the lighting will be relocated according to the change in pavement, and existing taxiway lighting and signage will be relocated.

3) New vehicle service road- An approximately 14-foot wide paved road will be constructed, with limited side sloping, from the Bombardier South taxiway, along the apron and extending to connect the highway/maintenance road leading to the CAA maintenance facility. The road will consist of 4 inches of pavement over 12" of gravel, for a total depth of 16" of excavation. This area has been cleared and graded at some point in the airport's history. It is currently a mowed grassed area with worn-in dirt wheel paths in between paved roads/taxiways and buildings.

All of the work areas have been previously disturbed and graded due to historic and ongoing airport operations, and are currently paved or mowed grass/landscaping adjacent to or in between active runways and taxiways. The project is expected to begin in the summer of 2015 and would take approximately five months to complete.

### **3. EXISTING CONDITIONS**

#### 3.1 Upland

All of the upland areas surrounding the project areas have been highly influenced by human activity. The turf grass/mowed field habitats are composed primarily of planted grass species that are mowed on a regular basis, with some ornamental trees. The turf grass/mowed field areas are not equivalent to the protected grassland habitat area associated with other portions of the airport. Because these areas are regularly mowed and maintained, the quality of habitat is unfavorable for protected grassland bird species.

The maintained grounds areas include the airport runways and structures and asphalt roads. Most of the developed lands are vegetated with lawns, and landscaped with trees and shrubs. Old field conditions exist generally adjacent to the maintained grounds portions of the airport. These fields are dominated by herbaceous vegetation (grasses) that is cut on a regular basis as required by FAA regulations.

#### 3.2 Surface Waters and Wetlands

The proposed work areas are located in uplands. There are no surface water bodies within the project area.

Areas that had the potential to be jurisdictional wetlands (as identified by a desk-top review of soil mapping, aerial photographs and National Wetland Maps) were investigated in the field on November 18, 2014. State wetlands are defined by the Connecticut General Statutes (CGS), and federal wetlands and navigable waters are defined by the U.S. Army Corp of Engineers (ACOE) under Section 10 of the Rivers and Harbors Act of 1899. There are no jurisdictional wetlands within the project areas.

The project will not discharge into impaired waters in the Towns listed on Table 2 on form DEEP-WPED-REG-015.

The intermediate and ultimate receiving waters of all discharges would be as follows:

- Work areas to the north end of Taxiway E and the service road will drain north to a grassed detention basin that outlets to a storm swale around the northern end of Runway 24 and discharges into Spencer Brook, which drains into Stoney Brook and ultimately the Connecticut River.
- Work areas for Taxiway W will discharge to Degrayes Brook that drains into Stoney Brook and ultimately the Connecticut River.
- Work areas to the southern end of Taxiway E will discharge to Seymour Hollow Brook that drains into Rainbow Brook and ultimately the Farmington River. Seymour Hollow Brook is listed as impaired due to de-icing fluid. The project will not add to this impairment.

#### **4. OTHER PERMITS REQUIRED**

CAA has received a Categorical Exclusion from the Federal Aviation Authority (FAA) as fulfillment of the NEPA review process for this federally-funded project. No federal, state or local permits or approvals are required.

The project areas were identified during correspondence with CTDEEP Wildlife Division on January 29, 2015 as containing Critical sand barren Habitat and foraging habitat for listed grassland birds. Per their recommendations, a warm season grass mix will be used for stabilizing disturbed soils. In addition, construction will be limited to the extent practicable between May 1 and August 31; it is not possible to limit all construction during these months due to the need to install and cure pavement. All materials and equipment will be staged on existing impervious surfaces.

#### **5. EMERGENCY PROCEDURES FOR FLOODING**

Bradley International Airport is a fully developed site with existing infrastructure in place to allow for significant rain events and prevent flooding within the airport's boundaries. The project will not substantially change such infrastructure or procedures. The airport is not located in a FEMA designated floodplain or floodway. The minor increases in impervious area when considered in the context of such a large area of existing impervious area are not expected to contribute to local or regional flooding.

#### **6. SOIL EROSION AND SEDIMENT (E&S) CONTROLS**

This SWPCP and attached plans has been designed to address the items on the review checklist DEEP-WPED-LIST-015. Per discussion with CTDEEP staff including Neal Williams, Karen Allen and Sharon Yurasevecz, at a meeting on Thursday March 26, 2015, some of the items on the checklist have not been provided because the project is anticipated to have such a minimal stormwater impact as compared to the large area of existing development surrounding the project site.

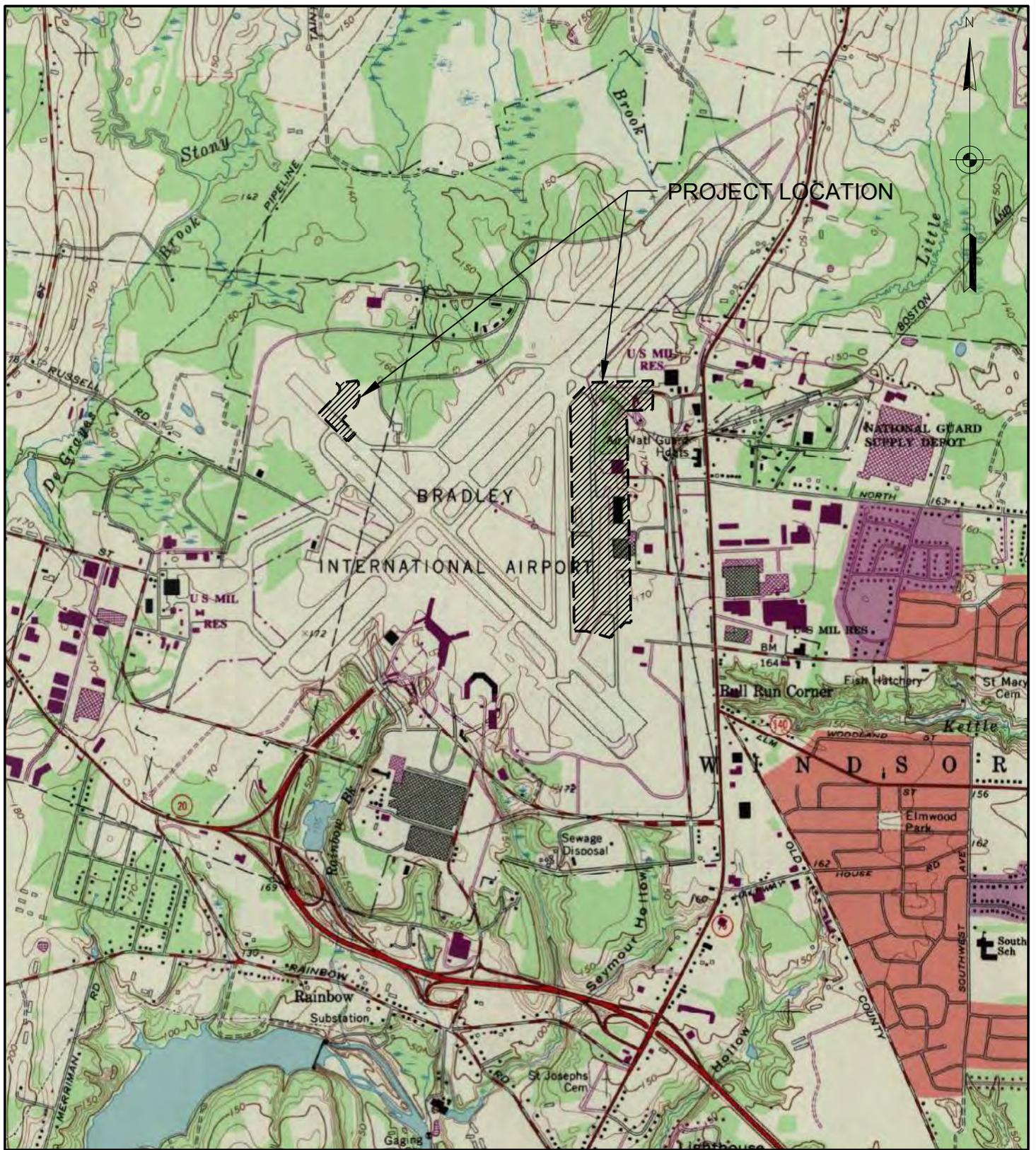
#### **7. POST-CONSTRUCTION STORMWATER CONTROLS AND E&S MEASURES**

There will be no permanent post-construction controls or E&S measures left in place after construction.

The three outfalls listed in Table 2 of form DEEP-WPED\_REG-015 will be routinely sampled and turbidity monitoring will occur during construction per the Monitoring Requirements of the CTDEEP General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities via procedures consistent with 40 CFR 136 until receipt of termination approval, typically 90 days after stabilization. A Stormwater Monitoring Report will be submitted (DEEP-WPED-SMR-015) within thirty (30) days following the end of each month for each sampling event. A Notice of Termination Form (DEP-PED-NOT-015) will be provided upon project completion.

## **Attachment A: Project Location USGS Map**

Drawing name: H:\306802\dwg\Exhibits\BDL-LOCUS.dwg Jul 09, 2014 - 9:13am



USGS QUAD = WINDSOR LOCKS, CT

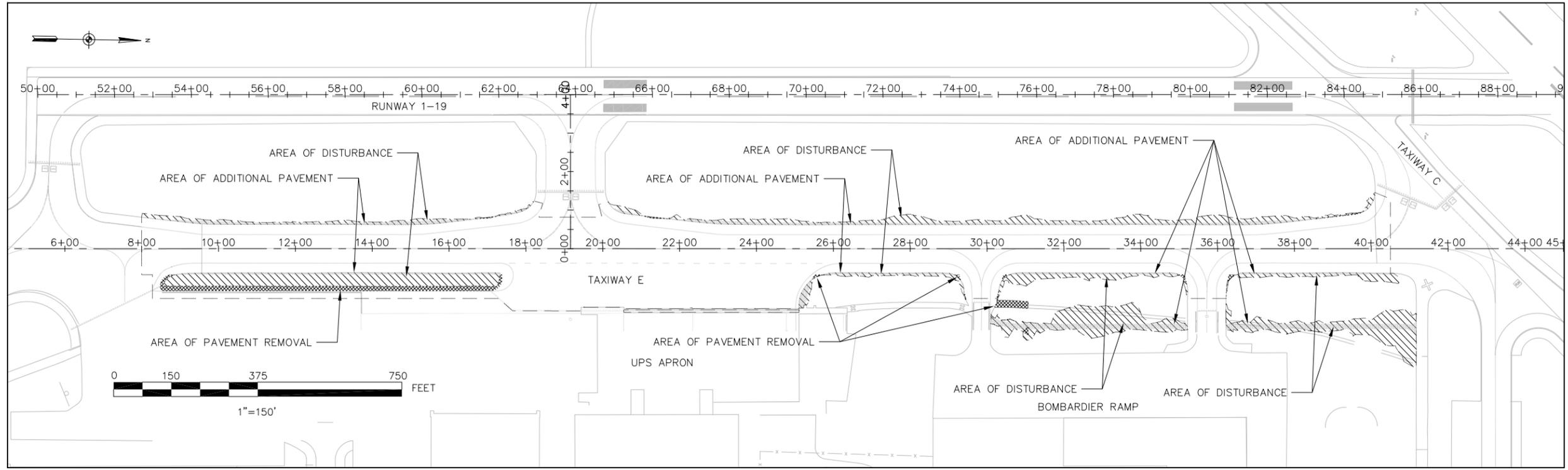
SCALE: 1" = 2000'

					150 Dow Street Manchester, NH 03101-1227 Tel 603-669-5555 Fax 603-669-4168 Web Page www.hoyletanner.com HOYLE, TANNER & ASSOCIATES © 2014		BRADLEY INTERNATIONAL AIRPORT WINDSOR LOCKS, CONNECTICUT		FIGURE 1	
					CHKD. BY MTO		DR. BY JLC		DES. BY KRP	

LOCATION PLAN

## **Attachment B: Site Plans**

REV. NO.	DATE	DESCRIPTION	BY



**TAXIWAY E**

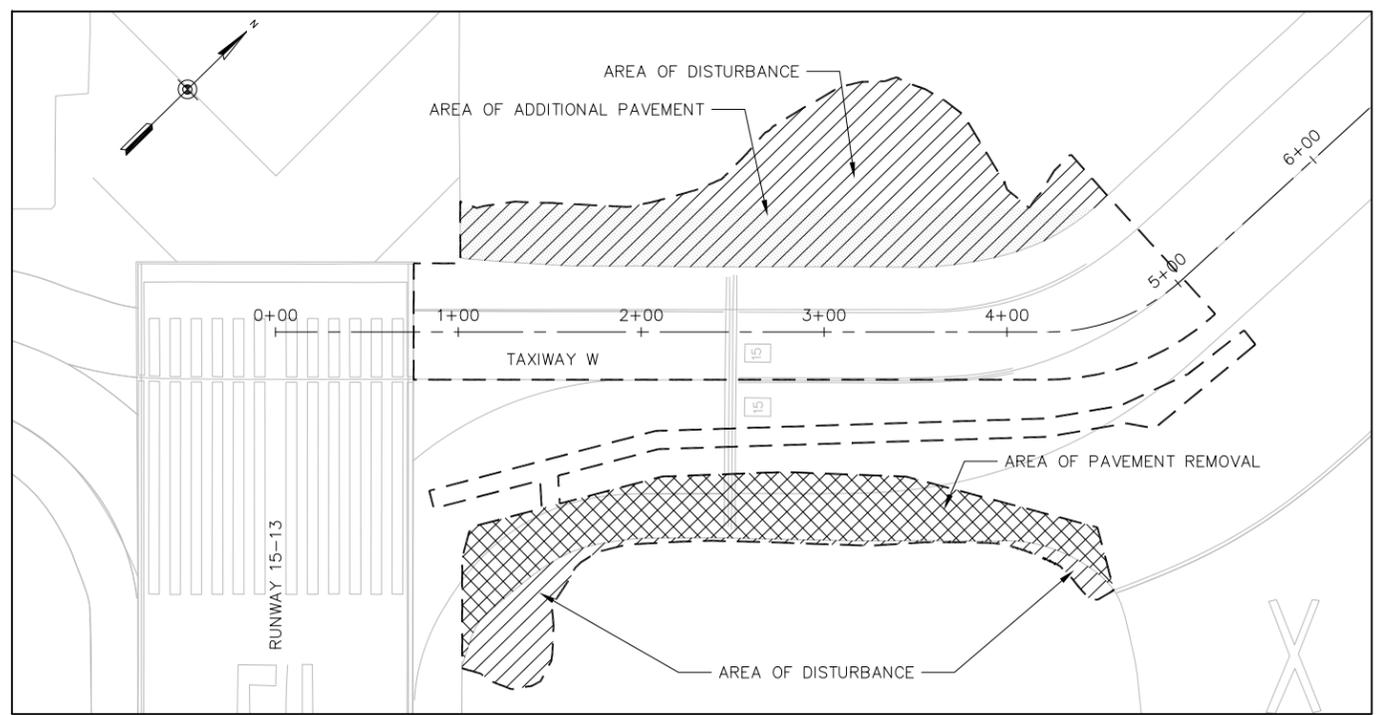
TOTAL AREA OF DISTURBANCE = 79,974 SF/ 1.84 AC.

**TAXIWAY E AND SERVICE ROAD**

SCALE: 1"=150'

**SERVICE ROAD**

TOTAL AREA OF DISTURBANCE = 45,743 SF/ 1.05 AC.



**TAXIWAY W**

SCALE: 1"=50'

**TAXIWAY W**

TOTAL AREA OF DISTURBANCE = 22,774 SF/ 0.53 AC.

**IMPERVIOUS SUMMARY**

TAXIWAY W = 9,978 SF/ 0.23 AC. ADDITIONAL PAVEMENT  
 TAXIWAY W = -11,263 SF/ -0.26 AC. PAVEMENT REMOVAL

SERVICE ROAD = 14,278 SF/ 0.33 AC. ADDITIONAL PAVEMENT  
 SERVICE ROAD = -1,687 SF/ -0.04 AC. PAVEMENT REMOVAL  
 SERVICE ROAD = -7,400 SF/ -0.17 AC. WHEEL PATH REMOVAL

TAXIWAY E = 23,960 SF/ 0.55 AC. ADDITIONAL PAVEMENT  
 TAXIWAY E = -11,934 SF/ -0.27 AC. PAVEMENT REMOVAL

TOTAL ADDITIONAL PAVEMENT = 48,216 SF/ 1.11 ACRES  
 TOTAL PAVEMENT REMOVAL = -24,884 SF/ -0.57 ACRES  
 TOTAL WHEEL PATH REMOVAL = -7,400 SF/ -0.17 AC.

NET = 15,932 SF/ 0.36 ACRES ADDITIONAL PAVEMENT

Drawing name: H:\306802\wg\Exhibits\BDL-FG101-Area of Disturbance.dwg Apr 07, 2015 - 1:34pm

**Attachment C:  
Temporary Air and Water Pollution, Soil  
Erosion, and Siltation Control Plan**

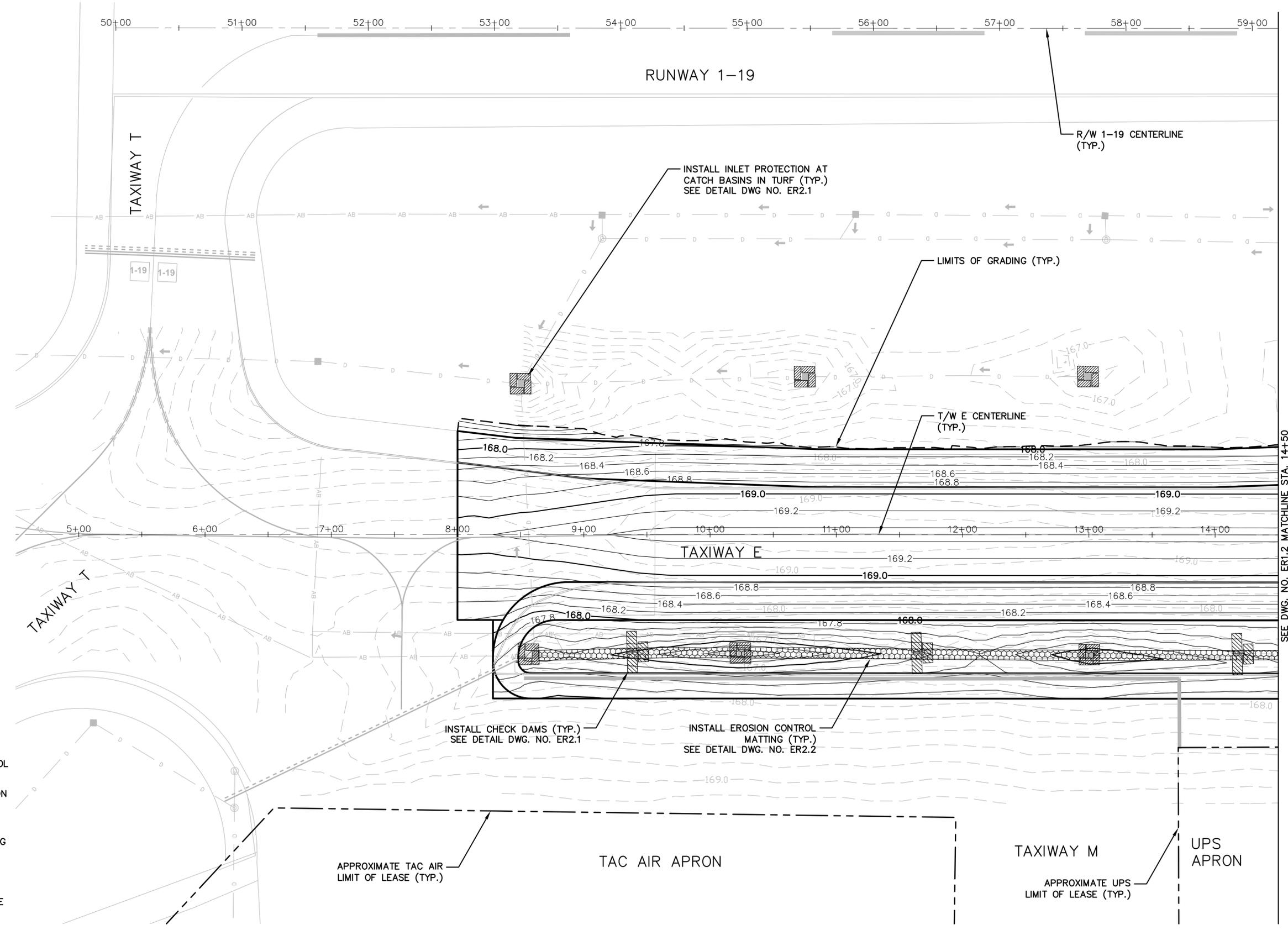


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BRADLEY INTERNATIONAL AIRPORT  
REHABILITATE, LIGHT AND SIGN TAXIWAY E  
REALIGN TAXIWAY W; CONSTRUCT NEW SERVICE ROAD  
**EROSION CONTROL PLAN  
TAXIWAY E  
SHEET 1 OF 5**  
DATE: MARCH 2015  
SCALE: 1"=40'

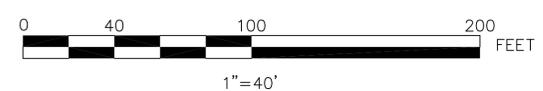
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3	2/13/15	60% DESIGN SUBMISSION	JLC
4	12/15/14	30% DESIGN SUBMISSION DO NOT SCALE DRAWING	JLC

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SHEET 15 OF 86

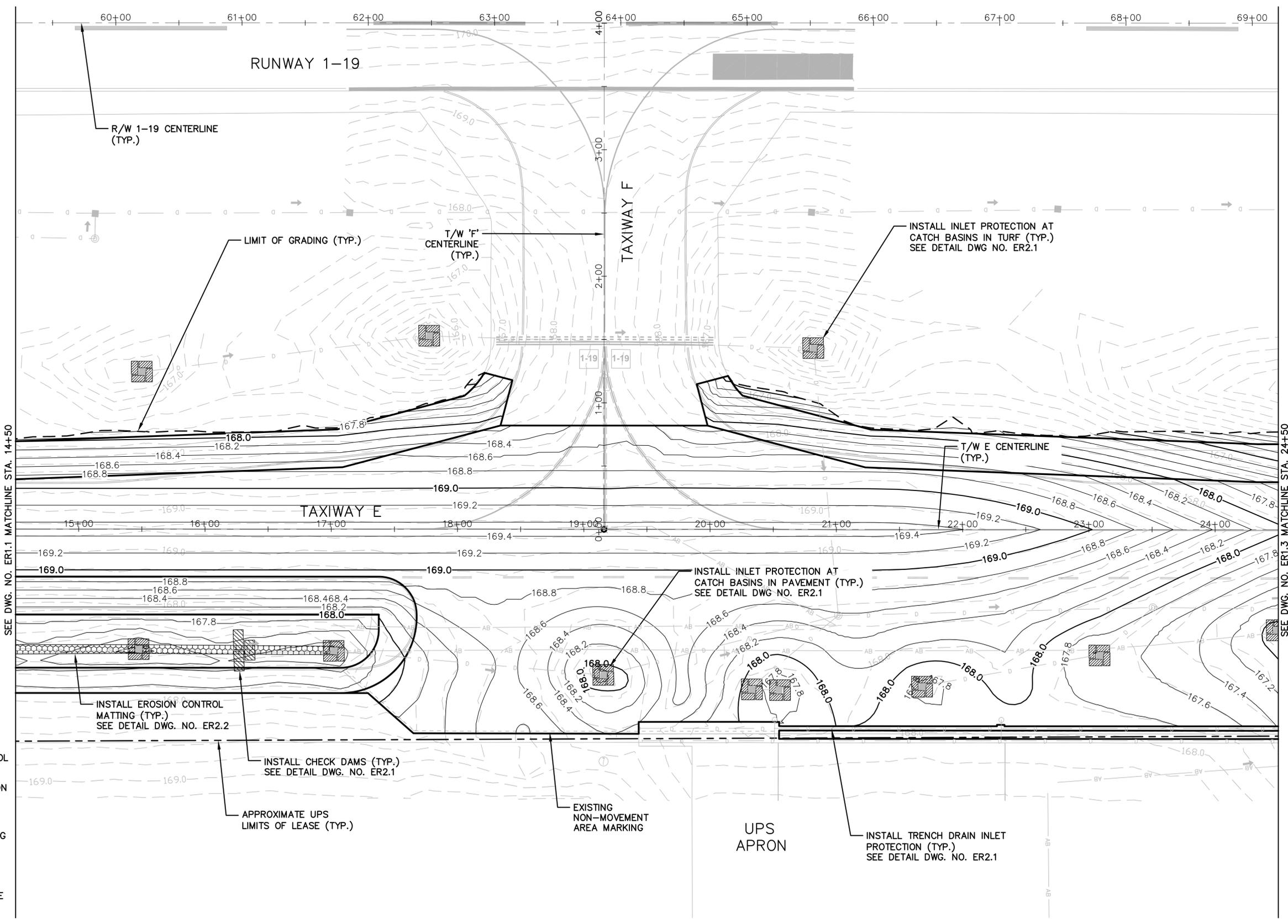


**LEGEND**

	PROPOSED EROSION CONTROL BLANKET
	PROPOSED INLET PROTECTION
	PROPOSED CHECK DAM
	PROPOSED LIMIT OF GRADING
	EXISTING DRAINAGE
	ABANDONED DRAINAGE
	EXISTING DRAINAGE MANHOLE
	EXISTING CATCH BASIN
	DRAINAGE FLOW



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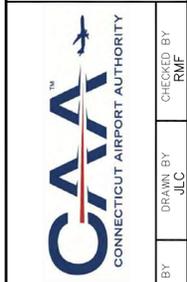
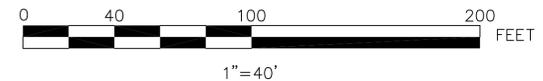


SEE DWG. NO. ER1.1 MATCHLINE STA. 14+50

SEE DWG. NO. ER1.3 MATCHLINE STA. 24+50

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	PROPOSED INLET PROTECTION
	PROPOSED CHECK DAM
	PROPOSED LIMIT OF GRADING
	EXISTING DRAINAGE
	ABANDONED DRAINAGE
	EXISTING DRAINAGE MANHOLE
	EXISTING CATCH BASIN
	DRAINAGE FLOW



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BRADLEY INTERNATIONAL AIRPORT  
 REHABILITATE, LIGHT AND SIGN TAXIWAY E  
 REALIGN TAXIWAY W; CONSTRUCT NEW SERVICE ROAD  
**EROSION CONTROL PLAN  
 TAXIWAY E  
 SHEET 2 OF 5**  
 DATE: MARCH 2015  
 SCALE: 1"=40'

REV. NO.	DATE	DESCRIPTION
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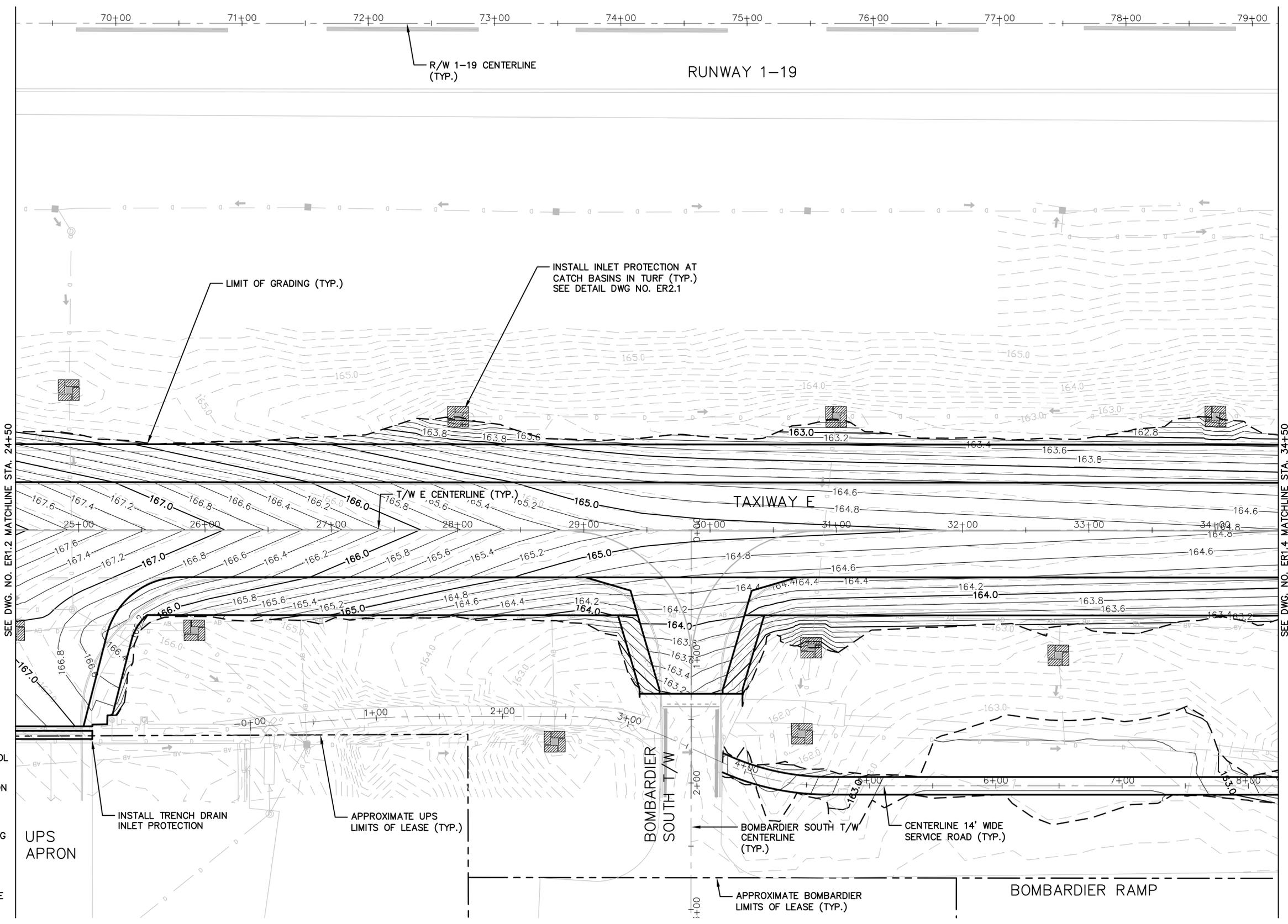
PROJECT DESIGNER  
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165 Park Street  
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Tel: 860-699-5555  
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BRADLEY INTERNATIONAL AIRPORT  
DESIGNED BY: MTO  
DRAWN BY: JLC  
CHECKED BY: RMF

REV. NO.	DATE	DESCRIPTION	BY
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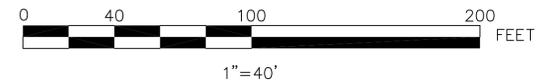
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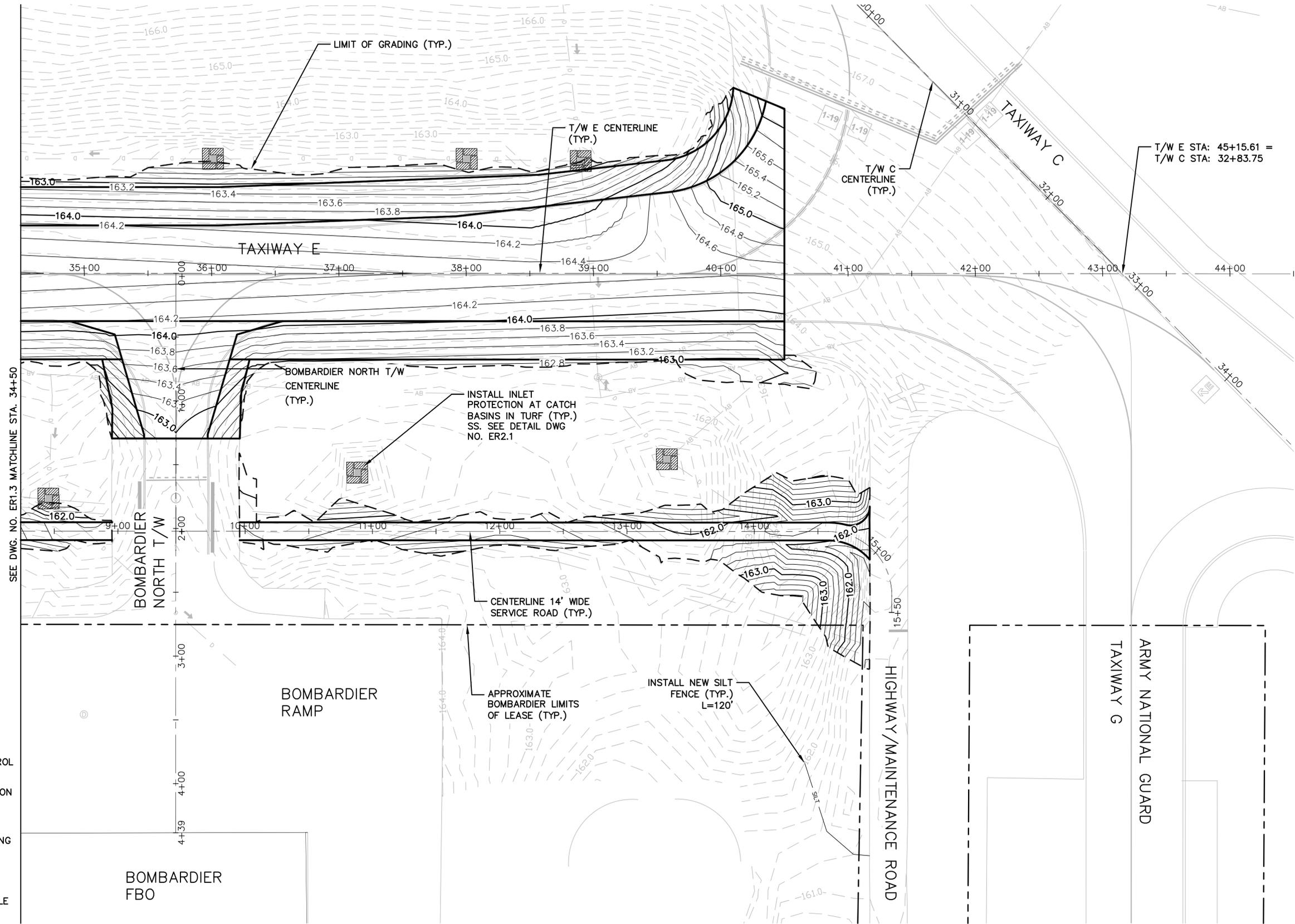
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	EXISTING DRAINAGE
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	EXISTING CATCH BASIN
	DRAINAGE FLOW



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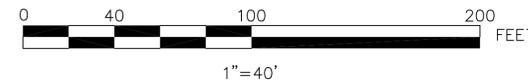
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	PROPOSED CHECK DAM
	PROPOSED LIMIT OF GRADING
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	EXISTING DRAINAGE MANHOLE
	EXISTING CATCH BASIN
	DRAINAGE FLOW

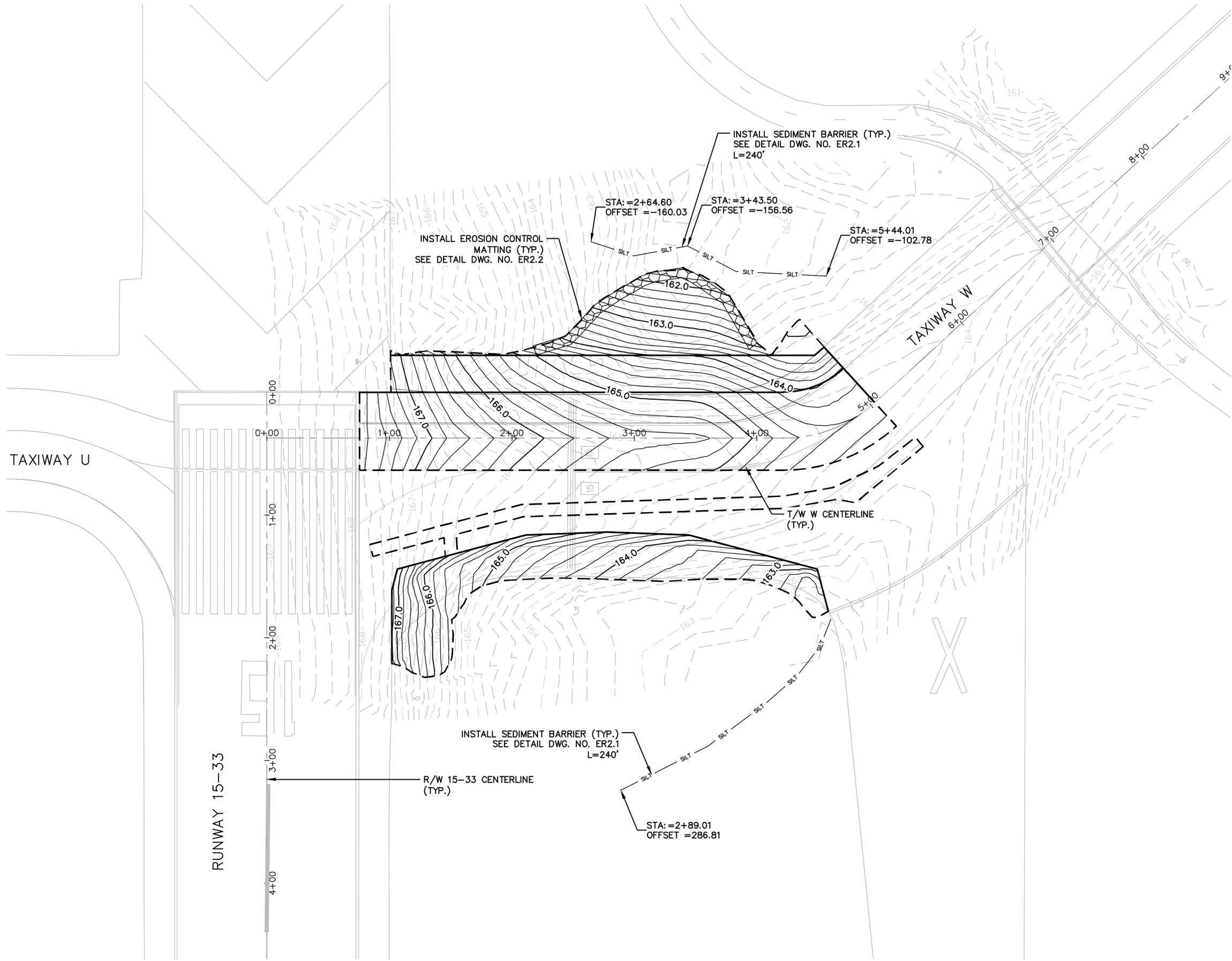
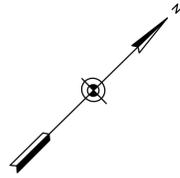


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T/W C STA: 32+83.75

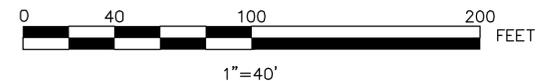


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PROJECT DESIGNER	
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EROSION CONTROL PLAN TAXIWAY E SHEET 4 OF 5	
DATE: MARCH 2015	
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REVISIONS	BY
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DATE	JLC
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SHEET 18 OF 86	



**LEGEND**

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	PROPOSED CHECK DAM
	PROPOSED LIMIT OF GRADING
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	ABANDONED DRAINAGE
	EXISTING DRAINAGE MANHOLE
	EXISTING CATCH BASIN
	DRAINAGE FLOW



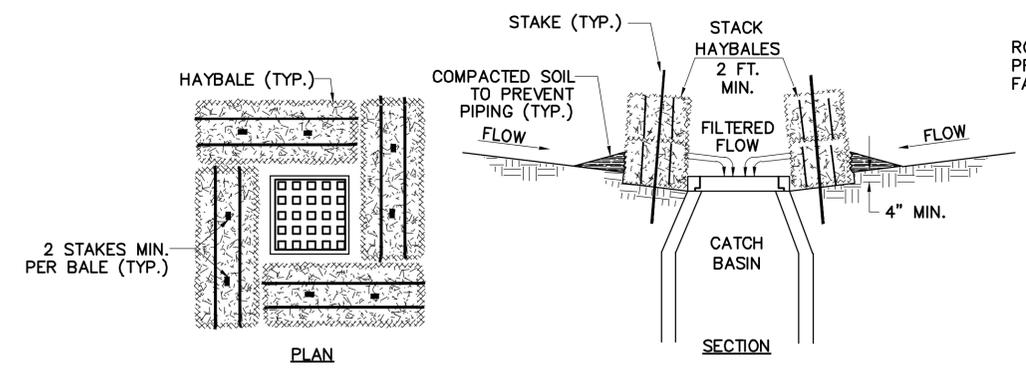
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PROJECT DESIGNER <b>Hoyle Tanner &amp; Associates, Inc.</b>	DESIGNED BY: MTO
REHABILITATE, LIGHT AND SIGN TAXIWAY E REALIGN TAXIWAY W; CONSTRUCT NEW SERVICE ROAD	BRADLEY INTERNATIONAL AIRPORT
<b>EROSION CONTROL PLAN TAXIWAY W SHEET 5 OF 5</b>	DATE: MARCH 2015
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BY: JLC	DATE: 3/20/15
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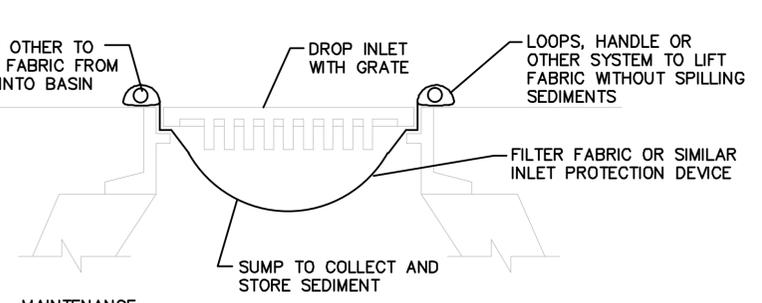
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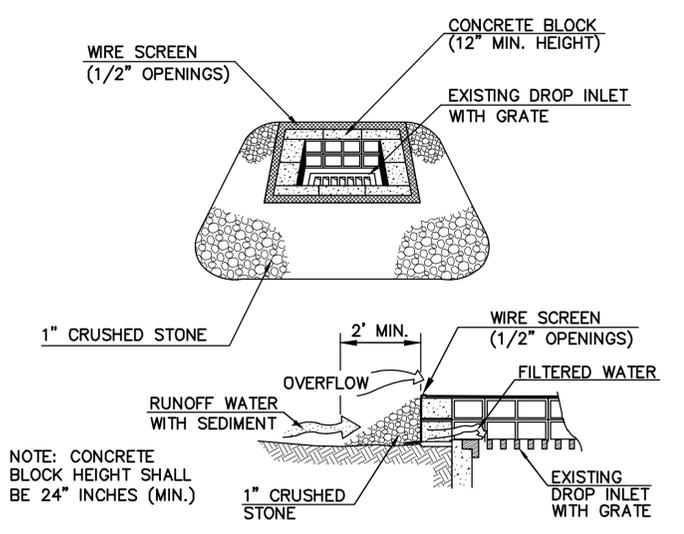
**HAY BALE INLET PROTECTION AT CATCH BASIN**  
NOT TO SCALE



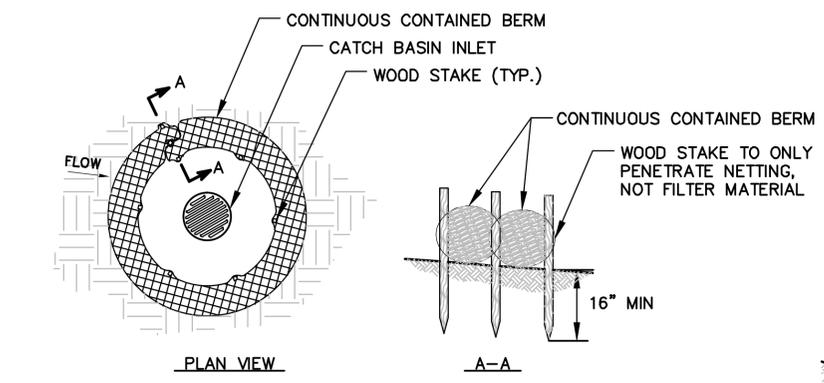
**MAINTENANCE:**  
CONTRACTOR TO CLEAN AFTER EVERY STORM. IF THE BARRIER BECOMES CLOGGED WITH SEDIMENT SO THAT IT NO LONGER ADEQUATELY PASSES FILTERED WATER, THE SEDIMENT SHALL BE REMOVED AND THE BARRIER SHALL BE REPLACED. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.

THE DEVICE SHALL BE USED FOR IN PAVEMENT CATCH BASINS, AND TRENCH DRAINS AND SHALL BE REMOVED WHEN THE DRAINAGE AREA HAS BEEN ADEQUATELY STABILIZED.

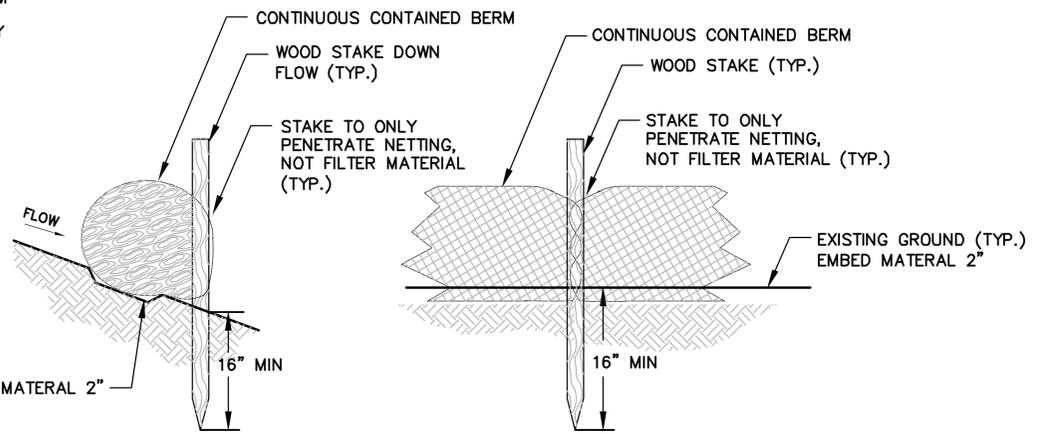
**FILTER FABRIC INLET PROTECTION AT CATCH BASIN/TRENCH DRAIN**  
NOT TO SCALE



**BLOCK & CRUSHED STONE INLET PROTECTION AT CATCH BASIN**  
NOT TO SCALE

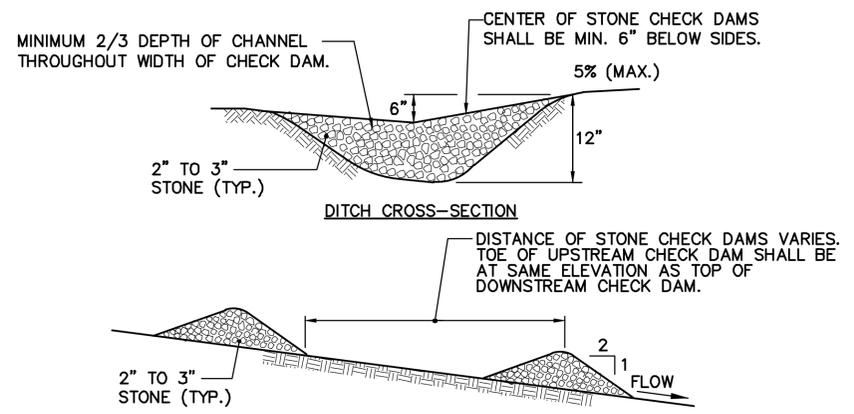


**CONTINUOUS CONTAINED BERM INLET PROTECTION AT CATCH BASIN**  
NOT TO SCALE

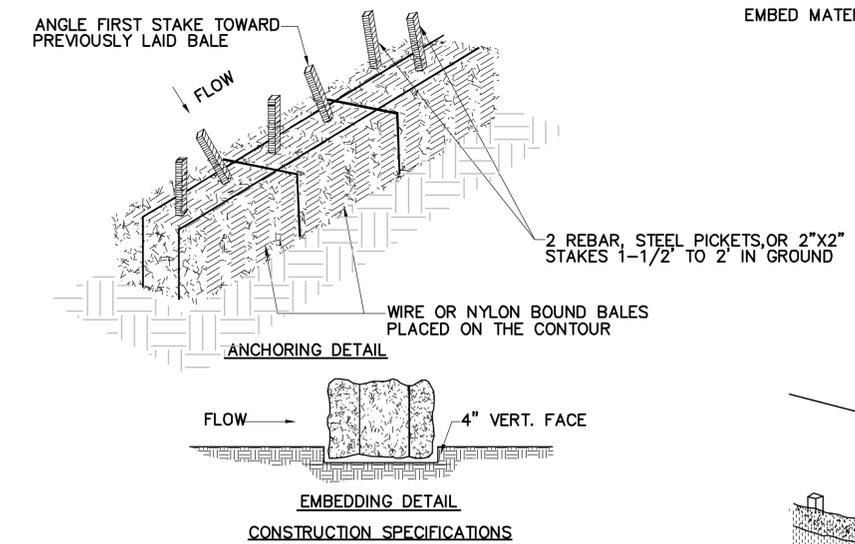


**NOTE:**  
CONTINUOUS CONTAINED BERMS CONSIST OF A SYNTHETIC TUBULAR NETTING FILLED WITH EROSION CONTROL MIX OR OTHER FILTER MATERIAL AND SHALL BE INSTALLED PER MANUFACTURERS INSTRUCTION.

**CONTINUOUS CONTAINED BERM SEDIMENT BARRIER DETAIL**  
NOT TO SCALE

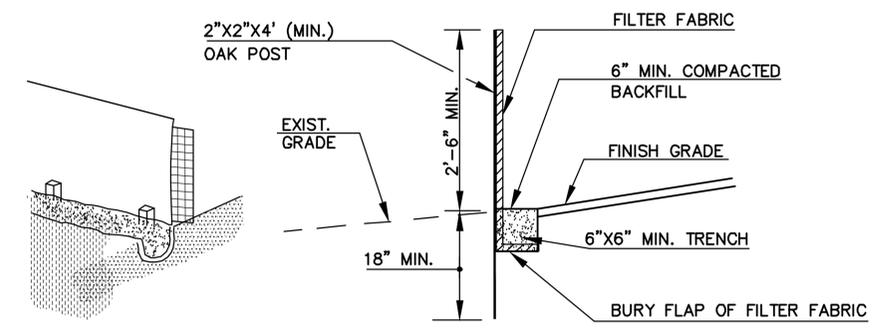


**STONE CHECK DAM DETAILS**  
NOT TO SCALE



- BALES SHALL BE PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
- EACH BALE SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF 4".
- BALES SHALL BE SECURELY ANCHORED IN PLACE BY STAKES OR REBARS DRIVEN THROUGH THE BALES. THE FIRST STAKE IN EACH BALE SHALL BE ANGLED TOWARDS PREVIOUSLY LAID BALE TO FORCE BALES TOGETHER.
- INSPECTION SHALL BE FREQUENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
- BALES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

**HAY BALE SEDIMENT BARRIER DETAIL**  
NOT TO SCALE



- NOTE:**
- SPACING OF WOOD FENCE POST NOT TO EXCEED 6'-0".
  - SILT FENCE SHALL BE INSTALLED BEFORE ANY EARTH REMOVAL OR EXCAVATION TAKES PLACE.
  - SILT FENCE SHALL BE INSPECTED WEEKLY OR AFTER RAIN. ANY SEDIMENT ACCUMULATED HIGHER THAN 1 FOOT ABOVE EXISTING GRADE SHALL BE REMOVED, ANY DAMAGED SECTIONS SHALL BE REPAIRED OR REPLACED.

**SILT FENCE SEDIMENT BARRIER DETAIL**  
NOT TO SCALE

**EROSION CONTROL MIX BERMS SEDIMENT BARRIER**

EROSION CONTROL MIX CAN BE MANUFACTURED ON OR OFF THE PROJECT SITE. IT MUST CONSIST PRIMARILY OF ORGANIC MATERIAL, SEPARATED AT THE POINT OF GENERATION, AND MAY INCLUDE: SHREDDED BARK, STUMP GRINDINGS, COMPOSTED BARK, OR ACCEPTABLE MANUFACTURED PRODUCTS. WOOD AND BARK CHIPS, GROUND CONSTRUCTION DEBRIS OR REPROCESSED WOOD PRODUCTS WILL NOT BE ACCEPTABLE AS THE ORGANIC COMPONENT OF THE MIX.

**COMPOSITION**  
EROSION CONTROL MIX SHALL CONTAIN A WELL-GRADED MIXTURE OF PARTICLE SIZES AND MAY CONTAIN ROCKS LESS THAN 4" IN DIAMETER. EROSION CONTROL MIX MUST BE FREE OF REFUSE, PHYSICAL CONTAMINANTS, AND MATERIAL TOXIC TO PLANT GROWTH. THE MIX COMPOSITION SHALL MEET THE FOLLOWING STANDARDS (SUBMITTAL REQUIRED):

- THE ORGANIC MATTER CONTENT SHALL BE BETWEEN 80 AND 100%, DRY WEIGHT BASIS.
- PARTICLE SIZE BY WEIGHT SHALL BE 100 % PASSING A 6" SCREEN AND A MINIMUM OF 70 %, MAXIMUM OF 85%, PASSING A 0.75" SCREEN.
- THE ORGANIC PORTION NEEDS TO BE FIBROUS AND ELONGATED.
- LARGE PORTIONS OF SILTS, CLAYS OR FINE SANDS ARE NOT ACCEPTABLE IN THE MIX.
- SOLUBLE SALTS CONTENT SHALL BE < 4.0 MMHOS/CM.
- THE PH SHOULD FALL BETWEEN 5.0 AND 8.0.

**INSTALLATION**  
THE BARRIER MUST BE PLACED ALONG A RELATIVELY LEVEL CONTOUR. IT MAY BE NECESSARY TO CUT TALL GRASSES OR WOODY VEGETATION TO AVOID CREATING VOIDS AND BRIDGES THAT WOULD ENABLE FINES TO WASH UNDER THE BARRIER THROUGH THE GRASS BLADES OR PLANT STEMS.

ON SLOPES LESS THAN 5% OR AT THE BOTTOM OF STEEPER SLOPES (2:1) UP TO 20 FEET LONG, THE BARRIER MUST BE A MINIMUM OF 12" HIGH, AS MEASURED ON THE UPHILL SIDE OF THE BARRIER, AND A MINIMUM OF TWO FEET WIDE. ON LONGER OR STEEPER SLOPES, THE BARRIER SHOULD BE WIDER TO ACCOMMODATE THE ADDITIONAL RUNOFF.

FROZEN GROUND, OUTCROPS OF BEDROCK AND VERY ROOTED FORESTED AREAS ARE LOCATIONS WHERE BERMS OF EROSION CONTROL MIX ARE MOST PRACTICAL AND EFFECTIVE. OTHER BMPs SHOULD BE USED AT LOW POINTS OF CONCENTRATED RUNOFF, BELOW CULVERT OUTLET APRONS, AROUND CATCH BASINS AND CLOSED STORM SYSTEMS, AND AT THE BOTTOM OF STEEP PERIMETER SLOPES THAT ARE MORE THAN 50 FEET FROM TOP TO BOTTOM (I.E., A LARGE UP GRADIENT CONTRIBUTING WATERSHED).

## TOPSOIL AND SEEDING

### 1. TOPSOIL:

SUITABLE TOPSOIL STRIPPED FROM THE SITE, FROM THE AIRPORT STOCKPILE OR FROM OFF-SITE SHALL MEET THE REQUIREMENTS OF SPECIFICATION SECTION T-905, TOPSOILING.

### 2. SEEDING:

USE PERMANENT SEED MIXES AND RATES BETWEEN 5/15 AND 9/30. USE TEMPORARY SEED MIXES FOR PERIODS LESS THAN 12 MONTHS. IF USING TEMPORARY SEED MIXES BETWEEN 10/01 AND 5/15, RE-SEED WITH PERMANENT SEED MIX AFTER 5/15

### 3. REGULAR SEED MIX

KIND OF SEED	LBS PER ACRE	% OF MIX
SWITCHGRASS	4.6	20
LITTLE BLUESTEM	4.6	20
CREeping RED FESCUE	3.45	15
BIG BLUESTEM	3.45	15
SILKY WILD RYE	2.3	10
INDIANGRASS	2.3	10
TOTAL	23 LBS/ACRE	

### 4. TEMPORARY SEED:

KIND OF SEED	LBS PER ACRE	MINIMUM PURITY %	MINIMUM GERMINATION %
WINTER RYE	112	85	80
OATS	80	85	80
ANNUAL RYEGRASS	40	85	80
SUDANGRASS	40	85	80
PERENNIAL	40	85	80

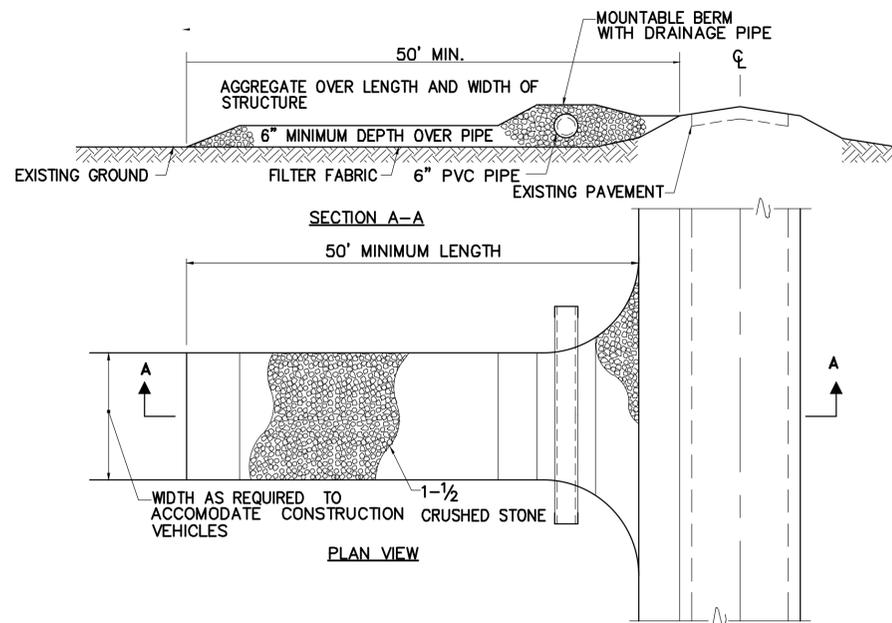
### 5. LIME AND FERTILIZER:

APPLY LIME AND FERTILIZER AT THE RATES SPECIFIED IN SECTION T-901, SEEDING.

### 6. MULCH:

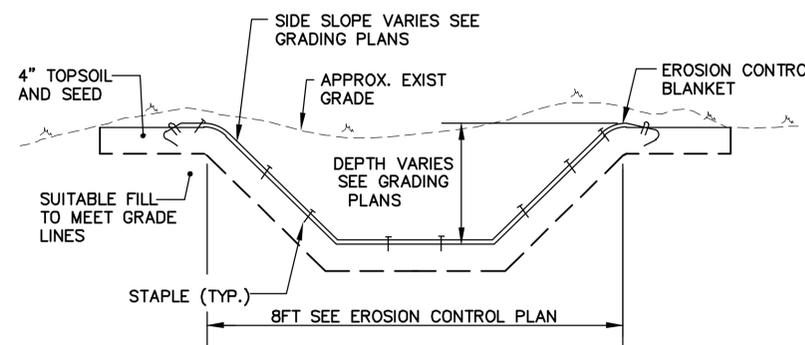
MULCH AND EROSION CONTROL MATTING SHALL BE AS SPECIFIED IN SECTION P-156 TEMPORARY AIR AND WATER POLLUTION, SOIL EROSION AND SILTATION CONTROL.

STRAW OR HAY (ANCHORED)	70 - 90 LBS	PROTECTED AREAS
STRAW OR HAY (ANCHORED)	185 - 275 LBS	WINDY AREAS
SHREDDED OR CHOPPED	185 - 275 LBS	MODERATE TO HIGH VELOCITY
EROSION CONTROL BLANKET	AS REQUIRED	AREAS AND SLOPES STEEPER THAN 3:1



**STABILIZED CONSTRUCTION ENTRANCE**

NOT TO SCALE



**VEGETATED SWALE DETAIL**

NOT TO SCALE

## EROSION CONTROL NOTES

- ALL EARTHWORK SHALL BE CONFINED TO THE LIMITS OF WORK AS SHOWN ON CONTRACT DRAWINGS.
- SILT FENCES OR EROSION CONTROL MIX BERMS SHALL BE INSTALLED WHERE SHOWN ON THE PLANS, ON THE DOWNHILL SIDE OF STOCKPILES OF TOPSOIL AND OTHER SOIL MATERIALS AND IN OTHER LOCATIONS AS REQUIRED, TO PREVENT SILT AND SEDIMENTATION FROM ENTERING EXISTING DRAINAGE CHANNELS.
- ALL TURF AREAS SHALL BE PERMANENTLY STABILIZED WITHIN 15 DAYS OF FINAL GRADING OR TEMPORARILY STABILIZED WITHIN 30 DAYS OF INITIAL DISTURBANCE OF SOIL.
- DUST CONTROL: ALL VEHICLE TRAFFIC AREAS AND EXPOSED SURFACES SHALL BE MOISTENED PERIODICALLY WITH ADEQUATE WATER TO CONTROL DUST.
- CONSTRUCTION ROAD: STONE CONSTRUCTION ROAD SHALL BE CONSTRUCTED AFTER ALL SILT FENCING AND OTHER CONTROL MEASURES HAVE BEEN INSTALLED, AND PRIOR TO ANY EXCAVATION ACTIVITIES ON THE SITE.
- SLOPE STABILITY: ALL SLOPES SHALL BE INSPECTED FREQUENTLY FOR SIGNS OF FAILURE, SLIPPING, AND/OR EROSION. ANY DAMAGE SHALL BE REPAIRED IMMEDIATELY.
- CONTRACTOR EROSION CONTROL MEASURES ARE NOT LIMITED TO THOSE SHOWN ON THE PLANS. THE CONTRACTOR SHALL PERFORM ANY AND ALL ADDITIONAL MEASURES TO CONTROL EROSION.
- SEDIMENT CONTROL AROUND CATCH BASINS SHALL BE INSTALLED WHERE INDICATED, AND PER THE DETAIL.
- STONE CHECK DAMS SHALL BE PLACED AS REQUIRED TO MINIMIZE SEDIMENTATION. ALL CHECK DAMS SHALL BE PERIODICALLY INSPECTED AND MAINTAINED AS DEEMED NECESSARY BY THE ENGINEER.

## OVERWINTER CONSTRUCTION AND STABILIZATION

- THE CONTRACTOR SHALL COMPLY WITH THE OVERWINTER CONSTRUCTION AND STABILIZATION REQUIREMENTS IN THE MAINE EROSION CONTROL AND SEDIMENT CONTROL BMP MANUAL.
- THE WINTER CONSTRUCTION PERIOD IS FROM NOV 1 TO APR 15.
- USE BERMS SEEDED ACCORDING TO TOPSOILING AND SEEDING NOTE 4 FOR SEDIMENT BARRIERS.
- APPLY TEMPORARY SEED AND MULCH AT TWICE THE NORMAL RATE ACCORDING TO TOPSOILING AND SEEDING NOTES 4 AND 5.
- MULCH STOCKPILES OF SOIL/SUBSOIL OVER WINTER WITH HAY OR STRAW AT TWICE NORMAL RATE.
- DO NOT PLACE PERMANENT SEED BETWEEN OCT 16 AND APR 1. PROTECT FINE GRADED AREAS WITH MULCH OR TEMPORARY SEED AND MULCH UNTIL FINAL TREATMENT.
- CONSTRUCT AND STABILIZE STONE-LINED DITCHES AND CHANNELS BY NOV 15. CONSTRUCT AND STABILIZE GRASS-LINE DITCHES AND CHANNELS BY SEP 1. INSTALL A SOD OR STONE LINER IF DITCHES AND CHANNELS CANNOT BE STABILIZED BY THESE DATES.
- DISTURBED SOILS WITH SLOPES LESS THAN 15% MUST BE SEEDED AND MULCHED BY SEP 15. IF NOT STABILIZED BY THIS DATE, USE TEMPORARY VEGETATION, SOD, OR MULCH.

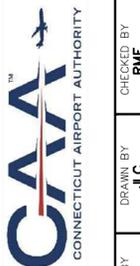
## HYDRANTS

- CONTRACTOR MAY USE EXISTING HYDRANT FOR DUST AND MILLING.
- HYDRANTS ARE LOCATED OUTSIDE AIRPORT SECURED AREA. CONTRACTOR MAY UTILIZE WITH WATER DISTRICT'S PERMISSION. WATER DISTRICT TO INSTALL METER AND PROPER BACKFLOW EQUIPMENT.
- CONTRACTOR SHALL UTILIZE A WATER TRUCK TO TRANSPORT INTO PROJECT AREA.
- CONTRACTOR TO PAY FOR FOR WATER USE INCIDENTAL TO THE PROJECT.

## NOTES:

- PRIOR TO PLACING EROSION CONTROL BLANKET, PREPARE THE SOIL BY RAKING AREA FREE OF CLODS AND LARGE STONES.
- SEED, MULCH AND FERTILIZER SHALL BE DISTRIBUTED AS SPECIFIED OVER THE PREPARED SOIL PRIOR TO PLACING THE EROSION CONTROL BLANKET.
- EROSION CONTROL BLANKET SHALL CONSIST OF HAY, JUTE MESH, OR OTHER AND BE APPROVED BY ENGINEER.
- ALL SEAMS SHALL BE OVERLAPPED A MINIMUM OF 3" AND SECURE WITH STAPLES SPACED 18"-24" ON CENTER.
- TO SECURE BLANKET TO GROUND, STAPLE PER MANUFACTURERS RECOMMENDATIONS.
- OVERLAP EROSION CONTROL BLANKET IN DIRECTION OF FLOW ONLY.
- WHERE SWALE SIDE SLOPES ARE FLATTER THAN 6:1 OR WHERE GRADE BREAKS ARE SUBSTANTIALLY HIGHER THAN THE SWALE BOTTOM, EROSION CONTROL BLANKET MAY BE TUCKED INTO THE SLOPE APPROXIMATELY 1' ABOVE SWALE BOTTOM. OTHERWISE, WELL-DEFINED CHANNELS SHALL BE PROTECTED TO THE TOP OF SLOPE AS SHOWN.

ENGINEER'S SEAL



100 Dryden Road  
Meriden, CT 06450  
Tel: 860-666-6556  
Fax: 860-666-6558  
www.caa-ct.com

PROJECT DESIGNER  
**Hoyle Tanner & Associates, Inc.**

REHABILITATE, LIGHT AND SIGN TAXIWAY E  
REALIGN TAXIWAY W; CONSTRUCT NEW SERVICE ROAD  
**EROSION CONTROL DETAILS**  
**SHEET 2 OF 2**

REV.	DATE	DESCRIPTION	BY
1	3/20/15	BID DOCUMENTS	JLC
2	3/9/15	90% DESIGN SUBMISSION	JLC
3	2/13/15	60% DESIGN SUBMISSION	JLC
4	12/15/14	30% DESIGN SUBMISSION DO NOT SCALE DRAWING	JLC

PROJ. No.: 306802  
FILE NAME: BDL-ER202  
AIP No.:

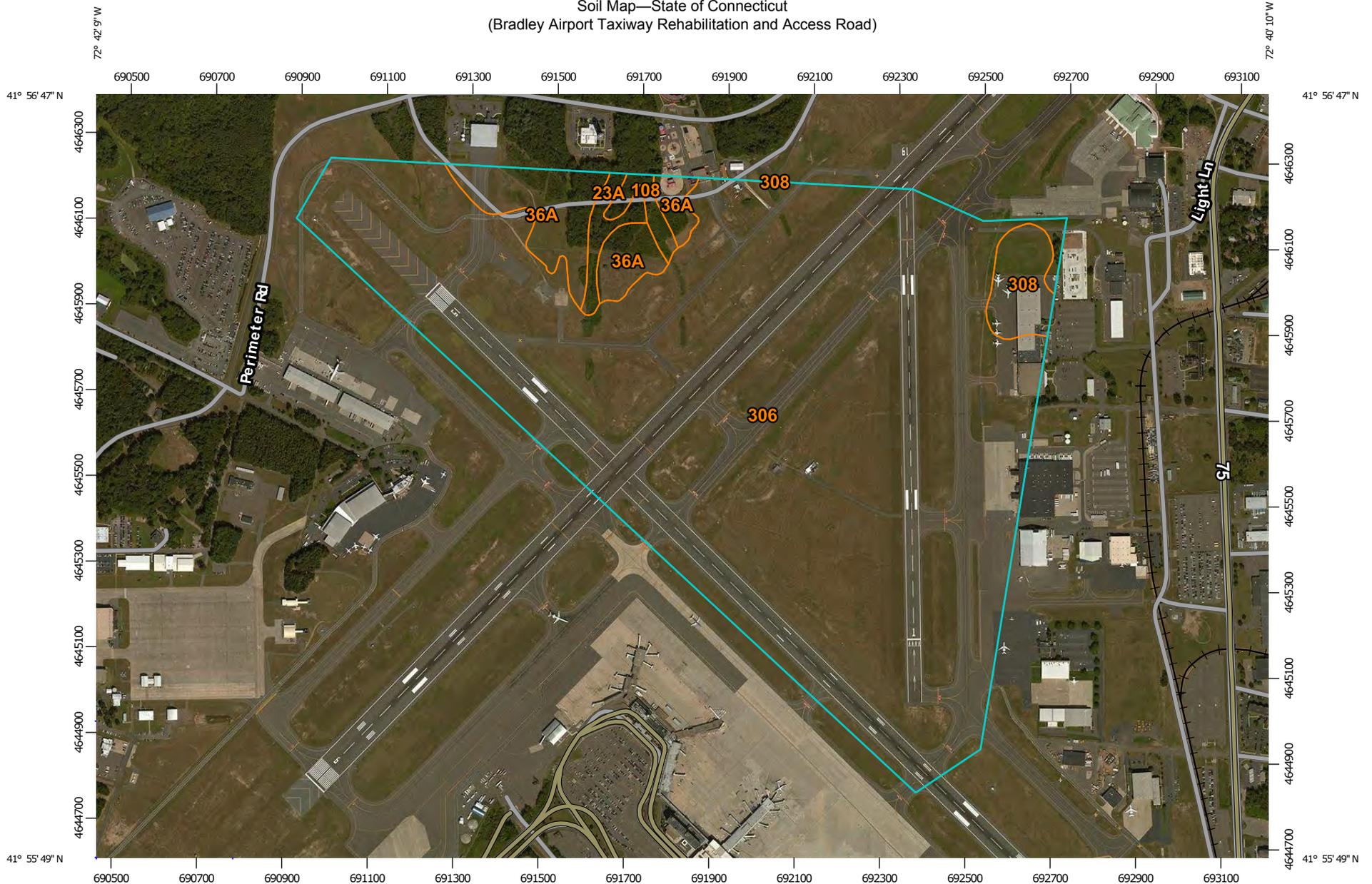
DRAWING NO.

**ER2.2**

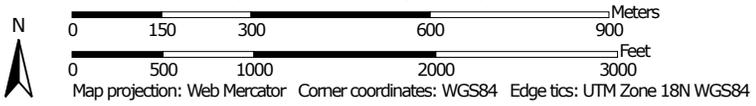
SHEET 21 OF 86

## **Attachment D: NRCS Soils Map**

Soil Map—State of Connecticut  
 (Bradley Airport Taxiway Rehabilitation and Access Road)



Map Scale: 1:12,600 if printed on A landscape (11" x 8.5") sheet.



## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

### Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

### Water Features



Streams and Canals

### Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

### Background



Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut

Survey Area Data: Version 11, Nov 19, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 25, 2013—Sep 9, 2013

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Map Unit Legend

State of Connecticut (CT600)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
23A	Sudbury sandy loam, 0 to 5 percent slopes	3.8	1.1%
36A	Windsor loamy sand, 0 to 3 percent slopes	20.8	5.8%
108	Saco silt loam	2.8	0.8%
306	Udorthents-Urban land complex	322.7	90.0%
308	Udorthents, smoothed	8.3	2.3%
<b>Totals for Area of Interest</b>		<b>358.5</b>	<b>100.0%</b>

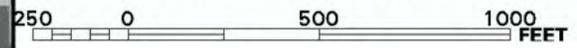
## **Attachment E: FEMA Maps**



Additional flood insurance is available in this community, contact your agent or the National Flood Insurance Program at (800) 638-6620.



MAP SCALE 1" = 500'



NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0216F

**FIRM**  
**FLOOD INSURANCE RATE MAP**  
 HARTFORD COUNTY,  
 CONNECTICUT  
 (ALL JURISDICTIONS)

**PANEL 216 OF 675**

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
WINDSOR, TOWN OF	090041	0216	F
WINDSOR LOCKS, TOWN OF	090042	0216	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

**MAP NUMBER**  
**09003C0216F**

**EFFECTIVE DATE:**  
**SEPTEMBER 26, 2008**



Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)



691000 M

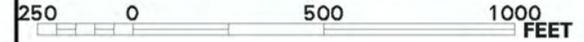
41°56'1  
72°41'13"

4646000 M

Additional insurance is available in this community, contact your local Flood Insurance Program at (800) 638-6620.



MAP SCALE 1" = 500'



NFP

PANEL 0204F

**FIRM**  
**FLOOD INSURANCE RATE MAP**  
 HARTFORD COUNTY,  
 CONNECTICUT  
 (ALL JURISDICTIONS)

**PANEL 204 OF 675**

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
EAST GRANBY, TOWN OF	090025	0204	F
SUFFIELD, TOWN OF	090038	0204	F
WINDSOR LOCKS, TOWN OF	090042	0204	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

**MAP NUMBER**  
**09003C0204F**



**EFFECTIVE DATE:**  
**SEPTEMBER 26, 2008**

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

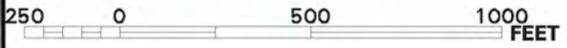
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)



lood insurance is available in this community, contact your local Flood Insurance Program at (800) 638-6620.



MAP SCALE 1" = 500'



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0208F

**FIRM**  
**FLOOD INSURANCE RATE MAP**  
 HARTFORD COUNTY,  
 CONNECTICUT  
 (ALL JURISDICTIONS)

**PANEL 208 OF 675**

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
SUFFIELD, TOWN OF	090038	0208	F
WINDSOR LOCKS, TOWN OF	090042	0208	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.



**MAP NUMBER**  
**09003C0208F**

**EFFECTIVE DATE:**  
**SEPTEMBER 26, 2008**

Federal Emergency Management Agency

ONE X

X0530

JOINS PANEL 0216

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)

## **Attachment F: Seeding Plan**

## ITEM T-901 SEEDING

### CONTRACT DOCUMENTS

**901-0.1** This section of these specifications is a part of the contract documents as defined in the general provisions. All applicable parts of the balance of the contract documents are equally as binding for this section as for all other sections.

Attention shall be directed to SGC-001 of these specifications entitled "Summary of Work and Special Work Requirements."

### DESCRIPTION

**901-1.1** This item shall consist of soil preparation, seeding, fertilizing, and liming the areas shown on the plans or as directed by the Engineer in accordance with these specifications.

### MATERIALS

**901-2.1 SEED.** The species and application rates of grass, legume, and cover-crop seed furnished shall be those stipulated herein. Seed shall conform to the requirements of Federal Specification JJJ-S-181, Federal Specification, Seeds, Agricultural.

Seed shall be furnished separately or in mixtures in standard containers; labeled in conformance with the Agricultural Marketing Service (AMS) Seed Act and applicable state seed laws; with the seed name, lot number, net weight, percentages of purity and of germination and hard seed, and percentage of maximum weed seed content clearly marked for each kind of seed. The Contractor shall furnish the Engineer duplicate signed copies of a statement by the vendor certifying that each lot of seed has been tested by a recognized laboratory for seed testing within six (6) months of date of delivery. This statement shall include: name and address of laboratory, date of test, lot number for each kind of seed, and the results of tests as to name, percentages of purity and of germination, and percentage of weed content for each kind of seed furnished, and, in case of a mixture, the proportions of each kind of seed. Wet, moldy, or otherwise damaged seed will be rejected.

Seeds shall be applied as follows:

**Warm Season Grass Mix:** In order to preserve and enhance the diversity of native species, it is necessary that the source for seed mixtures be locally obtained within the Northeast USA including New England, New York, Pennsylvania, New Jersey, Delaware, or Maryland.

New England Native Warm Season Grass Mix: (NEWP), New England Wetland Plants Inc, 820 West Street Amherst, MA 01002, or equal. Rate shall be 23 pounds per acre.

<u>Scientific Name</u>	<u>Common Name</u>	<u>Percent</u>
Panicum Virgatum	Switchgrass	20
Schizachyrium Scoparium	Little Bluestem	20
Festuca Rubra	Creeping Red Fescue	15
Andropogon Geradi	Big Bluestem	15
Elymus Villosus	Silky Wild Rye	10

Sorghastrum Nutans

Indiangrass

10

Seeding shall be performed during the period between March 15 and June 15 inclusive and August 15 to October 15 inclusive, unless otherwise approved by the Engineer.

### Other Considerations

Seeding Requirements:

- firm seed bed before and after planting
- use appropriate seed covering

Seed Bed Preparation:

- pH of 5.5-6.5
- soil temperature approximately 60° F
- planting depth: 1/4" -1/2"
- recommended use of 0-20-20 fertilizer, based on soil test; apply no nitrogen until the stand is established (late summer; use 20-40 lbs for half season)

When evaluating the stand remember, many of these grasses do not reach their full growth until the second growing season.

Source: CT Department of Environmental Protection/Wildlife Division

**901-2.2 LIME.** Lime shall be ground limestone containing not less than 85% of total carbonates, and shall be ground to such fineness that 90% will pass through a No. 20 mesh sieve and 50% will pass through a No. 100 mesh sieve. Coarser material will be acceptable, providing the rates of application are increased to provide not less than the minimum quantities and depth specified in the special provisions on the basis of the two sieve requirements above. Dolomitic lime or a high magnesium lime shall contain at least 10% of magnesium oxide. Lime shall be applied at the rate of 3 tons per acre. All liming materials shall conform to the requirements of ASTM C602.

**901-2.3 FERTILIZER.** Fertilizer shall be as specified above. They shall be applied at the rate and to the depth specified, and shall meet the applicable state laws. They shall be furnished in standard containers with name, weight, and guaranteed analysis of contents clearly marked thereon. No cyanamide compounds or hydrated lime shall be permitted in mixed fertilizers.

The fertilizers may be supplied in one of the following forms:

- a. A dry, free-flowing fertilizer suitable for application by a common fertilizer spreader
- b. A finely-ground fertilizer soluble in water, suitable for application by power sprayers; or
- c. A granular or pellet form suitable for application by blower equipment.

Fertilizers shall be spread at the rate of 460 lbs. per acre.

**901-2.4 SOIL FOR REPAIRS.** The soil for fill and topsoiling of areas to be repaired shall be at least of equal quality to that which exists in areas adjacent to the area to be repaired. The soil shall be relatively free from large stones, roots, stumps, or other materials that will interfere with subsequent sowing of seed, compacting, and establishing turf, and shall be approved by the Engineer before being placed.

## CONSTRUCTION METHODS

**901-3.1 ADVANCE PREPARATION AND CLEANUP.** After grading of areas has been completed and before applying fertilizer and ground limestone, areas to be seeded shall be raked or otherwise cleared of stones larger than 2 inches (50 mm) in any diameter, sticks, stumps, and other debris that might interfere with sowing of seed, growth of grasses, or subsequent maintenance of grass-covered areas. If any damage by erosion or other causes has occurred after the completion of grading and before beginning the application of fertilizer and ground limestone, the Contractor shall repair such damage include filling gullies, smoothing irregularities, and repairing other incidental damage.

An area to be seeded shall be considered a satisfactory seedbed without additional treatment if it has recently been thoroughly loosened and worked to a depth of not less than 5 inches (125 mm) as a result of grading operations and, if immediately prior to seeding, the top 3 inches (75 mm) of soil is loose, friable, reasonably free from large clods, rocks, large roots, or other undesirable matter, and if shaped to the required grade.

When the area to be seeded is sparsely sodded, weedy, barren and unworked, or packed and hard, any grass and weeds shall first be cut or otherwise satisfactorily disposed of, and the soil then scarified or otherwise loosened to a depth not less than 5 inches (125 mm). Clods shall be broken and the top 3 inches (75 mm) of soil shall be worked into a satisfactory seedbed by disking, or by use of cultipackers, rollers, drags, harrows, or other appropriate means.

### 901-3.2 DRY APPLICATION METHOD.

**a. Liming.** Lime shall be applied separately and prior to the application of any fertilizer or seed and only on seedbeds that have previously been prepared as described above. The lime shall then be worked into the top 3 inches (75 mm) of soil after which the seedbed shall again be properly graded and dressed to a smooth finish.

**b. Fertilizing.** Following advance preparations and cleanup fertilizer shall be uniformly spread at the rate that will provide not less than the minimum quantity stated in paragraph 901-2.3.

**c. Seeding.** Grass seed shall be sown at the rate specified in paragraph 901-2.1 immediately after fertilizing. The fertilizer and seed shall be raked within the depth range stated in the special provisions. Seeds of legumes, either alone or in mixtures, shall be inoculated before mixing or sowing, in accordance with the instructions of the manufacturer of the inoculant. When seeding is required at other than the seasons shown on the plans or in the special provisions, a cover crop shall be sown by the same methods required for grass and legume seeding. In the instance where a cover crop is sown and the contractor is required to come back at the next available warm-season planting season, the required method of sowing warm season grasses will be to utilize a seed slicer towed behind a farm tractor, or approved equal equipment. All other steps apply as specified above.

**d. Rolling.** After the seed has been properly covered, the seedbed shall be immediately compacted by means of an approved lawn roller, weighing 40 to 65 pounds per foot (60 to 97 kg per meter) of width for clay soil (or any soil having a tendency to pack), and weighing 150 to 200 pounds per foot (223 to 298 kg per meter) of width for sandy or light soils.

### 901-3.3 WET APPLICATION METHOD.

**a. General.** The Contractor may elect to apply seed and fertilizer (and lime, if required) by spraying them on the previously prepared seedbed in the form of an aqueous mixture and by using the methods and equipment described herein. The rates of application shall be as specified in the special provisions.

**b. Spraying equipment.** The spraying equipment shall have a container or water tank equipped with a liquid level gauge calibrated to read in increments not larger than 50 gallons (190 liters) over the entire range of the tank capacity, mounted so as to be visible to the nozzle operator. The container or tank shall also be equipped with a mechanical power-driven agitator capable of keeping all the solids in the mixture in complete suspension at all times until used.

The unit shall also be equipped with a pressure pump capable of delivering 100 gallons (380 liters) per minute at a pressure of 100 lb / sq inches (690 kPa). The pump shall be mounted in a line that will recirculate the mixture through the tank whenever it is not being sprayed from the nozzle. All pump passages and pipe lines shall be capable of providing clearance for 5/8 inch (16 mm) solids. The power unit for the pump and agitator shall have controls mounted so as to be accessible to the nozzle operator. There shall be an indicating pressure gauge connected and mounted immediately at the back of the nozzle.

The nozzle pipe shall be mounted on an elevated supporting stand in such a manner that it can be rotated through 360 degrees horizontally and inclined vertically from at least 20 degrees below to at least 60 degrees above the horizontal. There shall be a quick-acting, three-way control valve connecting the recirculating line to the nozzle pipe and mounted so that the nozzle operator can control and regulate the amount of flow of mixture delivered to the nozzle. At least three different types of nozzles shall be supplied so that mixtures may be properly sprayed over distance varying from 20 to 100 feet (6 to 30 m). One shall be a close-range ribbon nozzle, one a medium-range ribbon nozzle, and one a long-range jet nozzle. For case of removal and cleaning, all nozzles shall be connected to the nozzle pipe by means of quick-release couplings.

In order to reach areas inaccessible to the regular equipment, an extension hose at least 50 feet (15 m) in length shall be provided to which the nozzles may be connected.

**c. Mixtures.** Lime, if required, shall be applied separately, in the quantity specified, prior to the fertilizing and seeding operations. Not more than 220 pounds (100 kg) of lime shall be added to and mixed with each 100 gallons (380 liters) of water. Seed and fertilizer shall be mixed together in the relative proportions specified, but not more than a total of 220 pounds (100 kg) of these combined solids shall be added to and mixed with each 100 gallons (380 liters) of water.

All water used shall be obtained from fresh water sources and shall be free from injurious chemicals and other toxic substances harmful to plant life. Brackish water shall not be used at any time. The Contractor shall identify to the Engineer all sources of water at least two (2) weeks prior to use. The Engineer may take samples of the water at the source or from the tank at any time and have a laboratory test the samples for chemical and saline content. The Contractor shall not use any water from any source that is disapproved by the Engineer following such tests.

All mixtures shall be constantly agitated from the time they are mixed until they are finally applied to the seedbed. All such mixtures shall be used within two (2) hours from the time they were mixed or they shall be wasted and disposed of at approved locations.

**d. Spraying.** Lime, if required, shall be sprayed only upon previously prepared seedbeds. After the applied lime mixture has dried, the lime shall be worked into the top 3 inches (75 mm), after which the seedbed shall again be properly graded and dressed to a smooth finish.

Mixtures of seed and fertilizer shall only be sprayed upon previously prepared seedbeds on which the lime, if required, shall already have been worked in. The mixtures shall be applied by means of a high-pressure spray that shall always be directed upward into the air so that the mixtures will fall to the ground like rain in a uniform spray. Nozzles or sprays shall never be directed toward the ground in such a manner as might produce erosion or runoff.

Particular care shall be exercised to ensure that the application is made uniformly and at the prescribed rate and to guard against misses and overlapped areas. Proper predetermined quantities of the mixture in accordance with specifications shall be used to cover specified sections of known area.

Checks on the rate and uniformity of application may be made by observing the degree of wetting of the ground or by distributing test sheets of paper or pans over the area at intervals and observing the quantity of material deposited thereon.

On surfaces that are to be mulched as indicated by the plans or designated by the Engineer, seed and fertilizer applied by the spray method need not be raked into the soil or rolled. However, on surfaces on which mulch is not to be used, the raking and rolling operations will be required after the soil has dried.

**901-3.4 MAINTENANCE OF SEEDED AREAS.** The Contractor shall protect seeded areas against traffic or other use by warning signs or barricades, as approved by the Engineer. Surfaces gullied or otherwise damaged following seeding shall be repaired by regrading and reseeding as directed. The Contractor shall mow, water as directed, and otherwise maintain seeded areas in a satisfactory condition until final inspection and acceptance of the work.

When either the dry or wet application method outlined above is used for work done out of season, it will be required that the Contractor establish a good stand of grass of uniform color and density to the satisfaction of the Engineer. A grass stand shall be considered adequate when bare spots are one square foot (0.01 sq m) or less, randomly dispersed, and do not exceed 3% of the area seeded. If at the time when the contract has been otherwise completed it is not possible to make an adequate determination of the color, density, and uniformity of such stand of grass, payment for the unaccepted portions of the areas seeded out of season will be withheld until such a time as these requirements have been met.

#### **METHOD OF MEASUREMENT**

**901-4.1** The quantity of seeding to be paid for shall be the number of square yards of area seeded, including lime, fertilizer, lime and seed, applied at the above specified rates, within the areas designated on the plans or specified by the Engineer.

No separate measurement or payment will be made for establishing turf to areas disturbed by the Contractors operations outside of designated work areas.

#### **BASIS OF PAYMENT**

**901-5.1** Payment shall be made at the contract unit price per square yard, which price and payment shall be full compensation for furnishing and placing all material and for all labor, equipment, tools, and incidentals necessary to complete the work prescribed in this item.

**Payment will be made under:**

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>UNIT</u>
T-901-1	Seeding	Square Yard

#### **MATERIAL REQUIREMENTS**

ASTM C602                      Standard Specification for Agricultural Liming Materials

Rehabilitate, Light and Sign TW E, Realign TW W,  
Construct New Service Road  
Bradley International Airport  
Windsor Locks, Connecticut

Seeding  
Section T-901

---

ASTM D977  
FED SPEC

Standard Specification for Emulsified Asphalt  
JJJ-S-181, Federal Specification, Seeds, Agricultural

**END OF ITEM T-901**

## **Attachment G: Phasing Plan**

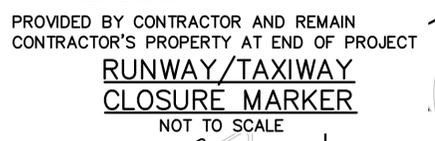
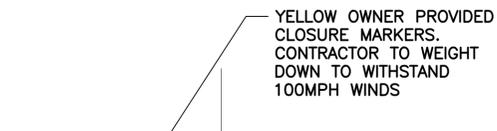
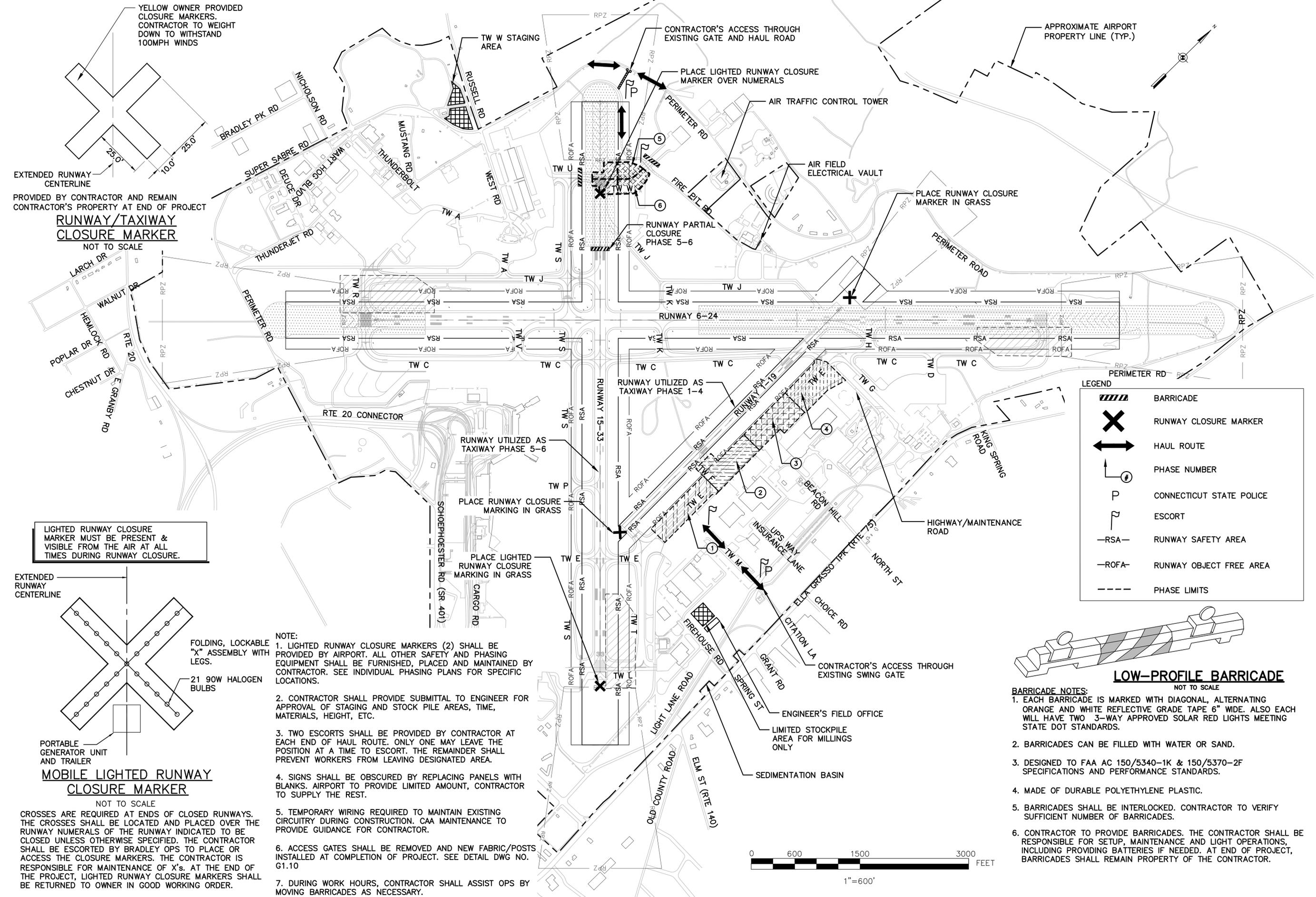


PROJECT DESIGNER  
**Hoyle Tanner & Associates, Inc.**  
165 Park Street  
Meriden, CT 06450  
Tel: 860-666-9966  
www.hoyletanner.com

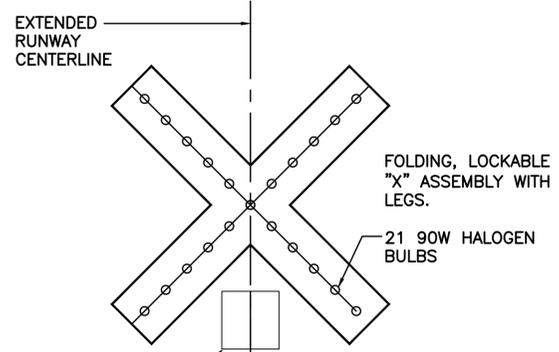
REHABILITATE, LIGHT AND SIGN TAXIWAY E  
REALIGN TAXIWAY W; CONSTRUCT NEW SERVICE ROAD  
**CONSTRUCTION SAFETY AND PHASING PLAN**  
DATE: MARCH 2015  
SCALE: 1"=600'

REV.	DATE	DESCRIPTION
BY JLC	3/20/15	BID DOCUMENTS
JLC	3/9/15	90% DESIGN SUBMISSION
JLC	2/13/15	60% DESIGN SUBMISSION
JLC	12/15/14	30% DESIGN SUBMISSION

PROJ. No.: 306802  
FILE NAME: **BDL-G104**  
DRAWING NO.  
**G1.4**  
SHEET 4 OF 86



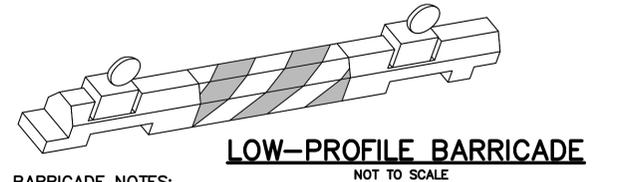
LIGHTED RUNWAY CLOSURE MARKER MUST BE PRESENT & VISIBLE FROM THE AIR AT ALL TIMES DURING RUNWAY CLOSURE.



- NOTE:
1. LIGHTED RUNWAY CLOSURE MARKERS (2) SHALL BE PROVIDED BY AIRPORT. ALL OTHER SAFETY AND PHASING EQUIPMENT SHALL BE FURNISHED, PLACED AND MAINTAINED BY CONTRACTOR. SEE INDIVIDUAL PHASING PLANS FOR SPECIFIC LOCATIONS.
  2. CONTRACTOR SHALL PROVIDE SUBMITTAL TO ENGINEER FOR APPROVAL OF STAGING AND STOCK PILE AREAS, TIME, MATERIALS, HEIGHT, ETC.
  3. TWO ESCORTS SHALL BE PROVIDED BY CONTRACTOR AT EACH END OF HAUL ROUTE. ONLY ONE MAY LEAVE THE POSITION AT A TIME TO ESCORT. THE REMAINDER SHALL PREVENT WORKERS FROM LEAVING DESIGNATED AREA.
  4. SIGNS SHALL BE OBTAINED BY REPLACING PANELS WITH BLANKS. AIRPORT TO PROVIDE LIMITED AMOUNT, CONTRACTOR TO SUPPLY THE REST.
  5. TEMPORARY WIRING REQUIRED TO MAINTAIN EXISTING CIRCUITRY DURING CONSTRUCTION. CAA MAINTENANCE TO PROVIDE GUIDANCE FOR CONTRACTOR.
  6. ACCESS GATES SHALL BE REMOVED AND NEW FABRIC/POSTS INSTALLED AT COMPLETION OF PROJECT. SEE DETAIL DWG NO. G1.10
  7. DURING WORK HOURS, CONTRACTOR SHALL ASSIST OPS BY MOVING BARRICADES AS NECESSARY.

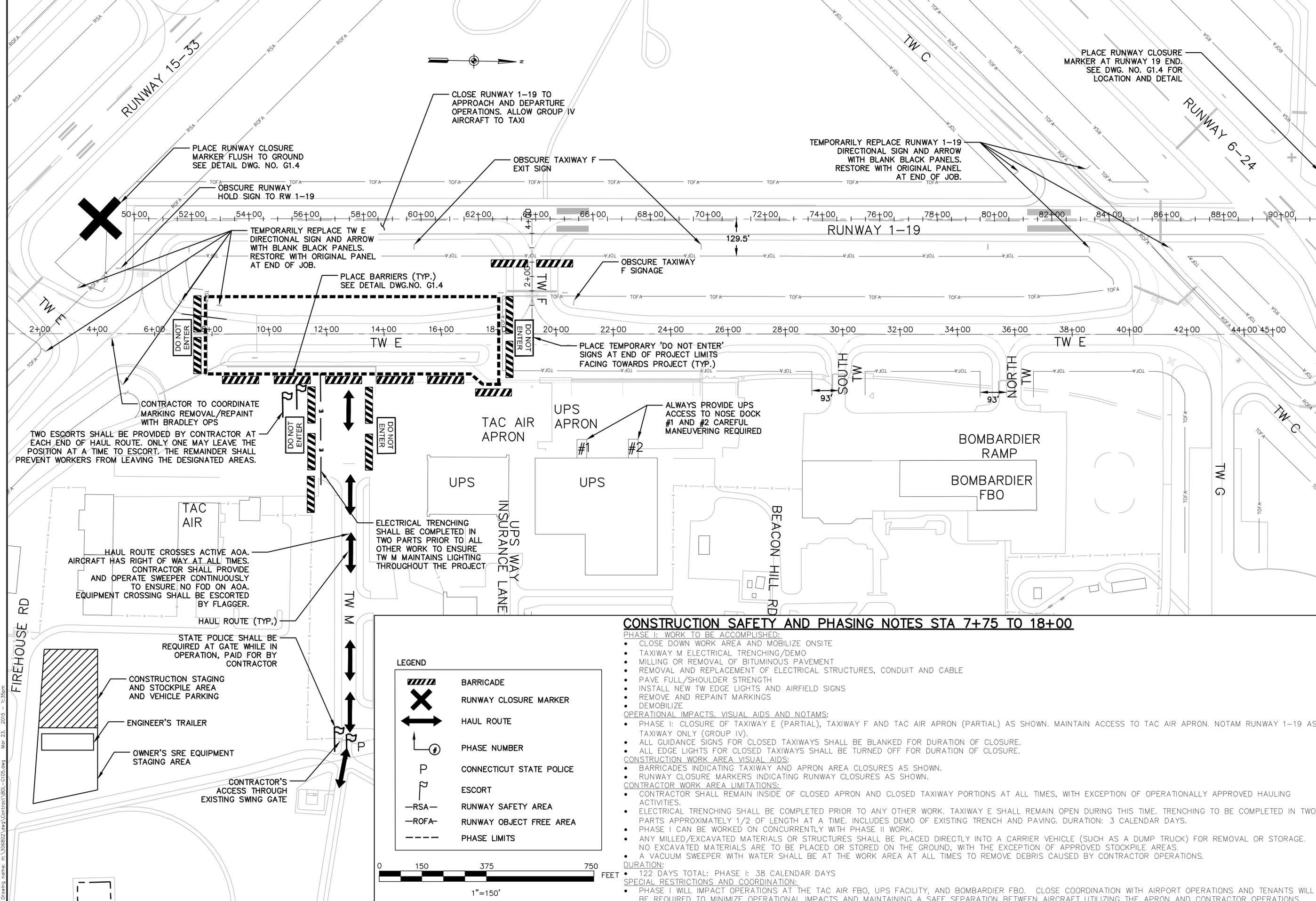
LEGEND

	BARRICADE
	RUNWAY CLOSURE MARKER
	HAUL ROUTE
	PHASE NUMBER
	CONNECTICUT STATE POLICE
	ESCORT
	RUNWAY SAFETY AREA
	RUNWAY OBJECT FREE AREA
	PHASE LIMITS



- BARRICADE NOTES:**
1. EACH BARRICADE IS MARKED WITH DIAGONAL, ALTERNATING ORANGE AND WHITE REFLECTIVE GRADE TAPE 6" WIDE. ALSO EACH WILL HAVE TWO 3-WAY APPROVED SOLAR RED LIGHTS MEETING STATE DOT STANDARDS.
  2. BARRICADES CAN BE FILLED WITH WATER OR SAND.
  3. DESIGNED TO FAA AC 150/5340-1K & 150/5370-2F SPECIFICATIONS AND PERFORMANCE STANDARDS.
  4. MADE OF DURABLE POLYETHYLENE PLASTIC.
  5. BARRICADES SHALL BE INTERLOCKED. CONTRACTOR TO VERIFY SUFFICIENT NUMBER OF BARRICADES.
  6. CONTRACTOR TO PROVIDE BARRICADES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SETUP, MAINTENANCE AND LIGHT OPERATIONS, INCLUDING PROVIDING BATTERIES IF NEEDED. AT END OF PROJECT, BARRICADES SHALL REMAIN PROPERTY OF THE CONTRACTOR.

Drawing name: H:\306802\Draws\Contract\BDL-G104.dwg Mar 23, 2015 1:25pm



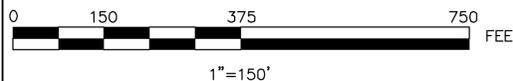
Drawing name: H:\\_306502.dwg | Contract: NBDL - G105.dwg | Mar 23, 2015 - 1:25pm  
 PROJECT DESIGNER: Hoyle Tanner & Associates, Inc. | PROJECT: BRADLEY INTERNATIONAL AIRPORT | DATE: MARCH 2015 | SCALE: 1"=150'  
 ENGINEER'S SEAL: [Blank] | CHECKED BY: RMF | DRAWN BY: JLC | DESIGNED BY: MTO

**CONSTRUCTION SAFETY AND PHASING NOTES STA 7+75 TO 18+00**

- PHASE I: WORK TO BE ACCOMPLISHED:**
- CLOSE DOWN WORK AREA AND MOBILIZE ONSITE
  - TAXIWAY M ELECTRICAL TRENCHING/DEMO
  - MILLING OR REMOVAL OF BITUMINOUS PAVEMENT
  - REMOVAL AND REPLACEMENT OF ELECTRICAL STRUCTURES, CONDUIT AND CABLE
  - PAVE FULL/SHOULDER STRENGTH
  - INSTALL NEW TW EDGE LIGHTS AND AIRFIELD SIGNS
  - REMOVE AND REPAINT MARKINGS
  - DEMOBILIZE
- OPERATIONAL IMPACTS, VISUAL AIDS AND NOTAMS:**
- PHASE I: CLOSURE OF TAXIWAY E (PARTIAL), TAXIWAY F AND TAC AIR APRON (PARTIAL) AS SHOWN. MAINTAIN ACCESS TO TAC AIR APRON. NOTAM RUNWAY 1-19 AS TAXIWAY ONLY (GROUP IV).
  - ALL GUIDANCE SIGNS FOR CLOSED TAXIWAYS SHALL BE BLANKED FOR DURATION OF CLOSURE.
  - ALL EDGE LIGHTS FOR CLOSED TAXIWAYS SHALL BE TURNED OFF FOR DURATION OF CLOSURE.
- CONSTRUCTION WORK AREA VISUAL AIDS:**
- BARRICADES INDICATING TAXIWAY AND APRON AREA CLOSURES AS SHOWN.
  - RUNWAY CLOSURE MARKERS INDICATING RUNWAY CLOSURES AS SHOWN.
- CONTRACTOR WORK AREA LIMITATIONS:**
- CONTRACTOR SHALL REMAIN INSIDE OF CLOSED APRON AND CLOSED TAXIWAY PORTIONS AT ALL TIMES, WITH EXCEPTION OF OPERATIONALLY APPROVED HAULING ACTIVITIES.
  - ELECTRICAL TRENCHING SHALL BE COMPLETED PRIOR TO ANY OTHER WORK. TAXIWAY E SHALL REMAIN OPEN DURING THIS TIME. TRENCHING TO BE COMPLETED IN TWO PARTS APPROXIMATELY 1/2 OF LENGTH AT A TIME. INCLUDES DEMO OF EXISTING TRENCH AND PAVING. DURATION: 3 CALENDAR DAYS.
  - PHASE I CAN BE WORKED ON CONCURRENTLY WITH PHASE II WORK.
  - ANY MILLED/EXCAVATED MATERIALS OR STRUCTURES SHALL BE PLACED DIRECTLY INTO A CARRIER VEHICLE (SUCH AS A DUMP TRUCK) FOR REMOVAL OR STORAGE. NO EXCAVATED MATERIALS ARE TO BE PLACED OR STORED ON THE GROUND, WITH THE EXCEPTION OF APPROVED STOCKPILE AREAS.
  - A VACUUM SWEEPER WITH WATER SHALL BE AT THE WORK AREA AT ALL TIMES TO REMOVE DEBRIS CAUSED BY CONTRACTOR OPERATIONS.
- DURATION:**
- 122 DAYS TOTAL: PHASE I: 38 CALENDAR DAYS
- SPECIAL RESTRICTIONS AND COORDINATION:**
- PHASE I WILL IMPACT OPERATIONS AT THE TAC AIR FBO, UPS FACILITY, AND BOMBARDIER FBO. CLOSE COORDINATION WITH AIRPORT OPERATIONS AND TENANTS WILL BE REQUIRED TO MINIMIZE OPERATIONAL IMPACTS AND MAINTAINING A SAFE SEPARATION BETWEEN AIRCRAFT UTILIZING THE APRON AND CONTRACTOR OPERATIONS.

**LEGEND**

	BARRICADE
	RUNWAY CLOSURE MARKER
	HAUL ROUTE
	PHASE NUMBER
	CONNECTICUT STATE POLICE
	ESCORT
	RUNWAY SAFETY AREA
	RUNWAY OBJECT FREE AREA
	PHASE LIMITS



**ENGINEER'S SEAL**

**PROJECT DESIGNER**  
 Hoyle Tanner & Associates, Inc.  
 100 Dryden Street, Meriden, CT 06450  
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 Fax: 860-666-6556  
 Web page: www.hoyletanner.com

**CONSTRUCTION SAFETY AND PHASING PLAN AND PHASING PLAN TAXIWAY E PHASE I**

REHABILITATE, LIGHT AND SIGN TAXIWAY E  
 REALIGN TAXIWAY W; CONSTRUCT NEW SERVICE ROAD

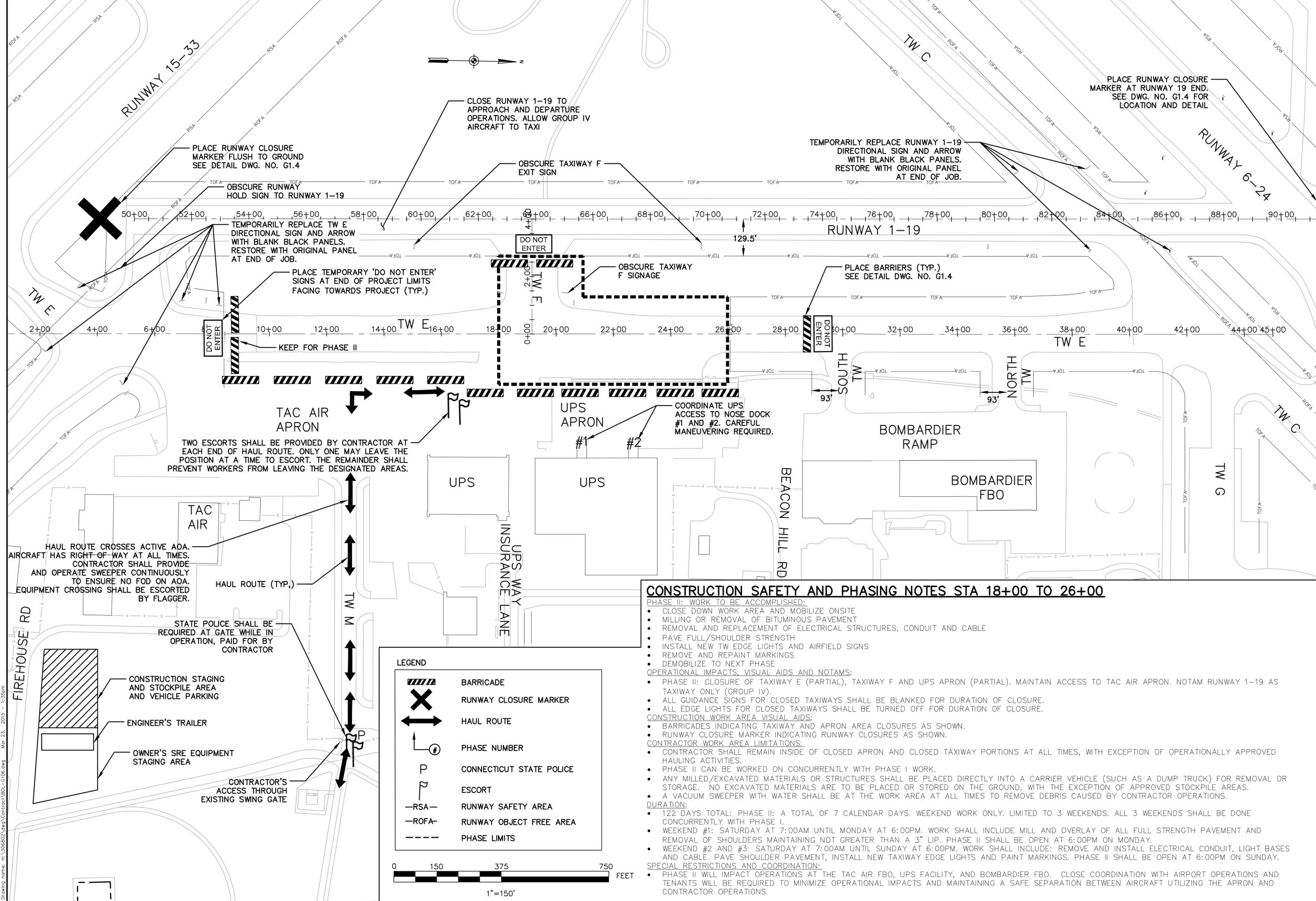
DATE: MARCH 2015  
 SCALE: 1"=150'

REV.	DATE	DESCRIPTION
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2	3/9/15	90% DESIGN SUBMISSION
3	2/13/15	60% DESIGN SUBMISSION
4	12/15/14	30% DESIGN SUBMISSION DO NOT SCALE DRAWING

PROJ. No.: 306802  
 FILE NAME: BDL-G106  
 AIP No.:

**DRAWING NO. G1.5**

SHEET 5 OF 86



ENGINEER'S SEAL

CHECKED BY: RMF  
DRAWN BY: JLC  
DESIGNED BY: MTO

PROJECT DESIGNER  
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REHABILITATE, LIGHT AND SIGN TAXIWAY E  
REALIGN TAXIWAY W; CONSTRUCT NEW SERVICE ROAD

**CONSTRUCTION SAFETY AND PHASING PLAN  
TAXIWAY E PHASE II**

DATE: MARCH 2015  
SCALE: 1"=150'

REV.	DATE	DESCRIPTION	BY
1	3/20/15	BID DOCUMENTS	JLC
2	3/9/15	90% DESIGN SUBMISSION	JLC
3	2/13/15	60% DESIGN SUBMISSION	JLC
4	12/15/14	30% DESIGN SUBMISSION	JLC

PROJ. No.: 306802  
FILE NAME: BDL-G106  
AIP No.:

DRAWING NO.  
**G1.6**

SHEET 6 OF 86

**CONSTRUCTION SAFETY AND PHASING NOTES STA 18+00 TO 26+00**

**PHASE II: WORK TO BE ACCOMPLISHED:**

- CLOSE DOWN WORK AREA AND MOBILIZE ONSITE
- MILLING OR REMOVAL OF BITUMINOUS PAVEMENT
- REMOVAL AND REPLACEMENT OF ELECTRICAL STRUCTURES, CONDUIT AND CABLE
- PAVE FULL/SHOULDER STRENGTH
- INSTALL NEW TW EDGE LIGHTS AND AIRFIELD SIGNS
- REMOVE AND REPAINT MARKINGS
- DEMOBILIZE TO NEXT PHASE

**OPERATIONAL IMPACTS, VISUAL AIDS AND NOTAMS:**

- PHASE II: CLOSURE OF TAXIWAY E (PARTIAL), TAXIWAY F AND UPS APRON (PARTIAL). MAINTAIN ACCESS TO TAC AIR APRON. NOTAM RUNWAY 1-19 AS TAXIWAY ONLY (GROUP IV).
- ALL GUIDANCE SIGNS FOR CLOSED TAXIWAYS SHALL BE BLANKED FOR DURATION OF CLOSURE.
- ALL EDGE LIGHTS FOR CLOSED TAXIWAYS SHALL BE TURNED OFF FOR DURATION OF CLOSURE.

**CONSTRUCTION WORK AREA VISUAL AIDS:**

- BARRICADES INDICATING TAXIWAY AND APRON AREA CLOSURES AS SHOWN.
- RUNWAY CLOSURE MARKER INDICATING RUNWAY CLOSURES AS SHOWN.

**CONTRACTOR WORK AREA LIMITATIONS:**

- CONTRACTOR SHALL REMAIN INSIDE OF CLOSED APRON AND CLOSED TAXIWAY PORTIONS AT ALL TIMES, WITH EXCEPTION OF OPERATIONALLY APPROVED HAULING ACTIVITIES.
- PHASE II CAN BE WORKED ON CONCURRENTLY WITH PHASE I WORK.
- ANY MILLED/EXCAVATED MATERIALS OR STRUCTURES SHALL BE PLACED DIRECTLY INTO A CARRIER VEHICLE (SUCH AS A DUMP TRUCK) FOR REMOVAL OR STORAGE. NO EXCAVATED MATERIALS ARE TO BE PLACED OR STORED ON THE GROUND, WITH THE EXCEPTION OF APPROVED STOCKPILE AREAS.
- A VACUUM SWEEPER WITH WATER SHALL BE AT THE WORK AREA AT ALL TIMES TO REMOVE DEBRIS CAUSED BY CONTRACTOR OPERATIONS.

**DURATION:**

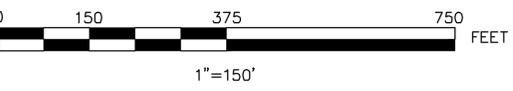
- 122 DAYS TOTAL: PHASE II: A TOTAL OF 7 CALENDAR DAYS. WEEKEND WORK ONLY. LIMITED TO 3 WEEKENDS. ALL 3 WEEKENDS SHALL BE DONE CONCURRENTLY WITH PHASE I.
- WEEKEND #1: SATURDAY AT 7:00AM UNTIL MONDAY AT 6:00PM. WORK SHALL INCLUDE MILL AND OVERLAY OF ALL FULL STRENGTH PAVEMENT AND REMOVAL OF SHOULDERS MAINTAINING NOT GREATER THAN A 3" LIP. PHASE II SHALL BE OPEN AT 6:00PM ON MONDAY.
- WEEKEND #2 AND #3: SATURDAY AT 7:00AM UNTIL SUNDAY AT 6:00PM. WORK SHALL INCLUDE: REMOVE AND INSTALL ELECTRICAL CONDUIT, LIGHT BASES AND CABLE. PAVE SHOULDER PAVEMENT, INSTALL NEW TAXIWAY EDGE LIGHTS AND PAINT MARKINGS. PHASE II SHALL BE OPEN AT 6:00PM ON SUNDAY.

**SPECIAL RESTRICTIONS AND COORDINATION:**

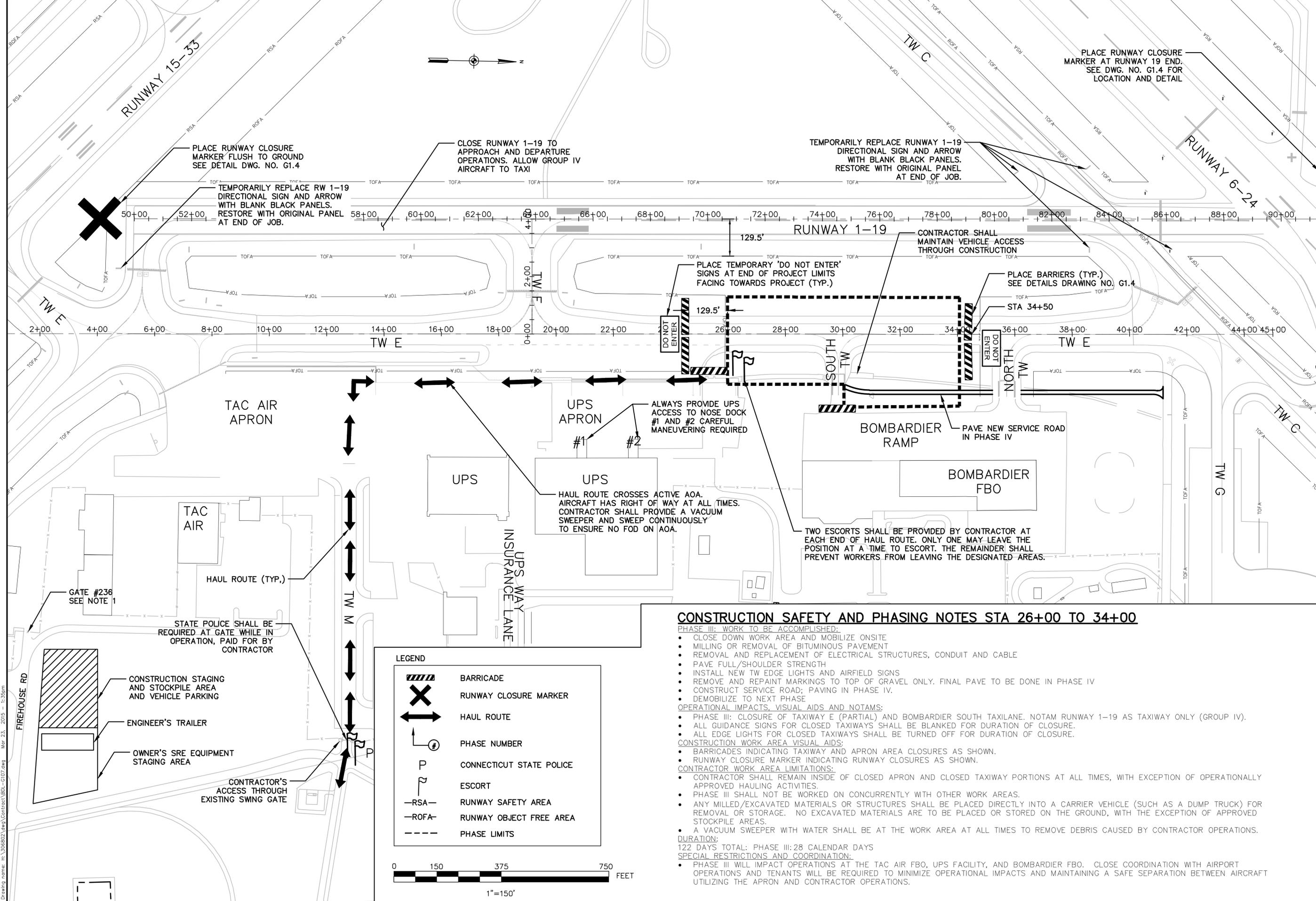
- PHASE II WILL IMPACT OPERATIONS AT THE TAC AIR FBO, UPS FACILITY, AND BOMBARDIER FBO. CLOSE COORDINATION WITH AIRPORT OPERATIONS AND TENANTS WILL BE REQUIRED TO MINIMIZE OPERATIONAL IMPACTS AND MAINTAINING A SAFE SEPARATION BETWEEN AIRCRAFT UTILIZING THE APRON AND CONTRACTOR OPERATIONS.

**LEGEND**

	BARRICADE
	RUNWAY CLOSURE MARKER
	HAUL ROUTE
	PHASE NUMBER
	CONNECTICUT STATE POLICE
	ESCORT
	RUNWAY SAFETY AREA
	RUNWAY OBJECT FREE AREA
	PHASE LIMITS



Drawing name: H:\306802\Draws\Contract\BDL-G106.dwg Mar 23, 2015 - 1:25pm



PLACE RUNWAY CLOSURE MARKER FLUSH TO GROUND SEE DETAIL DWG. NO. G1.4

TEMPORARILY REPLACE RW 1-19 DIRECTIONAL SIGN AND ARROW WITH BLANK BLACK PANELS. RESTORE WITH ORIGINAL PANEL AT END OF JOB.

CLOSE RUNWAY 1-19 TO APPROACH AND DEPARTURE OPERATIONS. ALLOW GROUP IV AIRCRAFT TO TAXI

TEMPORARILY REPLACE RUNWAY 1-19 DIRECTIONAL SIGN AND ARROW WITH BLANK BLACK PANELS. RESTORE WITH ORIGINAL PANEL AT END OF JOB.

PLACE RUNWAY CLOSURE MARKER AT RUNWAY 19 END. SEE DWG. NO. G1.4 FOR LOCATION AND DETAIL

PLACE TEMPORARY 'DO NOT ENTER' SIGNS AT END OF PROJECT LIMITS FACING TOWARDS PROJECT (TYP.)

CONTRACTOR SHALL MAINTAIN VEHICLE ACCESS THROUGH CONSTRUCTION

PLACE BARRIERS (TYP.) SEE DETAILS DRAWING NO. G1.4

ALWAYS PROVIDE UPS ACCESS TO NOSE DOCK #1 AND #2 CAREFUL MANEUVERING REQUIRED

HAUL ROUTE CROSSES ACTIVE AOA. AIRCRAFT HAS RIGHT OF WAY AT ALL TIMES. CONTRACTOR SHALL PROVIDE A VACUUM SWEEPER AND SWEEP CONTINUOUSLY TO ENSURE NO FOD ON AOA.

TWO ESCORTS SHALL BE PROVIDED BY CONTRACTOR AT EACH END OF HAUL ROUTE. ONLY ONE MAY LEAVE THE POSITION AT A TIME TO ESCORT. THE REMAINDER SHALL PREVENT WORKERS FROM LEAVING THE DESIGNATED AREAS.

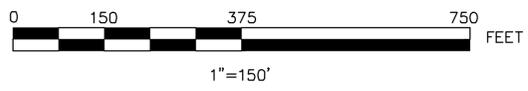
STATE POLICE SHALL BE REQUIRED AT GATE WHILE IN OPERATION, PAID FOR BY CONTRACTOR

**CONSTRUCTION SAFETY AND PHASING NOTES STA 26+00 TO 34+00**

- PHASE III: WORK TO BE ACCOMPLISHED:**
- CLOSE DOWN WORK AREA AND MOBILIZE ON SITE
  - MILLING OR REMOVAL OF BITUMINOUS PAVEMENT
  - REMOVAL AND REPLACEMENT OF ELECTRICAL STRUCTURES, CONDUIT AND CABLE
  - PAVE FULL/SHOULDER STRENGTH
  - INSTALL NEW TW EDGE LIGHTS AND AIRFIELD SIGNS
  - REMOVE AND REPAINT MARKINGS TO TOP OF GRAVEL ONLY. FINAL PAVE TO BE DONE IN PHASE IV
  - CONSTRUCT SERVICE ROAD; PAVING IN PHASE IV.
  - DEMOBILIZE TO NEXT PHASE
- OPERATIONAL IMPACTS, VISUAL AIDS AND NOTAMS:**
- PHASE III: CLOSURE OF TAXIWAY E (PARTIAL) AND BOMBARDIER SOUTH TAXILANE. NOTAM RUNWAY 1-19 AS TAXIWAY ONLY (GROUP IV).
  - ALL GUIDANCE SIGNS FOR CLOSED TAXIWAYS SHALL BE BLANKED FOR DURATION OF CLOSURE.
  - ALL EDGE LIGHTS FOR CLOSED TAXIWAYS SHALL BE TURNED OFF FOR DURATION OF CLOSURE.
- CONSTRUCTION WORK AREA VISUAL AIDS:**
- BARRICADES INDICATING TAXIWAY AND APRON AREA CLOSURES AS SHOWN.
  - RUNWAY CLOSURE MARKER INDICATING RUNWAY CLOSURES AS SHOWN.
- CONTRACTOR WORK AREA LIMITATIONS:**
- CONTRACTOR SHALL REMAIN INSIDE OF CLOSED APRON AND CLOSED TAXIWAY PORTIONS AT ALL TIMES, WITH EXCEPTION OF OPERATIONALLY APPROVED HAULING ACTIVITIES.
  - PHASE III SHALL NOT BE WORKED ON CONCURRENTLY WITH OTHER WORK AREAS.
  - ANY MILLED/EXCAVATED MATERIALS OR STRUCTURES SHALL BE PLACED DIRECTLY INTO A CARRIER VEHICLE (SUCH AS A DUMP TRUCK) FOR REMOVAL OR STORAGE. NO EXCAVATED MATERIALS ARE TO BE PLACED OR STORED ON THE GROUND, WITH THE EXCEPTION OF APPROVED STOCKPILE AREAS.
  - A VACUUM SWEEPER WITH WATER SHALL BE AT THE WORK AREA AT ALL TIMES TO REMOVE DEBRIS CAUSED BY CONTRACTOR OPERATIONS.
- DURATION:**  
122 DAYS TOTAL: PHASE III: 28 CALENDAR DAYS
- SPECIAL RESTRICTIONS AND COORDINATION:**
- PHASE III WILL IMPACT OPERATIONS AT THE TAC AIR FBO, UPS FACILITY, AND BOMBARDIER FBO. CLOSE COORDINATION WITH AIRPORT OPERATIONS AND TENANTS WILL BE REQUIRED TO MINIMIZE OPERATIONAL IMPACTS AND MAINTAINING A SAFE SEPARATION BETWEEN AIRCRAFT UTILIZING THE APRON AND CONTRACTOR OPERATIONS.

**LEGEND**

	BARRICADE
	RUNWAY CLOSURE MARKER
	HAUL ROUTE
	PHASE NUMBER
	CONNECTICUT STATE POLICE
	ESCORT
	RUNWAY SAFETY AREA
	RUNWAY OBJECT FREE AREA
	PHASE LIMITS



Drawing name: H:\\_306507.dwg Contract: BDL-G107.dwg Mar 23, 2015 1:25pm

ENGINEER'S SEAL

CMAA CONNECTICUT AIRPORT AUTHORITY

PROJECT DESIGNER: **Hoyle Tanner & Associates, Inc.**  
105 Elm Street, Meriden, CT 06450  
Tel: 860-666-6555  
www.hoyletanner.com

PROJECT: BRADLEY INTERNATIONAL AIRPORT  
DESIGNED BY: MTO  
DRAWN BY: JLC  
CHECKED BY: RMF

REHABILITATE, LIGHT AND SIGN TAXIWAY E  
REALIGN TAXIWAY W; CONSTRUCT NEW SERVICE ROAD

**CONSTRUCTION SAFETY AND PHASING PLAN TAXIWAY E PHASE III**

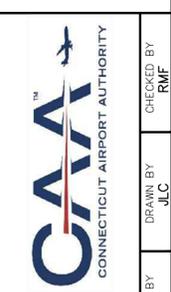
DATE: MARCH 2015  
SCALE: 1"=150'

REV.	DATE	DESCRIPTION	BY
1	3/20/15	BID DOCUMENTS	JLC
2	3/9/15	90% DESIGN SUBMISSION	JLC
3	2/13/15	60% DESIGN SUBMISSION	JLC
4	12/15/14	30% DESIGN SUBMISSION (DO NOT SCALE DRAWING)	JLC

PROJ. No.: 306802  
FILE NAME: BDL-G107  
AIP No.:

DRAWING NO. **G1.7**

SHEET 7 OF 86



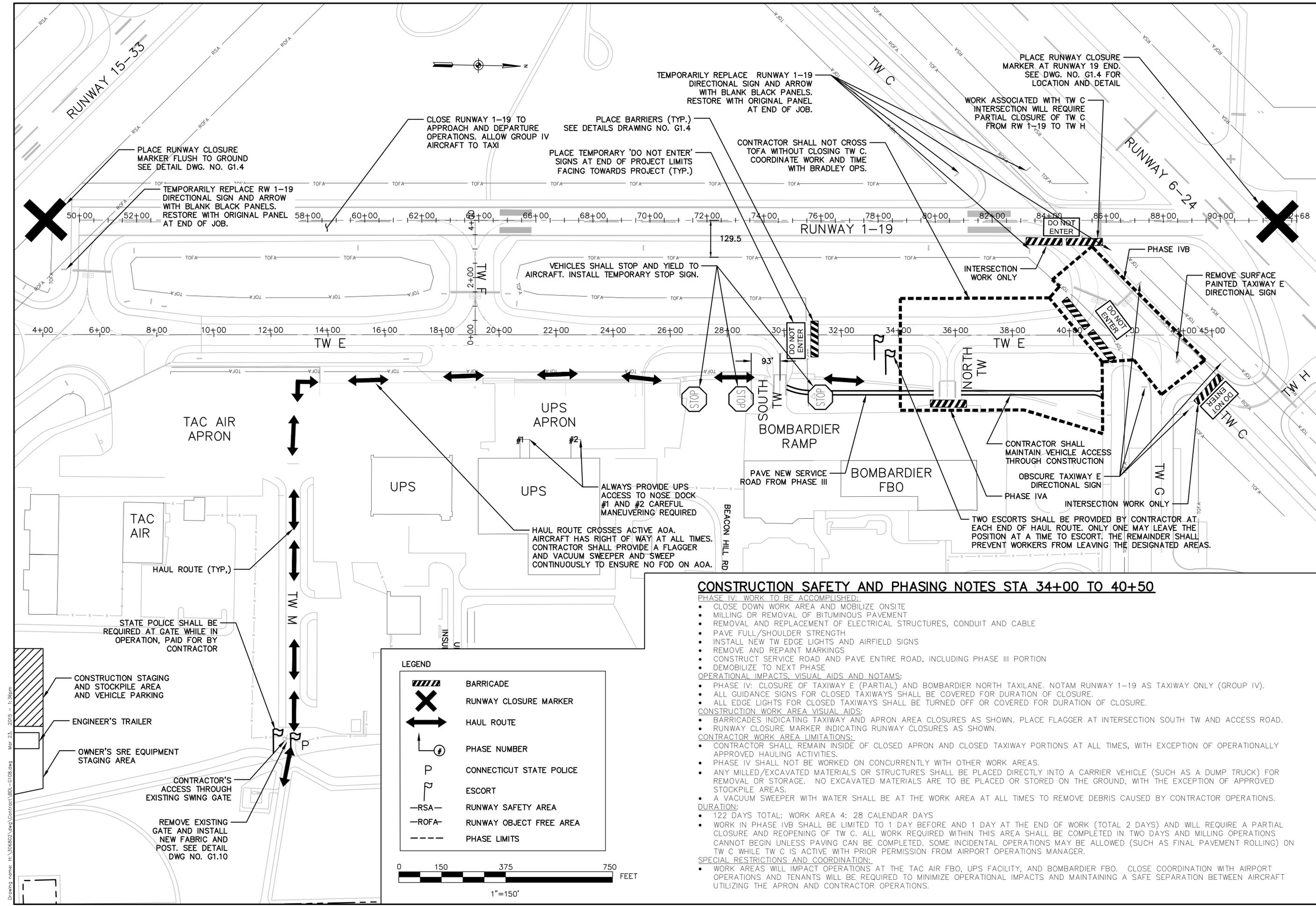
PROJECT DESIGNER  
**Hoyle Tanner & Associates, Inc.**  
100 Dryden Road  
Meriden, CT 06450  
Tel: 860-666-6555  
Fax: 860-666-6556  
www.hoyletanner.com

PROJECT: REHABILITATE, LIGHT AND SIGN TAXIWAY E  
REALIGN TAXIWAY W; CONSTRUCT NEW SERVICE ROAD  
**CONSTRUCTION SAFETY AND PHASING PLAN  
AND PHASING PLAN  
TAXIWAY E PHASE IV**

REV.	DATE	DESCRIPTION	BY
1	3/20/15	BID DOCUMENTS	JLC
2	3/9/15	90% DESIGN SUBMISSION	JLC
3	2/13/15	60% DESIGN SUBMISSION	JLC
4	12/15/14	30% DESIGN SUBMISSION DO NOT SCALE DRAWING	JLC

PROJ. No.: 306802  
FILE NAME: BDL-G108  
AIP No.:

DRAWING NO.  
**G18**  
SHEET 8 OF 86

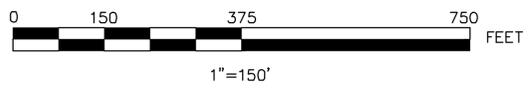


**CONSTRUCTION SAFETY AND PHASING NOTES STA 34+00 TO 40+50**

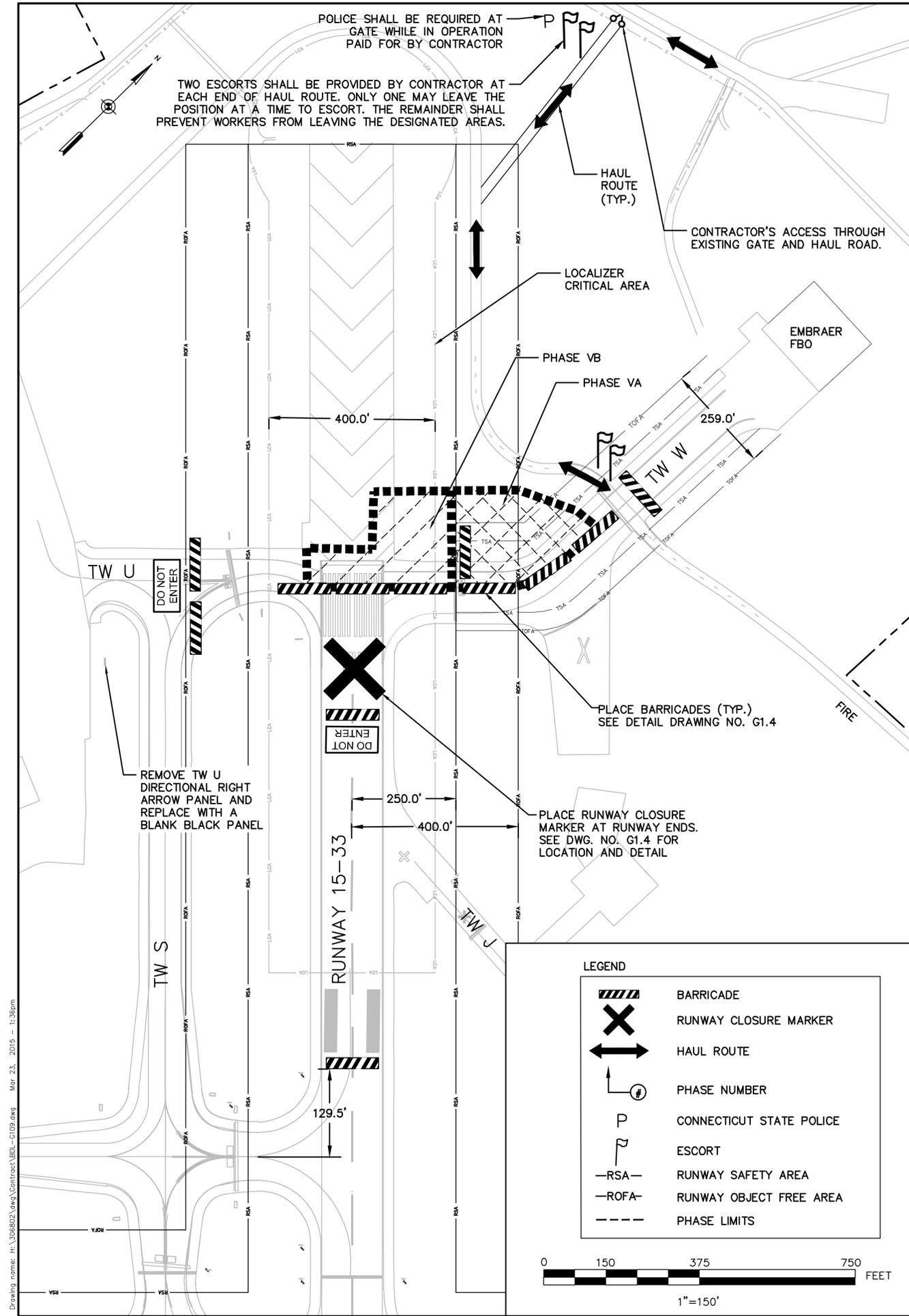
- PHASE IV: WORK TO BE ACCOMPLISHED:**
- CLOSE DOWN WORK AREA AND MOBILIZE ONSITE
  - MILLING OR REMOVAL OF BITUMINOUS PAVEMENT
  - REMOVAL AND REPLACEMENT OF ELECTRICAL STRUCTURES, CONDUIT AND CABLE
  - PAVE FULL/SHOULDER STRENGTH
  - INSTALL NEW TW EDGE LIGHTS AND AIRFIELD SIGNS
  - REMOVE AND REPAINT MARKINGS
  - CONSTRUCT SERVICE ROAD AND PAVE ENTIRE ROAD, INCLUDING PHASE III PORTION
  - DEMOBILIZE TO NEXT PHASE
- OPERATIONAL IMPACTS, VISUAL AIDS AND NOTAMS:**
- PHASE IV: CLOSURE OF TAXIWAY E (PARTIAL) AND BOMBARDIER NORTH TAXILANE. NOTAM RUNWAY 1-19 AS TAXIWAY ONLY (GROUP IV).
  - ALL GUIDANCE SIGNS FOR CLOSED TAXIWAYS SHALL BE COVERED FOR DURATION OF CLOSURE.
  - ALL EDGE LIGHTS FOR CLOSED TAXIWAYS SHALL BE TURNED OFF OR COVERED FOR DURATION OF CLOSURE.
- CONSTRUCTION WORK AREA VISUAL AIDS:**
- BARRICADES INDICATING TAXIWAY AND APRON AREA CLOSURES AS SHOWN. PLACE FLAGGER AT INTERSECTION SOUTH TW AND ACCESS ROAD.
  - RUNWAY CLOSURE MARKER INDICATING RUNWAY CLOSURES AS SHOWN.
- CONTRACTOR WORK AREA LIMITATIONS:**
- CONTRACTOR SHALL REMAIN INSIDE OF CLOSED APRON AND CLOSED TAXIWAY PORTIONS AT ALL TIMES, WITH EXCEPTION OF OPERATIONALLY APPROVED HAULING ACTIVITIES.
  - PHASE IV SHALL NOT BE WORKED ON CONCURRENTLY WITH OTHER WORK AREAS.
  - ANY MILLED/EXCAVATED MATERIALS OR STRUCTURES SHALL BE PLACED DIRECTLY INTO A CARRIER VEHICLE (SUCH AS A DUMP TRUCK) FOR REMOVAL OR STORAGE. NO EXCAVATED MATERIALS ARE TO BE PLACED OR STORED ON THE GROUND, WITH THE EXCEPTION OF APPROVED STOCKPILE AREAS.
  - A VACUUM SWEEPER WITH WATER SHALL BE AT THE WORK AREA AT ALL TIMES TO REMOVE DEBRIS CAUSED BY CONTRACTOR OPERATIONS.
- DURATION:**
- 122 DAYS TOTAL: WORK AREA 4: 28 CALENDAR DAYS
  - WORK IN PHASE IVB SHALL BE LIMITED TO 1 DAY BEFORE AND 1 DAY AT THE END OF WORK (TOTAL 2 DAYS) AND WILL REQUIRE A PARTIAL CLOSURE AND REOPENING OF TW C. ALL WORK REQUIRED WITHIN THIS AREA SHALL BE COMPLETED IN TWO DAYS AND MILLING OPERATIONS CANNOT BEGIN UNLESS PAVING CAN BE COMPLETED. SOME INCIDENTAL OPERATIONS MAY BE ALLOWED (SUCH AS FINAL PAVEMENT ROLLING) ON TW C WHILE TW C IS ACTIVE WITH PRIOR PERMISSION FROM AIRPORT OPERATIONS MANAGER.
- SPECIAL RESTRICTIONS AND COORDINATION:**
- WORK AREAS WILL IMPACT OPERATIONS AT THE TAC AIR FBO, UPS FACILITY, AND BOMBARDIER FBO. CLOSE COORDINATION WITH AIRPORT OPERATIONS AND TENANTS WILL BE REQUIRED TO MINIMIZE OPERATIONAL IMPACTS AND MAINTAINING A SAFE SEPARATION BETWEEN AIRCRAFT UTILIZING THE APRON AND CONTRACTOR OPERATIONS.

**LEGEND**

	BARRICADE
	RUNWAY CLOSURE MARKER
	HAUL ROUTE
	PHASE NUMBER
	CONNECTICUT STATE POLICE
	ESCORT
	RUNWAY SAFETY AREA
	RUNWAY OBJECT FREE AREA
	PHASE LIMITS



Drawing name: H:\\_306802\Drawings\Contract\BDR-G108.dwg Mar 23, 2015 1:35pm

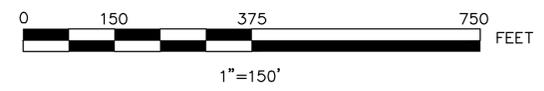


**CONSTRUCTION SAFETY AND PHASING NOTES**

- PHASE VA: WORK TO BE ACCOMPLISHED:**
- CLOSE DOWN WORK AREA AND MOBILIZE ON SITE.
  - MILLING OF BITUMINOUS PAVEMENT (VARIABLE DEPTH AND 4" DEEP)
  - REMOVAL OF EXISTING SHOULDER PAVEMENT
  - REPLACE SIGN, INSTALL NEW CONCRETE ENCASED CONDUIT AND LIGHT BASES AND CABLE
  - PAVE FULL/SHOULDER STRENGTH PAVEMENT WITH TREATMENTS AT TERMINATIONS
  - INSTALL NEW TAXIWAY EDGE LIGHTS AND AIRFIELD SIGNS
  - REMOVE PAINT AND PAINT PROPOSED MARKINGS
  - DEMobilize
- OPERATIONAL IMPACTS, VISUAL AIDS AND NOTAMS:**
- PHASE VA: CLOSURE OF TAXIWAY W (PARTIAL) ONLY. MAINTAIN ACCESS TO EMBRAER FBO AT ALL TIMES. AIRCRAFT SHALL BE TUGGED PAST WORK AREA.
  - ALL EDGE LIGHTS AND GUIDANCE SIGNS FOR CLOSED TAXIWAYS SHALL BE BLANKED OUT FOR THE DURATION OF THIS CLOSURE.
- CONSTRUCTION WORK AREA VISUAL AIDS:**
- BARRICADES INDICATING TAXIWAY CLOSURES ON THE WEST SIDE OF TAXIWAY W.
  - LIGHTED RUNWAY CLOSURE MARKERS FOR RUNWAY 15-33.
- CONTRACTOR WORK AREA LIMITATIONS:**
- CONTRACTOR SHALL REMAIN INSIDE OF CLOSED TAXIWAY PORTIONS AT ALL TIMES, WITH EXCEPTION OF OPERATIONALLY APPROVED HAULING ACTIVITIES.
  - PHASE VA CAN BE WORKED ON CONCURRENTLY WITH PHASE VB.
  - ANY MILLED/EXCAVATED MATERIALS OR STRUCTURES SHALL BE PLACED DIRECTLY INTO A CARRIER VEHICLE (SUCH AS A DUMP TRUCK) FOR REMOVAL OR STORAGE. NO EXCAVATED MATERIALS OR STRUCTURES ARE TO BE PLACED ON THE GROUND, WITH THE EXCEPTION OF APPROVED STOCKPILE AREAS.
  - A VACUUM SWEEPER WITH WATER SHALL BE ON SITE AT ALL TIMES REMOVING DEBRIS (FOD) CAUSED BY CONSTRUCTION OPERATIONS.
- DURATION:**
- 122 TOTAL CONTRACT DAYS: PHASE VA: 14 CALENDAR DAYS.
- SPECIAL RESTRICTIONS AND COORDINATION:**
- WORK AREAS WILL IMPACT OPERATIONS EMBRAER FBO. CLOSE COORDINATION WITH AIRPORT OPERATIONS AND TENANTS WILL BE REQUIRED IN ORDER TO MINIMIZE OPERATIONAL IMPACTS AND MAINTAINING A SAFE SEPARATION BETWEEN AIRCRAFT UTILIZING THE AIRFIELD AND CONSTRUCTION OPERATIONS.
- PHASE VB: WORK TO BE ACCOMPLISHED:**
- CLOSE DOWN WORK AREA AND MOBILIZE ON SITE.
  - MILLING OF BITUMINOUS PAVEMENT (VARIABLE DEPTH AND 4" DEEP)
  - REMOVAL OF EXISTING SHOULDER PAVEMENT
  - REPLACE SIGN, INSTALL NEW CONCRETE ENCASED CONDUIT AND LIGHT BASES AND CABLE
  - PAVE FULL/SHOULDER STRENGTH PAVEMENT WITH TREATMENTS AT TERMINATIONS
  - INSTALL NEW TAXIWAY EDGE LIGHTS AND SIGNS
  - REMOVE PAINT AND PAINT PROPOSED MARKINGS
  - DEMobilize
- OPERATIONAL IMPACTS, VISUAL AIDS AND NOTAMS:**
- PHASE VB: BARRICADES AND CLOSURE OF TAXIWAY W (PARTIAL), TAXIWAY U (PARTIAL), AND RUNWAY 15-33 NORTH OF TAXIWAY J. MAINTAIN ACCESS TO EMBRAER FBO AT ALL TIMES. NOTAM RUNWAY 15-33 AS A TAXIWAY SOUTH OF RUNWAY 6-24.
  - ALL EDGE LIGHTS AND GUIDANCE SIGNS FOR CLOSED TAXIWAYS SHALL BE BLANKED OUT FOR THE DURATION OF THIS CLOSURE. DISABLE RUNWAY LIGHTS, NAVAIDS, VISUAL AIDS (PAPI, REILS, MALS), SIGNAGE, LOCALIZER AND GLIDE SLOPE.
- CONSTRUCTION WORK AREA VISUAL AIDS:**
- BARRICADES INDICATING TAXIWAY AND RUNWAY CLOSURES ON THE WEST SIDE OF TAXIWAY W.
  - LIGHTED RUNWAY CLOSURE MARKERS FOR RUNWAY 15-33.
- CONTRACTOR WORK AREA LIMITATIONS:**
- CONTRACTOR SHALL REMAIN INSIDE OF CLOSED TAXIWAY AND RUNWAY PORTIONS AT ALL TIMES, WITH EXCEPTION OF OPERATIONALLY APPROVED HAULING ACTIVITIES.
  - PHASE VB CAN BE WORKED ON CONCURRENTLY WITH PHASE VA. ONLY 7 CALENDAR DAYS ARE ALLOWED FOR PHASE VB OF THE 14 CALENDAR DAYS AVAILABLE FOR WORK AREA VA, AND PHASE VB SHALL BE LIMITED TO THE LAST 7 DAYS OF PHASE VA
  - ANY MILLED/EXCAVATED MATERIALS OR STRUCTURES SHALL BE PLACED DIRECTLY INTO A CARRIER VEHICLE (SUCH AS A DUMP TRUCK) FOR REMOVAL OR STORAGE. NO EXCAVATED MATERIALS OR STRUCTURES ARE TO BE PLACED ON THE GROUND, WITH THE EXCEPTION OF APPROVED STOCKPILE AREAS.
  - A VACUUM SWEEPER WITH WATER SHALL BE ON SITE AT ALL TIMES REMOVING DEBRIS (FOD) CAUSED BY CONSTRUCTION OPERATIONS.
- DURATION:**
- 122 TOTAL CONTRACT DAYS: PHASE VB: 7 CALENDAR DAYS. ALL 7 CONSECUTIVE CALENDAR DAYS SHALL BE DONE CONCURRENTLY WITH THE 14 CALENDAR DAYS DURING PHASE VA, AND SHALL BE LIMITED TO THE LAST 7 DAYS OF PHASE VA.
- SPECIAL RESTRICTIONS AND COORDINATION:**
- WORK AREAS WILL IMPACT OPERATIONS EMBRAER FBO. CLOSE COORDINATION WITH AIRPORT OPERATIONS AND TENANTS WILL BE REQUIRED IN ORDER TO MINIMIZE OPERATIONAL IMPACTS AND MAINTAINING A SAFE SEPARATION BETWEEN AIRCRAFT UTILIZING THE AIRFIELD AND CONSTRUCTION OPERATIONS.
- SEE DWG NO. G1.4 FOR STOCKPILE AREA.

**LEGEND**

	BARRICADE
	RUNWAY CLOSURE MARKER
	HAUL ROUTE
	PHASE NUMBER
	CONNECTICUT STATE POLICE
	ESCORT
	RUNWAY SAFETY AREA
	RUNWAY OBJECT FREE AREA
	PHASE LIMITS



ENGINEER'S SEAL



100 Day Report  
March 2015  
Project No. 306802  
File No. BDL-G109  
AIP No. \_\_\_\_\_  
www.hoyletanner.com

**PROJECT DESIGNER**  
**HoyleTanner & Associates, Inc.**

REHABILITATE, LIGHT AND SIGN TAXIWAY E  
REALIGN TAXIWAY W; CONSTRUCT NEW SERVICE ROAD

**CONSTRUCTION SAFETY AND PHASING PLAN TAXIWAY W PHASE V**

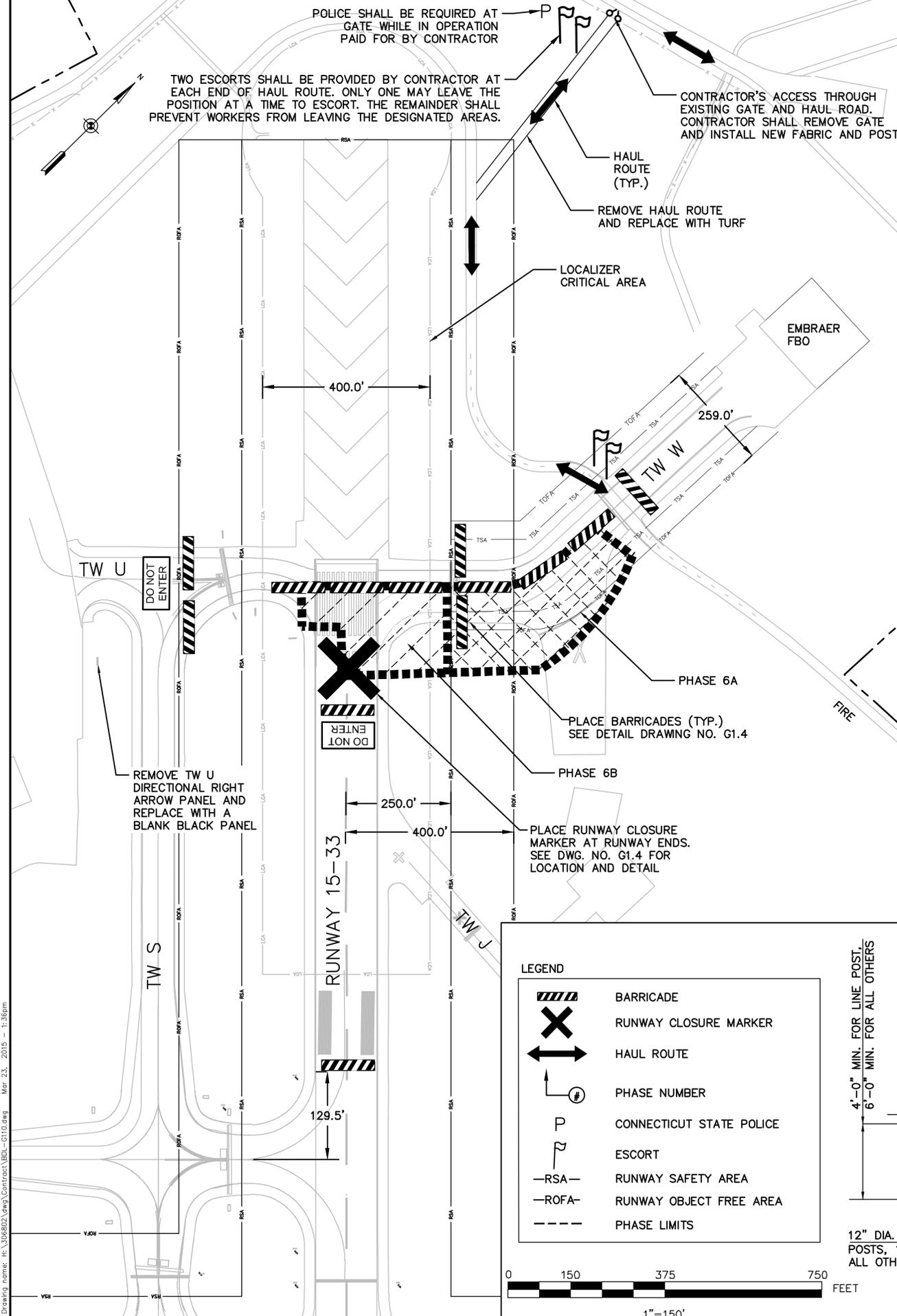
DATE: MARCH 2015  
SCALE: 1"=150'

REV.	DATE	DESCRIPTION	BY
1	3/20/15	BID DOCUMENTS	JLC
2	3/9/15	90% DESIGN SUBMISSION	JLC
3	2/13/15	60% DESIGN SUBMISSION	JLC
4	12/15/14	30% DESIGN SUBMISSION (DO NOT SCALE DRAWING)	JLC

PROJ. No.: 306802  
FILE NAME: BDL-G109  
AIP No.: \_\_\_\_\_

DRAWING NO.  
**G1.9**

SHEET 9 OF 86



**CONSTRUCTION SAFETY AND PHASING NOTES**

**PHASE VIA: WORK TO BE ACCOMPLISHED:**

- CLOSE DOWN WORK AREA AND MOBILIZE ON SITE
- REMOVAL OF EXISTING FULL (8") SHOULDER PAVEMENT (4")
- REPLACE SIGN, INSTALL NEW CONCRETE ENCASED CONDUIT AND LIGHT BASES AND CABLE
- PAVE SHOULDER STRENGTH PAVEMENT
- INSTALL NEW TAXIWAY EDGE LIGHTS AND AIRFIELD SIGNS
- REMOVE PAINT AND PAINT PROPOSED MARKINGS
- DEMOLIBLIZE

**OPERATIONAL IMPACTS, VISUAL AIDS AND NOTAMS:**

- PHASE VIB: CLOSURE OF TAXIWAY W (PARTIAL) ONLY. MAINTAIN ACCESS TO EMBRAER FBO AT ALL TIMES. AIRCRAFT SHALL BE TUGGED PAST WORK AREA.
- ALL EDGE LIGHTS AND GUIDANCE SIGNS FOR CLOSED TAXIWAYS SHALL BE BLANKED OUT FOR THE DURATION OF THIS CLOSURE.

**CONSTRUCTION WORK AREA VISUAL AIDS:**

- BARRICADES INDICATING TAXIWAY CLOSURES ON THE EAST SIDE OF TAXIWAY W. PLACE FLAGGER AT THE INTERSECTION OF THE ACCESS ROAD AND TAXIWAY W.

**CONTRACTOR WORK AREA LIMITATIONS:**

- CONTRACTOR SHALL REMAIN INSIDE OF CLOSED TAXIWAY PORTIONS AT ALL TIMES, WITH EXCEPTION OF OPERATIONALLY APPROVED HAULING ACTIVITIES.
- PHASE VIA CAN BE WORKED ON CONCURRENTLY WITH PHASE VIB.
- PHASE VIB SHALL START IMMEDIATELY AT THE COMPLETION OF VB.
- ANY MILLED/EXCAVATED MATERIALS OR STRUCTURES SHALL BE PLACED DIRECTLY INTO A CARRIER VEHICLE (SUCH AS A DUMP TRUCK) FOR REMOVAL OR STORAGE. NO EXCAVATED MATERIALS OR STRUCTURES ARE TO BE PLACED ON THE GROUND, WITH THE EXCEPTION OF APPROVED STOCKPILE AREAS.
- A VACUUM SWEEPER WITH WATER SHALL BE ON SITE AT ALL TIMES REMOVING DEBRIS (FOD) CAUSED BY CONSTRUCTION OPERATIONS.

**DURATION:**

- 122 TOTAL CONTRACT DAYS: PHASE VIA: 14 CALENDAR DAYS.

**SPECIAL RESTRICTIONS AND COORDINATION:**

- WORK AREAS WILL IMPACT OPERATIONS EMBRAER FBO. CLOSE COORDINATION WITH AIRPORT OPERATIONS AND TENANTS WILL BE REQUIRED IN ORDER TO MINIMIZE OPERATIONAL IMPACTS AND MAINTAINING A SAFE SEPARATION BETWEEN AIRCRAFT UTILIZING THE AIRFIELD AND CONSTRUCTION OPERATIONS.

**PHASE VIB: WORK TO BE ACCOMPLISHED:**

- CLOSE DOWN WORK AREA AND MOBILIZE ON SITE
- REMOVAL OF EXISTING FULL (8") SHOULDER PAVEMENT (4")
- REPLACE SIGN, INSTALL NEW CONCRETE ENCASED CONDUIT AND LIGHT BASES AND CABLE
- PAVE SHOULDER STRENGTH PAVEMENT
- INSTALL NEW TAXIWAY EDGE LIGHTS AND SIGNS
- REMOVE PAINT AND PAINT PROPOSED MARKINGS
- DEMOLIBLIZE

**OPERATIONAL IMPACTS, VISUAL AIDS AND NOTAMS:**

- PHASE VIB: BARRICADES AND CLOSURE OF TAXIWAY W (PARTIAL), TAXIWAY U (PARTIAL), AND RUNWAY 15-33 NORTH OF TAXIWAY J. MAINTAIN ACCESS TO EMBRAER FBO AT ALL TIMES. NOTAM RUNWAY 15-33 AS A TAXIWAY SOUTH OF RUNWAY 6-24.
- ALL EDGE LIGHTS AND GUIDANCE SIGNS FOR CLOSED TAXIWAYS SHALL BE BLANKED OUT FOR THE DURATION OF THIS CLOSURE. DISABLE RUNWAY LIGHTS, NAVAIDS, VISUAL AIDS (PAPI, REILS, MALS), SIGNAGE, LOCALIZER AND GLIDE SLOPE.

**CONSTRUCTION WORK AREA VISUAL AIDS:**

- BARRICADES INDICATING TAXIWAY AND RUNWAY CLOSURES ON THE WEST SIDE OF TAXIWAY W.
- LIGHTED RUNWAY CLOSURE MARKERS TO RUNWAY 15-33.

**CONTRACTOR WORK AREA LIMITATIONS:**

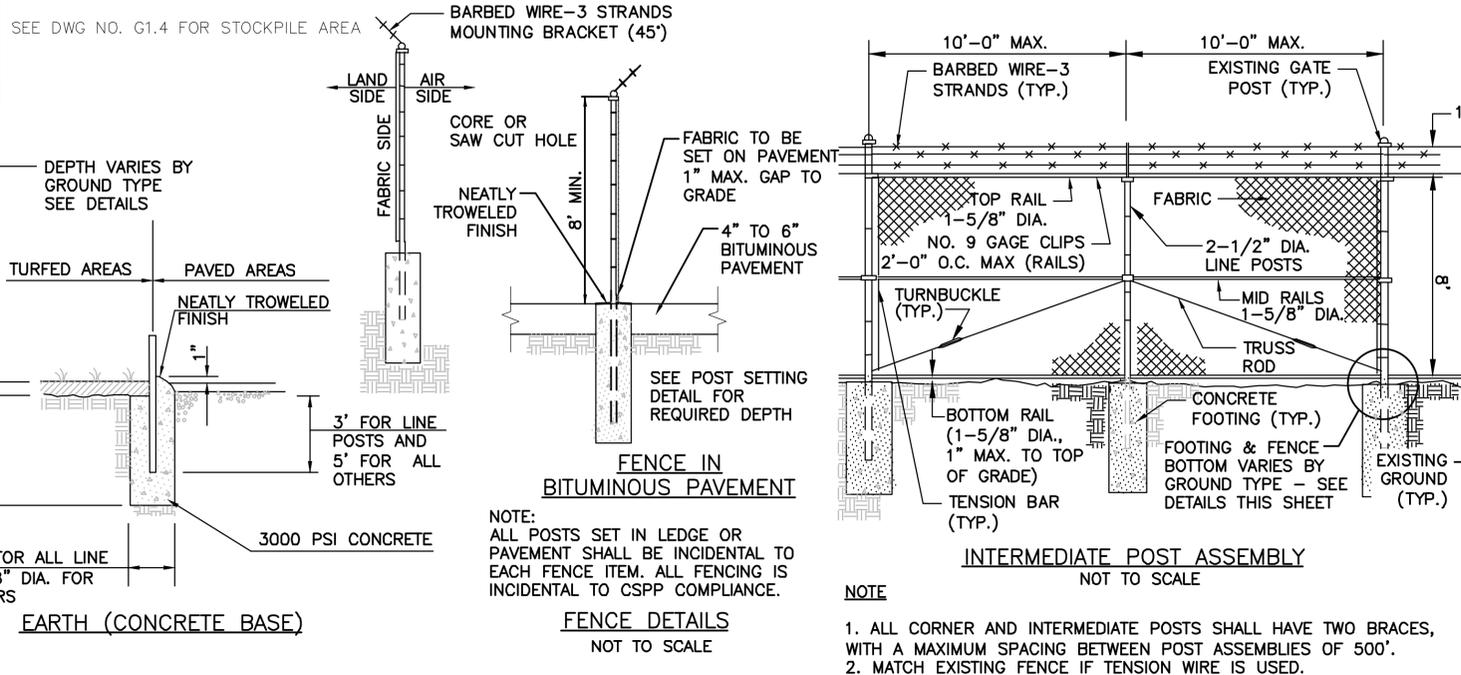
- CONTRACTOR SHALL REMAIN INSIDE OF CLOSED TAXIWAY AND RUNWAY PORTIONS AT ALL TIMES, WITH EXCEPTION OF OPERATIONALLY APPROVED HAULING ACTIVITIES.
- PHASE VIB CAN BE WORKED ON CONCURRENTLY WITH PHASE VIA. ONLY 7 CALENDAR DAYS ARE ALLOWED FOR PHASE VIB OF THE 14 CALENDAR DAYS AVAILABLE FOR PHASE VIA, AND PHASE VIB SHALL START IMMEDIATELY AT THE COMPLETION OF VB.
- ANY MILLED/EXCAVATED MATERIALS OR STRUCTURES SHALL BE PLACED DIRECTLY INTO A CARRIER VEHICLE (SUCH AS A DUMP TRUCK) FOR REMOVAL OR STORAGE. NO EXCAVATED MATERIALS OR STRUCTURES ARE TO BE PLACED ON THE GROUND, WITH THE EXCEPTION OF APPROVED STOCKPILE AREAS.
- A VACUUM SWEEPER WITH WATER SHALL BE ON SITE AT ALL TIMES REMOVING DEBRIS (FOD) CAUSED BY CONSTRUCTION OPERATIONS.

**DURATION:**

- 122 TOTAL CONTRACT DAYS: PHASE VIB: 7 CALENDAR DAYS. ALL 7 CONSECUTIVE CALENDAR DAYS SHALL BE DONE CONCURRENT WITH THE 14 CALENDAR DAYS DURING PHASE VIA.

**SPECIAL RESTRICTIONS AND COORDINATION:**

- WORK AREAS WILL IMPACT OPERATIONS EMBRAER FBO. CLOSE COORDINATION WITH AIRPORT OPERATIONS AND TENANTS WILL BE REQUIRED IN ORDER TO MINIMIZE OPERATIONAL IMPACTS AND MAINTAINING A SAFE SEPARATION BETWEEN AIRCRAFT UTILIZING THE AIRFIELD AND CONSTRUCTION OPERATIONS.



ENGINEER'S SEAL

PROJECT DESIGNER: **Hoyle Tanner & Associates, Inc.**

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Meriden, CT 06450  
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www.hoyletanner.com

BRADLEY INTERNATIONAL AIRPORT

REHABILITATE, LIGHT AND SIGN TAXIWAY W; CONSTRUCT NEW SERVICE ROAD

**CONSTRUCTION SAFETY AND PHASING PLAN TAXIWAY W PHASE VI**

DATE: MARCH 2015

SCALE: 1"=150'

BY	DATE	DESCRIPTION
JLC	3/20/15	BID DOCUMENTS
JLC	3/9/15	90% DESIGN SUBMISSION
JLC	2/13/15	60% DESIGN SUBMISSION
JLC	12/15/14	30% DESIGN SUBMISSION

PROJ. No.: 306802  
FILE NAME: BDL-G110  
AIP No.:

DRAWING NO. **G1.10**

SHEET 10 OF 86

## **Attachment H: Erosion Plan**

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**ITEM P-156 TEMPORARY AIR AND WATER POLLUTION,  
SOIL EROSION AND SILTATION CONTROL**

**CONTRACT DOCUMENTS**

**156-0.1** This section of these specifications is a part of the contract documents as defined in the general provisions. All applicable parts of the balance of the contract documents are equally as binding for this section as for all other sections.

Attention shall be directed to SGC-001 of these specifications entitled "Summary of Work and Special Work Requirements." and also to Division 01, Section 5713 Temporary Erosion & Sediment Control.

**DESCRIPTION**

**156-1.1** This item shall consist of temporary control measures as shown on the plans or as ordered by the Engineer during the life of a contract to control water pollution, soil erosion, and siltation through the use of silt fences, continuous contained berms, dikes, dams, sediment basins, fiber mats, gravel, mulches, grasses, slope drains, and other erosion control devices or methods.

The temporary erosion control measures contained herein shall be coordinated with the permanent erosion control measures specified as part of this contract to the extent practical to assure economical, effective, and continuous erosion control throughout the construction period.

Temporary control may include work outside the construction limits such as borrow pit operations, equipment and material storage sites, waste areas, and temporary plant sites.

Temporary control measures shall be design, installed and maintained to minimize the creation of wildlife attractants that have the potential to attract hazardous wildlife on or near public-use airports.

Temporary erosion control measures shall be in accordance with the *2002 Connecticut Guidelines for Soil Erosion and Sediment Control (the Guidelines)* or as shown in the special conditions, and as specified herein. In areas of conflict the more stringent shall apply.

**MATERIALS**

**156-2.1. SEDIMENT BARRIER.** Continuous Contained Berms, Erosion Control Mix Berm and/or Silt Fence, or as approved by the Engineer, may be used as a sediment barrier at the contractor's option. Any one of these methods or a combination of methods may be used to control sediment on the downhill side of areas disturbed by construction

**156-2.2. INLET PROTECTION.** Silt Fence, Filter Fabric, Stone, Continuous Contained Berms or Hay Bales, or as approved by the Engineer, may be used as inlet protection at the contractor's option. Any one of these methods or a combination of methods may be used to protect catch basins from sedimentations.

**156-2.3. CHECK DAMS.** Stone, Continuous Contained Berms or Hay Bales, or as approved by the Engineer, may be used as a check dam at the contractor's option. Any one of

these methods or a combination of methods may be used to protect channels from erosion and slow the flow of water within the channel.

**156-2.4. TEMPORARY SEEDING.** Grass that will not compete with the grasses sown later for permanent cover shall be a quick-growing species (such as annual ryegrass, oats, winter rye or sudangrass) suitable to the area providing a temporary cover.

**156-2.5. MULCHES.** Mulches may be hay, straw, fiber mats, netting, bark, wood chips, or other suitable material reasonably clean and free of noxious weeds and deleterious materials.

**156-2.6. FERTILIZER.** Fertilizer shall be a standard commercial grade and shall conform to all Federal and state regulations and to the standards of the Association of Official Agricultural Chemists.

**156-2.7. SLOPE DRAINS.** Slope drains may be constructed of pipe, fiber mats, rubble, Portland Cement Concrete, bituminous concrete, or other materials that will adequately control erosion.

**156-2.8. EROSION CONTROL BLANKET.** Erosion control blanket shall be biodegradable with straw or jute fiber and netting. Staples shall be as recommended by the manufacturer.

**156-2.9. CONTINUOUS CONTAINED BERMS.** Continuous Contained Berms consist of excelsior or coconut fiber used to intercept sediment runoff and help stabilize slopes. The sediment filter logs shall be at least 12 inches in diameter.

**156-2.10. SILT FENCE.** Silt fence filter cloth: The fabric for the silt fence shall meet the following specifications:

<u>Fabric Properties</u>	<u>Minimum Value</u>	<u>Test Method</u>
Grab Tensile Strength (lbs.)	90	ASTM D1682
Elongation at Failure (%)	50	ASTM D1682
Mullen Burst Strength (psi)	190	ASTM D3789
Puncture Strength (lbs.)	40	ASTM D751
Equivalent Opening Size	40-80	US Std Sieve

Fence post (for fabricated units) - The post shall be a minimum of 36 inches long. Wood post will be of sound quality hardwood with a minimum cross sectional area of 3.0 square inches. Steel post will be standard T or U sections weighing not less than 1 pound per linear foot. Maximum spacing shall be 10 linear feet.

Wire fence (for fabricated units) - wire fencing shall be a minimum 14.5 gauge with a maximum 6 inch mesh opening.

Prefabricated units - Prefabricated units may be used in lieu of the above method providing:

1. The filter cloth and fence post meet the above criteria.
2. The unit is installed per the manufacturer's recommendations.

**156-2.12. STONE CHECK DAMS.** Stone check dams shall be constructed in accordance with the details shown in the contract drawings.

**156-2.13. HAY BALES.** Hay bales shall consist of rectangular shaped bales of hay or straw weighing at least 40 pounds per bale. They shall be free from primary noxious weed seeds and rough or wood materials. Hay bales shall be tied with twine, wire will not be allowed.

**156-2.14. OTHER.** All other materials shall meet commercial grade standards and shall be approved by the Engineer before being incorporated into the project.

### **CONSTRUCTION REQUIREMENTS**

**156-3.1 GENERAL.** In the event of conflict between these requirements and pollution control laws, rules, or regulations of other Federal, state, or local agencies, the more restrictive laws, rules, or regulations shall apply.

The Engineer shall be responsible for assuring compliance to the extent that construction practices, construction operations, and construction work are involved.

**156-3.2 SCHEDULE.** Prior to the start of construction, the Contractor shall submit schedules for accomplishment of temporary and permanent erosion control work for clearing and grubbing; grading; construction; paving; and structures at watercourses. The Contractor shall also submit a proposed method of erosion and dust control on haul roads and borrow pits and a plan for disposal of waste materials. Work shall not be started until the erosion control schedules and methods of operation for the applicable construction have been accepted by the Engineer.

**156-3.3 AUTHORITY OF ENGINEER.** The Engineer has the authority to limit the surface area of erodible earth material exposed by clearing and grubbing, to limit the surface area of erodible earth material exposed by excavation, borrow and fill operations, and to direct the Contractor to provide immediate permanent or temporary pollution control measures to minimize contamination of adjacent streams or other watercourses, lakes, ponds, or other areas of water impoundment.

**156-3.4 CONSTRUCTION DETAILS.** The Contractor will be required to incorporate all permanent erosion control features into the project at the earliest practicable time as outlined in the accepted schedule. Except where future construction operations will damage slopes, the Contractor shall perform the permanent seeding and mulching and other specified slope protection work in stages, as soon as substantial areas of exposed slopes can be made available. Temporary erosion and pollution control measures will be used to correct conditions that develop during construction that were not foreseen during the design stage; that are needed prior to installation of permanent control features; or that are needed temporarily to control erosion that develops during normal construction practices, but are not associated with permanent control features on the project.

Where erosion may be a problem, clearing and grubbing operations should be scheduled and performed so that grading operations and permanent erosion control features can follow immediately if project conditions permit; otherwise, temporary erosion control measures may be required between successive construction stages.

The Engineer shall limit the area of clearing and grubbing, excavation, borrow, and embankment operations in progress, commensurate with the Contractor's capability and progress in keeping the finish grading, mulching, seeding, and other such permanent control measures current with the accepted schedule. If seasonal limitations make such coordination unrealistic, temporary

erosion control measures shall be taken immediately to the extent feasible and justified as directed by the Engineer.

The Contractor shall provide immediate permanent or temporary pollution control measures to minimize contamination of adjacent streams or other watercourses, lakes, ponds, or other areas of water impoundment as directed by the Engineer. If temporary erosion and pollution control measures are required due to the Contractor's negligence, carelessness, or failure to install permanent controls as a part of the work as scheduled or directed by the Engineer, the work shall be performed by the Contractor at his/her own expense.

The Engineer may increase or decrease the area of erodible earth material that can be exposed at any time based on an analysis of project conditions.

The erosion control features installed by the Contractor shall be acceptably maintained by the Contractor during the construction period.

Whenever construction equipment must cross watercourses at frequent intervals, temporary structures should be provided.

Pollutants such as fuels, lubricants, bitumen, raw sewage, wash water from concrete mixing operations, and other harmful materials shall not be discharged into any waterways, impoundments or into natural or manmade channels leading thereto.

**156-3.5 INSTALLATION, MAINTENANCE AND REMOVAL OF SILT FENCES.** Silt fences shall extend a minimum of 16 inches (41 cm) and a maximum of 34 inches (86 cm) above the ground surface. Posts shall be set no more than 10 feet (3 m) on center. Filter fabric shall be cut from a continuous roll to the length required minimizing joints where possible. When joints are necessary, the fabric shall be spliced at a support post with a minimum 12-inch (300-mm) overlap and securely sealed. A trench shall be excavated approximately 4 inches (100 mm) deep by 4 inches (100 mm) wide on the upslope side of the silt fence. The trench shall be backfilled and the soil compacted over the silt fence fabric. The Contractor shall remove and dispose of silt that accumulates during construction and prior to establishment of permanent erosion control. The fence shall be maintained in good working condition until permanent erosion control is established. Silt fence shall be removed upon approval of the Engineer.

**156-3.6 TEMPORARY DIVERSIONS.** The cost of temporary diversion stream at structures and all dewatering shall be borne by the Contractor.

**156-3.7. TEMPORARY GRASS SEED.** Temporary grass seed shall be a 50/50 split of the seed mix below and the T-901 New England Native Warm Season Grass Mix, with the exception of Winter Rye which shall be applied at the full (100%) rate. Apply the temporary grass seed mix and New England Native Warm Season Grass mix at ½ the rates shown in each table, with the exception of Winter Rye which shall be applied at the full (100%) rate, and choose the temporary grass seed for the time of season and type of seed used:

Seed	Lb./Ac	Seeding Depth	Recommended Seeding Dates	Remarks
Winter Rye	112	1-1.5 in	8/15-10/1	Good for fall seeding. Select a hardy species, such as Aroostook Rye.
Oats	80	1-1.5 in	4/1-7/1 8/15-9/15	Early fall seeding will die when winter weather moves in, but mulch will provide protection.
Annual Ryegrass	40	.25 in	4/1-7/1	Grows quickly but is of short duration. Use where appearance is important.

				With mulch, seeding may be done throughout growing season.
Sudangrass	40	.5-1 in	5/15-8/15	Good growth during hot summer periods.
Perennial	40	.25 in	8/15-9/15	Good cover, longer lasting than Annual Ryegrass. Mulching will allow seeding throughout growing season.

**156-3.8 EROSION CONTROL BLANKET.** Surfaces to receive erosion control blanket shall conform to the grades and cross-sections shown on the plans and shall be finished to a smooth and even condition with all debris, roots, stones, and lumps raked out and removed. The soil surface shall be sufficiently loose to permit bedding of the matting. Unless otherwise directed, seed ordered shall be applied prior to placement of the matting.

The material shall be unrolled in the direction of the flow of water. Where the blanket ends at the top and bottom of the slope, the material shall be secured by toeing the material in 6" deep and placing staples 12" on center across the fabric.

Where the erosion control blanket meets end to end, the end down gradient shall be secured by toeing in the material 6" deep and applying staples 12" on center across the matting. The end of the up gradient section shall overlap the toed in down gradient section by 12" and be secured by staples placed 12" on center across the fabric.

When adjoining rolls of erosion control blanket are laid parallel to one another, edges shall be overlapped 3" and staples placed 18" to 24" along the seam.

Staples shall be placed in a pattern that is recommended by the manufacturer.

Except where the blanket is turned down, all blanket material shall be spread evenly and smoothly so that it is in close contact with the ground. Bulging seams in either blanket material shall be cut out and joints formed as described above.

When instructed, additional seed shall be spread over the blanket material, particularly at those locations disturbed by building the slots. The blanket shall then be pressed onto the ground with a light lawn roller or by other satisfactory means.

The above specified spacing of staples may be changed as ordered, depending upon varying factors such as the season of the year or the amount of water encountered or anticipated.

**156-3.9 HAY BALES FOR EROSION CONTROL.** Hay bales shall be placed where shown on the Contract Drawings or as directed by the Engineer.

The bales shall be placed in accordance with the details shown on the Contract Drawings. Each bale shall be embedded in the soil a minimum of 4 inches and shall be anchored securely in place with a minimum of 2 stakes.

The Contractor shall frequently inspect the hay bales after installation and repair or replace any bales that become damaged and remove any silt that accumulates behind the bales.

Haybale barriers around catch basins shall consist of a minimum of four haybales installed as described above, around the inlet of a catch basin, in such a manner to prevent silt-laden water from entering the catch basin.

The Contractor will be required to inspect the haybale barriers weekly and after rainfall events exceeding 0.5 inches. The Contractor shall make any and all required repairs.

**156-3.10 STONE CHECK DAMS.** Stone check dams shall be placed where shown on the Contract Drawings or as directed by the Engineer.

The stone check dams shall be constructed in accordance with the details shown on the Contract Drawings. Maintenance and removal of the stone check dams shall be considered incidental.

**156-3.11 DUST CONTROL.** The Contractor shall maintain at the construction site the equipment necessary for the application of water for dust control within the construction site and on haul roads. The equipment shall be equipped with a shut-off control valve, which can be operated from the cab by the operator. The Contractor shall have a sufficient number of pieces of equipment to control the dust.

The Contractor shall apply water for dust control as necessary to prevent dust from the construction site and/or haul roads from being a hazard to aircraft and from being a nuisance to the public and as directed by the Engineer.

The Contractor shall furnish water for dust control that is clear and free of harmful amounts of oil, salts, acids, alkalis, sugar, silt, mud, grasses, organic matter or other substances injurious to the finished product, plant life or the establishment of plant life.

The Contractor shall be responsible for providing all water necessary for dust control and shall pay all fees relating thereto.

Should seasonal limitations make topsoiling, seeding, and mulching unrealistic, such areas shall be treated with polymer emulsion as a temporary dust and erosion control measure.

A motor operated vacuum sweeper with water shall be on site at all times and used to keep all paved surfaces clean and free of foreign object damage.

The Engineer reserves the right to employ outside assistance to provide corrective measures if the Contractor fails to provide proper dust control. Such incurred direct costs plus project engineering costs will be charged to the Contractor and appropriate deductions made from the Contractor's period cost estimates.

**156-3.12 SUBGRADE PROTECTION.** The areas of finished subgrade for the runway, taxiways, and roads shall, at the direction of the engineer, be treated with polymer emulsion for dust and erosion control. The Contractor shall protect the permeability of the underdrain backfill. The Contractor shall protect the treated subgrade areas from damage and shall repair at the Contractor's expense any area in which the polymer emulsion becomes disturbed.

**156-3.13 SEEDED AREA PROTECTION.** The areas of excavation and embankments, which are at finished grade and have been topsoiled, seeded, and mulched, but have not achieved grass growth shall, at the direction of the Engineer, be treated with bonded fiber matrix for dust and erosion control. The Contractor shall protect the treated areas from damage and shall repair at the Contractor's expense any area in which the bonded fiber matrix becomes disturbed.

**156-3.14 CONTINUOUS CONTAINED BERMS.** Prior to any earth removal or excavation a sediment filter logs shall be placed as recommended by the manufacturer. Maintenance of the filter logs shall include periodic removal of accumulated fines and silt as directed by the Engineer to maintain its proper function. The Contractor shall be responsible for the proper use of the sediment filter logs in all conditions during construction.

The Contractor will be required to inspect the sediment filter logs weekly and after rainfall events exceeding 0.5 inches. The Contractor shall make any and all required repairs.

## METHOD OF MEASUREMENT

**156-4.1** Temporary erosion and pollution control work required which is not attributed to the Contractor's negligence, carelessness, or failure to install permanent controls will be performed as scheduled or ordered by the Engineer. Completed and accepted work will be measured as follows:

**156-4.2. EROSION CONTROL BLANKET.** The quantity of erosion control blanket to be paid for shall be the area of erosion control blanket placed per square yard seeded, furnished, installed and accepted.

**156-4.3. SEDIMENT BARRIER.** The quantity of Silt Fence to be paid for shall be the number of linear feet of silt fence, measured in place along, furnished, installed and accepted. No additional measurement will be allowed for the overlap of material.

**156-4.4. HAY BALES.** The quantity of hay bales shall be measured by the number per each hay bale place for the duration of construction and until stabilization, measured as furnished and accepted.

**156-4.5. TEMPORARY SEED.** The quantity of grass seed to be paid for shall be the area seeded at the specified rate per square yard seeded, furnished, applied and accepted.

**156-4.6. STONE CHECK DAMS.** The quantity of check dams shall be measured by the number per each of installed check dams, measured as furnished, and accepted.

**156-4.7. INLET PROTECTION AT CATCH BASIN.** The quantity of inlet protection shall be measured by the number per each inlet at catch basins the protection is installed for the duration of construction and until stabilization, measured as furnished and accepted.

**156-4.8. DUST CONTROL.** No separate measurement or payment shall be made for dust control. All work involved in dust control including the furnishing of water will be considered incidental to the various items of work and all costs in connection with such provision and compliance shall be included in the various unit and lump sum prices bid for the work items specified under other sections of these specifications.

**156-4.9.** Control work performed for protection of construction areas outside the construction limits, such as borrow and waste areas, haul roads, equipment and material storage sites, and temporary plant sites, will not be measured and paid for directly but shall be considered as a subsidiary obligation of the Contractor with costs included in the contract prices bid for the items to which they apply.

## BASIS OF PAYMENT

**156-5.1. EROSION CONTROL BLANKET.** Payment shall be made at the contract unit price per square yard of erosion control blanket installed and accepted by the engineer. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, maintenance, and incidentals necessary to complete the item.

**156-5.2. SEDIMENT BARRIER.** Payment shall be made at the contract unit price per linear foot of sediment barrier installed and accepted by the engineer. This price shall be full compensation

for furnishing all materials and for all labor, equipment, tools, maintenance, and incidentals necessary to complete the item.

**156-5.3. HAY BALES.** Payment shall be made at the contract unit price per each hay bale installed. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, maintenance, and incidentals necessary to complete the item.

**156-5.4. TEMPORARY SEEDING.** Payment shall be made at the contract unit price per square yard of area seeded at the specified rates. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item.

**156-5.5. STONE CHECK DAMS.** Payment shall be made at the contract unit price per each stone check dam installed and accepted by the engineer. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, maintenance, and incidentals necessary to complete the item.

**156-5.6. INLET PROTECTION AT CATCH BASIN.** Payment shall be made at the contract unit price per each installed per catch basin. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, maintenance, and incidentals necessary to complete the item.

**Payment will be made under:**

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>UNIT</u>
P-156-1	Inlet Protection - Structure	Each
P-156-2	Inlet Protection – Trench Drain	Linear Foot
P-156-3	Sediment Barrier	Linear Foot
P-156-4	Check Dams	Each
P-156-5	Temporary Seeding	Square Yard
P-156-6	Erosion Control Blanket	Square Yard

Where other directed work falls within the specifications for a work item that has a contract price, the units of work shall be measured and paid for at the contract unit price bid for the various items.

Temporary control features not covered by contract items that are ordered by the Engineer will be paid for in accordance with Section 90-05 Payment for Extra work.

#### **MATERIAL REQUIREMENTS**

ASTM D6461 Standard Specification for Silt Fence Materials  
AC 150/5200-33 Hazardous Wildlife Attractants

**END OF ITEM P-156**

## **Attachment I: Wetland Report**

**Note: Attachments deemed non-material  
for the use in the SWPCP were removed  
from the report**

December 8, 2014

Hoyle, Tanner & Associates, Inc.  
150 Dow Street  
Manchester, NH 03101



Attn: Mr. Robert M. Furey  
P: (603) 669 5555 x158  
F: (603) 669 4168  
E: rfurey@hoyletanner.com

Re: Wetland Delineation Report  
Taxiway E Rehabilitation Area  
Bradley International Airport  
Windsor Locks, Connecticut  
Terracon Project No. J2147166

Dear Mr. Furey,

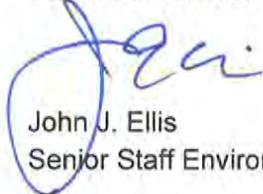
Terracon is pleased to submit the Wetland Delineation Report for the above referenced project. Based on the results of the delineation, wetlands and Waters of the United States (WUS) were not identified on the site.

A cover letter addressed to the New England District has been included with the enclosed report; however, a copy of this report has not been provided to the U.S. Army Corps of Engineers (USACE) by Terracon. A copy of the Wetland Delineation Report and attached letter should be submitted to the USACE for review and concurrence. The USACE can be reached at the following address:

US Army Corps of Engineers – New England District  
Regulatory Division  
696 Virginia Road  
Concord, MA 01742  
Attention: Ms. Diane Ray

Terracon appreciates the opportunity to have worked for you on this project. If you have any questions regarding the content of this report, please contact us at 515-244-3184.

Sincerely,  
**Terracon Consultants, Inc.**



John J. Ellis  
Senior Staff Environmental Scientist



Scott West  
Project Manager II

Enclosures

Terracon Consultants, Inc. 201 Hammer Mill Road Rocky Hill, Connecticut 06067  
P (860) 721 1900 F (860) 721 1939 terracon.com

Environmental

Facilities

Geotechnical

Materials

# Wetland Delineation Report

Taxiway E Rehabilitation Area  
Bradley International Airport  
Windsor Locks, Connecticut

December 8, 2014

Terracon Project No. J2147166



**Prepared for:**  
Hoyle, Tanner & Associates, Inc.  
Manchester, New Hampshire

**Prepared by:**  
Terracon Consultants, Inc.  
Rocky Hill, Connecticut

[terracon.com](http://terracon.com)

**Terracon**

Environmental



Facilities



Geotechnical



Materials

December 8, 2014



Ms. Diane Ray  
US Army Corps of Engineers – New England District  
Regulatory Division  
696 Virginia Road  
Concord, MA 01742

Re: Wetland Delineation Report  
Taxiway E Rehabilitation Area  
Bradley International Airport  
Windsor Locks, Connecticut  
Terracon Proposal No. J2147166

Dear Ms. Ray:

Terracon is pleased to submit the Wetland Delineation Report prepared on behalf of Hoyle, Tanner & Associates, Inc. This report describes the technical criteria, field indicators, and other sources of information used to identify and delineate wetlands. Based on the results of the delineation, wetlands and Waters of the United States (WUS) were not identified on the site. At this time, we are requesting that you perform a Jurisdictional Determination for the project and advise our client if a permit will be required for the proposed activity.

If you have any questions concerning this report, please contact John Ellis at (860) 929-7862 or by e-mail at [jjellis@terracon.com](mailto:jjellis@terracon.com).

Sincerely,  
**Terracon Consultants, Inc.**

A handwritten signature in blue ink, appearing to read 'J. Ellis', is written over the printed name and title of John J. Ellis.

John J. Ellis  
Senior Staff Environmental Scientist

A handwritten signature in blue ink, appearing to read 'Scott West', is written over the printed name and title of Scott West.

Scott West  
Project Manager II

Terracon Consultants, Inc. 201 Hammer Mill Road Rocky Hill, Connecticut 06067  
P (860) 721 1900 F (860) 721 1939 [terracon.com](http://terracon.com)

Environmental

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**APPENDIX A – EXHIBITS**

- Exhibit A-1 – Site Location Map
- Exhibit A-2 – Site Diagram
- Exhibit A-3 – National Wetland Inventory Map
- Exhibit A-4 – NRCS Web Soil Survey Map
- Exhibit A-5 – Town of Windsor Locks GIS Map

**APPENDIX B – AERIAL PHOTOGRAPHS**

**APPENDIX C – WETLAND DETERMINATION DATA FORMS**

**APPENDIX D – GROUND PHOTOGRAPHS**

**WETLAND DELINEATION REPORT**  
**Taxiway E Rehabilitation Area**  
**Bradley International Airport**  
**Windsor Locks, Connecticut**  
Terracon Project No. J2147166  
December 8, 2014

## **1.0 INTRODUCTION**

Terracon Consultants, Inc. (Terracon) was retained by Hoyle, Tanner & Associates, Inc. (Hoyle-Tanner) to perform a wetland delineation for the proposed Taxiway E Rehabilitation Area located at Bradley International Airport in Windsor Locks, Hartford County, Connecticut (project area). The project area covers approximately 3,000 linear feet of airport taxiway that is proposed for the construction of a new paved road. At the request of Hoyle-Tanner, the wetland delineation was focused on an approximate 3.52-acre portion of the project area (site). This site is located in the northernmost portion of the project area as depicted on Exhibit A-2 in Appendix A.

The purpose of performing the wetland delineation was to determine if wetlands or Waters of the United States (WUS) are present and, if so, to identify the boundaries. The wetland delineation was performed in accordance with the 1987 Corps of Engineers Wetlands Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (January 2012). According to U.S. Army Corps of Engineers (USACE) guidelines, wetlands generally have three essential characteristics: hydrophytic (wetland) vegetation, hydric soils, and wetland hydrology.

## **2.0 SCOPE OF SERVICES**

Terracon performed the following scope of work:

- Reviewed map and aerial photograph resources to assist with identifying suspect WUS and wetland areas at the site.
- Mobilized to the site to conduct the wetland delineation.
- Prepared a wetland delineation map showing WUS and wetland areas identified during the site visit, if any.
- Completed a Wetland Delineation Report that included delineation rationale, a discussion of applicable data, and recommendations for the site.

## **3.0 PRELIMINARY DATA GATHERING AND ANALYSIS**

Prior to performing the delineation, several map and aerial photograph resources were reviewed to assist with identifying WUS and wetland areas at the site. Each source of data is described in detail below.

### **3.1 Topographic Map**

The United States Department of the Interior Geologic Survey (USGS) 7.5-Minute Topographic Map of the site was reviewed to identify drainages or WUS within the project area. A portion of the Windsor Locks, Connecticut Quadrangle, dated 1984, can be seen as Exhibit A-1 in Appendix A. As illustrated on Exhibit A-1, two depressions and vegetated land are illustrated in the vicinity of the site at the parent tract. Indications of streams or wetland symbols are not illustrated at the site.

### **3.2 National Wetland Inventory Map**

The National Wetland Inventory (NWI) Map of the site was reviewed to identify potential wetland areas. The map for the site was published by the U.S. Department of the Interior's Fish and Wildlife Service (USFWS) and depicts probable wetland areas based on stereoscopic analysis of high altitude aerial photographs. The review of the NWI map did not identify mapped wetlands at the site. The NWI map is attached as Exhibit A-3 in Appendix A.

### **3.3 NRCS Web Soil Survey Map**

The Natural Resources Conservation Service (NRCS) Web Soil Survey (WSS)<sup>1</sup> map, accessed November 6, 2014, was reviewed to identify soil types, including hydric soils, in the area of the site. The NRCS soil survey map can be seen as Exhibit A-4 in Appendix A. The following soil types were identified within the project area based on an area of interest search of the WSS:

- Udorthents - Urban Land Complex (306) and smoothed (308): This complex consists of moderately well drained to excessively drained soils that have been disturbed by cuffing or filling, and areas that are covered by buildings and pavement. The areas are mostly larger than 5 acres. The complex is about 70 percent Udorthents, 20 percent Urban land, and 10 percent other soils. Most areas of these components are so intermingled that it was not practical to map them separately. Udorthents are in areas that have been cut to a depth of 2 feet or more or are on areas with more than 2 feet of fill. Udorthents consist primarily of moderately coarse textured soil material and a few small areas of medium

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<sup>1</sup> Posted at: <http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>

textured material (USDA, Soil Map Unit Descriptions). Udorthents (soil map units 306 and 308) are not listed on the Connecticut hydric soils list<sup>2</sup>.

### **3.4 Town of Windsor Locks GIS Map**

Terracon reviewed the Town of Windsor Locks Geographic Information System (GIS) Inland Wetlands Map (<http://ags.cdm.com/windsorlocksct/>) in an attempt to identify local wetland records for the site. As depicted on the GIS map, a wetland is illustrated to the southeast of the site in an adjacent detention basin. The wetland is illustrated at the base of a catch basin, in the northeast corner of the detention basin. Three apparent discharge pipes are shown in the southern portion of the detention basin. Terracon included an evaluation of this area as part of the wetland delineation. A copy of the Town of Windsor Locks GIS map is attached as Exhibit A-5.

### **3.5 Aerial Photographs**

Terracon reviewed aerial photographs obtained from the Connecticut State Library website (<http://www.ctstatelibrary.org/topics/aerial-photos>) to identify suspected wetland areas on the site. Aerial photographs were reviewed for years 1965, 1970, 1986, 1990, and 1995. Historical aerial photographs are attached in Appendix B. Terracon also reviewed recent aerial photography available on-line at <http://atlas.freshlogicstudios.com/>. The aerial photograph review is summarized below:

1965-1995: The site consists of partially wooded, vacant land. Two apparent drainage swales are visible and appear to run southwest to northeast in the central portion of the site.

Recent aerial photography (<http://atlas.freshlogicstudios.com/>) shows that the surrounding area has been redeveloped with an airport building to the southeast of the site, and that the interior portion of the site has been cleared. Ground cover appears to contain lawn grass, and a dry detention basin is shown to the southeast of the site. No evidence of wet areas (visible dark ground surface or ponded water) was observed based the recent aerial photograph from this source.

## **4.0 FIELD TECHNIQUES**

Terracon conducted the field investigation on November 18, 2014. An experienced Terracon wetland scientist used technical criteria, field indicators, historic aerial photographs, and other sources of information to evaluate the site. The evaluation methods generally followed the

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<sup>2</sup> Natural Resources Conservation Service, Hydric Soils – State of Connecticut, Tabular Data Version: 2, dated July 15, 2005

## Wetland Delineation Report

Taxiway E Rehabilitation Area ■ Windsor Locks, Connecticut

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routine on-site determination method referenced in the 1987 USACE Manual and 2012 Northcentral and Northeast Regional Supplement.

Wetlands generally have three essential characteristics: hydrophytic (wetland) vegetation, hydric soils, and wetland hydrology. Several representative observation locations were selected within each suspect wetland area. Vegetation, soils and hydrology were evaluated within each suspect area to determine if wetland characteristics were present. The techniques for evaluating the plant community, soils, and hydrology are described in the following sections.

### 4.1 Plant Community Assessment

Suspect areas were visually observed to determine the species and absolute percentage of ground cover for four stratum of plant community types. Herbs are generally observed within a five-foot radius, shrubs/saplings within a fifteen-foot radius, and trees and vines within a thirty-foot radius of the observation location. Trees and shrubs were not present at the site, and as such, only the herb layer was observed. Several representative observation locations were selected within each suspected wetland area to generally represent the vegetation characteristics of the whole community. The observed ground vegetation at the site consisted of mostly lawn grass similar to other landscaped areas of the airport property. Terracon used Newcomb's Wildflower Guide (Newcomb, 1977) to assist with the identification of ground cover.

For each species of vegetation observed, their wetland indicator status was evaluated. Indicator status was determined using the National Wetland Plant List: Northcentral and Northeast Region (USACE, 2012). Indicator categories for vegetation are presented below:

- **Obligate Wetland (OBL)** - occur almost always (estimated probability greater than 99%) under natural conditions in wetlands.
- **Facultative Wetland (FACW)** - usually occur in wetlands (estimated probability 67% - 99%) but occasionally found in non-wetlands.
- **Facultative (FAC)** - equally likely to occur in wetlands or non-wetlands (estimated probability 34% - 66%).
- **Facultative Upland (FACU)** - usually occur in non-wetlands (estimated probability 67% - 99%) but occasionally found in wetlands.
- **Obligate Upland (UPL)** – rarely occur in wetlands, but occur almost always (estimated probability greater than 99%) under natural conditions in non-wetlands.

The percent cover of the herb stratum was determined and dominance was evaluated. Aerial dominance was determined using the 50/20 rule. The number of dominant species with an

indicator status of OBL, FACW, and/or FAC was compared to the total number of dominant species across all strata. Typically, when more than 50 percent of the dominant species had an indicator status of OBL, FACW, and/or FAC, hydrophytic vegetation was considered to be present.

## **4.2 Hydric Soils Assessment**

After Terracon evaluated wetland vegetation, subsurface soil samples were collected using a spade and soil auger. The samples were collected to a depth of approximately 18 inches below ground surface and were visually compared to Munsell Soil Color Charts (Munsell, 1994), which aided in the evaluation of hydric soil characteristics. The soil samples were further examined for hydric soil indicators including, but not limited to, histosol, thick dark surface, sandy gleyed matrix, sandy redox, loamy gleyed matrix, redox dark surface, and/or redox depressions. If these or other hydric soil indicators were observed in the subsurface soil sample, the observation location was considered to have hydric soil.

## **4.3 Wetland Hydrology Assessment**

Visual indicators of wetland hydrology were evaluated. Examples of primary wetland hydrology indicators include, but are not limited to, surface water, high water table, soil saturation, water marks, sediment deposits, drift deposits, iron deposits, inundation visible on aerial imagery, sparsely vegetated concave surface, and water-stained leaves. If at least one primary or two secondary indicators were observed, the observation location was considered to have wetland hydrology.

## **4.4 Classification of Wetlands**

Upon completion of the review of the three wetland criteria at each area, a wetland determination was made. Under normal circumstances, if one or more of the wetland criteria were not identified, the area was not considered to be a wetland. If all three wetland indicators were identified, the area was classified as wetland. Vegetation, soil and hydrology assessment data from the site were recorded on USACE Wetland Determination Forms. The recorded data forms for the site can be found in Appendix C and the data point locations can be seen on Exhibit A-2 in Appendix A.

## **4.5 WUS Observations**

Terracon also made observations of any site features that may be considered a WUS (streams, swales, etc.). If a potential WUS was identified, observations regarding its characteristics were recorded. The following definitions were used when describing the WUS:

## Wetland Delineation Report

Taxiway E Rehabilitation Area ■ Windsor Locks, Connecticut

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- Flow Characteristics:
  - Perennial: contains water at all times except during extreme drought.
  - Intermittent: carries water a considerable portion of the time, but ceases to flow occasionally or seasonally.
  - Ephemeral: carries water only during and immediately after periods of rainfall or snowmelt.
- Ordinary High Water Mark: The limit line on the shore established by the fluctuation of the water surface. It is shown by such things as a clear line impressed on the bank, shelving, changes in soil character, destruction of terrestrial vegetation, the presence of litter and debris or other features influenced by the surrounding area.
- Bank Shape Descriptions:
  - Undercut: banks that overhang the stream channel.
  - Steep: bank slope of approximately greater than 30 degrees.
  - Gradual: bank slope of approximately 30 degrees or less.
- Aquatic Habitat Descriptions:
  - Pool: deeper portion of a stream where water flows slower than in neighboring, shallower portions, smooth surface, and finer substrate.
  - Riffle: shallow area in a stream where water flows swiftly over gravel and rock or other coarse substrate resulting in a rough flow and a turbulent surface.
  - Run: section of a stream with a low or high velocity and with little or no turbulence on the surface of the water.

## 5.0 FIELD OBSERVATIONS RESULTS

On November 18, 2014, Terracon performed fieldwork in an attempt to identify wetlands at the site. Based on Terracon's preliminary assessment, no wetland areas or other WUS were identified at the site based on available resources. However, the Town of Windsor Locks GIS Map depicts a wetland within the detention basin to the southeast of the site. Terracon understands that this area is outside the project site; however, for informational purposes included this area in our evaluation given its close proximity.

## Wetland Delineation Report

Taxiway E Rehabilitation Area ■ Windsor Locks, Connecticut

December 8, 2014 ■ Terracon Project: J2147166



### Detention Basin Evaluation

Terracon began the evaluation in the area of the mapped wetland within the detention basin, as this area represented the “wettest” location in the vicinity of the site. A USACE Wetland Determination Data Form – Northcentral and Northeast Region (Data Form) was completed within the detention basin and is attached in Appendix C. The data point location was based on observed pooled water, a result of a rain event the previous day, which appeared to be the represent wettest portion of the basin (in the eastern end). The location of DP-01 is depicted on Exhibit A-2 in Appendix A. Photographs of the data point area are attached in Appendix D.

As shown in the attached Data Form for sample location DP-01, a dark chroma loamy sand layer (10YR2/2) was observed to a depth of 15 inches below grade. The upper 5 inches of the soil profile was saturated at the time of the survey as a result of a rain event. Evidence of redoximorphic features were not observed in the upper part of the soil profile, and as such the soil was not considered hydric. Evidence of hydrophytic vegetation was lacking at this location. Terracon completed additional probes within the detention basin using a soil auger. Within the area mapped as wetland by the Town of Windsor locks, soil and ground cover conditions were consistent with DP-01. Higher chroma (drier) soils were observed in the central and western portion of the detention basin.

### Site Evaluation

Based on a review of available resources, no wetlands are mapped at the site. Terracon completed a Data Form (DP-02) in the southern portion of the site in the area of the proposed roadway. The location of DP-02 is depicted on Exhibit A-2 in Appendix A. The DP-02 location was chosen given the slight depressional landscape and associated catch basin within the lawn; thus having potential to collect runoff and exhibit “wet” characteristics. As shown in the attached Data Form for DP-02, no evidence of hydric soil or hydrophytic vegetation was observed at the DP-02 location. Additional soil probes were completed throughout the site in an attempt to identify hydric soil; however, hydric soil characteristics were not observed in soil within the site. The observed soil type was consistent with the mapped soil type (Urban land) based on distinct color differences in the soil strata which indicate the soil at the site has been reworked or graded over. Hydrophytic vegetation and indicators of hydrology were not observed at the site.

Based on the results of the field investigation, Terracon concludes that no wetlands are present at the site.

## **6.0 RECOMMENDATIONS**

Based on survey results, no wetlands or WUS were identified on the site. However, only the USACE can make the final determination on the jurisdictional status of wetlands or WUS, and on the need for permit processing and compensatory mitigation. It is recommended that a copy

## **Wetland Delineation Report**

Taxiway E Rehabilitation Area ■ Windsor Locks, Connecticut

December 8, 2014 ■ Terracon Project: J2147166



of this report be issued to the US Army Corps of Engineers – New England District, Regulatory Division for concurrence with these findings and to advise whether a permit will be required for the proposed activity.

The USACE can be reached at the following address:

US Army Corps of Engineers – New England District  
Regulatory Division  
696 Virginia Road  
Concord, MA 01742  
Attention: Ms. Diane Ray

The State of Connecticut considers wetlands as those areas containing hydric soils. Evidence of hydric soil was not observed at the site; however, given a mapped wetland was identified on the Town of Windsor GIS website, the client should consult the local conservation commission as to the status of the mapped wetland and concurrence with Terracon's findings.

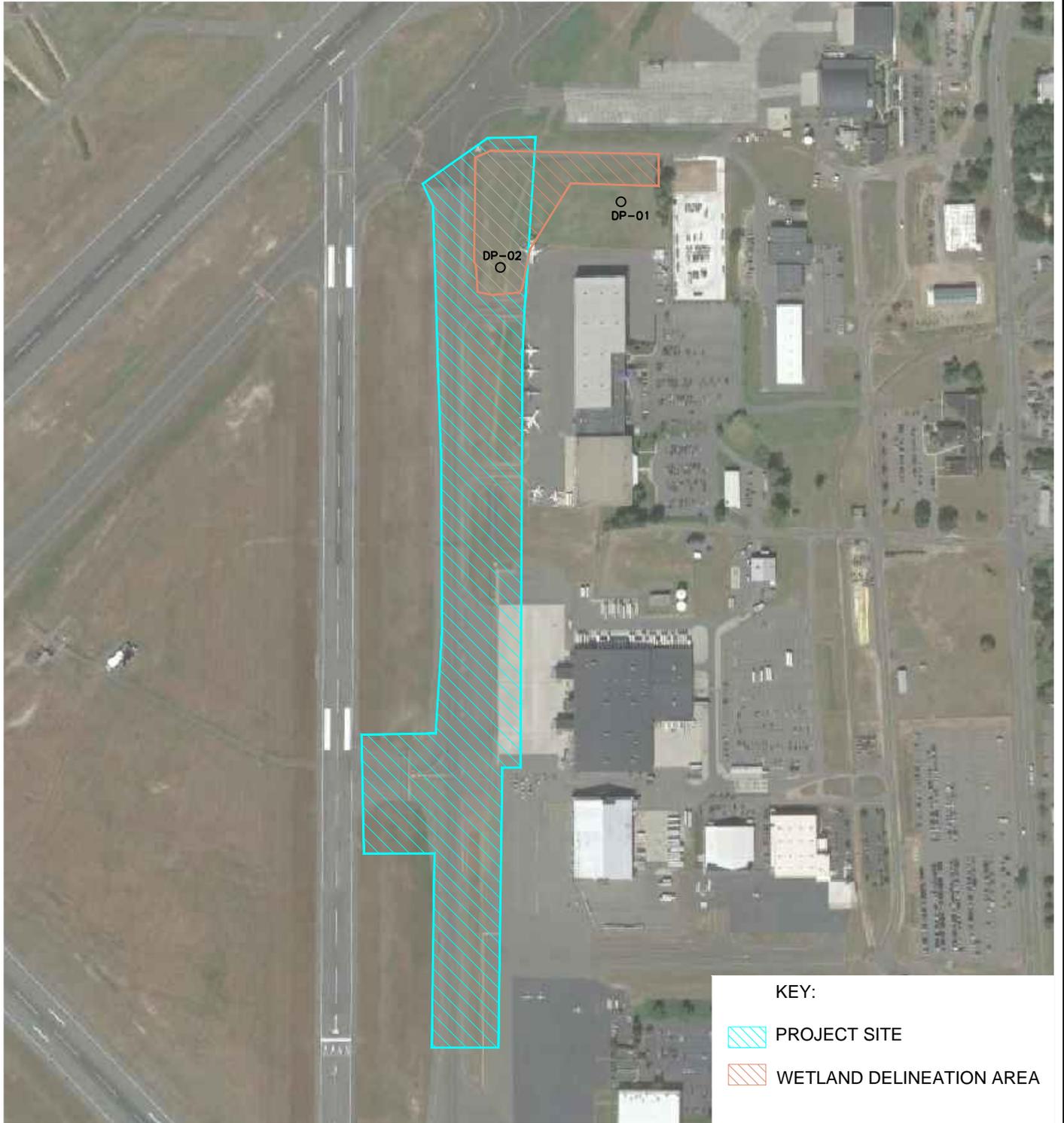
## **7.0 GENERAL COMMENTS**

The wetland delineation was performed using the 1987 USACE Manual and 2012 Northcentral and Northeast Regional Supplement. The manual provides assistance for delineating wetlands based on the three criteria discussed. However, the manual alone may not have provided enough information to document whether or not the three criteria were met. Various physical properties or other visual signs used to evaluate whether the three wetland identification criteria areas were satisfied may not be straightforward, especially in disturbed or problem areas. The manual also allows the user to visually estimate certain indicators such as the percentage of area covered by dominant species for the entire community. Terracon did not attempt to identify every possible plant species and did not classify soil type by laboratory methods. Due to seasonal changes, Terracon cannot guarantee the area to exhibit or not to exhibit wetland characteristics at all times of the year. The limitations of this wetland delineation should be recognized.

This report has been prepared in accordance with generally accepted scientific and engineering evaluation practices. This report is for the exclusive use of the client for the project being discussed. No warranties, either express or implied, are intended or made.

# **APPENDIX A**

## **Exhibits**

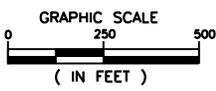


KEY:

 PROJECT SITE

 WETLAND DELINEATION AREA

- NOTES:
1. THIS DIAGRAM WAS PREPARED BASED ON AVAILABLE AERIAL PHOTOGRAPHY.
  2. USE OF THIS DIAGRAM IS LIMITED TO THE LOCATION OF THE SITE AND OTHER PERTINENT SITE FEATURES. ANY OTHER USE OF THIS DIAGRAM WITHOUT PERMISSION FROM TERRACON IS PROHIBITED.



Project Mngr:	JJE	Project No.	J2147166
Drawn By:	MCR	Scale:	As shown
Checked By:	JJE	File No.	J2147166.dwg
Approved By:	JSD	Date:	December 2014

**Terracon**

201 Hammer Mill Road Rocky Hill, CT 06067  
 PH. (860)721-1900 Fax. (860)721-1939

SITE DIAGRAM

WETLAND DELINEATION REPORT  
 TAXIWAY E REHABILITATION AREA  
 BRADLEY INTERNATIONAL AIRPORT  
 WINDSOR LOCKS, CONNECTICUT

EXHIBIT

**A-2**



# U.S. Fish and Wildlife Service National Wetlands Inventory

Nov 6, 2014



## Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

User Remarks:

Project Mngr:	JJE	Project No.	J2147166
Drawn By:	MCR	Scale:	As shown
Checked By:	JJE	File No.	J2147166.dwg
Approved By:	JSD	Date:	December 2014

**Terracon**

201 Hammer Mill Road      Rocky Hill, CT 06067  
PH. (860)721-1900      Fax. (860)721-1939

NATIONAL WETLAND INVENTORY MAP  
WETLAND DELINEATION REPORT  
TAXIWAY E REHABILITATION AREA  
BRADLEY INTERNATIONAL AIRPORT  
WINDSOR LOCKS, CONNECTICUT

EXHIBIT  
**A-3**

**APPENDIX D**  
**Ground Photographs**

**Wetland Delineation Report**

Taxiway E Rehabilitation Area ■ Windsor Locks, Connecticut

Date Photos Taken: November 18, 2014 ■ Terracon Project No. J2147166



**Photo 1:** View of site facing north-northwest.



**Photo 2:** View of site facing north.

**Wetland Delineation Report**

Taxiway E Rehabilitation Area ■ Windsor Locks, Connecticut

Date Photos Taken: November 18, 2014 ■ Terracon Project No. J2147166



**Photo 3:** View of detention basin, facing east-northeast from the site. Vicinity of DP-01 data point.



**Photo 4:** View of detention basin, facing east from the site.

**Wetland Delineation Report**

Taxiway E Rehabilitation Area ■ Windsor Locks, Connecticut

Date Photos Taken: November 18, 2014 ■ Terracon Project No. J2147166



**Photo 5:** View of DP-02 data point location and pooled water within detention basin.



**Photo 6:** View of DP-02 data point location within detention basin.

**Wetland Delineation Report**

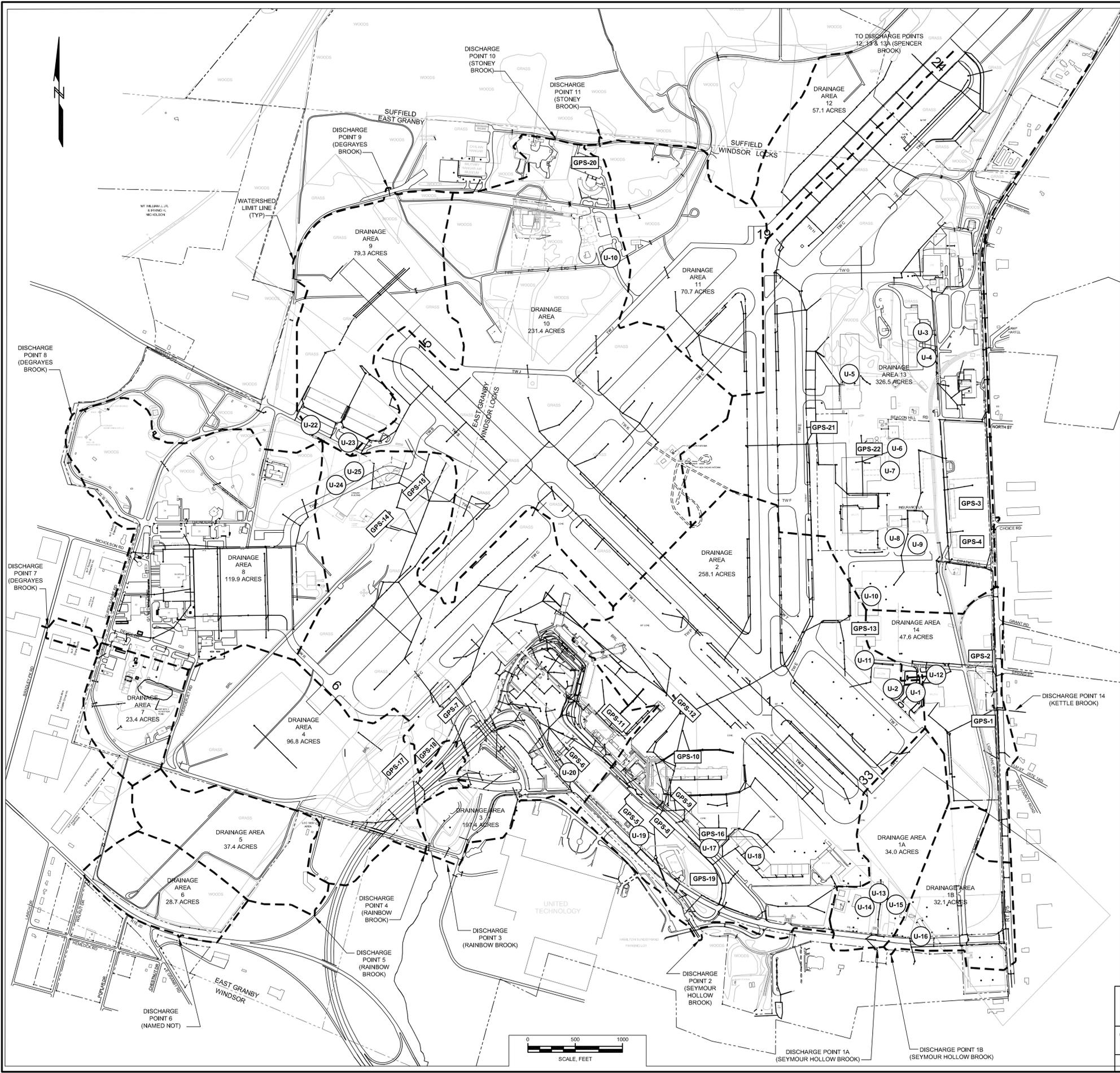
Taxiway E Rehabilitation Area ■ Windsor Locks, Connecticut

Date Photos Taken: November 18, 2014 ■ Terracon Project No. J2147166



**Photo 7:** View of soil profile at DP-02 data point location.

**Attachment J:  
Outfall Map of Bradley Airport, 2005**



CONDDOT/TENANT OPERATED OIL/WATER SEPARATOR TANKS			
TANK NO.	TANK SIZE (GAL)	CONTENTS	TANK LOCATION
U-1	1,000	OIL/WATER SEPARATOR	FIREHOUSE #1
U-2	1,000	OIL/WATER SEPARATOR	CONDDOT VEHICLE REPAIR
U-3	1,000	OIL/WATER SEPARATOR	CONDDOT MAINTENANCE
U-4	1,000	OIL/WATER SEPARATOR	CONDDOT COLD STORAGE
U-5	1,000	OIL/WATER SEPARATOR	BOMBARDIER
U-6	3,000	OIL/WATER SEPARATOR	UPS SERVICE
U-7	12,000	OIL/WATER SEPARATOR	UPS MAIN BUILDING
U-8	1,000	OIL/WATER SEPARATOR	TRAVELERS INDEMNITY
U-9	1,000	OIL/WATER SEPARATOR	CIGNA FLIGHT SERVICE
U-10	1,000	OIL/WATER SEPARATOR	TAC AIR
U-11	2-1,000	OIL/WATER SEPARATOR	TAC AIR
U-12	1,000	OIL/WATER SEPARATOR	TAC AIR
U-13	1,000	OIL/WATER SEPARATOR	ALAMO/NATIONAL RENTAL CAR
U-14	1,000	OIL/WATER SEPARATOR	BUDGET RENTAL CAR
U-15	1,500	OIL/WATER SEPARATOR	AVIS RENTAL CAR
U-16	1,000	OIL/WATER SEPARATOR	HERTZ RENTAL CAR
U-17	1,000	OIL/WATER SEPARATOR	ASIG
U-18	1,000	OIL/WATER SEPARATOR	RONCARI/AA
U-19	1,000	OIL/WATER SEPARATOR	STANDARD PARKING
U-20	1,000	OIL/WATER SEPARATOR	STANDARD PARKING
U-21	1,000	OIL/WATER SEPARATOR	FIRE STATION #2/FIRE ACADEMY
U-22	1,000	OIL/WATER SEPARATOR	AFCO, INC.
U-23	1,000	OIL/WATER SEPARATOR	AFCO, INC.
U-24	1,000	OIL/WATER SEPARATOR	SIGNATURE FLIGHT (WEST)
U-25	1,000	OIL/WATER SEPARATOR	SIGNATURE FLIGHT (WEST)

CONDDOT/TENANT OPERATED STORMWATER GROSS PARTICLE SEPARATORS (GPS)					
GPS NO.	OWNER	MODEL/SIZE	MANUFACTURER	LOCATION	YEAR
GPS-1	CONDDOT	11,000	VORTECHNICS	LOT 5A	2000
GPS-2	CONDDOT	11,000	VORTECHNICS	LOT 5B	2000
GPS-3	CONDDOT	11,000	VORTECHNICS	LOT 5C	2001
GPS-4	CONDDOT	11,000	VORTECHNICS	LOT 5C	2001
GPS-5	STANDARD PARKING	11,000	VORTECHNICS	EAST SIDE PARKING GARAGE	2002
GPS-6	STANDARD PARKING	11,000	VORTECHNICS	WEST SIDE PARKING GARAGE	2001
GPS-7	CONDDOT	9	CT PRECAST V2B1	DEICING AREA	2000
GPS-8	CONDDOT	9	CT PRECAST V2B2	BETWEEN TERMINAL ENTRANCE ROAD AND PARKING GARAGE ENTRANCE ROAD	2002
GPS-9	CONDDOT	6.4 CFS	DOWNSTREAM DEFENDER	EAST OF NEW TERMINAL A CONCOURSE OFF GATE 1	2002
GPS-10	CONDDOT	2.3 CFS	DOWNSTREAM DEFENDER	WEST OF NEW TERMINAL A CONCOURSE OFF GATE 2/4	2002
GPS-11	CONDDOT	2.3 CFS	DOWNSTREAM DEFENDER	WEST OF OLD TERMINAL A CONCOURSE OFF GATE 22	2004
GPS-12	CONDDOT	2.3 CFS	DOWNSTREAM DEFENDER	EAST OF OLD TERMINAL A CONCOURSE OFF GATE 27	2004
GPS-13	TAC AIR	1,000-gallon	UNKNOWN	BUILDING 85-207	19857
GPS-14 & 15	SIGNATURE FLIGHT SUPPORT	1,000-gallon	UNKNOWN	BUILDING 85-728	1993
GPS-16	ASIG	1,000-gallon	UNKNOWN	MAIN FUEL FARM	19857
GPS-17	CONDDOT	9	CT PRECAST V2B2	RDF BLAST FENCE SOUTH	2000
GPS-18	CONDDOT	9	CT PRECAST V2B2	RDF BLAST FENCE NORTH	2000
GPS-19	CONDDOT	9	CT PRECAST V2B2	LMO-TAXI-BUS-HOLDING AREA	2004
GPS-20	CONDDOT	1,000-gallon	UNKNOWN	CT FIRE ACADEMY	2004
GPS-21, 22	UPS	2 12,000-gallon	UNKNOWN	UNITED PARCEL SERVICE	1995

LEGEND	
	OIL/WATER SEPARATOR
	STORMWATER GROSS PARTICLE SEPARATOR (E.G. GPS-1)
	DRAINAGE AREA
	STORM DRAINAGE SYSTEM
	TOWN LINE
	PROPERTY LINE
	FENCE LINE
	UNPAVED ROAD
	PAVED ROAD
	BUILDINGS

CONDDOT PROJECT NO. 0165-2883  
 BRADLEY INTERNATIONAL AIRPORT  
 WINDSOR LOCKS, CONNECTICUT  
 CONNECTICUT DEPARTMENT OF TRANSPORTATION  
 NEWINGTON, CONNECTICUT  
 PROJECT NO.: 034800-910-1000



LOCATIONS OF STORMWATER  
 TREATMENT SYSTEMS AND  
 OIL/WATER SEPARATORS

CONDDOT\BRADLEY\034800\910\SWPPP\NOV 05\BRADLEY-SITEMAP 11-05.dwg

**Attachment K:  
CTDEEP Wildlife Division Correspondence**



Connecticut Department of  
**ENERGY &  
ENVIRONMENTAL  
PROTECTION**

Wildlife Division  
Natural History Survey – Natural Diversity Data Base  
79 Elm Street, 6<sup>th</sup> Floor  
Hartford, CT 06106-5127

January 29, 2015

Kimberly Peace  
Hoyle, Tanner & Associates, Inc.  
150 Dow Street  
Manchester, NH 03101  
kpeace@hoyletanner.com

**NDDB Determination No:** 201411205

**Project:** Rehabilitation of Taxiways E, F, and W at Bradley International Airport;  
Windsor Locks, CT

Dear Kimberly Peace,

I have reviewed Natural Diversity Data Base (NDDB) maps and files regarding the Bradley International Airport in Windsor Locks, Connecticut. According to our records, multiple State-listed species (RCSA Sec. 26-306) have been documented within or near your proposed project area.

This determination is valid for one year. Please submit an updated NDDB Request for Review if the scope of the proposed work changes or if work has not begun by **January 29, 2016**.

#### **STATE-LISTED PLANT SPECIES**

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According to our records, the following State-listed plant species has been documented at Bradley Airport:

- **Low frostweed (*Helianthemum propinquum*)**  
Protection Status: State Threatened  
Habitat: Dry, open, sandy soil. Blooms mid-late Jun.

This species has been documented growing in open-canopy woodlands and in frequently mowed grasslands.

In addition, the following Critical Habitat has been documented within the area highlighted for the re-alignment of stub Taxiway W:

- **Sand barren** – dry sandy deposits with woody or grassy vegetation maintained by fire or mechanical management. Subtypes include sparsely vegetated sand, sandplain grassland, pitch pine scrub, riverine dredge spoils, and other/unique.

Data collected in 2013 supports this designation, as *Carex vestita*, *Carex pennsylvanica*, and other species of dry sandplains were observed growing in close proximity to the site.

**To reduce impacts to sandplain grassland adjacent to Taxiway W, I recommend that disturbed soils be allowed to revegetate naturally without the addition of seed mixes.**

**If stabilization of disturbed soils is required, I recommend that a warm-season grass mix be established without the addition of topsoil, fertilizers, or soil amendments. An ideal warm-season grass mix for Connecticut would consist primarily of little bluestem (*Schizachyrium scoparium*) and should not include any nitrogen-fixing forbs, such as clovers (*Trifolium spp.*).**

For questions regarding Critical Habitats or State-listed plant species, please contact Nelson DeBarros ([nelson.debarros@ct.gov](mailto:nelson.debarros@ct.gov); 860-424-3585).

#### **STATE-LISTED WILDLIFE SPECIES**

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The following comments regarding State-listed wildlife species were provided by Laura Saucier, a CT DEEP wildlife biologist:

“Materials pertaining to the above project were forwarded to me for review by the DEEP Natural Diversity Database (NDDDB). Their records indicate that a number of state-listed species have been documented at Bradley Airport.

Project details include a new vehicle access road from the south side of the Bombardier building to Taxiway G. This grassy area provides foraging habitat for grassland birds and it will be lost from the construction of a new access road. Since the off-site mitigation acquisition for the entire airfield is nearly complete, additional mitigation for this habitat loss will not be required.

In addition, to minimize impacts to the birds from construction activities, we recommend:

- construction be done from August 31 to May 1 to avoid the sensitive nesting season;
- that all materials be staged on impervious surfaces;
- allow disturbed areas to revegetate naturally, or reseed with a warm season grass mix where soil stabilization is required.

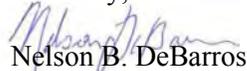
If you have any questions regarding grassland birds, please contact Laura Saucier ([laura.saucier@ct.gov](mailto:laura.saucier@ct.gov) or 860-424-3101)”

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Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy & Environmental Protection’s Bureau of Natural Resources and cooperating units of DEEP, private conservation groups, and the scientific community. This information is not necessarily the result of comprehensive or site specific field investigations. Consultations with the Data Base should not be substituted for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Data Base as it becomes available.

Please contact me if you have any questions ([nelson.debarros@ct.gov](mailto:nelson.debarros@ct.gov); 860-424-3585). Thank you for consulting the Natural Diversity Data Base and continuing to work with us to protect State-listed species.

Sincerely,

  
Nelson B. DeBarros  
Botanist/Ecologist