HIDDEN LAKE DAM / DEEP #06107
HIDDEN LAKE ASSOCIATION

REPORT ON IMPACT OF RAISING ROAD LEVEL AT EMERGENCY SPILLWAY

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HIDDEN LAKE ROAD
HADDAM, CONNECTICUT

JULY 2017

Prepared by:

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Emergency Road Overflow

Existing Situation & Increase in Pavement Elevation

An increase in the elevation of Hidden Lake Road would come with an attendant increase in water levels. Because of the span of the area and the extent of the low elevations, the water level increase would affect a substantial length of the road. The following analysis is based on a detailed survey prepared by Lloyd Pearson in 2010 and assumes that no vertical changes in the road elevations have occurred since that time.

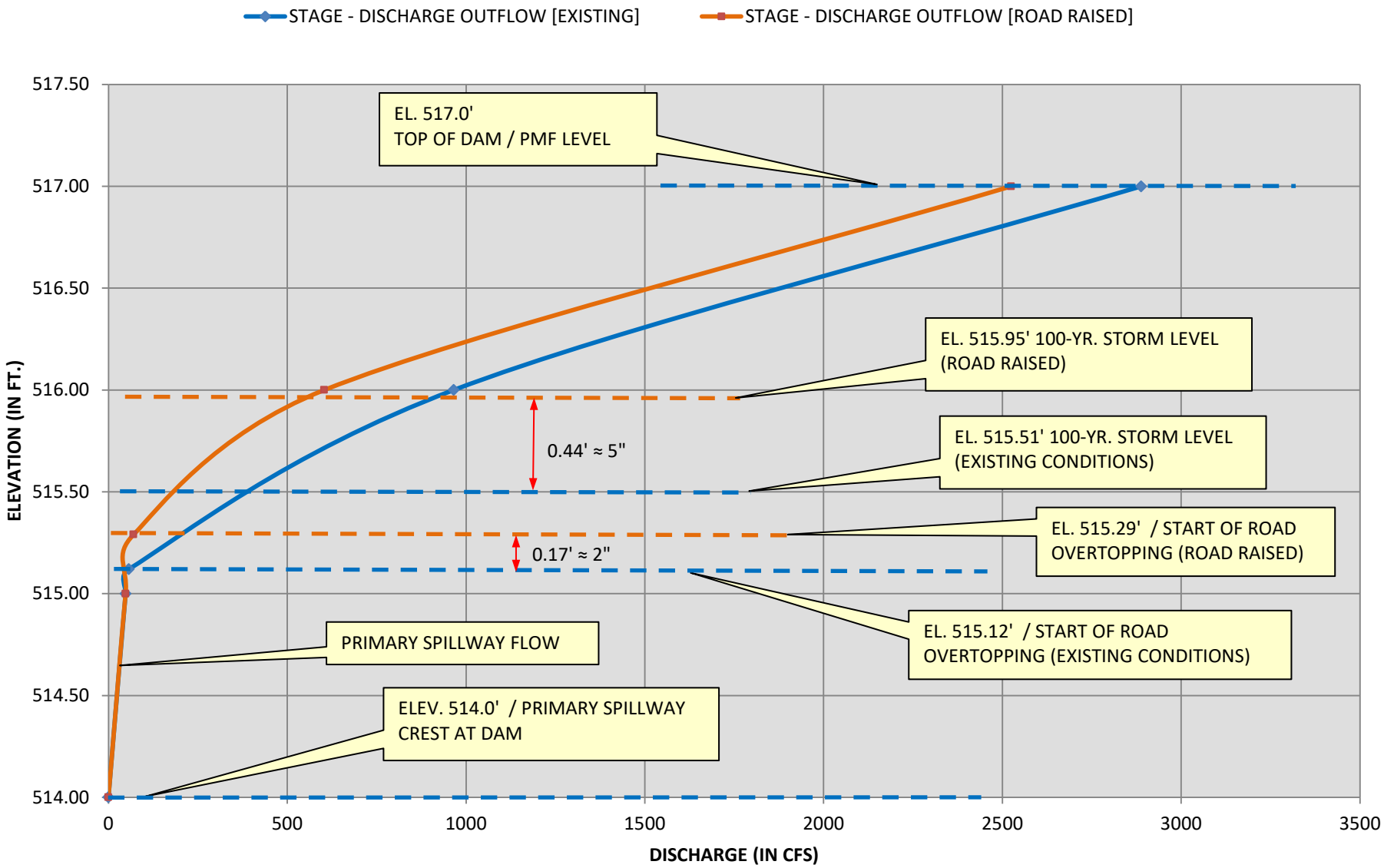
Calculations were done to assess the impact of raising the road level by two (2) inches across the length of the causeway crossing. In addition to raising the road elevations, new statistics related to an increase in precipitation values since the last analysis were also used. This, in particular, impacted the use of newly accepted extreme rainfall numbers for the 100-year, 24-hour storm event which, for the Haddam region, increased from 7.10 inches to 8.20 inches.

Results indicate that a 2-inch rise in road level would result in an increase of approximately five (5) inches in water surface elevation over the Hidden Lake area, resulting in forcing more water toward the spillway area and subsequently causing an increase in height due to the limited width of the spillway as compared to the road overflow expanse. For storm of lesser magnitude, water surface elevations would increase in proportion to the frequency. A chart showing the overflow values and trends is attached and compares the two distinct situations.

Of note are two items in relation to the water levels at the road used as an emergency overflow. One is that by using the new precipitation values, the 100-year values would have increased slightly in any case. Secondly, the vegetation along the edge of the road along the causeway and along the edge of the lake has a substantial impact on the height of the lake level during an overtopping situation. Heavy growth of vegetation if in place during a storm event could in itself cause a rise of several inches in elevation. This is

due to the fact that obstructions impede and slow down flow; when that happens the loss in velocity results in an increase in elevation. As such, it is recommended that the area be kept clear on a regular rather than an infrequent basis. The two following photos show the difference in growth to explain this recommendation.

HIDDEN LAKE DAM / OUTFLOW / STAGE - DISCHARGE



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Recommendations

As noted, vegetation along the edge of the lake and the edge of the road should be kept trimmed on a regular basis to avoid blocking flow in the event of a storm situation. Secondly, if this section of road is to be maintained as an emergency overflow area, then I would recommend that the road pavement be retained at its current elevation. Different storm frequencies would obviously have different incremental impacts on water levels, but the minimum that this dam should be able to pass comfortably is a 100-year event. Although I am uncertain as to the impact on individual properties, an increase of 5 inches in the event of a 100-year storm above the current anticipated levels could indeed impact some of the residential areas around the lake.

Background Information

Attached is a record drawing of dam repairs from 1969, prepared by Mozzochi & Associates of Glastonbury. Note on the right side, in the highlighted part, that the road area is called out as an emergency spillway. This alone should indicate that the section of road directly adjacent to the pond was originally intended as a supplemental overflow area. Observe also that in approving the plan (10-16- 1979), the State was aware of the situation (particularly since their stamp was directly beneath the words). Also, since I have worked with the Association on various projects, a parol record indicates that this was always intended to be an emergency overflow area. Lloyd Pearson's survey from 2010, which provided detailed elevations, essentially corroborated the original design concepts; an analysis prepared for the Emergency Plan also verified that the road would spill over during events less than the 100-year event.

As to Peter Spangenberg's recommendation, this would be good for drainage, but super-elevating the road in the wrong direction on a curve is not necessarily good for normal driving conditions. The road doesn't overtop on a regular basis, so I think

consideration should be given to keeping a well-defined crown in the center. The drawback for this option is only that on rare occasions when water level rises, it will come all the way to the center of the road before going over – leaving just the east-bound lane for safe travel. This should, however, be an infrequent situation.

1 CHECK EMBANKMENTS FOR CONFORMANCE TO TYPICAL SECTIONS.

RAISE EMBANKMENTS AS SHOWN

1 PLACE FILL IN DEPRESSION IN THIS AREA.

HIDDEN LAKE

"A"

"B"

30.5'

16'-0"

47'-0"

CORE AND PRESSURE GROUT AS REQUIRED

VERTICAL CRACKS IN WALL

CONCRETE WALL - TOP 12" WIDE

SPALLED

VERTICAL CRACK & SPALLING

CONCRETE SPILLWAY

SPILLAY SIDEWALL

17.6

7.6

13" 17"

VALVE

12" DIA. C.I PIPE

OLD VALVE

SAND BEACH

1 REBUILD PORTION OF SPILLWAY AND REPLACE CONCRETE SLAB TO ALIGN DOWNSTREAM FACE.

DI RUBBLE MASONRY

COBBLES & BOULDERS

HOUSE

FLOW

10'-0" MIN.

18"

"HARDPAN" BORROW AND LOAM & SEED

EXISTING GROUND

CONCRETE WALL

SECTION "A"-"A"
NOT TO SCALE

10'-0" MIN.

18"

SAND

"HARDPAN" BORROW

REMOVE & REPLACE EXISTING SAND BEACH ON TOP OF BORROW

CONCRETE WALL

SECTION "B"-"B"
NOT TO SCALE

PLAN
SCALE :- 1/8"=1'-0"

FOOT BRIDGE ACCROSS SPILLWAY

3'5"

5"

3'-0"

18" NEW EMBANKMENT

10"

TOP OF WALL

18" NEW EMBANKMENT

HOUSE

7'-0

12" DIA C.I PIPE OUT LET

DRY RUBBLE MASONRY

ELEVATION LOOKING NORTH
SCALE :- 1/8"=1'-0"

47'-0"

30.5'

TOP OF WALL

VERTICAL CRACKS

18" NEW EMBANKMENT

HORIZONTAL CRACK

16'-0"

10"

18" NEW EMBANKMENT

11'-4"

9'-0"

7" L/F

CONCRETE WALL

ELEVATION LOOKING SOUTH
SCALE :- 1/8"=1'-0"

1 REV. 10-9-79

DRAINAGE AREA

BRAULT RD

ROUTE 81

HIDDEN LANE ROAD

HIDDEN LAKE S14

HIDDEN LAKE ROAD

EXISTING SPILLWAY

EMERGENCY SPILLWAY

FRICKS POND

LOCATION PLAN
SCALE 1"=2000FT
(FROM U.S.G.S QUADRANGLE - HADDAM)

APPROVED
STATE OF CONNECTICUT
DEPT. OF ENVIRONMENTAL PROTECTION
BY ORDER DATED 6/14/79
Stanley J. Pac

HYDRAULIC DATA

DRAINAGE AREA = 0.89 SQ.M.
LAKE AREA = 40 ACRES
SPILLWAY LENGTH = 16'-0"
TOP OF CONCRETE WALL = 2'-2" ABOVE CREST
100 YEAR STORM RAIN = 5.1"
MAXI. WATER LEVEL IN LAKE = 1'-8" ABOVE CREST. (DURING 100 YEAR STORM)

HIDDEN LAKE PLAN
PREPARED FOR
HIDDEN LAKE ASSOCIATION

REV. 8-9-68 : SECTION "B"-"B" ADDED.
REV. 5-3-67 : GENERAL REVISION.

STATE OF CONNECTICUT
JOHN LUCHS JR.
NO. 3744
REGISTERED PROFESSIONAL ENGINEER

JOHN J. MOZZOCHI, & ASSOCIATES
CIVIL ENGINEERS
GLASTONBURY, CONN.

C-68-126

SCALE AS NOTED | DATE FEB 12, 1968