Staff Response to Questions about the Eastburn Storm Drainage Improvement Project

Purpose of Report

This report is to brief City Council on proposed storm drainage infrastructure improvements at Hazelton Drive and Fairheath Road within the Eastburn Storm Drainage Improvement Project (SDIP). Mr. Andrew Thrasher, a property owner of 6400 Hazelton Drive, addressed City Council on August 23, 2010 indicating he felt the project was inappropriately directing water to his property. City Council requested more information concerning the proposed improvements.

Introduction

The Fairheath/Hazelton area was originally developed in 1960 by Alta Enterprises (a.k.a. John Crosland Homes) as part of the Laurelwood Subdivision. The main storm drainage line is a 48-inch corrugated metal pipe (CMP) which eventually ties to a 54-inch CMP at the downstream end of the enclosed pipe system near Fairheath Road. The existing drainage system (shown in red on Figure 1) begins behind 6330 Hazelton Drive and terminates into a channel behind 4822 Fairheath Road. At the time of the development, storm drainage easements platted for the drainage system were 10-20 feet wide. This is smaller than today's standards of 25 or more feet. These narrow easement widths mean many homes are in close proximity to existing pipe locations.

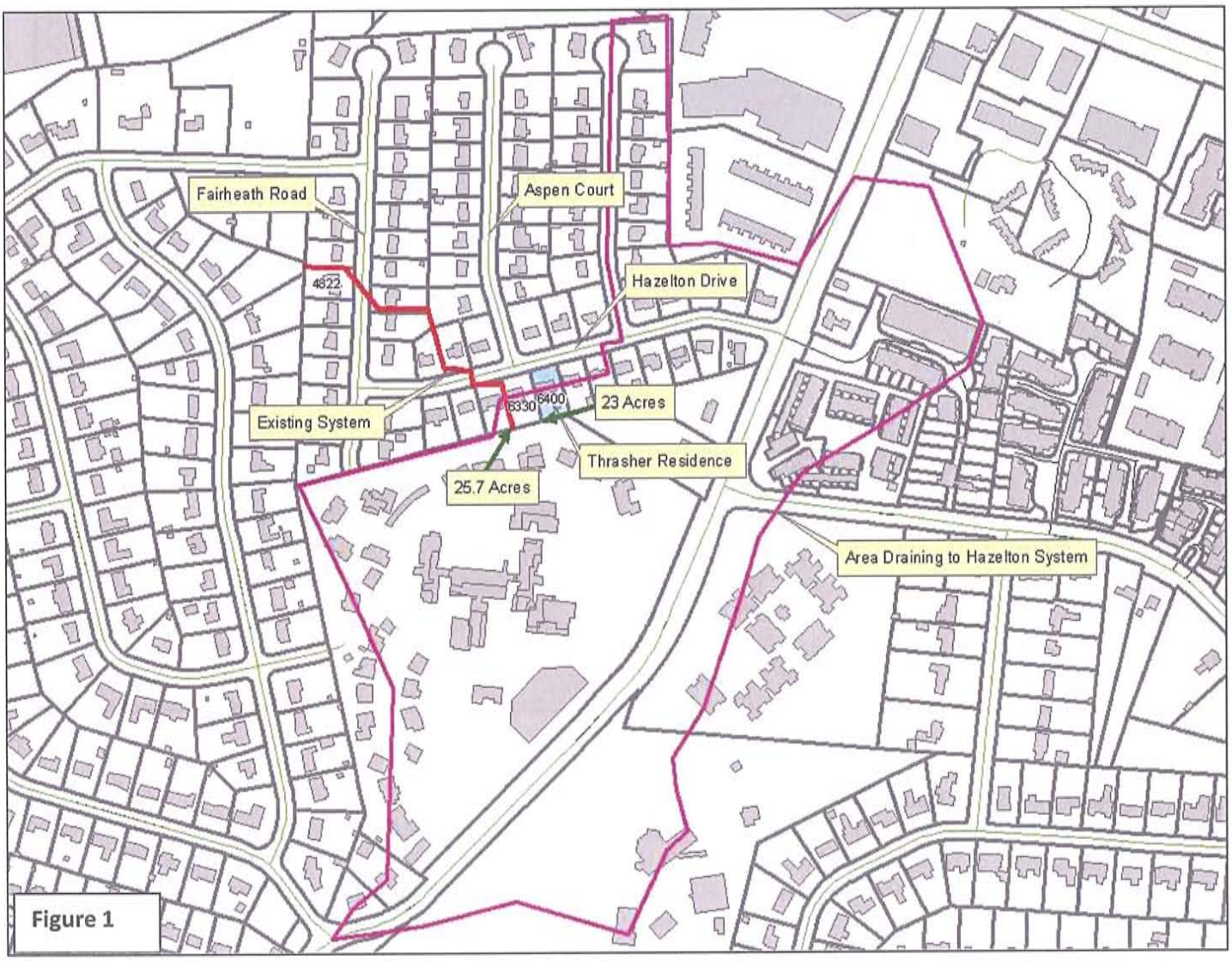


Figure 1

The area behind 6330 Hazelton Drive receives runoff from two directions: 25.7 acres draining from Sharon Road and the Presbyterian Homes – Sharon Towers Property and 23 acres to the east where a ditch system runs from Sharon Road behind Hazleton Drive. The combined area (shown in purple in Figure 1) drains to the 48-inch CMP. Since 1960, when the pipe system was originally installed by the developer, the area has continued to develop beyond the capacity of the pipe, making the current pipe system inadequate and undersized.

The Eastburn SDIP's drainage area covers about 450 acres and generally has the following boundaries: Fairview Road to the north, Sharon Road to the east, Sulkirk Road to the south and Park Road to the west (Figure 2). There are known structures and roads that flood and undersized systems throughout the neighborhood. Storm drainage infrastructure improvements are proposed at Glenkirk Road, Parkstone Drive, Woodwardia Drive, Park South Drive, Stokes Avenue, Sunnybrook Drive, Pendleton Avenue, Eastburn Road, Fairheath Road and Hazelton Drive.

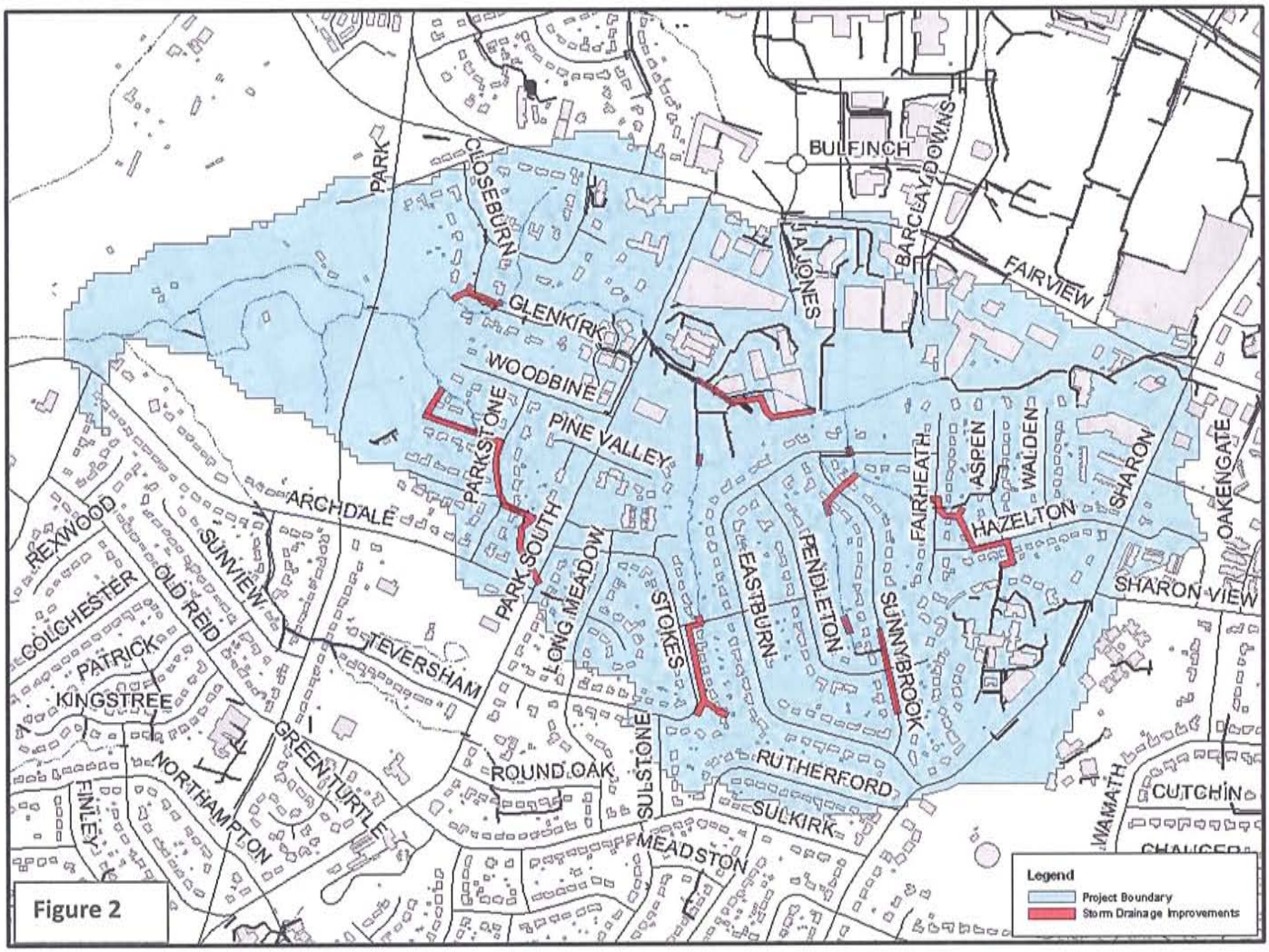


Figure 2

Flooding History at Fairheath/Hazelton Area

Citizen questionnaires collected in the fall of 2003 during the planning phase and 311 service requests report flooding of both Fairheath Road and Hazelton Drive, which has been documented with pictures and video by residents. In the summer of 2005, two storm events, both of which were less than a 10-year storm event, caused flooding of Hazelton Drive (Figure 3 and Pictures 1-5). On July 27, 2010

Charlotte Mecklenburg Storm Water Services (CMSWS) received four reports of flooding in the neighborhood including Hazelton Drive and Fairheath Road. The flooding of these streets can be attributed to the undersized 48-inch pipe system that starts in the backyard of 6330 Hazelton Drive.

Figure 3

Picture 1 – Flooding at Hazelton Drive in 2005, this also flooded on July 27, 2010.

Picture 2 – Flooding in the backyard of 6330 Hazelton in 2005.

Picture 3 – Flooding in the backyard of 6330 Hazelton in 2005.

Picture 4 – Flooding between homes at 6330 and 6324 Hazelton Drive in 2005.

Picture 5 – Flooding originating behind home at 6330 flowing between homes at 6330 and 6324 Hazelton Drive in 2005.

During heavy rain events water comes out of the 48-inch CMP system running between 6330 and 6324 Hazelton Drive and flows overland, flooding homes and roads. Underground video of the existing CMP system shows deterioration with corrosion in the bottom of the pipe. The bottom of the pipe system is missing in some sections of this enclosed storm drainage system. As a result, "blowouts" or holes in the ground or road surface along the existing pipe system have occurred and will continue to occur if the system is not upsized and replaced.

Proposed System Alternates

To address the undersized system, CMSWS is proposing a 6-foot by 4-foot reinforced concrete box culvert starting behind 6330 Hazelton Drive. Modeling for this culvert shows it is expected to contain 25-year storm events in accordance with City of Charlotte Design Standards. The 100-year storm events are still expected to flow overland along the current path. Alignment possibilities for the Fairheath/Hazelton area were shared during a public meeting on November 16, 2006 via exhibits depicting proposed alignments for the project area.

Replacing the existing infrastructure in its present location is the first preference for proposed improvements. However, it was noted at the 2006 public meeting three alignment alternates would be considered for the south side of Hazelton Drive due to the proximity of homes to the existing system. Based on City standards, 30-foot easement widths would be required for this section of pipe. The three alignment alternates included:

- Alternate A - between the homes at 6318 and 6324 Hazelton Drive
- Alternate B - between the homes at 6324 and 6330 Hazelton Drive where the current pipe exists
- Alternate C - between the homes at 6330 and 6400 Hazelton Drive.

During design, CMSWS also looked at Alternate D - installing the pipe between 6312 and 6318. The feasibility of each alternative (Figure 4) was evaluated.

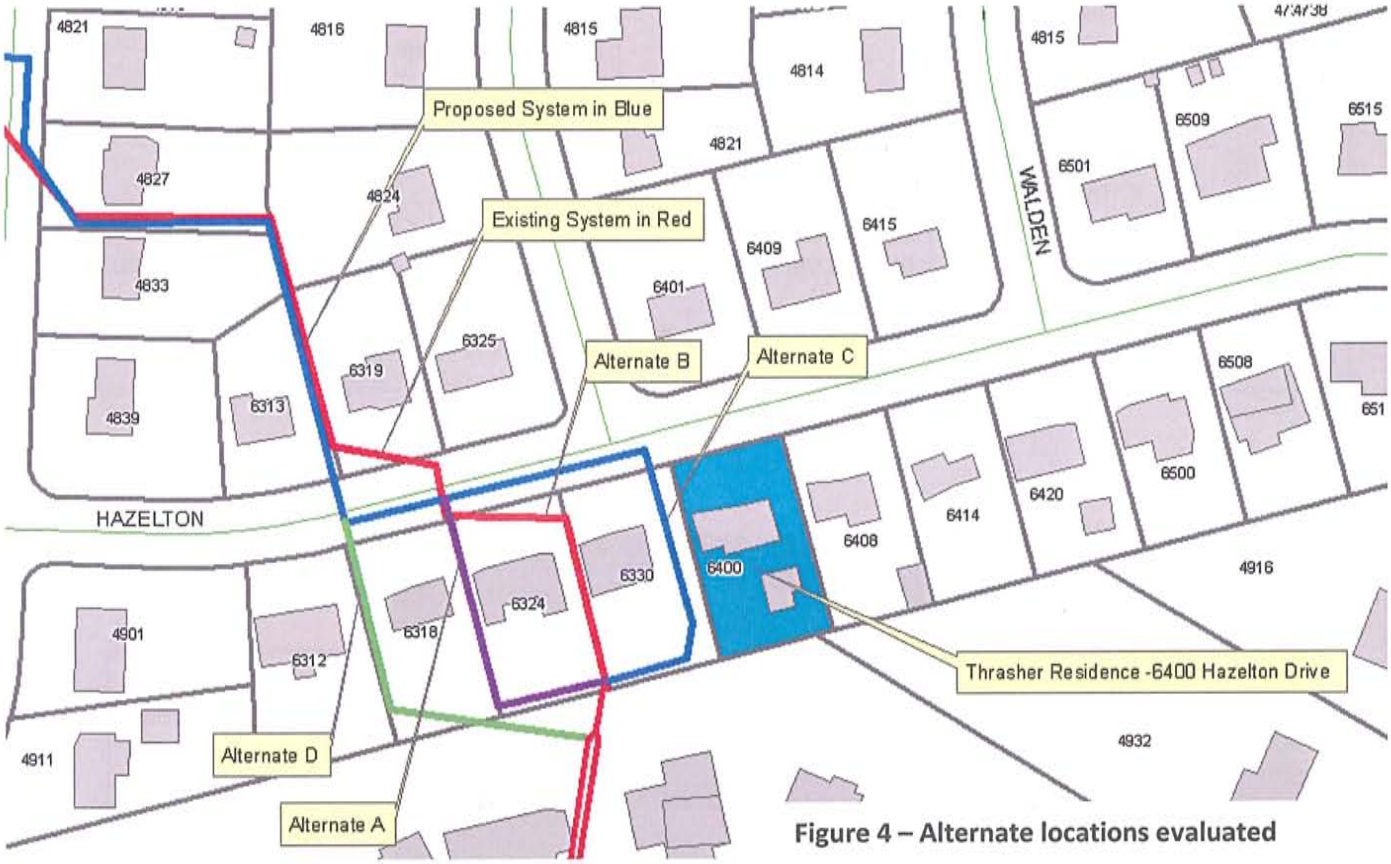
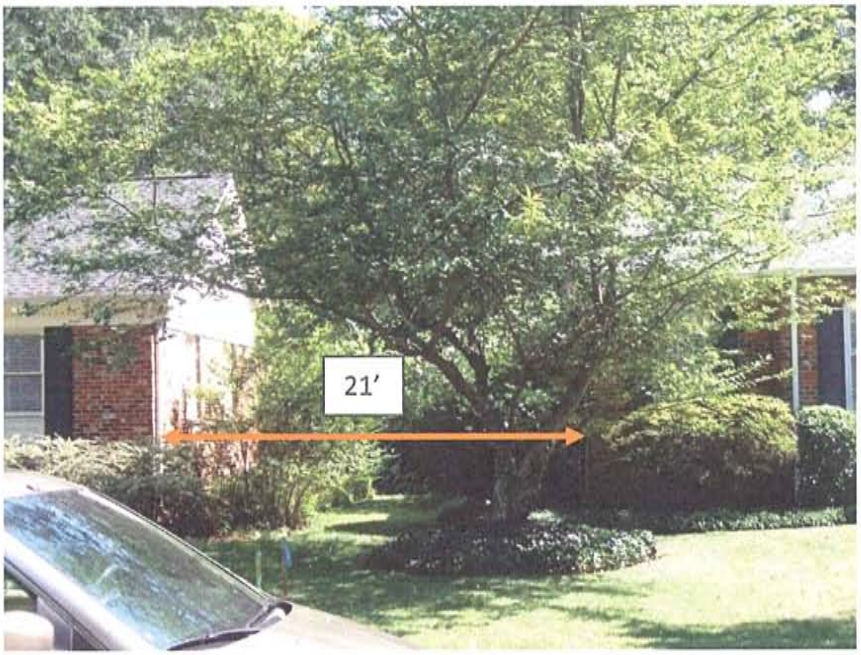


Figure 4 – Alternate locations evaluated

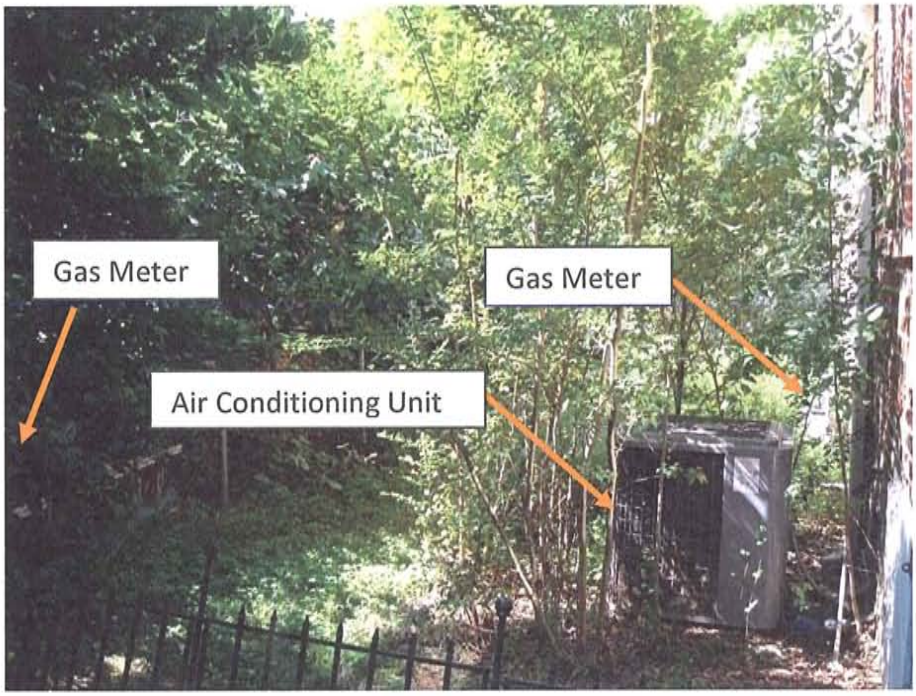
Several factors are considered when determining the best alignment: distance between the houses (is there enough space for the contractor's equipment and installation of pipe), depth of the excavation, depth of bedrock (will the contractor have to blast out rock) and tree loss. After reviewing the factors, pros and cons, Alternate C was decided to be the best option as illustrated in the following table.

	Alternate A Between 6318 & 6324	Alternate B Between 6324 & 6330	Alternate C Between 6330 & 6400	Alternate D Between 6312 & 6318
Distance between Houses	23 feet (Picture 6)	21 feet (Pictures 7, 8 & 9)	40 feet (Picture 9, 10 & 11)	38 feet (Picture 12)
Depth of excavation	10 – 13 feet	10 – 13 feet	10 – 13 feet	20 – 25 feet
Depth to Rock	15 feet	6.5 feet	14-19 feet	5 feet
Tree loss	2 trees and 5 small trees	1 small tree	2 trees	3 trees and 1 small tree
Pros	1. No rock within excavation		1. Distance between houses 2. No rock within excavation	1. Distance between houses
Cons	1. Distance between houses 2. Tree loss	1. Distance between houses 2.Rock within excavation – will have to blast very close to homes 3. HVAC, Gas meter & sewer within area	1. Tree loss	1.Depth of excavation 2. Rock within excavation – will have to blast close to homes 3.Tree loss

Picture 6 – From road, shows 23-foot clearance between 6324 and 6318 Hazelton.



Picture 7 – From road, shows 21-foot clearance between 6300 and 6324 Hazelton. The existing pipe is in this alignment. Any water flooding backyard areas spills over and flows between these homes to the street.



Picture 8 – From behind 6330 Hazelton between 6330 and 6324 Hazelton, shows air conditioning unit and gas meters. The existing pipe is in this alignment. An 8 inch sewer line is in this location as well. Flooding behind the 6330 Hazelton residence overflows and drains between these homes.

Picture 9 – Shows 6330 Hazelton with 40 feet on left (driveway) side between homes versus 21 feet on right side adjacent to 6324 Hazelton.

Picture 10 – Shows 40-foot clearance between 6330 and 6400 Hazelton.

Picture 11 – Back of yard looking toward the street between 6330 and 6400 Hazelton.

Picture 12 – View from road looking at Alternate D alignment between 6318 and 6312 Hazelton. Construction here would be very deep. Distance between homes is 38 feet.

Additional Alternatives

After meeting with the Thrashers to discuss their concerns, several other options were reviewed by CMSWS in an effort to meet their request.

Detention - CMSWS had not considered detention during the planning phase because there is a lack of vacant land. Detention for Sharon Towers, a senior citizen assisted living community, and their parking deck expansion was approved in October 2001 and constructed by October 2003. The detention was designed to meet the 2- and 10-year storm events as required at the time of the development. CMSWS investigated possibilities for detention systems large enough to attenuate flow from the Sharon Towers

site, alleviating downstream flooding. CMSWS determined the approximate detention basin size needed to capture and detain the runoff from this area. Those potential areas (assuming a 6-foot depth) are depicted in blue (Figure 5). Any shape would likely not be feasible due to cost of the land needed and the amount of infrastructure (homes, buildings, roads, utilities, etc.) that would have to be removed to build such a facility.

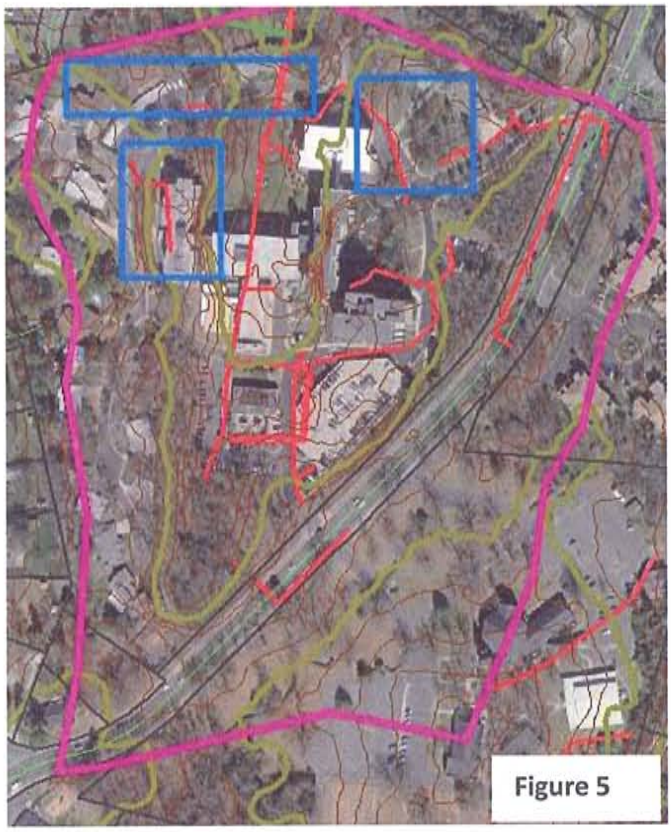


Figure 5

Buyout - The Thrashers asked if CMSWS considered purchasing the 6330 Hazelton property, razing the home and then installing the improvements. This option would be more costly, as illustrated in the following cost analysis. A home buyout would likely cost $300,000 above and beyond the engineering fix. While the shortening of the pipes would help offset some cost, the savings would be far short of compensating for this expense.

Approximate cost to acquire 6330 Hazelton	$300,000
Approximate cost of easements not having to purchase	- $44,275
Approximate savings from not having to install 160 lf of pipe	- $80,000
Expected **additional** cost for this option	$175,725

The above costs do not include demolition of the home nor rock removal.

Proposed Design

After studying the options during planning, design and real estate phases, Alternate C (the easterly side of 6330 Hazelton Drive) was deemed the most feasible, constructible, and suitable location for installation of a new drainage system (Figure 6). While a majority of the storm drainage easement (SDE) area for the system between 6330 and 6400 is located at 6330 Hazelton Drive, a small portion of the SDE will be on 6400 Hazelton, where the Thrashers live. (Figure 7) The actual 6'x4' pipe is located entirely on the 6330 property.

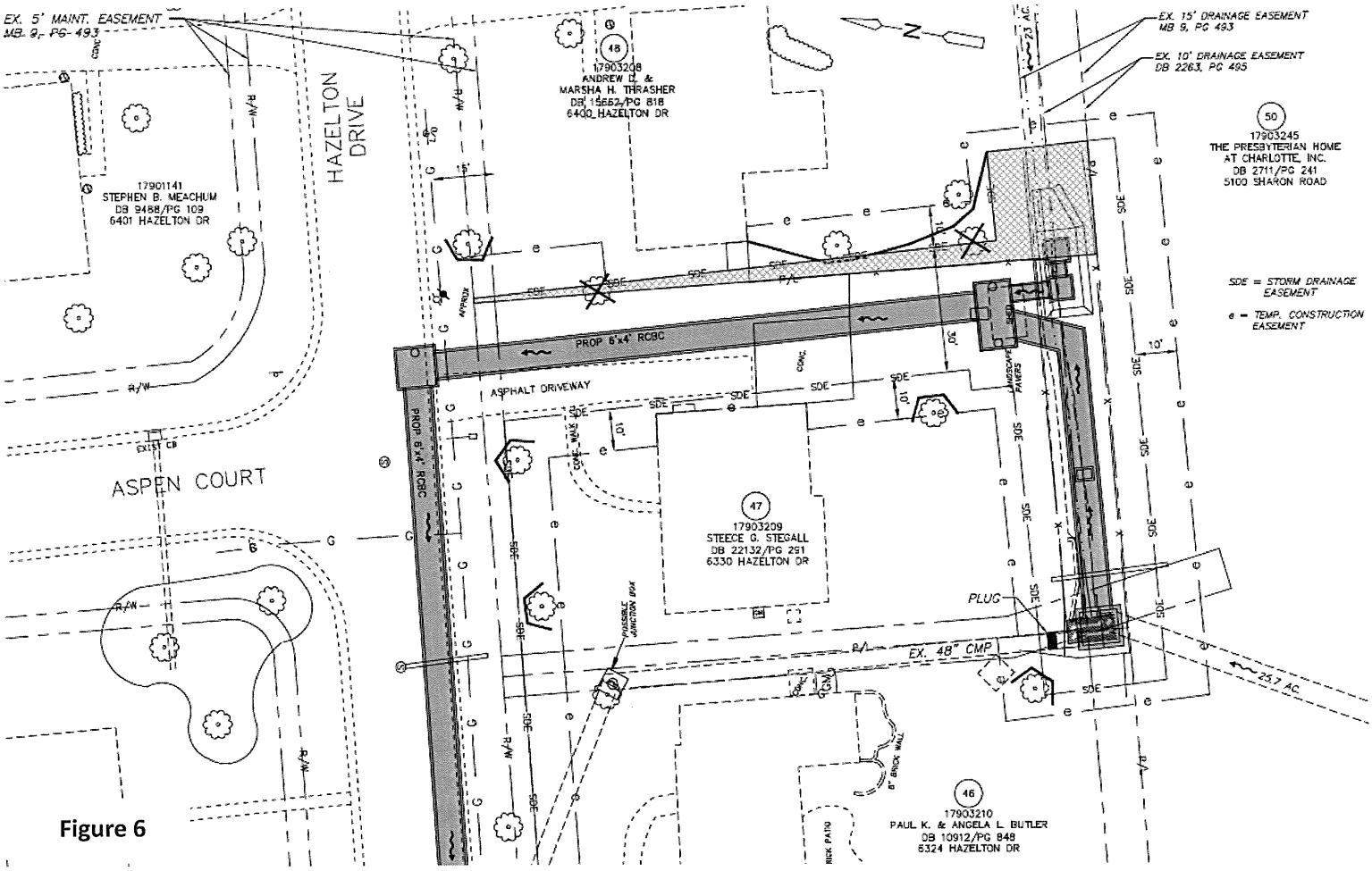


Figure 6

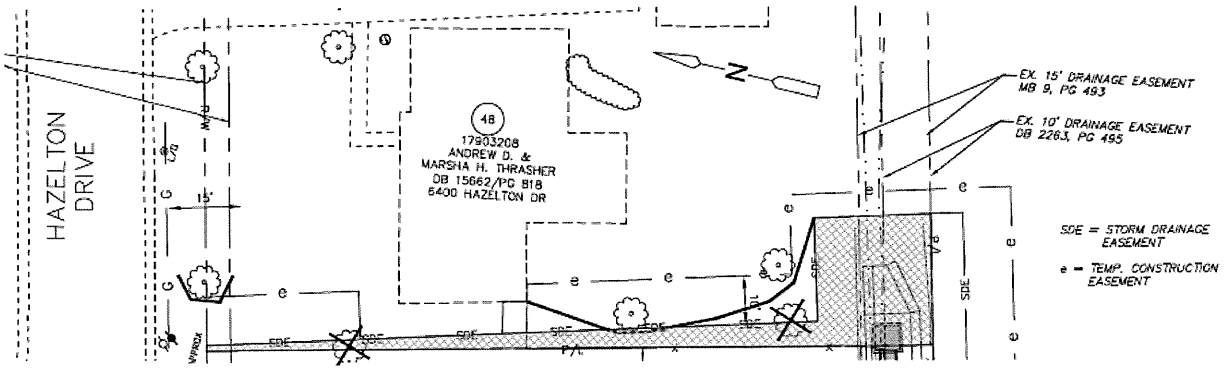


Figure 7

The backyard drainage ditch (Picture 13) is proposed to be intercepted by a paved concrete invert with a double slab top inlet design. A similar type inlet design is in Picture 14. A more conventional headwall design intercepting the ditch was originally presented to the Thrashers at the October 29, 2009 Eastburn Design public meeting. After listening to their concerns about safety, CMSWS replaced the headwall design with a double inlet slab top design. The openings on slab top inlets are 6 inches in height. A fence which the Thrashers currently have installed and which separates the backyard from the ditch will be replaced by CMSWS and will continue to separate the backyard from the ditch and new inlet.

Picture 13 – Existing drainage ditch flowing behind 6400 Hazelton.

Picture 14 – Example of a paved invert double slab top inlet for capturing flow.

Easement impact to the property

CMSWS kept the pipe and easement on the 6330 Hazelton property as much as possible. CMSWS also minimized the easement width as much as possible on 6400 Hazelton. The SDE on the side property at 6400 Hazelton Drive tapers from 6' in the back to 1' in the front. While this is a permanent easement, the majority of it is within the 6' sideyard zoning setback that each residence would be required to keep clear of any additions or expansions to their home. There are existing easements in the back of the property where the ditch is currently located. CMSWS needs some additional easement to tie-in the ditch to the new inlets and pipe system. In addition to the permanent Storm Drainage Easements there are additional temporary construction easements that are proposed outside of the SDE to allow room during construction. The temporary construction easements expire and cease to exist after the project is completed.

Impact of project on 6400 Hazelton

Currently the low point for the area draining to the existing 48-inch CMP is behind 6330 Hazelton Drive. The Thrashers were concerned that either removing or relocating this low point would be an attempt to pipe water uphill. Due to the already mentioned constraints of putting the new system in the same place as the existing system, the decision to route the pipe between 6330 and 6400 Hazelton works very well. We will be able to provide the necessary slopes in the pipes below ground, while keeping the general topography of the ground in the rear yards the same. The project will not be moving the low point from 6330 to 6400 Hazelton Drive. Any large flooding events will continue to drain, as they have been since the system was installed by the developer, between the homes of 6330 and 6324 Hazelton Drive.

Tree Concerns

Current plans indicate the necessity to remove two trees while saving two other trees. The City's Landscape Management staff evaluated these trees during the design phase. After the Thrashers expressed their concerns, the City's Landscape Management staff again re-evaluated these trees to determine if they could be saved. The first tree to be removed is a 37" willow oak in the front yard of the Thrashers which lies on the property line (Picture 15).

Picture 15 – 37" Willow Oak in front yard on property line in front of Thrashers home.

This 37" Willow Oak is in good health. However, even if the excavation of the trench went straight down, the edge of the trench would be around 4 feet away from the tree's rootball on one side and would likely remove the entire side's root system of the tree. CMSWS cannot guarantee survival of the tree and it would be potentially unsafe if left in place; therefore, removal is recommended. CMSWS also looked at the possibility of installing a drainage structure and angling the pipe away from the tree instead of running the system down the property line as planned. Even with this, this tree would be damaged and only stand a 50% chance of survival, thus the recommendation to remove.

For trees in the back, two are proposed to be saved and one is proposed to be removed (Picture 16).

Picture 16 – Picture of Thrasher's backyard at 6440 Hazelton showing 30" Willow Oak in the left foreground, a 20" Willow Oak in the middle background and an 18" Willow Oak in the right background.

While CMSWS is proposing to install tree protection for the 30" Willow Oak and the 20" Willow Oak, the 18" Willow Oak is being proposed to be removed. The 18" Willow Oak is not as full when compared to the 37" tree in the front yard due to competing trees near it which are keeping it from leafing out fully. It is in good health but is less vigorous due to the lack of an extensive canopy. Since CMSWS is impacting this tree on two of four sides, it may not react well to the construction. Therefore the City is recommending removal of the 18" Willow Oak. The removal could help the healthier 20" Willow Oak behind it. CMSWS will take care to protect the 20" tree behind it during construction.
In February, CMSWS proposed replanting trees but the Thrashers were not interested in discussing this. During Real Estate negotiation the Thrashers indicated they were not as concerned about removal of the 18" tree in the back of the property as they were with the 37" tree in the front. During negotiations they inquired about our ability to remove another tree that showed to be protected that is just outside the SDE which they felt would not survive after construction.

Property Owner Coordination
Below is a summary of the efforts made by staff to address the Thrashers concerns:
October 27, 2009 – Mr. Thrasher attended the Public Information meeting and requested a copy of the design drawings.
October 29, 2009 – Matthew Anderson, CMSWS, in responding to Mr. Thrasher's request, emailed the two PDF copies of the design drawings.
November 13, 2009 - Following a meeting with the Real Estate agent, Mr. Thrasher contacted City Council member Dulin. A meeting was set up with Mr. Thrasher, CMSWS staff and Council member Dulin for November 23, 2009.
November 17, 2009 – Real Estate agent Andrew Ponder sent Matthew Anderson a detailed list of concerns from the Thrashers. After reviewing the concerns CMSWS decided additional time was needed to answer concerns.
November 20, 2009 - Jennifer Smith, Storm Water Division Manger, contacted the Thrashers and asked if the meeting date could be moved to December 14, 2010 to allow staff to look into concerns.
December 14, 2009 – A meeting was held with Mr. & Mrs. Thrasher, City Council member Dulin, City Engineer Jeb Blackwell, Storm Water Division Manager Jennifer Smith, Project Manager Matthew

Anderson and Real Estate Agent Andrew Ponder. CMSWS discussed the reason for the project, the proposed alignment and the Thrasher's concerns about the trees and safety. During the meeting the Thrashers asked about other alternatives and whether or not these were considered. Real Estate Acquisitions in the Fairheath / Hazelton area were put on hold pending the evaluation of the other alternatives.

December 15, 2009 – Matthew Anderson emailed the Thrashers verifying their questions about other options being considered (such as other alignments, detention and property buyouts), other current and past projects built by Storm Water, speed bumps on Hazelton, construction duration, tree mitigation options and other tree-related concerns. Staff began evaluating the other options and gathering information to respond to the Thrashers.

February 3, 2010 – Matthew Anderson emailed the Thrashers with the staff responses to their questions and concerns. An offer was made to install safety fence for construction and replant trees. CMSWS informed the Thrashers CMSWS could not find a better option and asked them if they had time to work through concerns.

February 12, 2010 – CMSWS asked again if they had any time to discuss the findings in the February 3, 2010 email. They responded they were busy (husband out of town) and were hoping for a better outcome. They also said they would be letting their attorney handle the issue. CMSWS responded letting them know we could still discuss the tree replacements.

February 26, 2010 - CMSWS and Real Estate re-engaged the acquisition process and ordered appraisals.

June 2, 2010 – Following receipt of an independent third party appraisal, City Real Estate offered the Thrashers $13,100 for the easement which included $5,300 for the loss of trees and shrubs. A response was received from their attorney stating "the Thrashers cannot accept the current offer of $13,100. We are in the process of putting together a substantive counteroffer, and will respond as soon as practicable."

July 13, 2010 – A counteroffer of $90,000 which excludes replacement of the trees and fencing was received from the Thrashers attorney.

August 23, 2010 – Following failure to settle the difference between the $13,100 offered and the $90,000 countered by the Thrasher's the condemnation process was initiated with an agenda item placed for consideration by City Council. Mr. Andrew Thrasher spoke about his concerns with the project.

Current Project Timetable

The City is now concluding Real Estate negotiations for the project. Of the project's 74 total acquisitions, 43 have been donated, 22 settled and 4 have been approved for condemnation. We are still working with 5 property owners including the Thrashers.

CMSWS has informed the neighborhood that construction on the project will begin in February 2011. In order to meet this deadline we will need to be in the bid phase by October 2010 and recommending an award to the lowest responsible, responsive bidder to Council in early January 2011.