Summary #3 of Damage to Marginal Way
Nor'easter March 3-5, 2018
Edited 3.29.18

The nor'easter in early March 2018 that coincided with astronomical high tides, 50 MPH on-shore winds seemed at first glance to have little effect on the Marginal Way. There was debris – gravel, stones, soil scattered everywhere across the path from Little Beach to the Cove, but the asphalt paving seemed intact for the most part. Larger rocks were tossed across the path at the new Lighthouse revetment site.

However, closer inspection revealed multiple areas where earth embankments were washed out and rocks supporting this soil had been ripped away. These sites are now exposed to future serious erosion that will eventually threaten the stability of the path.

Twenty-seven points along the path are noted below that need minor to major remediation. A large number of these sites are, as one would expect, clustered at the headland between Bench 29 (Plaque and Geology sign island) and the Foot Bridge.

The 27 points are marked on the two sections of the Town GIS maps for the MW. Blue hatch lines also delineate many areas were waves washed well inland beyond the asphalt path.

The first preliminary assessment of conditions was collected on Tuesday March 6, after walking the MW with Darren Dixon, Ogunquit Administrative Services, and stonemason Kevin Garfield. Kevin has worked on multiple projects on the MW, building retaining walls such as the one south of Bench 31 and his walls held up perfectly during this storm. He understand the aesthetics required for work on the MW – the type and color of stone that blends into this environment, as well as the structural strength needed in this challenging setting.

Note: From Bench 29 around the headland (that runs in front of the Plaque/Geology Sign island) extending to the Foot Bridge, there are multiple spots where some type of reinforcement will be needed to secure the path. On this Northeast exposure of the Marginal Way, waves came on shore well past the plaque stones and washed out soil high up behind the bridge. Wave action bare-rooted shrubs and ripped large bushes completely out of the ground.

Whether or not this recent nor'easter is the new 'norm' for coastal storms, the path is in need of immediate remediation.

New additional notes in BLUE

Areas to be marked off to preserve embankments or path in RED

1. PRIORITY - Lower section of railings to Little Beach. Find out from fence company if lower sections can be constructed so they can be removed each winter.

2. PRIORITY - Lower sections of railings to staircase broken away at Mother's Beach. These railings are particularly vulnerable and have been broken apart almost yearly since installation. Devise different fastening system and remove them for the winter? People still go down onto the beach year round, no matter what.

3. South of Bench 8, reinforcement needed behind bushes where soil eroded. Extension of rocks that should be added to protect path at site #4

From S side of Bench platform (which needs more rocks in front of it) going N –
157' to bushes,
170' if go behind bushes.

Do not remove more vegetation.

4. HIGH PRIORITY - At base of Israel Head Rd. and Stearns Rd., erosion on ocean side of paving. Large rocks were dislodged, and soil was washed out under paving 6" to 18". Needs stronger longer lasting reinforcement of asphalt than just stone dust and gravel. Some type of revetment may be needed here. We must preserve access to cobble beach.

By 3.23.18, unsupported paving has **collapsed. 16'**

5. Along Lighthouse revetment, free up and raise the landscape cloth that is meant to hold the soil from leaching out into the rocks. The storm shifted many revetment rocks onto the cloth and buried the cloth in places so that it is well below soil level.

More soil will be needed in planting area.

Pavement broken in front of Peloquin home

Serious erosion starting in front of Feldman home. Cloth buried, soil drops off.

6. Bench 12 – place more stones in front of bench platform extending south from the revetment. Despite the huge natural outcrop next to the bench, this site experienced significant wave action that shifted and moved rocks away from the platform.

Place landscape cloth at N side of bench apron to hold soil line

On S side platform, fill in – reinforce at corner cut in.

NEW SITE TO CONSIDER FOR REMEDIATION: In front of Bench 16, oceanside – rocks torn away from that embankment. Fragile edge.

Rope off and post as fragile edge

* NOTE: Overwash in front of Bench 20 oceanside. More plant material in front of retaining wall could absorb and slow water flow (just N of Cherry at ravine). Not urgent now.

7. Bench 22 - Erosion of soil at base of platform as well as the area to the north of bench (right side of photo). How prevent further erosion?

Rope off and post fragile edge here

8. Benches 23 & 24 – LOW priority now. The rock surrounding the bench platform has, as our geology consultant Arthur Hussey said, a very weak crumbly quality that will continue to break apart, leaving the platform vulnerable. Gather ideas of how to stabilize the ground around the platform.

ATTENTION Now: In the top left hand corner of photo, the edge of the asphalt where it drops off going in to the benches needs to be reinforced. A gully has formed because of water runoff.

Patch edge of path to reinforce.

How to slow water runoff?

9. Bench 25 – Six feet in front of the bench platform, serious undercutting of soil. Need to stabilize and preserve the earth embankment that we still have. Otherwise, there will eventually be a sharp dropoff from the bench apron

Rope off and post as a fragile edge in front of bench so that we do not lose any more ground.

10. **PRIORITY** - 'Winterberry meadow' - Oceanside, south of Bench 25. This small area is one of only two spots on the path that is continually moist. Because of this moisture, we find the only Marsh fern on the path, as well as an impressive old stand of native Winterberry that we want to preserve, as well as what remains of the grass area. Access difficult to bring in material. Solutions suggested: large rocks *carefully* placed and pinned (not just *dumping* rocks) to hold the ground, *or* a wall. Any wall will need sufficient weep holes to deal with existing wet conditions as well as storm runoff.

Rope off edge as fragile to prevent further breakdown of loose rocks and grass edges

Detail of erosion on left side of above photo.

Save these plants!

NEW:

In front of Bench 26, line of old riprap on Oceanside – runoff is causing lose of soil/gravel between riprap stones. One idea offered: slow water runoff and prevent further soil erosion by placing pieces of landscape cloth between large boulders and then using graduated sizes of gravel to fill in crevices?

More washouts between large boulders just as path divides at the Plaque island.

Additional washouts in front of Oarweed Restaurant, Perkins Cove

11. Bench 29 – **HIGH PRIORITY** - Soil and rocks washed away at base of bench apron. *Severe* erosion to the south of the bench, coming very close to edge of paving. One Suggestion: build a wall out beyond apron, following the contours of the land, and get pinned to existing native rock. **13-15' long, varying from 2 to 4' high**.

Rope off and post south of the bench to prevent further loss of embankment.

Looking down from path at steep drop off south of B 29. Loose stones and soil will break down easily if people use this spot to climb down to the rocks and tidal pools below. Must preserve and reinforce this existing edge of path.

12. Bench 30 – small but careful repair of missing stones in apron.

ATTENTION: Plantings at Plaque area – tidy up, cut down goldenrod, add more mulch where washed away.

13. Between Benches 30 & 31 – washout on the north (left side) of the clump of bushes. How to stabilize this drop off? How to support the path shoulder that has washed out?

***N of bench, **8'** of curbing as immediate support of edge of macadam needed.

Rope off and post edge of path.

14. Bench 31 – **PRIORITY** to the north of the bench, a steep drop off of earth. How to protect bench platform and earth embankment on N side?

N side of bench platform –embankment breaking down (buffer for the bench)
S side of bench platform – washout - loose rocks that have broken apart from larger formations jeopardize embankment and platform on this side.

Rope off and post fragile edge North of bench

15. In front of Plaque site – S of Bench 31 (right side photo)- severe erosion from B31 to north end of "Rose" wall (rose bushes planted behind wall) – far left in photo. The rose wall was built about 5 or 6 years ago.

18-20' from N end of Rose wall (far left) to old stone work –reinforce at S end of B 31 (right side photo)

16. ROSE WALL ATTENTION:
Additional soil must be backfilled into the area behind the Rose wall where several inches of dirt were washed out and roses are bare rooted. Add mulch.

***S end of wall – **10'** of asphalt edge of path has no support under it. There is 6" drop from paving to soil level. Here, as with other similar spots, find a solution for edges of path.

S end of wall – connect end of wall into path with more stones where broken.

At N base of wall – cement does not go all the way down onto rock base – this needs repairing.

17. **HIGH PRIORITY** – Suggested: construct a new wall connecting the south end of the Rose wall to the "Curvy" wall (far left in photo), just north of Bench 33. - Extending the new wall around earth bluff with Sumac and backfilling will stabilize and reinforce the pavement where it has been under cut. Extend to #18 at Bench 33 (below). Total length approx.. **100'. E**dge of asphalt needs to be filled in underneath and reinforced for support.

Rope off from inside Rose wall past Curvy wall to protect remaining earth.

18. Serious erosion between S end of Curvy wall (right side photo) to Bench 33.

Rope and post from Rose wall area continuing past this section to protect earth embankment until repair solutions

ATTENTION: Short wall in front of B34 may need small fix at N end to slow erosion.

19. Oceanside in front of Bench 34, (at north end of existing short wall) - support shoulder edge of asphalt so the edge does not break off.

20. Site with three crabapple trees – most of the soil has been washed out at the base of the trees, leaving roots exposed. Challenge – how to add more soil to save trees and keep soil in place? Long term, possibility of installing a low barrier going in front of trees, stopping at old bayberry to the south, then fill in more soil around trees.

Suggested: Short term – a coir log with large stones behind it to hold log in place?

21. SERIOUS erosion– sharp drop off along Oceanside of paving 65' N of Bridge. **Extends 44'** from cemented stones – red flag – south across rubble of broken stones to next short wall (N of Bridge).

Rope off and post dangerous edge from 65' N of Footbridge to the Bridge

22. SERIOUS - deep washout behind the existing short wall, 35’ north of the Bridge.

Suggestion offered: extend wall S past Cedar/Honeysuckle.

NEW: N Oceanside of Bridge abutment was washed out – tie back into path to protect from further erosion – **5’.** The asphalt shoulder dropoff needs remediation.

23. Just south of the Bridge Oceanside abutment, behind a small Cedar, the bank is seriously undercut. Can best be seen from the north side of the Bridge. How best to resolve?

NEW: check Footbridge footings, especially inland north corner post. Gap between concrete footer and existing rock base.

24. South of the Cedar Grove, in front of the Fletcher home (north of Bench 37) – there are two old walls. Southern one is broken up from the storm. One idea proposed: put in new wall, continuing across the front of both old walls, and ending just under the huge Cedar oceanside. **Any work done must not affect or harm this Cedar tree.**

80' – 100'

25. South of Bench 37 (just past the huge Cedar, before little cherry tree inland) – fill in washout on Oceanside along asphalt edge.

26. Further south from Bench 37 (opposite the little cherry tree), on the curve, there is a 1' drop off on Oceanside of asphalt. Many people walk out to the edge of rocks at this point to take photographs. How to remediate – build up washed out area?

27. **NEW - HIGH PRIORITY** - Further south on curve, there is another sharp drop-off along the edge of path. Look for a cut off **old metal fence pipe** embedded in cement. To the N & S of pipe – problem. **16' length**

Rope off and post North and South of cut-off pipe to protect existing paving

North side of cut pipe

South of cut pipe