Abstract

Airfield construction projects have unique construction challenges due to their close proximity to aircraft operations. Emphasis on communication, safety areas, airspace protection zones, and foreign object damage is stressed. Incursions and incidents are of significant concern to the FAA, airport operator, and contractor. This paper discusses how time-lapse photography can be utilized to develop training and educational material pertaining to the construction practices and on-site awareness of airfields. This is illustrated through two case studies documenting runway reconstruction at two GA airports in Indiana. The paper is supplemented with several images and links to YouTube videos to illustrate these concepts. With some modifications and support, the proposed concepts could be applied to larger airports.

Pre-Construction Engagement

Prior to the start of construction at VPZ, several meetings with the designer, contractor, and owner took place to ensure the project ran smoothly. In these meetings, specific construction operations, runway and taxiway closures, and safety measures were discussed. This time was also used to confirm camera locations and contractor interaction throughout the project.

LAF Construction Plans

Construction Operations Studied

Purdue Research Plan View Depicting Construction Area and RPZ for Runway “28 Shortened”

Plane landing on “28 shortened” at LAF

Plane on taxiway “C” at LAF

Plane on taxiway “B” at VPZ

Plane on taxiway “A” at VPZ

VPZ Construction Operations

(Camera 1)

(e) April 29, 11:00 – Original pavement
(f) May 6, 11:10 – Milling runway threshold
(c) May 13, 09:15 – Soil treatment placed
(d) May 13, 11:30 – Soil mixed
(e) May 28, 15:30 – Asphalt placement
(f) July 1, 14:00 – Pavement markings placed

Camera 1 Video Playlist: http://tiny.cc/VPZcam1

VPZ Construction Operations

(Camera 2)

(e) April 29, 11:00 – Original pavement
(f) May 6, 10:35 – Milling nears completion
(c) May 13, 07:00 – Soil treatment placed
(d) May 13, 07:45 – Soil mixed
(e) May 25, 16:30 – Asphalt placement started
(f) June 30, 11:00 – Pavement markings placed

Camera 2 Video Playlist: http://tiny.cc/VPZcam2

Activities in Video Playlist | Date Range | Completion Time (Time in Video)
--- | --- | ---
Runway Milling | 5/2/16 – 5/11/16 | 10 days (10 min)
Soil Treatment | 5/12/16 – 5/25/16 | 14 days (5 min)
Asphalt Layers | 5/26/16 – 6/29/16 | 34 days (5 min)
Pavement Markings | 6/30/16 – 7/1/16 | 3 days (5 min)

Purdue University Airport (LAF) construction areas

Porter County Regional Airport (VPZ) construction areas and camera placements

LAF Plan View Depicting Construction Area and RPZ for Runway “28 Shortened”

LAF Elevation View Depicting Airspace Restrictions for Runway “28 Shortened”

VPZ Plan View Depicting Construction Area for Runway “28 Shortened”

VPZ Elevation View Depicting Airspace Restrictions for Runway “28 Shortened”

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Abstract

Time-Lapse Photography of Runway Reconstruction

For Education and Training

Drake Krohn¹, Darcy Bullock¹
Larry Goldstein¹, Linda Howard², Kitty Freidheim², Randy Berg²

1: Purdue University; 2: ACRP Committee Members

2015 Intersection Construction

2016 Intersection Construction

2016 West Construction

2 Camera Locations Used

Planned 2017 West Construction

Planned 2017 East Construction

Porter County Regional Airport (VPZ) construction areas and camera placements

Purdue University Airport (LAF) construction areas

Cameras at R/W 27 Threshold

Lights and tarped ‘X’ for R/W #27 closure

Camera at R/W 27 Threshold

17’ on-site air space restriction

12’ on-site air space restriction

The Graduate Research Award Program on Public-Sector Aviation Issues is sponsored by the Federal Aviation Administration (FAA) and administered by the Airport Cooperative Research Program (ACRP) of the Transportation Research Board of The National Academies of Sciences, Engineering, and Medicine. This is a highly competitive program designed to encourage applied research on airport-related aviation system issues and to foster the next generation of aviation community leaders.

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Abstract

Pre-Construction Engagement

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