Preliminary Site Investigation Drainage Report

Sunnyside Garden Apartments

51-01 39th Avenue

Sunnyside, Queens NY

Prepared For:

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INTRODUCTION

Sunnyside Garden Apartments is a residential apartment complex located at 51-01 39th Avenue in Sunnyside, Queens, NY. During heavy rainfalls the property has reported instants of flash flooding in localized areas of the property impacting the quality of life of the residents. The property manager, Phipps Houses, has retained the engineering services of AKRF, Inc. to assess the drainage conditions causing flooding. The purpose of this report will be to:

i. Identify potential causes of stormwater flooding
ii. Identify potential recommendations to alleviate flooding conditions.

EXISTING CONDITIONS

On June 28th, 2024 AKRF, representatives of Phipps Houses, and Sunnyside Garden apartment property managers, met on site to conduct a walkthrough to assess the existing drainage conditions and site infrastructure. The walkthrough focused on three areas that have experienced recent flooding as reported by the property ownership and management staff.

1. Ponding at the northwest courtyard by buildings G through K
2. Ponding at the northeast courtyard by building N through Q
3. Sewer back up in the basement and ground level apartments of buildings JJ through NN

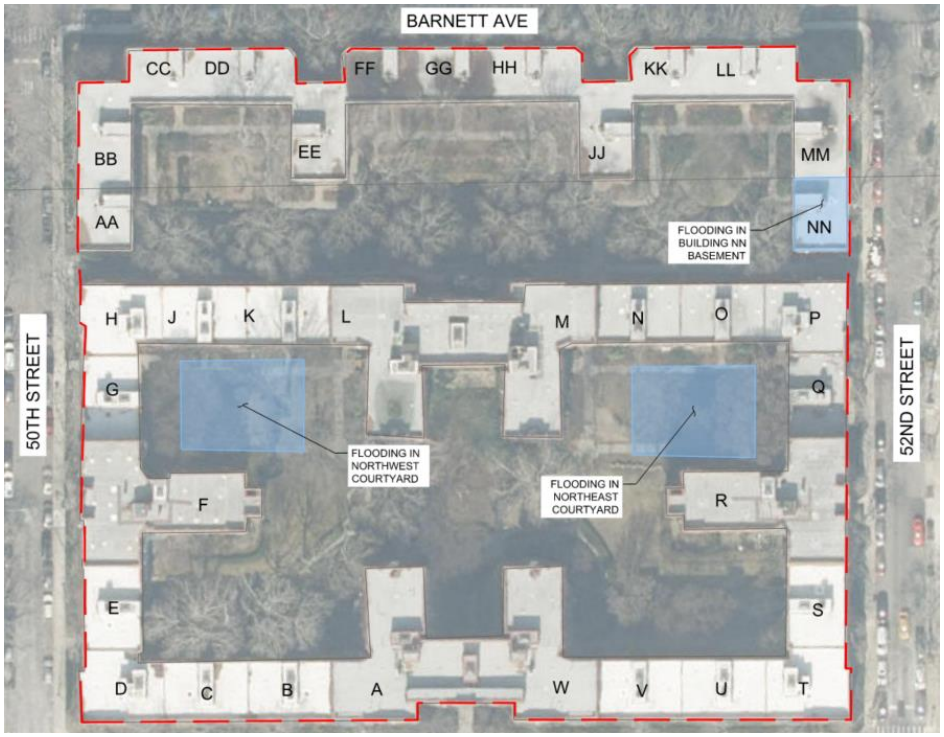


Photo 1 – Building locations and flooding

COURTYARD PONDING

The existing site drainage of the interior courtyards comprises of several catch basins, trench drains and two drywells. Based on record plans, the pipe sizes range from 4 to 15 Inches. The system conveys collected stormwater runoff to the southwest end of the site to CB#4 prior to passing under Building D and discharging to the combined sewer in 39th Avenue at MH#2. The courtyard to the north of buildings H to P was not included in the scope of this report as drainage issues have not been flagged for that area. Refer to an Existing Drainage Conditions Map in Appendix A which depicts the layout of the site drainage system based on the site inspection and available records plans included in Appendix D.

Based on the walkthrough, several of the catch basins are filled with sediment, debris or vegetation, which is impacting stormwater conveyance. Management staff noted that the northwest and northeast courtyards are only impacted during a large downpours t and thereafter the water drains within hours. The records, and corroborated by visual inspection, show the flood prone areas are at the topographically lowest points within the courtyard.

The topography of the site and layout of the site drainage combined with the sedimentation of the drainage system may present a few issues:

- Runoff may bypass upgradient, sediment-impacted catch basins and collect at the northeast/northwest low-points. It is unlikely these catch basins, or their outlet pipes, were sized for the bypassed flow.
- The storm drainage system flows from north to south, whereas the topography generally slopes from south to north. This means that drainage pipes “buck-grade” and likely have shallow slopes. This was corroborated by observing several very deep drainage structures at the topographically high parts of the site. Shallow sloped pipes are more prone to sediment impacts.

Photo 2 – Debris filled trench drain

Photo 3 – Debris-filled catch basin in northwest courtyard

Existing records indicate the presence of two drywells that were not visually verified in during the site visit. The records indicate that the drywells collect stormwater runoff from stairwell drains with small contributing areas and potential sump pits in the building. This information is to be verified through a video inspection. It does not appear these drywells contribute to collecting, retaining, or infiltrating stormwater runoff from the site except for the small stairwells.

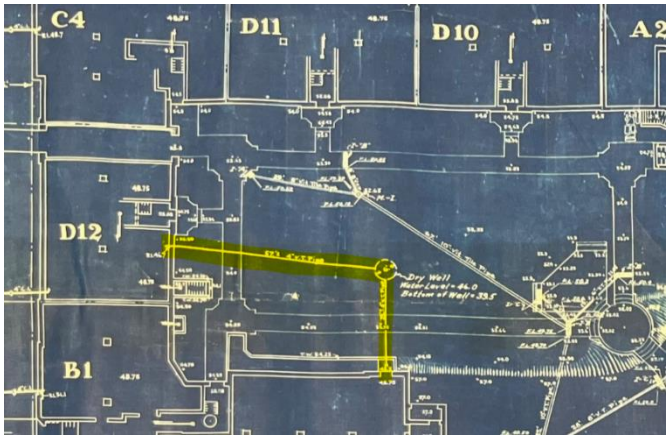


Photo 4 – Record drawing with highlighted stormwater connections of the dry-well in northwest

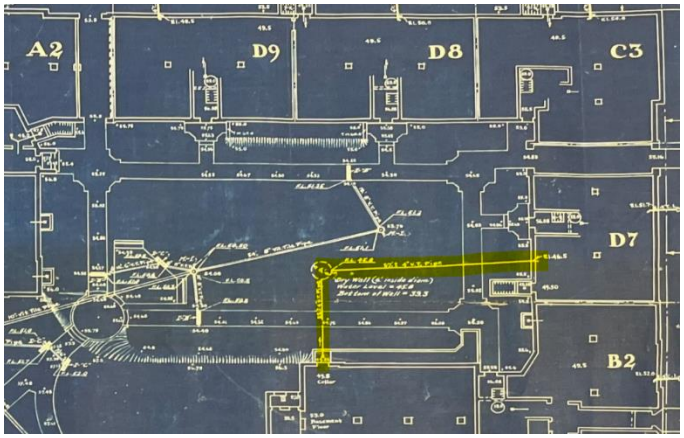


Photo 5 – Record drawing with highlighted stormwater connections of the dry-well in northeast courtyard

BUILDING CELLAR SEWER BACKUP

Buildings JJ through NN are located in the northeast corner of site north adjacent to 52nd Street. The sanitary flow and building roofs are believed to combine inside the cellar of building NN and connect to sanitary laterals. Figure 1 below shows the building laterals based on the Record Sketches found in Appendix D. Connection point for the sanitary laterals that go from the sanitary trap to the city sewer is not known.

Building management staff reports storm/sewage back up on the ground floor apartments of building at JJ thru NN in the past. It is believed that the flooding impacts of these apartments is the results of toilet/tub/shower back ups as opposed to stormwater runoff from outside of the building. Management staff notes that opening the sanitary house trap in the basement allows the backups to be contained to basement rather than backing up to the ground floor apartments. The reason for back up is not known at this time and requires additional investigation to determine cause, refer to recommendations section.

Photo 6 – Existing house trap located at Building NN

EXISTING CITY SEWER INFRASTRUCTURE

Based on available building records and city public sewer maps, there is a 15 to 18 inch sewer line running along an alley that separates the southern apartments (A-W) and courtyards with the northern apartments (AA to NN). As described above, it's unlikely that capacity issues with city infrastructure are causing the ponding impacts at the courtyard. However, City sewer infrastructure might be causing backups at buildings JJ thru NN. Additional investigations are needed to confirm.

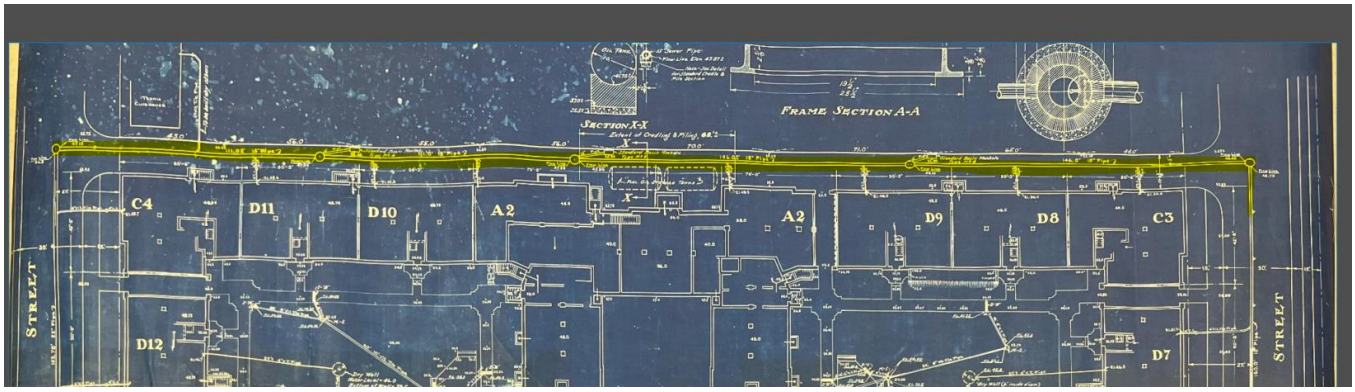


Photo 7 – Record drawing with highlighted sewer line running alone the alley that separates the southern apartments and courtyard with the northern apartments

COURTYARD FLOODING RECOMMENDATIONS

Based on the site investigation, it is possible that courtyard ponding is a result of non-functioning drainage infrastructure. AKRF recommends a phased approach to further analyze and potentially rectify the drainage issues.

i. Phase 1 – Catch Basin Cleaning
   a. Clean all existing catch basins and trench drains within the courtyard. Remove accumulated debris, vegetation, soils and sediment within the structures.
   b. Where feasible, clean pipe openings within structures.
   c. Refer to Appendix B for map identifying the critical catch basins / trench drains to be cleaned out per the site visit.

ii. Phase 2 – Pipe TV Inspection & Cleaning
   a. TV inspect all pipes along the trunk line from low points to outlet under Building D to identify potential sedimentation, damages, blockages, tree root intrusions, etc.
   b. Where required, jet clean pipes to remove accumulated sediment.
   c. Where tree root intrusions exist, clear pipes by "Roto-Rooter" or other methods.
   d. Locate drywells by TV inspecting from stairwell drains to confirm that drywells exist and verify the locations.
   e. Refer to Appendix C for map identifying the critical truck lines to inspect.

iii. Phase 3 – Maintenance & Monitoring Program Implementation
   a. Implement a comprehensive program to regularly maintain existing catch basins and pipes while monitoring the effectiveness of such maintenance. Suggested program elements are provided below.
   b. Inventory Baseline Condition: Gather existing photos and records of past flooding events to qualitatively characterize extent and depth of ponding. If possible, prior to Phase 1 and Phase 2 cleaning efforts, take physical measurements of ponding depths and limits to compare to future conditions. Record timeframe for ponded water to recede.
   c. Post-Cleaning Monitoring: Following and/or during any rainfall event greater than 1-inch:
      i. Photograph courtyard to document extents of ponding.
      ii. Prepare a sketch with dimensions to depict extents of ponding.
      iii. Take measurements of depth of ponding.
      iv. Record time for ponded water to recede.
      v. Compare findings to baseline conditions.

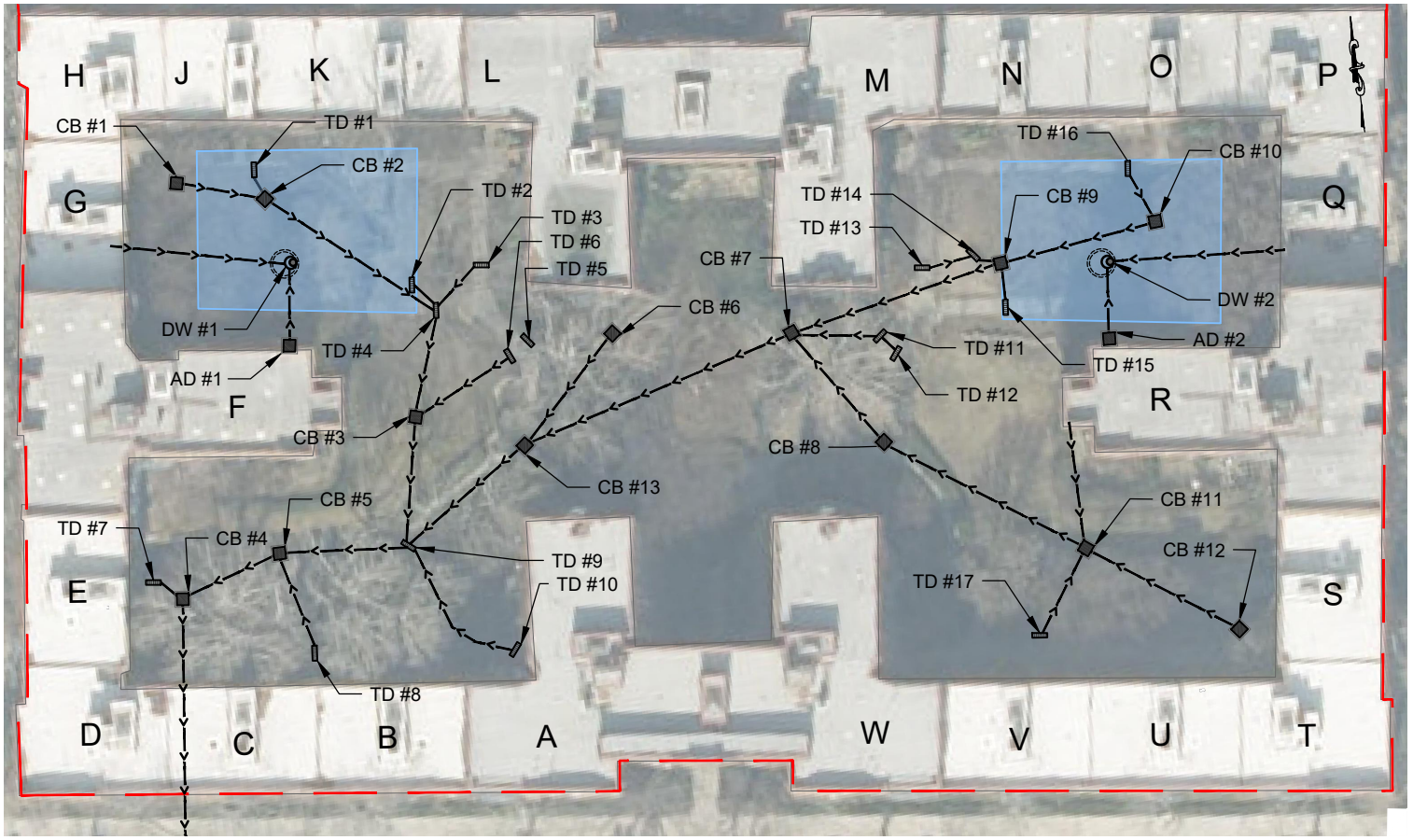
d. On-Going Maintenance: Regularly inspect catch basins following rainfall events. Remove accumulated debris to prevent clogging of outlet pipes, specifically at catch basins located in northeast and northwest sections of courtyard.

Based on the findings of the Post-Cleaning Monitoring, it may be revealed that the existing drainage system, once cleaned, has capacity to convey stormwater runoff and relieve ponding. In which case, continued maintenance would be the solution to managing the current ponding issues. In the event extensive ponding remains relatively consistent to the baseline conditions, additional drainage improvements measures may need to be considered to relieve the intermittent issues.

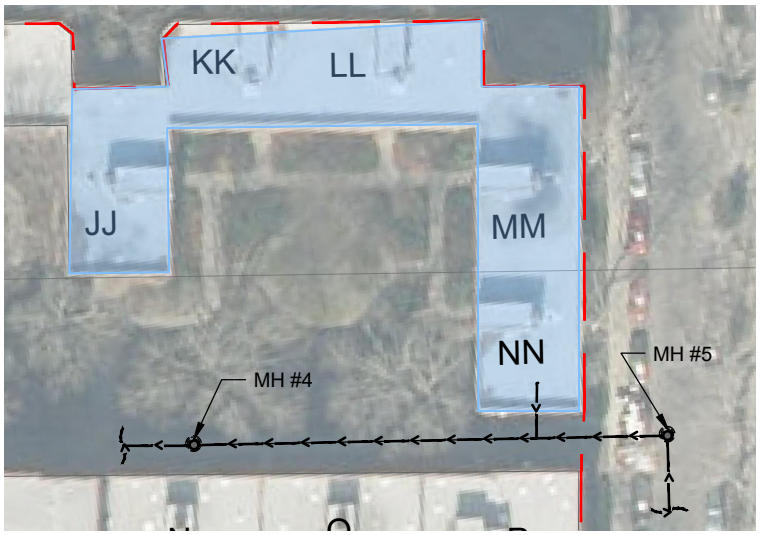
JJ THRU NN BUILDING FLOODING RECOMMENDATIONS

The flooding at ground floor apartments appears to have been rectified by property management opening the cover at the basement house trap during extreme rain events. However, this is a temporary fix. Based on the available records, it is unclear whether the house traps have a direct connection to the 15-inch sewer in the alley or to another sewer connection in 52nd Street. TV inspections may identify additional downstream blockages that could rectify semi-recurring basement flooding without the need to regularly open the basement house trap. It is recommended to hire a plumbing engineer familiar with older buildings to assess and provide recommendations.

APPENDICES



COURTYARD MAP



BUILDINGS JJ-NN MAP

0 30 60 120

SCALE: 1" = 60'

LEGEND

- SITE LIMITS
- EXISTING DRYWELL
- EXISTING CATCH BASIN/AREA DRAIN
- EXISTING MANHOLE
- EXISTING TRENCH DRAIN
- EXISTING FLOODING AREAS

ABBREVIATIONS:

CB - CATCH BASIN
TD - TRENCH DRAIN
DW - DRY WELL
AD - AREA DRAIN
MH - MANHOLE

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240818 - SUNNYSIDE GARDEN APARTMENT

EXISTING DRAINAGE CONDITIONS MAP

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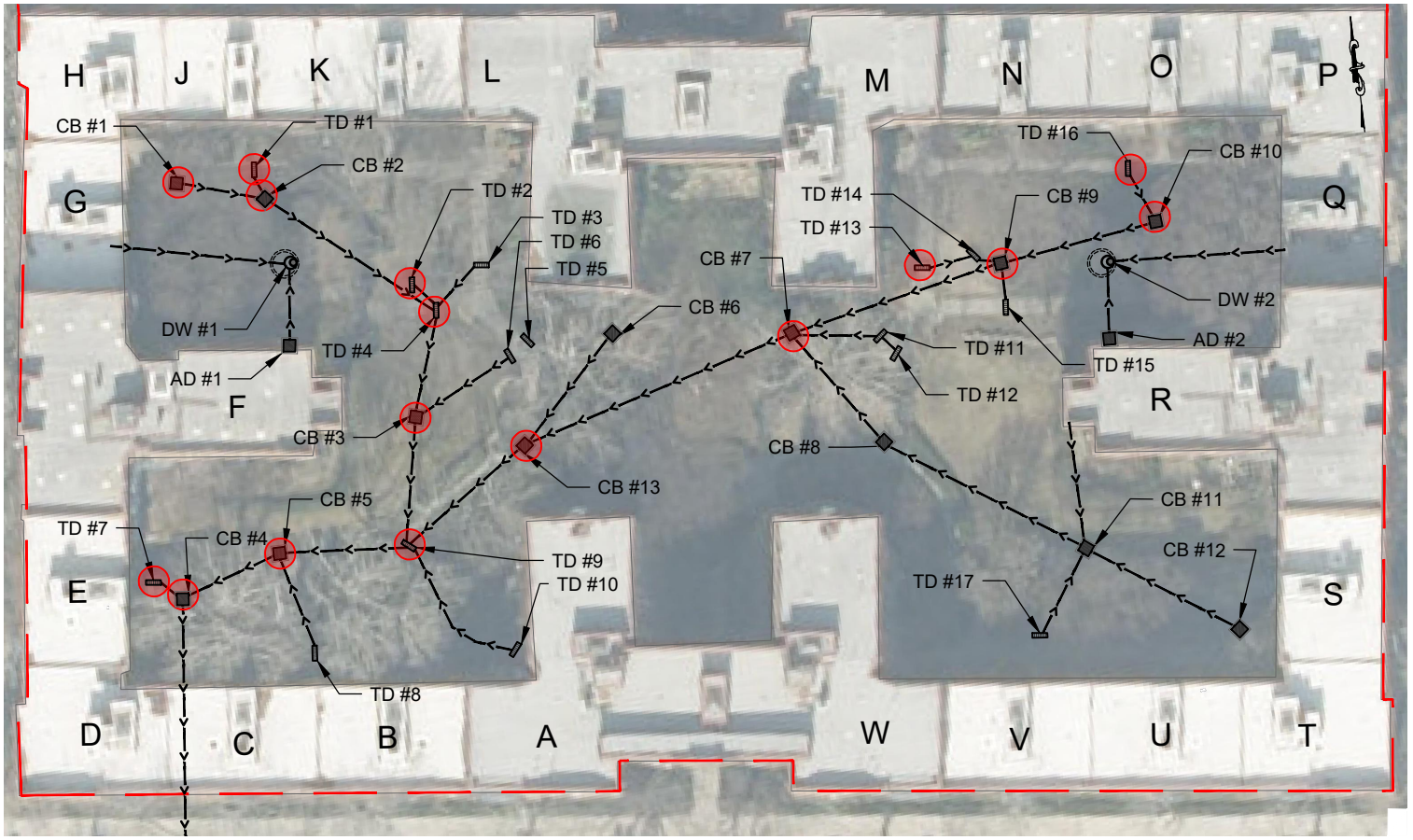
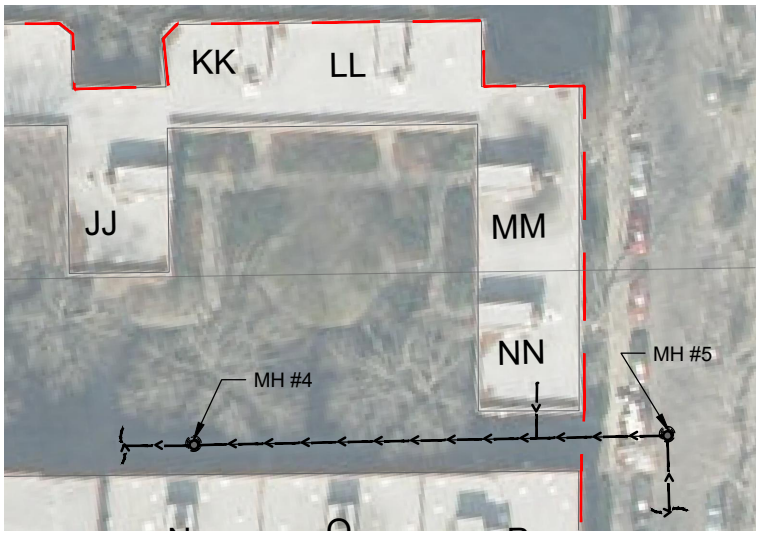
APPENDIX A



COURTYARD MAP



BUILDINGS JJ-NN MAP

0 30 60 120

SCALE: 1" = 60'

LEGEND

- SITE LIMITS
- EXISTING DRYWELL
- EXISTING CATCH BASIN/AREA DRAIN
- EXISTING MANHOLE
- EXISTING TRENCH DRAIN
- STRUCTURES TO BE CLEANED

ABBREVIATIONS:

CB - CATCH BASIN
TD - TRENCH DRAIN
DW - DRY WELL
AD - AREA DRAIN
MH - MANHOLE

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240818 - SUNNYSIDE GARDEN APARTMENT

PHASE 1 - CATCH BASIN CLEANING MAP

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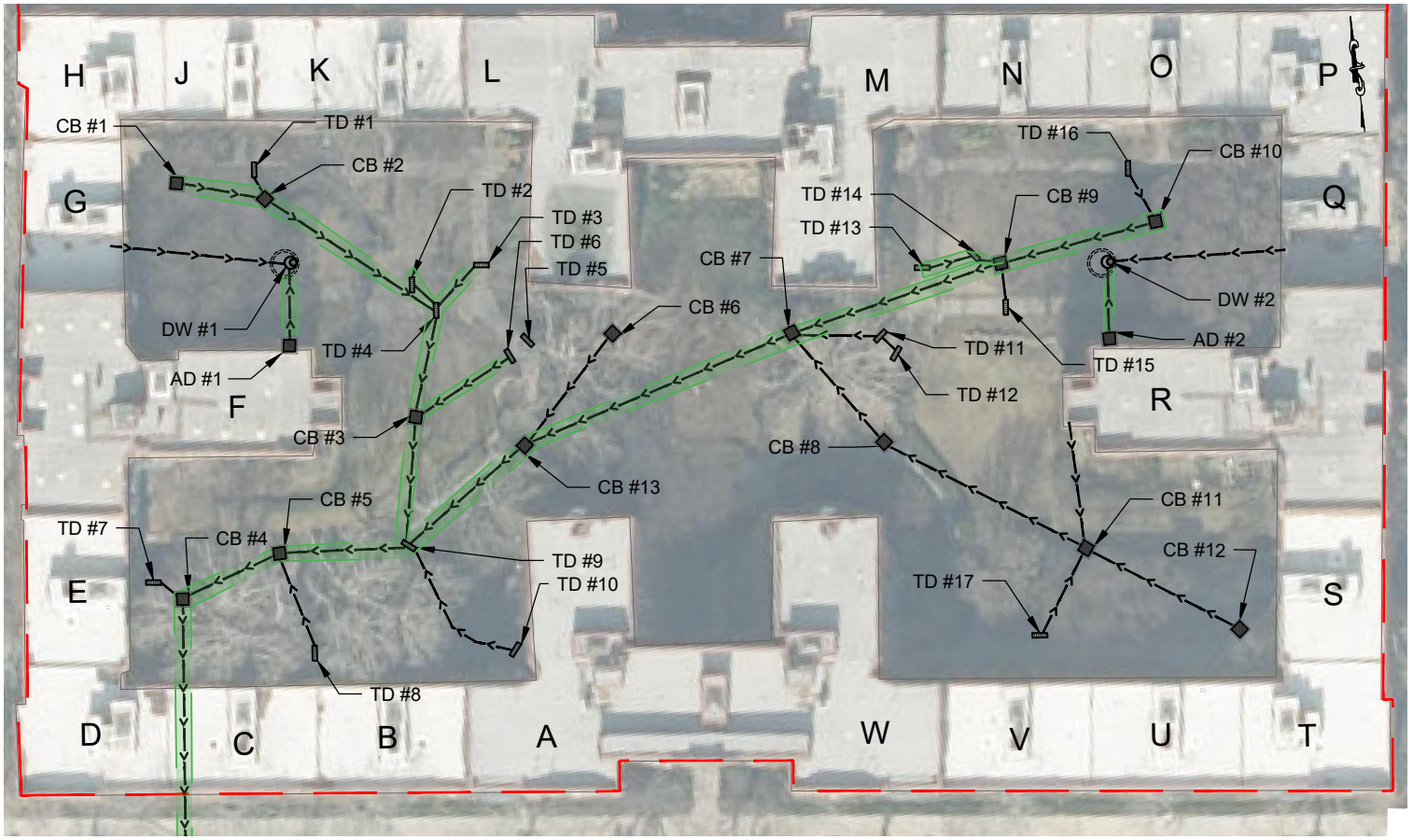
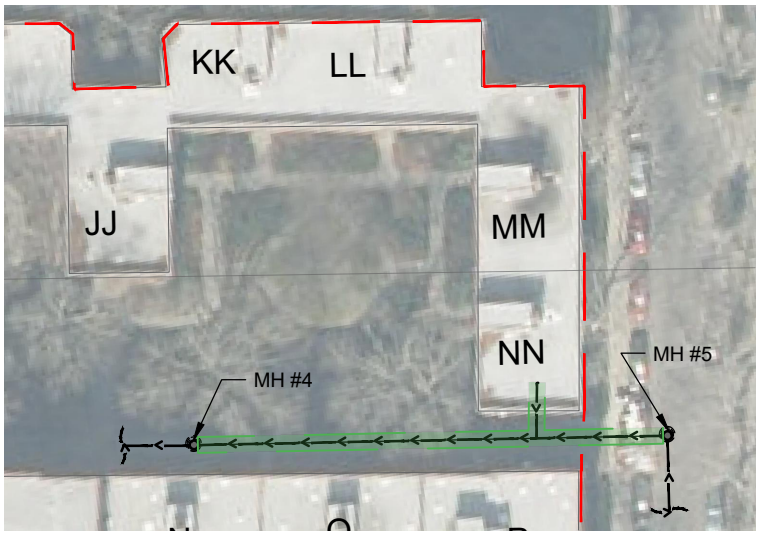
APPENDIX B



COURTYARD MAP



BUILDINGS JJ-NN MAP

0 30 60 120

SCALE: 1" = 60'

LEGEND

- SITE LIMITS
- EXISTING DRYWELL
- EXISTING CATCH BASIN/AREA DRAIN
- EXISTING MANHOLE
- EXISTING TRENCH DRAIN
- LINES TO BE CCTV INSPECTED

ABBREVIATIONS:

CB - CATCH BASIN
TD - TRENCH DRAIN
DW - DRY WELL
AD - AREA DRAIN
MH - MANHOLE

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PHASE 2 - PIPE TV INSPECTION & CLEANING MAP

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APPENDIX C

APPPENDIX D - EXISTING RECORDS

SECTION X-X

FRAME SECTION A-A

C4 D11 D10 A2 A2 D9 D8 C3

D12 D7

B1 B2

B1 B2

D1 D6

C1 D2 D3 A1 A1 D4 D5 C2

STREET

(FITTING

STREET

(DICKSON

50TH

52ND

39TH (MIDDLEBURG AVENUE)

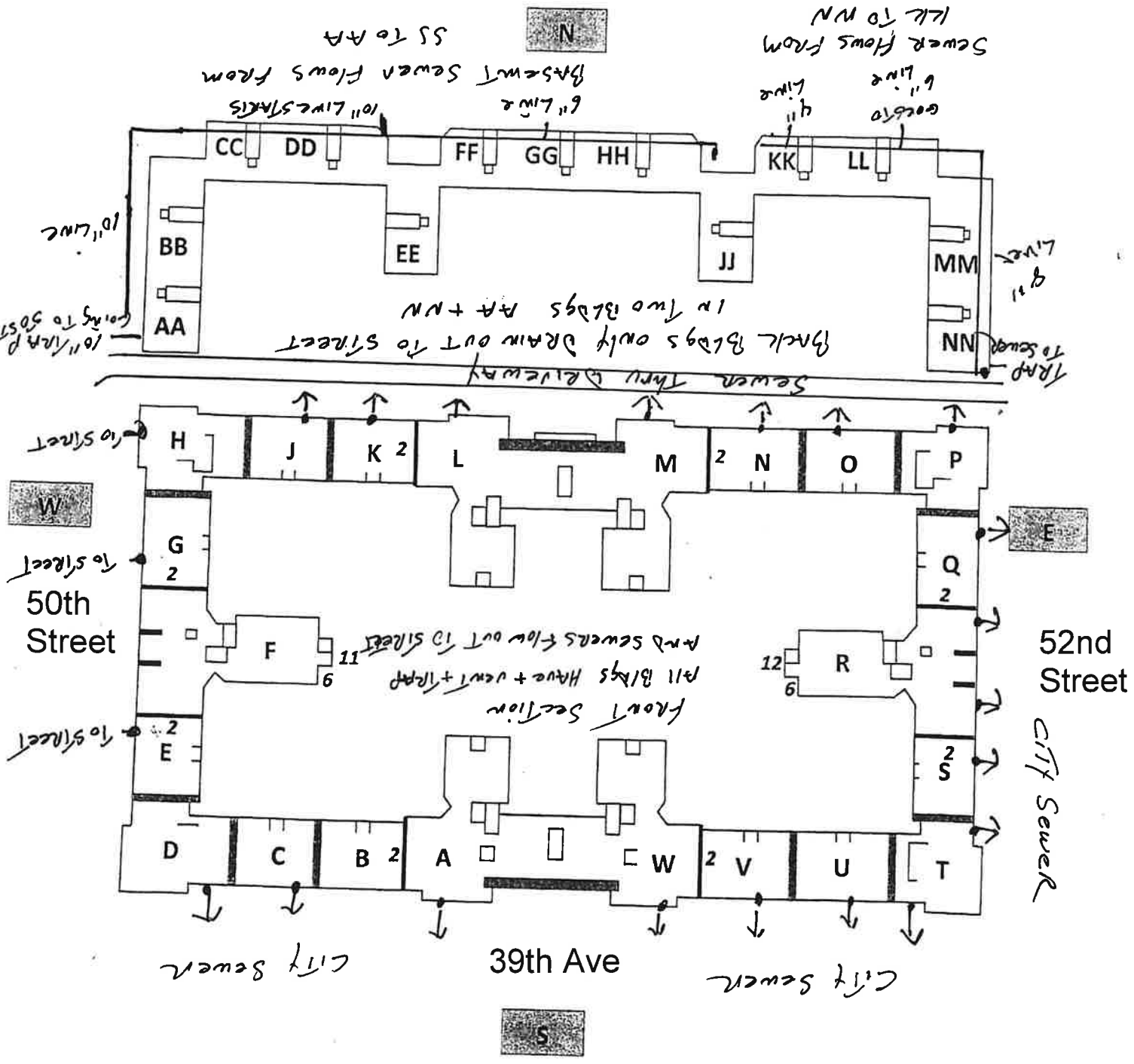
51ST (STONE ST.) STREET AVENUE

FRAME SECTION C-C

FRAME SECTION E-E

INLET A

DRAIN



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