



# Town of Glastonbury

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Richard J. Johnson  
Town Manager

April 7, 2015

The Glastonbury Town  
2155 Main Street  
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Re: Riverfront Park-Slope Stability

Dear Council Members:

This letter will supplement prior status reports on the Riverfront Park-slope stability matter and summarize the current status, next steps, action items and schedule to remediate the unstable slope condition.

## **Challenge**

Evidence of vertical and horizontal movement was observed in September 2014 as the Phase 2 project was nearing completion. This involved the patio adjacent to the boathouse, walkways, overlook, walls and other points in the area of the riverbank. The geotechnical engineer working on the project and other members of the project team were immediately notified and survey monitoring points were established to record and quantify the direction and magnitude of the movement. Additional groundwater monitoring wells were installed and additional soil borings were obtained. This data confirmed that a portion of the site was sliding in a southwesterly direction toward the Connecticut River.

The movement to date has created cracking and settling of the structures noted above that will require repair or replacement.

The general area of the slide and photographs depicting the cracking and settling is shown on the attached pages.

## **Initial Actions**

Upon identifying the conditions described above, several actions were initiated over the short-term. This included:

- Based upon survey, groundwater monitoring and soil borings, an underdrain system was installed for 200+ feet extending from the boathouse northerly. This system is designed to intercept and discharge groundwater away from the area of the slide.
- Soil load was removed from the area adjacent to the boathouse and northerly to lessen the overburden on soil layers.
- The Town commissioned the independent geotechnical engineering services of Geocomp. Dr. Allen Marr, President and CEO, has assisted the Town since early fall 2014.

## **Testing and Analysis**

In consultation with the project team and geotechnical engineers (Welti Associates and Geocomp), a series of tests were recommended and conducted. This required time to coordinate and perform; however, every effort was made to closely follow the recommendations of the geotechnical consultants. Along with Welti Associates and Geocomp, a geotechnical engineer from Haley & Aldrich was commissioned by Richter & Cegan.

Testing and analysis include:

- Soil borings
- Deep hole test pits
- Groundwater monitoring wells
- Ongoing survey of lateral and vertical movements
- Excavated patio and sidewalk to west and north of boathouse to provide load relief
- Conducted topographic survey of river bottom
- Installed inclinometers in affected areas (soil movement)

- Conducted additional soil strength tests
- Tested density of light weight concrete fill
- Performed cone penetrometer tests (soil strength)
- Completed global stability analysis
- Prepared alternative analysis
- Developed plan view and cross-sections for recommended solution

Note: The geotechnical team has recommended additional borings through the existing light-weight concrete. This will take place over the short term.

As noted above, the preceding was completed in consultation with the geotechnical engineers (3) and required time to schedule, perform and analyze results/findings.

### **Slope Stability Alternatives and Remediation Solution**

In his February 2015 letter, Dr. Clarence Welti outlined the alternatives considered and the remediation solution suggested to stabilize the slope. The solution involves 2 actions.

- Placing of rip rap at the toe of slope within the CT River to provide a resisting mass sufficient to counteract soil sliding pressures.
- Reconfigure/reconstruct the area at the top of slope through the use of light-weight materials (geo foam blocks, light-weight concrete, etc.) to lessen the load on the upper part of the slope.

The geotechnical engineers have concluded that reducing load and increasing resistance is the only option to effectively stabilize the slope.

### **State and Federal Permitting**

The work within the CT River is subject to review and permitting by the State DEEP and the Army Corps of Engineers (ACOE). Applications have been forwarded to both agencies and DEEP and ACOE are well aware of the slope instability condition through prior discussions with Town staff and members of the project team.

State DEEP – By letter of April 1, 2015, DEEP has authorized the installation of rip rap within the CT River. This authorization is for 120 days – April through July 2015. Any extension requires formal DEEP approval. Within 30 days following the authorization period, the Town must submit a proposed plan to mitigate for the placement of the rip rap (i.e. habitat, flood storage, etc.).

ACOE – This application is pending a general understanding on a plan to mitigate the impact of placing rip rap within the CT River. This can be accomplished by performing mitigation activities along the CT River or other locations within town as coordinated with State DEEP. The federal permitting process includes a fee in lieu of mitigation. For this approach, the Town would be required to make a deposit with ACOE if a suitable mitigation project is not identified.

Discussions are underway with both DEEP and ACOE to identify possible mitigation activities.

### **Cost Estimating and Funding**

With the remediation plan now confirmed and understood by DEEP and ACOE, efforts are focused on identifying the estimated cost of the remediation work. Initial focus is on the rip rap phase which will proceed before restoration of the top of slope. Design and alternatives for the top of slope will also proceed with cost estimating developed accordingly.

The ability to accurately estimate the cost of rip rap will require discussions with contractors typically performing this type of work. I would expect the rip rap to be transported by truck and barge to the location and then placed accordingly.

### **Next Steps and Action Items**

Over coming weeks, several actions are required. These actions will proceed concurrently and are intended to allow remediation work (toe of slope and top of slope) to proceed over July and August 2015.

### Design and Cost Estimating

The design for rip rap will be fine-tuned and reviewed/approved by the geotechnical engineers. Discussions will be held with contractors generally performing this type of work and formal proposals outlining costs, schedule, means and methods, etc. will be formally solicited.

Design alternatives will be developed for the top of slope area.

### Funding

Council will be asked to approve funding to allow the rip rap and top of slope remediation work to proceed. Estimates will be developed as noted above. Time is of the essence to award contracts and complete the work (particularly rip rap). The goal is to have a recommendation by the April 28<sup>th</sup> or May 12<sup>th</sup> meeting. This could present some challenges; however, work is underway to identify estimated costs as reasonably possible. Again, with the initial focus on the placing of rip rap.

### Contract Award

At this point, my sense is to award the contract for the rip rap through a proposal process. This could involve a waiver of the competitive bidding/proposal process to allow for negotiations with the select number of contractors performing such work. In the end, a formal proposal with costs, schedule, means and methods, etc. would be received from contractors. This should allow for a competitive and expeditious process to meet the July 1<sup>st</sup> start date noted below. This approach also provides the benefit of better understanding the best approach to placing of the rip rap.

Once the design is better understood for the top of slope work, alternatives will be forwarded for review and action. My thought is the top of slope construction will be subject to the competitive bidding process.

### Permitting – Mitigation

Discussions are proceeding with DEEP and ACOE. Specifically concerning the appropriate mitigation project. This could require funding to complete and will be better understood by the April 28<sup>th</sup> or May 12<sup>th</sup> meeting. It might be possible to establish a mitigation plan and schedule to allow for funding through the Capital budget process.

### Schedule

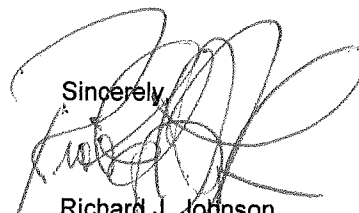
The overall goal is to complete remediation work over July and August with the placing of rip rap to begin on July 1<sup>st</sup> and top of slope work to proceed immediately thereafter. Timing is critical and the various actions noted herein are moving forward simultaneously.

Note: State and federal officials would require certain protection against turbidity and other factors relating to the placing of rip rap before June 30<sup>th</sup>. Accordingly, the July 1<sup>st</sup> start date.

As noted through previous discussions, stabilizing the slope is challenging. However, given the current set of facts and the information presented herein, the goal is to complete the recommended slope stability remediation as efficiently and expeditiously as possible. There is no other option. Some flexibility and understanding of the moving parts and need to develop and verify information is required. Essentially, there could be some updated information as additional data is gathered. Other factors influencing this topic are well understood and being discussed with all parties. This includes the Town considering all avenues for potential remuneration of remediation costs from responsible parties.

Additional information can be provided as may be requested.

Sincerely,



Richard J. Johnson  
Town Manager

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Attachments