PHILADELPHIA INTERNATIONAL AIRPORT

EXTEND RUNWAY 27L & ASSOCIATED TAXIWAYS

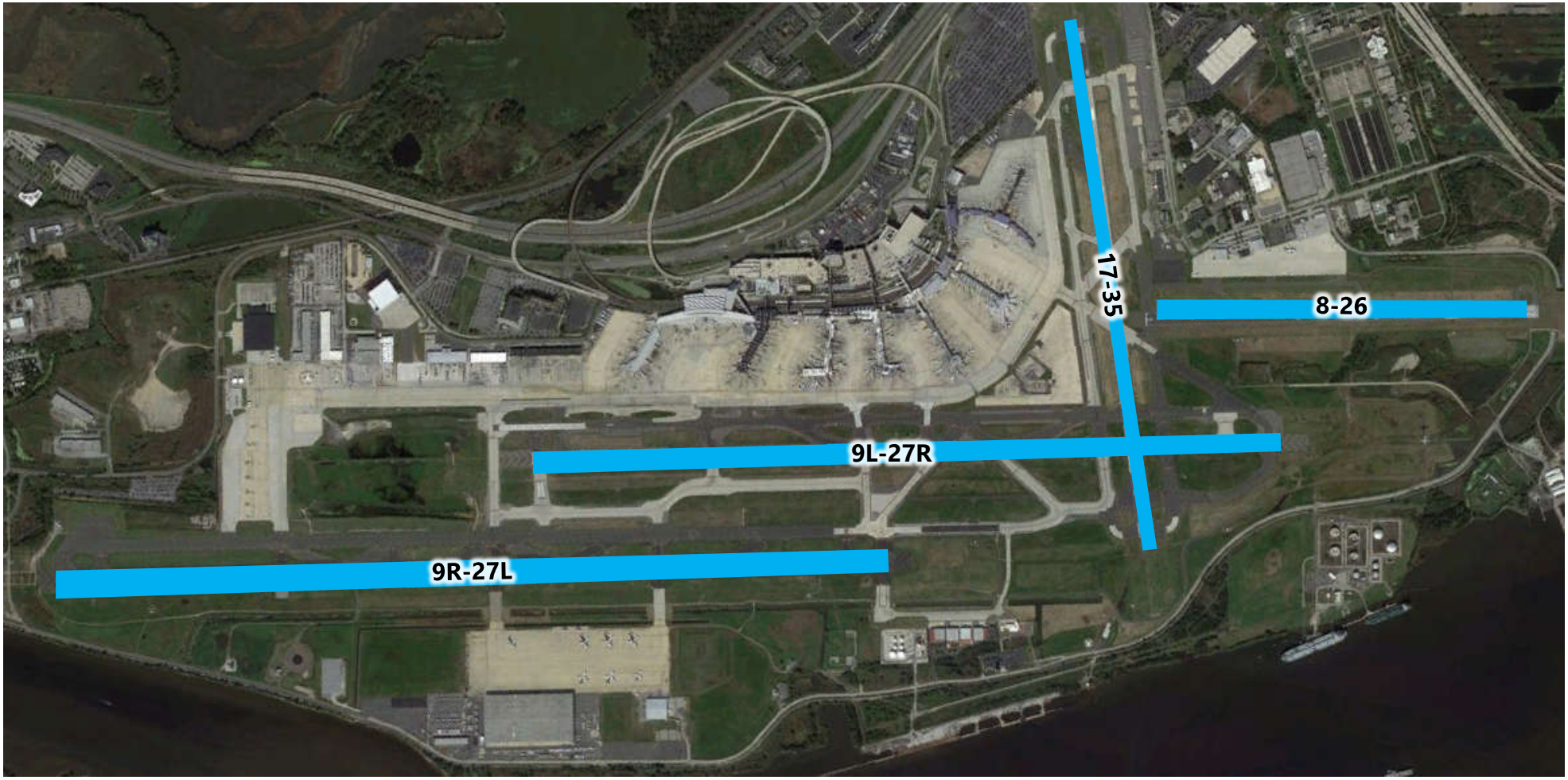
PRESENTERS:

Craig Twibell, PE

Chuck Dennie, PE

RS&H Burns

PHL Fun Facts



PHL Fun Facts - Bonus

History

- Opened in 1926 as Municipal Aviation Landing Field
- Dedicated in 1927 by Charles Lindberg as Philadelphia Municipal Airport
- Formally opened in 1940 with 40,000 passengers in the 1st year
- Changed to Philadelphia International Airport in 1945

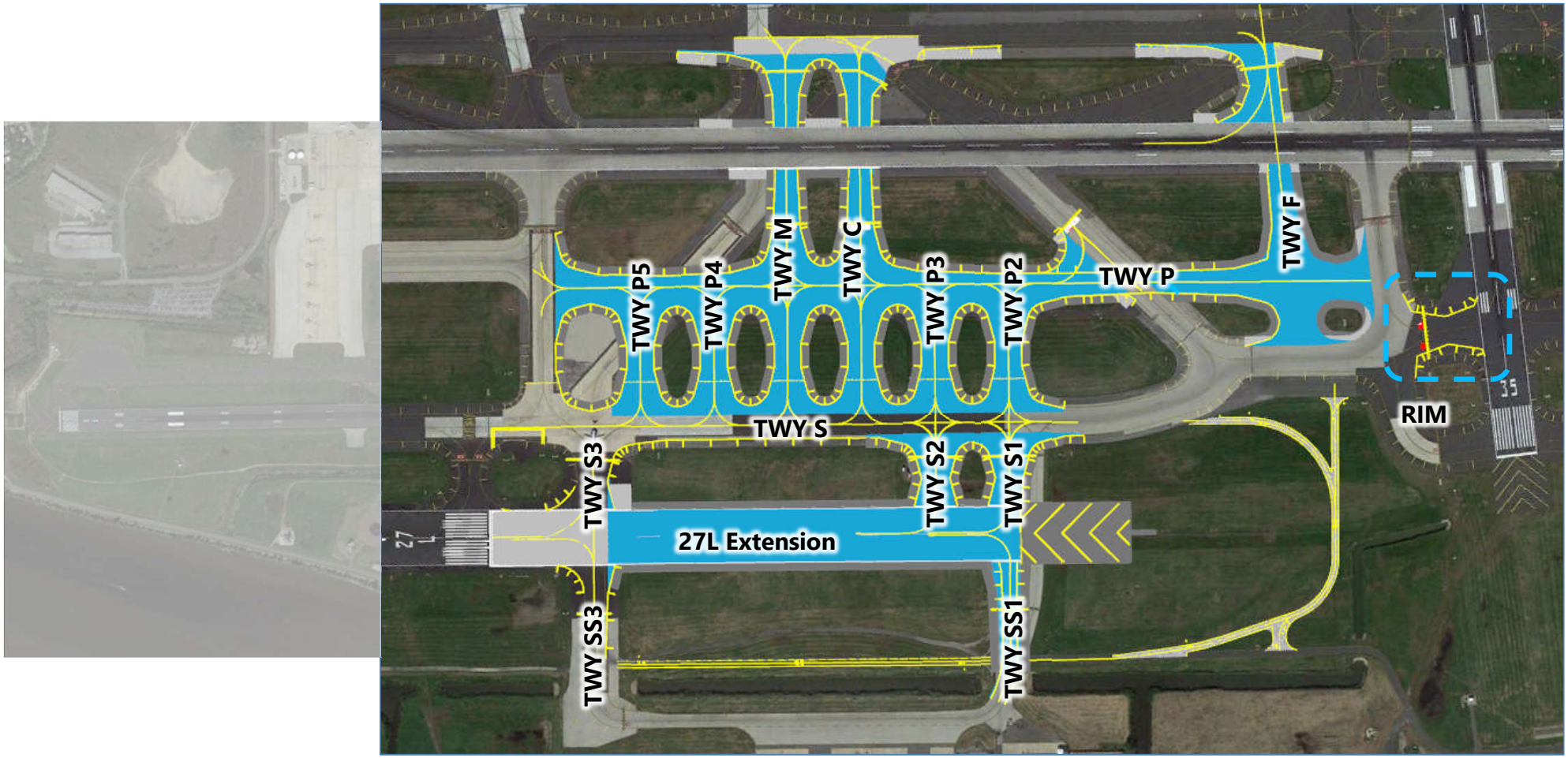
Now

- 20th busiest airport in U.S.
- Serves over 30M passengers
- Non-stop flights to 33 international destinations

Extra

- Philadelphia Co. - Concourse B, C, D, E and F; Rwy 8-26; part of Rwy 17-35
- Delaware Co. – Concourse A, Rwy 9R-27L, 9L-27R, part of Rwy 17-35

Project Location



Project Information

Package 1

- Earthwork, Subgrade, Duct Banks, Fuel Line

Package 2

- Runway 27L Extension; Reconfiguration of Taxiway M; New Taxiways C, P2, P3, P4, P5, S1, S2; Reconstruction of Taxiways SS1, SS3, S3

Package 3

- Reconstruction of Taxiway S; Extend Taxiway F; RIM at Runway 35

Package 1 - Phasing

WORK AREA 1 -

WORK AREA 2 -

WORK AREA 3 -

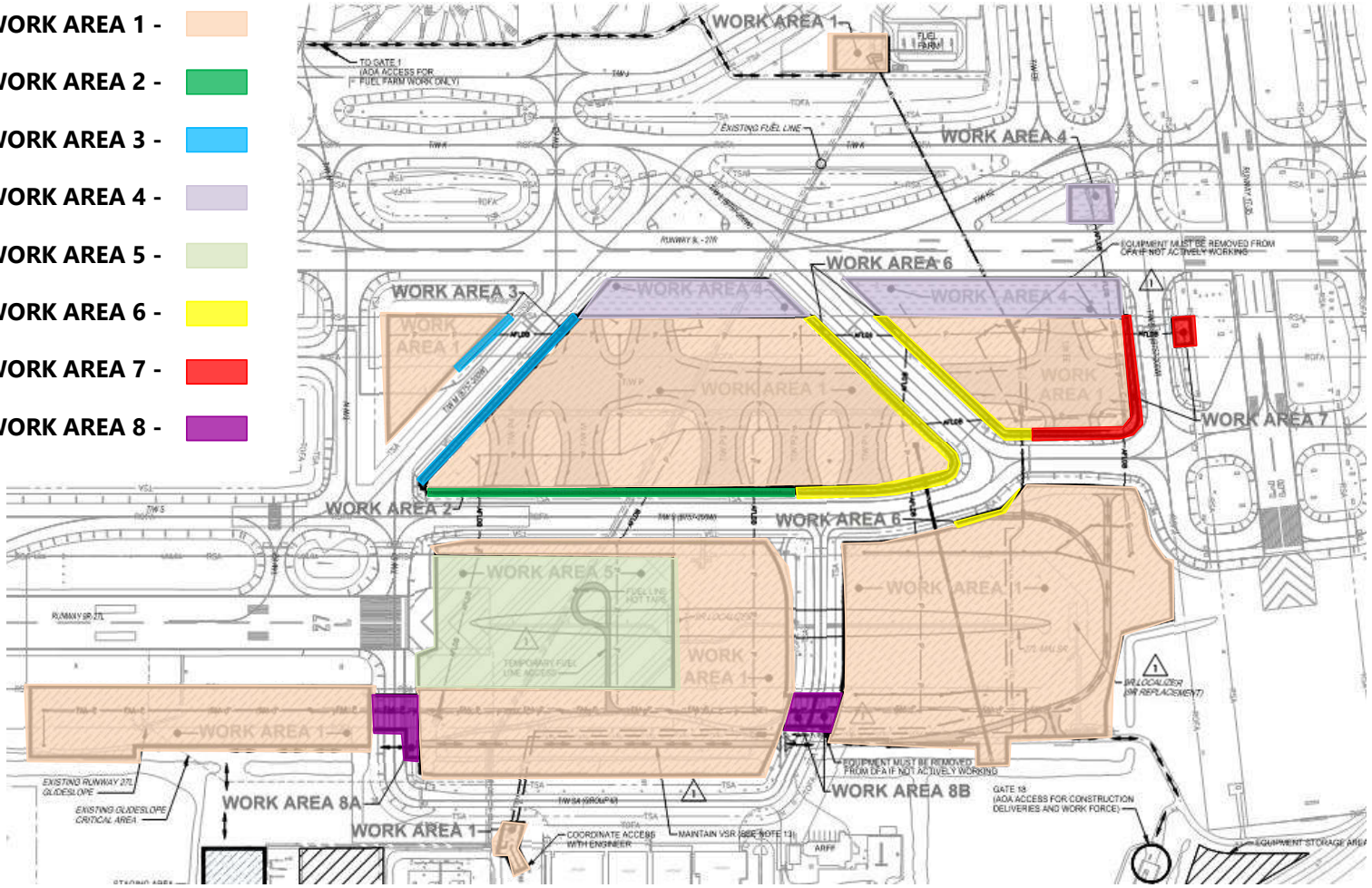
WORK AREA 4 -

WORK AREA 5 -

WORK AREA 6 -

WORK AREA 7 -

WORK AREA 8 -



Package 1 – Notable Quantities

Civil

- 35,000 CY of Excavation
- 92,000 SY of Aggregate
- 6,450 LF of Underdrain

Electrical

- 33,500 LF of Duct Bank
- 73 Aircraft Rated Handholes

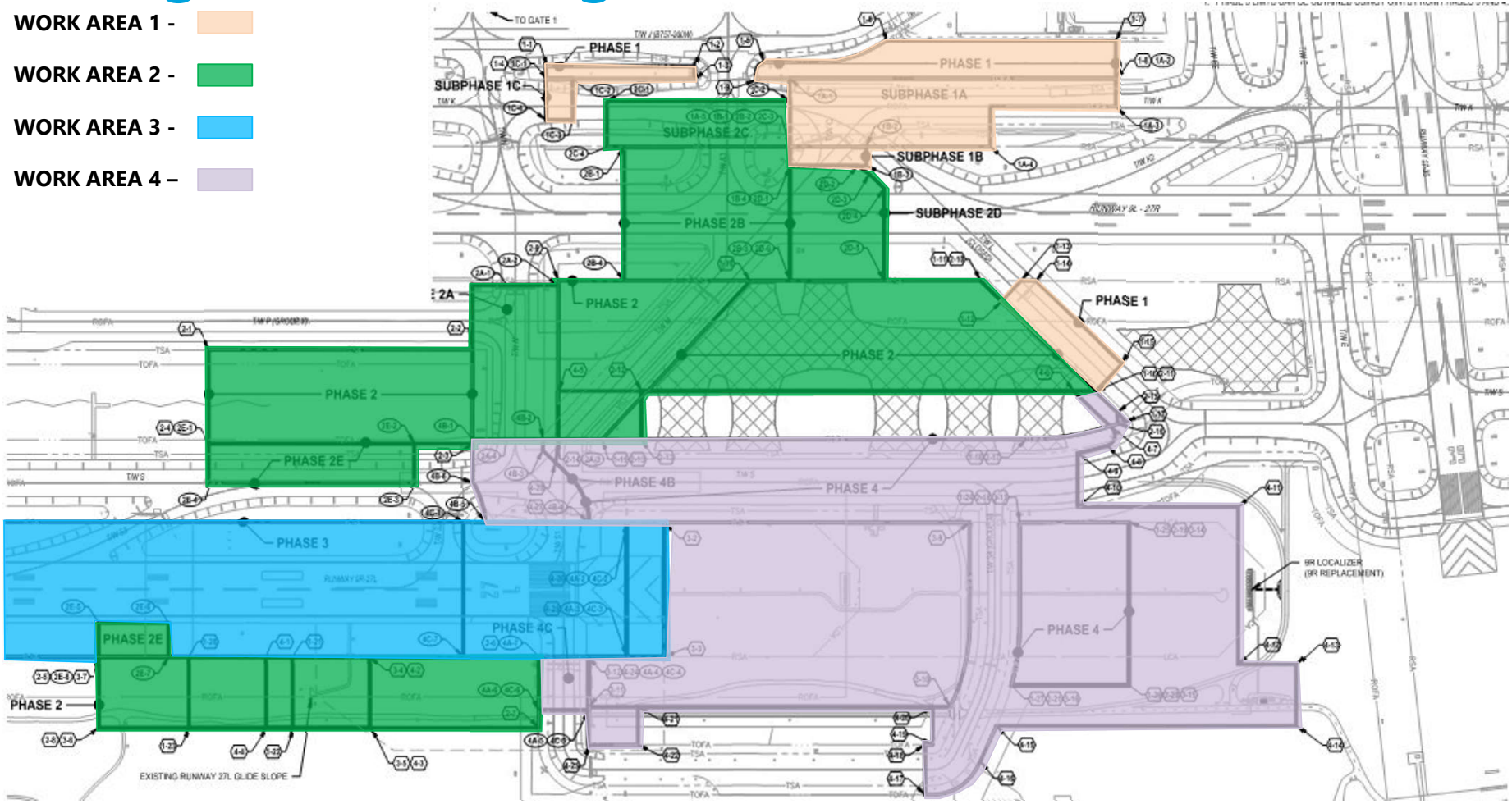
Package 2 - Phasing

WORK AREA 1 -

WORK AREA 2 -

WORK AREA 3 -

WORK AREA 4 –



Package 2 – Notable Quantities

Civil

- 56,500 CY of Excavation
- 74,970 CY of Aggregate
- 51,900 Tons of Asphalt
- 174,500 SF of Paint Markings

Electrical

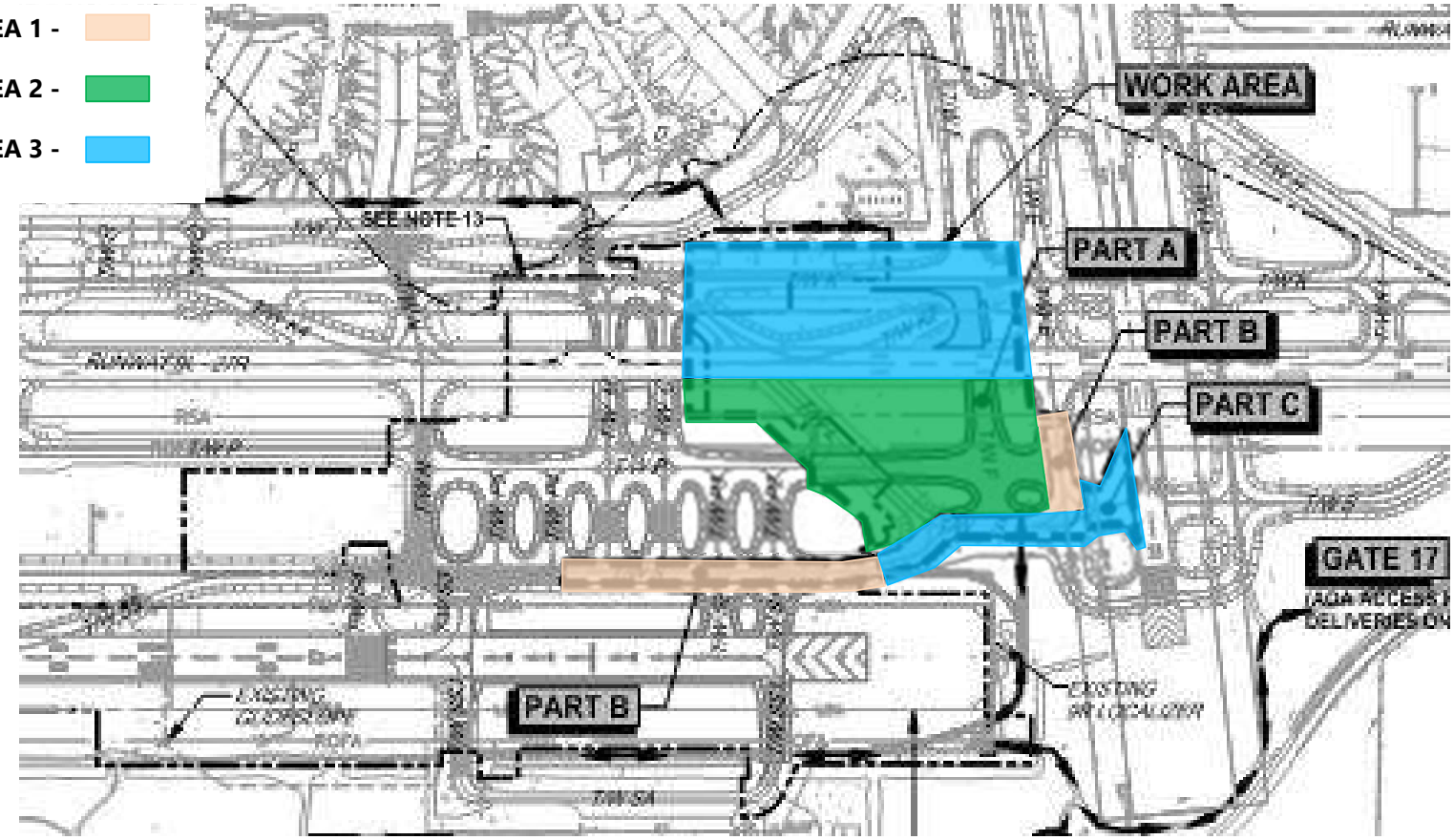
- 27.5 miles of Airfield Lighting Cable
- 1,119 Airfield Lights
- 100 Guidance Signs

Package 3 - Phasing

WORK AREA 1 -

WORK AREA 2 -

WORK AREA 3 -



Package 3 – Notable Quantities

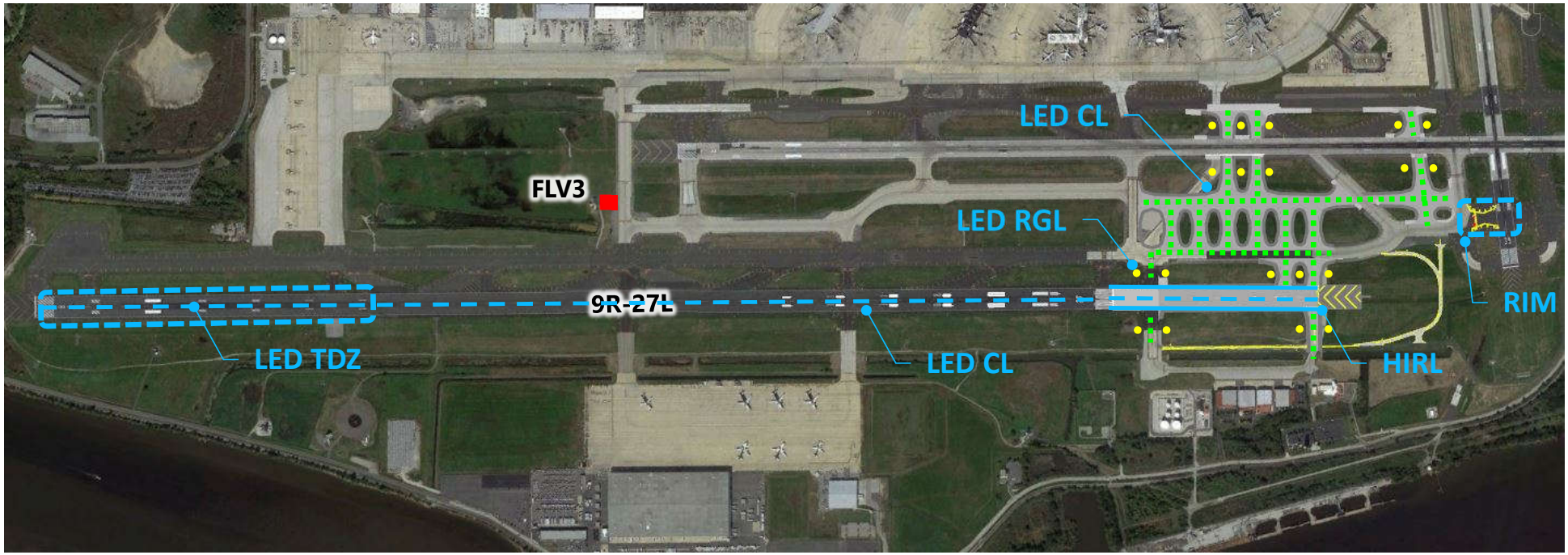
Civil

- 29,900 CY of Excavation
- 23,000 CY of Aggregate
- 37,120 Tons of Asphalt
- 67,730 SF of Paint Markings

Electrical

- 6.4 miles of Airfield Lighting Cable
- 317 Airfield Lights
- 20 Guidance Signs

Airfield Electrical



Challenges

Phasing

- *Multiple Packages*
- *Minimize impacts to Airport Operations*
- *Runway 9R-27L is the only CAT II/III runway*

Varying Pavement

- *Asphalt and Concrete Mix*
- *5" and 7" Asphalt, Varying depths of overlay*
- *17" and 18" PCC, Multiple tie-in points*

3 Electrical Consultants

- *Burns*
- *DY*
- *RS&H*

FAA System Implementation

Identifying Need

Identifying Need

» Master planning of flight mix, operations and climate determine needs for FAA systems

FAA System Implementation

RIPTION OF REIMBURSABLE ITEM	ESTIMATED
20 Engineering	$25
30 Environmental	$4
50 Construction	$50
60 Site Prep, Installation, Test and Checkout	$21
70 Inspection/Commissioning/Closeout	$7
Labor Subtotal	$108
Labor Overhead	$16
Total Labor	**$125**
abor	
30 Environmental	$5
50 Construction	$18
60 Site Prep, Installation, Test and Checkout	$19
70 Inspection/Commissioning/Closeout	$10
Non-Labor Subtotal	$52
Non-Lab	$3
TOT	$56

Identifying Need → Reimbursable Agreement →

Reimbursable Agreement

» Reimbursable Agreements can be put in place for FAA technical review assistance, construction inspection, and materials

Agreement Number
XXXXXXXXXXXX

NON-FEDERAL REIMBURSABLE AGREEMENT

BETWEEN

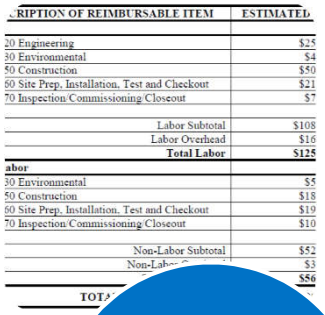
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

AND

XYZ AIRPORT AUTHORITY (XYZAA)
ABC AIRPORT
CITY, STATE

FAA System Implementation

Identifying Need



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Reimbursable Agreement

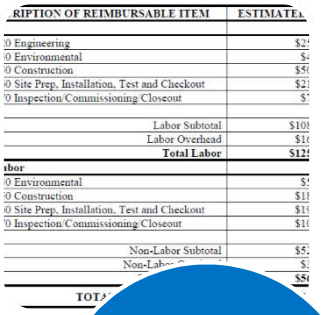
Furnished Materials

Furnished Materials

- FAA Materials are sourced through the depot in Oklahoma City, OK
- New equipment is generally required if the existing equipment is being phased out
- The reimbursable agreement will spell out what is provided by the FAA and what the contractor is responsible for

FAA System Implementation

Identifying Need



RIPTION OF REIMBURSABLE ITEM	ESTIMATE
0 Engineering	$2
0 Environmental	$
0 Construction	$5
0 Site Prep, Installation, Test and Checkout	$2
0 Inspection/Commissioning/Closeout	$
Labor Subtotal	$10
Labor Overhead	$1
Total Labor	**$12**
abor	
0 Environmental	$
0 Construction	$1
0 Site Prep, Installation, Test and Checkout	$1
0 Inspection/Commissioning/Closeout	$1
Non-Labor Subtotal	$5
Non-Lab	$
TOT	$6

Reimbursable Agreement

Furnished Materials

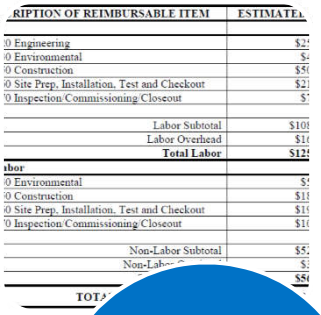
Flight Inspection

Flight Inspection

- Typically 8-12 week lead time
- FAA executed, but third party evaluation is available
- Required to implement new navigational aids

FAA System Implementation

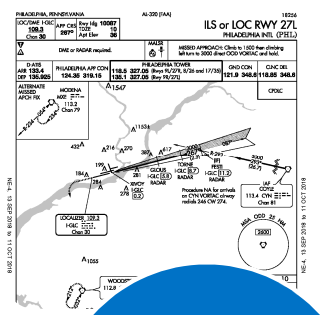
Identifying Need



Reimbursable Agreement

Furnished Materials

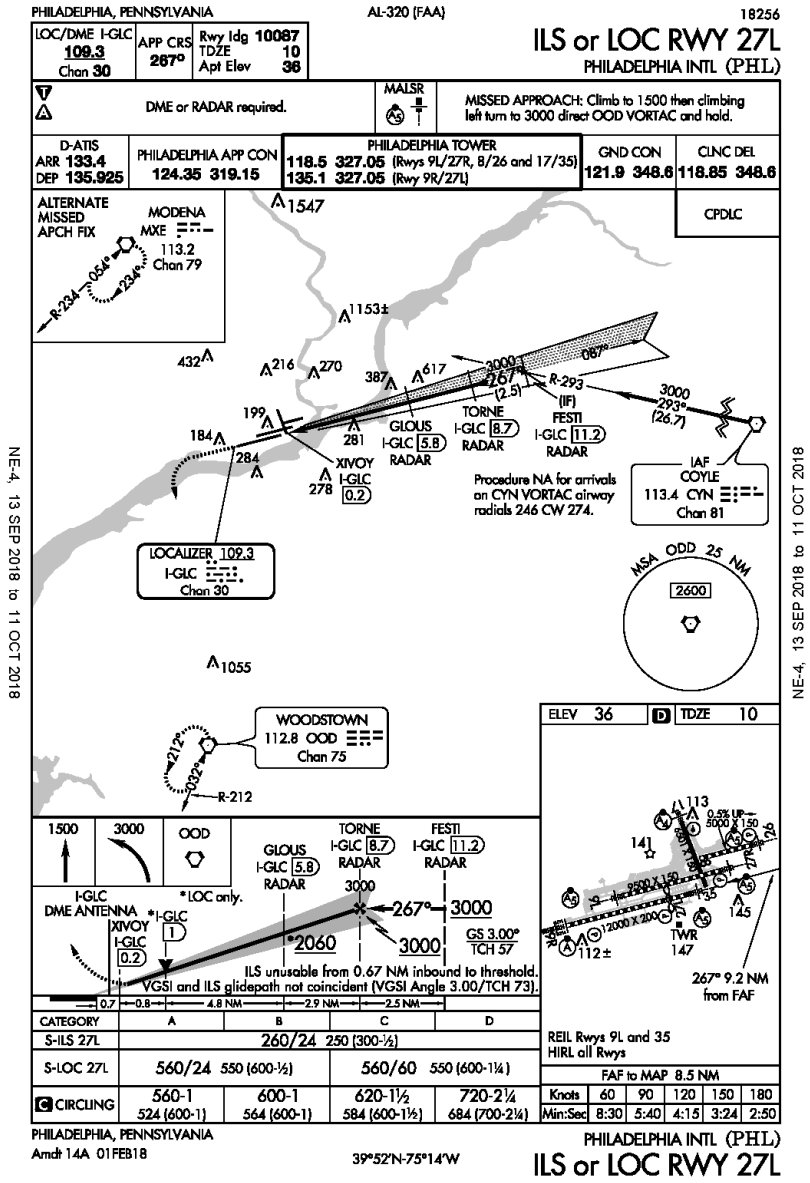
Flight Check



Charting

Charting

- Once flight check has passed, the AVN chart data is modified to include new ILS systems, declared distances, etc.
- Will be submitted within a 60 day window after flight inspection
- ILS burn-in required on CAT II/III
- Charting will be updated 38/63 days after submission




2018
Legend
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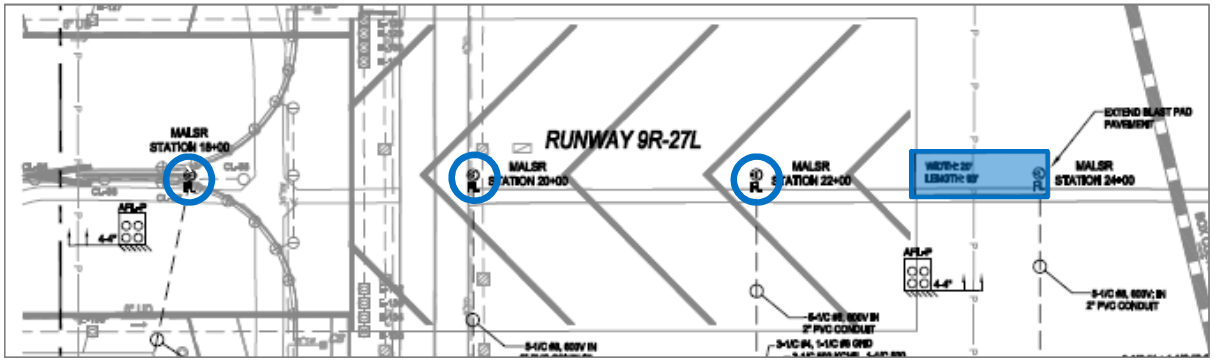
Google Earth
Image © 2018 DigitalGlobe
1000 ft
N

In-pavement MALSR System

Inset Steady-burn and flashers

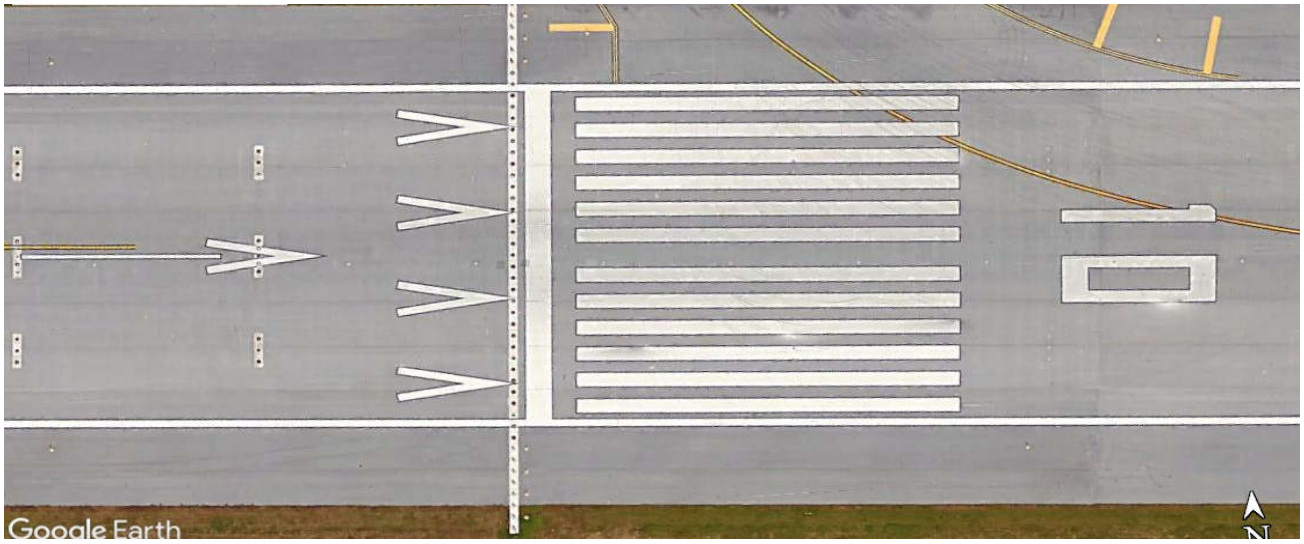
- » Hybrid systems have been used for a while (FAA E-2628b fixture)
  - MALSR steady burns and ALSF II flasher
  - Previously not certified by the FAA
- » PHL extended pavement to make last flasher inset
  - Reduces spare parts
  - Ease of landscaping



Threshold Bars

- Difficult to re-open pavement
- Fear of settlement
- Pre-cast or cast in place

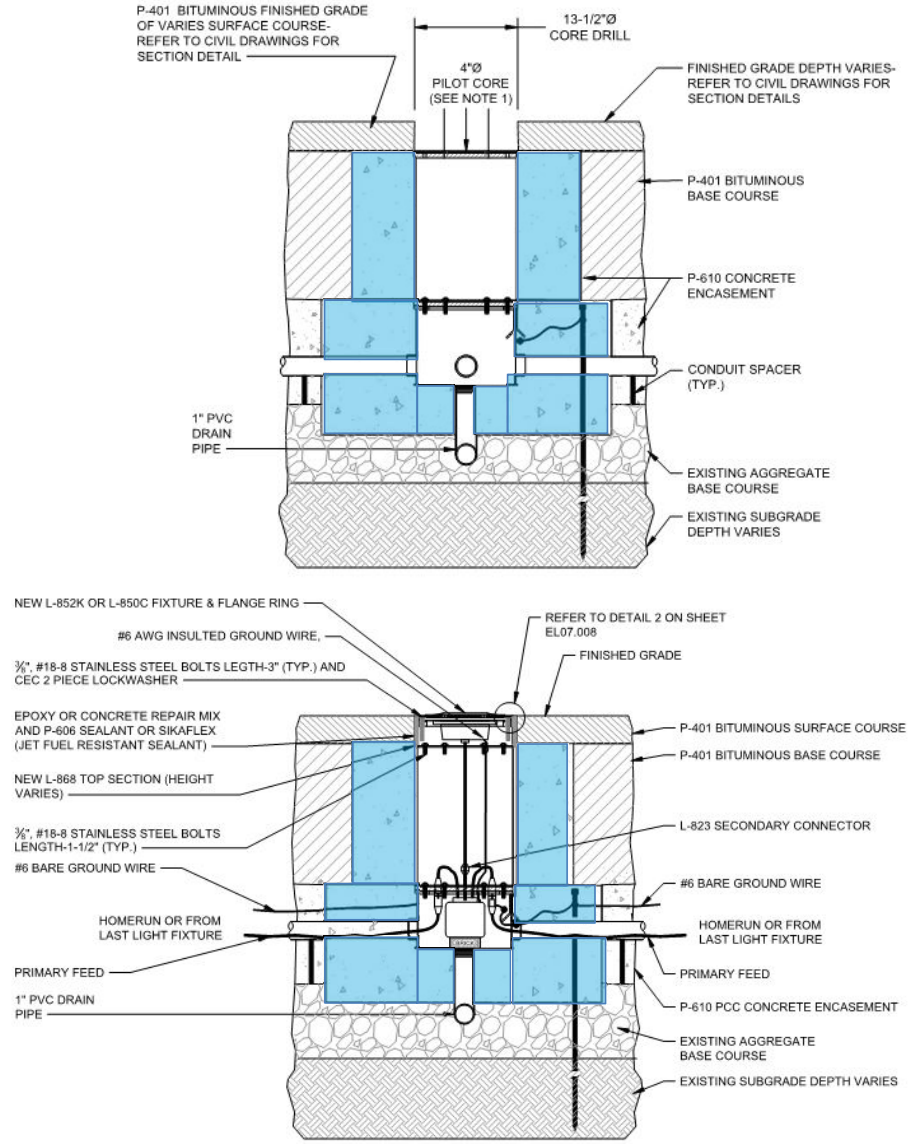
Several options have been permitted by regional FAA ADOs



Threshold Bars

Option 1

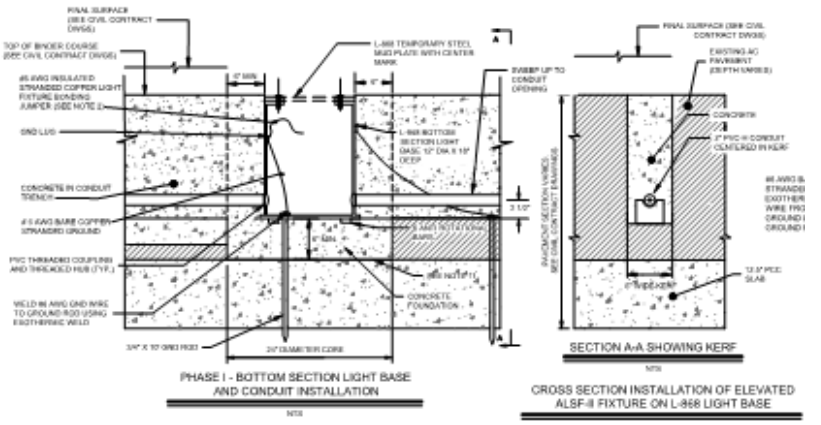
- Core individual light bases out similar to r/w centerline lights
- Alignment and spacing is critical

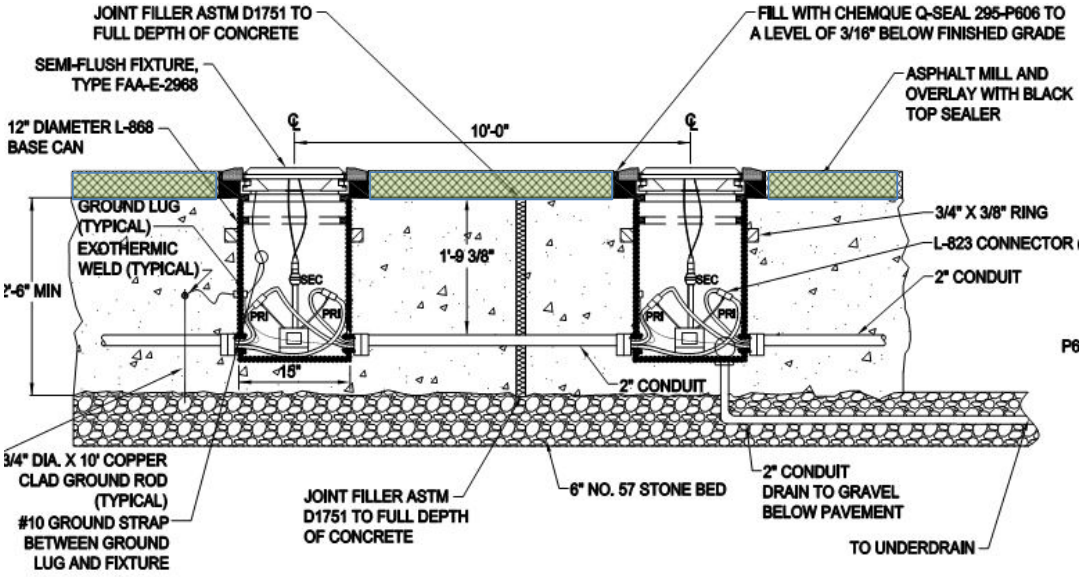


Threshold Bars

Option 2

- Install concrete bar below final pavement height and overlay with asphalt
  - Allows for mill and overlay
  - Potential differential settlement





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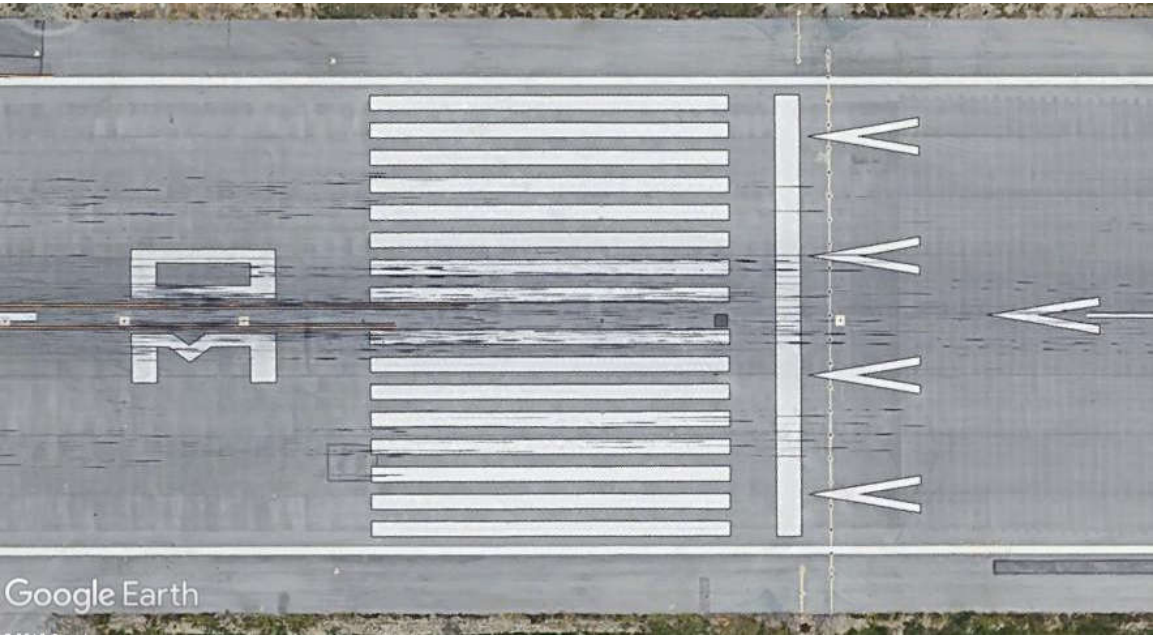
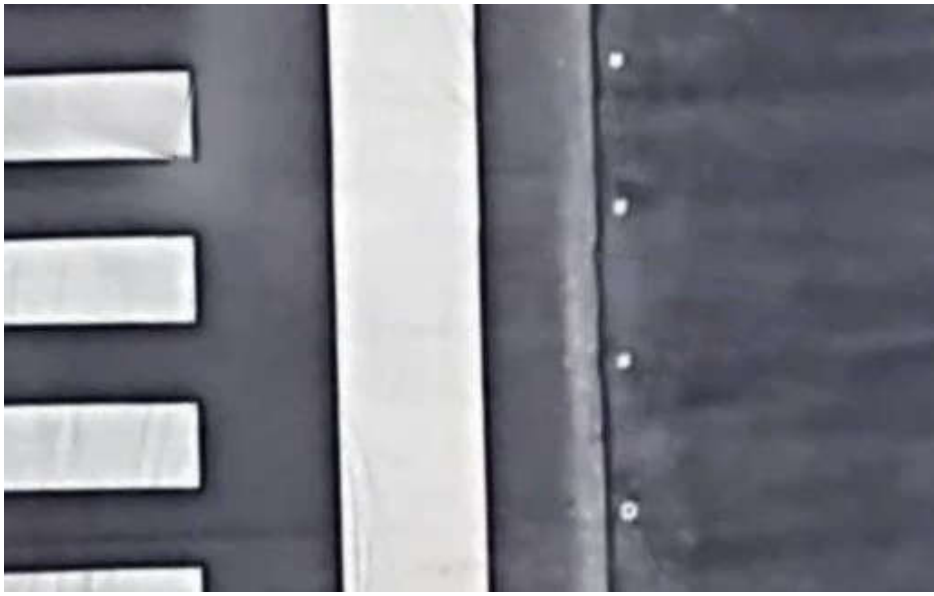
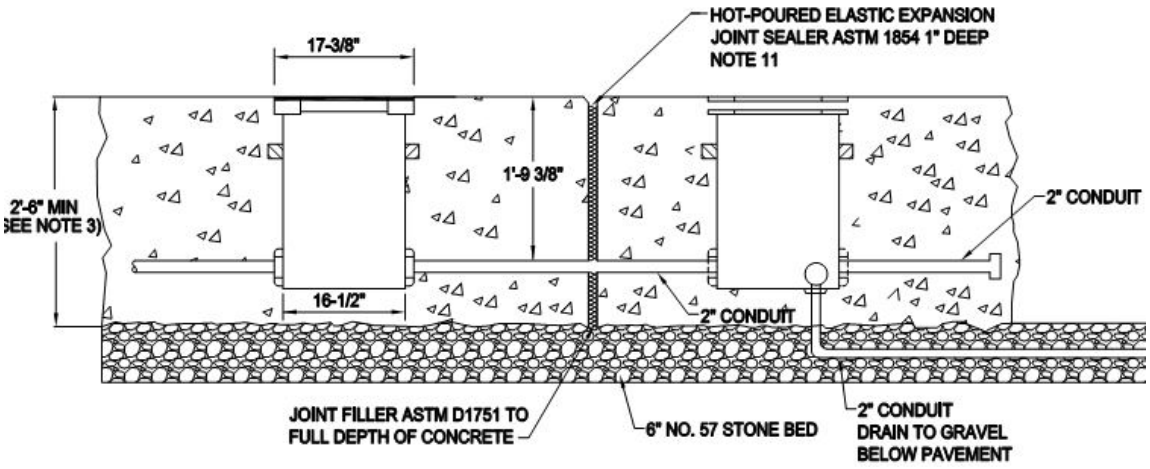


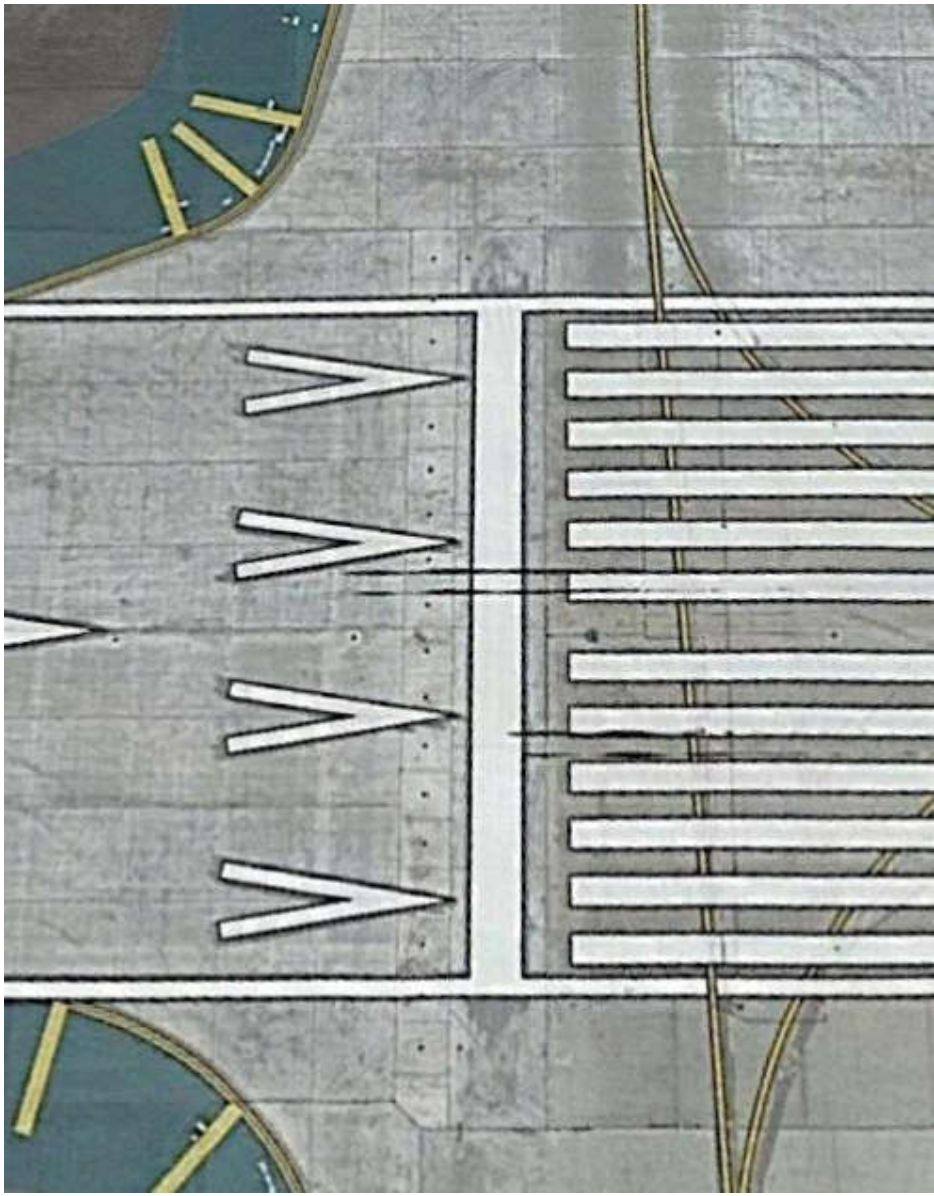


Threshold Bars

Option 3

» Lights installed in concrete panels
  – Most closely resembles FAA detail
  – Meeting final grade is critical



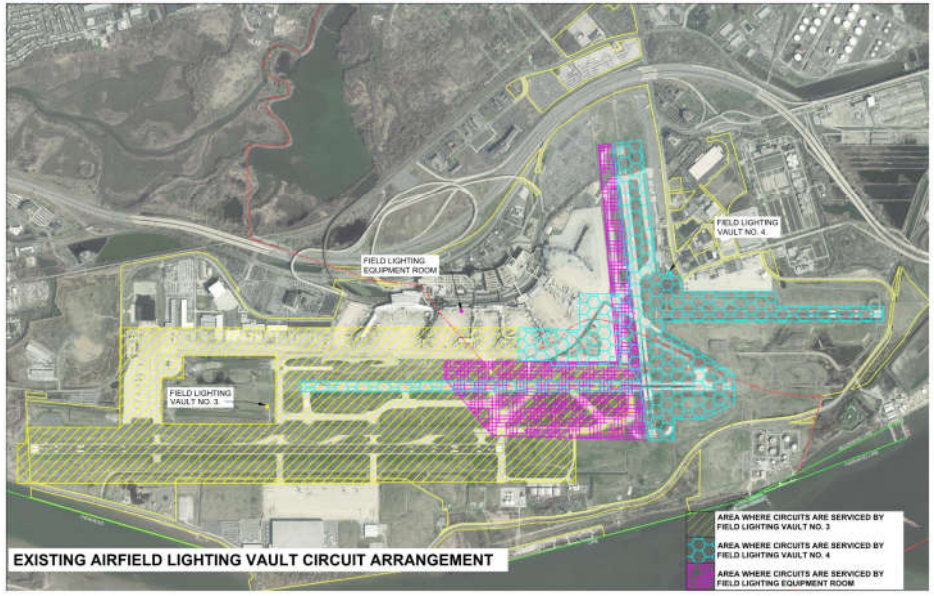


Vault Segregation at PHL

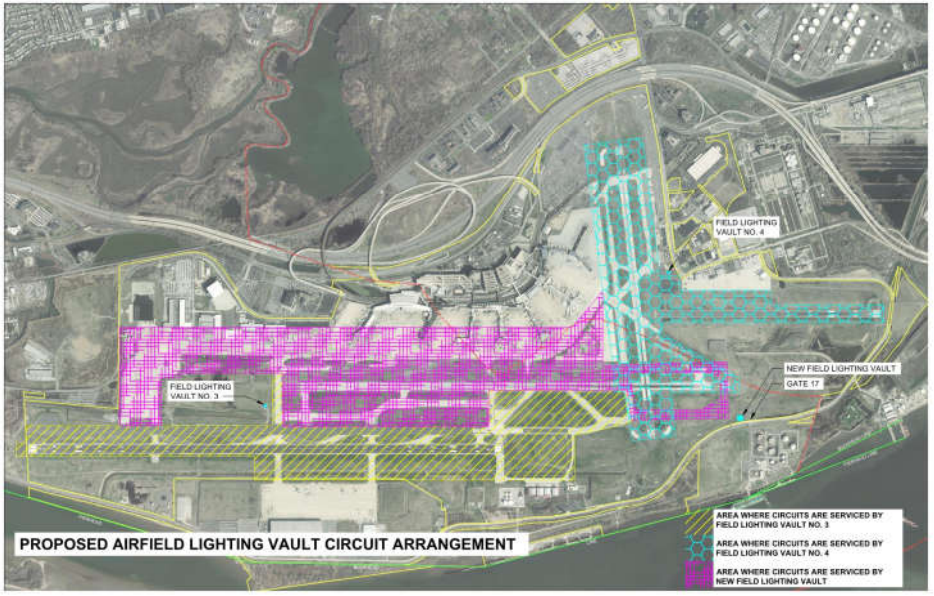
» 70% of airfield circuits are housed in two vaults: FLV3 & FLV4
» FLV3 serves the taxiway routes from the gates to the runways
» FLV4 serves 3 of the 4 runways
» A catastrophic loss in either vault will ground air travel at PHL

Vault Segregation

Existing conditions represent geographic demarcation that lacks resilience

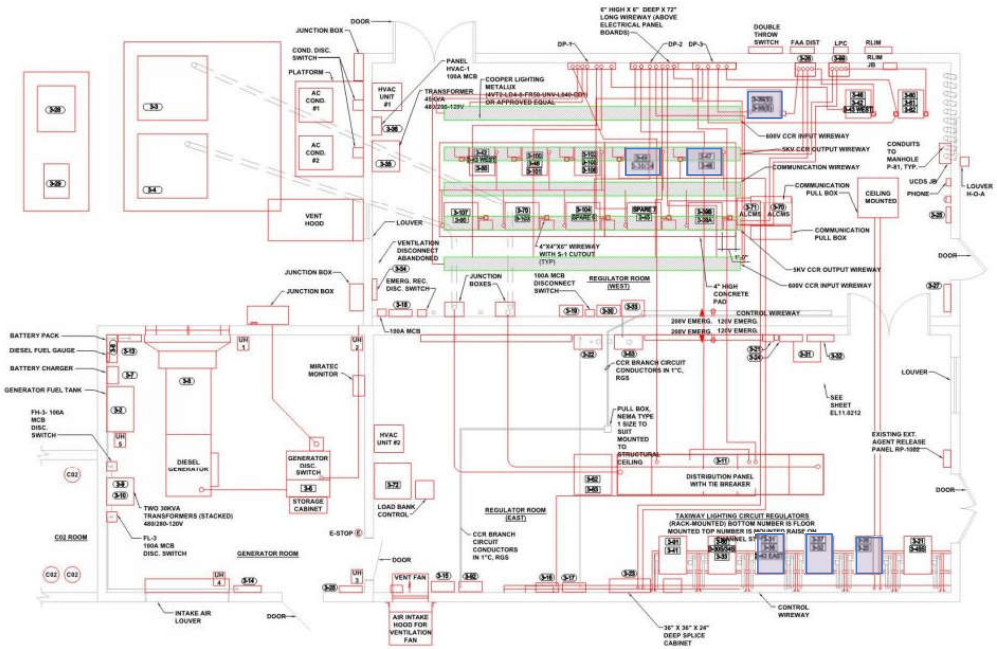


Proposed configuration that can withstand a catastrophic loss to any single FLV

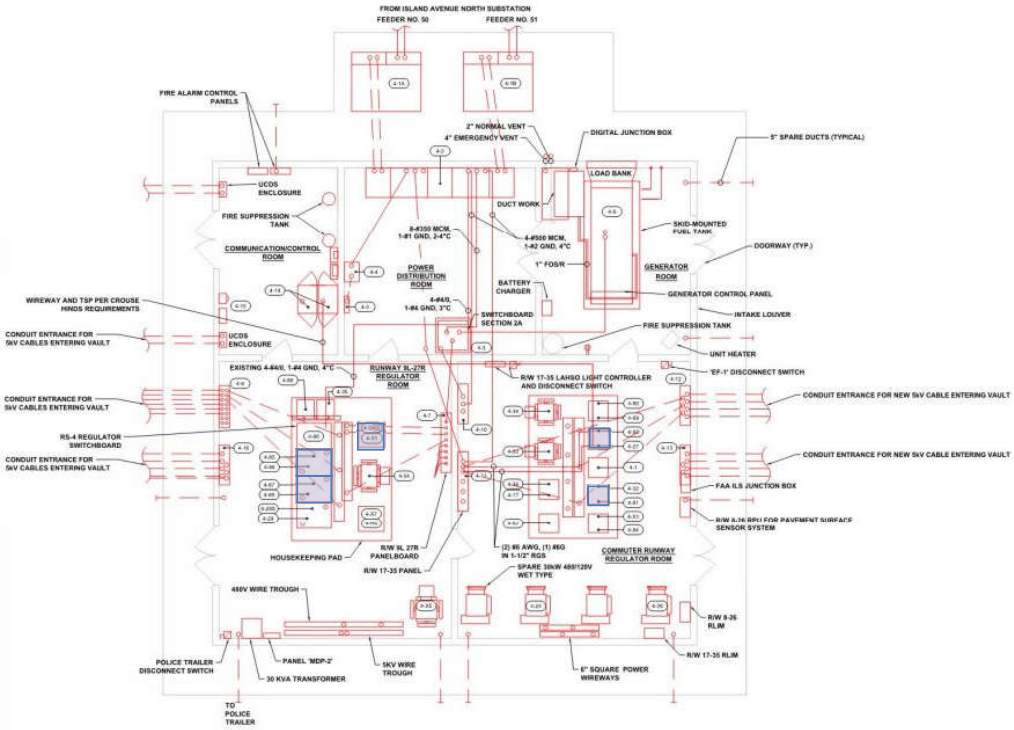


Vault Segregation

FLV3



FLV4



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