



Memorandum

TO: Mike Garrity, P.E., Jacobs
FROM: Amy M. Ball
DATE: January 23, 2013
RE: Coastal Floodplain Minimum Performance Standard CR2.4

In response to concerns expressed by Cape Cod Commission (CCC) Staff regarding the potential for adverse impacts within coastal resources, the Horsley Witten Group, Inc. (HW) has compiled the following data for consideration.

Specifically, CCC Staff has expressed concerns over whether the Provincetown Municipal Airport (Airport) would meet the following Minimum Performance Standards (MPSs) within the most recent Regional Policy Plan (RPP):

CR2.2 Accommodating Relative Sea-level Rise

All new buildings, including replacements, or substantial improvements to existing structures shall be designed as follows to accommodate documented relative sea-level rise rates in Massachusetts:

- 1. Within A-Zones, the lowest horizontal structural member shall be a minimum of one foot above Base Flood Elevation (BFE); or*
- 2. Within V-Zones, due to wave action, the lowest horizontal structural member shall be a minimum of two feet above BFE.*

and

CR2.4 Damage Prevention and Flood Minimization

To maintain the storm damage prevention and flood control functions of Land Subject to Coastal Storm Flowage (LSCSF):

- 1. No activity within a V-Zone shall increase the existing site elevations; and*
- 2. No activity within a V- or A-Zone shall increase the velocity of flood waters or increase flows due to a change in drainage or flowage characteristics on the subject site, adjacent properties, or any public or private way; and*
- 3. Placement of fill in hydraulically constricted areas shall not be permitted.*

The Airport proposes as one of its Capital Improvement Program (CIP) project elements to raze and reconstruct the existing terminal building to better accommodate existing and projected future demands for airport passengers and staff, including the Transportation Security Administration (TSA). In order to accommodate CR2.2, the Airport will be required to elevate the reconstructed terminal building approximately three feet above its existing grade. A number of alternatives have

been explored to accommodate CR2.2 while also addressing ADA compliance. It has been concluded by the Project Design Team, that this would necessitate adding fill to raise the existing elevations beneath the terminal itself as well as portions of the existing adjacent parking area. Jacobs has estimated that this will require the introduction of approximately 2400 CY of fill material within the 100-year coastal flood zone (A-zone).

It is our understanding that the CCC has expressed a concern is that this might have the potential to “increase the velocity of flood waters or increase flows due to a change in drainage or flowage characteristics on the subject site, adjacent properties, or any public or private way.” It is our assessment that the proposed terminal reconstruction and parking areas are not located within hydraulically restricted areas, and that there is virtually no chance of a measurable increase in either the velocity or flow rate of floodwaters associated with the project. To illustrate this HW evaluated the amount of the proposed fill in association with the total floodplain volume in the immediate area of Hatches Harbor in Provincetown.

Methodology

HW uploaded available LiDAR (Light Detection And Ranging) data for the Provincetown area from MassGIS and converted these data to a terrain model surface. Additional terrain surfaces were created using the defined elevation data of each existing flood zone from a GIS database (i.e., Zone V4, Zone A4, and Zone A2). These terrain surfaces were then compared individually to create the approximate flood volume storage shown on the attached figure and within the table below.

For simplicity, HW created somewhat artificial limits of the flood areas, using Race Point Road and the two major dune ridges on either side of the airfield to define the study area, and extending the study area or coastal flood basin out to the Atlantic Ocean. As such, the limit of available flood storage is actually greater than calculated.

Results

HW calculated the available flood storage volume within the study area to be approximately 15.5 million cubic yards (CY).

Table 1. Available flood storage volumes within study area at Provincetown Municipal Airport.

Volume Summary					
Name	Type	Cut Factor	Fill Factor	Approximate Area (SF)	Available Flood Storage Volume (CY)
ZONE A2 EL-10 VOLUMES	full	1	1	50,942,966	6,800,203
ZONE A4 EL-11 VOLUMES	full	1	1	17,441,210	4,302,178
ZONE V4 EL-13 VOLUMES	full	1	1	10,506,439	3,523,416
ZONE V4 EL-15 VOLUMES	full	1	1	2,162,434	910,313
Total				81,053,049	15,536,110

Mike Garrity, P.E.

January 23, 2013

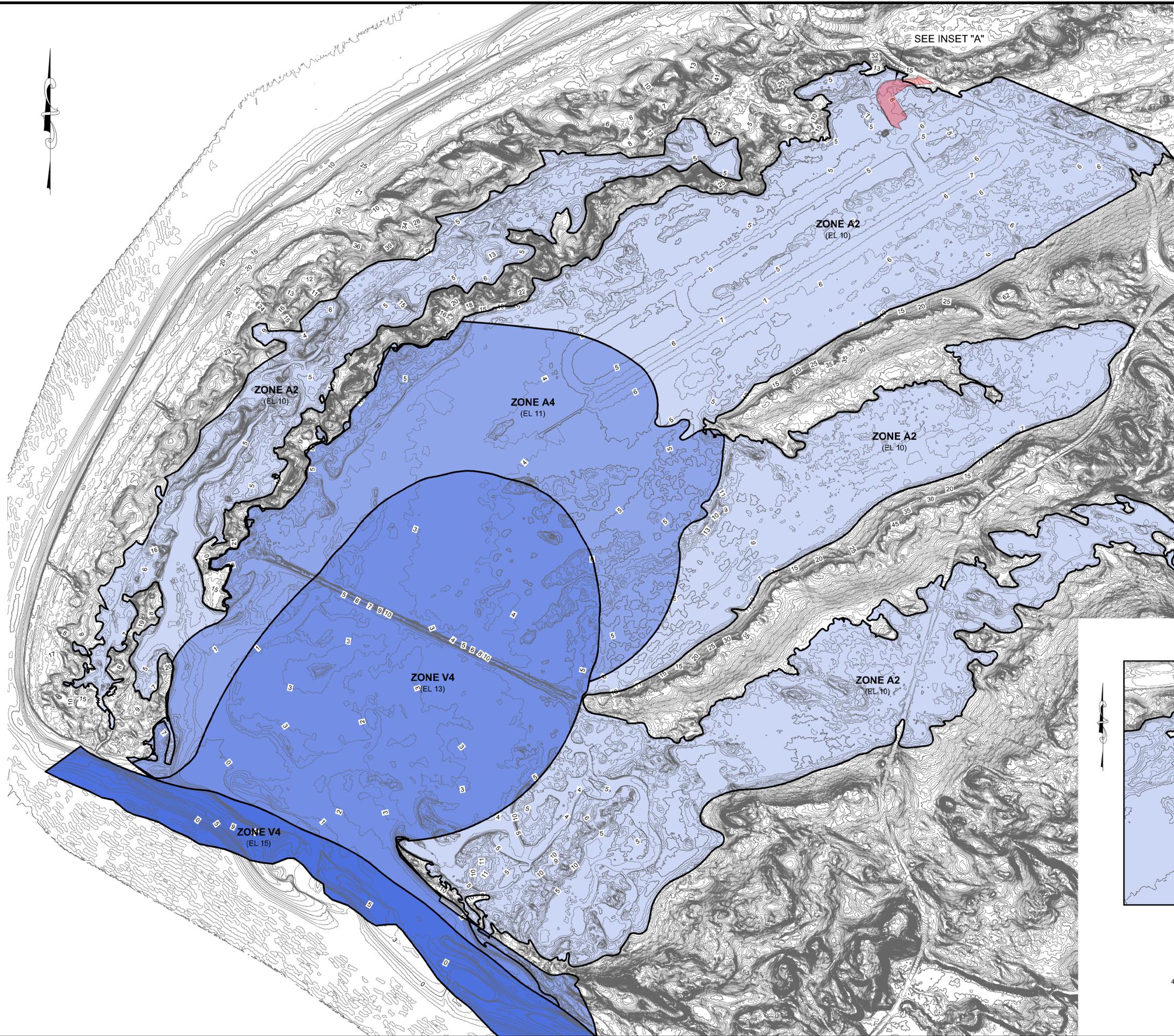
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Discussion

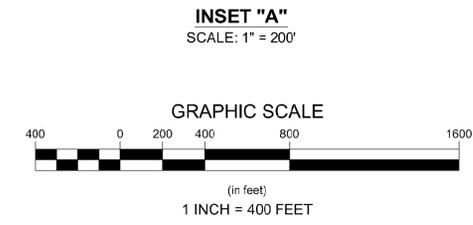
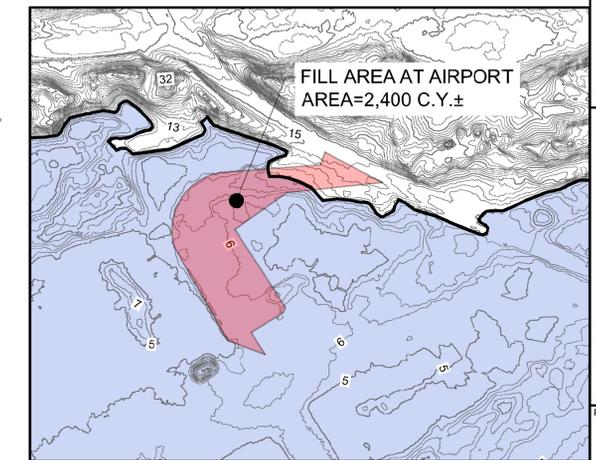
The proposed fill within the coastal floodplain would account for approximately 0.015% of the available flood storage within the study area. Given this magnitude and its location well within the “backwater” area of Hatches Harbor, the proposed fill required to meet the standards for MPS CR2.2 will have virtually no change on the velocity of flood waters or result in an increase in flows or flow characteristics at the Airport. In addition, there will be no new impacts to the surrounding resource areas or on adjacent properties (e.g., on NPS facilities).

Please do not hesitate to contact HW with any questions.

last modified: 01/18/13 by Mc H:\Projects\2004\4027 E&P-Town Airport\Drawings-4027\REVISED FLOOD ZONES.dwg



NOTE:
CONTOURS TAKEN FROM LIDAR DATA PROVIDED BY MASS GIS AND IS NOT THE RESULT OF A GROUND SURVEY BY THE HORSLEY WITTEN GROUP.



Revisions	Date	By	Appr	Description

Horsley Witten Group, Inc.
Sustainable Environmental Solutions
80 Route 6A
Sandwich, MA 02563
508-833-6600 voice
508-833-3150 fax

Drawn By: MJC
Checked By: AB
Date: JAN 18, 2013

Plan Set:
**PROVINCETOWN AIRPORT
FLOOD PLAIN VOLUME ASSESSMENT
PROVINCETOWN, MASSACHUSETTS**

Plan Title:
FLOOD ZONE ASSESSMENT AREA

Prepared For:
**Jacobs Engineering Group
Inc.**
343 Congress Street
Boston MA 02210
Phone: (617) 542-9222
Fax: ----

Survey Provided By:
Registration:
Phone: ----
Fax: ----
Direct: ----

**DRAFT
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Project Number: 4027
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