

Construction Safety

By: Glenn Boles

Date: May 6-8, 2008

Construction Safety
Western Pacific Region Airports Conference, May 6-8, 2008



**Federal Aviation
Administration**



Opening Video here



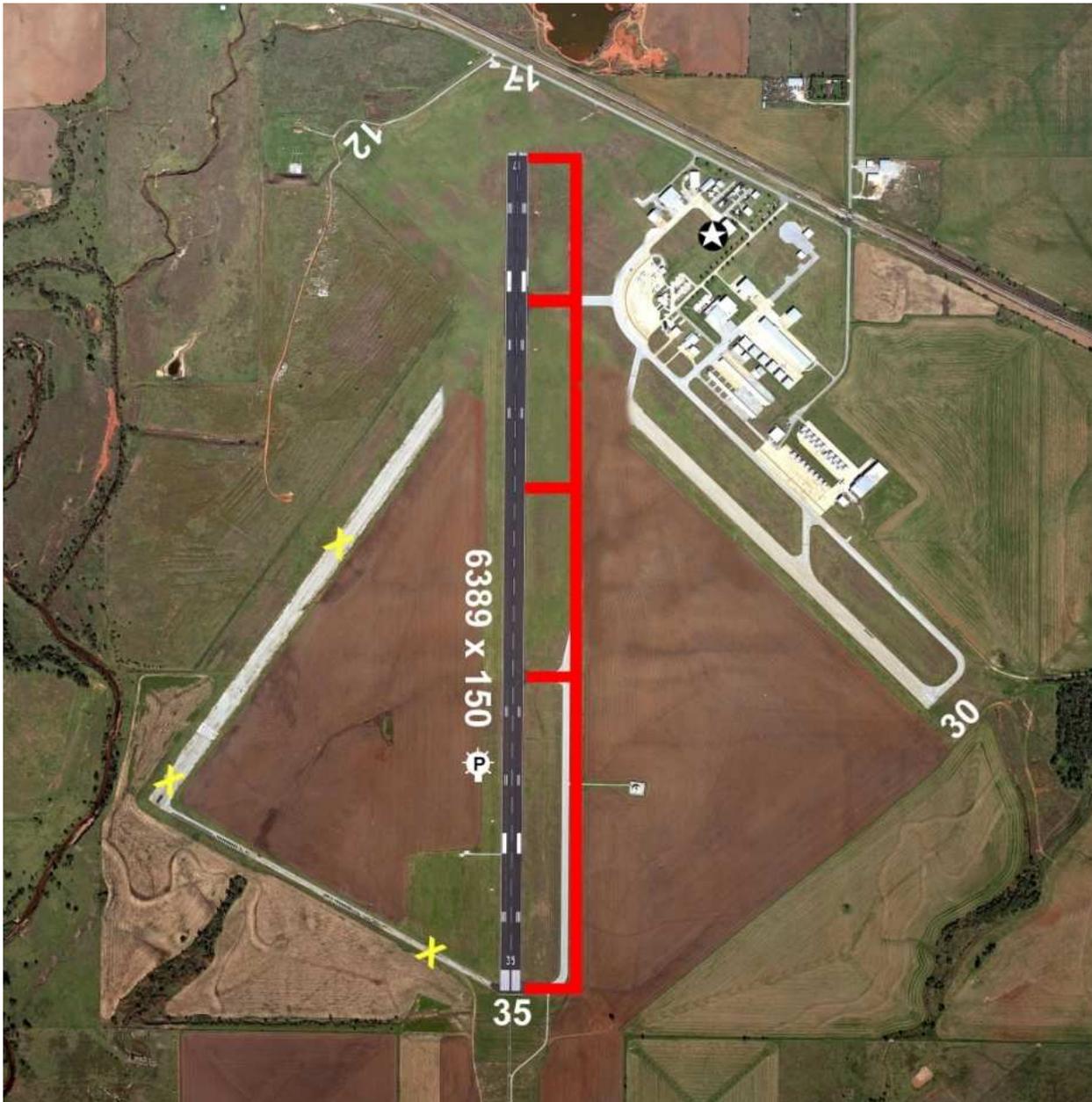
Enid-Woodring Regional Airport

Airport
Geometry
June 2003



Enid-Woodring Regional Airport

Final Airport Geometry October 2006



ELEVATION - TEMPORARY THRESHOLD LIGHTS AND FLAGS
NOT TO SCALE

TEMPORARY THRESHOLD LIGHT AND FLAG NOTES

- A. CONTRACTOR SHALL FURNISH AND INSTALL EIGHT RED FLAGS. EACH FLAG SHALL BE 2' x 2' AND SHALL BE MOUNTED ON 2.5' TALL FRAMES CONSTRUCTED SO AS TO SUPPORT THE FLAG IN AN OUTSTRETCHED POSITION. FOUR FLAGS SHALL BE PLACED BETWEEN THE LIGHTS ON EACH SIDE OF THE RUNWAY AS SHOWN. THE PURPOSE OF THE FLAGS IS TO INCREASE DAYTIME VISIBILITY OF THE RELOCATED THRESHOLD LOCATION. SEE DETAIL.
- B. THE CONTRACTOR SHALL INSTALL FOUR STAKE-MOUNTED MITL FIXTURES WITH RED/GREEN LENS ON EACH SIDE OF THE RUNWAY AT STATION 32+00. THE INNERMOST FIXTURE SHALL BE 10' FROM RUNWAY EDGE, ALIGNED WITH EXISTING RUNWAY EDGE LIGHTING FIXTURES. THE FOUR FIXTURES SHALL BE SPACED 10 FEET APART. CABLE BETWEEN TEMPORARY FIXTURES MAY BE SURFACE RUN AND TRANSFORMERS MAY BE SHALLOW BURIED. SEE DETAIL.
- C. THE CONTRACTOR SHALL INTERRUPT THE EXISTING RW LIGHTING CIRCUIT AT THE TEMPORARY THRESHOLD LOCATION AND INSTALL A "JUMPER CABLE" BETWEEN EACH INBOARD THRESHOLD LIGHT TO COMPLETE THE CIRCUIT TO INCLUDE THE TEMPORARY THRESHOLD LIGHTING AND EXCLUDE ALL EXISTING LIGHT FIXTURES NORTH OF THE TEMPORARY THRESHOLD LIGHTING. THE JUMPER CABLE SHALL BE PLACED IN AN EXISTING PAVEMENT JOINT AND COVERED WITH DUCT TAPE.
- D. THE CONTRACTOR SHALL FURNISH ALL MATERIALS AND EQUIPMENT NECESSARY FOR THE ABOVE DESCRIBED INSTALLATION AND SHALL RETAIN THE MATERIALS AND EQUIPMENT UPON REMOVAL AT THE COMPLETION OF THIS PROJECT.
- E. TEMPORARY THRESHOLD LIGHTING, FIXTURES, CABLE, FLAGS, AND OTHER MATERIALS WILL BE PAID FOR UNDER THE BID ITEM FOR TRAFFIC MAINTENANCE. ALL COSTS ASSOCIATED WITH THE INSTALLATION, MAINTENANCE AND REMOVAL OF TEMPORARY THRESHOLD MARKING AND LIGHTING SHALL BE INCLUDED IN THE TRAFFIC MAINTENANCE BID ITEM.

RUNWAY 35R APPROACH SURFACE
INNER WIDTH = 500'
LENGTH = 5,000' @ 20 TO 1 SLOPE
OUTER WIDTH = 1,500'

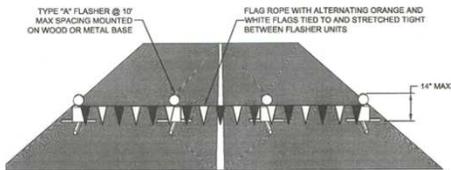
N 38° 22' 10.77"
W 97° 47' 23.00"
ELEVATION 1145.00

LEGEND THIS PHASE

- AIRCRAFT TAXI ROUTE
- FLAG AND FLASHER BARRICADE
- ✕ CLOSED RUNWAY CROSS
- ▨ PAVEMENT TO BE REMOVED
- WORK AREA THIS PHASE
- AIR OPERATIONS AREA
- CLOSED PAVEMENT

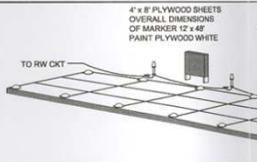
DURING THIS PHASE
RUNWAY 17L-35L IS 50' x 5,000'
AND IS INTENDED FOR USE BY A & B-II AIRCRAFT, INSTRUMENT NIGHT CIRCLES WITH VISUAL APPROACHES
RSA IS 150' WIDE / 300' BEYOND THRESHOLDS
ROFZ IS 400' WIDE / 200' BEYOND THRESHOLDS

RUNWAY 30 APPROACH SURFACE
INNER WIDTH = 500'
LENGTH = 10,000' @ 34 TO 1 SLOPE
OUTER WIDTH = 1,500'



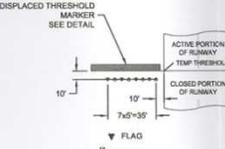
- 1. FLAG AND FLASHER BARRICADES, AS SHOWN ABOVE, SHALL BE FURNISHED, INSTALLED, MAINTAINED, RELOCATED WHEN NECESSARY AND REMOVED BY THE CONTRACTOR ONLY AFTER CONSTRUCTION AREA IS ACCEPTED AND IS OPEN TO AIRCRAFT TRAFFIC.
- 2. REFER TO THE CONSTRUCTION PLANS FOR SPECIFIC LOCATION REQUIREMENTS. PHASING, IF REQUIRED, SHALL BE COORDINATED WITH AIRPORT MANAGER, RESIDENT INSPECTOR AND ENGINEER.
- 3. CLOSURE MARKING SHALL BE INSTALLED AS REQUIRED TO ACCOMMODATE AIRCRAFT MOVEMENT.
- 4. BARRICADES SHALL BE CHECKED DAILY TO CONFIRM THEY ARE PROPERLY ALIGNED AND IN WORKING ORDER.

DETAIL - CONSTRUCTION MARKING LOW PROFILE FLAG AND FLASHER BARRICADE
NOT TO SCALE



PLYWOOD SHEETS SHALL BE CONNECTED TO FORM A UNIT IN A MANNER TO MINIMIZE DAMAGE TO AIRCRAFT (AND/OR TAXIWAY) SURFACES.

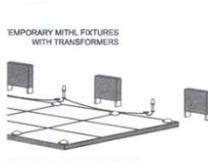
DETAIL - DISPLACED / RELOCATED THRESHOLD MARKER PANEL; TWO SUCH PANELS REQUIRED
NOT TO SCALE



DETAIL PLAN - LIGHTING FOR TEMPORARY THRESHOLD DURING CONSTRUCTION
NOT TO SCALE

DURING THIS PHASE
RUNWAY 17R-35L IS CLOSED

DURING THIS PHASE
RUNWAY 17L-35R IS 50' x 5,000'
AND IS INTENDED FOR USE BY A & B-II AIRCRAFT, INSTRUMENT NIGHT CIRCLES WITH VISUAL APPROACHES
RSA IS 150' WIDE / 300' BEYOND THRESHOLDS
ROFZ IS 400' WIDE / 200' BEYOND THRESHOLDS



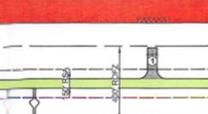
T. THE UNIT SHALL BE ANCHORED TO THE RUNWAY SURFACE IN A MANNER TO MINIMIZE DAMAGE TO AIRCRAFT (AND/OR TAXIWAY) SURFACES.

DETAIL - CONSTRUCTION MARKING CLOSED RUNWAY / TAXIWAY CROSS
NOT TO SCALE



DETAIL - CONSTRUCTION MARKING VEHICLE CHECKERED FLAG
NOT TO SCALE

3' SQUARE FLAG WITH ALTERNATING ORANGE AND WHITE 12" SQUARES



FLAGS SHALL BE CONSTRUCTED OF FABRIC AND SHALL BE MOUNTED ON A POLE SUITABLE FOR VEHICLE MOUNTING OR HANDLING BY PERSONNEL.

PHASE II
1" = 300'

RUNWAY 12 APPROACH SURFACE
INNER WIDTH = 500'
LENGTH = 10,000' @ 34 TO 1 SLOPE
OUTER WIDTH = 1,500'

N 36° 23' 01.12"
W 97° 47' 22.98"
ELEVATION 1161.23

RUNWAY 17L APPROACH SURFACE
INNER WIDTH = 500'
LENGTH = 5,000' @ 20 TO 1 SLOPE
OUTER WIDTH = 1,500'

KEYNOTES FOR CONSTRUCTION MARKING & LIGHTING

- UNLESS STATED OTHERWISE, ALL FUNCTIONS ARE TO BE PERFORMED BY THE CONSTRUCTION CONTRACTOR.
- 1. INSTALL FLAG AND FLASHER BARRICADES AS INDICATED, TO BE REMOVED UPON COMPLETION OF PHASE II.
- 2. INSTALL CLOSED RUNWAY CROSSES AS INDICATED, TO BE REMOVED UPON COMPLETION OF PHASE II.
- 3. INSTALL TEMPORARY LIGHTED THRESHOLD MARKER AT STATION 60+92 AS INDICATED, TO BE REMOVED UPON COMPLETION OF PHASE II.

PHASE II
OPEN PARALLEL TAXIWAY AS RUNWAY 17L-35R.
CLOSE RUNWAY 17R-35L. OVERLAY AND REHAB SHOULDERS.
REMOVE PAVEMENT AS SHOWN.

ENID WOODRING REGIONAL AIRPORT
ENID, OKLAHOMA

CONSTRUCTION SAFETY AND PHASING PLAN - PHASE II

LBR Inc. Airport Consultants
100 Terminal Building New York, NY 10018
Tel: 212-706-2000 Fax: 212-706-2005

PROJECT NO: AIP 3-40-0028-017-2005
DATE: January, 2005
SHEET: 4 OF 21



August 30, 2006

Day trip from Fort Worth, TX to Enid, OK

Cherokee 180, two on board

Clear and sunny

**. . . And what does a diligent pilot do before
departure?**



WDG Briefing video here



WDG Entering pattern video here





Construction Safety
Western Pacific Region Airports Conference, May 6-8, 2008



**Federal Aviation
Administration**



Construction Safety
Western Pacific Region Airports Conference, May 6-8, 2008



**Federal Aviation
Administration**



Construction Safety
Western Pacific Region Airports Conference, May 6-8, 2008



**Federal Aviation
Administration**

Before we get back in the airplane . . .

We know the conditions at the airport

We have the NOTAMS

So, where do we touch down?



WDG Final approach part 1 video here



WDG Final approach part 2 video here





Construction Safety
Western Pacific Region Airports Conference, May 6-8, 2008



**Federal Aviation
Administration**

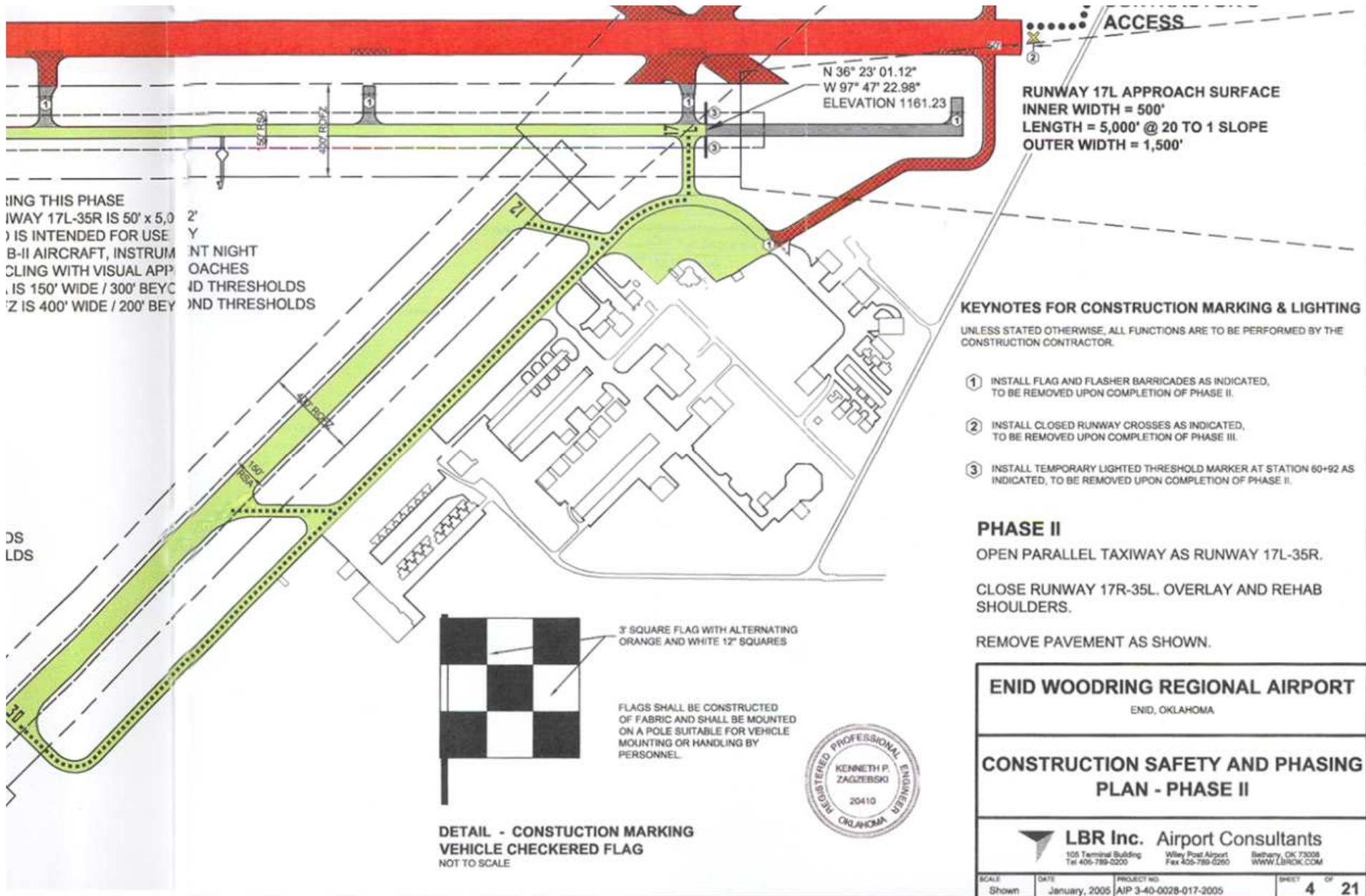


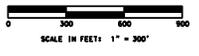
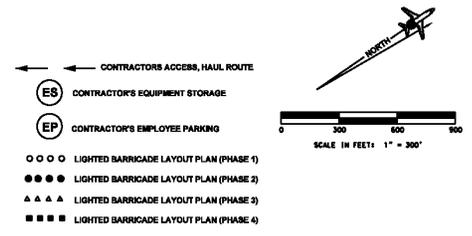
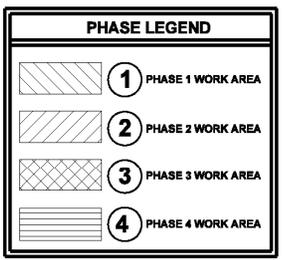
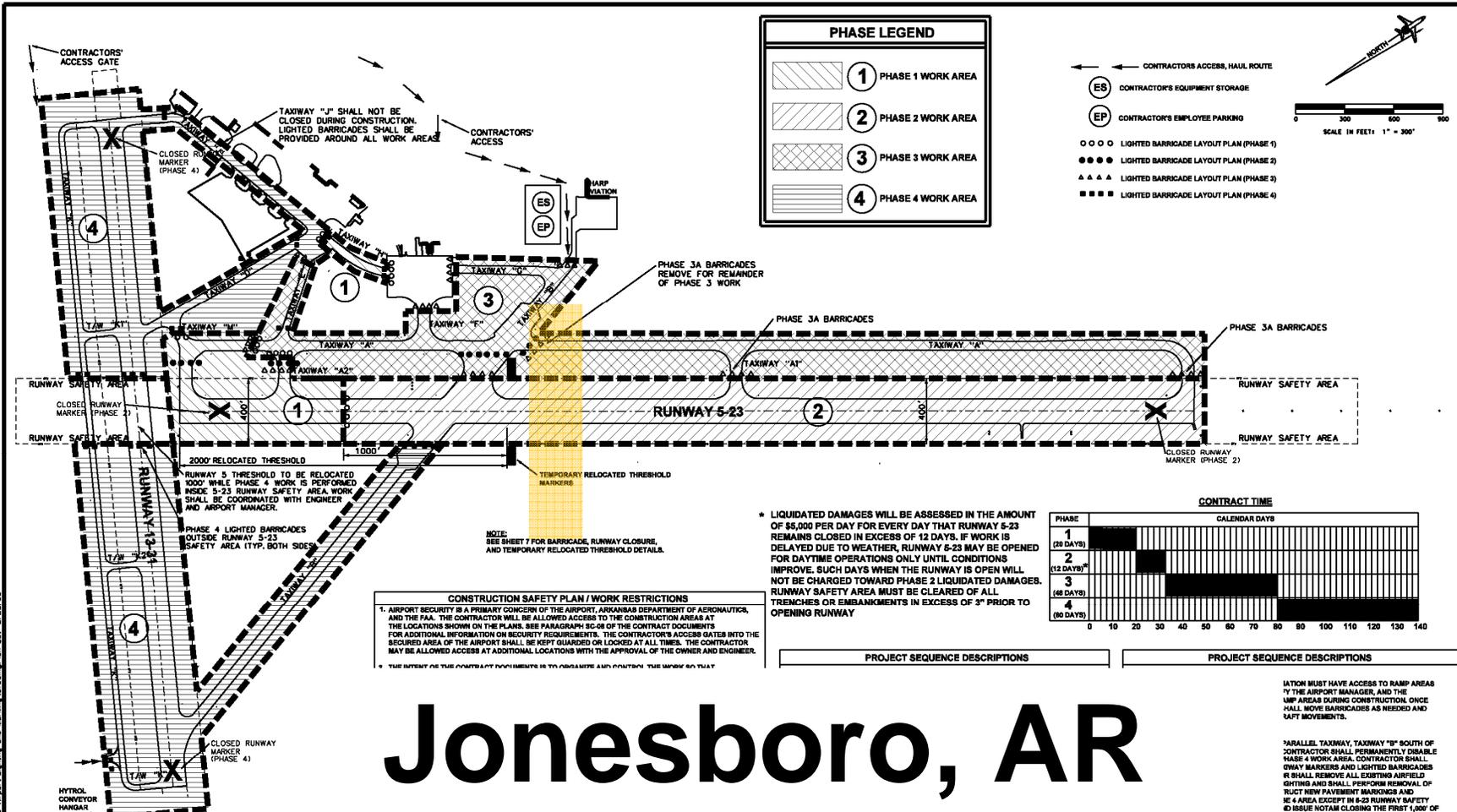
09/28/2006

Construction Safety
Western Pacific Region Airports Conference, May 6-8, 2008



**Federal Aviation
Administration**





GARVER ENGINEERS
"Engineers Since 1919"
 1010 BATTERY STREET • LITTLE ROCK, ARKANSAS 72202
 (501) 779-5833
 www.garverengineers.com

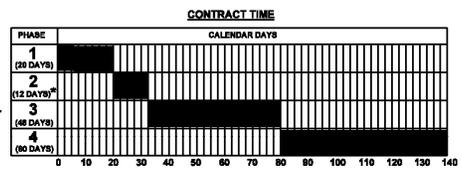
JONESBORO MUNICIPAL AIRPORT
 JONESBORO, ARKANSAS
AIRFIELD LIGHTING & MARKING REHABILITATION

CONSTRUCTION SAFETY PLAN AND SEQUENCE OF CONSTRUCTION

Job No. 05911305
 Date: APRIL, 2006
 Designed by: MHS
 Drawn by: MWW

Sheet Number
2

* LIQUIDATED DAMAGES WILL BE ASSESSED IN THE AMOUNT OF \$6,000 PER DAY FOR EVERY DAY THAT RUNWAY 5-23 REMAINS CLOSED IN EXCESS OF 12 DAYS. IF WORK IS DELAYED DUE TO WEATHER, RUNWAY 5-23 MAY BE OPENED FOR DAYTIME OPERATIONS ONLY UNTIL CONDITIONS IMPROVE. SUCH DAYS WHEN THE RUNWAY IS OPEN WILL NOT BE CHARGED UNDER PHASE 2 LIQUIDATED DAMAGES. RUNWAY SAFETY AREA MUST BE CLEARED OF ALL TRENCHES OR EMBANKMENTS IN EXCESS OF 3" PRIOR TO OPENING RUNWAY



CONSTRUCTION SAFETY PLAN / WORK RESTRICTIONS

- AIRPORT SECURITY IS A PRIMARY CONCERN OF THE AIRPORT, ARKANSAS DEPARTMENT OF AERONAUTICS, AND THE FAA. THE CONTRACTOR WILL BE ALLOWED ACCESS TO THE CONSTRUCTION AREAS AT THE LOCATIONS SHOWN ON THE PLANS. SEE PARAGRAPH 8C-08 OF THE CONTRACT DOCUMENTS FOR ADDITIONAL INFORMATION ON SECURITY REQUIREMENTS. THE CONTRACTOR'S ACCESS GATES INTO THE SECURED AREA OF THE AIRPORT SHALL BE KEPT GUARDED OR LOCKED AT ALL TIMES. THE CONTRACTOR MAY BE ALLOWED ACCESS AT ADDITIONAL LOCATIONS WITH THE APPROVAL OF THE OWNER AND ENGINEER.
- THE INTENT OF THE CONTRACT DOCUMENTS IS TO GUARANTEE AND PROTECT THE WORK SO THAT

OF WORK FOR RECEIPT OF INFORMATION OR INSTRUCTION. THE CONTRACTOR SHALL FURNISH A MINIMUM OF TWO (2) RADIOS IN EXCELLENT WORKING CONDITION FOR THE USE OF HIS PERSONNEL. ALL RADIOS SHALL BE MAINTAINED IN GOOD AND OPERABLE CONDITION AT ALL TIMES.

- THE CONTRACTOR SHALL INSURE THAT THE PAVEMENT SURFACE WITHIN AN ACTIVE AIRCRAFT MOVEMENT AREA IS KEPT CLEAN FROM DIRT, MUD, AND OTHER DEBRIS FROM THE CONTRACTOR'S EQUIPMENT.
- RUNWAYS 13-31 AND 5-23 SHALL BE CLOSED DURING CERTAIN PHASES OF CONSTRUCTION. CLOSED RUNWAY MARKERS (DETAIL ON SHEET 7) SHALL BE PLACED AT EACH END OF THE RUNWAY. NOTAMS CLOSING THE RUNWAY SHALL BE ISSUED AT LEAST 48 HOURS BEFORE COMMENCEMENT OF CONSTRUCTION. RUNWAY LIGHTS SHALL BE MADE INOPERATIVE DURING THE PERIOD OF CONSTRUCTION. RUNWAY CLOSURE, ILS EQUIPMENT SHALL BE MADE INOPERATIVE DURING RUNWAY 5-23 CLOSURE.
- THE CONTRACTOR SHALL TAKE CARE NOT TO DAMAGE EXISTING RUNWAY AND TAXIWAY LIGHTS THAT ARE TO REMAIN IN USE, AND SHALL BE RESPONSIBLE FOR REPAIR OF DAMAGED COMPONENTS. THE RUNWAY LIGHTS, WHEN NOT PLACED OUT OF SERVICE, SHALL BE TESTED EACH DAY AT 3:00 P.M. RUNWAY LIGHTS SHALL BE OPERATIONAL NO LATER THAN ONE (1) HOUR BEFORE SUNSET.
- ALL CONSTRUCTION EQUIPMENT MUST BE MARKED WITH 7x7 ORANGE AND WHITE CHECKERED FLAGS (DAY ONLY) OR FLASHING YELLOW, AMBER, OR RED HOME TYPE LIGHTS (DAY OR NIGHT). ALL VEHICLES AND EQUIPMENT MUST BE MARKED WITH THE CONTRACTORS NAME CLEARLY VISIBLE FROM 200 FEET.
- CONSTRUCTION AND HAULING EQUIPMENT WILL NOT BE ALLOWED ON AIRFIELD PAVEMENT UNLESS SPECIFICALLY SHOWN ON PLANS OR APPROVED BY THE ENGINEER.

PROJECT SEQUENCE DESCRIPTIONS

PERMANENTLY DISABLE RUNWAY AND TAXIWAY LIGHTS IN THE PHASE 2 AREA. INSTALL PHASE 2 CLOSED RUNWAY AND TAXIWAY MARKERS, AND INSTALL PHASE 2 LIGHTED BARRICADES WHERE NOTED ON THE PLANS. THE CONTRACTOR SHALL REMOVE ALL EXISTING AIRFIELD LIGHTING AND CONSTRUCT NEW AIRFIELD LIGHTING IN PHASE 2 AREA. CONTRACTOR SHALL CLEAN RUNWAY 5-23 AND PARALLEL TAXIWAYS UPON COMPLETION OF THE PHASE 2 CONSTRUCTION AND REMOVE THE CLOSED RUNWAY AND TAXIWAY MARKERS. CONTRACTOR SHALL REMOVE PHASE 2 LIGHTED BARRICADES, AND TEST LIGHTING CIRCUITS. RETRACT NOTAM. RUNWAY 5-23 LIGHTS SHALL BURN FOR A 48 HOUR TEST PERIOD AFTER COMPLETION OF THE PHASE PRIOR TO START OF NEXT PHASE OF CONSTRUCTION.

PROJECT SEQUENCE DESCRIPTIONS

LATION MUST HAVE ACCESS TO RAMP AREAS BY THE AIRPORT MANAGER, AND THE UWP AREAS DURING CONSTRUCTION. ONCE HALL MOVE BARRICADES AS NEEDED AND SAFE MOVEMENTS.

PARALLEL TAXIWAY, TAXIWAY "B" SOUTH OF CONTRACTOR SHALL PERMANENTLY DISABLE PHASE 4 WORK AREA. CONTRACTOR SHALL DRAW MARKERS AND LIGHTED BARRICADES IN SHALL REMOVE ALL EXISTING AIRFIELD LIGHTING AND SHALL PERFORM REMOVAL OF EXISTING NEW PAVEMENT MARKERS AND IE 4 AREA EXCEPT IN 5-23 RUNWAY SAFETY AREA. CONTRACTOR SHALL PERFORM ALL WORK IN RUNWAY 5-23 SAFETY AREA WITH RELOCATED THRESHOLD. ALL WORK IN RUNWAY 5-23 SAFETY AREA SHALL BE COORDINATED WITH THE ENGINEER AND AIRPORT MANAGER. CONTRACTOR SHALL CLEAN RUNWAY 13-31 AND TAXIWAYS AND REMOVE CLOSED RUNWAY AND TAXIWAY MARKERS. THE CONTRACTOR SHALL REMOVE PHASE 4 BARRICADES AND TEST LIGHTING CIRCUIT AT THE COMPLETION OF PHASE 4 CONSTRUCTION. RETRACT NOTAMS. THE CONTRACTOR SHALL COORDINATE WITH THE AIRPORT MANAGER AND SHALL MONITOR THEIR 2-WAY RADIO WHEN CROSSING THE RUNWAY 5-23 SAFETY AREA.

PHASE 3 (48 DAYS):
 ISSUE NOTAM CLOSING TAXIWAY "A" NORTH OF "B", AND STATING RUNWAY 5-23 SAFETY AREA HAS BEEN REDUCED TO 400 FEET. CONTRACTOR SHALL PERMANENTLY DISABLE ALL AIRFIELD LIGHTS IN PHASE 3 WORK AREA AND INSTALL CLOSED TAXIWAY MARKERS AND PHASE 3 LIGHTED BARRICADES WHERE NOTED ON THE PLANS. CONTRACTOR SHALL REMOVE ALL EXISTING AIRFIELD LIGHTING, AND CONSTRUCT NEW AIRFIELD LIGHTING IN PHASE 3A AREA (NORTH OF "B"). AFTER PHASE 3A WORK IS SUBSTANTIALLY COMPLETE, CONTRACTOR SHALL INCREASE PHASE 3 WORK AREA TO INCLUDE AREA SOUTH OF "B". AMEND NOTAM TO INCLUDE REMAINDER OF TAXIWAYS "A", "C", "D", "E", AND "F" NORTH OF RUNWAY 5-23. CONTRACTOR SHALL INSTALL REMAINING PHASE 3 BARRICADES, REMOVE REMAINING EXISTING LIGHTING, CONSTRUCT NEW AIRFIELD LIGHTING, AND CONSTRUCT NEW RUNWAY HOLD POSITION MARKINGS IN PHASE 3 AREA. CONTRACTOR SHALL TEST LIGHTING CIRCUITS, CLEAN ALL TAXIWAYS, REMOVE CLOSED TAXIWAY MARKERS, AND PHASE 3 LIGHTED BARRICADES UPON COMPLETION OF PHASE 3 CONSTRUCTION. RETRACT NOTAMS.

NOTE:
 DURING PHASE 4 CONSTRUCTION, HYDROL CONVEYOR MUST BE PROVIDED ACCESS TO THE AIRFIELD. HYDROL PILOTS WILL NOTIFY AND PRESCHEDULE ALL FLIGHTS WITH THE AIRPORT MANAGER AND THE CONTRACTOR TO OBTAIN ACCESS TO THE AIRFIELD DURING CONSTRUCTION. THE CONTRACTOR SHALL MOVE BARRICADES AS NEEDED AND PROVIDE A WING WALKER DURING ALL SCHEDULED ARRIVALS AND DEPARTURES FOR HYDROL PILOTS.

Jonesboro, AR

Construction Safety
 Western Pacific Region Airports Conference, May 6-8, 2008



Federal Aviation
 Administration

September 26, 2006

**Evening and night approaches to RW 5
Jonesboro, AR**

Beechcraft Bonanza A36, two on board

Clear and sunny



JBR Final approach part 1 video here



JBR Final approach part 2 video here



JBR Final approach part 3 video here





Construction Safety
Western Pacific Region Airports Conference, May 6-8, 2008



**Federal Aviation
Administration**

JBR Final approach night part 1 video here



JBR Final approach night part 2 video here



August 31, 2006

**Night-time aircraft taxiing simulation in vicinity
of closed taxiway, DFW Airport**

Clear



DFW taxiing clip 1 video here



DFW taxiing clip 2 video here



Excerpts taken from Marion C. Blakey's speech
September 26, 2006 ACI-North America - Reno, NV

“Let me be perfectly clear, It's everyone's job to maintain safety of the airfield during construction.”

“If your staff is thinking that safety is someone else's responsibility, you've got a problem. And it's a problem that needs to be nipped in the bud right then and there.”

“... collectively, we've got to make sure that safety – especially in the context of airport construction – is kept front and center”



- The airport owner has overall responsibility for construction activities on their airport.

- Over \$450 million in AIP funds are invested annually in the Southwest Region.

- Over 80% of that investment occurs in the vicinity of active runways, taxiways and aprons and most of the construction occurs while the airport is open.



RESPONSIBILITIES

Airport Owner
Consultant
Contractor
Construction Inspector
FAA



Responsibility

The “Airport Owner” is responsible:

For developing or approving a construction safety plan developed by an outside consultant/contractor

For submitting a plan for FAA approval

For monitoring implementation of the approved plan and enforcement of the terms in accordance with the construction contract

09/26/2006

Responsibility

The “Consultant” is responsible:

For developing a “project specific” construction safety plan in conjunction with the airport owner



Responsibility

The “Contractor” is responsible:

For submitting plans to the airport owner on how they plan to comply with project’s construction safety plan



Responsibility

The “Construction Inspector” is responsible:

For assuring the terms of the construction safety plan are implemented

For taking immediate action to notify responsible officials if aspects of the plan are not in compliance.

Responsibility

The “FAA” is responsible:

For receiving, reviewing and coordinating the construction safety plan within FAA for approval

***** (Please allow 60 days for FAA review) *****

For providing national guidance

09/28/2006



Advisory Circular 150/5370-2E is “THE” agency guidance for developing plans for operational safety during construction

Southwest Order 5200.5B has been CANCELLED and is no longer approved for use.

09/26/2006



**“WE” have the time to make
good decisions . . .**

**At 100 knots on final, pilots
only have seconds to make
the right decision**





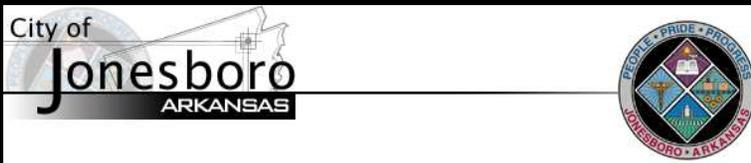
Construction Safety
“IS”
Critical to Flight Safety!!!

Construction Safety
Western Pacific Region Airports Conference, May 6-8, 2008



Federal Aviation
Administration

Our “Sincerest Thanks” to our Partners for their Assistance and Cooperation



Construction Safety
Western Pacific Region Airports Conference, May 6-8, 2008



Federal Aviation
Administration

Closing video here

