

**MICHIGAN AIRPORT DEVELOPMENT
PROGRAM PACKAGE
MDOT Airports Division**

**Ten Year Airport Capital Improvement Plan
2012-2022**

Prepared for:

**Antrim County Airport
Bellaire, Michigan**

December 2011

Contact:

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Antrim County Airport
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Bellaire, MI 49615
231-533-8524
fax 231-533-4096

Prepared by:

Mead&Hunt

**MICHIGAN STATE BLOCK GRANT PROGRAM
FIVE-YEAR AIRPORT CAPITAL IMPROVEMENT PROGRAM (CIP) FY-2012* to FY-2017**

*ACIP includes current development year (2012 already programmed - minor changes acceptable)

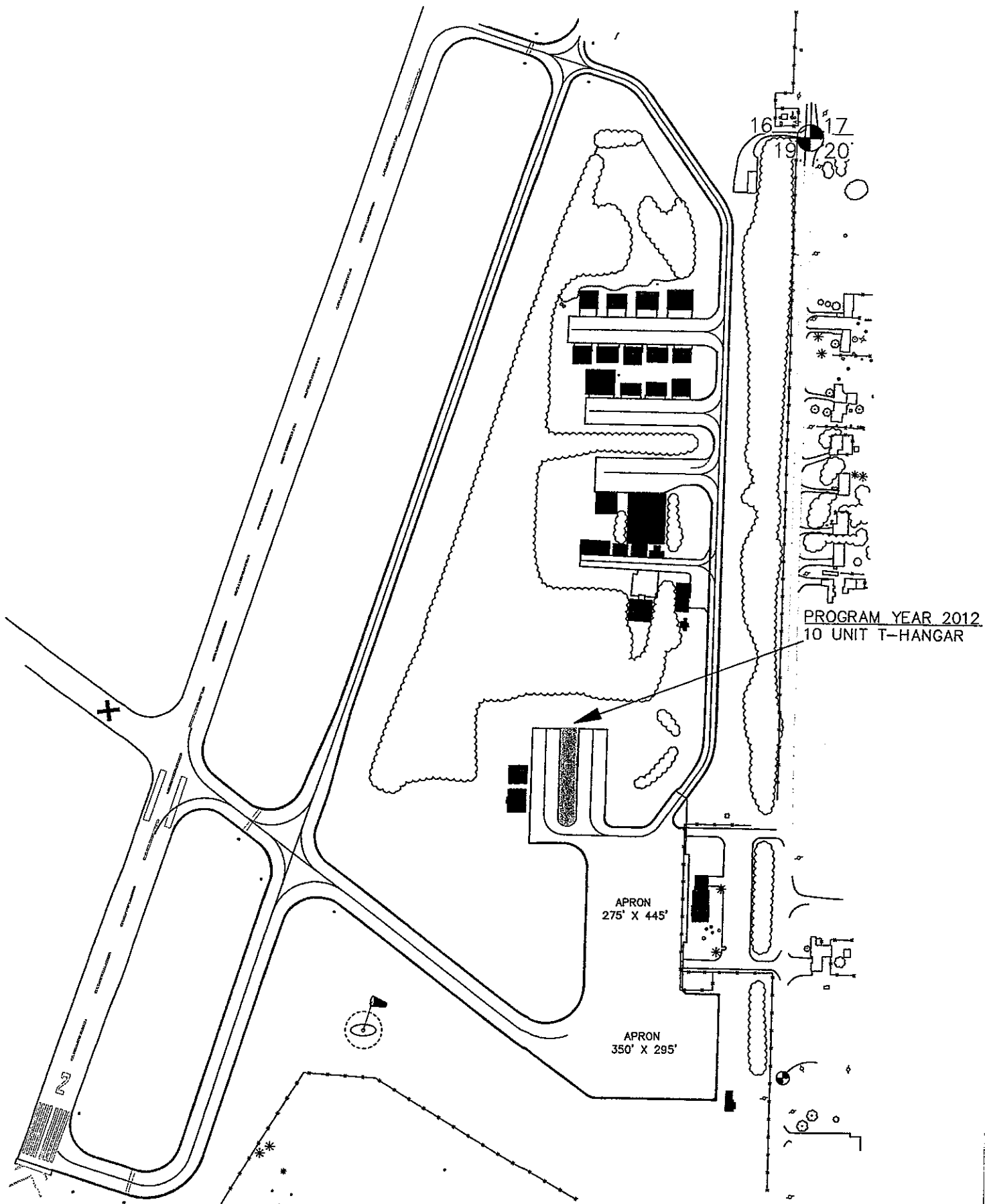
Airport Name: Antrim County Airport	Date prepared: 11/23/2011,
Associated City: Bellaire, Michigan	Prepared By: Mead & Hunt, Rodney Nettleton
Sponsor: Antrim County	Sponsor email address & phone: John Strehl, (strehlj@antrimcounty.org) (231) 533-8524

Airport Identifier: ACB		NIPIAS = C									Remarks/Item Justification - Provide as much detail as possible.
Development Year	Project Description	Shown on ALP*? (Yes or No)	ACIP Code**	NPIAS Priority Rating**	Federal Entitlements	Federal Apportionment	Federal Discretionary	State	Local	Total	
2012	Design 10 Unit T-Hangar	Yes	ST BD MS	31	\$26,600	\$0	\$0	\$700	\$700	\$28,000	To provide aircraft storage space for tenants
	Carryover \$122,000										
2013	Construct 10 Unit T-Hangar	Yes	ST BD MS	31	\$272,000	\$0	\$0	\$8,300	\$51,700	\$332,000	To provide aircraft storage space for tenants
2013	Airfield Pavement Marking	Yes	RE RW IM	68	\$0	\$33,250	\$0	\$875	\$875	\$35,000	Depends on condition.
	Carryover \$150,000										
2014											
2015	4 Bay SRE Building and Site Work	Yes	ST BD SN	38	\$300,000	\$21,100	\$0	\$8,450	\$8,450	\$338,000	To house 6 pieces of existing snow removal equipment.
2016	Runway 20 Approach Tree Clearing	Yes	ST OT OB	46	\$142,500	\$0	\$0	\$3,750	\$3,750	\$150,000	Depends on tree growth
	Carryover \$7,500										
2017	Rehabilitate Terminal Building (HVAC and Roof)	NA	CA TE IM	41	\$157,500	\$127,500	\$0	\$7,500	\$7,500	\$300,000	Depends on condition.

*Proposed airport development must be shown on current FAA-approved ALP prior to funding project.

**In accordance with FAA Order 5100.39A, Appendix 6 - Fields should be completed

(Refer to Airport Code spreadsheet provided on MDOT Aeronautics website under Block Grant Program for specific airport code)



PROGRAM YEAR 2012
10 UNIT T-HANGAR

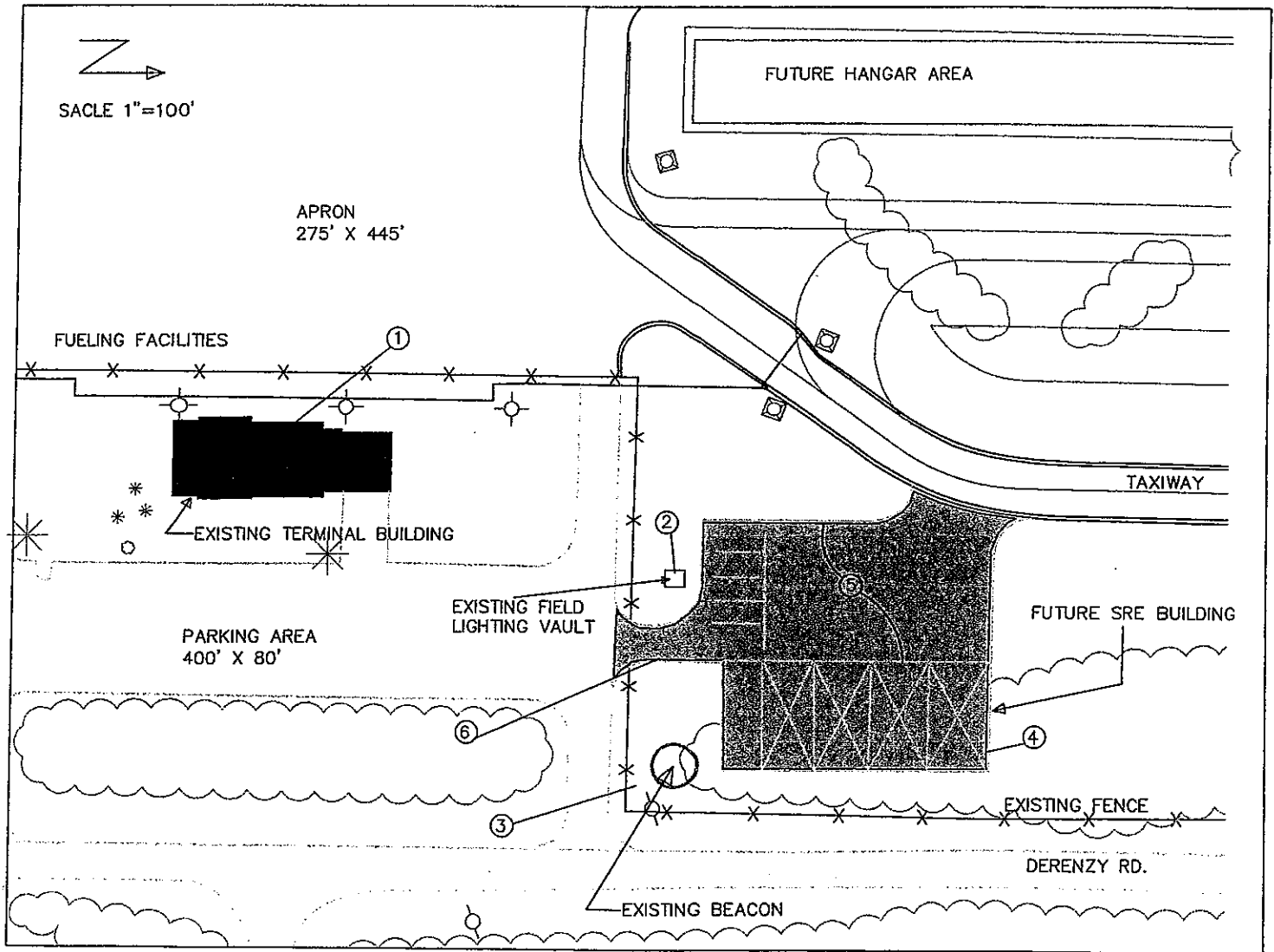
ANTRIM COUNTY AIRPORT										
5 YEAR PROGRAM										
2012										
PECKHAM ENGINEERING, INC.										
NO.	REVISIONS	BY	DATE	DRAWN	SLG	CHK.	REP.	DATE	02.11	SHT. 1 OF 1

ANTRIM COUNTY AIRPORT
4 BAY SRE BUILDING/SITE WORK

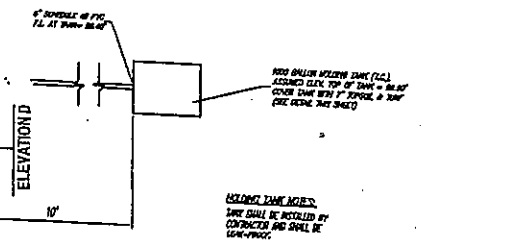
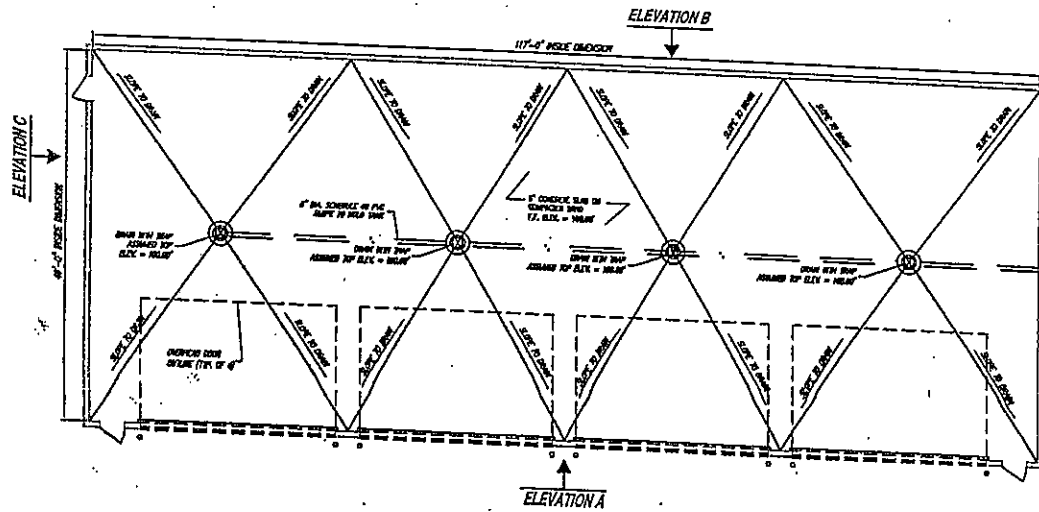
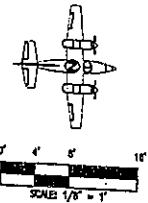
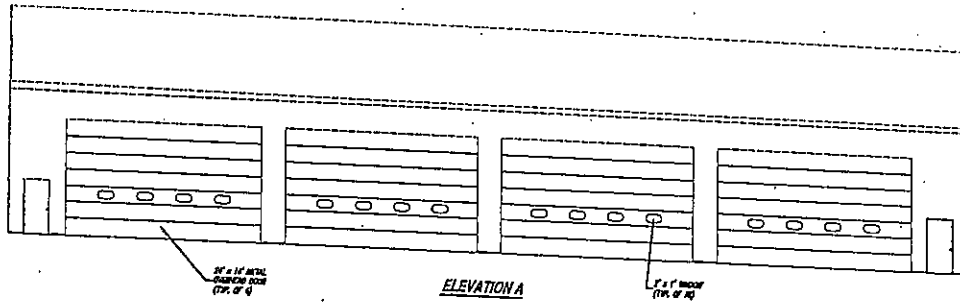
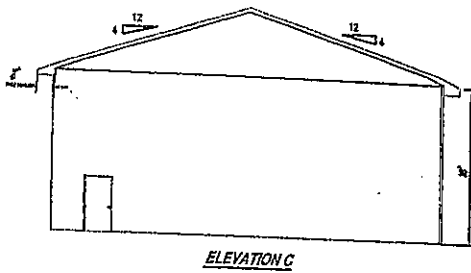


2014 PROGRAM

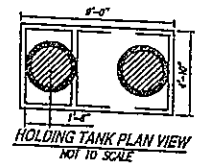
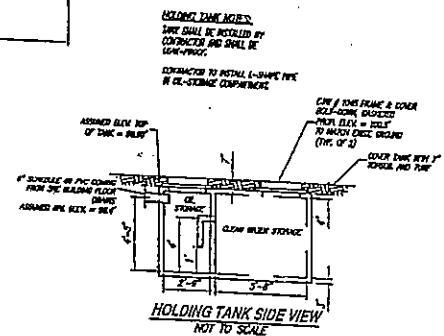
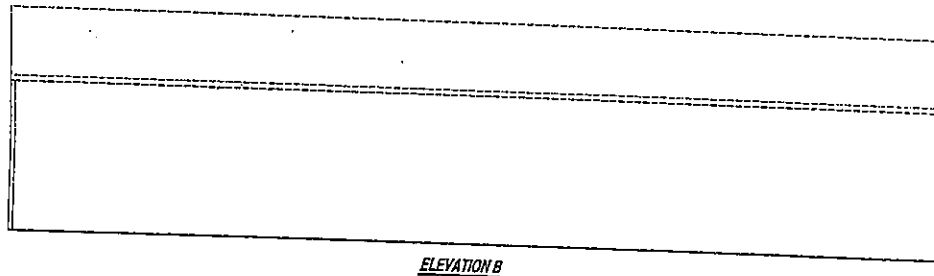
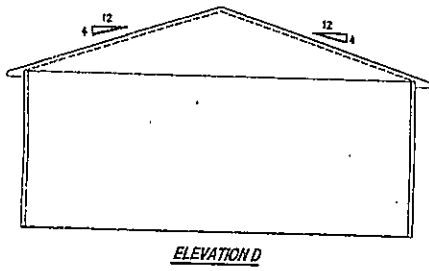
- 1) EXISTING TERMINAL BUILDING
- 2) EXISTING FIELD LIGHTING
- 3) EXISTING BEACON
- 4) FUTURE SRE/ARFF BUILDING
- 5) FUTURE APRON SRE BUILDING
- 6) FUTURE ACCESS DRIVE TO SRE BUILDING AND PARKING



ANTRIM COUNTY AIRPORT										
10 YEAR PROGRAM										
2014										
PECKHAM ENGINEERING, INC.										
NO.	REVISIONS	BY	DATE	DRAWN	SLG	CHK	RSP	DATE	SHT.	OF
								07-11	1	1



FLOOR PLAN
ASSUMED F.F. ELEV. = 700.50'



2011 PROGRAM
SRE STORAGE BUILDING
MANUFACTURING...

Snow Removal Equipment Calculations

1/2009

Airport Name:
 Location:
 Average Annual Snow Fall:
 Type of Airport:
 Annual Operations:

Enter data in yellow shaded cells

Gray shaded areas automatically calculated.

Time allowed for removal per AC 150/5200-30
 hours.

Critical Snow Removal Areas:

Primary Runway (usually one)

<input type="text" value="5,000"/>	length (ft) x	<input type="text" value="100"/>	width (ft)	=	<input type="text" value="500,000"/>	sq. ft.
	length (ft) x		width (ft)	=	<input type="text" value="0"/>	sq. ft.

Parallel taxiway and one or two principle connecting taxiways.

<input type="text" value="5,800"/>	length (ft) x	<input type="text" value="35"/>	width (ft)	=	<input type="text" value="203,000"/>	sq. ft.
<input type="text" value="1,200"/>	length (ft) x	<input type="text" value="35"/>	width (ft)	=	<input type="text" value="42,000"/>	sq. ft.
	length (ft) x		width (ft)	=	<input type="text" value="0"/>	sq. ft.
	length (ft) x		width (ft)	=	<input type="text" value="0"/>	sq. ft.

Terminal, Cargo, and General Aviation Aprons

Critical apron area assumed as 1/2 of the apron.

<input type="text" value="50"/>	% Req' x	<input type="text" value="600"/>	length (ft) x	<input type="text" value="75"/>	width (ft)	=	<input type="text" value="22,500"/>	sq. ft.
<input type="text" value="50"/>	% Req' x	<input type="text" value="750"/>	length (ft) x	<input type="text" value="300"/>	width (ft)	=	<input type="text" value="112,500"/>	sq. ft.
<input type="text" value="50"/>	% Req' x		length (ft) x		width (ft)	=	<input type="text" value="0"/>	sq. ft.
<input type="text" value="50"/>	% Req' x		length (ft) x		width (ft)	=	<input type="text" value="0"/>	sq. ft.
<input type="text" value="50"/>	% Req' x		length (ft) x		width (ft)	=	<input type="text" value="0"/>	sq. ft.

Other critical areas (ie. emergency or ARFF access roads)

<input type="text" value="825"/>	length (ft) x	<input type="text" value="20"/>	width (ft)	=	<input type="text" value="16,500"/>	sq. ft.	
	length (ft) x		width (ft)	=	<input type="text" value="0"/>	sq. ft.	
	length (ft) x		width (ft)	=	<input type="text" value="0"/>	sq. ft.	
Total Area					=	<input type="text" value="896,500"/>	sq. ft.

Snow Depth (in):
 Snow Density (lbs/cu. ft):
 Tons of Snow: tons

Rotary Plow

Rotary Plow Efficiency %:
 Minimum Rotary Plow snow removal rate: tons/hr

Displacement Plow

Operating Speed (mph):
 Plow Efficiency %:
 Plow Cutting Angle (degrees):

Effective Blade Length (ft) Required:
 Actual Blade Length (ft) Required:

Snowfall Maps

Antrim County Road Commission Snowfall
<http://www.antrimcounty.org/ac/snowfall.htm>

Eligible Items	Max Quantity	Size	
Rotary Plow	<input type="text" value="1"/>	<input type="text" value="222"/>	tons/hr Total
Displacement Plow	<input type="text" value="2"/>	<input type="text" value="10"/>	ft, Total
Sweeper	<input type="text" value="2"/>		
Hopper Spreader	<input type="text" value="2"/>		
Front End Loader	<input type="text" value="0"/>		

Assumptions Made:

Class 2 (up to 1500 tons/hr)
 Up to 2 times the # of snow blowers (plows should have equal capacity as max blower capacity).
 1 sweeper per 750,000 sq. ft. (rounded up)
 1 Hopper Spreader per 750,000 sq. ft.
 Front End Loader per 500,000 sq. ft. of critical apron space.

(See Figure 2-6 AC 150/5220-20 for GVW & HP rating @ carrier vehicles)

See AC 150/5220-20, Chapter 6, Paragraph 38 for minimum equipment requirements at CS and GA airports

Note: If an airport requests more than the listed quantities of snow removal equipment, special justification must be submitted.

This program assumes at least 90" annual snow fall.

Antrim County Average Snowfall

ANTRIM COUNTY ROAD COMMISSION

SNOWFALL

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	TOTAL
38 - 39	0.0	5.5	24.9	19.3	20.0	27.9	13.1	110.7
39 - 40	2.0	7.0	25.0	62.0	11.0	16.5	1.5	125.0
40 - 41	0.0	17.0	28.0	34.5	33.0	17.0	0.0	129.5
41 - 42	0.0	12.0	25.0	49.5	17.5	28.0	1.0	133.0
42 - 43	5.0	13.0	42.0	43.5	43.5	26.0	12.0	185.0
43 - 44	11.5	16.5	21.0	9.0	12.5	22.5	5.0	98.0
44 - 45	0.0	20.9	40.2	45.8	15.3	3.8	0.0	126.0
45 - 46	0.0	9.5	40.2	46.2	30.0	7.2	0.0	133.1
46 - 47	0.0	3.0	35.5	35.9	60.1	14.7	0.3	149.5
47 - 48	0.0	0.0	28.7	59.4	23.8	19.2	0.0	131.1
48 - 49	0.0	1.5	52.4	33.7	36.7	9.1	2.8	136.2
49 - 50	0.0	35.3	44.9	25.2	27.5	25.7	14.2	172.8
50 - 51	0.0	40.1	30.9	42.6	26.5	36.0	8.0	184.1
51 - 52	0.0	43.7	37.7	26.1	13.3	16.6	6.7	144.1
52 - 53	4.0	10.5	28.1	45.9	37.3	21.9	3.9	151.6
56 - 57	0.0	17.3	17.5	26.6	14.1	9.0	12.9	97.4
57 - 58	0.0	17.9	16.2	24.1	21.7	5.6	0.0	85.5
58 - 59	0.0	14.8	48.5	36.9	26.1	25.4	4.0	155.7
59 - 60	2.0	21.4	5.8	25.3	29.4	19.1	0.0	103.0
60 - 61	1.6	10.5	44.0	28.1	11.1	7.3	2.0	104.6
61 - 62	0.0	13.4	42.3	44.7	28.1	6.4	0.0	134.9
62 - 63	18.0	7.0	47.3	36.5	20.1	19.5	0.0	148.4
63 - 64	0.0	5.9	54.5	29.5	13.5	33.4	3.0	139.8
64 - 65	3.5	20.5	30.4	49.3	33.4	21.8	9.5	168.4
65 - 66	0.0	10.0	12.0	33.4	29.8	9.5	5.5	100.2
66 - 67	0.0	16.5	24.2	41.6	45.5	4.1	4.0	135.9
67 - 68	2.0	36.5	34.7	29.9	33.6	1.7	0.0	138.4
68 - 69	0.0	23.9	67.4	73.8	14.6	14.4	0.0	194.1
69 - 70	2.8	20.7	28.1	53.7	28.2	20.2	2.4	156.1
70 - 71	0.0	17.7	32.0	75.1	44.7	30.8	7.2	207.5
71 - 72	0.0	17.5	28.1	31.4	31.8	28.3	1.9	139.0
72 - 73	3.3	14.2	59.2	37.6	23.5	0.0	4.7	142.5
73 - 74	0.0	16.9	24.5	49.4	33.3	23.8	6.0	153.9
74 - 75	4.4	17.0	28.1	63.1	48.0	46.4	0.2	207.2
75 - 76	0.0	5.5	44.2	56.0	40.5	31.9	1.6	179.7
76 - 77	1.0	47.9	53.8	67.7	29.3	12.6	8.4	220.7
77 - 78	0.0	26.6	56.6	62.1	25.6	7.6	0.3	178.8
78 - 79	0.0	10.8	58.9	76.8	31.6	12.8	6.0	196.9
79 - 80	0.0	15.6	19.4	43.3	24.7	17.2	14.2	134.4
80 - 81	2.3	9.8	68.2	40.4	44.4	12.6	0.0	177.7
81 - 82	6.8	5.1	38.4	86.4	14.4	16.3	8.1	175.5
82 - 83	0.0	15.9	13.5	26.0	15.0	10.0	6.0	86.4
83 - 84	0.0	9.9	84.4	40.7	8.6	14.3	2.6	160.5
84 - 85	0.0	3.5	32.7	63.5	47.1	18.8	11.3	176.9

85 - 86	0.0	19.7	97.1	30.9	13.0	18.3	2.2	181.2
86 - 87	0.0	17.4	31.4	28.8	10.5	6.8	8.0	102.9
87 - 88	3.5	17.5	27.3	43.8	48.9	20.6	2.0	163.6
88 - 89	9.8	9.2	52.4	42.2	43.0	36.4	4.2	197.2
89 - 90	2.5	41.8	58.7	48.5	12.3	7.2	4.5	175.5
90 - 91	0.0	17.5	40.5	52.5	34.5	10.5	5.5	161.0
91 - 92	2.0	32.5	41.0	36.7	26.8	8.5	8.0	155.5
92 - 93	8.8	32.5	55.2	38.0	39.0	6.5	8.5	188.5
93 - 94	1.0	11.5	51.0	71.5	24.0	15.0	6.0	180.0
94 - 95	0.0	18.0	6.0	48.5	44.0	14.5	4.1	135.1
95 - 96	0.0	66.5	75.5	42.5	29.5	19.0	12.0	245.0
96 - 97	0.0	57.5	47.0	74.5	35.5	22.0	8.5	245.0
97 - 98	3.5	20.5	14.5	38.5	1.0	27.5	0.0	105.5
98 - 99	0.0	5.5	42.5	56.5	14.0	13.0	4.0	135.5
99 - 00	0.5	2.0	37.5	42.0	19.5	2.0	1.5	105.0
00 - 01	0.0	45.5	59.5	20.5	31.0	31.5	2.0	190.0
01 - 02	2.0	1.0	56.5	21.5	29.5	22.0	9.0	141.5
02 - 03	1.0	13.0	21.0	75.0	31.0	9.5	10.5	161.0
03 - 04	2.0	0.0	20.5	103.0	23.0	9.5	0.0	158.0
04 - 05	0.0	4.0	47.5	24.5	24.0	18.0	1.5	119.5
05 - 06	0.0	33.0	48.5	29.0	52.5	2.5	2.5	168.0
06 - 07	8.5	3.0	49.5	35.0	51.5	11.5	13.0	172.0
07 - 08	0.0	17.0	42.0	47.0	40.5			146.5
AVERAGE	1.7	17.8	39.4	44.5	28.3	16.7	4.7	152.9



AIRPORT MASTER RECORD

> 1 ASSOC CITY: BELLAIRE 4 STATE: MI LOC ID: ACB FAA SITE NR: 09562.*A
> 2 AIRPORT NAME: ANTRIM COUNTY 5 COUNTY: ANTRIM MI
> 3 CBD TO AIRPORT (NM): 01 NE 6 REGION/ADO: AGL/DET 7 SECT AERO CHT: GREEN BAY

GENERAL

10 OWNERSHIP: PU
> 11 OWNER: ANTRIM COUNTY
> 12 ADDRESS: PO BOX 520, 230 E CAYUGA
BELLAIRE, MI 49815
> 13 PHONE NR: 231-533-6353
> 14 MANAGER: JOHN C. STREHL
> 15 ADDRESS: 3366A DERENZY RD
BELLAIRE, MI 49815
> 16 PHONE NR: 231-533-8524
> 17 ATTENDANCE SCHEDULE:
JUN-SEP ALL 0800-1800
OCT-MAY ALL 0700-1700

SERVICES

> 70 FUEL: 100LL A
> 71 AIRFRAME RPRS:
> 72 PWR PLANT RPRS:
> 73 BOTTLE OXYGEN:
> 74 BULK OXYGEN:
75 TSNT STORAGE: HGR
76 OTHER SERVICES:

BASED AIRCRAFT

90 SINGLE ENG: 23
91 MULTI ENG: 0
92 JET: 0
TOTAL: 23
93 HELICOPTERS: 0
94 GLIDERS: 0
95 MILITARY: 0
96 ULTRA-LIGHT: 0

18 AIRPORT USE: PUBLIC
19 ARPT LAT: 44-59-18.8740N ESTIMATED
20 ARPT LONG: 085-11-54.0780W
21 ARPT ELEV: 623 SURVEYED
22 ACREAGE: 363
> 23 RIGHT TRAFFIC: NO
> 24 NON-COMM LANDING: YES
25 NPIAS/FED AGREEMENTS:NGY
> 26 FAR 139 INDEX:

FACILITIES

> 80 ARPT BCN: CG
> 81 ARPT LGT SKED: DUSK-DAWN
> 82 UNICOM: 122.700
> 83 WIND INDICATOR: YES-L
84 SEGMENTED CIRCLE: YES
85 CONTROL TWR: NONE
86 FSS: LANSING
87 FSS ON ARPT: NO
88 FSS PHONE NR:
89 TOLL FREE NR: 1-800-WX-BRIEF

OPERATIONS

100 AIR CARRIER: 0
102 AIR TAXI: 0
103 G A LOCAL: 2,300
104 G A ITNRNT: 2,300
105 MILITARY: 0
TOTAL: 4,600
OPERATIONS FOR 12 MONTHS ENDING 12/31/2007

RUNWAY DATA

> 30 RUNWAY IDENT: 02/20
> 31 LENGTH: 5,000
> 32 WIDTH: 100
> 33 SURF TYPE-COND: ASPH-F
> 34 SURF TREATMENT:
35 GROSS WT: SW 38.0
36 (IN THSDS) DW 55.0
37 DTW
38 DDTW
> 39 PCN:

LIGHTING/APCH AIDS

> 40 EDGE INTENSITY: MED
> 42 RWY MARK TYPE-COND: PIR - F / PIR - F - / - - / - / -
> 43 VGS: P4L / P2L / / /
44 THR CROSSING HGT: 42 / 45 / / /
45 VISUAL GLIDE ANGLE: 3.00 / 3.25 / / /
> 46 CNTRLN-TDZ: N - N / N - N - / - - - / - / -
> 47 RVR-RVV: - N / - N - / - - - / - / -
> 48 REIL: Y / Y / / /
> 49 APCH LIGHTS: / / / /

OBSTRUCTION DATA

50 FAR 77 CATEGORY: C / B(V) / / /
> 51 DISPLACED THR: / / / /
> 52 CTLG OBSTN: TREE / TREES / / /
> 53 OBSTN MARKED/LGTD: / / / /
> 54 HGT ABOVE RWY END: 65 / 89 / / /
> 55 DIST FROM RWY END: 1,650 / 2,895 / / /
> 56 CNTRLN OFFSET: 0B / 384L / / /
57 OBSTN CLNC SLOPE: 22:1 / 30:1 / / /
58 CLOSE-IN OBSTN: N / N / / /

DECLARED DISTANCES

> 60 TAKE OFF RUN AVBL (TORA): / / / /
> 61 TAKE OFF DIST AVBL (TODA): / / / /
> 62 ACLT STOP DIST AVBL (ASDA): / / / /
> 63 LNDG DIST AVBL (LDA): / / / /

(>) ARPT MGR PLEASE ADVISE FSS IN ITEM 86 WHEN CHANGES OCCUR TO ITEMS PRECEDED BY >

> 110 REMARKS:

- A 024 LNDG FEE APPLIES TO TURBINE & JET ENGINE ACFT; WAIVED WITH 100 GALLON FUEL PURCHASE.
- A 070 FOR FUEL OTHER TIMES CALL 231-536-7017.
- A 081 MIRL RY 02/20 PRESET; TO INCR INTST & ACTVT REIL RY 02/20 - CTAF.
- A 083 LGTD SUPPLEMENTAL WIND CONES EACH END RY 02 & 20.
- A 110 THIS AIRPORT HAS BEEN SURVEYED BY THE NATIONAL GEODETIC SURVEY.
- A 110 GCO AVBL ON FREQ 121.725 THRU MINNEAPOLIS ARTCC CD & FLT SVCS.
- A 110-1 BIRDS ON & INVOF ARPT.

CHAPTER 6. SELECTION OF ROTARY AND DISPLACEMENT PLOWS.

37. DESCRIPTION. This chapter provides guidance in the selection of rotary and displacement plows under varying winter operational conditions. It is intended to familiarize the operator with the graphs and tables discussed earlier for use in determining displacement plow geometrics and rotary plow capacities. Several practical examples are discussed including a mathematical analyses that involves a number of variables including snow density, plow efficiency, and equipment speed.

38. MINIMUM EQUIPMENT REQUIREMENTS.

a. **Commercial Service Airports.** For commercial service airports that provide scheduled air carrier service and experience snow conditions as presented in AC 150/5200-30A, at least one high-speed rotary snowplow is recommended. This plow should be supplemented with at least two displacement plows having equal capacity. In addition to this equipment, for each 750,000 ft² (70 000 m²) of primary pavement area, one towed or self propelled air-blast power sweeper and one hopper spreader for abrasives and solid de-icing chemical should be provided. If liquid de-icing chemical is used in lieu of, or in addition to, solid chemical, a minimum of one liquid spreader vehicle is recommended.

b. **Non-commercial Service Airports.** For non-commercial service airports having 10,000 or fewer annual operations and an annual snowfall of 30 inches (.76 m) or less, a minimum of one displacement plow should be provided. Airports having more than 30 inches (.76 m) of snow or those with over 10,000 operations and at least 15 inches (.38 m) of snow should have a minimum of one high-speed rotary plow supported by two displacement plows of equal capacity.

c. **Supporting Equipment.** Support vehicles such as sweepers and wheel loaders are usually needed to complete the removal of snow from all operational areas including secondary runways, taxiways, and ramp aprons.

39. DISPLACEMENT PLOW/VEHICLE COMPATIBILITY. A displacement plow must be properly paired with its carrier vehicle to achieve maximum operational performance. The level of performance between the two units is directly proportional to the type, size and weight of the plow and the power and weight of the vehicle. Figure 3-2, Carrier Vehicle Power versus Moldboard Length, provides a graphical representation of the vehicle power/displacement plow length relationship.

40. SELECTING A ROTARY PLOW FOR COMMERCIAL AND NON-COMMERCIAL SERVICE AIRPORTS.

In this example, an airport operator of a commercial service airport having an annual activity level of 35,000 operations wants to acquire a rotary plow for the upcoming winter season. Determine the size of the rotary plow needed based on the following conditions:

a. The airport snowplan calls for removal operations to begin when one inch of snow accumulates on the runway.

b. AC 150/5200-30A states that the primary surface area of this airport should be cleared in one hour.

c. Snow density is 25 lb/ft³ (400 kg/m³)-industry accepted standard.

GRAPHICAL SOLUTION

Step 1. Determine the size of the primary area to be cleared.

Location	Area
Main runway (9000 ft x 150 ft)	1,350,000 ft ²
Taxiways	187,000
Fillets	20,000
AARF apron and roads	20,000
Apron	40,000
Blast pads	60,000
Miscellaneous	20,000

Total primary area to be cleared 1,697,000 ft²

Note: For calculation purposes, the area may be rounded off to 1,700,000 ft² (158 000 m²).