Identification of Plan Boundary / Project Limits

The project area is located in the City of Sunbury, PA in wards 1 and 3. The northern project boundary is at Race Street and the southern project boundary is the proposed fish ladder at Garringer Street. The eastern project boundary is Front Street with the Susquehanna River being the western boundary. This area encompasses approximately 17 acres. Also associated with the project is an additional 7 acres surrounding the interchange of S.R. 147 and S.R. 61 near the southern project boundary.

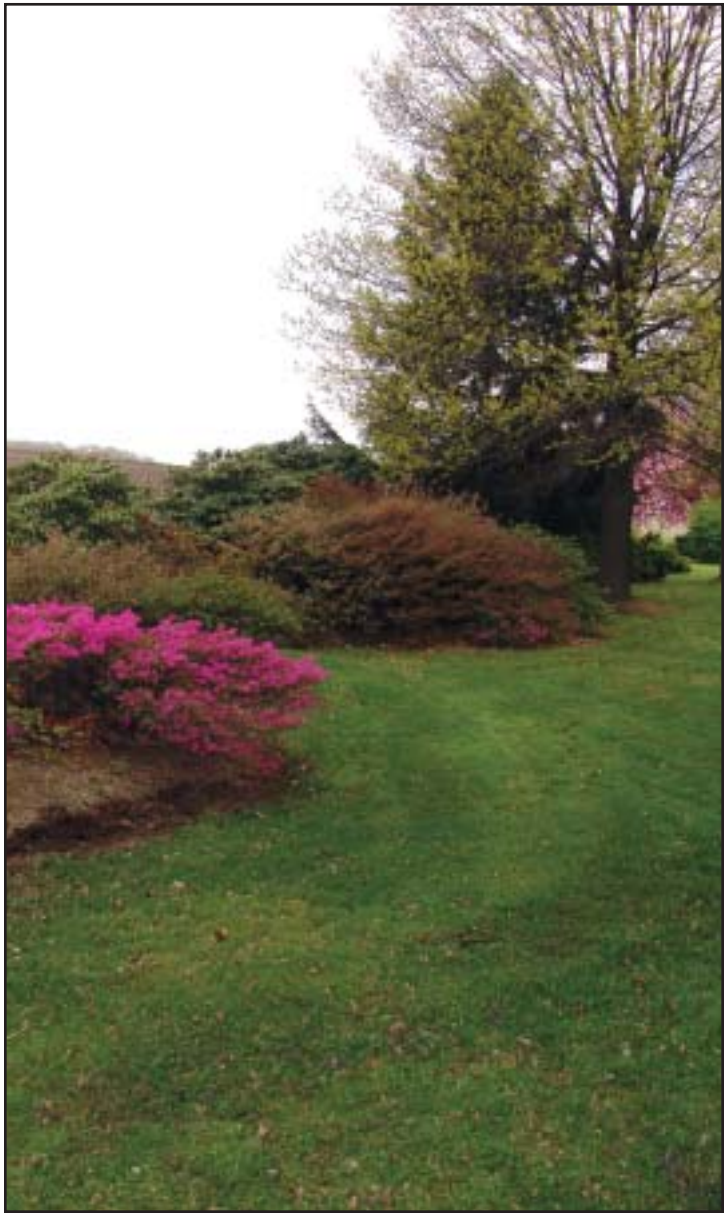
Description of Existing Conditions / Features

The project area is situated along the eastern bank of the Susquehanna River approximately 3500' south of the confluence of the North and West Branches of the Susquehanna River. The flood control wall divides the site into two distinctive portions, land side (east of the flood wall) and river side (west of the floodwall).

The land side topography can be described as generally flat with gentle slopes. The river side of the flood has level terraces created by the existing WPA stone walls and foundation for the flood wall that steps down to the river bank, with some high and steep slopes.

The land side portion of the project is currently zoned as open space (OS1) and is acting as a passive recreation area. The major land use adjacent to the site (on the east side of Front Street) is residential. The City's central business district is located on Market Street focusing on the town green of Cameron Park. Many of the residences within the city retain the historic vernacular architecture of Sunbury. Several of these structures have withstood many floods, as they predate the flood wall. During the 1930's the Works Progress Administration (WPA) constructed a wall along Sunbury's waterfront, which today is found on the river side of the US Army Corps of Engineers (ACOE) floodwall constructed in the 1950's. Varying in size and proportion, the WPA wall was constructed of dry laid stone. This wall can still be seen for most of the project's length. Many portions of the wall are beginning to be undermined by the erosion impacts created by Lake Augusta. This erosion is resulting in sections of the WPA wall that are failing and are in need of repair, removal or replacement. Other portions remain intact.

Flood wall along Front Street.



Plantings at Merle Phillips Park.

The land side of the project area is a well manicured landscape containing many mature trees, shrubs and perennials. Lawn extends the entire length of the project creating the existing park setting. The major park constraint is the floodwall that it blocks views and easy access to the river from the city.

The 100 year plain is defined by the flood wall location. The river side of the flood wall has been subjected to flood events. Because of the flooding the existing vegetation that remains is weathered. No wetlands are known to exist in the project area.

A Pennsylvania Natural Diversity Inventory (PNDI) search was conducted that resulted in two (2) potential impacts. These two potential impacts fall under the jurisdiction of the PA Department of Conservation and Natural Resources and the PA Fish & Boat Commission. These agencies should be contacted during preliminary engineering to determine what these potential impacts may be, and what steps will need to be taken to mitigate those impacts, if any. The PNDI Receipt which outlines these steps can be found in the report appendix.

The land side of the project can be accessed from any point along Front Street. The intersection of Front and Market Streets has a traffic light and a formal pedestrian crossing. Existing sidewalks that run from Arch Street to Church Street on the east side of Front Street provide access into Merle Phillips Park. There are no other formal pedestrian crossings on Front Street. Access to the river side of the project area is more limited. There are five existing metal stairwells that cross up and over the flood wall. There locations are at: Pennsylvania Avenue, Pine Street, South Street, and two located between Slough and Garringer Streets. There are two existing vehicular ramps located at Chestnut Street and one at the proposed Fish Ladder site near Garringer Street. These access points do not currently meet ADA standards. Because of the limited access to the riverside of the site, it receives limited use.

The existing flood control system of that protects Sunbury is a combination of 2.5 miles of flood wall, 2.4 miles of levees and several pumps monitoring stations. This system has evolved and been improved over the course of 60 years to protect the City from flooding. The largest component of the Sunbury protection flood protection system is the flood wall. There are two basic flood wall types, the T wall that averages 19' tall and 'I' wall which average 12' tall. Currently there are 6 openings in the current flood control system. These opening have been tested several times and have proven to be reliable against event floods. An independent evaluation of the flood wall was performed in 2002 by Civil & Environmental Consultants, Inc. who observed that the flood wall appeared to be in very good condition and recommended only minor drainage improvements be done to address seepage at specific locations.

Site Analysis - Opportunities & Constraints

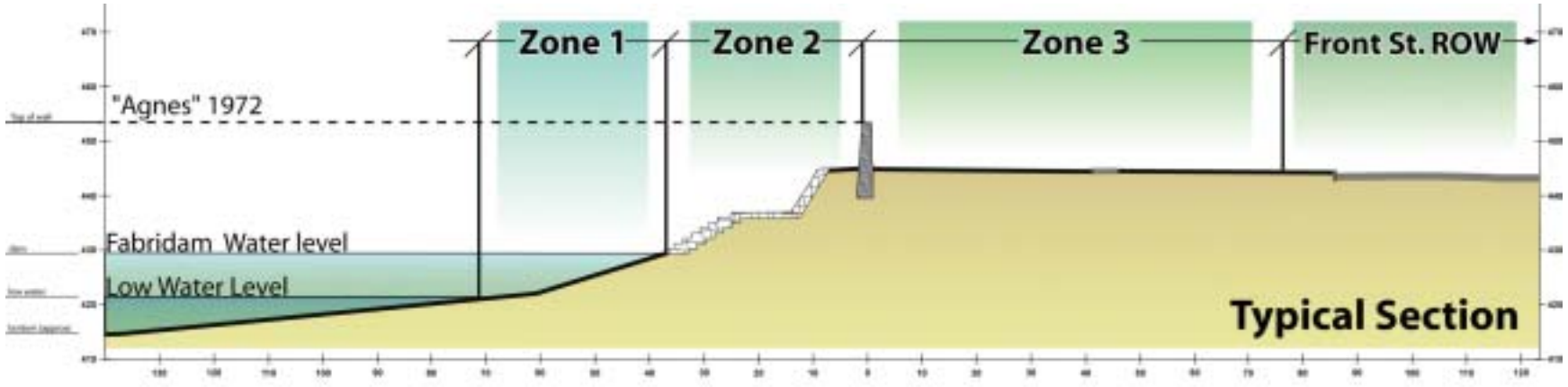
The approximately one mile long project area can be subdivided into three distinct ‘zones’, each with different opportunities and constraints for proposed design elements.

‘Riverfront Zone 1’ is the strip of land between the low water line and the high water line created by the fabridam and Lake Augusta. The seasonal inundation of Lake Augusta accelerates the riverbank erosion and prohibits any vegetative growth. This ‘zone’ is the most critical riverbank stabilization priority.

‘Riverfront Zone 2’ is the area of land between the normal high water mark created by Lake Augusta and the existing flood protection wall. This zone is subject to periodic flooding. This zone contains slopes and terraces of land created by the WPA wall with limited vegetation. Aside from the space provided above the former railroad abutment wall near Chestnut Street, there are no spaces large enough for any form of active recreation facilities other than a walking trail. Proposed design elements as well as any proposed vegetation within this zone will need to be able to withstand potential damage from floating debris, ice flows and other conditions created by the periodic flooding within this zone.

‘Riverfront Zone 3’ is the area of land between the existing flood control wall and the Front Street right of way. This zone is characterized as mostly level land that is completely protected from flooding by the flood wall. This zone provides for unlimited planting opportunities and redevelopment potential. The only limitation within this zone is the available width provided between the flood wall and Front Street. The area between Race Street and Walnut Street provides the most opportunity for improvements. The park space south of Walnut Street is relatively narrow and will only allow for the placement of a sidewalk or trail, landscaping, and amenities such as benches.

Site analysis zones.



Fabridam deflated looking across to the proposed fish ladder site.

Riverbank Stabilization Needs

It is natural for all rivers to have fluctuating water levels. This is typically due to natural runoff events such as rainstorms or snowmelt. These events increase water surface elevations for a short period of time (24 hours or less) then recede. Typically flows in the river are highest in the spring and lowest during mid-summer. Normal and river fluctuations allows for the establishment of riparian vegetation that naturally protect and stabilize riverbanks.

However, within the project area, water elevations also increase for a second reason; the annual inundation from backwater created by the Adam T. Bower Memorial Dam completed in 1970. This structure is an inflatable fabridam that creates the approximately 3,000 acre Lake Augusta typically between Memorial Day and Labor Day. This prolonged inundation hinders the growth of riparian vegetation, promoting instability within the soil matrix. As the dam is deflated in the fall, the rapid drawdown weakens the soil and promotes erosion, which has caused the loss of shoreline.

Initial field reconnaissance along with discussions with representatives of the City of Sunbury indicate that there are three areas within the project area in need of stabilization/ protection:

- Within the yearly fluctuation pool of Lake Augusta
- The WPA wall
- Between Lake Augusta and the Flood Wall

Although all three of these areas are impacted directly by the Susquehanna River, they require different designs to mitigate erosion and instability, and provide long term protection and stability. Each of these three areas are discussed below:

Within the yearly fluctuation pool of Lake Augusta - As stated previously, this zone is inundated annually from the backwater created from the Adam T. Bower Memorial Dam.

Over the 35 years that the dam has been in place an estimated 45 feet or approximately 26,000 cubic yards (conservative estimate) of riverfront has been lost. Recent estimates from the Municipal Authority Flood Control Department indicate that approximately 18 inches of riverfront is lost each year. The PA DCNR has been able to reduce the rate of erosion somewhat by altering the operation of the Fabridam. However, continued inundation by Lake Augusta will continue the loss of riverfront.

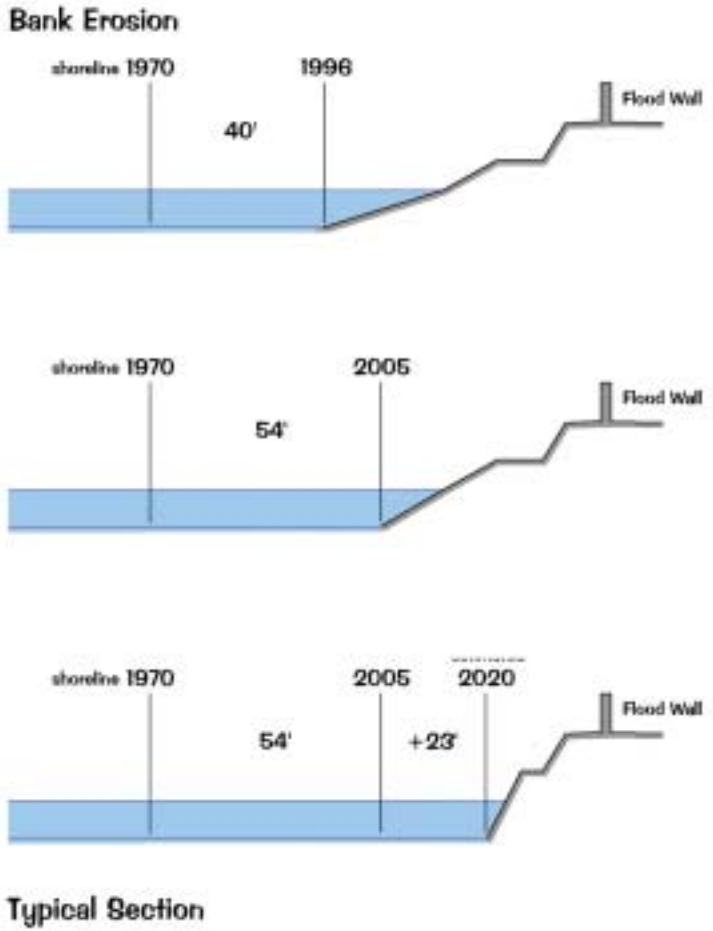
If this instability and erosion is allowed to continue the loss of riverfront will persist, further impacting the WPA wall and ultimately the Floodwall.

The WPA wall – This area can be divided into to sub-areas; the area upstream of Market Street and the area downstream of Market Street. The area upstream of Market Street appears to have been more directly impacted by inundation of Lake Augusta than downstream.

Upstream of Market Street, there is evidence of wall instability. According to discussions with representatives from the City of Sunbury, the normal pool elevation of Lake Augusta is in close proximity to the base of the wall. This inundation along with lake wave action has undermined the base of the wall resulting in instability and in some instances total collapse. It is estimated that approximately 20 percent of the WPA wall in this sub-area will need to be repaired or replaced. However, the actual amount of repair or replacement cannot be determined without detail field investigation and analysis. That analysis will take place during preliminary engineering. Additionally, the entire base of the wall in this sub-area should be stabilized and protected against future undermining.

Downstream of Market Street, the WPA wall is presently outside the inundation area of Lake Augusta. The wall in this area appears to be more stable and therefore requires minimal repair.

Between Lake Augusta and the Flood Wall - This area is inundated by less frequent flooding. River levels in this area raise and lower relatively quickly and is protected by a variety of vegetation such as grasses, scrub shrub and trees. Although this area appears to be more stable than others it has a tendency to collect natural and man-made debris during a flood event.



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