APPENDIX A

(i) Condition Survey of Pavements
(ii) Concrete Mixture Proportions Used in Pavements
(iii) Deicer Usage on Pavements
(iv) Core Locations and Core Catalog

Appendix A: Condition Survey of Pavements and Coring Information

Part 1: Survey Data

Introduction

Once the eight airports were selected attempts were made to collect the following information:

- Mix design and other Construction related information
- Deicer/Anti-icer yearly usage rates

Once this data was collected (if available), a visual survey of the pavements was made. Representative pavements at each airport were selected for analysis be it runways, taxiways, aprons, or deicing pads. The results of the field surveys can be found in the following sections.

Airport I

Material and Construction Related Information

Mix design information for Airport I can be seen in Table 1. Taxiway Echo was constructed in 1999, Taxiway Tango in 2003, and Taxiway Victor in 2004. Distress was first noticed in Taxiway Echo in 2003 and minor distress was seen in Taxiway Tango in 2008, while no distress was seen in Taxiway Victor.

Table 1: Airport I Mix Design Information

Taxiway	Cement Content (lbs/cy)	SCM Content (lbs/cy, Replacement %)	Water to Cement Ratio	Air Content (%)	Coarse Aggregate Content (lbs/cy)	Fine Aggregate Content (lbs/cy)
Echo	540 (Type I) (0.50% $Na_2O_{eq.}$)	90, 14 (Fly ash) (17.44% CaO)	0.33	5.6	1960 (AGG-19)	1200 (AGG-22)
Tango	549 (Type I) (0.57% $Na_2O_{eq.}$)	99, 15 (Fly ash) (27.22% CaO)	0.41	NA	1840 (AGG-18)	1153 (AGG-21)
Victor	381 (Type I) (0.61% $Na_2O_{eq.}$)	254, 40 (Slag)	0.42	NA	1840 (AGG-20)	1118 (AGG-21)

Deicer Usage

It was determined that only the Taxiways are deiced at Airport I, and the runways are deiced using mechanical brushes. Several different deicers have been used at Airport I, but the potassium acetate based Cryotech E36 deicer is currently predominantly used. The deicer usage from the winter of 1991-1992 to the winter of 2005-2006 can be seen in Table 2.

Table 2: Deicer Usage at Airport I

Deicing Season	UCAR [gallons]	Urea, Solid [tons]	Potassium Acetate [gallons]	Sodium Formate, Solid [tons]	Sodium Acetate, Solid [tons]
1991-1992	25,000	500	N/A	N/A	N/A
1992-1993	30,000	857	N/A	N/A	N/A
1993-1994	81,744	816	N/A	N/A	N/A
1994-1995	48,157	204	2,175	N/A	N/A
1995-1996	85,100	696	58,950	N/A	N/A
1996-1997	24,900	37	41,211	N/A	N/A
1997-1998	0	19	50,000	40	N/A
1998-1999	0	208	122,987	0	157
1999-2000	0	0	117,000	20	100
2000-2001	0	0	403,224	305	226
2001-2002	0	0	106,880	179	0
2002-2003	0	0	204,000	100	20
2003-2004	0	0	253,000	35	0
2004-2005	0	0	91800*	2*	0
2005-2006	0	0	130,800	0	113

* Values were updated for the 2006 DAPU Report.

Condition Assessment

Taxiway Echo had high severity map cracking along the joints and moderate to low severity map-cracking in the mid-panels. Visual examples from Taxiway Echo can be seen in Figure 1. Taxiway Victor was in decent condition so only three cores were selected. Two of the cores were taken from areas with the limited cracking and the other one was from an undamaged area. Taxiway Tango was in better condition than Taxiway Echo but not as good as Taxiway Victor. Visual examples from Taxiway Tango can be seen in Figure 2. Taxiway Victor was in decent condition so only three cores were selected. Two of the cores were taken from areas with the limited cracking and the other one was from a decent area. Visual examples from Taxiway Victor can be seen in Figure 3.

Figure 1: Airport I Visual Survey of Taxiway Echo

Figure 2: Airport I Visual Survey of Taxiway Tango

Figure 3: Airport I Visual Survey of Taxiway Victor

Airport II

Material and Construction Related Information

Airport II provided no materials-related or construction information, other than to identify the coarse aggregate source for the project.

Deicer Usage

Runways are deiced at Airport II with multiple deicers and anti-icers, but the potassium acetate based Cryotech E36 deicer and Urea is currently predominantly used. The deicer usage from the winter of 1989-1990 to the winter of 2007-2008 can be seen in Table 3.

Table 3: Deicer Usage at Airport II

YEAR SEASON	AOA SAND (Tons)	ROAD SAND (Tons)	ROAD/ TR. SALT (Tons)	UREA (Tons)	SODIUM ACETATE (NAAC) (US Tons)	SODIUM FORMATE (Tons)	POTASSIUM ACETATE (E-36) (Gallons)
2007-08	0	0	912	0	24	0	64,972
2006-07	5,041	0	986	0	91	0	115,767
2005-06	9,066	0	962	0	0	0	345,268
2004-05	5,157	511	1,521	0	122	0	264,624
2003-04	5,001	0	1,422	0	0	0	200,479
***2002-03**	5,041	0	1,109	0	62	0	87,641
2001-02	4,295	0	1,066	0	180	0	140,522
2000-01	13,852	0	2,106	0	522	0	322,265
1999-00	8,256	745	1,500	0	44	243	144,905
1998-99	8,049	0	893	519	0	0	94,192
1997-98	6,865	0	1,092	866	0	0	67,819
1996-97	10,287	0	1,675	1,054	0	0	59,734
1995-96	8,656	0	229	622	0	0	34,167
1994-95	7,748	0	1,250	735	0	0	29,992
1993-94	6,820	0	794	658	0	0	13,140
1992-93	10,068	0	916	921	0	0	4,400
1991-92	6,792	0	956	823	0	0	0
1990-91	7,445	0	781	620	0	0	0
1989-90	7,245	0	532	715	0	0	0

Condition Assessment

The distress was significant random cracking. Visual examples can be seen in Figure 4.

Figure 4: Airport II Visual Survey of Runway 30R/12L

Airport III

Material and Construction Related Information

The mix design information can be seen in Table 4. Runway 16R/34L was constructed in 1995 and distress was evident in 2003-2004.

Table 4: Airport III Mix Design Information

Taxiway	**Cement Content (lbs/cy)**	**SCM Content (lbs/cy, Replacement %)**	**Water to Cement Ratio**	**Air Content (%)**	**Coarse Aggregate Content (lbs/cy)**	**Fine Aggregate Content (lbs/cy)**
Runway 16R/34L	402 (Type I) (0.55% $Na_2O_{eq.}$)	134, 25 (Fly ash) (17.44% CaO)	0.44	6.0	1904 (AGG-27)	1065 (AGG-28)

Deicer Usage

Runways are deiced at Airport III with both potassium acetate based Cryotech E36 deicer and Urea, but the potassium acetate is currently predominantly used. The deicer usage from the winter of 1996-1997 to the winter of 2006-2007 can be seen in Table 5.

Table 5: Deicer Usage at Airport III

YEAR SEASON	**UREA (Tons)**	**POTASSIUM ACETATE (E-36) (Gallons)**
2006-07	706	93,850
2005-06	541.4	42,615
2004-05	539.1	20,103
2003-04	951	51,300
2002-03	105.8	1,600
2001-02	763	47,500
2000-01	568.8	9,200
1999-00	415.2	11,800
1998-99	242	16,400
1997-98	267	34,739
1996-97	272	10,598

Condition Assessment

The distress was moderate to low severity map cracking along joints and mid-panels. Visual examples can be seen in Figure 5.

Figure 5: Airport III Visual Survey of Runway 16R/34L

Airport IV

Material and Construction Related Information

Airport IV provided no materials-related or construction information.

Deicer Usage

Annual usage of the potassium acetate based Cryotech E-36 based deicer was estimated at 100,000 – 150,000 gallons depending on the weather. A solid sodium acetate based anti-icer known as NAAC, which is also produced by Cryotech, is used but the quantities could not be established.

Condition Assessment

All of the pavements surveyed at Airport IV had extensive map cracking in mid panels and D-cracking near the joints. The deicing pad had the most extensive damage. Examples of the damage in each taxiway can be seen in Figure 6, Figure 7, Figure 8, Figure 9, and Figure 10.

Figure 6: Airport IV Visual Survey of Taxiway Charlie 7

Figure 7: Airport IV Visual Survey of Taxiway Echo 5

Figure 8: Airport IV Visual Survey of Taxiway Echo 4

Figure 9: Airport IV Visual Survey of Taxiway Golf

Figure 10: Airport IV Visual Survey of Deicing Pad

Airport V

Material and Construction Related Information

Airport V provided no materials-related information other than the use of a slag aggregate.

Deicer Usage

Annual usage of the potassium acetate based Cryotech E-36 based deicer was estimated at 100,000 – 150,000 gallons depending on the weather. A solid sodium acetate based anti-icer known as NAAC, which is also produced by Cryotech, is used but the quantities could not be established.

Condition Assessment

Cores were taken from damaged and undamaged sections of runway 22R/4L. Cores 1, 2, 3, and 7 were taken from the undamaged sections with cores 4, 5, 6, 8, and 10 being taken from the damaged sections. The undamaged cores had moderate to no cracking on the surface, with the damaged sections having severe cracking. The cracks were in the form of map cracking both in the mid panel and along the joints. Cores 11 and 12 were taken from Taxiway Alpha 4. Core 11 was taken from a damaged section and core 12 was taken from an undamaged section. Examples of the damage in runway 22R/4L can be seen **Error! Reference source not found.** and Figure 12.

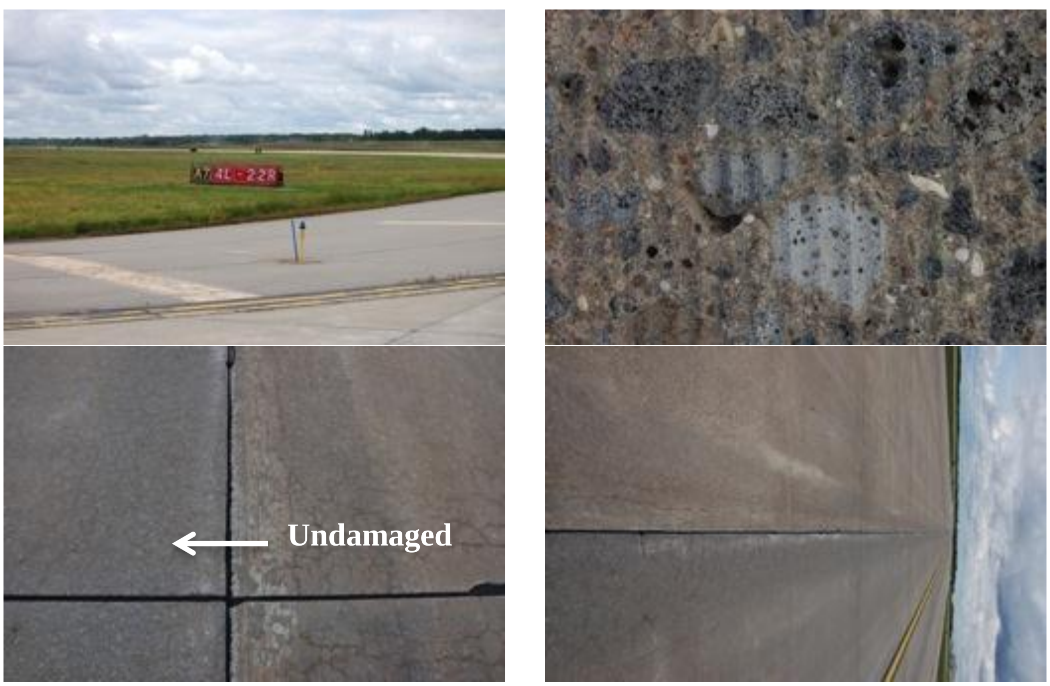

Figure 11: Airport V Visual Survey of Undamaged Sections

Figure 12: Airport V Visual Survey of Damaged Sections

Airport VI

Material and Construction Related Information

Airport VI provided no materials-related or construction information.

Deicer Usage

Airport VI was different from the other airports involved in this study by the fact that it rarely uses deicing chemicals. When used, a Urea deicer is used and can be used in significant quantities if weather demands it. This information is what was told to the researchers by airport personnel, however upon visits to the airport Cryotech E-36 based deicer was seen in the area where the deicers/anti-icers were kept.

Condition Assessment

For Airport VI, two taxiways and a runway were examined. Taxiway Bravo had severe cracking in the form of map cracking along with some structural cracking, which take the form of large singular cracks running parallel to longitudinal joints. Taxiway Foxtrot had some severe map cracking in the mid panels. Runway 23R/5L had map cracking which ran parallel to the longitudinal joints. Examples of the damage in the taxiways and runway can be seen in Figure 13, Figure 14, and Figure 15.

Figure 13: Airport VI Visual Survey of Taxiway Bravo

Figure 14: Airport VI Visual Survey of Taxiway Foxtrot

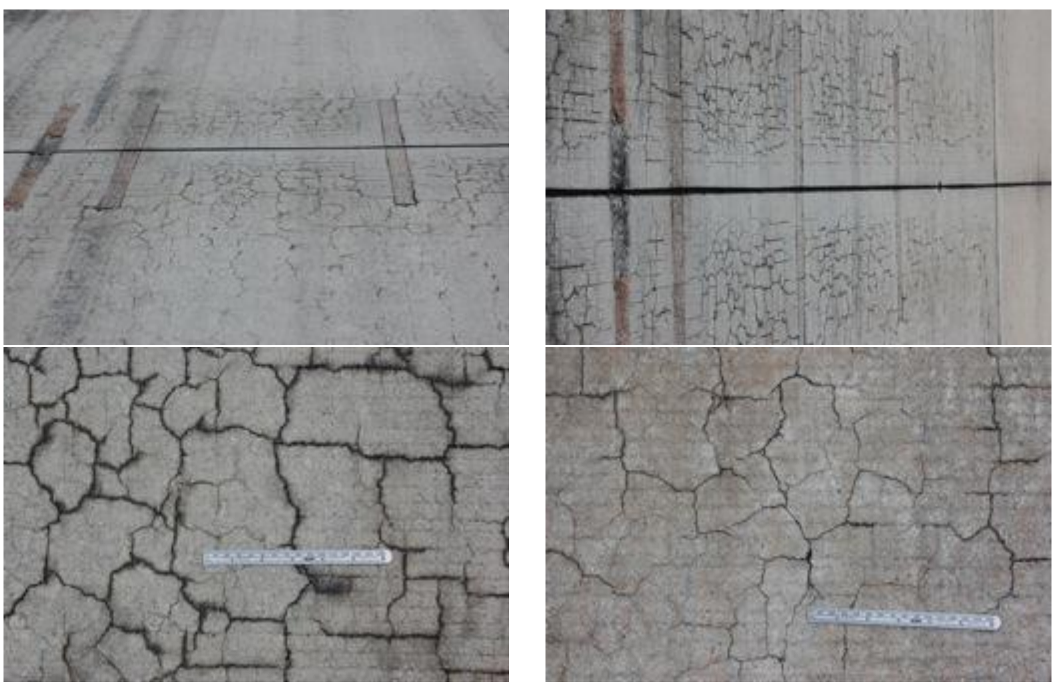

Figure 15: Airport VI Visual Survey of Runway 23R/5L

Airport VII

Material and Construction Related Information

Airport VII provided no materials-related or construction information.

Deicer Usage

Condition Assessment

Figure 16: Airport VII Visual Survey Representative Pictures

Airport VIII

Material and Construction Related Information

Airport VIII provided no materials-related or construction information.

Deicer Usage

Condition Assessment

Figure 17: Airport VIII Visual Survey of Runway 1R/19L

Figure 18: Airport VIII Visual Survey of the Apron

Part 2: Coring Information and Core Documentation

Core Locations

After the Field Survey for each airport pavement section, core locations were determined. These locations were chosen as representative samples for the given pavement. If possible undamaged locations were selected along with damaged locations in order to determine if there were any material differences in the concrete.

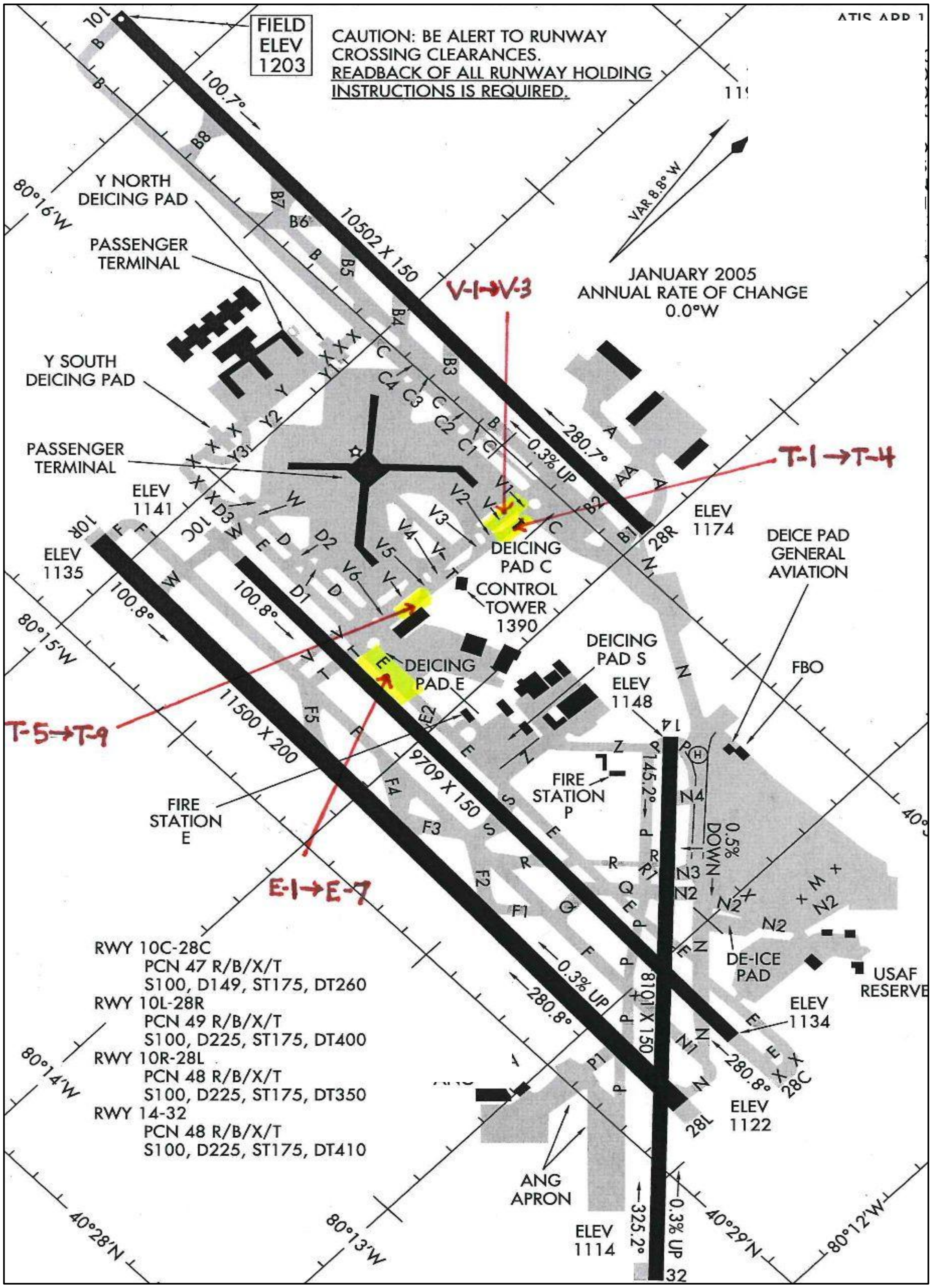

Figure 19: Core Locations at Airport I

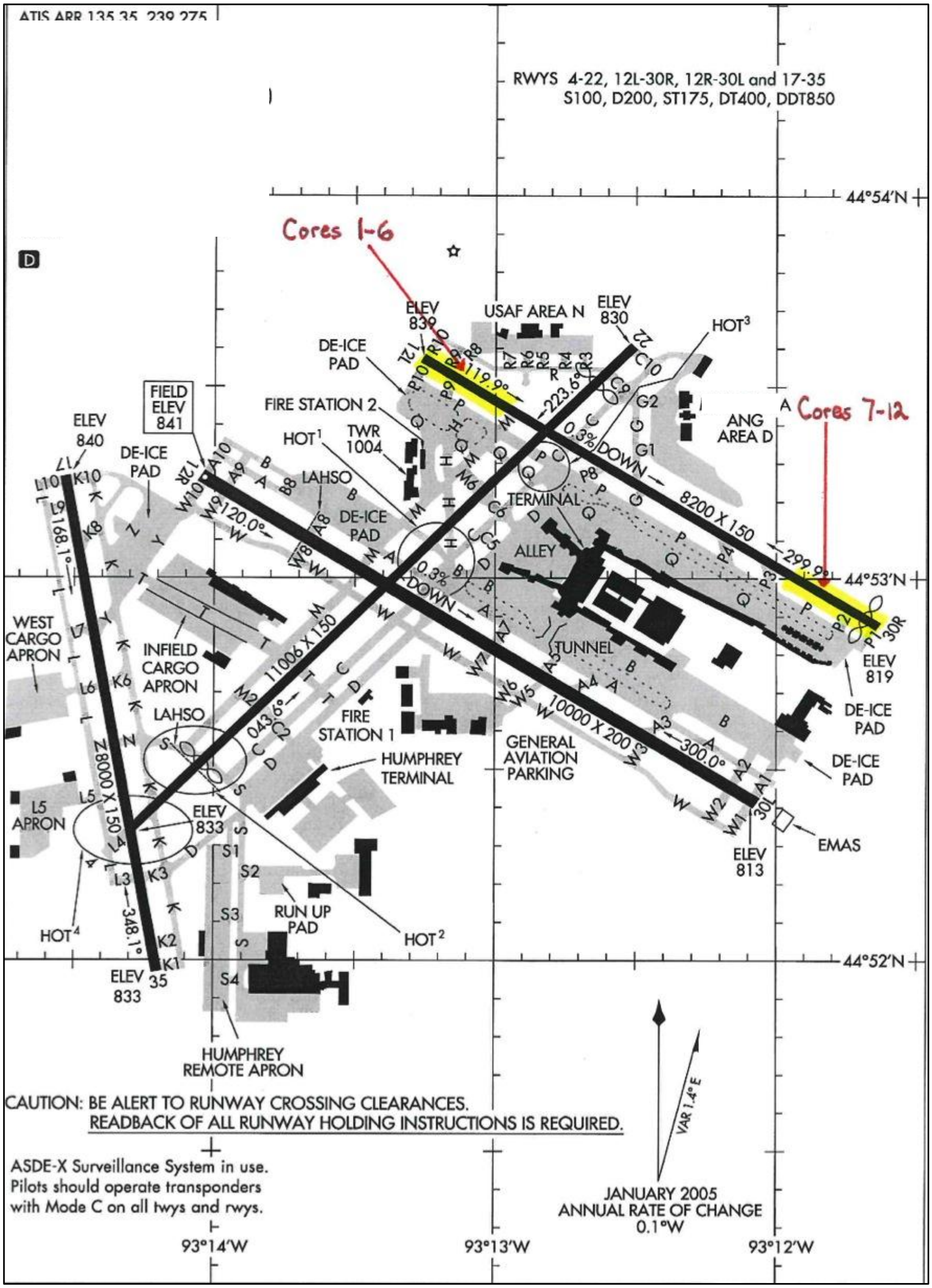

Figure 20: Core Locations at Airport II

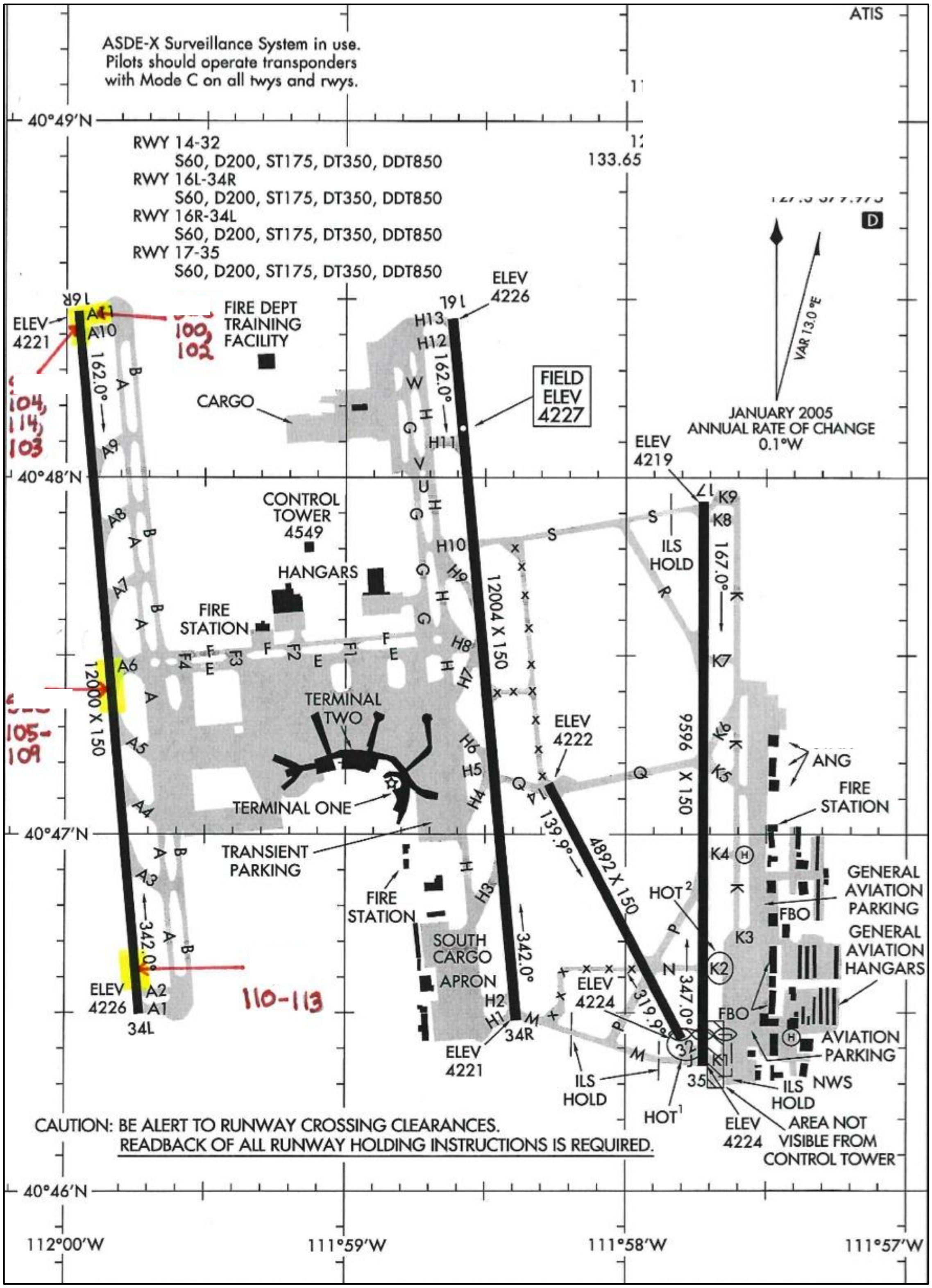

Figure 21: Core Locations at Airport III

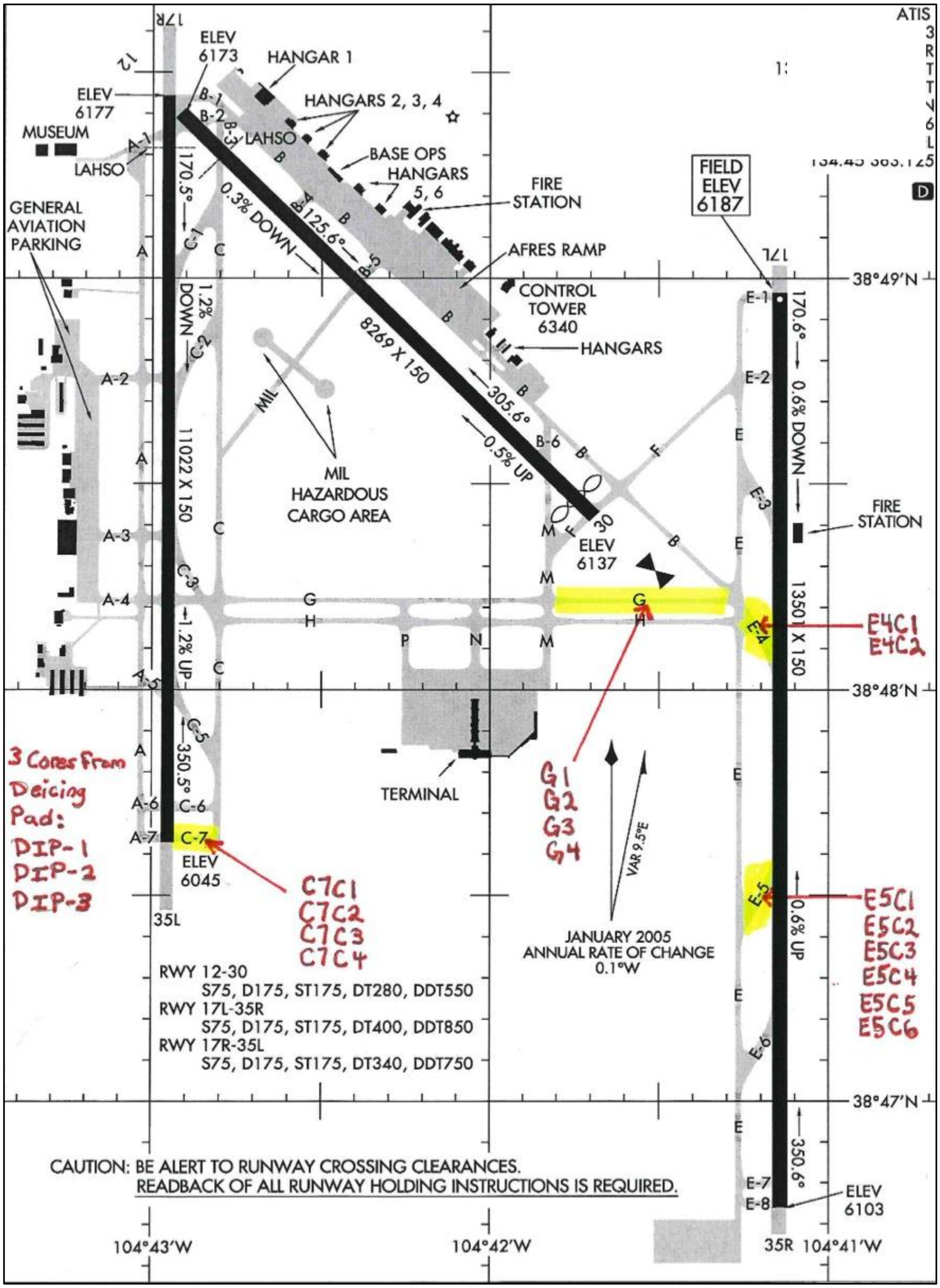

Figure 22: Core Locations at Airport IV

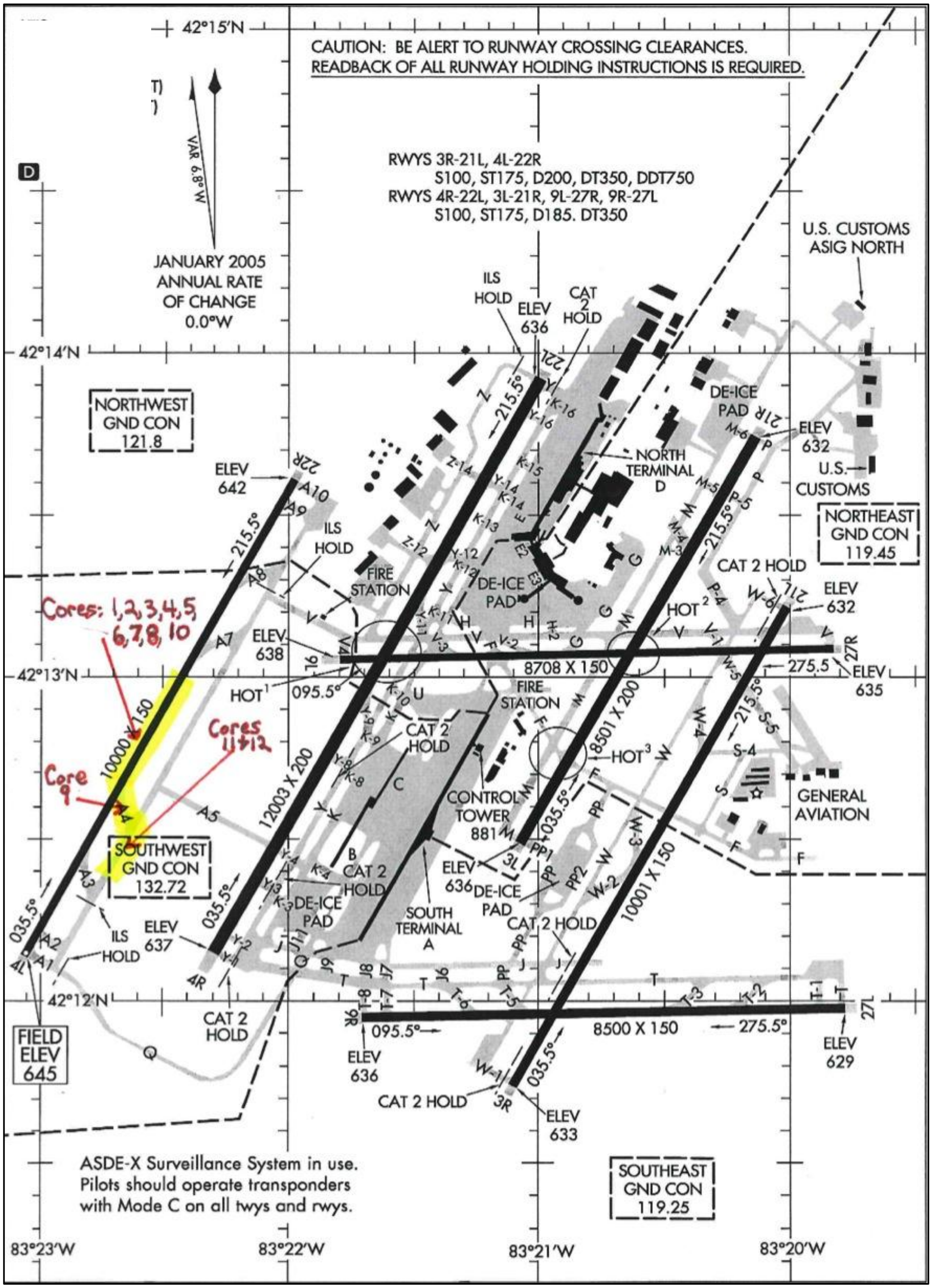

Figure 23: Core Locations at Airport V

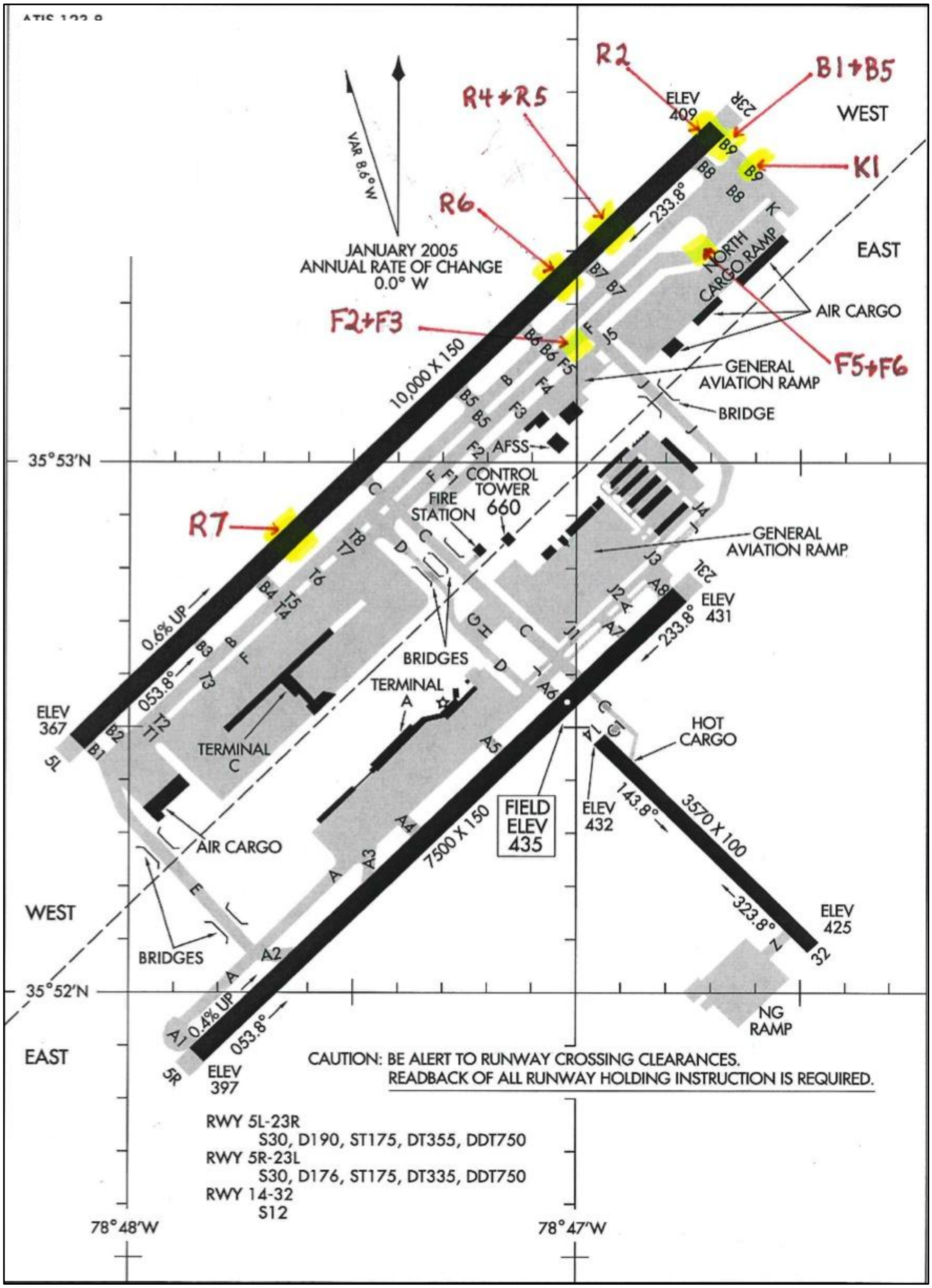

Figure 24: Core Locations at Airport VI

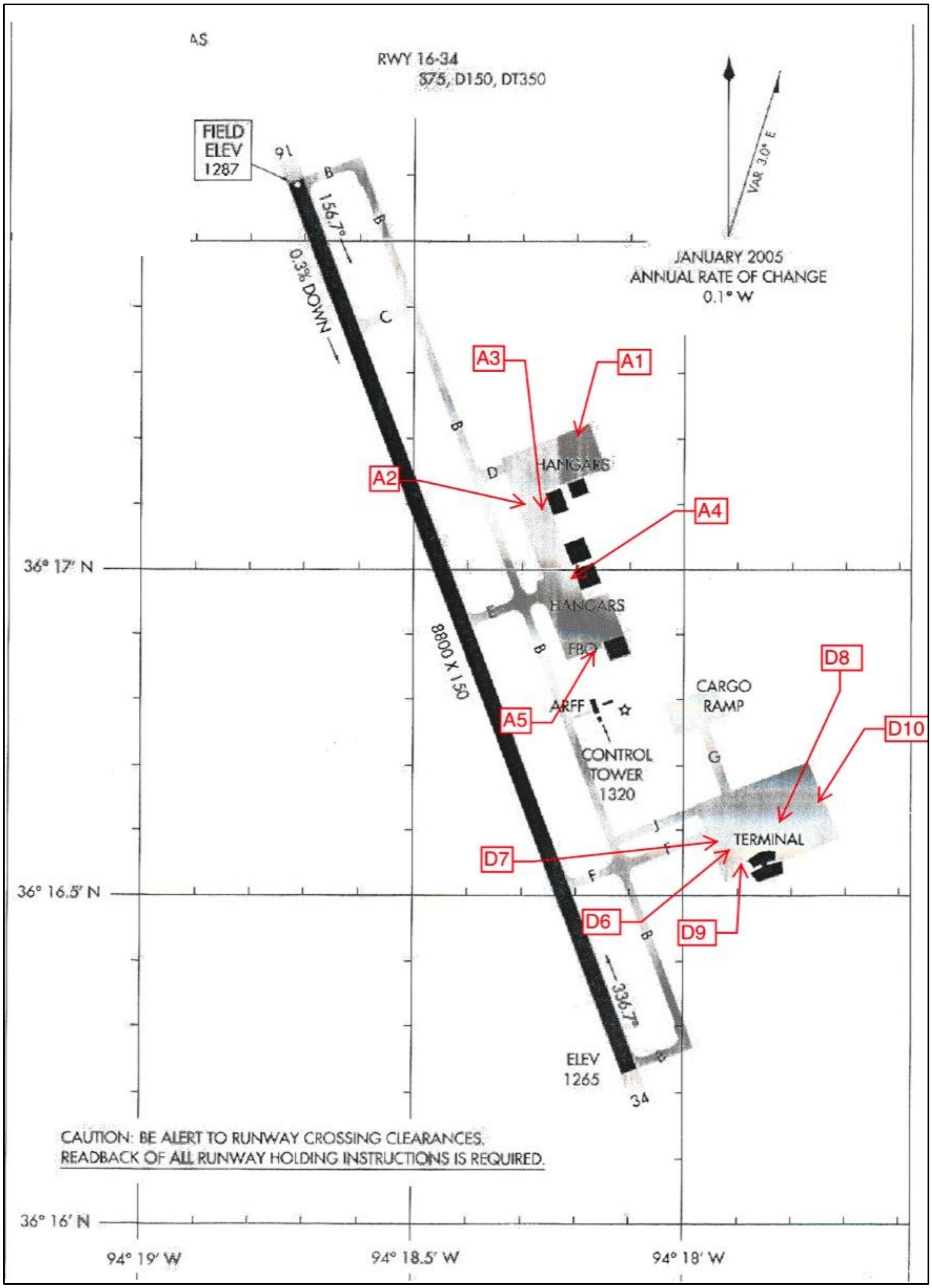

Figure 25: Core Locations at Airport VII

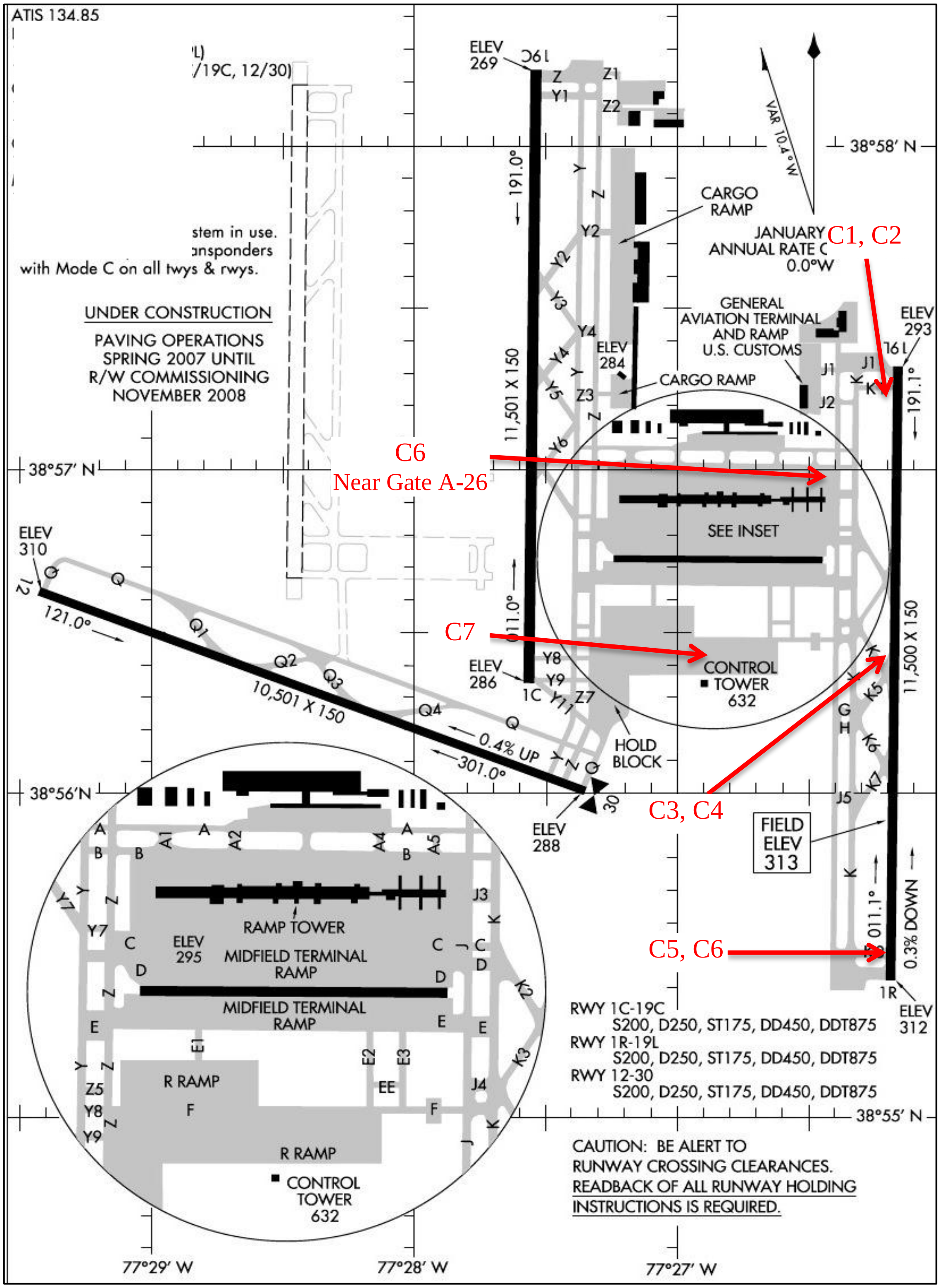

Figure 26: Core Locations at Airport VIII

Core Cataloging

The post-coring documentation of field samples included notes such as surface cracking intensity, location (if any) of ASR gel deposits on the surface of the cores, etc. These pieces of information for each airport were put together in what is called a core catalog.

Table 6: Core Catalog for Airport I

Core Label	Broken (Y/N)	Tining (Y/N)	Surface Cracking (0,1,2,3)	Visual ASR Gel (Y/N)	Length (in)	Broken At (in)	Notes
Airport I-Echo Taxiway-Core 1	N	N	1	N	7.25	NA	
Airport I-Echo Taxiway-Core 2	N	N	1	N	13.50	NA	Reaction Rims on Aggregate
Airport I-Echo Taxiway-Core 3	Y	N	1	N	15.50	?	Reaction Rims on Aggregate
Airport I-Echo Taxiway-Core 3A	N	N	2	N	15.50	NA	
Airport I-Echo Taxiway-Core 4	N	N	0	N	13.75	NA	
Airport I-Echo Taxiway-Core 5	N	N	1	N	15.50	NA	Crack terminates in Air Void
Airport I-Echo Taxiway-Core 6	N	N	1	N	6.50	NA	Steel Strand at Bottom of Core
Airport I-Echo Taxiway-Core 7	N	N	3	N	5.75	NA	
Airport I-Tango Taxiway-Core 1	N	N	3	N	8.25	NA	Top Separated from Core
Airport I-Tango Taxiway-Core 2	Y	N	3	N	8.50	?	Top in Pieces and Separated from Core,
Airport I-Tango Taxiway-Core 3	N	N	3	N	8.75	NA	Top Separated from Core
Airport I-Tango Taxiway-Core 4	N	N	0	N	8.75	NA	
Airport I-Tango Taxiway-Core 5	Y	N	0	N	8.50	7.875	
Airport I-Tango Taxiway-Core 6	N	N	0	N	10.50	NA	
Airport I-Tango Taxiway-Core 7	N	N	0	N	10.25	NA	
Airport I-Tango Taxiway-Core 8	N	N	0	N	8.75	NA	
Airport I-Tango Taxiway-Core 9	N	N	1	N	11.25	NA	Large Air Voids on Sides
Airport I-Victor Taxiway-Core 1	N	N	2	N	8.00	NA	Top Separated from Core
Airport I-Victor Taxiway-Core 2	N	N	1	N	8.25	NA	
Airport I-Victor Taxiway-Core 3	N	N	0	N	13.25	NA	Lots of Air Voids on Sides
Diameter for All Airport I Cores is 3.75” (92.25mm)			0=None 1=Slight 2=Moderate 3=Severe				

Table 7: Core Catalog for Airport II

Core Label	Broken (Y/N)	Tining (Y/N)	Surface Cracking (0,1,2,3)	Visual ASR Gel (Y/N)	Length (in)	Broken At (in)	Notes
Airport II Core 1	N	Y	2	N	18.00	NA	Crack on Surface leads to air void on side, Hole in Top
Airport II Core 2	N	Y	1	N	18.00	NA	Hole in Top
Airport II Core 3	N	Y	2	N	17.75	NA	Crack on Surface leads to air void on side, Hole in Top
Airport II Core 4	N	Y	0	N	19.75	NA	Hole in Top
Airport II Core 5	N	Y	2	N	18.25	NA	Hole in Top
Airport II Core 6	N	Y	0	N	18.00	NA	
Airport II Core 7	N	Y	1	N	18.00	NA	Hole in Top
Airport II Core 8	N	Y	1	N	18.38	NA	Hole in Top
Airport II Core 9	N	Y	0	N	19.25	NA	Small Hole in Top
Airport II Core 10	N	Y	0	N	18.75	NA	Spall on Top
Airport II Core 11	Y	Y	0	N	18.50	13.00	Spall on Top, Hole in Top
Airport II Core 12	Y	Y	2	N	18.00	12.50	
Diameter for all Airport II Cores is 4.5" (114.3mm)			0=None 1=Slight 2=Moderate 3=Severe				

Table 8: Core Catalog for Airport III

Core Label	Broken (Y/N)	Tining (Y/N)	Surface Cracking (0,1,2,3)	Visual ASR Gel (Y/N)	Length (in)	Broken At (in)	Notes
Airport II Core 100	Y	N	0	N	16.56	9.00	Slight Reaction Rims
Airport II Core 102	N	N	0	N	16.56	NA	Slight Reaction Rims
Airport II Core 103	Y	Y	2	N	15.63	7.00	Slight Reaction Rims
Airport II Core 104	Y	Y	0	N	16.38	7.50	Slight Reaction Rims
Airport II Core 105	Y	Y	1	N	18.44	4.50	Slight Reaction Rims
Airport II Core 106	N	Y	1	N	16.50	NA	Slight Reaction Rims, Air Voids on Side
Airport II Core 107	Y	Y	2	N	16.50	7.50	Slight Reaction Rims
Airport II Core 108	Y	Y	0	N	16.25	5.50	Slight Reaction Rims
Airport II Core 109	Y	Y	0	N	16.69	9.50	Slight Reaction Rims
Airport II Core 110	N	Y	2	N	15.88	NA	Slight Reaction Rims
Airport II Core 111	Y	Y	0	N	16.44	8.50	Slight Reaction Rims
Airport II Core 112	Y	Y	2	N	16.75	8.50	Slight Reaction Rims
Airport II Core 113	N	Y	1	N	16.19	NA	Slight Reaction Rims, Surface Cracking may be due to Transporting of Core
Airport II Core 114	Y	Y	3	N	16.38	7.50	Slight Reaction Rims
Diameter for all Airport III Cores is 4" (101.6mm)			0=None 1=Slight 2=Moderate 3=Severe				

Table 9: Core Catalog for Airport IV

Core Label	Broken (Y/N)	Tining (Y/N)	Surface Cracking (0,1,2,3)	Visual ASR Gel (Y/N)	Length (in)	Broken At (in)	Notes
Airport IV E5C1	Y	Y	2	Y	14.25	4.50	
Airport IV E5C2	Y	N	1	Y	13.75	3.50	
Airport IV E5C3	N	Y	1	Y	13.75	X	
Airport IV E5C4	Y	N	3	Y	13.75	2.63	Tie Bar
Airport IV E5C5	Y	Y	3	Y	13.50	6.88	Misplaced Tie Bar (At Bottom)
Airport IV E5C6	N	Y	2	Y	14.00	X	
Airport IV G1	N	N	0	N	15.13	X	Tie Bar
Airport IV G2	Y	N	2	Y	14.75	10.50	
Airport IV G3	N	N	1	N	14.88	X	
Airport IV G4	Y	N	3	Y	14.75	3.75	Dowel Bar
Airport IV DIP-1	N	N	2	N	8.25	X	Tie Bar
Airport IV DIP-2	N	N	3	N	9.25	X	
Airport IV DIP-3	N	N	2	N	9.00	X	Tie Bar and Brick
Airport IV E4C1	N	N	2	N	7.50	X	
Airport IV E4C2	Y	Y	1	Y	14.88	3.13	Tie Bar
Airport IV C7C1	N	N	2	N	13.88	X	
Airport IV C7C2	N	N	2	Y	14.25	X	Dowel Bar
Airport IV C7C3	N	N	0	N	13.88	X	
Airport IV C7C4	N	N	3	Y	13.75	X	
Diameter for all Airport IV Cores is 4" (101.6mm)			0=None 1=Slight 2=Moderate 3=Severe				

Table 10: Core Catalog for Airport V

Core Label	Broken (Y/N)	Tining (Y/N)	Surface Cracking 0,1,2,3)	Visual ASR Gel (Y/N)	Length (in)	Broken At (in)	Notes
Airport V Core 1	N	Y	0	Y	17.25	X	Small Metal Rod
Airport V Core 2	Y	N	1	N	18.00	11.00	Tie Bar and 1/2" Asphalt Layer
Airport V Core 3	N	Y	2	N	18.13	X	Tie Bar
Airport V Core 4	N	Y	2	Y	18.00	X	Tie Bar
Airport V Core 5	Y	N	3	Y	13.75	13.75	Tie Bar
Airport V Core 6	N	N	3	Y	18.00	X	
Airport V Core 7	N	Y	0	Y	17.00	X	Tie Bar, Dowel Bar, 1/2" Asphalt Layer
Airport V Core 8	N	N	0	N	15.50	X	Tie Bar
Airport V Core 9	N	N	3	Y	18.00	X	Tie Bar
Airport V Core 10	Y	N	3	Y	18.00	4.00	Tie Bar
Airport V Core 11	Y	X	X	Y	14.75	X	Top Destroyed during Coring
Airport V Core 12	Y	N	0	Y	13.50	2.00	Tie Bar
Diameter for all Airport V Cores is 3.75" (95.3mm)			0=None 1=Slight 2=Moderate 3=Severe				

Table 11: Core Catalog for Airport VI

Core Label	Broken (Y/N)	Tining (Y/N)	Surface Cracking (0,1,2,3)	Visual ASR Gel (Y/N)	Length (in)	Broken At (in)	Notes
Airport VI Bravo 1	N	N	2	Y	16.13	NA	6" ATB, Map Cracking
Airport VI Bravo 5	Y	N	3	N	15.38	Lengthwise	5" ATB, Cracked Lengthwise
Airport VI Foxtrot 2	N	N	2	N	16.38	NA	6 1/8" ATB, Lots of Clay
Airport VI Foxtrot 3	N	N	0	N	15.88	NA	6 3/8" ATB, Clay, Tie Bar @ 1"
Airport VI Foxtrot 5	N	N	3	N	17.75	NA	2" ATB
Airport VI Foxtrot 6	N	N	0	N	17.13	NA	2 1/4" ATB, Crack on Side
Airport VI Kilo 1	N	N	2	N	2.00	NA	Surface Cracking
Airport VI Runway 2	N	N	1	N	16.50	NA	4 3/4" ATB, 2 3/8 Depth of Crack
Airport VI Runway 4	N	N	2	N	2.00	NA	Full Depth Crack
Airport VI Runway 5	N	N	3	N	16.38	NA	ATB Falling Apart ~6"
Airport VI Runway 6	N	N	2	Y	16.13	NA	5" ATB, 9 3/8" Tie Bar
Airport VI Runway 7	N	Y	1	Y	16.38	NA	5 5/8" ATB, 8 1/2" Dowel Bar, Tie Bars Adjacent to Dowel Bar
Diameter for all Airport VI Cores is 5.75" (146.1mm)			0=None 1=Slight 2=Moderate 3=Severe				

Table 12: Core Catalog for Airport VII

Core Label	Broken (Y/N)	Tining (Y/N)	Surface Cracking (0,1,2,3)	Visual ASR Gel (Y/N)	Length (in)	Broken At (in)	Notes
A1	N	N	0	N	14.50	X	Top Cored Smaller
A2	Y	N	0	N	14.13	9.00	Top Cored Smaller
A3	N	N	2	N	14.00	X	Poor Compaction
A4	N	N	0	N	14.75	X	
A5	N	N	3	N	11.50	X	Cracked Full Length
D6	Y	N	1	N	14.00	6.50	Large Air Voids
D7	Y	N	1	N	12.00	3.25	Large Air Voids
D8	N	N	2	N	13.38	X	Large Air Voids
D9A	Y	N	1	N	13.75	4.25	
D10	N	N	0	N	11.75	X	Large Air Voids
Diameter for all Airport VII Cores is 4" (101.6mm)			0=None 1=Slight 2=Moderate 3=Severe				

Table 13: Core Catalog for Airport VIII

Core Label	Broken (Y/N)	Tining (Y/N)	Surface Cracking (0,1,2,3)	Visual ASR Gel (Y/N)	Length (in)	Broken At (in)	Notes
C1	Y	N	0	Y	15.25	10.00	R/W 1R North End, Medium Surface Wear
C2	N	N	0	Y	14.00	NA	R/W 1R North End, Medium Surface Wear
C3	N	Y	2	N	14.13	NA	R/W 1R Mid Section, Heavy Surface Wear
C4	N	Y	0	N	14.25	NA	R/W 1R Mid Section, Heavy Surface Wear, Large Air Voids on Side
C5	Y	Y	1	N	15.00	9.50	R/W 1R South End, Heavy Surface Wear
C6	Y	Y	0	N	15.13	14.00	R/W 1R South End, Heavy Surface Wear
C7	N	N	0	Y	14.13	NA	Gate A-26, Large Air Voids on Side
C8	Y	N	0	Y	19.50	12.00	Ground Control Tower & Opps. Building, Large Air Voids on Side, Connected to Other Cementitious Material
Diameter for all Airport VIII Cores is 3.75" (95.3mm)			0=None 1=Slight 2=Moderate 3=Severe				

Representative Core Visual Documentation

After the core catalog was completed digital photographs were taken of every core. A full-length photograph was taken along with four-inch incremental pictures for the full length of the core, followed by a photograph of the top surface. Special attention was paid to defects, anomalies, and artifacts of aggregate reactions such as cracks, rebar and tie bars, and AAR gel deposits. The following pictures are representative pictures of cores taken from each airport. For the sake of this reports length not all samples will be shown.