

APPENDIX B

Correspondence

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Memo

To: Martin Ginsburg; Dan Mulvey; Joe Dziegelewski
From: Michael St. Pierre, P.E.; Steven P. Byszewski, PE
Date: August 17, 2012
Re: River Club , Yonkers, NY -- Review of Historic Sewer Main Data

This Memo is a follow-up to our June 25, 2012 letter which addressed the existing Westchester County 48-inch sewer trunk main that traverses the project site. In the June letter, Sesi recommended that the existing sewer trunk main be replaced and relocated since the existing sewer line and manhole structures integrity are questionable and the slope remains unstable and susceptible to a future failure similar to the failure that occurred in 2007. Subsequently, we have reviewed the information contained on a CD provided to you by Westchester DEF.

An August 15, 2008 letter/report from CDM to Anthony LaCroce, PE of Westchester DPW was reviewed. It is titled *Preliminary Assessment of North Yonkers Trunk Sewer Alignment*. The assessment was conducted with the expressed purpose of identifying ... "areas that may be potentially susceptible to future slope failure or pipe displacement events." This report identifies an area within the River Club property (between sewer main stations 206+96 and 207+50) immediately north of the May 2007 pipe break, as having existing slope conditions similar to those observed and documented prior to the 2007 failure. The report states that in this area "Steep slopes and saturated soil conditions could contribute to a future failure event.". The report recommends slope stabilization methods for this area including removing large trees up-slope of the sewer pipe, flattening the slopes/re-grading, placing rip-rap on the slope and constructing a stabilizing berm at the base of the slope similar to the remedial measures that were done following the 2007 break. CDM notes that the close proximity of the wetlands at the base of the slope will require coordination with local and state agencies.

There are other data on the CD that document a prior repair of the line in an area located a few hundred feet north (just north of # 1155 Warburton building). This repair involved the insertion of a 30 in DIP pipe inside of a length of the 48 in RCP sewer main that had severely deformed. The slope and the soil conditions are most probably similar to the River Club parcel; however, no forensic study was found relative to the cause of the deformation and there are other possible unrelated circumstances that could have contributed to this deformation.

Based on our review of the August 2008 CDM report and our geotechnical knowledge of the site, the existing 48-inch sewer line must be stabilized/replaced/relocated as soon as possible to prevent a failure similar to the May 2007 failure. No construction should be done until the existing sewer main is permanently stabilized/replaced/relocated. It is our opinion that if nothing is done, it is likely that a failure of the sewer main will occur.

A handwritten signature in dark ink, appearing to read 'M. St. Pierre'.

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Geotechnical & Foundations
Land Planning
Geo-Structural
Environmental
Water Resources

Principals:

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June 25, 2012
N-5741

Ginsburg Development Companies, LLC
100 Summit Lake Drive
Valhalla, NY 10595

**RE: Existing Sewer Trunk Main
Proposed River Club Development
Warburton Avenue
Yonkers, NY**

Gentlemen:

SESI Consulting Engineers, PC has completed our geotechnical review of the existing subsurface information for the proposed River Club development to be located at 1109 and 1137 Warburton Avenue in Yonkers, New York. Specifically, we have looked at the proposed development plans and existing site conditions related to the existing 48-inch sewer trunk main that traverses the project site.

SITE DESCRIPTION

The proposed building site is bound by the Hudson River to the west, Warburton Avenue to the east, and existing multi-story residential developments to the north and south. The ruins of three houses are present on the property along Warburton Avenue. Most of the low-lying area on the western side of the site has been mapped as wetlands and water reportedly flows continuously into the wetlands from the higher elevations toward the west while the eastern portion of the site is typically heavily wooded. There is an existing 48-inch diameter sewer trunk main with associated manhole structures which runs generally in a north-south direction across the site. The existing 48-inch sewer main is very old and was reportedly constructed in the early 1900's and requires frequent maintenance and emergency repairs. The sewer main is visible at the surface in several locations on the property and is generally located on a steep slope. Stone and reinforced concrete retaining walls are in place in an effort to stabilize the slope and sewer main.

Based on our review of the plans, the site is approximately 330 feet by 640 feet with elevations varying from approximately elevation 75± along Warburton Avenue to approximately elevation +6 at the bottom of the slope and then remaining relatively level for approximately 200 feet, west, towards the Hudson River.

SEWER MAIN BREAK

During the weekend of May 5-6, 2007, heavy rains caused erosion of a portion of the slope resulting in fallen trees and a slope failure causing a break in the 48-inch diameter sewer line in the north-central portion of the site. The area of the slope failure was approximately 45 feet wide and 40 feet high and was originally on a slope of approximately 1.5 horizontal to 1 vertical. Westchester County contracted to have the sewer pipe repaired and the slope temporarily stabilized. In order to perform the repairs, the contractor constructed a construction access road using primarily shotrock fill placed at the base of the slope from behind the Greystone Railroad building at the southern end of the site towards the north into the project site. The broken section of the pipe was reportedly replaced with a new 48-inch diameter ductile iron pipe and the slope was stabilized using rip-rap placed in the failure area.

SEWER CONDITION

SESI understands that an evaluation of the existing sewer main and report was done by CDM for Westchester County. We have not been provided with this report at this time. Representatives of SESI have recently walked the site, paying particular attention to the area at the base of the slope, where the existing sewer main is located. There are some sections of the sewer main where the pipe is at the surface and visible. In fact, one location of the pipe is suspended above the ground surface to allow stormwater runoff to flow under the pipe. Additionally, the pipe is located in or at the base of a relatively steep slope with large diameter trees above the line. It is our opinion that the location of the sewer main is not stable and that a similar failure to the 2007 event may occur.

Since the existing sewer line and the manhole structures structural integrity are questionable and the fact that the location of the sewer line within the slope is not stable, we recommend that the existing sewer line on the project site be replaced and relocated to provide a stable location in conjunction with the proposed construction.

PROPOSED DEVELOPMENT PLANS

The current development plan has eliminated the proposed buildings being built over the sewer line. While building over the existing county trunk sewer line may be technically feasible, we do not think it is wise to do so. Therefore, GDC has agreed to accommodate the need to relocate the County Sewer line to provide a stable area for the sewer trunk main in their current development plan (attached). We have prepared the proposed relocation plan which provides a more efficient design by straightening the line and eliminating the bends that currently exist. This relocation also provides easy access for future servicing of the line, if necessary. Furthermore, by relocating the sewer trunk main behind a proposed retaining wall, the stability of the sewer trunk main will be greatly improved, thus eliminating the need for costly repairs as a result of a future slope failure.

If you have any questions, please call.

Sincerely,

SESI CONSULTING ENGINEERS, PC



Michael St. Pierre, P.E.
Vice President

Attachment: Grading & Utility Plan – Progress Print 6-25-12



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August 15, 2008

Mr. Anthony LaCroce, P.E.
Director of Capital Projects
Westchester County
Department of Public Works
148 Marine Avenue
White Plains, NY 10601

Subject: Preliminary Assessment of North Yonkers Trunk Sewer Alignment
Westchester County, New York

Dear Mr. LaCroce:

This letter report summarizes our preliminary assessment of a 48-inch diameter trunk sewer alignment, the North Yonkers Trunk Sewer, located along the east bank of the Hudson River within Westchester County, New York.

The 48-inch diameter RCP trunk sewer extends for approximately 7.7 miles along the east bank of the Hudson River through the Village of Dobbs Ferry, the Village of Hastings, and the City of Yonkers. Side slopes in the area of the sewer alignment are up to approximately 80 ft high and as steep as 1.5 horizontal to 1 vertical (1.5H:1V). The Westchester County Department of Public Works has requested that CDM conduct a preliminary assessment of slope conditions along the trunk sewer alignment within the Westchester County in order to identify areas that may be potentially susceptible to future slope failure or pipe displacement events.

Scope of Work

The purpose of this study was to assess the current slope conditions along the trunk sewer alignment and to provide preliminary geotechnical recommendations.

Specifically the work included the following:

- Conduct a paper review of the trunk sewer alignment including historic records of the 48-inch sewer pipeline installation, past and current aerial photo, topographic records, and surficial soil maps for the sewer alignment;



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- Conduct a limited field investigation along the alignment of the trunk sewer to observe and document (including photographs and rough hand measurements) the condition of the existing soils/ slope, exposed pipe section(s), area of groundwater seepage, and any evidence of slope movement/failed soils (i.e. stress cracks, vertical failure surfaces, tree line orientation, etc.); and
- Prepare a letter report that summarizes the information collected as part of the study and presents the findings and our preliminary recommendations, and identifies any future studies/testing that may be required.

Site Conditions

The North Yonkers Trunk Sewer alignment is located along the east bank of the Hudson River within Westchester County, New York. The pipeline extends 7.7 miles from north to south through the Village of Dobbs Ferry, the Village of Hastings, and the City of Yonkers. The sewer was constructed in 1935 next to a railroad track along a hilly terrain. The railway (Metro North Railroad) and associated stations/structures are currently owned and operated by the Metropolitan Transportation Authority (MTA) of New York State. The majority of the pipe alignment is located on wooded slopes along the railroad track. The pipeline is located approximately 25 to 450 ft from the railroad, with the majority of the alignment located within 50 to 150 ft of the tracks. The area surrounding the alignment is mostly developed for residential and commercial use. Several sections of the alignment are located beneath structures built after the construction/installation of the trunk sewer or within tunnels/under paved roadways.

Documents Reviewed

Historic Records of the Trunk Sewer

The concrete trunk sewer pipe was constructed in 1935. Construction drawings and record drawings of the trunk sewer are included in Appendix A-1 and A-2, respectively. The trunk sewer alignment consists of 10-inch to 66-inch precast concrete pipes, 48-inch to 72-inch monolithic concrete pipes, and U-shaped concrete pipes of various wall thicknesses and reinforcement arrangement. Pipe size generally increases from Section A in the north near Dobbs Ferry to the south, in Yonkers.

The pipeline is supported by a variety of methods depending on topography, soil type(s) and pipe size. The majority of the pipeline is bedded on engineered/compacted soil. Some portions of the pipeline are supported by concrete cradles, concrete piers, exposed and non-exposed concrete piles, and special structures (e.g. linear plate tunnels, etc). The majority of the pipeline has a minimum 2 ft of soil coverage.



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In 1968, manhole MH 209+38.43 in Section E-1 of the trunk sewer alignment was repaired. A new 48-inch I.D. pre-cast barrel and a 10-inch C.I. drop connection encased by concrete was constructed on a new slab over the existing pipe. The new structure is supported by the existing concrete cradle and 6-inches of crushed stone. Drawings of the repair are included in **Appendix A-3**.

In 1974, rehabilitation of existing manhole structures in Section D-3 of the trunk sewer alignment was conducted. Record drawings of the rehabilitation work are included in **Appendix A-4**. Manholes MH 94 (STA 238+95.04), MH 97 (STA 235+12.39) and MH 98 (STA 234+20.65) were raised to new final rim elevations. Manholes MH 99 (STA 233+20.65) and MH 100 (STA 231+92.43) were reconstructed by removing the top portion of the barrel and rebuilding them to new finished elevations. The frames were reset, joints pointed, and cracks patched on all existing manhole structures within section D-3 (STA 221+00 to 240+79.83) as necessary during the course of the rehabilitation work.

According to the drawing titled, "Rehabilitation of North Yonkers - Trunk Sewer Section 'E-1' ", dated April 1987, a new 30-inch RC pipe was installed inside a deformed/damaged section of the 48-inch trunk sewer pipe near 1157 Warburton Avenue. As part of the project, a bypass pipe was installed between manhole STA 212+40 and manhole STA 206+96.84 to circumvent an existing high-rise apartment building located at 1155 Warburton Avenue. Contract drawings are included in **Appendix A-5**.

In 2003, a new building development, 'River Club', was proposed to be constructed over the existing trunk sewer alignment at 1137 Warburton Avenue. The proposed building foundation, including piles and retaining walls, is to be constructed around the sewer line. The existing grade in the area will be changed significantly. Drawings of the proposed site development are included in **Appendix A-6**. It is our understanding that the proposed development is still in the permitting stages.

Aerial Photos

As part of this paper study, CDM obtained historic aerial photos of the east bank of Hudson River along the trunk sewer alignment. Current aerial photos from the years 1947, 1960, 1976, 1986 and 1990 are included in **Appendix B**. Based on the photos, the area has been largely developed over the past 60 years with increasing amount of residential and commercial buildings along the east side the railroad tracks. Some commercial ports and other facilities along the shoreline were also developed and redeveloped over the years, adding land and moderately changing the shoreline configuration.



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Topographic Records

Topographic maps from 1900, 1979, 1992, 1994 and 1998 were collected and included in Appendix C. The area is generally hilly with vertical differentials of over 100 ft. The topography along the pipeline varies from relatively level to an approximately 1.5H: 1V slope. Based on our review of these topographic maps, the changes of general topography over the years have been minimal.

Surficial Soils Maps and Available Subsurface Information

CDM reviewed available surficial soil maps of Westchester County as part of this study. Surficial Geologic Map of New York - Lower Hudson Sheet, compiled and edited by Donald H. Cadwell, and dated 1989 is included in Appendix D. The map indicates that the surficial soil in the area of the trunk sewer alignment consists mostly of till with variable texture, usually poorly sorted, relatively impermeable and potentially instable on steep slope. There are also areas of exposed bedrock or bedrock within one meter of existing ground surface. Surficial soils closer to the edge of the east bank of the Hudson River, typically consist of Lacustrine sand, which is a well sorted, stratified, quartz sand generally deposited by large bodies of water.

Additional available subsurface information included a drawing titled "Reconstruction of a Portion of the North Yonkers Trunk Sewer - Section D-3, prepared by Soil Testing, Inc., dated June 7, 1973 which provides the results of sixteen (16) soil boring conducted for the proposed rehabilitation/reconstruction of a section of the trunk sewer located between manhole 96 (STA 236+33.6) and manhole 100 (STA 231+92.43). The drawing is included as Appendix E. According to the test boring logs, subsurface conditions along this pipeline section generally consist of a fill layer, up to 32.5 ft in thickness, containing sand with varying amount of silt, gravel, garbage and vegetation. Underlying the fill is a dense to very dense sand layer with various amounts of gravel, silt and decomposed rock. The depth to groundwater encountered during the test boring program ranged from approximately 7 to 27 ft below existing ground surface.

Field Investigation

On December 6 to 7, 2007, Matthew Coombs and Kapila Pathirage (CDM), accompanied by Marian Pompa from the Department of Environmental Facilities of Westchester County, conducted a limited field investigation for the preliminary assessment of the trunk sewer alignment. The investigation included observation and photo documentation of the condition of the existing soils and slopes, exposed pipe section(s), area of groundwater seepage, and any evidence of slope movement or failed soils along the alignment of the sewer.



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In general, the majority of the trunk sewer pipeline evaluated during the field investigation was found to be in generally good condition consistent with the historic record/construction drawings provided by the County. No visible evidence of slope movement/failed soils (i.e. leaning trees, cracked soil surfaces, etc.), areas of groundwater seepage, or exposed pipe sections were observed for the majority of the alignment. Photographs of the condition of the trunk sewer and surrounding soils/slopes taken during the field investigation are included in Appendix F. An index of the photographs, providing the location and orientation of each picture along with a brief description, is also included in Appendix F. All photograph locations and references to pipeline stationing are based on the stationing scheme provided on the 1935 Record Drawings (Appendix A-2).

During the investigation several areas of concern were identified, as described below:

1. Station 367+89 [Photo ID NYTS 12-6-07 (43) to NYTS 12-6-07 (44)]: Surface erosion was observed around manhole and at pipeline surface. Part of the top of pipeline was exposed.
2. Station 347+60 [Photo ID NYTS 12-6-07 (03)]: Erosion was observed under the special structure and around the supporting frames.
3. Station 335+2.50 [Photo ID NYTS 12-6-07 (23) to NYTS 12-6-07 (25)]: The pipeline and manhole are exposed. Evidence of slope movement (i.e. leaning trees, displaced soil) was observed up-slope of the pipeline and manhole structure. The section of the trunk sewer appears to be acting as a retaining wall supporting the uphill soils.
4. Station 322+00 [Photo ID NYTS 12-6-07 (35) to NYTS 12-6-07 (38)]: Tiered timber retaining walls were observed above and below the pipe alignment. These walls indicate evidence of past movement (i.e. slide) of the slope up-hill of the pipe alignment.
5. Station 237+51.31 [Photo ID NYTS 12-6-07 (64) to NYTS 12-6-07 (65)]: Steep slope was observed up-hill of the pipeline alignment. The slope is densely vegetated but no large trees were observed. The slope flattens out below (down-hill) of the pipeline. The manhole structure is exposed and appears to be at the base/toe of the steep portion of the slope.
6. Station 206+96 to 207+50 [Photo ID NYTS 12-6-07 (72) to NYTS 12-6-07 (74)]: Located immediately north of the 2007 emergency repair site (1105-1135 Warburton Ave), the area is characterized by steep slopes terminating in a wetland area. Existing slope conditions are similar to those observed at the 2007 emergency repair location.



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7. Station 100+60 to 105+26 [Photo ID NYTS 12-7-07 (07) to NYTS 12-7-07 (09)]: The pipeline and manhole are exposed, which indicate that the structures are acting as a retaining wall. Evidence of slope movement (i.e. leaning trees and timber piles, displaced soil) was observed up-hill of the pipeline and manhole structure. A make-shift timber wall [Photo ID NYTS 12-7-07 (04) to NYTS 12-7-07 (06)] just south of the exposed pipe / manhole shows evidence of past slope movement.
8. In general, the soil cover at multiple locations along the trunk sewer alignment was observed to be eroded, exposing the top of the pipeline. The degree of exposure ranged from 6 to 8 inches of the top of the pipe exposed to pipeline exposure to the spring line.

Photographs of the areas of concern are included in Appendix G.

Recommendations

Based on the results of the paper review and on the findings of the limited field investigation, we are providing the following recommendations to address the six areas of concern identified in the previous section of this report:

No. 1: Station 367+89

Soil cover for the section of pipe and manhole at this location has been eroded and part of the top of concrete pipe was exposed. We recommend that a layer of crushed stone should be placed around the manhole and to re-cover the pipe. The crushed stone should be placed to a minimum of six inches above the top of the pipe and feathered into the existing slope grade, both up and down-hill of the pipe centerline.

No. 2: Station 347+60

Surface erosion was observed under the special structure. We recommend that large (12-inch) angular rip-rap be placed on top of filter fabric at the toe of the special structure to stabilize the structure and prevent further erosion.

No. 3: Station 335+02.50

The section of pipe and manhole structure observed at this location is experiencing excess surcharge loads exerted by soils up-hill of the alignment. In essence, a portion of the pipeline and the manhole structure are serving as a retaining wall. The existing slope should be reconfigured to alleviate the excess loads on the trunk sewer. We recommend that the slope be cleared of numerous large trees and vegetation contributing to the slide of soils



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up-slope of the pipe alignment. The slopes should be re-grade/flattened in a benched or stepped manner to the extent possible to reduce the load on the structure. Filter fabric should be placed over exposed soils and covered with crushed stone/rip rap. The exposed portions of the pipe should be covered with crushed stone a minimum 6 inches above the top of the pipe.

No. 4: Station 322+00

In order to stabilize the slope above and below the trunk sewer alignment, we recommend removing numerous large trees up-slope of the pipeline and re-grading/flattening the slope to the extent possible. Filter fabric should be placed over exposed soils and covered with crushed stone/rip rap. Below the pipeline, we recommend construction of a stabilization berm to reduce the potential for additional slope movement.

No. 5: Station 237+51.31

The primary concern along this section of the trunk sewer alignment is the steepness of the existing slope and the location of the pipe/manhole structure at the toe/base of the slope. During the field investigation, no evidence of slope movement was observed. At this time we do not recommend reconfiguring the slope. However, we do recommend that this section of the trunk sewer be periodically monitored and the condition of the slope documented (visual observation, photographs, etc.) so that future stabilization efforts can be made, if required, prior to a significant slide.

No. 6: Station 206+96 to 207+50

Existing slope conditions at this location are similar to those observed/documentated prior to the slope failure event (May 2007) immediately south of this location. Steep slopes and saturated soil conditions could contribute to a future failure event. We recommend stabilization of the existing slopes using methods similar to those utilized during the 2007 emergency repair work. Large trees should be removed up-slope of the pipe alignment. Existing slopes should be cut back and flattened/re-graded to the extent possible. The slope face should be stabilized by placing large (12-inch) angular rip-rap on top of filter fabric over the freshly graded/exposed subgrade. Additionally, we recommend that a stabilizing berm be constructed at the base of the slope. Construction of this berm will likely require coordination with local and state agencies due to the proximity of wetlands near the base/toe of the slopes.



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No. 7: Station 100+60 to 105+26

The section of pipe and manhole structure observed at this location is experiencing excess surcharge loads exerted by soils up-hill of the alignment. In essence, a portion of the pipeline and the manhole structure are serving as a retaining wall. The existing slope should be reconfigured to alleviate the excess loads on the trunk sewer. We recommend that the slope be cleared of the numerous large trees and vegetation contributing to the slide of soils up-hill of the pipe alignment. The slopes should be re-grade/flattened in a benched or stepped manner to the extent possible to reduce the load on the structure. Filter fabric should be placed over exposed soils and covered with crushed stone/rip rap. The exposed portions of the pipe should be covered with crushed stone a minimum 6 inches above the top of the pipe.

No. 8: Various Locations

At locations along the trunk sewer alignment where the soil cover has been eroded exposing the top of the concrete pipe, a layer of crushed stone should be placed to re-cover the pipe. The crushed stone should be placed to a minimum of 6 inches above the top of the pipe and feathered into the existing slope grade, both up and down-hill of the pipe centerline.

These recommendations should be considered preliminary only. Detailed recommendations for the areas of concern identified above, or other areas identified in the future needing remediation, should be made and will likely require additional site survey, site access evaluations, property and right of way limits, as well as an evaluation of the pipe condition. Additional measures, such as concrete encasement of pipe sections, construction of foundation systems for support of the pipe and manhole structures, etc., may be required based on the detailed evaluations as well as the condition of the pipe found during construction.

Closing

These preliminary recommendations have been prepared for the Westchester County Department of Public Works, Westchester County, New York, and are associated with the North Yonkers Trunk Sewer in Westchester County, New York, as understood at this time and described in this letter report. These recommendations have been prepared in accordance with generally accepted engineering practices. No other warranty, express or implied, is made.



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If you have any questions or comments, please feel free to contact me at 617.452.6425.

Very truly yours,

Camp Dresser & McKee

Kathleen M. Murtagh
Vice President

cc: Michael Memoli, CDM

Attachments:

- Appendix A-1 - Trunk Sewer Construction Drawings (1935)
- Appendix A-2 - Trunk Sewer Record Drawings (1935)
- Appendix A-3 - Trunk Sewer Repair - Construction Drawings (1968)
- Appendix A-4 - Trunk Sewer Rehabilitation - Construction Drawings (1974)
- Appendix A-5 - Trunk Sewer Rehabilitation - Construction Drawings (1987)
- Appendix A-6 - River Club - Proposed Construction Drawings (2003)
- Appendix B - Current and Historic Aerial Photographs
- Appendix C - Topographic Maps
- Appendix D - Surficial Geologic Map
- Appendix E - 1973 Soil Boring Logs Drawing
- Appendix F - Field Investigation Photographs and Photograph Index
- Appendix G - Photographs of Areas of Concern