

43rd Street Outfall Basin Study
Basis of Design Report
Project ST510C; Work Order 22

Prepared For:
City of Tampa
Stormwater Department



Submitted To:
Southwest Florida Water Management District



Prepared By:
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ENGINEERS • SURVEYORS • PLANNERS • SCIENTISTS

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(*under separate cover*)

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1. INTRODUCTION

1.1. Background

Flooding problems have persisted along a segment of the 43rd Street Outfall ditch from between Columbia Street to the 43rd Street crossing. The City of Tampa has indicated the frequency and severity of the flooding problems have increased since widening of I-4 reconstruction was completed in 2004. The Hillsborough Area Regional Transit (HART) Authority has documented structural and site flooding at the headquarters facility on 21st Avenue, to the north of Columbia Street. Both HART and the City have documented roadway overtoppings at 10th Avenue and 43rd Street. Past flooding problems are evident at the 43rd Street crossing with a berm that has been constructed along the ditch bank by an adjacent property owner.

1.2. Purpose and Scope

The City of Tampa and HART are cooperatively funding this study to; 1) analyze the flooding problems within the study area, 2) develop and compare preliminary alternatives to improve flood protection, 3) make a recommendation to improve flood protection, and 4) to incorporate water quality improvements as may be beneficial in seeking cooperative funding from the SWFWMD for design and construction phases. The City has authorized DRMP, Inc. to proceed with this study with the scope of work outlined below. The surface water model and GIS development for this study has generally been conducted in accordance with the *City of Tampa GIS Stormwater Model Parameterization Guide* (City GIS Guide), dated December 2011. Alternatives and recommendations in this report are preliminary in nature with additional survey and data collection necessary for the final design. Note that all elevation data for this study is reported in the NAVD88 vertical datum.

Task 1: Data Collection

This task involved collection and review of all data relevant to the flooding problems and developing a surface water model for the entire 43rd Street Outfall drainage basin. Data collected generally included; flooding documentation, available GIS layers, LiDAR terrain, City drainage and infrastructure information, Environmental Resource Permit (ERP) files at SWFWMD, and FDOT roadway projects. Supplemental field survey of existing culverts and ditch cross-sections was also conducted for this study with assistance from Polaris Associates, Inc. under separate authorization with the City.

Task 2: Develop Existing Conditions Model

This task involved developing a surface water model using XP-SWMM for the drainage basin contributing to the 43rd Street Outfall system. The model has been verified for accuracy by comparing peak stage results with observed and documented flooding conditions. A critical duration analysis was conducted of 5-year storms with the following durations: 1-hour, 2-hour, 4-hour, 8-hour, and 24-hour. The duration exhibiting the highest stages and flows in the focal area of the study was used for flooding and alternatives analyses. The 25-year, 24-hour storm was also simulated for design and permitting considerations of the alternatives analysis.

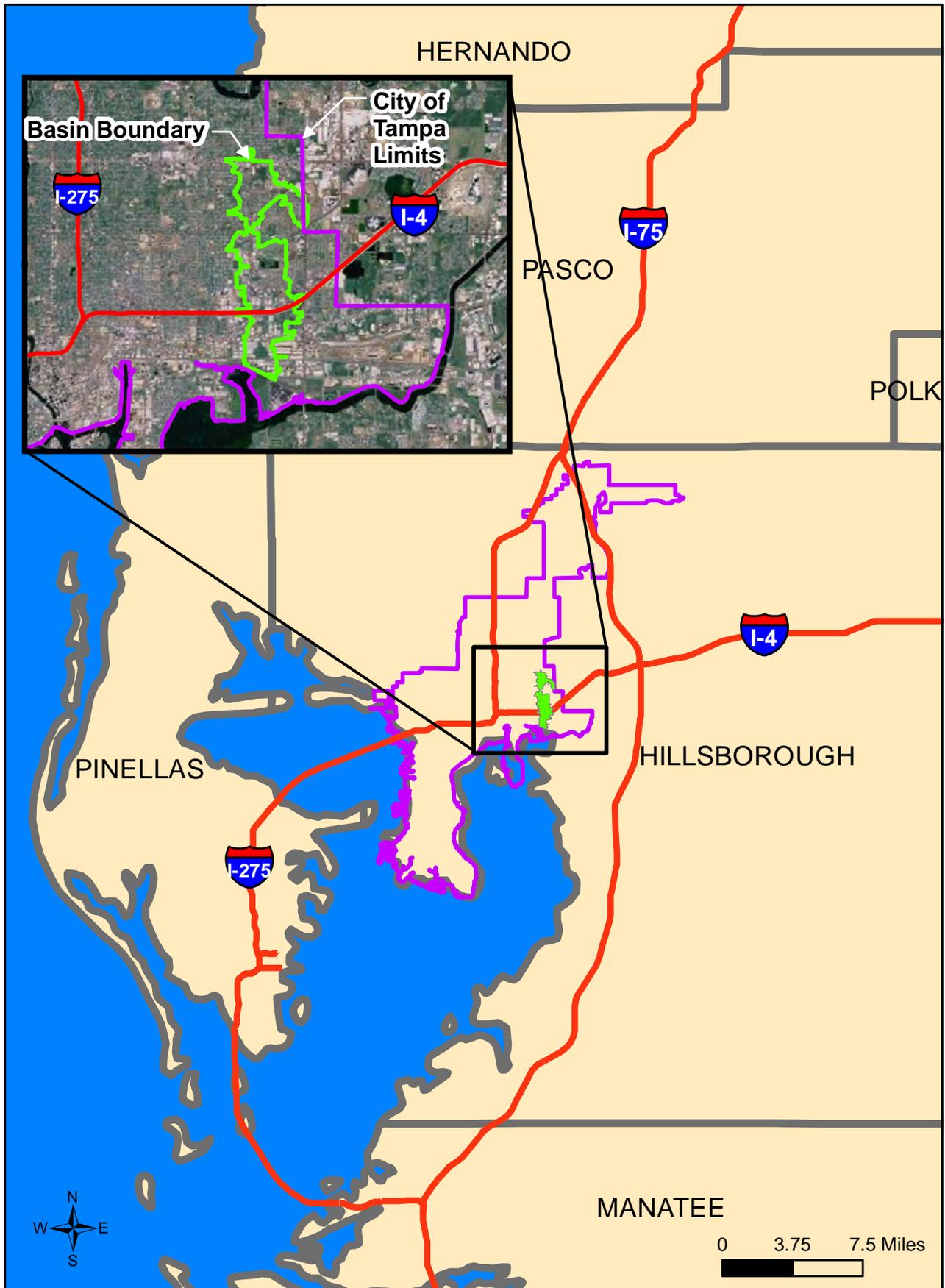
Task 3: Alternatives Analysis

This task involved preliminary analysis of feasible alternatives to address flooding problems in the focal area of the study from the HART facility southward to the 43rd Street crossing. Flood protection alternatives have been preliminarily designed to meet the level of service protection for the 5-year critical storm event. Alternatives considered include culvert and ditch conveyance upgrades, flow diversion, detention ponds, or any combination thereof. Potential utility conflicts have been researched and assessed for level of impacts for each alternative, with a summary table included in this report. Preliminary construction and property costs were tabulated for the alternatives. Water quality improvements were also to be incorporated into the alternatives where feasible. This final Basis of Design Report (BODR) documents the study and the recommendations, for ultimate submittal to the SWFWMD. Additionally, a GIS directory with all project files and model development has been submitted separately as described in the City GIS Guide.

2. PROJECT APPROACH

2.1. General Description of Study Area

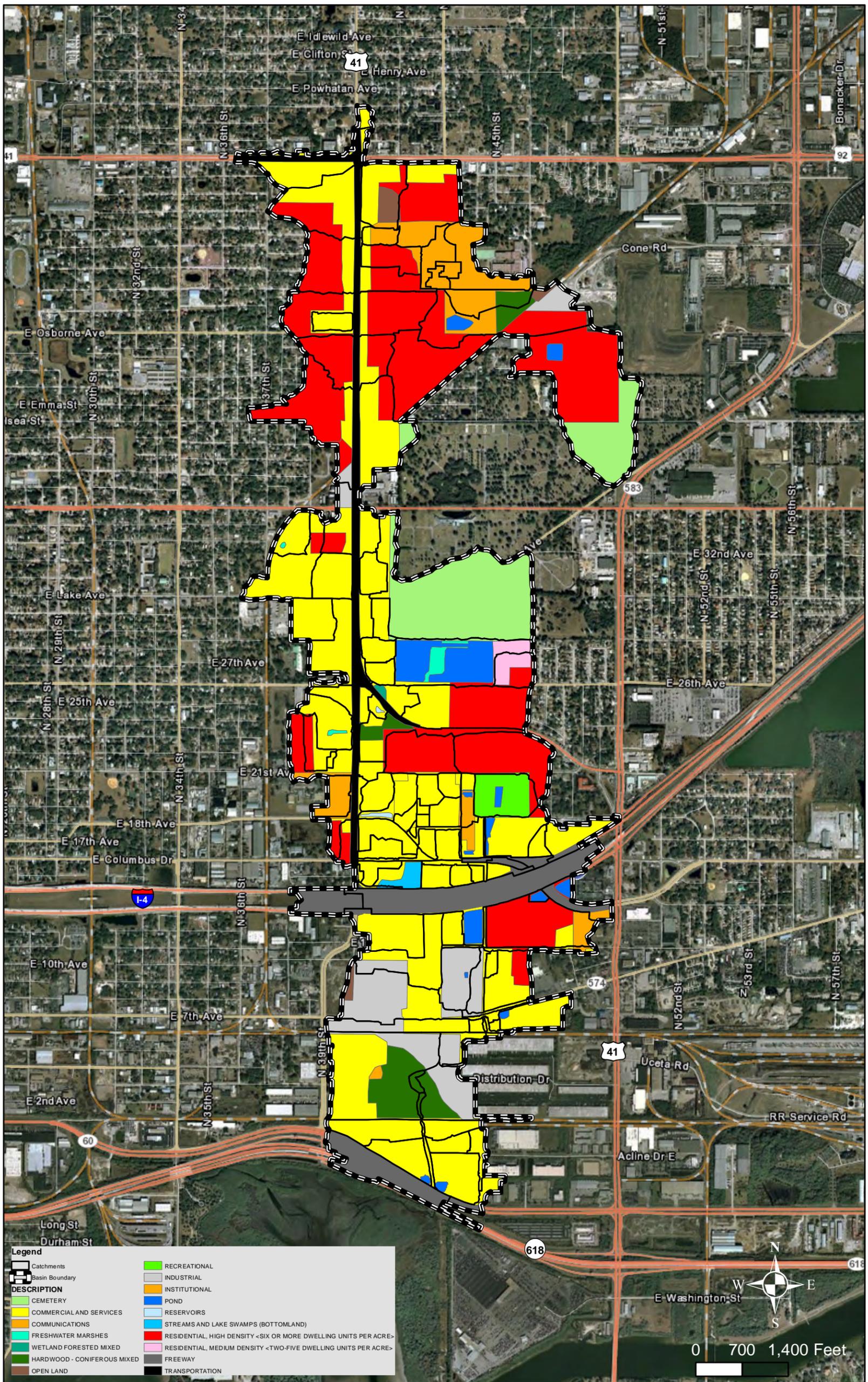
The study area is the entire drainage basin contributing to the drainage system known by the City of Tampa as the 43rd Street Outfall system. This drainage basin comprises approximately 1,118 acres of mostly urban lands. Figure 1 on the following page shows location of the drainage basin for the 43rd Street Outfall.



A land use GIS layer has been developed for this study originating from SWFWMD in the FLUCCS format. Some land use classifications have been adjusted for this study for modeling purposes. The land use layer is depicted on Figure 2 on the following page. The top two land uses include Commercial and Services at 38% and High Density Residential at 26%. Table 1 below is a breakdown of the land use types with acreages, percentages of the study area, and estimated percent imperviousness by land use type.

Table 1 – Land Uses

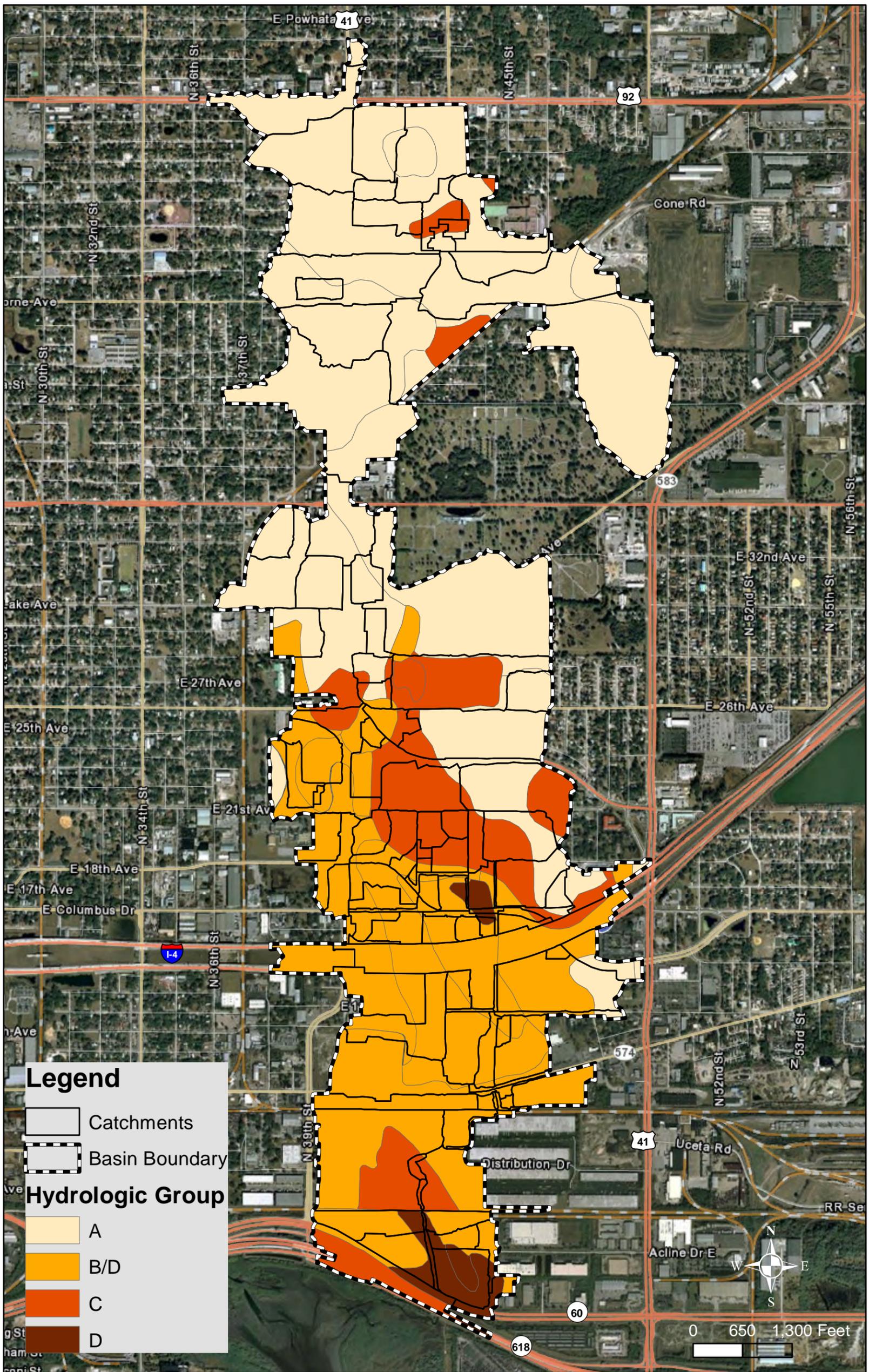
Land Use Classification	Area (acres)	Percentage of Total Area (%)	Estimated Percentage of Impervious Area (%)
COMMERCIAL AND SERVICES	422.9	37.8	70
RESIDENTIAL, HIGH DENSITY <SIX OR MORE DWELLING UNITS PER ACRE>	288.2	25.8	33
CEMETERY	85.9	7.7	13
FREEWAY	65.8	5.9	84
INDUSTRIAL	64.5	5.8	38
INSTITUTIONAL	60.5	5.4	54
TRANSPORTATION	35.7	3.2	91
HARDWOOD - CONIFEROUS MIXED	30.3	2.7	0
POND	29.7	2.7	71
RECREATIONAL	12.1	1.1	11
RESIDENTIAL, MEDIUM DENSITY <TWO-FIVE DWELLING UNITS PER ACRE>	7.0	0.6	36
OPEN LAND	6.6	0.6	0.0
STREAMS AND LAKE SWAMPS (BOTTOMLAND)	3.6	0.3	0.0
FRESHWATER MARSHES	3.5	0.3	0.0
RESERVOIRS	0.8	0.1	0.0
COMMUNICATIONS	0.7	0.1	0.0
WETLAND FORESTED MIXED	0.6	0.1	0.0
Totals	1,118.4	100.0	



The soils within the study area vary from well-drained sandy soils, characterized as hydrologic soil group (HSG) type A, in the northern and central parts at higher elevations to poorly-drained silty sands in the southern parts of the study area, characterized as HSG types C, B/D, and D. Soils classified as B/D are characterized as type D in a native and undrained state, however, they are considered B in urban areas with extensive and long-established drainage systems such as this study area. Therefore, B/D soils in this study area are characterized as type B. Figure 3 on the following page depicts the HSG soil types for the study area based on a soils GIS layer from SWFWMD. Table 2 below is a breakdown of the HSG soil types with acreages and percentages of the study area.

Table 2 – Soils

Hydrologic Soil Group (HSG)	Area (acres)	Percentage of Total Area (%)
A	575.9	51.5
B (B/D)	363.5	32.5
C	151.7	13.6
D	27.3	2.4
Totals	1118.4	100.0



2.2. Data Collection

Data collection was conducted at the onset of the study, with the following general description of relevant data:

- HART and City documentation of flooding on July 9, 2011
- HART site map
- City of Tampa GIS stormwater inventory (including drainage structures, piping, and channels)
- GIS data including LiDAR-based terrain, land use, soils, parcels, roadways, wetlands
- City of Tampa Drainage Atlas (historic hard copy maps)
- Environmental Resource Permit (ERP) files from SWFWMD
- FDOT roadway plans, drainage maps, and supporting calculations
- City of Tampa roadway and stormwater retrofit projects
- Surface water models of adjacent basins
- Field reviews to confirm drainage patterns and characteristics
- Survey of select channel cross-sections and culverts conducted by Polaris for this study

LiDAR data was obtained from SWFWMD based on flights taken in 2007 in the NAVD 88 vertical datum. This LiDAR data was developed into GIS terrain for extensive use in this study in developing the surface water model. Following are some of the major roadway and project construction plan sets that were utilized in developing the model for this study.

- Final Roadway Plans for reconstruction of SR 585A and 45 (N 40th Street) dated 1966
- Melburne Boulevard Pond Retrofit Project, Record Drawings dated October 3, 2003
- Final Roadway Plans for widening of SR 400 (I-4) dated 2003
- Permitted Roadway Plans for Lee Roy Selmon Crosstown Expressway dated 2002

Two studies of adjacent basins are available on the east side of this study area as described below:

- *East Lake Watershed Management Plan Update*, prepared for Hillsborough County, study conducted by Ayres Associates completed in January 2007
- *Southern Portion of 29th Street Outfall Drainage Study*, prepared for City of Tampa, study conducted by Bayside Engineering, Inc in August 1997 (with future model update and retrofit design proposed by Kimley-Horn and Associates)

All data historical or paper sources utilized in developing the surface water model are documented in the GIS modeling directory by hyperlink of the model features to “pdf”

documents of the relevant plan sheets with “clouding” of the specific data used. This methodology for documenting the model development (model backup) follows requirements set by the *City of Tampa GIS Stormwater Model Parameterization Guide* (or City GIS Guide).

2.3. Drainage Basin Characterization

The drainage basin for the 43rd Street Outfall is a linearly shaped basin approximately 3.2 miles long in the north-south direction with the upper 2.2 miles comprised of the storm sewer system for SR 599/569, a major arterial FDOT roadway also known as US 41 and locally known as 40th Street. The northern reaches of the system exist as an inter-connect with the storm sewer of US 92, or Hillsborough Avenue, that runs in the east-west direction. At the 40th Street and Hillsborough Avenue intersection, a 30-inch pipe is directed eastward and a 24-inch pipe is directed southward, so a smaller share of the flows is expected to flow south through the study area, with majority of flow traveling east out of the study area.

For the upper two-thirds of the drainage system length, the 40th Street storm sewer is the primary component, increasing in size to a 4-foot by 11-foot box culvert at the divergence from the roadway. Invert elevations along the system start at 46.1 ft, NAVD and fall 22.6 feet at a 0.20% slope to 23.5 ft, NAVD at the divergence from 40th Street. Along this route there are a number of connections from private stormwater pond outfalls serving commercial and residential developments. There are also several side street storm sewer systems that converge with the 40th Street system; notably at East Chelsea Street, East Lake Avenue, and East 28th Avenue. An important component of this system is a large stormwater treatment pond that was the subject of a major renovation in 2002 known as the Melburne Boulevard Pond Retrofit Project. This site was previously an FDOT borrow pit that had been connected to the 40th Street system as an off-line attenuation pond. The retrofit involved re-piping the system so that all flows go through the pond that has been broken up into treatment cells with specific functions being settling particles, treatment with wetlands plants, and residence time with open water permanent pool. Flows from this pond flow back into the 40th Street storm sewer via a 8-foot long concrete weir located within a structure in the road right-of-way.

The primary drainage system exits the 40th Street right-of-way at Columbus Drive and traverses eastward via ditch with numerous large box culverts at driveways. This segment of the system crosses from the north side of Columbus Drive to the south side at a Y-intersection with 19th Avenue. Additionally, several local drainage systems converge in this area including a segment of I-4, some highly impervious commercial sites, and a system from the HART headquarters facility. The HART system is part of the focal areas of this study. The HART system originates from the north at the 21st Avenue storm sewer that collects drainage from a residential area approximately 36 acres in size. This system enters the HART facility as a 29x45-inch storm pipe. The HART facility is drained with several ditch bottom inlets along the pipe system and surface flows from graded paved areas into adjacent ditching. This pipe is discharged into a ditch with an adjoining ditch from the east, that flows southward to the Y intersection at 19th Avenue

and Columbus Drive. It should be noted that residential and commercial areas drain into the HART collection system with no attenuation as these areas were developed prior to current stormwater rules that require attenuation and treatment. Other surrounding school, park, and commercial sites appear to have been constructed more recently with stormwater ponds connecting to the primary drainage system downstream of the HART system. Invert elevations along this part of the system fall 0.7 feet at a 0.03% slope from 23.5 ft, NAVD to 22.8 ft, NAVD at the headwall under I-4.

The 43rd Street outfall drainage system crosses the I-4 corridor through a 408 foot long 4-foot by 12-foot box culvert and travels generally southward as a ditch with box culvert crossings at roads including 10th Avenue, SR 574 (7th Avenue), and two crossings of railroad tracks. This portion of the system is another focal area of the study. Through this segment of the system, the ditch is described with a channel cross section of 15-foot wide bottom with steep banks and flows confined within the banks except at overtopping of roadway crossings. Flows enter the ditch along this segment from off-site residential and industrial/commercial areas, some with on-site stormwater ponds. The ditch system makes several jogs westward and crosses under 43rd Street through dual 36-inch culverts. This pipe crossing causes a constriction of flow in the ditch system with water backing up in the ditch and flowing across private properties. There is evidence of this flooding with protective measures that one property owner has taken by building an earthen berm along the property line. Invert elevations along this part of the system fall 9.1 feet at a 0.27% slope from 22.8 ft, NAVD to 13.7 ft, NAVD at the headwall of the 43rd Street crossing.

The southern portion of the 43rd Street outfall system is a ditch with three more sets of railroad crossings, the southern-most being a wooden bridge on piles. The ditch traverses through a sizeable undeveloped area that serves as overbank storage during high flows. Flows contribute to this segment from large industrial and commercial sites, with some of the smaller ones including stormwater ponds. The system leaves the study area at the crossing under SR 60 and the Lee Roy Selmon Expressway (SR 618) that is a 364 foot long 8-foot by 7-foot box culvert. Invert elevations along this part of the system fall 16.4 feet at a 6.36% slope from 13.7 ft, NAVD to -2.7 ft, NAVD at the headwall of the SR 60 crossing. On the south side of this crossing the system discharges into the northern-most reach of McKay Bay in the estuarine part of Tampa Bay.

2.4. Flooding Conditions

Flooding problems are known to occur generally in the southern half of the drainage basin. Several documented flooding areas that are listed and further described below are the focus area of this study:

1. HART Authority headquarters facility on 21st Avenue
2. South side of Columbus Drive, 43rd Street outfall ditch
3. South side of I-4, 43rd Street outfall ditch
4. 10th Avenue, 43rd Street outfall ditch
5. 7th Avenue (SR 574), 43rd Street outfall ditch
6. 43rd Street, outfall ditch

These locations of witnessed flooding are also documented in the accompanying GIS database as “flooding points” with accompanying pictures and videos taken by HART and City staff after a storm event on July 8, 2011. Rainfall records were reviewed from both SWFWMD and NOAA archives for all recording stations in the vicinity of the study area. The Tampa International Airport (NOAA site) is 7 miles to the west with recorded 3.7 inches of rainfall over a 11-hour period. Two stations at SWFWMD water control stations are 2.4 and 3.0 miles to the east with recordings of 4.7 and 5.0 inches over 6-hour periods.

The photos and video of the flooding at the HART facility shows flooding of service bays on the west side within the main building at about 6-inches deep and flowing south. Also, the southeastern part of the parking area is flooded up to about the middle of the tires on the buses. Video taken at 10th Avenue shows flooding over the roadway for an estimated distance of 420 feet from the culvert crossing westward to the stop sign at 43rd Street. Video taken at 7th Avenue does not show roadway flooding, however, it does show high flow velocity and falling water surface profile on the downstream side of the culvert crossing. Video taken at 43rd Avenue shows water sheet flowing across private property toward the large wooded area to the south where the ditch re-emerges. Still images extracted from the videos of documented flooding with locations are also depicted in Figure 4 on the following page.

Scott Garth (DRMP) field reviewed the HART facilities and adjacent properties on June 24, 2012 (Tropical Storm Debby) and observed no flooding, leading to the belief that flooding in this basin appears to be associated with short intense rainfall events.



2.5. Model Development

A surface water model has been developed for this study using the computer program XP-SWMM. The underlying program is the Environmental Protection Agency (EPA) Storm Water Management Model (SWMM) with utilization of two components, or blocks, for this study. Stormwater runoff hydrographs are developed using the RUNOFF block with a collection of sub-catchment, or basins, and rainfall distributions. The hydrographs are dynamically routed through the hydraulic junction-link network using the EXTRAN block.

2.5.1 GIS Database Framework

A GIS database has been developed for this study following the guidelines in the *City of Tampa GIS Stormwater Model Parameterization Guide* (or City GIS Guide). A junction-link network and catchments are included in this GIS database in support of the XP-SWMM model framework with all relevant hydraulic and hydrologic information included in attribute tables. Soils and land use layers are included as utilized for developing the hydrology of the basins. Sampling of impervious area by land use was conducted for the purposes of developing hydrology parameters with a supporting GIS layer. Model backup information is included as “pdf” documents that are hyperlinked in GIS with red “clouding” directing attention to information utilized in building the model. Times of concentration flow paths are included with supporting hydraulic data in an attribute table. Topography is included with a terrain and 0.5 foot contours based in LiDAR. Other features are also included such as the vertical datum conversion, flooding points, government-owned parcels, stormwater ponds, and the Tampa stormwater inventory.

2.5.2 Vertical Datum

All deliverables for this study are based on the **NAVD 88 vertical datum**. The main data sources for the model are referenced to the NAVD 88 datum including the terrain and survey conducted for this study. However, a number of other supporting documents for building the model are referenced to the NGVD 29 vertical datum. The following conversion factor was used as necessary for this study:

$$\text{Elevation in NAVD 88} = \text{Elevation in NGVD 29} - 0.86 \text{ feet}$$

This conversion factor is the average elevation difference between these two datums based on three points spaced out within the study area as determined from the CORPSCON program supported by the Army Corps of Engineers. The three points and supporting information for the datum conversion are included as a GIS layer.

2.5.3 Hydrology Methodology

The SCS Runoff Curve Number (CN) method has been chosen as the hydrology method for this study. Other methods such as Green-Ampt or Horton were considered and not chosen due to the high percentage of poorly-drained soils, especially in the focus area of the study. To meet City GIS Guide criteria, both DCIA and nDCIA impervious areas were estimated for each catchment based on GIS intersection of catchments with the land use layer. Impervious areas were estimated by choosing samples of typical development units within each land use category and delineating the amount of DCIA and nDCIA within each sample. Percentages for each land use category were calculated and utilized in the GIS intersection with catchments. Note that for modeling purposes, DCIA and nDCIA were combined into a total impervious area value. CN's were calculated for each catchment for the pervious area only. These composite CN values were developed using the CN values for the land use category, open space, with fair hydrologic condition and varying hydrologic soil group (HSG) soil types as listed in Table 2-2a of the TR-55 manual titled *Urban Hydrology for Small Watersheds* by the Soil Conservation Service (SCS), dated June 1986. Additionally, for any B/D HSG types the B values were used due to extensive and historic ditching throughout these parts of the study area. The impervious area sampling and CN calculations are included as GIS layers and supporting spreadsheets in the electronic delivery of this study.

Times of concentration (Tc's) have been developed for each catchment using TR-55 methodology. The upstream flow regime is considered sheet flow up to a maximum of 300 feet in length and calculated using the Manning's kinematic solution. The next downstream flow regime may include shallow concentrated flow over either pervious or impervious surface with the average velocity determined using the formulas from Figure 3-1 of the TR-55 manual. In some cases, other flow regimes were used including channel, gutter, pipe, and/or channel flow with assumed velocities of 1.0, 1.5, and 5.0 fps, respectively. The T'c flow paths are included as a GIS layer and the supporting spreadsheet for calculating the T'c values is included in the electronic delivery of this study.

Catchment delineations were performed by digitizing divides primarily based on the terrain. Ditching and piping collection systems were also considered in the delineations based on the City stormwater GIS inventory and various other plans and documents as included in the GIS database. A separate catchment has been delineated for any stormwater pond greater than 0.5 acres, and some smaller ponds were also included. The primary 43rd Street ditch system has been separated out with catchments based on criteria in the City GIS Guide to ensure that overbank storage is counted separately from the channel. Also based on direction from the City in the project scope, a separate catchment is delineated for any collection system with 36-inch or larger sized piping. There are a total of 121 catchments for this model, ranging in size from 0.18 acres to 81.27 acres.

This methodology was discussed with the City and SWFWMD in a meeting on 11-16-2012 and was found to be acceptable.

2.5.4 Hydraulics

A junction-link network is set up in the XP-SWMM model to simulate stormwater routing through the study area. The northern half of the study area is composed primarily of the 40th Street storm sewer system that is modeled as a series of pipe links with junctions at drainage structures. The link-junction framework is a simplification of the physical system with junctions at pipe confluences and changes in pipe size. The southern half of the study area is composed primarily of channel and culvert segments along the 43rd Street outfall ditch. Major secondary systems with piping at 36-inch diameter or larger, or stormwater pond outfall systems are modeled hydraulically and connected to the primary system. Several secondary ditch systems also tie into the 43rd Street outfall ditch in the vicinity of Columbus Drive, one of which drains the HART facility. The junctions along the primary system are generally zero-storage nodes, with storage areas accounted for in adjacent and connecting junctions. Stage-area relationships were automatically generated using GIS by intersecting the catchments with the terrain. One-tenth foot intervals were input into the model as directed in the City GIS Guide with some simplification of data where the number of allowable data points was exceeded in XP-SWMM. All junctions are inputted in the model as “sealed” so that the 2D function of the model is not utilized. Instead, overland weirs are included in the model to account for any overtopping of berms, roads, etc. that would allow flows under flooding conditions. These overland weirs were cut from the terrain, and using guidance from the program documentation are modeled in XP-SWMM as short 35-foot long channels. The exact spatial location and orientation of these overland weirs are included as a GIS layer. Stormwater pond outfalls are generally multi-faceted links that may contain a combination of weirs, orifices, and pipes. For this model using XP-SWMM, any vertical openings in structures (round or rectangular) are modeled as “side-mounted” orifices. Horizontal open tops of structures are modeled as vertical weirs. A junction is included to represent the interior part of any structure with piping to an outfall. Note that all box culverts are described in this report with the vertical dimension x horizontal dimension (H' x W').

Survey was conducted for this project to accurately model the 43rd Street outfall ditch from the intersection of Columbus Drive and 19th Avenue downstream to the 43rd Street crossing. Culvert invert elevations, sizes, and types were documented at each crossing. Existing water levels and silt build-up were noted. Ditch cross-sections were surveyed at the upstream and downstream side of each culvert crossing. The collected survey data is included in the GIS database. The 43rd Street outfall ditch is modeled as a channel with irregular sections based on surveyed cross-sections and trapezoidal sections at all other locations, that are approximated based on the terrain. All other hydraulic components of the model were developed either from as-built/construction plans or other collected documentation with some approximations of elevations based on the terrain. The sources of all hydraulic data used in the model are documented in the GIS database.

The model includes the following hydraulic components: 198 junctions, 109 pipes, 10 orifices, 45 weirs, 24 channels, and 122 overland weirs.

2.5.5 Channel Base Flows

From reviewing encountered water levels and evidence of normal high conditions (staining on endwalls), it appears there is a significant base flow along the 43rd Street outfall ditch originating at the Melburne Avenue pond and increasing to the outfall culvert under SR 60. Therefore, the model was set up with base flows originating at strategic junctions along the primary ditch. Flows were determined by an iterative method of running the model and checking for stable water levels at the preferred elevations along the ditch. These initial stages were set using the “initial depth” parameter in XP-SWMM. Included below is Table 3 with the base flow values and initial depths at the selected junctions along the ditch segment with base flow.

Table 3 – Base Flow Conditions

Junction Name	Location	Initial Elevation (ft, NAVD)	Initial Depth in Model (ft)	Base Flow added at Junction (cfs)
NA0505	Melburne Blvd. pond east of the waste management facility	26.94	1.00 (relative to orifice)	10
NA0165	4'x11' box culvert on north side of East Columbus Dr near E 19th Ave.	25.04	2.00	34
NA0225	4'x12.2' box culvert on south side of E 10th Ave.	23.70	2.80	19
NA0255	Twin 36" pipes, upstream side of 43rd Street crossing	15.50	2.00	26.5
NA0295	8'x7' box culvert on the north side of Adamo Drive	3.70	5.96	0

2.5.6 Boundary Conditions

Boundary conditions exist at four (4) outfalls or inter-connect locations around the perimeter of the study area. The primary model outfall is located on the south side of the 43rd Street outfall ditch box culvert crossing SR 60 and the Cross-town Expressway, junction NA0300 in the model. This boundary condition was set at a constant elevation of 3.57 ft, NAVD based on staining of the endwall. The three other boundary conditions are at inter-connections between adjacent drainage systems. Two of these are located just north of SR 60 on the east side of the study area (junctions NA0965 and NA0980 in the model), and one is located along Hillsborough Avenue at the north end of the study area (junction NA0305 in the model). For all three locations the boundary conditions are set at constant elevations at which significant overland flows would occur leaving the drainage basin under study. The reasoning is to set tailwater conditions that would not likely be exceeded, thereby, generating conservative flows leaving the study area at these inter-connects. Links connected to these boundary junctions were set for positive flow only to prevent backflows into the model.

Table 4 – Boundary Conditions

Junction Name at Boundary Condition	Location	Description of Boundary Condition	Tailwater Elevation (ft, NAVD)	Rationale for Setting Tailwater Elevation
NA0300	McKay Bay, connected to Tampa Bay	primary outfall for 43rd Street outfall ditch	3.57	staining on endwall
NA0965	SR 60 storm sewer system, south end of basin just east of primary outfall NA0300	inter-connect with 29th Street outfall, east side of study area	6.50	top of drainage structure
NA0980	Acline Drive south side ditch, just north of NA0965	inter-connect with 29th Street outfall, east side of study area	5.70	top of ditch bank
NA0305	Hillsborough Avenue storm sewer system, north end of basin, east side	inter-connect with larger storm sewer that travels east then north to Hillsborough River	49.40	overland flow elevation

3. EXISTING CONDITIONS

3.1. Model Verification

The model was verified by comparing the documented flooding from the July 8, 2011 storm event against model peak stages for the storm event that most closely matches that total rainfall depth. The recorded rainfalls for this event vary from 3.7 to 5.0 in the region with storm durations from 6 hours to 11 hours. The modeled storm that most closely matches the actual event at the study area is the 5-year, 4-hour storm event with 4.32 inches of rainfall. There are four locations where flooding was documented by photograph or video with the estimated flood elevation compared to the modeled peak stage in Table 5 below.

Table 5 – Flood Stages Comparison for Model Verification

Junction Name	Location	Flood Stage (ft, NAVD)		Source
		5-Year, 4-Hour	Observed	
HART Facility				
NA0620	Northwest corner of HART facility	29.23	29.2	estimated 6-inch flood depth in service bays, 28.6 service bays finished floor
NA0650	Southeast corner of HART facility	28.32	28.55	estimated 1.75-foot deep (half way up bus tires), 26.8 low pavement elevation in parking area
43rd Street Outfall Ditch				
NA0220	Upstream side of 10th Avenue crossing	27.44	27.0	based on extent of flooding over roadway in video
NA0255	Upstream side of 43rd Street crossing	18.66	19.0	estimated 6-inch depth sheet flow over 18.5 low top of ditch bank

3.2. Critical Duration Analysis

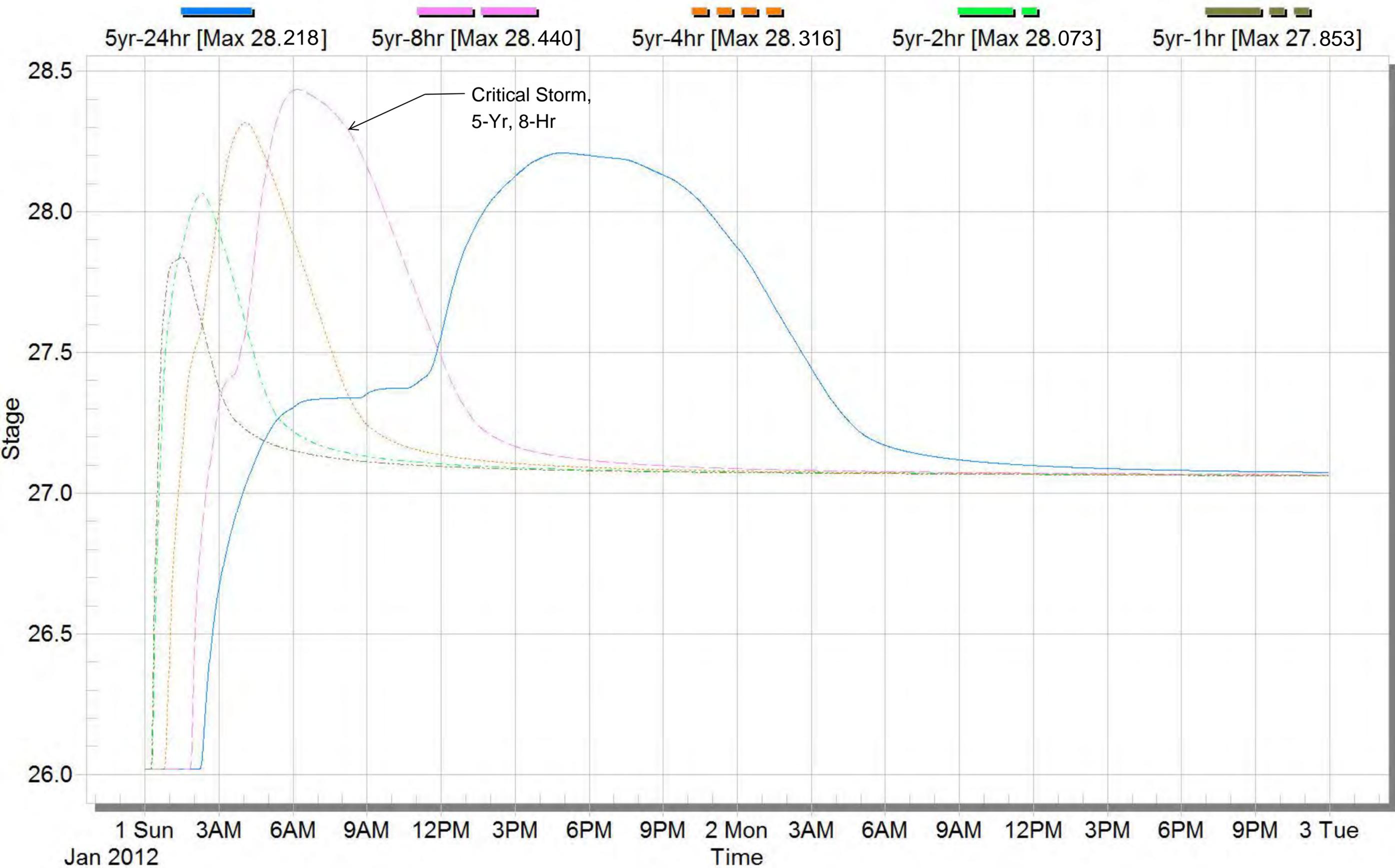
Pursuant to City requirements a critical duration analysis was performed for a series of 5-year storm events with varying durations and total rainfalls as listed in Table 6 below.

Table 6 – Critical Duration Analysis 5-Year Frequency Storms

Storm Duration	Rainfall Depth (inches)
1-hour	2.80
2-hour	3.50
4-hour	4.32
8-hour	5.36
24-hour	7.44

For this study, the critical storm is considered the duration that produces the most severe flooding at the focus area along the 43rd Street outfall ditch between the HART facility and the 43rd Street crossing. For the focus area, the critical storm is the 5-year, 8-hour storm. Figure 6 on the following page is a graph showing the time-stage relationships for each of the 5-year storms for the model junction at the HART facility. The 5-year, 8-hour peak stage is also the highest stage at all other junctions within the focus area.

Node - NA0650



43rd Street Outfall Basin Study
Time-Stage Graph at HART Facility, Junction NA0650
(Determination of 5-Year Storm Critical Duration)



Figure
6

3.3. Existing Condition Model Results

Table 7 below is a summary of peak stage and flow conditions at selected nodes in the focus area of the study along the 43rd Street outfall ditch between the HART facility and the 43rd Street crossing. Critical elevations are included for determination of flooding severity.

Table 7 – Peak Stages at Select Nodes in Focus Area for Existing Conditions

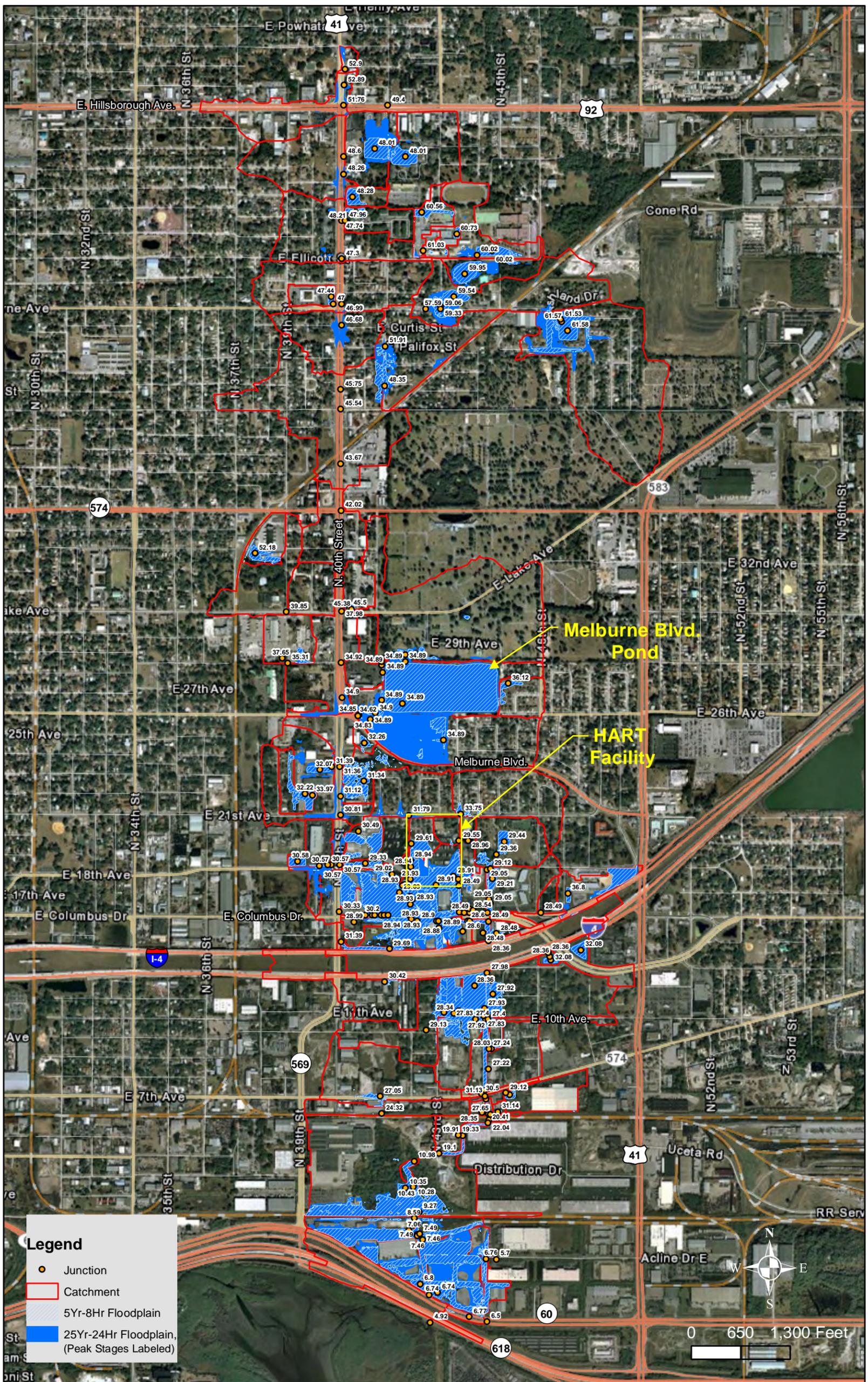
Junction Name	Location	Peak Stage (ft, NAVD)		Critical Elevation
		5-Year, 8-Hour	25-Year, 24-Hour	
HART Facility				
NA0620	Northwest corner of HART facility	29.33	29.61	28.6 service bays finished floor
NA0655	Southeast corner of HART facility	28.32	28.79	26.9 low pavement elevation in parking area
NA0605	HART facility outfall ditch, north side of 19th Avenue crossing	28.44	28.93	27.8 low edge of pavement
43rd Street Outfall Ditch				
NA0210	Upstream side of I-4 crossing	27.86	28.36	28.0 top of ditch bank
NA0215	Downstream side of I-4 crossing	27.61	27.98	28.0 top of ditch bank
NA1005	Upstream side of 10th Avenue crossing	27.52	27.83	26.0 low edge of pavement
NA0230	Upstream side of 7th Avenue crossing	25.93	27.22	30.1 top of ditch bank
NA0240	Upstream side of railroad crossings	25.02	26.35	29.1 low point of rail bed
NA0255	Upstream side of 43rd Street crossing	18.84	19.10	18.5 low top of ditch bank

 Shading indicates flooding at junction.

Peak stages and flows for all of the modeled storms under existing conditions are included in Appendix A and attribute tables for junctions and links, respectively, in the GIS database.

3.4. Predicted Flooding under Existing Conditions

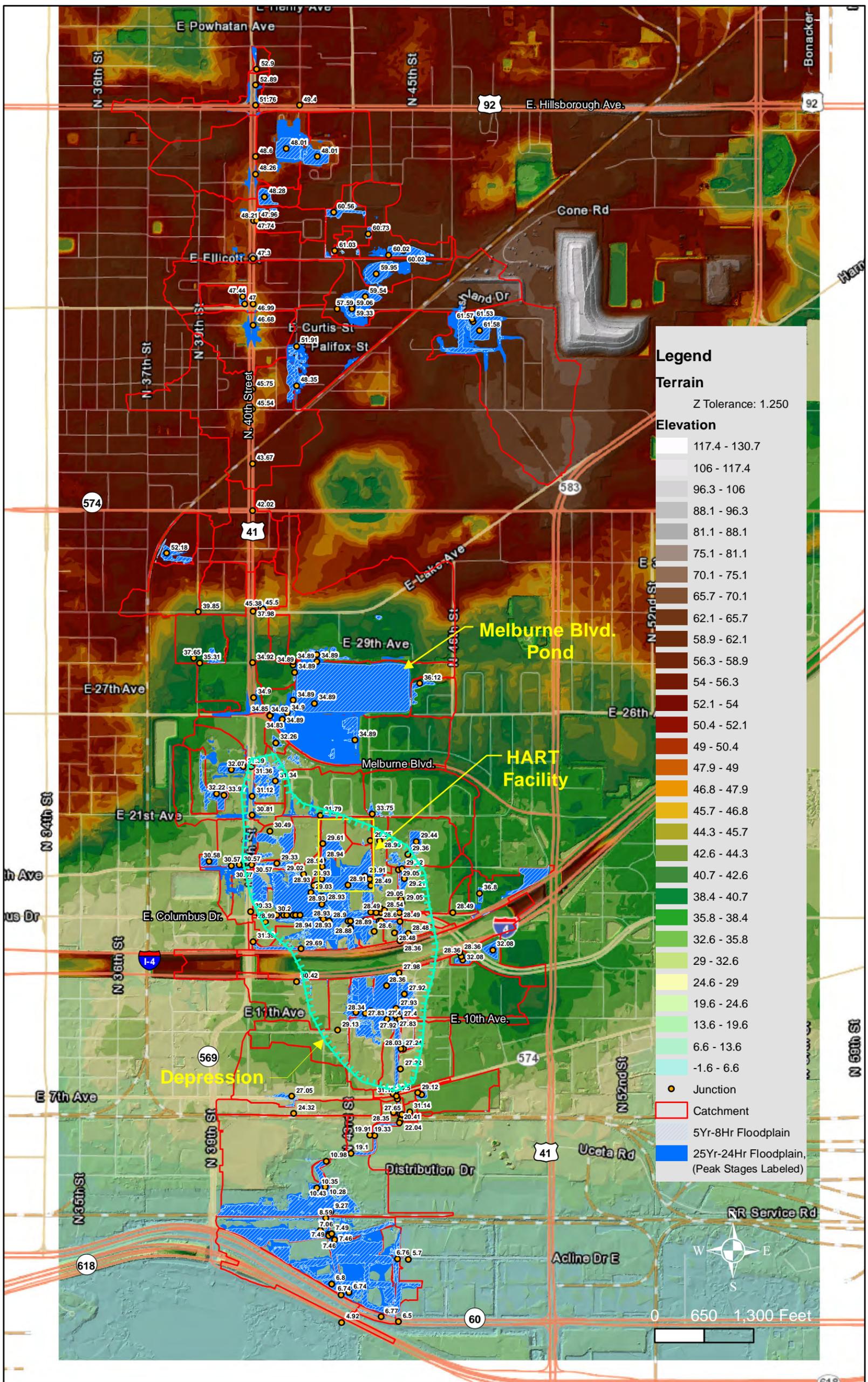
Floodplains for existing conditions have been delineated for the 5-year, 8-hour (critical storm) and the 25-year, 24-hour storm events based on peak stages generated from the model, see Figure 7 on the following page for floodplains shown on the aerial view. In the focus area, significant roadway flooding with overtopping occurs for both mapped storms due to ditch bank overtoppings along 19th Avenue and Columbus Drive. Roadway flooding and overtopping also occurs for both storms at the 43rd Street outfall ditch crossing with 10th Avenue.

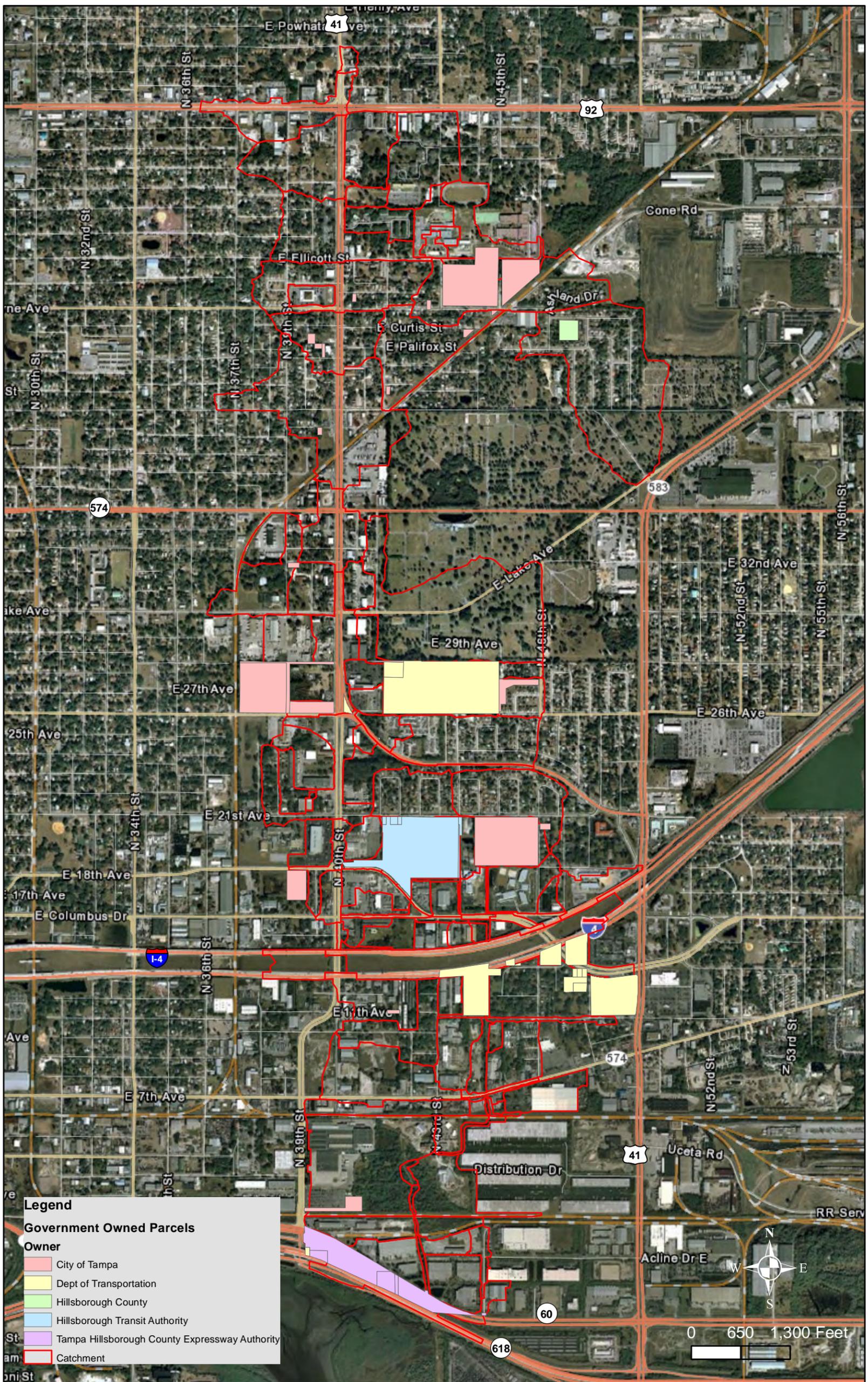


A large expanse of flooding over commercial sites, including the HART facility and others, occurs on both sides of I-4 in the vicinity of these roadway flooding areas. From review of the topography of this area, the cause of this flooding appears to be due to inadequate conveyance exiting a depression that is bisected by I-4. The 43rd Street outfall ditch crossings at 7th Avenue and adjacent railroad tracks appear to be the point of constriction. See Figure 8 on the following page for a view of the floodplains over terrain to see the floodplain extents within the depression and the point of conveyance constriction. This phenomenon is also documented by video during the July 8, 2011 event as high velocity flows were seen on the south side of 7th Avenue. A more localized flooding problem also appears at the south end of the focus area at the 43rd Street ditch crossing. At this location, flows overtop the ditch banks and across properties due to an undersized culvert along the ditch.

At the south end of the study area (outside of focus area), there also appears to be flooding for both the 5-year, 8-hour and 25-year, 24-hour storms of commercial areas and a City street (Acline Drive), and overtopping of railroad tracks crossing. Several large buildings may be at risk of flooding for the 25-year, 24-hour event.

Flooding also appears to the north of the focus area. For the 25-year, 24-hour storm, the Melburne Boulevard stormwater pond appears to overtop the banks and cause flooding of the entire Ace AA Used Auto Parts facility. Flooding also appears along several sections of a storm sewer system connecting two stormwater ponds to the 40th Street storm sewer including sections of Chelsea Street, 42nd Street, Osborne Avenue, and Ashland Drive. At the eastern pond on Ashland Drive, street flooding occurs for both mapped storms, and residential structures may be at risk for the 25-year storm. At the western pond on Osborne Avenue, both streets and residences appear to be at risk for both of the mapped storms. More street flooding appears to the south along 42nd Street for both mapped storms.





4. PROPOSED CONDITIONS

4.1. Proposed Improvement Alternatives

Three sets of preliminary alternatives have been developed and compared for improving flood protection in the problem areas identified in this study. These three preliminary alternatives are depicted in Figures 10, 11, and 12, and they are generally described below. Additionally, water surface profiles of the 43rd Street Outfall Ditch segment through the focus area are included for the three alternatives and existing conditions for the critical storm (5-year, 8-hour) in Appendix C.

Alternative 1: Conveyance Upgrades with South Pond

- Channel widening and reconstruction (varying widths up to **34 feet**) from HART Facility southward to 43rd Street crossing, distance of 3,970 linear feet.
- Installation of fabric filled concrete rip-rap, or other armoring, from I-4 crossing to 43rd Street crossing, distance of 2,740 linear feet.
- Acquisition of additional **4.3 acres** (affecting 16 properties) of right-of-way or easements for channel/culvert work.
- Secondary trunk line along Columbus Drive, **(2) 4' x 10' box culverts** for distance of 1,100 linear feet.
- Culvert crossing upgrades with multiple box culverts/pipes at **six (6)** roadway crossings and **two (2)** railroad crossings.
- Construction of **9.4 acre** stormwater pond for attenuation and treatment (South Pond).

Alternative 2: Conveyance Upgrades with North and South Ponds

- Channel widening and reconstruction (varying widths up to **15 feet**) from HART Facility southward to 43rd Street crossing, distance of 3,970 linear feet.
- Installation of fabric filled concrete rip-rap, or other armoring, from I-4 crossing to 43rd Street crossing, distance of 2,740 linear feet.
- Acquisition of additional **3.3 acres** (affecting 14 properties) of right-of-way or easements for channel/culvert work.
- Secondary trunk line along Columbus Drive, **(2) 48-inch pipes** for distance of 1,100 linear feet.
- Culvert crossing upgrades with multiple box culverts/pipes at **six (6)** roadway crossings and **two (2)** railroad crossings.
- Construction of **9.4 acre** stormwater pond for attenuation and treatment (South Pond).
- Construction of **7.1 acres** stormwater pond for flood storage and treatment (North Pond).

Alternative 3: Diversion System with North and South Ponds

- Diversion system along 40th Street with **4' x 6' box culvert**, distance of 3,900 linear feet.
- Acquisition of additional **0.4 acres** (affecting 4 properties) of right-of-way or easements for culvert work.
- Culvert crossing upgrades with single box culverts/pipes at **two (2)** roadway crossings and **one (1)** railroad crossing.
- Construction of **9.4 acre** stormwater pond for attenuation and treatment (South Pond).
- Construction of **7.1 acres** stormwater pond for flood storage and treatment (North Pond).

Note that additional conveyance (pipe) and inlet upgrades within the HART Facility may be beneficial to improve protection of portions of the property from localized flooding.

4.2. Proposed Stormwater Ponds

Following are characteristics of the preliminary designs of these ponds with the primary design functions in the headings (elevations in ft, NAVD88):

North Pond (7.1 Ac) – flood storage

- Off-line Wet Detention
- Property acreage = 7.1 acres (South Side of Columbus Drive)
- Berm Elevation = 27.5
- Control Elevation = 25.0
- Bottom Elevation = 16.5 (max. depth of 8.5 feet)
- Permanent Pool Volume = 39.9 ac-ft

It should also be mentioned that for Alternative 3, the North Pond may be designed with a bleed-down device at a lower control elevation (24.0 or lower) with a connection to the proposed diversion box culvert on 40th Street. Adding one or more feet vertically of additional storage in the pond may further improve flood protection and allow reducing the size of the 4' x 6' diversion box culvert. Additionally, a flap gate could be considered on the box culvert connection to the Columbus Drive ditch to direct and capture large storm flows into the pond. A small bleed-down pipe could be installed in parallel to allow slow and controlled recovery of the pond back into the ditch.

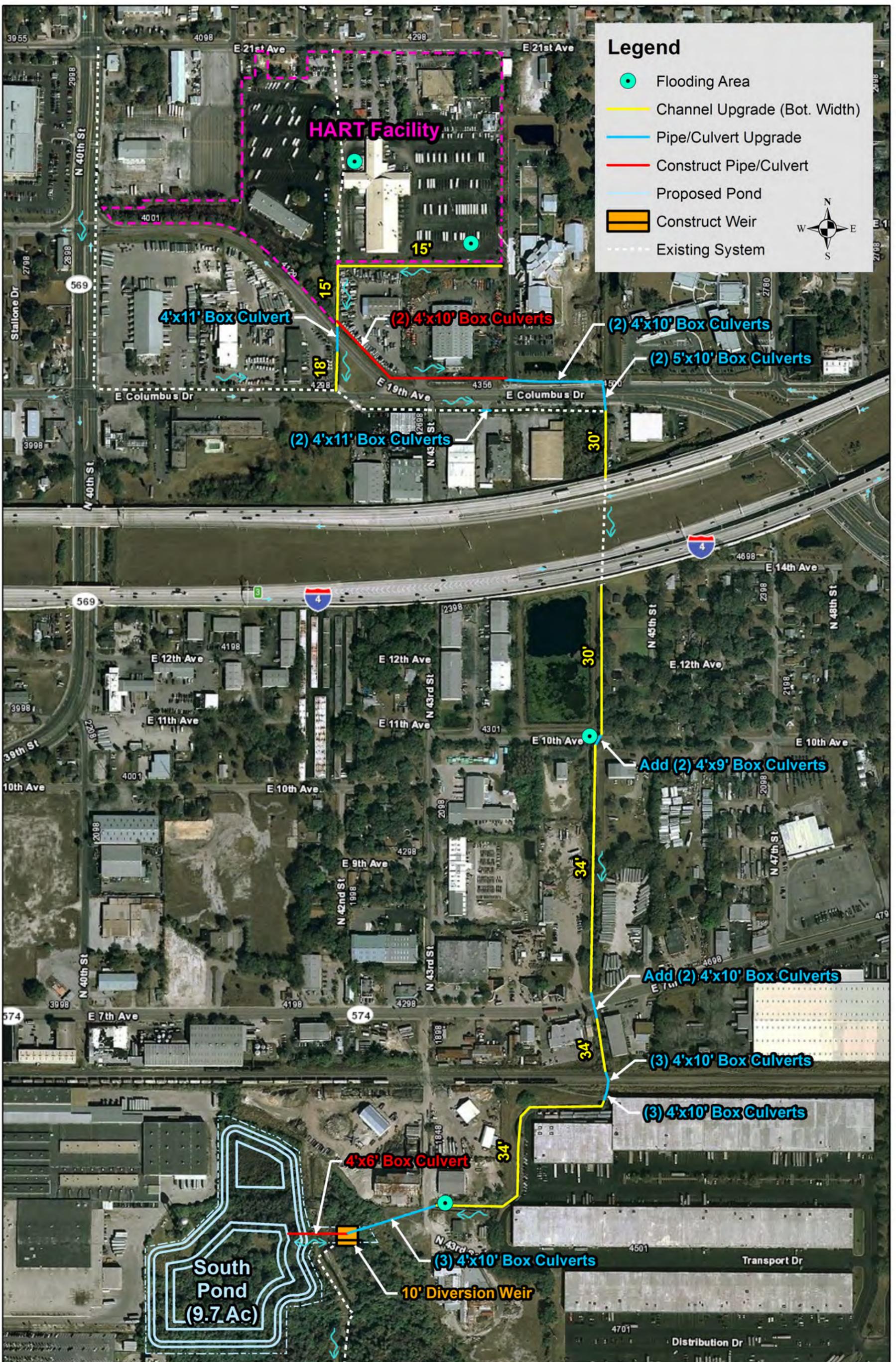
South Pond – attenuation and treatment

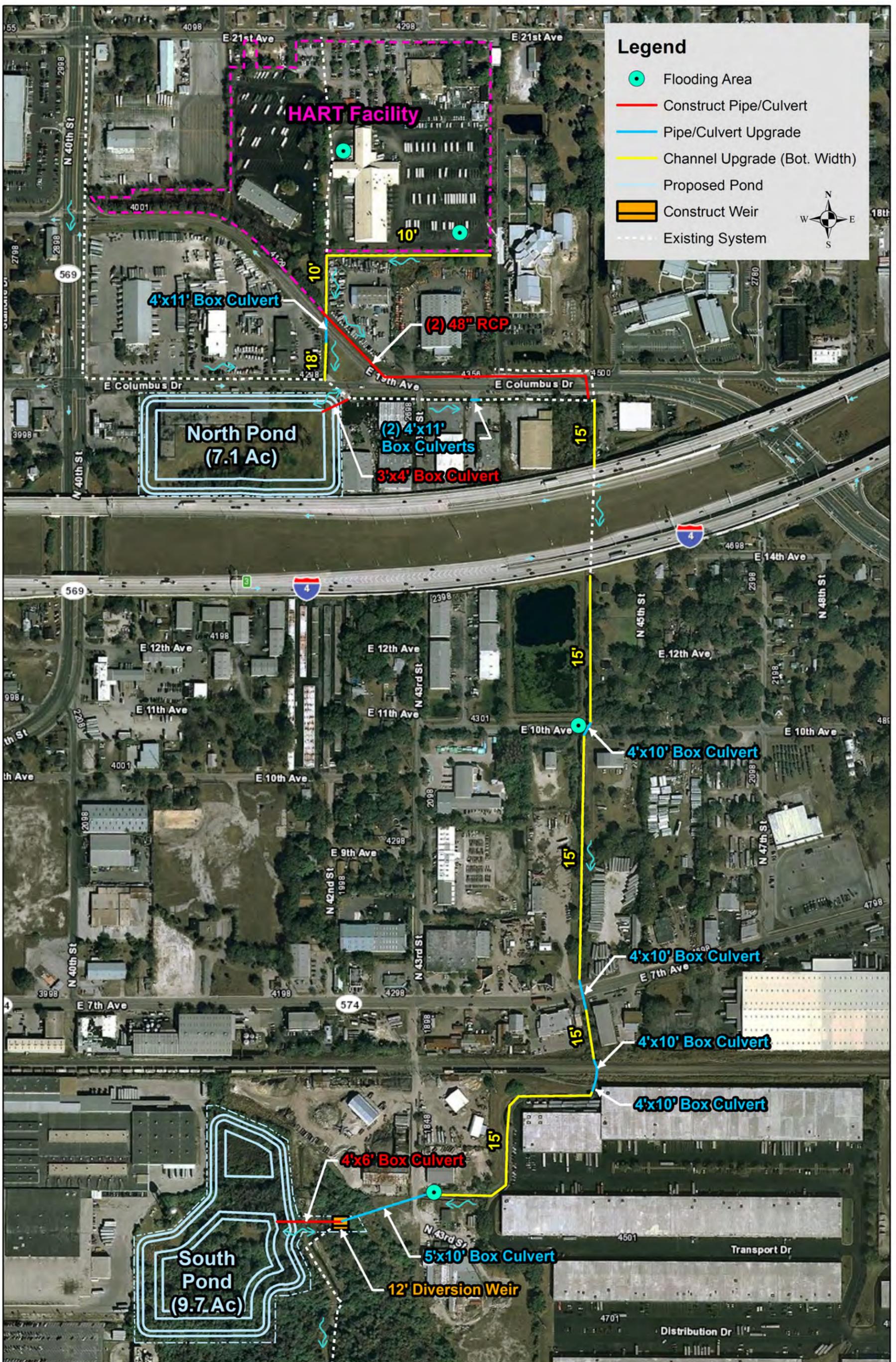
- Off-line/on-line Wet Detention
- Property acreage = 9.4 acres
- Berm Elevation = 20.0
- Shelf Elevation = 9.0
- Control Elevation = 6.0
- Bottom Elevation = -1.0 (max. depth of 7.0 feet)
- Permanent Pool Volume = 20.8 ac-ft

The South Pond could be designed to maximize treatment flow path with the addition of a small bleed-down device toward the southeast corner of the pond with connection to the adjacent outfall ditch.

All three alternatives provide significant water quality benefits to the receiving water of Tampa Bay through detention of stormwater in the permanent pools in the combinations of proposed North and South Ponds. The 43rd Street outfall is located in the Palm River Basin as delineated by FDEP (WBID 1536E). This basin is listed and verified as impaired for Dissolved Oxygen and Nutrients.

Please note that site-specific geotechnical investigations will be necessary to establish seasonal high/normal groundwater levels and possibly base seepage flows across the potential pond sites for use in final design. Contamination investigations over all potential pond sites are strongly encouraged early in the design process due to the historical industrial uses of the area. Additionally, potential for hazardous materials (such as asbestos or others) to exist in the existing buildings to be demolished for pond sites should be considered in evaluating costs and use of potential pond sites.





4.3. Proposed Conditions Model Results

The three alternatives have been determined in order to provide flood protection at the HART site, all roadway crossings, and private properties along the 43rd Street outfall ditch alignment within the focus area of the study between the HART site and the 43rd Street crossing. No adverse effects from proposed improvements are expected upstream of the focus area. Additionally, the south pond is included in the alternatives for the purpose of fully attenuating the increase of storm flows due to proposed channel and culvert upgrades so that downstream portions of the system and private properties see no adverse effects from the project.

The expected level of service for flood protection is the critical duration of the 5-year recurrence interval, identified as the 8-hour duration storm. Peak stages of the alternatives presented are below critical low pavement areas or within the top of ditch banks as further detailed in the table included below.

Table 8 – Peak Stages at Select Nodes in Focus Area for Proposed Conditions

Junction Name	Location	Peak Stage (ft, NAVD) 5-Year, 8-Hour				Critical Elevation
		Existing	Alt. 1	Alt. 2	Alt. 3	
HART Facility						
NA0655	Southeast corner of HART facility	28.32	26.85	26.88	26.89	26.9 low pavement elevation in parking area
NA0605	HART facility outfall ditch, north side of 19th Avenue crossing	28.44	26.82	26.84	26.84	27.8 low edge of pavement
43rd Street Outfall Ditch						
NA0210	Upstream side of I-4 crossing	27.86	25.92	26.03	26.21	28.0 top of ditch bank
NA0215	Downstream side of I-4 crossing	27.61	24.81	25.70	26.12	28.0 top of ditch bank
NA1005	Upstream side of 10th Avenue crossing	27.52	24.38	25.39	26.05	26.0 low edge of pavement
NA0230	Upstream side of 7th Avenue crossing	25.93	21.78	23.13	25.61	30.1 top of ditch bank
NA0240	Upstream side of railroad crossings	25.02	19.39	20.86	24.56	29.1 low point of rail bed
NA0255	Upstream side of 43rd Street crossing	18.84	16.50	16.79	17.12	18.5 low top of ditch bank

A critical aspect of this project will be to ensure that no adverse impacts occur downstream of the proposed improvements due to improving conveyance of the existing system. The South Pond is included in all alternatives and sized in order to provide attenuation so there is no increase in peak flows, as shown in the following table. The 25-year, 24-hour storm event was analyzed to show compliance with the attenuation requirement in SWFWMD permitting rules.

Table 9 – Peak Flows Comparison for Proposed Conditions

Link Name	Location	Peak Flow (CFS)							
		5-Year, 8-Hour				25-Year, 24-Hour			
		Existing	Alt. 1	Alt. 2	Alt. 3	Existing	Alt. 1	Alt. 2	Alt. 3
RA0280	43rd St Outfall Ditch, South of Railroad	399	353	317	319	491	484	448	460

4.4. Discussion and Comparison of Alternatives

Three feasible alternatives have been developed to provide comparable and reasonable levels of flood protection within the focus area of the study. Advantages and challenges are found with all three alternatives.

More specifically, Alternatives 1 and 2 focus on upsizing and improving conveyance of the existing 43rd Street outfall ditch. Increases of slope and conveyance also lead to increases of velocities in the channel to the extent that channel lining is recommended from the I-4 crossing southward to the 43rd Street crossing for a distance of 2,740 linear feet. For cost estimating, fabric-filled concrete rip-rap has been identified, however, other types of armoring could be explored such as articulating block or ditch pavement. Additionally, for Alternative 1 and to a lesser extent Alternative 2, right-of-way acquisitions or easements will be necessary for up to 4.3 acres involving 16 property owners along the banks of the existing channel segments. These negotiations could prove challenging to manage within a scheduled timeframe and cost, especially if grant funding and obligations are involved.

The main component of Alternative 3 is a proposed new diversion 4' x 6' box culvert along 40th Street, a portion of which is FDOT State Road 569. For Alternative 3, early coordination with FDOT will be important to gain FDOT's commitment to this conceptual plan.

Construction of large box culvert under active railroad tracks (or bore and jack equivalent pipes) owned by CSX railroad is a component of all three alternatives that is expected to be complex in design, approval, and construction. Alternative 3 provides an advantage concerning railroad issues in that the box culvert size is 4' x 6', as opposed to up to triple 4' x 10' for Alternative 1.

Utility relocations and conflict resolutions are expected to be difficult but not prohibitive for all three alternatives. See Appendix F for more detailed information about existing utilities. Both Alternative 2 and 3 involve negotiations with up to three separate property owners for construction of the North and South Ponds. These negotiations may lead to uncertainty in the schedule and project costs. An alternative site for the North Pond is also feasible on the north side of Columbus Drive, should the preferred location as shown on exhibits prove infeasible.

4.5. Estimated Alternative Costs

Detailed cost estimates are included for all three alternatives in Appendix C. Most construction unit prices are based on FDOT average annual construction contract values tabulated for the year 2011. Property cost estimates are further detailed in Appendix E, and are based on market or assessed property values displayed on the Hillsborough County Property Appraiser’s website. For some of the properties, recent sales values are also available for comparison. Alternative 3 is estimated as the least cost alternative at **\$8,963,000** including design, property acquisition, and construction costs.

Table 10 – Summary of Estimated Project Costs for Alternatives

Alternative	Estimated Project Cost
1: Conveyance Upgrades with South Pond	\$ 9,110,000
2: Conveyance Upgrades with North and South Ponds	\$ 9,149,000
3: Diversion System with North and South Ponds	\$ 8,963,000

4.6. Recommendation and Phasing

The scope of the flooding problem is large and a major commitment to improve the situation will be necessary. We understand the City is planning to partner for funding and divide the improvements into multiple phases to reach the desired level of flood protection in the study area.

Though estimated costs are close among the alternatives, the recommended course of action to provide necessary flood protection for the study area is **Alternative 3 with a diversion system along 40th Street and North and South Ponds**. The main reasons for this choice of recommendation are; 1) involvement with many fewer property owners (three as opposed to up to 19) that are critical to the project success, (2) avoidance of major disruptions to the 43rd Street outfall ditch, (3) and further distribution or splitting of stormwater flows instead of promotion of higher flow rates.

Following is a schedule of possible phasing for the recommendations. Each phase may be subdivided into property acquisitions and design/construction sub-phases.

Table 11 – Phasing of Recommendations

Phases	Estimated Property Costs	Estimated Design and Construction Costs	Total Estimated Phase Cost
1: Construct North Pond and connection to HART	\$ 1,500,000	\$ 1,266,000	\$ 2,766,000
2: Construct South Pond, diversion weir, and box culvert across 43rd Street	\$ 400,000	\$ 1,754,000	\$ 2,154,000
3: Construct diversion system along 40th Street to South Pond	\$ 57,000	\$ 3,986,000	\$ 4,043,000
		Total = \$	8,963,000

Appendix A

Existing Conditions XP-SWMM Model Input and Results

(under separate cover)

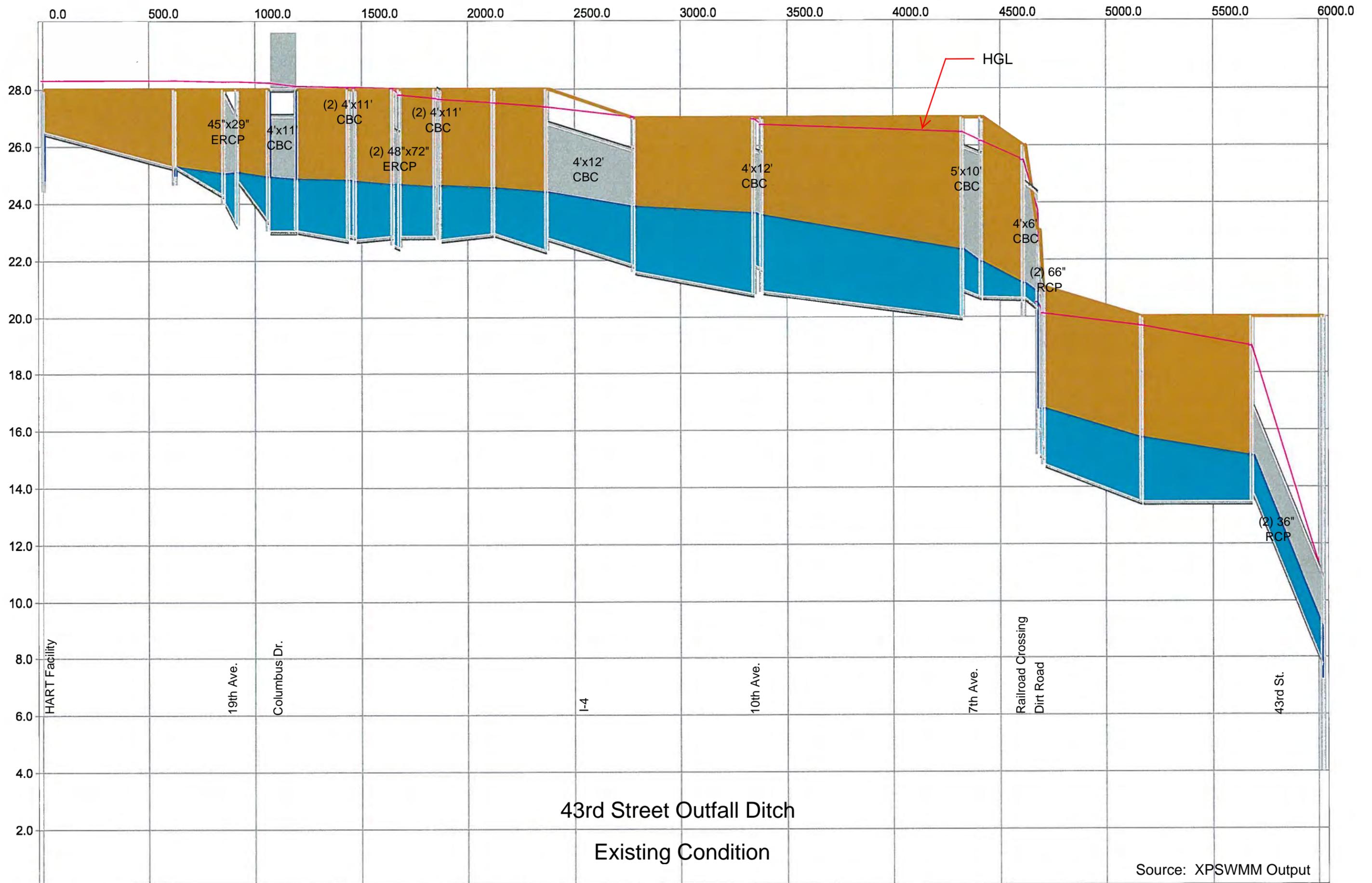
Appendix B

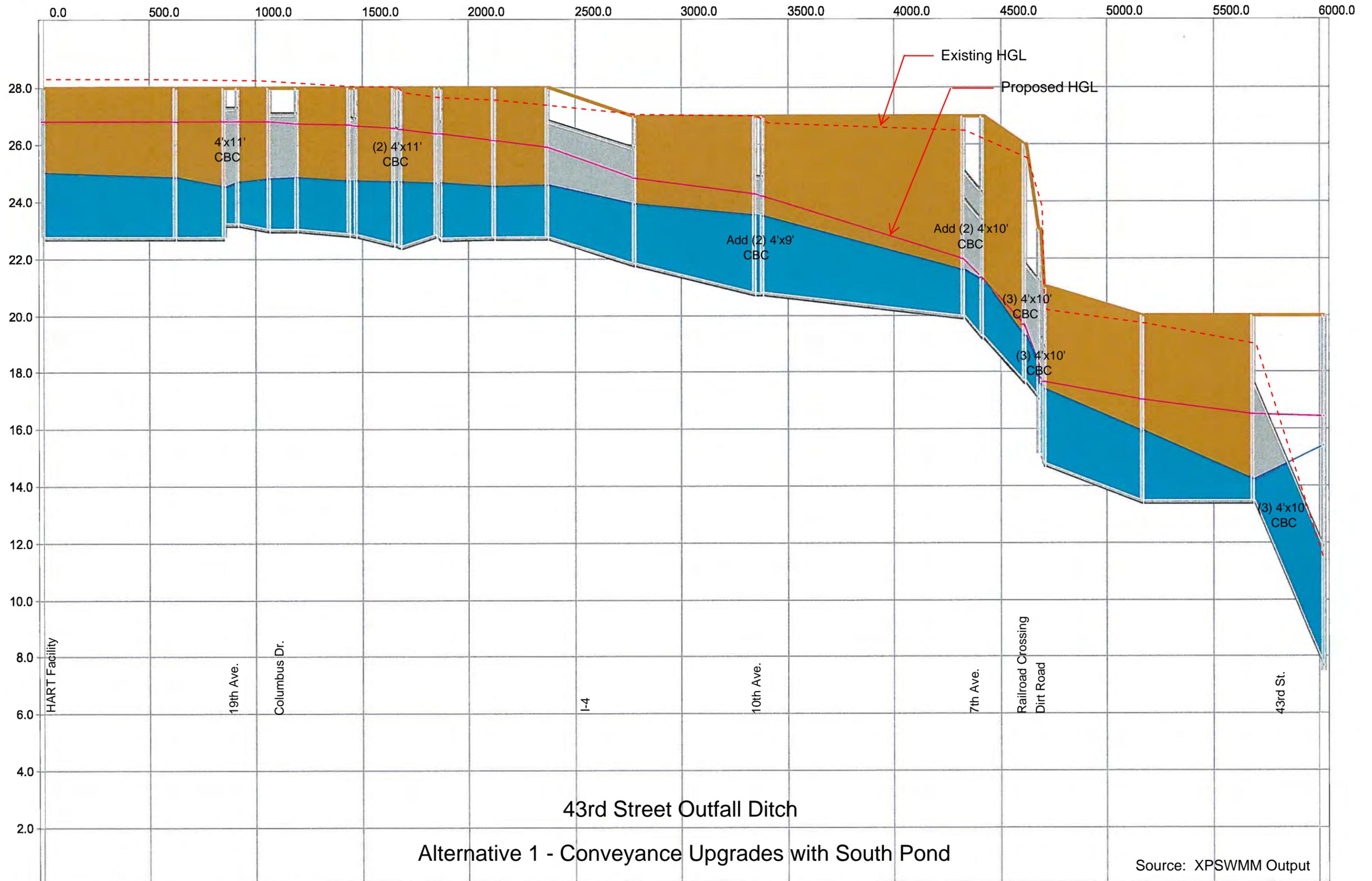
Proposed Conditions XP-SWMM Model Input and Results

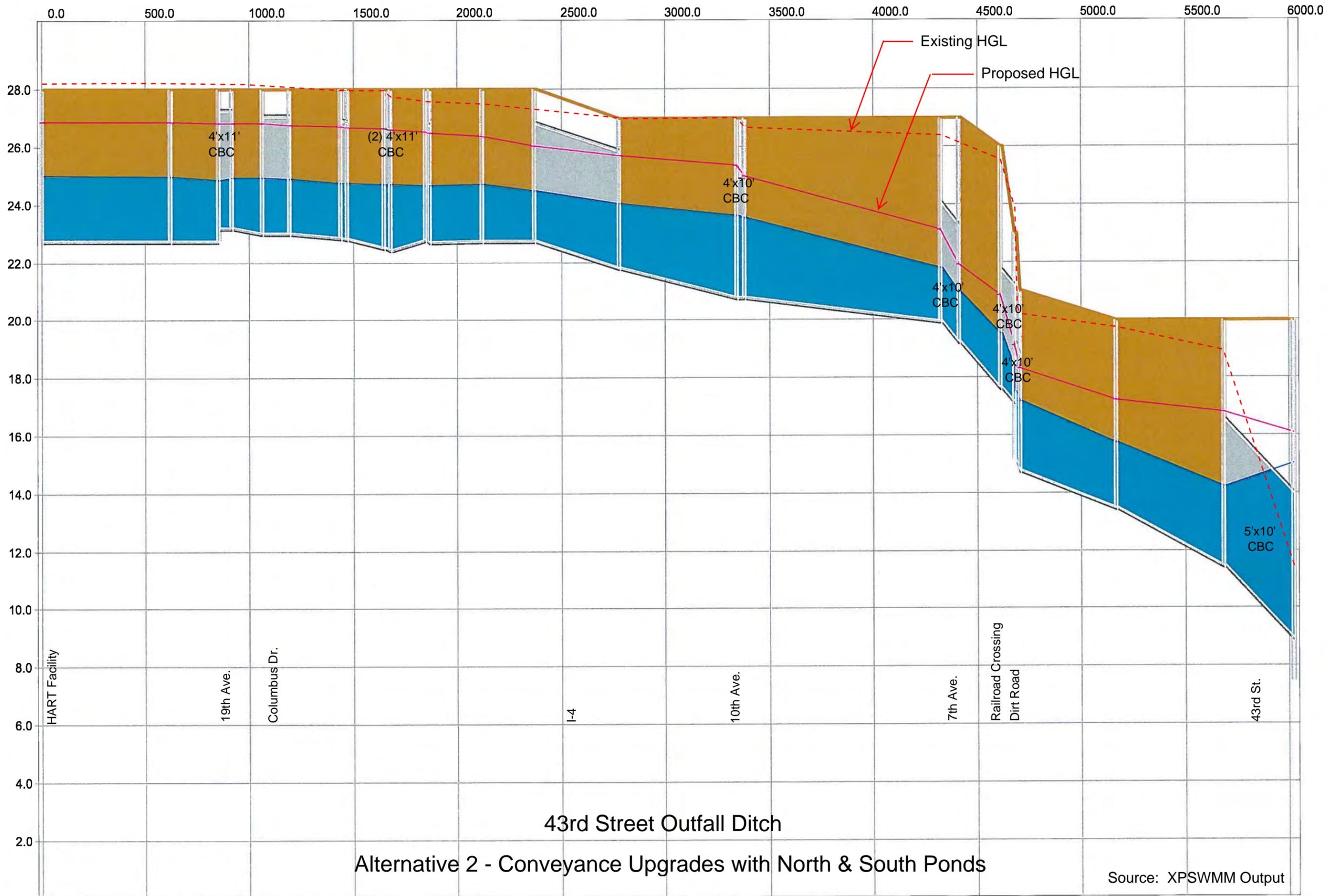
(under separate cover, includes Alternative 4)

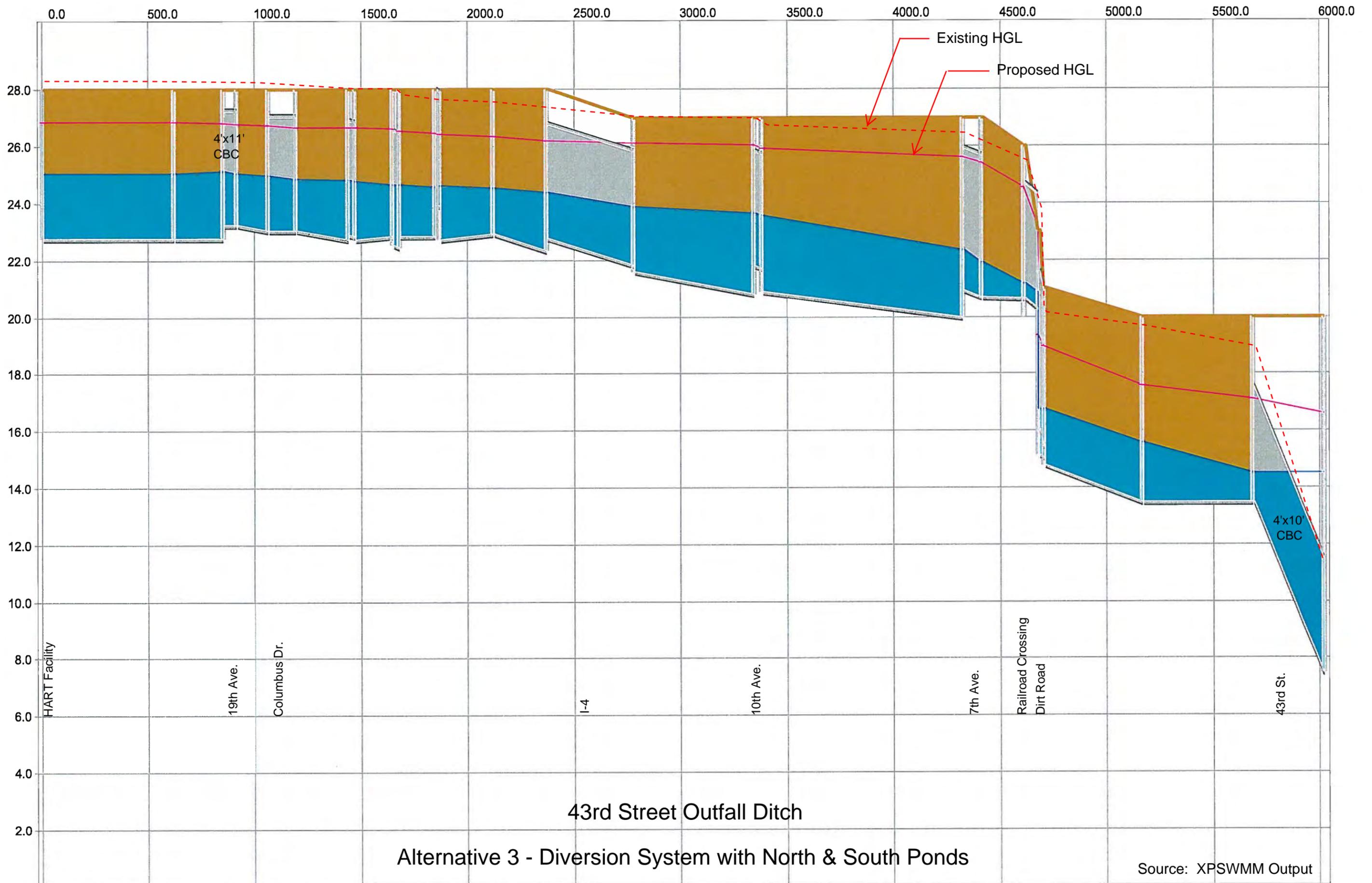
Appendix C

43rd Street Outfall Ditch Profiles for Existing and Proposed Conditions









Alternative 3 - Diversion System with North & South Ponds

Source: XPSWMM Output

Appendix D

Preliminary Project Cost Estimates

**Engineer's Estimate of Project Costs for
Improvements to 43rd Street Outfall Ditch Basin**

Alternative 1 - Conveyance Upgrades with South Pond

<u>Item Number</u>	<u>Description</u>	<u>Unit Cost</u>	<u>Units</u>	<u>Quantity</u>	<u>Total Cost</u>
1	Clearing and Grubbing	\$7,500.00	AC	20.6	\$154,500
2	Erosion Control	\$10,000	LS	1	\$10,000
3	Structure with 10-foot Diversion Weir	\$10,000.00	EA	1	\$10,000
4	Manhole Riser (for access to box culvert)	\$3,000.00	EA	2	\$6,000
5	Concrete for Endwall	\$670.00	CY	137.0	\$91,790
6	Building Demolition (1 story with small machinery)	\$4.50	SF	13,800	\$62,100
7	Box Culvert, 4' x 6'	\$526.00	LF	230	\$120,980
8	Box Culvert, 4' x 9'	\$684.00	LF	68	\$46,512
9	Box Culvert, 4' x 10'	\$736.00	LF	1,932	\$1,421,952
10	Box Culvert, 4' x 11'	\$789.00	LF	129	\$101,781
11	Box Culvert, 5' x 10'	\$789.00	LF	180	\$142,020
12	Channel Excavation	\$6.80	CY	39,511	\$268,675
13	Channel Lining with Fabric Formed Riprap	\$60.00	SY	21,174	\$1,270,467
14	Pond Excavation	\$4.00	CY	111,830	\$447,320
15	Pond Berm Embankment	\$5.00	CY	9,056	\$45,280
16	Performance Turf (Sod)	\$1.70	SY	41,500	\$70,550
17	Chain-link Fence (6')	\$13.00	LF	8,770	\$114,010
18	Concrete Sidewalk (Driveway), 6-inch Thick	\$40.00	SY	472	\$18,880
19	Concrete Sidewalk, 4-inch Thick	\$29.00	SY	392	\$11,368
20	Roadway Open Cut Restoration	\$57.00	SY	858	\$48,906
21	Roadway Lane Restoration	\$43.00	SY	2,583	\$111,069
	Maintenance of Traffic (12%)				\$548,899
	Mobilization & Demobilization (10%)				\$512,306
	Contingency Cost (20%)				\$1,127,073
	Construction Cost Sub-total				\$6,762,437
	Construction Engineering Inspection and Testing (5%)				\$338,122
	Engineering Design and Permitting (7%)				\$473,371
	Railroad Compliance and Permitting	\$100,000.00	LS	1	\$100,000
	Property Acquisition for Conveyance Upgrades and South Pond (see separate tabulation)				\$1,436,000
Estimated Project Costs, Alternative 1					\$9,110,000

**Engineer's Estimate of Project Costs for
Improvements to 43rd Street Outfall Ditch Basin**

Alternative 2 - Conveyance Upgrades with South and North Ponds

Item Number	Description	Unit Cost	Units	Quantity	Total Cost
1	Clearing and Grubbing	\$7,500.00	AC	25.7	\$192,450
2	Structure with 12-foot Diversion Weir	\$10,000.00	EA	1	\$10,000
3	Modify Drainage Structure (connect pipe)	\$1,500.00	EA	1	\$1,500
4	Manhole Riser (for access to box culvert)	\$3,000.00	EA	2	\$6,000
5	Concrete for Endwall	\$670.00	CY	118.0	\$79,060
6	Building Demolition (with wrecking ball)	\$2.00	SF	58,800	\$117,600
7	Building Demolition (with small machinery)	\$4.50	SF	13,800	\$62,100
8	Reinforced Concrete Pipe (RCP), 48-inch	\$130.00	LF	2,350	\$305,500
9	Box Culvert, 3' x 4'	\$400.00	LF	90	\$36,000
10	Box Culvert, 4' x 6'	\$526.00	LF	230	\$120,980
11	Box Culvert, 4' x 10'	\$736.00	LF	215	\$158,240
12	Box Culvert, 4' x 11'	\$789.00	LF	129	\$101,781
13	Box Culvert, 5' x 10'	\$789.00	LF	335	\$264,315
14	Channel Excavation	\$6.80	CY	15,465	\$105,162
15	Channel Lining with Fabric Formed Riprap	\$60.00	SY	15,162	\$909,733
16	Pond Excavation	\$4.00	CY	212,194	\$848,776
17	Pond Berm Embankment	\$5.00	CY	9,132	\$45,660
18	Performance Turf (Sod)	\$1.60	SY	61,274	\$98,038
19	Chain-link Fence (6')	\$13.00	LF	11,120	\$144,560
20	Concrete Sidewalk (Driveway), 6-inch Thick	\$38.00	SY	472	\$17,936
21	Concrete Sidewalk, 4-inch Thick	\$29.00	SY	392	\$11,368
22	Roadway Open Cut Restoration	\$57.00	SY	755	\$43,035
23	Roadway Lane Restoration	\$43.00	SY	2,000	\$86,000
	Maintenance of Traffic (12%)				\$451,895
	Mobilization & Demobilization (10%)				\$421,769
	Contingency Cost (20%)				\$927,892
	Construction Cost Sub-total				\$5,567,351
	Construction Engineering Inspection and Testing (5%)				\$278,368
	Engineering Design and Permitting (7%)				\$389,715
	Railroad Compliance and Permitting	\$75,000.00	LS	1	\$75,000
	Property Aquisition for Conveyance Upgrades and South/North Ponds (see separate tabulation)				\$2,839,000
Estimated Project Costs, Alternative 2					\$9,149,000

Engineer's Estimate of Project Costs for Improvements to 43rd Street Outfall Ditch Basin

Alternative 3 - Diversion System with North and South Ponds

Item Number	Description	Unit Cost	Units	Quantity	Total Cost
1	Clearing and Grubbing	\$7,500.00	AC	21.5	\$161,400
2	Structure with 10-foot Diversion Weir	\$10,000.00	EA	1	\$10,000
3	Modify Drainage Structure (connect pipe)	\$1,500.00	EA	2	\$3,000
4	Manhole Riser (for access to box culvert)	\$3,000.00	EA	12	\$36,000
5	Concrete for Endwall	\$670.00	CY	34.8	\$23,329
6	Building Demolition (with wrecking ball)	\$2.00	SF	58,800	\$117,600
7	Box Culvert, 3' x 5'	\$421.00	LF	90	\$37,890
8	Box Culvert, 4' x 6'	\$526.00	LF	3,910	\$2,056,660
9	Box Culvert, 4' x 10'	\$736.00	LF	335	\$246,560
10	Box Culvert, 4' x 11'	\$789.00	LF	67	\$52,863
11	Channel Excavation	\$6.80	CY	1,867	\$12,696
12	Pond Excavation	\$4.00	CY	212,194	\$848,776
13	Pond Berm Embankment	\$5.00	CY	9,132	\$45,660
14	Performance Turf (Sod)	\$1.60	SY	48,601	\$77,762
15	Chain-link Fence (6')	\$13.00	LF	5,690	\$73,970
16	Concrete Sidewalk (Driveway), 6-inch Thick	\$38.00	SY	981	\$37,278
17	Concrete Sidewalk, 4-inch Thick	\$29.00	SY	1,190	\$34,510
18	Roadway Open Cut Restoration	\$57.00	SY	375	\$21,375
19	Roadway Lane Restoration	\$43.00	SY	6,714	\$288,702
	Maintenance of Traffic (12%)				\$502,324
	Mobilization & Demobilization (10%)				\$468,835
	Contingency Cost (20%)				\$1,031,438
	Construction Cost Sub-total				\$6,188,628
	Construction Engineering Inspection and Testing (5%)				\$309,431
	Engineering Design and Permitting (7%)				\$433,204
	Railroad Compliance and Permitting	\$75,000.00	LS	1	\$75,000
	Property Costs for Minor Conv. Upgrades and South/North Ponds (see separate tabulation)				\$1,957,000
Estimated Project Costs, Alternative 3					\$8,963,000

Appendix E

Property Needs Back-up Information

FOLIO	Owner	Size (acres)	Assessed or Market Value	Buildings	Last Sale	Last Sale Date	Notes
North Pond (South side of Columbus Drive)							
1604760000	Bravura Investment Corp.	3.13	\$200,812	No	\$250,000	9/17/2003	
1604750000	Ricknata, LLC	0.58	\$60,984	No	\$500,000	12/30/2010	
1605630000	Ricknata, LLC	2.21	\$144,597	No	---	---	included above
1605640100	Ricknata, LLC	2.48	\$1,047,600	Yes	---	---	included above
		8.40					

North Pond - Option (North Side of Columbus Drive)							
1581050000	Old Dominion Freight Line, Inc.	5.63	\$1,237,657	Yes	\$590,000	8/1/1993	For Sale?

Estimated Property Purchase Price = \$1,000,000 based on considerations of assessed values and last sale prices of two options
 Estimated Administrative/Legal Costs = \$500,000 50% of estimated purchase price (from sample of FDOT estimates)
 Estimated Total Property Costs = \$1,500,000

South Pond							
1752930000	Southgate Tampa Industrial Ltd. Partnership	38.6 (using 9.7)	\$1,060,103	Yes (not affected)	N/A		land only (\$27,500 per acre)

Estimated Property Purchase Price = \$266,750 based on market land value prorated for 9.4 acres out of 38.6 acres total
 Estimated Administrative/Legal Costs = \$133,375 50% of estimated purchase price (from sample of FDOT estimates)
 Estimated Total Property Costs = \$400,000

FOLIO	Owner	Size (acres)	Assessed or Market Value	Buildings	Last Sale	Last Sale Date	Property Value Rate	Alternative 1 Impacts		Alternative 2 Impacts		Alternative 3 Impacts		
								Size (acres)	Cost	Size (acres)	Cost	Size (acres)	Cost	
Conveyance Upgrades														
Assume upgrades on HART property will not require property costs														
1581170100	Messina Holdings, Inc.	4.07	\$426,012	Yes (not affected)	N/A		\$105,000.00	per acre	0.08	\$8,400	0.04	\$4,200	0.04	\$4,200.00
1581170200	Messina Properties, Inc.	2.39	\$251,965	Yes (not affected)	N/A		\$105,000.00	per acre	0	\$0	0	\$0	0	\$0.00
1581200000	Bowman Transportation, Inc.	0.32	\$45,000	No	N/A			total purchase	0	\$45,000	0	\$45,000	0	\$0.00
1603900000	CMDL Investments, LLC	1.08	\$20,212	No	N/A		\$19,000.00	per acre	0.35	\$6,650	0.25	\$4,750	0	\$0.00
Assume upgrades on FDOT property will not require property costs														
1606770000	JL Baker Life Estate	0.46	\$9,686	Yes (not affected)	N/A		\$21,000.00	per acre	0.13	\$2,730	0.09	\$1,890	0	\$0.00
1605820000	Alton and Cathy Harn	0.3	\$7,920	No	N/A		\$26,000.00	per acre	0.13	\$3,380	0.09	\$2,340	0	\$0.00
1605800000	Alton and Cathy Harn	0.42	\$11,808	Yes (not affected)	N/A		\$28,000.00	per acre	0.13	\$3,640	0.09	\$2,520	0	\$0.00
1603980000	Alton and Cathy Harn	0.21	\$7,575	No	N/A		\$36,000.00	per acre	0.14	\$5,040	0.1	\$3,600	0	\$0.00
1606850100	Carl and Kathy Adkins	2.63	\$204,607	Yes (not affected)	N/A		\$78,000.00	per acre	0.36	\$28,080	0.26	\$20,280	0	\$0.00
1606860100	Tampa 10 Properties, LLC	1.36	\$117,467	Yes (not affected)	N/A		\$86,000.00	per acre	0.02	\$1,720	0	\$0	0	\$0.00
1606860000	Mabco Holdings, Inc.	2.88	\$317,302	Yes (not affected)	N/A		\$110,000.00	per acre	0.1	\$11,000	0	\$0	0	\$0.00
1606860250	A-1 Beverage Service, Inc.	2.29	\$288,938	Yes (not affected)	N/A		\$126,000.00	per acre	0.23	\$28,980	0.11	\$13,860	0	\$0.00
1607270000	Solid North, LLC	0.94	\$373,700	Yes		\$400,000		total purchase	0	\$373,700	0	\$373,700	0	\$0.00
1606960000	C and S Industries	0.57	\$72,600	Yes (not affected)	N/A		\$127,000.00	per acre	0	\$0	0	\$0	0	\$0.00
1604730000	Metropolitan Life Insurance	22.06	\$803,381	Yes (not affected)	N/A		\$36,000.00	per acre	0.73	\$26,280	0.51	\$18,360	0	\$0.00
1604270000	1607 Property Inc.	2.61	\$210,560	Yes (not affected)	N/A		\$81,000.00	per acre	0.13	\$10,530	0.11	\$8,910	0	\$0.00
1604280000	Pamela Snead	6.45	\$290,742	Yes (one bldg. affected)		\$550,000		estimated \$45,000 per acre plus \$100,000 for one bldg.	0.38	\$117,100	0.3	\$113,500	0	\$0.00
1604060000	Pamela Snead	0.54	\$58,370	No	N/A		\$108,000.00	per acre	0.17	\$18,360	0.12	\$12,960	0.12	\$12,960.00
1607950000	GAC Tampa, Inc.	2.92	\$315,037	Yes (not affected)	N/A		\$108,000.00	per acre	0	\$0	0	\$0	0.1	\$10,800.00
1604060100	JVS Contracting, Inc.	4.31	\$349,380	Yes (not affected)	N/A		\$81,000.00	per acre	0	\$0	0	\$0	0.12	\$9,720.00
Totals =									4.34	\$690,590	3.33	\$625,870	0.38	\$37,680.00

Alternative 1

Estimated Property Purchase Price = \$690,590 based on prorated market land value for partial takes of property or assessed value for full property takes with buildings
 Estimated Administrative/Legal Costs = \$345,295 50% of estimated purchase price (from sample of FDOT estimates)
 Estimated Total Property Costs = \$1,036,000

Alternative 2

Estimated Property Purchase Price = \$625,870 based on prorated market land value for partial takes of property or assessed value for full property takes with buildings
 Estimated Administrative/Legal Costs = \$312,935 50% of estimated purchase price (from sample of FDOT estimates)
 Estimated Total Property Costs = \$939,000

Alternative 3

Estimated Property Purchase Price = \$37,680 based on prorated market land value for partial takes of property or assessed value for full property takes with buildings
 Estimated Administrative/Legal Costs = \$18,840 50% of estimated purchase price (from sample of FDOT estimates)
 Estimated Total Property Costs = \$57,000



LAND USE REFERENCES

- VACATING OF R/W & EASEMENT
- Ord. 1885-A
 - Ord. 4473-A
 - Ord. 5273-A
 - Ord. 3560-A
 - Ord. 4358-A
 - Ord. 5322-A
 - Ord. 1271-A
 - Ord. 2009-173
 - Ord. 3992-A
 - Ord. 4298-A
 - Ord. 4386-A
 - Ord. 4387-A
 - Ord. 3544-A
 - Ord. 6753-A
 - D.B. 807, Pg. 26 & 27
 - Ord. 7773-A
 - Ord. 4818-A
 - Ord. 8270-A
 - Ord. 8271-A
 - Ord. 831-A
 - Ord. 84-A
 - Ord. 92-99
 - Ord. 93-209
 - Ord. 94-84
 - Ord. 99-774
 - Ord. 2001-40
 - Ord. 2001-69
 - Ord. 2010-169
 - Ord. 2012-48
 - Pl. Drain. Exam.

ACQUISITIONS OF R/W & EASEMENT

- Res. 6180-F
- Res. 6181-F
- Res. 6182-F
- C.M.B. "M"
- Res. 6183-F
- Res. 6184-F
- Res. 6185-F
- Res. 6186-F
- Res. 6187-F
- Res. 6188-F
- Res. 6189-F
- Res. 6190-F
- Res. 6191-F
- Res. 6192-F
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- Res. 6210-F
- Res. 6211-F
- Res. 6212-F
- Res. 6213-F
- Res. 6214-F
- Res. 6215-F
- Res. 6216-F
- Res. 6217-F
- Res. 6218-F
- Res. 6219-F
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- Res. 6224-F
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- Res. 6228-F
- Res. 6229-F
- Res. 6230-F
- Res. 6231-F
- Res. 6232-F
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- Res. 6274-F
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- Res. 6276-F
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- Res. 6280-F
- Res. 6281-F
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- Res. 6296-F
- Res. 6297-F
- Res. 6298-F
- Res. 6299-F
- Res. 6300-F

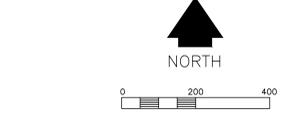
CITY PROPERTIES

- Res. 5004-D & Res. 5006-D
- (D.O.)
- C.R. 3137, Pg. 882
- Res. 6306-F
- Res. 1758-D & Ord. 6417-A
- Res. 454-F
- Res. 455-F
- Res. 456-F
- Res. 457-F
- Res. 458-F
- Res. 459-F
- Res. 460-F
- Res. 461-F
- Res. 462-F
- Res. 463-F
- Res. 464-F
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- Res. 494-F
- Res. 495-F
- Res. 496-F
- Res. 497-F
- Res. 498-F
- Res. 499-F
- Res. 500-F

SMALL SUBDIVISIONS

Approximate Property Needs

- Alternative 1
- Alternative 2
- Alternative 3
- Property Appraiser FOLIO No.



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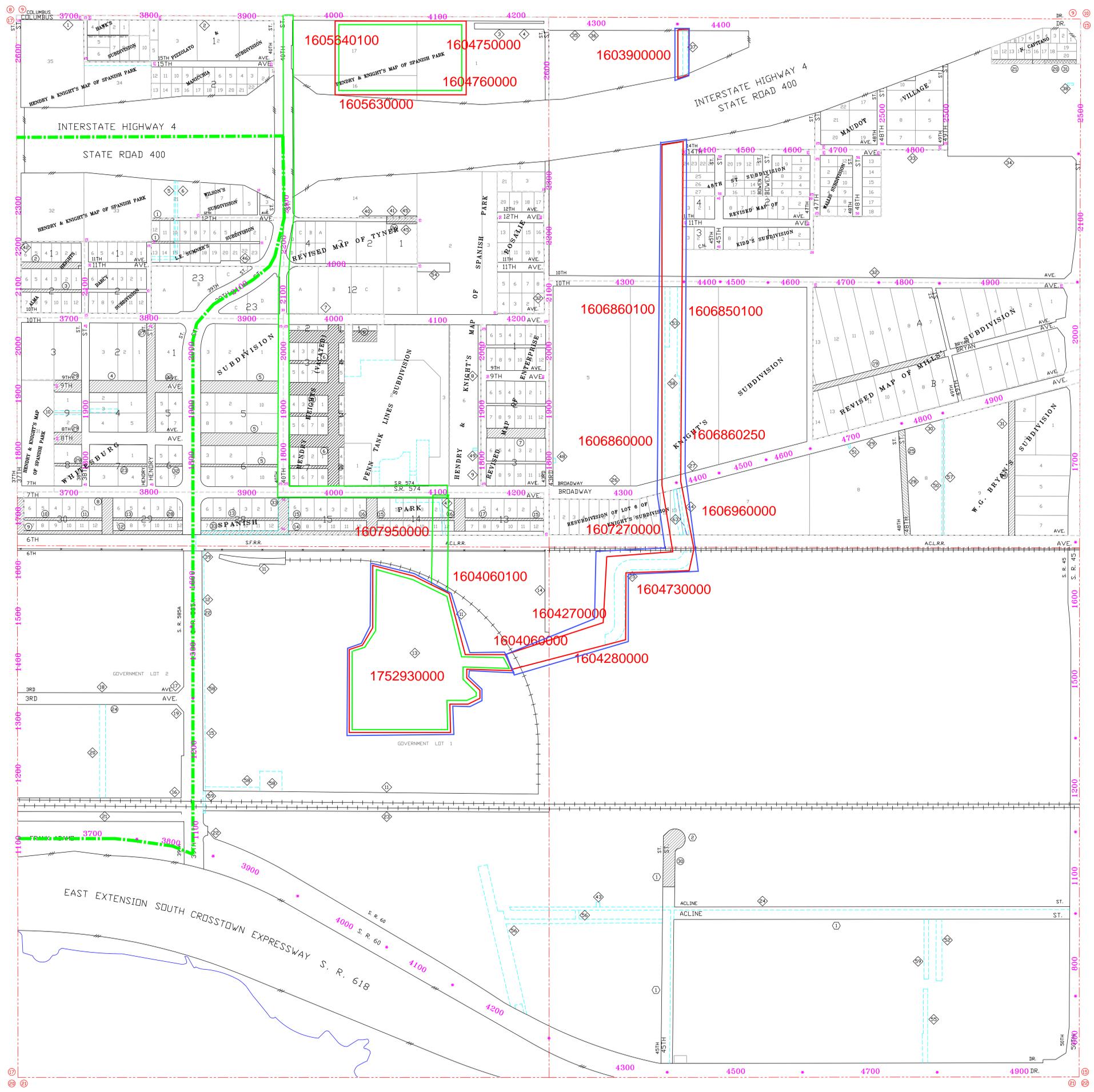


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CITY OF
 TAMPA, FLORIDA

R/W ATLAS

SEC. 9-T29S-R19E



LAND USE REFERENCES

- VACATING OF R/W & EASEMENT
- Ord. 4717-A
 - Ord. 4828-A
 - Ord. 4813-A
 - Ord. 4897-A
 - Ord. 4901-A
 - Ord. 4928-A
 - Ord. 5355-A
 - Ord. 5356-A
 - Ord. 5357-A
 - Ord. 5358-A
 - Ord. 5359-A
 - Ord. 5360-A
 - Ord. 5361-A
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 - Ord. 5364-A
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 - Ord. 5395-A
 - Ord. 5396-A
 - Ord. 5397-A
 - Ord. 5398-A
 - Ord. 5399-A
 - Ord. 5400-A

- ◇ ACQUISITIONS OF R/W & EASEMENT
- C.M.B. 18, Pg. 429
 - C.M.B. 18, Pg. 430
 - C.M.B. 18, Pg. 431
 - C.M.B. 18, Pg. 432
 - C.M.B. 18, Pg. 433
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 - C.M.B. 18, Pg. 500

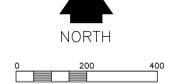
- CITY PROPERTIES
- Res. 474-I
 - Res. 474-II

Property Needs for 43rd Street
Outfall Basin Improvements

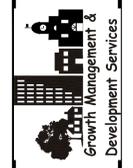
Approximate Property Needs

- Alternative 1
- Alternative 2
- Alternative 3

XXXXXXXXXX Property Appraiser FOLIO No.



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R/W ATLAS

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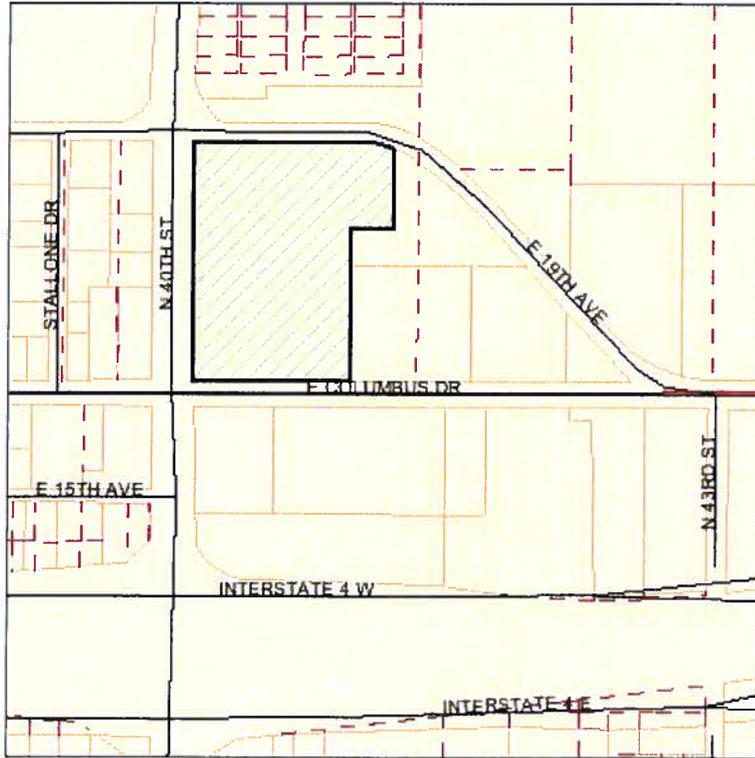
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Bob Henriquez
HILLSBOROUGH COUNTY PROPERTY APPRAISER



[VIEW PROPERTY RECORD INFORMATION]



FOLIO: 1581050000
 PIN NUMBER: A-09-29-19-4BO-000000-00001.0
 OWNER 1: OLD DOMINION FREIGHT LINE INC
 ADDRESS: 4004 E COLUMBUS DR
 TAMPA
 LEGAL DESC: LOT 1 LYING N OF 19TH AVE
 DOR CODE: 4814

VALUE SUMMARY:

BUILDING VALUE:	\$532,448
EXTRA FEATURE VALUE:	\$101,888
LAND VALUE (MARKET):	\$603,321
LAND VALUE (AGRI.):	\$0
JUST (MARKET) VALUE:	\$1,237,657
ASSESSED VALUE (A10):	\$1,237,657
EXEMPT VALUE:	\$0
TAXABLE VALUE:	\$1,237,657

SALES INFORMATION

NEW!

12/1/1988	\$100.00
12/1/1988	\$800,000.00
8/1/1993	\$590,000.00

FOLIO: 1581050000 PIN: A-09-29-19-4BO-000000-00001.0 ACREAGE: 5.63 / SQFT: 245,133

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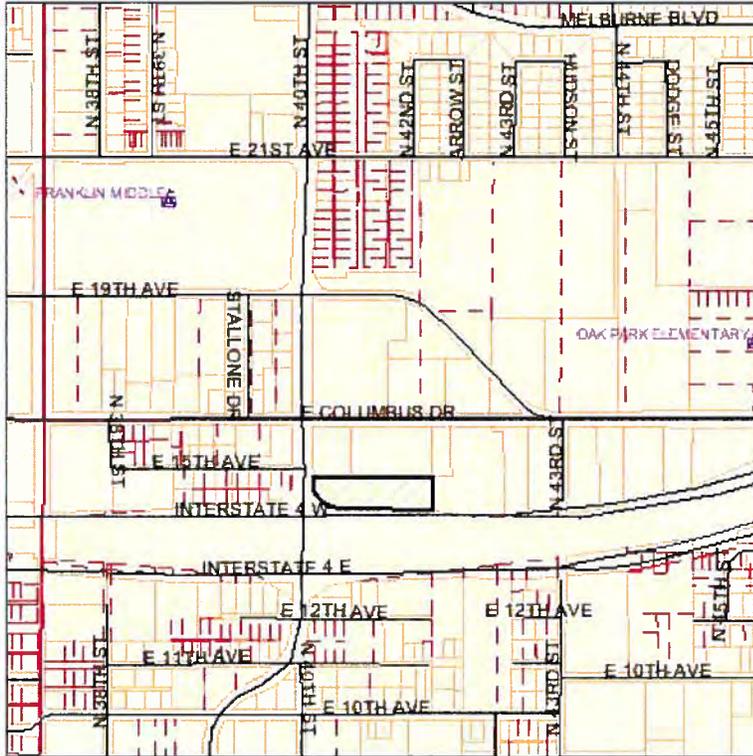
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Bob Henriquez
HILLSBOROUGH COUNTY PROPERTY APPRAISER



[VIEW PROPERTY RECORD INFORMATION]



FOLIO: 1605630000
 PIN NUMBER: A-16-29-19-4CZ-000016-00000 0
 OWNER 1: RICKNATA LLC
 ADDRESS: 2411 N 40TH ST
 TAMPA
 LEGAL DESC: ALL BLOCK 16 LESS STATE RD 400
 DOR CODE: 4000

VALUE SUMMARY:

BUILDING VALUE:	\$0
EXTRA FEATURE VALUE:	\$0
LAND VALUE (MARKET):	\$144,597
LAND VALUE (AGRI.):	\$0
JUST (MARKET) VALUE:	\$144,597
ASSESSED VALUE (A10):	\$144,597
EXEMPT VALUE:	\$0
TAXABLE VALUE:	\$144,597

SALES INFORMATION **NEW!**

1/1/1976	\$100.00
7/1/1989	\$1,750,000.00
6/1/1992	\$1,000,000.00
12/30/2010	\$500,000.00

FOLIO: 1605630000 PIN: A-16-29-19-4CZ-000016-00000 0 ACREAGE: 2.21 / SQFT: 96,365

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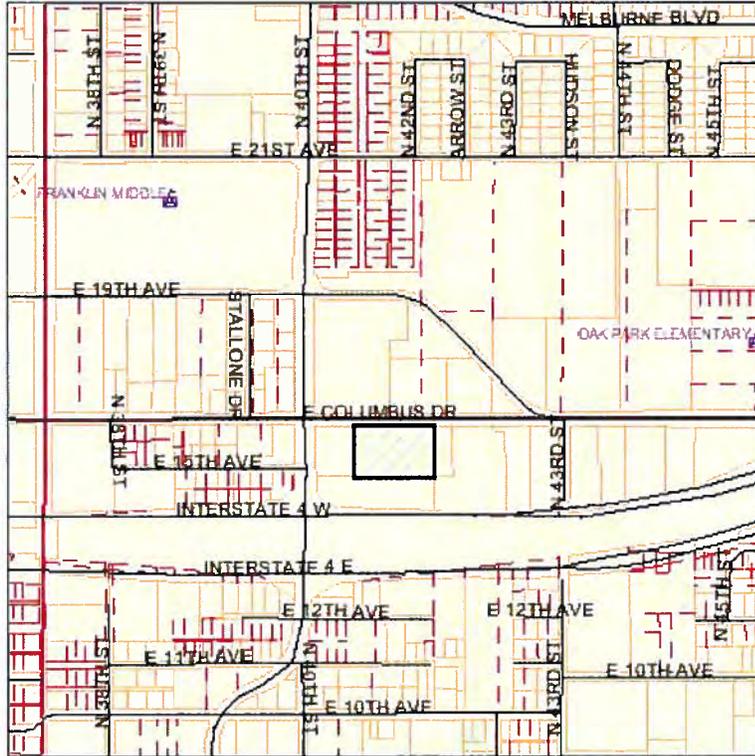
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Bob Henriquez
HILLSBOROUGH COUNTY PROPERTY APPRAISER



[VIEW PROPERTY RECORD INFORMATION]



FOLIO: 1605640100
 PIN NUMBER: A-16-29-19-4CZ-000017-00000.1
 OWNER 1: RICKNATA LLC
 ADDRESS: 4011 E COLUMBUS DR
 TAMPA
 LEGAL DESC: E 413.24 FT OF BLK 17 LESS R/W FOR COLUMBUS DR
 DOR CODE: 3924

VALUE SUMMARY:	
BUILDING VALUE:	\$1,163,483
EXTRA FEATURE VALUE:	\$55,731
LAND VALUE (MARKET):	\$262,504
LAND VALUE (AGRI.):	\$0
JUST (MARKET) VALUE:	\$1,047,600
ASSESSED VALUE (A10):	\$1,047,600
EXEMPT VALUE:	\$0
TAXABLE VALUE:	\$1,047,600

SALES INFORMATION		NEW!
12/30/2010	\$500,000.00	
6/1/1992	\$1,000,000.00	
7/1/1989	\$1,750,000.00	
1/1/1976	\$100.00	

FOLIO: 1605640100 PIN: A-16-29-19-4CZ-000017-00000.1 ACREAGE: 2.48 / SQFT: 107,943

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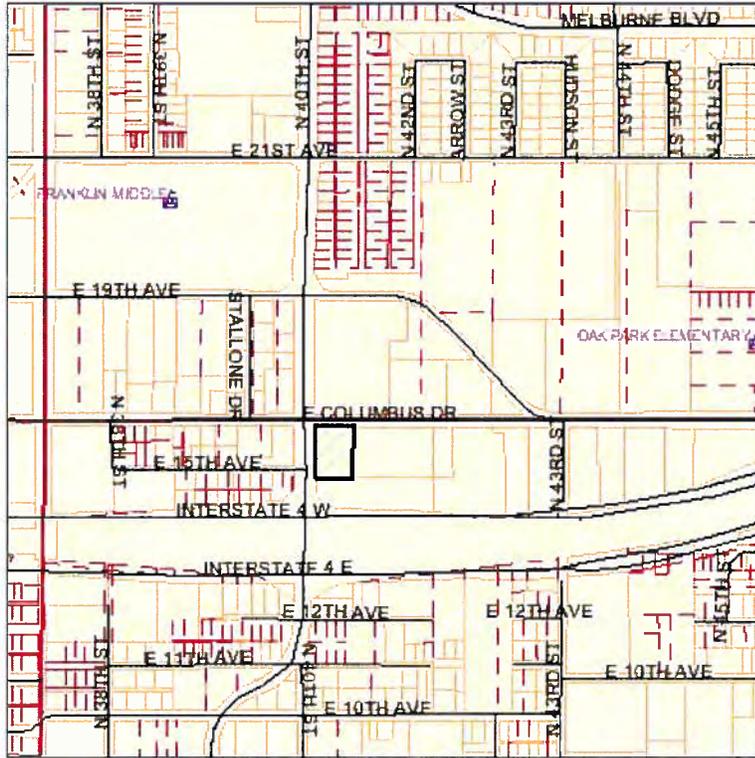
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Bob Henriquez
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[VIEW PROPERTY RECORD INFORMATION]



FOLIO:	1605640000
PIN NUMBER:	A-16-29-19-4CZ-000017-00000.0
OWNER 1:	GUTIERREZ GLADYS MONTERO TRUSTEE
ADDRESS:	2611 N 40TH ST TAMPA
LEGAL DESC:	413.24 FT
DOR CODE:	1420

VALUE SUMMARY:	
BUILDING VALUE:	\$88,128
EXTRA FEATURE VALUE:	\$139,059
LAND VALUE (MARKET):	\$180,970
LAND VALUE (AGRI.):	\$0
JUST (MARKET) VALUE:	\$408,157
ASSESSED VALUE (A10):	\$408,157
EXEMPT VALUE:	\$0
TAXABLE VALUE:	\$408,157

SALES INFORMATION		NEW!
6/8/2001	\$100.00	
4/1/1995	\$120,000.00	
1/1/1970	\$88,800.00	

FOLIO: 1605640000 PIN: A-16-29-19-4CZ-000017-00000.0 ACREAGE: 1.16 / SQFT: 50,462

Map created on 1/25/2013 2:09:28 PM.

0 376 ft

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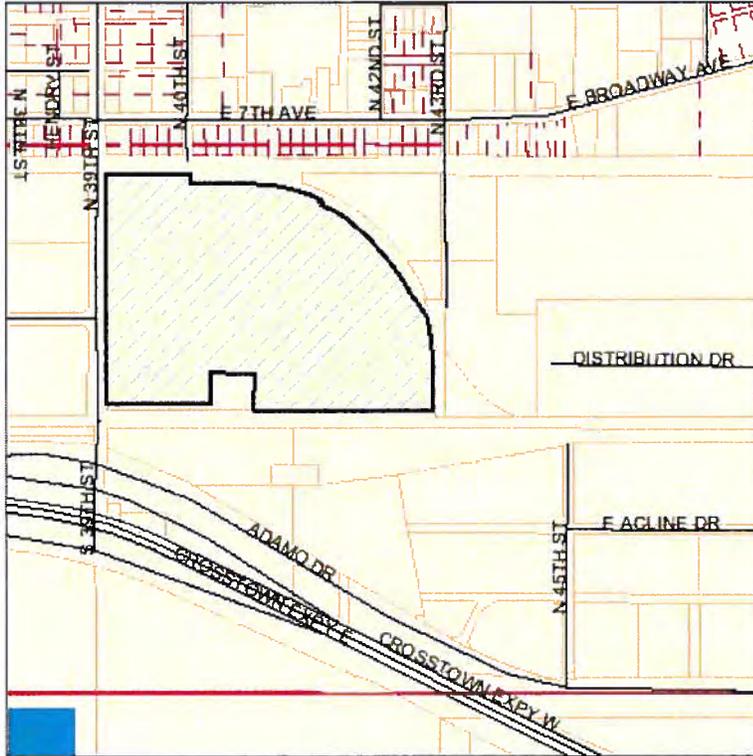
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[VIEW PROPERTY RECORD INFORMATION]



FOLIO: 1752930000
 PIN NUMBER: A-16-29-19-ZZZ-000005-89970 0
 OWNER 1: SOUTHGATE TAMPA INDUSTRIAL LTD PARTNERSHIP
 ADDRESS: 1601 N 39TH ST
 TAMPA
 LEGAL DESC: 535.50 FT AND S 38 FT TO POB
 DOR CODE: 4840

VALUE SUMMARY:	
BUILDING VALUE:	\$4,922,252
EXTRA FEATURE VALUE:	\$176,693
LAND VALUE (MARKET):	\$1,060,103
LAND VALUE (AGRI.):	\$0
JUST (MARKET) VALUE:	\$6,004,600
ASSESSED VALUE (A10):	\$6,004,600
EXEMPT VALUE:	\$0
TAXABLE VALUE:	\$6,004,600

SALES INFORMATION		NEW!
6/1/1998	\$807,600.00	
4/1/1988	\$4,700,000.00	

FOLIO: 1752930000 PIN: A-16-29-19-ZZZ-000005-89970 0 ACREAGE: 38.60 / SQFT: 1,681,629

Map created on 1/25/2013 2:06:17 PM.

0 376 ft

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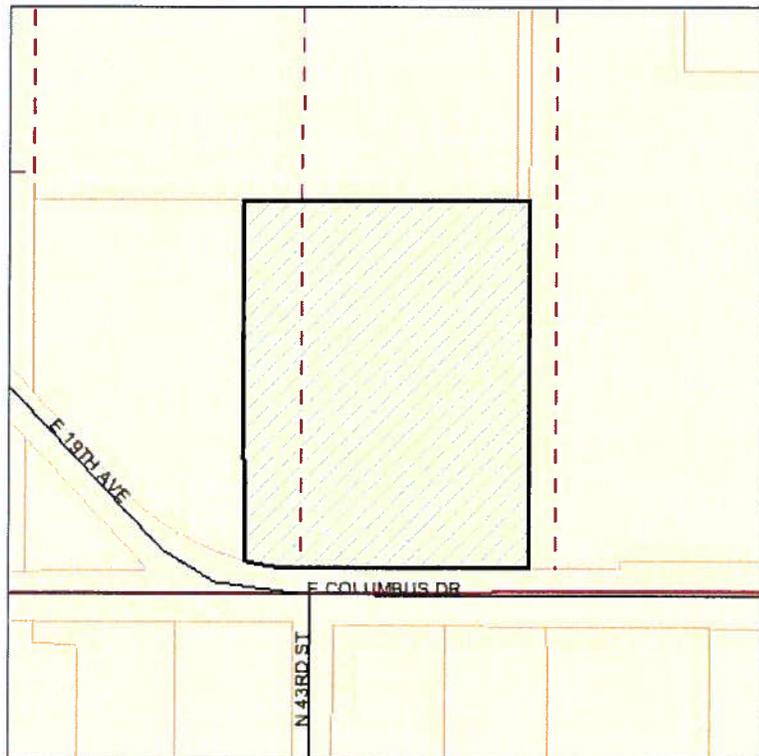
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[VIEW PROPERTY RECORD INFORMATION]



FOLIO: 1581170100
 PIN NUMBER: A-09-29-19-4BO-000000-00004.1
 OWNER 1: MESSINA HOLDINGS INC
 ADDRESS: 4310 E COLUMBUS DR
 TAMPA
 LEGAL DESC: N 89 DEG 5 MIN 59 SEC W 293.44 FT TO POB
 DOR CODE: 4830

VALUE SUMMARY:	
BUILDING VALUE:	\$327,411
EXTRA FEATURE VALUE:	\$52,455
LAND VALUE (MARKET):	\$426,012
LAND VALUE (AGRI.):	\$0
JUST (MARKET) VALUE:	\$749,400
ASSESSED VALUE (A10):	\$749,400
EXEMPT VALUE:	\$0
TAXABLE VALUE:	\$749,400

SALES INFORMATION		NEW!
12/1/1995	\$100.00	
12/1/1996	\$100.00	
7/1/1997	\$808,500.00	

FOLIO: 1581170100 PIN: A-09-29-19-4BO-000000-00004.1 ACREAGE: 4.07 / SQFT: 177,235

Map created on 2/11/2013 1:47:21 PM.

0 95 ft

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[VIEW PROPERTY RECORD INFORMATION]



FOLIO: 1581170200
 PIN NUMBER: A-09-29-19-4BO-000000-00004.2
 OWNER 1: MESSINA PROPERTIES INC
 ADDRESS: 4306 E COLUMBUS DR
 TAMPA
 LEGAL DESC: W 467.44 FT TO POB
 DOR CODE: 2753

VALUE SUMMARY:	
BUILDING VALUE:	\$35,568
EXTRA FEATURE VALUE:	\$44,695
LAND VALUE (MARKET):	\$251,965
LAND VALUE (AGRI.):	\$0
JUST (MARKET) VALUE:	\$332,228
ASSESSED VALUE (A10):	\$332,228
EXEMPT VALUE:	\$0
TAXABLE VALUE:	\$332,228

SALES INFORMATION		NEW!
5/18/2000	\$395,000.00	
1/1/1998	\$330,000.00	
12/1/1995	\$262,700.00	
4/1/1992	\$135,000.00	

FOLIO: 1581170200 PIN: A-09-29-19-4BO-000000-00004.2 ACREAGE: 2.39 / SQFT: 104,214

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0 94 ft

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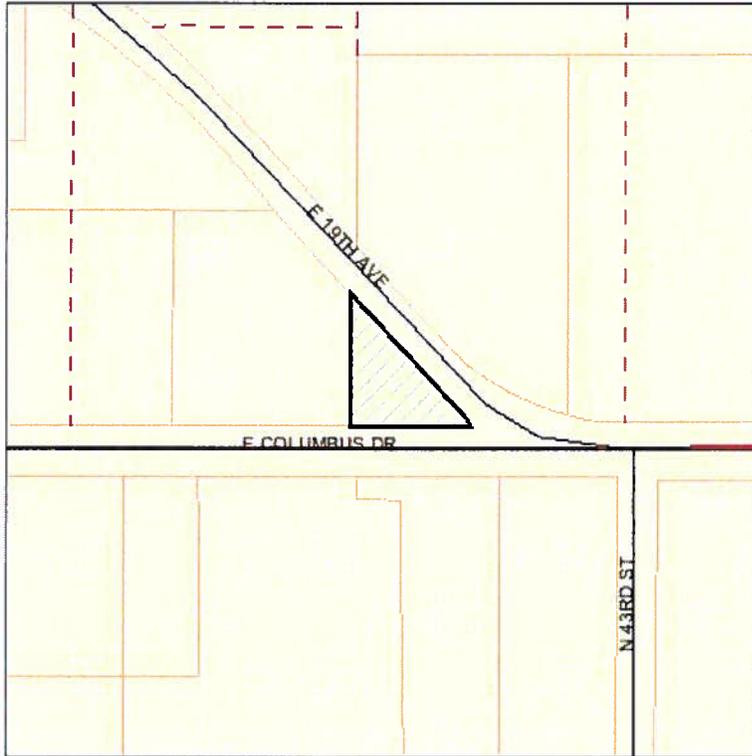
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[VIEW PROPERTY RECORD INFORMATION]



FOLIO: 1581200000
 PIN NUMBER: A-09-29-19-4BO-000000-00004.3
 OWNER 1: BOWMAN TRANSPORTATION INC

ADDRESS: 0 E COLUMBUS
 TAMPA

LEGAL DESC: DR AND ELY ALONG DR TO BEG
 DOR CODE: 4000

VALUE SUMMARY:

BUILDING VALUE:	\$0
EXTRA FEATURE VALUE:	\$0
LAND VALUE (MARKET):	\$20,212
LAND VALUE (AGRI.):	\$0
JUST (MARKET) VALUE:	\$20,212
ASSESSED VALUE (A10):	\$20,212
EXEMPT VALUE:	\$0
TAXABLE VALUE:	\$20,212

No Sales Found.

FOLIO: 1581200000 PIN: A-09-29-19-4BO-000000-00004.3 ACREAGE: 0.32 / SQFT: 13,761

Map created on 2/11/2013 1:49:52 PM.

0 95 ft

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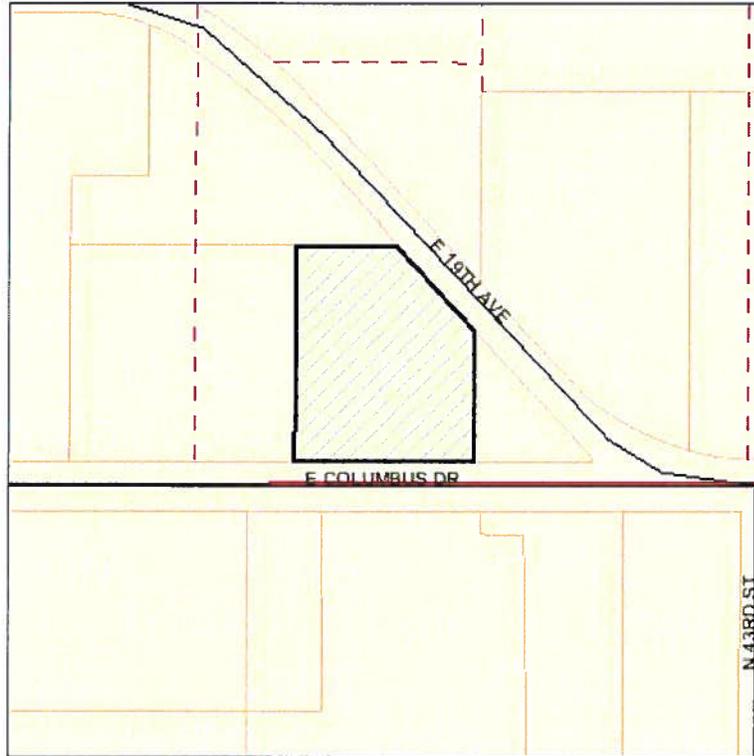
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[VIEW PROPERTY RECORD INFORMATION]



FOLIO: 1581080100
 PIN NUMBER: A-09-29-19-4BO-000000-00003.0
 OWNER 1: DAVIS NANCY JEAN TRUSTEE
 LASKIN LINDA DAVIS TRUSTEE
 ADDRESS: 4219 E 19TH AV
 TAMPA
 LEGAL DESC: OF LOT 3 S 162.55 FT AND W 231.20 FT TO BEG
 DOR CODE: 4400

VALUE SUMMARY:	
BUILDING VALUE:	\$176,272
EXTRA FEATURE VALUE:	\$41,248
LAND VALUE (MARKET):	\$160,717
LAND VALUE (AGRI.):	\$0
JUST (MARKET) VALUE:	\$378,237
ASSESSED VALUE (A10):	\$378,237
EXEMPT VALUE:	\$0
TAXABLE VALUE:	\$378,237

SALES INFORMATION		NEW!
11/1/1978	\$94,000.00	
2/1/1979	\$94,600.00	
7/1/1994	\$100.00	
5/6/2011	\$100.00	
5/9/2011	\$100.00	

FOLIO: 1581080100 PIN: A-09-29-19-4BO-000000-00003.0 ACREAGE: 1.36 / SQFT: 59,231

Map created on 2/11/2013 1:52:06 PM.

0 95 ft

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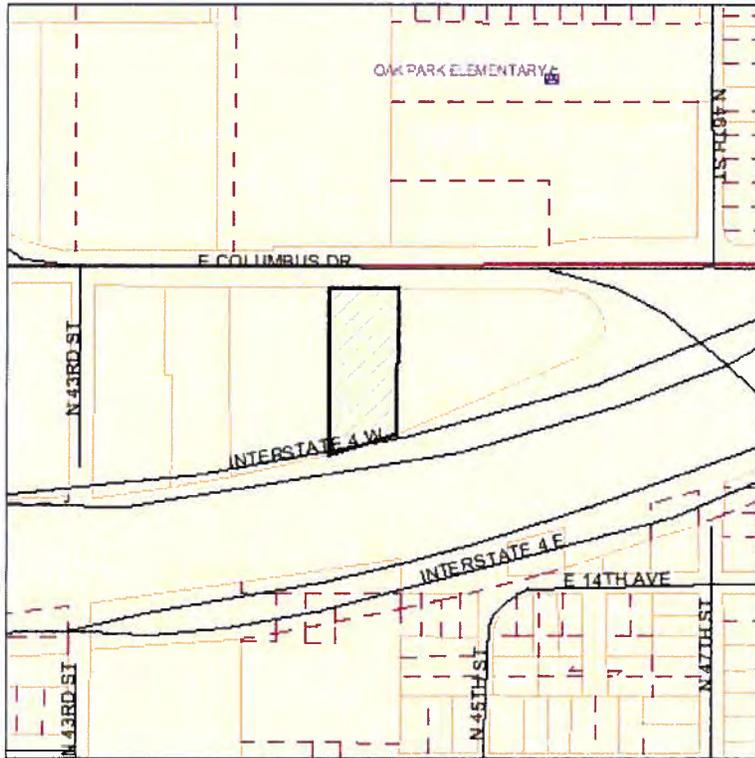
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HILLSBOROUGH COUNTY PROPERTY APPRAISER



[VIEW PROPERTY RECORD INFORMATION]



FOLIO: 1603900000
 PIN NUMBER: A-16-29-19-ZZZ-000005-80230.0
 OWNER 1: CMDL INVESTMENTS LLC
 ADDRESS: 4501 E COLUMBUS DR
 TAMPA
 LEGAL DESC: LYING N OF SR 400 AND S OF COLUMBUS DR
 DOR CODE: 4000

VALUE SUMMARY:

BUILDING VALUE:	\$0
EXTRA FEATURE VALUE:	\$0
LAND VALUE (MARKET):	\$45,000
LAND VALUE (AGRI.):	\$0
JUST (MARKET) VALUE:	\$45,000
ASSESSED VALUE (A10):	\$45,000
EXEMPT VALUE:	\$0
TAXABLE VALUE:	\$45,000

SALES INFORMATION **NEW!**

10/18/2004	\$800,000.00
3/1/1997	\$410,000.00
8/1/1984	\$1,100,000.00
8/1/1982	\$100,000.00

FOLIO: 1603900000 PIN: A-16-29-19-ZZZ-000005-80230.0 ACREAGE: 1.08 / SQFT: 47,058

Map created on 2/11/2013 1:56:29 PM.

0 154 ft

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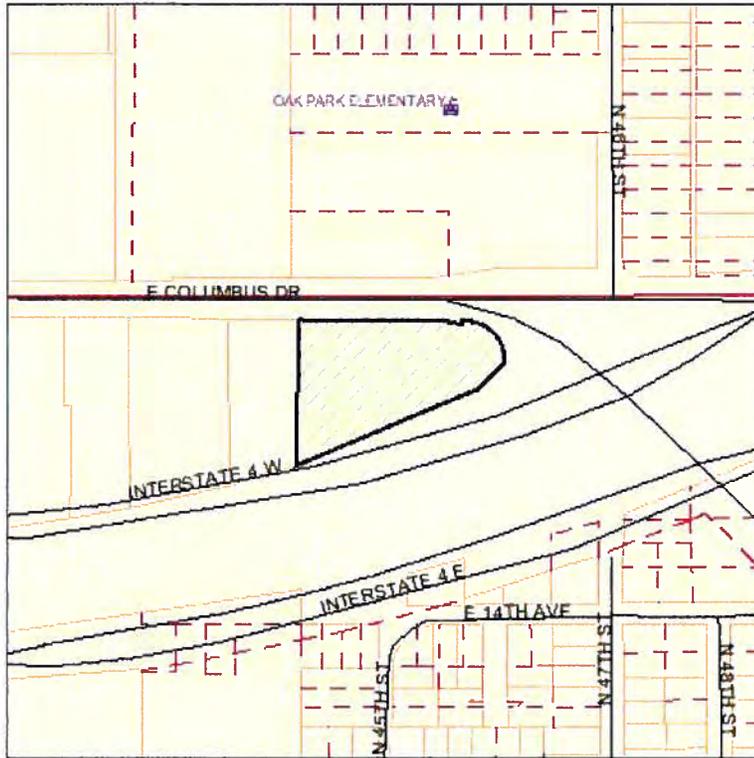
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Bob Henriquez
HILLSBOROUGH COUNTY PROPERTY APPRAISER



[VIEW PROPERTY RECORD INFORMATION]



FOLIO: 1603640000
 PIN NUMBER: A-16-29-19-ZZZ-000005-80100.0
 OWNER 1: CMDL INVESTMENTS LLC
 ADDRESS: 4501 E COLUMBUS DR
 TAMPA
 LEGAL DESC: 83.7 FT MOL TO BEG LESS RD R/W
 DOR CODE: 2502

VALUE SUMMARY:	
BUILDING VALUE:	\$150,454
EXTRA FEATURE VALUE:	\$15,097
LAND VALUE (MARKET):	\$150,031
LAND VALUE (AGRI.):	\$0
JUST (MARKET) VALUE:	\$315,582
ASSESSED VALUE (A10):	\$315,582
EXEMPT VALUE:	\$0
TAXABLE VALUE:	\$315,582

SALES INFORMATION		NEW!
10/18/2004	\$800,000.00	
3/1/1997	\$410,000.00	
8/1/1984	\$1,100,000.00	
8/1/1982	\$335,000.00	

FOLIO: 1603640000 PIN: A-16-29-19-ZZZ-000005-80100.0 ACREAGE: 2.04 / SQFT: 88,925

Map created on 2/11/2013 1:58:01 PM.

0 154 ft

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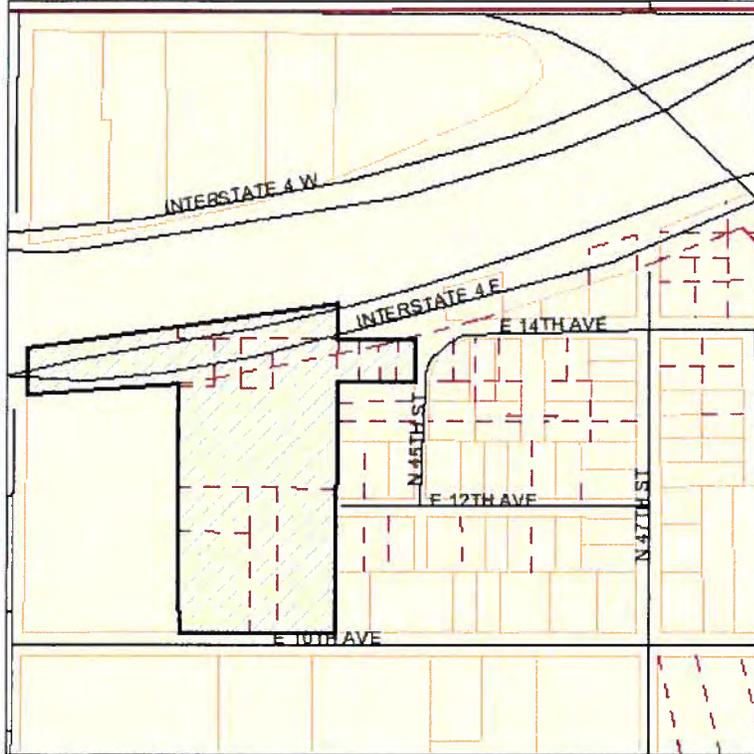
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HILLSBOROUGH COUNTY PROPERTY APPRAISER



[VIEW PROPERTY RECORD INFORMATION]



FOLIO: 1606750000
 PIN NUMBER: A-16-29-19-4D6-000000-00021.0
 OWNER 1: DEPT OF TRANSPORTATION

ADDRESS: 4405 E 14TH AV
 TAMPA

LEGAL DESC: OF NW 1/4 OF NE 1/4 LYING S OF ST RD 400
 DOR CODE: 8700

VALUE SUMMARY:

BUILDING VALUE:	\$0
EXTRA FEATURE VALUE:	\$0
LAND VALUE (MARKET):	\$185,400
LAND VALUE (AGRI.):	\$0
JUST (MARKET) VALUE:	\$185,400
ASSESSED VALUE (A10):	\$185,400
EXEMPT VALUE:	\$185,400
TAXABLE VALUE:	\$0

SALES INFORMATION

NEW!

12/12/2002	\$100.00
10/10/2002	\$100.00
8/27/2002	\$100.00
4/16/2002	\$100.00
6/28/2001	\$100.00
6/28/2001	\$100.00
6/28/2000	\$100.00
6/1/1997	\$50,000.00
6/1/1997	\$20,000.00
10/22/1996	\$100.00
10/1/1996	\$100.00
10/1/1996	\$100.00
10/1/1996	\$100.00
12/1/1994	\$21,000.00
12/1/1994	\$11,000.00
11/1/1990	\$100.00
8/1/1988	\$100.00
2/1/1987	\$25,000.00
7/1/1981	\$17,500.00
7/1/1977	\$1,700.00
1/1/1976	\$100.00
9/1/1967	\$100.00
8/1/1967	\$100.00
5/1/1967	\$100.00
4/1/1960	\$100.00

E-16

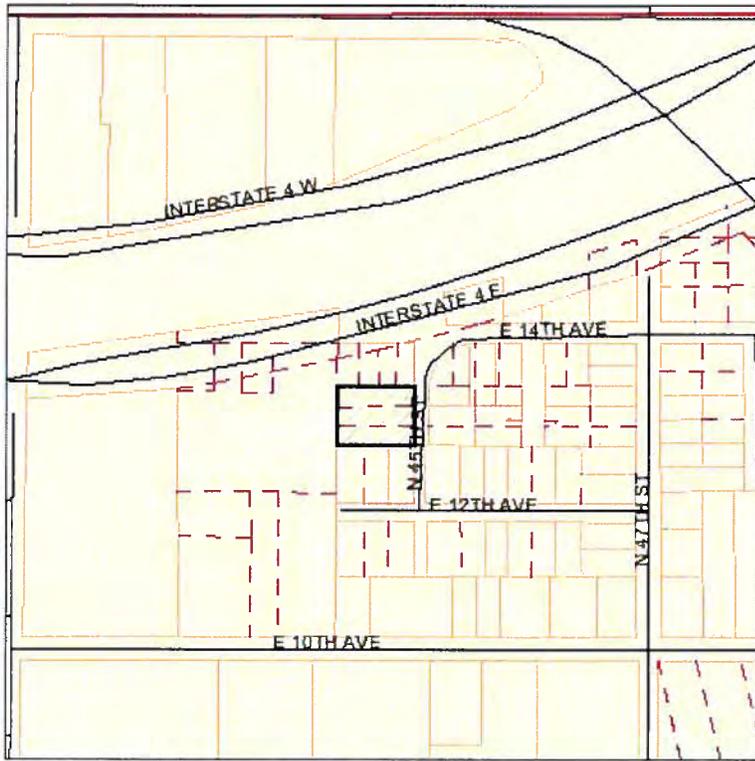
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[VIEW PROPERTY RECORD INFORMATION]



FOLIO: 1606770000
 PIN NUMBER: A-16-29-19-4D6-000000-00025.0
 OWNER 1: BAKER J L LIFE ESTATE
 MATTHEWS JANICE
 ADDRESS: 2308 N 45TH ST
 TAMPA
 LEGAL DESC: LOT 25 26 AND 27
 DOR CODE: 0100

VALUE SUMMARY:	
BUILDING VALUE:	\$17,554
EXTRA FEATURE VALUE:	\$7,291
LAND VALUE (MARKET):	\$9,686
LAND VALUE (AGRI.):	\$0
JUST (MARKET) VALUE:	\$34,531
ASSESSED VALUE (A10):	\$34,531
EXEMPT VALUE:	\$0
TAXABLE VALUE:	\$34,531

SALES INFORMATION	
2/7/2012	\$100.00

FOLIO: 1606770000 PIN: A-16-29-19-4D6-000000-00025.0 ACREAGE: 0.46 / SQFT: 19,942

Map created on 2/11/2013 2:12:55 PM.

0 154 ft

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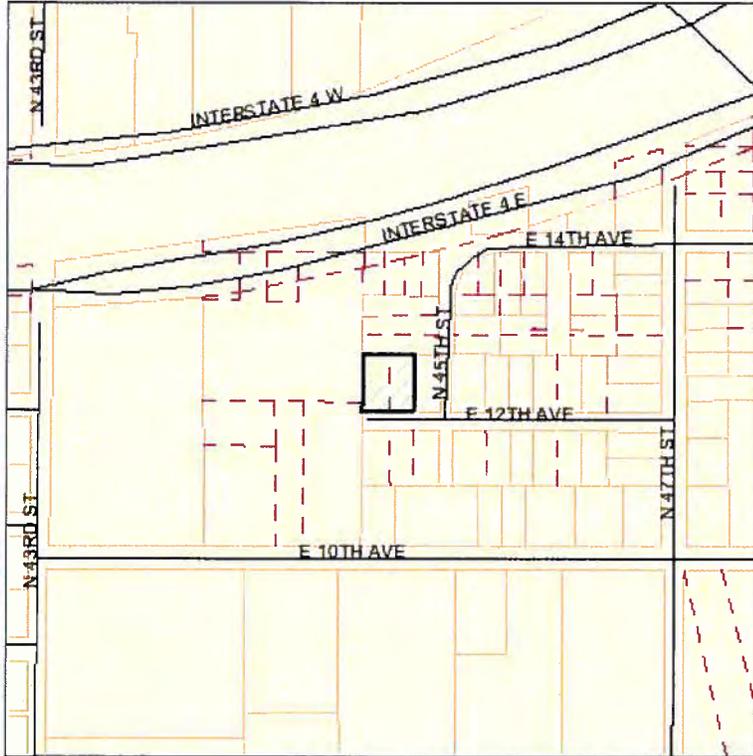
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[VIEW PROPERTY RECORD INFORMATION]



FOLIO: 1605820000
 PIN NUMBER: A-16-29-19-4D0-000004-00002.0
 OWNER 1: HARN ALTON E JR
 HARN CATHY J
 ADDRESS: 0
 TAMPA
 LEGAL DESC: LOTS 2 AND 3 BLOCK 4
 DOR CODE: 0000

VALUE SUMMARY:	
BUILDING VALUE:	\$0
EXTRA FEATURE VALUE:	\$0
LAND VALUE (MARKET):	\$7,920
LAND VALUE (AGRI.):	\$0
JUST (MARKET) VALUE:	\$7,920
ASSESSED VALUE (A10):	\$7,920
EXEMPT VALUE:	\$0
TAXABLE VALUE:	\$7,920

SALES INFORMATION		NEW!
11/1/1977	\$100.00	
4/1/1978	\$24,500.00	
2/1/1979	\$100.00	

FOLIO: 1605820000 PIN: A-16-29-19-4D0-000004-00002.0 ACREAGE: 0.30 / SQFT: 12,992

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0 154 ft

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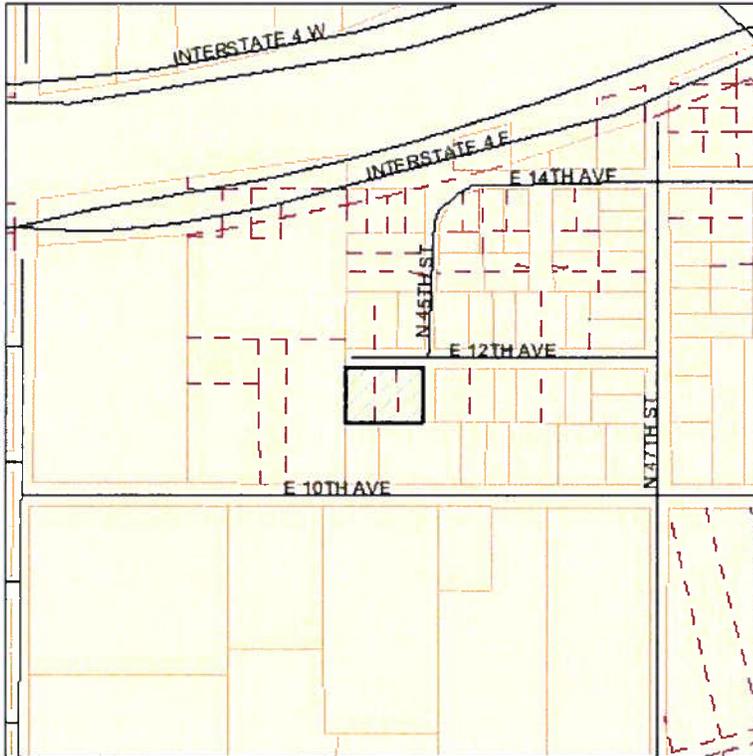
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[VIEW PROPERTY RECORD INFORMATION]



FOLIO: 1605800000
 PIN NUMBER: A-16-29-19-4D0-000003-00001.0
 OWNER 1: HARN ALTON E JR
 HARN CATHY J
 ADDRESS: 4405 E 12TH AV
 TAMPA
 LEGAL DESC: LOTS 1 2 AND 3 BLOCK 3
 DOR CODE: 0100

VALUE SUMMARY:	
BUILDING VALUE:	\$18,623
EXTRA FEATURE VALUE:	\$11,007
LAND VALUE (MARKET):	\$11,808
LAND VALUE (AGRI.):	\$0
JUST (MARKET) VALUE:	\$41,438
ASSESSED VALUE (A10):	\$40,548
EXEMPT VALUE:	\$25,000
TAXABLE VALUE:	\$15,548

SALES INFORMATION		NEW!
11/1/1977	\$100.00	
4/1/1978	\$24,500.00	
2/1/1979	\$100.00	

FOLIO: 1605800000 PIN: A-16-29-19-4D0-000003-00001.0 ACREAGE: 0.42 / SQFT: 18,410

Map created on 2/11/2013 2:14:59 PM.

0 154 ft

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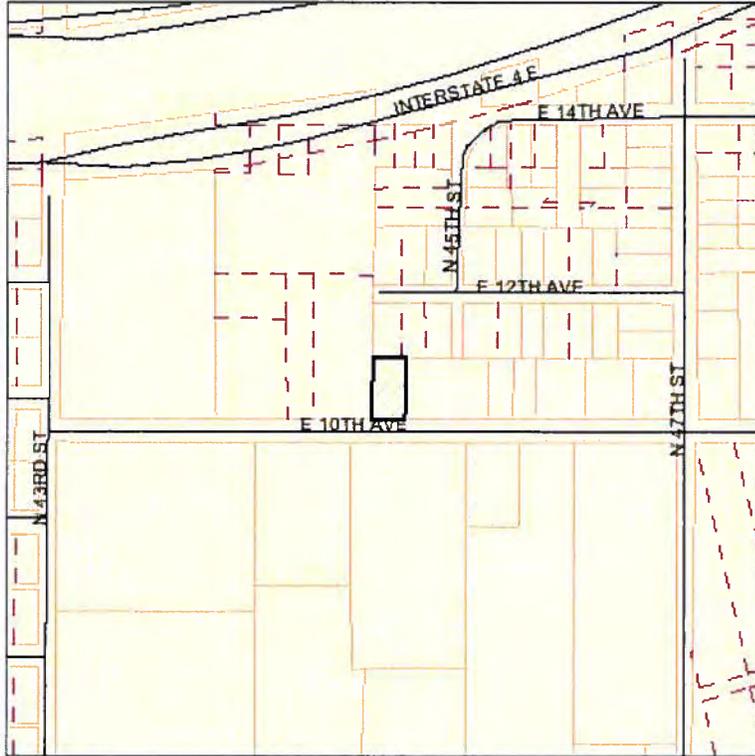
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HILLSBOROUGH COUNTY PROPERTY APPRAISER



[VIEW PROPERTY RECORD INFORMATION]



FOLIO: 1603980000
 PIN NUMBER: A-16-29-19-ZZZ-000005-80320.0
 OWNER 1: HARN ALTON E JR
 HARN CATHY J
 ADDRESS: 4404 10TH ST
 TAMPA
 LEGAL DESC: FT TO BEG
 DOR CODE: 9900

VALUE SUMMARY:	
BUILDING VALUE:	\$0
EXTRA FEATURE VALUE:	\$0
LAND VALUE (MARKET):	\$7,575
LAND VALUE (AGRI.):	\$0
JUST (MARKET) VALUE:	\$7,575
ASSESSED VALUE (A10):	\$7,575
EXEMPT VALUE:	\$0
TAXABLE VALUE:	\$7,575

SALES INFORMATION		NEW!
11/1/1977	\$100.00	
4/1/1978	\$24,500.00	
2/1/1979	\$100.00	

FOLIO: 1603980000 PIN: A-16-29-19-ZZZ-000005-80320.0 ACREAGE: 0.21 / SQFT: 8,932

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0 154 ft

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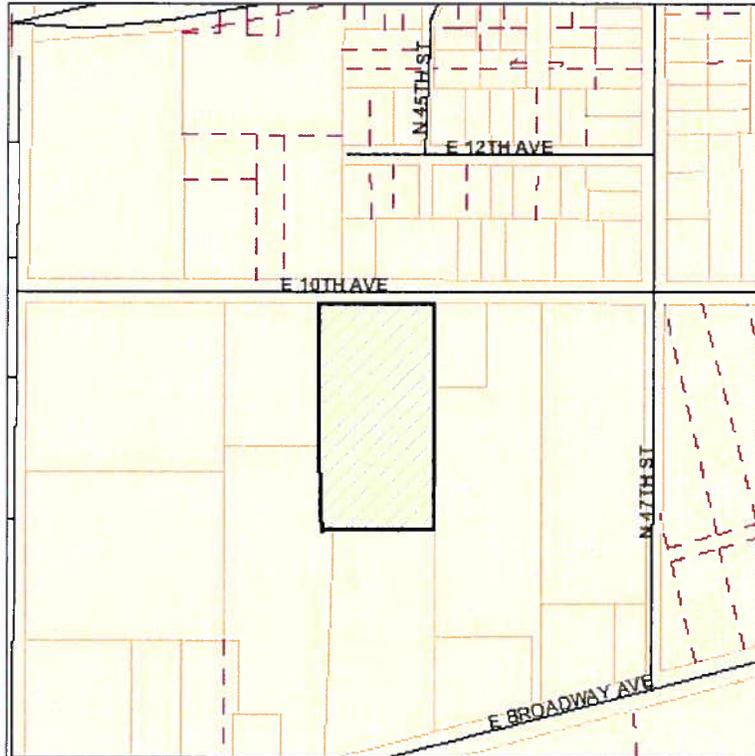
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HILLSBOROUGH COUNTY PROPERTY APPRAISER



[VIEW PROPERTY RECORD INFORMATION]



FOLIO: 1606850100
 PIN NUMBER: A-16-29-19-4D7-000000-00004.0
 OWNER 1: ADKINS CARL
 ADKINS KATHY
 ADDRESS: 4445 E 10TH AV
 TAMPA
 LEGAL DESC: 240 FT TO POB
 DOR CODE: 4820

VALUE SUMMARY:	
BUILDING VALUE:	\$277,434
EXTRA FEATURE VALUE:	\$22,995
LAND VALUE (MARKET):	\$204,607
LAND VALUE (AGRI.):	\$0
JUST (MARKET) VALUE:	\$414,800
ASSESSED VALUE (A10):	\$414,800
EXEMPT VALUE:	\$0
TAXABLE VALUE:	\$414,800

SALES INFORMATION		NEW!
7/2/2004	\$100.00	
10/1/2002	\$124,900.00	
5/23/2000	\$55,000.00	
7/1/1978	\$100.00	
7/1/1978	\$100.00	
11/19/2010	\$100.00	

FOLIO: 1606850100 PIN: A-16-29-19-4D7-000000-00004.0 ACREAGE: 2.63 / SQFT: 114,642

Map created on 2/11/2013 2:16:23 PM.

0 154 ft

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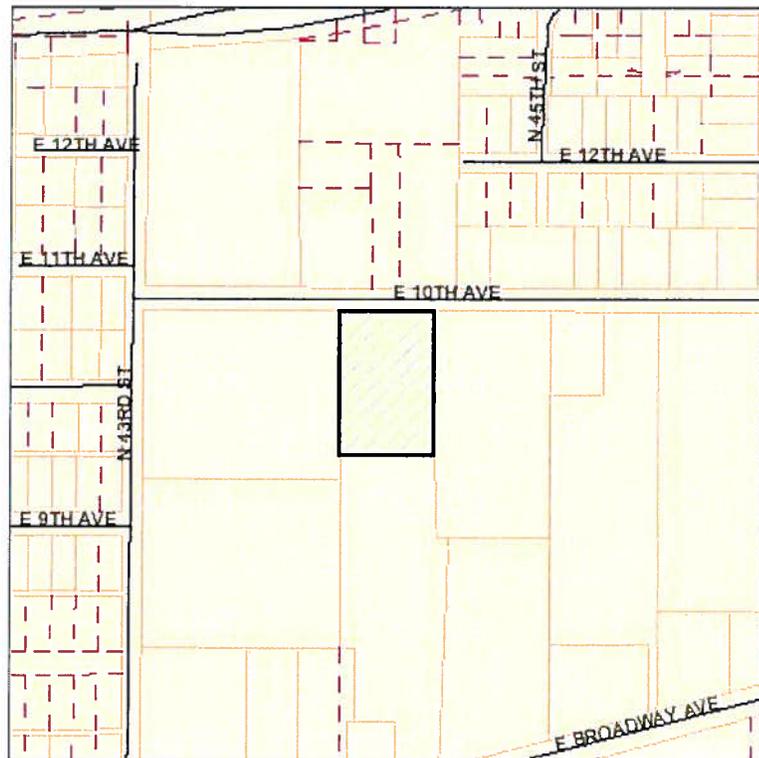
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Bob Henriquez
HILLSBOROUGH COUNTY PROPERTY APPRAISER



[VIEW PROPERTY RECORD INFORMATION]



FOLIO: 1606860100
 PIN NUMBER: A-16-29-19-4D7-000000-00004.2
 OWNER 1: TAMPA 10 PROPERTIES LLC
 ADDRESS: 4401 E 10TH AV
 TAMPA
 LEGAL DESC: W 197 FT OF N 300 FT OF LOT 4
 DOR CODE: 4820

VALUE SUMMARY:

BUILDING VALUE:	\$59,890
EXTRA FEATURE VALUE:	\$8,844
LAND VALUE (MARKET):	\$117,467
LAND VALUE (AGRI.):	\$0
JUST (MARKET) VALUE:	\$186,201
ASSESSED VALUE (A10):	\$186,201
EXEMPT VALUE:	\$0
TAXABLE VALUE:	\$186,201

SALES INFORMATION **NEW!**

12/19/2002	\$135,000.00
1/1/1999	\$109,100.00
6/1/1996	\$100,000.00
11/1/1995	\$100.00
7/26/2006	\$100.00
1/6/2009	\$145,000.00

FOLIO: 1606860100 PIN: A-16-29-19-4D7-000000-00004.2 ACREAGE: 1.36 / SQFT: 59.062

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0 154 ft

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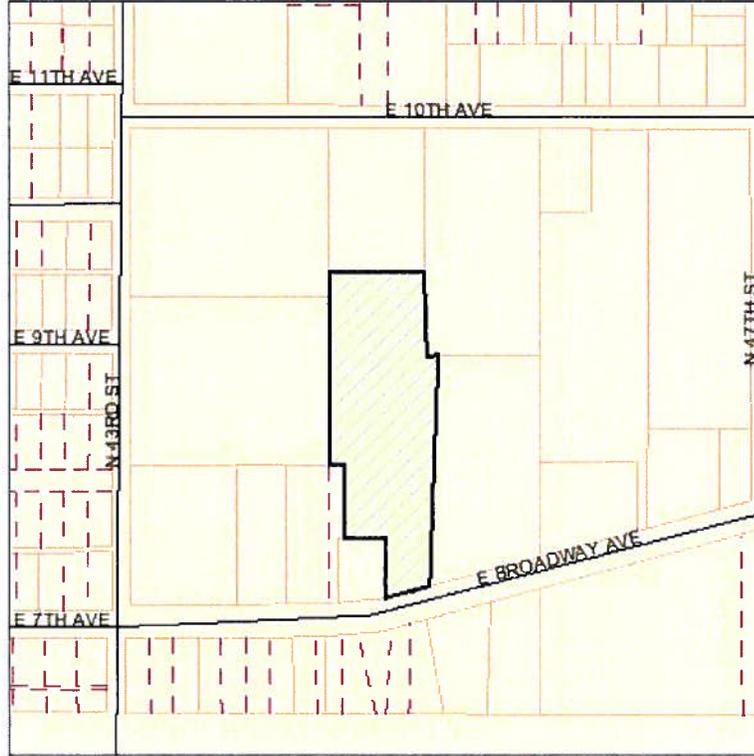
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[VIEW PROPERTY RECORD INFORMATION]



FOLIO: 1606860000
 PIN NUMBER: A-16-29-19-4D7-000000-00004.1
 OWNER 1: MABCO HOLDINGS INC
 ADDRESS: 4444 E BROADWAY AV
 TAMPA
 LEGAL DESC: POB LESS W 197 FT OF N 300 FT OF SD LOT 4
 DOR CODE: 1227

VALUE SUMMARY:	
BUILDING VALUE:	\$1,390
EXTRA FEATURE VALUE:	\$6,000
LAND VALUE (MARKET):	\$317,302
LAND VALUE (AGRI.):	\$0
JUST (MARKET) VALUE:	\$324,692
ASSESSED VALUE (A10):	\$324,692
EXEMPT VALUE:	\$0
TAXABLE VALUE:	\$324,692

SALES INFORMATION		NEW!
3/20/2001	\$100.00	
7/1/1999	\$230,000.00	
7/1/1978	\$100.00	
7/1/1978	\$100.00	
5/22/2006	\$450,000.00	
8/26/2011	\$325,000.00	

FOLIO: 1606860000 PIN: A-16-29-19-4D7-000000-00004.1 ACREAGE: 2.88 / SQFT: 125,438

Map created on 2/11/2013 2:18:45 PM.

0 154 ft

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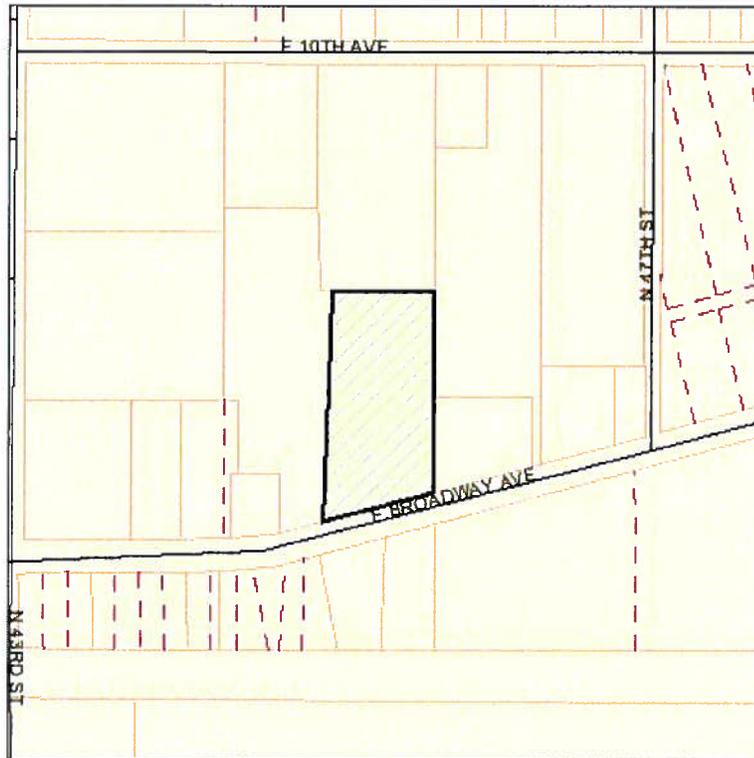
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Bob Henriquez
HILLSBOROUGH COUNTY PROPERTY APPRAISER



[VIEW PROPERTY RECORD INFORMATION]



FOLIO: 1606860250
 PIN NUMBER: A-16-29-19-4D7-000000-00004.3
 OWNER 1: A-1 BEVERAGE SERVICE INC
 ADDRESS: 4446 E BROADWAY AV
 TAMPA
 LEGAL DESC: TO 240.69 FT TO POB
 DOR CODE: 4900

VALUE SUMMARY:	
BUILDING VALUE:	\$22,257
EXTRA FEATURE VALUE:	\$12,728
LAND VALUE (MARKET):	\$228,938
LAND VALUE (AGRI.):	\$0
JUST (MARKET) VALUE:	\$263,923
ASSESSED VALUE (A10):	\$263,923
EXEMPT VALUE:	\$0
TAXABLE VALUE:	\$263,923

SALES INFORMATION		NEW!
3/1/1983	\$100.00	
1/1/1991	\$220,000.00	
7/1/1996	\$131,000.00	

FOLIO: 1606860250 PIN: A-16-29-19-4D7-000000-00004.3 ACREAGE: 2.29 / SQFT: 99,792

Map created on 2/11/2013 2:19:25 PM.

0 154 ft

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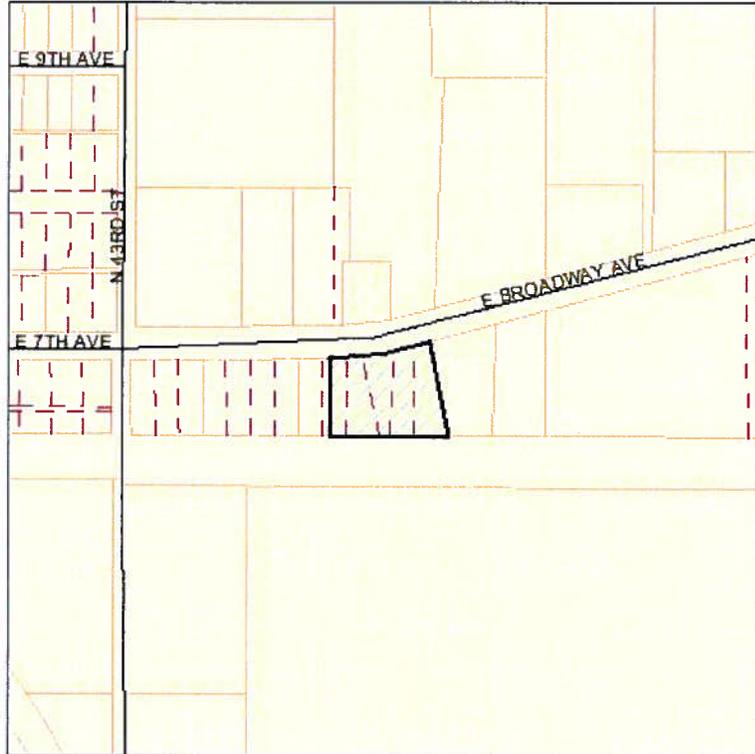
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Bob Henriquez
HILLSBOROUGH COUNTY PROPERTY APPRAISER



[VIEW PROPERTY RECORD INFORMATION]



FOLIO: 1607270000
 PIN NUMBER: A-16-29-19-4D8-000000-00011.0
 OWNER 1: SOLID NORTH LLC
 ADDRESS: 4319 E 7TH AV
 TAMPA
 LEGAL DESC: E 25 FT OF LOT 9 AND ALL OF LOTS 10 THRU 13
 DOR CODE: 1830

VALUE SUMMARY:	
BUILDING VALUE:	\$236,394
EXTRA FEATURE VALUE:	\$26,433
LAND VALUE (MARKET):	\$113,882
LAND VALUE (AGRI.):	\$0
JUST (MARKET) VALUE:	\$373,700
ASSESSED VALUE (A10):	\$373,700
EXEMPT VALUE:	\$0
TAXABLE VALUE:	\$373,700

SALES INFORMATION	NEW!
6/21/2004	\$750,000.00
3/31/2000	\$188,400.00
4/8/2009	\$552,300.00
12/14/2011	\$100.00
12/14/2011	\$170,000.00
12/28/2012	\$400,000.00

FOLIO: 1607270000 PIN: A-16-29-19-4D8-000000-00011.0 ACREAGE: 0.94 / SQFT: 40,762

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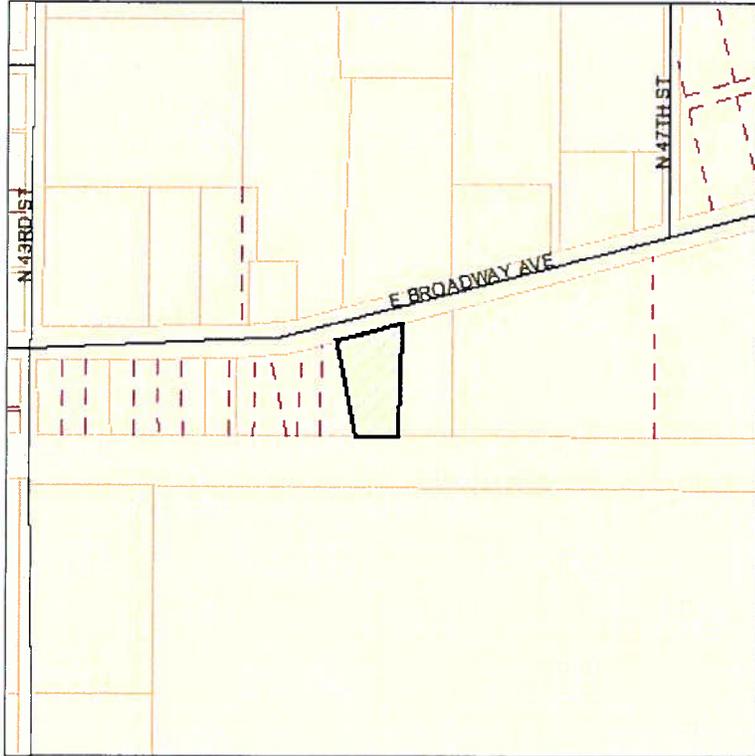
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Bob Henriquez
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[VIEW PROPERTY RECORD INFORMATION]



FOLIO: 1606960000
 PIN NUMBER: A-16-29-19-4D7-000000-00007.1
 OWNER 1: C & S INDUSTRIES
 ADDRESS: 4401 E BROADWAY AV
 TAMPA
 LEGAL DESC: 38 MIN E ALONG WLY BDRY OF LOT 7, 225.4 FT TO BEG
 DOR CODE: 4830

VALUE SUMMARY:	
BUILDING VALUE:	\$195,499
EXTRA FEATURE VALUE:	\$6,274
LAND VALUE (MARKET):	\$72,600
LAND VALUE (AGRI.):	\$0
JUST (MARKET) VALUE:	\$243,300
ASSESSED VALUE (A10):	\$243,300
EXEMPT VALUE:	\$0
TAXABLE VALUE:	\$243,300

SALES INFORMATION		NEW!
1/1/1975	\$10,000.00	
10/1/1984	\$110,000.00	
12/1/1991	\$100.00	
9/23/2005	\$615,000.00	
9/27/2010	\$100.00	
12/12/2010	\$397,000.00	

FOLIO: 1606960000 PIN: A-16-29-19-4D7-000000-00007.1 ACREAGE: 0.57 / SQFT: 24,636

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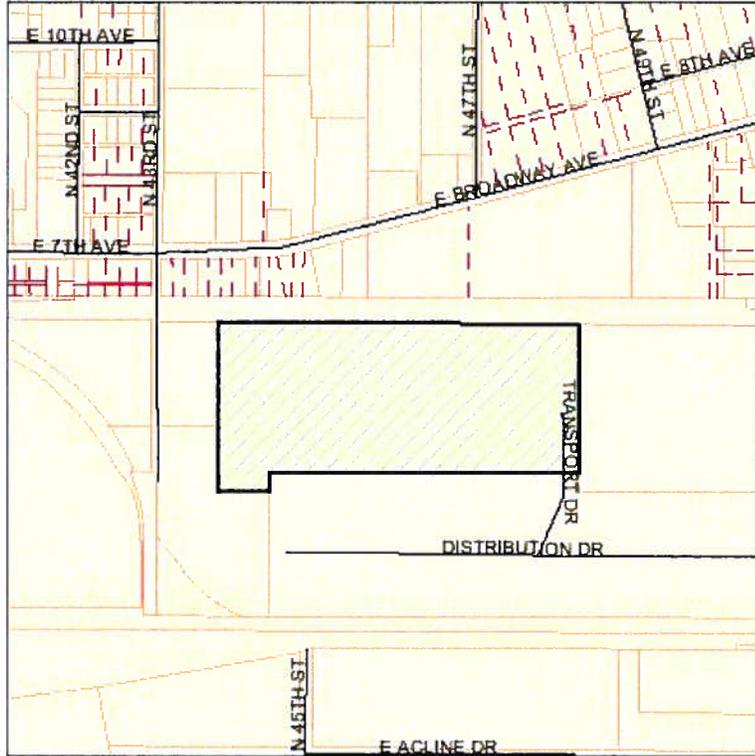
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Bob Henriquez
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[VIEW PROPERTY RECORD INFORMATION]



FOLIO: 1604730000
 PIN NUMBER: A-16-29-19-ZZZ-000005-80750.0
 OWNER 1: METROPOLITAN LIFE INS
 ADDRESS: 4528 TRANSPORT DR
 TAMPA
 LEGAL DESC: TO BEG
 DOR CODE: 4830

VALUE SUMMARY:	
BUILDING VALUE:	\$10,196,773
EXTRA FEATURE VALUE:	\$189,974
LAND VALUE (MARKET):	\$803,381
LAND VALUE (AGRI.):	\$0
JUST (MARKET) VALUE:	\$10,560,000
ASSESSED VALUE (A10):	\$10,560,000
EXEMPT VALUE:	\$0
TAXABLE VALUE:	\$10,560,000

SALES INFORMATION		NEW!
1/1/1978	\$4,107,700.00	
12/1/1978	\$4,607,000.00	
5/1/1985	\$7,200,000.00	

FOLIO: 1604730000 PIN: A-16-29-19-ZZZ-000005-80750.0 ACREAGE: 22.06 / SQFT: 960,941

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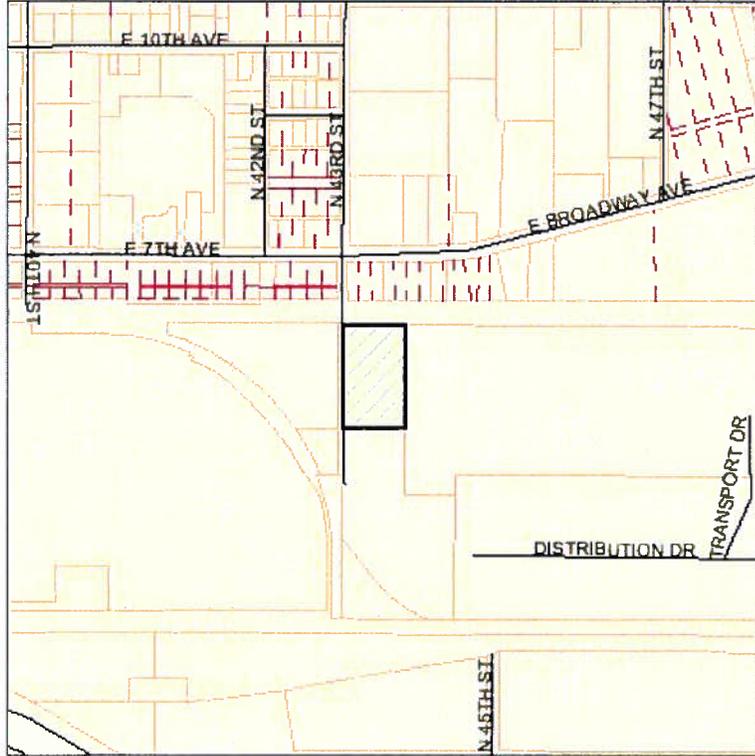
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[VIEW PROPERTY RECORD INFORMATION]



FOLIO: 1604270000
 PIN NUMBER: A-16-29-19-ZZZ-000005-80520.0
 OWNER 1: 1607 PROPERTY INC
 ADDRESS: 1607 N 43RD ST
 TAMPA
 LEGAL DESC: BEG
 DOR CODE: 4830

VALUE SUMMARY:	
BUILDING VALUE:	\$135,798
EXTRA FEATURE VALUE:	\$51,428
LAND VALUE (MARKET):	\$210,560
LAND VALUE (AGRI.):	\$0
JUST (MARKET) VALUE:	\$397,786
ASSESSED VALUE (A10):	\$397,786
EXEMPT VALUE:	\$0
TAXABLE VALUE:	\$397,786

SALES INFORMATION		NEW!
11/10/2004	\$100.00	
8/31/2000	\$99,091.00	

FOLIO: 1604270000 PIN: A-16-29-19-ZZZ-000005-80520.0 ACREAGE: 2.61 / SQFT: 113,502

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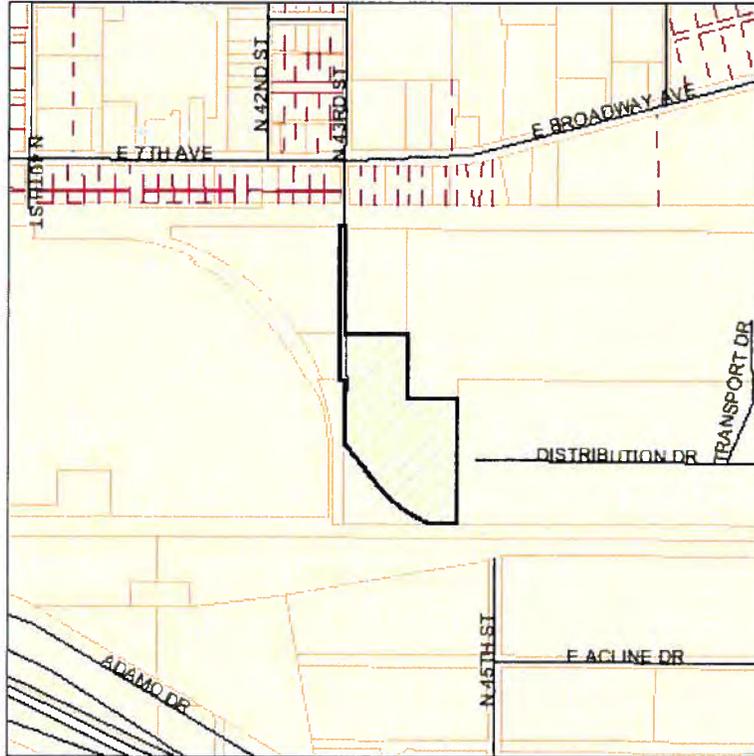
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[VIEW PROPERTY RECORD INFORMATION]



FOLIO: 1604280000
 PIN NUMBER: A-16-29-19-ZZZ-000005-80530.0
 OWNER 1: SNEAD PAMELA J
 ADDRESS: 1601 N 43RD ST
 TAMPA
 LEGAL DESC: LESS RR R/W & LESS THE S 600 FT THEREOF
 DOR CODE: 4104

VALUE SUMMARY:	
BUILDING VALUE:	\$184,235
EXTRA FEATURE VALUE:	\$25,099
LAND VALUE (MARKET):	\$290,742
LAND VALUE (AGRI.):	\$0
JUST (MARKET) VALUE:	\$500,076
ASSESSED VALUE (A10):	\$500,076
EXEMPT VALUE:	\$0
TAXABLE VALUE:	\$500,076

SALES INFORMATION		NEW!
3/5/2004	\$550,000.00	
12/1/1986	\$300,000.00	
9/1/1983	\$600,000.00	
5/11/2012	\$100.00	

FOLIO: 1604280000 PIN: A-16-29-19-ZZZ-000005-80530.0 ACREAGE 6.45 / SQFT: 280,856

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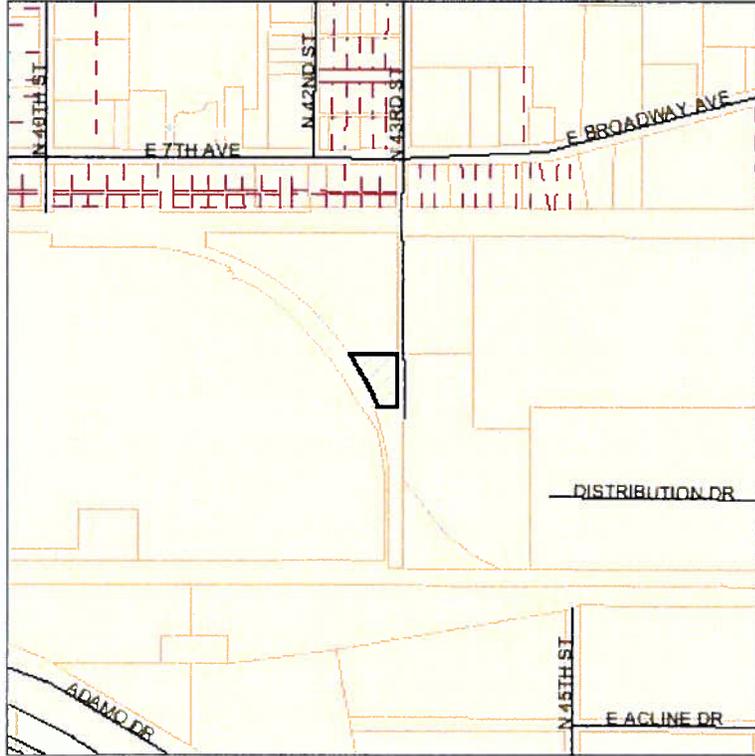
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Bob Henriquez
HILLSBOROUGH COUNTY PROPERTY APPRAISER



[VIEW PROPERTY RECORD INFORMATION]



FOLIO: 1604060000
 PIN NUMBER: A-16-29-19-ZZZ-000005-80390.0
 OWNER 1: SNEAD PAMELA J
 ADDRESS: 1600 N 43RD ST
 TAMPA
 LEGAL DESC: LESS RR R/W'S AND LESS E 20 FT
 DOR CODE: 4000

VALUE SUMMARY:

BUILDING VALUE:	\$0
EXTRA FEATURE VALUE:	\$0
LAND VALUE (MARKET):	\$58,370
LAND VALUE (AGRI.):	\$0
JUST (MARKET) VALUE:	\$58,370
ASSESSED VALUE (A10):	\$58,370
EXEMPT VALUE:	\$0
TAXABLE VALUE:	\$58,370

SALES INFORMATION **NEW!**

3/5/2004	\$550,000.00
12/1/1986	\$300,000.00
9/1/1983	\$600,000.00
1/1/1900	\$0.00
5/11/2012	\$100.00

FOLIO: 1604060000 PIN: A-16-29-19-ZZZ-000005-80390.0 ACREAGE: 0.54 / SQFT: 23,618

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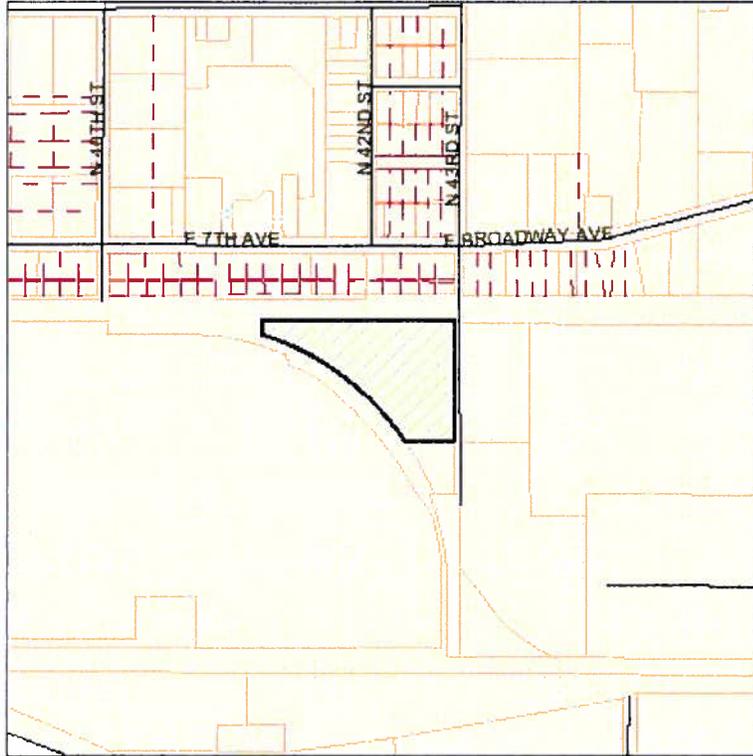
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Bob Henriquez
HILLSBOROUGH COUNTY PROPERTY APPRAISER



[VIEW PROPERTY RECORD INFORMATION]



FOLIO: 1604060100
 PIN NUMBER: A-16-29-19-ZZZ-000005-80400.0
 OWNER 1: JVS CONTRACTING INC
 ADDRESS: 1602 N 43RD ST
 TAMPA
 LEGAL DESC: S 454.95 FT TO BEG LESS E 20 FT
 DOR CODE: 4840

VALUE SUMMARY:	
BUILDING VALUE:	\$38,246
EXTRA FEATURE VALUE:	\$13,134
LAND VALUE (MARKET):	\$349,380
LAND VALUE (AGRI.):	\$0
JUST (MARKET) VALUE:	\$400,760
ASSESSED VALUE (A10):	\$400,760
EXEMPT VALUE:	\$0
TAXABLE VALUE:	\$400,760

SALES INFORMATION		NEW!
9/13/1999	\$100.00	
9/13/1999	\$100.00	
9/13/1999	\$100.00	
11/1/1980	\$250,000.00	
5/11/2006	\$500,000.00	

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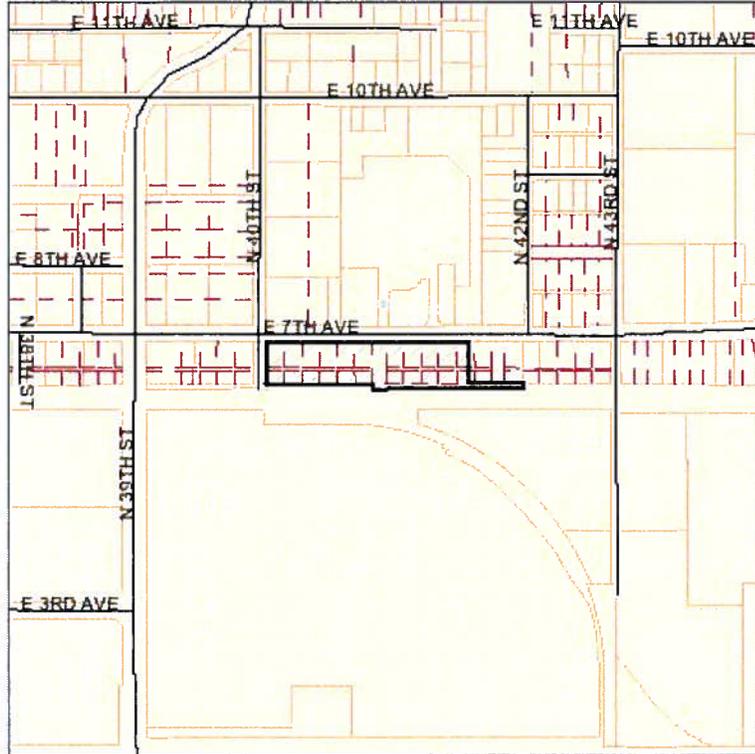
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Bob Henriquez
HILLSBOROUGH COUNTY PROPERTY APPRAISER



[VIEW PROPERTY RECORD INFORMATION]



FOLIO: 1607950000
 PIN NUMBER: A-16-29-19-4OB-000015-00001.0
 OWNER 1: GAC TAMPA INC
 ADDRESS: 4001 E 7TH AV
 TAMPA
 LEGAL DESC: AND S TO RR RT OF WAY BLOCK 14
 DOR CODE: 4103

VALUE SUMMARY:

BUILDING VALUE:	\$686,417
EXTRA FEATURE VALUE:	\$44,310
LAND VALUE (MARKET):	\$315,037
LAND VALUE (AGRI.):	\$0
JUST (MARKET) VALUE:	\$1,045,764
ASSESSED VALUE (A10):	\$1,045,764
EXEMPT VALUE:	\$0
TAXABLE VALUE:	\$1,045,764

SALES INFORMATION **NEW!**

5/1/1993	\$100.00
12/1/1985	\$22,200.00

FOLIO: 1607950000 PIN: A-16-29-19-4OB-000015-00001.0 ACREAGE: 2.92 / SQFT: 126,997

Map created on 2/25/2013 8:40:34 AM.

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Appendix F

Utilities Information

Preliminary Utilities Information for Proposed Improvements to 43rd Street Outfall Basin

General Location	Type	Exact Location	Size	Potential Impact to Design
19th Ave.	Gravity Sanitary Sewer	Northern lane crossing to the south to connect to system on Columbus	Unknown	Low
Columbus Ave.	Gravity Sanitary Sewer	Northern lane (east bound)	Unknown	Low
Columbus Ave.	Water Main	South side, just inside R/W. Cross drain located about 200' west of proposed Columbus crossing	12"	High
Columbus Ave.	Gas	South side, 12' north of R/W line. Crosses Columbus about 340' west of proposed Columbus crossing	3"	Low
Columbus Ave.	Telecommunications (AT&T BFO)	Near R/W on south side	N/A	Low
Columbus Ave.	Telecommunications	North side, 6-8 feet off pavement	N/A	Low
7th Ave.	Gravity Sanitary Sewer	Northern lane	Unknown	High
7th Ave.	Power/Light Poles	Both sides near R/w	N/A	High
7th Ave.	Water	18' off south R/W	12"	High
7th Ave.	Sanitary Force Main	Westbound lane line	42"	High
7th Ave.	Gas	North lane	3"	Low
40th St. (north of 39th intersection)	Telecommunications (Bell System)	Btwn. Right two lanes (north bound)	N/A	Medium
40st St. (north of 39th intersection)	Power/Light Poles	Near R/W on east side and in utility strip on west side	N/A	Medium
40th St. (north of 39th intersection)	Gas	East side, near R/W	2"	Low
40th St. (north of 39th intersection)	Water	West side, crossing at Columbus	16"	High
40th St. (south of 39th intersection)	Power/Light Poles	East side, near R/W	N/A	Medium
40th St. (south of 39th intersection)	Gravity Sanitary Sewer	West lane	Unknown	Medium
40th St. (south of 39th intersection)	Telecomm Pedestal	SE corner of 40th and 10th (direction unknown)	N/A	Low
40th St. (south of 39th intersection)	Water	13' off west R/W, crossing at 10th Ave.	16"	High

Appendix G

Meeting Minutes

**43RD STREET OUTFALL
Kick Off Meeting**

**MEETING MINUTES
JULY 31, 2012**

Attendees:

Artie Cintron – HART, cintrona@gohart.org
Randy Stribling – HART, striblingr@gohart.org
Alex Awad – City of Tampa, DPW, alexander.awad@tampagov.net
Al Hoel – City of Tampa, Stormwater, alhoel@tampa.net
Scott Letasi – SWFWMD, scott.letasi@watermatters.org
Robin Baily – SWFWMD, robin.bailey@watermatter.org
Scott Garth – DRMP, sgarth@drmp.com
John Minton – DRMP, jminton@drmp.com

I. Co-op Funding

- Applications due October 17th
- First co-op funding meeting is August 17th
- Money would be available in October 2013 (FY 14)
- We could do co-op funding for design cost only – future funding for construction cost

II. HART Survey – NAVD 88 by Charlotte Survey

- Some preoperty to the South was bermed off by a private property owner.
- Scott Garth to request survey be done in 1988

III. Models

- Any adjacent models available for boundary conditions
- No need to model anything under 24”
- Scott Letasi – check city GIS inventory
 - 24” pipes and above
- Interconnectivity at Acline – Mike Miller
- DRMP to look for Government owned lands

IV. Flooding

- Did not Occur during Tropical Storm Debbie (June 24-25, 2012).
- Storm has to be a shorter duration
- Scott Garth to contact Megan at FDOT for complaints.
 - Wait until after existing conditions for FDOT meeting
- Robin Bailey can provide SWFWMD complaint database

V. Funding

- Funding is 75% city; 25% HART

CC: Attendees
File

**43RD STREET OUTFALL
Progress Meeting**

**MEETING MINUTES
NOVEMBER 16, 2012**

Attendees:

Alex Awad – City of Tampa, DPW
John Early – City of Tampa
Scott Garth – DRMP
Ken Kniel - DRMP

- I.** SWFWMD application was for FY 14 (July is the beginning of FY 14), so time is OK
- II.** In August 2013, city will need to apply for FY 15 grants
- III.** City is OK with SCS method (CN) and FDOT rainfall distributions if SWFWMD is.
- IV.** Identify properties needed and viable properties
- V.** Invite Robin Bailey and Scott Letasi
- VI.** Ask Dallas if any water/sewer GIS
- VII.** Contact Yvette Bowman or Mike Miller if we want to use city actual unit cost, but using FDOT historical unit cost is OK
 - Use property appraised value for property cost
- VIII.** Contact Jimmy Cook or Barbara Lynch on CDC on North Boulevard
 - Give them H-15 (Atlas Page) and they can research easements for us.

CC: Attendees
File

43RD STREET OUTFALL STUDY
Project ST510C
Final BODR Meeting
City of Tampa Office – 6th Floor Conference Room

MEETING MINUTES
MARCH 1, 2013

Attendees:

Alex Awad, City of Tampa
John Early, City of Tampa
Randy Stribling, HART
Lynda Crescentini, HART
Scott Garth, DRMP
John Minton, DRMP
Ken Kniel, DRMP

The final BODR meeting was held at the City of Tampa Office to discuss the 43rd Street Outfall Study. Below is a summary of the items discussed.

- John Minton went over alternatives.
 - Alternative 1: Conveyance upgrades
 - Alternative 2: 5 acre site 4-sale \$1.8M (Alex)
 - 3.3 acre site vacant \$0.50M – active hotel willing to sell
 - Alternative 3: By-Pass
 - New Outfall down 40th Street
 - Minimal Upgrades to existing channel
- Question 1: Is South pond a viable option (i.e. is it a wetland)?
Answer: Some wetlands associated with ditching.
- Question 2: Alex asked if we could consider using all three parcels up North.
 - Lynda asked if we could check with FDOT for any surplus parcels for I-4 (Bill Scott – FDOT).
- \$1.5M FY 2014 for property acquisition...\$50K each to design (\$100K)
- Geotech will be needed for ponds and contamination potential
- Lynda – Agreed to initiate meeting with FDOT
 - Scott to determine FDOT PM for 39th Street RRR for Lynda
- Application due date for FY 2015 would be October 2014

DRMP, INC.

Principals
Wayne D. Chalifoux
Donaldson K. Barton, Jr.
Lucius J. Cushman, Jr.
Jon S. Meadows
Lawrence L. Smith, Jr.
William T. Stone



- Alex requested that DRMP do another analysis to use the 7.1 acre (South side of Columbus Drive) + 5 acre (North side of Columbus Drive) to reduce size of box culvert down 40th Street to pipe.
 - Could the 30" pipe under CSX remain as is?

ACTION ITEMS:

1. DRMP (Scott Garth) to determine FDOT PM for 39th Street RRR
2. DRMP (Scott Garth) to contact Bill Scott at FDOT for any surplus R/W
3. HART (Lynda Crescentini) to set up FDOT meeting

cc: File
Attendees

Appendix H

Alternative 4

Development of Fourth Alternative

The City has reviewed the draft of the report and conducted preliminary research on potential pond sites considered in the study. With the availability of properties in the study area, the City requested for DRMP to consider an additional alternative that relies more heavily on property acquisition in the vicinity of the flooding problem area along Columbus Drive. The addition of this fourth alternative is included in the final report as Appendix H. This fourth alternative is intended to resemble Alternative 3 with a diversion system along 40th Street, that is reduced in size from a box culvert to a pipe. The reduced size of the diversion system is beneficial considering close proximity to utilities and bore/jack requirements under the railroad tracks.

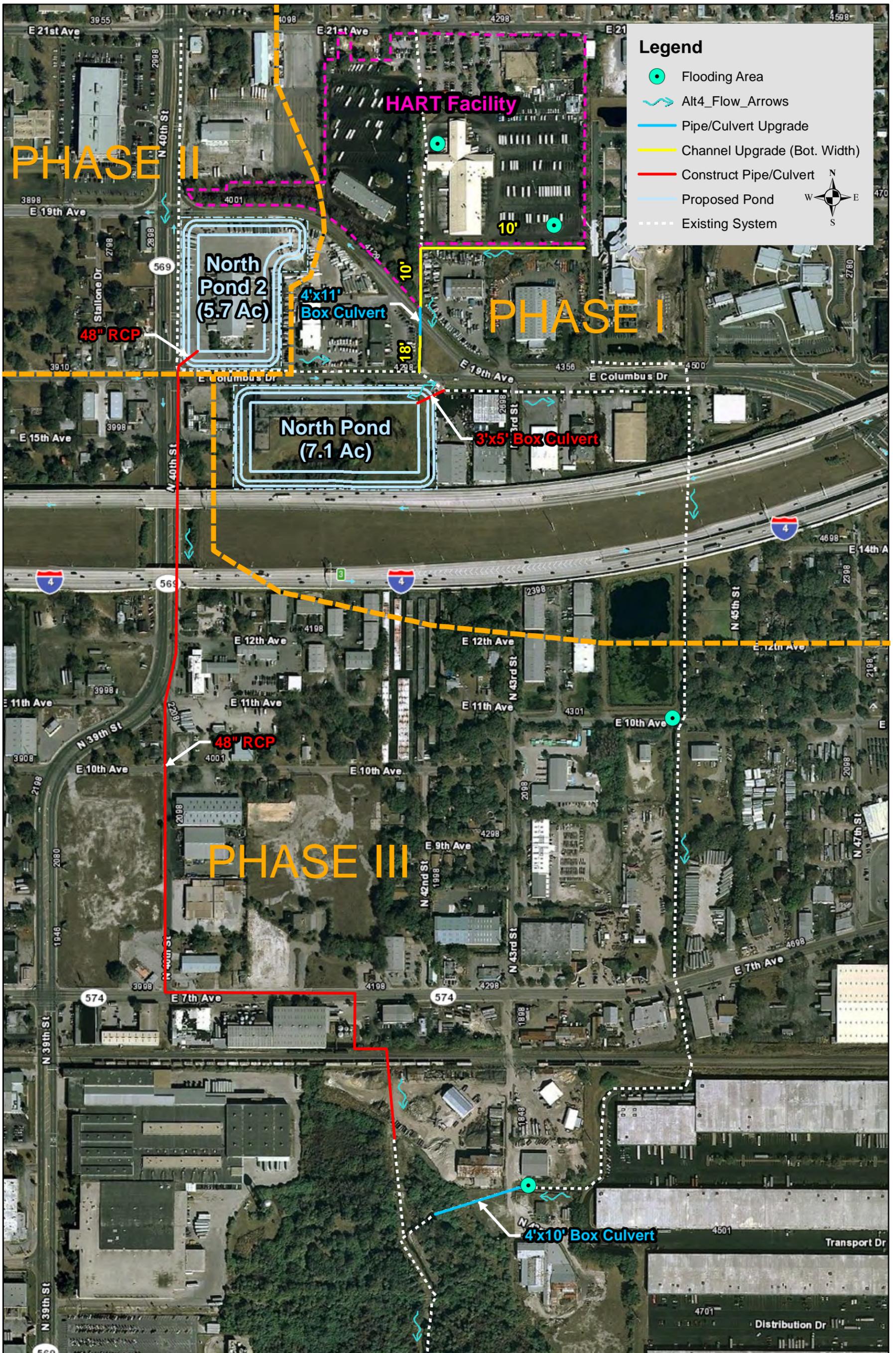
Alternative 4: Diversion System with two (2) North Ponds

- Diversion system along 40th Street with **48-inch pipe**, distance of 3,900 linear feet.
- Acquisition of additional **0.4 acres** (affecting 4 properties) of right-of-way or easements for culvert work.
- Culvert crossing upgrades with single box culverts/pipes at **two (2)** roadway crossings and **one (1)** railroad crossing.
- Construction of two stormwater ponds on either side of Columbus Drive sized at **7.1 acres** and **5.7 acres** that will provide flood storage, attenuation, and stormwater treatment (two North Ponds).

Alternative 4 differs from Alternative 3 in that the diversion system size has been substantially reduced in size from a 4' x 6' box culvert to a 48-inch pipe, and stormwater attenuation is sufficient in the two (2) north ponds to eliminate the need for the south pond. Characteristics of the preliminary design for the additional north pond are described below with the primary design function in the heading (elevations in ft, NAVD88).

North Pond (5.7 Ac) – stormwater attenuation/flood storage

- On-line Wet Detention
- Property acreage = 5.7 acres (North side of Columbus Drive)
- Berm Elevation = 29.0
- Control Elevation = 25.0
- Bottom Elevation = 16.5 (max. depth of 8.5 feet)
- Permanent Pool Volume = 28.2 ac-ft



As indicated in the table of peak stages below, Alternative 4 provides similar levels of flood protection as Alternative 3 at the critical areas of the study.

Table H-1 – Peak Stages at Select Nodes in Focus Area for Proposed Conditions

Junction Name	Location	Peak Stage (ft, NAVD)					Critical Elevation
		5-Year, 8-Hour					
		Existing	Alt. 1	Alt. 2	Alt. 3	Alt. 4	
HART Facility							
NA0655	Southeast corner of HART facility	28.32	26.85	26.88	26.89	26.80	26.9 low pavement elevation in parking area
NA0605	HART facility outfall ditch, north side of 19th Avenue crossing	28.44	26.82	26.84	26.84	26.79	27.8 low edge of pavement
43rd Street Outfall Ditch							
NA0210	Upstream side of I-4 crossing	27.86	25.92	26.03	26.21	26.20	28.0 top of ditch bank
NA0215	Downstream side of I-4 crossing	27.61	24.81	25.70	26.12	26.10	28.0 top of ditch bank
NA1005	Upstream side of 10th Avenue crossing	27.52	24.38	25.39	26.05	26.03	26.0 low edge of pavement
NA0230	Upstream side of 7th Avenue crossing	25.93	21.78	23.13	25.61	25.56	30.1 top of ditch bank
NA0240	Upstream side of railroad crossings	25.02	19.39	20.86	24.56	24.50	29.1 low point of rail bed
NA0255	Upstream side of 43rd Street crossing	18.84	16.50	16.79	17.12	14.82	18.5 low top of ditch bank

In the table included below, peak flows are compared in the channel downstream of the confluence with the proposed diversion system. For Alternative 4, proposed peak flows remain below existing conditions providing assurance of no adverse impacts downstream. Additionally, the existing and proposed peak flows are compared as required by SWFWMD.

Table H-2 – Peak Flows Comparison for Proposed Conditions

Link Name	Location	Peak Flow (CFS)									
		5-Year, 8-Hour					25-Year, 24-Hour				
		Existing	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Existing	Alt. 1	Alt. 2	Alt. 3	Alt. 4
RA0280	43rd St Outfall Ditch, South of Railroad	399	353	317	319	396	491	484	448	460	485

Discussion and Comparison of Alternatives

Alternative 4 involves acquisition of an additional property with an existing building and road frontages. If property acquisitions for Alternative 4 go favorably, the overall project cost would be significantly reduced by downsizing the diversion system (see summary of estimated alternative costs below). Additionally, other benefits with a downsized diversion system are envisioned including easier utility conflict resolution, lower difficulty and faster construction, lower maintenance of traffic demands, and less disruption to property owners (especially at CSX railroad crossing).

Table H-3 – Summary of Estimated Project Costs for Alternatives

Alternative	Estimated Project Cost
1: Conveyance Upgrades with South Pond	\$ 9,110,000
2: Conveyance Upgrades with North and South Ponds	\$ 9,149,000
3: Diversion System with North and South Ponds	\$ 8,963,000
4: Diversion System with Two (2) North Ponds	\$ 7,123,000

Recommendation and Phasing

The amended recommendation for this study is to proceed with feasibility investigations into purchasing the three potential pond sites included in both Alternatives 3 and 4 as listed below:

1. North Pond (7.1 Ac) – south of Columbus Drive w/ two-story building
2. North Pond (5.7 Ac) – north of Columbus Drive w/ warehouse building
3. South Pond (9.7 Ac) – west of 43rd Street crossing

At this time, Alternative 4 is the recommendation of this study due to considerable construction and design savings. However, any combination of two out of these three properties will satisfy the needs for pond construction for this project.

Included below is a schedule of possible phasing for Alternative 4.

Table H-4 – Phasing of Recommendation

Phases	Estimated Property Costs	Estimated Design and Construction Costs	Total Estimated Phase Cost
1: Construct North Pond (7.1 Ac) and connection to HART	\$ 1,500,000	\$ 1,266,000	\$ 2,766,000
2: Construct North Pond (5.7 Ac)	\$ 1,500,000	\$ 654,000	\$ 2,154,000
3: Construct diversion system along 40th Street and 43rd Street box culvert	\$ 57,000	\$ 2,146,000	\$ 2,203,000
		Total = \$	7,123,000

Included below is a breakdown of the estimated construction, design, and property costs for Alternative 4.

Preliminary Project Cost Estimate for Alternative 4

Alternative 4 - Diversion System with two (2) North Ponds					
Item Number	Description	Unit Cost	Units	Quantity	Total Cost
1	Clearing and Grubbing	\$7,500.00	AC	27.2	\$204,000
2	Structure with 10-foot Diversion Weir	\$10,000.00	EA	0	\$
3	Modify Drainage Structure (connect pipe)	\$1,500.00	EA	2	\$3,000
4	Manhole Riser (for access to box culvert)	\$3,000.00	EA	12	\$36,000
5	Concrete for Endwall	\$670.00	CY	34.8	\$23,329
6	Building Demolition (with wrecking ball)	\$2.00	SF	84,200	\$168,400
7	Reinforced Concrete Pipe (RCP), 48-inch	\$130.00	LF	3,780	\$491,400
8	Box Culvert, 3' x 5'	\$421.00	LF	90	\$37,890
9	Box Culvert, 4' x 6'	\$526.00	LF	0	\$
10	Box Culvert, 4' x 10'	\$736.00	LF	335	\$246,560
11	Box Culvert, 4' x 11'	\$789.00	LF	67	\$52,863
12	Channel Excavation	\$6.80	CY	1,867	\$12,696
13	Pond Excavation	\$4.00	CY	158,864	\$635,456
14	Pond Berm Embankment	\$5.00	CY	76	\$380
15	Performance Turf (Sod)	\$1.60	SY	36,683	\$58,693
16	Chain-link Fence (6')	\$13.00	LF	4,450	\$57,850
17	Concrete Sidewalk (Driveway), 6-inch Thick	\$38.00	SY	981	\$37,278
18	Concrete Sidewalk, 4-inch Thick	\$29.00	SY	1,190	\$34,510
19	Roadway Open Cut Restoration	\$57.00	SY	375	\$21,375
20	Roadway Lane Restoration	\$43.00	SY	6,714	\$288,702
	Maintenance of Traffic (12%)				\$289,246
	Mobilization & Demobilization (10%)				\$269,963
	Contingency Cost (20%)				\$593,918
	Construction Cost Sub-total				\$3,563,508
	Construction Engineering Inspection and Testing (5%)				\$178,175
	Engineering Design and Permitting (7%)				\$249,446
	Railroad Compliance and Permitting	\$75,000.00	LS	1	\$75,000
	Property Costs for Minor Conv. Upgrades and two (2) North Ponds (see separate tabulation)				\$3,057,000
	Estimated Project Costs, Alternative 4				\$7,123,000
<p><u>Cost Estimate Notes:</u></p> <p>1) Unit Costs are based on FDOT Item Average Statewide Unit Costs (2011), except as noted below.</p> <p>2) Building Demolition unit prices are from "Get-A-Quote.net".</p> <p>3) Maintenance of traffic includes permanent striping and signing.</p> <p>4) Roadway Open Cut Restoration based on Type B Stabilization (Pay Item No. 160-4) at \$3.10 /sy, Optional Base Group 9 (Pay Item No. 285-709) at \$12.30/sy, and 3 inches of Superpave Asphaltic Concrete (Pay Item No. 334-1-13) at \$13.00/sy with 50% contingency for milling and additional overlay pavement for lane reconstruction and 100% contingency for open cut restoration.</p>					