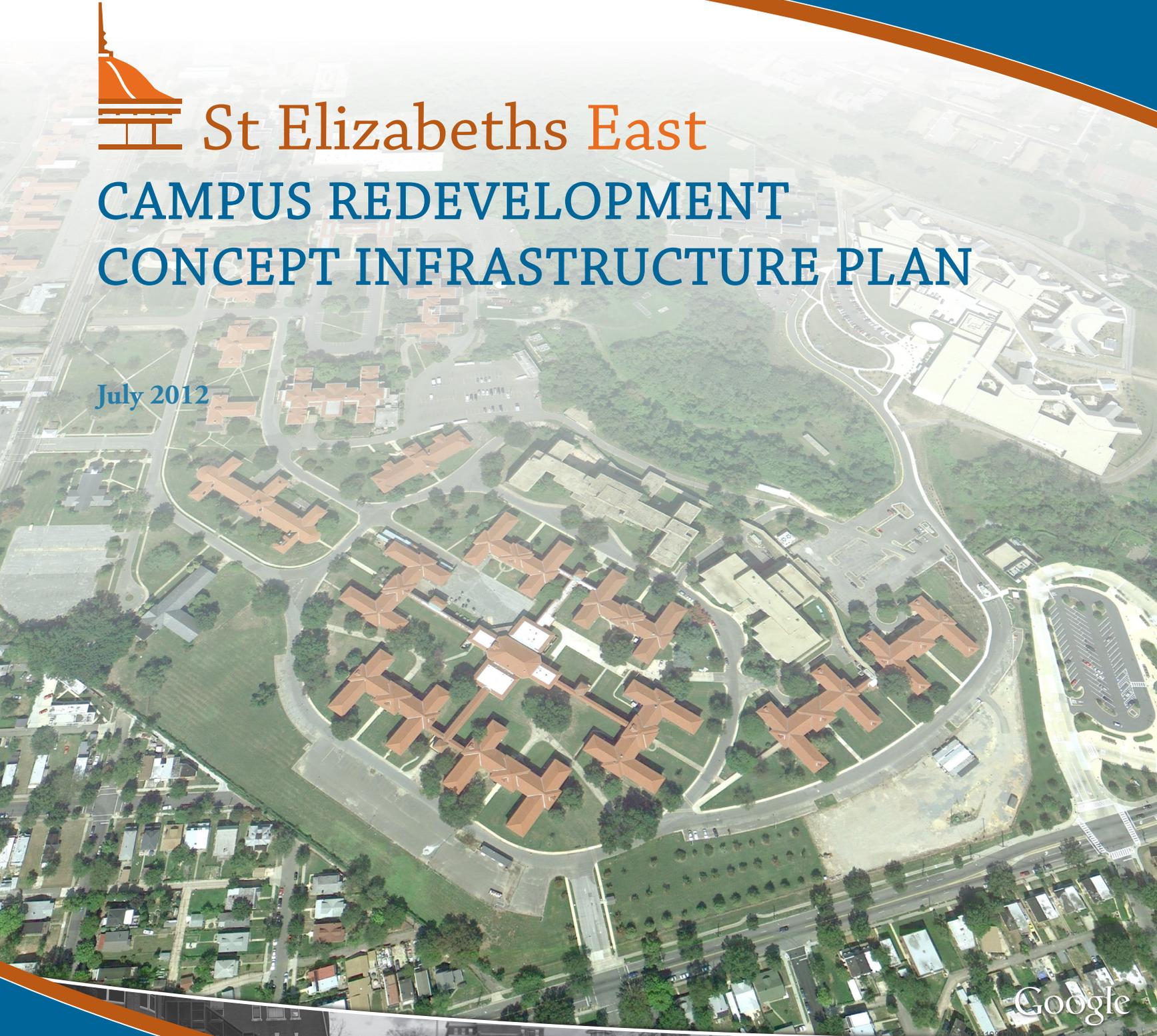




St Elizabeths East

CAMPUS REDEVELOPMENT CONCEPT INFRASTRUCTURE PLAN

July 2012



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St. Elizabeths East Campus Redevelopment Concept Infrastructure Plan

Prepared for
District of Columbia
Office of Deputy Mayor
for Planning & Economic Development

July 2012

CH2MHILL®

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Acronyms and Abbreviations

ASG	Ayres Saint Gross
CCTV	closed-circuit television
CIPP	cured in place pipe
CMP	corrugated metal pipe
Council	District of Columbia City Council
D/B	Design Build
DDOT	District Department of Transportation
DGS	Department of General Services
DHS	Department of Homeland Security
DMPED	Deputy Mayor for Planning and Economic Development
DDOE	District Department of the Environment
EA	Environmental Assessment
FEMA	Federal Emergency Management Agency
FIOS	Fiber Optic Services
gpm	gallons per minute
GSA	General Services Administration
FONSI	Finding of No Significant Impacts
KV	kilo volt
KW	Kilowatt
LF	linear foot
MBH	thousands of BTUs per hour
MLK	Martin Luther King
MGD	million gallons per day
MVA	mega volt amps
NASSCO	National Association of Sewer Service Companies
O&M	Operation & Maintenance
PEPCO	Potomac Electric Power Company
PACP	Pipeline Assessment & Certification Program
RCPR	Reinforce Concrete Pipe Rubber Joint
ROW	right-of-way
sf	Square Foot
VCP	vitriified clay pipe
WMATA	Washington Metropolitan Area Transit Authority

Executive Summary

The redevelopment effort for the approximately 170 acre east campus of St Elizabeths is now nearing the end of the planning phase. The master development plan has been completed which indicates over 5 million SF of adaptive reuse of existing buildings and new building development will occur on the east campus over the next 20- years. Upon completion of this infrastructure concept plan the District will be moving into the implementation phase. Infrastructure development is critical to supporting the development vision for the east campus. As such the completion of this concept plan and the pending development of preliminary plans for the stage 1 infrastructure systems for the east campus have been prioritized by the District.

This concept infrastructure plan contains documentation for the following stage 1 and stage 2 infrastructure systems:

- ❖ Primary Electrical (Power) Distribution
- ❖ IT/Communications
- ❖ Natural Gas
- ❖ Potable Water Distribution
- ❖ Wastewater Collection
- ❖ Stormwater Collection and treatment

Estimated costs for the stage 1 infrastructure system are \$31,434,000 and for stage 2 are \$22,763,000. The entire east campus concept infrastructure system as outlined in the plan (not including new roadway construction) has an estimated cost of \$54,200,000 as shown in appendix 12 of this plan.

Introduction

For the past two years the District has been diligently developing a physical redevelopment plan and complimentary economic development strategy to guide the revitalization of the East Campus of Saint Elizabeths and surrounding communities. While the planned consolidation of the Department of Homeland Security and eventual location of 14,000 -17,000 employees on the West Campus – directly across MLK Jr. Ave – was the initial impetus for this planning, the redevelopment of the East Campus has become a critical project in realizing the District’s goals of fiscal stability, job creation, and economic competitiveness. Success is most critical here as the communities surrounding Saint Elizabeths are among the most economically distressed in the District. Redevelopment offers the opportunity to provide amenities for local communities and the forthcoming future 4,400 Coast Guard employees – set to arrive on the West Campus in May 2013 – while creating a new center for innovation which will serve to further diversify the District’s economy. There are three distinct economic development goals for the Saint Elizabeths redevelopment:

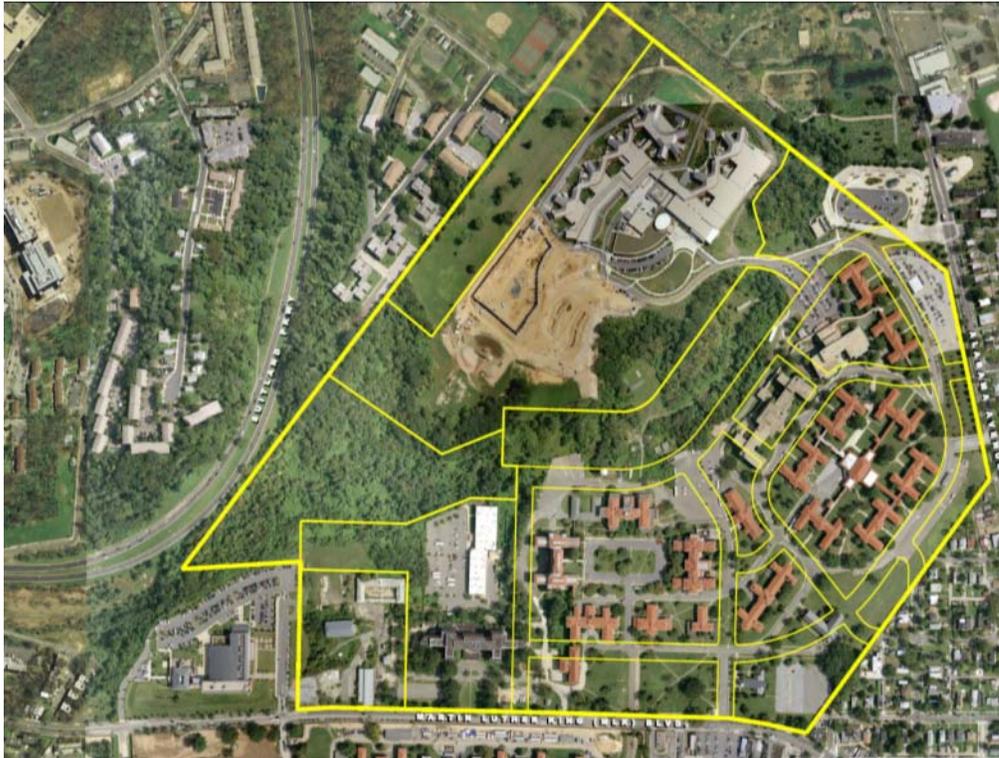
- Build an environment (both programmatic and physical) that encourages entrepreneurial businesses in dynamic and innovative sectors to grow in DC, and allows Federal government agencies to partner with the private sector in support of innovation and commercialization.
- Serve as the centerpiece for District-wide efforts to diversify the local economy and enable DC-based businesses to reduce reliance on federal procurement contracts and increase their competitiveness in private sector global markets.
- Promote DC’s existing social and economic assets, and build capacity in under-served communities, to ensure District residents and businesses participate in economic opportunities at St. Elizabeths.

The redevelopment effort is now transitioning into an implementation phase, and the District is engaged in a process of soliciting development and programmatic partners, as well as working closely with partner agencies to complete site entitlements including matter-of-right zoning. Infrastructure development is critical to supporting the above vision and as such has been prioritized by the District.

To assist in achieving the redevelopment of the east campus, the DMPED has prepared a master development plan and this concept infrastructure plan. The following sections outline the concept infrastructure plan for both stage 1 and stage 2 construction of the infrastructure systems needed to support the more than 5 million SF of adaptive reuse and new development planned for the east campus in the recently completed master development plan.

1.1 Project Description

The project consists of the 170 acre east campus of the former St Elizabeths mental hospital.



St Elizabeths East Campus

It will be redeveloped in two stages over the next 20 years into a mixed use site. The master plan for development calls for new housing, shopping, educational and business uses on the site. It includes adaptive re-use of approximately 1 million SF of existing historical buildings on the site. An additional 4 million SF of new development, as well as a 750,000 SF FEMA headquarters building, are planned for the east campus. Hospital operations have been moved to a new parcel east of the redevelopment sites. New infrastructure systems and transportation systems will be needed to serve the new uses and the increased density of the development. This concept infrastructure plan sets the framework for the future design and construction of the infrastructure and roadway systems to serve the east campus at build out conditions, with two distinct stages of construction presently planned.

At the present time, the DMPED, in coordination with DDOT, is completing preliminary infrastructure plans for the stage 1 construction area of the east campus. DDOT anticipates taking these preliminary plans and incorporating them into a D/B RFP to be issued in late 2012. Construction by the D/B team is anticipated to begin in spring 2013. DDOT will manage the D/B process and construction services for the stage 1 improvements.

1.2 Purpose and Objectives

DMPED hired the CH2M HILL team in 2011 to assist in its efforts to further the master plan and achieve the following goals for the project:

- Create an overall conceptual infrastructure and utility master plan that supports the *Master Plan Amendment: St. Elizabeths East Campus North Parcel Draft Environmental Impact Statement* (“East Campus master plan”), and includes a feasible approach to the first phase of development. The concept infrastructure plan should be financially feasible given the physical and economical constraints on the site.

- Work closely with the infrastructure financing consultant, Robert Charles Lesser and Co. (RCLCo.) to develop the concept infrastructure plan for the campus.
- Coordinate with ongoing East Campus transportation study and design efforts led by the District Department of Transportation (DDOT) to incorporate streetscape and transportation recommendations that support the development and land use goals of the master plan.
- Examine the impacts of development on historic resources and provide recommendations that mitigate these impacts to the greatest extent possible.
- Identify sustainable infrastructure features that will complement development on the East Campus through sustainable infrastructure.

This report of the conceptual utility infrastructure systems proposed to serve the new development on the East Campus is one of the deliverables provided by the CH2M HILL team under its contract with DMPED.

1.3 Project Assumptions and Considerations

1.3.1 Previous Work

This report utilized two previously completed reports related to providing infrastructure systems for the redevelopment of the east campus. Those efforts include:

- Roadway NEPA Documentation

NEPA work for onsite roadway system and Preliminary Roadway plans by DDOT. This effort has resulted in a completed Environmental Assessment (EA) for the impacts of the redevelopment and the proposed roadway system. The EA is resulted in obtaining a FONSI for the site.

- Existing Utilities Condition Report

Existing infrastructure condition assessment report by DMPED. DMPED hired the CH2M HILL team in 2011 to prepare an overall conceptual infrastructure master plan that would support the East Campus Master Plan recently completed by ASG. As the initial step in completing this conceptual infrastructure plan, the CH2M HILL team prepared an existing conditions survey (Level B) of the infrastructure systems in January, 2012. Major conclusions of the report are as follows:

- Water Systems – the entire area suffers from low pressure and flow issues.
- Wastewater Collection Systems – the only salvageable portion of the system may be the 18 inch diameter trunk sewer line running down the ravine and connecting to the DC Water manhole near the Suitland Parkway.
- Storm Sewer System – the only salvageable portions of the system may be the dual outfall pipes (54 inch and 42 inch diameter) running down the ravine towards Suitland Parkway.
- Electrical systems – except for the new service to the hospital, all the facilities on site were constructed as private system and as such is not considered reusable by the utility company
- Telecom Systems – all existing telecom (Verizon data, entertainment TV and CCTV systems) facilities are deemed obsolete and unsuitable for future use and will need to be removed or abandoned in the future.
- Natural Gas – piping on East Campus is old, but in reasonable condition and may be used in the initial stages of development if alignments do not conflict with new roadway alignments and new building locations.
- Steam Tunnels – were deemed to be hazardous materials and not located in acceptable areas for any type of reuse. Recommendation was removal of the 20% impacted by the new roadway configuration.

1.3.2 Obtaining of Design Standards

Obtaining of Design Standards and coordination with utility providers is ongoing. Each Utility Company signed a letter of acknowledgement they have reviewed this conceptual infrastructure plan and are in general agreement with the concept for service of the utilities as presented in this plan. Acknowledgement letters from the utilities companies can be found in Appendix 13

1.3.3 Typical Roadway Sections

The typical roadway sections shown in Appendix 3 were derived from the DDOT Preliminary Roadways plans. The utility locations within the ROW as shown in Appendix 3 were the result of a workshop with the utility companies and individual coordination efforts by the CH2M HILL team. Every effort was made to meet utility company standards and preferences as well as DDOT and other regulatory agency standards. Minutes of these and other meetings can be found in Appendix 11.

1.4 The Development Program

The Development Program for the east campus is shown in Exhibit 1c in Appendix 1 and consists of approximately 1 million SF of adaptive reuse of historic existing buildings from the former hospital and approximately 4 million SF of new buildings planned for east campus. In addition limited development of community gardens may occur on the North (farm) parcel, and a new 750,000 SF FEMA headquarters building may be developed on the north side of the campus directly north of the proposed Pecan Street ROW. All infrastructure systems were conceptually located and sized to serve the entire proposed development program as shown in the recently completed east campus master plan.

1.5 List of Exhibits

Exhibits referenced by Section 1 that are included in Appendix 1 are:

- ❖ 1A -- Vicinity Map,
- ❖ 1B -- Master Development Plan for East Campus,

Exhibits referenced by Section 1 that are included in Appendix 2 are:

- ❖ Parcel and Roadway Exhibit

Exhibits referenced by Section 1 that are included in Appendix 3 are:

- ❖ Cross Sections with Utility Placements

Permitting and Approvals

2.1 Local Regulations and Requirements

Local Regulations and Requirements are covered under the specific infrastructure system discussions.

2.2 Permit Review Process

The permit review process for the roadway and infrastructure construction will vary significantly depending on the timing of the dedication of the ROW to DDOT and on the delivery system selected for construction of the infrastructure systems. It is presently anticipated that the roadway and infrastructure systems will be constructed by the design build delivery method once preliminary plans are completed by DDOT and DMPED.

If the new ROW necessary for the new roadways and infrastructure systems has not been dedicated to DDOT prior to construction, most of the utility companies consider the project a “private development” . As such, roadway and infrastructure construction would fall under that category for permit reviews. Utility easements would need to be obtained for the trunk or feeder service lines prior to construction. DMPED would need to be the permit holder as the “private” master developer.

If the ROW has been dedicated to DDOT prior to construction of the improvements, then DDOT would be considered the lead agency/owner and the Design Build (D/B) team could get the permits and turn over the permits and improvements to DDOT upon acceptance of the completed infrastructure systems. As an alternative DDOT could hold the permits during construction.

2.3 Right of Way

The locations of the proposed roadway systems and ROW necessary for the redevelopment of the east campus, in accordance with the recently completed master development plan, have been established during the preparation of preliminary roadway plans for DDOT.

It is presently anticipated that upon completion of the zoning process for the east campus the ROW and other details of the funding and implementation of the roadway and infrastructure construction will be outlined in a Memorandum of Understanding (MOA) between DDOT and DMPED.

ROW will need to be dedicated to DDOT prior to the start of construction or temporary easements may be necessary to allow construction. The construction of the infrastructure systems in easements and not within the ROW may impact the ability of the utility companies to accept the systems for operation and maintenance after completion of construction.

Power Systems

3.1 Introduction

The existing electrical system on the East Campus was installed privately to the specific use of St. Elizabeth's, not by PEPCO, and thus is not considered reusable by PEPCO. PEPCO has indicated it has no use for the existing infrastructure. So all existing electrical distribution, cables, switches, conduit and manholes, will be removed. Old cables and transformers shall be removed/salvaged.

PEPCO has a substation on Alabama Avenue about a mile east of the East Campus. This substation has 140 MVA capacity. Several 13 KV feeders go by the campus on Alabama, but is said to have very limited reserve capacity available to tap into for the future and present needs of the East Campus.

A new 12 duct underground duct bank was constructed with 4 active feeders (8 ducts available for future needs of others). The duct bank is routed along Alabama Avenue, then north along Martin Luther King JR Boulevard, via 8th Street and Malcolm X Boulevard to the main gate (tunnel) at the West Campus. This will be a primary power point of connection for the East Campus.

Interconnecting system and coordination with the new hospital power service will require some relocating. The ultimate system will be reworked with this project to accommodate the new roadway configuration. Coordination will be necessary to avoid service interruptions to the hospital and WMATA Congress Heights Metro Station. Switching equipment may also need to be relocated in Phase 2 of the East Campus development.

PEPCO lines servicing the new hospital, WMATA, and other existing users on campus will need to remain in service and any abandonment of service for development coordinated with PEPCO.

Three sites may require temporary electric service from PEPCO for uses prior to Stage 1 construction. The user would pay for the installation and use of the services. These sites include:

- North Parcel (old farm) – may require a minimal power supply, perhaps a residential type service, to accommodate a community garden;
- Temporary power supply to existing buildings which have cellular telephone provider antenna transmitter stations, which will remain operational until new locations are available, possibly some perimeter security; and
- A temporary food service venue to support the West Campus community planned for opening in May 2013.

3.2 PEPCO Regulations and Standards

The electrical power distribution infrastructure proposed for the development may be constructed by the developer, provided there is strict adherence to PEPCO standards. These standards may be found at:

<http://www.pepco.com/business/services/new/res/>

For facilities built on private property there is no preference for contractors as far as PEPCO is concerned. Construction can begin once the proposed facilities drawings have been approved by PEPCO. If the property is made public before the infrastructure is built and certified then the contractors must be a PEPCO pre-approved contractor, construction cannot begin until PEPCO has finished design, and work must be done under PEPCO's design and permit.

3.3 Power Demand

3.3.1 Demand Assumptions

TABLE 3-1
Electrical Load Summary

	Area (sf)	Calculated Maximum Demand (kw)	Diversified Demand (kw)
Retail	289,243	7,231	4,339
Residential	1,627,475	16,275	9,765
Large Office	2,422,054	48,441	29,065
Small Office	273,635	5,473	3,284
Institution	600,524	21,018	12,611
Civic	61,689	1,542	925
Hotel	354,551	7,091	4,255
Parking	800,000	1,600	960
Totals	6,429,171	108,671	65,203

3.3.2 Power Load Growth

The above load summary is based on common loads found with the building types indicated. Very heavy users can be found within any of the categories. The FEMA property is not included in the loads above. It is anticipated the FEMA electric supply will come directly from MLK or Pecan Street and/or the West Campus system.

3.4 Electric System Design Criteria

The infrastructure described here and in the exhibits assumes primary power of 12,000 volts will be available from MLK Avenue, primarily and potentially Alabama Avenue. PEPCO has recently installed new duct banks in MLK. There are four feeders in MLK at this time.

3.4.1 Distribution System

The distribution system conceptualized for the East Campus includes a system of 4-way duct banks with 5" diameter conduits concrete encased. Each main street will include a 4-way duct bank with manholes spaced about 300' apart. A 2-way duct bank is indicated for each building power supply. It is assumed each building will receive a pad mount transformer next to the building. PEPCO will extend 12KV cables through the duct bank system to the transformers near each building where power will be stepped down to the utilization voltage in the building. Transformers will be owned and maintained by PEPCO.

3.4.2 Switches/other Components

No switches are indicated on the conceptual plan. PEPCO may or may not choose to include such switches somewhere on the East Campus in its final design.

3.4.3 Back-up Generation

Original conceptualization of the East Campus development plan included on-site power generation of a co-generation character. The concept of co-generation was discarded when economic feasibility did not materialize, nor was there a logical solution to manage the operations of such a plant. Individual buildings will provide its own backup power on an as needed basis.

3.5 Exhibits

The electric exhibits in Appendix 4 include a preliminary configuration. The quantity of conduits and routing in the final design may vary from that indicated.

IT/Communications

4.1 Introduction

Nearly all existing telephone and communication wiring on the site is or was hospital owned (private). Verizon was the telecommunication infrastructure owner only up to the main telecommunication building, this building, the Dix Building, is slated to be demolished. A few buildings have cellular telephone antenna/transmitter equipment owned by a variety of vendors. These facilities will require coordination with vendors prior to power interruption.

All existing cables are deemed obsolete and unsuitable for future use and are planned to be removed. Conduit, manholes and duct banks are to be removed or abandoned in place as they are deemed unsuitable for new work and do not align with the new roadway and conceptual infrastructure locations.

Existing entertainment TV wiring infrastructure is out dated and technologically unsuitable for reuse.

Any existing security systems infrastructure on the East Campus are remnants of St. Elizabeth's and thus of little value to new development. All such security systems should be scheduled for removal.

The new hospital is currently being served entertainment TV by Verizon FIOS. Although other commercial vendors are available for these types of services, infrastructure installed within the street will be by one vendor, while other vendors may offer services using that same infrastructure consistent with regulation and local agreements.

4.2 VERIZON Regulations and Requirements

Verizon will require compliance with its design guidelines and an opportunity to review and comment on proposed infrastructure designs intended for Verizon use. For further information concerning design guidelines contact David Wilkins at Verizon at 301-282-2984.

4.3 General Assumptions

A system of pathways in the streets is proposed for Verizon and other telecommunication provider's use. The pathways, typically, 4-way concrete encased duct banks with 4" diameter conduits concrete encased will be provided in the streets for all telecommunication wiring. Manholes will be provided with 4-way stub-out duct banks extending from a manhole to the property line for extension to individual buildings. The system of pathways, manholes and stub-outs is proposed to provide sufficient infrastructure with the roadways and utilities to preclude immediate and constant street damage as buildings of the development come online.

Three sites may require temporary telecommunications service for uses prior to Stage 1 construction these sites include:

- North Parcel (old farm);
- Temporary telecommunication services to existing buildings which have cellular telephone provider antenna transmitter stations, which will remain operational until new locations are available; and
- A temporary food service venue to support the West Campus community planned for opening in May 2013.

4.4 IT/Communication Infrastructure Layout

Multiple locations are indicated for connection to pathways in Martin Luther King Jr. Avenue, Alabama Avenue and extensions of 8th Street and Malcolm X Avenue. These access points will afford considerable flexibility in getting telecommunication cabling to the campus and/or to loop through to surrounding communities.

The 4-way duct bank layout assumes two ducts will be immediately occupied by Verizon cables for distribution through the campus. Two ducts will remain spare and available for other users.

4.4.1 Considerations for Other Users

The pathways will be constructed to Verizon standards and generally available for other providers as necessary.

One potential user of the telecommunications system pathways may be D.C. Net. At the time of writing of this report there is minimal interest in extending D.C. Net to the East Campus, but if D.C. should choose to occupy some of the buildings, the capacity is there.

Other providers will have access to the system should the service be requested. The exact details will be coordinated and agreed upon during the utility preliminary plan development.

4.5 Exhibits

The electric exhibits in Appendix 5 include a preliminary configuration. The quantity of conduits and routing, in the final design, may vary from that indicated.

Natural Gas System

5.1 Introduction

Existing natural gas piping on the East Campus is owned and maintained by Washington Gas. The gas lines do not go to each building, but go to three buildings of the St. Elizabeth facilities that required gas, like the central heating plant, and cooking facilities. Existing piping does not follow existing roads, but tend to be a direct routing from the street mains to the delivery point. Such routing conflicts with current concept development plans; including locations of proposed buildings where gas piping now exists. Thus, nearly all existing gas piping will be removed or purged/capped and abandoned in favor of new.

5.2 Washington Gas Regulations and Requirements

Natural gas piping will be provided by Washington Gas or its qualified contractors. Washington Gas typically does not invest in infrastructure until reasonable certainty exists that natural gas will be requested for a property. This concept is counter to this Concept Infrastructure Plan which is trying to organize all utilities on site, and place infrastructure to minimize disturbance to roadway infrastructure.

Washington Gas has an 8-inch 20 lb pressure main in MLK. The infrastructure is in reasonable condition but the system pressure is weak. Washington Gas is contemplating upgrades to the system in this Southeast region of the District of Columbia but needs a clear vision of future increased demand to make the investment. A substantial commitment to natural gas for the proposed development may be sufficient.

5.3 General Assumptions and Standards

It is noted that many modern buildings have minimal heating loads and often are constructed without natural gas supply. Office buildings, as an example, are largely cooling loads, minimal heat, often relying on localized electric reheat only. Large office buildings may or may not choose to use natural gas for heating in the large roof mounted or central plants. Buildings and facilities with logical gas requirements include food preparation and cooking facilities, large hot water users, or large heating loads. Such buildings usually include; residential, restaurants, hospitals, hotels, hair salons, etc. Energy efficiency criteria being applied to building design will play a big role in building owners choosing to include natural gas as an energy source. With the above in mind, Washington Gas will be reluctant to bear the cost for the infrastructure proposed with this development plan. While Washington Gas will insist on installing all gas lines with their own or pre-qualified contracting sources, the cost of such infrastructure will be passed on to the developer.

Washington Gas will provide natural gas directly to each building that requests gas. Washington Gas will provide meters and measure usage at each building or group of buildings under common ownership. The new infrastructure on site will be owned and maintained by Washington Gas all the way up to the building metering point. Exact details of design, construction, ownership and operations will be coordinated and agreed upon during the preliminary utilities plans preparation.

For further information concerning design guidelines contact Vjay Parmesn at Washington Gas at 703-750-4391.

5.4 Demand for Natural Gas

Consistent with the discussion above, natural gas may not be used in all buildings. The type of occupant, hours of operation, etc. all contribute to the load calculations.

TABLE 5-1
Gas Load Summary

	Area (sf)	Consumption Rate (MBH/sf)	Load (MBH)
Retail	289,243	10	2,892,430
Residential	1,627,475	10	16,274,750
Large Office	1,672,054	30	50,161,620
Small Office	273,635	0	-
Institution	600,524	10	6,005,240
Civic	61,689	10	616,890
Hotel	354,551	30	10,636,530
Parking	800,000	0	-
Totals	5,679,171		86,587,460

Optional uses can allow a large demand range.

5.5 Exhibits

The natural gas exhibits in Appendix 6 include a preliminary configuration. The piping and routing, in the final design, may vary from that indicated.

Potable Water and Wastewater

6.1 Introduction

The existing privately owned potable water system within the East Campus will be replaced with a new public system. Integral components of the new system that will be built separately by the District of Columbia Water and Sewer Authority (DC Water) include a 24-inch transmission main from Martin Luther King Jr. Boulevard, within the right-of-way of Pecan Street, to a new 2 MGD elevated water storage tank on the East Campus near the new hospital. This separate construction is scheduled to be completed in 2015 and must be operational before the construction of any new buildings on the East Campus. At a minimum, this will require that the Stage 1 connections to the DC Water system along Martin Luther King Jr. Boulevard, SE and Alabama Avenue, SE be completed to allow for connection of the Hospital to the new water distribution system. DC Water may require that the construction of the new water tank and 24-inch transmission connection to Martin Luther King Jr. Boulevard, SE be complete, prior to removal of existing water tank.

Coordinated efforts during development are necessary to ensure continuity of service, particularly to the hospital, availability of fire protection at an estimated rate of 1,000 gallons per minute (gpm) to existing buildings on the East Campus.

The East Campus will not be on a master meter system, as such all buildings (existing and proposed) will be individually metered for water usage.

The existing private gravity wastewater sewer system connects to DC Water's system through an existing 18-inch vitrified clay pipe (VCP) sewer along the ravine at a manhole near the north boundary of the East Campus adjacent to Suitland Parkway. DC Water will analyze the capacity and condition of its' receiving facilities downstream on receipt of this report. An existing 8-inch sewer connecting to the 18-inch outfall will serve the north parcel including the parcel intended for future agricultural use. With rehabilitation by a trenchless technology in accordance with DC Water standards, these two existing sewers are the only salvageable portions of the existing system on the East Campus. The remainder of the private system will be replaced by new sewers. The connection to the 18-inch outfall in the ravine can only be made if DC Water determines that the existing public pipe systems have adequate capacity.

Design and construction details of all water and wastewater sewer systems within the existing or future ROW are to be coordinated with DCWater and DDOT during plans preparation phase.

6.2 DC Water Regulations and Requirements

The applicable regulations and requirements of the District of Columbia Water and Sewer Authority (DC Water) include:

- Design standards and forms,
- Project Design Manual Volume 3 Infrastructure Design,
- Standard details and
- Permit application and documents.

All of these documents are available on-line at DC Water's website:

<http://www.dewater.com/business/permits/criteria.cfm>

6.3 General Assumptions and Abbreviations

A specific requirement of particular note from the Project Design Manual, Volume 3, Infrastructure Design, Part C, Section 1, Subsection 1.3 states: "The minimum size of water mains that are used for fire protection is 8-inch diameter." Consequently, it is anticipated that the majority of the new water distribution mains will be 10-inch diameter or larger.

New gravity collector sewers with a minimum diameter of 10 inches serving the greater part of the campus are anticipated.

Summary design flows shown assume all flows have been distributed or collected in the proposed systems at a single point. Actual design flows will vary depending upon actual water distribution and wastewater collection piping in the networks provided.

Abbreviations

Enumeration units

DU	dwelling units
SF	square feet

Flow rates

mgd	million gallons per day
gpd	gallons per day
gpm	gallons per minute

Water flows

ADF	average daily flow
MDF	maximum daily flow

Wastewater flows

BWF	base wastewater flow
AWF	average wastewater flow
PWF	peak wastewater flow
DF	design flow

6.4 Demand Analyses

Estimates of flow are based upon typical industry water and wastewater sewer flow projection factors as shown in the following chart. These factors originate from usages of various dwelling and building types and are expressed as gallons per day (gpd) on a per unit basis such as square foot (SF). The analysis is further detailed by the calculation of potable water demands and wastewater flows for 17 individual service areas identified as parcels.

TABLE 6-1
Flow Factor per Parcel Usage Type

Parcel Usage Type	Unit	Flow Factor (gpd)/Unit
Retail	Square Foot (SF)	0.048
Residential	SF	0.120
Residential	Dwelling Unit (DU)	Water: 121
Residential	DU	Sewer: 130
Large Office	SF	0.200
Small Office	SF	0.200
Institution	SF	0.620

TABLE 6-1
Flow Factor per Parcel Usage Type

Parcel Usage Type	Unit	Flow Factor (gpd)/Unit
Civil	SF	0.100
Hotel	SF	0.256

The number of square feet in each parcel usage type and number of residential dwelling units used in the subsequent calculations are based upon the current master plan for development for the Saint Elizabeths East Redevelopment.

6.4.1 Potable Water Demands

The following potable water flow projections detail the usage types, the number of units in each usage type, the associated flow factors and the resultant average daily flow (ADF) and maximum daily flow (MDF) in gpd in each of the 17 parcels. The flow rates are summarized in the chart below.

TABLE 6-2
Potable Water Demands Summary

Parcel No.	1	2	3	4	5	6	7	8	9
ADF (gpd)	0	0	114,700	15,000	223,700	114,300	36,200	3,900	100,500
MDF (gpd)	0	0	229,400	30,000	447,400	228,600	72,400	7,800	201,000
Parcel No.	10	11	12	13	14	15	16	17	Hospital
ADF (gpd)	2,100	147,400	26,300	45,600	23,400	109,600	33,900	79,500	103,800
MDF (gpd)	4,200	294,800	52,600	91,200	46,800	219,200	67,800	159,000	207,600

See Appendix 7C for Water Flow Projections

6.4.2 Wastewater Flows

The next wastewater flow projections detail the usage types, the number of units in each usage type, the associated flow factors and the resultant base wastewater flow (BWF), average wastewater flow (AWF), peak wastewater flow (PWF) and design flow (DF) in gpd in each of the 17 parcels and for the hospital. The peak and design flow rates are summarized in the chart below.

TABLE 6-3
Wastewater Flows Summary

Parcel No.	1	2	3	4	5	6	7	8	9
PWF (gpd)	0	0	660,800	86,400	1,288,400	658,400	208,400	22,400	578,800
DF (gpd)	0	0	991,200	129,600	1,932,600	987,600	312,600	33,600	868,200
Parcel No.	10	11	12	13	14	15	16	17	Hospital
PWF (gpd)	12,800	849,200	151,600	262,800	136,000	631,200	195,200	458,000	598,000

TABLE 6-3
Wastewater Flows Summary

DF (gpd)	19,200	1,273,800	227,400	394,200	204,000	946,800	292,800	687,000	897,000
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See Appendix 8C for Wastewater Sewer Flow Projections

6.5 Potable Water Distribution System

6.5.1 Potable Water and Fire Flow Demands

In conjunction with the demands listed in the table in section 7.4.1, a fire flow of 3500 gpm is required for the proposed system.

6.5.2 Existing Fire Flow Analysis and results

Fire protection work was conducted on the East Campus between November 2010 and August 2011 to enable compliance with the requirement of 750 gallons per minute (gpm) at each hydrant. Pressure testing was performed and recorded for all hydrants with 100 percent compliance above 750 gpm. The construction during this timeframe was to enable minimal fire and domestic service to the existing facilities with no consideration for future development.

6.6 Wastewater Collection System

TABLE 6-4
Overall Average Wastewater Flow

Outfall Description	Average Wastewater Flow (mgd)
Ravine located at the northern end of 13 th Street	1.550

6.7 Exhibits

Exhibits referenced by Section 6 include Appendix 7a and 7b, Water Layout Stages; and Appendix 8a and 8b, Wastewater Collection System Layout Stages.

Storm Water Drainage

7.1 Introduction

The majority of the existing storm water drainage system will be replaced by new facilities. The only exceptions are the existing 54-inch and 42-inch outfall pipes along the ravine towards Suitland Parkway. The 42-inch reinforced concrete pipe (RCP) line segment under the hospital access road has been lined with cured-in-place pipe (CIPP) and doghouse style manhole structures were constructed for the CIPP installation and connection of the hospital drainage pipes to the existing outfall line. To salvage the remainder of these outfall pipes, they will be rehabilitated also using trenchless technologies in accordance with DC Water standards. The existing storm outfall system within the Parcels east of 13th Street will be relocated outside of the Parcel boundaries to accommodate future development.

The new roadway storm water drainage piping will range and size from 15" to 48". All of the piping will be Reinforced Concrete Pipe with Rubber Gasket joints (RCPR). Roadway drainage facilities will include curb inlets and manholes with sizes and locations in accordance with DC Water and DDOT standards.

In general the new development of the East Campus will be served by existing facilities as follows (reference Exhibit titled "Road Names and Parcel Layout", sheets 1 and 2 for parcel locations):

- Parts of parcels 2, 3 and 7 drain west to Martin Luther King Jr. Boulevard,
- Parts of parcels 14 and 17 drain south to Alabama Avenue, SE.
- All other parcels areas, including the proposed Federal Emergency Management Agency (FEMA) parcel and the Farm parcel intended for future agricultural use, drain east and north through the existing 54-inch outfall,
- All roadway areas drain east and north through the existing 54-inch outfall; except the section of 13th Street, SE south of Dogwood Street which will drain south to Alabama Avenue, SE.

7.2 Local Regulations and Requirements

The District Department of the Environment (DDOE) is responsible for water quality regulation which includes:

- Water Quality Regulatory and Legislative Affairs
 - [Resources for Businesses](#)
 - [District Stormwater Fee](#)
 - [Separate Storm Sewer System MS4 Permit](#)
 - [Flood Zone Building Permits](#)
- Total Maximum Daily Load (TMDL) Documents
 - [Anacostia Watershed](#)
 - [Potomac River & Other Tributaries](#)
 - [Recently Approved TMDLs](#)
 - [Chesapeake Bay TMDL](#)
- Water Related Laws and Regulations
 - Water Quality Regulations
 - Watershed Protection Regulations

- Stormwater Regulations
- [Floodplain Management Regulations](#)
- [Water Pollution Control Act of 1984 \(DC Law 5-188\)](#)
- [Water Quality Monitoring Regulations \(21 DCMR Ch. 19\)](#)
- [Soil Erosion and Sediment Control and Stormwater Management Regulations](#)

All of these regulations are available on the DDOE’s website: <http://ddoe.dc.gov/service/water-quality-regulation>. Their disclaimer recommends obtaining printed versions for legal matters.

The District Department of Transportation (DDOT) is responsible for the development and maintenance of a cohesive sustainable transportation system while protecting and enhancing the natural, environmental and cultural resources of the District. This mission is accomplished in part through the enforcement of its standards and guidelines which include:

- [Construction Management Manual](#)
- [Design and Engineering Manual](#)
- [Manual on Uniform Traffic Control Devices](#)
- [Pedestrian Safety and Work Zone Standards](#)
- [Public Realm Design Manual](#)
- [Right of Way Manual](#)
- [Sidewalk Construction](#)
- [Standard Drawings](#)
- [Standard Specifications](#)
- [Temporary Traffic Control Manual](#)
- [Utility Work Zone Typicals](#)
- [Work Zone Safety and Mobility Policy](#)

These standards and guidelines are available at the DDOT website: <http://ddot.dc.gov/DC/DDOT>.

7.3 General Assumptions for stormwater systems

7.3.1 Construction Phasing

The storm drain construction in Stage 1 includes the construction of a new connection to the existing 54” outfall. The alignment of this new connection is within the new extension of 13th Street, SE thru the location of the existing water tower serving the Hospital. Construction of the new storm drain outfall connection will require that the new water distribution system is at a level of completion that allows the removal of the existing water tank.

7.3.2 Outfall Capacity

DC water is going to verify the capacity of their storm sewer system downstream of the 54” outfall pipe. Further study may be required to determine exact connection point to DC Water’s system downstream of the culvert below Suitland Parkway.

7.4 General Information for stormwater systems

7.4.1 Site Location

Geographically, the St. Elizabeths East Campus is located in the Southeast section of the District of Columbia near the confluence of the Potomac and Anacostia Rivers. The site is east of Interstate 295 and is generally bounded by Suitland Parkway to the North, Martin Luther King Jr. Boulevard to the west and Alabama Avenue, SE to the southeast. Hydrologically, the majority of the East Campus discharges the stormwater runoff into the adjacent

ravine that flows to the downstream Suitland Parkway drainage system and ultimately outfalls into the Anacostia River.

7.4.2 Rainfall

Rainfall intensity, duration and frequency are determined in accordance with the DDOE's *Stormwater Guidebook*, Appendix A, Figure A.1.

This reference is available on the DDOE's website: <http://ddoe.dc.gov/publication/stormwater-guidebook>.

7.4.3 Soils

Soil conditions were analyzed and the impervious percentages were determined by Arup USA, Inc. (Arup), under separate contract to DMPED. DMPED provided the Arup report, titled "Stormwater Quantity Control", dated March 12, 2012 to support the preparation of this document. The impervious area percentages provided in the Arup report were used to calculate Run-off Coefficients in order to provide Storm Drainage and Stormwater Management quantities. The runoff coefficients are shown on the table in Appendix 9C.

7.5 Design Criteria

7.5.1 Allowable Discharge

Allowable discharges are discussed in Subsection 8.5.3.1, Detention Volume Criteria which follows.

7.5.2 Flood Protection

The Federal Emergency Management Agency (FEMA) has designated the area of this site as "Zone X", within the National Flood Insurance Program. This is shown on Flood Insurance Rate Map (FIRM) Number 1100010076C, revised September 27, 2010. Zone X is defined as, "Areas determined to be outside the 0.2% annual chance floodplain".

The floodplain map is shown in Appendix 9D

7.6 Stormwater Management

7.6.1 Detention Volume Criteria

Current DDOE stormwater regulations require that the peak stormwater discharge rate from the 2-year and 15-year storm events must be controlled to the predevelopment rate. The current policy defines the predevelopment condition as meadow, prior to man's influence. This means that the predevelopment condition is considered to be before any development was performed at the site and not the current condition of the site as it is today. "The resulting volumetric calculations only require detention of stormwater, which is then released at a lower discharge rate, the 2-year predevelopment flow.

Based on a meeting with DDOE, it is anticipated that draft DDOE stormwater regulations will be implemented prior to this development obtaining permit approval. The draft stormwater regulations will require retention of storm water within the site (drainage area) in addition to detention requirements. Detention requirements and methods will only be used when controlling up to 15-year storm event is needed to prevent flooding downstream of a development site. A focus and major change of the draft stormwater regulations is stormwater retention in lieu of detention and filtration practices.

7.6.2 Retention Volume Criteria

Draft DDOE stormwater management regulations will change the required storage volumes from detention to retention. Each site (drainage area) will be required to retain 1.2" of storm water runoff from the entire site area, using varying reduction factors based upon the proposed surface composition. Reduction Factors will range from 0.95 for impervious areas to 0.00 for natural cover. Retention requires that the stormwater volume be infiltrated (on-site) or reused (on-site) without any discharge to a DC Water sewer (separated or combined) system. This retention requirement will also apply to the Public Right-of-Way, but only to the Maximum Extent Practical.

In a meeting with DC Water the design strategy of a regional stormwater management facility, which would serve the whole East Campus was discussed. DC Water's current policy is that any storm drain infrastructure upstream of a stormwater management facility is considered a private system, which would create a separate private utility service within the public roadway. Additionally, a regional facility would require legal agreements among the East Campus property owners for the purposes of future maintenance and operation of the facility. As a result, the current design strategy proposes that each development parcel will provide separate on-site (within the parcel boundary) stormwater management facilities. This will allow greater design flexibility for the design of each parcel, eliminate the need for a "private" utility within the public road system, and reduce any easement/covenant documents between individual ownership entities.

Possible stormwater retention methods for the individual parcels include: bio-retention, green roof, infiltration, re-use for building mechanical systems or irrigation, and permeable pavements. DDOE is also currently considering providing retention credits for trees that are planted in association with a development. The storm run-off from the public roadway will be treated separately using LID methods.

The following chart shows preliminary calculations of the stormwater retention volume required for each parcel based on draft regulations.

TABLE 7-1
Stormwater Management Retention Volume (Rv) Summary

Parcel No.	1	2	3	4	5	6	7	8	9
Rv (Ac.-ft.)	0.37	0.71	0.40	0.24	0.50	0.48	0.32	0.14	0.13
Parcel No.	10	11	12	13	14	15	16	17	Hospital
Rv (Ac.-ft.)	0.06	0.67	0.15	0.29	0.17	0.40	0.17	0.19	1.56

Note:
Retention Volume calculations are based upon Impervious Area percentages defined in "Stormwater Quantity Control" Report, dated March 12, 2012 by Arup USA, Inc.

7.6.3 Pretreatment and Water Quality Criteria

The DDOE stormwater regulations require that: "Any storm water discharge facility which may receive storm water run-off from areas which may be potential sources of oil and grease contamination in concentrations exceeding ten (10) milligrams per liter (mg/l), shall include a baffle, skimmer, grease trap or other mechanism which prevents oil and grease from escaping the storm water discharge facility in concentrations that would violate or contribute to the violation of applicable water quality standards in the receiving waters of the District..."

The draft DDOE stormwater regulations will require a Total Suspended Solids (TSS) removal rate of at least 65% if the site (or drainage area) cannot achieve at least 50% of the required retention volume, as defined above. Additional water quality treatment criteria apply to areas within the Anacostia Watershed Development Zone. It is understood that the St. Elizabeth's site is not within this zone.

7.7 Design Calculations

A summary of the 15-year stormwater flow rates to the outfalls locations as shown in the table below.

TABLE 7-2
15-yr Storm Event Flow Rates

Outfall Description	15-yr Flow (cfs)
Ravine located at northern end of 13 th Street	427.7
Intersection of Alabama Ave & 13 th Street	13.5
Intersection of Alabama Ave. & 12 th Street	8.0
South West of Proposed Parcel 7 going southwest along Martin Luther King Jr. Ave	18.3
West of Proposed Parcel 3 going north along Martin Luther King Jr. Ave	27.3

7.8 Exhibits

Exhibits referenced by Section 7 include Appendix 9a and 9b, Storm Sewer System Layout Stages.

Demolition of Steam Tunnels

8.1 Introduction

The East Campus of St. Elizabeth's used a central plant concept for heating. This concept utilized a system of steam tunnels to house heating pipes to distribute steam to each of the buildings. These steam tunnels date back to the early 1900's. Materials used in the tunnels and used as insulation on the pipes are now considered hazardous materials, including asbestos. The tunnels connect buildings, one to another. The tunnels will not be reused in the new development, can be deemed a security breach and the hazardous materials a health issue. The hazardous materials must be abated. Typically, two methods are used, containment or proper removal and disposal. Both methods are proposed in this concept plan. It is proposed to remove tunnels where the tunnel's existence will interfere with new construction such as roadways or new buildings. Where possible the existing tunnels will be abandoned in place after sufficiently capping and sealing entry and access points.

8.2 Regulations and Requirements

All abatement, whether removal of tunnels or containment, shall be performed in compliance with EPA abatement regulations and all other regulations.

These guidelines can be found at EPA website: <http://www.epa.gov/osw/hazard/>.

Asbestos removal is regulated under EPA's NESHAP regulations – 40 C.F.R., Part 61, Subpart M

8.3 Exhibits

Exhibits referenced by Section 8 include Appendix 10a and 10b, Steam Tunnel Demolition Stages.

Staging of Construction Considerations

9.1 Stage 1 Construction Considerations

Considerations for the staging of construction tasks and the provision of temporary facilities for the D/B team on site will be handled in detail during the preparation of the preliminary infrastructure plans for stage 1 area construction.

Some of the highlights and challenges in the stage 1 construction will include:

- There may be the need to supply utilities to up to 3 temporary uses prior to completion of stage 1 infrastructure construction. These may include the Gateway Pavilion, the north farm parcel, or other site uses,
- Maintaining utility services and access to the Hospital and WMATA Station during the construction of 13th Street.
- Maintaining services to the stage 2 area (existing utilities) will have to be closely coordinated with the utility company and DGS. It is essential that existing fire flows be maintained for those areas of stage 2 construction with historical buildings and that will not be serviced by new water facilities from the stage 1 construction.
- The future widening of MLK Jr Blvd will impact the stage 1 construction of Cypress Drive at the connection to MLK. It is anticipated that a temporary connection will be made to the existing MLK roadway section, with the future permanent street connection to be located some 20 ft east of the present MLK roadway.
- Rehabilitation of the wastewater collection and storm sewer lines in the ravine will require temporary access roadways and some new infrastructure beyond the actual limits of the stage 1 redevelopment parcels.
- Demolition and/or abandonment of all utilities within the ROW will be in accordance with DDOT and Utility company standards.

Close coordination will be needed with DC Water during their construction of a new 24 inch water transmission main within the future ROW of Pecan Street.

Temporary fill in stage 2 areas of the east campus needed to facilitate utility construction may entail the need for temporary access changes for building such as the Dix building.

Temporary easement may be required for infrastructure systems serving stage 1 areas but located within stage 2 areas or outside the proposed ROW including temporary turn-arounds and the existing wastewater and storm sewer lines that will be rehabilitated during stage 1 construction.

9.2 Stage 2 Construction Considerations

Stage 2 considerations for the staging of construction tasks will be minor compared to the stage 1 impacts. Some of the highlights include:

- The future widening of MLK Jr Blvd will impact the stage 2 construction of Pecan Street and MLK intersection if the widening is not accomplished prior to the completion of stage 2 construction.
- Variations in the ownership and timing of the development of the FEMA headquarters building may impact access and setbacks along Pecan Street and the timing of the relocation of the Blackburn Lab (building 88).
- Demolition and/or abandonment of all utilities within the ROW will be in accordance with DDOT and Utility Standards.

Conceptual Opinion of Construction Costs

10.1 Stage 1 Conceptual Construction Cost Summary

The estimated total cost for infrastructure and building demolition for Stage 1 of the east campus redevelopment is approximately \$31.5 Million in 2012 dollars as indicated in the below table. Construction cost of the stage 1 roadway system must be added to this value. Details of the individual infrastructure systems estimated construction costs are in the appendices.

Also, the construction cost estimates do not include any costs for stabilization of existing historical buildings or the relocation of building 88.

Additional construction costs may be incurred if offsite (outside of stage 1 areas and/or outside the east campus boundaries) storm sewer and wastewater collection systems do not have available capacity for build out flows from the entire east campus. DC Water is presently analyzing the downstream capacities for these systems. Offsite costs (if needed) for improvements to the capacity of these systems will have to be identified during the preliminary design effort and after DC Water has completed their analysis.

ITEM	ITEM DESCRIPTION		COMMENTS		TOTAL
1	TOTAL WATER SYSTEM COST				\$3,626,000
2	TOTAL SANITARY SEWER SYSTEM COST				\$2,305,000
3	TOTAL STORM SEWER SYSTEM COST				\$3,714,000
4	TOTAL ELECTRICAL DISTRIBUTION SYSTEM COST				\$3,318,000
5	TOTAL TELECOMMUNICATIONS SYSTEMS COST				\$2,919,000
6	TOTAL NATURAL GAS DISTRIBUTION SYSTEM COST				\$609,000
7	TOTAL STEAM TUNNEL DEMOLITION COST				\$2,900,000
8					\$0
9					\$0
10					\$0
TOTAL CONSTRUCTION COST (Items 1-10)					\$19,391,000
11	ENGINEERING				
	Preliminary Engineering	5	% of Items 1-10		\$969,550
	Final Engineering	5	% of Items 1-10		\$969,550
	Construction Engineering	10	% of Items 1-10		\$1,939,100
TOTAL ENGINEERING COST (Item 11)					\$3,878,000
TOTAL UTILITY INFRASTRUCTURE COST					\$23,269,000
	Phase I and Phase II ESA services				\$136,640
	Building Hazardous Materials Surveys - 16 buildings				\$209,820
		20	% of Items 27 & 28		\$69,292
TOTAL OTHER COSTS					\$416,000
19	BUILDINGS				
	Demolition - Building No. 124	SF	35463	\$60	\$2,130,000
	Demolition - Building No. 117	SF	12750	\$60	\$770,000
	Demolition - Building No. 119	SF	47282	\$60	\$2,840,000
	Building Relocation -	LS	1		\$0
	Building Contingencies	LS	35	% of Item 19	\$2,009,000
TOTAL BUILDING COST					\$7,749,000

Cost estimates are based on concept level planning documents, and are subject to change as concepts are refined and further developed.

Above cost include PEPCO Engineering and connection costs of \$130,000, Washington Gas connection fees of \$20,000, and Verizon Engineering and connection costs of \$40,000. These fees are in addition to any consultant design fees outlined in the above costs for infrastructure plans and specifications.

10.2 Stage 2 Conceptual Construction Cost Summary

The estimated total cost for infrastructure and building demolition for Stage 2 of the east campus redevelopment is approximately \$23 Million in 2012 dollars as indicated in the below table. Construction cost of the stage 2 roadway system must be added to this value. Details of the individual infrastructure systems estimated construction costs are in the appendices.

ITEM	ITEM DESCRIPTION		COMMENTS		TOTAL
1	TOTAL WATER SYSTEM COST				\$1,414,000
2	TOTAL SANITARY SEWER SYSTEM COST				\$1,256,000
3	TOTAL STORM SEWER SYSTEM COST				\$1,924,000
4	TOTAL ELECTRICAL SYSTEM COST				\$1,779,000
5	TOTAL TELECOMMUNICATIONS SYSTEMS COST				\$1,624,000
6	TOTAL NATURAL GAS DISTRIBUTION SYSTEM COST				\$354,000
7	TOTAL STEAM TUNNEL DEMOLITION COST				\$2,825,000
8					\$0
9					\$0
10					\$0
TOTAL CONSTRUCTION COST (Items 1-10)					\$11,176,000
11	ENGINEERING				
	Preliminary Engineering		5 % of Items 1-10		\$558,800
	Final Engineering		5 % of Items 1-10		\$558,800
	Construction Engineering		10 % of Items 1-10		\$1,117,600
TOTAL ENGINEERING COST (Item 11)					\$2,235,000
TOTAL UTILITY INFRASTRUCTURE COST					\$13,411,000
	Medical Waste Characterization and Disposal				\$9,800
	Phase I and Phase II ESA services				\$199,012
	Building Hazardous Materials Surveys - 16 buildings				\$204,335
	Building 88 Decontamination & Decommissioning				\$275,000
			20 % of Items 1-10		\$137,629
TOTAL OTHER COSTS					\$617,000
19	BUILDINGS				
	Demolition - Building No. 115	SF	35463	\$60	\$2,130,000
	Demolition - Building No. 116	SF	47282	\$60	\$2,840,000
	Building Relocation - Building 88	Lump Sum	1		\$1,500,000
	Building Contingencies	Lump Sum	35 % of Item 19		\$2,265,000
TOTAL BUILDING COST					\$8,735,000

Cost estimates are based on concept level planning documents, and are subject to change as concepts are refined and further developed.

Above cost include PEPCO Engineering and connection costs of \$35,000, Washington Gas connection fees of \$5,000, and Verizon Engineering and connection costs of \$20,000. These fees are in addition to any consultant design fees outlined in the above costs for infrastructure plans and specifications.

Path Forward with Development of Infrastructure Systems

11.1 Path Forward

It is recommended that the path forward include immediate efforts to develop preliminary infrastructure and roadway plans for the entire east campus. The infrastructure construction is anticipated to be by the Design Build delivery method, with a focus to initiate Stage 1 construction by spring 2013. As an alternative, preliminary plans for the infrastructure systems by stage could be developed.

11.2 Utility Companies

Continued coordination between DDOT and Utility Companies is necessary regarding method of design and scheduling of construction of the facilities that will be later owned and maintained by these companies within the DDOT ROW. Details of design, construction, ownership, and operation will be coordinated and agreed upon during preliminary plans preparation. Other special concerns related to the utilities include the rehabilitation of the outfall lines and the potential for cost impacts from lack of downstream capacity for the storm sewer and wastewater collection systems.

11.3 Preliminary Schedule

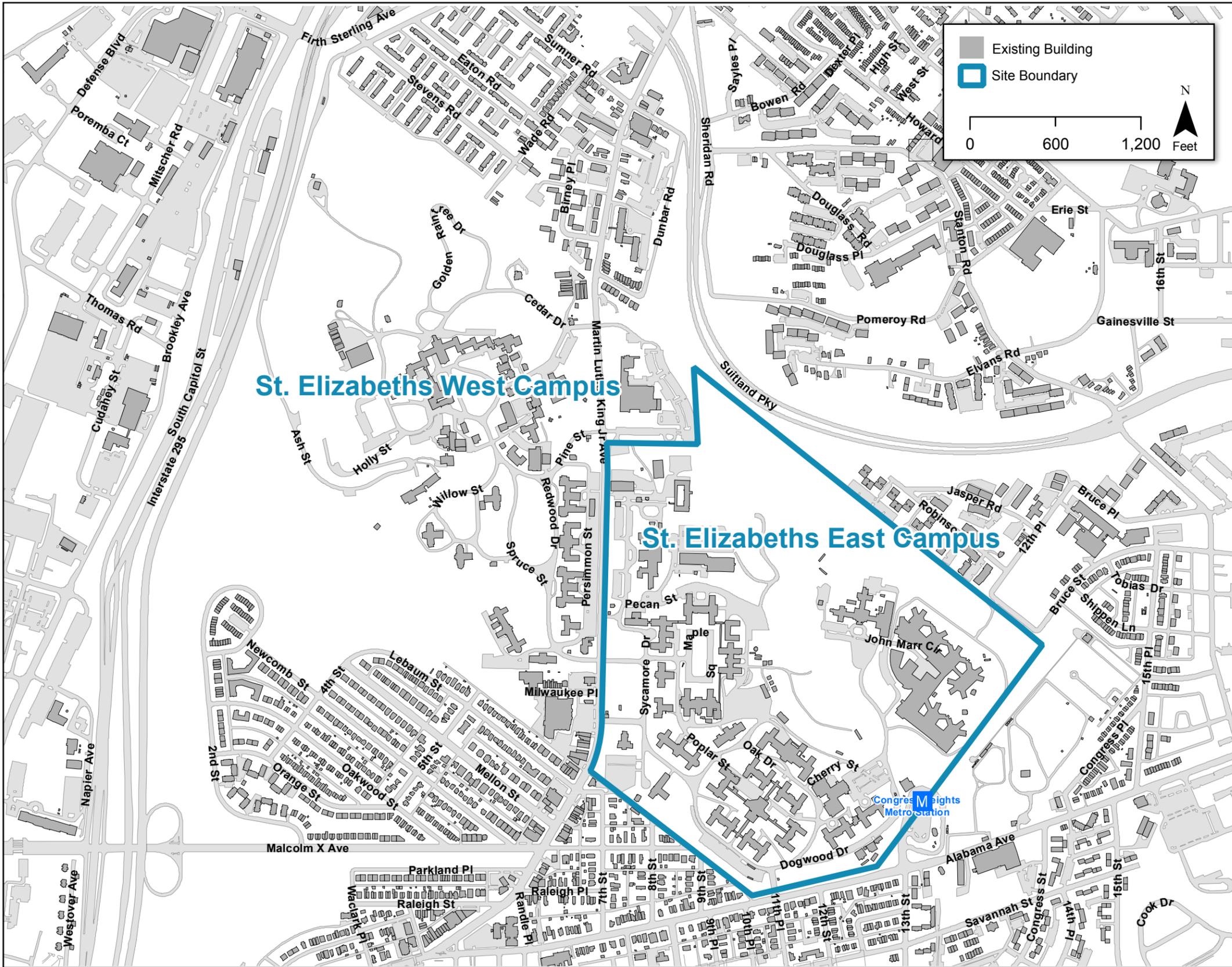
A preliminary schedule of significant milestones is listed below, subject to change during the finalization of this concept plan. A detailed schedule will be a component of the preliminary plans preparation scope:

- Summer 2012 – Begin preparation of preliminary Infrastructure plans and integrate preliminary roadway plans into Stage 1 design build package.
- Summer 2012 – Issue RFQ to pre-qualify design build teams for the east campus Stage 1 infrastructure and roadway construction
- Summer 2012 - Obtain FONSI on east campus EA
- Fall 2012 Site entitlements for east campus obtained
- Fall 2012 - Stage 1 RFP for infrastructure improvements issued
- Winter 2012 – Bids from D/B teams received
- Spring 2013 – Stage 1 infrastructure and roadway contract awarded
- Summer 2013 – Stage 1 construction begins

Appendix 1
St Elizabeth East Campus Mapping

1A

Vicinity Map



TBG100311192330WDC_EA_Vicinity-Map_4

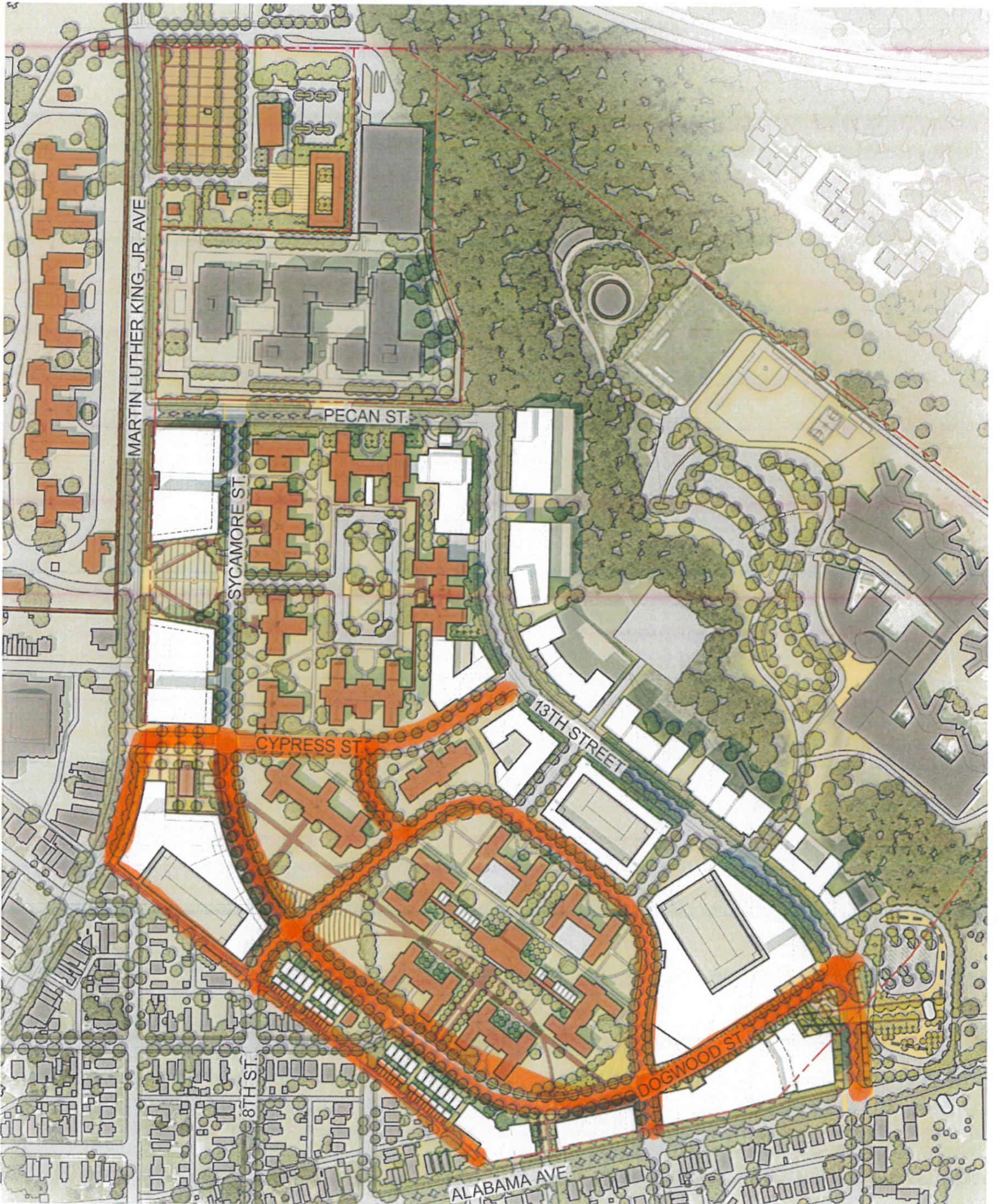
St. Elizabeths East Campus Vicinity Map

1B

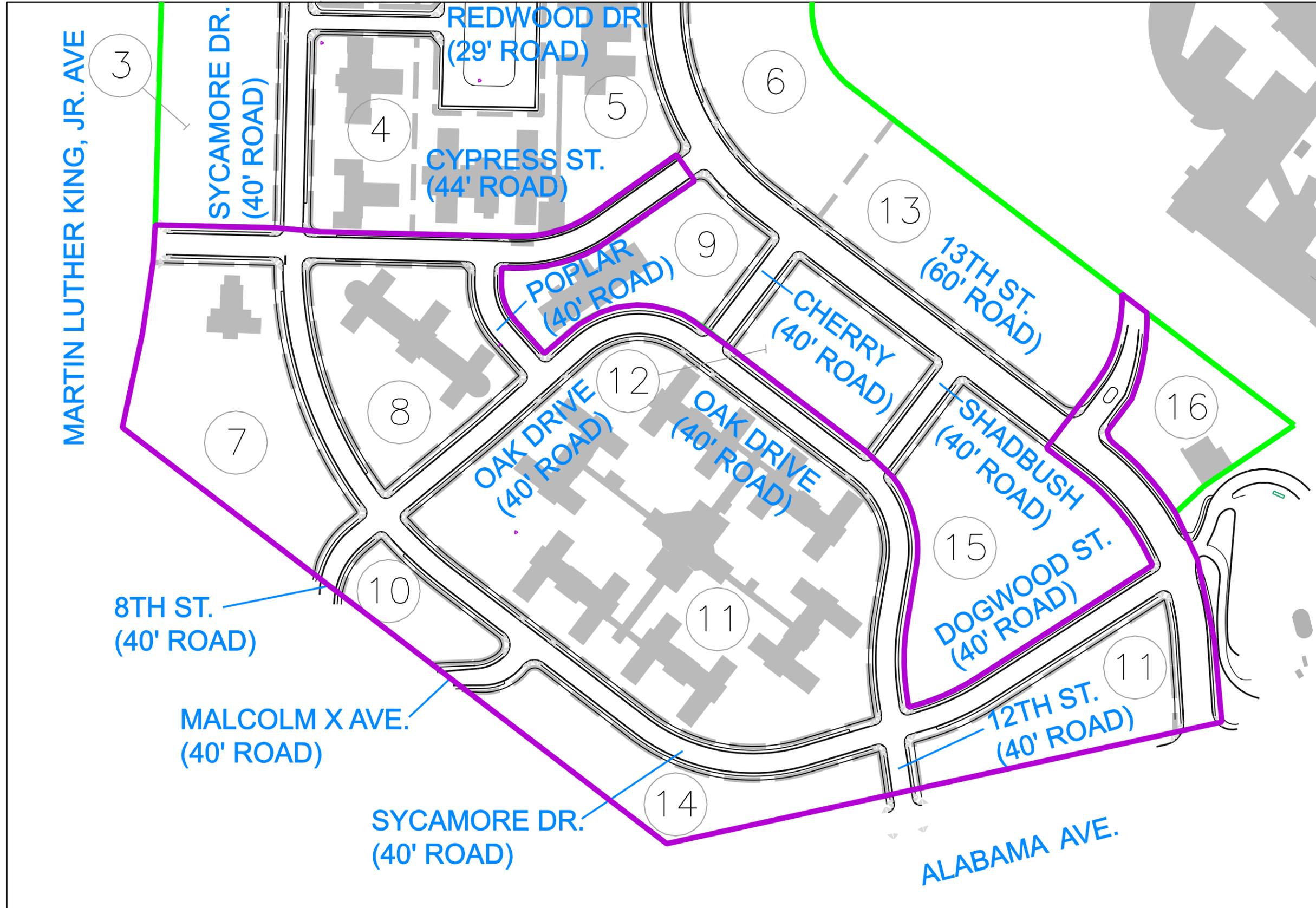
Phased Development Plan for East Campus



ALTERNATIVE 2



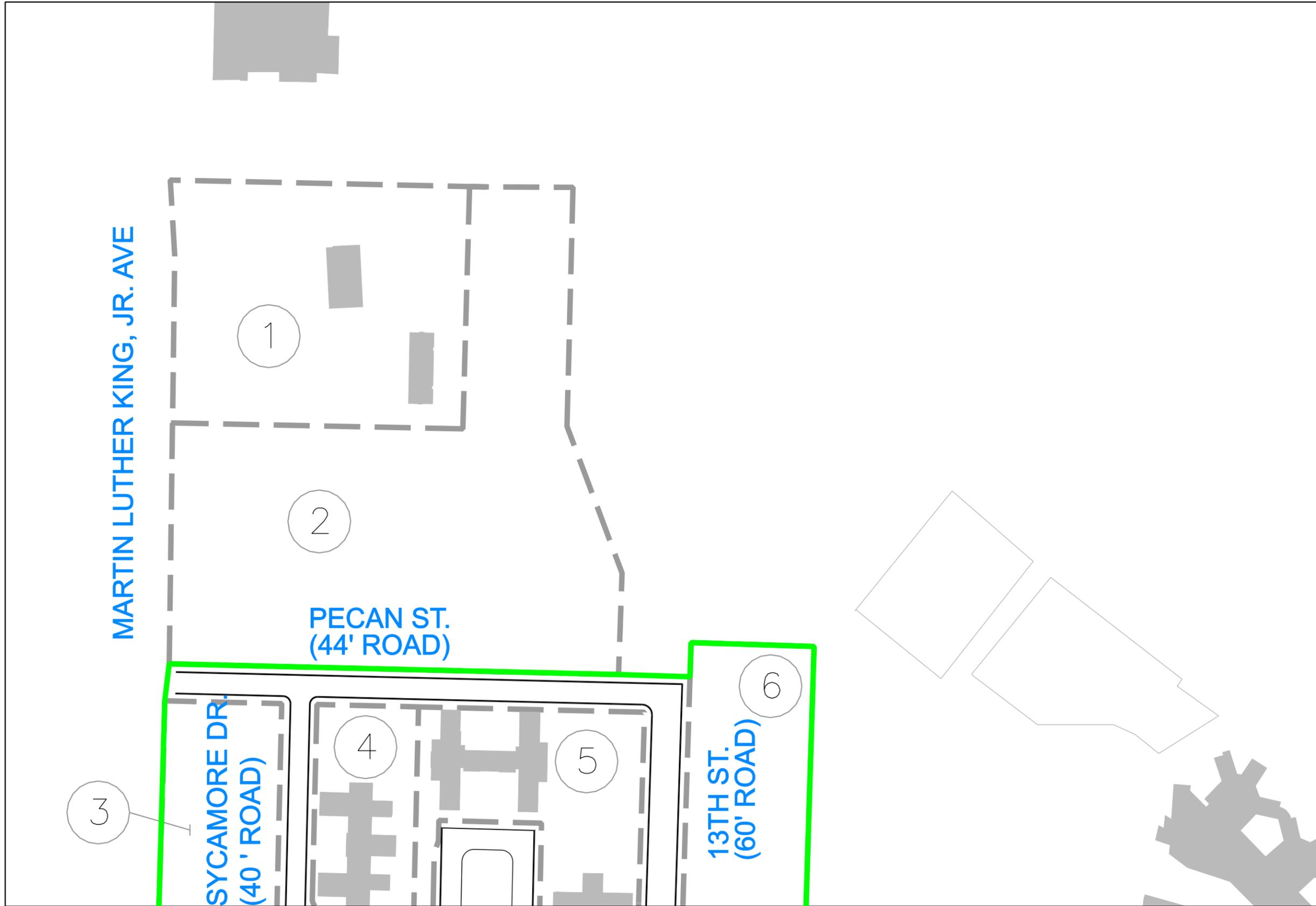
Appendix 2
Parcel Exhibit



- LEGEND
- STAGE 1 DELINEATION
 - STAGE 2 DELINEATION
 - PARCEL BOUNDARIES
 - BUILDINGS TO REMAIN
 - REPORT PARCEL NUMBER

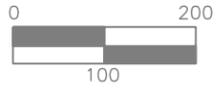
St. Elizabeths East Campus
Road Names & Parcel
Numbers





- LEGEND**
- STAGE 2 DELINEATION
 - PARCEL BOUNDARIES
 - BUILDINGS TO REMAIN
 - 1 REPORT PARCEL NUMBER

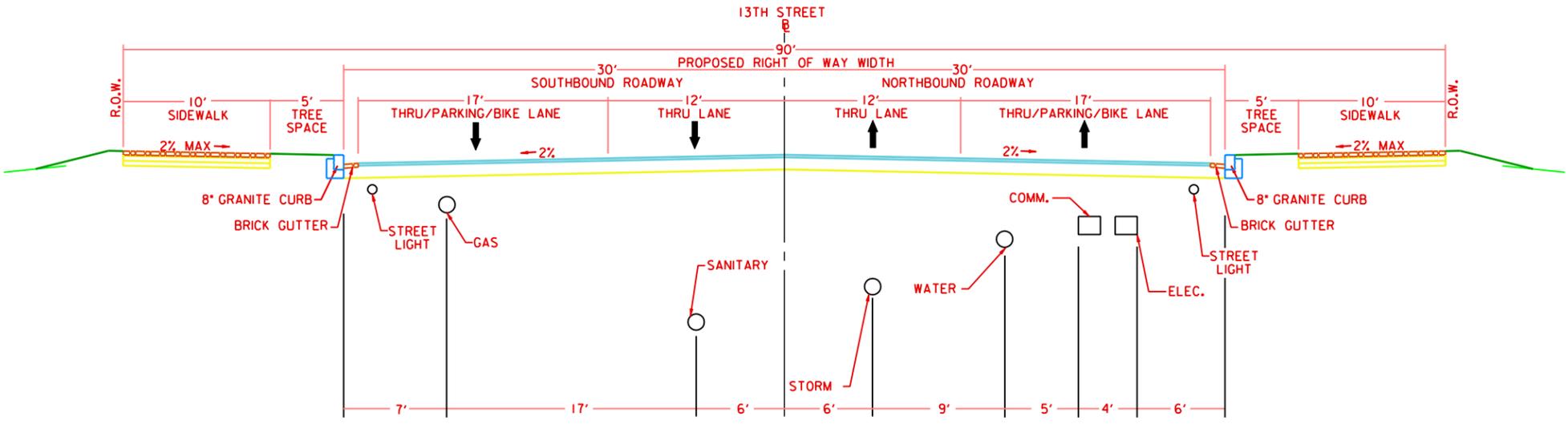
St. Elizabeths East Campus
Road Names & Parcel
Numbers



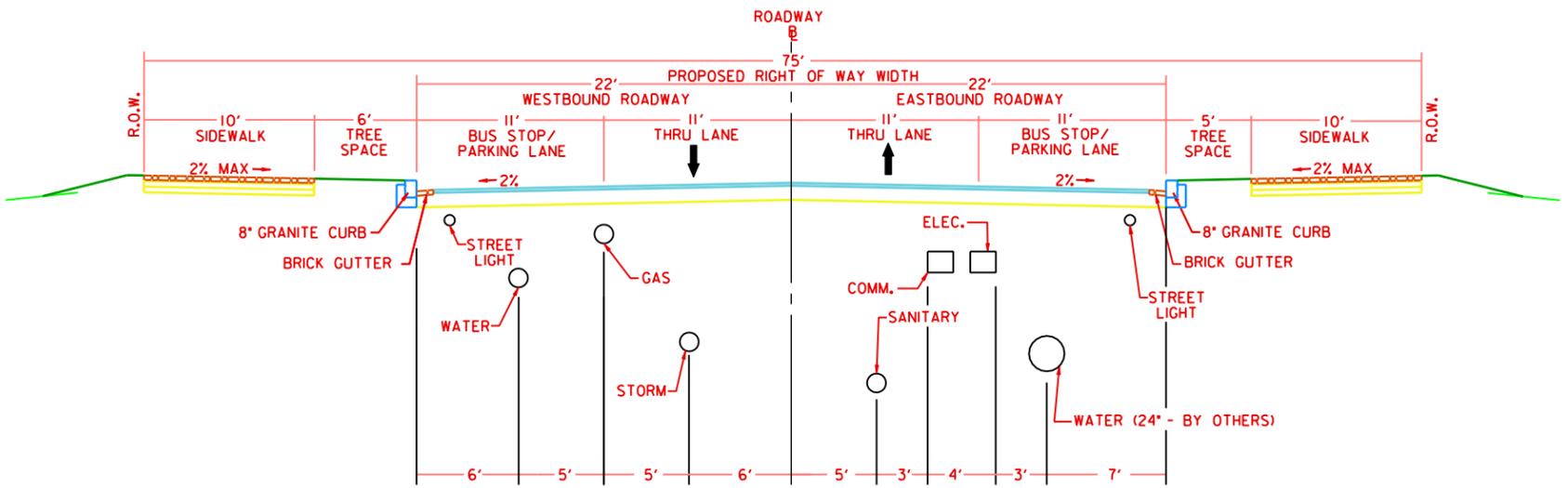
SEE SHEET 1 OF 2 FOR CONTINUATION

Appendix 3
Utility Placement Typical Sections

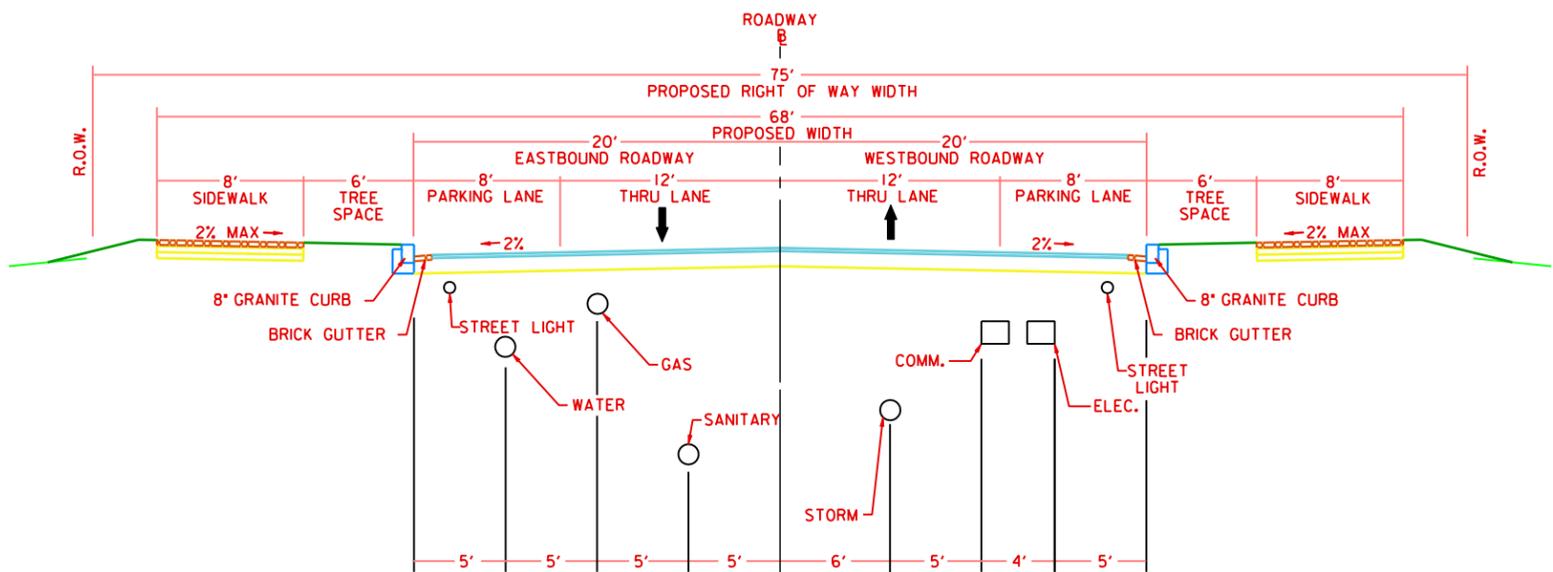
13TH STREET (LOOKING NORTH OR WEST) ONLY



PECAN ST (LOOKING EAST) ONLY



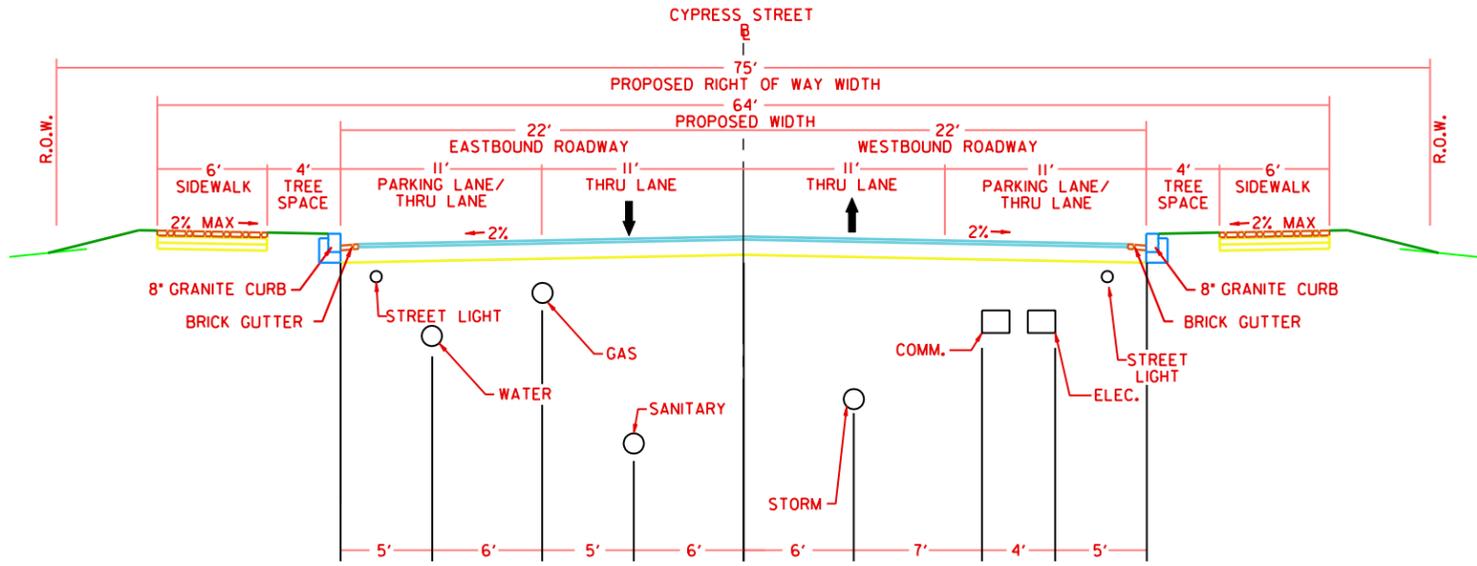
40' ROADWAY (LOOKING NORTH OR WEST) TYPICAL



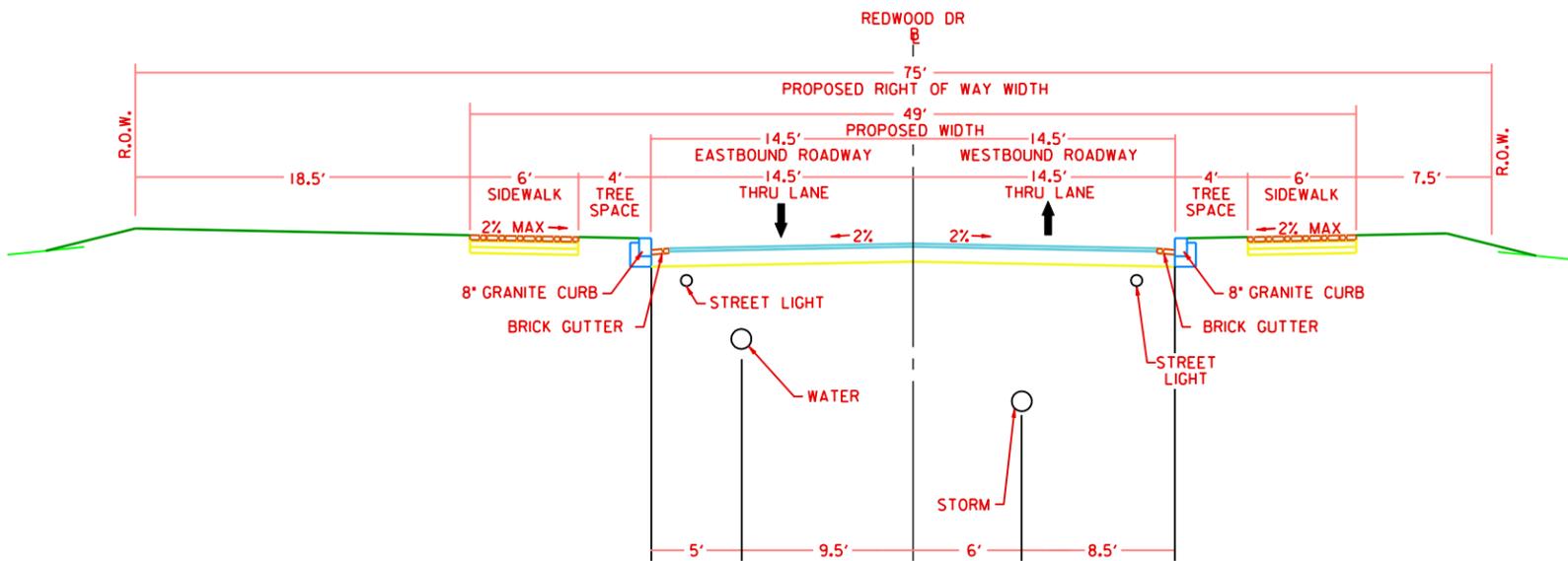
NOTE:

UTILITY INSTALLATION WILL BE DONE IN ACCORDANCE WITH THE STANDARDS OF EACH UTILITY. EXACT DEPTH OF COVER WILL BE DETERMINED DURING PREPARATION OF THE UTILITY PLANS AND COORDINATED WITH DDOT AND THE RESPONSIBLE UTILITY COMPANY

CYPRESS STREET (LOOKING NORTH OR WEST) ONLY



REDWOOD DRIVE (LOOKING WEST) ONLY



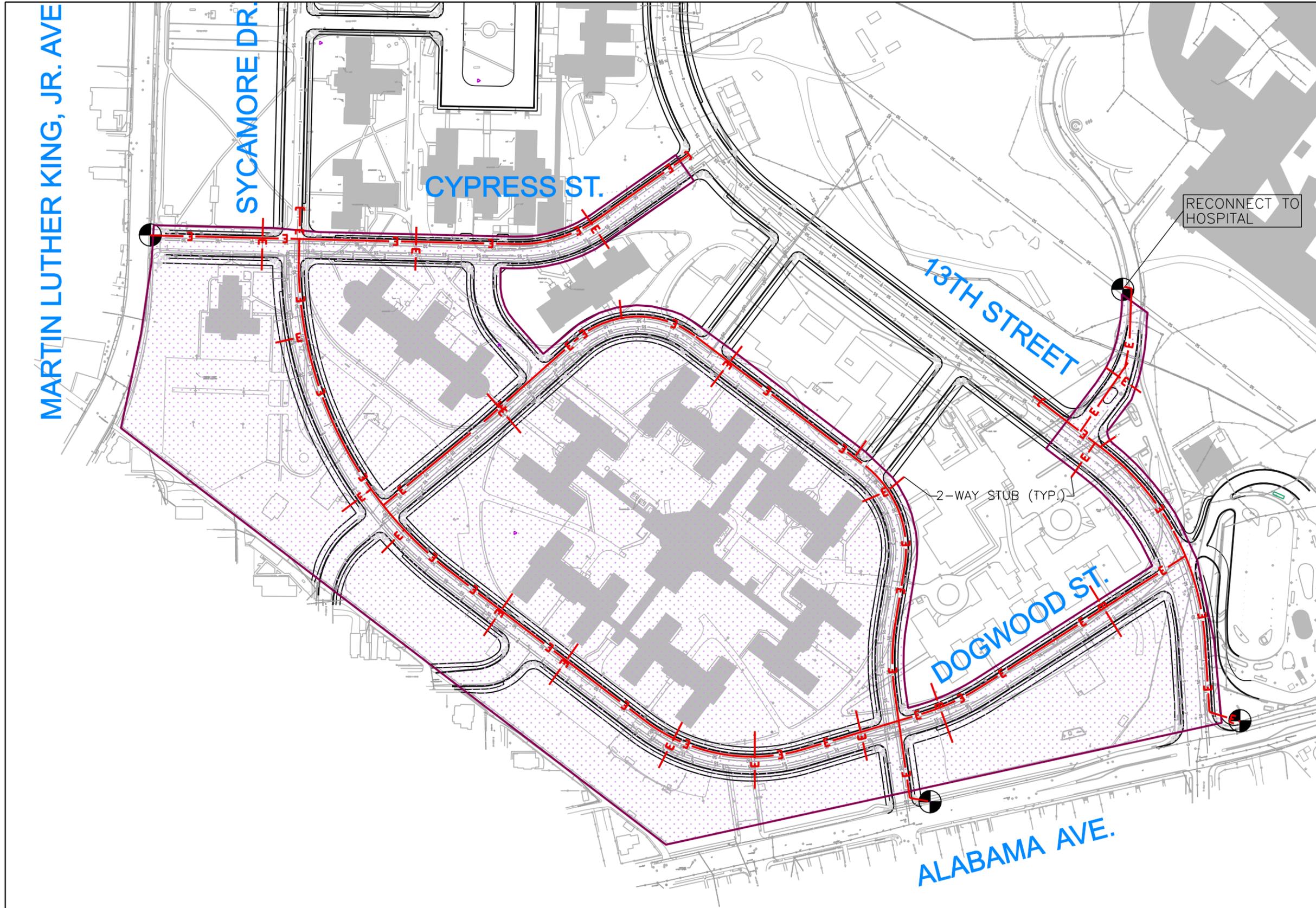
NOTE:

UTILITY INSTALLATION WILL BE DONE IN ACCORDANCE WITH THE STANDARDS OF EACH UTILITY. EXACT DEPTH OF COVER WILL BE DETERMINED DURING PREPARATION OF THE UTILITY PLANS AND COORDINATED WITH DDOT AND THE RESPONSIBLE UTILITY COMPANY

Appendix 4
Electrical Distribution System

4A

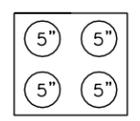
Electrical – Stage 1



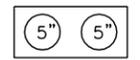
LEGEND

-  STORM DRAIN
-  SANITARY SEWER
-  ELECTRIC
-  TELECOMM
-  WATER
-  GAS
-  STAGE 1 DELINEATION
-  PARCEL BOUNDARIES
-  BUILDINGS TO REMAIN
-  STAGE 1 AREA
-  POINT OF CONNECTION
-  TEMPORARY CAP

 3' MIN. COVER (TYP.)

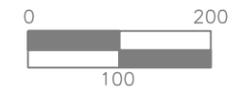


4-Way Concrete Encased
Ductbank In Street
2-Active; 2-Spare



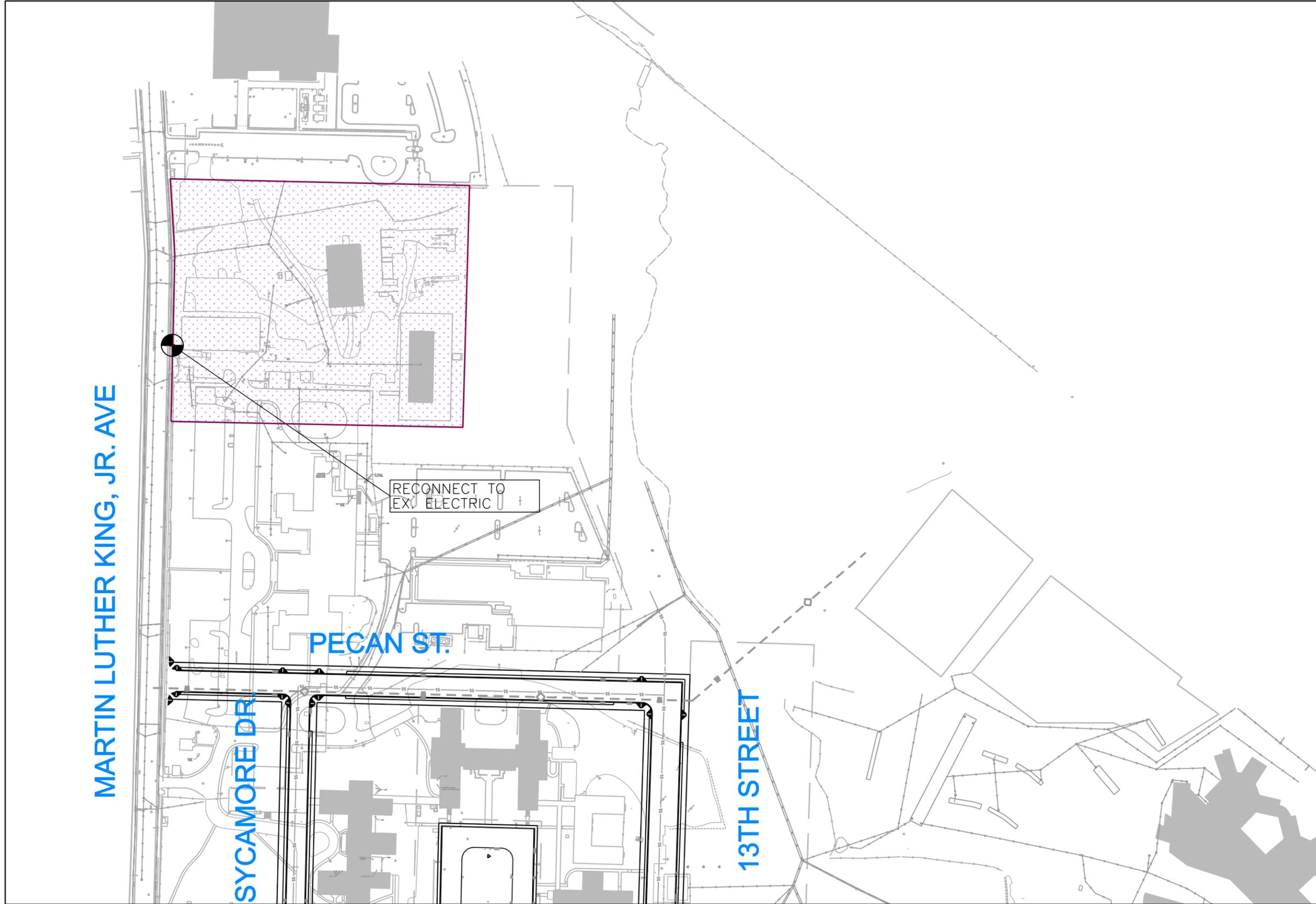
2-Way Concrete Encased
Ductbank
Stub From Manhole To
Property Line (To Preclude
Roadway Disturbance)

**St. Elizabeths East Campus
Electric Layout-Stage 1**



4B

Electrical – Stage 2



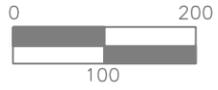
- LEGEND**
- STORM DRAIN
 - SANITARY SEWER
 - ELECTRIC
 - TELECOMM
 - WATER
 - GAS
 - STAGE 1 DELINEATION
 - PARCEL BOUNDARIES
 - BUILDINGS TO REMAIN
 - STAGE 1 AREA
 - POINT OF CONNECTION

3' MIN. COVER (TYP.)

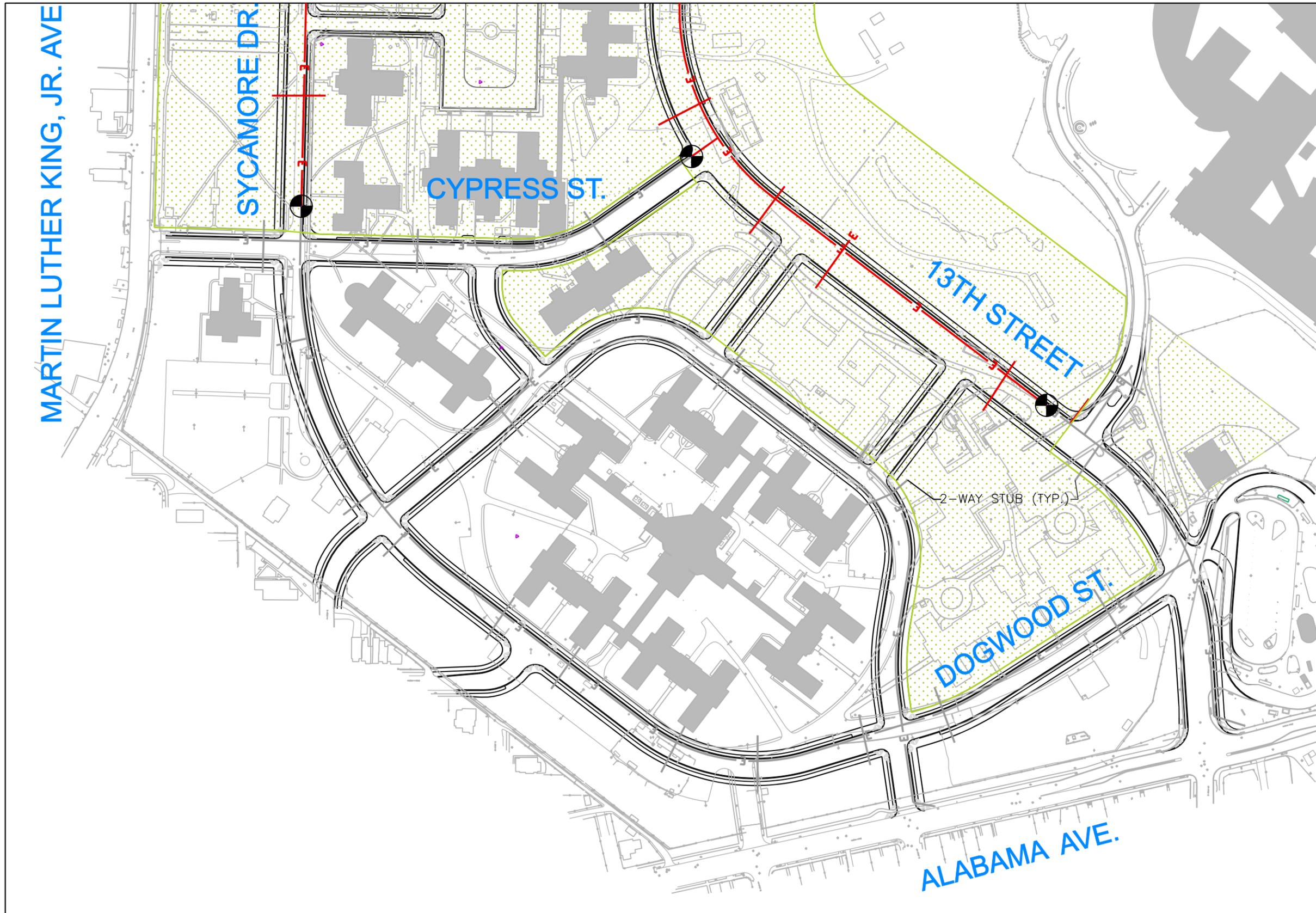
4-Way Concrete Encased Ductbank In Street
2-Active; 2-Spare

2-Way Concrete Encased Ductbank
Stub From Manhole To Property Line (To Preclude Roadway Disturbance)

**St. Elizabeths East Campus
Electric Layout—Stage 1**



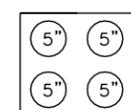
SEE SHEET 1 OF 2 FOR CONTINUATION



LEGEND

- STORM DRAIN
- SANITARY SEWER
- ELECTRIC (STAGE 2)
- ELECTRIC (STAGE 1)
- TELECOMM
- WATER
- GAS
- STAGE 2 DELINEATION
- PARCEL BOUNDARIES
- BUILDINGS TO REMAIN
- STAGE 2 AREA
- POINT OF CONNECTION

3' MIN. COVER (TYP.)

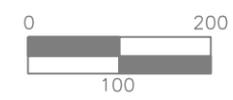


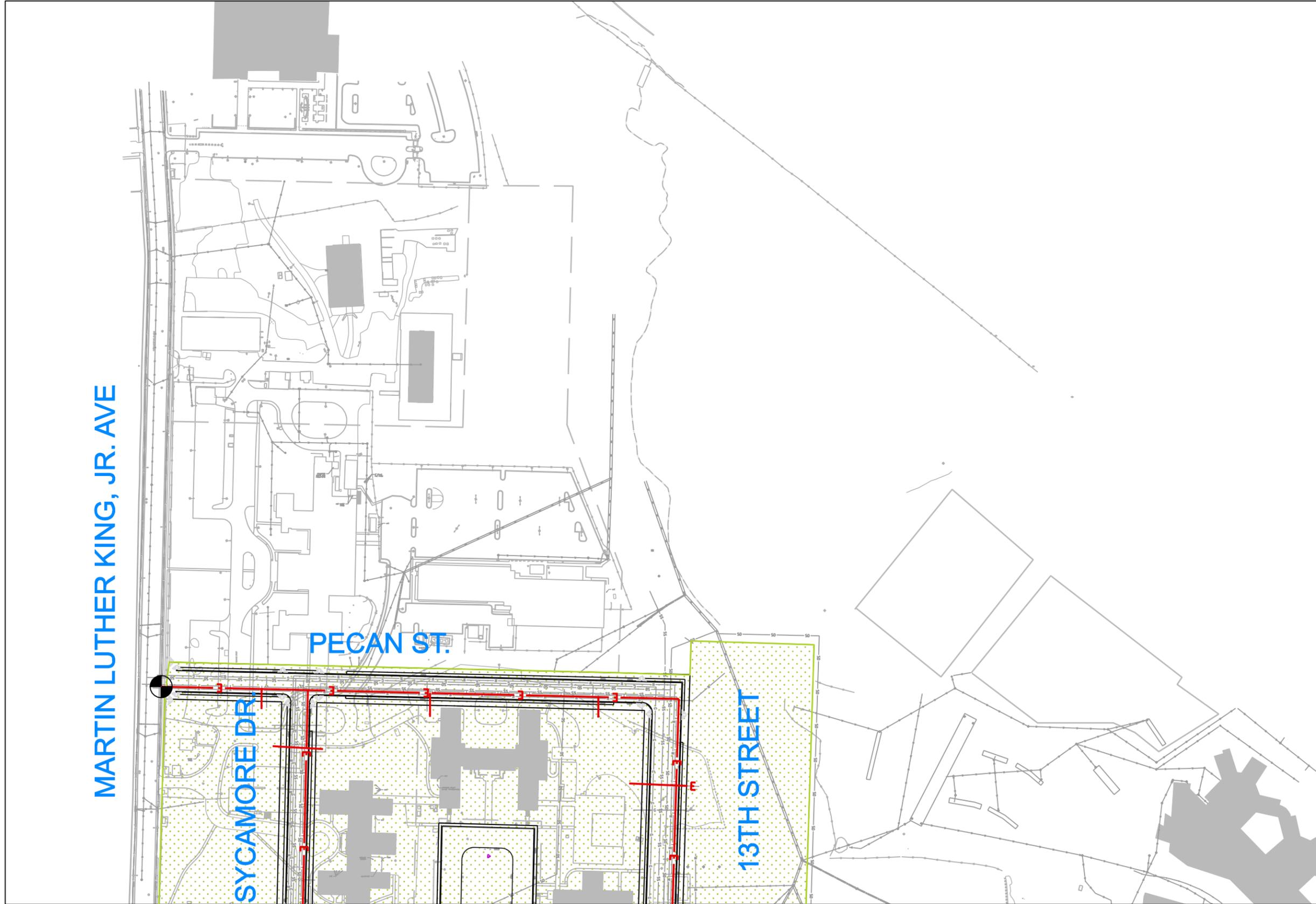
4-Way Concrete Encased
Ductbank In Street
2-Active; 2-Spare



2-Way Concrete Encased
Ductbank
Stub From Manhole To
Property Line (To Preclude
Roadway Disturbance)

**St. Elizabeths East Campus
Electric Layout-Stage 2**





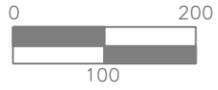
- LEGEND**
- STORM DRAIN
 - SANITARY SEWER
 - ELECTRIC
 - TELECOMM
 - WATER
 - GAS
 - STAGE 2 DELINEATION
 - PARCEL BOUNDARIES
 - BUILDINGS TO REMAIN
 - STAGE 2 AREA
 - POINT OF CONNECTION

3' MIN. COVER (TYP.)

4-Way Concrete Encased Ductbank In Street
2-Active; 2-Spare

2-Way Concrete Encased Ductbank
Stub From Manhole To Property Line (To Preclude Roadway Disturbance)

**St. Elizabeths East Campus
Electric Layout-Stage 2**



SEE SHEET 1 OF 2 FOR CONTINUATION

4C

Electrical Power Load Calculations

St. Elizabeth's East
 Building Gross Area Tabulation/Summary
 Based on Alt 2 Proposed Land Use
 April 19, 2012

Parcel	Historic Bldgs	Comments	Retail	Residential	(# of D.U.)	Large Office	Small Office	Institution	Civic	Hotel	Parking	Totals
1		New Construction	13,000			367,300						
2		New Construction	55,026			189,740						
3		New Construction	68,507	274,028								
4		New Construction			17							
5		New Construction	6,468	77,312	20							
6		New Construction	17,567	87,835								
7		New Construction	65,515			362,145						
8		New Construction	56,160	384,504		303,949						
9		New Construction		219,308								
10		New Construction						128,164				
11		New Construction						111,448				
12		New Construction								115,944		
13A		New Construction				230,568						
13B		New Construction				218,352						
13C		New Construction		204,296								
14A		New Construction		169,264								
14B		New Construction		210,928								
15		New Construction	7,000							131,152		
16		Agriculture Site (no buildings)										
17		Agriculture Site (no buildings)										
88		Historic Bldg to be Refurbished							22,590			
89		Historic Bldg to be Refurbished					31,278					
90		Historic Bldg to be Refurbished								107,455		
92		Historic Bldg to be Refurbished						111,930				
93		Historic Bldg to be Refurbished					139,926					
94		Historic Bldg to be Refurbished					13,869					
95		Historic Bldg to be Refurbished					18,275					
100		Historic Bldg to be Refurbished							39,099			
102		Historic Bldg to be Refurbished						33,920				
106		Historic Bldg to be Refurbished						41,000				
107		Historic Bldg to be Refurbished						41,000				
108		Historic Bldg to be Refurbished					35,123					
109		Historic Bldg to be Refurbished						51,062				
110		Historic Bldg to be Refurbished					35,164					
111		Historic Bldg to be Refurbished						41,000				
112		Historic Bldg to be Refurbished						41,000				
FEMA		New Construction				750,000						
Parking		Parking Scattered Beneath New Large Bldgs									800,000	
Area by Use/Occupancy (sf)			289,243	1,627,475	37	2,422,054	273,635	600,524	61,689	354,551	800,000	6,429,171
Design Load Rate (w/sf)			25	10		20	20	35	25	20	2	
Design Load by Use/Occupancy (kw)			7,231	16,275		48,441	5,473	21,018	1,542	7,091	1,600	108,671
Utility Co. Diversified/Demand Load (kw)			4,339	9,765		29,065	3,284	12,611	925	4,255	960	65,203

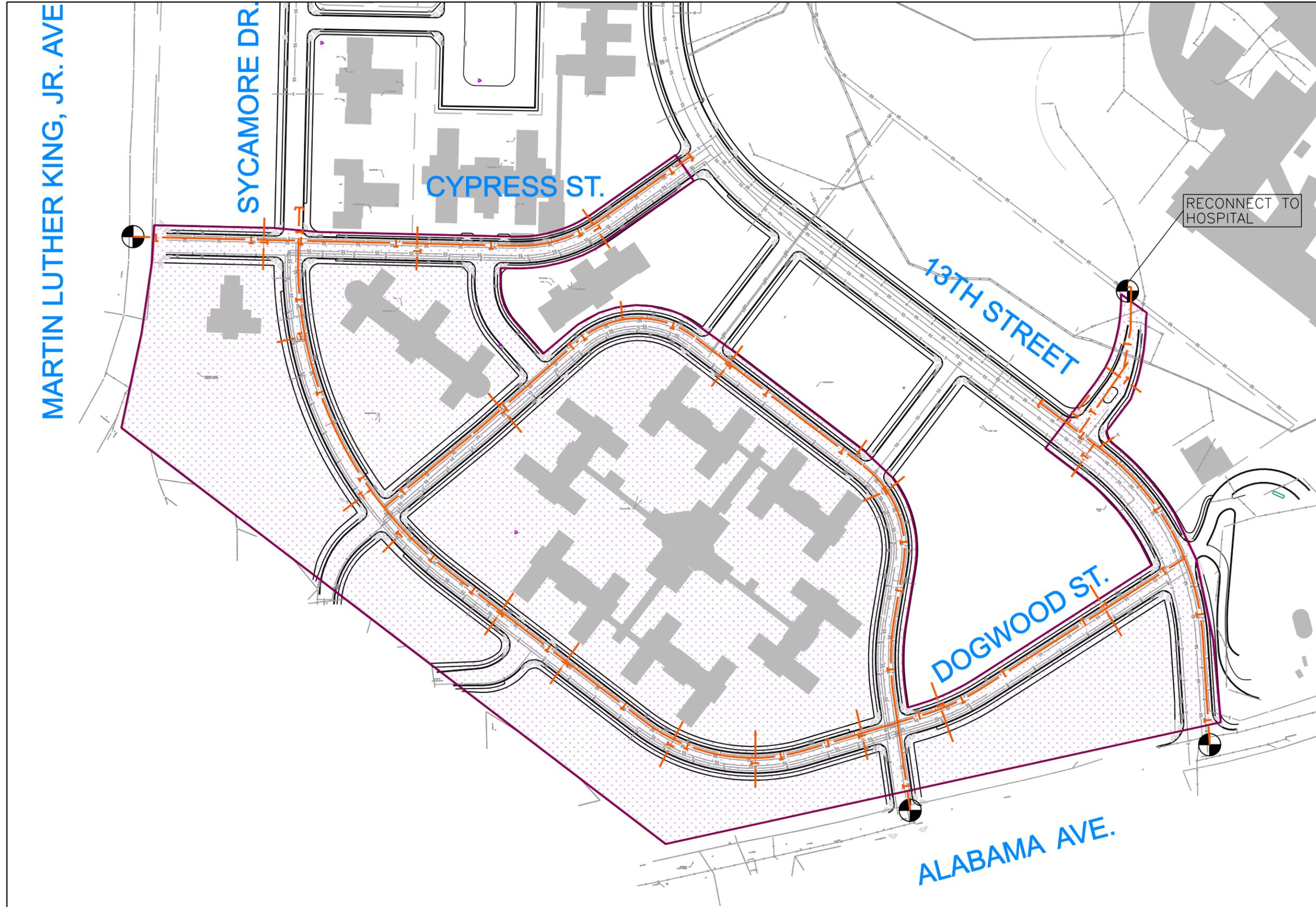
Electrical Load Summary

	Area (sf)	Calculated Maximum Demand (kw)	Diversified Demand (kw)
Retail	289,243	7,231	4,339
Residential	1,627,475	16,275	9,765
Large Office	2,422,054	48,441	29,065
Small Office	273,635	5,473	3,284
Institution	600,524	21,018	12,611
Civic	61,689	1,542	925
Hotel	354,551	7,091	4,255
Parking	800,000	1,600	960
Totals	6,429,171	108,671	65,203

Appendix 5
IT/Communications Systems

5A

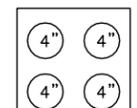
IT/Communication – Stage 1



LEGEND

- STORM DRAIN
- SANITARY SEWER
- ELECTRIC
- TELECOMM
- WATER
- GAS
- STAGE 1 DELINEATION
- PARCEL BOUNDARIES
- BUILDINGS TO REMAIN
- STAGE 1 AREA
- POINT OF CONNECTION
- TEMPORARY CAP

3' MIN. COVER (TYP.)

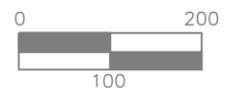


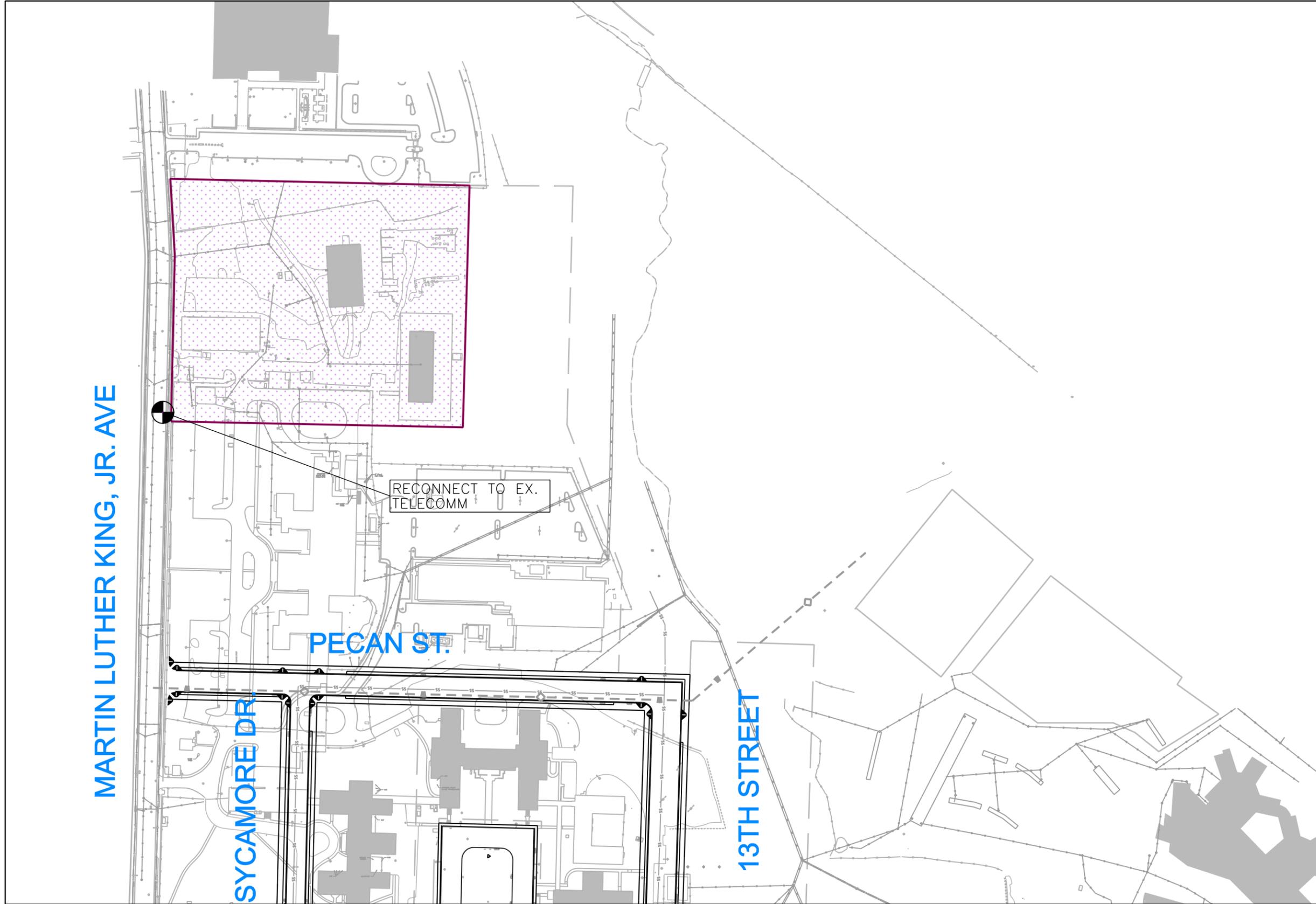
4-Way Concrete Encased
Ductbank In Street
2-Active; 2-Spare



2-Way Concrete Encased
Ductbank
Stub From Manhole To
Property Line (To Preclude
Roadway Disturbance)

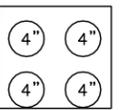
St. Elizabeths East Campus
Telecomm Layout-Stage 1



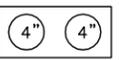


- LEGEND**
- STORM DRAIN
 - SANITARY SEWER
 - ELECTRIC
 - TELECOMM
 - WATER
 - GAS
 - STAGE 1 DELINEATION
 - PARCEL BOUNDARIES
 - BUILDINGS TO REMAIN
 - STAGE 1 AREA
 - POINT OF CONNECTION

3' MIN. COVER (TYP.)



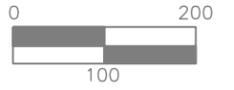
4-Way Concrete Encased
Ductbank In Street
2-Active; 2-Spare



2-Way Concrete Encased
Ductbank
Stub From Manhole To
Property Line (To Preclude



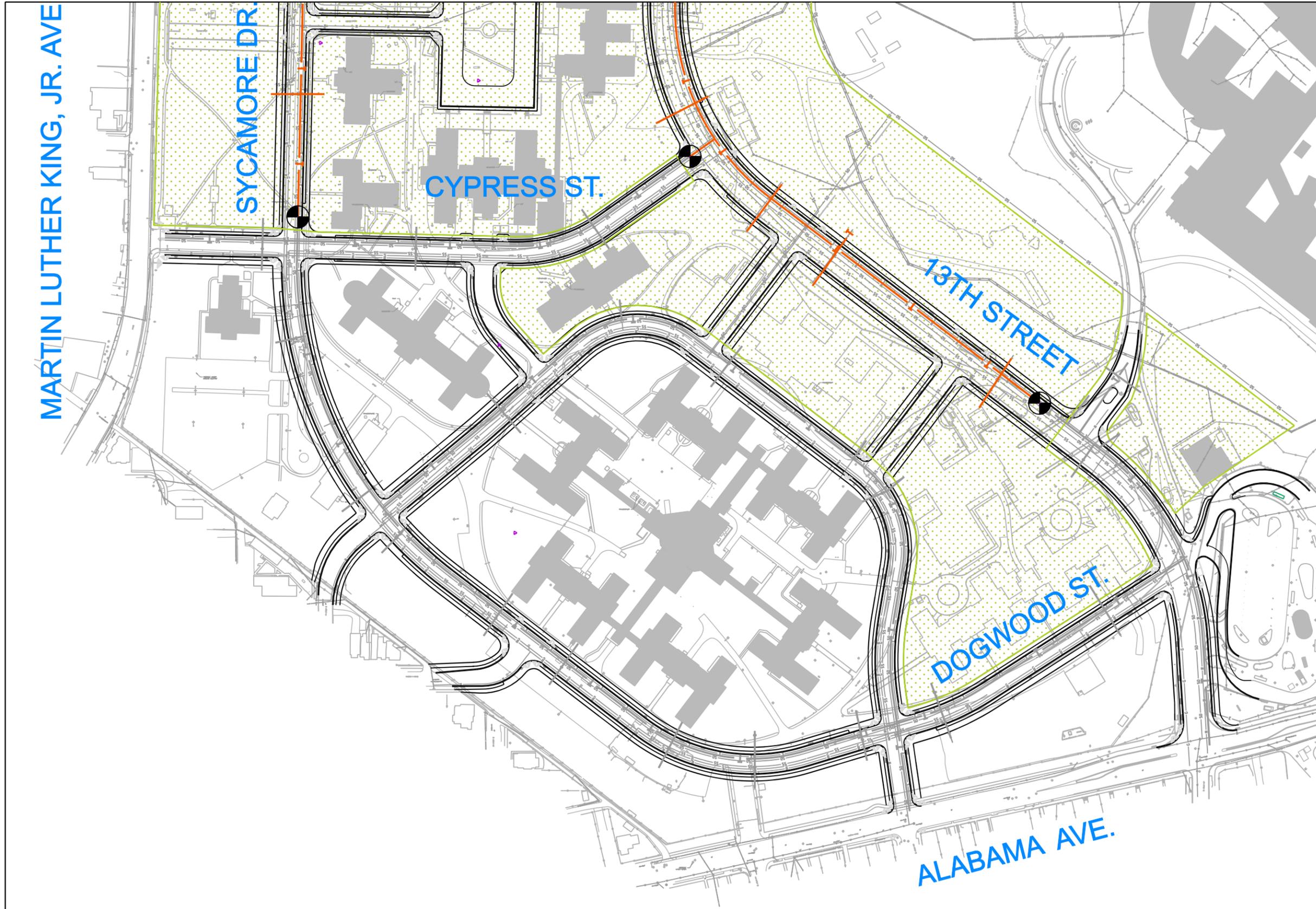
**St. Elizabeths East Campus
Telecomm Layout-Stage 1**



SEE SHEET 1 OF 2 FOR CONTINUATION

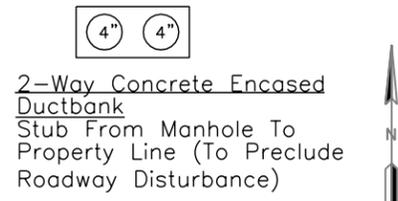
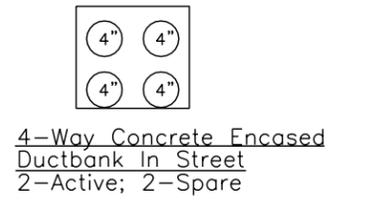
5B

IT/Communication – Stage 2

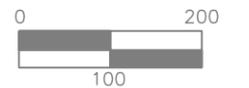


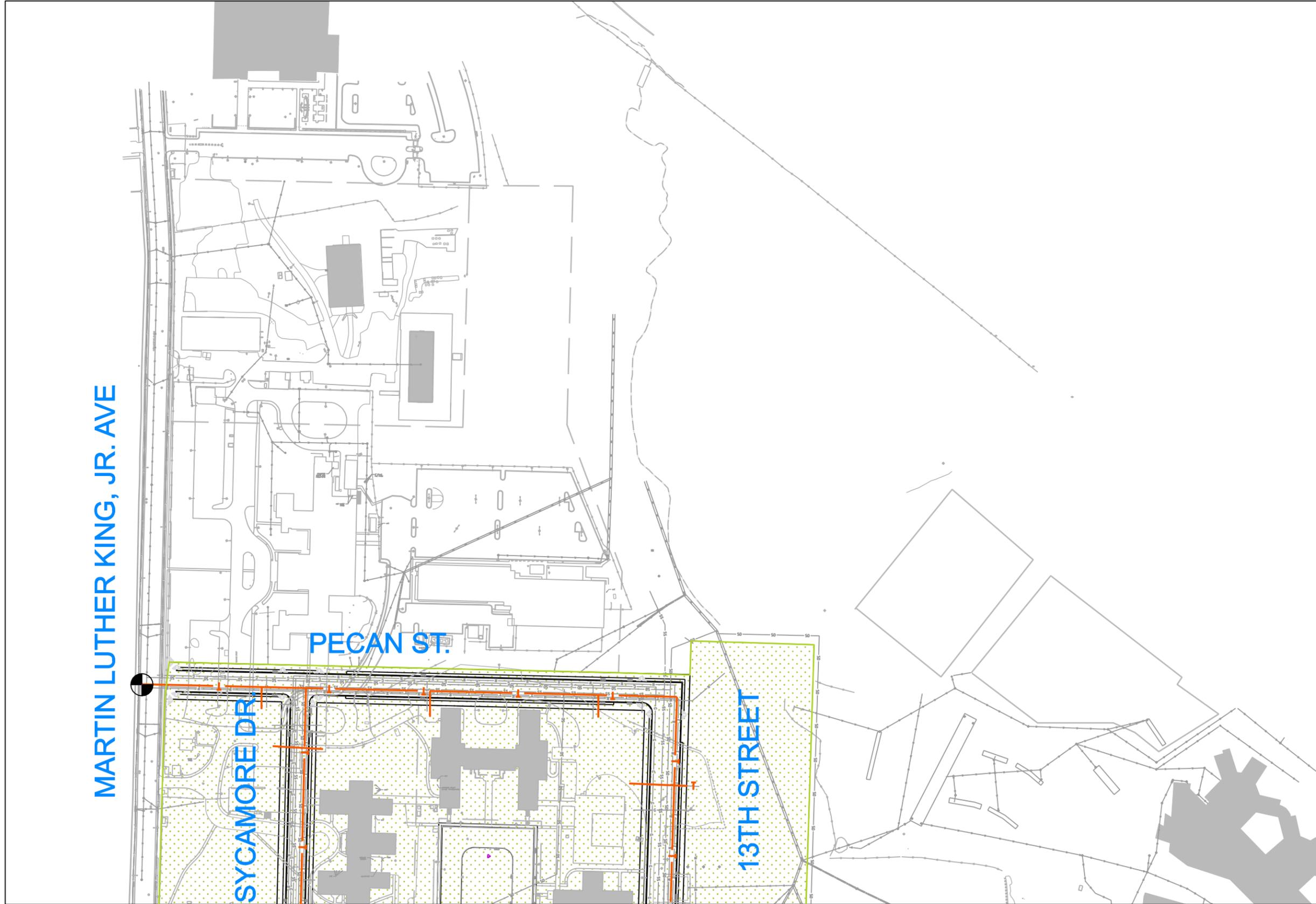
LEGEND

- STORM DRAIN
- SANITARY SEWER
- ELECTRIC
- TELECOMM (STAGE 2)
- TELECOMM (STAGE 1)
- WATER
- GAS
- STAGE 2 DELINEATION
- PARCEL BOUNDARIES
- BUILDINGS TO REMAIN
- STAGE 2 AREA
- POINT OF CONNECTION

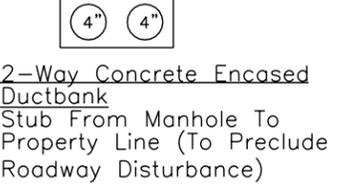
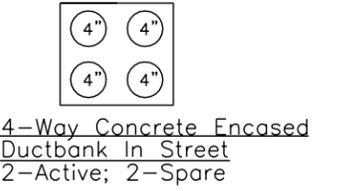


St. Elizabeths East Campus
Telecomm Layout-Stage 2

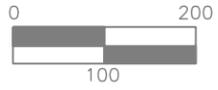




- LEGEND**
- STORM DRAIN
 - SANITARY SEWER
 - ELECTRIC
 - TELECOMM
 - WATER
 - GAS
 - STAGE 2 DELINEATION
 - PARCEL BOUNDARIES
 - BUILDINGS TO REMAIN
 - STAGE 2 AREA
 - POINT OF CONNECTION



**St. Elizabeths East Campus
Telecomm Layout—Stage 2**

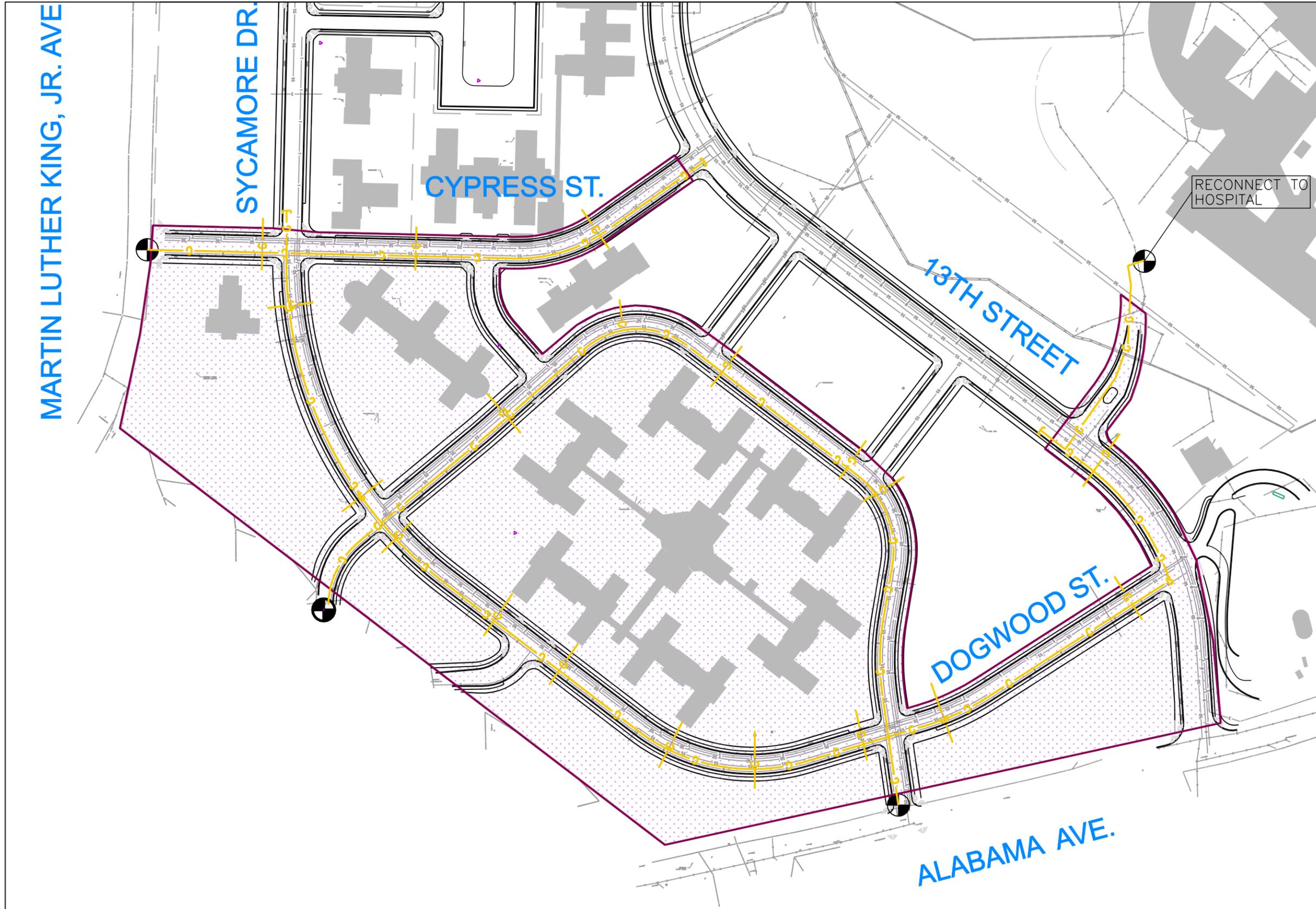


SEE SHEET 1 OF 2 FOR CONTINUATION

Appendix 6
Natural Gas Distribution System

6A

Natural Gas – Stage 1



LEGEND

-  STORM DRAIN
-  SANITARY SEWER
-  ELECTRIC
-  TELECOMM
-  WATER
-  GAS
-  STAGE 1 DELINEATION
-  PARCEL BOUNDARIES
-  BUILDINGS TO REMAIN
-  STAGE 1 AREA
-  POINT OF CONNECTION
-  TEMPORARY CAP

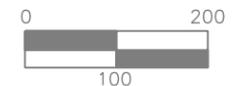
 3' MIN. COVER (TYP.)

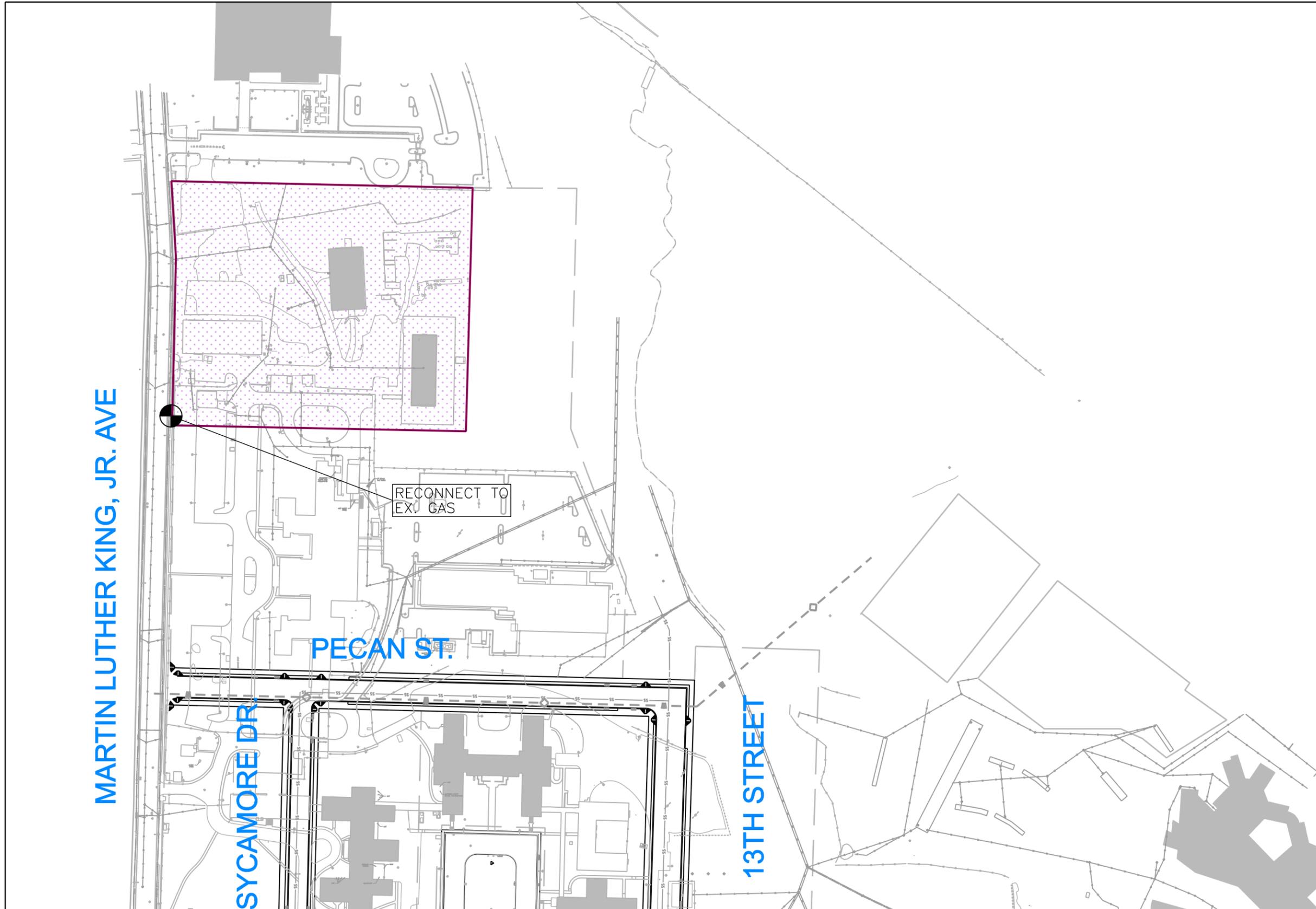
MATERIALS:

GAS IN STREET -
4" PLASTIC PIPE @ 20#
PRESSURE

BUILDING CONNECTIONS -
1.5" PLASTIC (TYP.)

**St. Elizabeths East Campus
Gas Layout - Stage 1**





LEGEND

-  STORM DRAIN
-  SANITARY SEWER
-  ELECTRIC
-  TELECOMM
-  WATER
-  GAS
-  STAGE 1 DELINEATION
-  PARCEL BOUNDARIES
-  BUILDINGS TO REMAIN
-  STAGE 1 AREA
-  POINT OF CONNECTION

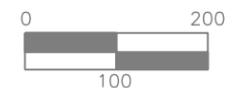


MATERIALS:

GAS IN STREET –
4" PLASTIC PIPE @ 20#
PRESSURE

BUILDING CONNECTIONS –
1.5" PLASTIC (TYP.)

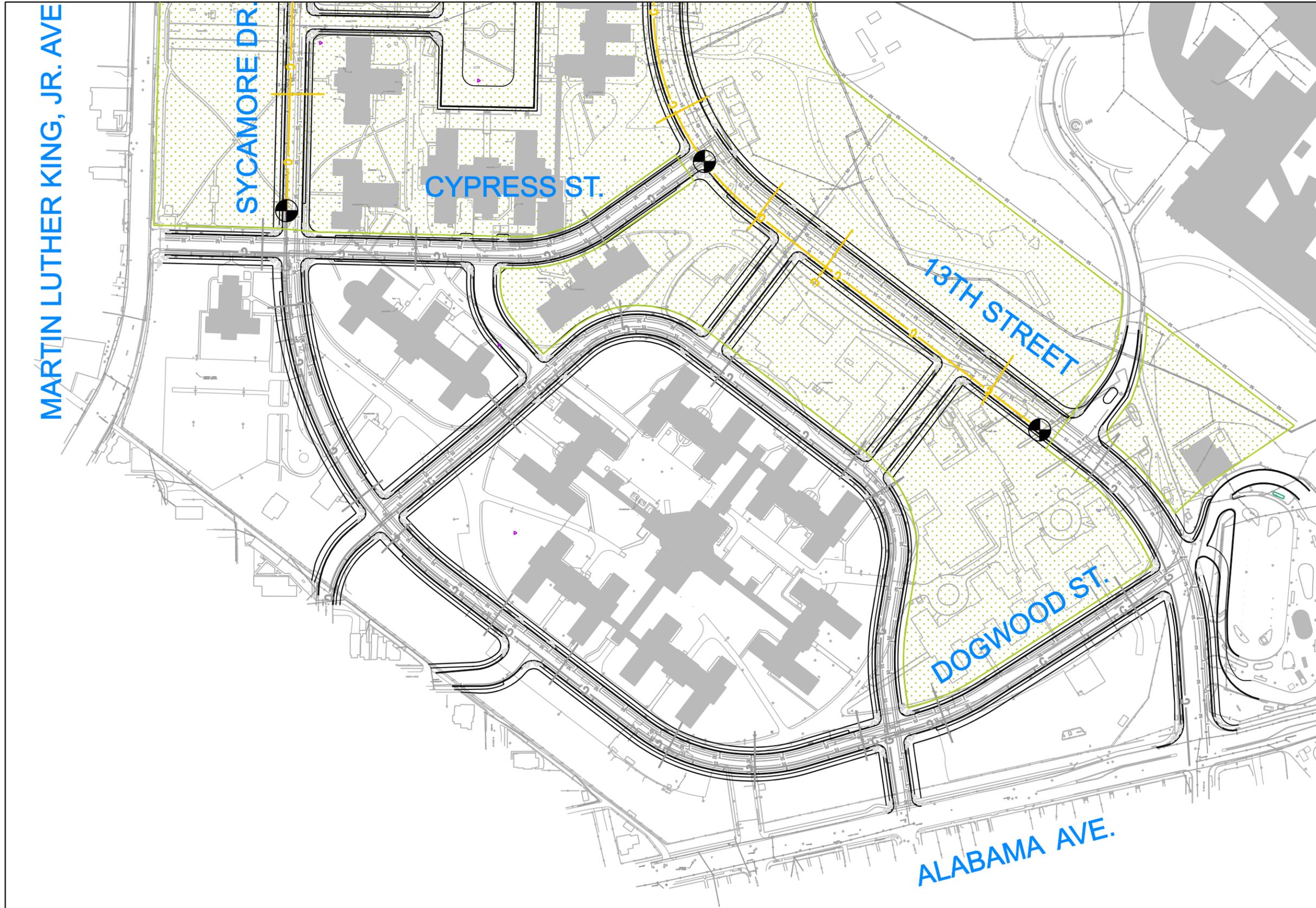
**St. Elizabeths East Campus
Gas Layout—Stage 1**



SEE SHEET 1 OF 2 FOR CONTINUATION

6B

Natural Gas - Stage 2



LEGEND

-  STORM DRAIN
-  SANITARY SEWER
-  ELECTRIC
-  TELECOMM
-  WATER
-  GAS (STAGE 2)
-  GAS (STAGE 1)
-  STAGE 2 DELINEATION
-  PARCEL BOUNDARIES
-  BUILDINGS TO REMAIN
-  STAGE 2 AREA
-  POINT OF CONNECTION

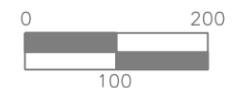
 3' MIN. COVER (TYP.)

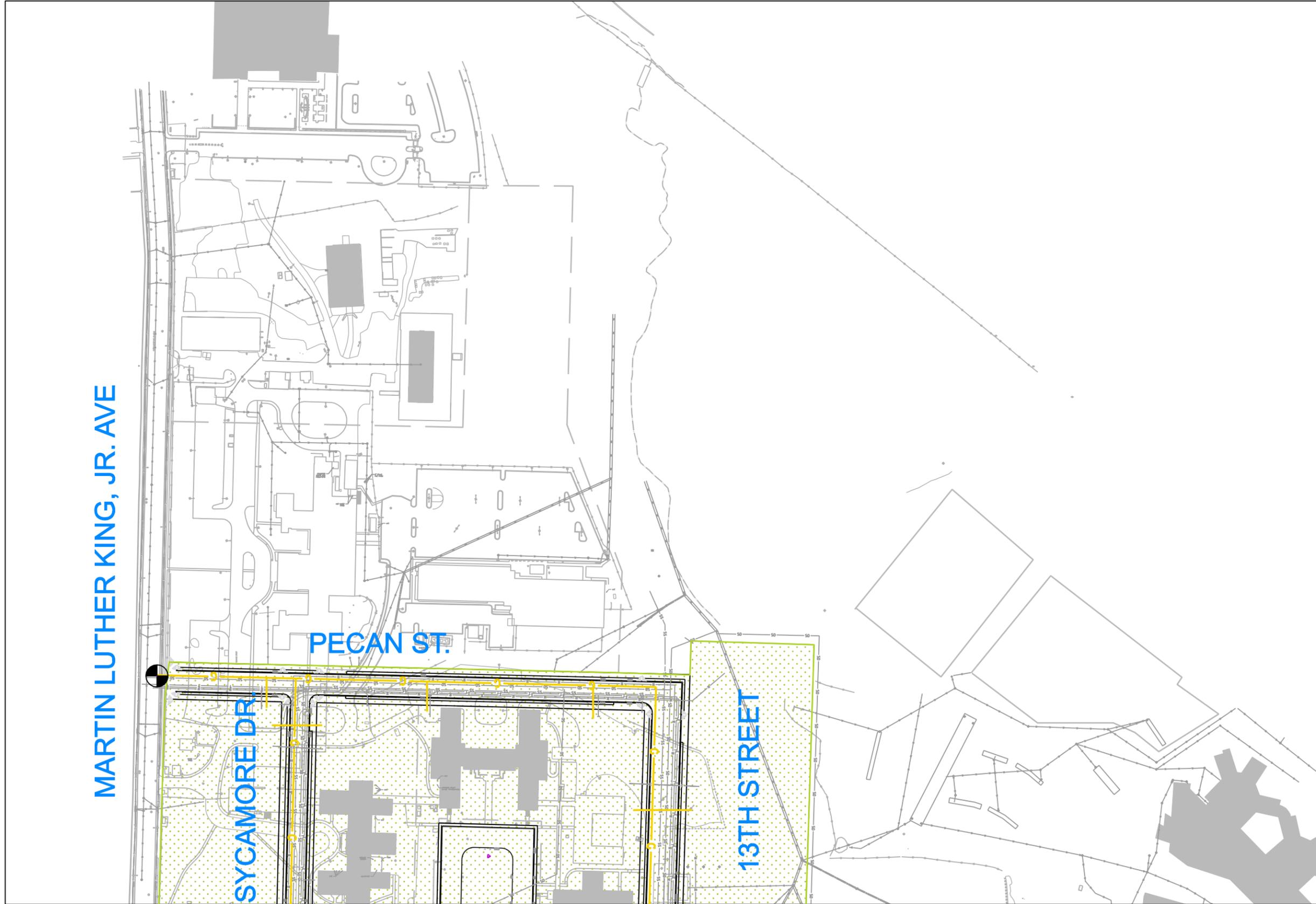
MATERIALS:

GAS IN STREET -
4" PLASTIC PIPE @ 20#
PRESSURE

BUILDING CONNECTIONS -
1.5" PLASTIC (TYP.)

**St. Elizabeths East Campus
Gas Layout - Stage 2**





- LEGEND**
- S—S— STORM DRAIN
 - SS—SS— SANITARY SEWER
 - E—E— ELECTRIC
 - T—T— TELECOMM
 - W—W— WATER
 - G— GAS
 - Stage 2 DELINEATION
 - Parcel BOUNDARIES
 - BUILDINGS TO REMAIN
 - ▨ STAGE 2 AREA
 - POINT OF CONNECTION

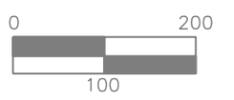
— 3' MIN. COVER (TYP.)

MATERIALS:

GAS IN STREET —
4" PLASTIC PIPE @ 20#
PRESSURE

BUILDING CONNECTIONS —
1.5" PLASTIC (TYP.)

**St. Elizabeths East Campus
Gas Layout—Stage 2**



SEE SHEET 1 OF 2 FOR CONTINUATION

6C

Natural Gas Load Calculations

St. Elizabeth's East
 Electrical Load Projections Based on Building Gross Area Tabulation/Summary
 Based on 'Alt 2 Proposed Land Use'
 April 27, 2012

Parcel	Historic Bldgs	Comments	Retail	Residential	(# of D.U.)	Large Office	Small Office	Institution	Civic	Hotel	Parking	Totals
1		New Construction	13,000			367,300						
2		New Construction	55,026			189,740						
3		New Construction	68,507	274,028								
4		New Construction			17							
5		New Construction	6,468	77,312	20							
6		New Construction	17,567	87,835								
7		New Construction	65,515			362,145						
8		New Construction	56,160	384,504		303,949						
9		New Construction		219,308								
10		New Construction						128,164				
11		New Construction						111,448				
12		New Construction								115,944		
13A		New Construction				230,568						
13B		New Construction				218,352						
13C		New Construction		204,296								
14A		New Construction		169,264								
14B		New Construction		210,928								
15		New Construction	7,000							131,152		
16		Agriculture Site (no buildings)										
17		Agriculture Site (no buildings)										
88		Historic Bldg to be Refurbished							22,590			
89		Historic Bldg to be Refurbished					31,278					
90		Historic Bldg to be Refurbished								107,455		
92		Historic Bldg to be Refurbished						111,930				
93		Historic Bldg to be Refurbished					139,926					
94		Historic Bldg to be Refurbished					13,869					
95		Historic Bldg to be Refurbished					18,275					
100		Historic Bldg to be Refurbished							39,099			
102		Historic Bldg to be Refurbished						33,920				
106		Historic Bldg to be Refurbished						41,000				
107		Historic Bldg to be Refurbished						41,000				
108		Historic Bldg to be Refurbished					35,123					
109		Historic Bldg to be Refurbished						51,062				
110		Historic Bldg to be Refurbished					35,164					
111		Historic Bldg to be Refurbished						41,000				
112		Historic Bldg to be Refurbished						41,000				
Parking		Parking Scattered Beneath New Large Bldgs									800,000	
Area by Use/Occupancy (sf)			289,243	1,627,475	37	1,672,054	273,635	600,524	61,689	354,551	800,000	5,679,171 sf
Design Load Rate		MBH/sf	10	10		30		10	10	30		
Design Load by Use/Occupancy (MBH)			2,892,430	16,274,750	-	50,161,620	-	6,005,240	616,890	10,636,530	-	86,587,460 MBH

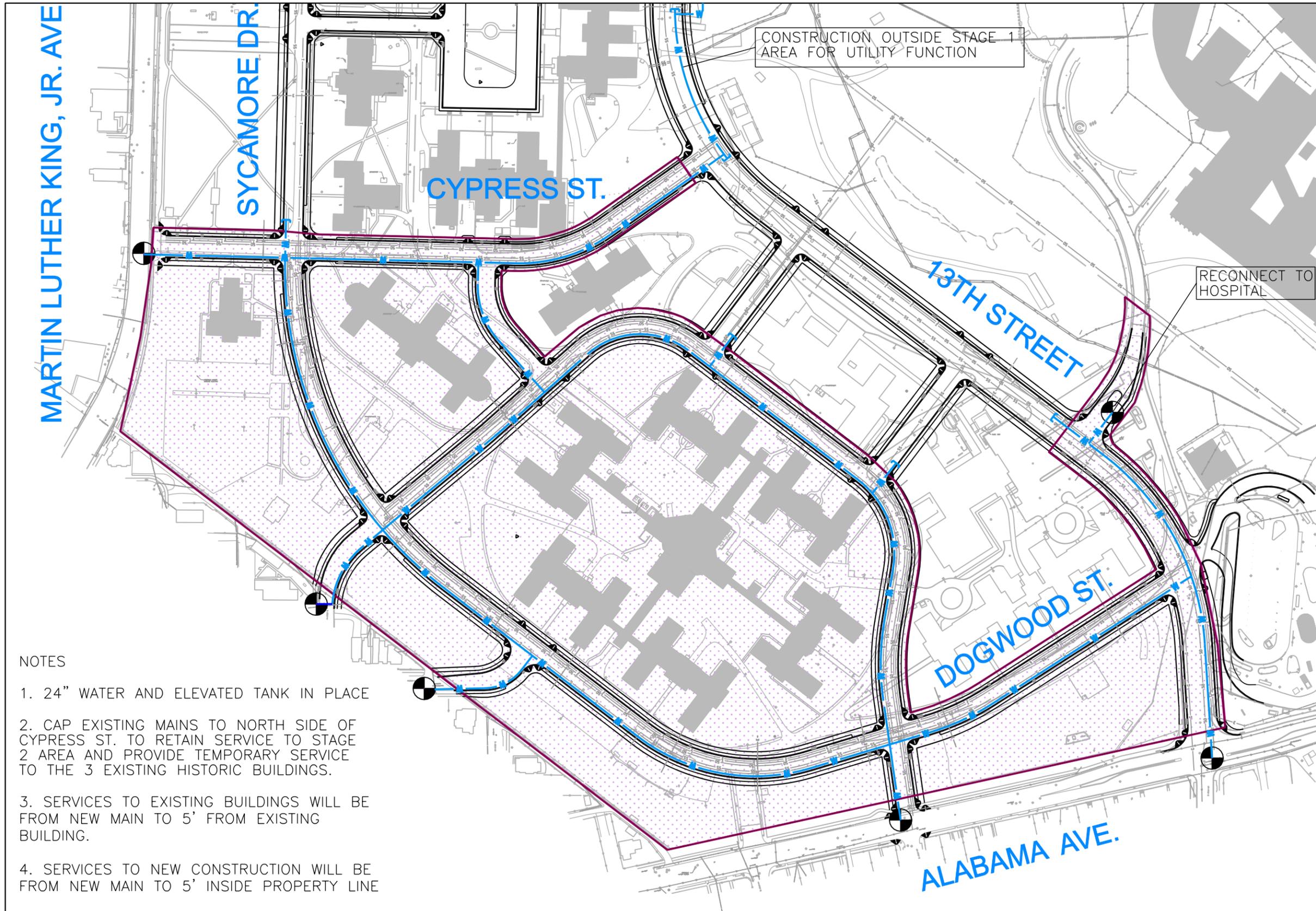
Gas Load Summary

	Consumption Rate		
	Area (sf)	(MBH/sf)	Load (MBH)
Retail	289,243	10	2,892,430
Residential	1,627,475	10	16,274,750
Large Office	1,672,054	30	50,161,620
Small Office	273,635	0	-
Institution	600,524	10	6,005,240
Civic	61,689	10	616,890
Hotel	354,551	30	10,636,530
Parking	800,000	0	-
Totals	5,679,171		86,587,460

Appendix 7
Potable Water System

7A

Potable Water – Stage 1



LEGEND

- STORM DRAIN
- SANITARY SEWER
- ELECTRIC
- TELECOMM
- WATER
- GAS
- STAGE 1 DELINEATION
- PARCEL BOUNDARIES
- BUILDINGS TO REMAIN
- STAGE 1 AREA
- POINT OF CONNECTION
- TEMPORARY CAP

4' MIN. COVER (TYP.)

MATERIALS:

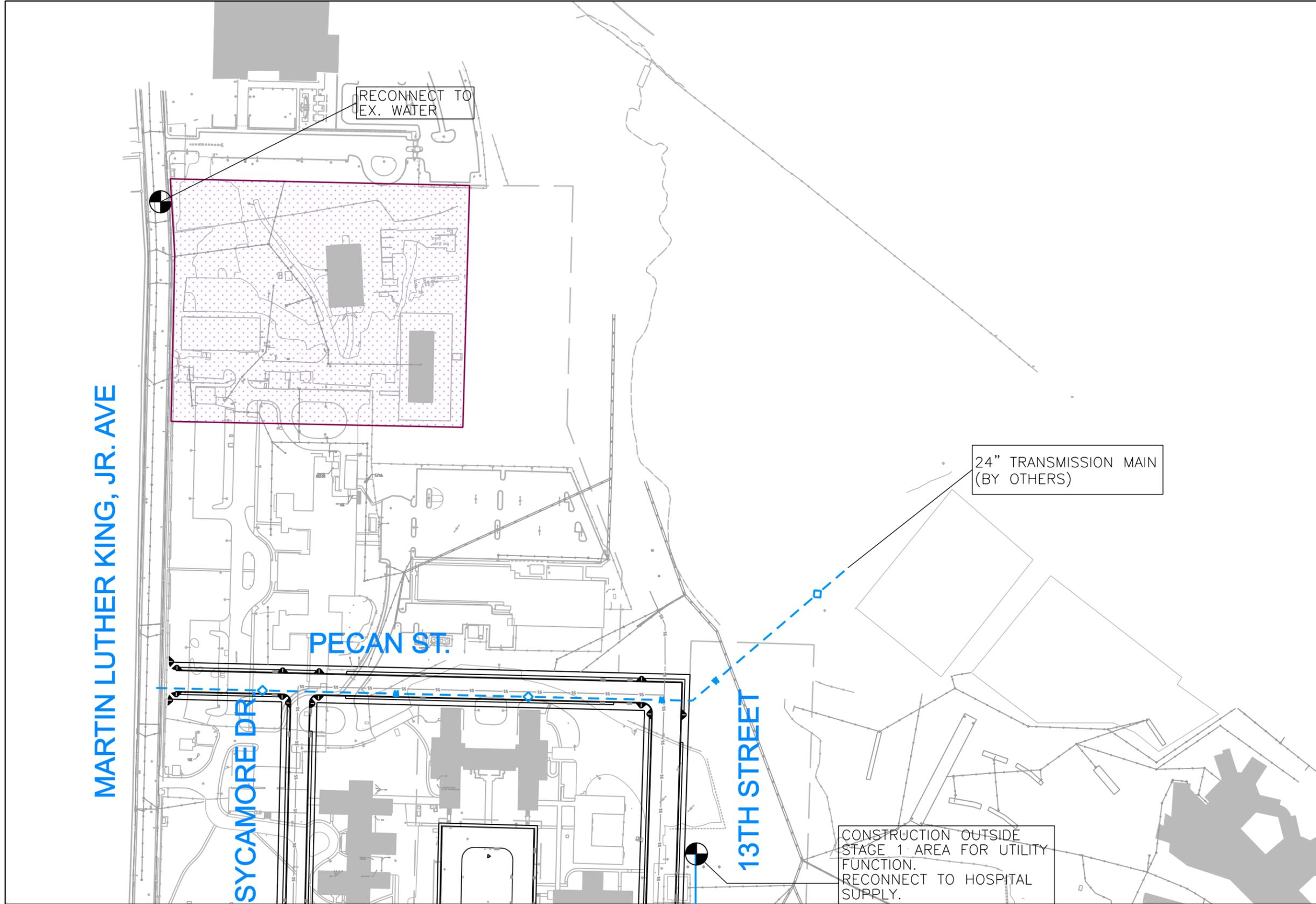
WATER PIPE - DUCTILE IRON PIPE (DIP) CL52

NOTES

1. 24" WATER AND ELEVATED TANK IN PLACE
2. CAP EXISTING MAINS TO NORTH SIDE OF CYPRESS ST. TO RETAIN SERVICE TO STAGE 2 AREA AND PROVIDE TEMPORARY SERVICE TO THE 3 EXISTING HISTORIC BUILDINGS.
3. SERVICES TO EXISTING BUILDINGS WILL BE FROM NEW MAIN TO 5' FROM EXISTING BUILDING.
4. SERVICES TO NEW CONSTRUCTION WILL BE FROM NEW MAIN TO 5' INSIDE PROPERTY LINE

St. Elizabeths East Campus
Water Layout - Stage 1





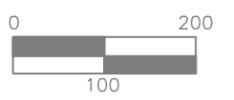
- LEGEND**
- SD— SD— STORM DRAIN
 - SS— SS— SANITARY SEWER
 - E— E— ELECTRIC
 - T— T— TELECOMM
 - W— W— WATER
 - G— G— GAS
 - ◇— ◇— WATER (BY OTHERS)
 - — STAGE 1 DELINEATION
 - — PARCEL BOUNDARIES
 - BUILDINGS TO REMAIN
 - ▨ STAGE 1 AREA
 - ⊙ POINT OF CONNECTION

○ —4' MIN. COVER (TYP.)

MATERIALS:
 WATER PIPE —DUCTILE IRON PIPE (DIP) CL52



**St. Elizabeths East Campus
 Water Layout—Stage 1**



RECONNECT TO EX. WATER

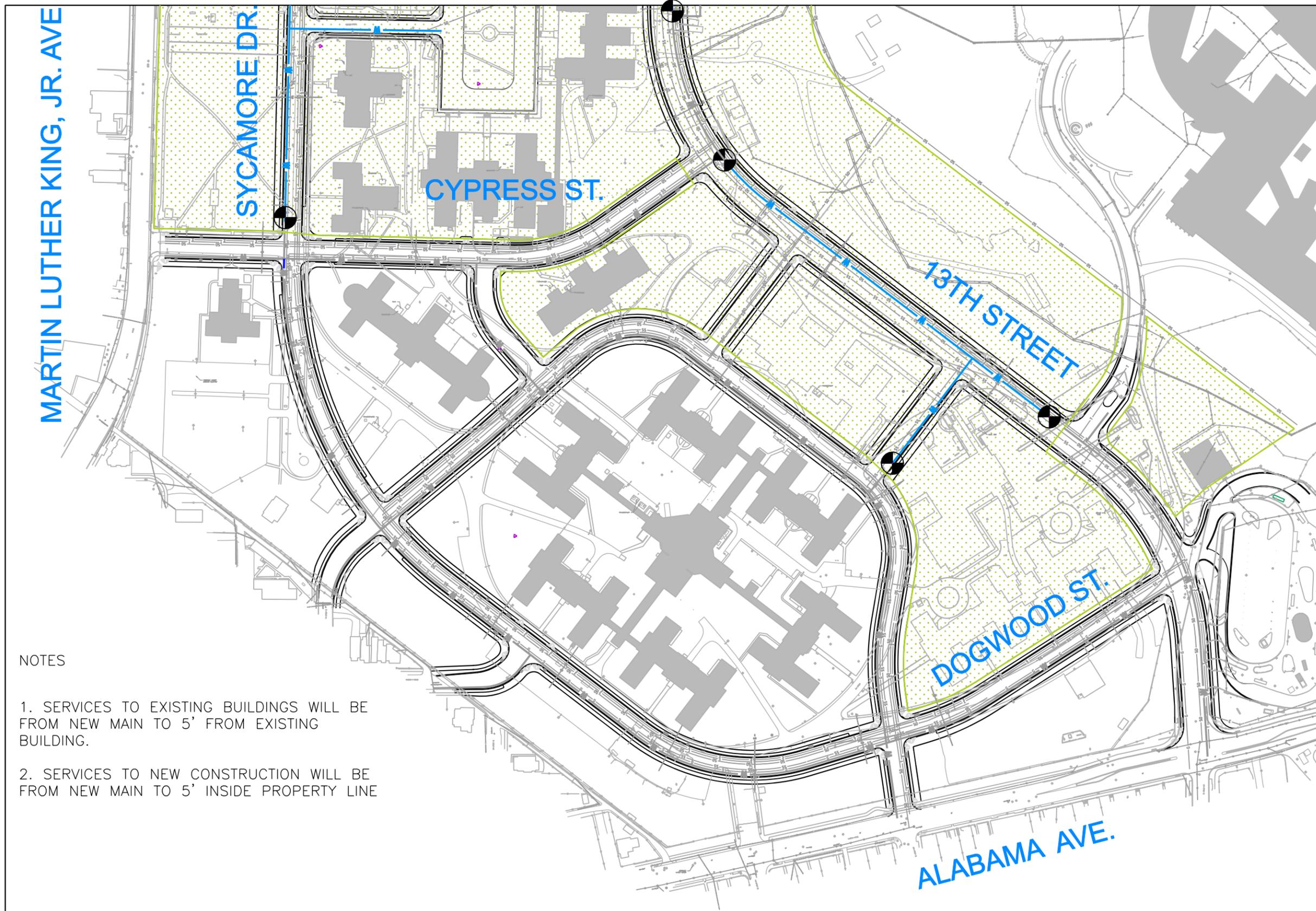
24" TRANSMISSION MAIN (BY OTHERS)

CONSTRUCTION OUTSIDE STAGE 1 AREA FOR UTILITY FUNCTION. RECONNECT TO HOSPITAL SUPPLY.

SEE SHEET 1 OF 2 FOR CONTINUATION

7B

Potable Water – Stage 2



LEGEND

- STORM DRAIN
- SANITARY SEWER
- ELECTRIC
- TELECOMM
- WATER (STAGE 2)
- WATER (STAGE 1)
- GAS
- STAGE 2 DELINEATION
- PARCEL BOUNDARIES
- BUILDINGS TO REMAIN
- STAGE 2 AREA
- POINT OF CONNECTION

4' MIN. COVER (TYP.)

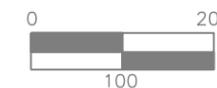
MATERIALS:

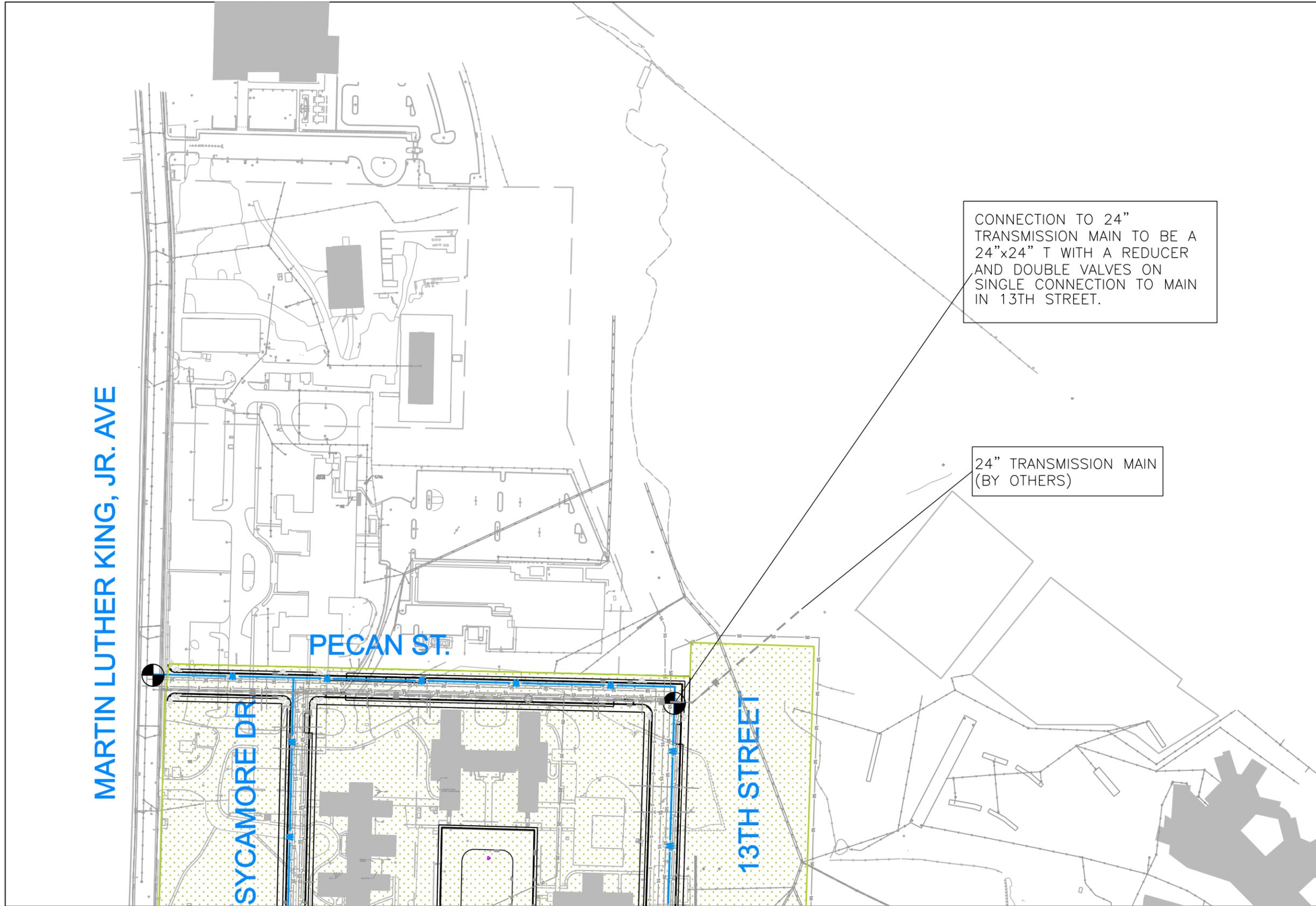
WATER PIPE -DUCTILE IRON
PIPE (DIP) CL52

NOTES

1. SERVICES TO EXISTING BUILDINGS WILL BE FROM NEW MAIN TO 5' FROM EXISTING BUILDING.
2. SERVICES TO NEW CONSTRUCTION WILL BE FROM NEW MAIN TO 5' INSIDE PROPERTY LINE

**St. Elizabeths East Campus
Water Layout - Stage 2**





- LEGEND**
- S—S— STORM DRAIN
 - SS—SS— SANITARY SEWER
 - E—E— ELECTRIC
 - T—T— TELECOMM
 - W—W— WATER
 - G—G— GAS
 - ◇—◇— WATER (BY OTHERS)
 - Y—Y— STAGE 2 DELINEATION
 - P—P— PARCEL BOUNDARIES
 - BUILDINGS TO REMAIN
 - ▨ STAGE 2 AREA
 - ⊙ POINT OF CONNECTION

CONNECTION TO 24" TRANSMISSION MAIN TO BE A 24"x24" T WITH A REDUCER AND DOUBLE VALVES ON SINGLE CONNECTION TO MAIN IN 13TH STREET.

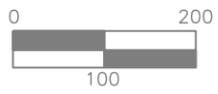
24" TRANSMISSION MAIN (BY OTHERS)

○ -4' MIN. COVER (TYP.)

MATERIALS:
 WATER PIPE -DUCTILE IRON PIPE (DIP) CL52



**St. Elizabeths East Campus
 Water Layout—Stage 2**



SEE SHEET 1 OF 2 FOR CONTINUATION

7C

Water Flow Calculations

Flow Projection Summary (Water)

Parcel	Average Daily Flow (mgd)	Maximum Daily Flow (mgd)
1	0.000	0.000
2	0.000	0.000
3	0.115	0.229
4	0.015	0.030
5	0.224	0.447
6	0.114	0.229
7	0.036	0.072
8	0.004	0.008
9	0.101	0.201
10	0.002	0.004
11	0.147	0.295
12	0.026	0.053
13	0.046	0.091
14	0.023	0.047
15	0.110	0.219
16	0.034	0.068
17	0.080	0.159
Total Site Flow	0.997	2.152

Flow Factor per Parcel Usage Type

Parcel Usage Type	Unit	Flow Factor (gpd)/Unit
Retail	SF	0.048
Residential	SF	0.120
Residential	DU (Dwelling Unit)	130 (San.) / 121 (Water)
Large Office	SF	0.200
Small Office	SF	0.200
Institution	SF	0.620
Civil	SF	0.100
Hotel	SF	0.256

Notes:

1. Summary design flows shown assume all flows have entered or have been collected in the proposed systems at a single point. Actual design flows will vary depending upon actual collection and distribution piping in networks provided.
2. Estimates of Flow are based upon typical industry water and sewer flow projection factors which originate from unit use (square foot) dwelling and building types and/or seating capacities.

Abbreviations:

- ADF** - Average Daily Flow
- MDF** - Maximum Daily Flow
- mgd** - Million Gallons Per Day
- gpd** - Gallons Per Day

Flow Projections: Water
 Project Name: **St. Elizabeths**

Parcel - 1					
	Use	Unit	# of Units	ADF(gpd)/Unit	ADF
	Retail	SF	0	0.048	0
	Residential	SF	0	0.12	0
	Residential	DU	0	121	0
	Large Office	SF	0	0.2	0
	Small Office	SF	0	0.2	0
	Institution	SF	0	0.62	0
	Civil	SF	0	0.1	0
	Hotel	SF	0	0.256	0
	Totals			Parcel ADF	0
				Parcel MDF	0

Parcel - 2					
	Use	Unit	# of Units	ADF(gpd)/Unit	ADF
	Retail	SF	0	0.048	0
	Residential	SF	0	0.12	0
	Residential	DU	0	121	0
	Large Office	SF	0	0.2	0
	Small Office	SF	0	0.2	0
	Institution	SF	0	0.62	0
	Civil	SF	0	0.1	0
	Hotel	SF	0	0.256	0
	Totals			Parcel ADF	0
				Parcel MDF	0

Parcel - 3					
	Use	Unit	# of Units	ADF(gpd)/Unit	ADF
	Retail	SF	68028	0.048	3300
	Residential	SF	0	0.12	0
	Residential	DU	0	121	0
	Large Office	SF	557040	0.2	111400
	Small Office	SF	0	0.2	0
	Institution	SF	0	0.62	0
	Civil	SF	0	0.1	0
	Hotel	SF	0	0.256	0
	Totals			Parcel ADF	114700
				Parcel MDF	229400

Flow Projections: Water
 Project Name: **St. Elizabeths**

Parcel - 4				
Use	Unit	# of Units	ADF(gpd)/Unit	ADF
Retail	SF	0	0.048	0
Residential	SF	0	0.12	0
Residential	DU	0	121	0
Large Office	SF	0	0.2	0
Small Office	SF	63422	0.2	12700
Institution	SF	0	0.62	0
Civil	SF	22590	0.1	2300
Hotel	SF	0	0.256	0
Totals			Parcel ADF	15000
			Parcel MDF	30000

Parcel - 5				
Use	Unit	# of Units	ADF(gpd)/Unit	ADF
Retail	SF	0	0.048	0
Residential	SF	0	0.12	0
Residential	DU	0	121	0
Large Office	SF	0	0.2	0
Small Office	SF	139926	0.2	28000
Institution	SF	223378	0.62	138500
Civil	SF	0	0.1	0
Hotel	SF	223399	0.256	57200
Totals			Parcel ADF	223700
			Parcel MDF	447400

Parcel - 6				
Use	Unit	# of Units	ADF(gpd)/Unit	ADF
Retail	SF	0	0.048	0
Residential	SF	204296	0.12	24500
Residential	DU	0	121	0
Large Office	SF	448920	0.2	89800
Small Office	SF	0	0.2	0
Institution	SF	0	0.62	0
Civil	SF	0	0.1	0
Hotel	SF	0	0.256	0
Totals			Parcel ADF	114300
			Parcel MDF	228600

Flow Projections: Water
 Project Name: **St. Elizabeths**

Parcel - 7				
Use	Unit	# of Units	ADF(gpd)/Unit	ADF
Retail	SF	68507	0.048	3300
Residential	SF	274028	0.12	32900
Residential	DU	0	121	0
Large Office	SF	0	0.2	0
Small Office	SF	0	0.2	0
Institution	SF	0	0.62	0
Civil	SF	0	0.1	0
Hotel	SF	0	0.256	0
Totals			Parcel ADF	36200
			Parcel MDF	72400

Parcel - 8				
Use	Unit	# of Units	ADF(gpd)/Unit	ADF
Retail	SF	0	0.048	0
Residential	SF	0	0.12	0
Residential	DU	0	121	0
Large Office	SF	0	0.2	0
Small Office	SF	0	0.2	0
Institution	SF	0	0.62	0
Civil	SF	39099	0.1	3900
Hotel	SF	0	0.256	0
Totals			Parcel ADF	3900
			Parcel MDF	7800

Parcel - 9				
Use	Unit	# of Units	ADF(gpd)/Unit	ADF
Retail	SF	0	0.048	0
Residential	SF	0	0.12	0
Residential	DU	0	121	0
Large Office	SF	0	0.2	0
Small Office	SF	0	0.2	0
Institution	SF	162084	0.62	100500
Civil	SF	0	0.1	0
Hotel	SF	0	0.256	0
Totals			Parcel ADF	100500
			Parcel MDF	201000

Flow Projections: Water
 Project Name: **St. Elizabeths**

Parcel - 10				
Use	Unit	# of Units	ADF(gpd)/Unit	ADF
Retail	SF	0	0.048	0
Residential	SF	0	0.12	0
Residential	DU	17	121	2100
Large Office	SF	0	0.2	0
Small Office	SF	0	0.2	0
Institution	SF	0	0.62	0
Civil	SF	0	0.1	0
Hotel	SF	0	0.256	0
Totals			Parcel ADF	2100
			Parcel MDF	4200

Parcel - 11				
Use	Unit	# of Units	ADF(gpd)/Unit	ADF
Retail	SF	0	0.048	0
Residential	SF	0	0.12	0
Residential	DU	0	121	0
Large Office	SF	0	0.2	0
Small Office	SF	70287	0.2	14100
Institution	SF	215062	0.62	133300
Civil	SF	0	0.1	0
Hotel	SF	0	0.256	0
Totals			Parcel ADF	147400
			Parcel MDF	294800

Parcel - 12				
Use	Unit	# of Units	ADF(gpd)/Unit	ADF
Retail	SF	0	0.048	0
Residential	SF	219308	0.12	26300
Residential	DU	0	121	0
Large Office	SF	0	0.2	0
Small Office	SF	0	0.2	0
Institution	SF	0	0.62	0
Civil	SF	0	0.1	0
Hotel	SF	0	0.256	0
Totals			Parcel ADF	26300
			Parcel MDF	52600

Flow Projections: Water
 Project Name: **St. Elizabeths**

Parcel - 13				
Use	Unit	# of Units	ADF(gpd)/Unit	ADF
Retail	SF	0	0.048	0
Residential	SF	380192	0.12	45600
Residential	DU	0	121	0
Large Office	SF	0	0.2	0
Small Office	SF	0	0.2	0
Institution	SF	0	0.62	0
Civil	SF	0	0.1	0
Hotel	SF	0	0.256	0
Totals			Parcel ADF	45600
			Parcel MDF	91200

Parcel - 14				
Use	Unit	# of Units	ADF(gpd)/Unit	ADF
Retail	SF	24035	0.048	1200
Residential	SF	165147	0.12	19800
Residential	DU	20	121	2400
Large Office	SF	0	0.2	0
Small Office	SF	0	0.2	0
Institution	SF	0	0.62	0
Civil	SF	0	0.1	0
Hotel	SF	0	0.256	0
Totals			Parcel ADF	23400
			Parcel MDF	46800

Parcel - 15				
Use	Unit	# of Units	ADF(gpd)/Unit	ADF
Retail	SF	56160	0.048	2700
Residential	SF	384504	0.12	46100
Residential	DU	0	121	0
Large Office	SF	303949	0.2	60800
Small Office	SF	0	0.2	0
Institution	SF	0	0.62	0
Civil	SF	0	0.1	0
Hotel	SF	0	0.256	0
Totals			Parcel ADF	109600
			Parcel MDF	219200

Flow Projections: Water
 Project Name: **St. Elizabeths**

Parcel - 16				
Use	Unit	# of Units	ADF(gpd)/Unit	ADF
Retail	SF	7000	0.048	300
Residential	SF	0	0.12	0
Residential	DU	0	121	0
Large Office	SF	0	0.2	0
Small Office	SF	0	0.2	0
Institution	SF	0	0.62	0
Civil	SF	0	0.1	0
Hotel	SF	131152	0.256	33600
Totals			Parcel ADF	33900
			Parcel MDF	67800

Parcel - 17				
Use	Unit	# of Units	ADF(gpd)/Unit	ADF
Retail	SF	65515	0.048	3100
Residential	SF	0	0.12	0
Residential	DU	0	121	0
Large Office	SF	382145	0.2	76400
Small Office	SF	0	0.2	0
Institution	SF	0	0.62	0
Civil	SF	0	0.1	0
Hotel	SF	0	0.256	0
Totals			Parcel ADF	79500
			Parcel MDF	159000

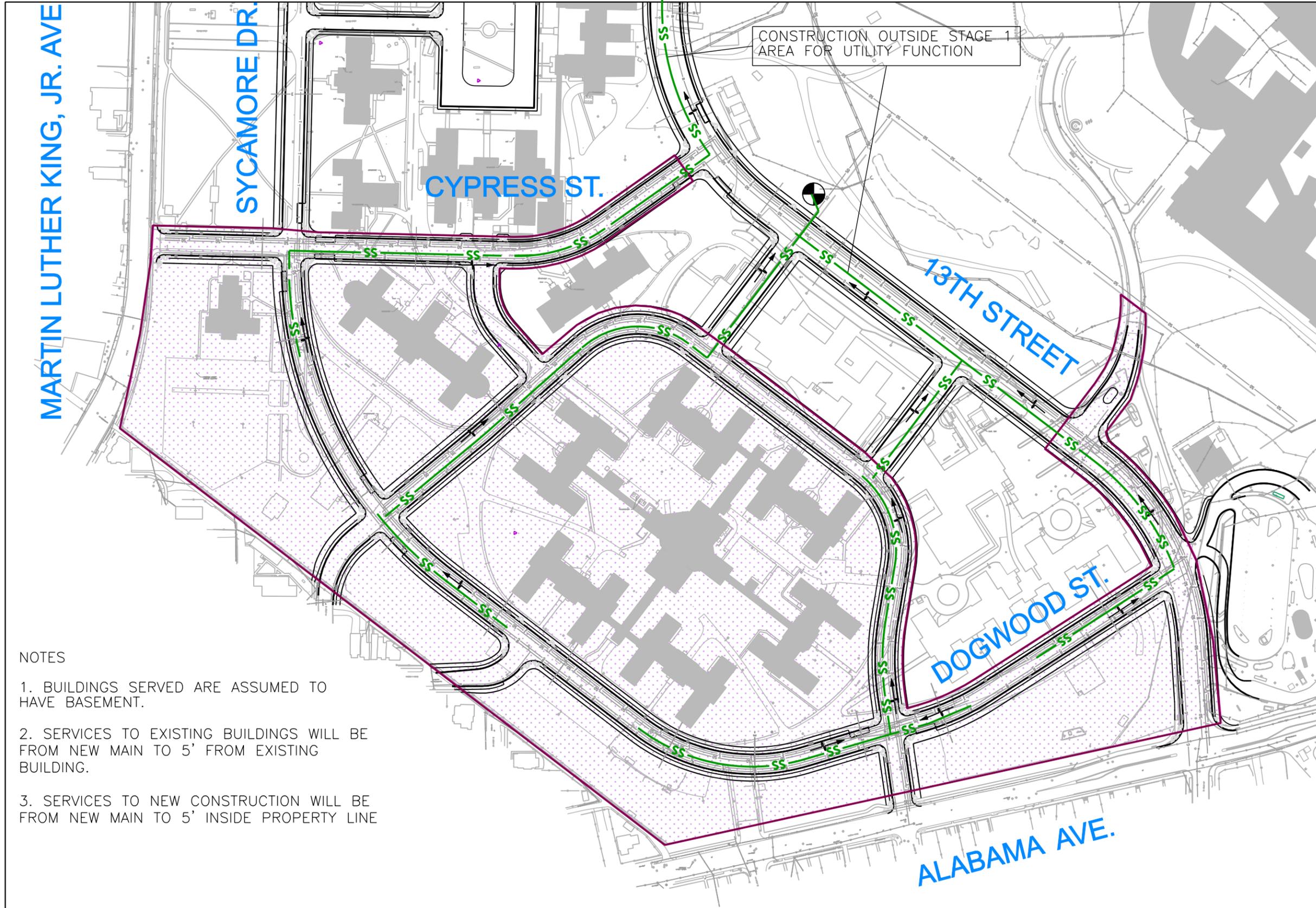
"New" Hospital (Existing)				
Use	Unit	# of Units	BSF(gpd)/Unit	BWF (gpd)
Hospital	# of Beds	300	346	103800
Totals			121	0
			0.2	0
			0.2	0
			0.62	0
			0.1	0
			0.256	0
			Parcel ADF	103800
			Parcel MDF	207600

Appendix 8
Wastewater Collection System

8A

Wastewater Collection System – Stage 1

CONSTRUCTION OUTSIDE STAGE 1
AREA FOR UTILITY FUNCTION



LEGEND

- STORM DRAIN
- SANITARY SEWER
- ELECTRIC
- TELECOMM
- WATER
- GAS
- STAGE 1 DELINEATION
- PARCEL BOUNDARIES
- BUILDINGS TO REMAIN
- STAGE 1 AREA
- POINT OF CONNECTION

10.5' MIN. TO
PIPE INV. (TYP.)

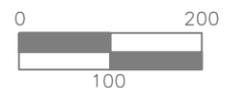
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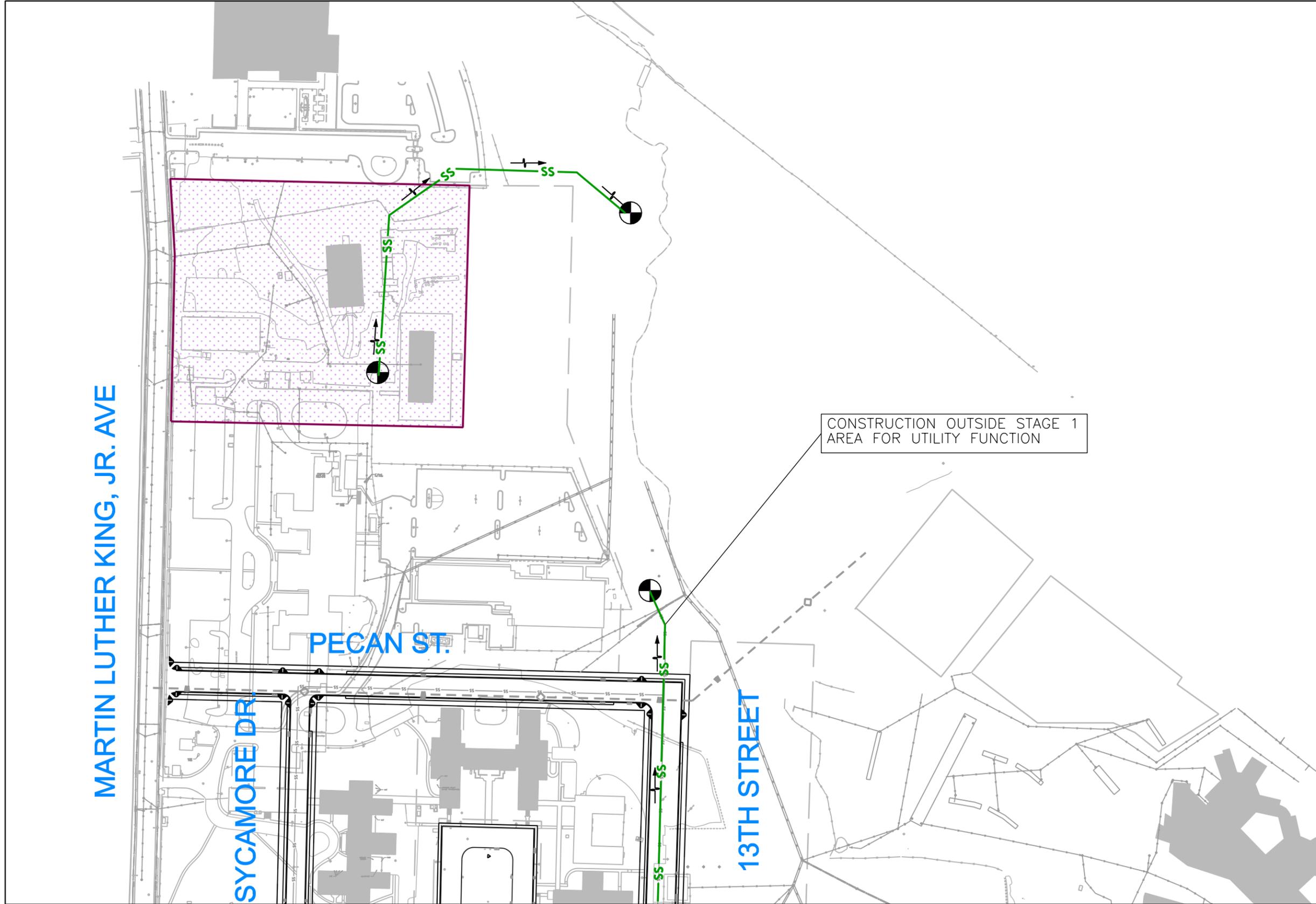
- SEWER PIPE IN STREET — PVC SDR 35.
- BUILDING CONNECTIONS — PVC SCH 40.

NOTES

1. BUILDINGS SERVED ARE ASSUMED TO HAVE BASEMENT.
2. SERVICES TO EXISTING BUILDINGS WILL BE FROM NEW MAIN TO 5' FROM EXISTING BUILDING.
3. SERVICES TO NEW CONSTRUCTION WILL BE FROM NEW MAIN TO 5' INSIDE PROPERTY LINE

**St. Elizabeths East Campus
Sanitary Layout—Stage 1**





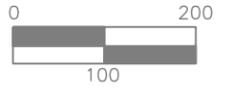
- LEGEND**
- STORM DRAIN
 - SS— SS SANITARY SEWER
 - |—|— ELECTRIC
 - |—|— TELECOMM
 - |—|— WATER
 - |—|— GAS
 - |—|— STAGE 1 DELINEATION
 - |—|— PARCEL BOUNDARIES
 - BUILDINGS TO REMAIN
 - ▨ STAGE 1 AREA
 - ⊙ POINT OF CONNECTION



- MATERIALS:**
- SEWER PIPE IN STREET — PVC SDR 35.
 - BUILDING CONNECTIONS — PVC SCH 40.



**St. Elizabeths East Campus
Sanitary Layout—Stage 1**



MARTIN LUTHER KING, JR. AVE

SYCAMORE DR

PECAN ST.

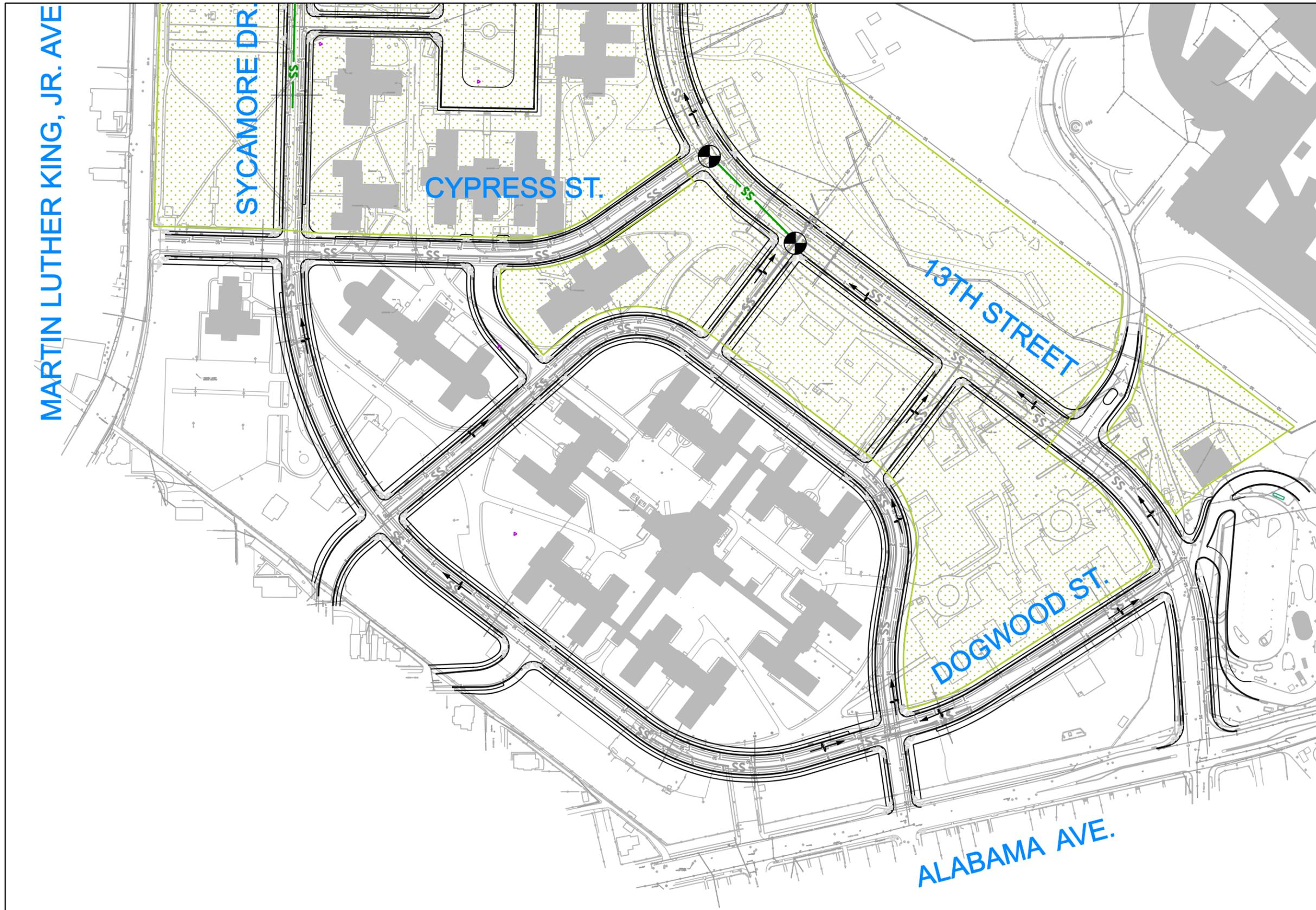
13TH STREET

CONSTRUCTION OUTSIDE STAGE 1
AREA FOR UTILITY FUNCTION

SEE SHEET 1 OF 2 FOR CONTINUATION

8B

Wastewater Collection System – Stage 2



LEGEND

- STORM DRAIN
- SANITARY SEWER (STAGE 2)
- SANITARY SEWER (STAGE 1)
- ELECTRIC
- TELECOMM
- WATER
- GAS
- STAGE 2 DELINEATION
- PARCEL BOUNDARIES
- BUILDINGS TO REMAIN
- STAGE 2 AREA
- POINT OF CONNECTION

10.5' MIN. TO PIPE INV. (TYP.)

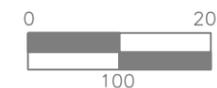
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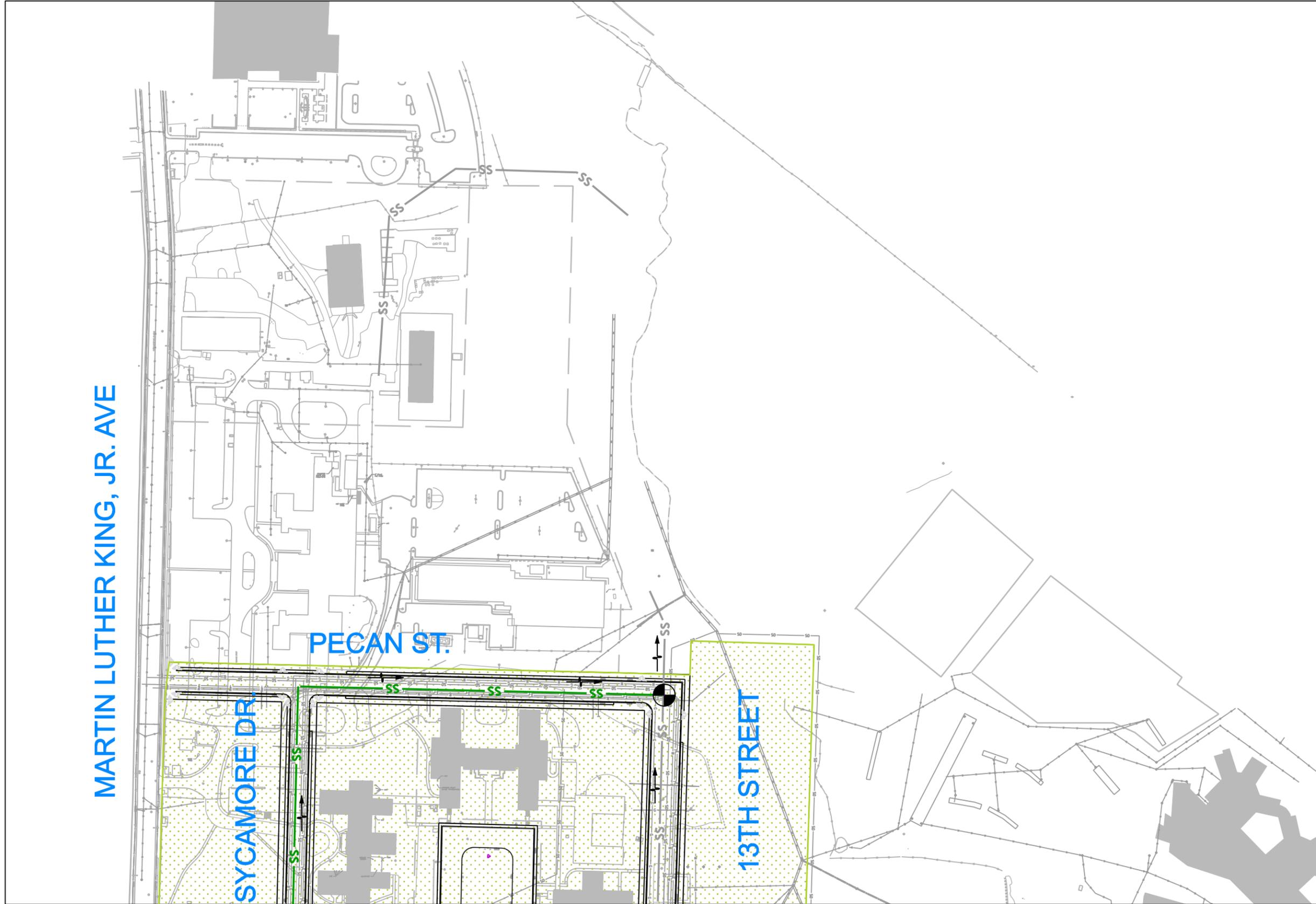
SEWER PIPE IN STREET - PVC SDR 35.

BUILDING CONNECTIONS - PVC SCH 40.



St. Elizabeths East Campus
Sanitary Layout-Stage 2





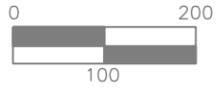
- LEGEND**
- STORM DRAIN
 - SANITARY SEWER (STAGE 2)
 - SANITARY SEWER (STAGE 1)
 - ELECTRIC
 - TELECOMM
 - WATER
 - GAS
 - STAGE 2 DELINEATION
 - PARCEL BOUNDARIES
 - BUILDINGS TO REMAIN
 - STAGE 2 AREA
 - POINT OF CONNECTION
 - 10.5' MIN. TO PIPE INV. (TYP.)

MATERIALS:

SEWER PIPE IN STREET – PVC SDR 35.

BUILDING CONNECTIONS – PVC SCH 40.

**St. Elizabeths East Campus
Sanitary Layout–Stage 2**



SEE SHEET 1 OF 2 FOR CONTINUATION

8C

Wastewater Collection Flow Calculations

Flow Projection Summaries: Sanitary Sewer
 Project Name: **St. Elizabeths**

Flow Projection Summary (Sewer)

Parcel	Base Sewage Flow (mgd)	Average Wastewater Flow (mgd)
1	0.000	0.000
2	0.000	0.000
3	0.115	0.165
4	0.015	0.022
5	0.224	0.322
6	0.114	0.165
7	0.036	0.052
8	0.004	0.006
9	0.101	0.145
10	0.002	0.003
11	0.147	0.212
12	0.026	0.038
13	0.046	0.066
14	0.024	0.034
15	0.110	0.158
16	0.034	0.049
17	0.080	0.115
Total Site Flow	0.997	1.550

***New Hospital AWF = 0.149 mgd

Flow Factor per Parcel Usage Type

Parcel Usage Type	Unit	Flow Factor (gpd)/Unit
Retail	SF	0.048
Residential	SF	0.120
Residential	DU (Dwelling Unit)	130 (San.) / 121 (Water)
Large Office	SF	0.200
Small Office	SF	0.200
Institution	SF	0.620
Civil	SF	0.100
Hotel	SF	0.256

Notes:

1. Summary design flows shown assume all flows have entered or have been collected in the proposed systems at a single point. Actual design flows will vary depending upon actual collection and distribution piping in networks provided.
2. Estimates of Flow are based upon typical industry water and sewer flow projection factors which originate from unit use (square foot) dwelling and building types and/or seating capacities.

Abbreviations:

- BWF** - Base Wastewater Flow
- AWF** - Average Wastewater Flow
- PWF** - Peak Wastewater Flow
- DF** - Design Flow
- mgd** - Million Gallons Per Day
- gpd** - Gallons Per Day

Flow Projections: Sanitary Sewer

Project Name: **St. Elizabeths**

Parcel - 1				
Use	Unit	# of Units	BSF(gpd)/Unit	BWF (gpd)
Retail	SF	0	0.048	0
Residential	SF	0	0.12	0
Residential	DU	0	130	0
Large Office	SF	0	0.2	0
Small Office	SF	0	0.2	0
Institution	SF	0	0.62	0
Civil	SF	0	0.1	0
Hotel	SF	0	0.256	0
Totals			Parcel BWF	0
			Parcel AWF	0
			Parcel PWF	0
			Parcel DF	0

Parcel - 2				
Use	Unit	# of Units	BSF(gpd)/Unit	BWF (gpd)
Retail	SF	0	0.048	0
Residential	SF	0	0.12	0
Residential	DU	0	130	0
Large Office	SF	0	0.2	0
Small Office	SF	0	0.2	0
Institution	SF	0	0.62	0
Civil	SF	0	0.1	0
Hotel	SF	0	0.256	0
Totals			Parcel BWF	0
			Parcel AWF	0
			Parcel PWF	0
			Parcel DF	0

Parcel - 3				
Use	Unit	# of Units	BSF(gpd)/Unit	BWF (gpd)
Retail	SF	68028	0.048	3300
Residential	SF	0	0.12	0
Residential	DU	0	130	0
Large Office	SF	557040	0.2	111400
Small Office	SF	0	0.2	0
Institution	SF	0	0.62	0
Civil	SF	0	0.1	0
Hotel	SF	0	0.256	0
Totals			Parcel BWF	114700
			Parcel AWF	165200
			Parcel PWF	660800
			Parcel DF	991200

Flow Projections: Sanitary Sewer

Project Name: **St. Elizabeths**

Parcel - 4				
Use	Unit	# of Units	BSF(gpd)/Unit	BWF (gpd)
Retail	SF	0	0.048	0
Residential	SF	0	0.12	0
Residential	DU	0	130	0
Large Office	SF	0	0.2	0
Small Office	SF	63422	0.2	12700
Institution	SF	0	0.62	0
Civil	SF	22590	0.1	2300
Hotel	SF	0	0.256	0
Totals			Parcel BWF	15000
			Parcel AWF	21600
			Parcel PWF	86400
			Parcel DF	129600

Parcel - 5				
Use	Unit	# of Units	BSF(gpd)/Unit	BWF (gpd)
Retail	SF	0	0.048	0
Residential	SF	0	0.12	0
Residential	DU	0	130	0
Large Office	SF	0	0.2	0
Small Office	SF	139926	0.2	28000
Institution	SF	223378	0.62	138500
Civil	SF	0	0.1	0
Hotel	SF	223399	0.256	57200
Totals			Parcel BWF	223700
			Parcel AWF	322100
			Parcel PWF	1288400
			Parcel DF	1932600

Parcel - 6				
Use	Unit	# of Units	BSF(gpd)/Unit	BWF (gpd)
Retail	SF	0	0.048	0
Residential	SF	204296	0.12	24500
Residential	DU	0	130	0
Large Office	SF	448920	0.2	89800
Small Office	SF	0	0.2	0
Institution	SF	0	0.62	0
Civil	SF	0	0.1	0
Hotel	SF	0	0.256	0
Totals			Parcel BWF	114300
			Parcel AWF	164600
			Parcel PWF	658400
			Parcel DF	987600

Flow Projections: Sanitary Sewer

Project Name: **St. Elizabeths**

Parcel - 7				
Use	Unit	# of Units	BSF(gpd)/Unit	BWF (gpd)
Retail	SF	68507	0.048	3300
Residential	SF	274028	0.12	32900
Residential	DU	0	130	0
Large Office	SF	0	0.2	0
Small Office	SF	0	0.2	0
Institution	SF	0	0.62	0
Civil	SF	0	0.1	0
Hotel	SF	0	0.256	0
Totals			Parcel BWF	36200
			Parcel AWF	52100
			Parcel PWF	208400
			Parcel DF	312600

Parcel - 8				
Use	Unit	# of Units	BSF(gpd)/Unit	BWF (gpd)
Retail	SF	0	0.048	0
Residential	SF	0	0.12	0
Residential	DU	0	130	0
Large Office	SF	0	0.2	0
Small Office	SF	0	0.2	0
Institution	SF	0	0.62	0
Civil	SF	39099	0.1	3900
Hotel	SF	0	0.256	0
Totals			Parcel BWF	3900
			Parcel AWF	5600
			Parcel PWF	22400
			Parcel DF	33600

Parcel - 9				
Use	Unit	# of Units	BSF(gpd)/Unit	BWF (gpd)
Retail	SF	0	0.048	0
Residential	SF	0	0.12	0
Residential	DU	0	130	0
Large Office	SF	0	0.2	0
Small Office	SF	0	0.2	0
Institution	SF	162084	0.62	100500
Civil	SF	0	0.1	0
Hotel	SF	0	0.256	0
Totals			Parcel BWF	100500
			Parcel AWF	144700
			Parcel PWF	578800
			Parcel DF	868200

Flow Projections: Sanitary Sewer

Project Name: **St. Elizabeths**

Parcel - 10				
Use	Unit	# of Units	BSF(gpd)/Unit	BWF (gpd)
Retail	SF	0	0.048	0
Residential	SF	0	0.12	0
Residential	DU	17	130	2200
Large Office	SF	0	0.2	0
Small Office	SF	0	0.2	0
Institution	SF	0	0.62	0
Civil	SF	0	0.1	0
Hotel	SF	0	0.256	0
Totals			Parcel BWF	2200
			Parcel AWF	3200
			Parcel PWF	12800
			Parcel DF	19200

Parcel - 11				
Use	Unit	# of Units	BSF(gpd)/Unit	BWF (gpd)
Retail	SF	0	0.048	0
Residential	SF	0	0.12	0
Residential	DU	0	130	0
Large Office	SF	0	0.2	0
Small Office	SF	70287	0.2	14100
Institution	SF	215062	0.62	133300
Civil	SF	0	0.1	0
Hotel	SF	0	0.256	0
Totals			Parcel BWF	147400
			Parcel AWF	212300
			Parcel PWF	849200
			Parcel DF	1273800

Parcel - 12				
Use	Unit	# of Units	BSF(gpd)/Unit	BWF (gpd)
Retail	SF	0	0.048	0
Residential	SF	219308	0.12	26300
Residential	DU	0	130	0
Large Office	SF	0	0.2	0
Small Office	SF	0	0.2	0
Institution	SF	0	0.62	0
Civil	SF	0	0.1	0
Hotel	SF	0	0.256	0
Totals			Parcel BWF	26300
			Parcel AWF	37900
			Parcel PWF	151600
			Parcel DF	227400

Flow Projections: Sanitary Sewer

Project Name: **St. Elizabeths**

Parcel - 13				
Use	Unit	# of Units	BSF(gpd)/Unit	BWF (gpd)
Retail	SF	0	0.048	0
Residential	SF	380192	0.12	45600
Residential	DU	0	130	0
Large Office	SF	0	0.2	0
Small Office	SF	0	0.2	0
Institution	SF	0	0.62	0
Civil	SF	0	0.1	0
Hotel	SF	0	0.256	0
Totals			Parcel BWF	45600
			Parcel AWF	65700
			Parcel PWF	262800
			Parcel DF	394200

Parcel - 14				
Use	Unit	# of Units	BSF(gpd)/Unit	BWF (gpd)
Retail	SF	24035	0.048	1200
Residential	SF	165147	0.12	19800
Residential	DU	20	130	2600
Large Office	SF	0	0.2	0
Small Office	SF	0	0.2	0
Institution	SF	0	0.62	0
Civil	SF	0	0.1	0
Hotel	SF	0	0.256	0
Totals			Parcel BWF	23600
			Parcel AWF	34000
			Parcel PWF	136000
			Parcel DF	204000

Parcel - 15				
Use	Unit	# of Units	BSF(gpd)/Unit	BWF (gpd)
Retail	SF	56160	0.048	2700
Residential	SF	384504	0.12	46100
Residential	DU	0	130	0
Large Office	SF	303949	0.2	60800
Small Office	SF	0	0.2	0
Institution	SF	0	0.62	0
Civil	SF	0	0.1	0
Hotel	SF	0	0.256	0
Totals			Parcel BWF	109600
			Parcel AWF	157800
			Parcel PWF	631200
			Parcel DF	946800

Flow Projections: Sanitary Sewer

Project Name: **St. Elizabeths**

Parcel - 16				
Use	Unit	# of Units	BSF(gpd)/Unit	BWF (gpd)
Retail	SF	7000	0.048	300
Residential	SF	0	0.12	0
Residential	DU	0	130	0
Large Office	SF	0	0.2	0
Small Office	SF	0	0.2	0
Institution	SF	0	0.62	0
Civil	SF	0	0.1	0
Hotel	SF	131152	0.256	33600
Totals			Parcel BWF	33900
			Parcel AWF	48800
			Parcel PWF	195200
			Parcel DF	292800

Parcel - 17				
Use	Unit	# of Units	BSF(gpd)/Unit	BWF (gpd)
Retail	SF	65515	0.048	3100
Residential	SF	0	0.12	0
Residential	DU	0	130	0
Large Office	SF	382145	0.2	76400
Small Office	SF	0	0.2	0
Institution	SF	0	0.62	0
Civil	SF	0	0.1	0
Hotel	SF	0	0.256	0
Totals			Parcel BWF	79500
			Parcel AWF	114500
			Parcel PWF	458000
			Parcel DF	687000

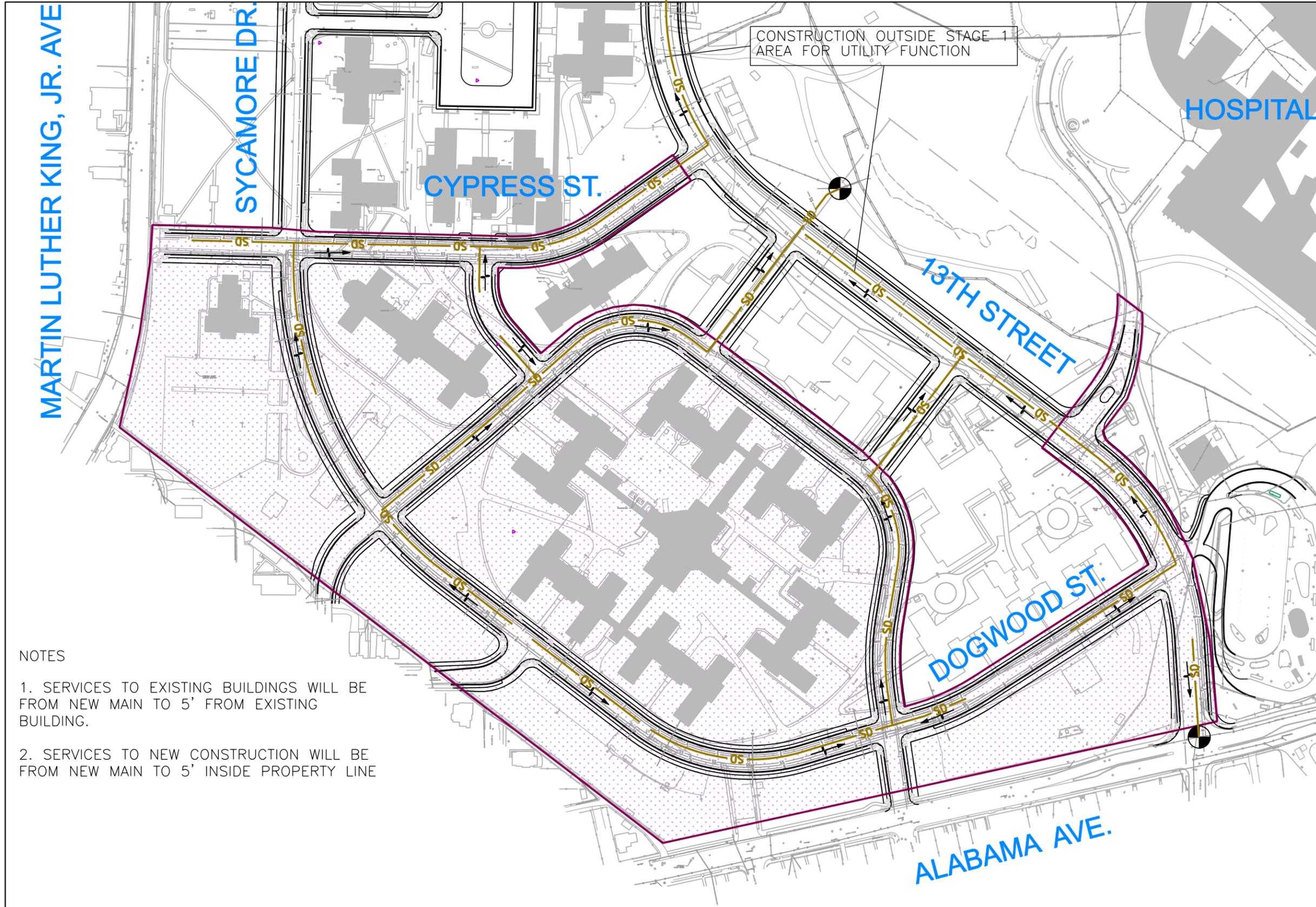
"New" Hospital (Existing)				
Use	Unit	# of Units	BSF(gpd)/Unit	BWF (gpd)
Hospital	# of Beds	300	346	103800
Totals			Parcel BWF	103800
			Parcel AWF	149500
			Parcel PWF	598000
			Parcel DF	897000

Appendix 9
Storm Sewer System

9A

Storm Sewer – Stage 1

CONSTRUCTION OUTSIDE STAGE 1
AREA FOR UTILITY FUNCTION

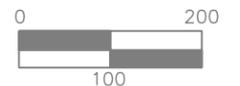


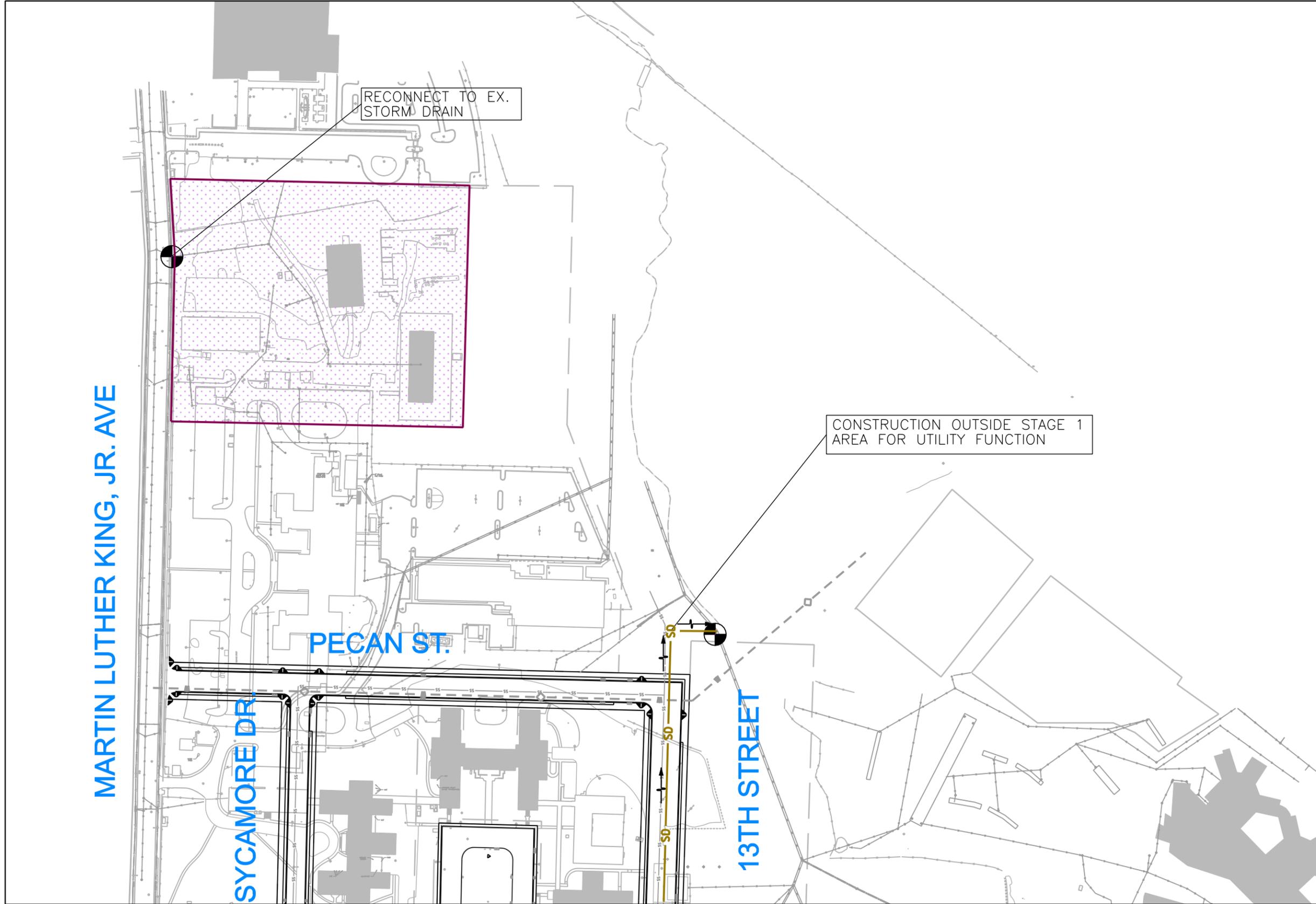
- LEGEND**
- STORM DRAIN
 - SANITARY SEWER
 - ELECTRIC
 - TELECOMM
 - WATER
 - GAS
 - STAGE 1 DELINEATION
 - PARCEL BOUNDARIES
 - BUILDINGS TO REMAIN
 - STAGE 1 AREA
 - POINT OF CONNECTION
 - 5' MIN. COVER (TYP.)

MATERIALS:
STORM DRAIN PIPE — RCPR CL III

- NOTES**
1. SERVICES TO EXISTING BUILDINGS WILL BE FROM NEW MAIN TO 5' FROM EXISTING BUILDING.
 2. SERVICES TO NEW CONSTRUCTION WILL BE FROM NEW MAIN TO 5' INSIDE PROPERTY LINE

**St. Elizabeths East Campus
Storm Layout-Stage 1**





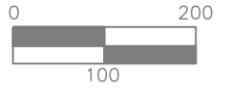
- LEGEND**
-  STORM DRAIN
 -  SANITARY SEWER
 -  ELECTRIC
 -  TELECOMM
 -  WATER
 -  GAS
 -  STAGE 1 DELINEATION
 -  PARCEL BOUNDARIES
 -  BUILDINGS TO REMAIN
 -  STAGE 1 AREA
 -  POINT OF CONNECTION

 5' MIN. COVER (TYP.)

MATERIALS:
 STORM DRAIN PIPE – RCPR CL III



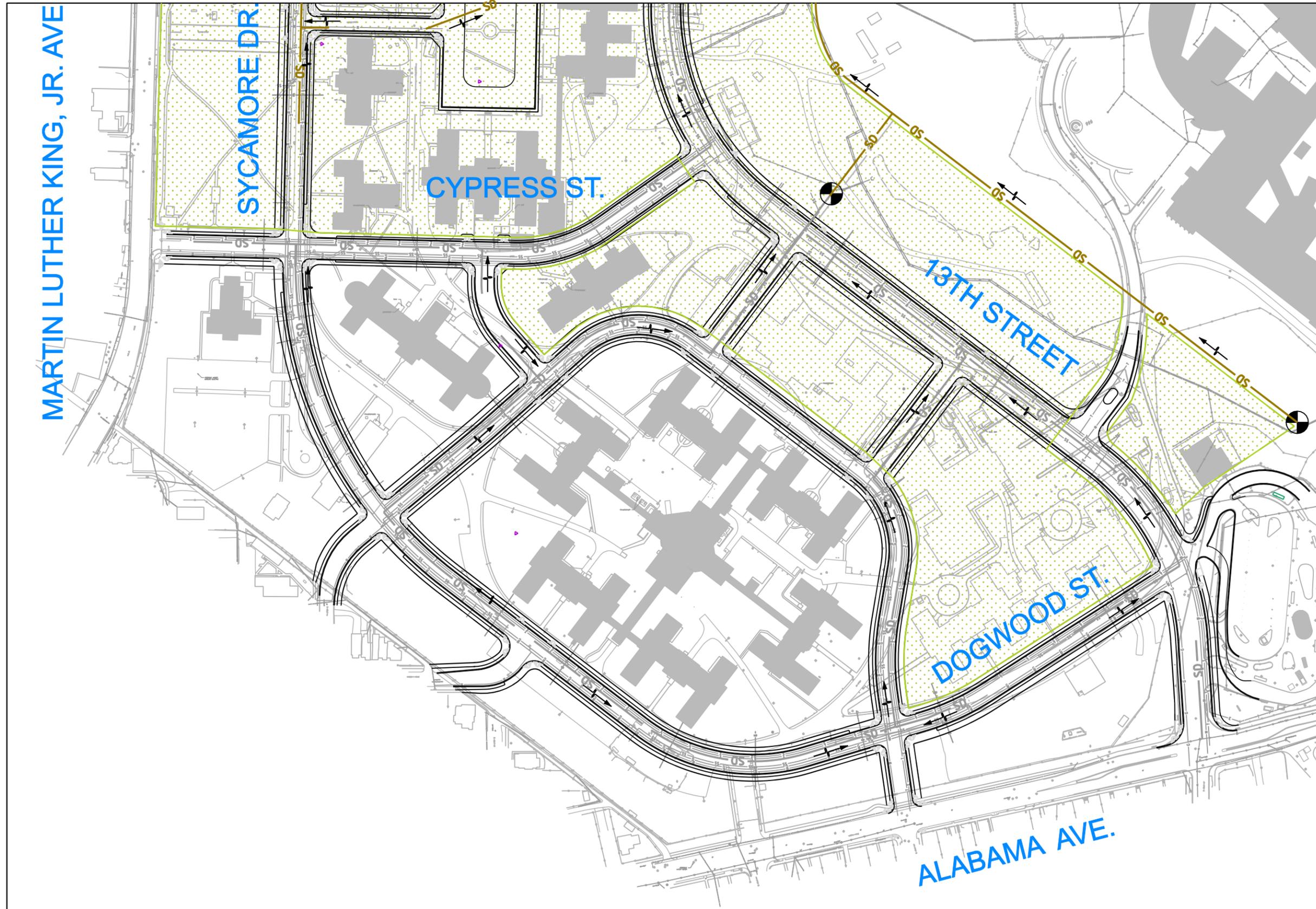
**St. Elizabeths East Campus
 Storm Layout-Stage 1**



SEE SHEET 1 OF 2 FOR CONTINUATION

9B

Storm Sewer – Stage 2



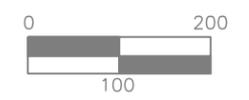
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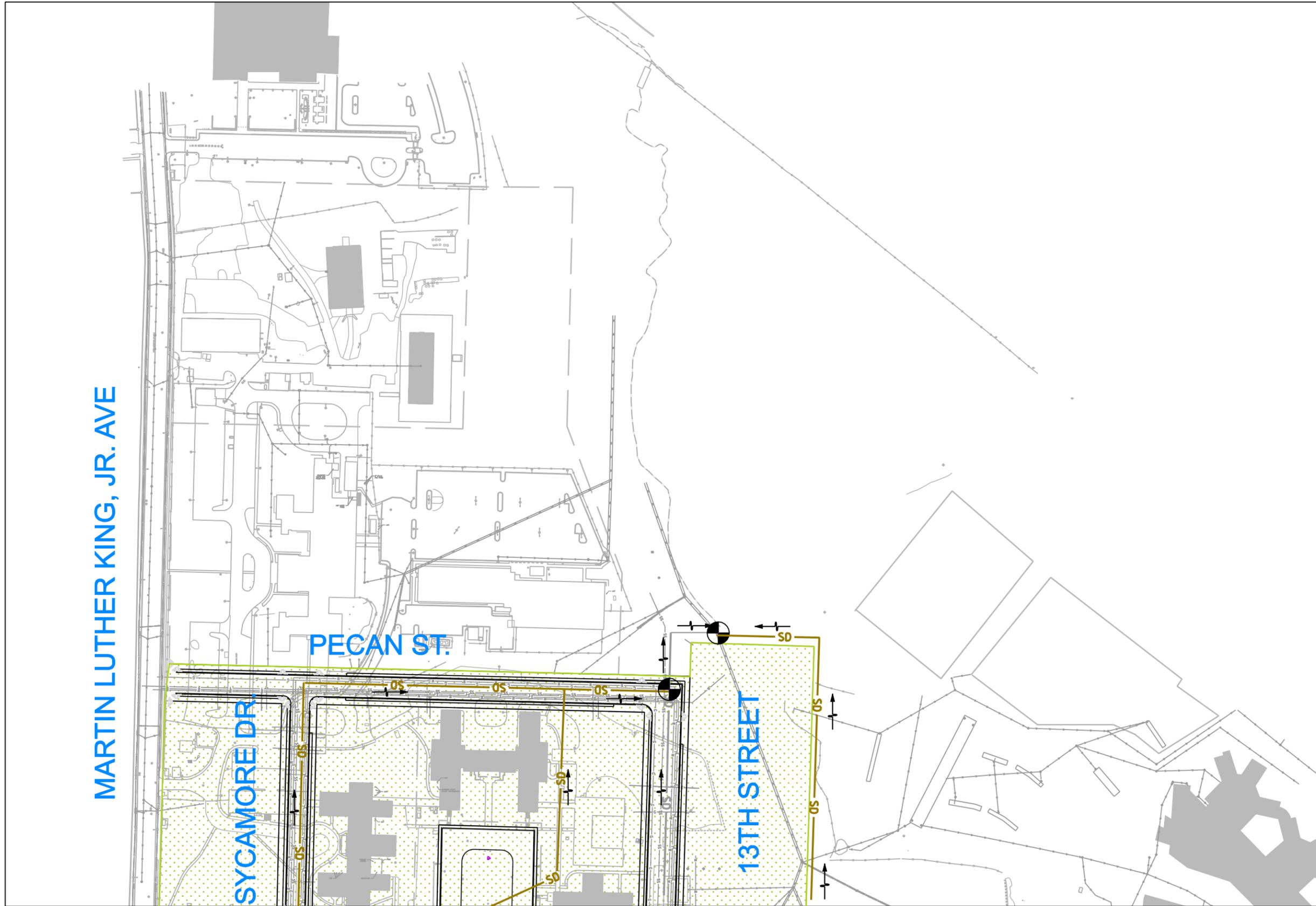
- STORM DRAIN (STAGE 2)
- STORM DRAIN (STAGE 1)
- SANITARY SEWER
- ELECTRIC
- TELECOMM
- WATER
- GAS
- STAGE 2 DELINEATION
- PARCEL BOUNDARIES
- BUILDINGS TO REMAIN
- STAGE 2 AREA
- POINT OF CONNECTION
- 5' MIN. COVER (TYP.)

MATERIALS:

STORM DRAIN PIPE —
RCPR CL III

St. Elizabeths East Campus
Storm Layout-Stage 2

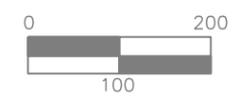




- LEGEND**
- STORM DRAIN (STAGE 2)
 - STORM DRAIN (STAGE 1)
 - SANITARY SEWER
 - ELECTRIC
 - TELECOMM
 - WATER
 - GAS
 - STAGE 2 DELINEATION
 - PARCEL BOUNDARIES
 - BUILDINGS TO REMAIN
 - STAGE 2 AREA
 - POINT OF CONNECTION
 - 5' MIN. COVER (TYP.)

MATERIALS:
 STORM DRAIN PIPE — RCPR CL III

**St. Elizabeths East Campus
 Storm Layout-Stage 2**



SEE SHEET 1 OF 2 FOR CONTINUATION

9C

Storm Runoff Calculations

Runoff Projections - Storm Drain - 2 Year

Project Name: **St. Elizabeths**

STORM FREQUENCY:		2 Year					
DRAINAGE AREA	% Impervious*	AREA	RUNOFF COEFF	(AREA) X (C)	*TIME OF* CONCENTRATI	RAINFALL INTENSITY	RUNOFF "Q ₂ "
		TOTAL	"C"	Σ A*C	INLET	"I ₂ "	
		(ac)	(ac)	(ac)	(min)	(in/hr)	(cfs)
1	41%	6.710	0.58	3.862	5.00	5.28	20.39
2A	46%	2.356	0.60	1.421	5.00	5.28	7.50
2B	46%	4.199	0.60	2.532	5.00	5.28	13.37
2C	46%	2.928	0.60	1.765	5.00	5.28	9.32
2D	46%	2.824	0.60	1.703	5.00	5.28	8.99
3A	83%	2.361	0.81	1.904	5.00	5.28	10.05
3B	83%	2.402	0.81	1.937	5.00	5.28	10.23
4A	52%	1.962	0.64	1.248	5.00	5.28	6.59
4B	52%	1.888	0.64	1.201	5.00	5.28	6.34
5A	64%	3.631	0.70	2.549	5.00	5.28	13.46
5B	64%	3.520	0.70	2.471	5.00	5.28	13.05
6A	89%	1.717	0.84	1.441	5.00	5.28	7.61
6B	89%	1.773	0.84	1.488	5.00	5.28	7.86
6C	89%	1.960	0.84	1.646	5.00	5.28	8.69
7A	100%	1.077	0.90	0.969	5.00	5.28	5.12
7B	100%	2.695	0.90	2.425	5.00	5.28	12.81
8A	35%	0.798	0.54	0.433	5.00	5.28	2.29
8B	35%	0.546	0.54	0.296	5.00	5.28	1.56
8C	35%	0.457	0.54	0.248	5.00	5.28	1.31
8D	35%	1.000	0.54	0.542	5.00	5.28	2.86
9A	59%	0.562	0.67	0.379	5.00	5.28	2.00
9B	59%	0.451	0.67	0.305	5.00	5.28	1.61
9C	59%	1.003	0.67	0.676	5.00	5.28	3.57
10	56%	0.881	0.66	0.580	5.00	5.28	3.06
11A	49%	3.238	0.62	2.006	5.00	5.28	10.59
11B	49%	2.630	0.62	1.629	5.00	5.28	8.60
11C	49%	2.457	0.62	1.522	5.00	5.28	8.04
11D	49%	2.915	0.62	1.806	5.00	5.28	9.54
12	89%	1.761	0.84	1.478	5.00	5.28	7.81
13A	79%	1.776	0.78	1.393	5.00	5.28	7.35
13B	79%	1.849	0.78	1.450	5.00	5.28	7.66
14A	76%	0.808	0.77	0.621	5.00	5.28	3.28
14B	76%	0.906	0.77	0.696	5.00	5.28	3.67
14C	76%	0.463	0.77	0.355	5.00	5.28	1.88
15A	97%	2.309	0.88	2.040	5.00	5.28	10.77
15B	97%	2.030	0.88	1.793	5.00	5.28	9.47
16	97%	1.617	0.88	1.429	5.00	5.28	7.54
17A	100%	0.778	0.90	0.700	5.00	5.28	3.70
17B	100%	1.266	0.90	1.140	5.00	5.28	6.02

* Information taken from ARUP "Stormwater Quantity Control" report, dated 03-12-2012

Runoff Projections: Storm Drain - 15 Year

Project Name: **St. Elizabeths**

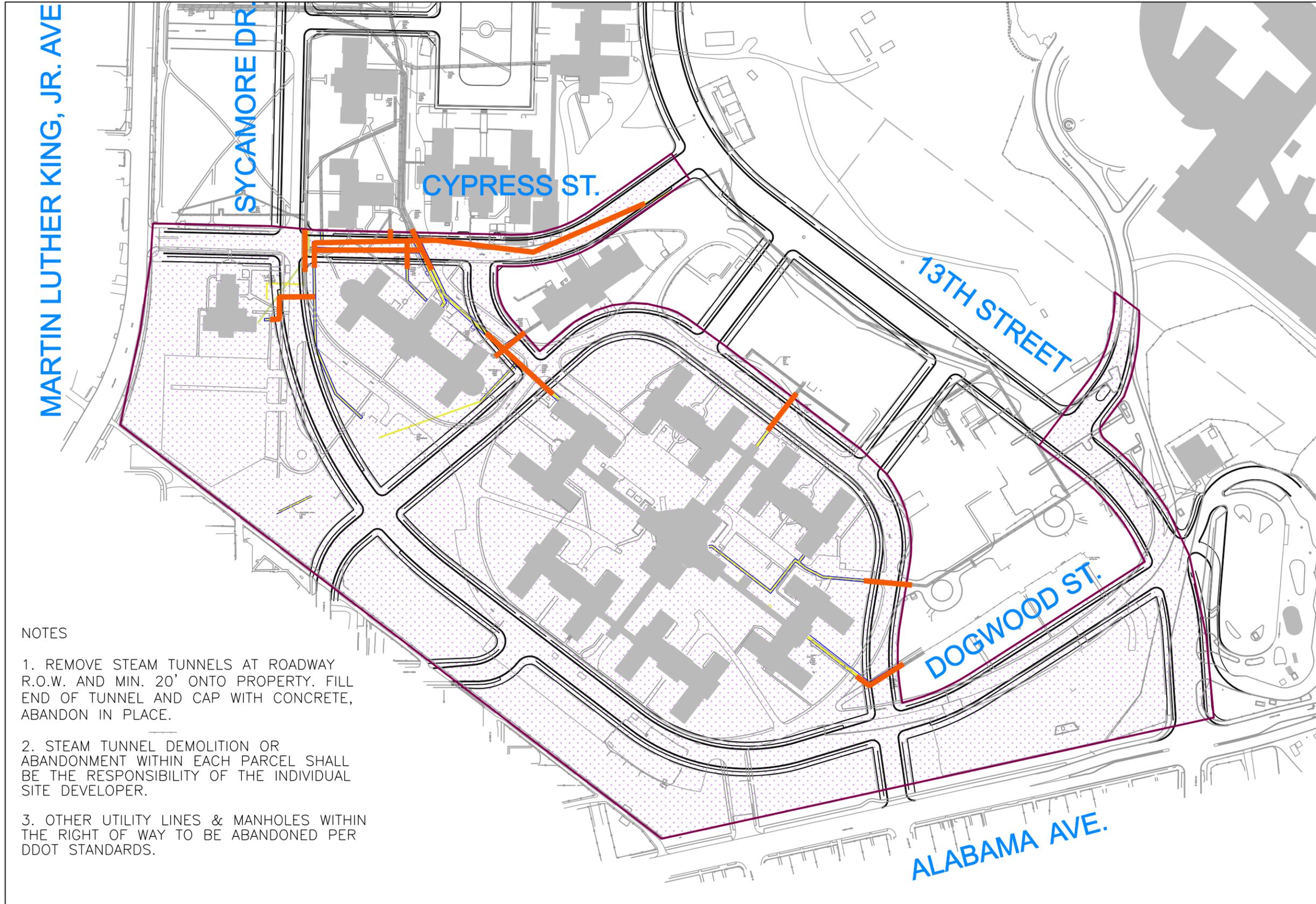
STORM FREQUENCY:		15 Year					
DRAINAGE AREA	% Impervious*	AREA	RUNOFF COEFF	(AREA) X (C)	*TIME OF* CONCENTRATION	RAINFALL INTENSITY	RUNOFF "Q ₁₅ "
		TOTAL	"C"	Σ A*C	INLET	"I ₁₅ "	
		(ac)	(ac)	(ac)	(min)	(in/hr)	(cfs)
1	41%	6.710	0.58	3.862	5.00	7.56	29.19
2A	46%	2.356	0.60	1.421	5.00	7.56	10.74
2B	46%	4.199	0.60	2.532	5.00	7.56	19.14
2C	46%	2.928	0.60	1.765	5.00	7.56	13.35
2D	46%	2.824	0.60	1.703	5.00	7.56	12.88
3A	83%	2.361	0.81	1.904	5.00	7.56	14.40
3B	83%	2.402	0.81	1.937	5.00	7.56	14.65
4A	52%	1.962	0.64	1.248	5.00	7.56	9.43
4B	52%	1.888	0.64	1.201	5.00	7.56	9.08
5A	64%	3.631	0.70	2.549	5.00	7.56	19.27
5B	64%	3.520	0.70	2.471	5.00	7.56	18.68
6A	89%	1.717	0.84	1.441	5.00	7.56	10.90
6B	89%	1.773	0.84	1.488	5.00	7.56	11.25
6C	89%	1.960	0.84	1.646	5.00	7.56	12.44
7A	100%	1.077	0.90	0.969	5.00	7.56	7.33
7B	100%	2.695	0.90	2.425	5.00	7.56	18.34
8A	35%	0.798	0.54	0.433	5.00	7.56	3.27
8B	35%	0.546	0.54	0.296	5.00	7.56	2.24
8C	35%	0.457	0.54	0.248	5.00	7.56	1.88
8D	35%	1.000	0.54	0.542	5.00	7.56	4.10
9A	59%	0.562	0.67	0.379	5.00	7.56	2.87
9B	59%	0.451	0.67	0.305	5.00	7.56	2.30
9C	59%	1.003	0.67	0.676	5.00	7.56	5.11
10	56%	0.881	0.66	0.580	5.00	7.56	4.38
11A	49%	3.238	0.62	2.006	5.00	7.56	15.16
11B	49%	2.630	0.62	1.629	5.00	7.56	12.32
11C	49%	2.457	0.62	1.522	5.00	7.56	11.51
11D	49%	2.915	0.62	1.806	5.00	7.56	13.65
12	89%	1.761	0.84	1.478	5.00	7.56	11.18
13A	79%	1.776	0.78	1.393	5.00	7.56	10.53
13B	79%	1.849	0.78	1.450	5.00	7.56	10.97
14A	76%	0.808	0.77	0.621	5.00	7.56	4.69
14B	76%	0.906	0.77	0.696	5.00	7.56	5.26
14C	76%	0.463	0.77	0.355	5.00	7.56	2.69
15A	97%	2.309	0.88	2.040	5.00	7.56	15.42
15B	97%	2.030	0.88	1.793	5.00	7.56	13.56
16	97%	1.617	0.88	1.429	5.00	7.56	10.80
17A	100%	0.778	0.90	0.700	5.00	7.56	5.30
17B	100%	1.266	0.90	1.140	5.00	7.56	8.61

* Information taken from ARUP "Stormwater Quantity Control" report, dated 03-12-2012

Appendix 10
Steam Tunnels

10A

Steam Tunnel Demolition – Stage 1



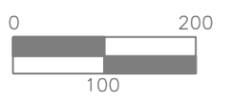
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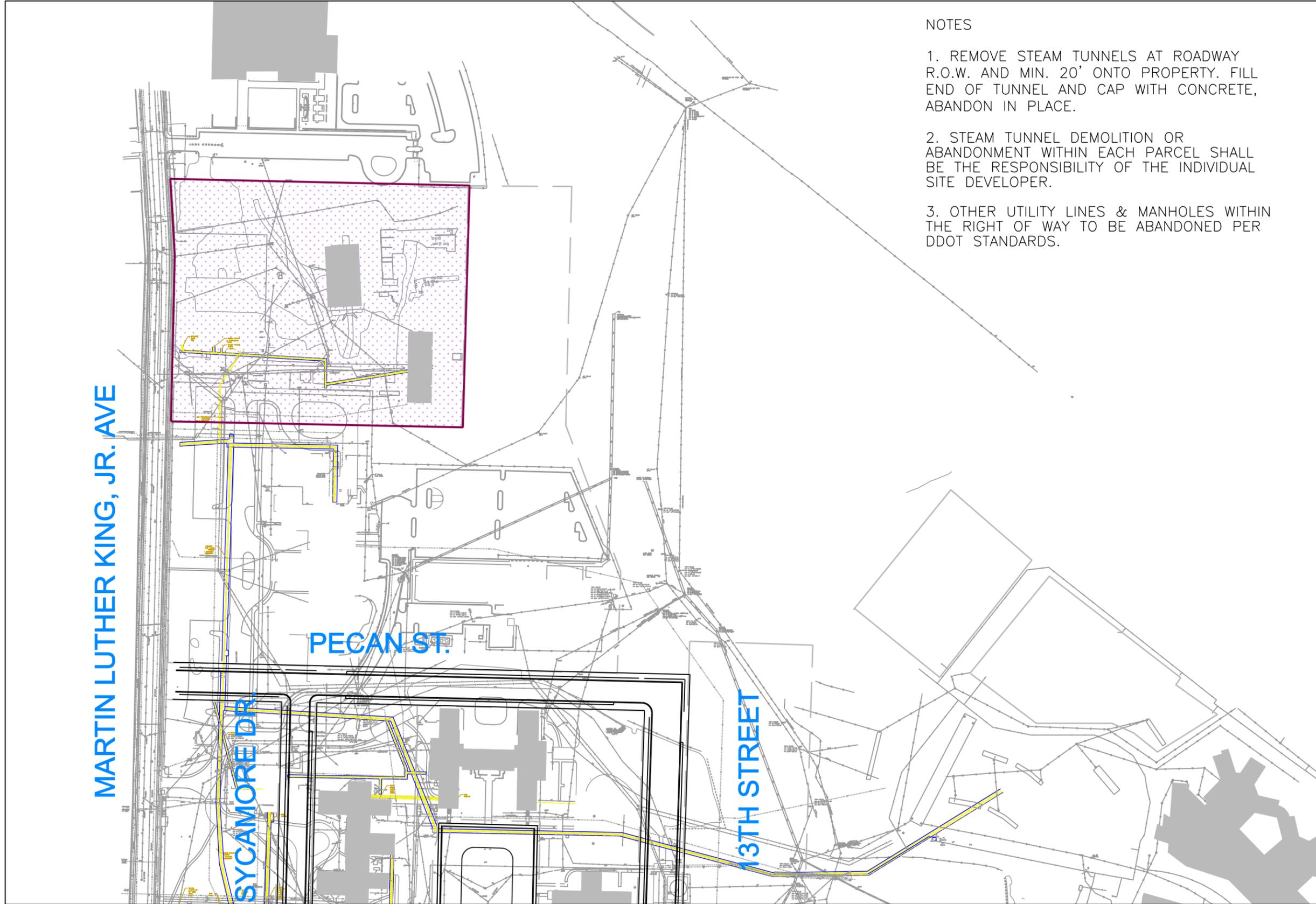
- STAGE 1 DELINEATION
- PARCEL BOUNDARIES
- BUILDINGS TO REMAIN
- STAGE 1 AREA
- LIMIT OF TUNNEL REMOVAL

NOTES

1. REMOVE STEAM TUNNELS AT ROADWAY R.O.W. AND MIN. 20' ONTO PROPERTY. FILL END OF TUNNEL AND CAP WITH CONCRETE, ABANDON IN PLACE.
2. STEAM TUNNEL DEMOLITION OR ABANDONMENT WITHIN EACH PARCEL SHALL BE THE RESPONSIBILITY OF THE INDIVIDUAL SITE DEVELOPER.
3. OTHER UTILITY LINES & MANHOLES WITHIN THE RIGHT OF WAY TO BE ABANDONED PER DDOT STANDARDS.

**St. Elizabeths East Campus
Steam Tunnel Demolition
- Stage 1**





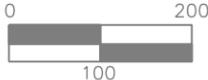
NOTES

1. REMOVE STEAM TUNNELS AT ROADWAY R.O.W. AND MIN. 20' ONTO PROPERTY. FILL END OF TUNNEL AND CAP WITH CONCRETE, ABANDON IN PLACE.
2. STEAM TUNNEL DEMOLITION OR ABANDONMENT WITHIN EACH PARCEL SHALL BE THE RESPONSIBILITY OF THE INDIVIDUAL SITE DEVELOPER.
3. OTHER UTILITY LINES & MANHOLES WITHIN THE RIGHT OF WAY TO BE ABANDONED PER DDOT STANDARDS.

LEGEND

-  STAGE 1 DELINEATION
-  PARCEL BOUNDARIES
-  BUILDINGS TO REMAIN
-  STAGE 1 AREA
-  LIMIT OF TUNNEL REMOVAL

St. Elizabeths East Campus
Steam Tunnel Demolition
- Stage 1



10B

Steam Tunnel Demolition – Stage 2

MARTIN LUTHER KING, JR. AVE

SYCAMORE DR.

CYPRESS ST.

13TH STREET

DOGWOOD ST.

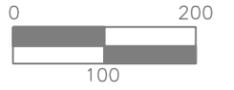
ALABAMA AVE.

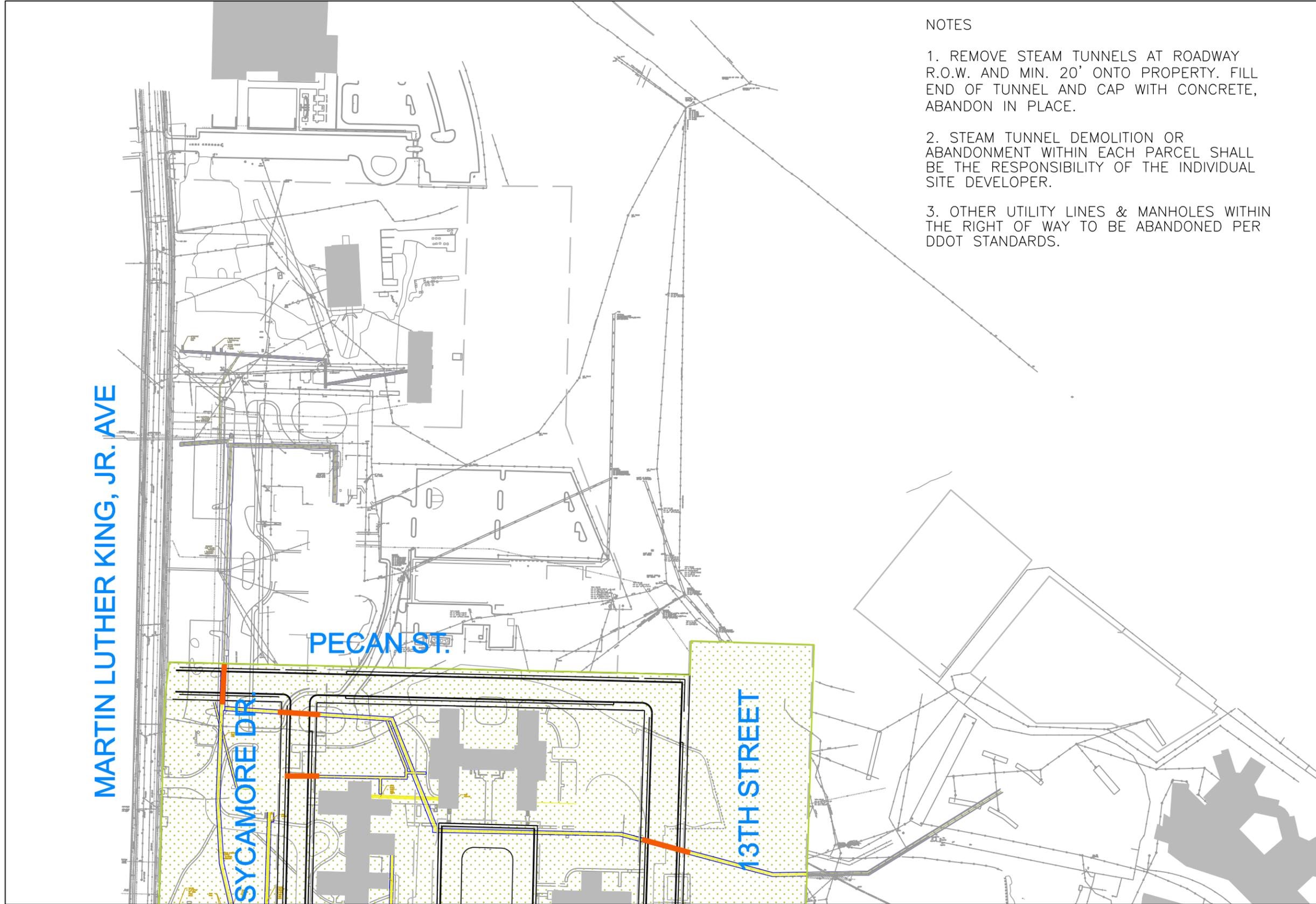
- LEGEND
-  STAGE 2 DELINEATION
 -  PARCEL BOUNDARIES
 -  BUILDINGS TO REMAIN
 -  STAGE 2 AREA
 -  LIMIT OF TUNNEL REMOVAL

NOTES

1. REMOVE STEAM TUNNELS AT ROADWAY R.O.W. AND MIN. 20' ONTO PROPERTY. FILL END OF TUNNEL AND CAP WITH CONCRETE, ABANDON IN PLACE.
2. STEAM TUNNEL DEMOLITION OR ABANDONMENT WITHIN EACH PARCEL SHALL BE THE RESPONSIBILITY OF THE INDIVIDUAL SITE DEVELOPER.
3. OTHER UTILITY LINES & MANHOLES WITHIN THE RIGHT OF WAY TO BE ABANDONED PER DDOT STANDARDS.

St. Elizabeths East Campus
Steam Tunnel Demolition
- Stage 2





NOTES

1. REMOVE STEAM TUNNELS AT ROADWAY R.O.W. AND MIN. 20' ONTO PROPERTY. FILL END OF TUNNEL AND CAP WITH CONCRETE, ABANDON IN PLACE.
2. STEAM TUNNEL DEMOLITION OR ABANDONMENT WITHIN EACH PARCEL SHALL BE THE RESPONSIBILITY OF THE INDIVIDUAL SITE DEVELOPER.
3. OTHER UTILITY LINES & MANHOLES WITHIN THE RIGHT OF WAY TO BE ABANDONED PER DDOT STANDARDS.

LEGEND

- STAGE 2 DELINEATION
- PARCEL BOUNDARIES
- BUILDINGS TO REMAIN
- STAGE 2 AREA
- LIMIT OF TUNNEL REMOVAL

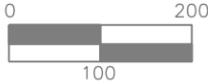
MARTIN LUTHER KING, JR. AVE

SYCAMORE DR

PECAN ST.

13TH STREET

St. Elizabeths East Campus
Steam Tunnel Demolition
- Stage 2



Appendix 11
Meeting Minutes

St Elizabeths East Campus Infrastructure Advisory Services - meeting with DC Water

PREPARED FOR: See attached sign in sheet

COPY TO: Karl Kratzer, Marlon Smoker

PREPARED BY: Richard Staudinger

DATE: September 27, 2011

PROJECT NUMBER: 428410

A meeting was held at 11 AM on Friday December 2, 2011 in room 325 of the Wilson Building in the District. The meeting was held to coordinate DC Water plans to build a new transmission line and 2 MGD water tower on the East Campus with DMPED plans to develop new site infrastructure to serve the East Campus redevelopment efforts.

The following notes or action items came out of the meeting and discussion with GSA at the meeting:

- DC Water (WR&A is consultant) is planning to construct a new 2 MGD elevated water storage tank on the East Campus near the new hospital site. The tank site is fixed, but there are several options available on the routing of the 24 & 30 inch diameter transmission main between MLK blvd. and the tank site and three options for routing the transmission main east of the tank back to the offsite system connection point.
- DC Water indicated that Ward 8 has historically had very low water pressures and volumes at the top of the hill where the East Campus is located. The west campus is building a new pump station to temporarily raise their water pressures and volumes for their development until the new elevated tank and transmission mains are constructed.
- The East Campus is served from a 14 inch diameter main along the east side of MLK blvd. that is tied to that new temporary pump station. The plan is to abandon the pump station and 14 inch main after the elevated tank is operational.
- The present schedule is for construction of the tank and transmission mains to start in mid 2013. DC Water is to provide a schedule to CH2M HILL of the project milestones.
- Within the East Campus, the approach discussed was that DMPED would develop the new infrastructure systems (water, storm, and sanitary) to DC Water standards and then turn the system over to DC Water to maintain as a public system. Negotiations are underway on the financial aspects of the new East Campus systems between DMPED and DC Water.
- DMPED would like to get the “build it to standards and turn it over” procedure memorialized in writing with DC water some time later on in the process. Should be a recommendation of the CH2M HILL infrastructure concept plan.
- DC Water has done hydraulic modeling (Hatch McDonnell is consultant) with their consultant and with an in house staff person. DC Water to supply contact information to CH2M HILL so we can look at model and see if it helps with the East Campus distribution system concept planning for the water systems.

- For Storm Sewers, a plan has been done and Jessica Demoise/Bryan McDermott are the contacts at DC Water for storm sewer information.
- The Sanitary Sewer is on GIS and Malcolm Pirnie is the Sewer Program Manager. Again contact Jessica or Bryan at DC Water to follow up in this area.
- DC Water requested CH2M HILL review the draft report on the transmission line alternative routes. We are to get back to DC Water by December 9th with any comments on the alignment locations. There is an FTP site with an electronic copy of the report available for download if needed. Contact Jessica for access.

water feature around the Coast Guard building, the system has two underground holding areas as well as one at grade detention facility.

Gas & Electric Systems

- Gas is currently supplied to the West Campus from an Ex. 8" Gas main in MLK Ave.
- Future gas is planned to be a high pressure main and from a single source (size is unknown). Thought of be entering the site near Gate #2.
- PEPCO has installed service to the West Campus near Gate #3.
- Electrical redundancy for the West Campus is supplied by generators. New substation was placed on southern end of the campus. Not sure if PEPCO has sized the feeder in MLK for the entire ST E's area.

Other

- Fly ash sites were mapped and material removed from the site as necessary
-

St Elizabeths East Campus Stormwater Management Criteria - meeting with DDOE

ATTENDEES: Rebecca Stack, DDOE Fasil Gebremariam, CH2M HILL
Robert Irwin, CH2M HILL Brad Job, AMT, LLC

COPY TO: Karl Kratzer, Marlon Smoker

PREPARED BY: Robert Irwin & Brad Job

DATE: July 17, 2012

PROJECT NUMBER: 428410

A meeting was held at 10 AM on Wednesday April 10, 2012 in room 505 at 1200 First Street, NE in the District. The meeting was held to discuss DDOE's new design criteria and implications on DMPED East Campus redevelopment efforts.

The following notes came out of the meeting and discussion with DDOE at the meeting:

1. Ms. Stacks outlined the current and upcoming DDOE's SWM Regulation. The proposed regulations are not available for distribution to the general public at this time. Regulations will be available after the internal review by DC agencies.
2. Estimated schedule for implementation of new criteria (Oct. 2012?)
 - Regulations are currently within a 4-6 week review period with agencies/organizations
 - + 90 day Public comment Period
 - + 30 DDOE comment response Period
 - There will be a 6 month "grandfather" period for projects already in the permit process.
3. Application of current regulations is to store the volumetric difference resulting from the 15-year post development flow compared to the 2-year pre-development (meadow) flow, using $T_c=5$ min.
4. Draft regulation will change volume requirement to retention of 1.2" of runoff (90th Percentile Storm Event) from the whole site. The area used for calculations includes both impervious and pervious areas with varying C-factors.
5. Draft regulations still require control of 2-yr and 15-yr flow rates from post-development to pre-development conditions. Basis of 2-yr design is for channel protection. Basis of 15-yr design is for flood prevention.
6. Pre-development condition for 2-yr flow should be meadow condition. Design for control of the 15-yr flow should be based on existing or proposed pipe capacity. DC Water should provide pipe capacity requirements/conditions.
7. Retaining 1.2" of runoff also applies to Public ROW, but to the Maximum Extent Practical within the ROW.
8. Design must show that infiltration and bioretention were considered and utilized wherever possible.
9. 1.2" runoff volume calculation to use the following C-factors: Impervious = 0.95, Compacted Cover = 0.25, Natural Cover = 0.0.
10. Calculations should be done for each Drainage Area within the site.

11. Drainage Areas (DA) that can provide more storage/re-use/infiltration can compensate for Drainage Areas that provide insufficient storage/re-use/infiltration. Maximum retention volume calculation for a DA is using 1.7" as the "P" value; minimum volume would be computed using P=0.6".
12. A DA that retain less than the volume computed using P=0.6"; must at least provide a quality structure providing TSS Removal of at least 65%.
13. Draft Regulations will also have a SWM credit program where sites can sell access gallons to the city. The city will then allow sites that cannot meet the SWM requirements to purchase these credits.
14. Approximate volume percentages for SWM practices that DDOE will consider as "retained" volume:
 - Bioretention w/ underdrain = 65%;
 - Permeable paving w/ underdrain = 60%;
 - Green Roof = 0.25" for every 1-inch of media.
15. Low Impact Development (LID), like bio-retention, permeable paver, trees, etc can be applicable within DDOT right of way.

St Elizabeths East Campus Storm and Sanitary Outfalls - meeting with DCWater

ATTENDEES: Brian McDermott, DCWater
Robert Irwin, CH2M HILL
Roger Gans, DCWater
Tom Fegley, AMT
John Boryschuk, DCWater
Brad Job, AMT, LLC

COPY TO: Karl Kratzer, Marlon Smoker

PREPARED BY: Robert Irwin

DATE: July 17, 2012

PROJECT NUMBER: 428410

A meeting was held at 10 AM on Friday April 13, 2012 in DC Water Offices at the Blue Plains Facility. The meeting was held to discuss East Campus sanitary and storm outfall condition assessment and DC Water's requirement to accept them into their system.

The following notes came out of the meeting and discussion with DCWater at the meeting:

We provided an overview of the site planning efforts to date and briefly described results of onsite utilities condition assessment results.

Storm/SWM:

1. DCWater's policy is to treat any storm drain upstream of SWM facility will be a private system. Discussed the possibility of if the East Campus development were to be designed with only one or two SWM facilities to treat the whole site. They would have to study the design to insure it meets all criteria and wouldn't create any future maintenance issues.
2. In the past DC Water has allowed some offline SWM facilities with a weir structure diverting the flow. The bypass must handle full 15-yr flow. The weir structure should be on private property and not maintained by DCWater.
3. The roadways will have LID features where possible, but adequate provision for building wet and dry utility services need to be considered when locating roadway LID facilities.
4. Issue was raised concerning how the
5. DC water will review CCTV and supporting information to determine whether they would consider taking over existing outfall based upon pipe condition and construction.
6. Additional concerns DCWater must consider before they accept the outfalls are
 - Maintenance access – must be able to access the full length of the outfall structures and stream downstream of the outfalls.
 - Erosion – must show that the existing outfall is stable and the future flows will not cause any erosion of the stream banks.
 - Outfall capacity – capacity existing stream valley downstream of the storm sewer system needs to be evaluated to show that it has capacity.

Sanitary Sewer:

1. Existing sanitary system will need to modeled using pre-development conditions. Once model is prepared proposed flow can be input. Downstream capacity of the DC sewer system needs to be evaluated which

will involve creating a model of pre and post development conditions for about a mile of the DC sewer system. The model will have to be based upon available data from counter maps and estimated or monitored flows.

2. DC Water is considering providing the modeling for sanitary system internally. This effort is estimated to take at least one (1) month.
3. DC water will review CCTV and supporting information to determine whether they would consider taking over existing sanitary outfall based upon pipe condition and construction. Maintenance access is a major concern
4. A thumb drive containing the CCTV inspection reports index file for both Sanitary and Storm Sewers, with links to tapes and pictures, available record sewer and SD plans, as well as ranges of flow projections possible connection points was given to DCWater to review.
5. AMT will provide TV inspection reports with grading (structural, o&m and overall) and is looking into the availability of a database file containing the reported information.

Water:

1. A short discussion of the water system occurred noting two items:
 - 1) The existing system as is cannot adequately support existing demands and therefore it is highly unlikely that any new buildings would be allowed to connect without the new 2 mgd storage tank being on line to increase pressure and reinforces supply.
 - 2) Easements will be required for the existing 14-inch water currently supplying the East Campus from the West if any new building permits were to be issued prior to the completion of the tank.
2. The new elevated tank is scheduled to begin detailed design in a month and estimated to be on line in 2015.
3. The cost of water and sewer mains to serve the East Campus was assessed by others to be in the range of \$14 to \$15 million.

St Elizabeths East Campus Major Utilities Providers Meeting

ATTENDEES: See Attached Sign in Sheet

COPY TO: Karl Kratzer, Marlon Smoker

PREPARED BY: Robert Irwin

DATE: July 17, 2012

PROJECT NUMBER: 428410

A meeting was held at 1 PM on Wednesday, April 16, 2012 in the CH2M HILL Washington, DC office. The meeting was held to discuss East Campus utilities requirements and general layout.

The following notes came out of the meeting:

Provided an overview of the East Campus Development Master Planning efforts to date and briefly described to proposed constructions stages.

- DMPED Acting as site master developer
- 30% Plans out for D/B by end of year
- 5 M SF mixed use development; 1M SF adaptive reuse, 4M SF new building
- Hope to have zoning by right in place by July 2012, Zoning is flexible to allow development change with market conditions
- Site will be constructed in two Stages, and may have up to three temporary site uses prior to construction of stage 1 development.

Three sites that may require temporary utilities for uses prior to Stage 1 construction begins would be:

- North Parcel (old farm) – may need updated water service for proposed farm uses. This could be an immediate need for community gardens,
- Will need to maintain existing fire flows to existing unoccupied buildings, which is estimated at about 1,000 GPM by Gilbane.
- A temporary food service venue will be needed to service the occupants of the Coast Guard site in May of 2013. This facility would not be anticipated to have permanent structures of any kind and the need for water and sanitary sewer would be minor. Power and telecommunications needs would be more significant.

Roger Gans from DCWater stated that the new water tower would have to be in place prior to construction of any new buildings. The new tank is now scheduled to be completed in 2015. He said the schedule has started to slip. DC Water will also require projected water flows for the temporary uses prior to Stage 1 construction.

PEPCO said that there is enough capacity in the existing system for the temporary uses. They would need the construction build out schedule to ascertain if enough power will be available during construction of stage 1 and stage 2 buildings. Temporary electrical service will be provided by overhead wiring.

Verizon says there is sufficient capacity for the temporary uses.

Verizon isn't the only supplier of telecom or data services in the area. They usually provide the "path" and others utilize the ducts to carry their system cables.

We need to check on where or not DCNet (carries DC Government data) will require facilities to St E's. Faras said there may be DC government facilities located on site in the future.

DCWater requested that the sanitary and storm systems be moved closer to the center line of the road to reduce the length of the laterals. Since the laterals are gravity, longer laterals will cause the mainline sewer to be deeper and may conflict other utilities on the other side of the road.

DCWater was concerned with the capacity and condition of the sanitary and storm sewer outfalls and if the downstream system was adequate to handle the future flows. They will analyze the downstream system. We have to give them our projected flow rates. AMT is to verify storm outfall under Suitland Parkway.

Pepco wanted their conduits under the sidewalk area. They were told that this was not possible do to the proposed LID systems along the roadway. Conduits can be adjacent to Verizon conduits.

Verizon Connection in MLK:

- Four feeders from the same source
- FEMA second feed from west side of parcel
- 12 way duct bank

Verizon conduit is to be looped through and tied back for redundancy

A letter of acknowledgement will be generated by CH2M HILL documenting the meeting and the proposed system locations for all to sign off on. No MOU will be required.

All utilities will give a list of preferred contractors/designers to be incorporated by CH2M HILL in the D/B documents.

All utilities will provide design criteria and specs to be used in the design or DB documents for the final design efforts.

DCWater will be doing the 24 inch diameter transmission line design and construction through the site within the future ROW of Pecan Street. CH2M HILL will send the latest plan and profiles for Pecan Street roadway plans to WRA (designer).

Water service to the Hospital (Stage 1) shall include new connections to be made on 13th Street. The Hospital will require redundant service to be provided.

DC Water stated Inspection procedures as well as standard materials and specifications will follow DCWater criteria.

The infrastructure concept plans and typical utility and road cross sections that were reviewed at the meeting will be updated based on the input from the meeting and distributed to the utilities for review and comment.

Updated flow calculations based on final development plan of 5 M SF of development will also be sent to the utility companies for comments and use in checking downstream capacities.

Specific Utility contact persons were assigned from each utility for the CH2M HILL team to coordinate with regarding reviews and standards. Points of Contact for utility connections:

Roger Gans (water and sewer)

Tri Dang (Pepco) submittals hard copies (3), temp power design criteria available at Web-site

Gabor Varsa (Verizon) submittals hard copy & pdf

Meeting: Utility Providers Workshop Date: 4/18/2012
 Location: CH2MHILL - DC office Time: 1⁰⁰ PM

Sign-In Sheet

NAME	ORGANIZATION	PHONE #	E-MAIL
Don Klingemann	S3E Klingemann	703-978-0100	donk@s3e.com
RICHARD STAUBINGER	CH2MHILL	703-376-5226	RICHARD.STAUBINGER@CH2M.COM
Bob Irwin	CH2MHILL	703-376-5146	ROBERT.Irwin@CH2M.COM
Feras Chmy	DMPED	on file	on file
Ethan Leash	DMPED	202-213-9215	ethan.leash@dc.gov
Monica Outland	DC Water	202-757-4291	Monica.Outland@dcwater.com
Tom Grala	DC Water	202-757-4110	thomas.grala@dcwater.com
Roger Gaus	DC Water	202-707-2452	rgaus@dcwater.com
BRAD JOB	AMT	202-289-4545	bjob@amtengineering.com
Tom Fogley	AMT	202-289-4545	tfogley@amtengineering.com
KEN SPRAU	WR&A	443-224- ¹⁷³⁵	ksprau@wrallp.com
Jamie Bell	WR&A	443-224-1739	jbell@wrallp.com
Mason Mattex	Pepco	202-872-3505	m1mattex@pepco.com
Jorge Rivera	Pepco	202-872-3253	jrivera@pepco.com
Tri Dang	pepco	202-388-2542	tdang@pepco.com
Brian McDermott	DC Water	702-646-8600	Brian.McDermott@DCWater.com

Com

Appendix 12
Conceptual Cost Estimates for Infrastructure
Systems

STAGE 1 SUMMARY of COSTS - ST ELIZABETHS EAST CAMPUS CONCEPT INFRASTRUCTURE PLAN
Conceptual Cost Opinion Summary

ITEM	ITEM DESCRIPTION		COMMENTS		TOTAL
1	TOTAL WATER SYSTEM COST				\$3,626,000
2	TOTAL SANITARY SEWER SYSTEM COST				\$2,305,000
3	TOTAL STORM SEWER SYSTEM COST				\$3,714,000
4	TOTAL ELECTRICAL DISTRIBUTION SYSTEM COST				\$3,318,000
5	TOTAL TELECOMMUNICATIONS SYSTEMS COST				\$2,919,000
6	TOTAL NATURAL GAS DISTRIBUTION SYSTEM COST				\$609,000
7	TOTAL STEAM TUNNEL DEMOLITION COST				\$2,900,000
8					\$0
9					\$0
10					\$0
TOTAL CONSTRUCTION COST (Items 1-10)					\$19,391,000
11	ENGINEERING				
	Preliminary Engineering	5	% of Items 1-10		\$969,550
	Final Engineering	5	% of Items 1-10		\$969,550
	Construction Engineering	10	% of Items 1-10		\$1,939,100
TOTAL ENGINEERING COST (Item 11)					\$3,878,000
TOTAL UTILITY INFRASTRUCTURE COST					\$23,269,000
	Phase I and Phase II ESA services				\$136,640
	Building Hazardous Materials Surveys - 16 buildings				\$209,820
		20	% of Items 27 & 28		\$69,292
TOTAL OTHER COSTS					\$416,000
19	BUILDINGS				
	Demolition - Building No. 124	SF	35463	\$60	\$2,130,000
	Demolition - Building No. 117	SF	12750	\$60	\$770,000
	Demolition - Building No. 119	SF	47282	\$60	\$2,840,000
	Building Relocation -	LS	1		\$0
	Building Contingencies	LS	35 % of Item 19		\$2,009,000
TOTAL BUILDING COST					\$7,749,000

Cost estimates are based on concept level planning documents, and are subject to change as concepts are refined and further developed.

STAGE 1 SUMMARY of COSTS - ST ELIZABETHS EAST CAMPUS CONCEPT INFRASTRUCTURE PLAN
Conceptual Cost Opinion Summary
POTABLE WATER AND FIRE SUPPLY SYSTEMS

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
1	12" Water	LF	4,950	\$250	\$1,238,000
2	10" Water	LF	2,950	\$240	\$708,000
3	8" Water	LF	350	\$235	\$82,000
4	Bldg Service Connections	EA	13	\$15,000	\$195,000
5	Fire Hydrants	EA	19	\$3,500	\$67,000
6	Wet Taps	EA	3	\$12,500	\$38,000
7	Temporary Meter Vaults (For Stage 2)	EA	3	\$17,500	\$53,000
8	Existing Water Demolition	LF	5,200	\$100	\$520,000
9					\$0
10					\$0
11					\$0
12					\$0
13					\$0
14					\$0
15					\$0
TOTAL WATER SYSTEM CONSTRUCTION COST (Items 1-15)					\$2,901,000
16	CONSTRUCTION CONTINGENCY	Lump Sum	25 % of Items 1-15	N/A	\$725,000
TOTAL WATER SYSTEM COST					\$3,626,000

Cost estimates are based on concept level planning documents, and are subject to change as concepts are refined and further developed.

STAGE 1 SUMMARY of COSTS - ST ELIZABETHS EAST CAMPUS CONCEPT INFRASTRUCTURE PLAN
Conceptual Cost Opinion Summary
SANITARY SEWER SYSTEM

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
1	10" Sanitary Sewer PVC SDR35	LF	6,700	\$165	\$1,106,000
2	48" Sanitary Manhole	EA	52	\$4,000	\$208,000
3	6" Building Connection PVC SCH40	LF	1,000	\$155	\$155,000
4	Building Sanitary Cleanout Manhole	EA	18	\$2,500	\$45,000
5	Existing Sanitary Demolition	LF	1,500	\$100	\$150,000
6	Sanitary Sewer Rehabilitation	LS	1	\$180,000	\$180,000
7					\$0
8					\$0
9					\$0
10					\$0
11					\$0
12					\$0
13					\$0
14					\$0
15					\$0
TOTAL SANITARY SEWER SYSTEM CONSTRUCTION COST (Items 1-15)					\$1,844,000
16	CONSTRUCTION CONTINGENCY	Lump Sum	25 % of Items 1-15	N/A	\$461,000
TOTAL SANITARY SEWER SYSTEM COST					\$2,305,000

Cost estimates are based on concept level planning documents, and are subject to change as concepts are refined and further developed.

STAGE 1 SUMMARY of COSTS - ST ELIZABETHS EAST CAMPUS CONCEPT INFRASTRUCTURE PLAN
Conceptual Cost Opinion Summary
STORM SEWER SYSTEMS

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
1	48" DIAMETER MANHOLE	EA	21	\$4,000	\$84,000
2	60" DIAMETER MANHOLE	EA	16	\$4,500	\$72,000
3	72" DIAMETER MANHOLE	EA	34	\$5,000	\$170,000
4	CURB INLET	EA	80	\$5,000	\$400,000
5	15" RCPR	LF	5,300	\$135	\$716,000
6	21" RCPR	LF	150	\$145	\$22,000
7	24" RCPR	LF	950	\$150	\$143,000
8	27" RCPR	LF	110	\$155	\$17,000
9	30" RCPR	LF	750	\$170	\$128,000
10	36" RCPR	LF	1,100	\$210	\$231,000
11	42" RCPR	LF	1,050	\$240	\$252,000
12	48" RCPR	LF	2,350	\$280	\$658,000
13	PARCEL STORM DRAIN CONNECTIONS	EA	39	\$2,000	\$78,000
14	Existing Storm Demolition	LF	3,550	\$100	\$355,000
15	Storm Drain Rehabilitation	LS	1	\$471,500	\$472,000
TOTAL STORM SEWER SYSTEM CONSTRUCTION COST (Items 1-15)					\$2,971,000
16	CONSTRUCTION CONTINGENCY	Lump Sum	25 % of Items 1-15	N/A	\$743,000
TOTAL STORM SEWER SYSTEM COST					\$3,714,000

Cost estimates are based on concept level planning documents, and are subject to change as concepts are refined and further developed.

STAGE 1 SUMMARY of COSTS - ST ELIZABETHS EAST CAMPUS CONCEPT INFRASTRUCTURE PLAN
Conceptual Cost Opinion Summary
ELECTRICAL DISTRIBUTION SYSTEMS

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
1	4-way 5" concrete encased ductbank	LF	7,000	\$225	\$1,575,000
2	Manholes	EA	20	\$20,000	\$400,000
3	2-way 5" concrete encased stub to bldg	LF	1,000	\$170	\$170,000
4	Trenching and backfill	LF	8,000	\$25	\$200,000
5	Street lighting conduit	LF	7,000	\$12	\$84,000
6	Maintain temp service to select bldgs	EA	10	\$1,000	\$10,000
7	Remove existing ductbank in ROW	LF	2,000	\$20	\$40,000
8	Cap and abandon ductbank	EA	9,000	\$5	\$45,000
9	Connect to PEPCO MH's in MLK/Alabama	EA	2	\$15,000	\$30,000
10	PEPCO engineering costs and fees	LOT	1	\$100,000	\$100,000
11					\$0
12					\$0
13					\$0
14					\$0
15					\$0
TOTAL ELECTRICAL DISTRIBUTION SYSTEM CONSTRUCTION COST (Items 1-15)					\$2,654,000
16	CONSTRUCTION CONTINGENCY	Lump Sum	25 % of Items 1-15	N/A	\$664,000
TOTAL ELECTRICAL DISTRIBUTION SYSTEM COST					\$3,318,000

Cost estimates are based on concept level planning documents, and are subject to change as concepts are refined and further developed.

STAGE 1 SUMMARY of COSTS - ST ELIZABETHS EAST CAMPUS CONCEPT INFRASTRUCTURE PLAN
Conceptual Cost Opinion Summary
TELECOMMUNICATIONS SYSTEMS

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
1	4-way 4" concrete encased ductbank	LF	7,000	\$200	\$1,400,000
2	Manholes	EA	20	\$20,000	\$400,000
3	4-way 4" concrete encased stub to bldg	LF	1,000	\$200	\$200,000
4	Trenching and backfill	LF	8,000	\$25	\$200,000
5	Maintain temp service to select bldgs	EA	10	\$1,000	\$10,000
6	Remove existing ductbank in ROW	LF	2,000	\$20	\$40,000
7	Cap and abandon ductbank	EA	9,000	\$5	\$45,000
8	Connect to manholes in MLK/Alabama	EA	2	\$15,000	\$30,000
9	Verizon engineering costs and fees	LOT	1	\$10,000	\$10,000
10					\$0
11					\$0
12					\$0
13					\$0
14					\$0
15					\$0
TOTAL TELECOMMUNICATIONS SYSTEMS CONSTRUCTION COST (Items 1-15)					\$2,335,000
16	CONSTRUCTION CONTINGENCY	Lump Sum	25 % of Items 1-15	N/A	\$584,000
TOTAL TELECOMMUNICATIONS SYSTEMS COST					\$2,919,000

Cost estimates are based on concept level planning documents, and are subject to change as concepts are refined and further developed.

STAGE 1 SUMMARY of COSTS - ST ELIZABETHS EAST CAMPUS CONCEPT INFRASTRUCTURE PLAN
Conceptual Cost Opinion Summary
NATURAL GAS DISTRIBUTION SYSTEMS

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
1	Trenching and backfill	LF	7,000	\$25	\$175,000
2	4" Plastic Gas Pipe	LF	6,000	\$40	\$240,000
3	1 1/2" Plastic Pipe Stub outs	LF	1,000	\$20	\$20,000
4	Maintain temp service to select bldgs	EA	20	\$1,000	\$20,000
5	Remove existing gas piping in ROW	LF	800	\$10	\$8,000
6	Cap and abandon gas piping	LF	800	\$5	\$4,000
7	Connect to existing mains in MLK/Alabama	EA	4	\$5,000	\$20,000
8					\$0
9					\$0
10					\$0
11					\$0
12					\$0
13					\$0
14					\$0
15					\$0
TOTAL NATURAL GAS SYSTEM CONSTRUCTION COST (Items 1-15)					\$487,000
16	CONSTRUCTION CONTINGENCY	Lump Sum	25 % of Items 1-15	N/A	\$122,000
TOTAL NATURAL GAS DISTRIBUTION SYSTEM COST					\$609,000

Cost estimates are based on concept level planning documents, and are subject to change as concepts are refined and further developed.

STAGE 1 SUMMARY of COSTS - ST ELIZABETHS EAST CAMPUS CONCEPT INFRASTRUCTURE PLAN
Conceptual Cost Opinion Summary
STEAM TUNNEL DEMOLITION

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
1	Cap and abandon existing steam tunnel	EA	12	\$10,000	\$120,000
2	Remove tunnels at roadway ROW	LF	1,000	\$200	\$200,000
3	Abatement/Dispose of Haz Mat	LF	1,000	\$2,000	\$2,000,000
4					\$0
5					\$0
6					\$0
7					\$0
8					\$0
9					\$0
10					\$0
11					\$0
12					\$0
13					\$0
14					\$0
15					\$0
TOTAL STEAM TUNNEL DEMOLITION COST (Items 1-15)					\$2,320,000
16	CONSTRUCTION CONTINGENCY	Lump Sum	25 % of Items 1-15	N/A	\$580,000
TOTAL STEAM TUNNEL DEMOLITION COST					\$2,900,000

Cost estimates are based on concept level planning documents, and are subject to change as concepts are refined and further developed.

STAGE 2 SUMMARY of COSTS - ST ELIZABETHS EAST CAMPUS INFRASTRUCTURE
Conceptual Cost Opinion Summary

ITEM	ITEM DESCRIPTION		COMMENTS		TOTAL
1	TOTAL WATER SYSTEM COST				\$1,414,000
2	TOTAL SANITARY SEWER SYSTEM COST				\$1,256,000
3	TOTAL STORM SEWER SYSTEM COST				\$1,924,000
4	TOTAL ELECTRICAL SYSTEM COST				\$1,779,000
5	TOTAL TELECOMMUNICATIONS SYSTEMS COST				\$1,624,000
6	TOTAL NATURAL GAS DISTRIBUTION SYSTEM COST				\$354,000
7	TOTAL STEAM TUNNEL DEMOLITION COST				\$2,825,000
8					\$0
9					\$0
10					\$0
TOTAL CONSTRUCTION COST (Items 1-10)					\$11,176,000
11	ENGINEERING				
	Preliminary Engineering		5 % of Items 1-10		\$558,800
	Final Engineering		5 % of Items 1-10		\$558,800
	Construction Engineering		10 % of Items 1-10		\$1,117,600
TOTAL ENGINEERING COST (Item 11)					\$2,235,000
TOTAL UTILITY INFRASTRUCTURE COST					\$13,411,000
	Medical Waste Characterization and Disposal				\$9,800
	Phase I and Phase II ESA services				\$199,012
	Building Hazardous Materials Surveys - 16 buildings				\$204,335
	Building 88 Decontamination & Decommissioning				\$275,000
			20 % of Items 1-10		\$137,629
TOTAL OTHER COSTS					\$617,000
19	BUILDINGS				
	Demolition - Building No. 115	SF	35463	\$60	\$2,130,000
	Demolition - Building No. 116	SF	47282	\$60	\$2,840,000
	Building Relocation - Building 88	Lump Sum	1		\$1,500,000
	Building Contingencies	Lump Sum	35 % of Item 19		\$2,265,000
TOTAL BUILDING COST					\$8,735,000

Cost estimates are based on concept level planning documents, and are subject to change as concepts are refined and further developed.

STAGE 2 SUMMARY of COSTS - ST ELIZABETHS EAST CAMPUS CONCEPT INFRASTRUCTURE PLAN
Conceptual Cost Opinion Summary
POTABLE WATER AND FIRE SUPPLY SYSTEMS

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
1	10" Water	LF	1,800	\$240	\$432,000
2	8" Water	LF	300	\$235	\$71,000
3	Bldg Service Connections	EA	17	\$15,000	\$255,000
4	Fire Hydrants	EA	5	\$3,500	\$18,000
5	Wet Taps	EA	4	\$12,500	\$50,000
6	Existing Water Demolition	LF	3,050	\$100	\$305,000
7					\$0
8					\$0
9					\$0
10					\$0
11					\$0
12					\$0
13					\$0
14					\$0
15					\$0
TOTAL WATER SYSTEM CONSTRUCTION COST (Items 1-15)					\$1,131,000
16	CONSTRUCTION CONTINGENCY	Lump Sum	25 % of Items 1-15	N/A	\$283,000
TOTAL WATER SYSTEM COST					\$1,414,000

Cost estimates are based on concept level planning documents, and are subject to change as concepts are refined and further developed.

STAGE 2 SUMMARY of COSTS - ST ELIZABETHS EAST CAMPUS CONCEPT INFRASTRUCTURE PLAN
Conceptual Cost Opinion Summary
SANITARY SEWER SYSTEMS

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
1	Sanitary Sewer PVC SDR35	LF	3,050	\$165	\$503,000
2	48" Sanitary Sewer Manhole	EA	31	\$4,000	\$124,000
3	6" Building Connection PVC SCH40	LF	900	\$155	\$140,000
4	Building Sanitary Cleanout Manhole	EA	15	\$2,500	\$38,000
5	Existing Sanitary Demolition	LF	2,000	\$100	\$200,000
6					\$0
7					\$0
8					\$0
9					\$0
10					\$0
11					\$0
12					\$0
13					\$0
14					\$0
15					\$0
TOTAL SANITARY SEWER SYSTEM CONSTRUCTION COST (Items 1-15)					\$1,005,000
16	CONSTRUCTION CONTINGENCY	Lump Sum	25 % of Items 1-15	N/A	\$251,000
TOTAL SANITARY SEWER SYSTEM COST					\$1,256,000

Cost estimates are based on concept level planning documents, and are subject to change as concepts are refined and further developed.

STAGE 2 SUMMARY of COSTS - ST ELIZABETHS EAST CAMPUS CONCEPT INFRASTRUCTURE PLAN
Conceptual Cost Opinion Summary
STORM SEWER SYSTEMS

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
1	48" DIAMETER MANHOLE	EA	7	\$4,000	\$28,000
2	60" DIAMETER MANHOLE	EA	6	\$4,500	\$27,000
3	72" DIAMETER MANHOLE	EA	12	\$5,000	\$60,000
4	CURB INLET	EA	52	\$5,000	\$260,000
5	15" RCPR	LF	2,200	\$135	\$297,000
6	18" RCPR	LF	400	\$140	\$56,000
7	24" RCPR	LF	200	\$150	\$30,000
8	27" RCPR	LF	500	\$155	\$78,000
9	30" RCPR	LF	200	\$170	\$34,000
10	36" RCPR	LF	600	\$210	\$126,000
11	42" RCPR (Storm Relocation)	LF	1,200	\$240	\$288,000
12	Existing Storm Demolition	LF	2,550	\$100	\$255,000
13					\$0
14					\$0
15					\$0
TOTAL STORM SEWER SYSTEM CONSTRUCTION COST (Items 1-15)					\$1,539,000
16	CONSTRUCTION CONTINGENCY	Lump Sum	25 % of Items 1-15	N/A	\$385,000
TOTAL STORM SEWER SYSTEM COST					\$1,924,000

Cost estimates are based on concept level planning documents, and are subject to change as concepts are refined and further developed.

STAGE 2 SUMMARY of COSTS - ST ELIZABETHS EAST CAMPUS CONCEPT INFRASTRUCTURE PLAN
Conceptual Cost Opinion Summary
ELECTRICAL DISTRIBUTION SYSTEMS

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
1	4-way 5" concrete encased ductbank	LF	3,600	\$225	\$810,000
2	Manholes	EA	12	\$20,000	\$240,000
3	2-way 5" concrete encased stub to bldg	LF	800	\$170	\$136,000
4	Trenching and backfill	LF	4,400	\$25	\$110,000
5	Street lighting conduit	LF	3,600	\$12	\$43,000
6	Maintain temp service to select bldgs	EA	4	\$1,000	\$4,000
7	Remove existing ductbank in ROW	LF	1,000	\$20	\$20,000
8	Cap and abandon ductbank	EA	5,000	\$5	\$25,000
9	Connect to PEPCO manholes in MLK	EA	1	\$15,000	\$15,000
10	PEPCO engineering costs and fees	LOT	1	\$20,000	\$20,000
11					\$0
12					\$0
13					\$0
14					\$0
15					\$0
TOTAL ELECTRICAL SYSTEM CONSTRUCTION COST (Items 1-15)					\$1,423,000
16	CONSTRUCTION CONTINGENCY	Lump Sum	25 % of Items 1-15	N/A	\$356,000
TOTAL ELECTRICAL SYSTEM COST					\$1,779,000

Cost estimates are based on concept level planning documents, and are subject to change as concepts are refined and further developed.

STAGE 2 SUMMARY of COSTS - ST ELIZABETHS EAST CAMPUS CONCEPT INFRASTRUCTURE PLAN
Conceptual Cost Opinion Summary
TELECOMMUNICATION SYSTEMS

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
1	4-way 4" concrete encased ductbank	LF	3,600	\$200	\$720,000
2	Manholes	EA	12	\$20,000	\$240,000
3	4-way 4" concrete encased stub to bldg	LF	800	\$200	\$160,000
4	Trenching and backfill	LF	4,400	\$25	\$110,000
5	Maintain temp service to select bldgs	EA	4	\$1,000	\$4,000
6	Remove existing ductbank in ROW	LF	1,000	\$20	\$20,000
7	Cap and abandon ductbank	EA	5,000	\$5	\$25,000
8	Connect to manholes in MLK/Alabama	EA	1	\$15,000	\$15,000
9	Verizon engineering costs and fees	LOT	1	\$5,000	\$5,000
10					\$0
11					\$0
12					\$0
13					\$0
14					\$0
15					\$0
TOTAL TELECOMMUNICATIONS SYSTEMS CONSTRUCTION COST (Items 1-15)					\$1,299,000
16	CONSTRUCTION CONTINGENCY	Lump Sum	25 % of Items 1-15	N/A	\$325,000
TOTAL TELECOMMUNICATIONS SYSTEMS COST					\$1,624,000

Cost estimates are based on concept level planning documents, and are subject to change as concepts are refined and further developed.

STAGE 2 SUMMARY of COSTS - ST ELIZABETHS EAST CAMPUS CONCEPT INFRASTRUCTURE PLAN
Conceptual Cost Opinion Summary
NATURAL GAS DISTRIBUTION SYSTEMS

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
1	Trenching and backfill	LF	4,400	\$25	\$110,000
2	4" Plastic Gas Pipe	LF	3,600	\$40	\$144,000
3	1 1/2" Plastic Pipe Stub outs	LF	800	\$20	\$16,000
4	Maintain temp service to select bldgs	EA	5	\$1,000	\$5,000
5	Remove existing gas piping in ROW	LF	200	\$10	\$2,000
6	Cap and abandon gas piping	LF	100	\$5	\$1,000
7	Connect to existing main in MLK	EA	1	\$5,000	\$5,000
8					\$0
9			1	\$1	\$0
10			1	\$1	\$0
11			1	\$1	\$0
12			1	\$1	\$0
13			1	\$1	\$0
14			1	\$1	\$0
15			1	\$1	\$0
TOTAL NATURAL GAS SYSTEM CONSTRUCTION COST (Items 1-15)					\$283,000
16	CONSTRUCTION CONTINGENCY	Lump Sum	25 % of Items 1-15	N/A	\$71,000
TOTAL NATURAL GAS DISTRIBUTION SYSTEM COST					\$354,000

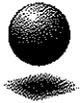
Cost estimates are based on concept level planning documents, and are subject to change as concepts are refined and further developed.

STAGE 2 SUMMARY of COSTS - ST ELIZABETHS EAST CAMPUS CONCEPT INFRASTRUCTURE PLAN
Conceptual Cost Opinion Summary
STEAM TUNNEL DEMOLITION

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
1	Cap and abandon existing steam tunnel	EA	6	\$10,000	\$60,000
2	Remove tunnels at roadway ROW	LF	1,000	\$200	\$200,000
3	Abatement/Dispose of Haz Mat	LF	1,000	\$2,000	\$2,000,000
4			1	\$1	\$0
5			1	\$1	\$0
6			1	\$1	\$0
7			1	\$1	\$0
8			1	\$1	\$0
9			1	\$1	\$0
10			1	\$1	\$0
11			1	\$1	\$0
12			1	\$1	\$0
13			1	\$1	\$0
14			1	\$1	\$0
15			1	\$1	\$0
TOTAL STEAM TUNNEL DEMOLITION COST (Items 1-15)					\$2,260,000
16	CONSTRUCTION CONTINGENCY	Lump Sum	25 % of Items 1-15	N/A	\$565,000
TOTAL STEAM TUNNEL DEMOLITION COST					\$2,825,000

Cost estimates are based on concept level planning documents, and are subject to change as concepts are refined and further developed.

Appendix 13
Letters



CH2MHILL

CH2M HILL
15010 Conference Center Dr
Suite 200
Chantilly, VA 20151
Tel 703 376 5000
Fax 703 376 5010

May 14, 2012

Mr. Tri Dang
PEPCO
3400 Benning Road, NE
Washington, DC 20019

RE: St Elizabeths East Campus Conceptual Infrastructure Plan
Request for Acknowledgement of Concept Plan and Typical Sections

Dear Mr. Dang,

Please find attached the conceptual infrastructure one line diagram for the proposed electrical distribution system and typical utility sections as have been revised based on your input at our April 18, 2012 workshop held at our office in Washington, DC. As we explained at the workshop, our client, the Deputy Mayor's Office of Planning and Economic Development (DMPED), is moving ahead with two proposed stages of construction on the east campus of St Elizabeths and will ultimately develop approximately 5 million SF of new and adaptive reuses on the site. All these facilities will require a new public infrastructure system of roadways and utilities to properly serve the new mixed use buildings and sites. Upon completion of the work, all facilities will be located in DDOT Right-of-way.

At this point we are developing a concept plan for all the future infrastructure systems and are soliciting your concurrence that the proposed locations on the attached material, subject to final design and verification of offsite capacities, are in general compliance with your system requirements. We need this acknowledgement before our client, DMPED, would be able to move ahead with preparing preliminary construction plans and specifications for the infrastructure systems.

Your acknowledgment by signing below would be most appreciated. Please return the signed portion of this letter to Michele Ford at the address listed above, or scan a copy and email it to her at Michele.Ford@ch2m.com.

Please feel free to call me directly at 703-376-5226 if you have any questions on this matter.

Very Truly Yours,



W. Richard Staudinger, PE
CH2M HILL

Acknowledgment of system general layout as shown:
(PEPCO)


Signature

6/13/12
Date

CC without attachments: Mr. Feras Qumseya, DMPED
Mr. Ethan Warsh

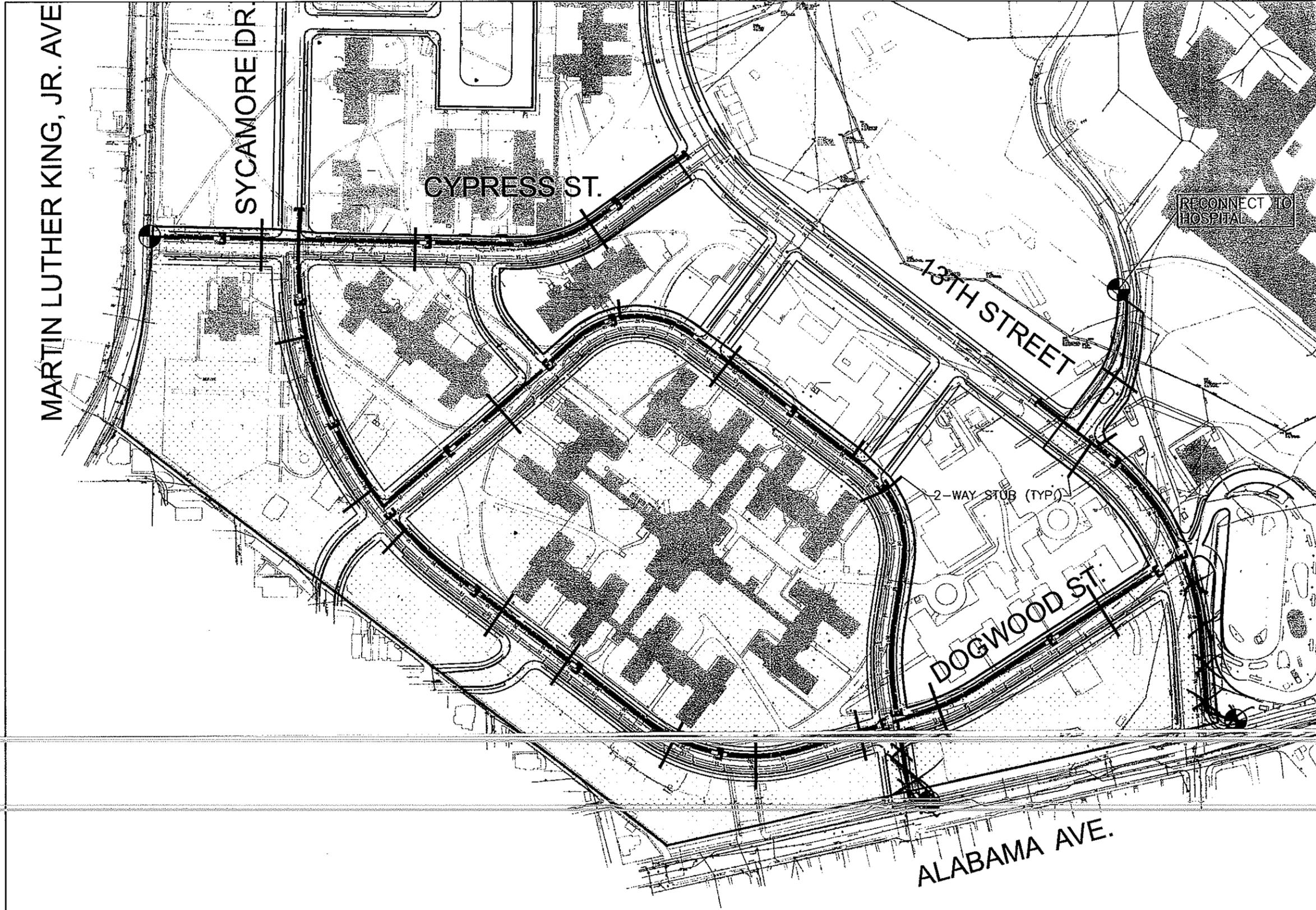
Attachments: Stage 1 & Stage 2 Utility Concept Plans
Proposed Typical Cross Sections

St. Elizabeth's East
 Building Cross Area Tabulation/Summary
 Based on Alt 2 Proposed Land Use
 April 19, 2012

Parcel	Historic Bldgs	Comments	Retail	Residential	(# of D.U.)	Large Office	Small Office	Institution	Civic	Hotel	Parking	Totals
1		New Construction	13,000			367,300						
2		New Construction	55,026			189,740						
3		New Construction	68,507	274,028								
4		New Construction			17							
5		New Construction	6,468	77,312	20							
6		New Construction	17,567	87,835								
7		New Construction	65,515			362,145						
8		New Construction	56,160	384,504		303,949						
9		New Construction		219,308								
10		New Construction						128,164				
11		New Construction						111,448				
12		New Construction								115,944		
13A		New Construction				230,568						
13B		New Construction				218,352						
13C		New Construction		204,296								
14A		New Construction		169,264								
14B		New Construction		210,928								
15		New Construction	7,000							131,152		
16		Agriculture Site (no buildings)										
17		Agriculture Site (no buildings)										
	88	Historic Bldg to be Refurbished							22,590			
	89	Historic Bldg to be Refurbished					31,278					
	90	Historic Bldg to be Refurbished								107,455		
	92	Historic Bldg to be Refurbished						111,930				
	93	Historic Bldg to be Refurbished					139,926					
	94	Historic Bldg to be Refurbished					13,869					
	95	Historic Bldg to be Refurbished					18,275					
	100	Historic Bldg to be Refurbished							39,099			
	102	Historic Bldg to be Refurbished						33,920				
	106	Historic Bldg to be Refurbished						41,000				
	107	Historic Bldg to be Refurbished						41,000				
	108	Historic Bldg to be Refurbished					35,123					
	109	Historic Bldg to be Refurbished						51,062				
	110	Historic Bldg to be Refurbished					35,164					
	111	Historic Bldg to be Refurbished						41,000				
	112	Historic Bldg to be Refurbished						41,000				
FEMA		New Construction				750,000						
Parking		Parking Scattered Beneath New Large Bldgs									00,000	
Area by Use/Occupancy (sf)			289,243	1,627,475	37	2,422,054	273,635	600,524	61,689	354,551	00,000	6,429,171 sf
Design Load Rate (w/sf)			25	10		20	20	35	25	20	2	
Design Load by Use/Occupancy (kw)			7,231	16,275		48,441	5,473	21,018	1,542	7,091	1,600	108,671 kw
Utility Co. Diversified/Demand Load (kw)			4,339	9,765		29,065	3,284	12,611	925	4,255	960	65,203 kw

Electrical Load Summary

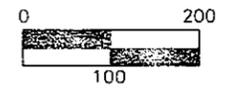
	Area (sf)	Calculated Maximum Demand (kw)	Diversified Demand (kw)
Retail	289,243	7,231	4,339
Residential	1,627,475	16,275	9,765
Large Office	2,422,054	48,441	29,065
Small Office	273,635	5,473	3,284
Institution	600,524	21,018	12,611
Civic	61,689	1,542	925
Hotel	354,551	7,091	4,255
Parking	800,000	1,600	960
Totals	6,429,171	108,671	65,203

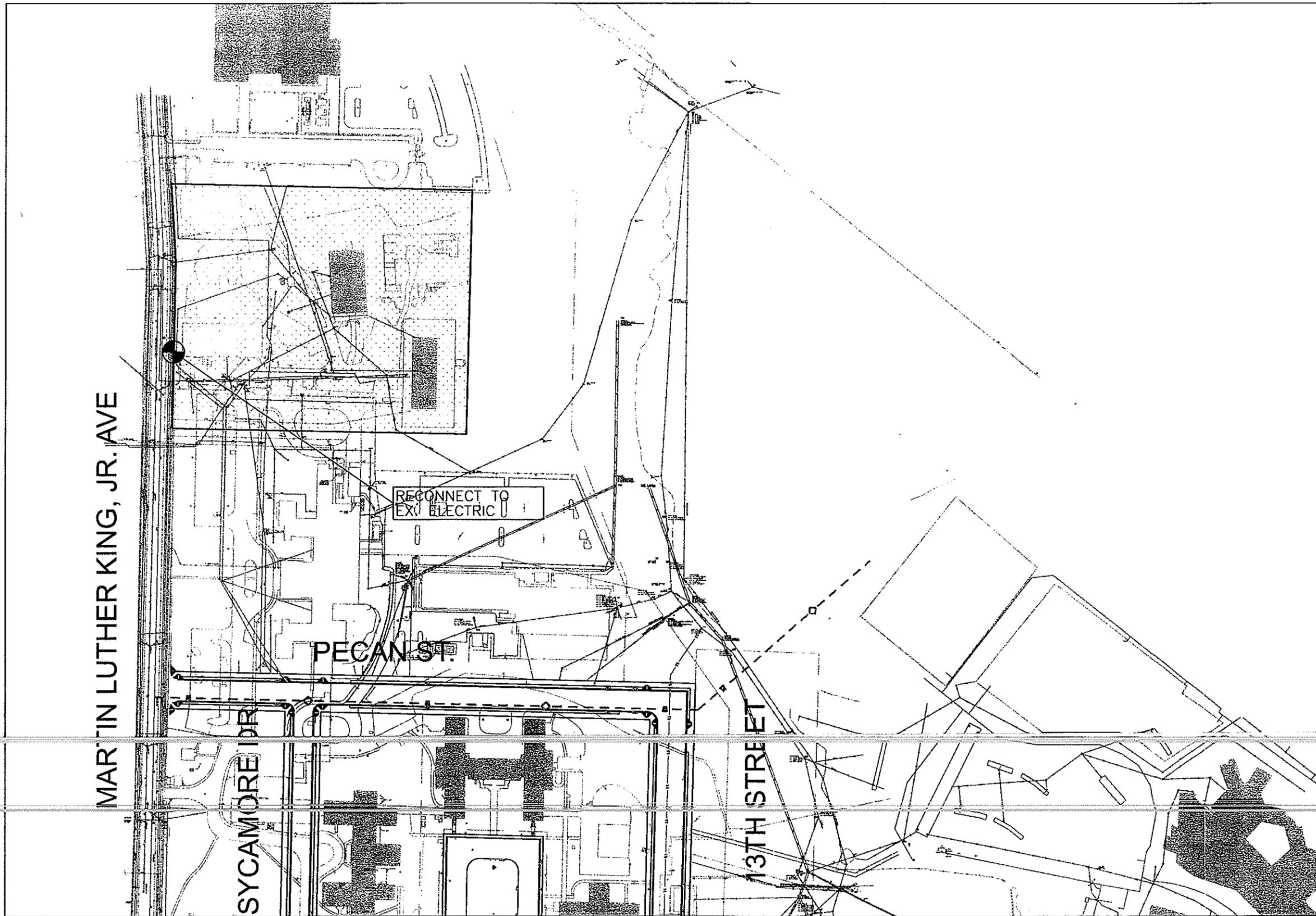


LEGEND

- STORM DRAIN
- SANITARY SEWER
- ELECTRIC
- TELECOMM
- WATER
- GAS
- STAGE 1 DELINEATION
- PARCEL BOUNDARIES
- HISTORIC BUILDINGS
- STAGE 1 AREA
- POINT OF CONNECTION
- TEMPORARY CAP
- 3' MIN. COVER (TYP.)
- 4-Way Concrete Encased Ductbank In Street
2-Active; 2-Spare
- 2-Way Concrete Encased Ductbank
Stub From Manhole to Property Line (To Preclude Roadway Disturbance)

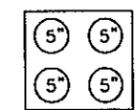
St. Elizabeths East Campus
Electric Layout-Stage 1



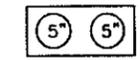


- LEGEND**
- x--- STORM DRAIN
 - u--- SANITARY SEWER
 - x--- ELECTRIC
 - x--- TELECOMM
 - x--- WATER
 - x--- GAS
 - STAGE 1 DELINEATION
 - PARCEL BOUNDARIES
 - ▨ HISTORIC BUILDINGS
 - ▤ STAGE 1 AREA
 - POINT OF CONNECTION

3' MIN. COVER (TYP.)

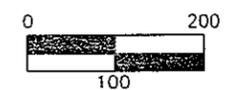


4-Way Concrete Encased
Ductbank In Street
2-Active; 2-Spare

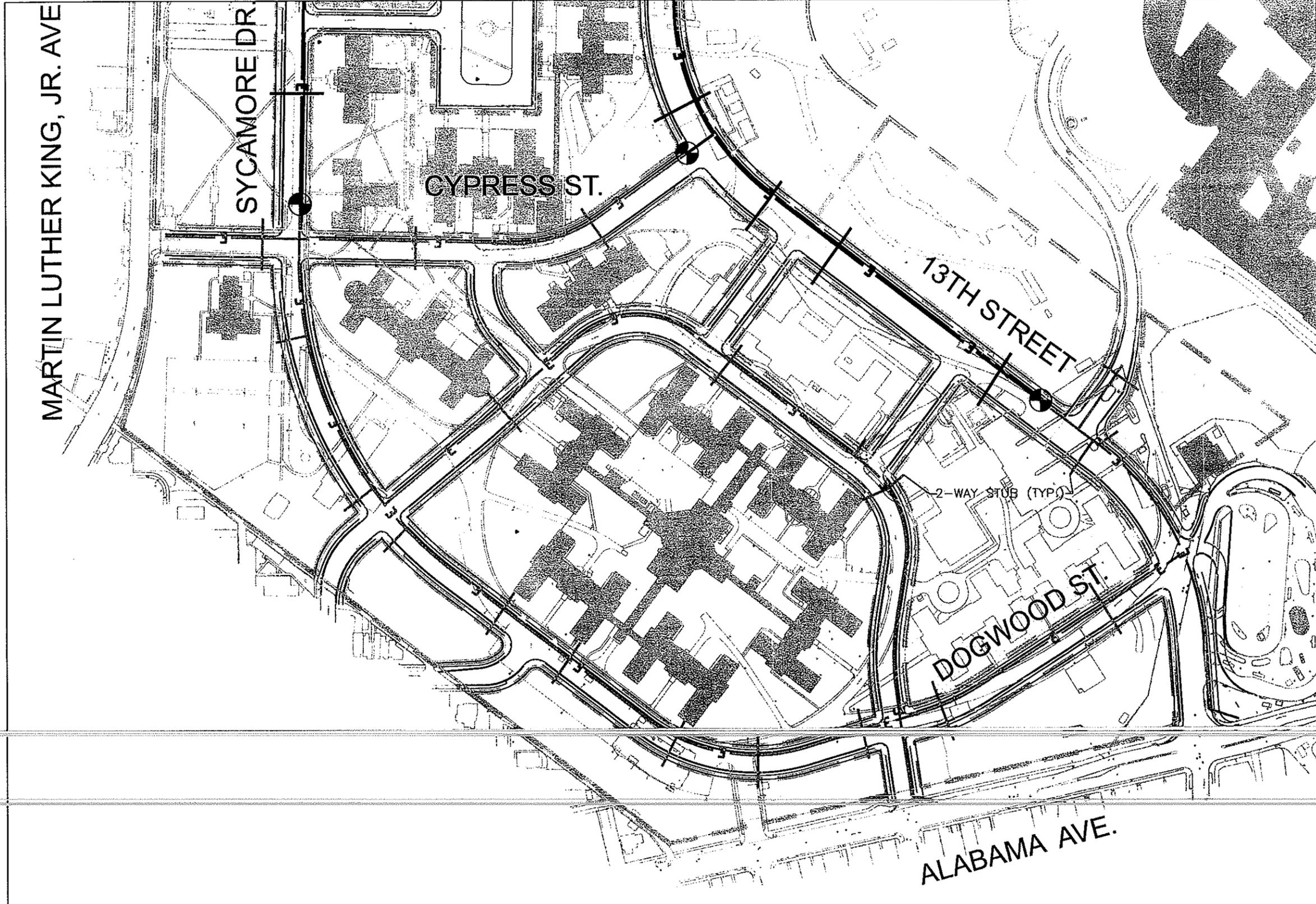


2-Way Concrete Encased
Stub From Manhole To
Property Line (To Preclude
Roadway Disturbance)

**St. Elizabeths East Campus
Electric Layout—Stage 1**



SEE SHEET 1 OF 2 FOR CONTINUATION



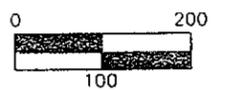
- LEGEND**
- STORM DRAIN
 - SANITARY SEWER
 - ELECTRIC
 - TELECOMM
 - WATER
 - GAS
 - STAGE 2 DELINEATION
 - PARCEL BOUNDARIES
 - HISTORIC BUILDINGS
 - STAGE 2 AREA
 - POINT OF CONNECTION

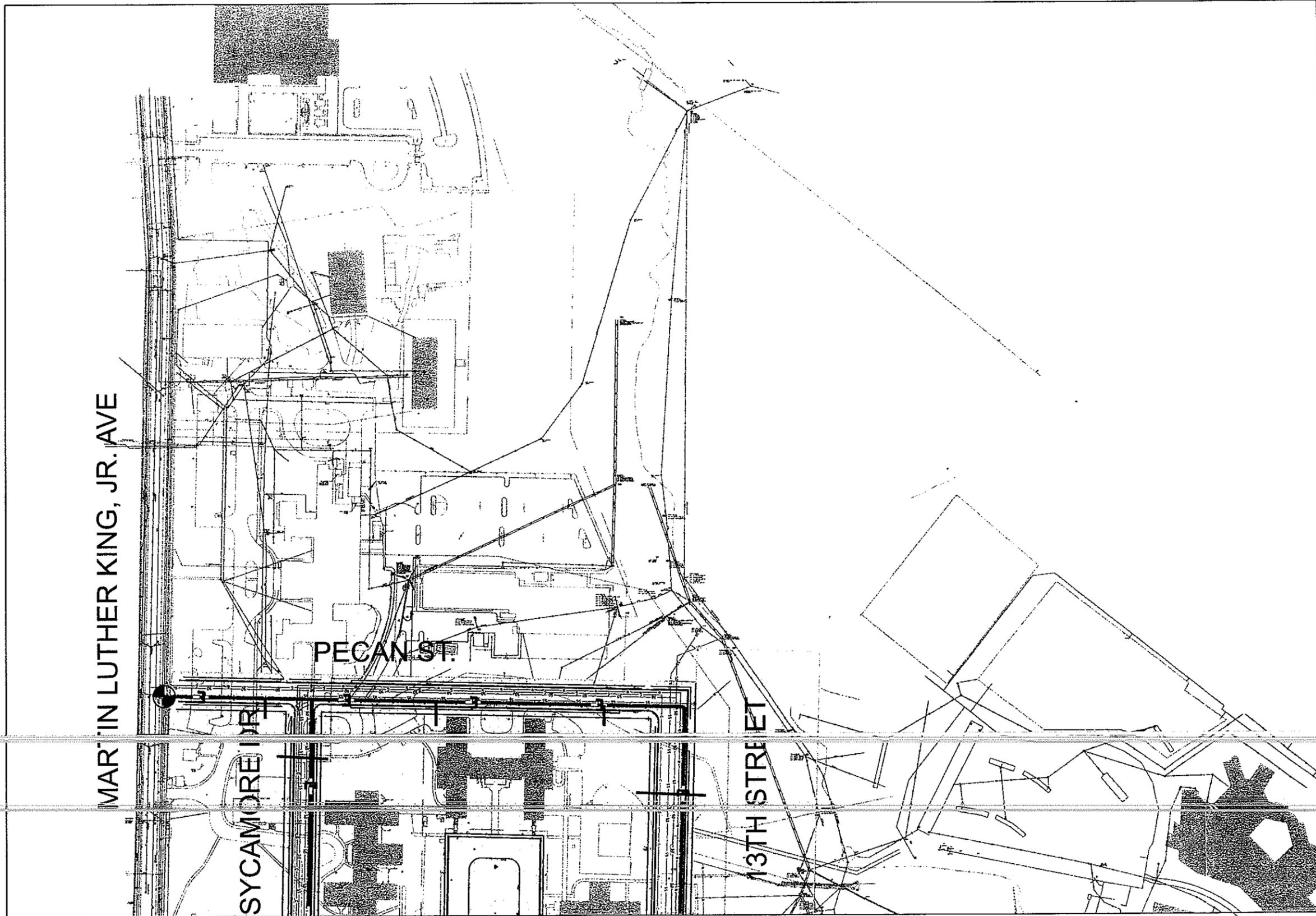
3' MIN. COVER (TYP.)

4-Way Concrete Encased Ductbank In Street
2-Active; 2-Spare

2-Way Concrete Encased Stub From Manhole To Property Line (To Preclude Roadway Disturbance)

**St. Elizabeths East Campus
Electric Layout-Stage 2**





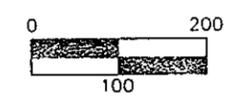
- LEGEND**
- STORM DRAIN
 - SANITARY SEWER
 - ELECTRIC
 - TELECOMM
 - WATER
 - GAS
 - - - STAGE 2 DELINEATION
 - █ PARCEL BOUNDARIES
 - █ HISTORIC BUILDINGS
 - STAGE 2 AREA
 - ⊕ POINT OF CONNECTION

3' MIN. COVER (TYP.)

4-Way Concrete Encased
 Ductbank In Street
 2-Active; 2-Spare

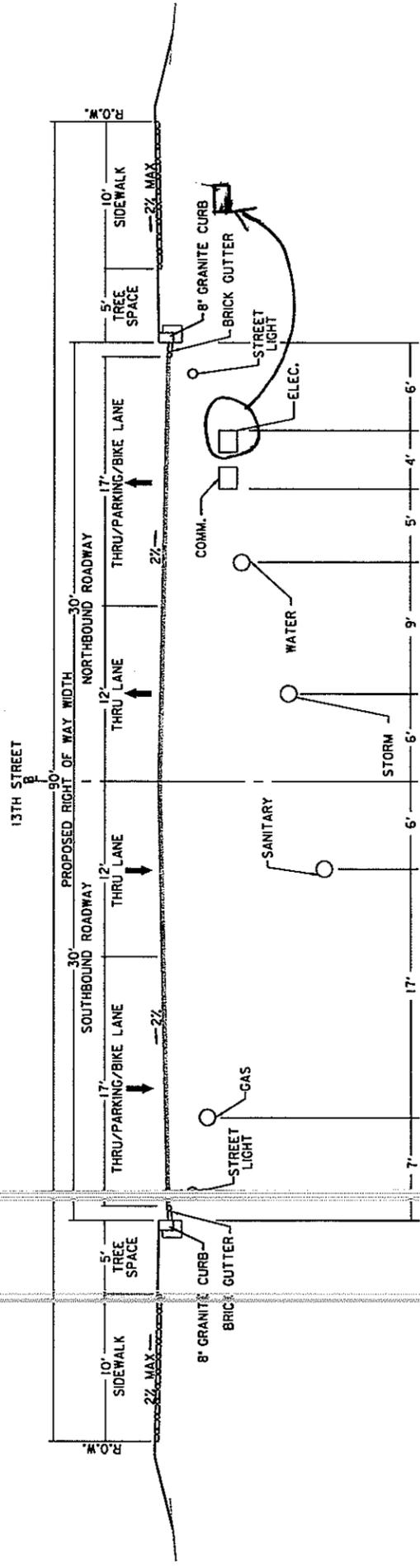
2-Way Concrete Encased
 Ductbank
 Stub From manhole to
 Property Line (To Preclude
 Roadway Disturbance)

**St. Elizabeths East Campus
Electric Layout-Stage 2**

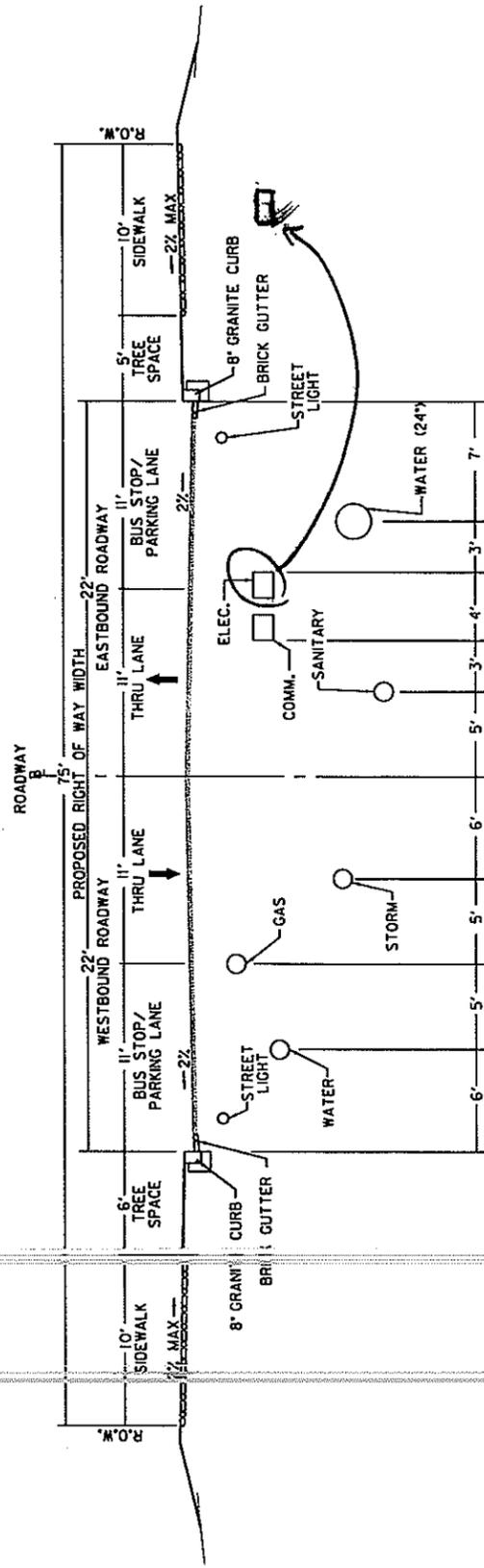


SEE SHEET 1 OF 2 FOR CONTINUATION

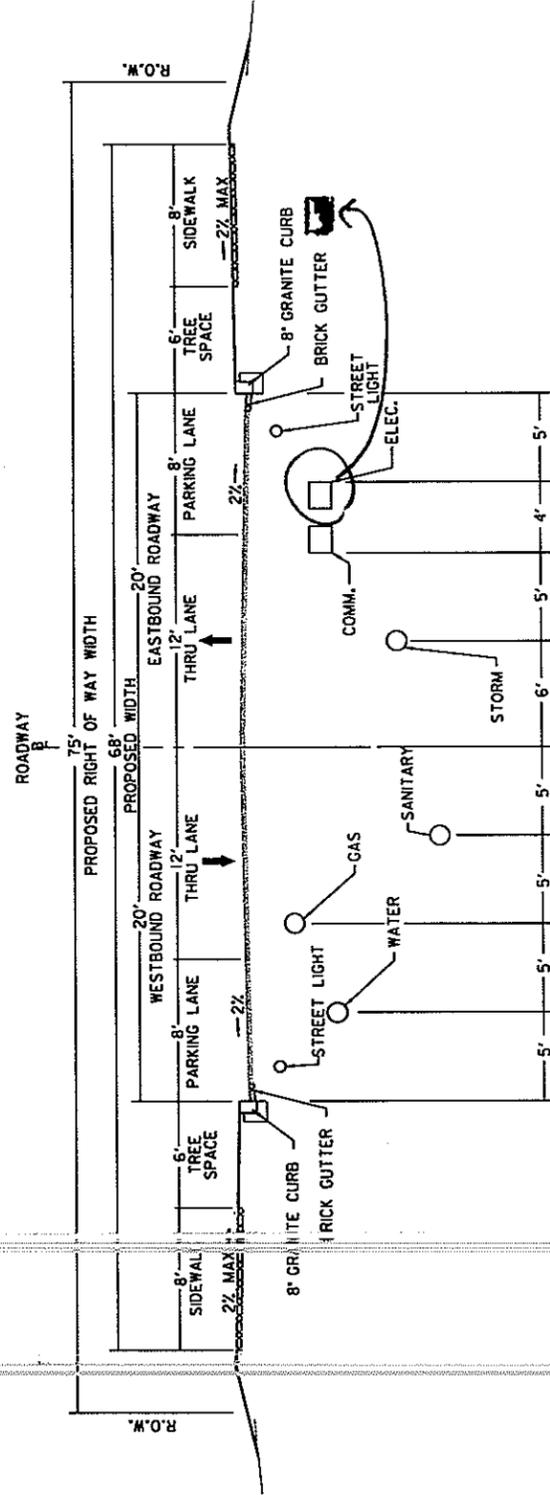
13TH STREET (LOOKING NORTH OR WEST) ONLY



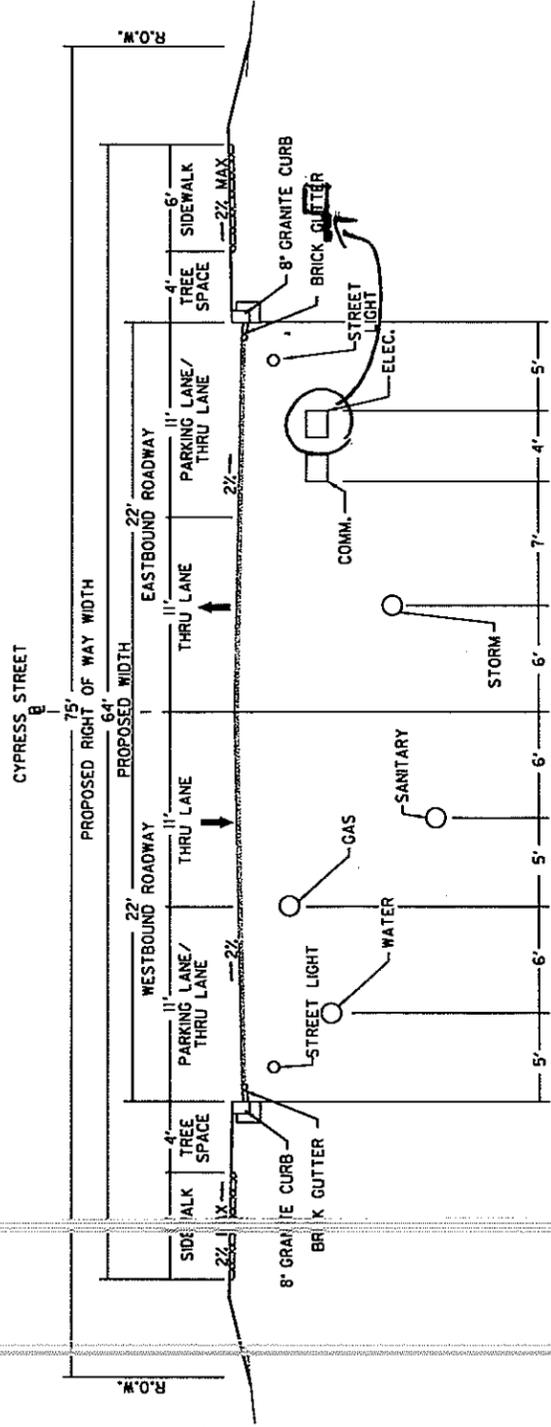
PECAN ST (LOOKING EAST) ONLY



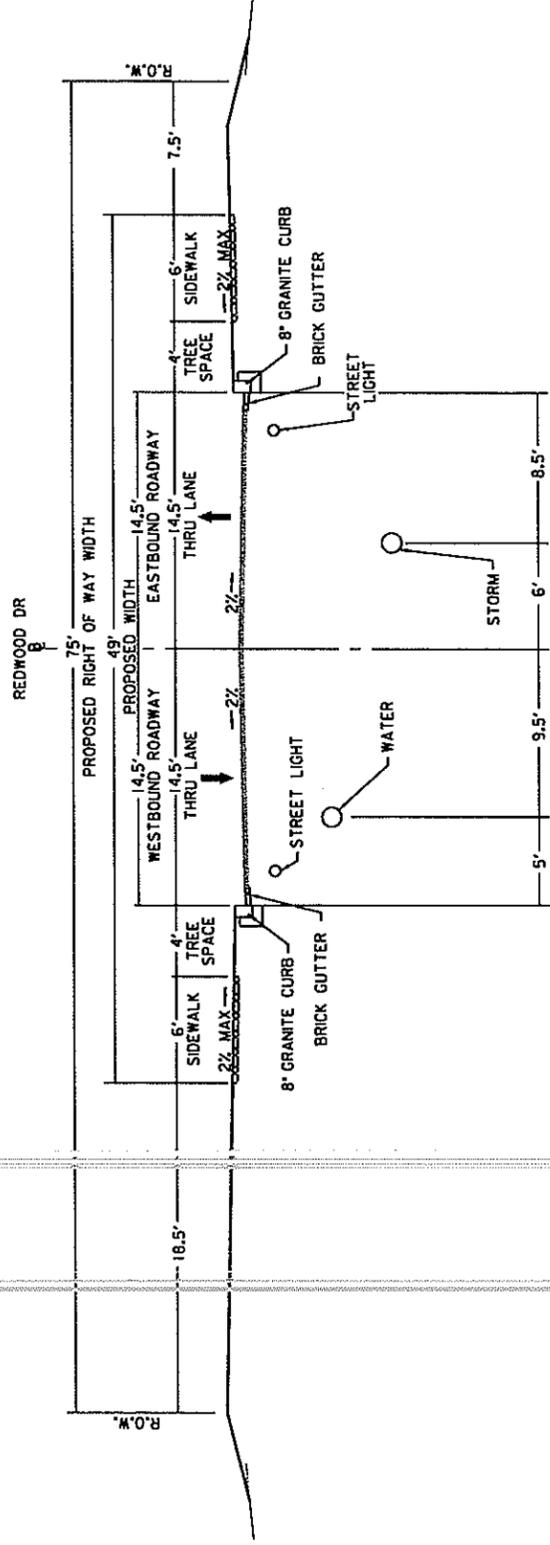
40' ROADWAY (LOOKING NORTH OR WEST) TYPICAL



CYPRESS STREET (LOOKING NORTH OR WEST) ONLY



REDWOOD DRIVE (LOOKING WEST) ONLY





CH2M HILL
15010 Conference Center Dr
Suite 200
Chantilly, VA 20151
Tel 703 376 5000
Fax 703 376 5010

May 14, 2012

Mr. Vjay Parmesn
Washington Gas
6801 Industrial Road
Springfield, VA 22151

RE: St Elizabeths East Campus Conceptual Infrastructure Plan
Request for Acknowledgement of Concept Plan and Typical Sections

Dear Mr. Parmesn,

Please find attached the conceptual infrastructure one line diagram for the proposed natural gas distribution system and typical utility sections as have been revised based on input at our April 18, 2012 workshop held at our office in Washington, DC. As we explained at the workshop, our client, the Deputy Mayor's Office of Planning and Economic Development (DMPED), is moving ahead with two proposed stages of construction on the east campus of St Elizabeths and will ultimately develop approximately 5 million SF of new and adaptive reuses on the site. All these facilities will require a new public infrastructure system of roadways and utilities to properly serve the new mixed use buildings and sites. Upon completion of the work, all facilities will be located in DDOT Right-of-way.

At this point we are developing a concept plan for all the future infrastructure systems and are soliciting your concurrence that the proposed locations on the attached material, subject to final design and verification of offsite capacities, are in general compliance with your system requirements. We need this acknowledgement before our client, DMPED, would be able to move ahead with preparing preliminary construction plans and specifications for the infrastructure systems.

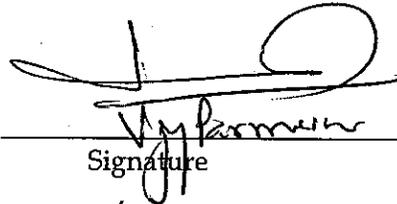
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Please feel free to call me directly at 703-376-5226 if you have any questions on this matter.

Very Truly Yours,

W. Richard Staudinger, PE
CH2M HILL

Acknowledgment of system general layout as shown:
(Washington Gas)

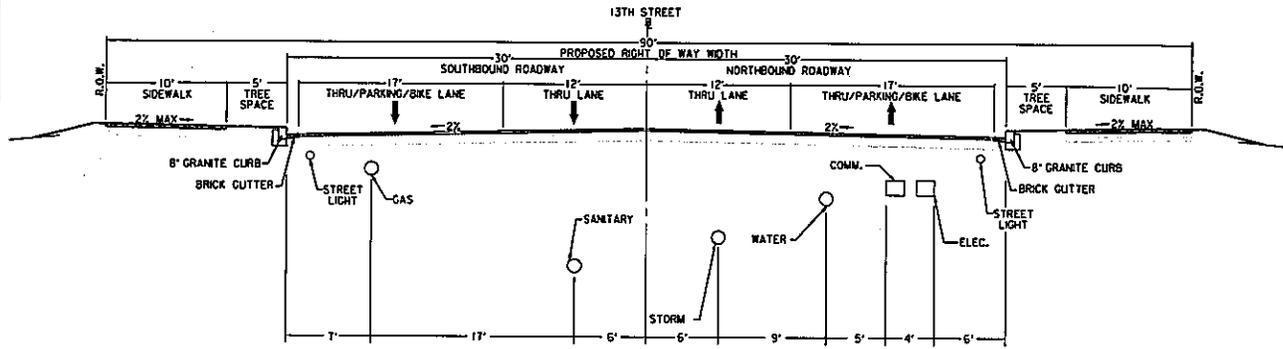

Signature _____ Date 6/12/12

VIJAY PARMESAN, ENGINEER
SYSTEMS REPLACEMENTS

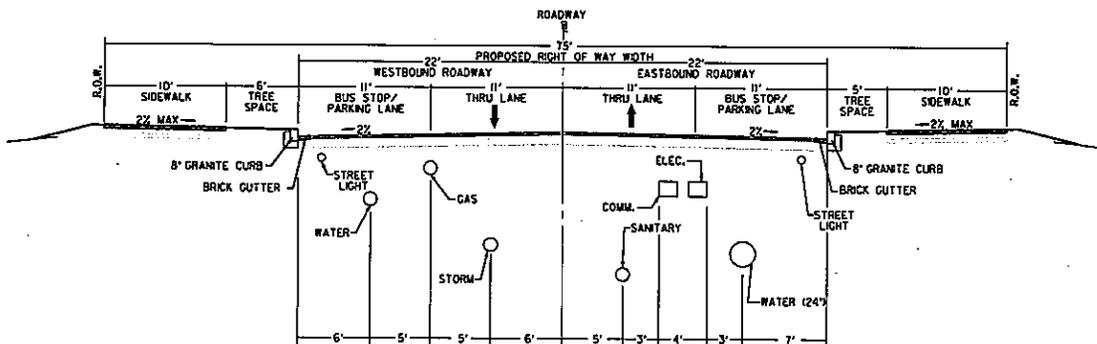
CC without attachments: Mr. Feras Qumseya, DMPED
Mr. Ethan Warsh

Attachments: Stage 1 & Stage 2 Utility Concept Plans
Proposed Typical Cross Sections

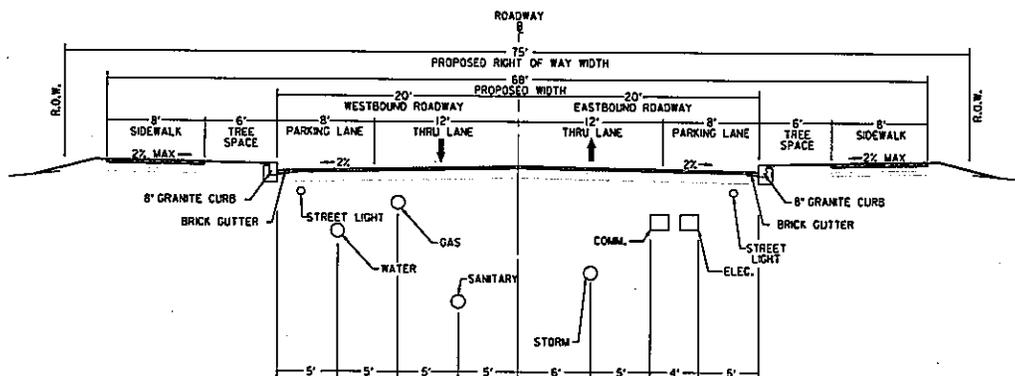
13TH STREET (LOOKING NORTH OR WEST) ONLY



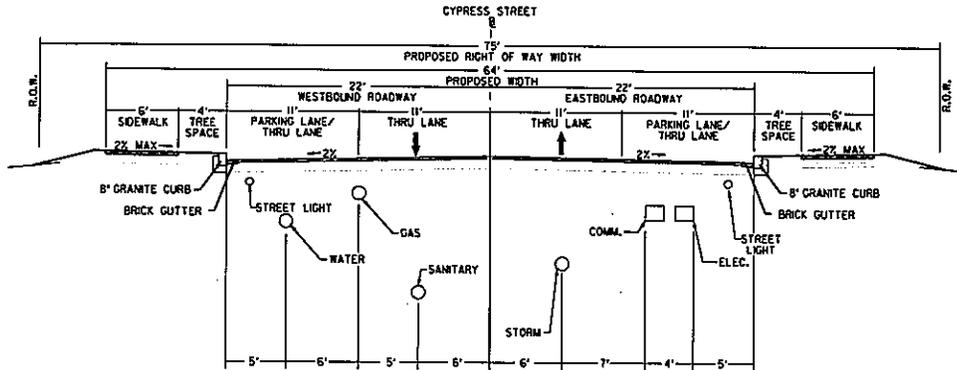
PECAN ST (LOOKING EAST) ONLY



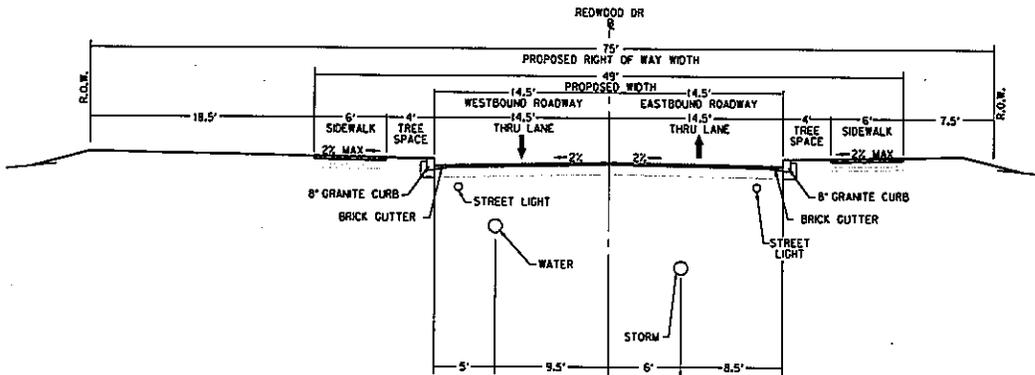
40' ROADWAY (LOOKING NORTH OR WEST) TYPICAL



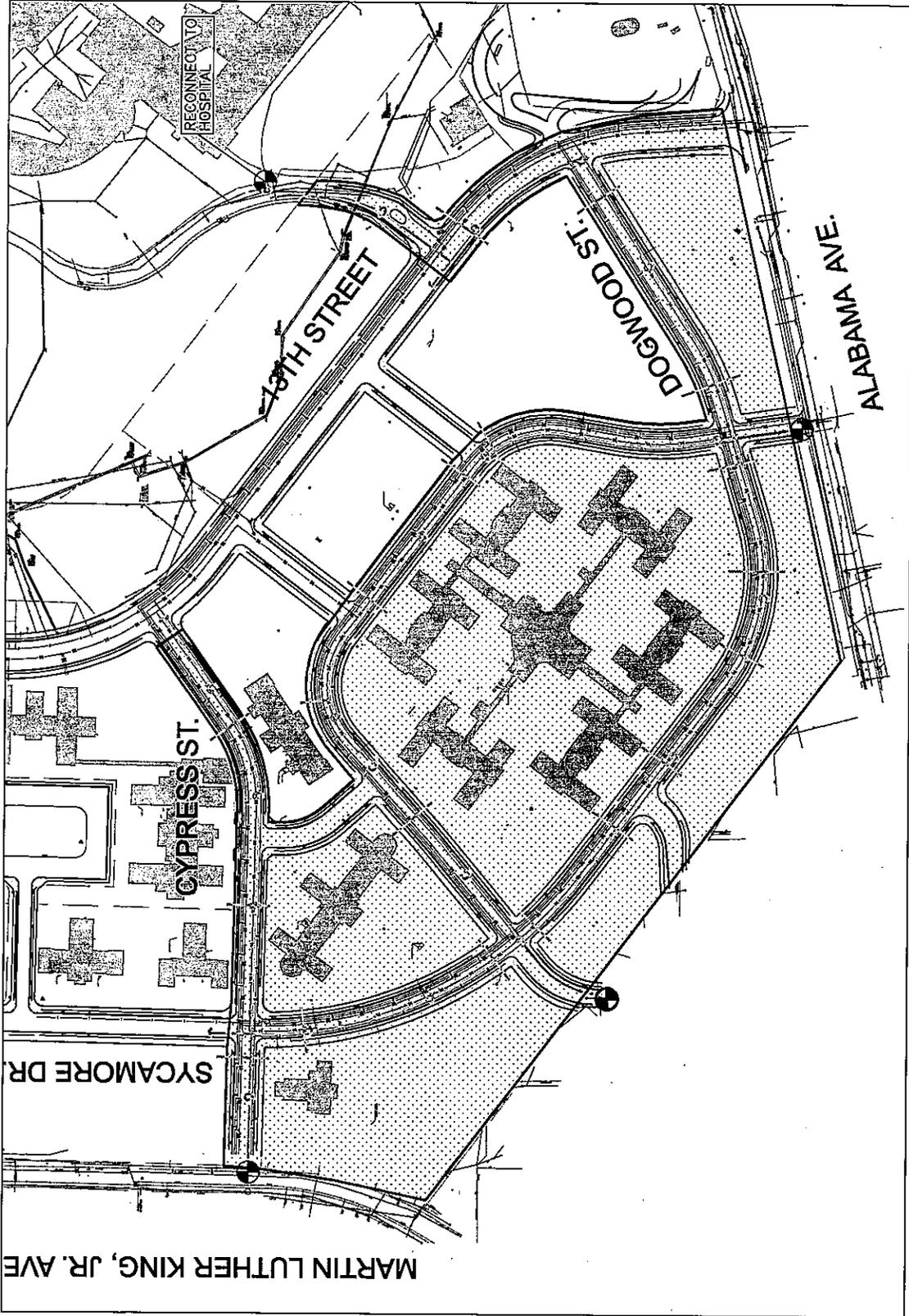
CYPRESS STREET (LOOKING NORTH OR WEST) ONLY



REDWOOD DRIVE (LOOKING WEST) ONLY



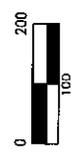
SEE SHEET 2 OF 2 FOR CONTINUATION

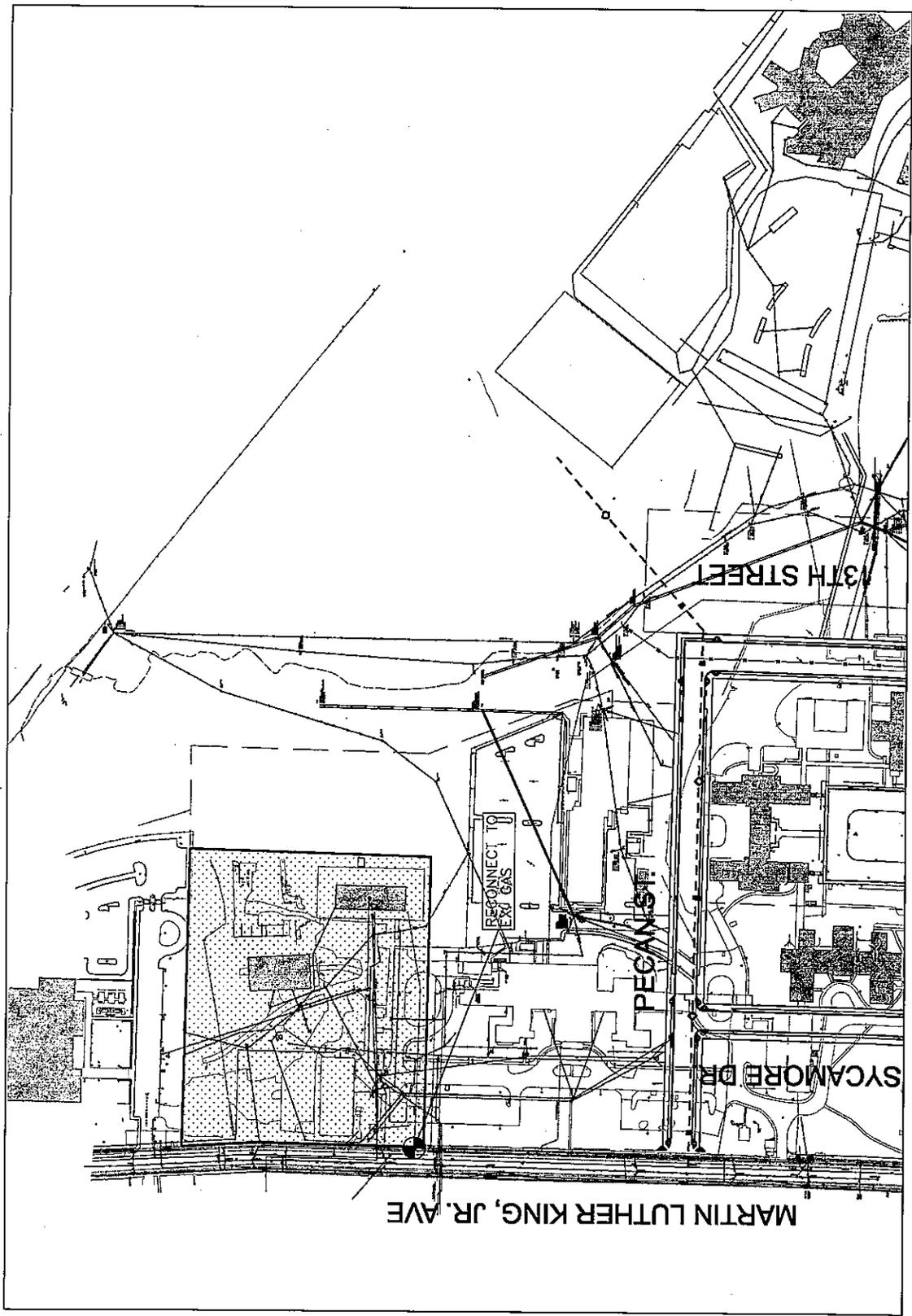


- STORM DRAIN
- SANITARY SEWER
- ELECTRIC
- TELECOMM
- WATER
- GAS
- STAGE 1 DELINEATION
- PARCEL BOUNDARIES
- HISTORIC BUILDINGS
- STAGE 1 AREA
- POINT OF CONNECTION
- TEMPORARY CAP
- 3" MIN. COVER (TYP.)

MATERIALS:
 GAS IN STREET -
 4" PLASTIC PIPE @ 20#
 PRESSURE
 BUILDING CONNECTIONS -
 1.5" PLASTIC (TYP.)

St. Elizabeths East Campus
 Gas Layout—Stage 1





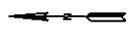
- LEGEND**
- +— STORM DRAIN
 - +— SANITARY SEWER
 - +— ELECTRIC
 - +— TELECOMM
 - +— WATER
 - +— GAS
 - +— STAGE 1 DELINEATION
 - +— PARCEL BOUNDARIES
 - +— HISTORIC BUILDINGS
 - +— STAGE 1 AREA
 - +— POINT OF CONNECTION

3' MIN. COVER (TYP.)

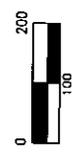
MATERIALS:

GAS IN STREET —
 4" PLASTIC PIPE @ 20#
 PRESSURE

BUILDING CONNECTIONS —
 1.5" PLASTIC (TYP.)

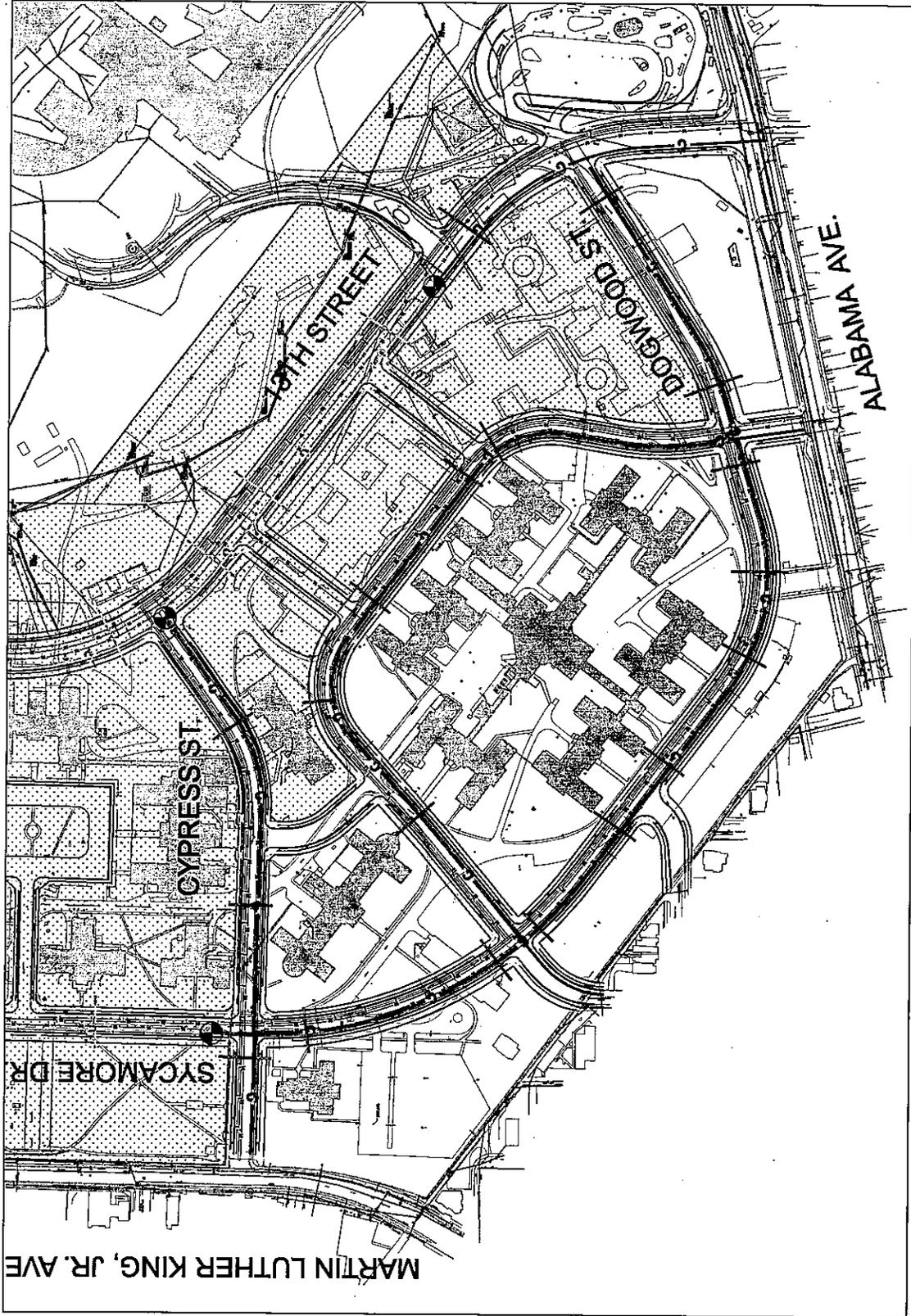


St. Elizabeths East Campus
 Gas Layout - Stage 1



SEE SHEET 1 OF 2 FOR CONTINUATION

SEE SHEET 2 OF 2 FOR CONTINUATION



- LEGEND**
- STORM DRAIN
 - SANITARY SEWER
 - ELECTRIC
 - TELECOMM
 - WATER
 - GAS
 - STAGE 2 DELINEATION
 - PARCEL BOUNDARIES
 - HISTORIC BUILDINGS
 - STAGE 2 AREA
 - POINT OF CONNECTION

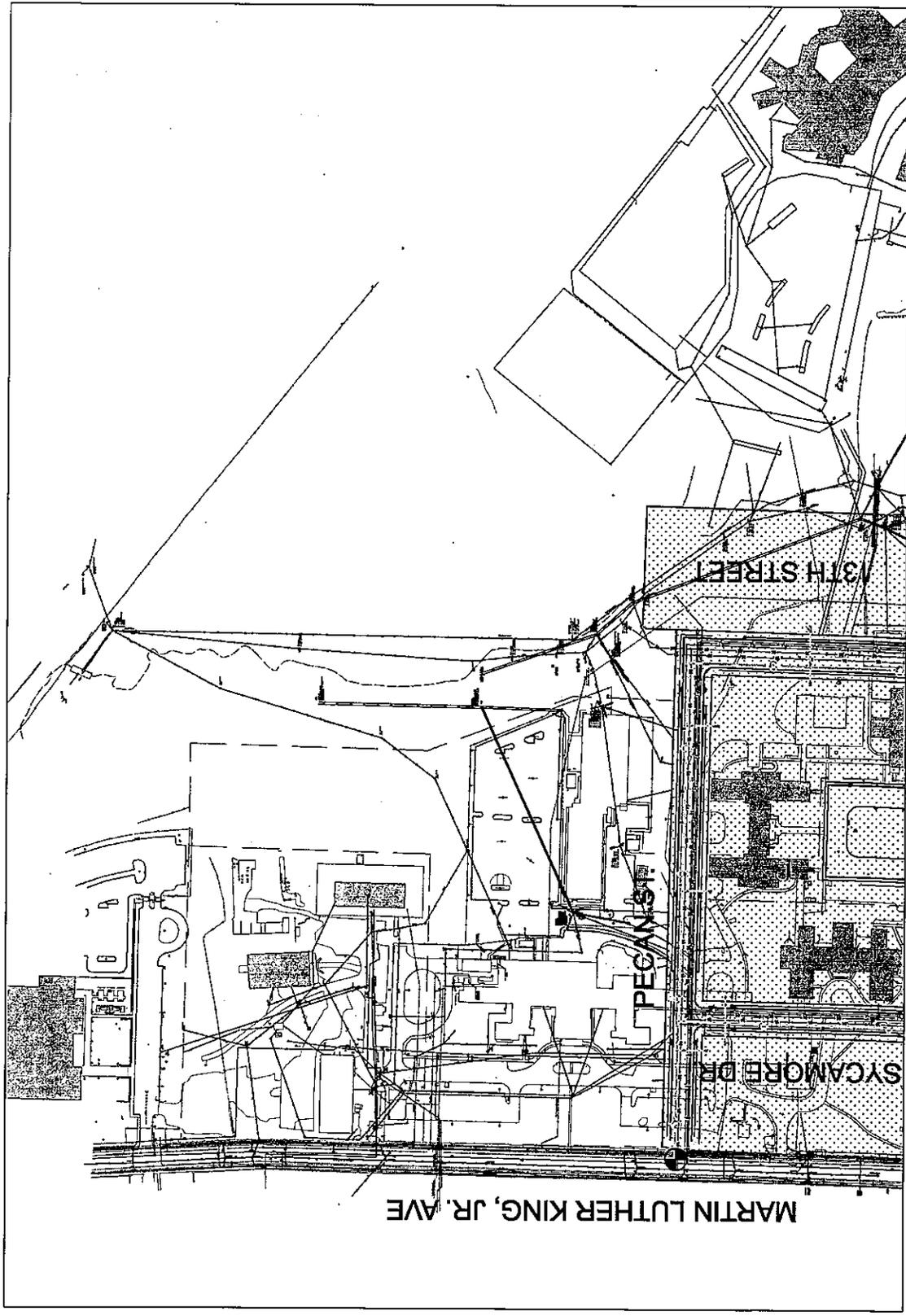
3" MIN. COVER (TYP.)

MATERIALS:

- GAS IN STREET -
- 4" PLASTIC PIPE @ 20#
- PRESSURE
- BUILDING CONNECTIONS -
- 1.5" PLASTIC (TYP.)

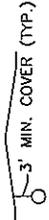
St. Elizabeths East Campus
Gas Layout—Stage 2





LEGEND

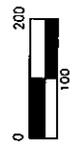
- STORM DRAIN
- SANITARY SEWER
- ELECTRIC
- TELECOMM
- WATER
- GAS
- STAGE 2 DELINEATION
- PARCEL BOUNDARIES
- HISTORIC BUILDINGS
- STAGE 2 AREA
- POINT OF CONNECTION



MATERIALS:

- GAS IN STREET - 4" PLASTIC PIPE @ 20# PRESSURE
- BUILDING CONNECTIONS - 1.5" PLASTIC (TYP.)

St. Elizabeths East Campus
Gas Layout - Stage 2



SEE SHEET 1 OF 2 FOR CONTINUATION

St. Elizabeth's East
 Electrical Load Projections Based on Building Gross Area Tabulation/Summary
 Based on 'Alt 2 Proposed Land Use'
 April 27, 2012

Parcel	Historic Bldgs	Comments	Retail	Residential	(# of D.U.)	Large Office	Small Office	Institution	Civic	Hotel	Parking	Totals
1	New Construction		13,000			367,300						
2	New Construction		55,026			189,740						
3	New Construction		66,507	274,028								
4	New Construction				17							
5	New Construction		6,468	77,312								
6	New Construction		17,567	87,835	20							
7	New Construction		65,515			362,145						
8	New Construction		56,160	384,504		303,949						
9	New Construction			219,308								
10	New Construction							128,164				
11	New Construction							111,448				
12	New Construction									115,944		
13A	New Construction					230,568						
13B	New Construction					218,352						
13C	New Construction			204,236								
14A	New Construction			169,284								
14B	New Construction			210,928								
15	New Construction		7,000							131,152		
16	New Construction											
17	New Construction											
88	Historic Bldg to be Refurbished	Agriculture Site (no buildings)										
89	Historic Bldg to be Refurbished	Agriculture Site (no buildings)							22,590			
90	Historic Bldg to be Refurbished						31,278					
92	Historic Bldg to be Refurbished							111,930				
93	Historic Bldg to be Refurbished						139,926					
94	Historic Bldg to be Refurbished						13,869					
95	Historic Bldg to be Refurbished						18,275					
100	Historic Bldg to be Refurbished								39,099			
102	Historic Bldg to be Refurbished							33,920				
106	Historic Bldg to be Refurbished							41,000				
107	Historic Bldg to be Refurbished							41,000				
108	Historic Bldg to be Refurbished						35,123					
109	Historic Bldg to be Refurbished							51,082				
110	Historic Bldg to be Refurbished							41,000				
111	Historic Bldg to be Refurbished							41,000				
112	Historic Bldg to be Refurbished											
Parking	Parking Scattered Beneath New Large Bldgs										800,000	
Area by Use/Occupancy (sf)			289,243	1,627,475	37	1,672,054	273,635	600,824	61,689	354,551	800,000	5,679,171 sf
Design Load Rate	MBH/sf		10	10		30		10	10	30		
Design Load by Use/Occupancy (MBH)			2,892,430	16,274,750		50,161,620		6,005,240	616,890	10,636,530		86,587,460 MBH

Gas Load Summary

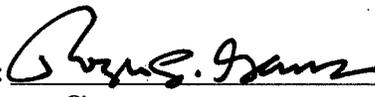
	Area (sf)	Consumption Rate (MBH/sf)	Load (MBH)
Retail	289,243	10	2,892,430
Residential	1,627,475	10	16,274,750
Large Office	1,672,054	30	50,161,620
Small Office	273,635	0	-
Institution	600,524	10	6,005,240
Civic	61,689	10	616,890
Hotel	354,551	30	10,636,530
Parking	800,000	0	-
Totals	5,679,171		86,587,460

Please feel free to call me directly at 703-376-5226 if you have any questions on this matter.

Very Truly Yours,

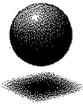
W. Richard Staudinger, PE
CH2M HILL

Acknowledgment of system general layout as shown:
(DC Water - Stormwater)

 6/12/12
Signature Date

CC without attachments: Mr. Feras Qumseya, DMPED
Mr. Ethan Warsh

Attachments: Stage 1 & Stage 2 Utility Concept Plans
Proposed Typical Cross Sections



CH2MHILL

CH2M HILL

15010 Conference Center Dr

Suite 200

Chantilly, VA 20151

Tel 703 376 5000

Fax 703 376 5010

May 14, 2012

Mr. Roger Gans
DC Water
5000 Overlook Avenue, SW
Washington, DC 20032

RE: St Elizabeths East Campus Conceptual Infrastructure Plan
Request for Acknowledgement of Concept Plan and Typical Sections

Dear Mr. Gans,

Please find attached the conceptual infrastructure one line diagram for the proposed potable water system and typical utility sections as have been revised based on your input at our April 18, 2012 workshop held at our office in Washington, DC. As we explained at the workshop, our client, the Deputy Mayor's Office of Planning and Economic Development (DMPED), is moving ahead with two proposed stages of construction on the east campus of St Elizabeths and will ultimately develop approximately 5 million SF of new and adaptive reuses on the site. All these facilities will require a new public infrastructure system of roadways and utilities to properly serve the new mixed use buildings and sites. Upon completion of the work, all facilities will be located in DDOT Right-of-way.

At this point we are developing a concept plan for all the future infrastructure systems and are soliciting your concurrence that the proposed locations on the attached material, subject to final design and verification of offsite capacities, are in general compliance with your system requirements. We need this acknowledgement before our client, DMPED, would be able to move ahead with preparing preliminary construction plans and specifications for the infrastructure systems.

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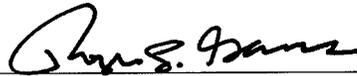
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Very Truly Yours,



W. Richard Staudinger, PE
CH2M HILL

Acknowledgment of system general layout as shown:
(DC Water - Water)


Signature

5/30/12
Date

CC without attachments: Mr. Feras Qumseya, DMPED
Mr. Ethan Warsh

Attachments: Stage 1 & Stage 2 Utility Concept Plans
Proposed Typical Cross Sections



CH2MHILL

CH2M HILL

15010 Conference Center Dr

Suite 200

Chantilly, VA 20151

Tel 703 376 5000

Fax 703 376 5010

May 14, 2012

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DC Water
5000 Overlook Avenue, SW
Washington, DC 20032

RE: St Elizabeths East Campus Conceptual Infrastructure Plan
Request for Acknowledgement of Concept Plan and Typical Sections

Dear Mr. Gans,

Please find attached the conceptual infrastructure one line diagram for the proposed wastewater system and typical utility sections as have been revised based on your input at our April 18, 2012 workshop held at our office in Washington, DC. As we explained at the workshop, our client, the Deputy Mayor's Office of Planning and Economic Development (DMPED), is moving ahead with two proposed stages of construction on the east campus of St Elizabeths and will ultimately develop approximately 5 million SF of new and adaptive reuses on the site. All these facilities will require a new public infrastructure system of roadways and utilities to properly serve the new mixed use buildings and sites. Upon completion of the work, all facilities will be located in DDOT Right-of-way.

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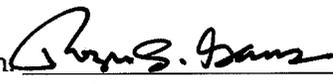
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Very Truly Yours,



W. Richard Staudinger, PE
CH2M HILL

Acknowledgment of system general layout as shown  5/30/12
(DC Water - Wastewater) Signature Date

CC without attachments: Mr. Feras Qumseya, DMPED
Mr. Ethan Warsh

Attachments: Stage 1 & Stage 2 Utility Concept Plans
Proposed Typical Cross Sections



CH2M HILL
15010 Conference Center Dr
Suite 200
Chantilly, VA 20151
Tel 703 376 5000
Fax 703 376 5010

May 14, 2012

Mr. Gabor Varsa
Verizon
13101 Columbia Pike FDC-1
Silver Springs, MD 20904

RE: St Elizabeths East Campus Conceptual Infrastructure Plan
Request for Acknowledgement of Concept Plan and Typical Sections

Dear Mr. Varsa,

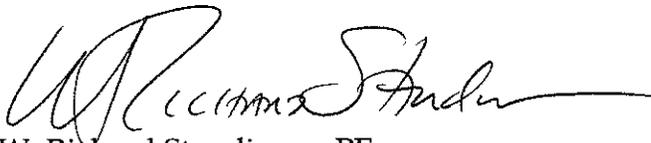
Please find attached the conceptual infrastructure one line diagram for the proposed IT/Communications system and typical utility sections as have been revised based on your input at our April 18, 2012 workshop held at our office in Washington, DC. As we explained at the workshop, our client, the Deputy Mayor's Office of Planning and Economic Development (DMPED), is moving ahead with two proposed stages of construction on the east campus of St Elizabeths and will ultimately develop approximately 5 million SF of new and adaptive reuses on the site. All these facilities will require a new public infrastructure system of roadways and utilities to properly serve the new mixed use buildings and sites. Upon completion of the work, all facilities will be located in DDOT Right-of-way.

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Very Truly Yours,



W. Richard Staudinger, PE
CH2M HILL

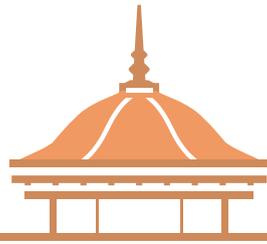
Acknowledgment of system general layout as shown:
(Verizon)



5-22-2012
Signature Date

CC without attachments: Mr. Feras Qumseya, DMPED
Mr. Ethan Warsh

Attachments: Stage 1 & Stage 2 Utility Concept Plans
Proposed Typical Cross Sections



St Elizabeths East

